NAVAL AVIATION NEWS

Air Brain Trust
Seattle Reserves

October 1947

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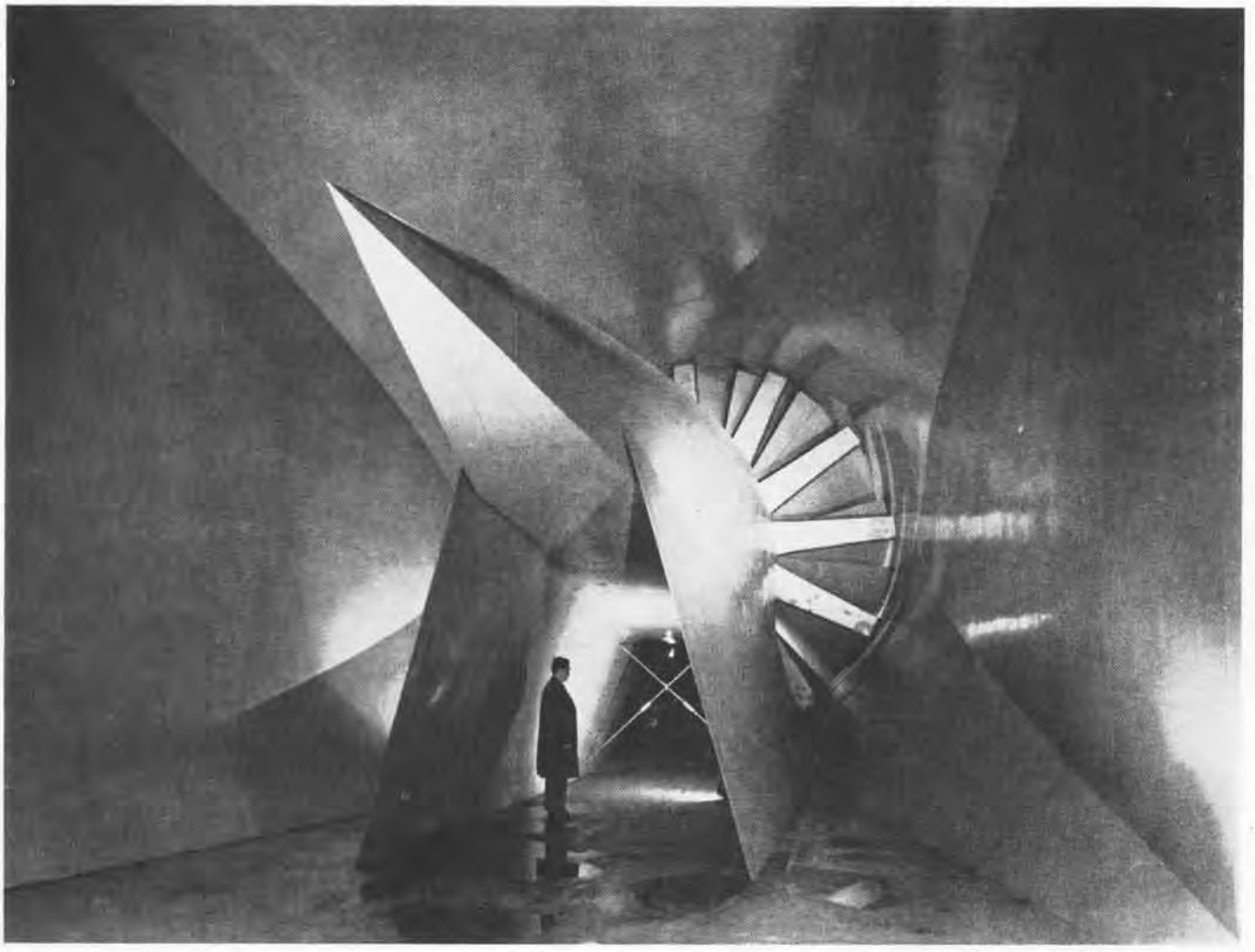
RESERVE AND REGULAR

Up in the land of the bean and cod, Reserve pilots use the field above to keep up flying abilities. Marines use the one below. Where are they? Ans. on last page.



AVIATION BRAIN TRUST

THE GENTLEMAN standing pensively before the awesome structure pictured above, is not getting a preview of the "kitchen of tomorrow." He is looking at the propeller of the giant NACA Icing Research wind tunnel at the NACA Cleveland laboratory. This modernistic machine is capable of simulating practically any icing condition extant, providing wind speeds of up to 430 mph, and producing 1500 tons of simulated rain every 24 hours in temperatures ranging to as low as 40° below zero.

This wind tunnel is typical of facilities the National Advisory Committee for Aeronautics utilizes to lead the way in aviation research. NACA has played some part, and usually a major part, in practically every aeronautical development that has come along since its establishment back in 1915.

12-FOOT PRESSURE WIND TUNNEL AT MOFFETT

Today most airplanes are equipped with the famous NACA cowling. NACA worked for long years on the laminar flow wing, the thermal anti-icer, supersonic air foils, and dozens of other aviation developments. It did fundamental research on the well-publicized Hughes *Hercules*. And in 1935 NACA was experimenting with a jet engine at Langley.

The National Advisory Committee for Aeronautics is composed of some 32 committees and subcommittees, whose members are drawn from throughout aviation, and include BUAER and DCNO (Air) heads.

Photographs on the following pages were taken by NACA photographers in their laboratories on projects of interest to Naval Aviation.

Model of a proposed fighter-type airplane undergoing flight test in the NACA free-flight tunnel at the Langley Laboratory

Inside view of free-flight wind tunnel shows pilot in cockpit and assistant adjusting plane of unusual design before flight

For Special Problems, Special Wind Tunnels

DOWN AT Langley Field, Virginia, there is a pilot who can boast of having flown probably more different types of planes than any other man living. Not only that, but he has flown planes of the most radical design known to aircraft engineers—and some that Buck Rogers hasn't gotten around to as yet.

On a typical day, this young man comes down to work in the morning, crawls into his cockpit and nonchalantly takes off in a weird-looking supersonic craft which he has never seen before. This pilot is really good; he requires no checkout, no cockpit familiarization, and doesn't even bother to glance through the operation manual. Quite often planes he flies experience malfunctions and crash, yet he has never gotten a scratch.

Free-flight wind tunnel is mounted in this huge steel sphere on bearings so it can be tilted through a wide range of angles

No, he isn't "super-pilot," but merely a guy with a "gimmick." The secret is that he flies all of his planes by remote control, with his cockpit firmly attached to *terra firma*. (*Note pix.*) The planes are small scale flight models.

HIS COCKPIT is located snug in the mouth of a huge wind tunnel. The tunnel is housed in a steel sphere some 60 feet in diameter, and is ingeniously mounted on bearings so it can be tilted through a wide range of angles to correspond up to a 30° glide angle, or a 30° climb angle. Non-powered models fly in a constant glide with the tunnel tilted down toward the air inlet end of the tunnel. Powered models fly toward the air inlet with varying degrees of up or down tilt, depending upon the speed of the model and wind velocity.

From the cockpit located in the floor of the tunnel near the outlet fan, the test pilot puts the little ship through its paces. In short order he can give the designer the "word" on whether it will or will not fly—and if not why not.

The remote control system is electrical. Control power is transmitted from the cockpit to the plane through a couple of thin flexible wires, which are hooked up to electromagnets attached to the ailerons, rudder and elevator. These magnets are actuated by the pilot, through two very small three-way switches.

Compare this method of quick inexpensive flight analysis of a new design with the way it used to work. In the old days, before a new airplane could be proved or disproved, a full-scale model had to be built by hand at considerable expense, and then had to be flown by a test pilot. The attendant risk to pilot and plane, attached to flying an aircraft of untried design, made excellent movie material. It also made progress a very slow and costly process indeed, to say nothing of creating a shortage of test pilots.

UNDOUBTEDLY many good ideas were completely lost to aviation in the early days, because some minor miscalculation occurred to wreck the new plane. This is the sort of thing prevented by the NACA "free-flight" tunnel.

In the tunnel, planes initially unstable in flight are often modified right there and made flight-worthy at practically no cost, and certainly no danger. A complete flight analysis report with flight films is compiled and given to the manufacturer before the new model goes into production.

Another unique and valuable research tunnel located at Langley, is the "spin" tunnel. It is a 20-foot vertical wind tunnel, with the air inlet at the bottom and the outlet at the top. Small scale dynamic models of plane types, with the

weight distribution identical, and with controls locked into spin condition are tossed into the tunnel and allowed to wind up.

After the plane has settled down to a steady spin, a magnetic field is set up within the tunnel which trips a solenoid attached to the plane's controls. This solenoid in turn, snaps the controls into a neutral condition or one opposing the spin. In this manner, the plane's ability to recover from a spin can be studied, and by varying the control forces used, it can be determined just what it takes to make a particular plane recover from a spin.

One model might recover with controls neutralized, another with opposite rudder, still others only with full opposite rudder and ailerons. In numerous instances, the spin tunnel results have influenced the final design of military airplanes. Based on the results obtained during spin tunnel tests, it has been possible to establish tail design requirements which indicate the minimum requirements for satisfactory recovery from a spin.

FROM SPIN studies, a criterion has been established which combines values of design parameters with the airplane mass distribution and relative density. Spin tests have also been extended to determine the best method of pilot escape from an uncontrollable spinning airplane. Inverted spin characteristics have also been fully analyzed.

At the moment, Navy plane models that will not be in operation in the Fleet for two or three years are undergoing very rigorous free flight and spin tests. So the business of saving the lives of naval aviators often begins before any flyer ever sees the plane.

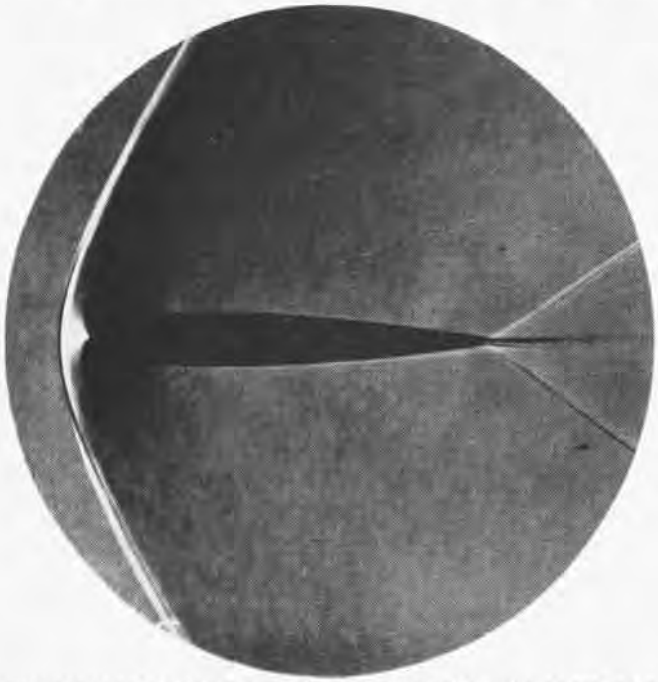
THE SWEPTBACK, low-drag airfoil has become an important design for high speed airplanes. NACA, at Langley Field, discovered theoretical advantages of this type high speed wing in early 1945. Since that time extensive investigations have been carried out using the NACA "free-falling," "wing-flow" and "rocket" techniques in actual flight.

Schlieren photography is used to photograph shock waves created by airfoils being tested in supersonic wind tunnels. These photographs show graphically the shock waves produced by different-shaped airfoils at high speeds.

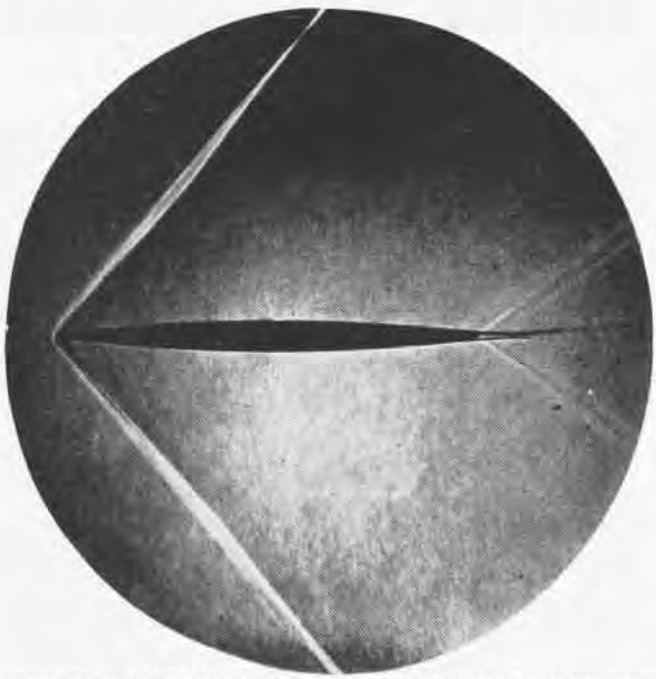
Model of SN2J in spin-tunnel is supported by the vertical air current while motion pictures are taken of plane's reactions

Schlieren photographs are taken by an apparatus which projects light through glass side plates in a tunnel, and records on film the light refraction due to density changes.

Shock waves are regions of increased air density where the air flowing at supersonic speeds is slowed down or turned aside. Location and severity depend on the shape of the airfoil or body and the speed of the air. Airfoils with sharp leading edges produce a clean-cut shock wave, while conventional leading edge airfoils set up very great shock waves and present more drag than can economically be overcome by sheer horse-power alone at faster speeds.



PHOTOGRAPH OF SHOCK WAVE FROM CONVENTIONAL WING AT MACH 1.5



SCHLIEREN PHOTOGRAPH OF HIGH SPEED AIR FOIL AT THE SAME SPEED

NAVY L-39 IS USED BY NACA TO STUDY SWEEP BACK WING STABILITY AND CONTROL PROBLEMS

SPOILER TYPE AILERON EFFICIENT TO MACH .98

The NACA *Tiamat* flies a controlled predetermined track and is tracked by radar while data are telemetered back to ground

Instruments being installed in wing of a P-51 to measure forces registered on small-scale half fuselage used in flow test

Supersonic Information Is Difficult To Obtain

In the wind tunnels a large number of supersonic airfoil sections have been tested and the lift, drag and pitching moment calculated up to Mach 8.0—approximately 6000 mph at sea level.

The NACA "free-falling" technique consists simply, of taking a research vehicle up to a maximum altitude that can be attained by the carrying plane and dropping it. The free-falling body is usually a needle-nosed, near-perfect aerodynamic design, and has high-speed low-drag wing, elevators and rudder.

Each of these components is completely instrumented. Pressure orifices are installed to measure the air pressures; strain, flutter and vibration gauges record those data. The body is filled with recording and telemetering equipment. On the way down, while the body is accelerating to and beyond the speed of sound, continuous readings are telemetered to the ground and the flight path is tracked by radar. Needless to say, it is a one-way trip, but very productive of research data on the transonic and supersonic zones.

The "wing-flow" method is used in both wind tunnel and in free flight. The system, as the name implies, takes advantage of the air flow over a wing to gain certain data. A small scale section of the unit being tested, i.e. wing, rudder, or in some cases a half fuselage with one wing and elevator attached (*shown in photograph*) is mounted on top of a conventional airplane wing and completely instrumented. Forces can then be measured from subsonic speeds through the transonic zone and into the supersonic range, inasmuch as an airplane moving through the air at a speed of Mach .75 may have an airflow over the wing of up to Mach 1.3. Flutter, drag and vibration are measured in this manner.

When used in a wind tunnel, a conventional wing section is mounted right on the floor of the tunnel, and the unit to be tested is mounted on top of this. Wind tunnel flow then reacts in much the same manner as free flight, and infor-

mation can be obtained at higher Mach numbers than from the usual wind tunnel stream.

Rockets have been used extensively for research in the high speed regions. Fully instrumented, high-speed components are built into the rocket, and during flight, information is telemetered to the ground. NACA has developed a fully-controllable rocket capable of flying rectangular patterns. However, no retrieving system is used. Perhaps months may be spent preparing a rocket for one flight, but when the flight is over, all the information desired has been telemetered to a recording machine for future study. Though it is a one-way ride, it is *one way* to get the dope.

DON'T GET the idea that NACA works with strictly "push button" research. For NACA test pilots are not all flying remotely-controlled or artificial devices. Mel Gough—Chief Flight at Langley—states that NACA pilots fly and test all types and models of modern aircraft. For example, at Langley Field, there are two L-39 airplanes, undergoing flight tests on a high speed wing installation. The L-39 is a converted Bell *Kingcobra* equipped with 35° swept back low-drag wing. Gough states that it is a very hot plane indeed. Stall characteristics are under study at the moment.

ONE of the methods being utilized at present concerns the use of dozens of short strings attached to the top of the sharp-edged wings. These strings naturally parallel the air stream and show, by their position during a stall, just what happens to the air flow over the wing. The strings are photographed automatically in flight, by cameras installed on the tail, and present some very interesting studies of air flow characteristics under various conditions.

Considerable work is also done at maximum altitudes at which a B-29 can fly, which is something over 40,000 feet.

If you like your whiskey clear, there is nothing like the exhilerating workout one can obtain in a nice nasty thunderhead. In addition to proving how ironclad your stomach is or is not, it does an excellent job of finding out whether the wings can be torn from an airplane. These loads put on an aircraft because of vertical currents are known as "gust" loads.

Down at Langley, rather than tear aircraft apart in thunderstorms, they simulate gust loads in a special tunnel. In this "gust tunnel" models of approximately six-foot span are catapulted to speeds up to 100 mph then released and allowed to fly over a controlled vertical gust. In this manner a number of investigations can be made of the reactions of airplanes to gusts having known characteristics.. So, if you go around looking for black clouds only in the interest of science, you are very likely duplicating NACA work—and they always get back.

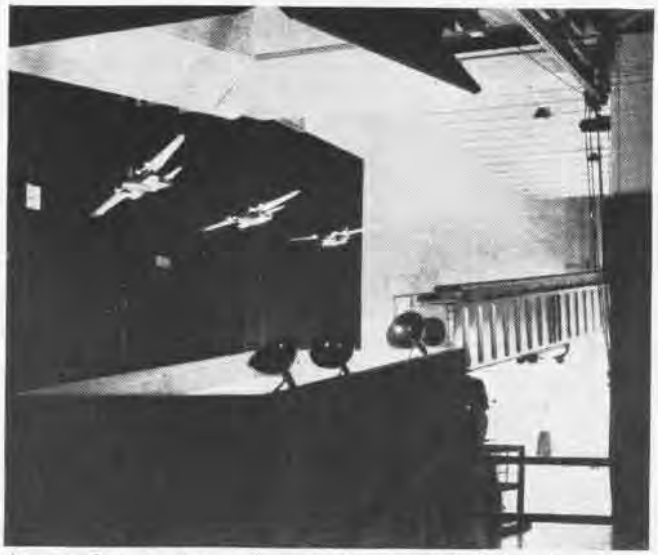
For a concrete example of facts obtained from the Langley gust tunnel we'll look at some recent tests.

A model of a canard-type—control surfaces forward—airplane was tested recently and it was found that the gust load increments were greater than the conventional case. Tests of models of two other unconventional types, one having a low-aspect-ratio wing, were also made in the gust tunnel to establish gust loads for use in design. An analysis of dynamic stress in single and repeated gusts was made for two large airplanes to provide information during the design stage of these airplanes, and gust tunnel tests were made with flexible models.

Several projects have been conducted to devise means for the circumvention or alleviation of turbulence. A gust-alleviation flap device was tested in the gust tunnel with promising results. This will smooth out the rough spots.

'Needle-nose' will be carried up to some 40,000 feet in B-29 where it will be dropped using NACA 'free-falling' technique

Models being tested in the 'gust-tunnel' are launched with this catapult at 100 mph. and flown through vertical gusts



A speed-flash photo of a seaplane model flying through an unsymmetrical gust in the gust-tunnel shows plane's reactions

B-24 with jet engine installed in bomb bay sprays water into jet intake at high altitudes to test interior icing on turbine

This NACA Fairchild with the extended exhaust and extra wing section did much early research on the thermal anti-icer

Cleveland Laboratory Gets Dope On Weather

OLD MAN weather, and his boon companion "icing" have been mortal enemies to aviation ever since the first airplane invaded their domain. The recent Hughes investigation was nothing as compared to the continuous investigation NACA has given "icing."

During the early 30's a Fairchild equipped with a short wing section bolted to the struts led the way in the development of the modern thermal anti-icing equipment. The plane was equipped with a spray pipe located just in front of the leading edge of the test section and had a long exhaust pipe running through the short wing. (*See picture*) Today the thermal anti-icer is installed on many Navy planes and several commercial models.

A modification of the old test idea is used today to determine the effect of icing on jet turbines. A B-24 with a jet turbine installed in the bomb-bay and with air scoop on top of the fuselage, has water sprayed into it at high altitudes, in varying quantities so as to study icing effects.

To find the amount of heat required to prevent ice, an auxiliary wing-section is mounted on top of the fuselage of a transport. This section is electrically heated while flying in icing conditions, and the amount of heat required to keep the extra section free of ice, is measured. Thus, the amount of heat needed for various types of wing is known.

