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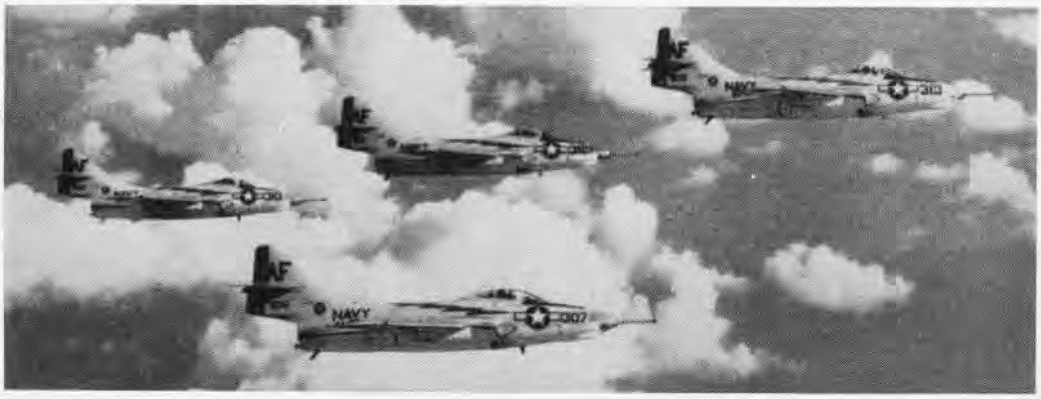
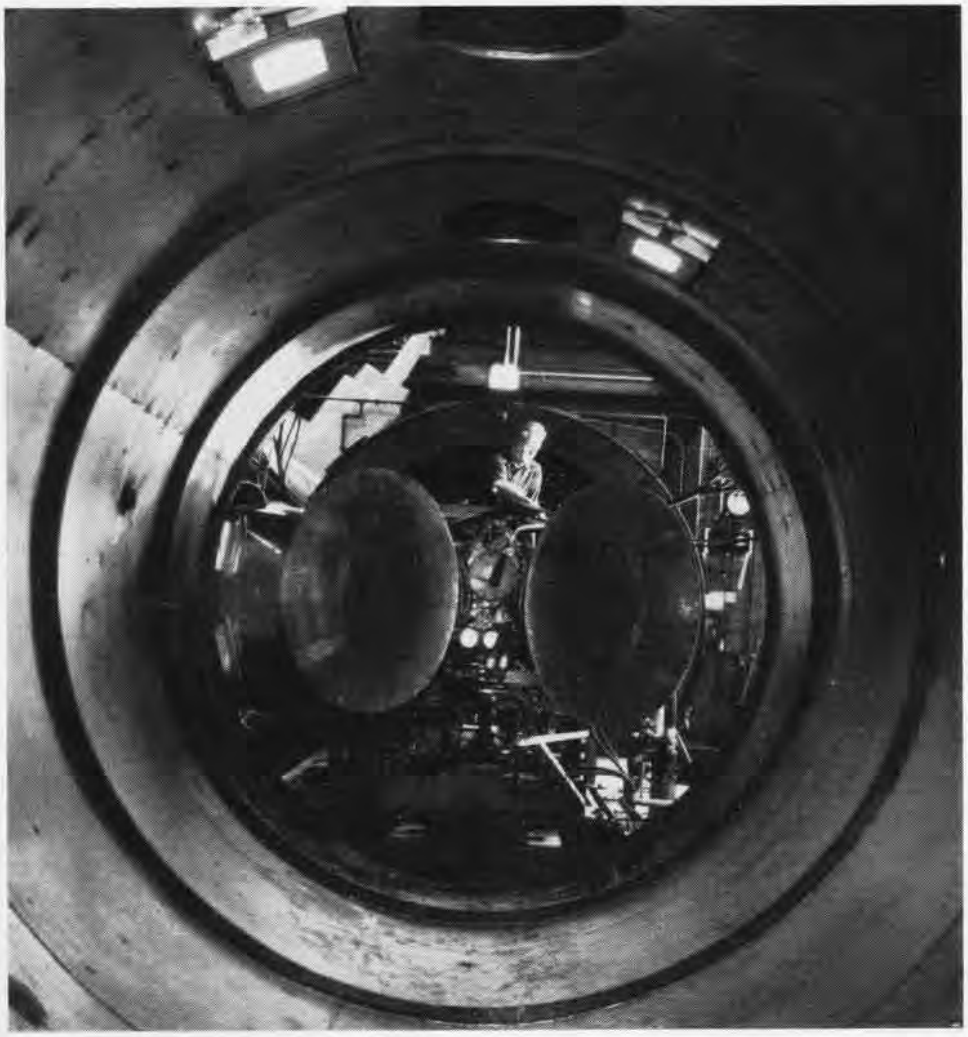


VA-66 Cougars, operating from USS Intrepid (CVA-11), fly high above the Arctic Circle on a routine mission off the coast of Norway.

'INTREPID' IS THE WORD

The squadron planes are seen on the flight deck of the Intrepid during the same deployment. The pictures were taken by the photographic pilots of VFP-62. The appropriate insigne indicates VA-66's determination and sure confidence in mission accomplishment.

PROOF OF QUALITY: TESTED AT TRENTON

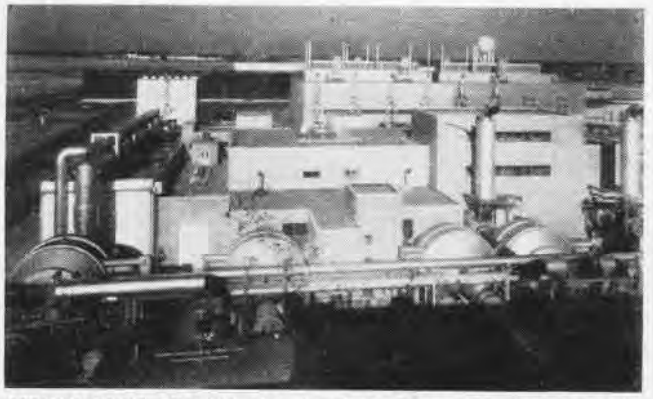


CAPT. W. E. KENNA

MAN'S CONFIDENCE in the machine that will convey or propel him from one point to another is important to his peace of mind. There are few circumstances where a man needs greater confidence in his vehicle than does the pilot of a modern warplane.

Over the years the combat pilot has had cause to wonder: Does the plane have the juice to get me safely off the deck? Is the range sufficient for the mission? How will it behave at high altitudes? Will it stand up under all the stresses and strains I might encounter? Does it have the stamina required to bring me back safely after the mission?

Many of these questions have been answered in the past. More and more are being answered today. New power plants designed for airplanes arriving in the Fleet today are being subjected to the most rigorous performance tests that have ever been conducted.



AERONAUTICAL TURBINE LAB AS SEEN FROM THE BLOWER RING

GIANT FANS WASH HEAT FROM WATER AND PERMIT ITS RE-USE

TAKE THE powerful J-75 engine that will power the P6M-2; the J-65 that propels the A4D *Skyhawk,* the FJ-4 *Fury* and the F11F *Tiger;* and the J-71 plant used in the F3H-2N *Demon.* All have been tested *at altitudes* during the past few months at the Aeronautical Turbine Laboratory (ATL), Naval Air Turbine Test Station, Trenton, N. J.

Other engines—new prototypes and older production models—are undergoing similar tests almost daily. In some instances the test is made to locate and correct a "bug" that was discovered in operation. In other cases the test calls for completely wringing out a new engine to prove it will live up to the manufacturer's predictions.

On occasion, the problem involves lending the Air Force a hand in testing out a new engine that may or may not be used as the power plant of a Navy airplane.

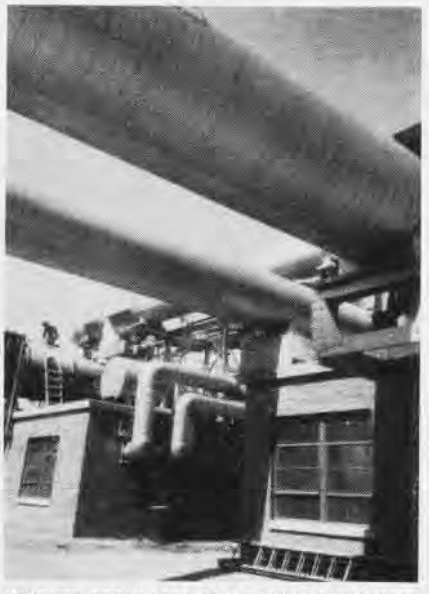
Not long ago NATTS received a high priority assignment. FJ-3 and FJ-4 *Fury* fighters in the Fleet were experiencing flame-outs when the planes reached a certain altitude. A Wright J-65 engine of the type used in the *Fury* was rushed to the laboratory at Trenton for study.

Altitude tests revealed that the engine was getting hot streaks in its turbine, which destroyed the blades. The cause of the hot streaks was discovered to be a too-rich fuel mixture at that altitude. Engineers recommended a change in the control settings which would overcome the problem. The "fix" worked. Word was flashed to the Bureau of Aeranautics in Washington and from there to *Fury* squadrons in the Fleet.

One of the most significant feats accomplished at ATL to date was the complete testing of the J-75 powerplant which will be used in the P6M-2 and other Navy planes. The J-75, with its thrust rated in the 10,000-20,000 pound class, is the largest and most powerful turbojet in the American defense arsenal. Such a powerplant had never before been given altitude calibration in a test cell.

The engine was locked in an altitude test chamber and Trenton's full facilities were brought into play. The engine was "flown" to a prescribed altitude and its maximum thrust was verified. Completely instrumented, all components of the engine were studied under conditions that ranged from sea level to thousands of feet. When tests were completed, the engine was pronounced satisfactory.

A physical plant capable of performing such a test is of necessity an immense establishment. The Naval Air Turbine Test Station occupies 74 acres in the heart of South Jersey's



WORKER REGULATES AIR FLOW DURING TEST

EXHAUST-HEATED WATER IS COOLED HERE

LINES MOVE AIR TO ALTITUDE TEST CELLS

farm country, six miles west of Trenton. Under command of Capt. W. E. Kenna, there are 11 officers and 456 civilians employed at an annual payroll of $2,238,000.

Heart of NATTS is the Aeronautical Turbine Laboratory which is considered its "Operations Department." ATL is commanded by Capt. Oliver H. Coté, Jr. All other station activities provide support for the Laboratory.

ATL is valued at more than 35 million dollars, about half the cost of developing a new engine from drawing board to production. A buried electric line sealed under pressure in oil and nitrogen delivers electric power of 132,000 volts to the laboratory. The power supplied is enough to provide lights in every house in Trenton, whose population is 128,000. When all machinery is in operation, the test facility has a connected load of 100,000 hp, or pulls 75,000 kw—three times the power used by industrial Trenton.

The lab requires so much water that a 20-inch pipeline has been installed to pipe up to 5000 gallons per minute from the nearby Delaware River into its storage tanks.

In full operation, the lab is so thoroughly soundproofed that a passerby assumes the noise he hears from a jet engine under test is no more than an auto's exhaust. Soundproofing in the laboratory cost $3-million. Actually, the only community relations problem to stem from noise was prompted by noise from the air bleeds on large blowers that pump air during tests. The offending bleed valves have now been shifted to another side of the building, away from the populated side of the laboratory.

The mechanics of testing an engine are as complex as they are important. The laboratory is divided into three sections, or wings, whose combined task is to create such atmospheric conditions as to "fool" an engine into believing it is actually in flight.

There is a High-Pressure Blower Wing which supplies treated engine-combustion air to the Test Wing. It contains three 6000-hp ram blowers, each delivering 90,000 cu. ft. of air per minute. For each ram blower there is a companion refrigeration plant for cooling and dehumidifying air. The blower wing also includes air intake filters, intake silencers and pressure check valves.

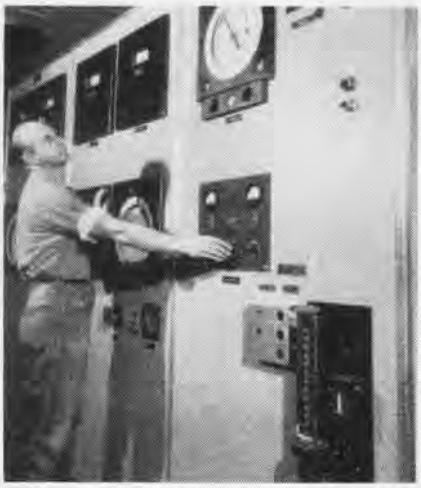
In the Test Wing there are two turbojet test cells, two turbojet altitude test chambers, a turboprop test cell, and the control stations used in actual tests of an engine.

The Exhaust Wing contains exhaust gas coolers, exhaust blowers, inter-cooling rigs and mufflers used in exhausting engine air from the altitude test chamber and the turboprop cell.

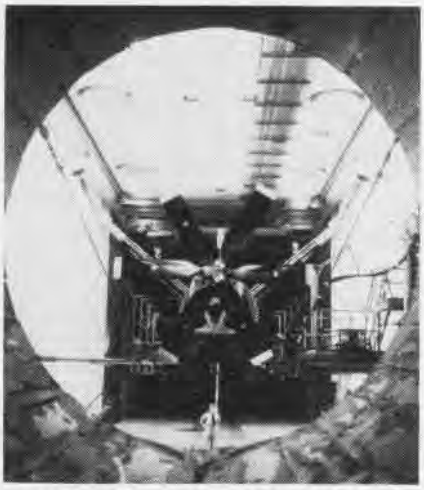
Auxiliary equipment includes a water pumping station, a water treatment plant, a 1,200,000-gallon reservoir, a dozen cooling towers, a machine shop, an electric substation, fuel storage tanks, a fire-protection system, a railroad siding, an auxiliary shop and a boiler house.

Different procedures are used for testing turbojets and turboprops. The turbojet is completely encased within a chamber while an iris-like tube is enlarged or contracted to the circumference of the turboprop engine's propeller. Maximum diameter of the tube is 20 feet, minimum is nine feet.

