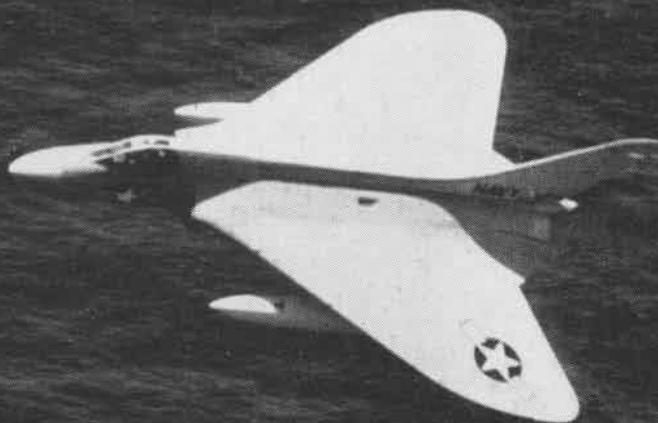
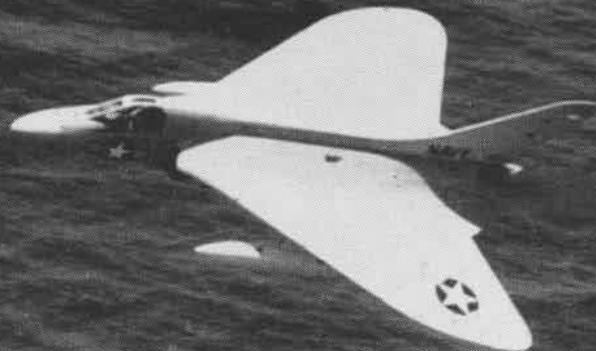


NAVAL AVIATION

NEWS



38th Year of Publication

DECEMBER 1956

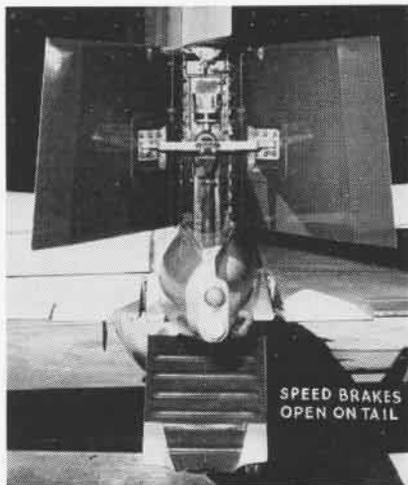
NavAer No. 00-75R-3



JET PRIMARY TRAINER ORDERED



BuAer has awarded a contract for an evaluation quantity of this new Temco jet trainer. It will be designated the TT-1, and first delivery is expected in July 1957. The award was made after competitive evaluation and tests were made at NATC Patuxent River. The 14 planes ordered will be delivered to the Naval Air Training Command. It is felt that starting students in jets, instead of transition from props, will improve training.





TAKE THE BITE OUT OF FROSTBITE

IT'S MIGHTY fine to spend the winter in sunny Florida. What can be better than lolling away the tag end of the year on sun-drenched beaches, far from snow and ice and cold?

But the Navy can't take a vacation and lie in the sun three months in the year. Navy tasks never end. They must be discharged 365 days a year, over large parts of the world, in rain and shine, in sleet and snow, in high temperatures, as well as in low.

Fortunately the Navy is not faced with prolonged extreme temperature conditions. At sea and near coastal areas where naval air operations are largely confined, the prevailing temperatures are not usually too extreme. Carriers don't operate where the seas are frozen over. Nor do they routinely launch planes from decks where icy

spray is making skating rinks for men and planes.

It is not implied, however, and it must not be inferred that ordinary winter flying is not cold weather operations. Any pilot who has flown out of Brunswick, Me., or Argentia, Quonset Pt., or in the Great Lakes area, or the men who fly and service the patrol and transport planes for the Alaskan, Aleutian runs—any of these men will state firmly that Naval Aviation operates under many severe cold weather conditions.

Modern high speed airplanes, capable of high altitude flight, are subject to extreme temperature changes within seconds. Fuel and lubricants, reliable under such sudden temperature drops, have been developed. But many other problems face the men who maintain and fly planes in low temperatures, or under winter conditions.



CREWMEN TESTED FACE MASKS AND ELECTRICALLY HEATED SUITS



IN FREEZING WATER, AN EXPOSURE SUIT WILL SAVE YOUR LIFE

IN THE BIPLANE days of early aviation, cold weather flying was attempted purely as a means of polar exploration, rather than as experimentation. The first carrier to conduct cold weather tests as such was the USS *Langley* (CV-1). In December 1931, she operated for 10 days around Cape Cod and Bar Harbor, in below-freezing temperatures. In addition to her flight operations with O3U's and F3B's, she tested flight deck gear operation, engine starting apparatus, cold weather clothing for pilots and deck hands. These tests showed how little was known about cold weather requirements and emphasized how much more study and preparatory work must be done before attempting another test.

Cold weather cruises made by carriers in the next ten years revealed that most difficulties of cold weather operations are those encountered on the ground, aboard ship, or on the water before and after each flight.

After WW II exploded over the world, our carriers operated, our planes flew under what was certainly cold weather conditions in both the North Atlantic and North Pacific.

Nowhere is there a better example of the advantages gained from having devoted time and energy to the solution

of cold weather problems than on the WW II Eastern Front in Europe. There the Russians consistently operated their planes and other mechanized forces, in temperatures as low as -40°C . German equipment was stopped dead still, completely immobile with congealed lubricating systems or with fuels that would not vaporize.

The Russians followed a back-breaking procedure. To maintain planes ready for flight their method was: drain and heat the oil; heat and circulate the coolant; heat the entire power plant with huge, cumbersome boilers or heaters, utilizing combustion gases. They covered with asbestos all lines susceptible to damage by intense heat and corrosive gases and provided special highly volatile priming and starting fuel. Finally, they cranked the engines for starting with large auxiliary power plants on trucks by engaging a propeller hub ratchet. Crude as these methods were, requiring much heavy equipment and untold hours of manpower, they worked. Russian planes were kept in the air while the Germans were hopelessly grounded.

Though our methods are considerably improved over the Russians' of 15 years ago, the same principles are involved.

The ideal situation would be to have all planes stowed



CDR. BYRD'S 1925 COLD WEATHER OUTFIT



LT. STAMM WEARS 1955 COLD WEATHER GEAR



THIS SUIT'S PROOF AGAINST EXTREME COLD



WITHOUT HEAT, MECH COULDN'T REPAIR PBY



IN COLD CLIMES, HEAT IS A VITAL THING



HEAT IT, SWEEP IT OFF, BUT ICE MUST GO

in heated hangars, or on a carrier's hangar deck. But nowhere in the Navy does this situation exist, so other protective measures must be taken.

One major problem of cold weather flight operations lies in difficulty of starting aircraft engines. More effort has been expended on this phase of winter flying than on any other. Past efforts have been successful in developing equipment reliable for use in temperatures as low as -65°F .

Two stages of the engine starting operation are required for exposed planes. Prior to an overnight shutdown, the lubricating oil must be diluted with gasoline to prevent congealing. When the temperature is below 0°F , reciprocating engines must be warmed to a temperature where they can be turned over easily. This usually takes one-half to an hour's heating. Jet aircraft with their high energy ignition system do not require preheating to start.

Pilots are advised to follow the exact procedures for starting each kind of aircraft engine as given in the Pilot's Handbook for each aircraft model.

Engine covers, that protect the engine from cold, ice and snow, and retain heat during preheating, are bulky things, and hard to handle. A newly developed lighter weight cover with inflatable pockets for cracking off ice accumulation is being tested by the planes on *Deepfreeze*.

Another grave problem of cold weather flying is icing—

from ice, snow and frost that accumulate on a plane parked on the field, as well as ice that can accumulate in flight.

A cardinal rule of flying is *Never take off with snow, ice or frost on the wings, propeller or empennage*. Violation of this rule is one of the surest ways known of being the subject of a Grampaw Pettibone obituary. A thin layer of ice, or snow which rapidly compacts into ice, will cause loss of lift and a treacherous stalling characteristic.

The exec of a patrol squadron recently back from deployment at Argentia gave his method of beating this problem. Just before the night maintenance crew secured at midnight, they shifted planes out of the hangar. Then they wheeled in the ones slated for operation next day. This was more than double work, but it paid off in dry, snow and ice-free airplanes to send out on operations the next morning.

Carriers follow a similar procedure when they re-spot planes and send the ones scheduled to fly the next day to the hangar deck to warm and dry off.

In this battle against snow, ice and frost, various preventive measures must be followed. In addition to engine covers, cockpit and wing covers serve as protection. The line crews, however, find the bulky wing covers awkward to handle in high winds. Many crews prefer to sweep snow off with brooms, knock ice off with knotted manila lines, and wipe frost off with an anti-frost fluid such as 'Kilfrost.'



P2V ENGINE GETS ITS PREHEAT, NECESSARY BEFORE STARTING



ALL THIS FINE SNOW MUST BE BRUSHED OFF BEFORE TAKE OFF



THIS MACHINE WILL LOAD SNOW ON TRUCK



ROTARY BLOWER GETS A THOROUGH CHECK



SAND IS SPREAD FOR PREVENTION OF ICE

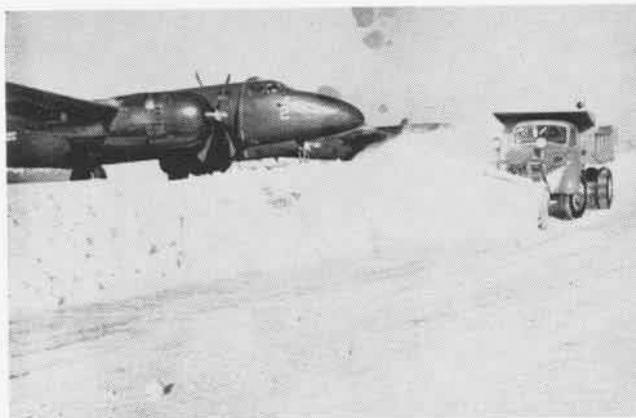
THESE FLUIDS, swabbed, brushed or sprayed on exterior surfaces of aircraft will effectively melt ice and frost, or if used as a preventive, are anti-ice and anti-frost.

Some other chemical aids are used. Rain repellent, a non-wetting coating applied to the outside of windshields and windows keep them free of rain. Anti-fogging compound, a coating applied on the inside of windshields and windows absorbs moisture as it condenses, and thus aids visibility. Alcohol has its uses—for anti-icing on wings, in a jet stream for clearing windshields, bled onto propellers in flight for anti-icing, and to prevent carburetor icing.

A thermal ice prevention system developed by NACA is now standard equipment for fast military planes and for most transport and cargo planes. Using either electrical heating for windshields, or exhaust gases for large surfaces, the systems, both continuous and cyclic (alternating) raise the temperature of critical surfaces sufficiently to prevent formation of ice on those surfaces.

De-icing equipment costs in weight, so its installation calls for a nice balance between this cost, and the need. Danger of icing is not critical above 20,000 or 25,000 feet. Frictional heating during high-speed flight effectively reduces the susceptibility of aircraft surfaces to icing. Simply stated—jet planes at their normal altitude and speed have comparatively little to fear from icing on surfaces. However, BUAER has issued a Technical Note No. 5-55 on Turbojet Engine icing.

Somebody has said, "Weather is not made by latitudes. It is compounded from air masses and their conflict with themselves, the earth and the seas." Ice is where you find it.



SOMETIMES IT'S NECESSARY TO PLOW AROUND PARKED PLANES

Not even the most elaborate de-icing gear works itself. It has to be turned on at the right time by a pilot who knows icing conditions when he sees them.

Cold is the absence of heat. Heat, then, is the answer to cold, heat for planes, and for men. As the English polar explorer Scott said, "It is quite a mistake to suppose that one becomes hardened to the cold; however, one becomes expert in keeping oneself warm." If a few basic principles are known and applied, it is possible to work in extremes of cold and still be comparatively comfortable. The Navy has applied those principles in continued research and development of clothing to protect its men exposed to cold.

The idea that heavy, bulky all-wool clothing is necessary for warmth is passé. Even the time-honored wool 'Long Johns' are almost a thing of the past. In their place the Navy is now issuing two-piece underwear made from all-cotton waffle-knit cloth. The waffle effect traps an insulating layer of warm air next to the skin. This new cloth also eliminated the itching and shrinkage of the woolies.

Increased use is being made of coated fabrics for water proofing, water repelling, and for insulation against cold. The two-piece winter flying suit, Intermediate Cold Weather Outfit, is made of permeable, water-repellent nylon with orlon fleece lining. An improved feature of the rubber coated Mark 4 exposure suit, for constant wear, allows the fabric to breathe. Perspiration will dry and thus eliminate its 'Turkish bath' characteristic. Also waterproof is the quick donning anti-exposure suit, for emergency use in patrol and transport type planes.

For extreme temperatures there is the Extreme Cold Weather Outfit. Tested by naval personnel on Operation Deepfreeze in both 1955 and 1956, this new gear provides a maximum of thermal protection, comfort and functionality with a substantial decrease in weight, in bulk, and in the total number of clothing items required. Worn over the winter flying suit, this outfit employs the double-moisture-barrier principle. Briefly, the jacket, trousers and mittens have a layer of insulation enclosed between two layers of waterproof, neoprene-coated nylon twill fabric. An attachable hood and rubber insulated boots complete the outfit. This gear was worn by the two Navy aerologists when they ascended to 40,000 feet in an open gondola last August. (See NANEWS, Oct. 1956).

Winter comes early and stays late at NAS BRUNSWICK, Me. To the men who are charged with the responsibility of keeping runways and taxiways free of ice and snow, winter means clearing off an average of 500,000 tons of snow!

Like other air stations with the same cold weather prob-

lems, this Maine Naval Air Station prepares for winter long before the first snow flies. During the summer, snow equipment is overhauled and painted. Spare parts are ordered and stored. New men are trained, taught how to operate and maintain the equipment, and how to plow in echelon.

Aerology plays a vital part in this anti-snow, anti-ice campaign. The aerologist gives the word that poises the entire operation. Twelve hours in advance of the time snow is forecast, assault plans are made final by the "Joint Chiefs of Staff." Members of this group represent station Operations, FASRon, station Transportation, and the Fleet Air Detachment. Armed with Aerology's current and advance wind and weather forecasts, the staff selects the duty runway and assigns priorities for clearing runways, ramps, and parking zones. Next to the duty runway, highest priority is given to ready duty aircraft parking, the anti-sub duty planes, and those on stand-by for SAR missions.

All squadrons are notified of the assigned priorities. Policing actions are put into force to remove all loose chocks, fire bottles, hatchets, and other equipment that could cause damage to the snow removal equipment.

After the storm hits and the snow reaches a depth of two inches, the heavy plowing equipment is started. Push-plows, the first line of defense, roll out. Travelling at 40 to 50 mph, in echelons of two, three, or four, they plow the snow into windrows from the duty airstrip and taxiways. Simultaneously, snow removal operations start on the station's roads and sidewalks.

On schedule, squadron personnel move their planes from the parking areas onto the already cleared runways. Parking areas are then cleared and the planes are returned. Whenever abnormally high winds accompany snow storms, parked planes are not moved. The snow removal equipment must weave in around them. Instead, the planes are turned into the wind, fueled to near capacity to increase weight, are secured with double tie-downs, and their normal control locks are strengthened by battens to prevent constant shaking from the wind.

When piles of snow grow large enough to hamper the pushplows, the heavy weapons, rotary plows, are brought into action. These lumbering monsters bite off huge chunks of snow, swallow it into a whirling fan and spew it out, a jet stream of mist-fine snow, a distance of 150 feet, or so.



CLOSE-UP OF ROTARY SNOW PLOW SHOWS IT'S A HUGE MACHINE



MAXIM ROTARY SNOW PLOW AND ONE-MAN SNOW REMOVAL TEAM

Maintenance of equipment is a major problem. Because it is necessary to plow right down to the ground, blades and associated equipment are heavy casualties. After eight hours of plowing, plow blades, bits or shoes need replacing or repairing. To handle these casualties and maintain wiper blades, heaters and defrosters, mechanics stand around-the-clock duty.

Snow clearance is not restricted to the daylight hours. During last year's record snow fall, NAS BRUNSWICK's snow removal teams worked 24 hours a day for two weeks.

To keep a carrier deck clear and ready for operations under snow and icing conditions requires a ready crew, use of foresight, knowledge of climatic conditions combined with accurate weather reporting and forecasting. Granted all these, the usual hand implements, supplemented by a couple of tractor sweepers and plows can accomplish it.

Successful operation of aircraft in cold weather results only from proper training and great effort of all the personnel involved, including ground crews, air crews, pilots, and all other supporting personnel. Developments of new techniques and improved equipment have changed past problems rather than eliminated them. Snow and ice, sleet and fog are still factors to be considered and guarded against.



BUT ARGENTIA'S RUNWAY MAKES DWARFS OF THESE FOUR PLOWS



GRAMPAW PETTIBONE

Saved by the Belt

A NavCad returning from a one-hour fam flight reached the point approximately 20 degrees from the landing line when the Runway Duty Officer noticed the F9F-2 beginning to settle. He advised the pilot to add power. Two more such transmissions made in rapid succession went unheeded. The Panther then entered a roll to the left until the wings were vertical as the aircraft struck the ground at about 125 knots. The airplane came to rest 260 feet from the point of initial contact.

Shoulder harness and safety belt locked tight saved the pilot's life. When the crash crew reached the scene, the pilot was still strapped in his seat. His helmet was hanging by the hose of his oxygen mask.

The helmet liner strap was not secured by the pilot, because "it is uncomfortable when strapped, feels like it is choking me since I started using an oxygen mask with it."

In the crash, the helmet withstood a severe frontal blow which crushed it in several places. The helmet was then knocked off or thrown off by a whipping action of the head, following which the pilot received a severe scalp laceration and a concussion. Had the liner strap been secured, the helmet



would probably have remained on and prevented the subsequent head injuries.

Mild lacerations of the left elbow were caused by disintegrating portions of the left side of the cockpit. Abrasions of both shins resulted when the rudder pedals were being torn out by impact. When the airplane came to rest, the pilot was still securely strapped in the seat but only small pieces of scrap metal remained forward of him.