To measure the effectiveness of icing equipment, a "tell-tale" strut is mounted on a wing equipped with anti-icers. The strut is not protected and collects the same amount of ice that would have been collected on the plane's wings had it not had protection. This checks the efficiency of anti-icing equipment installed.

Supplementing these flight methods of gathering icing data, the giant Icing Research wind tunnel at Cleveland can produce practically any weather condition desired, for study on the ground. These methods of weather study are the "easy" ways to find the answers; most pilots are familiar with the "hard" way.

One bit of research going on down at Langley of particular interest to big-boat pilots is the experiments being carried out at the seaplane "impact basin," and the "towing tanks."

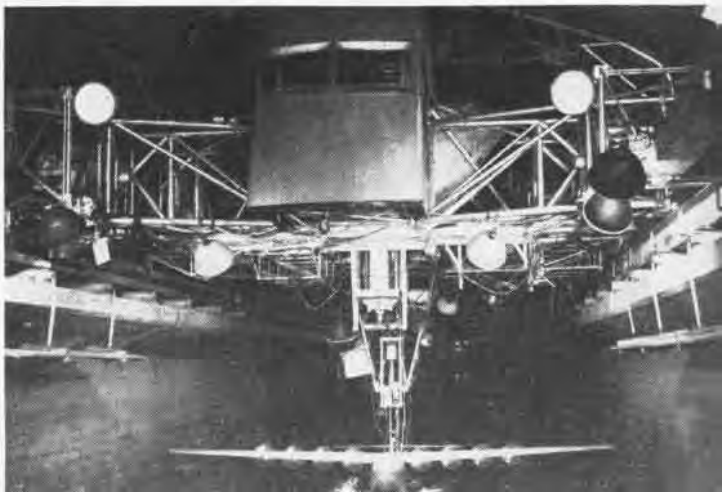
Seaplanes have always been known affectionately throughout the Navy by any one of a few thousand colorful adjectives, none of which denotes speed. Traditionally, anything with floats or a hull is placed in the same category with bull elephants and funeral processions so far as speed is concerned.

However, the flying boat has a brand new set of champions, both in the Navy and in NACA. These gentlemen claim that all the "old lady" needs is to have her bottom revamped a bit and she will show comparable landplanes a clean set of heels. In the towing tanks at Langley, they are backing up this talk with some good-looking models, hydrodynamic reports and *results*.

One new hull design that NACA claims will make a sprinter of flying boats, is known as the "planing-tail" hull. Instead of the conventional broad forebody, short, deep hull design, the planing-tail hull is long and narrow with the step

Models are accelerated up to 80 mph by overhead carriage, then dropped into the water to test ditching characteristics

Hydrodynamic qualities of the Hughes *Hercules* well known to NACA personnel who carried out tests in the towing tanks



Powered dynamic research model of 4-engine flying boat with the NACA planing-tail hull which cuts drag by fifty percent

streamlined back into a narrow V-shaped planing surface on the bottom of the tail which runs the full length of the plane. This "slim-jim" bottom reduces hydrodynamic and aerodynamic drag by 50%, which is more than sufficient to make the seaplane a real competitor of modern landplanes in speed.

Other hull designs working toward the same end aren't so radical a shift, but emphasize the long narrow hull, rather than the usual short fat forebody.

Seaplanes have the advantage over landplanes of being the only type of aircraft not ultimately restricted in size by the length and strength of airport runways. All they need is water, and the Navy has plenty of that—yo ho ho!

Plus the improvement the planing-tail hull offers in speed, it also offers superior rough water characteristics and practically removes porpoising from the pilot's list of worries.

In addition to the flying boat work going on at Langley, they are doing considerable research on a waterborne fighter design. If present experiments are an accurate indication of what is to come, waterborne fighters may be accompanying flying boats or land-based bombers into forward areas where no airfield has yet been established.

Considerable ditching research has been carried out at Langley both in towing tanks and outdoor catapults. The ditching characteristics of 17 Army and Navy airplanes were determined during the war. As a result of information gained from these tests, future airplane models will have good ditching qualities "built in."

This article has discussed various projects under study by NACA. Now, just how does a problem get into the hands of the National Advisory Committee for Aeronautics?

In the first place, inasmuch as NACA is primarily a predesign organization, the majority of the work done by them is pure research, and oftener than not, research is initiated by NACA itself. This is because new experimentation and continuing development keeps them well in front of production demands. Just as one experiment in any scientific field, if followed to its conclusion, inevitably unearths a variety of new contingent lines of development, so it does in NACA.

Once any new idea or design has been carried to its ultimate conclusion, data and information gained from it are turned over *en toto* to the whole aviation industry with recommendations of how it should be utilized.

Now, what if a manufacturer or one of the military services comes up with a special problem which needs correction or development, and which NACA is best equipped to handle? In this case, it is introduced to one of the committees or subcommittees for consideration. The NACA committee system represents every interest in aviation.

If the board queried feels the project is worthy, it will be accepted by NACA and work will begin.

During the war, of course, NACA's facilities were devoted largely to military needs. As a result, much of the pure research went by the boards during the war and many facilities were applied to corrective research. In some cases today a problem having to do only with a particular Army or Navy model, and not aviation as a whole, is accepted by NACA because it has the best setup for handling the problem. But in peace time, it must first be screened by some committee before acceptance.

The few projects mentioned herein all concern the Navy. However, as NACA is a national organization, it does a great deal of work for civilian and Army aviation.

In all, NACA has some 40 wind tunnels operating at its three laboratories located at Langley, Cleveland and Moffett. These tunnels vary in size from an eight-inch tunnel to the giant 40 x 80-foot full scale tunnel at Moffett. In speeds, the supersonic tunnels run as high as Mach 4.5—something more than 3400 mph at sea level.

All types of power plant facilities are located at Cleveland. Practically all research on jet turbines, propellers and reciprocating engines is conducted there in addition to most of the icing and weather research.

Langley is the largest NACA establishment and has been a part of NACA since 1920. Moffett and Cleveland were added in 1940 in anticipation of war needs. Moffett is a smaller edition of Langley and is engaged almost exclusively in high speed research. Langley handles east coast stuff and Moffett, west coast.

For the latest in aviation look to the National Advisory Committee for Aeronautics. "The airplanes of tomorrow are flying today in the research laboratories of NACA."

A king-sized fan for hot weather—an upstream view of the propeller installation in Langley 8-foot hi-speed wind tunnel

GRAMPAW PETTIBONE

Let's Use the Runway

An SB2C-5 pilot took off shortly before dark as part of a night flying section operating from Kobler Field, Saipan. After about two hours of section tactics, the group returned to the field and commenced a normal break-up. This pilot was number two to land and was making his first night landing at this field. The following excerpts are from the statements which he made after the crash:

"I took a slightly longer than normal interval with the intention of giving the plane ahead of me sufficient time to clear the runway. On the downwind leg, I went over my check-list and as I started my turn at the 180° position, I called the tower for the customary "wheels down and locked" check. I made another quick cockpit check after the call was completed and also noted that I was at 400 ft. with about 45° more to turn. I looked at the field I was approaching and saw four rows of lights of equal brilliance. My immediate impression was that the two outer rows of lights designated the coral strips on each side of the runway, which strips I knew to exist from my day flying experience on this field. As I began my flare out, I noticed some lights halfway down the runway and immediately interpreted these to belong to the plane that landed ahead of me. My reaction was to adjust the throttle and assume a three point eighty knot power approach so as to land as smoothly and short as was possible. That maneuver cut off all my vision forward, but I could still maintain directional control by observing the row of lights on either side. I held that attitude all the way down and only a split second before the impact, when the lights disappeared, did I realize I was wrong. The plane hit hard, bounced twice and then flipped on its back. My shoulder harness had kept me from any injury up to that point, so I unfastened my safety belt and began to look for a way out. The canopy had closed about three-quarters of the way, so I kicked a hole thru the starboard side of the plexiglas. The opening was still fairly small and would not permit my exit with the chute on. I was being drenched with gasoline by

then, but I managed to unfasten one leg strap and was working on the other when I lost consciousness due to the fumes. I came to about an hour later in the dispensary and was told I had landed dead center between the taxi strip and the runway—initial contact being made with a huge pile of coral."

Grampaw Pettibone says:

Chalk up another life saved by proper use of the shoulder harness. Next time you are scheduled for night flying, I'm sure you'll get a thorough briefing on the field lighting system, and be ready to take a wave-off if any doubt exists concerning your alignment with the runway in use. I don't imagine that you'll have to be reminded about locking the canopy in the full open position for landings after this experience either.

As a safety precaution squadrons practicing night landings should station a signalman with emergency flares at the approach end of the runway.

"Dear Grampaw Pettibone:

"I continue to be surprised at the theories and opinions held by naval aviators about various factors in the handling of an airplane by its pilot.

"Once, some years ago, I heard a *Chief Flight Instructor* in an intermediate flight training squadron say that downwind landings in the SNV weren't bad in a moderate wind. He had even permitted his student in a couple of cases to go ahead and land downwind when the student had misinterpreted the indication of the wind sock. But in each case he didn't permit the flaps to be used. When I asked him why he didn't let the students use flaps the Chief Flight Instructor said, "Well, that is the best way, isn't it? You don't want the wind blowing against the back side of the flaps."

"The above is about the most outstanding expression of ignorance I have ever heard expressed by a naval aviator. However, I hear opinions voiced frequently which are not in agreement with my own opinions. The following are a few that I have heard recently:

"*I do not agree* that when landing in a crosswind with a twin-engine plane, you should use more power on the upwind engine during the final approach and landing than is used on the downwind engine.

"*I do not agree* that in an incipient groundloop the outboard wing (in the turn) *rises* due to the centripetal force acting on the plane in the turn. An aviator who is an operations officer and senior member of an aircraft accident board says this force is the same as the force tending to lift the outboard wheels of a car off the road as it goes around a sharp curve, and the procedure when a driver runs into a curve at a fast speed is to speed up to a faster speed. He got out a text book with a formula for centripetal force to prove his point. I attempted to show him how centripetal force and centrifugal force produce a couple tending to roll the car, but he still seems to think centripetal force acts at the center of gravity of the car and is produced by the velocity and that the faster the turn the greater the force tending to hold the car on the road. He still thinks the outboard wheels tend to rise from the road.

"*I do not agree* that in a threatened groundloop one should use opposite rudder and, if necessary, a blast of 'gun,' and if this isn't enough to stop the groundloop, use the outboard brake. Personally, I believe in using the *brake* and a fair amount of rudder from the very beginning and would probably not use a blast of gun unless the plane had made a pretty nasty bounce landing and there was a chance to straighten it out and go around again for another landing. In case brakes didn't hold very well and a great deal of force on a brake pedal was needed to get positive braking effect I would keep the rudder pedals in neutral because in that position I can apply more force on the brake pedal. (See Tech. Note 49-42, quoted in this issue. G.P.)

"*I do not agree* that in some planes, the PBJ1 for example and also in the GH, you get greater cruising speed with established power settings by climbing

500 feet above the cruising altitude and then descending to cruising altitude. Yet many pilots say you get it 'over the hump' or 'on the step' and that no swivel chair pilot in the Bureau can tell them it isn't true.

"As a matter of information, I have managed somehow to avoid a groundloop. Haven't had one in these 21 years of fooling around with planes, but I admit that I have made other embarrassing errors. Also, since I own two Howards and sometimes have to pay as much as 36c a gallon for gasoline I would be 'getting them over the hump' if I thought there was anything in that theory. But as it is, I'm stubborn and dumb. I just climb to cruising altitude and level off and when I pull up to the gas pump I just say 'Fill her up.'

"One of your early flight students"

Grampaw Pettibone says:

Thanks a lot for your interesting letter. That yarn about the Chief Flight Instructor is a tough one to believe, but if you say you heard it, I'll take your word for it.

Not too long ago I printed the story of a pilot who washed out a JRB trying to correct for a strong wind from the right by carrying 30" of manifold pressure on the starboard engine and about 15" on the port engine during the last part of his approach. Throttle settings on twin-engine planes should be as nearly equal as possible on landing until the plane is rolling on the ground. Then, of course, a little additional power on the upwind engine may assist in keeping the plane from weathercocking into the wind. The use of extra power on the upwind engine at any time before the wheels are on the deck will probably result in the plane landing in a skid.

As for the argument that the outboard wing of an airplane rises during a groundloop, you can refer anyone with this notion to Grampaw's Groundloop File, for I have literally thousands of cases on hand where the plane groundlooped to the right and required replacement of the left wing, and an equally large number of left hand groundloops which required replacement of the right wings or wing tips. Why don't you take your friend for a fast spin around the block and convince him that a car rolls away from the direction of a high speed turn and that the *inside* wheels tend to leave the ground rather than the outside wheels.

The old theory about getting a plane "on the step" has been exploded a good many times (see Naval Aviation News for Nov. 1946) however, it will probably continue to be a popular misconception for the next 100 years.

Congratulations on completing 21 years of flying without a groundloop—wish I could say the same.

Close Shave

The pilot of the first F6F in the picture above had a very close shave when his aircraft was destroyed right up to the cockpit in a landing accident. He landed short at an airport 4500 feet above sea-level and was attempting to turn off at the intersection when he was over-run by the airplane landing directly behind him. As the number two plane in a group of eight that were landing, he should have kept his plane rolling down to the far end of the runway. The pilot in the plane which over-ran him landed long and fast and apparently did not hear the tower's transmission to take a "wave-off." He burned both tires flat in a 1000 foot skid down the runway in an effort to avoid the collision. Evidently he was not aware of the increased landing speed on high altitude fields, and his technique in trying to avoid the collision was very poor. An intentional swerve or groundloop might have prevented the collision after it was too late to take a wave-off.

Bird Error?

During the last twelve months the accident analysts who make up *Grampaw Pettibone's* staff studied reports of 2572 *major* damage accidents to Navy aircraft. Each accident is carefully analyzed to determine the principal cause factor and any contributing causes. Not long ago a weary analyst came up against an accident that defied ready classification. It concerned an F8F mid-air collision with a bird, which, believe it or not, necessitated a major overhaul for the aircraft, as the bird struck and stuck in the leading edge of the starboard wing center section. The impact was sufficiently great to damage the front auxiliary beam. After chewing on his pencil for awhile the analyst wrote down the following:

"This is one for the birds. No pilot error involved. Pilot conforming to traffic pattern and completing check-off list prior to landing. Pilot states definitely that he did not see bird prior to collision. Due to death of bird it can not be established whether or not bird saw aircraft prior to collision. In any event tower had not authorized bird to enter traffic circle. 100% Error of Other Personnel—Bird."

Slow Reaction

The pilot of an SNJ made a normal landing. During the landing roll the plane started a slow swerve to the right unnoticed by the pilot until a groundloop was well developed. Throttle was then added in an effort to regain control and take off again. The groundloop rapidly increased and the plane flipped over on its back when it left the runway. Luckily the pilot of the plane escaped injury.

Grampaw Pettibone says:

To let a groundloop develop is bad enough but to help it along adds insult to injury. Early and judicious use of the brakes would have prevented this accident. The addition of throttle after the groundloop has developed tends only to increase the severity of the loop, resulting in much greater damage to the aircraft involved. The following is quoted from *Technical Note 49-42*, and it's just as true today as it was five years ago:

"Pilots also have a tendency to delay too long in using brakes for correcting a groundloop. Experience has proved that brakes are of very minor value in correcting a groundloop which has gotten well under way, but they are of inestimable value in preventing a groundloop from starting or in the incipient stage if they are properly used during the run."

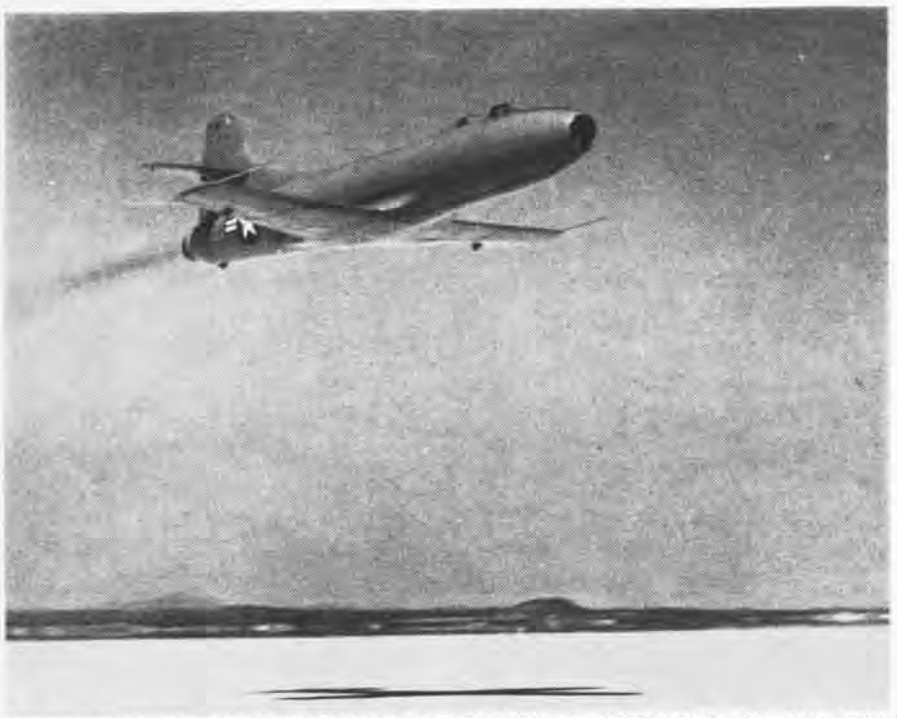
Haste Makes Waste

An FAU pilot started his engine and gave the "pull chocks" signal to the plane captain. As the plane began to roll forward, the starboard landing gear retracted. The aircraft settled to the runway damaging the propeller and causing sudden stoppage to the engine.

On the morning of this accident the landing gear actuating cylinder had been changed by a dependable and experienced petty officer. He was hurrying to get the plane in commission for a group hop, and reversed the hydraulic lines as he made the connections to the new actuating cylinder.

Grampaw Pettibone says:

This is not the first accident due to reversing the hydraulic lines. Two others have been reported in the past year. The only safe procedure is to *drop-check* the landing gear on all planes after repairs have been completed. You lads who work on planes must always remember that the safety of the pilot, and in larger planes the entire crew, is in your hands. No matter how great the rush to get a plane in the air—don't take any short cuts that jeopardize the aircraft or crew.



DOUGLAS SKYSTREAK ZIPS TO WORLD SPEED RECORD AT MUROC; NOTE SHADOW ON SAND BELOW

MEET THE CHAMP

IN 1946 naval aviation annexed the world's long-distance flight record. In August, 1947 the Navy took over the world's speed record for the first time in 24 years. Twice in the space of one week the Douglas *Skystreak* flashed over the three kilometer course to establish new world speed records. The first time piloted by Commander Turner F. Caldwell of BuAer, a new mark of 640.7 was set. Five days later, Major Marion E. Carl of Patuxent Naval Air Test Center, flying the same plane, broke the *old* record and established a new one of 650.6 mph.

On the first run, the blood-red D-558 test plane was not developing full power. Turbine rpm was about 100 revolutions lower than its rated 7700, lowering thrust efficiency to approximately 92%. Outside air temperature was around 77° on the first run as compared to 90° on the second flight. (Speed of sound goes up with temperature as do compressibility effects.) On the last flight the plane was developing 101% power, or over 7700 rpm.

Primary flight instruments on the D-558 consist of air speed indicator, Mach meter and altimeter. Engine instruments most important are the RPM indicator and the tail-pipe temp. gauge.

Minus refrigeration, the air impact at 600 mph would cause the cockpit temperature to rise some 75° over outside temperatures. Flying at Muroc Lake in temperatures running around 90°, it can get very hot in a very short period of time. The cooling system went out on Commander Caldwell during a practice flight, but he just pulled up to 10,000 feet and slowed down a bit to cool off." However, he claims it's a quick way to get a Turkish bath.

At maximum power the plane eats up kerosene at the rate of 600 gallons per hour. The tank holds only 215 gallons, which means "Hurry up, Old Fellow" or "How to take a quick course in clock-watching." At cruising power —550 mph—the plane uses only 400 gallons per hour.

A few facts about how it feels to fly the world's hottest airplane were voiced by Commander Caldwell in an informal interview.

"Flying a plane like the *Skystreak* spoils a pilot for the conventional plane. You just don't want to go back to the torque, vibration and noise inherent in all propeller aircraft—not to mention the little difference of a few hundred mph in air speed.

"Acceleration on take-off is normal, about .4 G, approximately the same as in reciprocal airplanes. But the run is somewhat longer due to the much higher take-off speed. The plane leaves the deck at about 160 mph. Half flaps are used on take-off, full flaps on landing. Wheels have to go up immediately after take-off.

AFTER EACH lap on the record run a 180° turn was made at 1300 feet. Speed was 575 mph in a vertical bank. This maneuver pulled about 3 Gs.

"After straightening out from the turn, I maintained altitude until fairly close to the marked course, where I entered a 30° dive to obtain maximum speed across the strip. Major Carl used a much shallower dive out of his turns and it was found that the variation in dive made little or no difference in speeds. Air speed during the landing approach was from 220 to 250, the plane setting down at 160. With brakes off, the landing roll was about 3½ to 4 miles."

