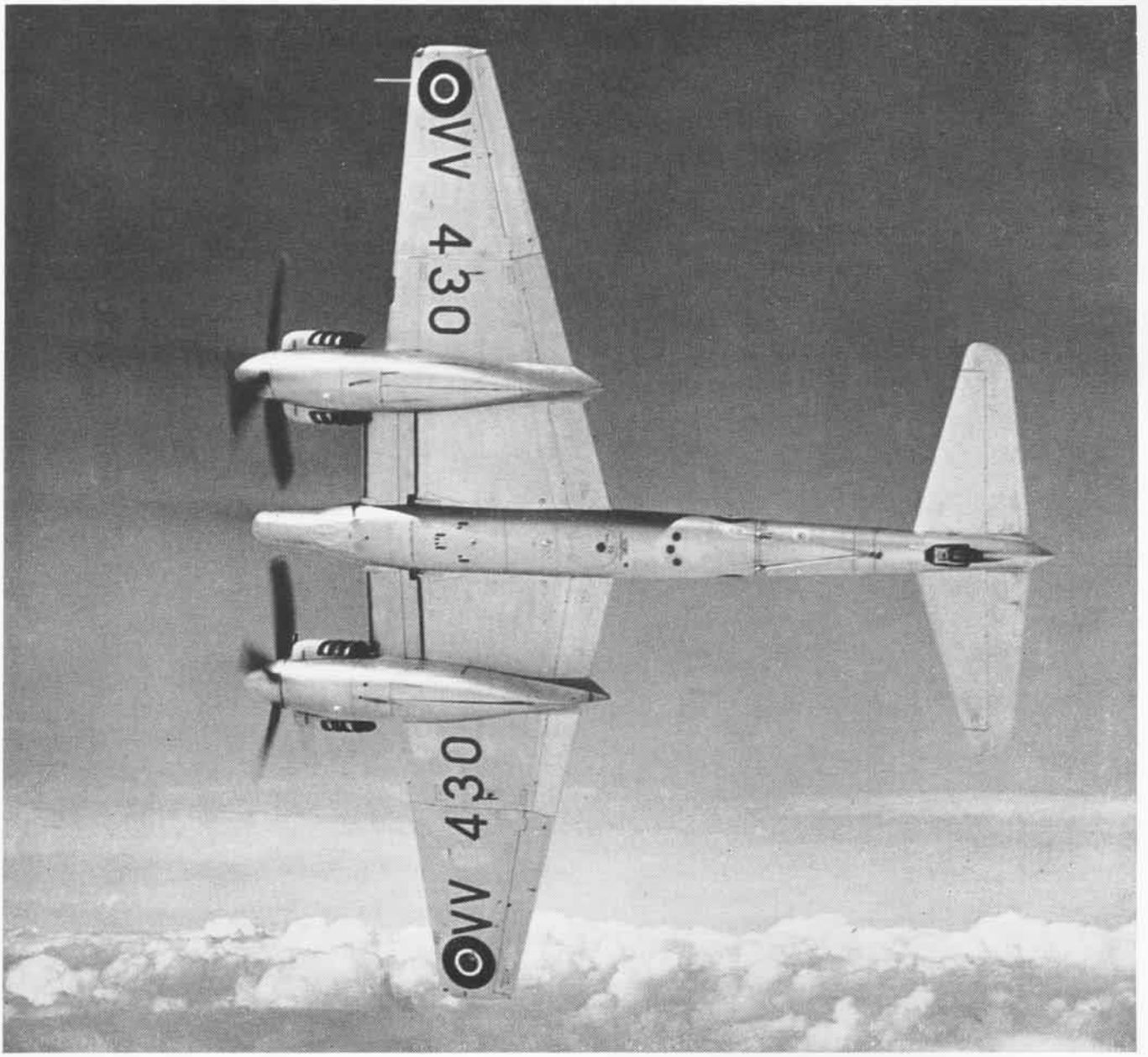
NAVAL AVIATION NEWS

RESTRICTED

Models That Fly
Bailout Testing
NavAer 00-75R-3

November 1948

RESTRICTED



CURVES AND ANGLES

Friendly planes? The top one is a high-speed carrier-based fighter, but whose? Under the behemoth shown below is a PB4Y-1, no less. *Answers are on the last page.*

BAIL OUT!

ONE OF the Navy's new jets cruised along at 200 knots near NAS PATUXENT RIVER. A flash of white whipped past the pilot's head. His sleek blue plane shuddered as a heavy jolt hit it.

Looking back, the pilot saw his rudder was gone, sheared off by the seagull whose body had struck it. He zoomed the plane up from 2,000 to 11,500 feet.

Opening the canopy, he pulled the safety belt and shoved the stick forward. He found himself floating in the air alongside the plane, his right arm injured from hitting the cockpit on the way out.

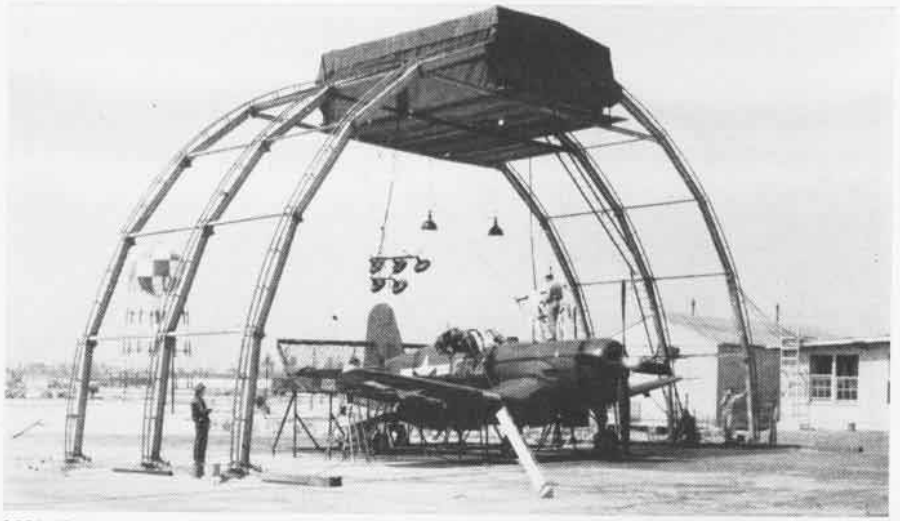
He was lucky. The Navy's flight safety files are full of case histories of other pilots who bailed out in flight, men who lost a leg on a stabilizer, who were frozen in the cockpit by centrifugal force and crashed with their planes, or whose chutes tangled in the rudder and carried them to their death.

During the war 5,000,000 parachute jumps were made, counting paratroopers. Techniques of bailing out of troop-carriers were well worked out. The question of how to get out of a crippled fighter or torpedo bomber was the subject of heated and long arguments.

In 1947, Bureau of Medicine and Surgery and the Fleet Marine Force at Cherry Point launched a year-long scientific ground investigation of bailout techniques. It sent 245 different Marine aviators over the side in 1,865 simulated bailouts to see what happened when they hit the slipstream and what fouled them up when they ran into trouble.

Planes used in the tests were the F4U, F6F, F7F, SB2C, F8F and SNJ. High speed movies recorded every move made by the pilots in 1,227 of those bailouts. They were analyzed to find the good and bad ways of getting out of a cockpit in a hurry. Pilots wore full flight clothing with headset, goggles, oxygen masks and other "entanglements". Seat or back-type chutes were worn. In many cases these proved the worst danger to the pilot because they fouled with the cockpit opening or caught on projections.

Engines turned up to give slipstreams of 100 to 140 mph. A sizeable rope net woven by station firemen caught the men as they leaped from the aircraft.



CORSAIR ANCHORED UNDER FLOODLIGHTS FOR TESTS; CAMERAS WERE INSTALLED ON TOP HANGAR

THE OBJECT of the Cherry Point tests was threefold:

1. To find methods and minimum time of escape from various plane types and the value of routine training in escape procedures.

2. To determine equipment and plane structures most often fouled, as well as other factors causing delay and/or injury.

3. To ascertain any modification of flight clothing and equipment, as well as design and location of related structures within the aircraft to cut down on hazards.

As a result of findings in the third item, BUAER has designed a connector for the mike cord, G suit airline, oxygen line, and heated suit wire, which places them all in one tube. This eliminates the multiplicity of odd wires which often got tangled with shoulder harness or chute straps in an emergency. More details on this item are contained later in this article.

One of the best ways of starting an argument among naval aviators is to ask someone the best way to bail out of a plane in flight. Most pilots agree that the easiest way is to fly the plane at slow speed, straight and level, then go over the side, hugging the fuselage as closely as possible. Some declare the earphone cord should be disconnected before jumping; others state it will come loose itself with no strain when the pilot leaves. What did the Marine tests show? Numerous pilots said they sustained jerks from the cord, some painful. The new Navy connector will free all personal gear connections with one motion when the safety belt is unbuckled.

The biggest fault of most pilots bailing out is jumping too high out of the cockpit and striking the rudder or stabilizers. Rolling fighters, dive bombers and torpedo bombers upside down and bailing out has not proved successful and is not recommended by many authorities, although many a man owes his life to this technique. A lot who used the system are dead, too.

PILOT JUMPS TOO FAR OUT ON AIRPLANE WING

Another piece of advice given pilots in trying to bail out while in a spin is to go over the side of the cockpit on the inside of the spin. This is easier said than done. Flight safety records show numerous cases like the following:

"Ens. J———, flying an AD-1, tried to bail out on the inside of a spiral but the force was too great. He was forced to go out on the outside. Stabilizer struck the pilot in the process, resulting in amputation of right leg about six inches below the knee."

Or:

"Lt. (jg) C——— in midair collision at 5,000 feet in an F6F. Right wing of *Hellcat* gone and plane went into violent spin to left. First thought was to get out on inside of spin . . . couldn't even move head to the left. Had to go out on outside. Goggles blew off. Parachute pack caught on the side of the fuselage and had to kick himself free. Left shoe came off."

WHAT WERE some of the findings from the Cherry Point experiment? The official report on it sets forth these in summary:

1. The best method of exit was demonstrated to be complete disconnection followed by a vault from the seat and/or floor, aimed low and perpendicular to the path of the plane.

2. There was a wide individual range in escape times and there was a difference in escape time in various cockpits; the larger the cockpit, the faster the escape.

3. There were nine failures to escape and 43 hazardous delays. Most frequent cause was the fouling of the parachutes and/or pararaft kit.

4. No failure to escape was caused by failure to completely disconnect.

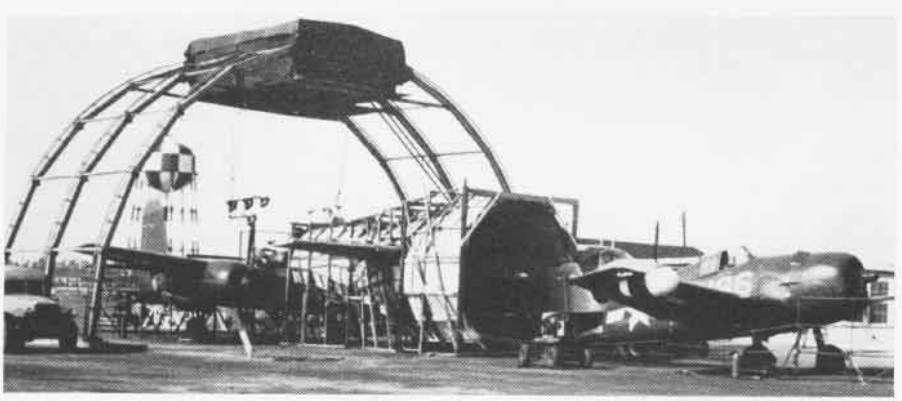
5. Pilots saved two to five seconds by not disconnecting completely but increased their chances of fouling the tail surfaces. The connections pulled free but frequently did so with rather forceful jerks. Several pilots complained of pain as the headset cord was pulled free.

6. It made no difference whether the pilot was left-handed or right-handed nor on which side of the fuselage he bailed out.

7. Goggles were ripped off by the slipstream.

8. Certain parachutes seemed to be better fitted for certain planes.

9. The most frequent opinions given by participating pilots were the training value of such a procedure and the need for a single, quick multiple disconnect. This



HELLCAT (RIGHT) COOLS ENGINE OF MARAUDER (CENTER) WHICH GAVE SLIPSTREAM TO AN F7F

latter BuAer is developing. The air training command incorporates practice bailouts in the training of cadets.

The BuMed experiment idea was conceived in 1945 to get information because of the relatively high incidence of injury during and immediately after escape from aircraft and the lack of data on procedures.

Planes used for the test were restrained by cables on the ground, with tails elevated in normal flight position. Slipstream was furnished by the plane's propeller at 2200 rpm. Remote control cables enabled the engines to be throttled back after each leap. Cameras were located in the housing atop the skeletonized nose hangar girders (*see photo*) and floodlights used to aid in photographing each jump. Timing devices also were included in the pictures to give time lapse.

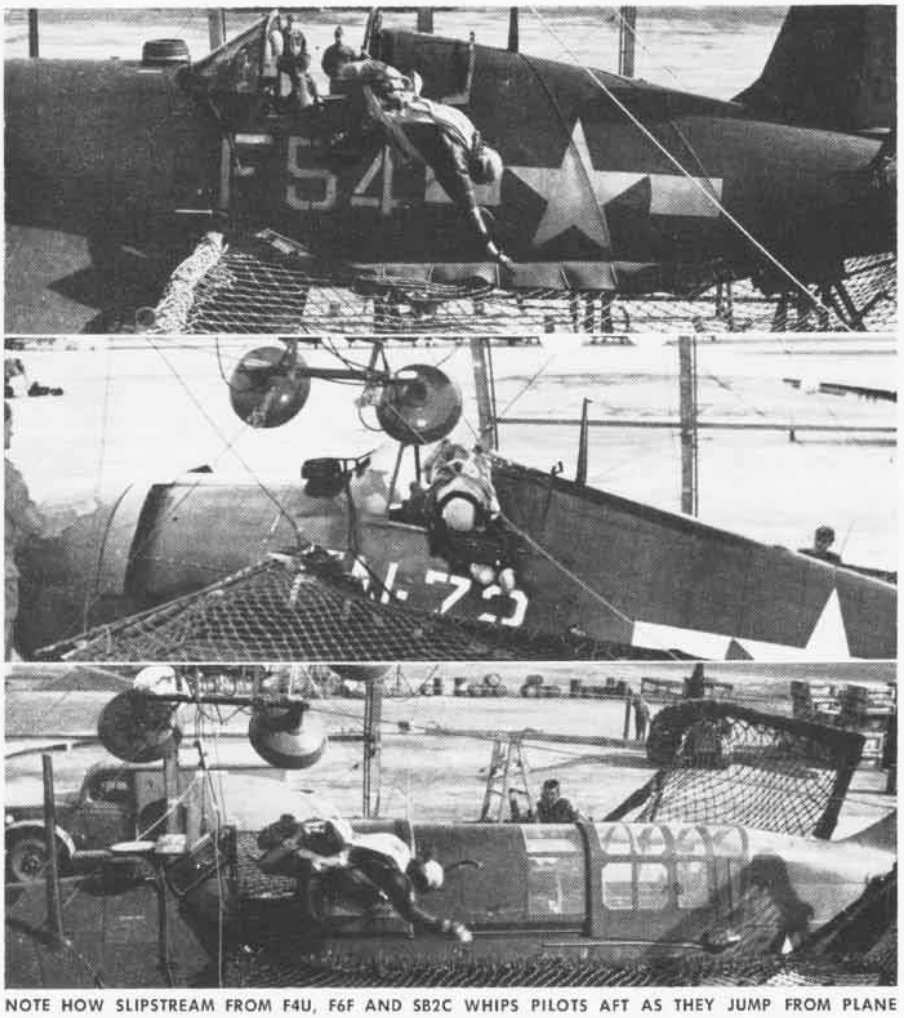
The F7F raised a problem because the pilot would have to bail out near the propeller. Slipstream in this case was supplied by a JM in a wind tunnel. Because this *Marauder's* engines tended to heat up, an F6F was place ahead of it to cool it (*see photo pg. 2*).

Pilots found the best way to get out was to vault from the seat or floor, keeping the head and shoulders as low as possible and sliding down the side of the fuselage. After rising from the seat by pulling up with his hands on the windshield, he turns to the side of his exit, keeping as low as the cockpit permits, placing hands on the rim of the cockpit and pulling, at the same time springing from the seat or floor straight out, perpendicular to the path of the plane and aiming low.

The reason for the snappy, powerful spring at right angles to the path of the plane is to make possible better clearance of the parachute. The slipstream quickly deflects the pilot and he may pivot on the leading edge of the canopy. In small cockpits this may cause disastrous jamming of the parachute diagonally across the cockpit opening, the pararaft may wedge against the windshield or the pilot's foot may temporarily hang on the rim of the cockpit. These things happened repeatedly in the tests.

Analyzing the jumps, BuMed found that 242 jumps from F4U's took an average of 10 seconds. It took 12.5 seconds for men to clear the F6F cockpit, and the same for the F7F. The F8F tests took 13 seconds, the SB2C 10 seconds and the SNJ 6 seconds, probably because of its larger cockpit opening and less gear in the cockpit. About two-thirds of the time in each escape was consumed disconnecting gear and the rest in the actual bailout.

The test officials found that pilots tended to escape faster as they became more experienced. Most of the men made eight jumps. The range of time it took for the men to get out varied greatly. Shortest time out of an F4U was 4.5 seconds and the longest took 27 seconds. One pilot zipped out of an SNJ in 2.9 seconds in one test and the slowest took only 9 seconds. The average pilot made jump #8 three seconds faster than it took him to make his initial leap.



NOTE HOW SLIPSTREAM FROM F4U, F6F AND SB2C WHIPS PILOTS AFT AS THEY JUMP FROM PLANE

In the F4U and F6F pilots were asked to completely disconnect their fittings, while in the rest the pilots made four jumps completely disconnected and four after opening the canopy and unfastening their safety belts. There were no failures to escape because of failure to completely disconnect. However, there were five cases in which the shoulder harness caught in the chute harness and held up the pilots as much as five seconds. For this reason, it is considered good practice to throw back the shoulder harness. Few pilots did this.

There were 12 pilots in the tests who had previously bailed out in actual flight, 10 once and 2 twice. Nine of these 12 believed this type of training was invaluable, while three did not. The men were not briefed on how to bail out, but most of them put one foot on the side of the cockpit, although the vault method proved faster. Examiners believe that previous bailouts had no bearing on the men's ability to abandon plane fast. They were, however, more appreciative of the tests and slightly more deliberate in their motions. The difficulty appeared to be that they could not recall the details of their previous bailouts made under stress.

There were 52 failures and delays in escape in the 1865 jumps observed. Of these nine failed completely to escape. Forty-one were delayed by parachutes or pararaft kits wedging or catching inside the cockpit.

Those things happen every day too. Lt. (jg) F——— in an SB2C had to do something quick when his cockpit filled with smoke recently. He tried to bail out but could not free himself from the cockpit as the parachute caught in some unknown manner. At 400 feet, he gave up trying to get out and made a water landing. Another pilot in an F4U caught his foot under the rudder pedal while trying to bail out in a spin and almost went with his plane.

A number of jumpers in the Cherry Point test had difficulty in getting out

BAILOUT BY LT. CDR. JAMES SMITH AT JACKSONVILLE DEMONSTRATES HOW JUMPING LOW HELPS ESCAPING PILOT TO MISS ELEVATORS OF F7F

of the small F7F and F8F cockpits. They found it necessary to rise up in the slipstream before they could turn around and dive overside. As they tried this the back chute caught on the canopy. Three accidentally pulled their ripcords. Some bailout "experts" have told pilots to stand up in their cockpits and pop their chutes if they want to escape. One student at a training station tried this technique in a *Yellow Peril* and rode it into the ground because the shroud lines tangled in the rudder.

The type of chute used had an effect on escape times. Testers found men with QAS chutes got out faster than those with seat service in the F4U. In the F6F the reverse was true. Putting a pararaft kit on the chute almost doubled the escape time from the F8F because of its smaller opening. Backtype chutes worked best in the F7F and F8F.

The investigation showed that the pilot's size and weight had no apparent effect on how fast he got out of the cockpit. It showed that indecision on the pilot's part, even though he knew he was going to bail out, and wasted motion slowed down the bailout times in many cases.

TEN JUMPERS experienced difficulty in clearing the F7F front cockpit. Because of the smallness of the cockpit, many pilots found it necessary first to rise up in the slipstream before they could turn around. As they attempted this the back parachute rubbed and caught on the slight projection of the canopy leading edge.

Three pilots accidentally pulled their ripcords. There undoubtedly would have been more of these cases had the rings not been tied down by the investigators. The right parachute riser of one pilot in an F4U caught around the top stop of the seat adjustment level. As the pilot rose up he was held in a semi-raised position. This pilot never discovered what fouled him.

One other failure was caused by the pilot's foot catching on something in the cockpit of the F8F. There was one case in the SB2C where the pilot's foot slipped from the rim of the cockpit opening and temporarily caught in the front angle adjoining the windshield.

There were four pilots who jumped too high and struck the aerial on the *Corsair*. This was clearly a case of poor technique. There were five cases in which the shoulder harness fouled the escape momentarily. The harness was not thrown back by the pilot in any of these cases. It is believed that the harness hardware temporarily caught on the parachute harness aided by the added friction of the straps passing over the pilot's shoulders.

The test officials made numerous body measurements of pilots to see if the length of their legs and arms had any effect on their bailout ability. The survey failed to show any connection with their technique.

As a result of findings at the MCAS CHERRY POINT experiments, the Navy is procuring three types of connectors to eliminate the multiplicity of wires and tubes connecting the pilot to his radio and survival gear.

Douglas Aircraft Co., is manufacturing one type (*see photo*) with a nylon "sock" enclosing the wiring and tubing leading from the oxygen, G suit, heated suit, microphone and headphones. The lower end of the tube plugs into the console in the plane at the side of the pilot's seat. By merely standing up, the pilot can disconnect the

THIS PILOT FAILED TO KEEP BODY DOWN LOW

PUTTING FOOT ON COCKPIT RAISES PILOT UP

THIS PILOT HAS CORRECT METHOD OF BAILOUT

DISCONNECT EARPHONE CORD TO PREVENT JERK

plug and is free to bail out. The tube stays with him. This type will be in the AD-2 and F3D aircraft.

The second type is being made by Chance Vought Aircraft Co. for use in the F6U, F9F, F2H and F7U jet fighters. It is a composite quick disconnect which can be used with planes having pilot-ejection seats or without them. This type has two disconnects, on the console and on the chest portion of the tube. It attaches to the harness or flight suit by a spring clip.

Neither of these types is government furnished equipment. Best features of these designs are being incorporated in the third type which BUAER expects to have in production about 18 months hence. This connector will hitch onto the safety belt near the buckle. Chance Vought will manufacture this model also.

ALL THREE types are designed to simplify the entangling wires and tubes which might conceivably halt or delay a pilot when he tried to bail out of his plane or to use his ejection seat.

In the BUAER type, all of the connections are released by one simple motion already familiar to pilots—releasing the safety belt. Good features of this type of connector over the present system in cockpits include:

1. It quickly disconnects the pilot from all of his plane connections when the safety belt is released.

2. Reduces escape time 100%.

3. Prevents equipment entanglements during escapes where the pilot either willfully failed to complete disconnections or did not have time to do so.

4. Centralizes connections formerly scattered throughout the cockpit, thereby making more room in the cockpit. The connector is situated at the waist level where the bulky anti-G and heating suit connections will be the shortest and most out of the way.

5. Puts pilot's connections in a comfortable out-of-the-way position, reducing entanglements and annoyances in flight.

6. It is easily adaptable to the ejection seat through use of the seat release. It makes possible use of oxygen with the initial descent in the ejection seat, since a valve can be placed to cut in a small oxygen bottle fastened to the bottom of the seat for initial descents through very high altitudes.

WHEN IT is desirable to leave the ejection seat in midair, the master lever of the belt release will free him in one motion. The minimum number of motions to achieve this is to be desired while the pilot is tumbling through the air in his seat. It is also desirable to have all of the pilot's gear secured in such a manner that no portion will further endanger him while he is riding his seat to the ground.

Need for such a quick disconnect type of release became apparent with first practice bailouts in the Cherry Point research project. The first pilot to bail out, Lt. Olen H. Price, made a prototype of the release later adopted by BUAER for its design.

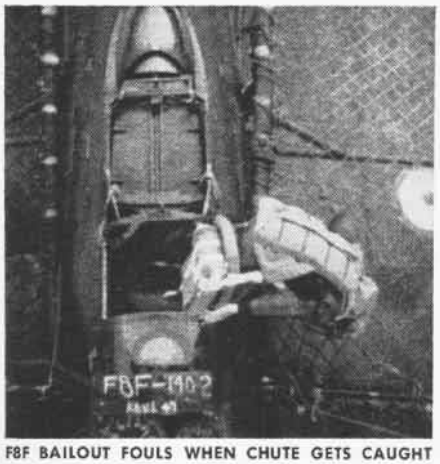
The problem of bailing out, as studied at Cherry Point, is, of course, concerned

DOUGLAS-TYPE GEAR CONNECTOR CUTS JUMBLE

only with low speed flight. In the case of 500 mph jets, no pilot will be able to go over the side and use his chute. Impact with the lethal airstream and deceleration probably would kill him instantly. No parachute can withstand the opening shock at those speeds, either, since about 250 mph is the best any service type now can withstand.

To meet this situation, the Navy is developing ejection seats which will catapult the pilot high in the air above his plane. A chute on the seat will open and he can ride it down to safer altitudes and then use his personal chute. Another approach being studied is design of the airplane so that the whole nose section, complete with pilot and seat, can be jettisoned in an emergency. The pilot will get out of his "capsule" after it decelerates.

Several of the newer Navy jets incorporated ejection seats but only the Douglas *Skystreak* is designed around the jettisonable nose section. This system of escape has not been actually used to date, although the ejection method has worked at speeds up to 500 mph without injury to the man making the test.