The NavCad remembered hearing several aircraft call for landing in-

structions, but had no recollection of the approach on which he crashed and recalled nothing more prior to awakening in the hospital. For this reason, it was considered that carbon monoxide poisoning or hyperventilation may have existed during the latter stages of the flight. However, this could not be established. The amnesia following the accident may have been caused by the concussion.



Grampaw Pettibone Says:

This should convince any doubting Thomases that personal safety equipment is used in airplanes for a reason. Tight shoulder harness and seat belt saved this lad's life. But it's a miracle he didn't get himself killed after his helmet flew off.

A proper fit in mask and helmet shouldn't be too uncomfortable. It's my guess that this lad either had a poor fit or else hadn't become accustomed to the feel of a mask. But it's a cinch now he's joined the chinstrap cinchers.

Split Seconds

After returning from a skip-bombing mission in a jet fighter aircraft, the pilot was shaken when his plane captain pointed out several dents in the leading edge of the wing, scratches on the bottom of the fuselage and pieces of Yucca cactus imbedded in an air scoop.

The pilot's wingman, who had been flying behind him, had been impressed by the low level of the pass, so low that jet wash had raised considerable dust.



Grampaw Pettibone Says:

The way I figure it, if this gent had delayed his pull-out as much as 1/50th of a second, he'd have made his mark in this world for sure. You can't pull up from six feet under. Had he calculated his dive angle and closing speed toward the ground, he would have realized that, at the time he began his pull-out, he was angling toward the ground at the tremendous speed of about 500 feet per second.

Gee! the NOISE!!



Son! why don't
you drive a
concrete spreader?



Same Song, Second Verse

A little over a year ago, the pilot of a TV-2 departed on an IFR clearance estimating one and one half hours enroute with approximately three hours of fuel aboard. Three hours after take-off, lost and low on fuel, he broke out below an overcast and found his ADF hadn't been pointing to a radio station after all. He had executed a penetration and let-down through instrument conditions in an area of thunderstorm activity. He landed wheels-up uninjured, in a wheat field. The aircraft received "Charlie" damage.

One year later the same pilot, flying an SNJ, was on a night VFR cross-country from Missouri to Texas. About two hours and 35 minutes after take-off, he believed he was close to zero fuel and saw no welcoming runway or beacon lights.

Seeing a highway down below, he decided he'd better not wait till the fan quit. He dragged the highway with landing lights and set up a landing pattern. Because of a 20 to 25-knot wind, he kept flaps up and landed uneventfully gear-down in the middle of the 22-foot width of paving. Incidentally the highway was bordered by telephone poles and lines just 40 feet on either side of the center line.

The pilot discovered he was 30 miles from his destination. Investigation by maintenance personnel showed 20 gallons of fuel in the reserve tank, and the fuel gage was found to be accurate. It's common knowledge that 20 gallons is all the reserve fuel available in

a J-bird—but the pilot made this highway-type night landing *without even switching to reserve.*



Grampaw Pettibone Says:

Lad, I think it's time somebody cut you in on the facts of flyin' and let you know you've got a lot to be thankful for. From here on out, you'd better plan every flight like your life depended on it unless you want those roses you've been smellin' like to suddenly turn out to be lilies.

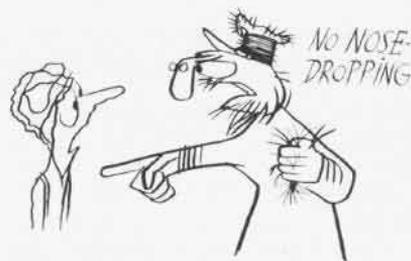
Barrier Bounder

During day quals, the pilot of an AJ-1 was approaching the carrier for his fifth landing when his aircraft was observed to enter the groove slightly fast. The pilot was given a fast signal by the LSO. The attitude and altitude of the aircraft were good, and, after answering the fast signal, the pilot received a Roger for the rest of the approach. Just prior to the cut, the aircraft's attitude changed, with the nose falling through, causing loss of altitude at the ramp.

The hook struck the round-out of the ramp and broke off. The right main gear touched down two feet forward of the ramp, the left gear making contact 18 feet up the flight deck. The aircraft touched down with nose wheel on the center line, bounced, touched down again near the number seven wire, then bounced over the number one and two barriers. The deck was clear, and the pilot rode the brakes until the aircraft plunged over the bow. He then applied full power.

The plane broke up on contact with the water and the ship cleared the debris by about 30 feet. The pilot exited through the pilot's hatch, surfaced, and waved to personnel on the LSO platform as they passed overhead. Pilot and crewman were rescued from the drink by ship's helicopter within a couple of minutes.

The accident board concluded that the primary cause of the accident was the pilot's error in dropping the nose of the aircraft and descending rapidly at the ramp. They concluded that when the pilot is at minimum air speed and altitude during an approach any error is magnified and may be impossible to correct. For this reason such a pass must be waved off early and the pilot brought in slightly higher and



slightly faster until such tendencies are corrected.

The LSO stated that such accidents can be prevented only by continually impressing upon the pilots the dire danger of letting the nose of the AJ drop at the ramp either on anticipating a cut or experiencing the natural high feeling that a new pilot has in approaching the ramp in this type aircraft.



Grampaw Pettibone Says:

There's a time and place for everything! It seems to me that when the AJ bounced over the barriers that was the time and the place for two-blocking the throttles instead of trouncing the brakes. He'd have had a fair chance of staying airborne after leaving the ship. If forced to ditch, he could have executed the maneuver with at least some degree of control and less likelihood of personnel injury.

With an aircraft as heavy as an AJ and as critical in all respects during carrier operations, perfection should be pursued on every approach, particularly during carquals. LSO's always remember the important fact that a pilot looks a lot better on a wave-off than he does in the old spud locker.



THE GRUMMAN F11F-1F Tiger, a faster version of the Navy's supersonic F11F-1, is powered by the General Electric J-79 turbojet with afterburner. Its indented or pinch waist fuselage is clearly shown. There were minor revisions to the basic Tiger airframe to permit installation of a larger power plant. Capacity of the inlet ducts was increased to allow for a greater airflow requirement, and the aft fuselage was rebuilt to house the larger diameter of the afterburner.

Units Cop Battle 'E's Champlain, Valley Forge Winners

The Atlantic Fleet Air Force has announced the winners of the AirLant Battle Efficiency Awards for 1956. These were two repeat awards for the coveted "E."

The antisubmarine carrier, USS *Valley Forge*, based at Norfolk, Va., and commanded by Capt. J. B. Payne, has won for the second consecutive year in the CVS/CVE class, while Antisubmarine Squadron 27, also from Norfolk, rang up a second tally for the VS class. Cdr. E. R. Hanson commands this squadron.

The USS *Currituck*, commanded by Capt. P. D. Buie and based at Norfolk was top unit in the AV/AVP class.

Battle "E" honors have gone to three NAS CECIL FIELD squadrons, and to the USS *Lake Champlain*, based at Mayport, Fla. Capt. J. B. M. Young is skipper of the carrier.

Two units of CAG-10, currently serving as air arm for the *Coral Sea*, won the top award. Honors among ComAirLant jet attack squadrons went to VA-106, skippered by Cdr. H. H. Hills. VA-104, led by Cdr. G. E. Ford, garnered the "E" as the outstanding prop attack squadron.

In the day-fighter class, VF-13 earned top billing. Commanded by Cdr. C. D. Winner, the squadron is a unit of ATG-201.

Another Florida unit, Sanford's VAH-7 headed by Cdr. L. B. Libbey, walked off with honors in the VAH

class while Airship Squadron One from Weeksville, N. C., won the ZP award. This squadron is skippered by Cdr. W. A. Clark.

NAS NORFOLK's VP-44, led by Cdr. R. D. Macklin bested all other VP sea-plane contenders while VP-11 from Brunswick, Me., won for VP land-plane units. Patrol Squadron Eleven is commanded by Cdr. W. M. Hodges.

NACA Award to Whitcomb Gets Distinguished Service Medal

The NACA conferred its highest award, the Distinguished Service Medal, upon Richard T. Whitcomb, aeronautical research scientist at the Langley Aeronautical Laboratory. Whitcomb, who developed the "area rule" concept for supersonic aircraft, is the first person to receive the award since it was established last year. Dr. J. C. Hunsaker, NACA Chairman, presented the award in Washington, D. C.

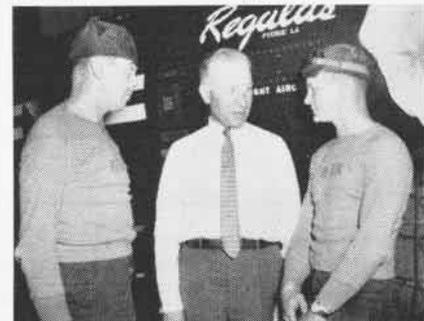
The "area rule" provides a means of reducing the drag rise of airplanes which occurs at transonic and supersonic speeds. Whitcomb found that when the combined cross-sectional area of wings, fuselage, tail and other surfaces of the plane is reduced, the drag rise is lowered substantially. In practice the design usually results in a narrow waist about mid-section of the aircraft fuselage.

Whitcomb, employed by NACA since 1943, is assistant head of the eight-foot transonic tunnels section of the Langley Lab, Langley Field, Va.

Cordiner Visits Randolph Discusses the Navy as a Career

Ralph J. Cordiner, Chairman of the Defense Department Committee on Professional and Technical Compensation, and President of General Electric, visited the USS *Randolph*, flag-ship of ComCarDiv-6.

Mr. Cordiner talked with officers and men, discussing what improvements could be made to further the desirability of a naval career. While aboard he observed night and day air operations, aerial refueling, replenishment



MR. CORDINER CHATS WITH RANDOLPH MEN

operations, and had a first-hand look at Navy men and equipment in action.

The Advisory Committee, headed by Mr. Cordiner, was established by Sec-Def to inaugurate measures which would attract and retain qualified career men in the Armed Services.

More WV-2's are Ordered New Order is Fifth Made by Navy

A \$50,000,000 re-order by the Navy for wv-2 *Super Constellation* radar planes extends deliveries of the huge electronic sky sentries through 1958.

Bulging with six tons of electronic detection devices, the wv-2 aircraft are designed to give U.S. fleets maximum warning against unidentified air and surface ships.

The wv-2 picket planes have been flying day-and-night surveillance off both the Pacific and Atlantic coastlines for several months. Recent activation of an airborne early warning wing in the Hawaiian Islands will extend the aircraft's screening operations.

In addition to their array of intricate electronic instruments, the wv-2's are equipped with complete berthing and feeding facilities for the crew to permit efficient round-the-clock operations. WV-2's can also track weather disturbances to improve storm warning services.

Tradewind's First Run Made on Honolulu-Alameda Flight

Air Transport Squadron Two's *Indian Ocean Tradewind* arrived at NAS ALAMEDA six hours and 45 minutes after takeoff from Honolulu. The flight reportedly exceeded all existing seaplane records, but failed to establish a new prop-driven mark.

Piloted by LCdr. Charles E. Feiock, the huge logistic support aircraft became the first turbojet seaplane to fly from the mainland to Hawaii. The westward trip from Alameda was made in eight hours, 24 minutes.

On the return hop, the *Tradewind* beat the old record of 10 hours, 21 minutes, set by her predecessor, the *Caroline Mars*.

Powered by four Allison T-40 prop-jet engines, the *Indian Ocean Tradewind* is one of seven R3Y aircraft recently delivered to Air Transport Two.

More Laurels for FDR Ends Successful Shakedown Cruise



AD-6'S ON FDR PREPARE FOR A LAUNCH

The recently converted *FDR* (CVA-42), now featuring steam catapults and an angled deck, has distinguished herself with safety records during shakedown training at Guantanamo Bay. Eleven Navy and Marine squadrons qualified aboard the carrier for both day and night flying.

Using the mirror landing system, over 2800 arrested landings and an equal number of catapult shots were made during the eight-week cruise, with no personnel or serious equipment casualties.

A special word of thanks was given to the outstanding work by squadron personnel of Air Group 17, and to the ship's company air department.

Present skipper of the *FDR*, which is slated for post-shakedown repairs at Norfolk, is Capt. T. W. Hopkins.

Public Relations Idea 'Nooners' Club at Whidbey Island

A monthly "Nooners' Day" has been inaugurated at the Whidbey Island CPO Club. These luncheon gatherings will not be incumbered with membership cards, dues, and official records.

Sole purpose of the "Nooners' Day" Club will be to establish good public relations between the chief petty officers and high-ranking military, civic and government officials. It will also give the Chiefs a chance to keep informed of the latest news.

Additions to Ault Field Survival Training Tank Built

Two new additions to Ault Field's facilities are scheduled for completion next spring. They are a survival training tank for pilots and crewmen and a \$466,000 sewage treatment plant.

The latter is made necessary by the increased population of Ault Field and will be located near Whidbey Island's West Beach.

The survival training tank will be approximately 65 feet long and 20 feet wide. It will be 12 feet deep at its deepest end. A dunking apparatus simulating the cockpit of a plane will be set up to plunge into the water at a steep angle. It will give its occupants valuable training in escape techniques.

Other phases of survival training will also be made possible by completion of the tank.

"Target date" for completion of both projects is now June 1957.

Skywarriors are Welcomed VAH-1 Qualifies on the Forrestal

The deafening roar of powerful turbojets heralded the return of VAH-1 *Tigers* to Jacksonville after 15 days of operations aboard the *Forrestal*. The squadron was the first, flying the A3D *Skywarrior*, to qualify for carrier-based operations aboard the big carrier.

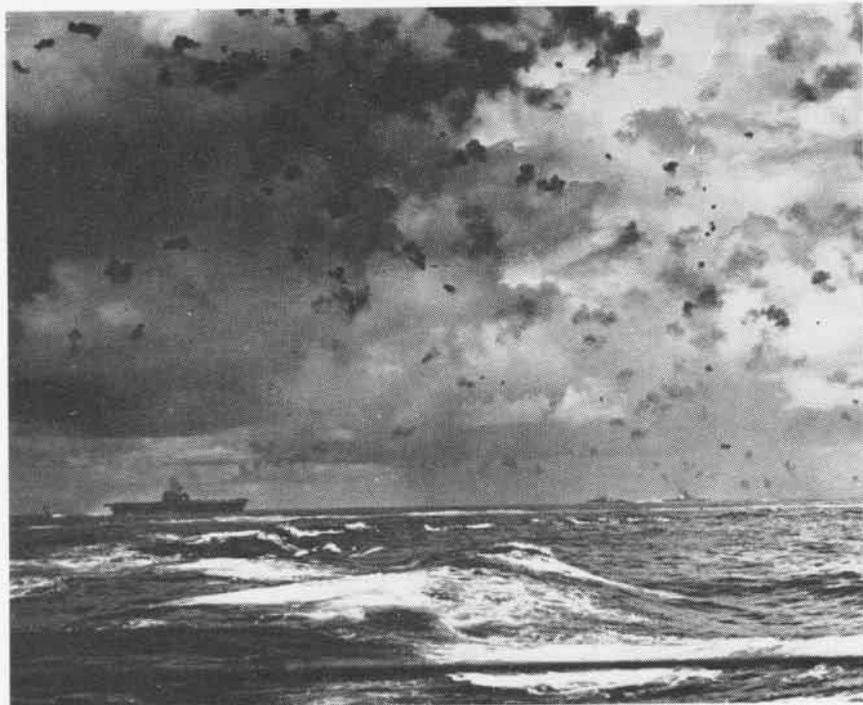
Cdr. Paul F. Stevens, VAH-1 skipper, was quick to express satisfaction with the squadron's performance aboard ship. "The operations were extremely successful for the first time aboard with new aircraft," he said, "particularly considering that this was a heavier aircraft with all the attendant complexities."

The powerful seagoing bomber performs in the 600 to 700-mph class at altitudes above 40,000 feet. An atomic weapon carrier, it is capable of making unescorted attacks against defended enemy submarine bases and harbor installations in any part of the world.

The heavy attack squadron will conduct operations from NAS JACKSONVILLE until January when they will be deployed in the *Forrestal* for a Sixth Fleet Mediterranean cruise.



CAPT. W. E. ANDROSKO, USMC, piloted this HUP as it chopped its way through the 2000 mark, at Ellyson Field. The 'copter, first of its kind to achieve this feat, was the first Navy HUP to reach the 1000-hour mark back in July 1954. Praise was given to students, instructors, and the maintenance department of HTU-1 for their excellent care in handling the helicopter.



WELL DONE, BIG E

JAPANESE BOMB SPLASHED ASTERN OF 'BIG E' AS ENEMY PLANE PULLED OUT OF DIVE

A GREAT SHIP bows out of the Navy with the order to strike the USS *Enterprise* (CV-6) from the U. S. Naval Vessel Register and sell the *Big E* for scrap. The next ship to bear the name *Enterprise* will have as lofty a tradition to live up to as has ever been the lot of any ship entering the Line.

There never was a ship the Japanese tried harder to sink than the USS *Enterprise*. Six times the wishful Nipponese announced she had been sunk and six times the *Enterprise* suffered structural damage from enemy hits and near misses during World War II, but she still sailed on.

Only 20 years ago, on 3 October 1936, she was launched. To those who loved the *Enterprise* and served on her, it is hard to see her headed for the scrap heap. But this is not the end of the *Enterprise*. Her memorial will be a living one, the next ship to be christened the USS *Enterprise*.

Words quoted as the ship slid down the ways into the water were prophetic. A line from Othello has been fulfilled in her career: "May she also say with just pride: 'I have done the State some service.'"

Indeed it is hard to measure the worth of the *Enterprise*. Statistics are cold. They tell little of the drive for victory, the fighting hearts of the men

who ran the ship and flew the airplanes, the triumphs over near disasters.

Winner of 20 battle stars during World War II in the Pacific, the *Enterprise* shot down 911 Japanese planes, sank 71 ships and damaged 192 more. She steamed more than 275,000 miles during the war. Her magnificent record included participation in every major battle of the Pacific except the Battle of the Coral Sea.

Commissioned 12 May 1938, CV-6 was the seventh Navy ship to bear the name *Enterprise*. The CV-6 was a giant in contrast to her predecessors. The aircraft carrier had a displacement of almost 20,000 tons, a length of 825 feet, and a maximum breadth of 109 feet. She had been built at an approximate cost of \$19,000,000.