When asked if he enjoyed flying the D-558, Commander Caldwell gave a positive "Yes, it was a very exhilarating experience, the nearest thing to combat flying I've come across since the war." That, coming from a three-time winner of the Navy Cross in combat, sounds like the ungarbled word!

Major Carl, Marine Ace with 16 enemy planes to his credit, who has been flying jets for two years, said: "It's the sweetest airplane I've ever flown."

CALDWELL POSES IN COCKPIT OF SPEEDY PLANE

CARL, PATUXENT FLIGHT TEST PILOT, WITH P-80

If in trouble, D-558 pilot pulls lever, dropping nose section off plane; he then releases seat, tumbles backward and uses chute

Russ Thaw, Douglas test pilot, tries out the escape mechanism as he drops from nose; decompression of compartment delayed

D-558 PILOT ESCAPE

(The following article on the high speed escape hatch in the D-558, holder of the world speed record of 650.6 mph, was written by R. C. Donovan, Douglas project engineer for the *Skystreak.*)

SAFETY provisions at transonic velocities for the pilot of the D-588 *Skystreak* in case of extreme emergency entered discussions early in 1945 between BuAer, NACA and Douglas Aircraft's engineers.

While no difficulties were expected in pilot egress at subsonic speeds as the normal direct cockpit bailing-out method used in combat craft was to be employed, numerous ideas were discussed concerning transonic safety exit for the pilot. It was evident that direct bailing out into the air stream would be unfeasible.

The most logical solution seemed to be the release by the pilot of a suitable enclosure which would fall free and slow down to the speed that would permit him safely to bail out.

Consideration was given to slowing the nose compartment during its free fall by parachute or dive brakes. Both were decided against due to structural difficulties in the case of dive brakes and because a suitable chute that would open successively at high speeds was not available.

Another method to which only minor consideration was given was that of having the pilot and the seat remain attached to the rear portion of the fuselage after the nose was jettisoned. Because of the difficulty of possible nose collision and that the rest of the airplane probably would react in an abrupt nose-up at the moment of c.g. change, this suggestion was deemed inadvisable.

Investigation of the present method indicated that the nose compartment would slow down to about 300 mph without any decelerating devices, and that it would be satisfactory to bail out at this speed, especially as some protection was afforded at the moment of egress.

The design finally evolved into a mechanical fastening of the pilot's compartment to the remainder of the fuselage by four bomb rack-type hooks. Those were designed to operate mechanically by a pull handle (*see drawing, right*). Flight and secondary controls were converted to rotary motion for simplicity in pressure sealing as well as to provide a simplified disconnect that would not entail breakage.

By this method the nose compartment could be assembled to the airplane and any number of trial jettisons made, as shown above, without disturbing the control system. The enclosure jettison also may be actuated by ground personnel for reaching the pilot in case of an emergency.

Due to the pressurized cabin, it was necessary to prevent explosive decompression at altitude. A time delay was introduced into the jettisoning system to permit reducing the pressure before actual disengagement of the nose.

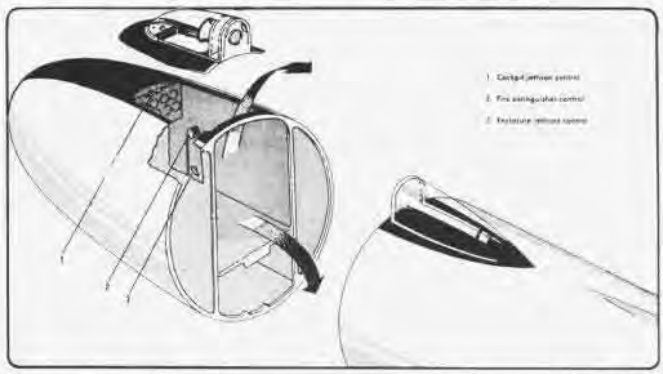
The NACA now is conducting tests on stability of a full-scale nose in the free-fall condition and is also conducting small-scale tests to reproduce the jettisoning in high speed flight. Tests have been made on jettisoning the nose from the flight airplane on the ground, suitably supported so as to insure that the mechanism is operating satisfactorily.

TESTS also were made in the altitude chamber with the pilot in the cockpit of the *Skystreak* so he might obtain experience with the anticipated occurrences should he be forced to use this method of escape at high altitude. These tests were concluded satisfactorily.

Due to the cautious inching-forward nature of the flight research program into the transonic range, the jettisonable escape hatch is not expected to be used. It affords the pilot a super-safety provision as a last resort method of egress.

The careful approach to this problem is consistent with traditional policies of the Navy Department and the Douglas Company in affording every possible protection to pilots.

(Ed. note: The jettisonable nose section idea is being adapted for possible use in the F2H configuration. This section would have small drogue chutes or fins to stabilize the fall until slowed down to a speed where the pilot could bail out safely. Other jet plane designs call for ejection of the pilot in his seat by a small powder charge.)



Escape controls are all within easy reach of *Skystreak* pilot; he can jettison the canopy or nose section if emergency arises

RESERVISTS PILE UP RECORD

Here come Ens. R. Newhard and Lt. (jg)'s G. Jesmer, J. Elliott, W. Gaerisch

THREE *Corsair* fighters in tight wing to-wing formation plunged down ward in a simulated dive bombing attack on the airstrip, and, in a move which seemed long overdue, the aircraft pulled out and roared into a steep climb. Streaks of vapor trailed momentarily from their wing-tips.

A little old lady, the collar of her black coat turned up despite the bright sunshine, seemed to shudder as she gasped:

"Isn't that sort of flying extremely difficult?"

The Chief Aviation Machinist's Mate, to whom the query was directed, grinned as he turned to reply:

"It would be *impossible*, Ma'm, if those Marine pilots were not thoroughly experienced ex-combat flyers with thousands of flight hours on their log books."

The conversation was cut short as the *Corsairs* thundered earthward in another chilling sweep.

The question in the elderly lady's mind was probably shared by many of the 20,000 guests welcomed at the NARTU first anniversary "open house" last June 29 by the Naval Air Reserve Training Unit in Seattle, Washington. But not for long. Many a spine-chilled spectator left the grounds of the Seattle Air Station later that day satisfied that the "Weekend Warriors," both commissioned and enlisted, know the whys and wherefores of flying and maintaining naval aircraft, and, furthermore, know how to put those facts across to an interested public. Although now on part-time duty, they are still sharp.

CAPTAIN GREBER (L)—REAR ADMIRAL WAGNER

In one short year since the commissioning ceremony on 1 July 1946, the Seattle NARTU has grown into an effective establishment, carrying on its activities in accordance with the program's objective of peacetime preparedness, and has become a thoroughly accepted and respected part of the Puget Sound area community.

AND THAT'S just about what the Commanding Officer, Captain C. F. "Dutch" Greber, wants it to be. Academy graduate of 1921 and wartime winner of the Navy Cross, Captain Greber has special reasons for wanting to make his tour for CNAResTra the most successful of his naval career. Reports from the Pacific Northwest outpost indicate that his aims are being accomplished and that the NARTU is forging ahead under his leadership.

The Captain is a Seattleite by adoption, a fact which dates from his marriage to a Seattle girl in 1929, but his current assignment here is his first. If he hadn't produced a bang-up outfit, he might have come in for heavy-handed ribbing from some of his Seattle businessmen friends. Nor would these same realistic gentlemen condone military leave for their employees unless they knew that time spent on training duty would benefit both the Reservist and the Navy. Notable in that connection is the fact that only one business establishment out of hundreds contacted for the March and June training periods failed to O. K. employee military leave for the Naval Air Reservists.

Get ready for new thrills—the Navy exhibition team is taxiing out to do its stuff for the 20,000 spectators who have come to watch the anniversary 'open house' air show

NARTU SEATTLE's 1st Lt. C. B. Morehouse and NAS SQUANTUM's Ens. W. Reynolds, Cornell and M.I.T. oarsmen, compare notes

The man behind the man with the gun—W. K. Jacobson, AOM3c, loads guns for 1st Lt. V. B. Brown to fire in a gunnery drill

SEATTLE's initial period of training duty for Organized Reservists began in late March of this year. A full schedule awaited the participants, and included ground school, conditioning and athletic program, lectures, and the all important flights. Excellent weather, among other things, enabled the pilots, most of them University of Washington students, to amass air totals that were outstanding.

The NARTU is particularly proud of the official comments of Rear Admiral E. C. Ewen, CNAResTra, on the Spring training period:

"The CNAResTra notes with pleasure the outstanding results of the first annual Training Duty Cruise at NARTU, NAS SEATTLE. The enviable record of an average flight time per pilot of 46.1 hours, plus an average availability of 84%, is an achievement that officers and men alike can well be proud of. Results such as these can only be obtained through full cooperation and determination of all hands concerned. It is desired to make special mention of the 4.0 safety record which reflects alert and conscientous contributions toward fulfilling the missions assigned. The CNAResTra wishes to extend to officers and men, both active and inactive, who participated in the training cruise, a 'Well Done'."

THE SEVEN-DAY week maintained during the initial year also seemed well worth the extra effort, when Rear Admiral F. D. Wagner, Chief of Naval Air Training, after inspecting the Seattle installation last June with his staff of 15, stated that: "In general, NARTU SEATTLE is in excellent condition and could well serve as a model NARTU."

Warming as these comments have been, no heads have been turned as a result. All hands are aware that the program is just getting a good start and are working for the long pull ahead.

Aside from the efforts of Captain Greber, and his Executive Officer, Commander Leif S. Melsom, to forge NARTU, SEATTLE, into a smoothly operating team, much credit must be given to the big type-training officer, Lieutenant Commander Dwight S. "Pete" Herrold.

Given a free hand to reorganize the department on his arrival last March, the ex-footballer from the Washington State "Cow" College, backed by ten years of experience in the Operating Force, including a hitch as C. O. of FAETUPAC, started things snowballing in the right direction without delay. One outstanding accomplishment is the fact that the Seattle Unit's Organized Squadrons have reached the point where they do all their own administrative work.

Stationkeepers L. Melton, S2c, and L. Campbell, AOM2c, attach miniature practice bombs to plane flown by 1st Lt. E. Dick

Plane captain J. W. Purvis, AMM2c, watches Lt. Cdr. W. E. Lohse sign yellow sheet. Co-pilot Lt. Cdr. R. Glaspey stands by

SNJ's are flown by Organized Reservists during the NARTU 'open house.' 'Weekend Warriors' certainly know all the angles

Assistant flight officer, Lt. (jg) V. A. Wallace briefs pilots prior to a PV flight. Relief map shows rugged nearby terrain

INSISTENCE on rigid compliance with standards of safety set by BUAER and CNAResTra has kept the accident totals among the lowest. There have been no fatalities to date. (Said while knocking on wood.)

A high point reached in training duty periods came, when, in cooperation with the Surface Reserve, a simulated attack was made on a DE involving a torpedo attack by aircraft from VA-74A. *Hellcat* fighters from VF-73A supplied a Combat Air Patrol for the vessel, and were directed by fighter director officers to "attack and destroy" the TBM's before the initial attack could be pressed home.

Organized Reserve enlisted personnel contributed much to the success of the training periods. In June, for example, rated men on board for cruises were integrated into the Operations and Maintenance Departments. They were thus able to assist stationkeepers in handling the heavy workload during the period when some 250 Organized and Volunteer Reserve officers were taking their two-weeks training. The 6979.1 flight hours chalked up attests to the fine teamwork shown by all hands.

When all is said and done, however, the question to be met is:

"Are the Seattle Squadrons trained to the point where they could be ready for combat in a minimum of time?"

The answer to that, in the opinion of those on the scene is: . . . "YES."

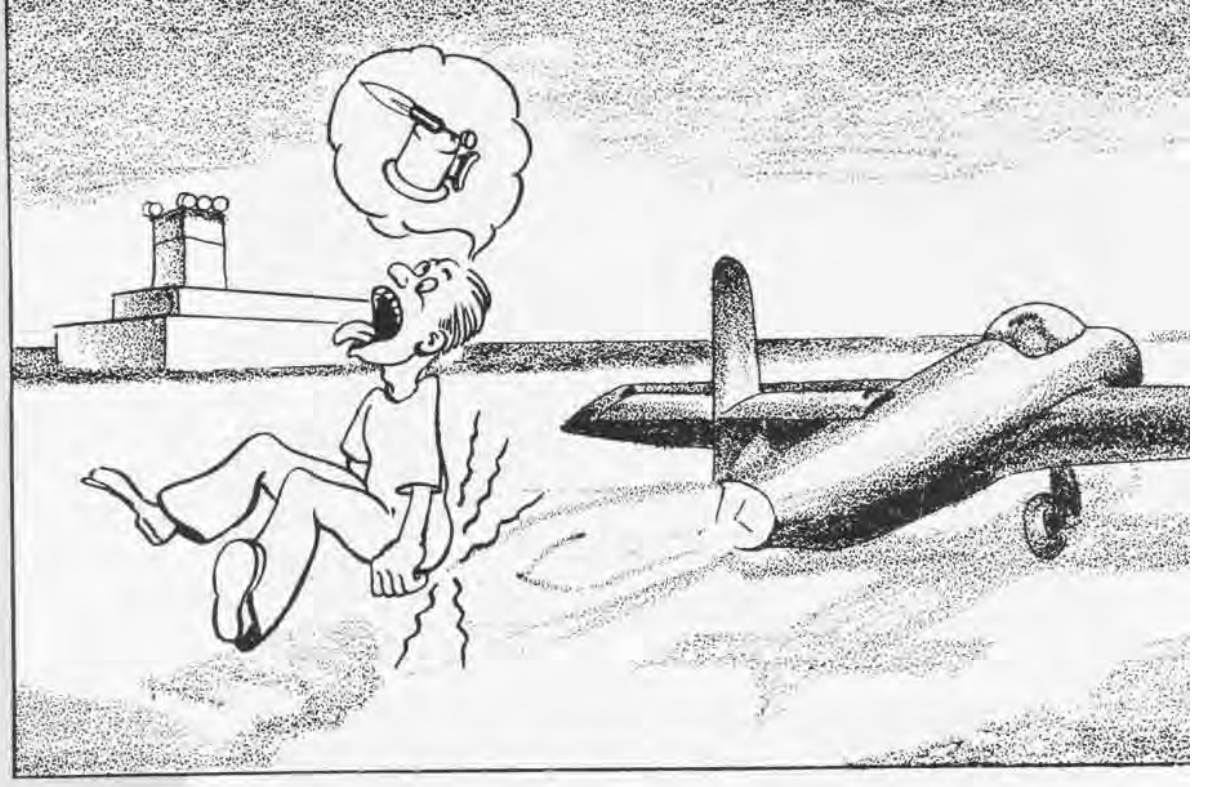
NARTU Seattle Reserve Squadrons

CVG-73	Lt. Cdr. C. H. Rothenberger, C.O.
VA-73-A	Lt. Cdr. W. H. Seaborn, C.O.
	Lt. W. N. Christensen, Exec.
VA-74-A	Lt. Cdr. A. J. Schultheis, C.O.
	Lt. W. C. Pellett, Exec.
VF-73-A	Lt. Cdr. F. R. McDonald, C.O.
	Lt. F. E. Green, Exec.
VF-74-A	Lt. R. C. Whitney, C.O.
	Lt. C. L. Brown, Exec.
CVEG-75	Lt. Cdr. R. P. Morse, C.O.
VA-75-E	Lt. N. E. Berg, C.O.
	Lt. F. F. Bertogna, Exec.
VF-75-E	Lt. Cdr. R. L. Loesch, C.O.
	Lt. R. E. Loesch, Exec.
FASRON 169	Lt. Cdr. F. A. McFarland, C.O.
	Lt. Cdr. H. Klinge, Exec.
FASRON 69	Cdr. W. W. Paull, C.O.
	Lt. A. B. Snyder, Exec.
VP-ML-62	Lt. Cdr. A. L. Petitjean, C.O.
	Lt. Cdr. J. L. Smith, Exec.
VP-ML-67	Lt. Cdr. C. D. Brislawn, C.O.
	Lt. Cdr. W. E. Lohse, Exec.
VR-55	Lt. Cdr. R. W. Horn, C.O.
	Lt. L. A. Smith, Exec.
VMF-216	Capt. T. M. Tomlinson, C.O.
	Capt. W. W. Rogers, Jr., Exec.

In the dawn's early light, stationkeeper F. O. Thompson, AMM3c, gives the 'thumb-up' signal to pilots about to take off in a PV

No one has needed to hit the silk yet, but V. L. Slauson, AS, plays it safe and takes a 'chute from Pvt. G. R. Graham, USMCR

JET ENGINE EXHAUST WILL GIVE YOU HOT SEAT — KEEP DISTANT



FLIGHT SAFETY BULLETIN 2-47

JET AIRCRAFT will be seen oftener on decks of carriers and ramps of air stations, so handling personnel must learn new precautions to avoid injury. They have no propellers to lop off an arm, but their engines are dangerous at both ends.

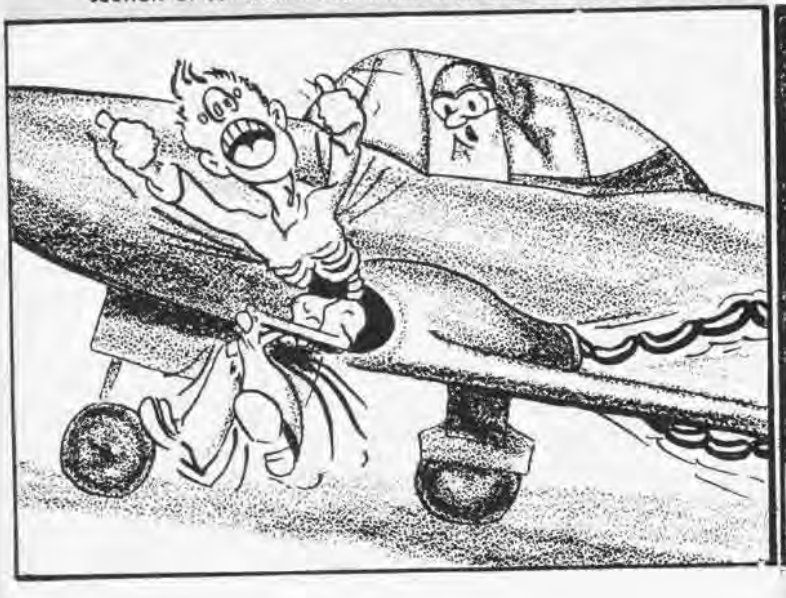
Here are the things to watch out for:

Exhaust Blast—the most hazardous ground danger of a jet. The danger cone behind the engine varies with the temperature and velocity of the blast. The blast will blow loose stones, rocks and gear with considerable force and will toss a person a considerable distance.

Suction—Air entering the intake scoops builds up a terrific suction. Hats, eye glasses, rags, tools and loose clothing will be sucked into the engine and may cause major damage to the machinery.

Cool Down—After a jet engine is shut off the tail pipe and cone are hot for half an hour. Asbestos gloves should be worn if work it to be done around them.

SUCTION OF JET ENGINE AIR INTAKE WILL COLLECT MUCH LOOSE GEAR



THAT TAIL CONE STAYS HOT A LONG TIME, MATE, SO KEEP MITTS OFF

Calling All Pilots!

Navy Will Use Army Flight Service Network for Flight Following

SOMETIME this month the Air Force will start keeping tab on naval aircraft. It's all a part of the plan on which the Air Force and the Navy have been working since early this year.

Under the new arrangement, following of naval aircraft on VFR flight plans will be discontinued by the CAA and taken over by Flight Service using the AAF Military Service Communications System. Use of this system, designated Plan 62, is expected to result in savings for the Navy and also to ease the military load on CAA facilities.

Outstanding features are the rapid communications between all stations in the U. S. and a new system of "flight following" in which aircraft positions are plotted at all times by Flight Service so that pilots can be advised immediately of weather changes or other hazards.

Flight Service, which began in 1943 and was recently put under the Air Transport Command, has nine operational centers throughout the country (see map). These centers are located at McChord Field, Tacoma, Wash.; Hamilton Field, San Rafael, Calif.; March Field, Riverside, Calif.; Lowry Field, Denver, Colo.; Wright Field, Dayton, Ohio; Fort Worth AAF, Maxwell Field, Montgomery, Ala.; Olmsted Field, Middletown, Pa.; and MacDill Field, Tampa, Fla.

Each center has its trained Flight Service staff, a communications set-up maintained by AACS (Airways and Air Communications Service) and an Air Weather station. Within each center's area, interphone lines connect Flight Service with AAF, Navy and Marine bases, AAF and Navy air-to-ground communications and the Airway Traffic Control centers. Over these lines pass all information on military flying.

FLIGHT FOLLOWING PANELS TAB ALL AIRCRAFT

Rapid communications allow Flight Service to keep an up-to-the-minute plot on all aircraft and any hazards they might encounter. Complete information on weather, reports on civilian and military airfield conditions, radio aids, beacons and any other subjects connected with aviation makes it possible for Flight Service to get pilots out of trouble before they realize they are near it.