F8F BAILOUT FOULS WHEN CHUTE GETS CAUGHT

SHOULDER STRAPS FOULED THIS PILOT ESCAPE

CHUTE HARNESS CATCHES IN PLANE'S COCKPIT

GRAMPAW PETTIBONE

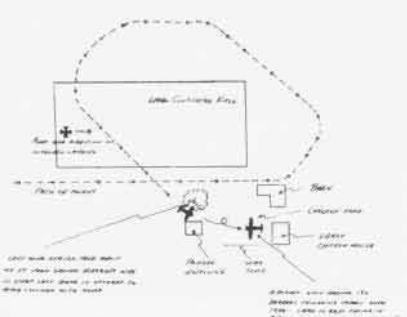
Sometimes I Wonder

The pilot of the SNJ pictured below took off from NAS WILLOW GROVE at 2041 on a round robin night flight and arrived back in the immediate vicinity of the field at 2335 with his scheduled flight completed. He then proceeded to a local area without further clearance and practiced wing-overs and climbing and gliding turns.

At approximately 2400 he turned east to intercept the northwest leg of the Willow Grove Radio Range. It took what he describes as "a long time" to cross the beam and he concluded that he was much farther from the station than he had realized. Since he was down to 20 gallons of fuel, he decided to look for an alternate field rather than attempt to locate Willow Grove, and headed in the general direction of Easton, Pa. When he thought that he was in the vicinity of Easton, he blinked his landing lights and called over the radio requesting runway lights. This proved to be useless inasmuch as there were no airfields in that immediate vicinity which were equipped with radio or lighting facilities.

With 10 gallons of gas left, the Ensign notified his passenger of the situation and of his intention to make a forced landing rather than abandon the aircraft. The passenger elected to stay with the plane rather than bail-out. A small amount of ground fog made the selection of a suitable area difficult, but the pilot turned on his landing lights and located a flat field. After dragging the area the pilot tried to make a 180° turn to the left, hold this heading for about a mile, and then make another 180° to line up his approach. Evidently one or both of these turns was somewhat short of 180 degrees, because he came over the selected area at an angle as shown in the diagram.

Suddenly he saw a group of trees ahead and realized that he would be



unable to clear them. At this time he lowered wheels, cut the switch, and turned off the gas. His landing lights picked up a house directly ahead. In an effort to avoid hitting the house, he put the plane in a 45° bank and collided with the trees in that attitude. The SNJ spun around approximately 180 degrees at an altitude of about 40 feet and then hit the ground. Both pilot and passenger miraculously escaped injury. The aircraft received strike damage.

Grampaw Pettibone says:

Son, you must wear a horse shoe under each arm pit to get away with a stunt like that!

The errors in this flight are so obvious that I hesitate to go over them. After completing your assigned night flight, you decide to leave the vicinity of the air station and put on a little show for your passenger. Then you forget to keep a close check on your fuel supply. Finally you discover that you've managed to get lost right in your own backyard. At this point I question your judgment in deciding to try a landing at night in unfamiliar terrain and I'm certainly surprised that your passenger was still there. In his place I think I would have bailed out long before.

Dear Grampaw Pettibone:

Your article "Generator Trouble?" in a recent issue reminds me of a similar experience with a happier ending which I had in a JRB in the summer of 1945.

Returning from Hamilton Field in the afternoon to Oakland on a Special NATS flight, I discovered that the wheels were not fully retracted and that the switch had not been returned from the UP position to the neutral position.

I tried to lower the wheels at reduced speed and could not notice any difference in their position or any effect on the performance of the plane. Nearing the field rapidly I released the clutch and wound down the wheels with the hand crank. After several turns the crank became stiff and I was unable to crank any more although the warning lights still indicated an unsafe position of the gear. At this point I started to check the electrical system as best I could. Generators were on and all fuses seemed to be O.K. I even switched lights in the indicators but the red light stayed on.

I buzzed the tower and asked for a visual check and was told that the gear appeared to be fully down. Passengers being aboard prompted me to ask the "Meat Wagon" to stand by. After consulting the copilot, passengers were told of our plight and I started in for my landing.

I came in fast and when I cut the throttles the horn blew. Having a flash view of an inquiry board and a scalding article by Grampaw Pettibone, I poured on the coal and took a "go around." After all, I had plenty of gas and perhaps I could force the gear down with a few "G's."

Wingovers and tight pull-ups proved fruitless, so I released the clutch and found I could get three more turns of the crank. The green light came on and a check of the horn indicated "Gear down and locked." I notified the tower, got a Roger and came in for an uneventful landing.

After rehashing my experience with the boys I was reminded that the clutch should remain *in* while turning the crank. My real embarrassment came the next morning when the plane was hoisted up for a check and it was found that the circuit breaker was open and the only thing necessary to restore functioning of the gear was to push the circuit breaker reset button under the seat.

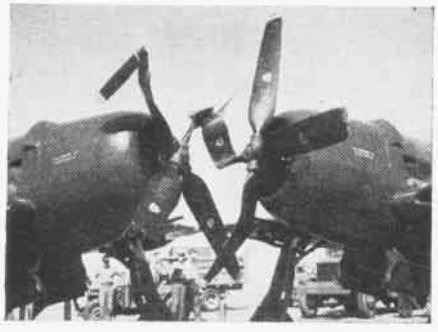
Apparently the cause of failure was leaving the gear switch in the "UP" position too long before returning it to neutral. And the now obvious remedy was the circuit breaker reset button.

I agree with you when you say you need more stories with happy endings, as they may show more light on the probable causes of many accidents.

Sincerely
Lt. A1(L) (Inactive)

Grampaw Pettibone says:

Thanks for this story of a near accident. In the past couple of months there have been three more wheels-up landings in JRB's and SNB's caused by failure to turn on generator switches. Maybe the solution will be to secure the generator switches in the "ON" position with light safety wire.



Uncage Your Eyeballs!

This picture of two *Bearcats* nose-to-nose tells the story of a pure bonehead accident which stopped a flight before it ever reached the runway. A young Ensign in one of the F8F's, Number 8 in the flight, having seen seven other F8F's taxi out to the ramp, rushed out to join his group in the warm-up area. On the way out he ran head-on into an eighth F8F standing by on the far corner of the ramp. When questioned about his part in the accident the Ensign stated: "Sir, I simply didn't uncage my eyeballs."

Grampaw Pettibone says:

How true, how true! You certainly explained the situation clearly and concisely, but you should have uncaged that wooden head on top of your shoulders too. Let this accident be a lesson to you and to others who may get caught in similar situations. The latest batch of taxi accidents shows that the Navy still has in its fold a few throttle-jockeys, brake-stompers, knuckleheads (no relation to swivelheads), and oh yes, a pilot with caged eyeballs!

Dear Grampaw Pettibone:

Here is one I thought might interest you as it is a little out of the ordinary. Recently a plane of this squadron came in for a hard landing nose down. It bounced back into the air and it was clear that the nose wheel had suffered a badly broken leg.

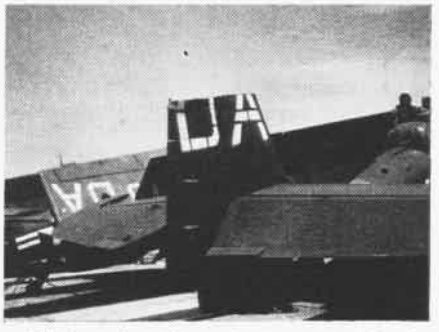
This looked bad! It could mean a major overhaul or at least a minor overhaul when the landing was effected, but not the helicopter Navy. The pilot came to a hovering position at about 10 feet and lowered his crewman by a mechanical hoist carried by all HO3S helicopters. The pilot hovered lower and the crewman pulled the damaged wheel completely off the plane. Then the pilot circled while the crewman erected a barricade 2 feet high, 4 feet wide and 2 feet thick out of 8" by 8" planks and sandbags. These sandbags were not actual sandbags, but sacks of flour, as sandbags were not immediately available and time was at a premium. Following this a normal landing was made utilizing the barricade on the ground in place of the nose wheel.

All this took place 200 miles away from the home base at a small civilian airport. However, flight safety was observed throughout. Due to the initiative of the crewman, the city fire truck and a civilian doctor were in attendance in case of a mishap. After refueling, the plane proceeded to the home base where another safe barricade landing was made, as shown in the enclosed pictures.

Commanding Officer,
Helicopter Utility Squadron Two.

Hey, Where's My Head?

A group of TBM's had completed one simulated glide bombing attack on the western tip of a reservoir in accordance with the briefing for a coordinated attack. When permission was granted to make a second low level attack, the leader of the second division of TBM's started his attack run from the North. Upon reaching the lake, he changed his course to East to enable his division to fly the full length of the lake. At an altitude of approximately 250 feet, he hit a high tension power line strung across the narrow part of the lake between two bluffs. The cable hit the canopy about 4 inches below the top and shattered the windshield and tore a part of the canopy off. In addition, the top half of the vertical stabilizer and rudder were sheared off. The wingmen who were flying in a stepped up position missed the cable.



Flying glass from the impact with the cable cut the pilot's chin, nose and lips. He was wearing a helmet and goggles which saved his eyes from injury. His first impulse was to make a water landing straight ahead, but on discovering that his engine was still running and that he hadn't really decapitated himself, he headed for a nearby emergency strip. The strip looked "Awfully small," and after dropping his wheels and preparing to land he decided to return to his point of departure *100 miles away!*

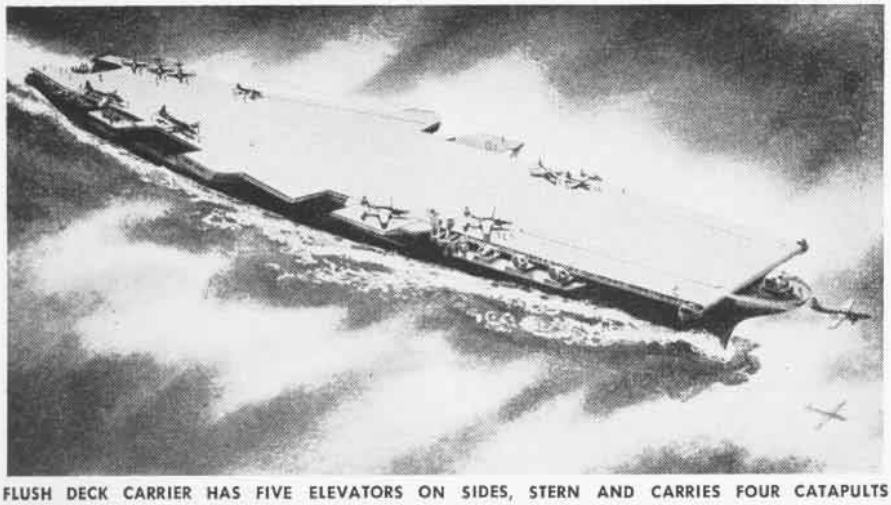
Grampaw Pettibone says:

Looks like you almost became "The Headless Wonder." I think that the blame for this accident can be divided between you and the person responsible for the pre-flight briefing. Although you were not aware of the existence of the cable across the western end of the lake, you should have exercised greater vigilance when you led your division into that area.

In view of the damage to your plane and chin, I think it would have been wiser for you to land at one of the fields nearer the scene of the accident, rather than attempt the 100 mile flight back to your home base. After reading your accident report and looking at the pictures, one of my assistants added this:

There was a young fellow named Bill
Who said, "How's this for a thrill?
If you think that I'm slipping
Take a look at this clipping
I'm one guy who's real hard to kill!"

DID YOU KNOW?



FLUSH DECK CARRIER HAS FIVE ELEVATORS ON SIDES, STERN AND CARRIES FOUR CATAPULTS

Flush Deck Carrier

SOMETHING new in aircraft carrier contours was revealed recently when the Navy released the above artist's conception of the new $124,000,000 supercarrier weighing 65,000 tons which is scheduled to start building late this year or early in 1949.

Designated the CVA-58, it represents design studies which were started in October 1945 and resulted in some 78 different designs being made before acceptance. The carrier will have a 1,030-foot flight deck, 130-foot waterline beam and have four catapults for speedier launching of jets.

The carrier will be built at Newport News Shipbuilding and Dry Dock Corporation. It will be the only operational carrier without the traditional island, although the Navy had two previous carriers, the *Langley* and *Ranger,* which had no islands. Radar and ship bridges will be on telescoping structures.

As shown by the drawing, the four catapults will be located two on the bow in the usual position and two amidships, pointed slightly at an angle to launch planes from after elevators.

Instead of having its elevators in the middle of the deck as in present carriers, the CVA-58 will have them along the sides with a large elevator at the extreme after end of the flight deck. By putting elevators along the sides, greater deck area is available for continuous launching. Jet aircraft because of their faster fuel consumption cannot orbit over a carrier waiting for squadron mates to join up. The Navy had to develop a carrier capable of getting its air group in the air faster—thus the side elevators and four catapults.

The Navy has not announced officially what planes would operate off the new huge carrier but since it will not be completed for several years, it may handle planes still only on the drawing boards. Latest and heaviest plane to operate off a carrier is the P2V-2 *Neptune* which was JATO-launched off the *Coral Sea.* The Navy recently revealed the XAJ-1, a new carrier plane with two reciprocating engines and one Allison jet in the tail.

Its weight and performance were not revealed, but the plane is between the P2V and present attack planes like the AD-1 and AM-1 in size. It carries three men, has pressurized cockpit, tricycle landing gear and its outer wing panels fold inboard for carrier handling. The vertical tail folds onto the right surface of the horizontal tail.

The new carrier is one of several U.S. warships whose design does not allow passage through the Panama Canal. It should be capable of operating an airplane well over 100,000 pounds. Long range planes will enable the ship to stay farther away from enemy shores, thus being harder for search planes to find. Its island-less construction also will make it more difficult to see. Speed of the CVA-58 is expected to be around 33 knots.

Fighters Fly to Honolulu

Carrier-Hopping Spans the Pacific

Demonstrating a new technique in "ferrying" fighter and attack planes to distant zones, the Navy sent a dozen F4U's, F8F's and AD-1's from Air Group One hopping across the Pacific from California to Hawaii, using aircraft carriers as "landing fields" en route.

The operation was from Moffett Field to Barber's Point and was the first long range ferrying flight by short range planes. After taking off at Moffett, the planes flew out 800 miles to the carrier *Tarawa.* Another 800 miles farther out they refueled aboard the *Princeton* and then made the last hop to Oahu.

Eight destroyers and the light cruisers *Pasadena* and *Astoria* were spotted about 200 miles apart along the flight route as picket vessels, maintaining constant radar observation. Long range search and rescue planes also patrolled the first and last legs of the flight as an added safety precaution. The elapsed time was slightly under 11 hours for the long flights.

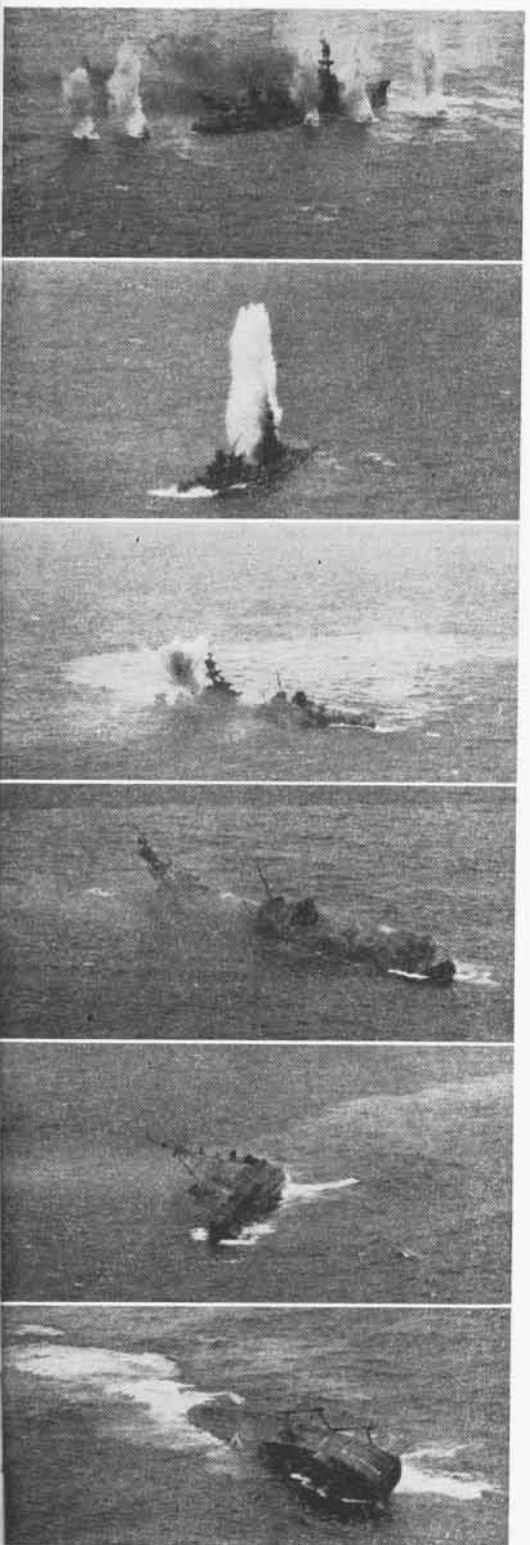
Navy Reopens Air Stations

'Mothball' Fields Resume Operation

The Navy is reopening a number of its air stations to provide facilities to help take care of the 2600 Reserve pilots being called back to active duty and others of its expanding aviation branch.

Fields that have been in "mothballs" like Fort Lauderdale and Cecil Field, Florida, are being reactivated to provide facilities for fleet operations on the Atlantic seaboard. Also being reactivated are MCAS EDENTON, N.C.; NAAS BARIN FIELD, Ala. and NAAS CABANISS, Tex.

Mainside station at Miami, Fla., also will be reopened after having been used by Embry Flying School and by numerous private interests for hotel facilities. Reserve pilots will continue to fly off Master Field. Miami is slated to reopen in January, as is Ft. Lauderdale. Edenton will reopen in March, according to present plan, to give more Marine facilities on the East Coast. A number of the above fields are being prepared to handle the influx of aviation cadets at Pensacola and Corpus Christi as a result of transfer of Advanced Training from NAS JACKSONVILLE, which becomes a fleet air activity.



AERIAL torpedoes and bombs helped send to the bottom the heavy cruiser *Salt Lake City*, veteran of 31 engagements against Jap sea, air and land forces and a survivor of the Bikini atom bomb tests.

The famous old ship sank in the Pacific 130 miles off Southern California after absorbing everything that 15 surface ships and scores of aircraft had.

The entire operation was planned along the lines of progressive damage, thereby accounting for the prolonged agony of the gallant lady of war. The initial phase of destruction began with heavy aerial machine gun bursts and rocket fire, followed by five, six and eight-inch shelling by cruisers and DD's. Navy and Marine air groups dropped 105 100-lb bombs on the *Salt Lake City*.

The famous old "Swayback Maru" went down bow first in a somewhat graceful manner after absorbing shells, rockets, bombs and the final as well as fatal torpedoes. Sequence photographs taken by VU-7, shown on this page, depict various stages of the sinking of the radioactive ship whose usefulness to the Navy was ended.

The *Salt Lake City* fought in the battle off Cape Esperance where she won the nickname of "The One Ship Fleet" in helping rescue the stricken cruiser *Boise*. In another surface action off the Alaskan Komandorski islands, she stopped a Jap force twice her size.

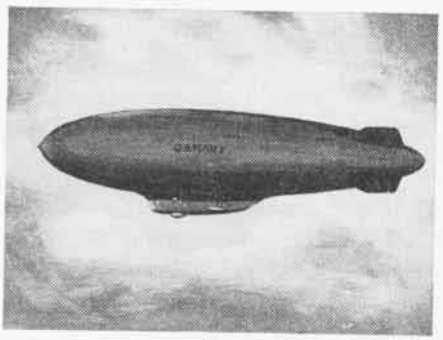
PLANES SINK CRUISER

Navy To Get Bigger Blimp

N-Ship to be Twice Size of K-Models

A contract to design the largest nonrigid, lighter-than-air blimp ever planned has been let by the Navy to Goodyear Aircraft Corp.

The new N-type blimp, nearly twice the size of the K-blimps used for antisubmarine patrol in World War II, is capable of long range patrol over open ocean areas. Specifications call for an



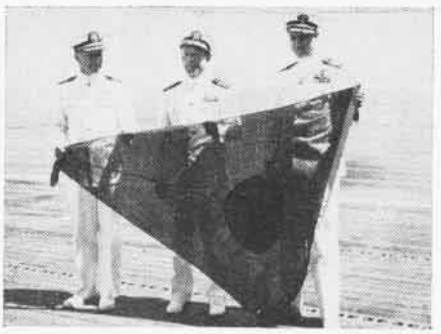
ARTIST'S DRAWING OF NEW, LARGER DIRIGIBLE

envelope 324 feet long, 71 feet wide and 92 feet high.

The double-deck, 87-foot car under the blimp will house crew, controls and the two 800-hp Wright Cyclone air-cooled engines. Maintenance and repairs of the engines would be possible while the dirigible is in flight. Normal crew will be 14 officers and men with relief crew living quarters on the lower deck, away from engines.

Galley and mess complete with electric refrigerator and range are to be installed. Two 18-foot reversible, controllable-pitch propellers connected to the engines through transmission shafts are to be mounted on nacelles suspended from the car. Gearing design is such that one engine can turn one or both propellers. Another radical change from normal blimp design is the proposed retractable tricycle landing gear.

VMR-152, EL TORO—Knobs of the propeller governor controls of the R5D-3's are being reshaped to facilitate the differentiation between propeller controls and throttle controls.



Present, past *Philippine Sea* CO's Pratt, Cornwell, Van Deurs, hold Battle award

Squadrons Win E. Pennants

Two Carriers Given Fleet Recognition

Twelve Navy and Marine squadrons, two aircraft carriers and two seaplane tenders have been awarded battle efficiency pennants for outstanding records in the first postwar fleet training contest.

The contests were based on the intratype performance of each ship or aircraft as a fighting unit in competition with all other ships or squadrons of its type in the same fleet. Ships are flying the pennant on the foretruck for the year while facsimiles of the pennant are painted on the planes of squadrons.

The winning aviation units and their skippers were:

Valley Forge, Capt. Richard W. Ruble
Philippine Sea, Capt. J. L. Pratt
Suisun (AVP-53), Capt. C. C. McCauley
Timbalier (AVP-54), Capt. A. McB. Jackson
VP-HL-11, Cdr. C. D. Mott (now VP-21)
VF-71, Lt. Cdr. A. B. Smith, Jr.
VA-17-A, Lt. Cdr. R. S. Farkas (now VA-174)
VF-21, Cdr. J. C. Eckhart
VP-MS-9, Lt. Cdr. W. R. Dunne (now VP-49)
VA-2-B, Cdr. A. B. Sweer (now VA-25)
VMF-214, Major D. H. Sapp
VF-11-A, Cdr. R. S. Rogers (now VF-111)
VA-5-A, Cdr. E. S. Keats (now VA-54)
VP-HL-13, Cdr. N. A. Johnson (now VP-25)
VP-MS-7, Lt. Cdr. Warren Weeks (now VP-47)
VMF-212, Lt. Col. W. B. Carneal

VR-6, PACIFIC—On a recent trip from Tokyo, the pilot rang the bell for the orderly and it stuck. Before the co-pilot got back to the cabin to let everyone know nothing was wrong, the orderly had all passengers strapped in with life jackets on. How's that for efficiency and fast work?

Marine Transports Busy

VMR-252, CHERRY POINT—Take a look at a month's work done by this transport squadron to support Marine Reserve and jet squadron operations.

When the 2,000 Reserve pilots and groundcrewmen moved to Cherry Point for their annual maneuvers, VMR-252 put 14 R5C's and two R4D aircraft into the air lift to help bring the men here and take them home again. Flights were made to Miami, Columbus, Willow Grove, Squantum, New York, Glenview, Jacksonville and Grosse Ile.

During the trip to Cherry Point, VMR-252 made 21 flights, covering 8,500 miles and carried 525 passengers, plus 18,000 pounds of baggage and an equal amount of cargo. The return trip involved similar air lift. Both operations were made without mechanical difficulties with squadron planes.

While the Reserve maneuvers were in progress, the squadron sent an R5C across the U.S. to accompany VMF-122, the Marine jet squadron led by Lt. Col. Marion E. Carl. The operation was a cross-country navigation flight. In the R5C were carried a jeep power unit, a spare jet engine, spare parts and jet mechanics. The flight went via Fort Worth, El Toro, Ogden, Medford, Ore., and Olathe.

The R5C proved its worth in that at each overnight stop repairs were needed on one or more of the *Phantoms,* using parts and mechs carried on the plane.

Another activity of the squadron during July was use of four R5C's to carry the Naval Academy's 100-man football squad from Guantanamo, Cuba to Patuxent. The flight covered 8,240 miles. The middies had been in the Caribbean on maneuvers and wanted to get back early to start football practice.

Squadron Numbers Change

Returns to Wartime Designations

The Navy has abandoned its squadron naming system, adopted in 1946, calling them by such titles as VP-ML-7 and VF-5-A, and returned to its time-tried old numbering system. Starting with September 1, those squadrons were designated simply VP-7 and VF-51.

By order of CNO, the numbers of all squadrons were changed to conform to the old system, which did not tell what type of carrier they were assigned to nor the plane type they flew. The VP-ML-7 name indicated that the squadron flew medium landplanes, but under the present system this fact is not discernible from its new title, VP-7.

No changes were made in Marine squadron designations. Reserve squadrons are considering changes and renumbering, but no official switch has been made.

Transport, observation, development, helicopter, utility and blimp squadron designations remain unchanged. The Navy is reviving the designation of composite squadrons again, such as VC-4, which will do all-weather operations.

New VO Squadron Selected

Pilot, Plane Pool is Organized

After the close of World War II and the resultant mass decommissioning of many warships, there arose a feeling among officers of battleship and cruiser aviation units that organization of these units should be revised.

The system in effect then saw each keeping its own unit based ashore while within the continental limits of the U.S. This kept the ships from getting the maximum use of their units.

As a result, Observation Squadron Two has been formed. It consists of all officers, men and planes of the various aviation units previously based aboard individual ships. Those desiring planes aboard for a particular cruise now draw the pilots, men and planes from VO-2, based conveniently at Norfolk.

The new squadron has 27 officers, 106 men and 14 SC-1's and SC-2's. Lt. Cdr. M. J. Franger is commanding officer and Lt. Cdr. F. W. Bowen, executive of the new outfit.

VMR-152, EL TORO—To train squadron pilots in bad weather flying, a number have been sent to Adak, Alaska, aboard flights as observers. The round trip takes a week.