By the time America was plunged into WW II, the *Enterprise* was part of the Pacific Fleet. On 28 November 1941, as flagship of Task Force Eight, the *Enterprise* left Pearl Harbor. In addition to Air Group Six, she carried 12 VMF-211 aircraft for delivery to the new airfield on Wake Island. The same day the Commanding Officer issued Battle Order Number One, the first sentence of which read, "The *Enterprise* is now operating under war conditions." On 4 December, the planes were launched at a point about

175 miles north of Wake to fly to the island, and the Task Force retired toward Pearl Harbor.

The *Enterprise* was originally scheduled to arrive on 6 December, but heavy weather forced the Task Force Commander to slacken speed, and revise his ETA to 7 December. At dawn on 7 December, the force was some 200 miles from the island of Oahu. A small group of *Dauntless* scout-bombers from VS-6 were launched for the flight to Pearl.

Shortly afterwards one of the pilots of these planes was heard to exclaim over the radio, "Please don't shoot, this is an American plane." Then another pilot radioed to the ship, "Pearl Harbor is being attacked by enemy planes. Maybe Jap planes." From Fleet Headquarters came confirmation from Adm. P. N. L. Bellinger: "Air raid, Pearl Harbor. This is no drill."

The *Enterprise* hoisted her battle flag and launched aircraft to seek out the carriers from which the Japanese planes had taken off. The results of this search were negative, but on 10 December, she sank the Japanese sub I-170 that had scouted the Hawaiian islands in connection with the Pearl Harbor attack. It was the first Japanese combatant ship sunk by U. S. forces. First blood for the *Enterprise*!



CV-6 ENTERPRISE

WORLD WAR II

Presidential Unit Citation
Navy Unit Commendation

★

Pearl Harbor

★

Sinking I-170

★

Pacific Raids 1942

★

Battle of Midway

★

Guadalcanal Landings

★

Defense of Guadalcanal

★

Battle of Eastern Solomons

★

Battle of Santa Cruz Islands

★

Battle of Guadalcanal

★

Battle of Rennell Island

★

The Gilberts

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The Marshalls

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Pacific Raids 1944

★

Hollandia

★

The Marianas

★

Palau

★

Leyte

★

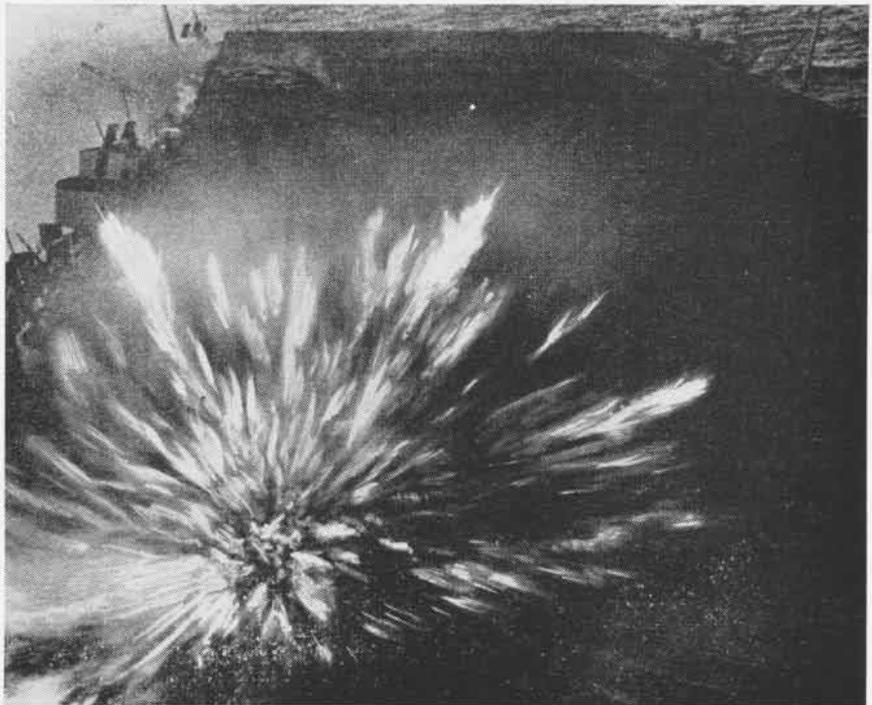
Luzon

★

Iwo Jima

★

Okinawa



ENEMY BOMB HIT DECK 24 AUGUST 1942 DURING BATTLE OF THE EASTERN SOLOMONS

Less than two months later, on February 1, the *Enterprise* and her sister ship, the *Yorktown*, constituted the carrier striking power in the force that launched the first American offensive operations in the Pacific.

The *Enterprise*, Admiral Halsey's flagship, was the core of a task force which made an attack on Wake on 24 February, and one on Marcus on 4 March. To hit Marcus, the *Enterprise* was within 1000 miles of Japan.

In April the *Enterprise* and several other screening ships acted as escort for the USS *Hornet* in company with TF-16 to effect the first American offensive against the Japanese homeland. On the flight deck of the *Hornet* were 16 B-25's of the 17th AAF Air Group under the command of LCol. James H. Doolittle. On 18 April 1942, these aircraft gave Tokyo its first aerial attack of the war.

At the Battle of Midway, 4-6 June 1942, U.S. Navy airpower aboard the *Enterprise*, the *Hornet* and the *Yorktown* and based ashore at Midway, and U.S. Marine Corps and U.S. Army airpower also based at Midway inflicted a telling defeat upon the enemy force. Japanese forces went down for a count of four carriers, one heavy cruiser, and 258 aircraft. All ships were sunk by carrier aircraft of the U. S. Navy.

Misled by position reports, the first carrier strikes had difficulty locating the Japanese carriers. In this predicament, Commander Air Group Six of the *Enterprise*, estimating that the enemy might have reversed course, decided to turn north. According to CinCPac, this was "one of the most important decisions of the battle and one that had decisive results." CAG-6 found the enemy just as its carriers were about to launch an all-out attack against Midway and the U. S. Task Force. Those Japanese planes never left the deck of their carriers.

The *Enterprise* planes were in at the kill of all four carriers and the heavy cruiser sunk at Midway. The American victory in this action wrested the initiative from the Japanese and was one of the decisive battles of the entire war.

In the invasion of the Solomons and in repelling recapture, the *Enterprise* played a prominent and effective role. Despite tremendous poundings, the *Big E* came through again and again. She supported the landings, 7-9 August, participated in the Battle of the Eastern Solomons, 23-25 August, and took part in the battle of Santa Cruz Islands, 26-27 October. She fought in the Battle for Guadalcanal, 12-15 November, in which she assisted in sinking



THESE DOUGLAS DIVEBOMBERS RETURN TO ENTERPRISE AFTER HEAVY BLOW AT PALAU

89,000 tons of war and cargo ships—two battleships, one heavy cruiser, three destroyers, and 11 cargo ships. The last Guadalcanal engagement occurred 29-30 January 1943, the Battle of Rennell Island, and the *Enterprise* was there.

During the first part of 1943, the *Enterprise* continued its battle career as flagship of Commander Task Force 16. When the big carrier reached Pearl Harbor 8 May, it was honored as the only carrier to fight through the entire first year of the war. Four U.S. carriers had been sunk in action: the *Lexington* in the Coral Sea, the *Wasp* in the South Pacific, the *Yorktown* at Midway, and the *Hornet* in the Battle of Santa Cruz. The *Enterprise* stood a long vigil as the only carrier in the South Pacific since the *Saratoga* was under repair and the *Ranger* was operating in the Atlantic. She became the first aircraft carrier to win the Presidential Unit Citation.

From July 20 to October 31, 1943, the *Big E* was back at Bremerton for needed repairs. But before the year was out she was with TF-50 ready to participate in the Gilbert Island Occupation 18-24 November.

When the Japanese, finding that their bombers were no match for a *Hellcat* screen, began sending in medium bombers after dark, the *Enterprise* met the challenge. On the night of 26 November, a team of two *Hellcats* and one *Avenger*, led by LCdr. E. H. (Butch) O'Hare went into action. It was the first aerial battle of

its type, and it so disrupted enemy attack that it was credited with saving the task group from damage. The *Enterprise* at once put fighter operations on a "round-the-clock" basis.

The *Enterprise* participated in the Marshalls Campaign 29 January-22 February 1944. In the raid on Truk, 17-18 February, VT-10 of the *Enterprise* made the first night bombing attack in the history of the United States Navy. Pilots made 25 runs, scored 13 direct hits, three near misses; and two hits on islets mistaken for ships. Naval Historian S. E. Morison says, "This night bombing run resulted in about one third of the total damage to shipping effected by the entire carrier force." Total tonnage sunk in the two day attack was about 200,000 tons.

In March, the *Enterprise* provided air cover for the occupation of Emirau, and on 30 March-1 April, as part of TF-58 made strikes on the western Carolines. The *Big E* also supported landings of southwest Pacific forces at Hollandia.

Early June found the *Enterprise* engaged in the Marianas Islands. On 11 June, she launched her planes against Saipan. The *Enterprise's* share in the destruction of enemy forces included three ships sunk, two damaged, and 39 planes destroyed.

In support of the occupation of Palau, the *Enterprise* and her task force operated in the Volcano and Bonin Islands 31 August-1 September, then moved south to make preliminary strikes on Palau, Yap and Ulithi on

10 September, and remained to support the landings on Peleliu 15 September and operations ashore until the 18th.

From then on action was taken in support of the Leyte Landings in which the carrier conducted preliminary strikes on Formosa, the Ryukyus and northern Luzon (10-15 October). She supported the landing (20 October), participated in the Battle for Leyte Gulf (24-26 October) and continued support of the Leyte occupation throughout October and November.

The *Enterprise* had the distinction of being the only carrier in action against all three of the widely scattered Japanese forces in this operation. *Big E* planes hit the Southern, Central and Northern forces in succession.

COMMANDING OFFICERS OF THE ENTERPRISE

Capt. Newton H. White, Jr.
 Capt. Charles A. Pownall
 Capt. George D. Murray
 Capt. Arthur C. Davis
 Capt. Osborne B. Hardison
 Capt. Carlos W. Wieber
 Capt. Samuel P. Ginder
 Capt. Matthias B. Gardner
 Cdr. Thomas J. Hamilton
 Capt. Cato D. Glover
 Capt. Grover B. H. Hall
 Capt. William L. Rees

THEY SERVED ABOARD

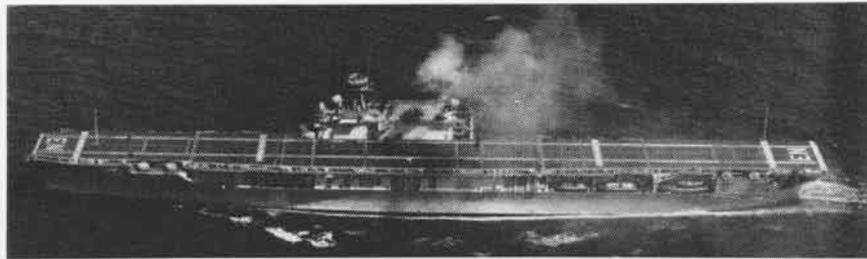
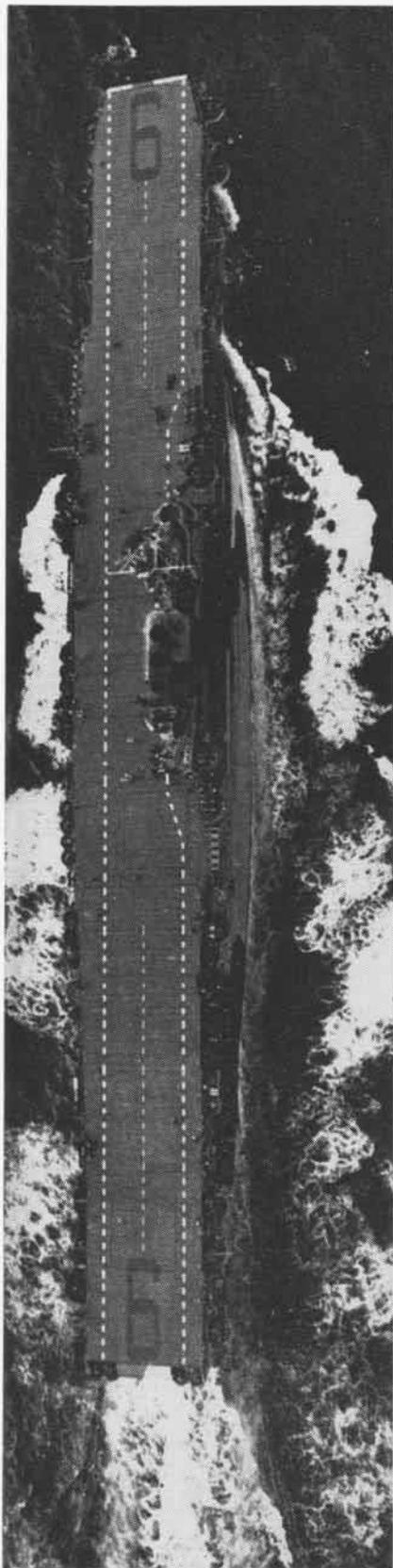
Enterprise Air Group
 VF-6, VB-6, VS-6, VT-6, VB-3

Air Group Ten
 VF-10, VB-10, VS-10, VT-10, VF(N)-101

Air Group Six
 VF-2, VB-6, VT-6

Air Group Twenty
 VF-20, VB-20, VT-20, VF(N)-78

Air Group Ninety
 VF(N)-90, VT(N)-90



THE SHIP'S COMPLEMENT ON COMMISSIONING WAS 82 OFFICERS, 1447 ENLISTED MEN

EARLY the first morning, her planes delivered an attack on the Japanese force in the Sulu Sea, damaging two battleships and a heavy cruiser. That afternoon her bombers blasted the battleship *Musashi*, one of the world's largest battleships, in the Sibuyan Sea. She was sunk by aerial attack alone. The next day, October 25, the *Enterprise* participated in an all-day battle against a Japanese carrier force, assisting in the sinking of four carriers,

Tokyo after which she moved southward to support the assault and capture of Iwo Jima from 19 February to 8 March. Ten days later she went back to Japan with TF-58 attacking targets on Kyushu as a preliminary to the Okinawa campaign. The next day she joined TG 58.2 covering the severely damaged *Franklin's* return to Ulithi.

The *Enterprise* returned to Okinawa support on 8 April and was hit by two kamikazes on the 11th. She retired to



AT THE END OF 1942, THE USS ENTERPRISE WAS THE ONLY CARRIER IN THE PACIFIC

one light cruiser and two DD's.

As 1945 operations opened, the *Enterprise* was a night carrier. With the USS *Independence*, she made up the first night carrier division in the U.S. Navy. Operations of the task force were in support of the landings at Lingayen Gulf and were marked by operations in the South China Sea from 10-19 January. The force ranged south to attack shipping and various other targets as far down as Saigon.

In February, the *Enterprise* participated in the first carrier strikes on

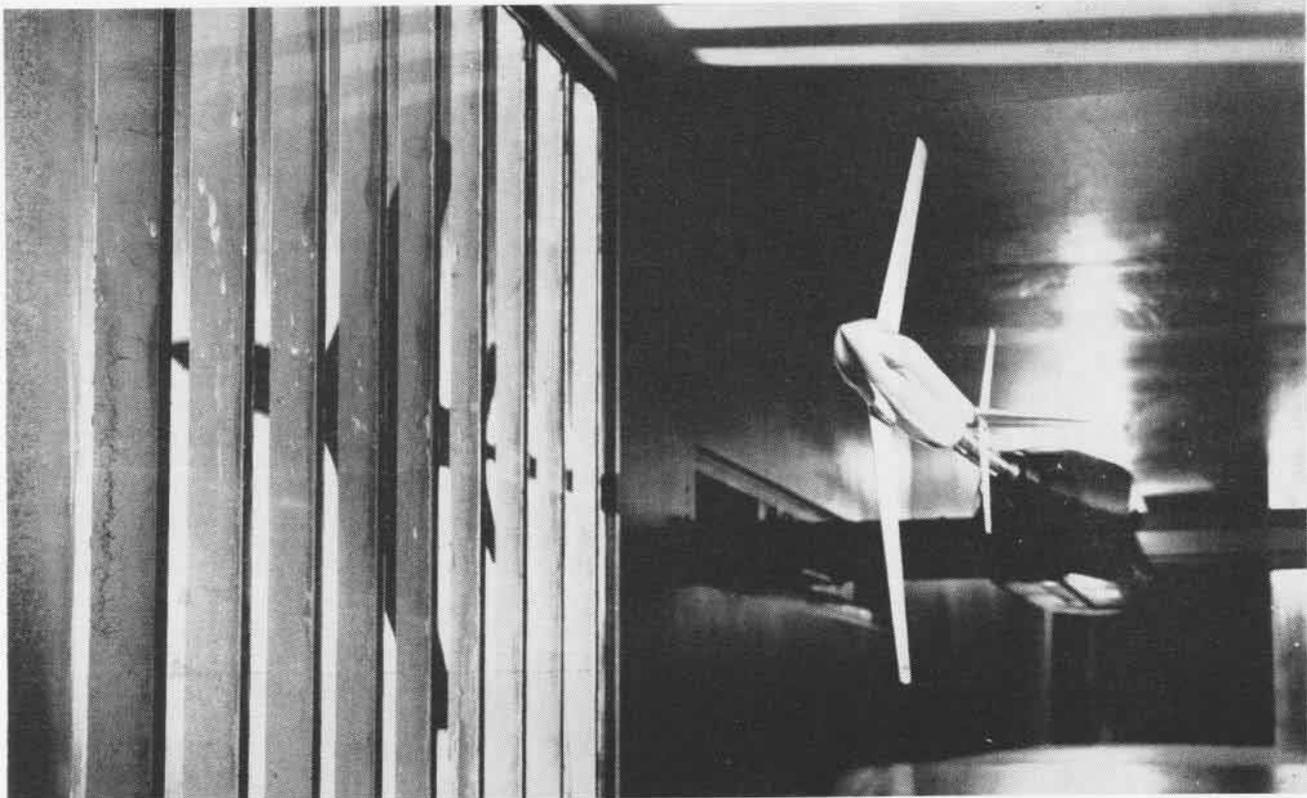
Ulithi, but returned on 11 May to the fray. On the 14th she was hit again by suicide planes and retired. This was the last action for the USS *Enterprise*.