The Navy expects to use the Communication Service and flight advisory features of Plan 62, but does not desire or expect Army Flight Control to extend to naval aircraft.

Navy and Marine Corps air stations began connecting to the Plan 62 network in July of this year. Until adequate services are provided and procedures for their use are formulated, the CAA will be used to supplement VFR (CFR) communications.

During the first quarter of fiscal 1948, while installations are being made at naval air activities, IFR and VFR flight plans will be handled in duplicate on both CAA and Plan 62 communications systems. IFR and VFR flight plans will continue to be transmitted on both systems.

DEPARTURE from naval installations which are part of the Plan 62 system will not involve any new procedures for Navy pilots. For departure from fields where there is no clearance authority, Navy pilots on a VFR flight plan may make collect telephone calls to the nearest center to file flight plans, or, if a phone is not available, may take

NAVY WILL TIE IN TO COMMUNICATIONS CONNECTING NINE FLIGHT SERVICE CENTERS IN U. S.

off and call in their flight plans to Flight Service through the nearest AACS airways radio station or control tower.

Pilots will normally contact Flight Service through AACS airways radio stations. When necessary, however, contact may be established through any Navy or Army tower in the system.

Naval aircraft requiring a change of route or point of first intended landing on a VFR flight plan can contact Flight Service through an AACS airways radio station or tower and advise them.

Flight Service advisory messages tell a pilot what to expect along his route and tell him his best course of action when in trouble. Navy pilots flying under VFR conditions have been instructed to make position reports wherever practicable to AACS airways radio stations enroute in order to receive necessary Flight Service advisories.

Pilots planning IFR flight will secure a CAA Airway Traffic Control clearance. If CAA communications facilities are not available, the CAA clearance may be relayed through Flight Service.

When changing IFR flight plans enroute, Navy pilots will contact CAA communications stations for CAA Airway Traffic Control clearance; however, if this is impossible, AACS airways radio stations may be contacted for coordination between CAA and Flight Service.

WHEN FLYING under IFR conditions, pilots will make position reports to CAA communications as required by Civil Air Regulations, and to the AACS airways radio stations enroute.

Flight service centers must be notified by the pilot when flight is terminated at a base which is not connected on the Plan 62 network. Collect phone calls to Flight Service centers are authorized for this. Failure to file arrival or RON messages may cause search and rescue facilities to be alerted in a hurry and extensive expenditure of funds for tracking down the aircraft.

As soon as possible naval aircraft will be equipped with radios covering 4765 Kcs. and/or 137.88 Mcs. for proper communications with AACS airways radio stations. Since this will take some time, emergency Flight Service advisory messages may be transmitted to Navy planes on control tower frequencies.

AACS airways radio stations are called by the location name followed by the word "Airways," such as "Bolling Airways." This is distinct from the CAA radio call system which uses the location followed by the word "Radio."

LATEST BLUE ANGELS TEAM, FROM LEFT TO RIGHT, THELEN, KNIGHT, CLARKE, RHODES AND MAY

BLUE ANGELS TEAM THRILLS PUBLIC

THE ANGELS come and go, but the Navy's *Blue Angels* flight exhibition team rolls on, entertaining more than a million spectators at 30 air shows across the nation in the past 16 months.

The team of ace fighter pilots has traveled more than 35,000 miles to participate in the shows. They performed in nearly every locale from the West Coast to the East and from El Paso to Chicago. None of the original four-man team is still on duty with the *Angels*, calls of sea duty, line school and other acts of BUPERS being what they are.

Today's team comprises five fighter pilots flying F8F's and a Jap-painted SNJ and 11 machinist's mates and radiomen to maintain the equipment. They operate out of Jacksonville.

They are not a stunt team, but show the public intricate patterns of combat flying. Their show includes evasive fighter tactics executed in tight formation, column loops, Cuban eights and reverse echelon rolls, ending up with a mock dog fight with the *Zeke*. Somehow the Jap always gets shot down, leaving a trail of smoke and dropping a dummy which is promptly "captured."

Originally the *Angels* flew F6F's, but were equipped with the best fighter the Navy had when they became available. The pilots were from the instructors advanced training unit at Jacksonville who volunteered for such duty. Their first public showing was at the Southeastern Air Show and Exposition at Craig Field on 16 June 1946.

Since then they have flown at Corpus Christi, Des Moines, Pensacola, Denver, Omaha, Beth Page, L. I.; Cleveland Air Races, Parkersburg, W. Va.; Ottumwa, Jacksonville, Oakland, Santa Maria, Calif.; Miami, Atlanta, Banana River, Whiting Field, El Paso, Tampa, St. Petersburg, Orlando, Charleston, S. C.; Memphis, Philadelphia, Birmingham, and Chicago.

Present members of the team are Lt. Cdr. Robert Clarke, leader; Lt. Cdr. Dusty Rhodes, Lt. R. H. Thelen, Lt. Charles A. Knight and Lt. (jg) William C. May.

NAS QUONSET—The Petersons have a corner on the chaplains' billets at this station. They are Cdr. A. Peterson and Lt. K. C. Peterson.

This is *what the well-dressed transonic plane driver will wear. The big sponge-rubber anti-buffet helmet is modeled by Gene May, pilot of the Navy-Douglas test plane, the D-558, which has made more than a score of flights at Muroc air base.*

THE ABC'S OF THE NAVAL AIR RESERVE UNITS

IF A CHIEF says, "There's a NARVU at the NARTU," he's not using double talk but good Naval Air Reserve lingo. NARVU, NARTU, NARA and NAS are all officially correct abbreviations for specific types of units within the Naval Air Reserve Training Command. These units have been set up throughout the country to meet the many and varied situations existing in different locations.

NAS—The largest unit operated by the Naval Air Reserve Training Command, of course, is the Naval Air Station. The primary mission of this type of unit is the training of Naval Air Reserve personnel, both Organized and Volunteer. These facilities vary in size. NAS Los ALAMITOS, for example, provides for the training of 2 CV Groups, 3 CVE Groups, 2 Patrol Squadrons, 2 Transport Squadrons, 4 FASRONS and 2 Marine Squadrons. NAS DENVER, on the other hand, provides for 1 CVE Group, 1 Patrol Squadron, 1 Transport Squadron, 2 FASRONS and 1 Marine Fighter Squadron.

NARTU–Next in size are the Naval Air Reserve Training Units, which are based on air stations operated by the regular Navy. These are separate commands, which, for the sake of economy, share the existing facilities of the stations on which they are based. At present there are four NARTU's located at Anacostia, Jacksonville, Norfolk and Seattle and one NARTU(LTA) located at Lakehurst.

NARA–An outlying facility of one of the above mentioned units is called a Naval Air Reserve Auxiliary. Previously these units were known as "Satellite Fields," a term no longer used. The facility at Charleston is a NARA. This type of unit is administratively, operationally and logistically supported by the NAS or NARTU to which it is attached, in order to provide flight facilities for a NARVU(A).

NARVU—The fourth unit within the Naval Air Reserve Training Command is a Naval Air Reserve Volunteer Unit. It consists of inactive Volunteer Reservists, organized into groups for instructional and training purposes. A NARVU may be located at any reserve NAS, NARTU or NARA or at an independent location. When a NARVU is engaged in active flying, it is identified as a NARVU(A).

● NARTU LAKEHURST—Airship Squadron 51, the first lighter-than-air Reserve squadron, has begun operations at this NARTU. With an authorized complement of 65 officers and 250 enlisted personnel (150 aviation and 100 general service rates), the squadron drills one weekend each month in order that Reservists from New York, Philadelphia and Washington may participate regularly.

● NAS Los ALAMITOS—A group of 21 officers on their annual cruise flew up to Moffett Field, visited the NACA Test Laboratory, and got the low-down on methods for modern and progressive testing of aircraft.

Bringing home ten first trophies, the swimming team placed second in the 11ND swimming meet. Dub Bowen, S1c, former all-Navy middleweight champion, reported aboard and organized a boxing team for competition with local teams.

● NAS BROOKLYN—Naval Air Reserve Volunteer Unit 3-2 was scheduled to be commissioned at Buffalo, N. Y., on 2 August. Lt. Cdr. Victor A Zucarelli was due to report as C. O. During July carrier pilots flew an average of 34.5 hrs. per pilot. A group flight to NAS JACKSONVILLE, led by Air Group Commander Bosee, was enjoyed by 20 of the pilots.

● NAS OLATHE—Members of VA-70-A, VF-70-A, VF-55-L and station pilots helped dedicate the airport at Coffeyville, Kansas, before an estimated crowd of 15,000.

During July a total of 2097 hours were flown. Pilots are now using the impact area at Fort Leonard Wood as well as the bombing target at Osage for practice—by courtesy of the Army.

● NAS ATLANTA—A good safety record was chalked up in July—no injuries to personnel and only very slight damage to three aircraft.

With the installation of a 1-CA-1 Link trainer at the NARA in Charleston, the Volunteer Unit there is starting to recruit Link operators. Commissioning date for GCA Unit No. 24 at Atlanta was scheduled for 1 August.

● NAS DALLAS—For rendering assistance during the Texas City disaster, the following men received Letters of Commendation: Wilbur B. Webb, CAP; Charles H. Lewis, ACRM; Lynn G. Becknell, AEM1c; Frederick W. Kitrell, Jr., S1c; Charles R. Gipson, AETM1c; Vernon R. Dersch, PhoM1c; William J. Brown, AMM1c; Mendel L. Black, T/Sgt., USMCR.

● NAS COLUMBUS—One hundred new Organized Reservists signed up in July.

According to the recently signed lease, the Navy and the City will divide the cost of maintaining the field. The Airport Council and the Navy will have equal say in its operation and CAA personnel will continue to operate the tower.

NAS BROOKLYN Anniversary Air Show

New York Herald Tribune Photo

AT KINDLEY FIELD, BERMUDA NARTU ANACOSTIA RESERVISTS WIND UP THEIR TRAINING CRUISE

● NAS ST. LOUIS—Helping in local crises now seems to be a regular feature of this station's activities. Latest exploit involved the rescue of two workmen who were buried in a cave-in during construction of a nearby sewer. The station furnished a crane, drag line and operator, who stayed on the job until the men were brought out alive. Station bluejackets acted as shore patrol.

● NARTU ANACOSTIA—Organized Reservists, shown in the picture, from left to right are: kneeling—E. Steinkuller, AMM-1c; D. J. Witchey, ARM3c; J. Carthel, AMM1c; G. M. Sindelar, AMM2c; F. Lago, AMM1c; J. M. Flynn, ARM2c; H. W. Brown, ARM1c; *standing*—J. Vandenberg, S1c; R. A. Kinney, ARM2c; Lt. Cdr. J. W. Sheehan; S. R. Dixon, AMMF2c; Lt. H. Horton; Ens. I. M. Brown; Ens. E. Marmorstone; Ens. L. W. McChesney; Lt. H. K. Hoover; Lt. F. W. Forman; H. B. Ray, ACETM; Lt. Cdr. N. Carrothers; Lt. Cdr. P. Claggett; *blister hatch*—Ens. T. B. Abernathy; Ens. W. J. Carrion; and Ens. G. E. Hill. J. Douglas, PhoM1c, who was also on the cruise, took the picture at Kindley Field.

● NAS MIAMI—High winds or hurricanes—communications are prepared. Daily tests have been run on the 7ND hurricane plan. A voice circuit was established and tested between the station and Coast Guard operations.

Out of a total of 90 enlistments or reenlistments, obtained in July mainly through night recruiting, 45 were transferred to 0-2.

● NAS MINNEAPOLIS—Don't look now, but the 6,000 Reservists you see here don't all belong to the Air Reserve. Twin City Surface Naval Reserve Units have moved into the station for drill periods and have been allotted space for gear storage and offices.

● NAS OAKLAND—Seven officers and eighteen men of VR-64 and VR-65 were ordered to COMNATS at Moffett Field for training duty as a fully self-sustaining unit. Upon reporting they were assigned to a cargo passenger run from the field to San Diego. A rigid schedule of one and a half trips a day was adhered to as a result of much hard work on the part of all hands in the squadron. Believed to be the first VR squadrons to report as a self-sustaining unit, the outfit was commended by Admiral Reeves for its work.

● NARTU NORFOLK—The Marine Air Detachment boasts that 100% of its enlisted complement is on board. Better yet—15 men are barking at the door, trying to get on the list.

The softball team won the runner-up trophy in the 5ND tournament.

● NAS NEW ORLEANS—July score for operational accidents stayed at a nice round 0. The OY-1 assigned as a rescue plane was put to use recently when a transient fighter had a forced landing 50 miles from the station. The pilot was rescued with only minor injury.

After numerous difficulties the Supply Department has the gasoline situation under control for present operations.

● NAS DENVER—Fifteen officers and 30 men reported during July for the first annual training cruise for fiscal '48. Pilots flew 442.3 hours for an average of 36.8 hrs. per pilot. Ground officers present on the cruise supervised the training of the 0-2 personnel. Stationkeepers were divided into two competing recruiting teams during July and helped "up" the monthly count to 92 recruits.

● NAS GROSSE ILE—There were no accidents of any kind during July. This fine record was due in great part to the vigilance of tower personnel.

● NARTU JACKSONVILLE—Congratulations to the Maintenance Department for keeping availability of aircraft within the upper 10%; during July, for example, they hit a 95.4% average.

Listen in on Wednesdays at 1030 to WMBR and "Meet Your Week-End Warriors." This weekly NARTU radio program is now a regular feature on the *Kay and Van* show, which is presented daily and which enjoys the highest Hooperating of any local morning program. Utilization is made in the script, which is prepared by the PIO, of local color in order to impress upon the listener that the Jacksonville NARTU is a local outfit, that its members are local boys and that it has become a vital part of the community.

● NAS MEMPHIS—Sixteen officers and seven men flew down to Pensacola for bombing and gunnery practice during their July cruise. Two Reserve pilots ferried a PBY-5A from Weeksville, N. C., to Memphis. During the same month 364 men of the O. R. were under instruction.

● NAS SQUANTUM—Excellent cooperation is being received from employers in the granting of military leave to Naval Reservists. O. R. squadrons are setting up an enlisted men's Procurement Board to spur the needed interest in recruiting.

● NAS GLENVIEW—554 enlisted personnel are now attached to O. R. squadrons. WAVE stationkeepers, of whom there were 18 as of July, like their job so well that no requests for release have been received to date and enthusiasm reigns.

AT NAS MINNEAPOLIS, CAPTAIN WHALEY ESCORTS AMBASSADOR BUTLER TO PLANE FOR AUSTRALIA

IT'S AN OLD STORY

Moral: Avoid that slipstream.

SLIPSTREAM accidents continue with an alarming frequency. This is principally due to the lack of mental alertness and to the failure of pilots in maintaining sufficient interval during the landing approach. You must be particularly cautious around a busy airfield at a time when several planes are in the landing pattern. It is then that the famous adage "Seconds saved—lives lost" becomes justly applicable. *Flight Safety Bulletin No.* 20-45 gives detailed information regarding slipstream accidents.

To avoid such accidents it will really pay-off if you follow these pointers: keep a safe interval behind the preceding plane by planning your approach, take a longer interval under calm wind conditions as it takes longer for the slipstream to dissipate, maintain sufficient airspeed to enable you to keep control of the plane at all times, look for crosswind conditions that may blow slipstream into your flight path and keep clear of carrier stackwash by not overshooting the groove. Experience is often a severe teacher so don't wait until you are caught in a slipstream to learn of its dangers; instead, develop a healthy respect for it now.

CASE I The pilot of an SB2C-5 was making a normal approach to the runway at a distance of about 800 feet behind and 150 feet to the left of his division leader. When just breaking his glide he encountered the slipstream of the plane ahead which forced down the left wing and nose of his plane. An attempt was made to regain normal flight attitude but it was to little avail. The plane struck the mat hard on the left wheel and propeller. It was the opinion of the aircraft accident board that 30 degree cross-wind of 12 knots from the right blew the slipstream of the lead plane into the path of the next plane with resultant damage.

CASE II An F4U-4 pilot made a normal approach to the runway and the plane had almost assumed a three point attitude when a violent slipstream was encountered. This slipstream came from a plane ahead; it having just taken a wave-off after approaching to within 10 feet of the service runway. The left wing of the *Corsair* went down and was dragged several feet before recovery could be effected.

CASE III Four TBM-3E's were returning from a routine tactical flight and had completed the break-up for landing. The pilot of the second plane in the landing circle had been cleared for a landing but upon entering the base leg he encountered "some slipstream." He was then flying at approximately 90 knots and at 200 feet altitude. The force of this slipstream was sufficient in strength to force his plane into a vertical bank. An attempt was made to regain a normal flight attitude but so much altitude was lost during this maneuver that the plane struck the water which was about 75 yards from the end of the runway, turned over on its back and sank. *Avoid that slipstream.*

DID YOU KNOW?

Lambert Field in St. Louis
No Longer Controlled by Navy Tower

Naval aviators from a number of air stations continue to come into NAS St. Louis on cross-country flights, apparently without knowledge of Navy or CAA requirements.

Pilots' statements indicate that they have never been briefed on the condition of the field—the fact that Lambert Field is a municipal field; that the municipal tower controls all approaches; the Navy tower is not manned; and that carrier breakups are taboo. A good deal of embarrassment has been experienced in the past as a result of these actions.

CONTRACTOR TO OVERHAUL USED COMMANDOS

Overhaul Contract Placed
Curtiss-Wright Will Recondition R5C's

Curtis-Wright has been awarded a $2,000,000 contract to overhaul the Navy's 36 R5C *Commando* aircraft. Included in the complete overhaul will be incorporation of design improvements and standardization items, such as new instrument panels, cargo section insulation, relocation of auxiliary power unit, and new surface control locks.

NAS San Diego, where the R5C's are currently being overhauled, has been advised to terminate induction of this model for overhaul and to complete only those aircraft now in process. Thereafter, NAS San Diego will no longer be designated an R5C overhaul activity.

It is planned that Curtiss-Wright will produce three overhauled R5C aircraft per month, commencing in February 1948.

The *Commando*, used by the Marines, was the workhorse of their transport squadrons during the war. In the Marianas campaigns these high-speed, whale-bellied aircraft hauled millions of pounds of aerial cargo, mail, medical supplies, and rations into the battle zones and, on return trips, evacuated wounded from field hospitals crowded beyond capacity with casualties.

This One Will 'Cow' You
Alameda Football Field Catches Fire

NAS Alameda—The barnyard brigade will be interested in this one. Had it happened during football season, it could have been result of a "hot" game between the NAS *Hellcats* and one of their fiery opponents.

When the turf of the NAS gridiron recently belched smoke like a string of destroyers under forced draft, onlookers could only shrug and wonder.

The station nursery authorities were checked—after the fire department quenched the smoke—and it was learned that the sun-dried fertilizer was cause of it all. A carelessly-tossed cigaret started the manure to smoldering.

Which is all by way of warning, moist fertilizer is best for all-around results, but be sure to avoid fires.

Missing Marine Plane Found
Rainier Icefield to Retain Victims

Almost buried in the icy wall of South Tahoma glacier on Mt. Rainier, the remains of the missing Marine R5C which carried 32 men to their deaths were found on 22 July, more than seven months after the plane disappeared.

Forest Ranger Bill Butler sighted part of the wreckage at the 10,000-foot level. The following day skilled mountain climbers reached the scene. Part of the tail surface was found 150 feet down.

Other evidence which made possible the identification were some health records and service record books and a piece of Marine Corps uniform. No bodies were recovered. Due to danger of crevasses opening and shifting of the glacier, there will be no attempt to recover the bodies.

First Lt. Vincent E. Murphy, attached to engineering section of VMR-152 went to Seattle to assist in identifying the wreckage. The plane was assigned to that squadron.

At the request of the New York City government, the Navy is training special airport fire fighting and crash crews at NAS Floyd Bennett Field, in a program to provide highly trained units to man the municipal airports—LaGuardia, Idlewild, Newark and Floyd Bennett. Here an instructor wields a crash axe to expose wing cells of the plane in an effort to release gasoline fumes. The Navy Mobile Fire Fighting Unit is from Memphis.

Phantom Will Get Ice Test

Jet To Be Exposed on Mt. Washington

The Navy will ice-test a *Phantom*, jet fighter plane, by exposing it this winter to the frigid blasts on top of Mt. Washington, New Hampshire, one of the highest mountain peaks on the East Coast.

The 6,288-ft. site was selected because of the severe icing conditions it breeds along with the 150-mile-an-hour winds that sweep through that part of the White Mountains. It also is unique in the United States in that it bears vegetation similar to that of the Arctic regions.

A primary object of the tests will be to correlate engine and wing icing conditions in order to determine whether the jet engine under the operating conditions or the plane's wings will ice-up first. Engineers from the Aeronautical Engine Laboratory, NAMC PHILADELPHIA and the Aircraft Icing Research Laboratory of the Wold-Chamberlin Company, Minneapolis, will conduct the tests.

The plane will be secured in a flat-topped "Butler" building to be erected on top of the mountain. The building will be opened at both ends to form a natural wind tunnel when the tests are run, and will be closed during non-test periods to protect the engineers from the severe winter of Mt. Washington, where the thermometer sometimes drops to 40° below zero.