Rear Adm. *W. G. Tomlinson (r.) new MATS Pacific Division Commander, and his predecessor, Rear Adm. M. B. Gardner, check over the Western Pacific MATS facilities*

NAS Birmingham Activated

Reservists Now Train at 25 Stations

Newest station to be established under the Chief of Naval Air Reserve Training is NAS BIRMINGHAM, which was commissioned during October. This station, which will provide refresher training for Organized and Volunteer Air Reservists, is the 25th unit in the Reserve chain to be activated since the war. It is the first naval air station to be set up in the Birmingham area.

For some months, however, NAS ATLANTA has supported a Naval Air Reserve Auxiliary at Birmingham. Members of the Associated Volunteer Unit at this NARA as well as other Reservists in the region showed so great an interest in the program, that they demonstrated their capacity to support an independently operated station. Thus, when the Naval Air Reserve came to decide upon the locality for a new station, Birmingham proved a natural choice.

The station adjoins and utilizes the operating facilities of the Birmingham municipal field. It occupies a portion of the former Army Modification Center, namely one bay of a ten bay hangar and two small outlying buildings. City authorities and the local Chamber of Commerce were most cooperative in making necessary facilities available to the Navy.

Naval Air Reserve operations at Birmingham will be closely integrated with those of its next-door neighbor, the Air Force Reserve, in order to avoid duplication and unnecessary expenditure of public funds.

Present plans call for training one CVE group and a fleet air service squadron. Stationkeeper allowance is set up for 13 officers and 130 enlisted men. About 42 planes are being assigned to the station in the near future.

'Early Bird' Pays Short Visit

Old Timer Drops in at NAS Norfolk

NAS NORFOLK—A recent visitor here was Fred Brauninger, one of the three living members of the original "Early Birds."

For the benefit of the uninitiated, the Early Birds comprise an organization whose members participated in aerial flights between 1903 and 1906. Mr. Brauninger made his first flight with Orville Wright in 1904 and enjoyed it so much that he set about teaching himself to fly. Apparently he was a good instructor. He obtained his pilot's license in 1909.

Mr. Brauninger recalls that Glenn Curtiss, another aeronautical pioneer, once advised him to leave monoplanes alone. According to Curtiss, they definitely were not here to stay.

New Opportunity To Go USN

Certain Reserve Aviators Are Eligible

Former Naval Aviation Cadets, who have been designated Naval Aviators and who have received their commissions since 31 December 1946, may now submit their applications for appointments to commissioned grade in the line of the Regular Navy.

In order to be considered for transfer, an applicant must have completed, prior to 1 January 1949, not less than eighteen months of continuous active commissioned service immediately following completion of duty as an aviation cadet. He must also have been less than 25 years of age upon successful completion of training as an aviation cadet.

It is contemplated that a Board will be convened in the Navy Department on or about 1 February 1949, and semi-annually thereafter, for the purpose of selecting such eligible officers for transfer to the Regular Navy in numbers sufficient to meet the needs of the service. Selection will be based upon information submitted in the application, the individual's records on file in BuPers and information obtained from BuMed.

Further information and necessary application blanks may be obtained from the Offices of Naval Officer Procurement in the various districts. An application to be considered must be forwarded in sufficient time to be received in the Bureau of Naval Personnel prior to 1 January 1949. Requests for applications for later selections will be promulgated to the service through the media of Bureau Circular Letters.

Each candidate accepted for appointment will be issued a permanent commission in the grade in which he holds a permanent commission in the Naval Reserve.

Palmyra Rejoins the 'Clan'

VR-1 Planes Land Again on Its Field

VR-1, Hawaii—Lonely Palmyra island in the mid Pacific has been restored to the flight route of Hawaii-to-Samoa planes after its grass-grown runways had been repaired and field lighting restored.

Acting on request by CAA authority for air lift to and from the island, VR-1 made bi-weekly flights to the island. The landing strip was found overgrown with vegetation and quite rough in spots. Field lighting for night operations was usable but weak in intensity due to a voltage drop from a point halfway down the runway.

The flight schedule was changed to include Palmyra and omit Johnston island. Palmyra will be a flag stop on the return trip from Samoa to Honolulu.

First photograph of the Navy's new TO-1 (F-80) jets operating with VF-52 on the West Coast shows four of the speedy Lockheed Shooting Stars over California terrain. The squadron had six pilots who completed the Air Force jet transition training course at Williams Field, Ariz., who served as instructors for the rest of the pilots. About half of the squadron's pilots now have qualified in the new trainer. VF-52 is commanded by Cdr. Edward J. Pawka and is at San Diego.

PILOTS SIT SIDE-BY-SIDE IN NEW DOUGLAS JET

Newest Jet Is Hot, Versatile

Range, Speed Give Multi-Purpose

Latest Navy entry in the all-jet aircraft field is the Douglas XF3D-1, a twin jet shipboard all-weather fighter now being tested at Muroc.

Powered by two Westinghouse turbojets, the XF3D-1 with its electronic aids, is expected to be one of the most versatile of jet aircraft, capable of carrying on fighter or bomber missions of numerous types. It is a two-place, high-speed plane suited for varied tasks aboard a carrier with but little modification and without compromise of its basic role. Its range and high speed make it adaptable as an attack fighter, reconnaissance plane, or escort fighter.

The XF3D-1, first fighter to be built for the Navy by Douglas, is of conventional design, with exceptionally clean streamlining and square wingtips. Two unique features represent great advancement in pilot safety—the non-glare backlighting of the instrument panel and console, and a novel under-side escape chute.

The lighting system for the instrument panel and consoles was designed and developed by Douglas. It prevents glare in the pilot's eyes and assures constant lighting of all gages and dials. Letters and numbers are etched in transparent lucite and the entire panel is lighted from behind with red light. Consequently, failure of one bulb will not mean loss of one instrument gage, for the remaining lights will continue to illuminate the gage as well as the rest of the panel.

Escape device of the XF3D-1 employs a principle used in many school building fire escapes. It permits exit through a chute in the floor of the plane, should bailing out be necessary at high speeds. At lower speeds, bailing out is provided for through the normal method.

The cockpit of the plane is pressurized and provided with an air cooling and heating system. The plane also is equipped with speed brakes, consisting of two hydraulically actuated flaps, which extend outward from the fuselage just forward of the tail. By use of these, the pilot can quickly decelerate for slow carrier landing approaches, for maneuvering, or to keep his plane from exceeding its maximum speed limits while in a dive.

VR-8, Pacific—It never rains but it pours. This squadron used 5,000 sheets of paper in letters, speed-letters and dispatches in a frantic effort to locate MacArthur seats a few months ago. The seats finally came and were installed. In fact, they are still coming in, far in excess of the number ordered.

SQUANTUM RESERVE TELECAST

The television camera focuses on Colton Morris and Lt. Roger Harrison (inact.); communications truck is in rear

Lt. (jg) J. Sowar, GCA officer, listens as M. Galdafonson and A. Gaunt tell how GCA talked them down safely at field

Ordnancemen demonstrate arming of rockets on Corsair while assistant producer Paul Birthgrath describes operation

Squantum enlisted men interestedly watch television screen as naval air station is described by narrators for audience

CONTACT — bogey bearing two seven zero — closing in at 70 miles—angels five! Flash red—contact green!" With these words the NBC television show featuring the Naval Air Reservists at NAS SQUANTUM got underway. The show was carried by the Richmond, Washington, Baltimore, New York City, Schenectady and Boston stations. It met with enthusiastic audience approval and won plaudits from National Broadcasting Company officials.

Much hard work preceded the actual telecast. First the technical problems of televising such a show had to be surmounted; then the staff of WBZ-TV in Boston and the Squantum PIO had to sell the network on carrying the shooting script they had outlined. After that there was the matter of timing the show and getting in plenty of action.

Weather threw a snag on the scheduled date for the telecast, blowing in a sticky sea fog. The show was cancelled. Then the PIO went into action and finally on 5 August, the next evening, the show went on.

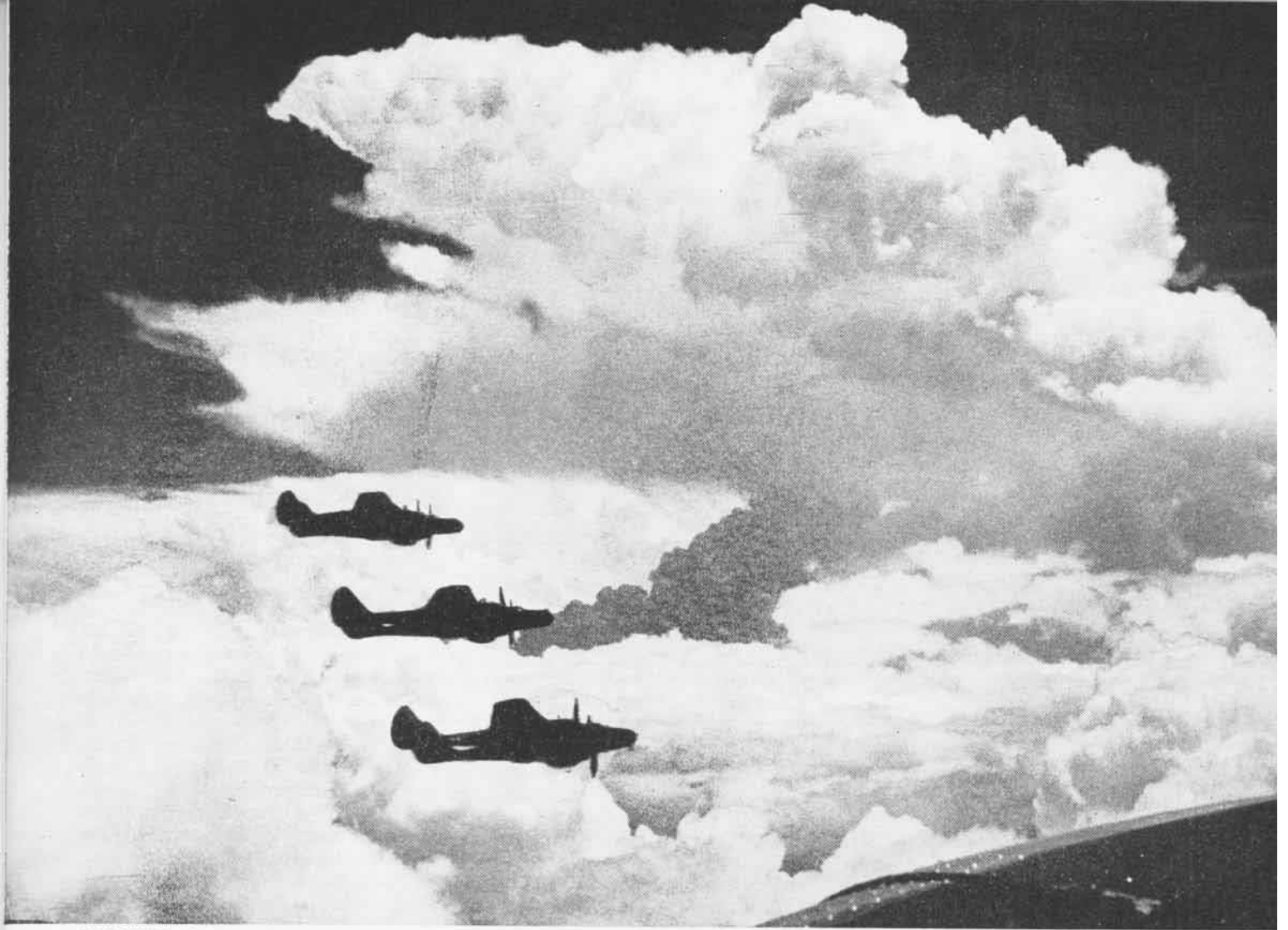
The telecast depicted the mission of the Naval Air Reserve under simulated conditions. As the program opened, six pilots, acting as the fighter intercept group of a Pacific island, were waiting anxiously for a radar report of enemy planes coming in. The briefing of the pilots was overheard. Then the loudspeaker commanded, "Scramble all aircraft. Pilots, man your planes."

The cameras then switched to the scene of the telecast, sweeping the air station while the narrators told where the telecast was originating and what the program was all about. Launching of fighters, a crash demonstration, carrier landings, refueling and rearming demonstrations, a GCA demonstration and interviews with Reserve participants were all in the script. Special Events Director of WBZ, Colton G. Morris who was a former lieutenant commander, and Roger Harrison, Farm Editor of WBZ, formerly a lieutenant, were the narrators.

The simulated crash which showed a *Hellcat* making an approach for a landing as if out of control and then showed a plane afire amid the sound of sirens and crash alarms was so realistically done that local news men phoned the station wanting the story.

Dinty, the Marine mascot, also got into the act, nipping at the heels of selected participants in the best bulldog fashion.

Stars of the show were CVEG-56 pilots who had just reported aboard for two-weeks training duty. With three hours rehearsal beneath their safety belts, they made their debut before the TV cameras with the savoir-faire of seasoned veterans on both the combat and the video circuits for a top-flight performance.



BLACK WIDOWS OF PROJECT THUNDERSTORM MADE 1300 PENETRATIONS OF STORM CLOUDS AS PILOTS AND WEATHER OBSERVERS RECORDED USEFUL DATA

RIDING THE ROUGH STUFF

THE HAZARDS of flying through thunderstorms are as much mental as mechanical. In fact, if the mental hazard—pilot fear—is kept under control, the mechanical hazards—turbulence, lightning, hail and icing—become much less dangerous. This is a basic conclusion reached in the USAF project of deliberately flying aircraft through thunderstorms to learn how it can best be done. Stated simply, the advice to pilots is: *Keep calm and follow the rules.*

The rules in this case are the techniques worked out in two years of experimental flying by pilots of F-61 *Black Widows* operating first in Florida and later in the Ohio area.

The project was organized with the Air Force, Navy, Weather Bureau, and NACA as participating agencies; and a Thunderstorm Advisory Committee of outstanding civilian and military scientists outlined the general plan of investigation. As the aircraft, properly instrumented, flew through the storms, a network of ground weather stations observed and recorded surface data and upper air soundings. Ground radar, in addition to controlling the aircraft, was used for study of cloud echoes produced by the thunderstorms.

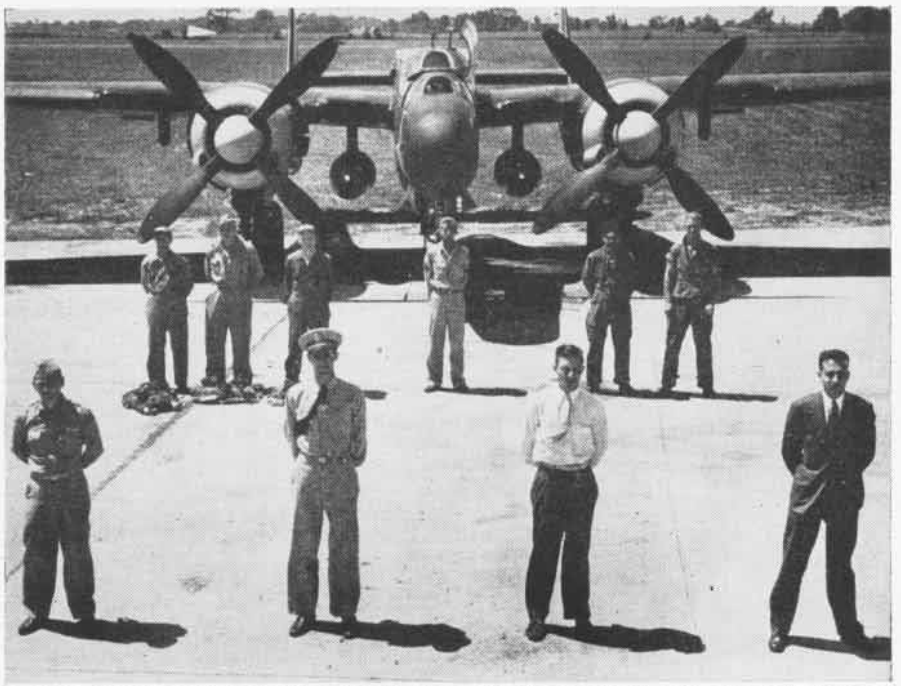
Data on the activities and findings of the project have been presented in a USAF report "Operational Feasibility of Aircraft Through Thunderstorms" from which the following information has been gleaned.

Five aircraft and crews were alerted daily for a 12-hour period during which the weather forecasters felt that thunderstorm activity was most likely. They took off when the storm activity was developing, requiring some 30 minutes to reach their assigned altitudes (6,000, 10,000, 15,000, 20,000, and 25,000 feet) and get into position for penetration of the storm. Actual traverses were begun with the ground controller giving the aircraft vectors which would take them through the heart of the storm.

Each plane would average five to ten traverses during a mission. During each traverse, the weather and radar observers kept a log noting time of cloud entry and exit, location and intensity of areas of precipitation and turbulence, lightning flashes, formation of ice on the aircraft. Pilot comments were picked up by wire recorder. After each flight, the crew—pilot, radar observer, and weather observer—were questioned as to the conditions found.

ALL PILOTS were trained to use as little aerodynamic control as possible. Attitude flying with a minimum of elevator control action prevents setting up a pitch oscillation which could ultimately lead to excessive control movement and possible structural failure.

Most of the storms were crossed without undue difficulty, but enough of them gave positive proof that a thunderstorm can never be regarded lightly. At some time and place within a storm the going is likely to be tough; so "the word," as detailed on the next pages, is this: Expect trouble, but keep cool.



PROJECT OFFICERS REPRESENT USAF, NAVY, NACA, WEATHER BUREAU; F-61 AND CREW IN REAR

Easy Does It — With Thunderstorms

EACH thunderstorm contains cells which may be in any development stage. A majority in any one storm, however, are either at peak or dissipating stages. The cells are turbulent areas. The in-between air is calm. The worst time to fly through a cell is between the end of the building and the start of the peak stages, for the cell at that stage is in its most turbulent cycle.

Turbulence generally is regarded as one of the most dangerous hazards associated with thunderstorm flying, because of its effect on the aircraft and the pilot. The disturbed angular motions of an airplane in turbulent air, even with fixed stability and proper piloting technique, are dependent not only on the maximum intensity of a single gust, but also on the sequence, spacing and intensity of all gusts encountered.

The sharp edge gust with its steep gradient delivers that solid jolt so familiar to anyone who has flown in rough air. A series of these occurring close together will shake an airplane the way an automobile reacts to a roadbed of railroad ties. These gusts because of their steep gradient can impose great stresses upon aircraft. The stress increases with the velocity of the gust and the speed of the plane.

Drafts are the huge columns of rapidly rising or descending air which form an integral part of the thunderstorm's structure. Although the effects of drafts are quite spectacular from the pilot's point of view, they are not so important with regard to stress loads imposed upon the aircraft. However, attempting to maintain a constant altitude in heavy drafts can easily be a pilot's first step down the road to serious trouble.

The possibility of a downdraft forcing an aircraft into the ground or dangerously close to it seems remote. The lowest altitude used during the project was 6,000 feet, and there were no instances where the aircraft at this altitude lost more than 2,000 feet. The downdrafts would subside when the airplane broke clear of the clouds underneath the storm.

ON THE basis of pilots' reports, certain altitudes seem to contain definite limits of turbulence. Scaled from one to six, ranging from extreme to minimum intensity they are: (*1*) 14,000 to 20,000 — turbulence severe; (*2*) 25,000 to 29,000 — turbulence less severe, much snow; (*3*) 20,000 to 25,000 — turbulence less severe to moderate; (*4*) 10,000 to 14,000—turbulence occasionally severe, mostly moderate; (*5*) 6,000 to 10,000—turbulence from moderate to light; (*6*) 6,000 and below—turbulence generally light, occasionally moderate.

A general rule of thumb is to stay as low as you can, yet safely clear all terrain obstacles, to avoid the severest turbulence.

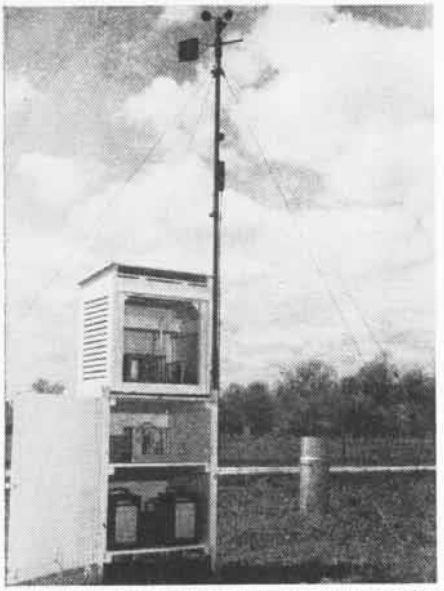
There is no reliable way of recognizing in advance a thunderstorm which may provide hailstones. The greatest frequency of large hailstones is found in the Nebraska and Colorado regions, and the Thunderstorm Project, operating in Florida and in Ohio, encountered no hail of serious consequence. Damage to aircraft was limited to punctured deicer boots, dented propeller spinners and intercooler shutters, and battered nose sections. The F-61 is equipped with a composition nose section which is far less durable than the metal used in the rest of the fuselage. Hail damage was quite annoying to the maintenance section but proved to be no actual hazard in flight.

Flight procedure to minimize the hazard of hail appears to be limited to altitude selection. Staying as far below the freezing level as practicable should be the first choice.

LIGHTNING is one of the greatest psychological hazards to pilots flying through thunderstorms. Twenty lightning strikes on aircraft were recorded during the project. All occurred around and above the freezing level at free air temperature readings from plus 2 to minus 25 degrees C.

No major damage by lightning was experienced by the F-61 thunderstorm aircraft. However, lightning strikes burned off radio antennas and static discharge wicks, drilled holes up to the size of a dime in wing tips, rudders and elevators, and bent one airspeed pitot head 15 degrees from the horizontal. In this case the pilot reported he was flying through a thunderstorm at 26,000 feet in heavy snow. "Radio static kept building in intensity until it was so severe that I couldn't keep the earphones close to my ears. I heard what sounded like the sharp burst of a German 88 mm. A sheet of flame simultaneously enveloped the entire cockpit. My airspeed indicator jumped from 190 to 500 and stayed there. Everything looked a bit fuzzy.

RADAR GEAR IS HOUSED IN NOSE OF THE PLANE



GROUND STATIONS KEPT TABS ON THE WEATHER

"The air was so turbulent and the instruments jumped around so much that I couldn't tell for a moment what was going on. I just let the airplane buck through. After what seemed hours, the airspeed came back to normal." (Film records showed that the airspeed indicator maintained an erroneous 500 mph reading for approximately 30 seconds.) The radar operator, who was not wearing dark goggles, said he could not read his panel for about two minutes.

ALL-METAL aircraft, properly bonded, act like a Faraday cage. The metallic structure acts as a shield to shunt any discharge current around the occupant. Consequently, there can be little difference of potential between points on the bonded metal surface of the plane.

It does not seem likely that a direct lightning hit will seriously injure the aircraft occupants unless there is deficient bonding of metallic parts. Where bonding is defective or lacking or where the aircraft is constructed of non-conducting materials (wood and fabric), large differences of potential may be established during a thunderstorm, creating a definite hazard to both occupants and aircraft.

NACA analyses indicate that the faster an airplane travels through a thunderstorm, the more rapid is the rate at which it will produce and acquire charges. Reduction in airspeed allows charges to fall off and permits corona discharges to diminish in intensity.

Advice to pilots: Reduce airspeed. If precipitation static or St. Elmo's fire is severe and outside air temperature is between minus 25 and plus 2 degrees C, fly out of that zone. Seek a level above or below that temperature band. If aircraft has trailing antenna, make sure it is reeled in. Turn cockpit lights full bright or put on dark goggles. Do not keep phones too close to ears. This will prevent possible accoustic shock. The tendency for St. Elmo's fire and precipitation static sounds to build up rapidly in intensity should be regarded as a preliminary warning that a discharge may be imminent.

Conclusions of the USAF report outline pilot techniques for safe thunderstorm flying with two major points: *1. The airplane must be readied before penetration. 2 Fly attitude.*

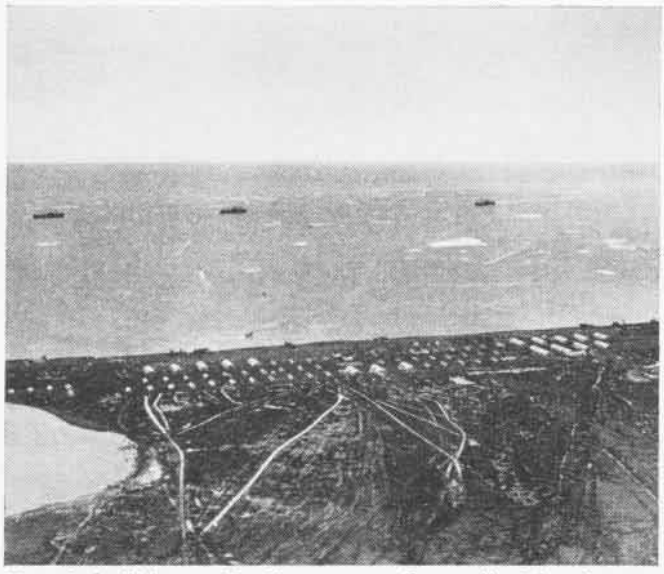
- When warned by radio crash static of thunderstorm proximity, the pilot must slow down to the best penetration speed and constantly keep the aircraft prepared for long periods. He should check his instruments, lights, pitot and carburetor heat, de-icing and oxygen equipment, safety belts, mixture, RPM's manifold pressure, etc. By the time he hits the storm he knows everything is ready. This is important because it is the pilot's first safety valve and gets him set for the actual entry.
- In approaching the storm, increase RPM for gyroscopic stability. If flying jet aircraft, extend dive flaps. This will tend to keep the airplane from quickly picking up too much speed in unusual attitudes.
- Keep mixture rich, pitot and carburetor heat on. Uncage gyro instruments and check for proper settings. Check vacuum pressure and make mental note where pump switch is located.
- Be sure altitude control is turned off if auto-pilot is being used. Tighten safety belts. Turn off any radio equipment made useless by static. Make sure trailing antennas are reeled in. If at night, turn cockpit lights full bright or put on dark glasses to minimize effect of lightning.

ONCE IN the storm, devote all attention to flying the plane. *Expect* turbulence, precipitation, lightning, and don't let them cause undue concern.