It was age that got the *Enterprise*, not enemy bombs. What the late Secretary of the Navy, James V. Forrestal, wrote in October 1945, is as true today: "Time has accomplished what the enemy failed to do in four years of desperate and costly effort; the USS *Enterprise* must be taken out of service because modern planes cannot be flown in combat from her flight deck."



IN SEPTEMBER 1945, THE 'BIG E' LED TF-1 UNITS OUT OF PEARL, HEADED FOR HOME

SHE LIVED UP TO HER NAME, ENTERPRISE



A SCALE MODEL of the Bell X-2 is ready for calibration tests in the Unitary Plane Supersonic Wind Tunnel. It is mounted with wings vertical and attached from the aft end to a sting support through which pressure tubes and electrical leads pass data for tabulation.

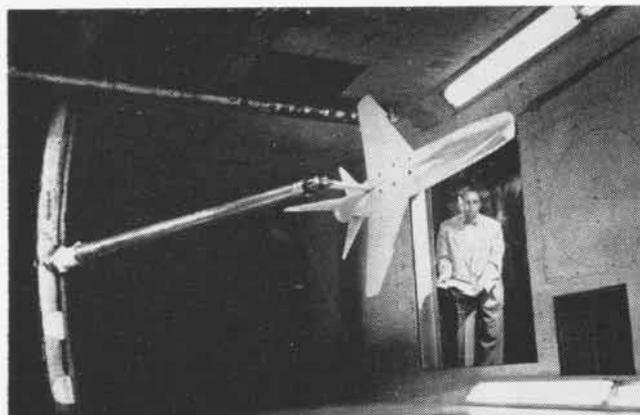
LANGLEY HOLDS TRIENNIAL INSPECTION

TRIENNIAL INSPECTIONS are a tradition of the Naval Advisory Committee for Aeronautics. The one held at the Langley Aeronautical Laboratory down in the Tidewater area of Virginia in October gave 1600 repre-

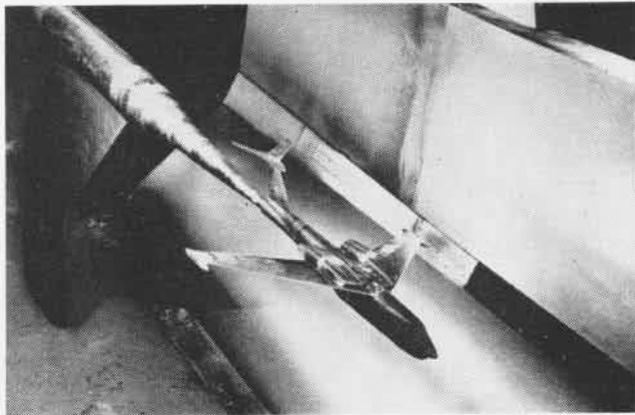
sentatives of the aircraft industry, military services and press a comprehensive view of the problems of flight today—and tomorrow.

Established in World War I, Langley, NACA's first facility, has not lost

the quality that has been the heart of its program—foresightedness. Four decades of experiment have not dulled imagination or wearied scientists in their search for answers to the problems of flight aviators meet today.



TO STUDY the effects of aerodynamic characteristics at altitudes simulating spinning conditions, this scale model XF8U-1 is used.



THE WORLD'S first multijet attack seaplane, the XP6M-1, in scale model form underwent aerodynamic studies in transonic tunnel.

IN 1953, at the last Triennial, it was reported that enough had been learned about the aerodynamics of the transonic range to warrant attempts to design tactical airplanes capable of low supersonic speeds. And indeed this prediction was well founded, for—though it could not be disclosed then—Richard T. Whitcomb had developed the area rule which would be of great value to designers of supersonic airplanes.

Today NACA is focussing its major research effort on two goals: (1) airplanes fast enough to shrink the globe until two points will be within a com-

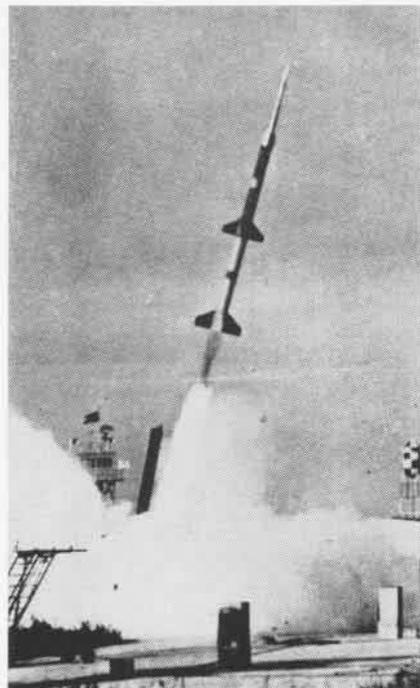
regarding the design of research facilities required.”

Some idea of the problem of aerodynamic heating is grasped when one learns that temperatures generated on the skin of a ballistic missile can become hotter than the surface of the sun. In manned aircraft, the problem of keeping the pilot and equipment cool enough is even more severe. NACA scientists point out that present day fighter planes are at the threshold of serious heating difficulties since the temperature caused by aerodynamic heating can rise as much as 300 de-

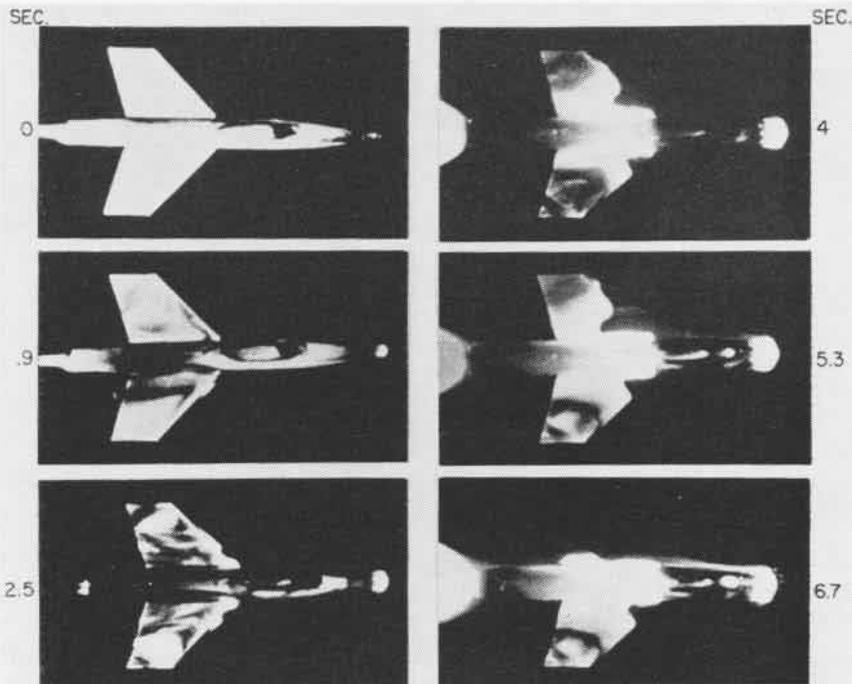
capable of speeds up to 13,000 mph.

NACA's fast, high-flying rockets, fired from Pilotless Aircraft Research Station at Wallops Island, Virginia, carry aloft scale models of aircraft missiles and components. One four-stage rocket-propelled research missile (shown below) attained a speed in excess of Mach 10.4 (nearly 7,000 mph at high altitude) and penetrated more than a million feet into the sky.

In the nose of the research missile was packed instrumentation and telemetering equipment to record and then transmit to a ground receiving sta-



TELEMETERING equipment in the nose of missile transmits data on aerodynamic heating.



THIS SERIES of pictures shows a stainless steel airplane model in a rocket exhaust research jet at Langley Laboratory. As heat is generated, the nose melts and the wings disintegrate.

fortable day's journey, and (2) ballistic missiles that can travel the required distances at desired velocities without being destroyed by aerodynamic heating.

At the opening of the Triennial Inspection, Mr. Floyd L. Thompson, Associate Director of the Langley Aeronautical Laboratory emphasized the immense research problems that lie ahead in developing information that is needed for extremely high-speed, high-altitude missiles and man-carrying aircraft.

"Not only must we learn how to design aircraft capable of flight at high temperatures," he said, "we must also learn much more than we know now

greens (F) at only twice the speed of sound. At three times the speed of sound and 2000 mph at high altitude, the temperature would be about 660 degrees. At Mach 20 and 13,000 mph, the temperature would be above 20,000° Fahrenheit.

But before NACA scientists could study the problem of aerodynamic heating, they had to produce it. Wisely enough, in their research, they have not tried one method, but several to get the answers. Experts have used four-stage rockets zooming 200 miles above the earth, supersonic air jets hotter than a blast furnace, aircraft wings only inches thick, and light gas guns

tion, information about aerodynamic heating. From the ground, the rocket's journey, which ended in the Atlantic Ocean, was monitored by both radar and special photographic equipment.

Operated under Langley's Pilotless Aircraft Research Division are two "hot jet" combustion products tunnels, one of which utilizes gases issuing from a 2½ inch rocket engine. The jet provides temperatures above 4100° to simulate conditions of high speed, high altitude flight. The other combustion tunnel at speeds to 1300 mph makes use of high pressure air which is heated to 3500° by burning ethylene gas in a combustion chamber.

SPECIAL research aircraft are being flown by NACA pilots at the High Speed Flight Station, Edwards, Cal., to investigate the heating phenomena at speeds between two and three times the speed of sound. Despite the recent crash of the Bell X-2, the research plane program is being extended by use of the X-1B and X-1E. The wing of the latter plane has a thickness of only four percent of its chord. Under construction by North American is the X-15, designed to fly faster and higher than man has even ventured.

Langley for several years has been using supersonic air jets to simulate heating and loads on aircraft at hyper-

sonic speeds, but the need has become apparent for much larger jets. One NACA jet is supplied with air heated to 1000° at 3000 psi.

Still another technique, proved only recently in a small pilot model, provides a jet of air heated to 4000° F and corresponding to that encountered above Mach 5. Although it can be maintained for only 20 seconds at a time, the air flow and temperatures possibly match closely conditions experienced in actual flight.

The new Langley supersonic blow-down tunnel, slated for operation next year, will enable NACA scientists to test structural components under conditions of aerodynamic heating and loading in a test section six feet high and 8¾ feet wide at speeds between Mach Nos. 2 and 3.

Design engineers always have had to

consider carefully the problems created by aerodynamic interference which occur when flow around one part of the airplane disturbs another. With the attainment of supersonic flight, these problems have grown in severity and complexity. As the Mach number is increased, pronounced changes occur in the patterns and strengths of the flow.

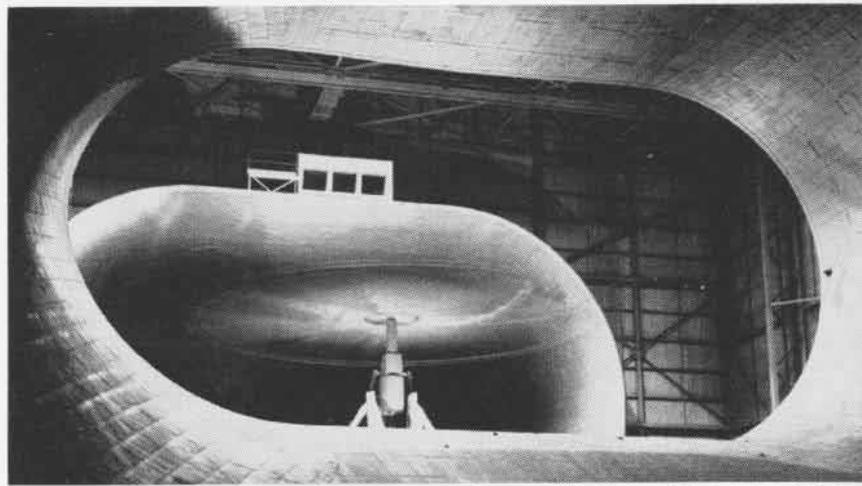
Dr. H. J. E. Reid, Director of the Langley Laboratory, describes the new Langley Unitary Plan Supersonic Wind Tunnel as the result of planning which began in the minds of America's top aeronautical scientists more than a decade ago. It was realized that no single private firm was able to finance

test sections where airplane and missile models are mounted for study is four feet wide, four feet high, and seven feet long. One test section covers a range from 1.5 to 2.7 times the speed of sound—approximately 1100 to 2100 mph—while the other is for scientific studies at 2.5 and 5 times sonic speed—about 1900 to 3800 mph. These figures are based on the speed of sound at sea level of 760 mph.

Newest testing device on display was one designed for the study of aircraft landing load problems. Known as the Landing Loads Track, it has a 50-ton test carriage which is catapulted by a hydraulic jet at speeds up to 150



SMALL RAM jets at rotor blade tips form halo effect above Helicopter Test Tower at night.



THE WHIRLING helicopter rotor is being investigated in simulated forward flight up to 101 feet per second. Rotor tip speeds are tested up to 425 feet per second at the Langley Laboratory.

the construction and operation of facilities required to provide the information needed for supersonic aircraft.

An investigative group formed by the Government studied the situation and concluded that the Government ought to provide wind tunnel facilities for transonic and supersonic aircraft on a unified basis. This has been done, and industry and the military services have available to them the data provided by three large supersonic wind tunnels placed in service within the last year. They are located at Langley Field, the Lewis Propulsion Laboratory at Cleveland, and the Ames Aeronautical Laboratory at Moffett Field. These three NACA wind tunnels cost \$75,000,000.

In the Unitary Plan Tunnel at the Langley Laboratory, two test sections are provided. The working part of the

mph along a 2200-foot track. The carriage is stopped within the last 600 feet by a grooved nose block on the front of the carriage. The block engages five cables stretched across the track. The cables are attached to 20 Navy Mk. IV arresting gear engines, each capable of absorbing 4,000,000 foot-pounds of energy.

A number of propulsion systems were considered by its designers. The hydraulic jet was selected because of its economy of installation and operation. The system costs less than five dollars per shot to operate as compared to rocket power costing about \$6,000 per shot.

Water in the tank is under 3260 psi air pressure. On catapulting, water is forced through the seven-inch diameter nozzle at a maximum velocity of 660 feet per second, by a remote-controlled,

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Water in the tank is under 3260 psi air pressure. On catapulting, water is forced through the seven-inch diameter nozzle at a maximum velocity of 660 feet per second, by a remote-controlled,

quick-opening valve. Incidentally, the largest standard fire hose nozzle is about five inches. NACA scientists when to the New York City Fire Department with the problem, and found that the seven-inch nozzle, especially designed and constructed would give them the water velocity required.

Velocity of the carriage is governed by both the length of time the valve is open and by the air pressure. As the carriage is fired, the water jet is reversed by a specially shaped bucket attached to the main carriage. The jet stream's change in momentum produces a thrust of 400,000 pounds, accelerating the carriage to 150 mph

of aircraft they will use in the future.

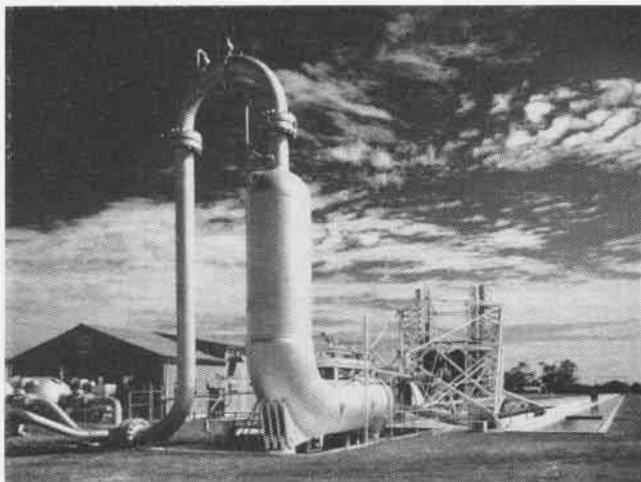
An outdoor water basin is built along the Landing Loads Track to supplement two indoor towing basins used by the Hydrodynamics Research Division of the Langley Lab. An arm on the carriage can tow a model in making high speed hydrodynamic research studies.

For the first time, scientists have been able to measure helicopter rotor blade pressures accurately. Miniature electrical pressure gauges, developed for this purpose by NACA, were exhibited for the first time.

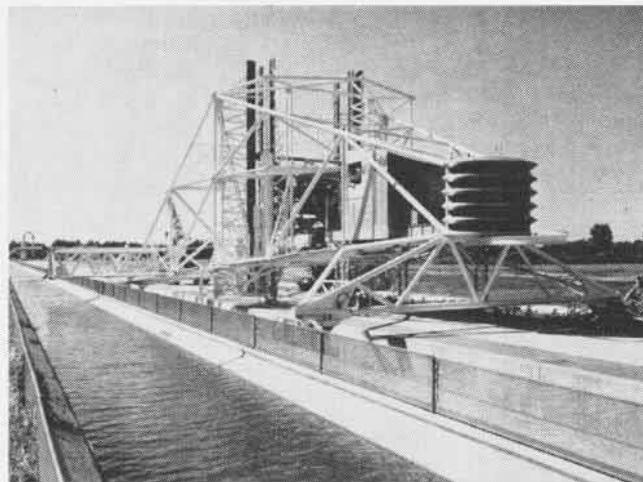
Fifty of the gauges were embedded in a rotor blade installed on a wind

Helping scientists determine what some of these piloting problems may be is a machine which never leaves the ground. It is capable of duplicating the vertical and pitching motions of almost any possible airplane within the limits of disturbances likely to be encountered. It has the unique feature of being able to apply normal acceleration to a pilot who sits in a chair mounted on the machine. He controls his motion by working an airplane control stick.

A slide projector mounted to the chair projects a sighting image on a screen ahead of the pilot. A small red ball strung on fine wires is his target.



STUDIES of ground loads on aircraft in landing is made using a drop test rig catapulted 400 feet in 3.5 seconds along a track.



A WATER jet travelling at a velocity of 450 miles per hour undergoes a 180° change of direction to deliver thrust of 400,000 lbs.

within 400 feet and three and a half seconds. On a small scale, it would be as if you trained a garden hose on an empty tin can, with top removed, and forced it across the ground.

Equipment being tested drops freely from the test rig when it has reached the optimum forward speed, until the desired vertical velocity is obtained. An instant before ground contact, an engine applies a prescribed vertical force to simulate the landing weight of the aircraft under consideration.