Although the actual tests will not get under way until later, construction of the building was scheduled to be completed by mid-September. After that time the winds and the weather are too severe for the builders to work in. For the same reason, the engineers will work in groups of three and rotate their duty by spending 20 days up the mountain and 10 days down.

The plane will be carried to the top of the mountain on a railway flat car over the Mt. Washington cog railroad.

Glide-Stretching Dangerous

NATS Gives Findings on GCA Flying

Continued experiment with GCA approaches has brought out the fact that the pilot in actual instrument approach should not get below the glide path and should maintain air speed of about 10 knots in excess of contact approach speeds, NATS reports.

On the final leg it may happen that, while the plane with the usual power setting remains about on the glide path until the one-half or possibly the one-quarter mile point, there may nevertheless be an almost imperceptible decrease in air speed. This may result from jiggling of power settings on the final leg or from the fact that the power setting or the air speed, or both, may be a shade below normal.

In such a case, the plane has remained in glide path by stretching its glide. The result evidences itself as a sharp drop below glide path, which, if it does not occur until the end of the runway, is unimportant. If it occurs a quarter of a mile back, the effect is so rapid that neither the GCA operator nor the pilot may be able to compensate for it unless they are unusually alert and rapid in their reactions.

It is obvious, of course, that excessive factors such as a combination of excess speed and extra distance above the glide path may be equally hazardous unless the runway is a long one.

Navy PBM Saves Ill Seaman

Lands in Hazardous Water for Rescue

Naval aviation added another rescue to its long list of mercy missions at sea recently when a *Mariner* from VP-MS-5 at Hamilton, Bermuda, flew 383 miles out into the Atlantic to pick up a merchant seaman ill with appendicitis.

Lt. Andrew Sinclair piloted the plane and brought it down for a landing on heavy seas, near the S.S. *Eastern Guide*, to pick up the seaman. The transfer was made in eight minutes and the PBM took off with JATO. The man, Martin Lopez, was taken to the naval hospital for the operation. The round trip took six and a half hours.

Coral Sea Is Commissioned

Third Midway-class Carrier is Ready

Third and last of the *Midway*-class big carriers, the *Coral Sea* (CVB-43) is scheduled for commissioning at Newport News, Virginia October 1 and will be fitted out at the Naval Shipyard at Norfolk.

The *Coral Sea* is a sister ship to the *Midway* and *Franklin D. Roosevelt*, being 968 feet long, 136 feet wide and having a depth of 84 feet from center line, flight deck amidships. Standard displacement of the CVB's is 45,000 tons with full load displacement of 60,000 tons.

FDR, SISTER SHIP TO CORAL SEA, AT LISBON

The ships can carry 125 aircraft, including 65 F4U's, and eventually probably will have jet fighter squadrons and attack bombers such as AD-1's, AM-1's.

Named after the famous battle of Coral Sea, May, 1942—the United States Navy's first major victory in the war—the ship will be attached to the Atlantic fleet. In the battle the Navy lost the *Lexington*, but sank the Jap carrier *Shoho*, two destroyers, and shot down 104 planes. The carriers *Shokaku* and *Zuikaku* were heavily damaged.

It was the first time in history that a decisive naval engagement had been fought without surface ships taking combatant roles, the whole battle being fought by aerial strikes from the rival fleets' aircraft carrier forces.

The Navy's new attack bomber, the AD-1 Skyraider, passed its carrier qualification test during June aboard the U.S.S. Sicily (CVE-118). The largest single-seat plane in the Navy's air arm, the big Douglas bomber showed good characteristics—stability in the groove, low landing speed and ease of handling. Abandoning the bomb bay of the old TBF-type aircraft, the Skyraider carries its load of bombs or torpedo externally.

Randolph Put in Mothballs

Veteran War Carrier Finishes Career

Another of the Navy's war-tried aircraft carriers, the U.S.S. *Randolph*, has joined the "mothball fleet," reporting to Philadelphia shipyard for overhaul and deactivation.

The *Randolph* started her war career in Admiral Marc A. Mitscher's carrier task force that launched audacious strikes twice against Tokyo and other Jap targets. It provided close air support for the invasion of Iwo Jima, inflicting 52 casualties on the Jap air force and destroying 71 on the ground.

While lying at anchor in Ulithi on March 11, 1945, a Jap *Kamikaze* crashed into her side killing 26 men. After 16 days of day-and-night on-the-spot repair work, the *Randolph* was ready to fight again and supported the Okinawa invasion. At one time, Admiral Mitscher used the *Randolph* for his flagship after two others were hit by *Kamikazes*.

RANDOLPH'S ISLAND CARRIES 317 JAP FLAGS

Four days after she got back to San Pedro in June, 1945, an Army P-38 crashed on her flight deck forward, killing 14 of her crew. Returning to Jap waters, she participated in final blows at the Jap Navy. Since the war's end, the carrier was used for training Annapolis midshipmen, made a tour of the Mediterranean sea, and this year carried midshipmen to Norway and Sweden.

With the retirement of the *Randolph*, the *Shangri-La* (CV-38) is the only aircraft carrier on active duty in the U. S. Fleet which has seen war action. There are 21 CVB's, CV's and CVE's still active.

Seaplane Rescues F6F Pilot

Small SC-1 Outstrips Larger Planes

Although the SC-1 *Seahawk* is not supposed to be a rough-water plane, it rescued a downed *Hellcat* pilot from the turbulent and cold Atlantic off Nantucket Island recently while a Coast Guard PBY and a Navy B-17 from VX-4 orbited overhead.

The pilot of the rescue plane, Lt. (jg) B. A. Hoffman was from the aviation unit of the U.S.S. *Little Rock* CL-92. He was taking off from the Quonset Point ramp when he heard the rescue reports coming in, so he proceeded to the scene. He made the landing and rescued the pilot who was near death from exposure.

The rescue by the little cruiser float plane was a source of satisfaction to its proponents, who sometimes feel observation aviation is a Navy stepchild, according to the *Little Rock* aviation unit.

Evolution of Hamilton-Standard props from 1930 to the present is seen here. Note the progression from the almost pointed blade at left to the square tip or "paddle shape" at right. This latter type is to be used on P2V-2 (*Truculent Turtle*) and on future aircraft. Two of the advantages of this blade are its light weight and internal electrical de-icing. The paddle has a hollow steel core with a steel sheet to give it its shape.

NATS Officer Is Busy Man

Caring for Children Is Extra Job

NAS MOFFETT FIELD—Being air transport officer for this NATS station requires something extra in ability.

While he was handling one dependent flight, several children arrived for the trip to Honolulu. In the rush to pack and catch the bus from San Francisco, dinner was overlooked and they arrived crying and wanting something to eat. The cook was absent from the galley, so the air transport officer rolled up his sleeves and fried some bacon and eggs for them.

One woman arrived from Washington with two children, aged seven and 19 months respectively. She had been informed when leaving that someone at each stop would take care of the kids. On arriving at Moffett Field, they were turned over to—you guessed it. This is probably good experience. It is not in *Air Traffic Regulations*.

All-Jet Squadrons Forming

Phantoms Will Equip Fighter Outfits

The Navy's first squadrons to be equipped with all-jet aircraft are in process of being formed as NAS QUONSET POINT—VF-17-A and VF-18-A, formerly on the U.S.S. *Randolph*, which is being deactivated.

The squadrons will be land-based while they are checking out in operation of their planes. A Marine squadron, VMF-14-B, also will be equipped with jets as they come off the production lines. First jets to be received were FH-1's with FJ-1's scheduled to augment them later.

First pilots to fly the jets went to Patuxent River Naval Air Test Center to check out in them and fly them to Quonset. Some F8F's will be retained by the squadrons, in addition to jets.

The first Navy squadron to use jets was VF-1-E at San Diego . It had FR-1 Ryan *Fireballs*. This month's cover photograph shows planes of this squadron flying formation on an R5D on the West Coast. The unit now has F6F's.

COMAIRLANT GETS FH-1's TO EQUIP SQUADRONS

Mystery of New 'Alphabet'

NANews Solves Navigation Quandary

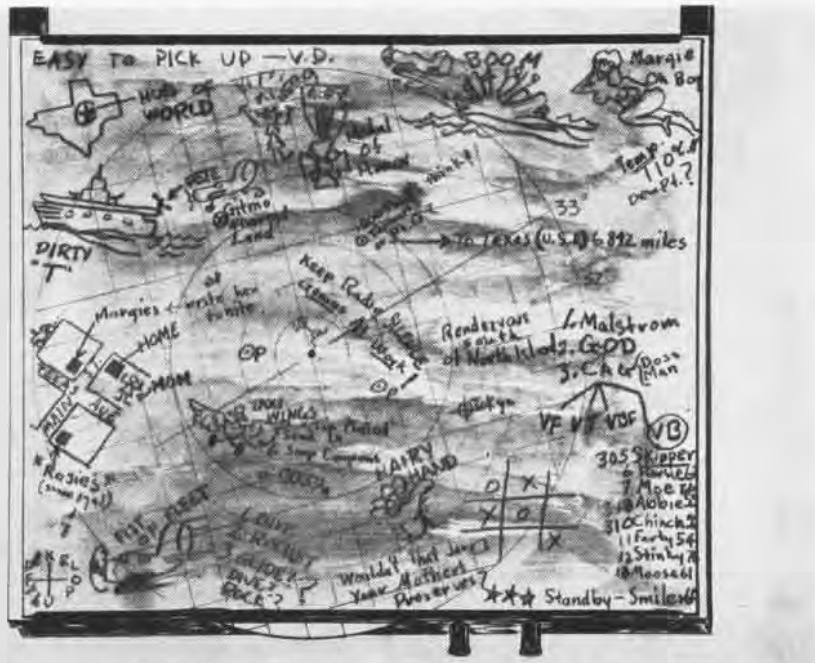
The monthly news letter from VRU-1 in the Pacific said "the new POMAR position reporting and code went into use 1 July." The item was labeled "Navigation."

"Must be a new kind of Loran or something," one NANEWS writer opined. "Better call BUAER Electronics Section, maybe we're missing something."

Three different experts in that section had never heard of POMAR. Neither had a commander in piloted aircraft nor a man in NATS' own headquarters. Finally someone thought that Aerology might know something about it.

The story finally came out—it wasn't a new navigation program, merely a new-type of form which pilots must fill out and radio in hourly on long over-water hops. It is all part of the revised weather and position reporting system approved by the International Civil Aviation Organization. It replaces a somewhat longer form called the *Combined Aircraft Weather Report Code* and several other reports and is for use by Navy, Army and commercial planes.

What does "POMAR" stand for? The report has three sections—Position, Operational, Meteorological. And the "AR" stands for *aircraft report*.



After briefing, Smiler Smirk's board resembled something "Out Of This World."

Fog Foilers Get Fighters

Landing Aids Research Makes Progress

The Navy's latest contribution to participation in the integrated landing aids program being carried on at Arcata, California, is the assignment of two fighter planes to the experimental project. An F6F and an F7F will be used for evaluation of the various types of aids, both for take-offs and landings. Previous work has been done with transport planes, chiefly emphasizing bad weather landings. Take-offs are less of a problem with large aircraft because of their greater stability.

The Arcata projects include high intensity lighting systems, both approach and runway; 11 different types of FIDO installations for thermal fog dispersal; ILS equipment; and GCA equipment. Contract for operation of the Landing Aids Experiment Station is held by Trans-Ocean Airlines which took over the work after United Airlines withdrew. The program is a joint Army, Navy, CAA undertaking.

NATS is sending representatives to participate in an instrument landing school being conducted at the Arcata station. The school, a sixteen-weeks program, began in August for the purpose of evaluation and further development of GCA, ILS, FIDO, and high intensity lighting. ComNATSPac has a quota of one plane commander per week for participation in this program. Army and Air Transport Association representatives also will be included.

A Navy aviation training film is being made at the Landing Aids Experiment Station to indoctrinate pilots in the operation and application of the various low visibility aids.

These Jacksonville gunners won the National Servicemen's Skeet Trophy at Syracuse, N.Y., in August. They are, standing, left to right, Capt. G. C. Miller, captain of the team; 1st Lt. W. W. Bryant, USMC; Lt. (jg) F. E. Field; Lt. Cdr. H. A. Robinson, and D. T. Gallitano, aviation chief ordnanceman. Kneeling, Lt. C. C. Orton and E. A. Varner, aviation chief firecontrolman. Orton and Varner were high gunner and runner-up.

Coco Solo Sprays Mosquito

Malaria Pest Licked by OY Sprays

NAS Coco SOLO—Anopheles Annie is beginning to find life on this Panama air station is getting tougher all the time. Because the malaria rate here went up with the advent of the rainy season, a spraying control program was launched to keep down mosquitos.

Operations department fitted out an OY-1 aircraft at the A&R department with a 30-gallon tank and externally mounted spraying system. The air station and adjacent areas have been sprayed daily with a mixture of DDT and oil, with very gratifying results.

NEW PLANES – NEW FEATURES

BENDING NOSE GEAR PERMITS NAVY'S XFJ-1 JET FIGHTER TO 'KNEEL DOWN' FOR EASY HANDLING

XFJ-1 Has 'Kneel Down' Gear XSN2J-1 Offers 'Push Button' Training

FINAL demonstrations of two new Navy airplanes, built by North American, the production model of the XFJ-1 jet fighter and the experimental XSN2J-1 intermediate trainer, are being held at NATC Patuxent River.

Despite its weight of 12,000 pounds, the XFJ-1 will travel at more than 550 miles an hour. It is the first Navy fighter to employ a single ram duct with its entrance in the nose. With the air intake, engine and fuel tanks enclosed in the fuselage and with its stubby, super-thin laminar flow wings, the plane has the appearance of a "flying bomb."

The XFJ-1 is powered by a single General Electric TG-180 axial-flow turbo-jet engine. Its exceptional rate of climb puts it in the mile a minute class.

Special feature of the fighter is the bending nose gear, which enables it to "kneel down" on the crowded deck of a carrier. This gear permits ground crews to lower the plane to a dolly, on which it can be taxied or easily pulled to any position desired. The nose gear is operated independently of the main gear by means of two telescopic "kneeling" cylinders attached to the gear shock strut. Actual lowering and raising is accomplished by a hydraulic hand pump. When in the kneeling position the nose gear is completely retracted. The hot jet exhaust thus is shot into the air where it cannot burn personnel or make them ill from fumes.

The Navy has ordered a production version of this fighter for assignment to operating squadrons with the fleet.

The low-wing, all metal XSN2J-1 was built to meet the need for more advanced trainers and a revised pilot training program made necessary by the development of new high-speed fighters, bombers and transports. Faster, heavier and more powerful than current trainers, it has the "feel" of a big service type plane. Designed primarily for carrier training, it may also be utilized for advanced dual instruction.

CLOSE-UP OF XSN2J-1 'UPSET' CONTROL PANEL

A unique feature of the XSN2J-1 is a set of controls in the back cockpit which enables the instructor to "upset" certain instruments in the student's front cockpit to simulate emergency conditions during training. With three push buttons, for example, the instructor can "spill" the student's gyro instruments and fuel gauge; with five others he can "upset" the front cockpit airspeed, altimeter, turn and bank, oil and fuel pressure gauges.

The plane is powered by a nine-cylinder Wright engine with a take-off rating of 1,100 hp. It is equipped with a single-stage, two-speed supercharger.

KEEPING pace with the high performance of modern fighters, the XSN2J-1 has a top speed of 270 mph and a service ceiling of 30,000 feet. Using a take-off run of about 500 feet, it will climb at more than 2,000 fpm, and has a stalling speed of 75 mph.

The trainer has a range of more than 2,000 miles. Its normal fuel load is 260 gallons with provisions for carrying two additional 58 gallon droppable wing tanks. Normal gross weight is 8,500 pounds and the wing span is 42 feet, 11¼ inches. Both the front and rear cockpits are similar and are arranged in accordance with the new "functional cockpit."

The Navy has ordered two XSN2J-1's for evaluation in the training program.

FASTER AND HEAVIER, THE NEW TRAINER HAS THE 'FEEL' OF A POWERFUL SERVICE TYPE PLANE

AND THERE I WAS...

Fire Away!

NATS Squadron Two had an amusing incident on recent *Mars* flights from Honolulu to Alameda. The plane was two hours out and the Plane Commander was making a routine tour through the passenger compartment

A woman civilian passenger, obviously badly frightened, asked, "Where's the fire?"

The Plane Commander knew nothing of any fire, so posed a classic, "What fire?"

Whereupon the lady pointed to the flight orderly who was busily engaged in spraying insecticide about and asked, "He's spraying! Isn't that because we're on fire?"

Now I'll Tell One

NOBODY ever believes me when I tell this story, so I guess there is no harm in telling it once more. It happened in the good old days before the war. I was detailed to ferry an ancient J2F to Norfolk. It had been so warm in Pensacola that I forgot all about snow and ice.

So there I was at 20,000 feet over Norfolk, almost out of gas and with a plenty tired you know what. Woe was me! It had snowed heavily the night before! There were at least two feet of soft snow on Chambers Field. Why that snow would have grabbed my wheels like a Sand Street tailor after a new customer.

Well, the answer was easy, put her down in the water. Fine, but those pieces of ice in Willoughby Bay would put more holes in my hull than there are in an old piece of Swiss cheese.

So I'll tell you what I did. I circled up wind from the field, rolled the nose tab forward and pushed that worthy old *Duck* into a screaming dive. The rigging wires started to hum. At 2,000 feet the tune resembled "Nearer My God To Thee," so I started an easy pull-out. Still about one mile up wind. I leveled out a few feet above the bay, screaming toward the field with an incredible air speed.

As the sea wall passed by, I nosed her over a little. (Maybe I forgot to tell you that the wheels were still up)

The main float touched onto the smooth snow as gently as a bird.

A little forward stick held her on, pushing into the snow harder every foot.

At the terrific speed we were making, the friction of the snow caused so much heat that a path 10 feet wide, as long as the runway, was melted immediately to water.

When the now-floating plane slowed down by water resistance, I quickly lowered my wheels; and, as the water drained off the field, I taxied calmly to the parking area and stepped comfortably onto the damp but firm ground. Mission completed!

D. H. Adams, Lt. Cdr. USN.

Bombs Away!

SINCE printing the story of *Dilbert* antics of the Gooney birds at Midway, NANEWS has received a special dispatch concerning the malicious activities of a much more specialized denizen of the air. And this character carries on his subversive activities right here in the U.S.A.

Personnel at NAS TERMINAL ISLAND have decided it is definitely a good thing that cows don't fly. An informative letter from Capt. Jackson R. Tate tells why.

Encouraged by a superabundance of tranquillity caused by reduced aircraft operations, multitudes of feathery, warm-blooded sea gulls have found Terminal Island a dreamy, smog-covered paradise. After gaining control of the air, the screeching horde turned the runways into veritable parking lots.

The air station's pseudo-ornithologists easily spy (and dodge) the antics, private lives and loves of the sea gulls and many other feathered relations. Since the outset of winter the gulls have preferred placing their posteriors upon the warm concrete runways to floating them in the cold waters of the bay.

Like their cousins out at Midway, the gulls refused to observe the traffic patterns. For a time the gull fatality rate resulting from collisions involving aircraft threatened to surpass the high pedestrian scores chalked up by motorists in a nearby city.

Desperate corrective measures were needed. A rigid and mandatory course of instruction was augmented by fast scooter patrol. Success of this training is testified by the current negligible gull fatality rate.

The well-indoctrinated Terminal gull sees and complies with course changes more promptly than many of the local Dilberts. He now parks only upon the runway not in use.

These dear little aquatic members of the subfamily Larinae have worn out their welcome, however. Evidently resenting the rigid course of instruction, they have practiced long and hard on what seems to be their specialty. So accurate is their aim that station personnel consider carefully before gazing skyward.

Their uncanny precision under average California conditions of visibility (zero-zero) leads to the speculation that they may be outfitted with radar or a similar device. They might teach Mr. Norden a thing or two.

Gulls are quite impartial in their choice of targets, blasting seamen's hats and shiny brass visored caps indiscriminately and with impunity. It is obvious that they do know a head from their tails but they just don't seem to give a hoot.

Well, anyway, it's a good thing cows don't fly.

VR-4, MOFFETT FIELD—This squadron has found a good way to locate plane cargo in short time. The corners of the crates are painted different colors with a fast-drying lacquer put on by fountain brushes. Each delivery point has a color of its own and loaders always look for it.

TECHNICALLY SPEAKING

MOBILE LIFT IN COLLAPSED POSITION HAS 70-INCH MINIMUM HEIGHT

STRUCTURE FULLY EXTENDED REACHES MAXIMUM HEIGHT OF 94 INCHES

MOBILE LIFT DESIGNED TO HOIST GUIDED MISSILES

THE PROBLEM of arming airplanes, particularly high wing types such as the PB4Y-2, with pilotless aircraft or guided missiles has been solved by the design of a new piece of gear, the Mobile Lift, Aero X-1A. Weight of the pilotless aircraft and guided missiles prohibits or makes dangerous the use of present manual or electric hoisting equipment.