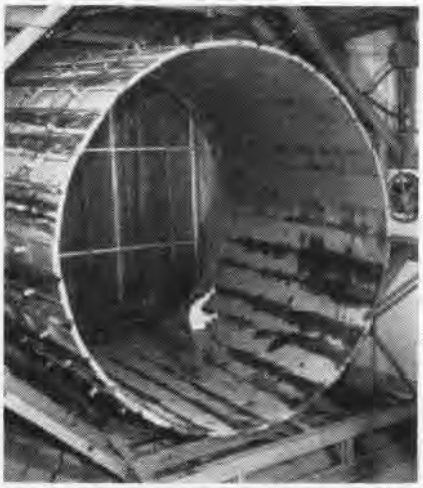
Both types of engines are mounted so as to prevent exhaust gases from being recirculated into the engines' intakes during the test. The test beds the engines rest on are so constructed and instrumented as to permit accurate measurement of the engine's thrust during the test.



ENGINEER MANS CONTROLS IN TEST AREA



TURBOPROP ENGINE POSITIONED FOR TEST



ADJUSTABLE CONE OF TURBOPROP STAND

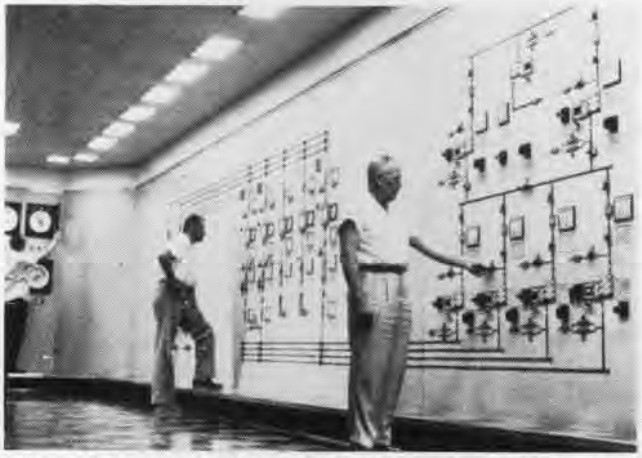
An engine arrives at Trenton in a vacuum-sealed steel case. It is taken into the huge machine shop where recording devices and strain gauges are attached to the engine to obtain accurate recordings of temperature, endurance, fuel consumption, thrust and hundreds of other performance factors during the test.

Completely "wired," the engine is rolled to the test wing and locked into a test chamber.

Up front is the huge pressure blower ring, a three-story structure which houses the ram blowers, refrigeration equipment and all the components necessary to simulate ram pressures and altitude temperatures.

In the blower wing, free air is drawn in, filtered, dehumidified and brought to the required temperature and pressure. The blowers, coupled with the refrigeration heat exchangers and subsequent re-heaters, create the desired air humidity, density and pressure.

No matter what the atmospheric temperature or humidity may be on the day of test, the air can be reduced to minus 65 degrees Fahrenheit or heated to 190 degrees to simulate



LABORATORY OPERATION IS MONITORED IN MAIN CONTROL ROOM

the exact altitude and airspeed required for the test. A specific temperature can be maintained or temperatures may be graduated to simulate climb from sea level to maximum altitude. Treated air can be pushed through the test cell at the rate of more than a million cubic feet per minute, at several times the velocity of the most severe hurricane.

Just as the blower wing simulates the flow of air at altitudes into the inlet of the engine, the exhauster wing simulates the suction of exhaust from the engine's exit to create a realistic altitude condition.

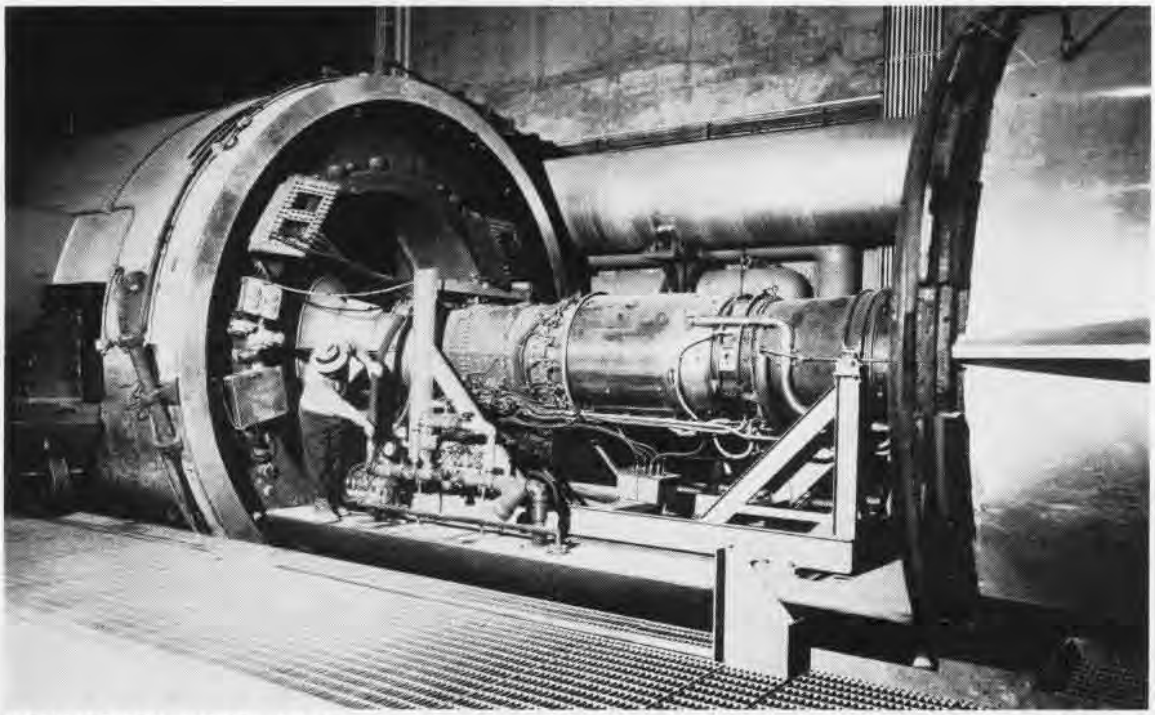
The altitude exhauster wing is a four-story building which houses the components and equipment required to simulate exhaust conditions. Equipment includes 14 multi-stage centrifugal machines with their step-up gears, electric motors and the auxiliary equipment and controls needed to provide the required altitude pressure at the engine exit.

The test wing, where the engine is secured in a chamber, is a four-story structure which houses five test areas, the two altitude chambers, two turbojet cells and one turbo-prop cell. In addition, there are control rooms, working space to connect instrumentation and metering devices, an operations control center for the whole laboratory on the third deck and individual control centers for the various tests. A $5,140,000 contract has been awarded for construction of a new altitude test chamber and an extension to the ram blower building. Ground has already been broken for this construction, which will permit the simulation of even greater altitudes and speeds.

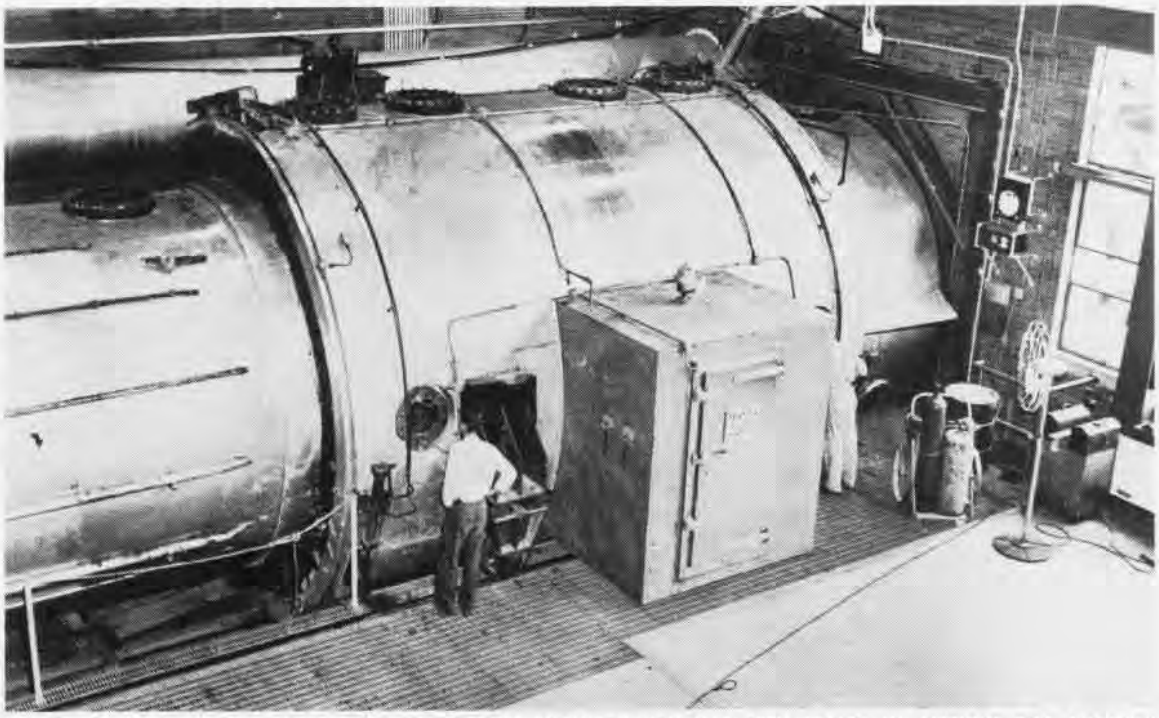
In the three wings, air must travel 700 feet from the blowers through the test chamber and into the exhauster wing before it is returned to the atmosphere. To avoid any power losses, the three wings are as nearly in alignment as possible. "Elbows" were carefully avoided. As air goes through the engine in the test chamber, it may emerge from the engine as exhaust at 3500 degrees. Within a few feet this extreme temperature is knocked down to 175 degrees to prevent hot-blast damage to the downstream exhausters.

At Trenton, the "dry cooler" system of exhausters is used. Water is circulated through a maze of pipes to cool hot exhaust gases. In other laboratories, water is sprayed directly into the exhaust. Each system has its advantages, engineers agree, but the principal achievement of the dry system is that it does not create a steam problem.

Test facilities now in use at Trenton were designed to simulate altitudes up to 65,000 feet. "But," says Mr. G. R. Simpson, chief of the engine performance division, "even now we can create altitude conditions in excess of 65,000 feet. We can, through very careful control of humidity, temperature and pressure in the blower wing, create the



WORKER CHECKS FITTINGS ON J-40 ENGINE IN ALTITUDE TEST CELL. J-40 WAS ONE OF FIRST TURBOJETS TESTED



PORTHOLES ALLOW VISUAL INSPECTION OF TURBOJET ENGINE WHICH HAS BEEN SEALED IN AIRTIGHT TEST CHAMBER

molecular structure of air that might be expected at altitudes greater than 65,000 feet."

One of the most complicated aspects of the laboratory is the instrumentation that is employed. More than 23 miles of copper tubing and 26 miles of thermocouple wire interlace the equipment and connect the various instrumentation systems. Tape recorders, stress-measuring devices, temperature graphs, computing equipment and even IBM cards are used to obtain and record findings of a test.

From the third deck of the test wing, operators in Supervisory Control can study a 35-foot panel whose dials, gauges and lights register what is happening at any point in the laboratory. The instrumentation is so complete that an engineer can glance at the board and learn that a valve is half-open where it should be a quarter-open in a remote part of the laboratory.

"Permissive" controls are employed on the Blower, Refrigeration, and Exhauster Wing equipment. If an operator in any part of the plant wants to start up or make an adjustment in this equipment, he requests permission from the control operator. The valves in the large air and exhaust gas ducts are controlled from Supervisory Control.

Local control panels are installed so operators can monitor, through a thermopane window, what is happening in each of the test areas. Engineers are protected from possible explosions and fires by the bullet-proof window and by temperature controls which sound alarms when temperatures in the test zone reach the danger point.

When a test is in progress the main control operator can talk by telephone or intercom with a man anywhere in the laboratory. Supervisory Control can also monitor conversations between men at any two points in the lab because it is also the communications center.

In case of an emergency, all operations can be stopped by the throwing of a single switch in the control room.

Three basic types of tests are run at Trenton:

Steady state testing comprises the majority of tests, since calibration and qualification testing of engines and accessories is included in this category.

Transient tests are conducted to learn the characteristics of the engines' components and accessories during acceleration and deceleration testing. Engine variables are recorded during these tests.

Environmental testing covers a wide range to insure the performance of engine components and accessories under extreme temperature and humidity conditions such as would be encountered in polar or desert areas.

The turbojet engine is often described as one of the simplest of all modern engines. A common explanation of

BEHIND BULLET-PROOF GLASS, TECHNICIAN WATCHES CONTROLS

its principle is that a compressor pulls in a stream of air, builds up its pressure and sends the compressed air into a combustion chamber.

Here fuel is injected, mixed with the compressed air, ignited and burned. The hot gases resulting from combustion are routed through a turbine—a wheel with blades or "buckets" around the circumference which drives the compressor—and this expanded gas is expelled through a relatively small tail pipe at high speed. The action of this high speed stream of exhaust gas creates within the engine a reaction in the opposite direction, or forward thrust.

It is the *variables* of this simple principle that keep NATTS in business. In an effort to get greater performance from an engine, manufacturers modify various components or adjust their placement within the engine. A minor adjustment may have a major effect on the engine's performance.

Alteration of the fuel control mechanism might improve the engine's performance at sea level but cause flame-out at high altitudes. A basic engine might perform perfectly from sea level to maximum altitude, but might malfunction when its afterburner is cut in. Such are the headaches which must be studied and overcome.

In recent months, NATTS has tested some engines for windmill starting and sea level performance, others for helicopter control system evaluations, others for ability to use a different fuel than that for which they were designed, and still others for cold and hot weather starting.