Thunderstorms must be flown primarily with gyro instruments and airspeed, since barometric instruments give false readings because of rapid changes of pressure. Concentrate principally on keeping a level attitude by the gyro horizon. You may gain or lose several thousand feet, but by using a minimum of elevator control you can ride the most severe storm with a minimum amount of stress on the aircraft.

- Do not "chase" airspeed. It will result, especially in high-speed and heavy aircraft, in excessive attitudes. It is easy to visualize the results of the nose being high and a sudden gust increasing the angle of attack to a stall. Don't forget that heavy rain may slow down the indicated airspeed reading as much as 70 mph.
- Maintain original heading—it's the quickest way out. Don't make any turns unless absolutely necessary. Remember that sound planning, proper procedures, as outlined above, plus, above all, common sense and an intelligent outlook will see you safely through. In the opinion of the Thunderstorm Project experts, the reduction of mental strain upon the pilot through enlightenment, proper training and experience holds the greatest promise for safe flying through thunderstorm areas.

PROPELLER HUB SHOWS WHY HAIL WAS MAINTENANCE BOTHER ALTHOUGH NOT TOO HAZARDOUS



Naval facilities at Pt. Barrow are 'kept alive' by the annual supply expedition of ships; here barges do unloading

Barges off Pt. Barrow await their turn to pick up another load of cargo; ships can visit only once yearly, during August

Northernmost oil well on North American continent stands on shore as first task fleet ships offshore unload their cargo

Point Barrow

POINT Barrow, northernmost segment of land on the North American continent, under U. S. jurisdiction, is a beehive of activity a few days during August when the frozen Arctic ocean unfreezes long enough to permit ships to enter and unload their supplies.

These pictures taken by a unit of VP-61 under Lt. Cdr. Charles A. Van Dusen, show the barren, muddy land where the Navy has been drilling for oil for several years. VP-61 returned to the U. S. recently after photographing large areas of Alaska's southern panhandle for natural resources.

Most of the year, Navy planes can operate to Barrow and land on the airstrip shown below, to keep workers supplied. Big and little Quonset huts, plus a few wooden houses, make up the town of Point Barrow, near which Wiley Post and Will Rogers were killed in an airplane crash some years ago. After the August "thaw," the Arctic takes over control.

Supplies unloaded from barges line Pt. Barrow beaches during the few days when ships can sail up to the naval facility's front door; runway with PBY's and R4D are on left, above are several of the thousands of frozen lakes dotting Arctic area

RESERVES OPERATE ON WRIGHT

DALLAS TBM COMING IN FOR LANDING ON WRIGHT, GETS A CUT FROM LANDING SIGNAL OFFICER

THREE years after they made their last carrier landings off Okinawa and Japan, a detachment of Naval Air Reserve pilots from Dallas, Texas, flew their planes aboard the USS *Wright* and operated from the CVL for three days in the Gulf of Mexico.

It was the first Reserve group in history to complete a full scale simulated combat operation in peacetime aboard a carrier and the first time a Reserve pilot had landed on a flight deck since the war was over. So successful was the operation that it drew praise from John Nicholas Brown, Asst. Secretary of the Navy for Air; Vice Admiral J. D. Price, Deputy Chief of Naval Operations (Air), and Rear Admiral J. W. Reeves, Chief of Naval Air Training Command.

The Dallas Naval Air Reserve detachment consisted of two air groups making up eight squadrons of 56 carrier planes—*Corsairs, Hellcats* and *Avengers* —plus a patrol squadron of three *Catalinas,* four PV's and one R4D. In the entire operation 320 carrier landings were made with only one prop nicked and two tail wheel malfunctions.

The whole operation was a part of the Dallas men's two-weeks active duty training. A total of 103 officers and 138 enlisted men participated. Officers were all seasoned war veterans but of the enlisted men 75% had never been on an aircraft carrier.

The group arrived at NAAS WHITING FIELD, a satellite of Pensacola, to practice field carrier landings. Unfortunately, a Gulf hurricane was in the area at the time, so pilots got in only a moderate amount of advance practice before going aboard the *Wright.* They brought their own landing signal officer, maintenance men and deck crewmen, who worked with the *Wright's* crew in handling the planes aboard.

Reserves flew off for gunnery practice and performed other carrier operations without hitch. It was regarded as a significant commentary on the value of the Reserve aviation training program under Rear Admiral Richard F. Whitehead and points the way for greater use of carriers in the Reserve training program.

The pioneering achievement brought the following message of congratulations to the Dallas Reserves from John Nicholas Brown, Asst. Secretary of the Navy for Air:

"This is the first occasion of its kind in the history of the Naval Air Reserve Training command, and a great step forward in their activities. This precedent reflects great credit on the state of training, and on readiness for more advanced operations."

Vice Admiral J. D. Price said, "The carrier training operation was a small scale experiment before the Navy establishes the policy to make this type of operation a general annual requirement for Naval Air Reserve training.

Admiral Reeves' comment was that "The outstanding success of the project was the result of good planning and preparation by CO, NAS DALLAS and staff, of the enthusiastic ability and capacity for hard work on the part of all members of the detachment and of excellent support by the USS *Wright,* NAAS WHITING and NAS PENSACOLA." The CO of Dallas is Capt. M. A. Nation.

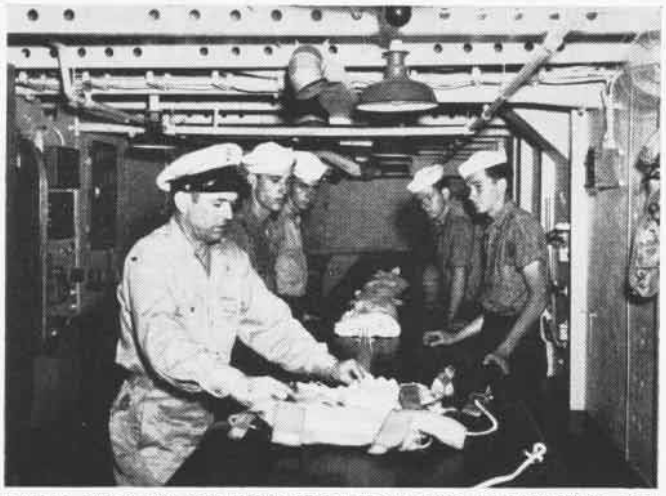
Adm. Whitehead issued the following statement on the maneuvers: "We have moved steadily forward, making notable strides in the preparation of peacetime Reserves for wartime mobilization. Throughout the country, other streamlined Reserve squadrons stand by, ready to follow them aboard and prove their merit."

THE DALLAS detachment was under command of Lt. Cdr. J. W. Scoggin and was made up of parts of two carrier air groups—CVG-55 under Lt. E. B. Crawford and CVG-83 under Lt. Cdr. R. W. Jarvis, Jr. Also included were parts of VP-ML-53 and VR-74. The two groups took turns attacking and defending the *Wright* in the training cruise and the experiment resulted in great success.

The patrol squadron started its cruise by making a patrol flight to Guantanamo Bay, Cuba. After completing this assignment, it returned to assist in the carrier operations.

One highlight of the operation came when Lt. Cdr. Robert Jarvis, first Texan to land aboard, unfurled the Lone Star flag of the state of Texas as he rose out

LT. HUNT, RESERVE LSO FROM DALLAS, GUIDES IN A PLANE AS REGULAR SHIP'S LSO LOOKS ON



DALLAS RESERVISTS GET INSTRUCTION FROM CHIEF IN PARACHUTE LOFT

CATALINAS FROM DALLAS MADE TRAINING HOP TO GUANTANAMO, CUBA

75 PERCENT OF DALLAS ENLISTED MEN HAD NEVER BEEN ABOARD CARRIER

L/C JARVIS, FIRST DALLAS MAN ON WRIGHT, UNFURLS THE TEXAS FLAG

of the cockpit—and all the Texas men aboard came smartly to attention.

In honor of the outstanding success of the maneuver, the Texas flag was thereupon ordered flown from the carrier by her commanding officer, Capt. Dale Harris.

ADMIRAL Reeves himself was flown aboard the carrier by Ens. Joe Simoneau the last day of the operation and spent almost the entire day watching the Texas fliers complete their training schedule. He went ashore also via Reserve "taxi."

Ens. C. E. Franklin of VF-84-A was the high-time carrier pilot with 57 hours in his F6F. Lt. E. S. Clinkscales, PBY pilot, led all Dallas men with 70 hours.

The Dallas operation aboard the *Wright* was the highlight of the summer as far as the Reserve training program was concerned, but it had numerous competitors for public attention in other parts of the country.

Earlier, Reserves from NAS LOS ALAMITOS and OAKLAND "defended" the Southern California coast from "attack" by the First Task Fleet and scored a success in intercepting the ships. Two VF squadrons, 63A and 64A, composed of 18 fighters, made a coordinated attack on the carrier force which drew a favorable ruling from the intertype exercise umpires. Air Group 63 leader was Lt. Cdr. A. Trusso and the squadron commander Lt. Cdr. J. Farley. The Oakland group of 12 *Hellcats,* five *Corsairs* and five TBM's was led by Lt. Cdr. H. F. Greene. Opportunity for coordinated long range operation of patrol planes with submarines in searching for and attacking a high speed surface force was included in the exercises and provided important training seldom obtained for the VP squadrons and subs.

The *Black* or attacking force was to hit and run air strikes on West Coast installations around San Diego and San Pedro. The *White* force made up of subs and shore-based Reserve planes protected the target areas.

Weather hampered operations of both the Oakland and Los Alamitos Reserve "defenders." The latter's fighters sneaked through the overcast to make an excellent attack on the surface forces during the exercise, demonstrating that the war-tried veterans of the Reserve squadrons had not forgotten the craftiness they used so well against the Japanese.

The atom-bomb-weary APA *Gascon-ade* was sunk during the exercises by CV and CVE strikes and by DD gunfire (*see photo*). Other operations during the exercises consisted of a sortie, anti-submarine operations, search and rescue drill, and air operations. Helicopters were used on the CV's and proved valuable for plane guard duties and utility operations. One helicopter made a rescue at sea, picking up a pilot who had been forced to make a parachute jump after a midair collision. The pilot was recovered shortly after he came through the clouds in the immediate vicinity of the CV group.

The Los Alamitos-Oakland participation of Reserves with the regular fleet's exercises was the largest to date, although Marine squadrons attending the 1947 annual active duty cruise at El Toro had a chance to operate in cooperation with several carriers on the West Coast. They made no landings or take-offs, however.

RESERVE fliers got good wartime experience in another, small-scale operation this summer when NAS GROSSE ILE'S CVG-59 cooperated with the Air Force in a large scale attack on Oscoda Air Force Base in Michigan.

O-2'S FROM DALLAS RELOAD WING GUNS OF CORSAIR ON WRIGHT'S DECK

PILOTS FROM DALLAS RESERVE UNIT GET LAST MINUTE WORD AT WHITING

Photo planes took pictures of the base before the attack for target analysis and photo interpretation study. The morning of the strike, the Air Group was briefed on targets, opposition strength and primary mission. That afternoon 42 Reserve planes went in and hit the base with good results. Also during the cruise, units of VF and VA-60-A made coordinated attacks on an 83-foot Coast Guard boat in Lake St. Clair. The highly-maneuverable target gave the pilots some of the best practice they have had since joining the Reserve.

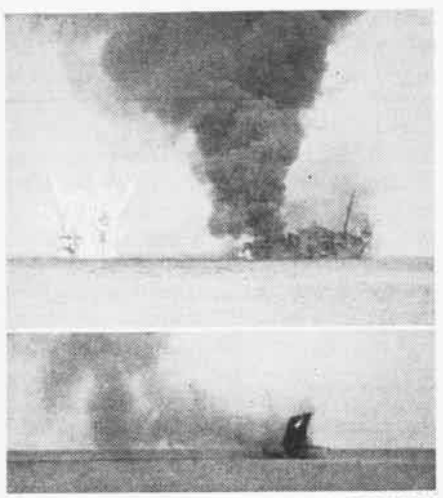
This fall, Reserve squadrons from Seattle, Oakland and Los Alamitos will work with the Pacific fleet in another intertype exercise which will see the pilots "defending" the West Coast from ships steaming offshore.

As a part of the general Navy program of building up its strength, a call was put out the past summer for 2,600 Reserve pilots to sign up for active duty with the fleet for at least a year. The first segment of this quota was for 1,300 men. Enough applicants showed interest to have filled that figure in a month, although the processing took a little longer.

Of the first 1,300 men to apply, about 60 percent transferred from Organized Reserve squadrons and the rest from Volunteer Reserve lists. About 400 of the men went to the Air Training Command as instructors and the balance to VF, VA and VP squadrons, to MATS or to the Office of Naval Officer Procurement and aviation ground duties. Of the total, 1,150 were aviators.

So WELL grounded in combat-type flying were the first 600 Organized Reserve pilots called up that they went directly to the fleet without any refresher training. Fifty-five Volunteer pilots called back were sent to Advanced Training at Jacksonville for refresher. A study is now being made to determine whether Volunteers need a short refresher training course before participating in all fleet squadron drills.

Many of the Reserve pilots called back went into newly-formed squadrons which were made possible by the recent Navy move creating five squadrons in an air group instead of three. For instance, VF-173, commissioned at Quonset Point in August, laid claim to being the first squadron to have a USNR majority in its squadron complement. Of a total of 25 pilots, 18 were recalled into active service from civilian life under the expansion program. Two midshipmen were included in the total pilot complement.



PACIFIC FLEET EXERCISE SINKS 'GASCONADE'

HURRICANE CUT DOWN FIELD CARRIER LANDING PRACTICE OF TEXANS BUT THEY WERE UNDAUNTED

RESERVES PLAY IT SAFE

A CONSTANT battle is being waged by Naval Air Reserve units to keep their weekend warriors safety conscious. As *Grampaw Pettibone* has often pointed out, "There are old pilots and bold pilots, but no old bold pilots."

Top honors for safety during fiscal 1948 go to NARTU ANACOSTIA, NAS WILLOW GROVE and NAS LOS ALAMITOS in one-two-three order. The Reserve Lighter-than-Air Unit at NAS LAKEHURST chalked up a perfect record during the same period.

Key man in the safety picture at the squadron level is the aviation safety officer in each Organized Reserve squadron. He is directly responsible to the squadron CO for safety within the unit. It is his job to see that "the word" on safety gets around to all squadron members. The *Manual for Safety Officers* is his guidebook.

Overall responsibility for safety falls upon the aviation safety officer at the various stations and units within the Reserve circuit. He coordinates the efforts of the squadron officers and supplies them with the latest data.

A continual barrage of safety information and material from CNO, DCNO (Air), CNATra, CNAResTra is also sent out to give latest pointers and to keep Reservists safety-minded. Regular features include *WRECKord* posters, distributed by DCNO(Air) to all stations and units, and the *Aviation Safety Bulletin,* sent to all squadrons and units from Command headquarters in Glenview. The Bulletin contains safety advice as well as a resumé of accidents reported each month to CNAResTra.

To drive home important safety precautions, a catchy character known as *"All Wise" Thundercloud,* Chief Weekend Warrior, expounds words of wisdom on the back page of the *Naval Air Reserve Bulletin.* This cartoon, which is the brain-child of Lt. Cdrs. Matt Portz and Uncus Fretwell, is set up to double as a safety poster.

THIS EFFECTIVE BULLETIN BOARD AT NAS WILLOW GROVE WAS DEVELOPED BY LT. CDR. W. HAAS

Stations and units also come up with some novel ideas for plugging the safety angle. Organized Reservists at NARTU SEATTLE, for example, are greeted with a life-size cut-out of *Grampaw Pettibone* giving forth with a typical comment. "Miss Happ" is the local sage at NAS WILLOW GROVE. She is pictured telling such sad tales as that of Joseph J.—a good pilot who got careless and "bluffed his way through, riding his luck as some guys will do."

"But one day near the end of a hop
His engine coughed and came to a stop.
Now Joe is as cold as yesterday's egg,
He was too d---- wide on his downwind leg."

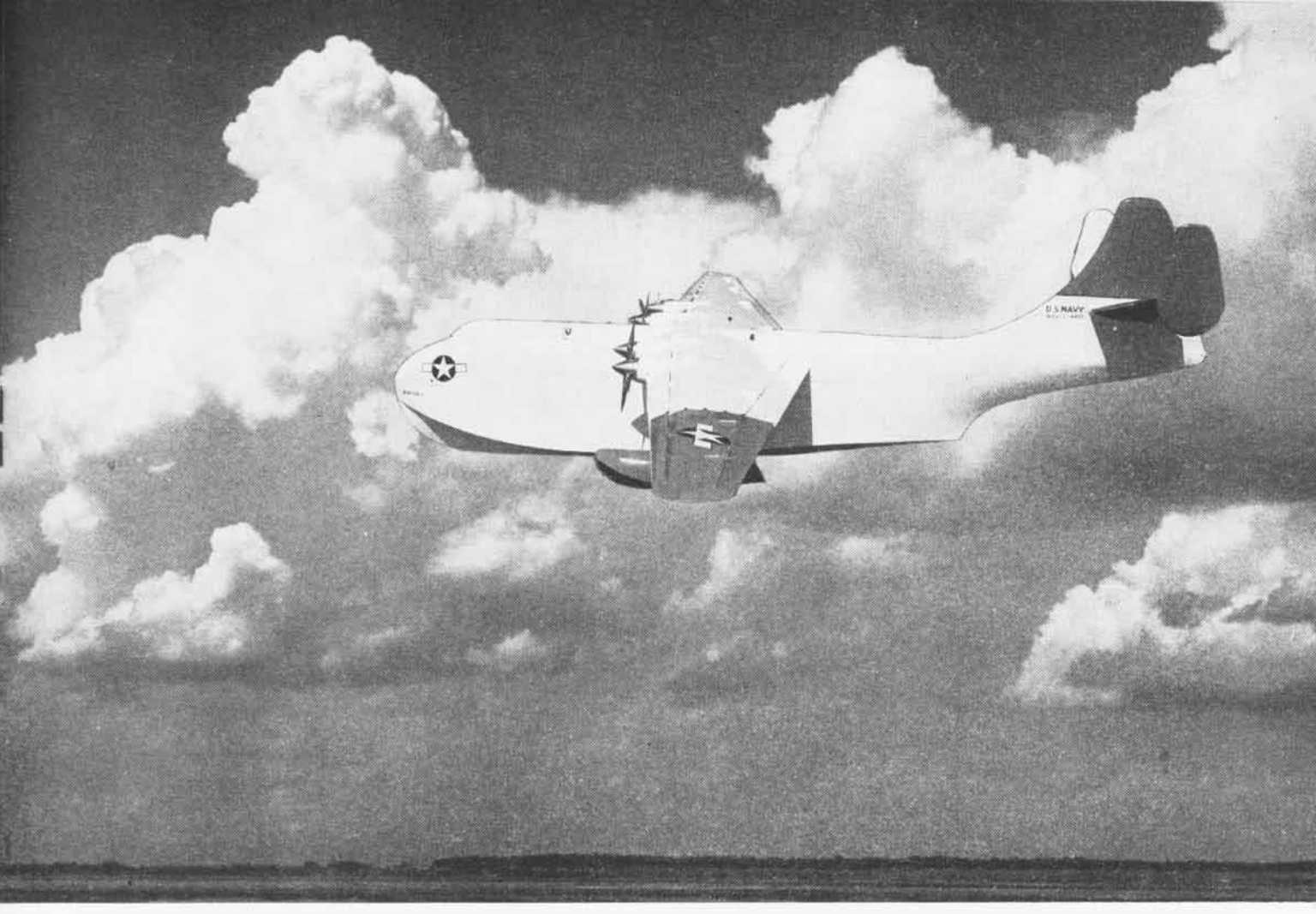
Another eyecatcher that gained attention at NAS NEW YORK is the shoulder strap cartoon, drawn by Armand O. Troncone, AD2.

The aviation safety officer at NAS WILLOW GROVE, Lt. Cdr. Walter Haas, has placed bulletin boards, specially tailored for the effective presentation of safety material, in each ready room and in operations at that station.

Nor is safety information beamed only at pilots. Enlisted men are given generous slices. Down at NAS NEW ORLEANS, for example, the line maintenance division has made up a set of safety rules which are read to all incoming O-2's and which are also posted in all line shacks for further study. In addition O-2's are given safety ins-and-outs of taxi procedures, preflighting of aircraft, fueling, oiling, visual checking and general line maintenance.

Climax of the Reserve safety campaign was the two weeks course for station officers held at Glenview in September by NAResTraCom.

This constant drumming on the safety theme has paid off. The low Reserve accident rate shows that Reservists take their weekend training seriously and not as a vacation junket. But until the rate goes down to 0.00 the safety drive will still be set for full steam ahead.



Radio-Controlled Models

WHITE-CAPPED "boots" at San Diego naval training station lined the shores of the dredged-out estuary across from Lindbergh field to watch a gleaming white seaplane take off and land on the water.

It was an airplane, and it wasn't. From a distance, its 14½-foot wingspan was deceiving. It acted like a real plane as its four engines turned up 5000 rpm, but it had nobody aboard. Making as much noise as one of its PB2Y ancestors, the plane roared up and down the estuary while engineers across from the boot camp peered at it through binoculars and took photographs of it.

Actually, the plane was a real flying model of the newest of the company's new seaplanes, then under development. To test how its hull design functioned in actual landings and take-offs, Consolidated-Vultee had constructed a radio-controlled free-flying model. It is an exact 1/10th scale model of the real airplane, scheduled itself to fly in a few months. It gives Consolidated data on what to expect when its big new seaplane first takes to the air.

Wind tunnels can give certain static scientific data to help engineers, but this model gave greater information because it was not tied down to anything and was subject to all the dynamic forces that affect a real plane's flight.

Photographs of the flying models, accompanying this article, are of a four-engined research model, and two experimental flying boats.

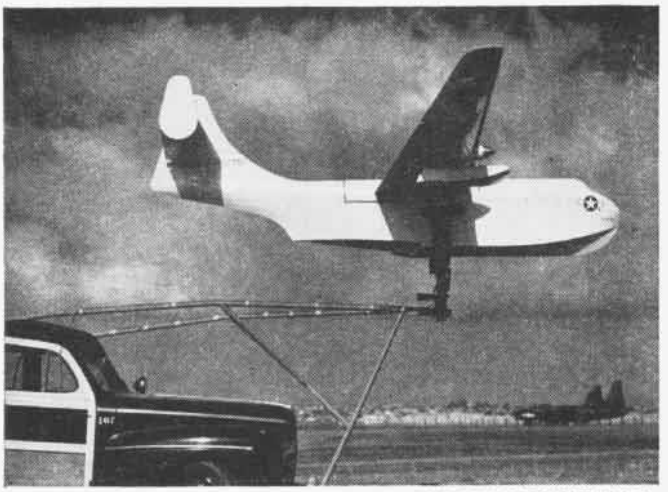
Not only are the models built to exact scale, but their weights and performance, as well as the dynamic forces acting on them, are to scale. By flying the model, the designer can tell how the big plane will behave and head off hazardous and costly difficulties.

Just as the Navy controls its target drones from ground stations, Consolidated has a radio hook-up with its scale models. First it had to solve the weight problem since the assembled model weighs only 90 pounds and the radio control system had to be held to 20 pounds. A power plant turning out 1½ to two horsepower and weighing only three or four pounds was another requirement that had engineers stymied for a while since none existed at the time.

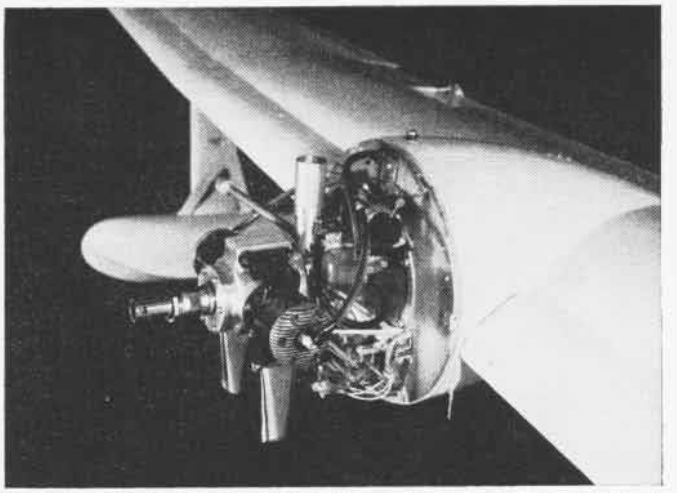
NOTHING had ever been heard of a radio receiver capable of actuating seven controls with positioning accuracy of 1.25% and weighing no more than 20 pounds, complete with battery pack. Both had to be built especially for the model program. In four months the motor was ready, a midget power plant with two-cycle twin cylinder opposed-type gasoline engine, producing scale power and rpm for the 2100 hp R-3350 engine used in the full scale airplane.

The model itself was a geometric duplicate of the full scale airplane except for the leading edge wing slots which were necessary to duplicate full scale lift characteristics.

The wing and hull were of balsa monocoque construction resulting in a higher strength weight ratio than the full scale airplane. Another saving in weight was made by Metl-bonding the wing spars and using plexiglas fitting wherever possible. Tail surfaces are the conventional ribbed type and covered with silk. Propellers are machined from 24 ST dural and are adjustable in pitch, as in a big plane.



STATIONWAGON YOKE PERMITS AERODYNAMIC TESTS ON SEAPLANE MODEL



TWO HP ENGINE ATTACHES TO NACELLE JUST LIKE ON A BIG PLANE

THE MODEL is equipped with a special 16 mm. moving picture camera, trim indicator, speed indicator, sweep second timer, accelerometers and electric contacts which give a time history of the step, bow and sternpost contact with the water. The camera is interconnected with the starboard throttle and can be operated at will, enabling continual flight records to be made of take-offs and landings. The radio controls are capable of handling the plane up to distances of 3,000 feet. Engines have throttles that can be controlled by radio or shut off completely. If the plane gets in a bad attitude, the controls automatically revert to a predetermined position upon cutting the carrier signal. If the plane flies beyond the range of the transmitter, the maximum amplitude of the signal will gradually reduce. The model then goes into a gradual left turn and returns into range. Beyond 3,000 feet, normal visual control of a model is impractical.

One of the unique features which resulted from the development is the method of measuring the aerodynamic forces. A station wagon was rigged with a quickly detachable trusswork supporting a roller cage in front of the car. The model was mounted in a yoke which was fastened into the roller cage. Strain gauges located on the yoke measure the forces acting on the model. Simultaneous readings were made of the strain gauges and a sensitive low speed airspeed indicator mounted near the model. This enabled six component aerodynamic data to be computed readily. Comparison with wind tunnel results showed good agreement of life, moment and control effectiveness for the small model.