The Aero X-1A mobile lift has a maximum capacity of 2500 pounds at a maximum speed of 15 miles per hour. Basically it is an assembly of two existing pieces of handling equipment:

1. Bomb trailer, Mk 3 Mod 1, complete. (List of drawings—BuOrd Sketch No. 108649; General arrangement – BuOrd Drawing No. 375943; Service Manual—BuOrd for Mk 3 Mod 1 bomb trailer.)

2. Lift truck, Army M-22 with wheels, axles and drawbar removed. (General arrangement—Army Ordnance Drawing No. E-8503; War Department Technical Manual TM 9-762; War Department Standard Nomenclature List G-161.)

3. Lift mobile, Aero X-1A. (General arrangement—BuOrd Drawing No. 511461; List of drawings—BuOrd Sketch No. 132536.)

Additional structural details were added to the Mk 3 Mod 1 bomb trailer frame to act as a support for the modified M-22 lift truck and at the same time provide the additional height required to fulfill the purpose for which it was designed.

Pilotless aircraft or guided missiles placed on the mobile lift are raised or lowered hydraulically by two hand pumps located on the front end of the lift frame. Each pump is provided with its own hand-operated release valve.

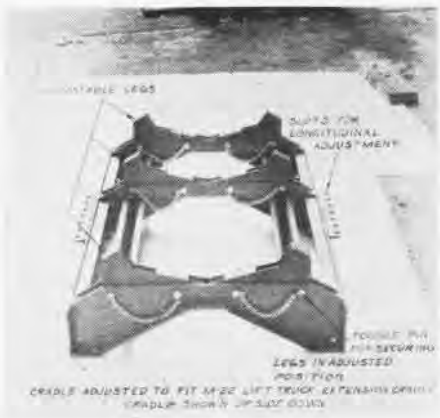
Operation of the forward pump handle raises the forward end of the cradle, while operation of the rear pump handle raises the rear end of the cradle. When either end of the cradle is raised from its collapsed height of 70 inches to its maximum height of 94 inches above the ground, the tilting angle is approximately 15 degrees. The maximum vertical travel of the cradle is 24 inches.

When the two hand pumps are used to raise the cradle, it is kept level by operating the pump handles in unison. The release valve on each pump permits lowering of the cradle to any desired height or angle within the range indicated above.

The upper portion of the mobile lift can be moved laterally a distance of eight inches (four inches to each side of the longitudinal center line) by using the handwheels and operating mechanism provided at each end of the lower structure.

When increased height is required, the standard M-22 truck extension cradle can be assembled on top of the mobile lift cradle.

The capacity load of 2500 pounds must be reduced to 2000 pounds when the ex-



CRADLE ADJUSTED TO FIT M-22 LIFT TRUCK EXTENSION CRADLE SHOWN UPSIDE DOWN

CRADLE ADJUSTED TO FIT M-22 LIFT TRUCK CRADLE CRADLE SHOWN UPSIDE DOWN

ADJUSTABLE CRADLE WITH PAD AND HOLDING DOWN STRAPS ASSEMBLED

TILTING ANGLE UP TO 15 DEGREES IS REACHED BY USE OF HAND PUMP

OVERALL HEIGHT OF 110 INCHES IS MAXIMUM WITH EXTENSION CRADLE

EXTENSION CRADLE RAISES COLLAPSED POSITION HEIGHT TO 86 INCHES

REAR VIEW OF MOBILE LIFT FOR PILOTLESS AIRCRAFT SHOWS CATWALK

tension cradle is used. (The extension cradle weighs 412 pounds.) When the extension cradle is installed, the minimum height above the ground will be 86 inches, and the maximum height will be 110 inches.

Following are weights of the various components of this equipment:

Trailer, Mk 3 Mod 1—1430 pounds; Lift truck, Army M-22 (without wheels, axles and drawbar)—1080 pounds; Additional structure—1398 pounds. Total weight of the mobile lift, Aero X-1A—3908 pounds. Capacity—2500 pounds at 15 miles per hour. With the addition of the M-22 truck extension—412 pounds, total weight of the mobile lift equipment is 4320 pounds, and capacity is 2000 pounds at 15 miles per hour.

Distribution of the mobile lift, Aero X-1A, has been determined as follows: three units to NAS ATLANTIC CITY, N. J., Squadron VP-HL-4; two units to Naval Aircraft Modification Unit, Johnsville, Pa.; three units to Naval Air Ordnance Test Station, Chincoteague, Va.; three units to Naval Air Missile Test Center, Point Mugu, Calif.; three units to NAS KANEOHE, Oahu, T. H., Squadron VP-HL-13; three units to Naval Ordnance Test Station, Inyokern, Calif.

No further distribution of the Aero X-1A mobile lift is contemplated at this time.

CONTROL SURFACES SUFFER FROM GUN BLAST

Parking Aircraft Too Close to a Carrier's Turrets Leads to Damage

DOES YOUR carrier fighter plane fly as though it did not have a port elevator? Or does your TBM take a lot of elevator to fly level? Maybe you can blame it—not on the plane captain or the hangar deck crew—but on your carrier's five-inch batteries.

Sound far fetched? BUAER has reissued a Technical Order, No. 13-47, explaining how the blast effect of 5" antiaircraft guns on a carrier may have a bad effect on control surfaces. About 144 elevator failures and several unexplained crashes of *Avengers* over a period of years during the war pointed the finger of suspicion at the batteries.

BLAST DAMAGE LEAD TO THIS BAD CONDITION

Known failures of the elevators consisted of cracking of the ribs near the trailing edge. Other failures were disintegration of the elevator outboard of the tab and aft of the elevator hinge line.

Probable cause of some of these failures was attributed to spotting the planes on the flight deck within range of the 5" guns' blast. This effect from 5" 38's is considered bad on the fabric-covered controls if the plane is within a 75-foot circle located 35' out on the gun axis measured from the gun breech. In the case of 5" 54 guns, the center of the danger circle is on the line 42' from the breech.

If planes have to be spotted inside the circle while firing is going on, the surfaces should be inspected afterward, especially in the area adjacent to the trailing edges. If any distortion is spotted, the fabric should be removed for further inspection.

NEW METHOD IN AIRBORNE MESSAGE PICK-UP

VMO-6—A highly satisfactory means of message pick-up from the ground by observation aircraft in flight has been developed by Marine Observation Squadron Six.

The old system of trailing a weight or "fish" from a line lowered from the plane, commonly called "fishing," was felt to be unsatisfactory for several reasons. The line invariably snarls when pulled in after the pick-up has been accomplished. It is necessary to use an extremely heavy weight to prevent excessive trailing in the apparent wind. A satisfactory point for attaching the line to the plane is not available, and it is extremely dangerous to hold the line in the hands. Although the use of a reel would eliminate snarling, the small size of the cockpit and lack of satisfactory attaching points make the reel impracticable.

The device finally evolved after experimentation is pictured in the accompanying drawing. It consists of a mild steel rod of ¼ inch round stock, 6½ feet long.

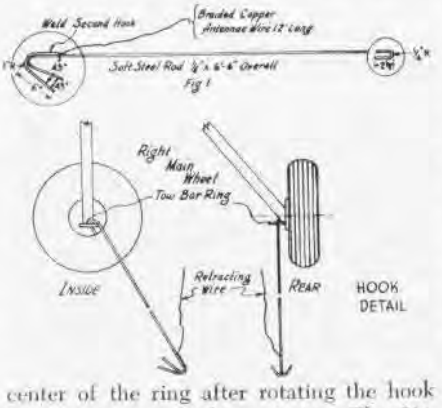
Grapple end of hook. One end of the rod is bent to form a hook (*see drawing*) and a supplementary hook is welded on top of the bend to form a grapple effect. Welding on top of the bend prevents the message line from fouling on the weld.

Attaching end of hook. The end of the rod to be attached to the plane is bent with a small enough radius of bend to allow the entire attaching end of the rod to be pushed through the tow bar attaching ring on the right main landing gear. Thus, when the bend is pushed through the ring and pulled back, the rod is attached firmly, but may swivel up and down in a vertical plane.

Retraction of hook. A length of flexible, braided copper antenna wire is attached to the rod near the message grapple end, and secured to the main cross-brace behind the pilot's seat. This permits lifting the device up from a trailing position for removal of messages, or disengagement of the attaching hook from the ring on the right landing gear. Flexible, braided wire was chosen for its non-tangling properties.

Technique of use. The hook is stowed inside the plane as standard equipment, attaching end forward. When the observer wants to pick up a message, he opens his right hand door, pulls the hook forward and out of the plane. The pilot puts the plane in a nose high attitude at approximately 60 mph, thus reducing the apparent wind in velocity, and causing it to blow more directly toward the end of the hook, as the observer pushes it down to the ring in the right landing gear and attaches it. Test flights proved that completely inexperienced personnel averaged five seconds on their first try at attaching the hook while in flight, and the apparent wind caused no difficulties at all.

Detachment is easier yet, consisting merely of pushing forward until the attaching hook is free of the ring and then drawing the whole thing back through the



center of the ring after rotating the hook 90° to prevent catching again. The 6½ foot length brings the grapple end of the device even with the observer when it is retracted to remove messages. By its own weight the device will trail at an angle of approximately 60° at 70 mph, giving about 5½ feet below the wheels to the grapple hooks.

The soft steel hooks bent on the rod will straighten out easily if they strike any object, thus eliminating any danger of damage to landing gear or plane in case the grapple hooks should snag some solid object. The hooks straightened out upon striking a light pine pole ¾" x 1½" being used to support the message pick-up line.

Advantages of device. This readily available, easy to operate method of picking up messages prevents tangling of lines. It is away from center line of aircraft and prevents lines fouling tail wheels. The pilot can sight on the wheel, thus aiding him in lining up on center of message pick-up poles, and also in judging his depth perception as to how high or low to pass over poles. There is no danger of injuries from snapped lines flying back into cockpit. The device eliminates bulky reels or other snarl preventing devices.

Since the final development three pilots have made twenty successive pick-ups each with no misses yet, and all pilots are enthusiastic about the method.

The device was developed jointly by the Commanding Officer and the Engineering Officer of VMO-6, with all pilots contributing valuable suggestions.

Crash Gear Proves Its Worth

NAS Alameda—A second instance showing the effectiveness of high-speed crash equipment occurred when another F8F-1 ground looped and overturned at this station. The plane landed on its back in the sand with the pilot trapped in the cockpit.

HIGH SPEED CRANE DOES SPEEDY RESCUE WORK

The rapid transit "personnel carrier" with its specially designed crane (see NA-News, Sept., page 28) went into action immediately. Because the crane is mounted on the front of the vehicle, the driver was able to come directly to the tail of the plane. His assistant placed the sling around the fuselage just forward of the empennage. At the instant the sling was rigged, the driver hoisted the plane while his assistant moved the pilot clear. The trapped pilot was extricated from the cockpit just four minutes after the alarm was sounded, which was less time than it took the regulation salvage equipment to arrive at the scene of the accident. The maneuverability of the high-speed equipment was responsible for the immediate rescue.

To analyze the relative merits of the crash vehicle modified by NAS Alameda and the GarWood and Bay City cranes, a simulated crash was performed in which all three vehicles were timed. The distance to the scene of the simulated crash was approximately 3470 feet. The crash equipment modified by the station arrived first. The GarWood equipment arrived 20 seconds later, and the Bay City crane one minute later. This run was on a hard-surface runway, and if a crash were considerably off the runway it is doubtful if the Bay City crane, because of its weight, would be able to proceed over the loose sand. The GarWood crane would have similar difficulty and certainly would bog down before the personnel carrier.

The advantage of having a vehicle with the crane mounted on the forward part of the truck lets the driver bring it into position without any maneuvering. Any vehicle required to stop and back in sand is liable to become bogged down for a long enough period to make it ineffectual as crash equipment.

➤ ***BuAer Comment*—The advantages of speed and maneuverability in a crash rescue vehicle are obvious, and therefore the modified personnel carrier is a welcome addition to the heavier but slower specialized lifting equipment already provided by BuAer.**

However, the new unit is primarily a first-aid emergency appliance for use on light planes and should be used to supplement rather than replace existing equipment.

✧

NAS Patuxent River—A torpedo dive bomber took off from here recently on a routine test flight. During the flight it was forced to make an emergency water landing. A VR-3 training flight took off immediately after hearing of the emergency and was first to find the ditched pilot. The VR-3 plane radioed the position and other related information to the Patuxent tower. A PBY in the area landed and picked up the pilot (uninjured), while the NATS aircraft was standing by.

NAS QUONSET INSTALLS REFINEMENT OF G.C.A.

THE HEIGHT FINDER ANTENNA IS MOUNTED ON A 67-FT. TOWER TO ELIMINATE GROUND CLUTTER

Search and Height Finding Antennas are New Features of Station's Radar System

CONSTRUCTION on the Navy's latest refinement in all weather landing system has been completed, and the new Ground Controlled Approach traffic system at NAS QUONSET POINT is in for operation.

The new radar system, first of its type installed anywhere, is operated from the airport control tower and combines the advantages of already proved Navy-Bendix GCA plus two new devices which will instantly identify aircraft in the approach pattern and determine the altitude of each plane.

Search and height finding antennas have been raised on 67-ft. steel towers in order to help eliminate "ground clutter" caused by nearby obstacles. Radar circuits have been improved and operators will be allowed precise visual presentations of the 30-mile sky-space around the airfield. In addition, fewer controllers will be required.

The biggest of all advantages, however, will be the centralization of all these instrument weather radar devices in the airport control tower. All information received by these instruments is fed to a control room located directly beneath the visual control tower, thus eliminating the need for separate crews for instrument weather and normal contact tower operations. In contrast to sets now in use, the mobile GCA trailer unit employed for precision instrument landings requires no operators and may be "plugged in" to service any runway.

One of the two new devices to be employed is a separate very high frequency identification indicator which flashes on a compass rose the bearing of any plane communicating with the tower on voice radio. This beam marks the plane's exact position in relation to the airport, thus eliminating any confusion as to the identity of planes in the vicinity (as they appear on the radar screen).

THE PRECISION AZIMUTH & ELEVATION SCOPES

THE SEARCH SCOPE AND HEIGHT FINDER SCOPE

Second of the new devices is a radar height-finding antenna, indications of which appear on a scope adjacent to the all round control scope. The zone air controller can point the antenna in any direction and immediately determine the altitude of the plane appearing on the height finding grid.

The long delays prevalent now during bad weather when planes are "stacked" at different altitudes and wait their turn to land will be largely eliminated by this new GCA system. Clearer presentation and improved equipment will permit accurate radar surveillance and tower control of several planes at the same time.

PLANES will be orbited about the field and fed into the landing path at a rapid rate so that the transition from the airways to the ground will be accomplished smoothly and with little delay. For a high rate of instrument landings, special techniques will be set up, and NAS QUONSET POINT will be the scene of many tests. These tests will be coordinated with the work of the United States Navy Air Navigation Electronics Project, NAAS CHARLESTOWN, R. I.

GCA TRAILER UNIT REQUIRES NO OPERATORS

Still newer refinements are being planned for each Navy installation of Ground Controlled Approach. Investigation into improved GCA equipments will be given a high priority on the research list and fixed installation development will provide superior performance, greater economy of maintenance and require fewer personnel, resulting in greater overall economy than is possible by using obsolete mobile equipment of wartime design and manufacture.

Of the 27 Navy GCA stations planned for use in the United States, 24 are now in full operation. The Navy also has stations operating abroad. The final objective is the development of an airport traffic control system for use at naval air stations throughout the world that will permit the operation of aircraft under all conditions of the weather and visibility.

New Medicine, Old Complaint

NAAS CABANISS FIELD—In recent months Basic Training Squadron VT-2C, flying SNJ-type aircraft from here, has been concerned with the old problem of preventing wheels-up landings during night flying operations.

Experience has shown that a pilot making a night landing looks farther ahead than when making a day landing. Hence, he often does not see a red Very's star fired from the runway duty officer's position on the landing end of the duty runway. Previously the usual landing gear-spotter and runway duty officer equipped with Very's pistols have been utilized to prevent this type of mishap. Since this

SAFETY OFFICER CUTS NIGHT FLYING HAZARDS

equipment did not prove 100 per cent effective as a preventive measure, an additional means of waving planes off during night flying operations was developed by the squadron safety officer.

The new equipment consists of 330 ft. of No. 18 gauge wire connected at one end with a 24-volt SNJ-type aircraft battery and at the other with two Mark III Very's pistols mounted on a portable wooden frame to fire at an angle of 80° from the horizontal. Included in this wooden frame is a red-lensed Aldis lamp mounted to shine directly toward landing aircraft as an additional means of warning to the pilot.

Very's pistols are fired by a 12-volt solenoid energized by the battery. Voltage line droppage which amounts to 12 volts makes it necessary to use a 24-volt battery to energize the 12-volt solenoid after passing through the 330 ft. of wire. A trigger and bomb depress switch similar to that found on F6F type aircraft has been employed to close the circuits on both guns and Aldis lamp. This gives two separate circuits and either gun may be fired depressing the control switch for that gun and lamp. Both guns and Aldis lamp may be used by simultaneously closing both switches. This equipment is laid out with the trigger and battery at the end of the runway with the runway duty officer and the Very's pistols and Aldis lamp 330 ft. up wind on the landing course.

In the event it becomes necessary for the runway duty officer to give an incoming plane a wave-off, it provides two additional flares and a red warning light well down the landing runway and in such a position as to minimize the possibility of its being overlooked, as has happened occasionally with the conventional wave-off system.

➤ ***BuAer Comment*—This appears to be a clever solution to a chronic difficulty in night landings.**

HYDRAULIC TEST EQUIPMENT SPEEDS CHECKING

Landing Gear Check Aided

NAS JACKSONVILLE—Equipment developed at this station by a civilian employee permits safe and convenient operation and checking of landing gears and doors without waiting for the hydraulic plumbing in the cockpit to be completed.

The method involves the use of a selector valve and relief valve that are plugged into the landing gear up and down lines. These valves cut off the rest of the hydraulic system allowing installation of the hydraulic plumbing to continue uninterrupted while landing gear and doors are operated for checking purposes.

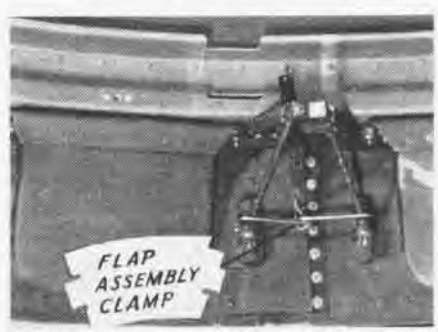
The addition of a pressure gage to the test equipment enables the inspector to check the pressure throughout the test.

[DESIGNED BY WILLIAM E. RIDGEWAY]

Clamp Protects Flap Assembly

NAS SAN DIEGO—This station has developed a clamp to prevent damage to the SB2C-1 cowl flap slide during transportation and storage.

The clamp snaps easily in place across the lever assembly and locks the flap assembly in closed position. Previously the



SIMPLE CLAMP HOLDS SB2C'S FLAP ASSEMBLY

flap slide was being damaged because the flaps opened so far as to allow the slide to become disengaged from its track.

When this occurred and the flaps were closed, the slide overlapped the flap and was split. Replacement of the micarta slide then was required. The clamp can be removed easily to clean or to permit work on the cowl flap assemblies.

Winter Flight Gear Okayed

To evaluate new lightweight aeronautical winter flight gear, approximately 90 suits comprising shirt, trousers, jacket, coverall and detachable parka hood were issued to Task Force 68 on Antarctic Operation *High Jump*.

A report from the BUSANDA official observer, which supplemented previous reports from BUAER personnel, commented favorably upon the insulation, wind-proofness, water-proofness and light weight of these garments. Generally, the trousers, jacket and hood were worn over standard underwear (not woolen), summer flying suits or dungaree trousers and chambray shirts, wool shirts and sweater. Coveralls were seldom worn except by personnel exposed or in afterstation of the PBM during flights when temperatures of minus 5° F were common.

(Personnel who handled and wore the

BUSANDA REPORTS FAVORABLY ON WINTER GEAR

new BUAER clothing generally favored it over the Navy standard winter clothing and over the standard leather winter flight gear.) The report stated that BUAER trousers and jackets were considered 25 per cent warmer than the highly-efficient N-1 Navy standard clothing items and 30 per cent lighter in weight. Officers, look-outs, flight crews and exposed personnel wore both types of assemblies.

In view of the many favorable comments in connection with desirable qualities of warmth, lightness of weight, wind-proofness, water-proofness and quality of material, it was strongly recommended that the design of the BUAER garments be investigated for possible application to the Navy standard cold-weather clothing.

The Commander of one task group was wearing a coverall suit when the helicopter in which he was a passenger fell into the Antarctic Ocean. Only his ankles and arms were slightly wet after approximately five minutes immersion, and only slight cold was noted by him after exposure in a water temperature of 30° F.

✧

NATS, ATLANTIC—Ferry Squadron Two found a good way to dispose of used engine oil. A droppable fuel tank on a Mk II bomb trailer is wheeled under an engine being overhauled and the oil drained into the filler opening. The fuel strainer permits visual check of the oil's condition. The full tank is emptied by opening the drain plug at the bottom. The idea came from Chiefs J. J. Vitco and D. E. Smith.