In all, the laboratory has run tests on engines for seaplanes, Navy and Air Force fighters, the *Regulus II* missile, and a helicopter.

To date, only turbojet and turboprop engines have been tested at Trenton. Addition of the new altitude chamber will permit testing of engines now considered "futuristic." One test presently scheduled involves a new type engine for a missile. Facilities are available to burn high energy fuels (NANEWS, February 1958). Such engines will be tested. The laboratory is equipped to test certain components of a nuclear-powered aircraft power plant without the installation of a nuclear reactor at the lab, an engineer revealed.

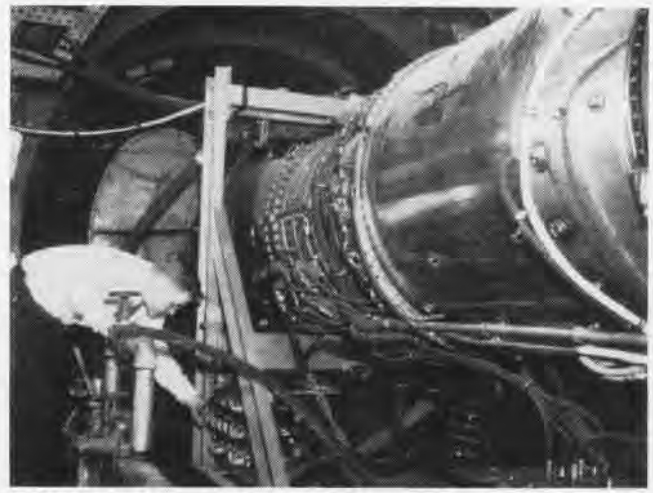
NATTS TRENTON is not in competition with related government test facilities such as the NACA Lewis Flight Propulsion lab in Cleveland or the Air Force Arnold Engine Development Center at Tullahoma, Tenn. Actually each facility complements the other.

A coordinating committee, representing the Navy, Air Force and NACA, was formed about two years ago to keep abreast of what each test facility is doing at all times. The committee meets quarterly to exchange information.

Through the sharing of future test schedules and completed test findings, it is often possible for one agency to take advantage of findings made by another. When a "crash" test program becomes necessary, parts of one engine can be studied at the Navy lab while other parts are tested simultaneously at the Air Force laboratory or by NACA.

Such a course was followed on the YJ67-W4 engine, when NATTS TRENTON studied inlet distortion on the main engine; Arnold EDC, afterburner and ramjet aspects.

RAdm. Selden B. Spangler, present commander of the Naval Air Material and Development Center, is credited with conceiving the original need for a turbine test laboratory when he was chief of the power plants division in the Bureau of Aeronautics in 1943. He has since been referred to as "Mister Power Plant" by the press. The Admiral still keeps close check on the pulse of the Center from his desk at Johnsville, a few miles away.



ATTACHED CABLES AND WIRES HELP TO MEASURE PERFORMANCE

The ability to simulate actual flight conditions in an aircraft engine test cell has long been the goal of aircraft engine designers. Early reciprocating engines were subject to brief sea level testing, then used in flight after little or no altitude testing. Failures resulted.

Jet engines had been developed so rapidly in the Forties that the government felt it necessary, in the national interest, to construct laboratories which could be used to test engine performance and evaluate commercially manufactured engines to learn whether they met military performance and endurance requirements.

The Aeronautical Engine Laboratory at Philadelphia was first in this country to conduct an engine calibration under simulated altitude conditions.

The Navy considered modifying the laboratory at Philadelphia to accommodate jet engine tests, but engine manufacturers made such rapid progress in the design and production of jet engines that AEL was not considered satisfactory. Plans for the present facility were begun in 1944.

ENGINES ARE RECEIVED, CHECKED AND INSTRUMENTED IN SHOP

Before the first construction contract was awarded, a representative was sent to Germany after WW II to study test methods and laboratory layouts.

Construction of the present laboratory in Trenton began in 1949. The installation was called the Air Turbine Laboratory until July 1951 when its name was changed to Naval Air Turbine Test Station. The present plant was formally opened November 4, 1955.

Trenton was chosen as site of the lab for a number of reasons. The Navy owned sufficient property there and the land offered a firm foundation which would be required for the heavy equipment. There was a ready and adequate supply of fresh water and electric power. Good transportation facilities were available and the site was handy to major highways and railways. A good, ready labor market was available within a 10-mile radius of the station.

A major problem of putting such a large laboratory into commission was getting enough qualified engineers. Initially the problem was solved by a coast-to-coast recruiting effort. Aeronautical, mechanical and electrical engineers reported from states as far away as Florida and California.

Since then, two programs of technical education have been put into effect. In one program, graduate engineers may attend one of several universities in the area (including Princeton) with Navy help. Part of the cost of their schooling is borne by the Navy. Graduate engineers are also granted a certain amount of time away from work to attend classes. If they exceed the allotted time, they are charged with annual leave. At present, six members of ATL's 50-engineer staff are enrolled in postgraduate courses.

In another program, area high school graduates with an aptitude for college training in an engineering field are assisted by the Navy. The student begins at a salary of $2970 a year. He spends half his time in school and half at ATL. After 18 months in the program, his salary is raised to $3175. New raises are granted until, at the end of the five-year course, the student receives $4480 per year.

The Navy's price tag for this form of education is a contract signed by the student binding him to work for the Navy an equivalent time for each period he spent in school.

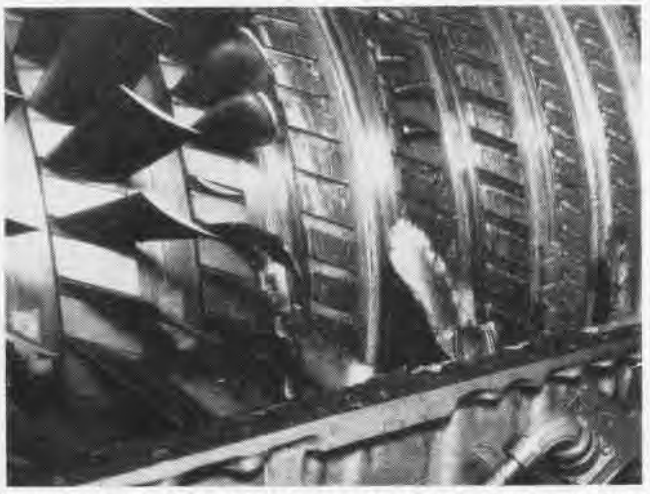
NATTS TRENTON does not have the final authority to accept or reject a manufacturer's engine for Naval service. Actually, the station is an independent test facility under the technical direction of the Bureau of Aeronautics. It can only measure performance and make recommendations.

So thorough is its testing program and so valid are its recommendations after a test is completed, however, that the station is held in high esteem by the Navy Department and aircraft engine manufacturers.

Of some three dozen reports, findings and recommendations submitted to date, each one has been accepted.

One engine was found to require an improved ignition system before it would satisfactorily relight at altitude. Another required major changes—the installation of a closed lubrication system to overcome bearing failures at high temperatures—before it was acceptable for high flight speeds. Others have been found to require changes in main engine and afterburner fuel control schedules to avoid burning out of turbines in flight. Most engines have performed strictly according to the manufacturer's guarantee.

Major emphasis at NATTS TRENTON is currently focused on testing out those engines which have already been placed in Naval service and those which will join the Fleet in the immediate future. Steadily improving fleet safety records show that the station's influence is being felt in the Fleet. Pilot reactions gratify Trenton engineers.



BLAST CAUSED BY AFTERBURNER CUT-IN SHEARED COMPRESSOR BLADES IN THIS JET. THE PROBLEM WAS TO LEARN CAUSE AND CURE

By testing current operational engines as they are perfected by manufacturers and by testing radical new engines as they are developed, NATTS TRENTON will cast an increasingly long shadow over the flying Fleet.

There was a time when the word "test pilot" provoked instant admiration for the daring type of individual who would willingly gamble his life by taking off in an airplane with a new power plant to see how it worked in flight. Trouble was, the prototype engine too often shared the same fate as the pilot when the plane crashed, and the designer was left to speculate on why it did not work.

Nowadays, with early test "flights" being made on the ground, as likely as not by an engineer who has never pulled on a hard hat, the term "test pilot" has lost a lot of its former danger. Many live pilots are first to admit that such progress at Trenton is a very good substitute for glamor.

GRAMPAW PETTIBONE

A Matter of Method

A chase pilot flying an F2H-2P at 15,000 feet discovered his radio transmitter had become inoperative. In order to inform his buddy, under the hood in the other *Banshee*, of the transmission difficulties, he decided to fly directly under him and pull up in front, relying on jet blast and slipstream to attract his attention.

In the pilot's words, "The vertical separation between our aircraft looked to be sufficient when I started under, and it is my opinion that I eased back on the stick unconsciously while looking up and back at the other aircraft.

"I felt the shock, and knew that my tail had hit the other aircraft. There was a violent pitch up and down, the aircraft rolled about 40 or 50 degrees from side to side, and I found that there was no pressure on the rudder pedals. Positioning my rear view mirror so I could see the tail, I noted that all but 18 inches of the vertical stabilizer had been sheared off. I realized I would have no airspeed indication since the pitot tube was mounted on the part of the tail that was missing."

Following the collision, both aircraft were tested for stall characteristics and both were landed successfully. The bob-tailed *Banshee* utilized the services of another buddy who flew wing on him and called out airspeeds during the flight test at altitude and the straight-in approach for landing.

The pilots made the following statements concerning how the accident could have been prevented.

Clipped Tail: "I should have maintained a satisfactory vertical separation from the other aircraft. In case of radio failure on an instrument hop, the chase pilot should pass the other aircraft to the side, and S-turn in front, rather than passing under and pulling up."

Scarred Belly: "I should have followed the squadron SOP (standard operating procedure) which calls for the instrument pilot automatically coming contact after any three minutes without radio contact with the chase pilot. In this case, the time interval between last contact and the collision was approximately seven minutes, but I was too engrossed in executing the climbout and changing radio frequencies to accurately note the passage of time and therefore materially contributed to the cause of the accident."

Grampaw Pettibone Says:

Sounds like you both know *now* that this wasn't the smartest trick you ever pulled, but do you realize just how lucky you are to still be takin' on the old ozone? The odds are against both aircraft getting back on the deck complete with pilots after a mid-air tangle.

When you stop to think that a study made by the Safety Center people shows that 70% of the Navy's mid-air collisions occur during formation flying, the method of getting the attention of a buddy under the hood becomes purty important. Reminds me of the time little Johnny was out in the garden and he tried to get his Dad's attention with a soft tomato. He got it but it cost him a warm pair of britches.

Arresting Thought

In a recent ComNavAirPac Aviation Safety Bulletin encouraging the use of runway arresting gear the point is made that apparently many pilots are of the opinion that using the old chain to stop their flying machines dims their reputations as pilots. The Bulletin suggests that if such is the case each pilot ask himself the following question: *Where do I look the silliest, at the end of the wire and probably on the runway or in the boondocks up to my axles in dirt?*

To continue, "In practically every case where the aircraft overruns, parts are damaged and have to be replaced. This means the plane is in the barn awaiting parts and/or getting fixed which deprives the squadron pilots of a plane to fly.

"There are even times when the gear can save you from blowing tires and wearing down wheels and brakes.

If you are a little fast near the end of the runway, and have been braking hard, releasing the brakes and catching the wire may mean the difference between creating and eliminating the extra heat that blows the tire and damages the wheel and brake. Again you have saved a plane from being down for repairs."

Grampaw Pettibone Says:

Howabout it fellers? **Sounds reasonable, doesn't it? Using the runway arresting gear causes a little inconvenience, but it is heavily outweighed by the time and money lost and the inconvenience that occurs when the plane overruns.**

Dear Grampaw Pettibone

Looks as though everyone reads more into the RADFACS than is in them, as well as into RON situations. The original *Timber-r-r-r* article (August issue) mentioned NAS DALLAS being closed for transient refueling after 2200 and your November lead item didn't uncloud the picture. NAS DALLAS has been open 24 hours a day for years except when we get the opportunity to conduct landing and taxi areas repairs.

The RADFACS does state AF-ANG closed for fueling after 2200. R5D pilots should read info for NAVY only.

LCDR, USNR-R, NAS DALLAS

Grampaw Pettibone Says:

Like I always say in cases like this, "First mistake I ever made. . . ." Thanks for setting me straight on the transient refueling situation at NAS Dallas. But why did you hold your tongue so long?

Just to make sure that my tired old eyes weren't failing me and that my thinkin' box hadn't konked out, I gave the RADFACS test to six local senior-type naval aviators and every dad-burned one of 'em misread or misinterpreted the remarks on NAS Dallas in the directory of aerodromes portion of the RADFACS just like I'd done. Now, mind you, I'm not excusin' myself for my faulty interpretation of the Navy refueling picture at your field, but when so many others made the same mistake it appeared to me that the facts should be presented in such a way that misinterpretation would require greater effort. I'm taking steps to see that this is done.

Whoops, Wrong Handle

After returning from a training flight, the pilot of an A4D-1 made the usual slow turn onto the taxiway following landing rollout. Feeling uncomfortably warm, he decided to open the canopy. Instead of actuating the canopy control as intended, he momentarily moved the landing gear control to the UP position. Immediately realizing his error, he restored the control to the proper position.

The landing gear retraction safety latch failed to perform its function of preventing retraction of the landing gear. The nose gear and starboard landing gear collapsed, the *Skyhawk* coming to rest on its nose and right wing tip.

Prior to transitioning to the A4D, the pilot flew approximately 400 hours in F9F's in which the canopy control is located in the same relative position as the A4D landing gear control. On one occasion some six weeks earlier, the pilot had reached for the landing gear control handle instead of the canopy control but checked himself in time.