Instruments provide scientific data on the landing gear as a shock absorber, the physical nature of skidding processes during wheel spin, the elastic behavior of tires in yawed rolling and similar characteristics. Results are analyzed by NACA aeronautical scientists for use by the aircraft industry and the military services in the design

tunnel model to record the variation and distribution of pressures for a wide range of flight conditions. NACA scientists said the results enabled them to determine the actual rotor lift as well as the magnitude and frequency of the rotor blade bending and twisting moments that are caused by the air loads.

Vibratory loads are being measured on all types of rotor systems, including the single rotor blade and the multi-rotor arrangements, where interference between the blades causes significant differences in the blade loads.

NACA visualizes the flight of tomorrow when pilots will have to master many techniques not faced by today's airmen. Hypersonic planes will fly at speeds many times faster than sound at altitudes well toward the upper limits of the atmosphere of the earth.

The pilot's job is to sight the image on the ball at all times as the ball moves from one height to another.

When the machine duplicates characteristics of the WW II fighter, the pilot has little difficulty keeping the image and ball in line. His problem increases when the machine produces a modern supersonic fighter flying at about 50,000 feet. When characteristics of future airplanes are reproduced things get really difficult. This is especially so during the period the "plane" "re-enters" the atmosphere.

The succession of devices and techniques displayed at the Triennial Inspection of the Langley Aeronautical Laboratory indicated the magnitude of the problems in aeronautics. Such a facility is an assurance of continued rapid improvement in the performance of our airplanes and missiles.



ALEXANDER MAKES A JUMP FROM AN HSS-1

Swimmers to the Rescue Possible Aids for Downed Pilots

Chester L. Alexander, ADT, of VX-1, NAS KEY WEST, is currently testing the theory that a helicopter and an underwater swimmer can often join forces in the water rescue of downed pilots.

Many Navy planes today are equipped with oxygen systems which enable a trapped pilot to survive for a short time, even though his aircraft is submerged. According to tests at the Underwater Swimmers School at Key West, a swimmer equipped with an aqua-lung, and jumping from a 'copter, might reach and free the pilot in time to save his life.

This school at Key West is the only one of its type. It trains Navy, Coast Guard and Army personnel.

New Bombing Range Open Facility Trains for Loft Bombing

Fleet air bombing accuracy received a boost with the commissioning of the "canned run" loft bombing range at NAAS FALLON, a key deployment site for Miramar Fleet Air Detachment.

Although a similar instrumented bombing range has been in operation at NOTS CHINA LAKE for experimental purposes, the Bravo 16 range at Fallon is the first loft bombing range designed primarily for use by fleet squadrons.

Loft bombing is a technique for low-altitude, high speed drops on a target where altitude approach and bomb size make passing over the target dangerous and restrictive.

In loft bombing, the approach is made at high speed and very low altitude, the plane pulling into a high speed climb nearing target with the

bomb being automatically released during the climb. The plane then performs a one-half Cuban 8 maneuver enabling it to retreat along the identical course of approach before the bomb reaches its target.

Bravo 16 Range tracks the aircraft through the entire maneuver and traces the vertical profile of the run on a graph. Speed checks are provided.

At the completion of each run, the graphs and other data are compared to the ideal run for the particular type aircraft. Information on specific errors is passed immediately to the pilot.

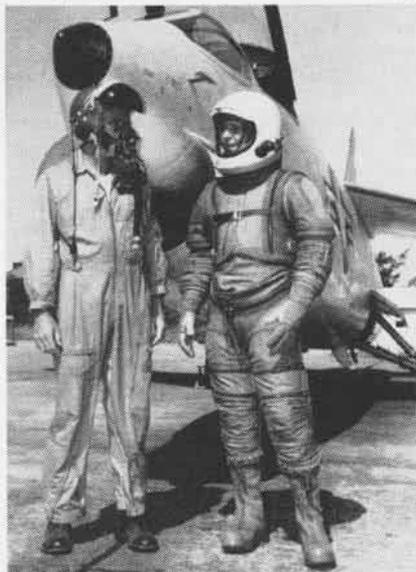
Equipped with positive and accurate knowledge of his errors, the pilot will improve each run he makes.

Civilian Pilot 'Maydays' Atlantic City Rescues Lost Plane

LCdr. C. Anderson of VA(AW)-33 is credited with rescuing a civilian Piper *Tri-pacer*, lost over the Atlantic, 15 miles from the coast.

A faint "Mayday" call was received from the civilian aircraft by the control tower at Atlantic City. The pilot said he was lost and requested a steer.

Lt. C. A. Jantzen, operations duty officer, lifted two AD's out of the FCLP pattern at the air station and sent them out on a search. LCdr. Anderson spotted the plane about 15 miles out at sea, and led the 19-year-old pilot back to Atlantic City.



CONTRAST between ordinary flight suit and new Navy-Goodrich full pressure high altitude suit is shown. At right, John Konrad, chief test pilot for Chance Vought, wears this suit which completely encloses his body.



ASST. SECNAV Albert Pratt presents coveted Conway trophy to Capt. Frank F. Gill, CO, NAS Minneapolis. Award is given to most efficient of 27 Naval Air Reserve facilities.

At the Head of the Class Outstanding Training Record Made

When Ens. W. A. Cargile received his designation as a Naval Aviator, he was climaxing a training period during which he achieved outstanding records. His standard scores for both basic and advanced flight training were the highest possible under the established grading system. His final overall grade, which included flight and ground training, was 81-03. This is, according to Advanced Training Unit 206, the highest grade ever made by a student completing the jet syllabus of ATU 206. According to CNATRA statistics, his grade is one such in a thousand.

Further distinguishing himself, Ens. Cargile set a new gunnery record for ATU 206 students flying F9F-2's, when he chalked up a 38.6 percent score in air-to-air gunnery.

Aviation First Recalled Beginning of Jet Carrier Aircraft

When the McDonnell Aircraft Corporation Management's Club celebrated the first all-jet carrier take-off and landing on the USS *Franklin D. Roosevelt* ten years ago last July, the pilot who made the historic flight attended. LCdr. James D. Davidson, NATC test pilot in 1946, was the one who flew the McDonnell FH-1 *Phantom* on the great occasion.

Today he is Cdr. Davidson and air officer of the attack carrier, USS *Kearsarge*. While in St. Louis, Cdr. Davidson renewed old acquaintances and viewed F3H-2N production lines.

Marines Land Again Join in Operation Teamwork

United States and Thai Marines took part in an amphibious landing demonstration in the Gulf of Thailand during October. Elements of MAW-1, Navy Beach Group One, Pacific Landing Force Training Unit, and U. S. Navy assault ships supported the operations.

The maneuver, known as Operation *Teamwork*, was preceded by two weeks of intensive training and instruction at the Thailand Naval Base at Sattahip, near Bangkok.

Thailand's Royal Marines, with U. S. Marines, Third Marine Division, landed at Had Chao Samran Beach.

Killer Whales Destroyed VP-7 Accomplishes Special Task

Adm. Jerould Wright, Commander in Chief, Atlantic Fleet, has announced the completion of another successful mission by VP-7 against killer whales off the coast of Iceland.

Killer whales annually plague Icelandic fishermen by damaging and destroying thousands of dollars worth of fishing nets. Last year VP-18 destroyed hundreds of killer whales with machine guns, rockets and depth charges.

Before the Navy lent a hand last year, killer whales threatened to cut the Icelandic fish catch in half. This created a crisis because fishing employs about 20% of the population and accounts for the majority of Iceland's foreign currency income.

The Icelandic Office requested help, and Capt. W. A. Sherrill, Commander of the Naval Forces in Iceland, assigned VP-7 to the task of ridding the coastal areas of killer whales. Ranging from 20 to 30 feet in length, they are feared as one of the deadliest of ocean creatures.

Medic on USS Saratoga Flight Surgeon from Puerto Rico

Lt. Caleb Gonzalez, MC, the Navy's first Puerto Rican flight surgeon, participated in a full-scale surgical operation in the ultra-modern operating room aboard the *Saratoga*.

Dr. Gonzalez was a member of the first class to be graduated from the School of Medicine of the University of Puerto Rico. He attended the Navy's School of Aviation Medicine at Pensacola, where he received training which qualified him as a flight surgeon.

Gonzalez is serving with CVG-4, which is conducting operations from the decks of the mighty *Sara*.



VADM. DAVIS JUST BEFORE HIS FLIGHT
**DCNO (Air) Handy in Jets
Inaugurates Anacostia Program**

When the first TV-2 jet trainer was delivered to its future home, NAS ANACOSTIA, VADM. William V. Davis, DCNO (Air) was the first Washington-based pilot to take it off. The complement of two TV-2's is now on hand for pilot proficiency flights for Naval Aviators of the Washington area. The first Anacostia-based jet plane took off on its intended mission with Adm. Davis, an experienced jet pilot, at the controls.

While serving as Director of Flight Tests at NATC PATUXENT RIVER, Adm. Davis flew every jet plane which came through the Center until his detachment in 1950. He has checked out in the F3D, F2H-1,2,3, F7U-1, F9F-1,5, TV-2, French Fouga CM-107, F-84, F-86, FJ-1, and FH-1.

Switching to rockets, he was the second Naval Aviator to exceed the speed of sound, in the D-558-2. Only recently, Adm. Davis checked out in the British *Provost*.

BuAer Wins Safety Award Safety Director Congratulated

The Bureau of Aeronautics has won the annual Industrial Safety Award six times, five consecutively.

At a ceremony in the office of the Chief of BUAER, RAdm. James S. Russell presented Mr. William C. Sexton, director of BUAER's safety program, with the "Secretary of the Navy Award for Achievement in Industrial Safety." This award recognizes the success of BUAER in keeping the accident rate lower than the Navy average.

In passing along the Secretary's award, Adm. Russell congratulated Mr. Sexton for a job well done.



'THUMBS UP!' The new High Speed Refueling System at NAS Moffett Field is ready to go with Capt. Arthur S. Hill, Commanding Officer, opening the first valve. Pilot of the Navy's A4D Skyhawk about to be refueled is Cdr. G. C. Anderson of VF(AW)-3. Facilities of the system include eight stations that accommodate eight aircraft simultaneously. The JP-4 fuel is pumped from a 105,000-gallon tank. Each station fuels an airplane at a rate of 400 gallons per minute.

Christmas Is For Guys And Dolls!



Oh, you great big beautiful doll!



A word on Christmas from an expert.

As the bells ring out "Joy to the World," the occasion is celebrated around the world by officers and men of the United States Navy. Hundreds of parties are given for the children here and abroad. At Christmas time, the ideal of a world at peace finds vivid expression in the spirit of giving.



"I love you, Santa Claus."



"Is this really all mine?"



*To a young Italian lady
from a Bluejacket*



A live doll for Santa



All this—and presents too!

* * *

NOT PIE, BUT PRESENTS FROM THE SKY

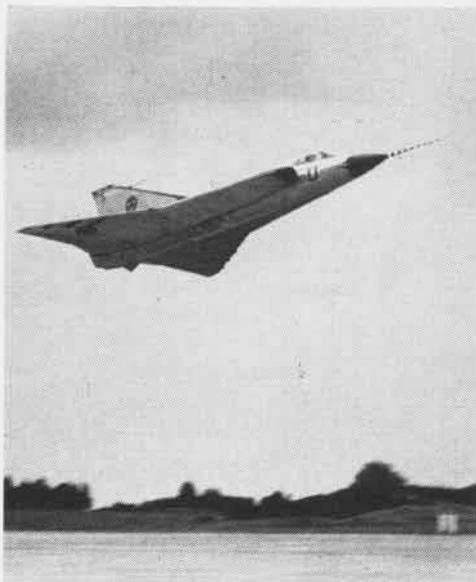
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WHEN SANTA Claus in his Navy blue uniform takes off to make his rounds from NS KODIAK, he uses modern methods. The gifts are carefully wrapped. Then as the Coast Guard UF speeds over tiny settlements, the crew parachutes them down. Over the mountains to the valleys, the UF makes its way. As the aircraft prepares to make its drop, the children rush out to claim the gifts.

There is everything to delight children, but practical presents are not out of order. Coats, scarves, and mittens are welcome in a cold climate.

In these pictures you see Christmas 1955 come to the isolated village of Old Harbor on Kodiak Island. Actually, delivery was made on 21 December, so the presents were put away for Christmas. However, the children were positive the candy couldn't stay fresh until then, so they ate it up.



AVON ENGINE WITH AFTERBURNER POWERS CRAFT



DOUBLE DELTA CONFIGURATION OF THE WINGS IS OUTSTANDING CHARACTERISTIC

SWEDISH FIGHTER IN PRODUCTION

When the new Saab-35 supersonic jet fighter was demonstrated in early October, it was disclosed that the Swedish plane had gone into quantity production.

Three J-35 prototypes were shown on the ground and in the air. The aircraft effectively demonstrated

its short take-off and landing runs as well as its impressive speed. Several low-altitude, high-speed runs and quick rolls revealed its maneuverability. One of the J-35's flew at considerable supersonic speed in level flight at approximately 7000 feet altitude.



ON OCTOBER 5, THE NEW SAAB J-35 DRAKEN (OR DRAGON) WAS DEMONSTRATED FOR THE FIRST TIME TO THE SWEDISH PRESS

NAVAL AIR RESERVES TOP-FLIGHT TEAM

A MIGHTY force, a trained, crack team—this is the Naval Air Reserve. These *Warriors* give up their weekends and 14 consecutive days during the year to keep in top battle readiness. They will be qualified to mobilize for their nation's defense, whenever and wherever our country needs them.

Oakland Air Fair

A spectacular demonstration of military air power was staged at the annual NAS OAKLAND Air Fair. An estimated 150,000 spectators were on hand for the show this fall.

With Reservists participating, the

event featured many of America's newest planes. There were demonstrations, fly-overs, maneuvers, and a static display of Navy and AF aircraft.

Highlight of the five-hour program was the precision flying of the *Blue Angels* and the USAF *Thunderbirds*. Navy and Marine Reservists from Oakland participated in three fly-overs of 16 F2H *Banshees*. Aircraft from Alameda and Moffett Field were also used to demonstrate Naval air power.

Norfolk's 'Miss Cougar'

NARTU NORFOLK has reconstructed from scrap a static display



'CAN I be a sailor like you?' This picture was snapped during NAS Oakland's Air Fair.



'MISS COUGAR' receives her title from lovely Lynette Twyford, Miss Norfolk of 1956.



CAPT. STIELER extends special congratulations to J. A. Norton, AC1, at NAS Atlanta.



THOUSANDS of Spokane residents turned out to see the aircraft displays at the station.



VIEW OF of the Naval Air Reserve display at the Virginia State Fair, at Richmond, Va.



THIS 52F Tracker will replace the AF Guardian at the Lakehurst Naval Air Station.



CUB SCOUTS on tour test low pressure chamber during visit at NARTU Miami facilities.



NAVAL AND MARINE Reservists stand in formation on parade grounds during the annual military inspection at NAS Floyd Bennett Field.



LCDR. AL RHEINECKER, VF-922 CO, receives the "Order of the Banana Tree" from Cdr. Norman Parmley (L) and LCdr. Lawrence Sovanski.

model of the F9F-6 *Cougar*. The model, christened "Miss Cougar" by Lynette Twyford, "Miss Norfolk 1956," made its debut at the Virginia State Fair at Richmond this fall.

In addition to the *Cougar* model, which is complete in every detail, the NARTU exhibit included cutaway jet and piston aircraft engines. The Reserve outfit won first place in educational exhibits in stiff competition.

Atlanta Man Commended

Capt. R. E. Stieler, NAS ATLANTA CO, has awarded J. A. Norton, AC1, a letter of commendation for "alertness and devotion to duty."

Owing to Norton's quick thinking, two possible aircraft accidents were averted. Through his effort, an R4D, which was having difficulty in making its approach, landed safely. A few days later, he ordered a wave-off to a plane whose landing gear was not properly lowered, though the pilot had reported "gear down and locked."

S2F at Lakehurst

The first two S2F *Trackers* have arrived at NAS LAKEHURST. These will give the area Reservists a chance to keep abreast of latest submarine hunter-killer tactics.

Two squadrons are currently beginning the transition to the *Trackers*.

Open House at Spokane

The Naval Air Reserve Facility, Spokane, conducted an open house and air show this autumn. The famed *Blue Angel* aerial team put on an exhibition.

Approximately 75,000 attended the show. On display were 23 aircraft

from the Navy, Coast Guard, Air National Guard, Air Force, and civilian sources. The Navy's *Demon* and HUP-2, and an AF 102-A were put through their paces for the audience.

Adm. Gallery Inspects

RAdm. D. V. Gallery, Chief of Naval Air Reserve, and BGen. A. F. Binney, USMC, conducted the annual military inspection at NAS FLOYD BENNETT FIELD.

The Admiral inspected the Reserve units on the parade grounds while approximately 5000 civilian guests looked on. Fleet Admiral William F. Halsey was among the distinguished guests.

Naval aircraft, in use by the Reservists, were on static display near the parade formation. Families of the men were able to get a first-hand view of planes flown by the Reserve *Warriors*.

Inventor at Dallas

Chief Petty Officer W. B. Webb, of NAS DALLAS, has been awarded a patent for an emergency wave-off signaling device. During a special ceremony, Capt. W. L. Richards, station CO, presented the patent to the inventor.

The invention, described as a "discharge device," is a remotely fired type of Very's pistol. The device makes it possible to alert a pilot that something is wrong with his plane or approach in the final moments of his let down, after the tower, for technical reasons, can no longer communicate with him.

Chief Webb has been working on the invention and seeking a patent for it since 1951. Two other of Webb's patents are pending in Washington, D. C.

VF-922 at Los Alamitos

The St. Louis squadron, VF-922, enjoyed a change of scenery on its two-week active duty cruise at NAS LOS ALAMITOS. Hard work was the order of the day, but all hands had a chance to enjoy the California sunshine.

Pictured above is LCdr. Al Rheinecker, Jr., new squadron CO, who was awarded the coveted "Order of the Banana Tree." The donors are former squadron skippers, Cdr. Norman Parmley and LCdr. Lawrence Sovanski.

BARTU's in Washington

A group of 44 officers, members of West Coast BUAER Reserve Training Units, arrived in Washington, D. C., in mid-October for their 14-day active duty tour. Purpose of the cruise was an orientation course conducted at BUAER itself, where the Reservists learned the organizational set-up of the Bureau, its mission, and methods.