SERVICE Test
INTERIM REPORT DIGEST

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

SC-2 (257 Hours)

Alternate Air Door Motor. Dust shield for jack screw broke at gear case after 34.9 hours operating time. Installation is a contractor's modification to correct previous trouble.

After 257 hours test time, alternate air door stuck midway between alternate air position and direct air position. Total travel of door was one inch when attempting to move door to either position with cockpit control switch. Foam rubber air seal had torn and jammed door. Increased effort required to operate doors caused limit switches to close prematurely. Limit switches of motor are actuated by tension or compression of screw jack shaft. *Recommend* that positive mechanical limit switches be employed and that molded gasket be replaced by foam rubber gasket.

Exhaust Riser. After 198 hours flying time, exhaust riser cracked circumferentially approximately five inches from flange. This is first failure of modified exhaust system.

Propeller Governor. Propeller hunted from 200 rpm below to 100 rpm above the selected rpm. Governor was removed, and relief valve, Curtiss P/N 104709, was found scored, resulting in reduced oil pressure and sluggish operation.

FD-1 (13 Hours)

J30-P-20A Turbo-Jet Engines. Failures of both engines, Nos. P-400004 and P-400005, production models of Westinghouse B19-X2B manufactured by Pratt & Whitney, were disclosed when engines could not be turned over on attempting to start them for a morning flight. Last flight on previous day was for 95 minutes, during which the left engine, P-400004, was operated singly for 20 minutes and had one air start, and the right engine, P-400005, was operated singly for ten minutes with no air starts. Engine P-400004 has total operating time of 29 hours and 45 minutes, and engine P-400005 has total of 38 hours and 45 minutes.

Disassembly of the right engine showed that the babbitt bearing oil seal rings, RH P/N 14G-145-1 and P/N 14G-754-2 and LH P/N 14G-145-2 and P/N 14G-753-1, of the No. 3 bearing had melted and had blocked the oil scavenging outlet. The steel backed babbitt lined bearing inserts were found to be scuffed. All other parts, including turbine shaft, appear in excellent condition.

Left engine showed same failure of No. 3 bearing as described above. Rear bearing oil seal apparently failed first and permitted lubricating oil to escape into combustor and be burned, as evidence of oil smudge was prevalent.

Engine failures were result of inadvertently conducting single engine operation with engine selector valve turned to the "Both On" position. With this valve in "Both On" position and one throttle closed, enough fuel will pass through the dump valve to maintain a slow fire in combustor.

Operation of dump valve during single engine operation is as follows: When throttle is closed the dump valve operating pressure ceases to be a function of the governor pump pressure and becomes a function of the aircraft fuel booster pump. This pressure, about 15 psi, is maintained above the piston valve in the dump valve. Pressure below piston valve becomes the spring force alone, about 5 psi. When operator shuts off engine selector valve and therefore shuts off all fuel flow to the engine, the 15 psi above the piston valve becomes zero; the 5 psi valve spring below the piston valve forces the valve from its seat in the dump outlet and the fuel in the fuel manifold is then jettisoned due to gravity plus residual air pressure in the combustor.

When engine selector valve is left in "Both On" position during single engine operation, the 15 psi fuel pressure from the aircraft fuel booster pump is maintained on the top of the piston valve in the dump valve of the dead engine, and the valve will remain closed. This fuel will slowly pass around the spiral groove on the valve piston, which is provided for lubrication purposes, and enter the fuel manifold in sufficient quantity to maintain a slow fire in the combustor.

A ground test made to determine amount of fuel entering the combustor during the above condition showed ½ gallon of gasoline pumped out of disconnected fuel line on left engine while right engine operated at idle speed for 10 minutes.

It is not known if this amount of fuel into the combustor is increased during flight, but single engine operation with the engine selector valve in "Both On" position, air duct closed, and throttle closed, has produced an increase in engine tail pipe temperature on the secured engine. This indicates a slow burning fire can occur in combustor after the engine is otherwise properly cooled and shut down.

Damaged bearings will be replaced at Service Test and tests will continue.

J30-P-20A Turbo-jet engine No. P-400008 failed after 38 hours, nineteen minutes of test time at 31,000 feet during routine flight. Pilot's first indication of ensuing engine failure was slight loss in rpm, accompanying decrease in turbine out-let temperature, and a slight vibration. Engine was immediately shut down, and airplane was operated only on the other engine during remainder of flight.

Investigation showed all the turbine blades to be burned off at the mid-section equally around the periphery of the turbine rotor. Although cause of failure has not been determined, it is believed that previous improper single engine operation, similar to that in failures of engines Nos. P-400004 and P-400005 may have been a contributing factor.

Inboard Flap Assembly. After 13.92 hours flight time in BuNo. 111754 and 8.44 hours in BuNo. 111758, 90 percent of the flush rivets in the trailing edge of the inboard flaps, P/N R-82-MCD-4-18006, were found to be loosened. Modified brazier rivets, AN 45AD4-2, were inserted at equal intervals between original rivets with the rivet heads on the lower side of the flap skin. Upper flap skin was countersunk .015" to permit a tight flap fit. *Recommend* that trailing edge of inboard flaps be spot welded in accordance with procedure used on outboard flaps.

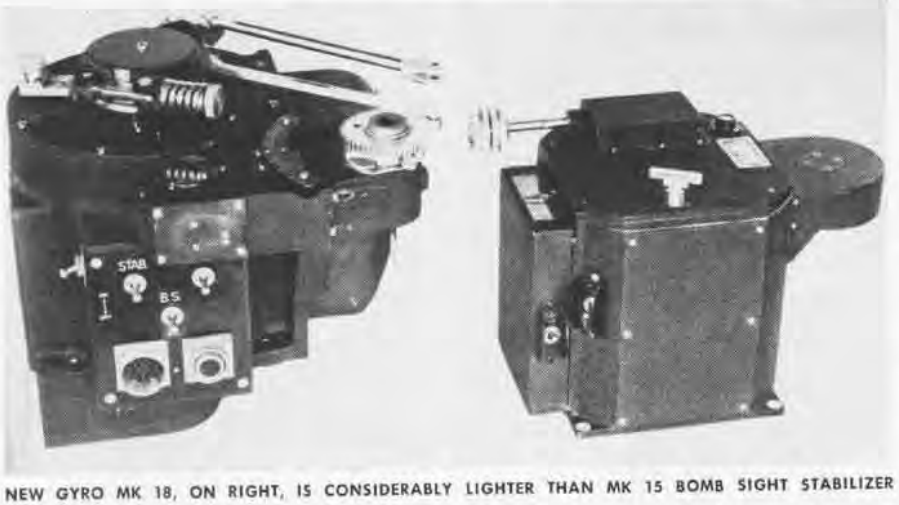
Engine Air Duct Connector. The flexible connector between the butterfly valve assembly and the intermediate duct is fabricated from rubber or a rubber composition. This connector is clamped to after end of of butterfly valve assembly and forward end of intermediate duct assembly with two clamps. During engine operation, the high pressures distort the rubber connector, resulting in the formation of a pocket ½ to ¾ of an inch in depth that disturbs the airflow through the duct.

Oil Pressure Line. Two failures of the oil pressure line, P/N AMS4070, from oil pump to filter have occurred in flight, resulting in complete loss of lubricating oil pressure. In each case damage to engine was avoided by immediate shut down. Due to the short length and necessary bends in the tubing, stress is imposed during normal engine operation. No vibration was noticed at time of failure. First failure occurred at 27 hours, 35 minutes engine time during ferry flight. Second failure occurred at 28 hours, 5 minutes engine time. Tubing was replaced on both right and left engines with AN-H-6A-8 flexible medium pressure hose.

NATS PACIFIC—Usually NATS pilots are on the warpath for bugs. VR-8 recently flew 17 pounds of live beetles from Hawaii to Guam. This time it was a shipment from the Fiji Islands, donated by the British Department of Agriculture to combat banana root borers which are attacking the banana plants on Guam.

AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE



NEW GYRO MK 18, ON RIGHT, IS CONSIDERABLY LIGHTER THAN MK 15 BOMB SIGHT STABILIZER

Modification of 20 mm. Spring Drive

It is considered necessary for safety of personnel that drive spring guide caps be installed on 20mm. M3 guns employed in aircraft turrets. The purpose of the cap is to prevent the drive spring plunger from being forcibly ejected through the hole in the drive spring guide in the event of breakage of the drive spring plunger.

Internal threads cut in the wall of the cap of size to conform to external threads cut on the extension of the drive spring guide head provide a means of attaching the cap to the drive spring guide head. A lock washer is provided to prevent the cap from unscrewing from the drive spring guide head. Modification of the drive spring guide head and manufacturing details of the cap are shown on Bureau of Ordnance Sketch Number 1425835.

A project has been initiated at the Naval Gun Factory for the manufacture of drive spring guide caps and the modification of the drive spring guide heads in sufficient quantity for installation on all 20mm. M3 guns installed in aircraft turrets. In addition, spare caps and modified drive spring guide heads will be allowed to service activities under the appropriate turret installation on NAVORD List 20870 and subsequent revisions.

Patrol Planes to Have Mk 18 Gyro

The accompanying figure illustrates the relative size of the gyro, Mk 18 Mod O in comparison with its predecessor, the bombsight stabilizer, Mk 15. Whereas the bombsight stabilizer weighed 42 pounds,, the new gyro, Mk 18, will weigh only 20.5 pounds and will be able to perform any of the functions of the stabilizer except permit the use of the bombsight, Mk 15. In addition, when used with the AN/APA-5A auxiliary bombing radar, the bombsight mount, Mk 2 Mod 1 is not required.

The gyro establishes a stabilized axis in azimuth and can be used with either or both of the following equipments now authorized for installation in VP aircraft:

a. AN/APA-5A auxiliary bombing Radar

b. Stabilized bombing approach equipment, Mk 2 Mod 1 (Minneapolis-Honeywell C-1 Auto Pilot)

In addition, it has many other possible applications where azimuth stabilization is required.

As the nomenclature indicates, the equipment is a gyroscope. It acts as a stabilizer only after attaching some other unit such as the stabilized bombing approach equipment, Mk 2, sector box or the AN/APA-5A selsyn.

It is expected that the gyro, Mk 18 Mod O, will be put on production VP and ASW aircraft beginning with the twenty-third P2V-2 aircraft and on all PBM-5A aircraft. It is not planned to install these gyros retroactively in existing aircraft.

Line maintenance of this equipment will consist of oiling the bearings, removing dust, renewing commutator brushes, replacing lamp bulbs, and testing. Specific instructions covering the above and in addition the operation and installation of this equipment will be contained in NavOrd OP 1669 which is expected to be distributed to all VP Squadrons and FASRONS by 15 December.

Parts and supplies required for line maintenance will be listed in NavOrd list 20870, Revision F. In general they consist of a line maintenance set, stock number J942-S-2750, and a recoiling set, J942-R-471-450. Both are available in the aviation ordnance supply system. Spare replacement gyros will be allowed one per squadron and will be available under stock number J942-G-1660.

WRENCH CAN BE USEFUL IN TIGHT QUARTERS

Chief Designs Gun Wrench

NAS JACKSONVILLE—The leading ordnance chief of VA ATU No. 4 designed a new-type wrench to facilitate rapid installation or removal of the Edgewater adapters on SB2C 20 mm M1, M2 guns.

This wrench is a spanner made of ½" boiler plate with a span of 3⅞" in diameter and is tapped to fit a standard ½" drive ratchet.

Because of limited working space around the 20 mm. gun mounts in the SB2C, the ordnancemen in the unit found this spanner useful.

[DEVELOPED BY E. H. MCMAHAN, ACOM]

Corpus Equips Photo Planes

NAS CORPUS CHRISTI—The A&R Department recently completed the modification of eight PB4Y-1P aircraft well ahead of the BUAER schedule. Primary objective was the installation of equipment to prevent fogging of camera lenses after descent from cold to warmer air.

All anti-icing equipment and cabin heating equipment, previously removed, was re-installed. Locally designed and manufactured heater ducting was installed to convey heat to the lenses of four cameras through perforated ring ducts mounted on the camera cones.

The airplane was completely equipped for installation of trimetrogon cameras. An electric light warning system was installed to prevent damage to the trimetrogon camera cradle in closing the bomb-bay doors. All BUAER changes and bulletins were incorporated including ditching equipment for the crew. No fogging of camera lenses was detected.

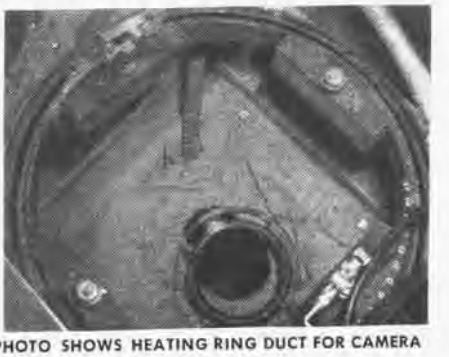
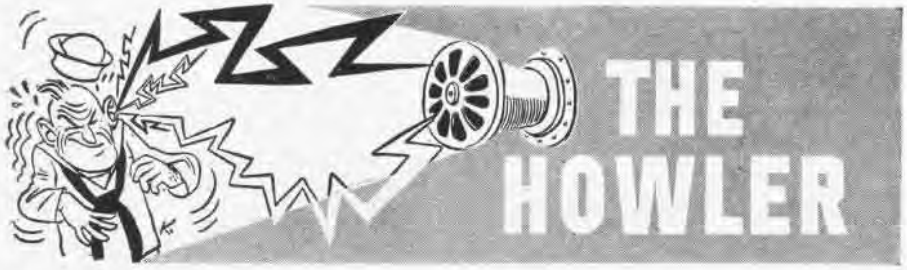


PHOTO SHOWS HEATING RING DUCT FOR CAMERA



Check CO2 Bottles. What good's an emergency system if it fails in the emergency? If something goes wrong with the hydraulic system regularly operating a plane's landing gear, the pilot has been taught to use the carbon dioxide bottle, and he has a right to expect it to function in the emergency. Too often he's finding that nothing happens. That is, nothing to get the landing gear down; plenty happens after that.

Three recent crash landings might have been prevented if proper maintenance had kept the CO2 bottles in operating condition. Instead, the bottles were partly empty.

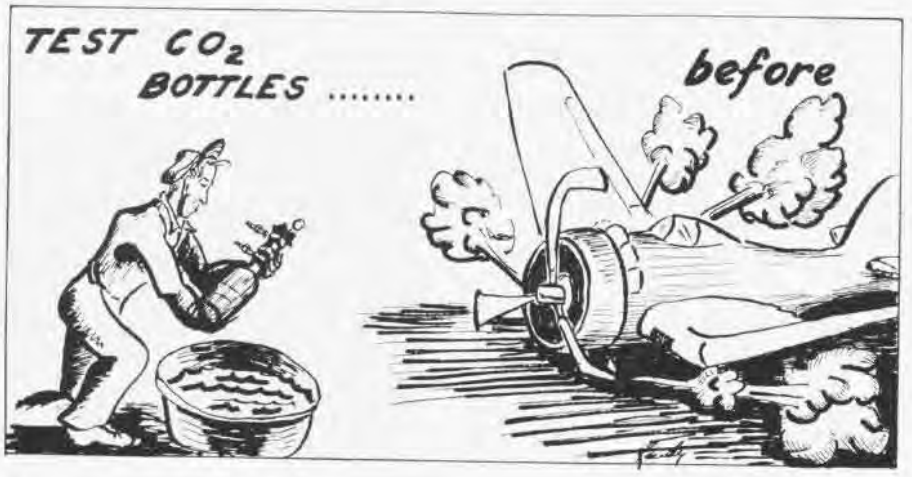
After one F4U crash landing, the activity involved checked all bottles, filled them, and tagged them with the date of the check. When a second similar accident occurred, it was found that several of the previously weighed and checked bottles again were only partially full. In addition, during the second accident, when the CO2 was activated a portion of it blew back through the cutter valve assembly (P/N 25865 Walter Kidde Co.) rather than through the CO2 system.

This activity found the following two sources of CO2 system failures: *1.* Because of faulty or worn seals the CO2 was leaking from the bottles. *2.* Because of worn, insufficient, or dried out packing in some of the cutter valve assemblies the CO2 would flow back through the cutter handle. All CO2 bottles were weighed and refilled. In addition to visual check of the seals, the bottles were immersed in water for five minutes and leaking seals replaced. All cutter valve assemblies were pressure checked, and 52% required new packing.

A second activity, experiencing similar trouble resulting in an PG-1-D crash landing, tested the CO2 bottle and valve and found the diaphragm or seat leaking. The bottle was recharged and resealed twice for water testing. In the first test leaks were found around the stem (*see 1 in photo*), at the attaching fitting to the landing gear system (*2*), and at the parting surface of the bonnet valve assembly (*3*). In the second test there was leakage at the attaching fitting to the landing gear system.

POINTS OF LEAKAGE ON THIS TYPE CO2 BOTTLE

BuAer recommends that all CO2 bottles be submerged in water after each recharging operation to check for possible leakage. Thorough inspection of the bottle and its connections should be made at each 30-hour check of aircraft. *A small leak undiscovered may cost lives. Check those bottles!*



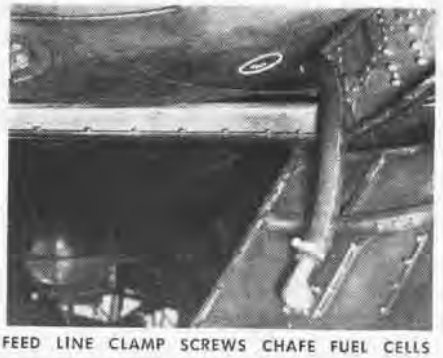
Oil Separator Installation. Loss of engine oil through the crankshaft breather tube on an R50-5 aircraft (R-1820-40C engine) was traced to faulty installation of the oil separator (Pesco type B-3, manufacturer's P/N 218-F).

Comment by BuAer on the RUDM points out that the oil outlet connection on the Pesco oil separator, model 218-F, is a removable ½ inch hose nipple with a No. 52 drilled restriction protected by a perforated disc strainer. It appears that this special nipple fitting was replaced inadvertently with a standard nipple fitting, resulting in low efficiency of the vacuum pump and loss of engine oil.

Fuel Line Clamps. A squadron RUDM states that on three F8F-1B aircraft the clamp, P/N AN-748-56-58-66, at elbow installation, fuselage droppable tank feed line, P/N 55361, was found with the turn screw on top. As a result the clamp screw chafed against the internal fuel cell. (*See photo*)

These aircraft had F8F service change No. 24 installed at A&R NAS Norfolk. It is the opinion of the operating activity that the clamps were improperly reinstalled upon completion of this modification. All aircraft which have undergone this modification at A&R NAS Norfolk should be visually inspected for similar discrepancies.

F8F Aircraft Bulletin No. 36 is being issued covering this situation.


FEED LINE CLAMP SCREWS CHAFE FUEL CELLS

F7F Hydraulic Leak. Night Composite Squadron One reports development of a severe hydraulic leak on an F7F-3N while taxiing to the parking line after a routine flight.

Investigation showed failure of the port engine hydraulic pressure line, P/N AN-39303-602, and the port engine vapor vent line, P/N AN-856-4-14, because of chafing of the hydraulic line against the carburetor end fitting of the vapor vent line. The cuff of the vapor vent line had worn clear through the hydraulic pressure line, and the vapor vent line itself had been severed. Further checking of four similar installations showed chafing which had progressed far enough to make three of the aircraft unsafe for flight.

Activities operating F7F aircraft should inspect these lines to guard against chafing, pending receipt of the contractor's recommendations for remedial action.

THINGS WERE HOT WHEN THIS BEARING MELTED

Plug Loose—Plane Crashes. Snowballing effects of a little careless maintenance on an F8F-1 (P&W R-28—34W engine) sound like a modern version of the old missing-horseshoe-nail story. This one runs the gamut from an oil drain plug not being tightened and safety-wired to the resultant crash of the plane. Here's the box score on the engine!

Failure to tighten and safety the rear section scavenge oil screen drain plug after check resulted in loss of the drain plug and finger strainer with consequent draining of the lubrication system in flight.

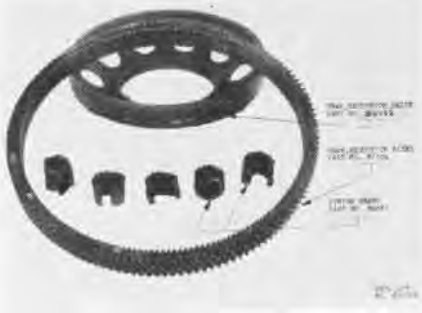
The crankshaft oil transfer bearing, P/N 58128, failed. Silver from this bearing melted and ran out through the torque indicator booster pump oil transfer pipe, P/N 58127, solidifying at the lower end. (*See photo.*) The reduction driving gear hub, P/N 81456, was severely scored.

Front assembly drive support, P/N 78529, was scored because of failure of front secondary counterbalance bearing, P/N 84289, and scoring of front secondary counterbalance, P/N 96778. Governor drive housing on front assembly drive support was broken.

Front master rod bearing, P/N 84752, was burned out and front master rod, P/N 80245, was damaged. Rear master rod bearing was slightly scored.