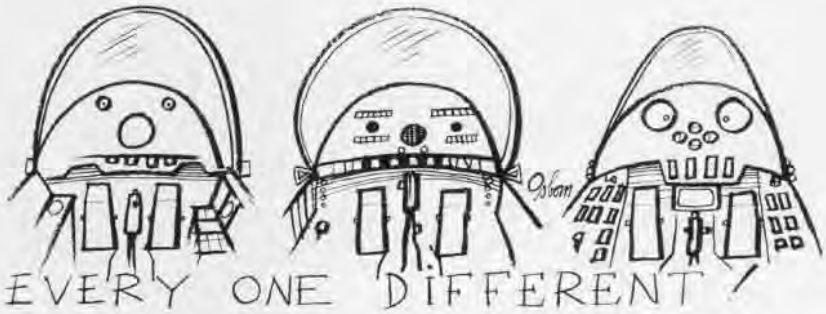
According to the flight surgeon, the high cockpit temperature may have served as a stimulus for a conditioned response or reflex with no conscious thought involved in his actions. Since the pilot had only 37 hours in the A4D, the habit pattern formed in the F9F appeared to be dominant in the unconscious.

Grampaw Pettibone Says:

The pilot—a senior, very experienced gent—admits that he goofed on this one. When actions get too automatic, there's nothing but trouble ahead.

Except for the mechanical failure of the landing gear retraction safety latch, the pilot could have goofed and got by with it. But mechanical failures do cause accidents, and this one would have been avoided if the pilot had paused to think before moving the handle.

There's a need for greater standardization in cockpit design so it won't be so easy for a preoccupied pilot to goof. Many accidents are caused by pilots and other personnel, but a good many others are caused by design, material failure and mechanical malfunctions. Any safety effort worth its salt reaches from the drawing board to actual flight ops and requires the helping hand of all hands along the way. And the pilot still has to remember that his hops are flops when his thinkin' stops.



Story of the ICCP

BIG V, LITTLE g

6000-POUND DEADLOAD IS FIRED FROM A SCALE SIZE MODEL OF THE C-14 CATAPULT

WHEN THE Navy's first CVAN is properly shaken down and takes aboard her first aircraft, pilots can expect a surprise on their first "cat" shots. The giant slingshot will have a velvet touch. Innovations will be countless in the first nuclear-powered carrier, but not the least of them will be the ICCP—the Internal Combustion Catapult Power Plant.

The idea of an internal combustion powered catapult has been under study for 13 years. In 1954 a contract for the plant was let to Reaction Motors, and the assembled "cat" will be in operation at the Naval Air Test Facility (Ship Installations), Lakehurst, N. J. this year. It will go to sea for the first time in the USS *Enterprise*, CVAN-65, in September 1961.

Since Lt. T. G. Ellyson was first slung into the air at the Washington Navy Yard in 1912 from a "cat" using compressed air as the driving force, the slingshots have used a variety of power sources to get aircraft airborne. Flywheels were used aboard cruisers, then powder charges, the famous hydraulics of World War II carriers and finally steam. The ICCP is another step forward, embodying all the power the steam cat delivered as smooth acceleration without the initial "kick" so uncomfortable to carrier pilots.

The ICCP—or C-14—eliminates the initial shock of the takeoff run by providing controlled pressure in the cylinder throughout the entire stroke of the piston. An electro-mechanical servo system controls a series of valves to maintain pressures at the initial setting during the entire run of the shuttle.

The C-14 operating principle is, as its name implies, the creation of pressure by the burning of fuel in a combustion chamber. The system is divided into four main parts—the combustion chamber, a compressor system, a pumping package, and controls. Fuel and compressed air are forced into the combustion chamber and ignited. Results are formation of gas, terrific expansion and heat. Some of the heat is dissipated by introducing a spray of water and the hot gasses are led into the catapult cylinder to move the piston at sufficient speed. The piston is linked to the shuttle which is attached to the plane by a bridle or pendant.

The air compressor system employed by the C-14 catapult is probably the largest in existence. In one minute it can compress 32,000 cubic feet of free air into a 950 cubic foot accumulator tank at a final pressure of 1500 pounds per square inch. Compressed air is delivered from the steam turbine-driven air compressors to a receiver just below the flight deck where air is stored until it is needed for a launch.

The combustor is a cylinder approximately 24 inches in diameter and 13 feet long. It is divided into an air-fuel mixing zone, a combustion zone and a water cooling zone. A hot gas manifold connects the combustor package with the launching cylinder.

Fuel is supplied to the combustor through control valves from a "pumping package." In this unit, JP-5 is pumped from supply tanks into an accumulator. Simultaneously water is stored in a reservoir and the fuel and water are pressurized in their tanks ready for delivery.

An electro-mechanical servo control system regulates the opening and closing of air, JP-5 and water control valves to maintain a constant pressure or force in the launching tubes during a catapult shot.

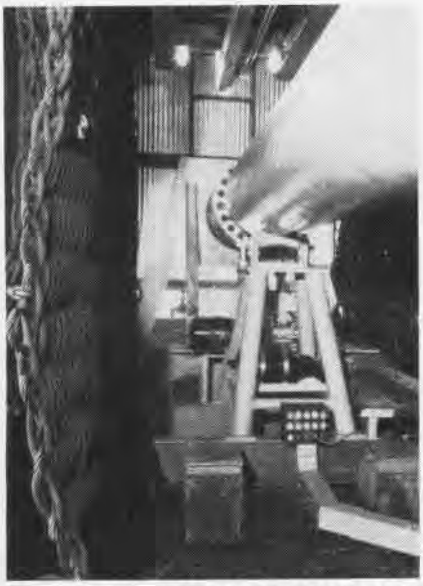
The initial pressure setting is based on relative wind velocity over the flight deck and the weight and take-off speed of the aircraft to be launched.

WHEN THE aircraft is positioned on the catapult, the pilot takes his two-finger turnup, the pipe whines, and Fly-2 signals the deck-edge control console operator who presses a button to start a complicated, fast but very brief sequence of events. Result—one jet aircraft, weight high in five figures, smoothly accelerated from zero mph to flying speed in less than the length of a football field.

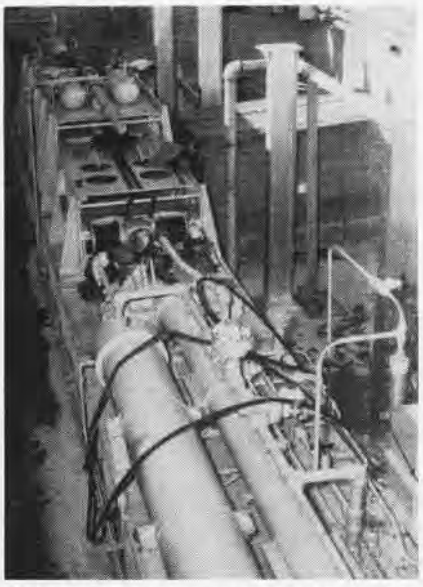
When the button goes down, the servo mechanism control system takes over. Air and fuel are metered into the combustor from the air receiver and the fuel accumulator. Spark plugs ignite the mixture.

Water is injected downstream of the combustion zone to cool the gasses enough to prevent overheating of the catapult components. The servo-system then regulates instantaneously the

DEADLOAD SIMULATES WEIGHT OF AIRCRAFT



MESHED CABLE GUARDS AGAINST EXPLOSION



RETRACTION ENGINE IS INSTALLED IN BED

amount of air and fuel being admitted during the launch to maintain the predetermined launching pressure.

As soon as the launch is completed, the three servo control valves close and an exhauster valve opens. Igniters shut off, and the fuel and water accumulators are vented. Any sludge or water that accumulated in the combustion chamber is blown free. The JP-5 and water pumps begin recharging the accumulators and air compressors recharge the receiver.

When pressure in the launching tubes has decayed to five psi, the shuttle and pistons are retracted to battery position. The exhaust valve is closed and the system is ready for the next launch. Elapsed time for the whole operation is less than half a minute.

The heaviest of the Navy's carrier based planes, the A3D *Skywarrior*, can be handled by the C-14 without even approaching the full capability of the catapult engine. There is ample room for the aircraft designers to come up with planes with six figures in the weight column.

Study of the feasibility of the ICCP had progressed to a point in 1954 where a contract could be awarded to Reaction Motors Inc., of Denville, N. J., for work on a production model.

First a quarter-scale experimental power plant was made. It tested satisfactorily, so a full-scale prototype model was begun. The prototype was exactly like the production model except that it was connected to a simulator tube which measured performance, rather than to a catapult.

Next step is installation of the power plant on a catapult at the Naval Air Test Facility (Ship Installations), Lakehurst, N. J.

The ICCP has had 2000 simulated firings to date. Hazards of explosion, inherent in any new combustion package, have been carefully studied and adequate safety precautions have been adapted to make the C-14 safe.

In a test scheduled for late this year a 100,000-pound dead load will be fired. Designers and engineers who have watched the C-14's development believe it can handle considerably more weight if that becomes necessary.

The nuclear carrier *Enterprise* will be equipped with four C-14 catapults. Each catapult will be able to launch an aircraft every 30 seconds, provided that the deck handling crews can spot planes that quickly between launches. Thus an entire deck load of combat planes can be quickly launched.

C-14 CATAPULT (FOREGROUND) BEING INSTALLED AT LAKEHURST. NOTE C-13, CENTER

AWARD GIVEN BUAER EXPERT

A PIONEER aviator and recognized authority on Naval aircraft propulsion, Mr. Carlyle S. Fliedner has been awarded the Distinguished Civilian Service Award by the Navy Department.

The presentation was made by the Honorable Garrison Norton, Assistant Secretary of the Navy for Air.

Mr. Fliedner is senior power plant engineer in the Bureau of Aeronautics. He plans to retire this year after more than 36 years of military and civilian service.

The citation, signed by the Secretary of the Navy, was awarded "for distinguished performance as Technical Assistant to the Director of the Power Plant Division of the Bureau of Aeronautics and for exceptional service over a period of years in guiding and directing the research, development and service operation of Naval aircraft power plants.

"Your ability, wisdom, outstanding devotion to duty and unwavering loyalty to the Navy have kept Naval aircraft power plants continuously at the forefront of world aeronautical progress," the citation continues.

"The success of Naval aircraft as a most vital force for peace in the world today is in no small measure attributable to your exceptional ability, engineering judgment, devotion to duty and inspired leadership. By virtue of your extraordinary contributions to the Nation's defense you are richly deserving of the Navy's Distinguished Civilian Service Award.

The award is the Navy's highest civilian honorary award, and Mr. Fliedner is the fourteenth BUAER employee to merit such recognition since the award was established in 1944.

Mr. Fliedner served as an Ensign with a Navy squadron in France in WWI. He began his civilian service as Associate Aeronautical Engineer with the Washington Navy Yard in 1923 "at the time a transition was being made from motorboat engines to airplane engines for use in Naval aircraft."

He worked with the Naval Aircraft Factory in Philadelphia for some time, then transferred to BUAER where he has served continuously since 1926.

In 1945 he was presented BUAER's highest award, the Meritorious Civilian Service Award, for his outstanding contributions during WW II.

FLIEDNER EARNS HIGHEST CIVILIAN AWARD

Anticipating retirement later this year, Mr. Fliedner plans to spend considerable time traveling through the back streets of Europe. His hobbies are photography, collecting stamps, and first editions of aviation and automotive books, and collecting and restoring antique clocks and old guns.

NATTC is Six Years Old

City of Norman Helps Celebrate

The Naval Air Technical Training Center, Norman, Oklahoma, has begun its seventh year of operation since it was reactivated in January 1952.

In observance of the sixth anniversary, Mayor June Benson proclaimed Navy Appreciation Day in Norman. The local newspaper, The Transcript, presented a special 10-page section devoted to activities at the base.

The paper gave readers a close look, both with pictures and stories, of operations at the station. The training of students, recreational activities, community projects, and sketches of some top officers and interesting personalities were included. Letters of congratulations and appreciation from the leading civic organizations were printed. Each page carried the message: "Best wishes on your 6th Birthday from these NATTC Boosters," followed by a list of local merchants and business firms.

Since the station was reactivated, more than 72,000 men have received training at the Class P Aviation Fundamentals School, the only one of its kind in the Navy. Designed to provide initial aviation training for the men who keep the Navy's planes flying, the school bridges the gap between recruit training and more advanced schools. About 27 per cent of all enlistees are trained in Norman. Capt. Lloyd W. Parrish has been Commanding Officer since September 1955. Cdr. Gerald Pearson is Executive Officer.

Seaplane Ops Observed

FAW-14 Officers Tour Pacific Area

Capt. H. B. Stott, Chief Staff Officer, and Cdr. C. J. Economou, Training Officer of Fleet Air Wing 14 conducted a 30-day tour of West Pacific seaplane facilities.

Primary objective of the 20,000-mile trip was to observe seaplane operations. The two officers visited virtually every spot in the Far East where FAW-14 squadrons and tenders operate, and became personally familiar with the problems confronting them.

FAW-14 is the parent wing of four seaplane patrol squadrons, each comprising 12 P5M *Marlins*, and a complement of 45 officers and 289 enlisted. FAW-14 is based at NAS NORTH ISLAND, San Diego.

The four squadrons participate in training exercises at North Island when not operating out of their overseas home bases, Sangley Point and Iwakuni. There are additional seaplane facilities in Hawaii, Midway, Guam, Okinawa, Kwajalein, Oppama.

Plane Captain's Handbook

Increases Understanding of S2F

The VS-36 maintenance department has published a "Plane Captain's Book" on the upkeep of the S2F.

Ltjg. J. E. Pearson, editor of the 35-page booklet, has covered all important items. These include dimensions and characteristics of the aircraft through its ignition and fuel system. The handbook was printed through the courtesy of the USS *Essex* on which VS-36 was embarked during NATO exercises.

The small handbook can be carried in the pocket of each plane captain.

THE SHANGRI-LA STINGERS

NOW ABOARD the USS *Shangri-La* on a West Pacific cruise, VA-113 had until recently been stationed at NAS MIRAMAR where it prepared for its new deployment. Known as "the Friendly Squadron," the hard driving unit has already established a reputation as a close-knit, effective fighting team.