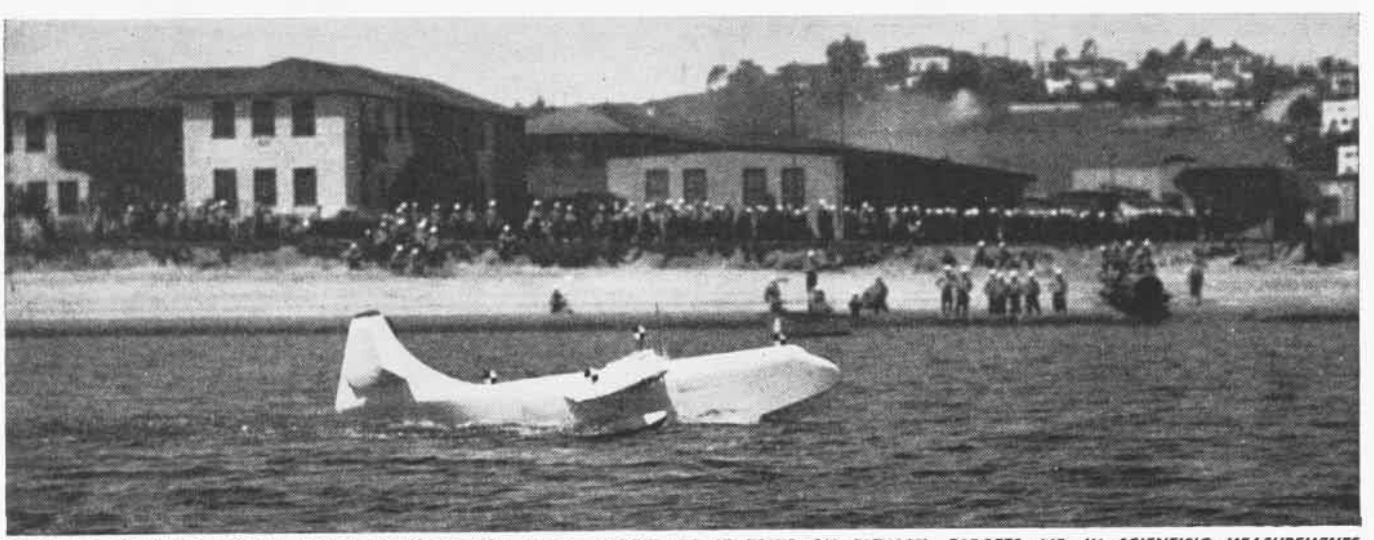
Not only is the model geometrically similar but it is also dynamically similar to the full scale airpane. Weight of the XP4Y-1 model complete with engines, propellers, fuel, instruments, receiver, battery pack of B, C, and 14 volts of wet cell A batteries, is 83 pounds—42,500 pounds full scale. Since the scale gross weight is about 90 pounds, this permitted six pounds of lead ballast to be added to balance the model with the pitching moment of inertia to scale.

Engines are started by hand from a booster battery. The fuel-air mixture is also adjusted by hand. When everything is ready, the booster is disconnected, the radio turned on and the model becomes controlled from the transmitter.

The transmitter is equipped with trimming knobs which trim the zero position of the rudder, elevator and throttles in case of any variations. This feature saves considerable time that might otherwise be spent in adjusting for a slight day-to-day variation in radio equipment.

With the 3,000-foot range of the radio, center of gravity limits of hydrodynamic stability can be obtained readily. Landing characteristics can be studied with variations of trim and sinking speed, and seaworthiness determined for various degrees of wind and sea conditions.

AN INTERESTING feature of the miniature engines is the large external intake manifolds which carry the mixture from the crankcase to the cylinder instead of drawing it through an internal by-pass located in the cylinder wall.



BOOTS AT TRAINING SCHOOL WATCH CONSOLIDATED FLYING MODEL AS IT TAXIS ON ESTUARY; TARGETS AID IN SCIENTIFIC MEASUREMENTS

FOUR TWO-HP ENGINES DRIVE THIS SLEEK EXPERIMENTAL PLANE MODEL

Gas tanks of the XP4Y-1 model are in the engine nacelles behind the fire wall. The four-engine model shown here has power plants completely buried in the leading edge of the wing. It also incorporates a pressurized fuel system.

DURING early stages of development, considerable trouble was experienced with engine stoppage. This was caused primarily by faulty carburetion and salt spray shorting the ignition system. This problem was licked by using direct fuel injection and redesigning the shielding. The model has gasoline capacity for 25 minutes of operation and in most cases the model has been beached under its own power at the end of each run. This is accomplished by taxiing to the ramp and slowing down the model by intermittently cutting the ignition.

Consolidated also built motorless models and launched them from a catapult similar to ones used to toss TDD drones into the air for Navy gunners to use in target practice. Launched out over the estuary waters, the model gives hydrodynamic data on landing characteristics of the plane.

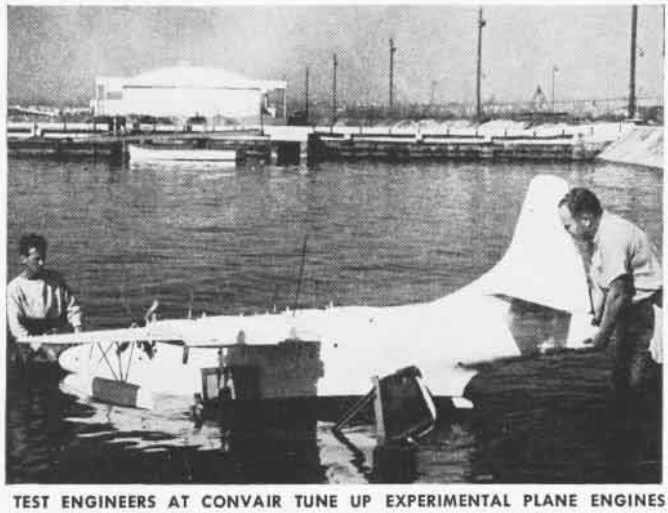
To handle the plane from the ground, a complete station similar to a cockpit was constructed. It has a wheel control column, rudder pedals and two throttle-control levels. The instrument board has radio instruments, an elapsed-time clock, flap and ignition switches and control surface trim adjustment knobs. It even has an adjustable seat for the operator's comfort.

Elevators, rudder, ailerons, flaps and independent throttles are operated by small, electric position servo motors. To prevent overriding and hunting, the servos have magnetic armature brakes that are instantly released whenever an operating current flows to the servo.

A free-flight model has two advantages over a towing basin system of testing plane designs. In the basin, models can only pitch and rise and their speed is limited to that of the 16-ton towing carriage to which the model is attached. Acceleration effects accompanying the reduced power loadings of modern seaplanes have a big effect on spray and stability. With the scale model, all effects which free flight could put on an actual plane were possible for Consolidated to duplicate.

To make it easier to keep track of the models in flight, one wing tip and the rudder were painted bright orange. The same color scheme is applied to corresponding controls on the ground transmitter. This helps the operator keep straight in his mind the flight direction and orient himself to execute a flight maneuver.

Excellent results obtained thus far during take-off and landing tests have stimulated studies on the possibility of



TEST ENGINEERS AT CONVAIR TUNE UP EXPERIMENTAL PLANE ENGINES

determining dynamic flight characteristics by use of free flight remotely-controlled models. Consequently, an automatic gyro-pilot which weighed about five pounds was developed.

In addition to stability criteria, this equipment will lend itself to all forms of hydrodynamic research such as hydrofoil studies, hull forms, auxiliary sustention and high lift devices. Effects of modifications to existing flying boats can be determined quickly and accurately. The time from conception to production of the full scale airplane will be measurably reduced, with resultant saving in cost.

SEVEN-CHANNEL RADIO CONTROL PANEL HANDLES PLANE WHILE IN AIR

MOVIE CAMERA RECORDS CATAPULTING OF A MOTORLESS FLYING MODEL

LT. GAY TALKS SHOP WITH LT. CDR. HAMILTON AND SKIPPER ASHWORTH

CHRISTMAS PARTY ABOARD HORNET WAS WELCOME RESPITE FROM WAR

TORPEDO SQUADRON ELEVEN

TO THE regular commissioning of Torpedo Squadron Eleven 10 October 1942 at NAS SAN DIEGO was added a special ceremony, the awarding of the Navy Cross to Lt. (jg) George C. Gay. He was the lone survivor of the gallant but futile attack of Torpedo Squadron Eight at the Battle of Midway. Symbol of daring in the face of odds, Gay as a pilot of the newly formed VT-11 represented part of the past that held promise for the future.

Commanded by Lt. Cdr. Frederick L. Ashworth, the squadron was made up, for the most part, of personnel who had had no combat experience. Thus the insigne of the squadron designed by Walt Disney portrayed a baby hurling a torpedo, a skull on the warhead.

On 23 October, the squadron embarked for Hawaii, and after some time there headed for NAS NANDI, Fiji Island, 15 February 1943. Two months later they were stationed at Henderson Field, Guadalcanal, for combat operations. From the middle of April to the middle of July, VT-11 pilots extended the area of destruction as they engaged in almost daily strikes against the enemy. Again and again they left areas in the condition defined by two words in one of their action reports, "completely plastered."

One of the brilliant accomplishments of the tour was a night mine-laying mission in which 14 TBF's of VT-11 participated, cooperating with 12 BTF's of VSMB-143, 14 B-17's and a New Zealand PBO, the latter plane carrying flares for navigation. Twenty TBF's carried one mine each while the other planes were loaded with bombs. The target was Kahili Harbor from Buin to Tonlei on Bougainville, an area which was softened up by four B-24's the night of 23 May at 2400, just three hours ahead of the main and highly successful attack.

The force was over the target at 0300. The approach to the harbor was made at 1800 feet by the mine-carrying planes. These dropped to 1200 feet for the crucial run. The mission was an unqualified success; the mines were dropped accurately and safely on the first run. This completely coordinated operation effectively befuddled the enemy so that there was only a token opposition of light AA. All planes returned undamaged.

Every pilot deserved credit for his part. VT-11 pilots had nothing but praise for the B-17 pilots who laid string after string of bombs along the beach to put searchlight and AA positions out of commission. Similar targets on two nearby islands were attacked by four supporting TBF's who used dive bombing tactics to accomplish their mission.

In strikes against Munda and Vila airfields, Kolombangara, the Rekata Bay area and Kahili Harbor, all of which they struck again and again, VT-11 pilots carried out hazardous missions. Marc A. Mitscher, at that time ComAirSols, in commending Air Group 11 at the end of the tour wrote, "No unit has excelled you in exacting . . . the maximum toll for your honored dead."

On 19 July, the squadron flew to Espiritu Santo, and exactly one month later arrived at NAS ALAMEDA.

September 25, 1943 marked the reforming of the squadron under the command of Lt. Cdr. Radcliffe Denniston Jr., USN, as well as the opening of a year of training—six months at Alameda and six months at Hilo. In Hawaii, training in group attacks, live bomb loading, radar bombing and navigation was emphasized. By 29 September 1944, VT-11 was ready and eager to add its stinger strength to the *Hornet*.

★★★

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

VT-11 PILOTS engaged in several training exercises before the squadron hit Okinawa on 10 October. On that day, they made three strikes against Naha airfield and one strike against Naha town. Devastation was meted out sufficient to crater the airfields, knock planes and installations out of commission, and destroy or damage buildings in the town. The enemy's AA fire, heavy though it was, failed to damage the VT-11's.

In seven strikes on the 13th and 14th of October, VT-11 hit three airfields as well as shipping and installations in Takao Harbor, Formosa. These strikes marked three important "firsts" in the squadron's second tour: first encounter with enemy aircraft, first damage by AA fire and first water landing in combat operations.

On the 18th and 19th of October, four strikes against the three largest Japanese airfields on Luzon—Clark, Nichols and Nielson—dealt heavy damage to planes and hangars. In the attack on Nichols, anti-aircraft fire sent Lt. William H. Winner's plane down. It was the first VT-11 crew lost in enemy operations on their second tour.

AFTER another strike 20 October on the beach at Dulag, Leyte, in support of the landings there, the *Hornet* headed for port, but on the 24th, it was ordered to intercept the Japanese Fleet headed east toward the San Bernardino Straits. At 1040 the 25th, a strike was launched at a distance of 340 miles from the enemy force which was attacking CVE's off Leyte.

VT-11 planes carried four 500-lb.

bombs each. Although they carried no wing tanks, they made a 600-mile round trip combat flight without the loss of a single plane. Success crowned the flight, for VT-11 made five hits on a battleship and two hits on a *Nachi*-class cruiser. A second strike spelled damage to two other cruisers. On the following day three strikes were launched against the scattered units of the Japanese Fleet, resulting in damage to a light cruiser off Mindoro and a destroyer west of Panay.

On 5 and 6 November, the squadron again hit Clark field in five strikes. A few days later on the 10th, a convoy was reported heading for Ormoc Bay, and on the morning of the 11th, a strike was launched. By the time VT-11 planes arrived, there remained only three destroyers and one DE of the original convoy, other air groups having accomplished the destruction of the other vessels. Air Group 11 went into action, sank one destroyer, left one dead in the water, slightly damaged the third, and left the DE burning heavily.

On the 13th and 14th of November, the squadron participated in six strikes against shipping in Manila Bay. Anti-aircraft fire was intense. In this action, the squadron commander, Lt. Cdr. Deniston, Ensign Burton T. Oberg and their crews were lost. Retribution was exacted to a small extent in that the squadron sank or helped to sink 18,000 tons of shipping and damaged an additional 22,500 tons during these strikes.

The squadron made its eighth strike on Clark Field the 19th of November.

The *Hornet* returned to port 23 November, and there were no squadron operations until 10 December. By that time it was clear that from now on it was largely a fighter war. On the 14th, 15th and 16th of December, there were 18 daylight fighter sweeps and strikes against airfields and shipping in the Bataan area and only four VT strikes. Even those strikes lacked suitable targets.

COMBAT CREWMEN HEAR JUST HOW IT HAPPENED

On 25 December 1944, Lt. Cdr. John A. Fidel reported aboard as the new skipper. Five days later the *Hornet* sortied on what was to prove the most rigorous, most profitable and most disastrous period of operations in the history of VT-11. The mission of Task Group 38.2 was the support of the Luzon lands.

Strikes on 3rd and 4th of January against shipping and airfields in southern Formosa were hampered by foul weather. While planes were forced back on one strike, a few strikes were accomplished on instruments. Continued bad weather blocked strikes on the 6th and 7th of January when only one of five strikes got through to the target, Malabat airfield on Luzon.

On the 9th, two strikes against Takao Harbor netted one medium cargo vessel and three luggers sunk and damage to 31,500 tons of shipping. But the cost to the squadron was high . On the first strike, a small caliber bullet penetrated the fuselage of David Mangum's plane, wounding Roy Balcombe who died within 15 minutes despite instant first aid. On the second strike, Lt. (jg) Gordon Bell and his crew were knocked down by AA fire. They were seen in a rubber boat about a mile off shore but were never seen afterward.

On 12 January, four strikes were made on shipping off Phan Rang and Qui Nhon, Indo-China. The first strike scored two torpedo hits on a 2500-ton tanker, one torpedo hit on a large tanker and four hits on a medium cargo vessel, all of which sank. Two DE's were damaged by strafing, one of which exploded. The second strike was unable to reach its target because of low ceiling. During the third strike a *Katori*-class cruiser was sunk by two torpedo hits. During the final strike a destroyer escort was damaged with one bomb hit, but misfortune again dogged VT-11 in the loss of Lt. (jg) William Maier and his crew.

On the 16th, strikes against Hong Kong spread destruction over a dockyard. On the third strike, the target ships were surrounded by DD's and DE's which put up intense AA fire and downed Lt. (jg) Edwin McGowan and his crew. Another plane was hit, but there was no injury to personnel. On the fourth strike, VT-11 damaged 3 enemy tankers.

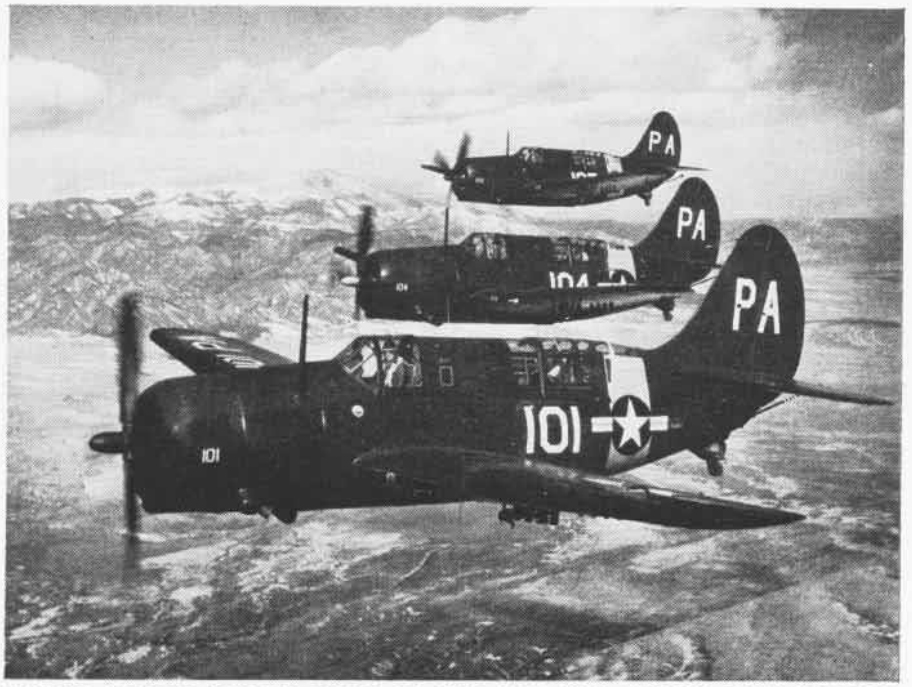
Strikes on Formosa on the 21st which netted 21,000 tons of shipping damaged or sunk concluded the tour. The *Hornet* headed for port.

In support of the Leyte, Mindoro and Luzon invasions, VT-11 had sunk 51,400 tons and damaged more than 100,000 tons of shipping, flown 68 strikes and made a formidable record of destruction in ground installations. In addition to sinking a light cruiser and a destroyer, VT-13 could list as "probably sunk" or damaged 13 Japanese war vessels.

On 1 February 1945, VT-11 left the *Hornet*. Battle-proved warriors of the Philippines and China Sea, they had played their part valorously in the Pacific. And now due east—and home!

WHEN THIS PICTURE WAS TAKEN FOR THE RECORD, 8 DECEMBER 1944, BATTLE-PROVED VT-11 WAS READY FOR FINAL ROUND OF THEIR SECOND TOUR

Denver's Air Reservists Fly High



WEEKEND WARRIORS FROM NAS DENVER FLY THEIR SB2C'S HIGH OVER THE ROCKY MOUNTAINS

THE NAVAL air station at Denver truly may be said to sit on top of the nation. With its altitude of 5,680 feet, it is the highest naval air station in the world. It is also the farthest from any large body of water. Set against the impressive backdrop of the Rocky Mountains—just where the wide midwestern prairies begin to relinquish their hold—the station itself makes a dramatic appearance with its hangars and planes gleaming in the crystal clear air.

Contrary to popular belief, the weather at this station is good enough to permit flying 94% of the time. This figure is not based on guesswork but on an analysis covering the last five years which was part of an extensive weather charting program undertaken by the Navy, the Army and local weather stations. The worst month last year was March—the weekend warriors could only fly 89% of the time.

However, don't get the idea that flying at Denver follows the usual fair weather pattern. The difference in atmospheric pressure between sea level and Buckley Field (15 psi as opposed to 13.8 psi) requires various changes in aircraft practices. To set your plane down smoothly at this station, for example, you have to land at a considerably higher ground speed than would be feasible at sea level. Failure to do this accounts for the stalling-out occasionally performed by visiting firemen.

The rarefied air also explains the long runways at Denver, for it takes a longer run to get a plane off the ground. Carburetors have to be leaned out to overcome loading up in ground operations. Similarly, since "snatching" gunnery tow sleeves off the ground is impossible, these sleeves have to be placed in cans, from which they are pulled after take-off, for use in gunnery exercises.

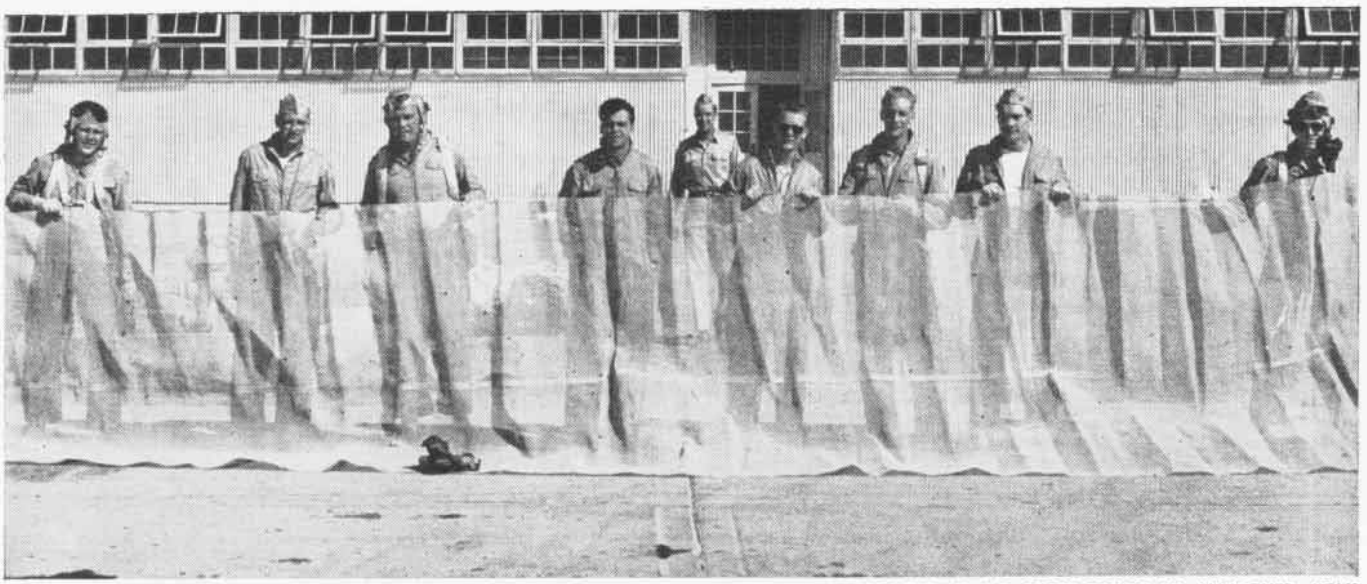
NAS DENVER is located at Buckley Field 10 miles from the city. When the Navy acquired this former Army air base in 1946, it found the field in a bad state of repair. With the public works department bearing the brunt of the assault, hangars were repainted and strengthened, runways were resealed and, in short order, the station was put in first-class condition. At this time personnel had to bring their own lunches or snatch a few bites from the solitary hot dog stand concession on the base.

On 16 February 1946, the station was officially commissioned and thus took its place among the 22 in the original Naval Air Reserve Training network. Commander Thurston H. James, the present executive officer, served as CO until the present commanding officer, Captain H. L. Hoerner, took over. Both of these men have contributed much to the smooth functioning of present operations.

During the war, Captain Hoerner, an Academy graduate of the Class of 1927, was assistant operations officer for Staff, ComSoPac and later for Staff, Commander of the Third Fleet, serving under Admiral Halsey. From 1945 to March 1947 he was air officer for Staff, ComWesSeaFron.

Cdr. James, a naval aviator who has been associated with the Reserve since 1926, fought with numerous squadrons in the Pacific during the war. He was especially selected for the job of setting up NAS DENVER on the basis of the record he chalked up in the Marshall Gilbert area in base development.

SQUADRON CO'S LINE UP WITH R. ADM. WHITEHEAD AND CAPT. HOERNER AFTER NAS INSPECTION



O. R. PILOTS FROM NAS DENVER HOLD UP GUNNERY SLEEVE THEY SHOT UP DURING PRACTICE HELD AT AIR FORCE RANGE IN WENDOVER, UTAH

RIGHT FROM the start Denver has been fortunate in having an enthusiastic and hard-working group of station-keepers. Immediately after the station was opened all billets were filled. Three months later there was a good-sized waiting list. Local businessmen claim that the Naval Air Reserve treats its personnel so well that they make well-satisfied and useful members of the communities in which they live.

The nine Organized Naval Air Reserve squadrons at Denver are virtually up to complement. They include 155 aviators, 63 ground officers and 913 enlisted men. In addition, over 50 Associated Volunteer Reserve officers, only about five of whom are in a drill pay status, take part regularly in week-end training,

NAS DENVER also has a Marine Corps Organized Reserve squadron, comprised of 54 officers and 174 men. The head of the Marine Air Reserve Detachment is Lt. Col. Wayne McElroy Cargill, who flew with a Marine Headquarters Squadron in the Pacific during the war. The detachment includes 3 officers and 37 men.

At the two weeks training maneuvers held at El Toro in August, Marine aviators averaged 30.3 hours. With plane availability hitting 100% for the entire period, VMF-236 ended up in the top spot for availability for the second consecutive year.

The station supports an Associated Volunteer Unit at Salt Lake City. This AVU(A), which is composed of 153 naval and Marine aviators and ground officers and 19 men, is one of the most active units in the country and is chalking up a fine record in its training activities.

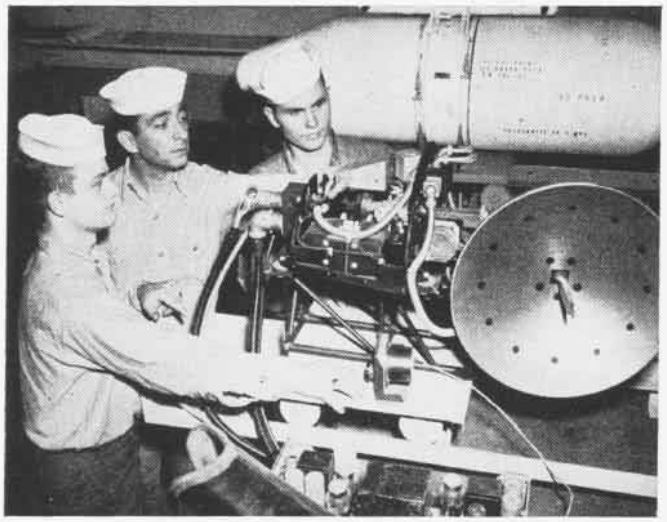
WAVES are doing an excellent job at Denver. There are nine WAVE station-keepers. WAVE Volunteers come out regularly on weekends to help in different departments on a non-pay basis. Recently the latter were rewarded for their efforts by being flown on an R4D training flight to San Francisco for a 12 ND WAVE reunion.