Gear teeth on outside diameter of the reduction drive gear, P/N 82332, and the inside diameter of the reduction fixed gear, P/N 82334, were stripped, and the reduction gear pinions, P/N 84685, were stripped and broken. (*See photo.*) The reduction fixed gear support, P/N 73964, was warped.

An R-2800 engine is an intricate, efficient, and expensive power plant, but it can't protect itself against a careless mech. Until Buck Rogers produces an aircraft engine that can yell when something is wrong—an unsaftied oil drain plug, for instance—the mechs still carry the ball.



GEARS TOOK BEATING AFTER MECH NEGLIGENCE

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All-Weather Approach Lighting. *Aero Digest*, Vol. 55, No. 2, August 1947, pp. 60, 128, illus.

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Notes on Atomic Energy. William S. Parsons, Rear Adm., USN. *Air Affairs*, Vol. 1, No. 4, Summer, 1947, pp. 475-483.

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How to Take Flying Pictures. Hans Groenhoff. *Air Facts*, Vol. 10, No. 8, August 1947, pp. 26-32, illus.

The Safe Flight Indicator. Leighton Collins. *Air Facts*, Vol. 10, No. 8, August 1947, pp. 49-55, illus. Stall warning device.

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AAF Begins Tests with Bell XS-1. *Aviation Week*, Vol. 47, No. 7, August 18, 1947, p. 12.

Defensive Air Patrols Urged by Gen. Kenney for U. S. Frontiers. Alexander McSurely. *Aviation Week*, Vol. 47, No. 7, August 18, 1947, p. 15.

Design Changes in J-33 Turbojet. John Foster, Jr. *Aviation Week*, Vol. 47, No. 7, August 18, 1947, pp. 21, 22, illus.

Turbojet "Yardsticks" Checked in Flying Lab Tests. W. O. Meckley. *Aviation Week*, Vol. 47, No. 7, August 18, 1947, pp. 26, 29, illus.

CAA to Continue Fight for ILS Omni-Range Airways. *Aviation Week*, Vol. 47, No. 7, August 18, 1947, p. 47.

Runt Racers. Gaither Littrell. *Flying*, Vol. 41, No. 3, Sept. 1947, pp. 32, 33, 95, 96, illus. Smallest man-carrying planes compete at Cleveland.

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The Second Ten. Gen. H. H. Arnold. *Skyways*, Vol. 6, No. 9, Sept. 1947, pp. 24, 25, 49, 52, 55, 61, illus. Airmen holding pilots' licences 11 to 21 were colorful group.

Pylon Pilots. Al Bachmann. *Skyways*, Vol. 6, No. 9, Sept. 1947, pp. 33-39, 58, illus. Past years' participants in National Air Races.

Designs Aircraft Whistle

NAS Whiting Field—A warning whistle for aircraft in distress is in the advanced stages of development by a chief parachute rigger of the maintenance department. The whistle is so designed that it can be actuated at the discretion of the pilot and is operated by the passage of free air through an externally located device.

It is designed to alert personnel on the ground, thereby serving to warn them of an aircraft about to crash, effect an emergency landing, or of an aircraft that has been abandoned or is out of control. Its tone will be easily distinguishable from that of any existing distress signals such as fire or crash sirens.

VP-MS2 San Diego—Want to see the world? Join this *Mariner* squadron. In eight months it furnished ferry crews for 12 flights to Saipan, 18 to Norfolk, 16 from Norfolk to San Diego, 18 to Seattle, and one each to Alameda and Panama.

AVIATION PROGRESS

(The following are excerpts from July Progress reports prepared by BuAer, indicating developments made during June.)

Armament Division

Bomb Shackle Release—The plunger release portion of the Aero X4A design mechanism has successfully released 50 lb. spring-loaded plunger. The transfer switch has been improved and meets all requirements.

Manual Hydraulic Release—Reworked prototypes of the two self-controlled emergency manual hydraulic release units for bomb racks and shackles are being constructed. Two prototypes were made by Harvey Co., of Los Angeles. Preliminary tests showed line pressure insufficient to operate satisfactorily.

Rocket Launcher—Modification of MK 9 Mod 2 launcher to remove the microswitch is about ready for publication. Naval Gun Factory is making sufficient kits to modify 10,000 launchers and test stands to be used at various maintenance depots.

Tow Targets—Project has been initiated to inspect and test Mk 8 antiaircraft target reel flanges which have been returned from service. Reels with cracks need stronger ribs. Tests will determine compliance with specifications.

Tow Target Line—Tow line guide for F8F airplane operated satisfactorily under all conditions. Grumman is preparing service bulletin.

Ship's Installations Division

Arresting Gear—The increase in weight and/or speed of future carrier aircraft and the attendant increase in arresting hook size, dictates need for larger diameter deck pendants. An investigation was made of adequacy of leaf spring-type wire supports used on steel decks and yielding elements on wood decks to support the heavier wire at the right height. About one inch additional height will be necessary, it was found.

Shipboard Crane—Steps are being taken to secure the new Navy 30-10 experimental cranes built by Le Tourneau. It can lift 16,000 pounds, has an outreach of 15' 3" and is highly maneuverable. They would be put on CV-9 class carriers.

Shock Absorbers—A change request has been written requesting that a pressurized arresting gear reservoir be incorporated in all XFJ-1 and FJ-1 airplanes.

JATO on SC-1—Take-offs by *Seahawks* using standard JATO units were reported by the U.S.S. *St. Paul*. One unit blew its safety disk, but rudder control was sufficient to keep the plane on heading. One take-off simulating conditions of a rescue mission (minimum gas load) was made in three seconds. Insufficient reports have been received to evaluate adequately use of JATO on SC-1's.

Design Elements Division

Loose Rivets, Wrinkled Skin—Following carrier landings, loose rivets at the wing roots forward of the main beam and wrinkled fuselage skin were detected on AD-1 aircraft. All Model AD-1 aircraft, delivered and undelivered, on the West Coast are being modified by the contractor at El Segundo, and all on the East Coast by A&R, NAS Norfolk.

Piloted Aircraft Division

ASW Airship Design Study—Part I of the design study of an ASW airship has been completed by the Goodyear Aircraft Corporation. This portion of the contract requires the analysis of the relative merits of two engine installation schemes: (a) two liquid cooled engines mounted internally in the car and interconnected so one engine may drive two propellers mounted on outriggers, (b) two air cooled engines mounted externally in nacelles on outriggers in the conventional manner. The latter has been decided as the better and part 2 of the design study is proceeding on that basis.

ASW Airship Contract—Various airplane contractors have been requested to indicate interest in submitting a proposal for the design and construction of an ASW airship. Specifications for the airship and design data are complete.

SC-2—Four SC-2 airplanes are nearing completion of the buffet modifications at the contractor's plant, bringing the total to six modified airplanes. The remaining four requiring modifications were to be returned to Columbus within two weeks. This modification involves only contractor responsibility items.

HRP-1—The first aircraft is now 65 per cent complete and the last one is 13 per cent complete. The delay is attributed to failure to receive sub-contracted transmission parts. Barring further delays in procurement of sub-contracted parts, the whole program should not be set back more than two months.

SC-1—Since the primary mission of the SC-1 is now utility and rescue, Military Requirements has directed that a Model SC-1 aircraft be prototyped for removal of all armor and armament. The saving in weight will be approximately 471 pounds.

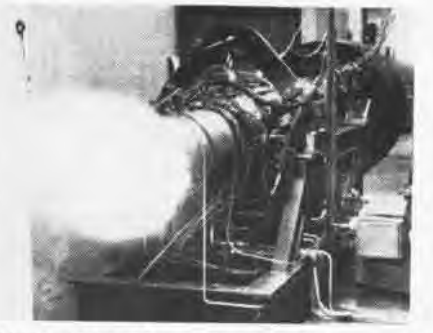
HTL-1—Although these helicopters were not procured for shipboard use, three machines have been assigned to shipboard duty. The HTL has no rotor brake or wheel brakes and reports of difficulty due to the lack of these features have been received.

XJL-1—Preliminary demonstration of the first airplane is now underway. A pin in the main landing gear actuating system was sheared during a recent flight which will necessitate some delay in redesign and replacement of damaged parts.

XJR2F-1—The static test report of the revised and strengthened engine mount, dynafocals and mounting bolts has been accepted. The engines for the first flight article have been hung on the center section, and the outer panels are ready for attachment.

Airborne Equipment Division

Cockpit Enclosures—as part of a program to develop more heat resistant cockpit enclosures for transonic and supersonic aircraft, a project has been established at NAES to explore the possibilities of using readily formed methyl methacrylate in the construction of economical molds for casting enclosures out of thermosetting type transparent resins which are more heat resistant than the conventional acrylic materials now used.



Wanta *light, Mac? You can light up off jet engine's exhaust, but it is not recommended procedure and Navy plane handlers are being warned to stay away from both ends. This particular engine is touted as the country's most powerful—5,000 pounds thrust. It is made by Lockheed.*

Power Plant Division

Turbo-Jet—Military Requirements has been requested to authorize elimination of the external gear box on the J-34 engine and the red-lining of the tachometer indicator in the cockpit at 101.5% in place of the normal 100%. To put the box in its normal place would interfere with the spar of the F2H-1 airplane and require costly redesigning.

Helicopter Engines—Fifty R-985-AN-1 engines will be modified to AN-5's for use in the 40 Sikorsky H03S-1 helicopters being purchased. Ten CFE engines and 20 GFE engines will support the helicopter program until modification of the engine is accomplished.

Engine Cooling—R-3350-24W engines in P2V-2's are being reworked by incorporating latest production head deflectors to give greater cooling. NATS will run flight tests on reworked exhaust stacks with shrouding removed to reduce vibration caused by the large overhanging moment on the R-3350-8 engine.

Housing Corrosion—BuAer and P&W are studying the problem of corrosive particles collecting on the fuel feed valves due to electrolytic action between the stainless steel valve and the magnesium case.

SUPPLY NEWS
FROM ASO AND SUPPLY DIVISION BUAER

Maintenance Usage Data

For nearly three years the Aviation Supply Office has been in the business of collecting and compiling data on the usage of spare parts in the maintenance of naval aircraft. It was at the height of the war, when production was in full swing, that the need for closer control of this huge tide of materials dictated the establishment of the usage data program.

This program was not strictly a swivel chair concept, for the fleet commands themselves found that the plentiful supply of spares, which they had long sought, actually had its disadvantages when the supply became burdensome in some lines. No carrier was so huge that it could devote space to carrying excess parts in stock, and the number of conceptions of how many of what range of parts were needed to operate an activity were as plentiful as the number of Aviation Supply Officers. The need was apparent for closer control of maintenance spares and the obvious means of doing it was to prepare realistic allowance lists which would govern the range and quantity of spares to be fed into the various operating activities. So ASO took on the job, with the pledge of the fleet commands to furnish the information.

ASO meanwhile had not been operating in the dark. A comprehensive record of the flow of materials through the Aviation Supply system was being obtained from the operation of the stock status reporting system. But the data on quantities of material being moved as obtained from these reports represented issues of spares from supply depots to operating activities. How much of these issues became stock on the shelf of the operating activity, and how much was actually used, and what its relation was to the extent of operations, was all information that could not be obtained from this source.

Only the User Knows

The objective in the new program, therefore, was to learn what was actually being *used*, and it was necessary to obtain the data from the point where the usage actually took place. It was hardly feasible to ask the mechanic himself to report usage, for he had neither the time nor the inclination to do it. So the alternative was to set up shop stores from which the mechanics would draw their parts as they needed them. It was admitted that here, too, there was a gap between the issue window of the shop stores and the airplane on which the parts were to be replaced. But, since there are distinct limits to the range and quantity of materials that a mechanic can carry

THERE'S NO ROOM ABOARD FOR UNUSED ITEMS

in his tool box or in the pocket of his dungarees, it was agreed that for all practical purposes the issues from shop stores could be considered as actual usage. Further, the information was collected so close to the operations in point of time that the usage data could be used, in conjunction with the operational data for the same activity, to arrive at usage rates in terms of parts used for any given number of operating plane months. Previously, any usage data from whatever source obtained could only be used in conjunction with operational data that bore no relation to it in point of time.

The report form used for Section "B" material was the BRR (Section B Report and Requisition Form) which was merely another version of the Section B Allowance List with the items arranged according to stock number for convenience in reporting. A column for reporting usage was added and a section of the cover page was provided for reporting the operational data that correspond to the usage reported.

Paper Work Paid Off

Like all new programs, this one had its share of growing pains. Many misunderstood what was wanted. Others manifested a typical resistance to additional paper work. And still others simply didn't keep good enough records to furnish accurate data. Many reports made so little sense that they had to be discarded. But from many others came the much needed information.

At ASO these reports were edited and prepared for machine tabulation, and as the accumulated data grew, usage rates of real value began to emerge. After the earliest tabulations, it was not certain whether the usage rates were valid or not, for there was nothing with which to compare them. Only after succeeding tabulations were made over a longer period of time could it be determined whether the rates would become stable or would wallow around in a sea of inconclusive figures.

Valid Data Soon Showed Up

As it happened, both eventualities occurred. However, the stable rates were not only in the majority but they emerged right where they were needed—in the items that are big and bulky and expensive. The fact that usage of gaskets for 30 operating plane months ranged from zero to 100 was of little consequence when the rates for wing panels ranged from zero to two. The cost of one wing panel would go a long way toward buying enough gaskets to fight another war. And not only have the usage rates for individual models tended to stabilize with succeeding tabulations, but there is a remarkable degree of similarity in the rates for comparable parts in different models.

So, gradually, but with the firmness based on the data furnished by the activities performing the maintenance, the excess allowances are being cut down. Any corner grocer will tell you that he can't afford to carry a lot of stock that isn't moving, and the Navy can't afford it either. So the extra ailerons and extra engines that go to sea for the ride are being beached. Furnishing all the parts needed without cluttering up the storerooms doesn't have to be just wishful thinking when the right figures are available. So if the personnel who fill out the BRR's have misgivings about the value of the job, remember that there are real benefits in this program.

Electronics Items Included

Among the most recent developments in the collection of usage data is the inclusion of electronics material in the program. A column for reporting issues is included in the Section "R" Allowance Lists, and operating activities are being requested to report their usage in the same manner as for Section B material.

A revision of the report form for Section B material, the BR (report form only) has been prepared and submitted to the fleet commands for approval. In addition to dropping the requisition features of the BRR, the new BR has eliminated the nomenclature and all reporting columns except that for issues.

Directives Consolidated

Also awaiting approval is a new covering letter for the usage data program, consolidating and bringing up to date all previous directives. The new letter combines into one document all the "who, what and when" about reporting data.

Though this may sound imposing, it is really just an effort to obtain more data with less work. Most contributors have already discovered that when records are kept with this end in view, the actual preparation of a usage report isn't much work anyway. And, in return, the contributor gets the benefit of the collective experience of all activities in the form of an allowance list that tells you what and how many are needed for your operation. That certainly makes a fair exchange.

AUGUST SUPPLEMENT

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AFLOAT AND ASHORE

VRF-2, PATUXENT RIVER—Lt. (jg) Clyde G. Hunt returned to his home station recently after 16 days of ferrying Naval aircraft over the United States. Upon his arrival he turned in an itinerary that looks like a manuscript, for it contained information pertaining to nine deliveries and 70 hours flown in this period. Lieutenant Hunt's ferry qualifications card permits him to ferry 17 different types of Naval aircraft, and he is one of three pilots selected by VRF-2 to undergo training in jet-model aircraft when these types are turned over to ferry squadrons for delivery.

✧

VMF-211, PACIFIC—This squadron uses an idea for keeping track of engineering checks on its F4U-4's which is both a time and money-saver.

The planes get checks at 30, 60, 90 and 120 hours. Previously the entire procedure for each check was mimeographed on a separate sheet for check crews to follow. Now a system is used whereby the 30-hour check sheet is made to serve for the 30 and 90-hour checks. For the 60-hour check a separate sheet is added with only the additional items on it that are required for this inspection.

For the 120-hour check, a third sheet is added with further additional items. The title on the basic sheet is left blank and the type of check filled in. Considerable work is saved typing up stencils.

✧

NAS TILLAMOOK—The air station's Public Works chief quarterman aided in saving the life of an electrocuted power company lineman recently. While working on high tension lines, the man stepped on an 11,000-volt wire. Power immediately was grounded out and the man removed from the pole. A call for assistance was made to the quarterman, who resided nearby, and he applied artificial resuscitation until relieved by a local physician.

✧

VR-3—Sounds like the early days of the war. The squadron recently had a lot of gyro instrument failures. Being unable to get replacements after a couple of weeks, the squadrons changed gyros from plane to plane 12 times to maintain schedules.

NATS, ASIA—The first scheduled VR-6 flight into NAF Naha, Okinawa, landed the last of June at the Army air base there. The move proved advantageous to pilots since it is served by the Naha range and also has an operating GCA unit there. Housed in L-shaped Quonsets, the detachment is severely cramped after having had nine Quonsets and four Butler huts at NAS YONABARU. The move required them to give up such things as movie projectors, refrigerators and ping pong area. Running water and stateside heads are being installed.

✧

VP-MS-3, PACIFIC—The squadron recently aided in search for survivors of a collision between a local fishing sampan and a tugboat. The search and rescue plane dropped Mk 8 flares around the scene, in cooperation with a Coast Guard vessel. The surface craft reported best results were obtained when the flares were dropped three in a line, 10 to 15 seconds apart. The missing four men could not be found although the search went on for four hours.

✧

MAG-25, EL TORO—Gas leaks in R5D's were stopped by following a Douglas Aircraft Co., pamphlet recommending use of clear lacquer, cement EC-776, Sealer N-T Blend C and Fairing Glaze PX-2353.

LETTERS

SIRS:

Ebony Jack is a cantankerous old blackbird that has become the scourge of the skies over the mall before the Ad building at Alameda. His domain is a cypress tree, and woe to him who would encroach on *Ebony's* territory—particularly whitehats (*see cut*), as scores will attest who have cowered under his attacks.

Bold as brass, black as soot, and swift as a swallow, the lone feathered raider strikes without warning. The ladies he ignores, but when a sailor hoves into view, the war is on. Dropping like a plummet, *Ebony* levels off at head height and during the next few moments man and bird engage in a duel of fluttering wings and flailing arms.

In every encounter so far *Ebony Jack* has emerged the victor, leaving his red-faced opponent resquaring his hat and restoring his ruffled dignity. The black phantom respects neither rank nor rate.

NAS ALAMEDA — S. J. MICHAEL, COMMANDING OFFICER

SIRS:

The accompanying picture was taken during the WAVE's fifth anniversary dance held at NAS DALLAS in July. It may be of interest to NANEWS readers looking for familiar faces.

NAS DALLAS — J. B. HOLTON, CDR.

SIRS:

I have no idea where you got the picture or the story to go with it, but your picture in the story "Photos Assess Bomb Drop," NANEWS July, was incorrectly titled. It is not a shot of an LST.

It may help some bomber to know that it is a submarine. I am a sub sailor so I don't want any bombs to fall around me by mistake. We had plenty during the war (mistakes).

U.S.S. BUGARA — W. W. SOALS, CEM

¶ NANEWS checked with VF-13-A which sent the picture from Saipan and was advised the ship being bombed was a YO, not an LST as the caption identified it.

SIRS:

Recently a board of senior pilots in VA-11-A selected Ens. H. M. Walker, Jr., as the squadron's "Pilot of the Month" for July. Outstanding competitors were voted on after consideration of each individual officer's past achievements in:

1. Excellence in use of primary weapons—dive bombing, glide bombing, rocket firing and gunnery. 2. Superiority in general air work and air discipline. 3. Smartness in military bearing and military courtesy. 4. Accuracy and expedition in discharge of collateral duties.

Ens. Walker is the first member of the squadron to receive its traveling trophy (a miniature SB2C aircraft on a base of dark brown onyx, held by the enlisted man at the extreme right of the photo.) A pilot who wins it three times is designated sole possessor.

Walker enlisted in the Navy in July, 1941, and served in the Aleutians before entering flight training. He began flying *Helldivers* in May 1946 and has logged 140 hours since then and made 16 carrier landings.

NAS DALLAS — MILTON L. WRAY, ENS.

THE COVER. Sixty aviation writers in California saw these VF-1-E Ryan *Fireballs* fly past a NATS transport with props feathered. NATS Photographer George T. Chapman shot this spectacular picture of right echelon air formation.

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NAVAL AVIATION NEWS

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NAVAL AVIATION

NEWS

FAST, TOUGH fighters and attack planes of today's Naval Aviation equal any in the world. Can you identify them? Check your recognition with answers opposite page.

SQUADRON INSIGNIA

THE DRAGON on NAS *Trinidad's* insigne represents the station's planes poised to crush any enemy dragons who dare attack; stinger points to the air station. VPP-2's cameras and iris show the unit's mission as an eye of the Fleet. FASRON 115's symbol features a bear with tool box and a PBY with background of snowy mountains. VMF(N)-553's cat from Hell hunts enemy in the dark with flashlight and six-barrelled pistol. This squadron boasts the highest score of any Pacific night-fighting outfit and the only night-fighting ace of any service.

FASRON 115

VMF(N)-533

VPP-2

NAS TRINIDAD