The VA-113 story makes up in color what it lacks in length. Commanded by Cdr. R. L. "Zeke" Cormier, the squadron lives up to its "Stinger Bee" insignia.

Cdr. Cormier reported as skipper in March 1957 and immediately organized the "Albino Angels" whose close-in precision flying spell-bound the huge crowd at Miramar's Air Show last August. As a project for Zeke, it was a natural since he had served

MEN LOAD SKYHAWK WITH PRACTICE AMMO

as leader of the *Blue Angels* for three consecutive years.

The squadron was originally commissioned a fighter squadron ten years ago. At that time, it joined Carrier Air Group 11 and is a component of the same outfit today.

Since the Stinger Bee was adopted for the squadron insignia, a pair of crossed baseball bats has been added to the patch for the purpose of showing, according to Chief N. A. Aiello of the maintenance department, that "we play ball with anyone."

At the opening of the Korean conflict, VA-113 was deployed to the fighting area. Flying F4U *Corsairs*, the *Stingers* made two combat tours to the Far East where they established several enviable records and were awarded the Presidential Unit Citation.

During the last two Far East cruises aboard the USS *Kearsarge*, the squadron pilots flew the famed F9F *Panthers*.

THE 'ALBINO ANGELS' OF VA-113, ORGANIZED BY CDR. CORMIER, FLY A4D SKYHAWKS

In 1956, the squadron was officially re-designated Attack Squadron 113. It made its first cruise as an attack squadron aboard the USS *Essex*.

The XO, LCdr. Patrick F. Cunningham, and the operations officer, Lt. Mitch Simmons have been at Cdr. Cormier's right hand during the squadron's training cycle.

Since VA-113's mission is special weapons delivery, the Skipper could not have hand-picked a better pair. LCdr. Cunningham served as Air In-

EXEC AND SKIPPER TALK OVER TACTICS

telligence Officer and Weapons Employment Officer aboard the USS *Oriskany* before reporting to VA-113. Lt. Simmons was formerly stationed at Kirtland AF Base, Albuquerque, N. M., where he worked at the Naval Air Special Weapons facility.

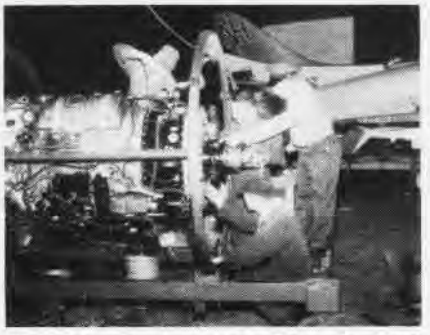
Currently over 37 confirmed individual "E" awards in special weapons alone are held by the squadrons 19 pilots. The rewards were received in three deployments to NAAS EL CENTRO and two at NAAS CHINA LAKE and one at NAAS FALLON.

Under the command of Cdr. Cormier, the squadron has logged over 4500 hours. The majority of the time accumulated in the speedy A4D-2 *Skyhawks* since the switch was made last July from the F9F-8B *Cougars*.

In their daily runs to NAAS EL CENTRO, the squadron has expended a monumental load of ordnance on the desert targets. A total of 5497 Mk. 76 practice bombs have been dropped as well as quantities of other types.

Members of the squadron's ordnance team shown in column 1 are, left to right: N. H. Tollenaar, AO3; H. F. Stimson, AO3 (face hidden); J. W. Hoag, AO2; Walter Brandon, AO2, and L. M. McClelland, AO2.

The maintenance crew, advised by Chief E. S. Miller consists of C. A. Waters, ADJAN (on top of engine); R. W. Pharr, AD1 (foreground) and J. Sanders, ADJAN, next to Chief.



CHIEF MILLER HELPS MAINTENANCE CREW

PILOT'S HEROISM CITED

A COLUMBUS, Ohio, reserve pilot who elected to risk his life rather than the lives of residents in the path of his stricken TV-2 has been accorded singular recognition for his heroic accomplishment.

Lt. Willis C. Culberson, Aviation Cadet Procurement Officer assigned to the NAS COLUMBUS, has been honored as one of the "Top Ten Men of Columbus, Ohio" by the *Columbus Citizen*, a leading daily newspaper.

Culberson's feat took place following a takeoff in a TV-2 with filled tip

MAYOR GIVES CULBERSON CIVIC AWARD

tanks from runway 27 at the NAS. During climbout he experienced engine malfunction and progressive power failure. Because of heavily populated areas beneath him and in line of flight, Lt. Culberson decided to retain the tip tanks and attempt to make an emergency landing downwind in the vicinity of the airport.

On impact in an open area short of the field, the TV-2 engaged a link-chain boundary fence which acted as an arresting barrier. One tip tank exploded and the aircraft received strike damage. Lt. Culberson, who sustained minor injuries, was able to abandon the aircraft without assistance.

In addition to a general vote of thanks from residents northwest of the airport, the city of Columbus, through its mayor, the Honorable Maynard E. Sensenbrenner, presented Culberson with a special citation. The citation praised Culberson for displaying "superior airmanship and in the face of imminent danger . . . avoiding a possible public disaster."

A HOMEOWNER THANKS HERO AFTER FEAT

The "Top Ten" accolade won by Lt. Culberson was the second of such nature awarded to personnel of the Capital City NAS. In 1956, Capt. L. L. Koepke, then skipper of the NAS COLUMBUS, was similarly honored.

Savage Sons on Ranger

VAH-5 Qualifies 19 in Skywarriors

Heavy Attack Squadron Five pilots who prefer to be known as the "Savage Sons of Sanford," hung up an enviable record recently aboard the USS *Ranger* (CVA 61).

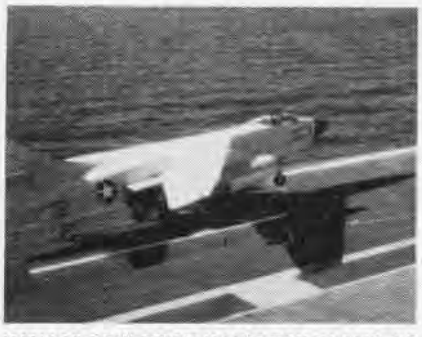
In a single day's operation, the Sanford unit recorded 100 A3D landings and what the squadron believes may be a "possible" record for *Skywarriors* in daytime carquals.

Qualifying 19 of its group as A3D carrier plane commanders during the week's operation off the Florida coast, the "Red Tails" were led by Cdr. Joseph M. Tully, Jr., VAH-5 CO.

Pilots of Heavy Attack Squadrons Nine and Eleven also participated in the carquals aboard the Navy's newest and largest attack carrier.

Although the "first" honors for catapult and arrested landings were taken by Lt. Robert W. Kennedy of Five, the polished performance of the attack wing's skipper rated an unusual "adoption" ceremony. Capt. James E. Reedy, C.O. of Heavy Attack Wing One, was made a full-fledged "Savage Son" at the conclusion of the qualifications.

Still another honorary designation was accorded RAdm. Albert G. Mumma, BUSHIPS Chief, who came aboard the *Ranger* in a *Skywarrior* piloted by Cdr. Tully.



'SAVAGE SON' REEDY MAKES TOUCH AND GO

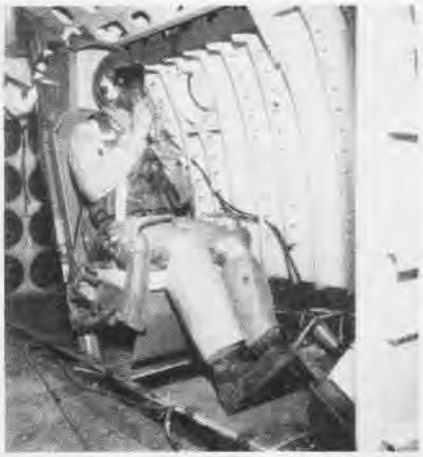
LCDR. W. H. SHAW, *CO of USS Sellstrom instructs Ens. John Lindgren of VW-15 on the operations of the radar picket ship. Officers and men from Argentia were aboard to learn surface angle of Early Warning Barrier.*

Five New DDG's Ordered

To be Armed with Tartar Missile

Contracts totalling $85,093,644 have been awarded for the construction of five guided-missile destroyers which will be armed with the *Tartar* surface-to-air missile. The three contracts also include preparation of working plans. Work will be done on both coasts and in Michigan.

Defoe Shipbuilding Corporation of Bay City, Mich., will construct two destroyers for a fixed contract price of $33,140,520. Bath Iron Works of Bath, Maine will build two for a fixed price of $34,133,200. The Todd Shipyards of Seattle will build one for a fixed price of $17,819,924. These contracts will bring to 13 the number of guided missile destroyers under construction. The *Gyatt*, armed with the *Terrier* missile, is already operational.



TEST DUMMY 'SIERRA SAM' IN P6M SEAT

NOTS SCIENTISTS PREPARE P6M COCKPIT SECTION FOR EJECTION SEAT ON SNORT

ROCKET SLED TESTS P6M SEATS

A 4.1 MILE heavy duty railroad track in the Mojave Desert has been the scene of unique ejection seat equipment experiments in recent months.

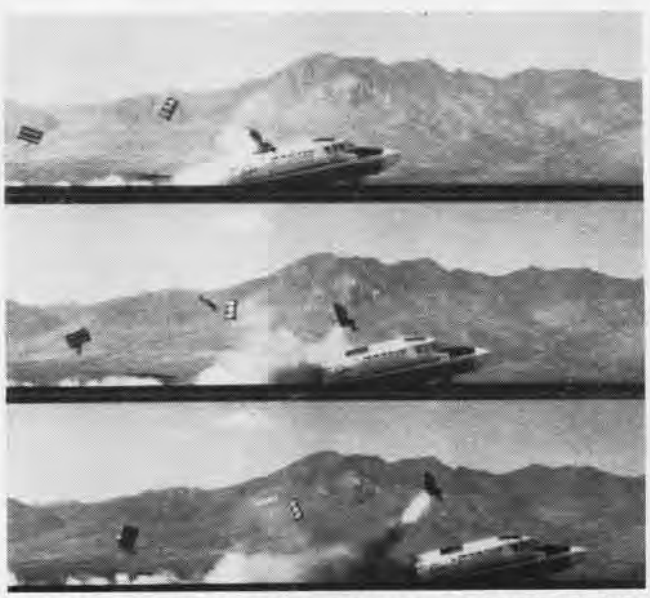
Rocket-powered sleds carrying mockup P6M cockpit sections have been fired at very high speeds while testing the big seaplane's revolutionary rocket-propelled ejection seat equipment. Results of the tests, which have been conducted under the direction of the Bureau of Aeronautics, have demonstrated a ground level escape capability of the radically new seat from 115 knots to the maximum sea level speed of the huge *Seamaster*.

The track called SNORT—Supersonic Naval Ordnance Research Track—is located at the U. S. Naval Ordnance Test Station, China Lake, Calif.

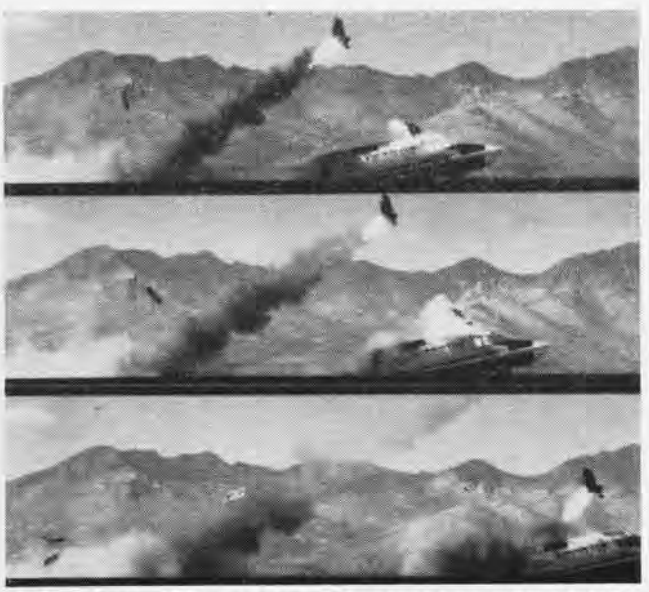
Designed to bridge the gap between wind tunnel and free-flight testing, SNORT permits the testing and intact recovery of full scale missiles, rockets, launchers and aircraft components in a wide speed range.

The rocket-powered sleds used on the track are capable of speeds in excess of 2000 mph. Items to be tested are fired down the track on sleds equipped with varying combinations of rockets, depending on the type test being conducted and the desired speed to be attained. The sled is brought to a safe and rapid stop by a metal finger or scoop which protrudes from the bottom of the sled and hits water contained in a 10,000 foot long graduated-depth trough between the rails.

The multiple dummy firings during the P6M test series, which were permanently recorded on film, produced the finest testing results ever achieved on this type of project, according to the China Lake ordnance scientists.



P6M SEAT IS ROCKET-PROPELLED CLEAR OF AFT HATCH POSITION



ROCKETS PROPEL FIRST SEAT AS SECOND SEAT EMERGES FORWARD

PLUMBBOB BLAST SEEN FROM RADAR SITE

PLUMBBOB FLIGHT FLASH FACTS

TIME ZERO! The flash from the nuclear detonation illuminates the barren Nevada Test Site with the intensity of a hundred suns. This is it! The Navy pilot is awed by the tremendous release of nuclear energy so close to his aircraft.

"Stand by for shock wave!" The voice of the aircraft controller shatters the radio silence within the cockpit.

Instinctively, the pilot braces himself. Tense, waiting for the inevitable to happen, he concentrates on his flight instruments. WHRUMP! The aircraft responds to the wave's impact.

He quickly verifies the fact that his plane has withstood the nuclear detonation and relaxes. Mission completed. As he turns toward home base bringing valuable data, he watches with fascination the fiery, mushroom-stemmed cloud rise.

On the ground after the radiation checks, instrument technicians and engineers will go over the aircraft pulling recorded findings out of various compartments. This is why the aircraft flew so close to the blast—to determine the response of naval aircraft to a nuclear explosion. Coded gust, blast, thermal and radiation effects will be processed and analyzed in order to improve theoretical prediction methods for wartime missions.