The mission of the BARTU is to provide an adequately trained force of Reserve personnel to be available for mobilization in time of war or national emergency. It will fill a portion of the mobilization requirements of BUAER and its field activities.

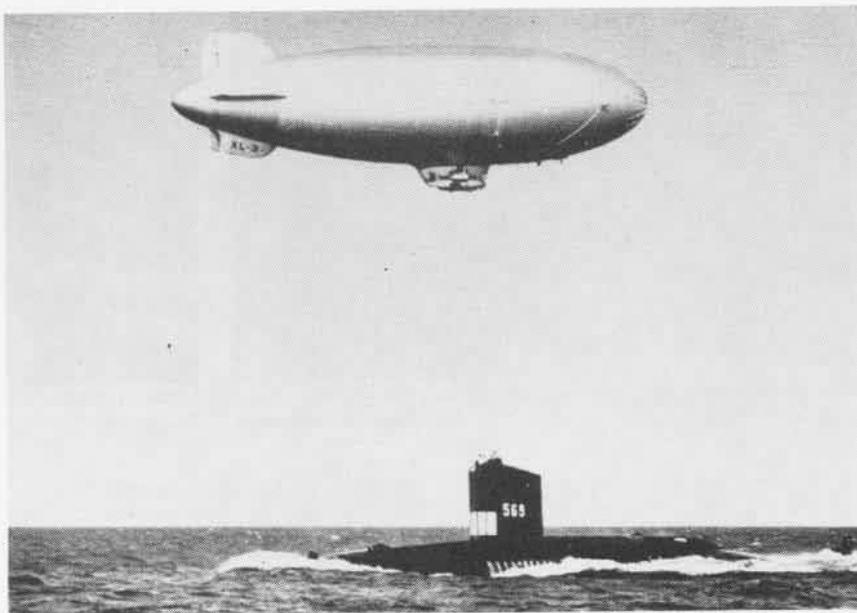
Arrangements were made for the group to visit several Navy installations in and near the Washington area. Among these were NAS NORFOLK, NADMC PHILADELPHIA, NATC PATUXENT RIVER, and the David Taylor Model Basin, Carderock, Maryland.

Represented in this cruise were BARTU's 776, 777, 778, 779, and 873 from the Oakland and Los Alamitos areas. Details of the cruise will be featured in NANews, January 1957.

ALBACORE IS ANOTHER 'BELIEVE IT OR NOT'



SCALE MODEL IN AN NACA WIND TUNNEL



NOTE STRIKING RESEMBLANCE IN CONFIGURATION OF BLIMP AND SCALE MODEL, LEFT

FLYING under water sounds incredible, but it actually happens when the submarine USS *Albacore* takes off. So like flight is the sensation that a heavier-than-air pilot is bound to find aspects of this kind of submarine travel far more familiar than he dreamed.

The submarine was designed for undersea flight on the basis of scale models built and evaluated in towing tests at the David Taylor Model Basin and wind tunnel tests at the Langley Aeronautical Laboratory of NACA. Shaped like a fish with a blimp-like tail, the *Albacore* (AGSS-569) has a single five-bladed propeller 11 feet in diameter. Such is its configuration that, like a plane, it performs better and faster in its natural element, submerged. While going straight on the surface, the bow seems to want to submerge, just as a plane gets up speed and flies itself off. In a submerged turn, the bow tends to rise.

The *Albacore*, termed the world's fastest submarine, is an experimental submersible. Conventionally powered, the vessel has, like other submarines, forward and aft diving planes. But there the resemblance ends. A conventional submarine has a diving officer who, by giving orders to a bow planesman and a stern planesman, as well as the helmsman, controls the path of the ship. The time lag in this system

caused by the necessary thought on the part of the diving master of what orders to give, and the time to relay the orders, is impractical for high speed submarines. At times, it could be dangerous.

In the *Albacore*, all of these functions are handled by the pilot. He has controls and instruments similar to those in aircraft. Seated at the controls, with safety belt fastened, the pilot can put the ship through gyrations which have been named "hydrobatics." They consist of sharp climbing and diving turns which subs have heretofore been unable to duplicate.

Forward and aft movement of the yoke controls the diving planes for



PILOT LT. W. J. HERNDON AT CONTROLS

depth changes. A wheel on the yoke controls the rudder. Experiments on the best instrumentation are still going on, but some of the flight instruments are identical to those in all-weather aircraft.

To a man with wings, the artificial horizon is important. It is equally important in the *Albacore*. A digital gyro indicator presents the course being steered. A rate of dive indicator shows the absolute rate of rise or dive in feet per second. As in a plane, its reading is the result of the speed of the ship and the pitch angle (attitude) being used. The depth error indicator is a linear gauge which shows the difference between the actual depth and desired depth. The desired depth is put in manually by the pilot.

And then there is the "iron mike," or auto-pilot. When the pilot puts the craft on automatic control, the captain can make adjustments on a control panel which cause the ship to turn to a certain heading, climb or dive to a specified depth and at a pre-determined angle of attack.

With the pilot doing the flying, the ship is a bit sluggish in answering to movements of the diving planes, but not nearly as much as conventional subs. It answers the helm immediately and can turn well inside a highly maneuverable destroyer. A number of

HTA pilots have flown the *Albacore*, including some from VF-82. Many have made helpful suggestions on instrumentation and control. One of these will be carried out in the near future, that of putting in "artificial feel" to obviate a tendency on a pilot's part of overcontrol. A number of pilots describe flying the *Albacore* as like "flying instruments with the seat of the pants."

The *Albacore* actually banks in submerged turns. Two things cause this phenomenon. First cause stems from the fact that the center of gravity is below the buoyancy, and then the streamlined sail, or superstructure, knifes through the water to increase the rate of bank. Consideration is being given to removing the sail in order to heighten speed and increase aerodynamic efficiency.

There seems to be no tendency for personnel to experience vertigo, and owing to maintenance of neutral buoyancy, no centrifugal force is felt. Also, because of neutral buoyancy, the ship does not gain speed in a dive, or lose it in a climb (30 degrees maximum). It does, however, lose some speed in turns.

Top speed of the *Albacore* is classified, but it climbs like an SNB under normal power settings. On one such test climb, it went up 200 feet, climbing at a 20 degree angle, at 18 knots, in 35 seconds, or approximately 350 feet a minute.

There is room for improvement in the *Albacore* design, but it is certainly a step in the right direction. As the Commanding Officer, LCdr. Jon L. Boyes remarked: "Flying submarines are today, where aircraft were in the early 1930's."

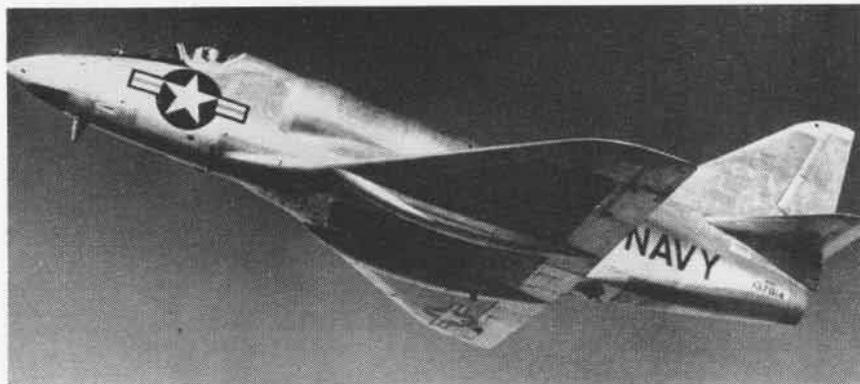
Plans are being made to construct other submersibles in the *Albacore* design. These will undoubtedly be nuclear-powered. The *Albacore* will long be remembered as the pioneer design for flying under water. The ship's motto, *Praenutius Futuri*, which means literally "Portent of the Future" or "Forerunner," was indeed well chosen.

IFR-IQ?

If a taxiing pilot receives a flashing white light signal, what should he do?

Answer on Page 40.

'MIGHTY MIDGET' AT MOFFETT



THE A4D SKYHAWK, THE 'MIGHTY MIDGET,' IS AMERICA'S SMALLEST COMBAT JET PLANE

THE LIGHTEST and smallest of America's jet aircraft has arrived at Moffett Field. The A4D *Skyhawk*, nicknamed the "Mighty Midget," has completed its Fleet Introduction Program at Quonset Point, and has been assigned to VF(AW)-3 for its FIP at Moffett. This is the A4D's West Coast debut.

Four VF(AW)-3 pilots attended the Quonset program: LCdr. E. N. Brown, Team Leader; Lt. L. G. Harper; Lt. W. J. Cooper; and Lt. E. H. Schorz. Maintenance Officer LCdr. L. H. Hunts and 22 enlisted men also were on hand.

The two *Skyhawks* allotted to Moffett Field were piloted from Quonset Point by LCdr. Brown and Lt. Cooper. The flight, covering 2500 miles, was accomplished in approximately six hours of actual flight time, an average of 410 knots.

So small that there is no necessity for incorporating the folding wing principle, this carrier-jet has a wing span of 27 feet, with a 38-foot length—slightly over half the size of many current jet fighters. The "Mighty M" is built around a powerful Wright J-65 *Sapphire* turbojet engine.

The development of this attack plane has brought about an innovation in pilot flight suits. The new integrated torso suit is a snug-fitting garment that includes life jacket, survival equipment, and parachute harness in a single unit. The flight suit incorporates within its structure the combined qualities of a seat belt, shoulder straps, and parachute harness. This leaves the pilot free of the usual encumbrances.

The pilot is held in the seat by four

quick-action fittings. When the pilot ejects himself in an emergency, the whole ejection seat unit flies clear of the aircraft. The seat falls away and the parachute is opened automatically by a timing device. Each ejection unit is equipped with its own oxygen supply. This makes it possible for the aviator to bail out of his craft safely at any altitude.

First flight of the *Skyhawk* was in June 1954. It established a 500 km. closed course world record of 695.163 mph in October 1955.

Although the A4D is designed to carry an atomic weapon, provisions have been made for the adaptation of conventional bombs, rockets, mines, torpedoes, and various other armament.



NEW (L) AND STANDARD FLIGHT SUITS

LET'S LOOK AT THE RECORD

Bouquets for ATU-212 Attains Excellent Flight Record

NavCad W. G. Shapire of ATU-212, NAAS KINGSVILLE, Texas, brought down his TV-2 recently to mark the completion of 10,000 accident-free flight hours for the Unit.

The mission of ATU-212 is indoctrinating student aviators in the ways of the TV-2 jet. During the 131 days in which the accident-free hours were accomplished, 230 fledgling pilots completed training at Kingsville.

Cdr. M. J. Wooley is Officer-in-Charge of the Advanced Training Unit.

Safety Record Made VF-73 Praised for Performance

VF-73 made a perfect safety record during a year's operation. During this time the squadron switched from *Cougars* to *Furies*.

This feat was accomplished during the time the squadron operated from the carrier *Hornet* in the South Pacific from September until December 1955 and during the squadron's operations from NAS QUONSET from January to October. Commanding officer of VF-73 is Cdr. W. J. Ruefle.

RAdm. Dale Harris, ComFAir Quonset, congratulated VF-73 upon its record. "Your commendable safety

record contributed greatly to the all-Navy safety effort and goal of 3.0 in 1956. Well done."

The Navy is aiming for a goal of only three accidents in every 10,000 hours of flying throughout this year.

Award to Navy Man Winner of Model-Home Contest

John F. Cook, Jr., AA, now stationed at NAAS MUSTIN FIELD, Philadelphia, was named national grand-prize winner in the \$1000 model-home contest sponsored by the National Association of Home Builders.

The 18-year-old, from Lenexa, Kansas, won a local competition in Kansas City, Mo. After this victory, Cook's entry was placed in national competition.

The prize money, which must be used for a college education, will be placed in a trust fund until Cook completes his present tour with Navy.

Another Record Set Trans-American Round Trip Fast

Three pilots of VF-144 stationed at NAS MIRAMAR set a round trip trans-continental speed record of 10 hours and 49 minutes when they flew three *Cougar* jets from Miramar to Peconic River Field, Long Island, New York,

and then returned to Miramar. The total distance was 4,924 miles.

The pilots were Cdr. Gerald A. Robinson, squadron CO, Cdr. Donald Michie, XO, and Ens. Ronald K. Hess. A fourth pilot, Ltjg. Harold F. Beers, was grounded at Peconic River Field because of fuel tank trouble.

Only one refueling stop was made on each leg of the trip. Both stops were made at NAS OLATHE. The jets flew at approximately 450 mph at an altitude of 40,000 feet.

The previous record of 11 hours, 18 minutes, 27 seconds was set by Lt. John Conroy of the California Air National Guard on May 22, 1955 when he made the flight in an F-86A *Sabrejet*.

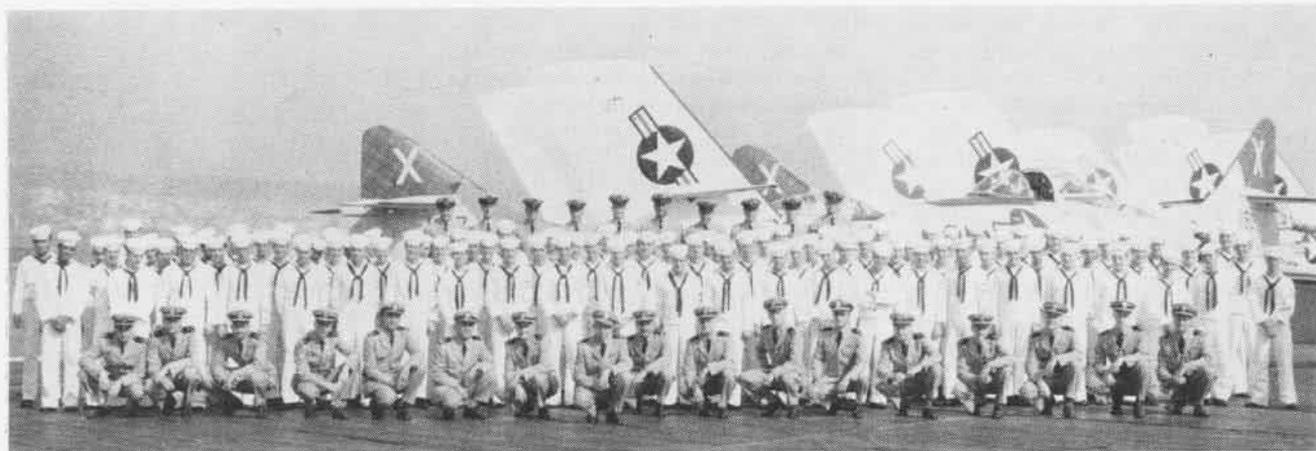
Capt. N. A. Campbell, CO of NAS MIRAMAR, and Cdr. R. C. Tylutki, CO of Air Group 14, were on hand to greet the pilots on their return.

Pilot Makes Record Instructor at BTU-2, Saufley

Lt. Donald R. Hubbs, flight instructor at NAAS SAUFLEY FIELD, has logged 2,000 accident-free hours of syllabus time. His log shows that he has a total flight time well over 3,500 hours.

In October 1955, Lt. Hubbs won a safety award for 1000 hours of accident free instruction time. He reported to Saufley in 1954.

After 35 months in the training command, Hubbs is now slated to attend Photo Interpretation and Air Intelligence Schools in Washington.



VA-46, WHOSE members are called the "Clansmen," is attached to the USS *Randolph*, CVA-15, now with the Sixth Fleet in the Mediterranean. VA-46 claims the distinction of being the first designated jet attack squadron in the Navy, the first operational squadron to carry an atomic weapon on the *Cougar*, both shore-based and ship-based, and

the first operationally deployed squadron to have a real capability in handling air-to-air guided missiles. They were the first operationally deployed squadron to night qualify using the mirror landing system and the first completely equipped with TACAN. These records, VA-46 asserts, were set in a period of approximately 13 months.

NO BUSINESS LIKE SHOW BUSINESS



THE USS PHILIPPINE SEA, CVS-47, RECENTLY BECAME THE FIRST CARRIER TO BE BASED AT LONG BEACH SINCE WORLD WAR II DAYS

AFTER THE USS *Philippine Sea* was converted from a CVA to a CVS-type aircraft carrier early in 1956, she headed south for Long Beach, Cal., where the city put out the welcome

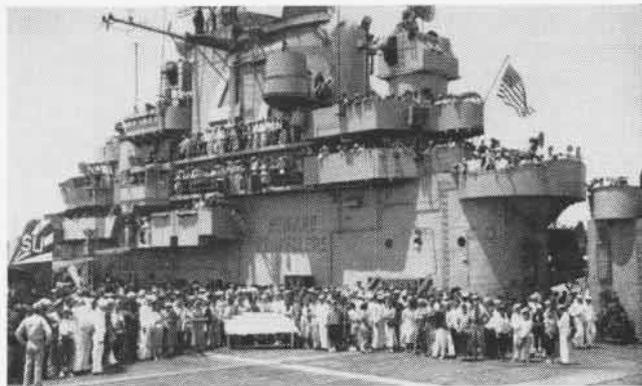
mat. She earned her nickname "Showboat" in 1949 when she visited many a foreign port as a good will ambassador.

Commanded by Capt. E. L. Farrington, she was host this year to several

groups. She also played in an MGM movie and appeared on TV. She is now being readied for her sixth cruise to the Far East, commanded by her new skipper, Capt. G. S. James, Jr.



BOYS ON TWO BUDDY CRUISES ENJOYED LIFE ON A CARRIER



DEPENDENTS WERE INVITED TO SEE WHERE THEIR MEN WORKED



ACTOR DAN DAILEY (C) DISCUSSES AN S2F FLIGHT HE TOOK



THOUSANDS OF BOY SCOUTS IN SAN FRANCISCO CAME ABOARD

IN FOREIGN SKIES

Experimental Air Center

An agreement to establish a new training center for experimental aerodynamics to serve the NATO countries was signed in October by representatives of Belgium and the United States. The Center will be at Rhode St. Genese, near Brussels.

The two countries have agreed to finance jointly the operation of the Center for a period of two years. It is expected that NATO will subsequently undertake the financing.

The Center, an educational and training facility for postgraduate study and research in the aeronautical field for students and young engineers of the NATO nations, will offer a two-year course. The first year will be devoted to study, the second to applied research. The Center can accommodate 20 students, and the first group already has been selected from applications received from eight NATO nations.