Denver has a number of Organized Reserve pilots with outstanding war records. Typical of them is Cdr. H. C. Hollenbeck, veteran NATS pilot who helped blaze air trails to the Aleutians and Pt. Barrow.

On the facilities side, the hot dog stand has long since been replaced by a large and comfortable snack bar operated by Ship's Service. From the money made in the snack bar and the ship's store, Ship's Service has contributed to the Welfare and Recreation fund, and given money to help make the Service Club a fine recreational center for the men on the station.

0-2 MEN ON FOURTEEN DAYS CRUISE ANSWER UP TO MUSTER BEFORE GOING TO THEIR CLASSES

WAVES G. LEISTER AND L. SANFORD DO A JOB



JIM BREWER, JOE PETRAGLIA AND PAUL GILMORE STUDY RADAR GEAR

CHIEFS C. W. CULBERTSON AND G. E. PENNOCK CHECK OUT PLANE RADIO

The station maintains close contact with local civic groups and holds its regular quota of open houses for visitors from surrounding communities. An interesting project has been set up for the local Boy Scouts. Once a month these scouts are brought out to the base in a station bus for practical instruction in the fundamentals of aviation. With the help of the two officers and one enlisted man, who supervise the project, the boys have built their own hobby shop where they turn out such items as gas model airplanes. Needless to say, this program has aroused great enthusiasm not only among the Scouts but also on the part of their sponsors in the community.

THINGS ARE never actually quiet at Denver. All during the week stationkeepers are getting planes and equipment geared for Organized Reserve training activities. Facilities on the station have been made available for the Colorado Air National Guard and National Guardsmen are busy training and maintaining their own planes and hangar. There is a steady succession of flights in and out of the station, for Denver is a convenient layover and refueling spot for east to west and north to south hops. On the new cross country flight operated by MATS, which replaces (temporarily at least) the *Hotshot,* NAS DENVER is a regular stopping point.

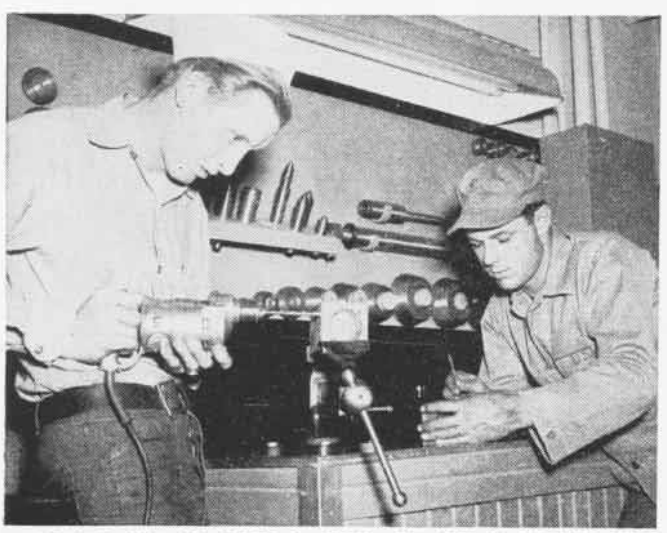
But it is on the weekends that the station really comes to life. It is then that Organized and Volunteer Reservists pour onto the base, driving their cars, riding their horses or even flying their own planes to get there. It is then that training really goes into high. If anyone ever doubted that the Rocky Mountain area would be a good place to locate a new naval air station, just let them go out and watch operations at NAS DENVER on a typical weekend.

DENVER RESERVE SQUADRONS

FASRon-155—Lt. Cdr. F. R. Clark, Jr., CO; Lt. Cdr. R. L. Norton, Exec.
CVG-85—Cdr. J. B. Espy, CO.
VF-86-A—Lt. Cdr. W. R. Frank, CO; Lt. Cdr. C. H. Fliesbach, Exec.
VF-85-A—Lt. W. C. Kelly, CO; Lt. C. J. Ray, Exec.
VR-75—Cdr. H. C. Hollenbeck, CO.
FASRon-55—Lt. Cdr. F. J. Tuck, CO; Lt. Cdr. G. W. Rienks, Exec.
VA-85-A—Lt. Cdr. R. J. Rugen, CO; Lt. S. B. Pittman, Exec.
VP-ML-75—Lt. Cdr. J. H. Kilker, CO; Lt. Cdr. T. M. Wilson, Exec.
VA-86-A—Lt. Cdr. C. H. Cheyney, CO; Lt. (jg) L. G. Jacobs, Exec.
VMF-236—Capt. Leslie C. Reed, CO; Capt. Edward G. Weber, Exec.

THE FOLLOWING officers are shown in the picture taken during the annual inspection of NAS DENVER: *left to right,* Lt. P. F. DeWees; Lt. Cdr. R. J. Rugen; Lt. Cdr. F. R. Clark, Jr.; Lt. Cdr. J. H. Kilker; Lt. Cdr. C. H. Cheyney; Cdr. H. C. Hollenbeck; Capt. G. A. T. Watson; Rear Admiral Richard T. Whitehead; Capt. Hoerner; Lt. Cdr. F. J. Tuck; Lt. W. C. Kelley; and Lt. Cdr. J. B. Espy.

Pilots holding up their gunnery sleeve are: Lt. Cdr. H. L. Thorp; Lt. Cdr. W. R. Frank; Ens. L. G. Shannon; Lt. (jg) E. W. Jones; Lt. C. H. Fleisbach; Lt. (jg) J. H. Jacoby; Lt. (jg) W. H. Martin, Jr.; Lt. R. K. Whitney; and Ens. D. C. Kirkpatrick.



A. COFFIELD MM3 AND S/SGT. A. CLOYD AT WORK IN MACHINE SHOP

J. D. SWIFT, W. MELLANG AND F. LONG CHECK DISCREPANCY SHEETS

Joint Training Program

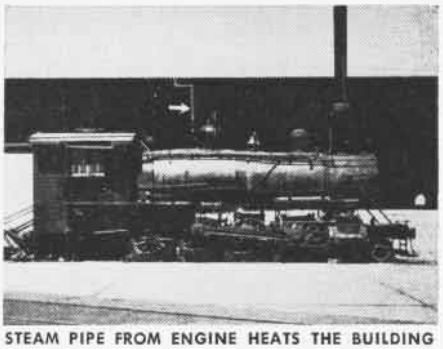
TRAINING courses to prepare personnel for industrial management billets in naval aviation industrial activities and for inspection billets in the field offices of the naval material inspection service have been developed and successfully carried out as a joint project by the Office of Naval Material and the Bureau of Aeronautics.

Both military and civilian personnel have been enrolled during the past year in a series of 12-week courses given at the Office of Naval Material Training School, NAS ALAMEDA. For those selected for the training school by BUAER emphasis has been placed primarily on phases of training in industrial management engineering; whereas, for the selectees of the office of Naval Material the stress has been on phases of inspection services.

With the introduction of industrial management offices in overhaul and repair departments at naval air stations and the adoption of management engineering staffs at bureau level, the need for training additional personnel in the practical application of the principles of industrial management has been recognized by the Bureau of Aeronautics. Consequently, personnel ordered to the school from aviation activities are specifically trained for industrial management billets at O&R's and management engineering billets in BUAER. Likewise, personnel ordered to the school from inspection activities are specifically trained for inspection billets in field offices of the Material Inspection Service.

The overall curriculum schedule includes courses in industrial relations, organization, plant layout, office layout, conference leading techniques, work simplification, production control, planning, color conditioning in industrial plants, statistical quality control, man-hour cost accounting, specialized operations applicable to administering industrial management offices in overhaul and repair departments. Since the classes comprise two separate groups, representing the Office of Naval Material and BUAER, specialized instruction relative to the requirements of each group has been fully developed and such instruction is presented independently to each group for most effective results.

So far, 414 students have successfully completed these courses of instruction. In addition to the regular curriculum presented to officer personnel on active duty and civilian personnel employed by the Navy, three two-week summer courses are offered for volunteer reserve officers on inactive duty.



STEAM PIPE FROM ENGINE HEATS THE BUILDING

Old Engine Heats Building

NAS ALAMEDA—Faced with the problem of tearing through a half mile of solid concrete roadbed to lay steam pipes to heat a big out-building, officials here decided on a better idea to warm employees working in the structure.

The old locomotive pictured here was switched onto a siding running parallel with the building and converted into a steam plant. Built in 1901, the engine was a coal-burner designed to pull freight cars at 250 lbs. steam pressure.

A 3" pipe fitted to a steam dome supplies 10,000 lbs. of live steam an hour to keep workers in the 400x200' building warm. In the center of the structure, an overhead vent and fan throws hot air through four 18" ducts, which scatter heat throughout the building.

Contaminated Oxygen Lines

VR-5, SEATTLE—A contaminated oxygen system was discovered on a plane during a routine service check. Samples of a liquid found in the system were analyzed and proved to be trichlorethylene. This product is classified as an anesthetic, and, if inhaled over a prolonged period, could result in nausea, apparent intoxication and, in extreme cases, death.

Upon receipt of the laboratory analysis, further investigation was initiated to determine when this liquid could have been introduced into the system. It is believed that the product was used as a cleaning and degreasing solvent, when the oxygen system was renovated during heavy maintenance at Lockheed. The oxygen tanks on this aircraft were replaced and the entire system purged to remove all traces of the contamination. The alacrity with which this discrepancy was resolved may have eliminated a serious crash due to the ill effects experienced by pilots using contaminated oxygen.

▲ *BuAer Comment* —**T.O. No. 10-47 prescribes safe procedures in the operation of trichlorethylene cleaning systems and warns that breathing air shall not exceed 200 parts of trichlorethylene per million. Since instructions for handling and installation of oxygen equipment warn against contamination with oil or grease, and only pure dry oxygen is specified for oxygen systems, degreasing should not be necessary. If oxygen lines become contaminated, it is recommended that they be replaced.**

Idea Speeds Work on Flaps

To facilitate synchronization of the flap position autosyn transmitters on R5D aircraft, an instrument mechanic at Moffett Field, Charles W. Vaughan, has suggested use of a seven-wire extension from the cockpit long enough to reach the position of the person adjusting the flap transmitter. The extension uses two cannon plugs, AN 3106-16S-1S, female, and AN 3100-16S-5P, male, and 420 feet of #20 wire. Time of manufacture is three man-hours.

In the previous method of performing this operation the flaps are set approximately "on" by use of an electrical harness installed at the flap transmitter. Final synchronization is done by oral direction because the flap harness and test indicator must be removed. The test gear must be removed since the master indicator in the aircraft and the test indicator do not read the same because of overhaul tolerances and the electrical characteristics of autosyn indicators. The indicators are sluggish because of having two indicators on one transmitter.

The main disadvantage with this method is that the person setting the flaps cannot see the indicator in the cockpit as he sets in any adjustments at the transmitter. At least two men are necessary for this operation, and it takes an average of 16 man-hours to synchronize flaps.

Under the suggested method, after the indicator is calibrated it is removed from the extension and placed in the center panel of the aircraft. Inspection requirements prohibit substitution of another instrument after an indicator has been synchronized for any individual aircraft.

The proposed method can be used in conjunction with an idea developed in the hydraulic section, making it possible to control flaps from under the plane. With use of the flap control and the extension from the cockpit, a set of flaps can be synchronized by one man in a fraction of the time formerly required by two. The originating activity estimates annual savings of $1,560 from this idea, submitted under the Navy Beneficial Suggestion program for its employees.

'OPEN AIR' FLYING

LT. CDR. VAN DUSEN INSPECTS STRIPPED-DOWN PLANE, TALKS TO TOMMY HALL, PLANE'S PILOT

VP-61, ALASKA—Take another look at the picture of the Bell helicopter accompanying this article—would you like to fly around in it in Alaska's frigid temperatures?

The picture shows Lt. Cdr. Charles A. Van Dusen, skipper of VP-61's aerial survey detachment at Big Delta, Alaska, inspecting the 47-B helicopter owned by a commercial Seattle firm. Unique part about the plane is the fact it has no plexiglas bubble or canopy to protect the pilot and passenger from slipstream and has no skin on the fuselage.

The plane was used for hauling field survey parties and supplies for the U.S. Geological Survey which is working with the Navy in a photographic survey of Alaskan resources.

After the Navy squadron had helped do a small repair job on the helicopter, the pilot, a Lt. (jg) in the Naval Reserve, took Van Dusen for a hop. Highlight of the somewhat windy flight came when the helicopter chased a 2500-pound buffalo down the Big Delta river.

"He got kinda mad at us, looked like a prize bull in the ring, snorting and pawing preparatory to trying to gore his tormentor. It was an exciting ride and reminded me of what it must have been like to ride with the good old Wright brothers," Cdr. Van Dusen reported afterward.

Second Cable Saves Target

VFF-211, PACIFIC—To save towed gunnery targets from being shot off, ordnance has adopted the following arrangement. Two separate strands of seven-strand cable are attached to the target harness. Quick splice loops are made on both ends of these cables. The other ends are fastened to the single tow cable.

Statistics show that four out of five targets previously lost in practice are now being retained by the second cable. Depending upon individual squadron experiences, the length of these cables may be varied.

Jettisoning F8F Wing Tips

NAS ALAMEDA—A unique "moulting" process is currently being installed at this station on F8F *Bearcats*. The modification synchronizes shedding of the wing tips by jettisoning the remaining tip automatically and instantaneously if either tip should fail.

Development of this process began when it was learned that an F8F wing tip could rip off during a high-speed dive with excessive pull-out acceleration. With one wing tip gone the aircraft would roll violently and could become uncontrollable at high speed. At low altitudes this could lead to a crash.

Equipment for the moulting process consists of an electrical circuit routed from one wing to the other through the fuselage. A micro-switch is attached to a detonator, which synchronizes the jettisoning of the wing tips. Jettisoning is accomplished by electrically energized blasting caps which ignite a pliofilm-covered detonating cord. The detonator blows off the remaining tip, should one rip off when the aircraft is coming out of a dive.

Synchronizing the jettisoning of the wing tips eliminates the hazard of the F8F lurching out of control if one tip fails. Pilots can make safe, albeit almost wingless, landings when the new modification is installed.

VR-2 Devises Flying Hood

VR-2, ALAMEDA—The training division recently designed and tested a new type instrument flying hood, which has met with the approval of squadron pilots.

Designed after the venetian blind principle, the hood increases the visibility of the instructor in the starboard seat to approximately 70° off the port bow, while still restricting the vision of the student.

Also embodied is a feature which enables the pilot on instruments to revert immediately to contact flight by simply pulling the black cloth panel hanging in front of him.

Marine Squadron Sets Mark

VMF-322, PACIFIC—So you think squadron life is one long round of sitting around the ready rooms reading magazines? Take a look at this squadron's activities for a month, for a little more accurate example.

In May 1014 flights were made, covering 2,020 hours in the air. These included 42 familiarization flights, 338 gunnery, 29 instruments, 24 tactics, 4 GCA, 55 test, 135 utility, 11 administration, 126 bombing and rockets, 3 navigation, 31 rockets and strafing, 19 rockets, bombs and strafing, 44 JANAFEX, 4 air spot, 2 photographic, 2 observer, 26 GCI and 119 bombing.

Total hours was believed a new record for a day fighter squadron with only 24 aircraft. The previous two months had seen low availability due to transfers and replacements of old aircraft, so the intensive training was designed to bring all pilots back up to peak.

CHART SHOWS PILOT FLIGHT HOURS OF VMF-322

All flights were tactical. The squadron fired 82,147 rounds of .50 cal ammunition, 1,394 miniature bombs, 1,338 SCAR rockets, 60 100-lb. water-filled bombs and 40 500-lb. bombs. VMF-322 had only 25 available pilots during the period with 80.8 average hours per pilot.

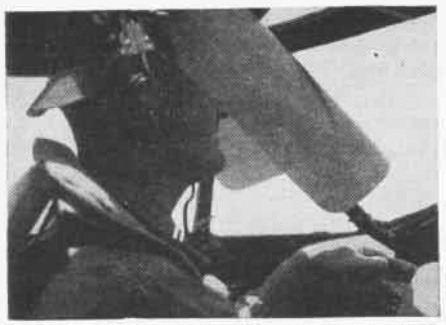
Undue Wear On Torque Tube

VP-28—A discrepancy was noticed in the elevator torque tube assembly on a PB4Y-2 when, in accordance with PB4Y Bulletin 258, the elevators were removed and inspected on a routine 120-hour check.

Over 50 percent of the bolt holes on the flange end of the elevator torque tube were found to be elongated. The wear on the holes is peculiar in that it apparently happened within a one-month period, since a careful inspection a month previously had shown no discrepancies in the elevator torque tube assembly.

The plane is in its fifth month of service, and logs and discrepancy reports give no indication of any reason for undue wear on the torque tube.

To be prepared for any future recurrence, and to insure against excessive loss of service of aircraft due to lack of parts, the squadron has ordered an elevator torque tube assembly unit through local supply. The worn assembly has been sent to O&R for replacement of the flange ends which were worn.



BLASTED SHADE KEEPS PILOTS EYES IN COCKPIT

USCG Has New Shade Idea

From the Coast Guard Air Station at San Diego comes another version of the instrument flying eyeshade described in the July issue of NANEWS, developed by VMP-354.

Whereas the Marine photo squadron used blue goggles and an amber eyeshade, the Coast Guard idea was still simpler. Instead of goggles and hood, the former are dispensed with and the underside of the hood sand-blasted, preventing vision outside the cockpit.

Sand-blasting prevents the glare and reflections from the plexiglas. Any color material can be used, although green was found most satisfactory. The entire elimination of blue goggles provides better observation of the instrument panel and eliminates "foggy goggles."

The hood may be mounted on an old welder's mask frame, or it can be riveted to the regulation hood used for instrument training. Two wing nuts on either side permit proper adjustment. Measurements of the hood are 15½" in length and 20½" in width.

Barge Will Be Mars Berth

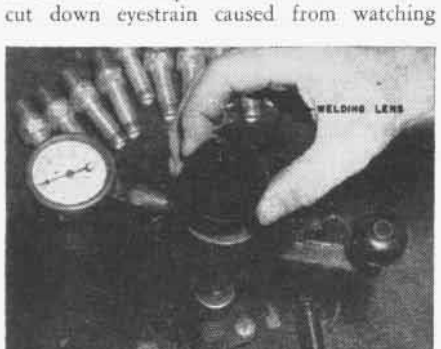
NAS ALAMEDA—A 120-foot barge, the size of an average city lot, is being reassembled into three sections to form a new U-shaped dock for *Mars* aircraft docking at NAS ALAMEDA. The prefabricated 360-ton Army surplus barge will replace the present *Mars* slip, which was built eight years ago from construction battalion pontoons.

The steel barge was obtained as surplus without cost to the Navy. Original cost of the structure was $200,000. It will be floated and moored into place within several weeks, and is to be a permanent fixture.

Lens Cuts Down Eye Strain

NAS NEW ORLEANS—A civilian worker in the O&R shop worked out an idea to cut down eyestrain caused from watching sparks jump from electrodes while he was testing spark plugs.

Charles E. Redler noted that his vision deteriorated after working at the test machine for a few minutes and that he had difficulty in seeing several hours later. To prevent injury to his eyesight, he placed a lens taken from a pair of welder's goggles over the spark-viewing window on the tester. He has noticed no eyestrain since. This idea may be useful to other O&R shops.



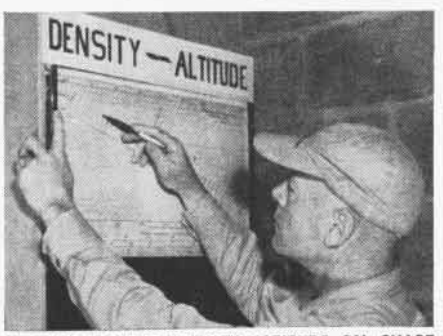
LENS CUTS DOWN ON INTENSITY OF PLUG SPARK

Chart Aids Pilots of HU-2

HU-2, LAKEHURST—A Reserve naval aviator getting helicopter training with this squadron is shown using a density and pressure altitude conversion chart which has proved helpful to pilots here.

Since density altitude varies greatly from day to day and hour to hour, especially in summer months, the board was developed so pilots can rapidly calculate the altitude just prior to flight.

The board, shown being used by Wyman



W. ELLIS FIGURES DENSITY ALTITUDE ON CHART

Ellis, CAA inspector, was made with a salvaged altimeter permanently set at 29.92" HG. Thus the altimeter constantly indicates pressure altitude. In addition, the outside air temperature is required, so a thermometer was installed with the bulb mounted outside the hangar and shielded from the sun.

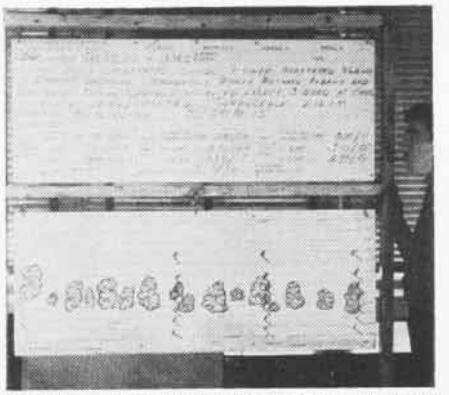
Now pilots can predict the helicopter's performance by entering the ordinate with temperature, following it to the intersection with the diagonal pressure altitude line and reading the density altitude at the bottom of the chart. Right below this scale is a relative density scale by which variations in the useful load of the helicopter may be computed as density altitude varies.

A miniature chart is being prepared to carry in each plane. Density altitude then may be determined within the accuracy of the instruments when the aircraft is on extended flight or away from home base.

Pilots Briefed on Weather

NAS QUONSET POINT—Past experience has demonstrated the need of some aid in briefing and issuing identical weather clearances to a large number of pilots at the same time, in connection with hurricane evacuation and other mass flights. For this purpose a display board, (*see photo*) was recently developed by aerological personnel at NAS QUONSET POINT.

The double plexiglas panels are 20" x 50" in size, swung free on hooks. Either panel may be reversed, or the entire rack and display may be reversed. The upper panel contains, as background under the plexiglas, an exact replica of the weather



DISPLAY BOARD BRIEFS WHOLE GROUP AT ONCE

section of the Aircraft Clearance Form (NavAer 423).

The reverse of this panel is similar. The lower panel background shows the direct route profile from Quonset Point to Albany, New York, and from Albany to Burlington, Vermont, Quonset's two main evacuation airports. The reverse of the lower panel has as background a blank cross-section on which the profile for any other flight path may be entered together with the weather.

The weather clearance panel and cross-section weather are filled in, using various colored grease pencils. On group briefings and clearances, the pilots copy the weather information on their own clearance forms which are then signed by the aerological clearance officer.

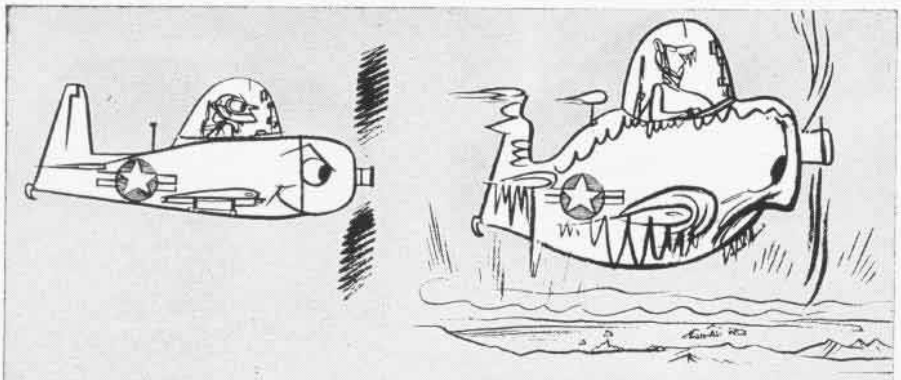
Truck Saves Wear on Units

NAS NORFOLK—This station has developed a hand truck for moving AN/APS-4 radar equipment which cuts down on damage, saves 50 percent on labor of handling and saves 67 percent on space required to store them. Other activities may want to copy the idea.

The two-wheeled hand cart was developed and made of salvaged material by O&R department. Each truck holds a radar unit vertically. One man with the truck can do a job which formerly required two men.

The devices cut down on the amount of handling since the radar units are placed into the rack upon removal from the plane and stay there during transportations and storages prior to overhaul and after.

TRUCK REDUCES WEAR AND TEAR ON RADAR UNIT



CARRIER COLD WEATHER FLYING SENSE

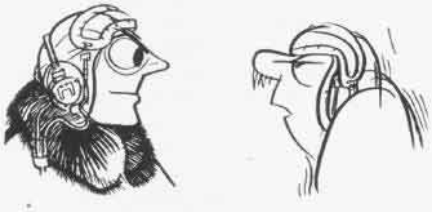
★ ★ ★

(This is a condensed version of the newest aviation training pamphlet, Carrier Cold Weather Flying Sense, just off the press. Sense pamphlets have long been favorites with naval aviators)

★ ★ ★

THE SAVVY pilot, the well-informed bird man doesn't pretend to love cold weather. He would no more choose a regular run over the South Pole than a penguin would put out 50 cents for a Turkish bath.

Flying in cold weather is tough *because* the weather is cold. Drastically low temperatures mean lower human



efficiency. The lower the mercury, the longer it takes people to get things done. Yet cold-weather flying requires the best a pilot can offer in alertness and precise, pains-taking preparation. It means planning ahead when the normal impulse is to find a warm sack and hole up for six months.

In addition to extra alertness and expert pre-flight preparation, flying in the frigid zones makes other demands on pilot, flight equipment and airplane. Clothing must fit perfectly if it is to give reasonable protection. The plane has to be fitted out with elaborate deicing equipment. Tougher-starting engines need a smart hand at the controls. Quick shifting weather requires a quick shifting pilot. Icing is a real menace. Some instruments go haywire in certain areas. Navigation is sometimes a full-time job. And survival may mean a tight struggle between the rescue forces and time.