This, then, was the primary purpose for the participation of naval men and aircraft in *Operation Plumbbob*, the most recent series of the nuclear tests carried out at the Nevada Test Site.

To accomplish this mission, the Special Weapons Effects Branch was established in the Bureau of Aeronautics. AD-4, as it is called, has definite responsibilities: it specifies which aircraft will be used, defines and justifies requirements, and obtains approval from Headquarters, Armed Forces Special Weapons Project in Washington to include the Navy program.

Once this is done, AD-4 Branch assigns the aircraft weapons effects projects to the Naval Air Special Weapons Facility (NASWF), located at Kirtland AF Base, Albuquerque, New Mexico. Commanded by Capt. A. I. Boyd, this BUAER research and development activity is concerned with the integration of nuclear weapons with naval aircraft. Much material is gathered during actual nuclear tests. Since NASWF took part in *Operation Teapot* at the Nevada Test Site in 1955 and *Operation Redwing* at the Eniwetok Proving Ground in 1956, it now has a large nucleus of trained and experienced personnel to do such work.

NASWF DETACHMENT, FJ-4, HSS-1, A4D-1: THE NAVAL PERSONNEL AND AIRPLANES THAT PARTICIPATED IN OPERATION PLUMBBOB

A SKYHAWK FLIES HIGH ABOVE THE HOOVER DAM-LAKE MEAD AREA

CDR. MONTUNNAS POINTS TO NASWF PLUMBBOB INSIGNE ON A4D

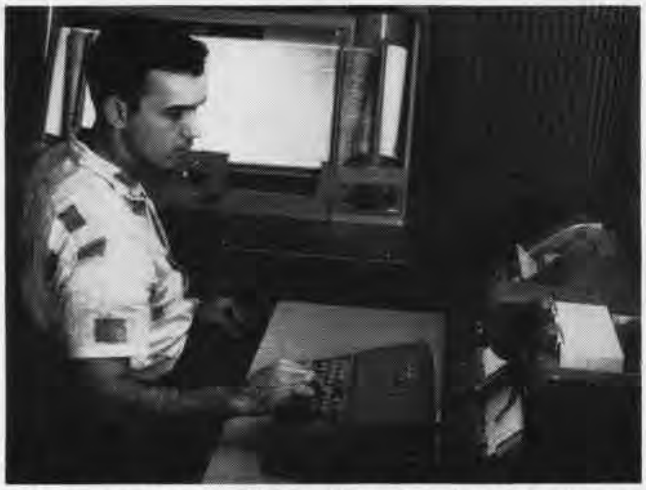
Planning for *Plumbbob* started early in 1956. New and different problems were anticipated since Navy jet aircraft and a helicopter were to be used for the first time. Two North American FJ-4 *Furies*, two Douglas A4D-1 *Skyhawks* and a Sikorsky HSS-1 had been selected. The planes were extensively instrumented at the contractors' plants, assisted by the Naval Radiological Defense Laboratory in San Francisco. Large numbers of aircraft spares and special ground handling equipment were assembled at the Special Weapons Facility or forwarded to the test site.

Pre-operational training was conducted at Kirtland. In late March 1957, a huge truck convoy proceeded to the staging area at Indian Springs, Nevada. There, a large warehouse was converted to quarter naval and contractor personnel, who were based there until September. Quonset huts were used for maintenance and material functions. In all, 13 officers, 45 men and about 40 contractor employees were assigned to the BuAer project.

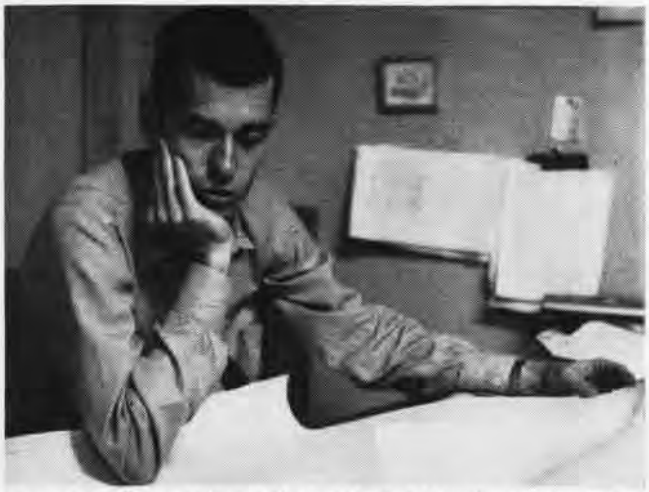
Cdr. Stanley Montunnas headed the NASWF Detachment, which included the men who would pilot the planes. LCdr. A. R. Hansen was assistant. Cdr. Montunnas, Lt. R. R. Miears and Lt. J. H. Wynn would fly the *Skyhawks;* LCdr D. S. MacKay and Lt. A. G. Lane the *Furies;* LCdr. W. W. Wickwire and Ltjg. R. E. Trandem would fly the HSS-1. One FJ-4 and one A4D were designated primary aircraft. Their mission was to make the run to the vicinity of the burst. The helicopter assigned was the primary vehicle of that type for each 'shot.'

A carefully plotted 'race track' pattern had been prepared for weeks to position the aircraft at 'shot' time. Upon its accuracy rested the fate of the pilot and his aircraft. The planes arrived at a carefully pre-computed point in space at a fixed speed, precisely at Time Zero (the instant of nuclear explosion). Aircraft controllers directed heading and speed changes by means of UHF radio. These changes were determined by comparison of the actual position with the pre-plotted location at a specific time prior to the detonation. A Time Zero position prediction computer was installed in radar vans to aid the controllers during the final run.

The optimum radar location at the Nevada Test Site was selected in August 1956. Equipment was procured at an accelerated pace from Army,



ANALYST OPERATES MACHINES THAT 'READ' THE DATA GATHERED



LT. JACK WYNN STUDIES RACE TRACK PATTERN BEFORE FLIGHT

FORK LIFT USED TO REMOVE PILOTS FROM PLANE AFTER MISSION

'HOT' FURY WASHED DOWN BY INDIAN SPRINGS RAD-SAFE TEAM

Navy, Marine Corps and Air Force. A new aircraft radar beacon system was developed for more precise control.

The success of the flights during numerous shots reflected the months of painstaking preparation, and the employment of the latest electronic components. The results demonstrated dramatically that carrier-based aircraft can perform nuclear missions in wartime safely.

Initially, the stand-by jet aircraft (second FJ-4 and A4D-1) orbited over a point where the effects were negligible. During the latter part of the operations, both planes of each type were sent in to obtain additional effects and to correlate results. Normally, each jet was controlled by its own radar.

Immediately after each shot the planes landed at Indian Springs AF Base and were given radiation checks by the Air Force Radiation Safety Team. A portion of the field was set aside for the decontamination of 'hot' aircraft. As the aircraft taxied to the parking area, a special fork lift truck met it so the pilot could step out without contacting the fuselage. The pilot is not subjected to residual radiation within the cockpit, but each test plane might be contaminated. If so, it was allowed to 'cool' and given a washdown with water.

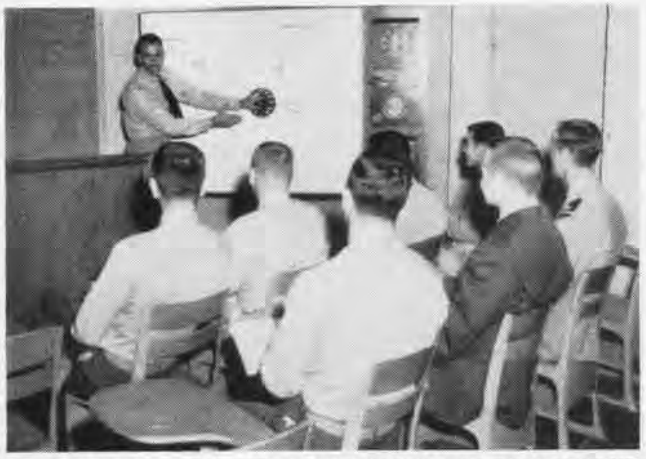
During this series of tests, airships took part in nuclear tests for the first time. Since NAS LAKEHURST was assigned the project to study the effects on lighter-than-air craft, experts from that station, headed by LCdr. D. D. Wallstein, and civilians from the Aeronautical Structures Laboratory, Naval Air Material Center, went to Nevada. Two ZSG-3's, containing extensive instrumentation were exposed to critical blast effects.

Naval participation in *Operation Plumbbob* required the coordinated efforts of many activities. In addition to the people and places already mentioned, there were Marine aircraft controllers from MCAS EL TORO, helicopter pilots from HS-4 at Ream Field and electronics specialists from Naval Air Missile Test Center, Point Mugu.

The jet test pilots, all attached to NASWF, were volunteers. The experience of flying so close to a nuclear explosion defies description—the anticipation, the blast, the shock wave! The words of Cdr. Montunnas tell the story: "You never quite realize you are flying near a nuclear detonation until it 'pops off', then it's all over before you can do anything about it!"

RADAR 'PARK' LOCATED 13 MILES FROM NUCLEAR DEVICE SITE

A NAVY ZSG-3 AIRSHIP AWAITS ARRIVAL OF THE SHOCK WAVE



LT. GARDNER EXPLAINS OMNI DEMONSTRATOR TO METG STUDENTS

CROSS-COUNTRY FLIGHT BRIEFING IS GIVEN BY LTJG. DEMPSEY

MORE TRAINING IN-BETWEEN

PRE-FLIGHT, primary and basic are completed. The VA, VF, VP and VS students are sent to Advanced Training Units for specialized training before joining squadrons, but what happens to the men who will become lighter-than-air and helicopter pilots?

The Multi-Engine Training Group at Forrest Sherman Field, NAS PENSACOLA, takes over for 12 weeks. METG was organized 1 July 1956 to make a student an unrestricted pilot prior to LTA or helicopter training.

Sixteen men are accepted every two weeks. The quota is divided between the Navy and the Marine Corps. Maj. E. W. Cassidy is the Officer-in-Charge; LCdr. G. G. Andrews is his assistant. There are 34 instructors and 31 SNB-5 *Beechcrafts* in the entire group.

The curriculum is divided into three categories: academic, flight and flight procedures. The courses, running concurrently, are integrated with one another, paralleling the 'A' phase of advanced training.

Academic subjects include instrument navigation, aerology and engineering. The students learn flight regulations, the theory and use of computers, weight and balance, and flight planning through available weather data. They become familiar with aviation publications, the capabilities of the SNB and the operation of flight instruments.

The flight phase of the syllabus puts theory into practice. The Link Trainer is used. They make their solos in the *Beechcraft*. Ultimately, there are cross-country flights, which give practical experience in flying through various types of weather, over unfamiliar terrain and in and out of strange air fields.

Flight procedures extend the basic information to include maneuvers and emergency methods. OMNI, GCA, and air traffic control procedures are studied and practiced within this category of the training program.

Upon successful completion of the METG course, the students receive an instrument card and are designated unrestricted pilots. The airship men go on to Glynco, Georgia, for a final 15 weeks of LTA training. The helicopter pilots transfer to Ellyson Field, Pensacola, for their last eight weeks of specialized instruction.

TIMBERLAKE, TD2, INSTRUCTS LT. STROMAN IN LINK TRAINER

SIMULATED INSTRUMENT FLYING IS PART OF THE CURRICULUM

CDR. T. C. DURKIN *greets President Eisenhower and his brother, Milton, at the Olathe air station after their unexpected landing.*

PRIOR TO *indoctrination flight in a Tracker, Cdr. Wooten, center, briefs Capt. Harris and Wing Commander Creeper of the NATO staff.*

PRESIDENT LANDS AT OLATHE

IT STARTED out to be just another Wednesday at NAS OLATHE. The commanding officer, Capt. F. M. Slater, had departed on official business, leaving the executive officer, Cdr. T. C. Durkin in command. Otherwise, strictly SOP was in effect.

The news broke at 1110. President Dwight D. Eisenhower, in his official plane, was over Kansas City and ready to land. The Municipal Airport was fogged in. The President might have to use the Navy strip.

By 1115 the word was official and definite. The Commander-in-Chief would pay an unscheduled visit to Olathe, Kansas.

Columbine III touched down at 1127. The President and Dr. Milton Eisenhower had arrived to attend the funeral of their brother, Arthur. They had been preceded by a TWA *Constellation* bearing members of the working press.

The 17 minutes between scuttlebutt and fact were busy for all hands at the station. Transportation to Kansas City had to be provided for the entire party. Capt. Slater's sedan was the only official vehicle on board and this was reserved for the President. All available private automobiles were pressed into service to accomodate the rest of the group.

Cdr. Durkin greeted the President. The entourage departed shortly forming one of the most unusual motorcades in recent Presidential history.

Dallas H. Grey, FP1, was all prepared to act as the President's driver. He was behind the wheel when President Eisenhower explained to him that regulations required that a secret serviceman perform the service. Grey grinned, saluted smartly, the President smiled and all was secure.

Three hours after arrival, the distinguished visitor took off from NAS OLATHE. The memory of the unexpected honor will last a long time.

Canadians Visit NARTU Norfolk

Two Royal Canadian officers were given an insight into the operation of the Naval Air Reserve and its participation in anti-submarine warfare during a visit to NARTU NORFOLK.

Captain Frazier Harris, Royal Canadian Navy, and Wing Commander Jack E. Creeper, Royal Canadian Air Force, both from the NATO staff at Norfolk, were briefed by Capt. R. S. Rogers, the commanding officer of the naval air reserve unit.

Cdr. A. L. Wooten, executive officer, then took the visitors for an indoctrination flight in a *Tracker*.

VP-703 Commissioned at Dallas

A new air unit was added to the organized defense forces in the Texas-Oklahoma area when Patrol Squadron 703 was commissioned at NAS DALLAS, Texas.

The newly organized Weekend Warrior outfit is commanded by Cdr. William D. Wilder who lives in Corpus Christi.