This is the second project of its type designed to serve NATO defense needs. The SHAPE Air Defense Technical Center was established at the Hague in 1955 for NATO members.

British Officers Visit

Three Royal Navy aircraft maintenance officers visited Naval Air Facility, Litchfield Park, Arizona. They were Capt. L. C. Beard, Cdr. T. R. Cruddas, and LCdr. C. H. W. Clarke. They were accompanied by Cdr. J. A. Laurich of the Bureau of Aeronautics.

The officers were visiting various naval aeronautical facilities throughout the United States. During their visit at Litchfield Park, aircraft preservation problems were discussed.

The officers witnessed a demonstration of preservation techniques. The visit concluded with a tour of the extensive desert storage areas.

ICAO is Honored by Award

On October 12, the International Civil Aviation Organization officially received from the Honorable Vittorio Pertusio, Mayor of Genoa, Italy, the

Christopher Columbus International Communications Prize. The ICAO, which is an United Nations organization in the field of aviation, has its headquarters in Montreal, Canada.

The prize of five million lire was presented on the occasion of the Fourth International Communications Congress at Genoa in connection with festivities honoring Christopher Columbus. The award is made to the individual or institution which, through discoveries, activities or initiative, makes the greatest contribution during the preceding four years to the development of communications between men.

The prize is given in the hope of fostering understanding and cooperation between peoples and facilitating the exchange of ideas.

'Magister' is Flown by NATC Pilots

A Parisian atmosphere prevailed at NATC PATUXENT RIVER when the French CM-170 *Magister* trainer was put through its paces by NATC pilots. RAdm. Duerfeldt, CO of NATC, also made a flight.

Manufactured by Fouga of Toulouse, France, this plane is already in use by the French Air Force as a basic and primary trainer. The purpose of these tests is to determine whether the plane would be of value to the Navy's air training program.

The all-metal, mid-wing, V-tail jet plane cruises at 200 knots and has a



JAPANESE ordnance experts toured the USS *Bon Homme Richard* in Yokosuka. Some 180 industrial, civil and business leaders participated. Here they view a Navy Banshee.

maximum speed of 400 knots. Armament consists of 30 cal. machine guns. The plane also carries a complete fire control system. Most unusual for a plane of its type, however, is a periscope mounted at eye level in the rear cockpit to aid in forward vision.

The Fouga, as it is popularly known, is handled by an all-French crew. Jacques Grangette is the civilian test pilot and Gerard Garnault, the flight mechanic. Flight Test was fortunate enough to have an interpreter, Airman Maurice Comtois, who did his job very efficiently.

Helicopters for Sweden

In a speech which he made before the Royal Naval Association, Swedish Navy Chief, VAdm. Ericson announced plans to form a naval helicopter unit.

He indicated that tests carried out in recent years supported this proposal. He spoke of the wide use of helicopters made by the United States Navy and said that he considered it necessary to have rotary wing craft an integral part of the Royal Navy.

According to reports, the first order will be for twelve helicopters.

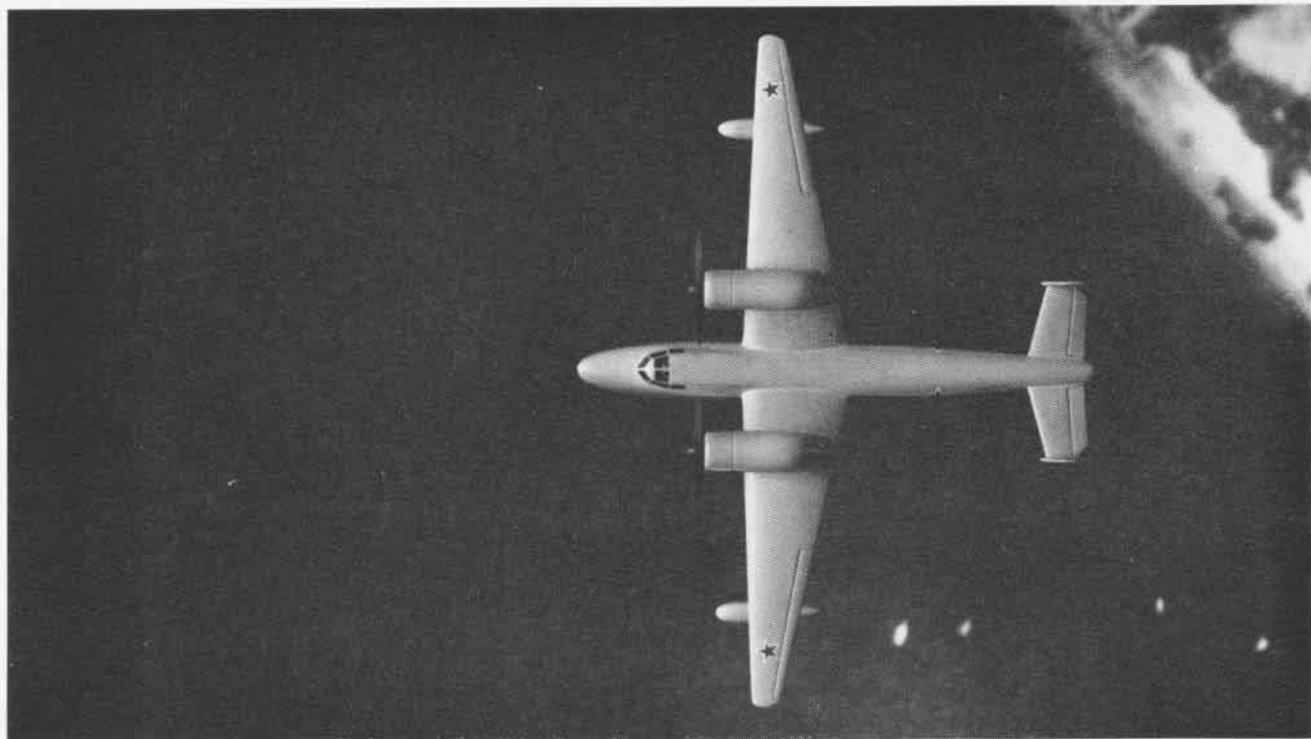
USSR Torpedo Drops

An article in the *Soviet Fleet* describes the dropping of an aerial torpedo at high speed. The article opens with a description of the arrival of several Navy Air Force officers aboard a trawler. The trawler tows a target into the firing range.

Shortly after reaching the range, an aircraft is sighted over the target releasing its torpedoes. "Multi-colored domes of small parachutes, like flak, burst open one after the other at a predetermined altitude and follow the path of the torpedo so as to soften its fall.

"In another moment, the torpedo leaves behind a white trail on the surface of the dark blue sea. Despite great speeds involved, the pilot had been able to determine exactly the aircraft's angle of approach, its maneuvers, the release of the torpedo, its flight path, and its gliding on water and at the target.

"He had entered his observations in a notebook. It is late at night when the training ends, and each of the aircraft crews taking part . . . receives thanks for the good job. . . ."



USSR PATROL AIRCRAFT MADGE



The Madge, a USSR Navy long-range reconnaissance aircraft looks something like the Martin Mariner. The Madge's high gull wing, twin tail with dihedral, and heavy fuselage make for this similarity.

The engines mounted on top of the wing appear extremely large. The fuselage carries its size well

aft, with the after step break occurring just below the tail. Outboard of the engines, the wing tapers sharply on the trailing edge to a sharp tip.

Constructed of metal, Madge has a gross weight of about 50,000 pounds, a maximum speed of approximately 165 knots, and a wing span of some 100 feet.



VA-126 SETS RECORDS AT FALLON

VA-126 SPENT two and a half weeks at NAAS FALLON. According to squadron report, it flew more hours, made more sorties, and dropped more bombs than any previous *Cutlass* squadron. It produced a better squadron average in high altitude dive-bombing and polished off its deployment by qualifying more of its pilots for the coveted individual "E" than any squadron in any type of aircraft.

As the newest F7U-3 squadron on the West coast, VA-126 was commissioned in early April under the command of Cdr. G. L. Cassell. Cdr. Cassell set the pace for the deployment himself on the first morning at Fallon by flying the earliest hop, at 0620. Throughout the two and one-half week stay, he led his squadron in bombs dropped and hours and sorties logged. He was also the first pilot to qualify for an "E." In 14 flying days, VA-126 logged 424.0 hours and 511 sorties.

Fresh from VX-5 at NAS MOFFETT, LCdr. William W. West, Operations Officer, was convinced that any pilot could be taught to dive bomb with consistent accuracy. Determined that above all else VA-126 would be a safe squadron, he personally flew the first five familiarization hops with each new *Cutlass* pilot. Slowly he developed in each one that confidence and skill which are basic to so exacting a job as dive-bombing. His preparatory syllabus meant later success.

When the Fallon deployment came along, the squadron was ready for intensive work on their first operational commitment, high-altitude dive-bomb-



LCDR. J. S. WEISS, EXEC, SHOWS DIVE

ing. The squadron dropped over 1900 practice bombs preparing for the competitive exercises conducted by Cdr. R. E. Elder, CAG-12. And the results were spectacular! Eleven of the squadron's 18 pilots, or 61% qualified for the individual Navy "E," dropping their one bomb apiece within the prescribed standards for excellence. The squadron average error was less than 400 feet, an achievement in the history of high-altitude dive-bombing.

Apparently LCdr. West's conviction that he could teach any pilot to dive bomb was justified. Of the 11 "E's," seven of them were dropped by first tour pilots with fewer than 500 hours apiece. LCdr. West's enthusiastic leadership paid off.

The maintenance crew had an important hand in the outstanding squadron record. On two shifts, covering all but three hours of the 24 in a day, they volunteered to work overtime to provide a high aircraft availability. They did a fine job, too, for the average availability was over 80% for the 12 aircraft flown to Fallon; and all 12 flew back to Miramar upon conclusion of the deployment.

Line Chief H. C. Jones, ADC, managed to clip the turn around time on his planes from sixty to twenty minutes, and he did it with a crew which was new not only to the *Cutlass* but to the Navy as well.

But another record not shown is one less tangible. The fact that 424 pilot hours and 10,200 maintenance hours were co-ordinated into a successful deployment only suggests the spirit of co-operation that prevailed.



CHIEFS MAGNUSON AND JONES WITH F7U-3

LTA Pilot is Honored President Presents Harmon Trophy

On October 23, President Eisenhower presented the Harmon International Trophies to the 1956 winners in a ceremony at the White House. One of the winners was LCdr. Charles A. Mills, USN.

He received the "Aeronaut" (lighter-than-air) trophy for operating his airship in an ice-accreting experiment unparalleled in airship history. LCdr. Mills was in charge of the airship all-weather evaluation project from July 1954 until February 1956. He directed operations in the vicinity of NAS SOUTH WEYMOUTH, flying frequently under instrument conditions and doing his work during periods of heavy icing and extreme vibration.

At the same time LCdr. Mills received his award, the "Aviator" trophy was presented to Group Capt. John Cunningham of England. Capt. Cunningham piloted the de Havilland *Comet III* on the first around-the-world commercial jet-propelled flight, covering a distance of more than 30,000 miles in a total flying time of 56 hours.

The "Aviatrix" trophy was given to Mme. Jacqueline Auriol of France on the basis of her piloting a jet-propelled fighter plane at a speed of 715.35 mph. She thus became the world's fastest woman pilot. This is the third time Mme. Auriol has been awarded the Harmon Trophy.

Recognition by the Harmon Trophy Committee is given annually for "the most outstanding international achievements in the arts and/or science of aeronautics for the preceding year with the art of flying receiving first consideration."

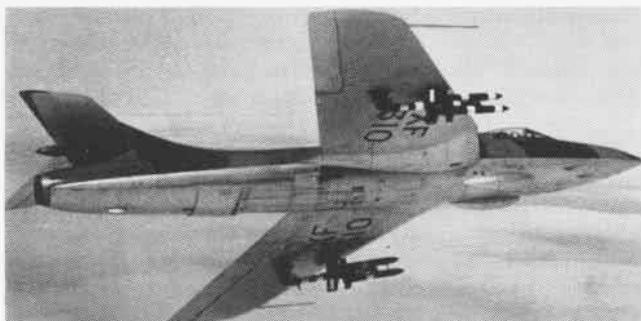
At a luncheon honoring the trophy winners after the presentation, Adm. Arthur Radford, Chairman of the Joint Chiefs of Staff, was the principal speaker. Mr. William R. Enyart, past president of the Federation Aeronautique Internationale, was toastmaster. The luncheon was given by the de Havilland Company at the Sheraton-Carlton Hotel.

Others on the program included the Hon. John E. Coulson, British Charge d'affairs; His Excellency Herve Alphond, French Ambassador, VAdm. Charles E. Rosenthal, RN, and Mr. A. F. Burke, Managing Director of the de Havilland Company.



IN THIS FLIGHT, THE HAWKER HUNTER MARK 6 IS CARRYING TWO 100-GAL. EXTERNAL GASOLINE TANKS AND 24 THREE-INCH ROCKETS

BRITISH MISSILES ARE NOW DISPLAYED

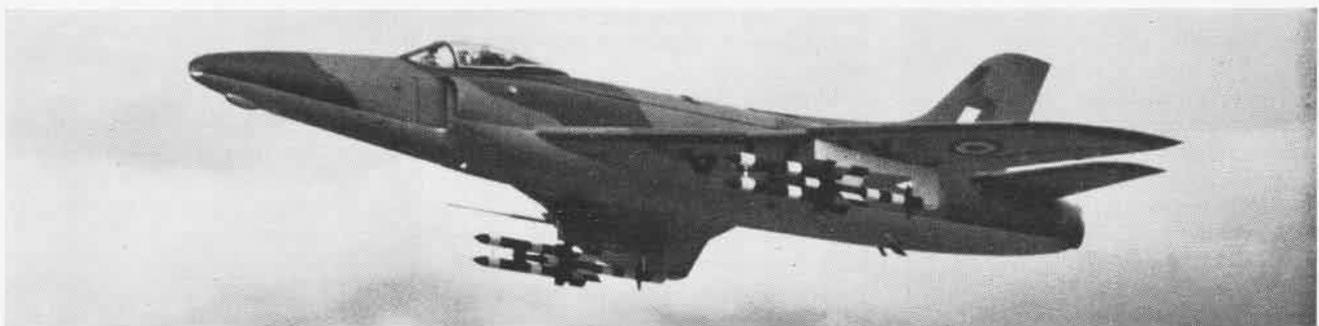


THE HUNTER MK.4 IS SHOWN ARMED WITH FIREFLASH MISSILES



THE SEAHAWK CARRIES BOMBS, WING TANKS, ROCKETS AND GUNS

★ The Fairey Fireflash air-to-air weapon has been described as the first British guided missile to have destroyed a target aircraft. It is also the first such weapon to be delivered in quantity to the RAF. It has no engine, but is accelerated to supersonic speed by upper and lower booster motors. Some dozen Fireflashes were displayed at Farnborough as well as a huge array of missile accessories. ★



THE PROTOTYPE SUPERMARINE MARK 7 SWIFT IS FITTED WITH TWO FAIREY FIREFLASH MISSILES, BUT IT CAN CARRY FOUR

BUAER ESTABLISHES AVIONICS DIVISION

THE RAPID expansion of electronic techniques into the armament and navigation fields in combination with aircraft has prompted the Bureau of Aeronautics to combine certain previous organizational units into a new division. The Avionics Division made its official debut August 15 with Capt. W. E. Sweeney as its first director. Assistant Director is Capt. E. C. Callahan, and chief technical assistants are Dr. L. H. Glassman and Mr. J. M. Brearley.

The interlocking effects of research and design in the fields of armament, fire control, and navigation with the older electronic equipments such as communications and radar—and the great impact of the whole on aviation—led to the use of the term "avionics." This word is a combination of the first syllables of the word "aviation" and the last syllables of "electronics."

In a day in which the development of avionics has caused such terms as "weapon systems," "system concept," "system manager," etc., to become fairly common, there was a need to streamline organization so that there might be some central unit which would know the problems to be encountered and the direction of the solutions. It was getting more and more difficult to know where to turn for information on a particular technical matter. Officers in the Fleet and representatives of Industry or other services were hard put as to whether to turn to the Bureau of Aeronautics, the Bureau of Ordnance or the Office of the Chief of Naval Operations when a matter of avionics was involved.

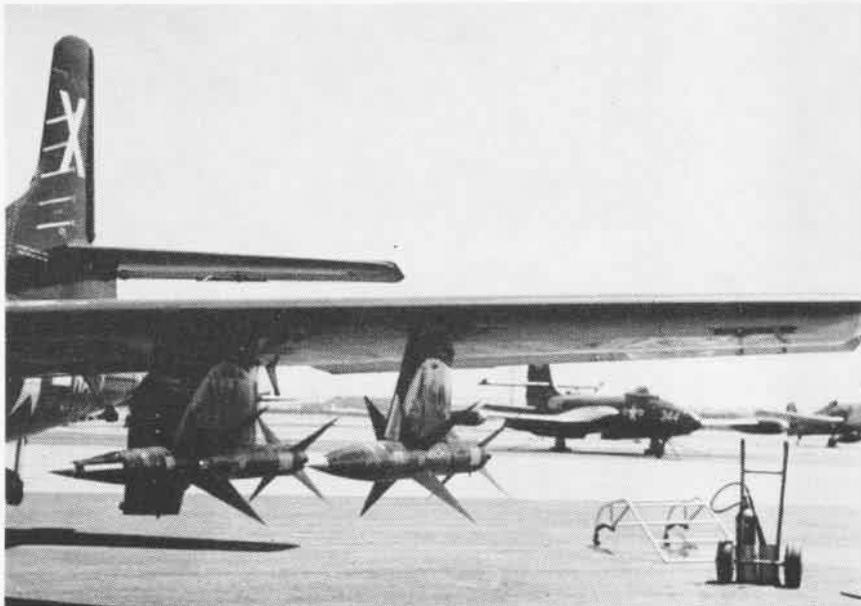
The new organization uses personnel already trained in the old. The same experts previously engaged in the various fields of research and development continue to serve.

In establishing the Avionics Division, these changes took place:

1. The Armament and Electronics Divisions were disestablished and personnel drawn from them formed the Avionics Division.

2. Navigation, formerly with the Airborne Equipment Division, became part of the Avionics Division.

3. Tow Targets and Armor, previously in the Armament Division, were transferred to Airborne Equipment.



SPARROW AIR-TO-AIR MISSILES ARE NOW OPERATIONAL ON NAVY AND MARINE AIRCRAFT

4. The Electrical Branch (formerly in the Electronics Division) was transferred to the Airborne Equipment Division.

Earlier action had transferred all aviation fire control from BUORD to the Bureau of Aeronautics.