Fortunately, the carrier-based pilot gets a cold weather break. Land-based people, contending with ground temperatures of 50 or so below, have to start, warm up and take off in an almost perpetual cold blow just as some Alaska-based Navy and Army squadrons did during the war.

But carriers don't operate where the seas are frozen over or icy spray plasters the flight deck. Flying from flat-tops is confined, for the most part, to regions where mercury readings on the deck do not fall much below minus 9°C (plus 15 F) and the temperature of the sea is above freezing.

In terms of you and the body beautiful this is cold, but in terms of your airplane it means relatively easy starting, warm-up, and launching. But even so, you'll be doing business a long way from the Equator . . . so dress for the occasion. There's nothing like cold hands, cold feet, or a cold rump to make a sissy out of the toughest cookie in the Navy. You can start beating the frigidity by padding yourself with the proper cold weather flight clothing. But

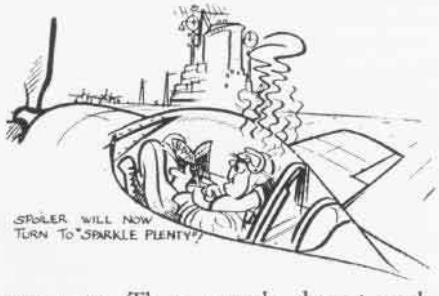
the stuff is useless unless it fits. Try it for size, then try it again . . . Dilbert can't waggle a finger in gloves that are too small and he is all thumbs in the giant size. Calf-length pants give him the New Look and also pneumonia.

The idea is to protect yourself. If you draw an electrically-heated suit, get the word on the way to operate it. And the straight dope on which hooks to fasten and zippers to yank to drape it around you correctly.

The Well Primed Plane

Your airplane will be set up for cold-weather flying too. With only a few alterations, the same plane you flew around San Diego can make its way around Greenland, but the differences must be understood.

Oil dilution, for instance. Anytime the temperature seems likely to fall below 2°C, engine oil will be diluted with fuel for easier starting and quicker



warm up. These remarks do not apply to jets. The principal reason for dilution is to get a quicker flow of oil moving around through the engine on cold days. Properly performed, the process cannot possibly harm your power plant. All you have to remember is that you'll take off with about 10 percent less oil in your tank than in warm weather and

make your plans accordingly. Used aboard ship, dilution helps to eliminate the clumsy coverings and engine heating devices employed by landbased people at their frozen-over bases and makes quicker launchings possible.

Because warm up has to be performed with a certain extra amount of care in cold weather, the smart pilot never neglects the idle-mixture test set forth in TO 80-44. Fail to make the test on an engine getting too rich a mixture and you can wind up with fouled plugs. Skip it and you may let yourself in for that supreme aviation thrill—an engine failure on take-off. In cold weather the tendency is to set too rich a mixture, a trick which can lead to what the

statistical people call sudden stoppage. Take the time to check.

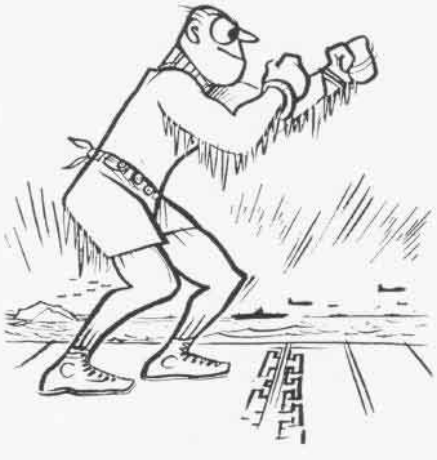
Too rich an idle-mixture will partially

foul your plugs as you taxi out of the gear after landing. Watch for smoke. If it comes out black and heavy when you open the throttle, you're fouling 'em fast.

The experts warn against allowing the engine to heat up or cool off too rapidly. Even in the most frigid weather it's possible to overheat an engine by closing it off completely from outside air. In a prolonged glide or long approach, of course, it's sensible to shut the cowl flap to avoid fast cooling, but the word is to open them again as soon as you hit the deck.

Watch Those Watts

Until more efficient cold weather batteries are developed, you must coddle the one you have. Battery capacity, like the price of ice in Alaska, goes down

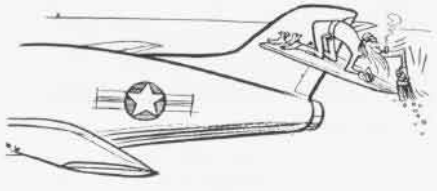


with the mercury; and even normal use takes more out of the juice box in cold season than in July. For this reason, auxiliary power units are used to crank up your plane and you are urged to avoid excessive drain on the battery during long periods of idling when the generators are cut out.

Another villain is Ice and he ain't nice. The discomforts of cold can be endured . . . The first step is to find out all you can about ice and its sneaky habits, the second is to find out about the de-icing equipment on your plane. Not even the most elaborate de-icing gear works itself: it has to be turned on at the right time by a pilot sufficiently savvy to know icing conditions when he sees them.

Carriers can skirt around the margins of extremely cold regions of the world where overcast is commonplace. Some pilots are so cautious about icing inside the overcast that they don't dare do the smart thing, which is to get over it as quickly as possible.

No one in his right mind would start a flight with visible ice on any part of the plane surfaces because of its obvious menace to the aerodynamic qualities of tthe aircraft. There's no reason to feel any different about snow just because you think it *might* blow off. The pilot who strings out fogey after fogey is the one who wipes off snow (a) by hand, or (b) with a large whiskbroom kept specially for the purpose.

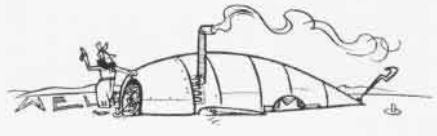


If you take off from a wet deck, it's a good trick to limber up landing gear, ailerons, flaps and bomb bay doors to make sure water splattered over them hasn't frozen stiff once you're in the air. Intense cold makes oil sluggish, so when you come around into the downwind leg, pump your brake pedals as you let the wheels down to help out oil circulation.

Making Like a Pigeon

The contact-weather, plotting board system of carrier plane navigation is all right for normal flying, but there are two large factors working against it: Terrific winds and frequent instrument conditions. When Dilbert makes a navigation error in a 10-knot wind over Florida, he winds up somewhere in Alabama, with a fair chance of finding a field to sit down in. The same kind of foolishness in a 40-knot gale around Greenland can dunk him a hundred miles off Cape Farewell.

Not even the canniest dead reckoner gets along on that system alone in a howling wind or when he's on instru-



ments a good part of the time. Some pilots report a 180-degree reversal of compass bearing in the Greenland area; where this leaves the dead reckoner is anybody's guess . . . cold weather operations demand a knowledge of every kind of navigation possible to CV pilots. The best navigators know all the systems and check one against another.

If You Get Into Trouble

The best dope is not to ditch in really cold water if it can be avoided but to make for the nearest shore. You can't set up housekeeping on a grand scale with the limited gear in your plane but you'll wear better for a longer time on land than in the sea.

Of course this does not apply if land is far off and you can arrange to dunk within hailing distance of an escort vessel. In that case the recommended procedure is to go in about a thousand yard ahead of the ship, into the wind. In that way the rescue people can break out their equipment and prepare the swimmer while you're drifting toward them. When one of your buddies ditches, don't ever let him out of your sight. Keep orbiting within a reasonable distance and give with the radio, ever mindful of proper wireless discipline. A crowd of frantic pilots yelling into their radios will foul up a detail at a time when a minute can mean a life. *A pilot in ordinary winter flight gear will be paralyzed and near death in from eight to fifteen minutes if dunked in sea water that is near freezing.*

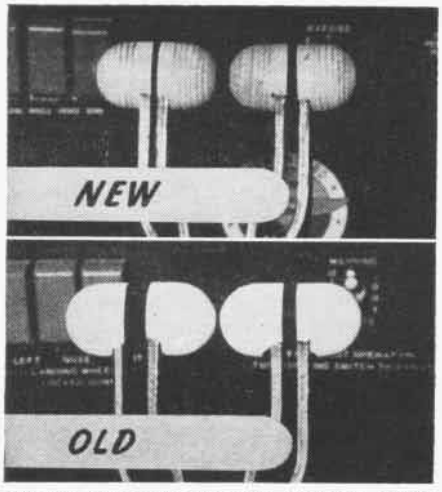
The smart operator doesn't let himself in for trouble in cold weather areas.

He watches his gas like a beagle. Ever mindful of erratic winds and weather, he always allows himself a fat margin for getting home. He knows his radio aids the way Fatima knows her dance. He checks and double checks his navigation. His only contact with ice is in cokes.

As you can see, carrier cold weather flying has its problems. Not a one of them can't be solved by constant alertness, keen preparation and smart piloting.

Every naval aviator will meet the cold as part of the all-weather program. When you put on your ear muffs, it's up to you to know the situation, face it squarely, and come out with the answers.

That way, you'll meet and beat the cold.



VMR-152 HAS NEW PROPELLER CONTROL KNOBS

Knob Aid for Busy Pilots

VMR-152, SANTA ANA—This squadron has undertaken modification of propeller control knobs on all R5D aircraft as shown in the above picture. This modification is designed to prevent pilots from inadvertently grasping the throttles instead of the propeller controls, while observing the propellers to adjust their synchronization.

FH-1 Belly Tank Is Tested

BUAER Ships Installations division recently completed tests to determine if FH-1 jets could make arrested landings with external fuel tanks attached.

Field tests resulted in stopping the dead load in the barriers in all cases. In two out of four engagements, both barriers engaged both main landing gear struts and the external tank came to rest under the dead load after separation from its attachment fittings.

In the remaining two engagements the first barrier caught the right strut and second barrier the left strut. Inherent slewing of the airplane caused the tank to become free and proceed about 60 feet forward of the arrested position of the dead load.

BUAER lifted the restriction on FH-1 arrested landings with drop tank and outlined the results from barrier engagements with the tank installed. Because of tank missile and fire hazard, it was strongly recommended that the tank be empty when landing.

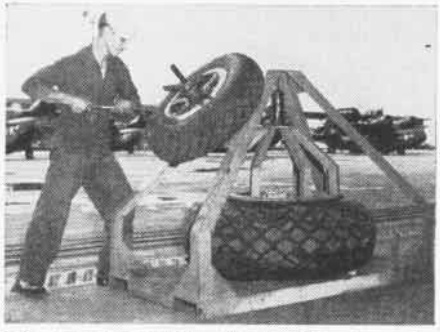
Cover Protects Radio Gear

VMT-2, EL TORO—This squadron conducts GCA qualification flights in the SNJ-type aircraft. In order to do this, planes have to be equipped with two transmitters, necessitating radio installations in the after cockpit—on the shelf behind the student.

Frequently rain leaks from the cockpit enclosure into the transmitters. When this water reaches the tube sockets it causes an arc from the screen grid to the ground.

Tech. Sgt. Maurice H. Alexander, NCO in charge of the radio shop, in conjunction with the parachute loft, has devised a rubberized canvas, waterproof cover to fit over these transmitters, thus protecting them from leaking water.

WATERPROOF JOB SHELTERS SNJ TRANSMITTERS



Naval Air Facility, Annapolis, has developed a portable tire bead breaking device which greatly aids removing of airplane tires from wheels and cuts down on damage from hammers. It is made of scrap material and will take any size of tire.

Two O&R's Are Reactivated

Under the expanding naval aviation program, two former "A&R's" are being reactivated under the new designation of Overhaul and Repair. They are at MCAS EL TORO and NAS SEATTLE.

Col. Elliott E. Bard will be in charge of the activity at El Toro, and the Seattle O&R will be under the command of Capt. Roy Jackson.

It is believed that the reopening of the maintenance organization at El Toro will more than double the station's present Civil Service complement of about 900. The former A&R employed more than 2,100 workers.

The Seattle O&R workload will consist mainly in handling patrol type planes from the Boeing storage pool at Renton. Employment is estimated at approximately 2,000.

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Air Defense Today. Lt. Gen. George E. Stratemeyer. *Aero Digest*, Sept. 1948, pp. 45-48, 161-163.

New Weapons for Air Supremacy. Lt. Gen. B. W. Chidlaw. *Aero Digest*, Sept. 1948, pp. 50-53.

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A Study of Wing De-Icer Performance on Mount Washington. Dwight L. Loughborough, Howard E. Greene, Paul A. Roush. *Aeronautical Engineering Review*. Sept. 1948, pp. 41-50, illus.

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U.S.A.F. Wants More than 70 Groups. *Aviation Week*, Sept. 6, 1948, pp. 13-17.

Government Aviation Obligations Under 1949 Fiscal Year Appropriations. *Aviation Week*, Sept. 6, 1948, p. 18.

Navy Now Expanding Aviation Program. *Aviation Week*, Sept. 6, 1948, pp. 19-26.

Electronic Airways Open New Market. *Aviation Week*, Sept. 6, 1948, pp. 29, 30.

Munitions Board in New Role. *Aviation Week*, Sept. 6, 1948, pp. 35, 36.

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U.S.A.F. "Unveils" Speed Designs. *Aviation Week*, Sept. 13, 1948, pp. 25-27, illus.

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Exit in Extremis. *Flight*, Aug. 19, 1948, pp. 199-201, illus. (Latest development of ejector seat for high-speed escapes.)

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Shoulder Harness—A Must. John P. Jefferson. *Skyways*, Oct. 1948, pp. 28, 29, 54, 55, illus.

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Navy Makes New Records with Martin Flying Boat. *U. S. Air Services*, Sept. 1948, pp. 12-14.

Safety in the Skies. Cdr. Harold Bradley Say, USNR. *U. S. Naval Institute Proceedings*, Sept. 1948, pp. 1111-1119. (Navy's transports flying record.)

Aircraft Reconnaissance in Tropical Storms. Charles R. Coates, Chief Aerographer's Mate. *U. S. Naval Institute Proceedings*, Sept. 1948, pp. 1127-1133.

High Speed Aircraft Navigation. Cdr. Wallace A. Sherrill. *Western Flying*, Sept. 1948, pp. 16, 20.

SUPPLY NEWS
FROM ASO AND SUPPLY DIVISION BUAER

Provisioning the Skyraiders

In provisioning spare parts for AD-1 and AD-2 aircraft, only the known critical shortages of material common to both aircraft were considered. To provide for urgent interim requests at subsequent dates, the full expenditure of funds allotted was not recommended.

The contractor advised that in addition to showing plane bureau number applicability of parts on the AD-2 Illustrated Maintenance Parts List, the numerical parts list will be columnized by type modifications, i. e. AD-1, AD-1Q, AD-2, AD-2N, AD-2W and AD-2Q, for ready reference.

Douglas hydraulics experts attended the provisioning conference to advise regarding maintenance difficulties on the 3,000 psi hydraulic system. The Navy policy of nonprocurement of line assemblies was reviewed, and it was agreed that while continued procurement of steel lines was not desirable, it was necessary until suitable bending, flaring, and test equipment is made available to O&R establishments.

Thirty sets each of all hydrauilc lines were procured for immediate requirements. The contractor reported that the cost of special equipment to bend and flare steel tubing is $3,000. Since, according to the contractor, the rejection rate on tubing received from steel manufacturers is 70%, a thorough inspection is recommended for all steel tubing received or used in bulk lengths by the Navy for AD aircraft, including test and check as indicated in Douglas specification drawing 4264626. The contractor also stated that no change to the 3,000 psi hydraulic system is planned.

Designation Changes

An official change by BuAer of designated AD aircraft on contract NOa(s)-9238 is as follows:

Former	*New*	*Serial Nos.*	*Total*
AD-2	AD-3	122729-122853	125
AD-2Q	AD-3Q	122854-122876	23
AD-2W	AD-3W	122877-122907	31
AD-2N	AD-3N	122908-122922	15

The majority of items formerly peculiar to the AD-3 program are slowly being assimilated in part or completely into the AD-2 program, all aircraft under contract NOa(s)-8522 being still located at contractor's plant. Changes are being accomplished by the "quick fix" program now under way on AD-2 aircraft. Therefore, very few major assemblies will be peculiar to AD-3 aircraft. However, equipment items and some small assemblies will be peculiar. Such major design changes, as they now exist, between AD-2 and AD-3 are as follows:

AD-3 P/N 5266156,-1, landing gear shock struts (AD-2 P/N 5256376-500,-501)—struts lengthened 4" to give greater shock absorption, plus telescopic action. (Contemplated, under test)

AD-3 P/N 5263693-6,-7, main landing gear fixed fairing (AD-2 P/N 5254070-6,-7)—Change in contour, better fairing, clearances.

AD-3 P/N 5265713, door assembly oil cooler (AD-2 P/N 5258891)—New 22" oil cooler being installed.

AD-3 P/N 3252249, regulator installation, pilot oxygen (AD-2 P/N 5263800)—New location, slightly different method of attachment used, new regulator.

AD-3 P/N 5265259-500, gear installation, tail wheel (AD-2 P/N 5256380-502)—New link assembly, new yoke assembly.

AD-3 P/N 3263730, switch installation, landing gear control.

"B" Lists Expanded

There was a marked tendency toward inclusion of items formerly included only in "C" or overhaul lists into "B" or maintenance lists. This action was advisable as maintenance activities have shown usage of such parts prior to O&R overhaul of AD aircraft. In general, such parts now have been included in both "B" and "C" lists. Personal experience in field installation of such parts by Lt. Franck of Attack Carrier Air Group Nineteen is basis for changed or modified listings.

Procurement of elevator and rudder tip assemblies has been made only tentatively. Visual inspection and the progressive method of assembly within the manufacturing department show that these tip assemblies are not removable by maintenance activities and would require very careful removal by O&R of 75 ST skin in order to drill out the internally riveted structure, plus use of oversize flush cherry rivets to replace skin. Excessively high issue of elevator and rudder assemblies on AD-1 aircraft susbstantiates this. At the request of conferees, the contractor has initiated engineering action to provide an improved method of replacement.

Maintenance activities have been requesting P/N 5261223, enclosure assembly, as complete assembly, when replacement of only P/N 5261223-32, plexiglas canopy, was required. The contractor advises that no known failure of the structure has occurred and that maintenance activities request the complete installation since only the simple removal of six bolts is required on assembly, compared to approximately 75 screws on plexiglas. The plexiglas is jig drilled for ready installation. Recommendation of conferees is to remove P/N 5261223 from section "B" and replace with P/N 5261223-32. Stricter rationing control by supply activities of the complete assembly has previously been recommended by ASO.

The total quantity of parts which are peculiar either to the AD-2W, -2N or -2Q are shown in the "D" or add list to contract NOa(s)-9238 and will be delivered concurrent with completion of each 10 aircraft of the particular designation involved with parts common "B" quotas.

Major differences of the AD-2W are as follows:

Fuselage fuel tank (360 gal.) removed from fuselage and replaced by five wing fuel cells with capacity about 413 gallons. Wings, engine mounts, lower cowling, fuselage structure, oxygen installation and flight controls differ.

Provision for three-man crew in lieu of single place by type aircraft.

It is strongly recommended that provisioning teams continue to convene at contractors' plants for best utilization of the technical services available to the contractor. It is also recommended that the assignment of personnel qualified by reason of personal and detailed experience with specific type aircraft be continued.

Panther Supply Problems

Structural fuselage-powerplant parts which may be interchangeable between the Allison and Nene engines are not yet known by the prime contractor, inasmuch as the Nene engine has only been installed on the experimental F9F-2 aircraft. Engine control installations are known for the Nene engine only and many are undergoing changes.

Each engine has its own peculiar water injection system. The Nene engine requires a reservoir with a water capacity of 25 gallons, while the Allison requires one with a capacity of 15 gallons. It is impossible to supply only the larger tank since the contour and overall dimensions of the Allison engine prohibit sufficient area for its installation.

Mounting trunnions are also peculiar to each model engine. Very little interchangeability is anticipated between these engines, their peculiar control systems, or their structural requirements. This establishes a double load on the Navy supply system since both types of spares must be procured because of these peculiarities.

For the first time the source-coding team encountered the problem of control rods, made of aluminum alloy and which go through air-tight bulkheads, being chromium plated. These parts, which are relatively simple to manufacture and which ordinarily would be coded "M1," were actually coded "P1" because of the inability of O&R activities to chromium plate aluminum alloy parts.

The prime contractor has assigned his part number to specified lengths of certain rolled section that he easily forms from standard gage sheets of aluminum. These rolled sections are coded "P" since it was considered more economical for O&R activities to have on hand lengths of these sections from which they may cut any desired length and bend as required.

At the time of the F9F provisioning conference, final decisions had not been reached regarding the following:

1. Whether or not the covers for the engine ram-air-ducts should be made so as to be airborne.

2. Whether the folding wing struts are overloaded when required to lift the outer wing panel after it is made structurally heavier to incorporate the newly designed wing tip fuel tanks.

The results of these considerations will be published at a later date.

GCA BOX SCORE

August Approaches	8,801
Instrument Approaches	298
Total Approaches	142,053
Total Instrument	6,377

SERVICE Test INTERIM REPORT DIGEST

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

AD-2 (206 Hours)

Exhaust Stack Clamps. Two of the latest type Marmam clamps installed on after position of Nos. 10 and 3 cylinders failed at 42 and 56 hours respectively. In both cases cracks developed along outer edge of spot weld depression. Although present clamp design is improvement over original, its service life is still unsatisfactory.

Engine Control Quadrant. Difficulty was found in making power adjustments with the engine control quadrant friction knob partially tightened, as the propeller control moved when throttle was moved, and vice versa. Examination showed that the fixed lamination between throttle lever and propeller lever rotated slightly when either lever was moved. The length of 5/16" O.D. tubing used to hold the fixed lamination stationary was a loose fit on the 3/16" bolt. Holes provided in the casting for the 3/16" laminated stop bolt were too large, permitting propeller control lever or the throttle control lever to move approximately 5/8", thus making small changes in engine power difficult.

As temporary fix the fixed lamination in the engine control quadrant was made stationary as follows:

1. Holes in quadrant casting used to attach fixed lamination stop bolt were reamed to .250".
2. The 3/16" bolt was replaced with a 1/4" bolt having same length.
3. The 5/16" O.D. tubing spacer was replaced with one 3/8" O.D. x 1/4" I.D., having two grooves 1/32" deep and 5/8" wide cut around its outer circumference to interlock with tines of the fixed lamination.

Recommend that contractor redesign control quadrant to remove all interference between the throttle control lever and the propeller control lever.

Oil Cooler Air Duct. It is difficult to install the oil cooler air duct for the following reasons:

1. Chafing strip cemented to inner perimeter of the after end of the duct is dislodged when edge of chafing strip contacts oil cooler flange during installation of duct.
2. Because of the small holding power of oil cooler duct clamps, the oil cooler duct is easily dislodged from its position on oil cooler flange when oil cooler forward fairing is installed and mated with oil cooler duct.
3. Oil cooler duct does not fit properly over flange of oil cooler because the position of the oil cooler duct is controlled by the oil cooler forward fairing and sufficient adjustment is not provided.
4. Inner edges of duct wall at mating point of oil cooler duct and oil cooler forward fairing are bent during installation; this prevents proper mating of the two pieces.

Because of vibration, the cam lock used to join the oil cooler duct and forward fairing pulled its securing rivets out of oil cooler forward fairing.

Recommend that oil cooler duct and oil cooler forward fairing be constructed as an integral unit to facilitate removal and installation. In lieu of this, *recommend* that two quick disconnect adjustable legs be provided for forward corners of oil cooler duct to position duct in relation to engine mount prior to installation of oil cooler forward fairing and that present cam lock latches be removed. Also *recommend* that a durable chafing strip be provided between oil cooler duct and oil cooler flange.

Spark Plug Leads. No part number is provided for the spark plug leads in the parts catalog, AN02A-35JG-4, revised 15 May 1948. Paragraph 7-78 of AN 02-35JG-2, the service instructions for this engine, states that the spark plug leads cannot be rewired and must be replaced as a unit. *Recommend* that a revision notice be issued to provide a part number for the spark plug leads.

Cylinder Fin Separators. Separators located to left of front spark plugs were found loose or missing on all cylinders except No. 2. The separators installed to the right of the spark plug were all tight except cylinder No. 9 which was missing. The three fin separators installed between the rocker boxes of No. 10 cylinder were loose. Examination showed that the amount of the fin that is upset over the fin separator to hold the separator in place on the cylinder is not uniform for all the separators on all cylinders. *Recommend* that engine manufacturer investigate discrepancy and provide cylinder cooling fin separators that will last the life of the engine between overhauls.

Exhaust Stack. After 104.6 hours operating time, exhaust stack for cylinders 8 and 10 broke at a point adjacent to weld attaching the tail pipe connecting flange. *Recommend* that design of this exhaust stack, P/N 525899-12, be improved to increase service life.

Cloth Boot. Boot for oil cooler door actuator disintegrated. Temporary fix was manufactured from water proof canvas. *Recommend* that contractor provide boot with increased service life.

Crankcase Drain. After 110 hours engine operation, an oil leak developed at after end of crankcase main oil drain tube. Lower half of line was galled on surfaces where it entered supercharger housing and contacted oil tube flange, P/N 130D85. Oil seal ring, P/N 4036D11, had its inner diameter cut away by the galled surface of the tube during expansion and contraction of the engine. *Recommend* that closer inspection be made for misalignment during installation of the crankcase main oil drain tube and that crankcase main oil drain tube expansion joint be redesigned to hold tube in suspension with an "O" ring seal in such a manner that chafing and galling between drain tube, supercharger housing and the drain tube attaching flange will be prevented.

Armor Plate. After 110 hours, left hand forward and after anti-drag ring armor plates were found loose. The riv-nuts had pulled out of the anti-drag ring skin. Armor attachment bolts were safety wired and had not loosened in the riv-nuts at time of failure. *Recommend* that contractor reinforce anti-drag ring in the area where the armor is attached.

Intake Drain Lines. Four of the six lower cylinder intake drain lines failed after 144 hours of airplane operating time. Two lines were broken at flare and two were broken flush with external end of sleeve. Four light steel sheet metal clamps were also broken. Drain lines are supported approximately every 10 inches, and this support is insufficient because of vibration present in this area. Neither fuel nor oil has been observed to drain from these lines, either during starting or after idle engine periods as much as 16 hours. Maintenance required to keep drain lines in operation is excessive. As temporary fix, drain lines have been removed from the engine and the fittings capped.