Most of the officers and men assigned to the squadron are from the south Texas area. They formerly participated in the air reserve program at NARF HOUSTON, before it closed.

Capt. W. L. Richards read the letter of authority placing VP-703 in commission. The squadron will operate twin-engine P2V *Neptune* land-based patrol bombers. Training will include long-range navigation, anti-submarine tactics, bombing problems, mining, evasive maneuvers, and many other aspects of modern naval air warfare.

Movie Veteran Inspects Atlanta

A 26-man team from Chief of Naval Air Reserve Training, headed by Capt. I. M. Hampton, conducted annual administration and logistic inspection at NAS ATLANTA.

One of the members, LCdr. Frank Coghlan of the Liaison staff, took time out on the first day for a television interview on WSB-TV. He was exceptionally well-qualified for the job since he is a veteran of the movies.

Mr. Coghlan played the part of Sam in the movie, "Penrod and Sam", and has acted with the famous Dead End Kids. Just before he entered the Navy in 1942 as a Naval Aviation Cadet, he was portraying Mickey Rooney's pal in the "Andy Hardy" series.

The inspection was up to par and the interview was very successful.

LCDR. FRANK COGHLAN *is interviewed by George Page on Atlanta television station.*

Lakehurst Blimp Used for TV

Dave Garroway, nationally known TV personality, began his seventh year as host of "Today" on NBC-TV, by saluting the Naval Air Reserve Training Program from a Navy blimp.

Following breakfast with Capt. James W. Condit, the commanding Officer, Mr. Garroway joined his TV crew aboard a blimp at Lakehurst at 0500 and flew to New York City.

The purpose of the flight was to fulfill the many requests Dave had received from his viewers to televise New York City from the air. During the two hours aloft, live television cameras picked up shots of Manhattan Island, the Statue of Liberty, the Empire State and other landmarks.

The sixth anniversary show also included films showing NARTU personnel during the week in their regular jobs and also as Weekend Warriors.

LCdr. D. W. Crowder, NARTU flight training officer, piloted the airship. Host and co-pilot was executive officer, Cdr. M. A. Holzrichter.

Navy Man Receives Army Award

The Army doesn't forget former soldiers entitled to high World War II honors. This was proven dramatically at NAS OAKLAND.

A surprised John Paul Gellerman, AE1, a member of ship's company, was presented with the bronze star for an enemy encounter in the 1944 Rome-Arno Campaign.

The bronze star was pinned on Gellerman by his Navy skipper, Capt. Wallace H. Weston, who also presented the citation signed by the Secretary of the Army for heroic action as an Army infantryman fourteen years ago.

NAS NY Presents Big Premiere

The movie "South Pacific" opened in New York City on March 20th with all the pomp and circumstance of a Hollywood premiere. There was one big difference. It was strictly a naval affair and all proceeds went to the Navy-Marine Stadium Fund.

NAS FLOYD BENNETT FIELD and the New York Chapter of the Navy League presented the world premiere benefit and designated it Naval Air Reserve Night.

Arrangement were made through Mr. George Skouras, president of Magna Theatre Corporation, which is the distributor of the movie. Mr. Skouras also offered RAdm. H. H. Caldwell, Chief of Naval Air Reserve Training, the opportunity to conduct regional premieres of "South Pacific" in 20 major cities in the United States where Naval Air Reserve activities are.

BRONZE STAR *is pinned on former Army infantry man Gellerman by Captain Weston.*

The lavish Technicolor film, produced at 20th Century-Fox, opened at the Criterion Theatre at Broadway and 43rd Street. Six hundred preferred seats were set aside as the "Golden Circle." Prominent friends of the Navy paid $100 a ticket for this location, which also enabled them to purchase a memorial seat in the new stadium. Approximately 1000 seats were sold to members of Naval and Marine Air Reserve Squadrons, active duty personnel and civil service employees attached to Floyd Bennett, for contributions of $5.00, $3.00 or $1.00.

"South Pacific" is a Rodgers and Hammerstein production in the Todd-AO process and is based on the Broadway show from James Michener's book. It stars Mitzi Gaynor and Rossano Brazzi and was filmed on Kauai, the "Garden Island."

RAdm. E. C. Holden (Ret.), President of the Navy League New York Chapter, and Capt. J. H. Newell, the commanding officer of NAS NEW YORK, were responsible for the event.

SET TO FLY NAVY *are Paul Cunningham and Bill Healion of NBC-TV, CAA's Cliff Weaver, Dave Garroway, Capt. Condit, LCdr. Hannigan.*

SOUTH PACIFIC *premiere arrangements made by Mr. Skouras, Mr. Josh Logan, RAdm. Caldwell, Mr. Oscar Hammerstein and Capt. J. Newell.*

MONTEREY HAS NEW SCHOOL

THERE'S A NEW version of a well-established Navy educational program that should be of particular interest to 1300-type naval officers.

On 1 July 1958, the School of Naval Sciences will officially replace the General Line School as a component of the U. S. Naval Postgraduate School, Monterey, California.

The new school will offer both academic and professional education to eligible naval officers who do not possess a baccalaureate degree. The course is tailored to meet both the needs of the Navy and the academic requirements of individuals qualifying for the Five Term College Training Program. Officers who successfully complete the prescribed curriculum will be awarded the degree of Bachelor of Science (Undesignated).

At the start, the school will be geared to accept semi-annual registration of approximately 50 students per class. It is anticipated that eventually all officers eligible for the Five Term Program will be educated at Monterey. However, for the immediate future the School of Naval Sciences will supplement but not replace the program at the 53 civilian colleges and universities throughout the country.

The first class will convene in August 1958. The officers who will attend were chosen by a Selection Board and their orders are being cut. In the future, selection will be made by administrative action of the Chief of Naval Personnel. All applicants to the Five Term College Program will be considered.

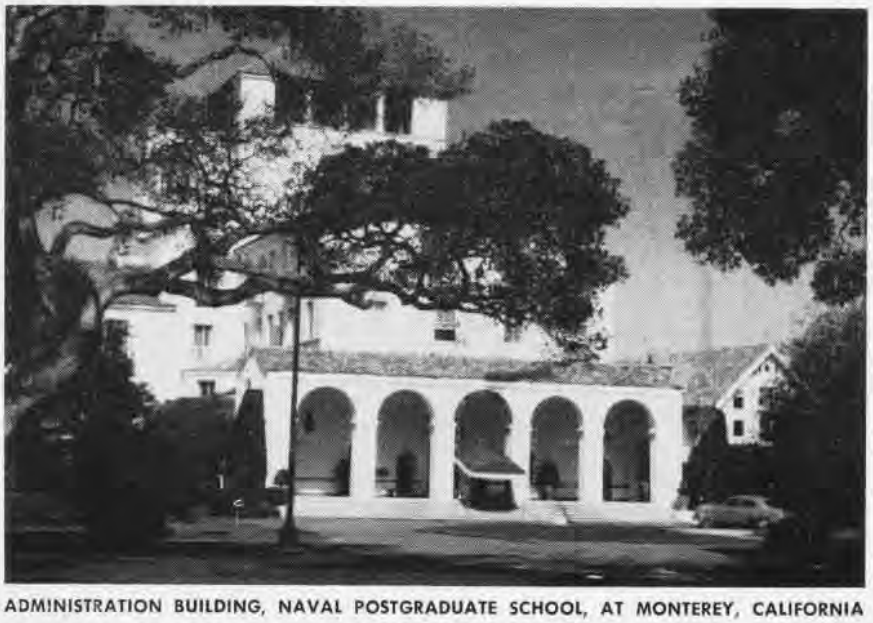
Entrance requirements and application procedures will be identical to those outlined for the Five Term Program in BUPERS Instruction 1520.48A Once admitted, each student will have his academic and service background re-examined and his credits re-evaluated. As a result, some officers may find it necessary to take refresher courses without credit. Most students will require two to two and a half years of study to complete work for a degree.

This educational program has several advantages over the Five Term Program at civilian institutions. The School of Naval Sciences offers a curriculum particularly meaningful to career officers in today's modern Navy. The degree they earn will be backed up by courses in the humanities, but the emphasis will be placed on mathematics and science. Moreover, academic counsellors will be able to advise students on course selection to a much greater degree than is possible at civilian schools.

In addition, officers who have been away from academic studies for several years are finding it more and more difficult to gain admission to already overcrowded colleges and universities. A fully accredited naval institution will relieve them of the frustrating experience of seeking entrance at one after another of them.

In return, the Navy feels it will gain well-motivated officers, more specifically educated to meet its stepped up technical requirements.

The School of Naval Sciences will also offer the professional General Line subjects prescribed for Naval officers with approximately five to seven years of commissioned service. There will continue to be two classes a year for the 9½-month course.



ADMINISTRATION BUILDING, NAVAL POSTGRADUATE SCHOOL, AT MONTEREY, CALIFORNIA

ASO Helps Small Business

1957 Contracts Total $46 Million

Contracts totaling $46,144,786 were awarded to small business concerns last year by the Naval Aviation Supply Office at Philadelphia. Larger concerns also subcontracted much of their work to small business.

ASO is the largest inventory control center in the Navy Supply System.

CAA Orders New Recorders

Devices Will Reduce Human Error

A voice time signal recording development is expected to increase the efficiency of air traffc control operations, according to the Dictaphone Corporation.

The voice time signal feature will be present in special recording machines which the Civil Aeronautics Administration has ordered and will soon put into use at all U. S. airports where traffic is controlled.

Dictatape recorders currently used by CAA at airfields are of the four-channel type, capable of recording four audio signals simultaneously on quarter-inch magnetic tape. The addition of a fifth channel, with a voice announcing the time at regular intervals, means that the exact time of all communications between aircraft and traffic control facilities will be known and preserved.

Incorporation of the voice time signal will eliminate many chances for human error which have always been a potential with operators depending on themselves to announce the time. It is expected to enable the CAA to pinpoint the reporting time of each aircraft and to have precise information available for later reference use.

VA-151 WINS THE LOFT-Y 'E'

A FEW MILES west of NAAS FALLON, the eight-mile-long bombing range lay ready for the next run, a competitive exercise (COMPEX) drop. The three spotters in their towers spaced around the bulls-eye had reported ready. The 'sky-screen' operator was standing by to measure the speed of the jet along the run-in line. The profile tracker was ready to trace the soaring maneuver on a large sheet of graph paper for detailed analysis.

As the VA-151 pilot checked in for a COMPEX run, he was cleared on target. From his position several thousand feet above the terrain, he could see the run-in line leading south to the bulls-eye in the distance. Checking all switches again, he rolled his FJ-4B aircraft into a steep diving turn at full power. Finally leveling off, the aircraft seemed to be skipping from dune to dune over the desert at nearly top speed. As he hurtled down the run-in line making the last few adjustments, the pilot barely noticed the markers flashing by, counting down the distance to the bulls-eye.

In the range control tower, his progress was recorded by the flashing sky-screen markers and the profile tracking machine commenced its trace.

As he flashed over the bulls-eye, the pilot smoothly started upon a hi-'G' loop, trying to hold the aircraft on a precise and steady path. Up past the vertical and over on his back, when finally the bomb released and went on up, far above the aircraft. Continuing on through the horizon, the pilot finally rolled out, gaining speed toward the ground as he moved along the escape path away from the target.

Many seconds later the practice bomb burst on the target, was spotted, then plotted on the range control target sheets. At the end of the exercise, the results for the entire squadron were computed.

The rules of competition are concise and complete. A COMPEX is a squadron effort; maintenance, ordnance, and plane captain crews directly contribute to the score received. Once the pilot accepts the aircraft and takes-off on his mission he must complete the drop or be penalized. Thus a faulty bomb-rack, radio failure, bad air-speed indicator, or any other crew error can count as heavily as pilot error. The pilot must make a perfect mission, for he has but one run to get his bomb away and on target.

PILOTS PLAN NAVIGATION FOR ATTACK MISSION: CDR. SEVILLA, FRONT ROW CENTER

No excuses are accepted for forgetting a switch, for poor estimation of the target winds and temperature, or for missing a step in the loft bombing sequence. In particular, the target crew can give the pilot no information, but can only tell him that the target is clear for his run. The final squadron score is then computed from the best 15 pilots in a 12-plane unit.

In three exercises in which Attack Squadron 151 competed, 60 COMPEX runs were made. In the first, six pilots bettered the standard score and qualified for E's. In the second, 13 pilots made the grade, Cdr. Sevilla and Ltjg. W. H. Weingartner for the second time. On the third and final exercise run, nine pilots bettered the standard score. Second timers were LCdr. C. A. Borley, XO, Lt. R. P. Smith, Ltjg. R. R. Reese, Ltjg. N. L. Bianchini, Ltjg. L. D. Meyer, and Ltjg. W. L. Jones

Cdr. Sevilla had qualified in all three exercises, and 19 of the 20 pilots assigned had qualified for at least one "E." The squadron with a total of 28 "E's" earned a grade of "Outstanding" in each exercise.

The COMPEX is the final exam after months of arduous training. In the case of VA-151, their success is the more remarkable because of the fact that they switched to FJ-4B *Furies* halfway through the normal training cycle in F9F-8 *Cougars*. This meant time spent in getting checked out in the *Furies*.

The training of the squadron was complete and varied. Once basic tactics were completed, the weapons system checkout began. Each pilot also completed the inflight refueling syllabus. VA-151 pilots were the first to practice the inflight refueling syllabus with the Navy's R3Y tankers stationed at NAS ALAMEDA.

Because this was the first weapons deployment in FJ-4B's for VA-151, the pilot's worked on a dawn to dusk schedule preceding the COMPEX. The daily schedule involved 32 loft sorties, eight special weapons dive bombing sorties and four strafing sorties.

Training really paid off for the *Black Knight;* and 28 "E's" proved it.