The Avionics Division is so organized as to bring together all units that should be properly associated in the development or research in a particular area. The Director and Assistant Director have four support Staff units, the names of which fairly describe their activities: Plans, Fiscal, Administration and Fire Control Support. These are headed by Cdr. L. C. Powell, Cdr. J. C. Kemp, Jr., Cdr. L. C. Morse and Cdr. R. W. Laughead respectively. Fire Control Support is included in the Staff, rather than Line, organization because it operates in the field of maintenance and procurement of equipment rather than in its research and development.

There are three Line units: Weapons Delivery Systems, headed by Cdr. R. J. Schneider, includes missile guidance, fire control design, radar and weapons. Aircraft Weapons Systems Management, under the direction of LCol. L. F. Fox, is concerned with undersea warfare systems, fighter operations systems, attack systems, as well as utility, training and support, and AEW sys-

tems. Weapons Support Systems, directed by Cdr. F. I. Faulkner, involves communications, navigation, IFF, electronic countermeasures; underwater search, detection and classification, and technical support.

Each line group, headed by an assistant director of the Division, is responsible for research and development of the components and systems within his jurisdiction. The Weapons Systems Management Group, for example, is charged with the responsibility of combining components, sub-systems and systems into single weapon systems for various types of aircraft.

The Avionics Division relies on BUAER field activities and field activities of other bureaus to measure the performance of new systems. Such field activities are the Naval Air Test Center, Patuxent River, Md., the Naval Air Missile Test Center, Pt. Mugu, Cal., the Naval Air Development Center, Johnsville, Pa., the Mine Countermeasures Facility at Panama City, Fla., the Special Weapons Unit at Albuquerque, N. M., the U. S. Naval Avionics Facility, Indianapolis, Ind., the Naval Ordnance Test Station, China Lake, Cal., Naval Research Laboratory, Anacostia, D. C., the Naval Aviation Ordnance Test Station, Chincoteague, Va., and the Naval Electronics Laboratory, San Diego.

Aerologist Presents Paper Delegate to International Meet

Lt. Alfred N. Fowler, Aerological Officer of the Navy Hurricane Hunter squadron at NAS JACKSONVILLE, presented a paper in late October to the International Conference on Radio and Sonic Aids in Marine Navigation held in Hamburg, Germany.

Material he gathered as navigator, pilot and flight aerologist during six seasons of hurricane hunting has made him a specialist.

Lt. Fowler reported on five different flights into hurricane Betsy of 1956 as well as highlights from past seasons.

The use of AEW radar in storm detection and the importance of the Loran navigation system for long overwater flights were included. Part of his paper is to be published by the conference committee.

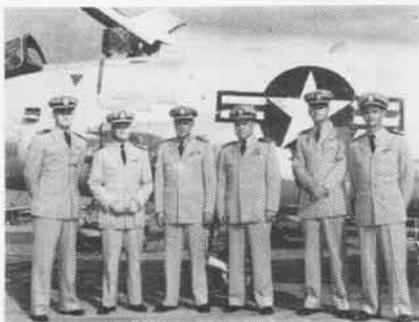
First F8U Squadron VF-32 Takes Indoctrination Course

The nucleus of the first Navy F8U-1 *Crusader* squadron has completed a four-day indoctrination training program in the fighter at the Chance Vought plant.

Cdr. G. C. Buhner, VF-32 CO (fourth from left in picture), headed the six officers who went through field service's ground training course. Nine pilots of VX-3 and VF(AW)-3 also took the course.

Based at Cecil Field and currently equipped with F9F-8 *Cougars*, VF-32 is slated to receive the *Crusader* this winter. Pilots who took the training with their skipper are: Lt. J. P. Allen, Lt. M. G. McCanna, Jr., Lt. H. E. Rutledge, and Lt. D. D. Davison.

The indoctrination course consisted of familiarization with the cockpit, fuel system and J-57 engine. Instruction also covered controls and stabilization, and utility systems.



VF-32 PILOTS TRAINED AT CHANCE VOUGHT

FASRON-102 OPENS SCHOOL



A CLASS SHOWN WITH INSTRUCTOR HOPWOOD AND THE GTC-85 WHICH IS CARRIED BY A3D

FLEET AIRCRAFT Service Squadron 102, NAS NORFOLK, has opened a school in light field maintenance and servicing of gas turbine power units and gas turbine compressor units.

Instructors are Airesearch factory representatives, Bob Bowles and Ken Hopwood, who teach a one-week course on the two gas turbine compressor models in current use, and on alternate weeks, a similar course on gas turbine power units.

The school is an outgrowth of the GTP-GTC shop maintained by FASRON-102 since December 1953. At that time, the patrol squadrons were turning to P5M *Marlin* seaplanes, and new aircraft, Navy-wide, were being converted to alternating current for the operation of certain equipment.

The Navy's first widespread use of an electrical power unit capable of producing stable alternating current as well as long-used direct current for aircraft circuits was in the *Marlin*. The unit was compact, lightweight, and had good control characteristics. Properly maintained, the gas turbine power unit performed admirably. Its use was extended to R7Y and R6D aircraft.

At the same time, the gas turbine compressor came into use. This unit is now used on any aircraft having a gas turbine starter, such as the F11F, A3D, A4D, and the F8U. It is also used on aircraft carriers as a starting device for jet aircraft. Highly versatile, it may be suspended from a bomb-rack of a jet fighter plane or installed in the

bomb bay of heavier patrol aircraft.

As early as 1953, FASRON-102 was employed as a Class C maintenance activity for GTP units, and later was designated at a GTC-GTP activity for all ComAirLant units. Maintenance department petty officer J. L. Dunn, AD1, and Airesearch representative, Ken Silvers, pioneered in developing test equipment and servicing techniques.

Because of the experience gained in the field of gas turbine power and compression units, FASRON-102 was selected by ComAirLant to conduct a school on the subject, and the first class was held on 13 August 1956. All quotas are assigned by ComAirLant upon request of units, including the U. S. Coast Guard, which utilize gas turbine compressor or gas turbine power.

In its first six weeks, the school instructed 58 men. It proved an effective method of training them to maintain highly complex equipment.



KEN SILVERS EXPLAINS OIL PUMP UNIT

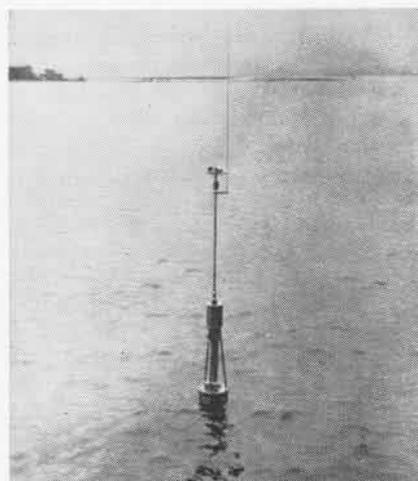


BECAUSE OF poor sea conditions, this A1-2 was catapulted off the Lexington, berthed at Yokosuka Navy pier. Lex planes flew to Atsugi where crews continued their training.

Floating Weather Buoys Six-hourly Information Broadcast

A number of instrumented weather buoys have been launched by the Navy along known hurricane paths off the southeast coast of the U. S. These free-floating, bright yellow buoys will provide regular weather reports in the tropical Atlantic Ocean, the Caribbean, and Gulf of Mexico, in areas where hurricanes spawn or move.

By using these buoys, the U. S. Navy weather facilities may be able to detect or locate hurricanes at an early date, in areas where only occasional ship reports are now available. The device was developed for the Bureau of Aeronautics by the National Bureau of Standards and the Naval Research Laboratory. Over-all length of the buoy is 25 feet, of which 14 feet is below the surface of the water. Its



FREE-FLOATING ROBOT WEATHER STATION

total weight is slightly over 300 pounds.

Above the water is a superstructure containing instruments, and a seven foot whip antenna. The automatic weather station will transmit by radio each six hours over ranges in excess of 1000 miles. The information to be broadcast by the robot weather observers includes wind direction and speed, and air and sea water temperature.

Positions of the buoys will be determined daily by radio direction finders. At the end of the hurricane season, they will be picked up by Navy ships for use next season.

Navy Neptunes Get Skis Equipped for 'Deepfreeze' Use

Four jet-equipped P2V-7 Neptune patrol bombers are being fitted with over-sized skis by the Lockheed Aircraft Corporation. They will be used in the Antarctic during *Deepfreeze*.

Five feet wide and 16 feet long, the skis are made of composite aluminum alloy and steel. They will be attached to the two-wheel main landing gear. A smaller ski is to be mounted on the plane's nose landing gear.

In gear-down position, the Neptunes' wheels will be stationary, while the skis are movable, thus permitting either wheel or ski landings. With the gear up, the skis will serve as landing gear doors.

Last AD-6 Model Accepted Douglas Turns to Building AD-7

With delivery of the last AD-6 to the Navy, the *Skyraider* production lines at Douglas Aircraft's El Segundo Division are now devoted to the AD-7, latest in the *Skyraider* series.

The final AD-6 was accepted by the BAR pilot, Lt. John A. Romano, and flown to NATC PATUXENT RIVER, by Cdr. L. E. Burke.

A single-place version of the famed "Able-Dog" series, the AD-6 attack bomber was one of 50 model designations and approximately two dozen different configurations produced by the Douglas El Segundo Division during the past 11 years.

In continuous production since its first flight on March 18, 1945, the AD *Skyraider* has become one of the most famous propeller-driven aircraft. More than 3000 have been built.

The first AD-7 deliveries have already been made to the U. S. Navy.



RADM. J. B. Pearson, Jr., *BnAer General Representative, breaks ground for new BAGR building in El Segundo, as T. E. Springer, vice-president of Douglas Aircraft, assists.*

Chalk up One for VW-11 Outstanding Utilization of WV-2

While deployed to Argentina, Newfoundland, VW-11 has set what it believes is a utilization record for WV-2 radar *Constellations*.

During August, the squadron flew a total of 1462 hours of operational early warning barrier flights. The daily utilization hours per aircraft was 5.24.

Star performer was plane number five (below), which flew 219 hours during the month. In the picture is the crew which flew it over the 200-hour mark, together with the squadron's XO, Cdr. C. A. Skinner, and the maintenance control officer, Cdr. Ray Newman. PPC on this flight was Cdr. L. E. Lewis.

The next day another crew skippered by LCdr. A. E. Linder flew the same plane to bring its total to 219 hours.

Crews worked seven days a week to meet VW-11's aircraft commitments.



CREW PUT THIS WV-2 THROUGH ITS PACES

JP-5 BECOMES FUEL MAINSTAY

WHEN CDR. R. W. "Duke" Windsor, Jr., piloted his F8U-1 *Crusader* to a record-smashing 1015.428 miles per hour, the fuel that gave him power was JP-5. The *Crusader* gobbled it up at the rate of about five quarts a second as Windsor swept down the measured 15-kilometer course at Inyokern, California.

Actually, the plane was using less fuel at 40,000 feet than it does when flying with afterburner at lower altitude. Jet engines are more economical on their fuel at high altitudes.

Windsor turned on the plane's afterburner soon after he reached the speed run altitude and kept it on over the course, around the 85-mile circle at the north end and back down the course on his south run. Fuel consumption of a jet engine with afterburner going is about double what it uses for normal cruising.

JP-5, the fuel used in Windsor's *Crusader*, was designed especially for carrier aircraft use. It is going to be the principal fuel aboard carriers for some time to come.

Two carriers equipped for straight JP-5 and having reduced amounts of avgas aboard for reciprocating engine use, are already deployed: the *Randolph* in the Mediterranean and the *Bon Homme Richard* in the Far East. By the first of January, four more carriers will be converted to JP-5 fuel: the *Forrestal*, *Shangri-La*, *Bennington* and *Lake Champlain*. The remaining attack carriers will be modified progressively as they come in for overhaul.

The general introduction of JP-5 fuel establishes something of a record in development and implementation. When studies indicated that straight JP-5 fuel was the answer to certain critical operating problems, CNO approved the program whereby the fuel, engine and carriers would be geared to its use. At that time, January 1955, it was assumed that it would be three years, but right now JP-5 is in use.

During the Korean conflict, supplying carriers with enough gasoline to keep conventional and jet aircraft flying posed great problems in fuel logistics. The carriers kept steaming back and forth off the coast launching al-



BEFORE JP-5 FUEL WAS ACCEPTED, IT WAS THOROUGHLY TESTED AT NAVAL FACILITIES

most continuous air operations against land targets. The rate of fuel used by the jets under these conditions was so high that carrier storage capacity for aviation gasoline was inadequate and refueling at sea became more frequent.

Since avgas is always stored in special tanks in the center of the ship to reduce the possibility of hazardous fuel leaks in the event of battle damage, space in this center area of carriers naturally was at a high premium. There was really no way to increase protected storage of fuel. But jets were here to stay and something had to be done to make jet fuel available in greater quantities aboard carriers.

What was needed was a fuel that could be stored safely in less protected areas. This would mean a fuel with a higher flash point. JP-5, a special 140° flash point kerosene which can be stored safely in the skin tanks of the ship because of its low detonation point, was therefore developed.

Before the Korean conflict was over, JP-5 was being used in the form of jet mix—two parts JP-5 and one part avgas, or three parts of this special kerosene and one part avgas. It was found that jet engines in use at that time could operate on mixtures, and this, of course, permitted an increase of fuel storage since JP-5 could be stored in more vulnerable areas. Jet-mix served well as a stop gap, but it was only that; something else was needed.

By 1954, progress in engine combus-

tor design indicated that the general use of JP-5 was feasible. BUAER inaugurated with CNO approval an extensive development program. This involved engines, aircraft and ships.

VARIOUS fuels were tested at the Aeronautical Engine Laboratory, Philadelphia and NATC PATUXENT RIVER in cooperation with Naval air stations at Oceana, Quonset Point, Atlantic City and Miramar. Tests indicated that JP-5 had many advantages over any other fuels for shipboard use.

Its initial advantage had already been indicated; it did not require protected storage. By using JP-5, large increases in fuel capacity could be made available on carriers. At the same time, use of JP-5 reduced to a minimum the danger of explosion.

As testing went on, there were still other JP-5 dividends: JP-5 gave up to five percent increase in range. Fuel evaporation—and this was a particularly drastic limitation in some other fuels—was greatly decreased. With aerodynamic heating looming as a major problem, a fuel that could resist it was very attractive. JP-5 was the answer.

This versatile fuel also had another thing in its favor: it would facilitate joint carrier operations since all other NATO jet aircraft can operate on it.

In fact, JP-5 is a kind of all-purpose fuel. Not only is it used for jet aircraft but it can be used, in an emergency at sea, in ship's boilers.

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MRS. U. S. NAVY 1956 steps from the cockpit of an F9F-8T after becoming the first woman passenger to fly faster than the speed of sound. Grumman test pilot Ernie Von der Heyden flew Mrs. Ellis in the two-seat jet.

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LETTERS

SIRS:

It was with interest that I read the article "The Bing-Ding Rides Again" in the September issue of NANEWS. I was fortunate enough to be ship's cadre on the 116 and consequently a "plank owner" of the ship. (I do not believe anyone else can use that plank and will demand it upon the ship's retirement.)

The good record of the 116 described in the article plus the good past record can be traced to the ship's first Captain, Capt. T. A. Turner. A ship of the Navy usually ends up the way it starts out . . . and the 116 started off in good style.

I'm also glad to see she has a flag aboard again and wonder how many others in the V-3 Division occasionally think about the *Bing-Ding*. I also wonder if any of the others remember the "Outrigger Incident" occurring in Kailua Bay?

A. D. CALDWELL

San Bernardino, Cal.

SIRS:

The article *Ice Floes Ahead*, NANEWS, October 1956, was particularly interesting since VP-6 flew ice patrols in the summer of 1949 for the Point Barrow Expedition. Other Whidbey Island-based squadrons did the same thing the year before.

WILLIAM M. HUEY

SIRS:

I have just finished reading the August 1956 copy of NANEWS, and Ronald J. Hobin's article "Power for the Kick-off," pp. 1-5, has left some doubt in my mind. In that article, Mr. Hobin stated that the H-8 catapult has been the workhorse of Naval Aviation since the end of WW II as the end of a long line of hydraulic catapults.

True, the H-8 is the end of a long line of catapults, but it can hardly be said that the H-8 has been the workhorse when it didn't become operational until long after the war. I think you will find that the real workhorse of the 'cats' has been the H-4, which has carried the load since the war, and is still performing admirably aboard the Navy's first line carriers which have not as yet received catapult conversions.

D. N. HUGO, AB1

¶Hugo is essentially correct. The H-8 did not come into usage until the advent of jets during the Korean conflict in 1950. It became apparent that a much stronger 'cat' was necessary to launch these planes. The H-4 was and is a good device, but to launch jets, the weaker fore-

runner of the H-8 needed a lot of wind over the deck for safety. A number of our carriers still have the H-4; a number went from the H-4 to steam 'cats' but a good number of carriers were converted to the H-8 for jet operations.



THANK-YOU DANCE FOR 'BUSY BEE' MEN

Gay Party at Yokohama Men from 'Busy Bee' at Orphanage

Officers and men of the USS *Bon Homme Richard* rode a Navy bus from Yokosuka to Yokohama, right into the hearts of 124 orphans. Purpose of the trip was a visit to Our Lady of Lourdes Baby Home.

It wasn't long after the Americans arrived that the Japanese youngsters overcame their shyness. Each Navy man became a two-hour father to two or three little children.

Ice cream was proclaimed the order-of-the-day, so 39 little ladies in their best party dresses piled into the bus with their adopted "daddies," and went to the Yokohama Army Post Exchange.

After the ice cream, back at the orphanage, the children danced their thanks with a Japanese ritual dance.

● The United States leads the world in jet engine output. A total of more than 88,000 jet and turboprop engines have been produced since 1942. Estimated flight time totals a minimum of 23.7 million hours.

IFR-IQ?

According to OpNav Air Traffic Control Procedures Section, the pilot should return to his starting point on the airport.

Ref: ANC, Procedures for Control of Air Traffic, pp. 3.221.

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● COVER

Like three butterflies in formation, these F4D Skyrajs fly near the coast of San Diego, California.

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