Recommend that *1.* engine contractor develop a lower cylinder and intake pipe drain system that is integral with engine; *2.* drainage for all installation attitudes be provided and all external drain lines be more rigidly supported; *3.* external drain lines have a service life equal to overhaul interval of engine.

Fuselage Skin. Crack was found running spanwise between the rivets attaching the fuselage skin which forms the after oil cooler discharge air duct to the fuselage at station 96.000. Crack was 12" long and centered spanwise in duct opening. Fuselage skin was also cracked longitudinally at all three Dzus fastener holes and the center fastener was missing. *Recommend* that contractor reinforce fuselage skin which forms after part of oil cooler discharge air duct to prevent recurrence.

Ignition Leads. A number of defective ignition leads for the R3350-26W engine were replaced because of cracked insulation at spark plug end. Outside side rubber covering on leads was cracked and on some was split at seam. *Recommend* that contractor develop ignition leads which will last the service life of engine.

Oil Consumption. Oil consumption flights were made on the engine at 30 hours and 144 hours, consisting of 2.0 hours at maximum cruise power and 1.0 hour at normal rated power. Results were as follows:

At 30 hours:

1 hour NRP (2600/45")—.012 lbs/BHP/hr. (3.75 gals)

2 hours Max. Cruise (2300/32")—.007 lbs/BHP/hr. (2.75 gals for two hours)

At 144 hours:

1 hour NRP (2600/45")—.0187 lbs/BHP/-hr. (5.8 gals)

2 hours Max. Cruise (2300.32")—.016 lbs/-BHP/hr. (6.25 gals for two hours)

Maximum allowable oil consumption at normal rated power is 7.7 gal/hr. or .0221 lbs/BHP/hr. for the R3350-26W engine.

Believe that most of the oil consumed is being passed from rocker boxes through the intake and exhaust valve stem guide clearances to lower cylinders. Crankcase breather outlet line shows indication of some oil passage after each flight. Due to the cutoff angle of the breather tube with the air stream, a slight negative pressure is believed to exist at breather outlet. Condition under investigation.

AM-1 (320 Hours)

Engine Oil Strainer. Access for the engine oil strainer and sump plugs through the side accessory panels is not adequate for inspection and maintenance. Engine oil strainer and sump plugs are located at arm's length from side accessory panels, which complicates replacement and safety wiring. *Recommend* that contractor provide readily removable access door in oil cooler panel assembly, P/N 10-5058030, to improve accessibility for maintenance of engine oil screen sump plugs and to comply with paragraph 227 of Spec. SD-24-E.

Brittle Connectors. The propeller control tube joint clamp connector, P/N SA115A1, was found to be very brittle. It is apparently cast from a non-ferrous metal. Re-use of these connectors is considered an unsafe practice as their strength is unknown after clamp connector ears have been opened and closed as required during removal and reinstallation of propeller control. *Recommend* that contractor provide a tube joint clamp connector made of tougher material and that tube joint clamp connector not be re-used.

Propeller Control Installation. During engine build up, difficulty was found in tightening clamp used to hold propeller control centered in hole at engine mount ring fire seal because access to clamp is obstructed by other installed equipment. *Recommend* that propeller control support clamp riveted to after side of engine mount ring fire seal be removed and riveted to forward side of fire seal in order to make clamp bolt accessible and to simplify installation and adjustment of propeller control.

Emergency Landing. During routine test flight, the hydraulic pressure dropped to zero shortly after wheels were retracted. Unsuccessful attempts were made to lower wheels hydraulically and by means of emergency extension air bottle. Airplane was finally landed wheels up on concrete runway.

Investigation showed that pressure loss was caused by open pressure vent valve. The valve was opened accidentally by the pilot or through vibration. Main gear had been attached improperly by maintenance personnel. The access provided for the pull cable installation and adjustment is highly inadequate. Following damage resulted from the landing: propeller damaged beyond repair; engine sudden stoppage; left hand half fork door damaged beyond repair; right hand half fork door minor damage; left bomb pylon damaged beyond repair.

I said pull *not push on the stick!*

P2V-2 (235 Hours)

At 235.8 hours, seven cylinders on starboard engine were found to be losing compression, necessitating a complete engine change. One cylinder was changed on the port engine. All eight cylinder failures were result of concentric groove valve seat failures.

Distributor Assembly. During engine magneto check, erratic operation with excessive rpm drop off occurred when employing one magneto. Examination showed that a shorted out condenser had caused arcing and burning of one set of breaker points in left distributor of port engine.

Thermostat Assembly. A short circuit in the cam driving motor of the thermostat assembly rendered the automatic feature of the oil cooler air exit door inoperative on the starboard engine. Brushes showed no abnormal signs of wear and no foreign particles were found which might have caused electrical contact between armature and housing. Thermostat assembly was replaced.

Fuel Leaks. After 231 test hours, fuel leaks developed between inner diameter of fuel cell interconnector gaskets and interconnector tube, P/N 135653-4, located between two outer panel cells of port wing. Cold flow set in the gaskets was quite evident, and marks from tool scoring were present. Scoring marks on gaskets were not in alignment with each other. Torque loading on flange bolts was satisfactory. Ten days prior to leakage, fuel had been changed from 100/130 to 115/145 octane. As remedial action, gaskets were locally manufactured with all specified dimensions except that inner diameter was reduced to 2.480" or .005" less than the minimum specified on the drawing for this part. Care was taken to insure a smooth contour free of tool marks on inner sealing circumference of gasket. Material used was rubber, synthetic, aromatic resistant, specification E-15a AM1 (1-60). *Recommend* that contractor provide a more dependable seal at the fuel cell interconnector.

Hydraulic Packing. Loss of hydraulic fluid and sluggish operation of bomb bay doors resulted when an "O" ring packing, AN-6227-14, failed. The "O" ring provided a seal between the bomb bay door actuating cylinder gland nut and the piston rod.

Propeller Control. During a preflight engine turn-up the propeller on the port engine would not respond to switch control for rpm selection. Investigation showed that the snap ring which positions the phenol socket insert in the cannon connector shell had vibrated out of the ring retaining slot, allowing the insert to move away from the pin contact. Discrepancy was corrected and after one flight of 2.1 hours, an identical failure occurred on starboard engine. *Recommend* that connectors be used which conform to specification AN-W-C-591b, paragraphs D1c(4) and D1c(4)a.

Spark Plug Leads. Six spark plug lead sleeves were found cracked, necessitating replacement. Inspection of the replaced sleeves and those in stock revealed that a large percentage had a well-defined line resembling a grain the entire length of the sleeve. Some of the sleeves had a second line diametrically opposite the other. The failed sleeves had cracked along these lines; in some cases cracks were evident in new ones prior to use. *Recommend* that contractor investigate.

Varicam Control. In event of an electrical short or switch failure which may cause the varicam motor to continue to operate and move the varicam to the full nose up or nose down position, there is no provision for stopping the motor except to turn off all electrical current, or open the varicam control circuit breaker, both of which are unsuitable as emergency procedures.

Three degrees out of trim, either nose up or nose down, is considered the limit that a pilot could manually hold the plane in level flight at an air speed of 150 knots. As the varicam control is used most frequently during take-off and landing operations and the travel of the control is approximately one degree per second, a positive emergency electrical shut off switch is considered necessary. *Recommend* that an on-off switch be provided on the pilot's center control stand so that the electrical circuit between the varicam motor and elevator trim control switch in the cockpit can be opened in event of an electrical short or switch failure.

Panel Assembly. After 231 test hours, a two-inch tear developed in rear channel of outboard panel assembly, side engine cowl. The tear started in bend of the inboard leg at the lower extremity. It followed the bend for approximately one inch, then continued diagonally across the leg and stopped at a rivet. Failed area was reinforced with a metal patch. *Recommend* that panel assembly be redesigned.

Exhaust Manifold. Weld assembly, P/N 51785-105, drawn from new stock could not be fitted into exhaust manifold. When it was attached to the cylinder stack, a gap of ¼" existed between one edge of connecting flange and connecting flange of an adjoining assembly. Believe that flange was improperly welded to body of assembly. *Recommend* closer factory inspection to insure interchangeability.

Cylinders. During preflight turn-up an appreciable loss of power from the starboard engine was noticed. Compression was being lost through the exhaust valves or valve seats on Nos. 2, 7, 9, 13, 15, 16 and 17 cylinders. Three cylinders were removed from the engine, and in all the valve seat was found to be floating loosely in the concentric groove seat retaining ring.

Port engine was inspected for compression and results showed that cylinder No. 5 had failed with same discrepancy. *Recommend* that engines equipped with latest modified exhaust valve seats be furnished as soon as practical to replace those now in use.

AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE

20 mm Springs Give Trouble

Our friend, Joe, looking at the 20 mm driving spring, seems a bit confused. It all started when Naval Proving Ground, Dahlgren, Va. reported that many 20 mm driving springs (A25596) used on the 20 mm automatic gun M3 and 20 mm automatic gun AN-M2 were defective. BuOrd was just as confused as our friend.

An investigation revealed that many springs were manufactured from improper steel, and it was determined that the following conditions existed (*1*) springs coiled in a clockwise direction with a dab of green paint on the ends were satisfactory; (*2*) springs coiled in a clockwise direction which were not marked with green paint were unsatisfactory; (*3*) springs coiled in a counter clockwise direction were satisfactory regardless of whether paint had been applied. (The accompanying figure illustrates coil direction).

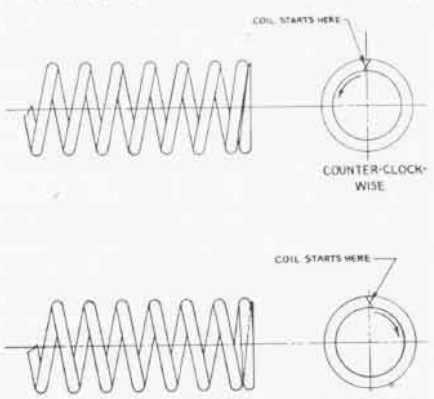
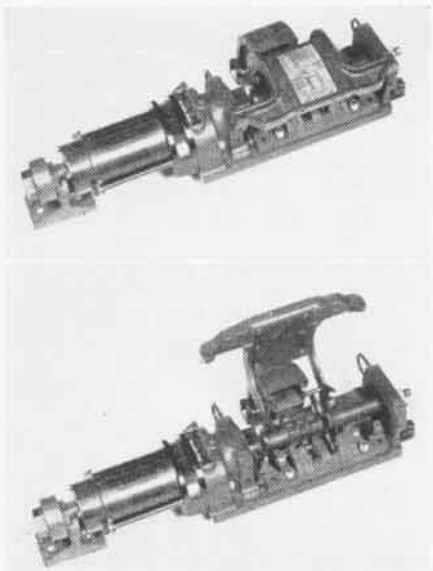


DIAGRAM SHOWS 2 METHODS OF SPRING WIND

A number of naval supply activities have completed segregation of unsatisfactory springs following the above method of inspection. The table below indicates the number of unsatisfactory springs reported by certain of these activities:

Activity	Total Unsatisfactory	Total on Hand
ASD, NSC, Oakland	20,058	35,237
ASD, NSC, Norfolk	12,711	31,448
NSD, NSC, Pearl Harbor	1,208	not reported
NAS, San Diego	43	1,774
NAS, Alameda	1,042	2,118

Inspection instructions to operating activities, NavOrd OMI V4-48, have been issued. Army Ordance has agreed to replace all unsatisfactory springs free of charge; therefore BuOrd desires a prompt report on the quantities of unsatisfactory springs found as a result of this inspection.



TWO VIEWS SHOW MECHANISM FOR 20 MM. FEED

20mm T-22 Feed Mechanism

The 20 mm T-22 feed mechanism developed at Naval Gun Factory, Washington, D.C. uses the forward portion of the electric M3 (T15) feed mechanism combined with a power spring unit to replace the motor.

The spring is wound by gun recoil through a bracket bolted to the top of the receiver. A belt pull capacity of 100 lbs. and the ability to feed three rounds without rewinding has been realized. The low profile of this feeder and the lack of external power requirements make a highly advantageous combination.

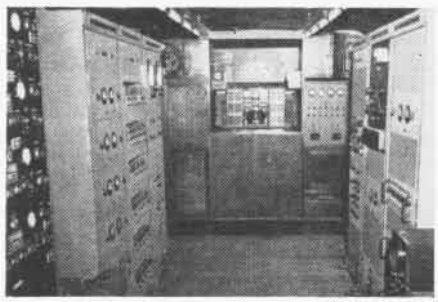
This mechanism is now undergoing field tests at the Naval Proving Ground, Dahlgren, Va.

Dahlgren Tests Plane Mines

The prototype of an important improvement on aircraft laid mines was tested recently at the Naval Proving Ground, Dahlgren, Va.

This device, which fits the Mk 25 mine, provides an easily attached unit incorporating stabilizing fins for free flight and a parachute which opens at low altitude to provide a low impact velocity. Mines with this unit can be laid accurately but gently by bombsight from any altitude. Altitude at which the parachute opens is automatically set between 3,000 to 5,000 feet. Since the opening is late in the trajectory, no estimate of wind drift is necessary. The unit is self-contained and bolts into position.

In the tests at the proving ground, mines were dropped from altitudes of 5,000 to 28,000 feet with encouraging results. It is a very interesting sight to see the parachute open and hold on a 2000-pound mine which has fallen 25,000 feet unchecked.



MOBILE ORDNANCE LAB, LOOKING TO THE FRONT

Push-Button Mobile Lab

The world's first push-button mobile laboratory has been developed and built at Naval Gun Factory, Washington, D. C., for rocket blast investigation. It is a complete mobile and self-contained scientific laboratory with its own ten-kilowatt power generator, meterological data recording equipment, rocket thrust and blast recording equipment, temperature measuring apparatus and racks of automatic electronic analyzing machines.

The laboratory is fully automatic and is designed so that when driven into position, pick up circuits connected, and the equipment turned on, the operator pushes a button and automatic timing circuits do the rest of the work.

Four built-in cameras automatically record data from 68 signal channels. A small but complete built-in darkroom allows the operator to produce finished records in a few minutes.

The temperature of this push-button laboratory is maintained automatically by electric heat and air conditioning. No factor has been overlooked to make this the most modern and most completely-equipped mobile laboratory it is possible to build.

Although specifically designed by the Naval Gun Factory, at the direction of Bureau of Ordnance, for use in rocket research, this mobile push-button laboratory is in demand by all parts of the Navy, including Bureau of Medicine and Surgery and Bureau of Ships for use in allied problems connected with guns, bombs, aircraft and ship installations and high explosive investigations.

Much of the new-type equipment in this laboratory was designed specifically for this purpose and is duplicated nowhere else in the world. It is estimated that this laboratory is worth more than a half million dollars.

LETTERS

SIRS:

Your article "Navy Cameras Over Alaska" published in the July edition was very interesting. The pictures of the old Loening amphibian aircraft that took part in the 1929 expedition brought back old memories to the writer. Your statement that the Alaskan area had not been photographed since the 1929 expedition, however, is in error.

In April, 1932, an expedition left San Diego, Calif., under command of Lt. R. B. Harrel, with Lt. J. P. W. Vest as executive officer. Two other pilots, Ch. Bosn. Rieber and Aviation Pilot 1c John C. Lafferty, made up the crew.

Two Loening amphibian (OL-8) planes flew from San Diego to Seward, Alaska, where they were disassembled and placed aboard the U.S.S. Gannet, later sunk by a German submarine off Bermuda in 1942. The entire Alaskan peninsula and all of the Aleutian islands were mapped from the air by this expedition.

The entire expedition crew was based aboard the *Gannet* and all plane servicing and maintenance work was done from and on the ship. A special cradle was built to hold one OL-8. The other plane was partially disassembled and secured on deck below the cradled plane. The *Gannet* travelled from one island to another. Planes were hoisted out upon anchoring of the ship and air photographic work was carried on.

Approximately 540 hours were flown by this expedition without a single minor accident. The mission was completed well ahead of schedule and the expeditionary force returned to San Diego in August of 1932.

JOHN C. LAFFERTY, LT. CDR.
BARIN FIELD OFFICER IN CHARGE

SIRS:

For a long time we have been reading *Grampaw Pettibone's* sage advice on how to become a gray-bearded aviator. We have benefited much from the careful collection of wisdom and experience (hard won by others) that he dispenses each month.

We feel sure that he will be gratified to know of an outfit in the Navy that has profited from his wise counsel and has proved this recently by turning in a bang-up job. We think he'd like to hear about Attack Carrier Air Group Nine, recently returned from a four-months' tour of duty in the Mediterranean, under the command of Cdr. J. H. Pennoyer, with an outstanding record of safety in a prolonged and intensive period of carrier-based operations.

In brief, AG-9 left for Europe on the *Philippine Sea* on 20 February 1948 with 93 aircraft aboard. It returned four months and six days later with 92 of those 93 aircraft still flyable.

During this period they flew a total of 8,534 hours and made 3,299 day landings and 46 night landings aboard the carrier with only a few minor mishaps. One aircraft that didn't return went into the drink off Crete due to engine failure. The pilot was picked up promptly.

We feel this is a record for any carrier air group to shoot at.

Are you sure *we pulled outa that dive?*

Best wishes for your continued success in persuading naval aviators that while perhaps in some cases "experience is the best teacher," only a top-priority *Dilbert* insists that this includes personal investigation of the techniques of major crashes.

THE STAFF OF CARDIVFOUR

SIRS:

This squadron feels that the AD is an excellent gun platform in addition to its primary mission of attack bombing. During August, VA-65 conducted formal air to air gunnery excerises, making overhead runs from 2,500 feet above the sleeve. This squadron's average for the 21 pilots firing was 18%. The four best pilots had averages of 34.92%, 33%, 32.2% and 29.2%.

GLEN B. BUTLER
COMMANDING OFFICER

"That sounds like good shooting for a big, singleman plane like the AD. Any other AD squadrons have any better marks?

SIRS:

Free balloons provide an effective method for practical training of aerology and aerostatic students. Shown in the picture is one of these balloons which was assigned to NARTU LAKEHURST for the training of Naval Air Reservists.

This balloon contains 35,000 cubic feet of helium gas and carries up to six students. The record flight endurance for balloons of this type and size is 61 hours; record flight distance is 1,056 miles.

R. C. GOSSOM, CDR.
COMMANDING OFFICER
NARTU LAKEHURST

SIRS:

In a recent issue Oakland claimed that they have the only Organized Reservist to hold the rank of captain—Captain Albert Boles with 31 years of naval service.

We hate to be constantly claiming superiority in one respect or another, but we happen to have Captain C. C. Troensegaard who is attached to VP-ML-66 and instead of 31 years of naval service he has over 38 years, having joined the Naval Reserve June 2, 1910. Incidentally, the Captain is a good friend of Captain Boles, and Oakland was his first duty station.

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

SIRS:

The mascot of VMF-214 may be a little fuzzy, but squadron operations definitely are not. For overall performance in all forms of exercises, VMF-214 was recently awarded the Navy "E." The award carries with it an unspecified amount of prize money as well as the right to wear the Navy "E" and to display it on all squadron planes.

Midnight III, VMF-214's mascot, shown in the picture, thoroughly approved of the award. Not only did the squadron deserve it, but it still left him the unique distinction of being the only black sheep in the outfit.

COMMANDING OFFICER
VMF-214
USS RENDOVA

Going my way?

LETTERS

SIRS:

In your September *News*, page 5, you have a picture of a jet engine. You say it's a TG-180. We think it's a Westinghouse 24-C. Are we right?

JET TURBINE OVERHAUL DIV.
NAS ALAMEDA

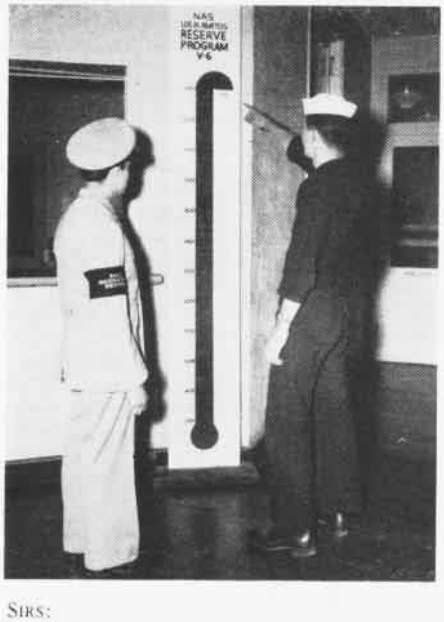
You're right as rain. We bow to the boys who fix 'em. To our inexperienced eyes, the J-34 and J-35 engines look a lot alike when they have their outside "clothes" off.

SIRS:

The temperature at NAS LOS ALAMITOS isn't so hot that Chief Mickey Tousignant CPN and C. E. Atkinson PN3 of the recruiting department have to check the thermometer on the quarter deck in the administration building. Actually they are inspecting the recruiting thermometer which measures the number of men taken aboard in the V-6 program. During August, when this picture was taken, the station surpassed its quota of 2400 men by 31.

In order to make room for the overflow of recruits seeking to join the Naval Air Reserve, the station painter was forced to paint an extension on the thermometer by swinging it around and down—now it's a case of down being up.

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



SIRS:

In spite of the constant and heavy work load of processing transpacs, salvaging stricken aircraft, lending maintenance support to four multi-engine squadrons and operating and maintaining a contingent of eight utility aircraft, FASRON 117 personnel find time to exhibit their atheltic prowess, and we play just as we work—hard!

Shown in the photograph are three championship teams in three major sports in Fleet Air Wing Two annual intermural sports classic.

Pictured in the front row are Cdr. P. K. Blesh, CO, Lt. Cdr. G. E. Pittam, Exec., and members of the champion volleyball squad, left to right: R. H. Neff, AO1; ChGun. C. C. Lacy; H. R. Baker, AO1; J. D. Ahearn, ADC; R. J. Meharg, PR2; H. L. Swails, AO1. The second row tennis champions are Lt. T. E. Smith; Ens. M. L. Wray; V. Kerrigan, AK3; W. W. Rowntree, ADC; D. M. Farley, SK2; B. F. McNeal AK2. In the rear row are the champion basketball team: R. W. Dierlam, ADC; R. W. Ryan, ADC; ChMach. H. G. Brown; R. D. Sexton, AD1; P. Valadez, SN.

COMMANDING OFFICER
FASRON 117, PACIFIC

SIRS:

While reading your very wonderful magazine, I came across an article concerning the flight hours put in by VMF-211. (The article said the outfit set a new squadron record of 1,357 hours in a month and 124.7 hours in one day.)

I'll admit that their record of 124.7 hours is a high but I think I have a better record to relate which was set by my squadron in May of this year during a JANAFEX we were having. In the 24-hour period our squadron flew 202.2 hours and was operating under slim help at the time. During the JANAFEX our line consisted of 24 men and in engineering there were six.

I do believe this to be close to a record if not one. During the 24-hour period, only two planes went out of commission and were immediately put back in by expert and fast hands of their plane captains.

Also, I can beat 211's monthly record by relating the flying status of our sister squadron, VMF-235, MAG-15, who flew 2,020.2 hours in a 30-day period. They also were at the time short-handed. I believe they set the Marine Corps record, as the last known record was about 1,700 hours.

Just thought I'd tell you of this because the flying that our MAG has done really shouldn't be set aside as just another operating squadron's flight time. And when you come right down to it, 1,200 hours is just an ordinary monthly operating time for VMF-115. Not bragging or trying to domineer VMF-211, just relating the truth. No one could say anything against 211 as they were a crack outfit during the war, as now, no doubt. No offense boys.

R. P. BLECHER, PFC
VMF-115, PACIFIC

CONTENTS

● RECOGNITION QUIZ

(Inside front cover)

Top—Sea Hornet. British carrier-based version of the Hornet fighter; a single-seat medium range fighter and strike aircraft is the Mk 20. The Mk 21 is a two-seat night fighter, recco plane. Lower—U. S. A. F. B-36, world's largest land-based bomber. Six P&W engines of 3,000 hp push the plane at 300 mph. Wing span is 230 feet, length 163 feet. Gross weight is 278,000. Claimed range is 10,000 pounds of bombs 10,000 miles.

● THE COVER

Four TBM's of NAS Oakland's VA-61 Reserve Squadron wing their way westward over picturesque Golden Gate Bridge at San Francisco. Under this bridge sailed thousands of ships during the war and over it flew thousands of Navy planes headed for Hawaii.

● THE STAFF

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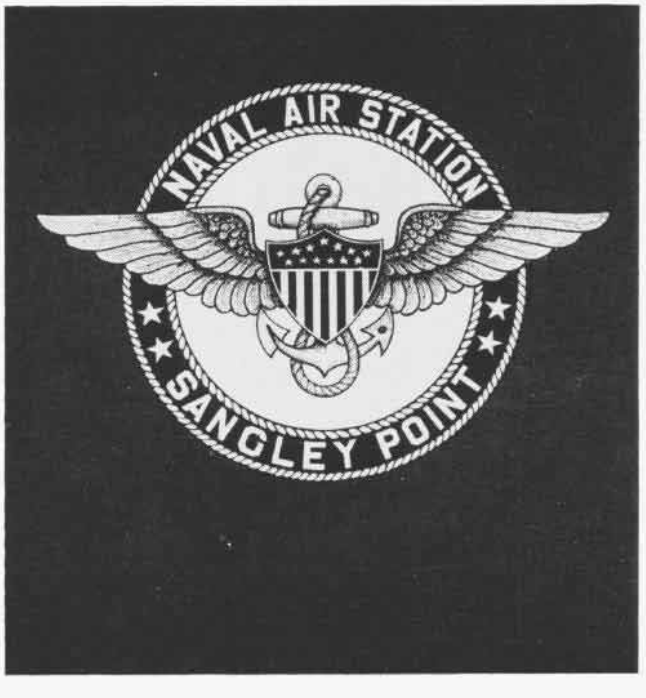
STATION INSIGNIA

THIS month we present four station insignia, representing activities from Newfoundland to the Philippines. Unique among them is that of Argentia, Newfoundland, which bears the aurora borealis and two rock formations, called 'Isaacs Heads', which were landmarks near the field. Ice-covered water forms the insigne foreground. Paxtuxent River's insigne has on it indications of three types of work done by the active air test center—testing of new planes, support of fleet operations and a base for transport squadrons of the Navy.



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