CWO WALLER EXAMINES ORDNANCE RECOVERED BY HIS EOD TEAM

QUARMBY AND SCHOENICK DISMANTLE FAULTY AIRCRAFT ROCKET

THEY FIND BOMBS EVERYWHERE!

by Staff Sgt. Edwin D. Brey, USMC

WITHIN a ten-month period, members of the Explosive Ordnance Disposal team at MCAS MIAMI have investigated frantic reports of explosive materials under beds, water and piers, on beaches, in homes, towers, garbage dumps, trailers, churches and schools—some 125 calls in all.

The team is comprised of CWO Thomas G. Waller, TSgt. Paul I. Parslow, SSgt. Harold V. Quarmby and Sgt. Terry W. Schoenick; all members of Marine Aircraft Group 31. Members were trained at the Navy Ordnance Disposal School at Indian Head, Md., to render safe or dispose of any domestic or foreign ordnance that might pose a hazard to personnel or equipment.

The team's mission is to remove ammunition from crashed aircraft and disarm faulty or unserviceable explosives. Educating the public to the dangers of mishandled explosives is another important part of their work.

Many false reports of bomb plants are referred to the unit. Each must be carefully investigated.

Working closely with police authorities one day last year, the team investigated an anonymous phone call, warning that 15 sticks of dynamite had been wired with a time attachment set to explode in one hour under a prominent Miami bridge.

A search of the bridge and surrounding area revealed no explosives. While returning to the station by police car, the team received a call reporting the finding of an item of unknown ordnance on Juno Beach. Marines and police arrived at 2:00 A.M. Investigation revealed that the bomb was of a type familiar to the team. It was photographed, disarmed and re-photographed before being removed from the beach.

At 8:15 the same morning, the team investigated another false bomb report in Miami's Crandall Park.

Some people show gratifying caution in dealing with ordnance finds. In November some children playing in a vacant lot found a fragmentation hand grenade of World War II type. Without touching the dangerous hardware, they telephoned the Marine EOD team who immediately answered the call. The children had heard of the team over a local television station.

Not everyone is as careful, however. A distressed woman called on one occasion to state that she thought she had found a bomb. In the course of routine questioning, one of the sergeants obtained a description that fitted perfectly a particularly dangerous type of home-made bomb. Concerned for the woman's safety, he urged her not to touch it.

"It's in my car," she said. "I found it on the beach and put it in the car!"

"Leave it where it is," warned the sergeant. "We'll be right there." Securing a police escort, the team rushed to the woman's home. They found that she had gone, leaving word with a baby sitter that the Marines were coming. The baby sitter calmly told the men she had put the bomb under a bed in the bedroom.

Somewhat comforted by the fact that the house was still standing, the team investigated. Luckily, the bomb turned out to be a fishing marker.

Citizens are frequently warned that explosives do not become safe with age; that the reverse is often true.

During a recent excavation for a downtown Miami building, a bulldozer turned up a Civil War "Hotchkiss" projectile. It measured 13½ inches long and was 4½ inches in diameter. The outside of the shell was badly deteriorated. To render the museum piece safe without damaging it extensively, the team opened the shell case by a prescribed procedure.

Examination of the opened shell revealed that the black powder filling had not been harmed by its long burial. It was still dangerous.

Working on a 24-hour basis, the team often gets emergency calls in the middle of the night. One call last Easter morning reporting a flying saucer was a bit out of the ordinary, however.

The night clerk of a suburban

PIT IS DUG BEFORE DETONATING DANGEROUS BOMB

LINEAR CHARGE IS PLACED ON CASING TO OPEN CASE WITHOUT EXPLODING FILLER

SMOKE AND DEBRIS RISE FROM ROCKET AFTER THE CASE IS BLASTED

AFTER BLAST, EOD MEN DETERMINE CONTENTS OF THE ROCKET

hotel was first to report the phenomenon. Looking from the hotel out over the water's edge, he spotted a green glowing light. The light would flare up and die, repeating the performance at seemingly timed intervals. The clerk made a hasty retreat and called the local police. Equally hesitant to approach the unknown "something," police called Gunner Waller for Marine EOD assistance. The marines responded immediately to the call.

Investigating, Mr. Waller found that the eerie light was being caused by a Mark VII flare that had washed ashore. As the waves receded, the flare would blaze up, then when struck by the next incoming wave, the flare again became temporarily extinguished.

While some incidents have an air of comic relief, others are fraught with danger. A case in point began when Sgt. Schoenick answered a call from the Dade County Sheriff's department which had raided a private garage in Miami's residential area. Amid other loot, police had found two cases of badly crystallized dynamite.

Dynamite, explains Gunner Waller, becomes extremely sensitive with age. The pure nitro-glycerin will drain out and form beads along the bottom of the separate sticks. A slight disturbance can cause detonation. In storage, dynamite is turned at regular intervals to prevent such a dangerous separation.

The sheriff's department was not equipped to handle the explosive in its deadly state, so Marine EOD team was asked to dispose of it.

Sgt. Schoenick responded. He learned that homes and other buildings in the area prevented any demolition on the spot and that it would have to be moved to the Air Station before it could be safely disposed of.

Schoenick stripped his jeep by removing the seats and other metal parts that could become shrapnel in an explosion. Then, using blankets as cushioning, he carefully transferred the dynamite to the jeep by use of an improvised blanket cradle.

Describing the incident, Schoenick said, "It was a long, lonely drive from that garage to the Air Station."

TOOL FOR MISSILE RESEARCH

An unique laboratory tool to advance the nation's long range missile program has been used regularly the last few years according to the National Advisory Committee for Aeronautics.

Called an Atmosphere Entry Simulator, the device enables scientists to investigate on the ground the problems of intense aerodynamic heating and thermal stresses of missile and space craft as they re-enter the earth's atmosphere at high speed.

Dr. Alfred J. Eggers, Jr., of the NACA's Ames Aeronautical Laboratory, invented the device several years ago.

In the simulator, scientists set up in the laboratory a vertical slice of the earth's atmosphere. It is scaled to reproduce the ever increasing air densities a missile encounters as it plunges back to earth near the end of its trajectory.

Through this laboratory duplicate of the atmosphere, NACA research scientists fire a small model of the missile design under study. A high velocity gun launches models through the simulator at speeds above 10,000 mph.

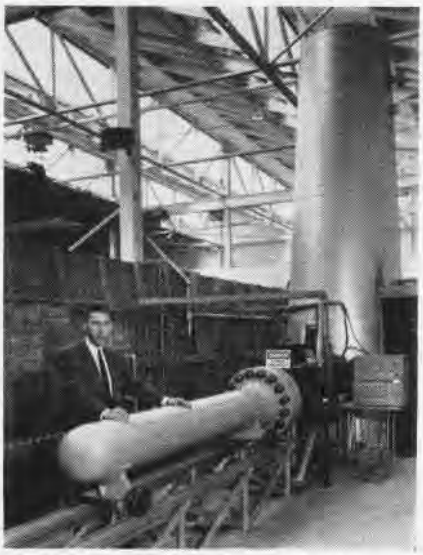
In the picture, a tubular tank holding high pressure air is in the foreground. When a valve is opened, air flows from the reservoir through a specially shaped test section (dark area beneath high voltage warning sign) into a vacuum tank, the chimney-like structure at the right. While the air is in motion, a high velocity gun fires a test model through the apparatus from right to left.

As the model moves upstream through the simulator, the air grows more and more dense, still duplicating the full-scale missile's experience in the atmosphere.

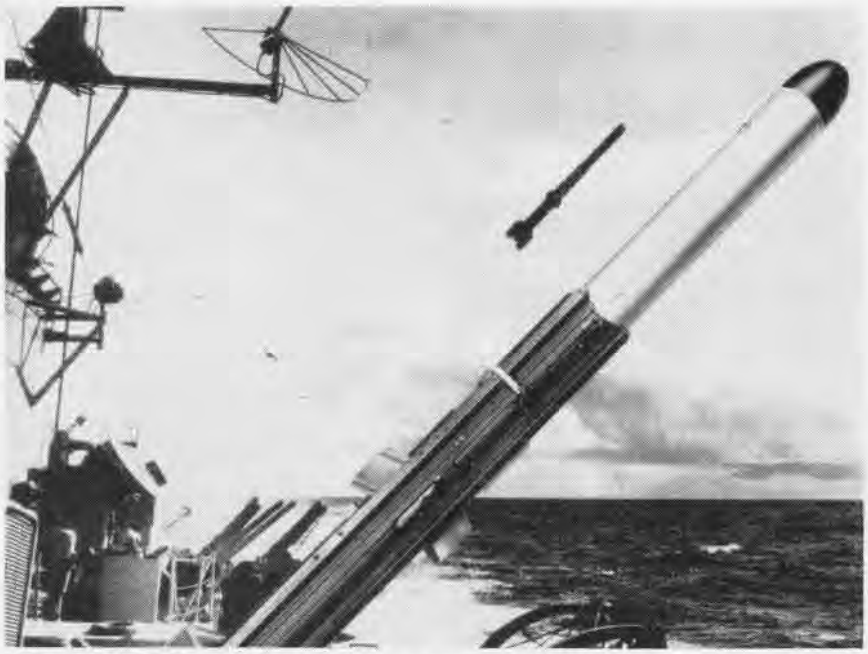
During the flight, electronic timers record the model speed. Shadow-graph stations picture the shock-wave patterns set up in the air and a spectrograph can be used to analyze the incandescence surrounding the model.

The atmosphere entry simulator has been used at Ames Laboratory for nearly a year. Using it, scientists have been able to determine whether or not the corresponding missile would remain essentially intact while traversing the atmosphere.

A larger simulator will operate at the NACA Ames Laboratory this year.



DR. EGGERS AND THE DEVICE HE INVENTED



SIXTH OPERATIONAL MISSILE, *scheduled to augment the Navy's arsenal this year, is the "RAT"—Rocket Assisted Torpedo. Designed for destroyers which will use existing five-inch gun mounts as launchers, the rocket-propelled torpedo is fired at enamy subs while they are beyond effective retaliation range. After dropping the airframe, the RAT is retarded by parachute and goes beneath the surface where, after shedding its nose cone, it seeks out the target by sound and destroys it. The RAT joins the Sidewinder, Petrel, Regulus, Terrier and Sparrow in the U.S. Navy's functional family of offensive and defensive missiles.*

Mirror Landings are Made

Kingsville Trains Tracker Pilots

Pilots of Advanced Training Unit 402 at NAAS Kingsville, Texas became first to make mirror landings ashore using S2F *Trackers*. A week later they joined jet pilots of ATU-201, also based at Kingsville, in making carrier qualifications aboard the carrier Antietam off Padre Island in the Gulf of Mexico.

In preparation for shipboard qualifications, simulated conditions were set up at the Alice-Orange Grove auxiliary landing field at Alice, Texas. With a carrier deck area marked off on the main runway, components of the mirror landing system were installed on either side.

Nearing the approach area, pilots saw six horizontal green lights in a row, extending to each side of the mirror. A group of source lights located 150 feet behind the mirror were focused into a single spot to form the "meatball" sought by the pilots.

Pilots maneuvered their planes until the meatball appeared dead center in the mirror, then proceeded to land.

Copter Airlifts Copter
Crashed HUS Plucked from Marsh

An HR2S helicopter of HMR(M)-461, based at MCAF NEW RIVER, has been used to airlift an HUS helicopter from a Florida swamp where the smaller helicopter had made an emergency landing after an engine failed.

First Lt. C. S. Popok was making a navigational flight from New River to Miami when his HUS suffered an engine failure only minutes after takeoff from NAS SANFORD.

Following the engine failure, Lt. Popok demonstrated his skill in autorotating the crippled helicopter to a safe landing in the marsh. The copilot, 1st Lt. R. P. Frierson, and crew chief SSgt. B. Ahearn, escaped injury, as did Lt. Popok.

Although the copter landed without damage, there was the problem of extracting the aircraft from its soggy berth. Because of the marsh underfooting, salvage of the stricken aircraft seemed nearly impossible until a suggestion was made to use the "skyhook" method, never before tried with this type aircraft.

HR2S LIFTS HUS IN TEST AT NEW RIVER

A practice lift was made at New River to determine whether such an airlift was possible. On the test, the Sikorsky HR2S lurched into the air with its valuable cargo snugly suspended below.

The HR2S was flown to NAS SANFORD. A day later, the HUS was raised clear of the swamp and airlifted back to Sanford for an engine change.

A 'SIMPLE' GYRO IS CHECKED IN DUST FREE CHAMBER BY SPERRY ENGINEER J. WILSON

ACCURATE GYRO DESIGNED

A "FRICTIONLESS" gyro," said to be up to 60 times more accurate than previous gyros, has been developed by Sperry for use in missile, aircraft and ship navigation systems. The new gyro has been trade-named *Rotorace*.

The development hinges on a unique method for controlling ball bearings within "simple" gyroscopes—devices with finely balanced spinning wheels that have an inherent ability to point continuously to a fixed position in space.

It is reported to be so precise that it allows a missile to strike within 23 yards of a target after flying a 150-mile distance.

Such high accuracy is achieved through constant rotation of the ball bearings in the gimbals on which the gyro is suspended. As one bearing is rotated clockwise, the bearing at the opposite end of the gyro is spun counter-clockwise. The rotation is reversed periodically, which cancels friction and "averages out" errors caused by irregularities found in even the finest ball bearings.

"Coupled to Doppler radar systems," says a Sperry engineer, "*Rotorace* gyros will significantly improve navigational accuracy without increasing costs." As Doppler radar informs the pilot "how far," *Rotorace* gyros tell "what direction."

The twin gyro "platform" in which the *Rotorace* principle is being applied for the Air Force is said to be especially adaptable for bombing systems, fighter maneuvers and guided missile applications.

The new gyros are in volume production. They will allow aircrews to fly "hairline" courses, unaided by other navigation devices, over the poles and other areas where ground radio aids and magnetic compasses are either nonexistent or very unreliable.

Safety Belts are Urged
NAS Memphis Booms Auto Safety

Operation Safety Belt has been launched at NAS MEMPHIS. The goal of a well-publicized campaign is to get a safety belt installed in the automobile of every Navy and Marine motorist serving at Navy Memphis.

After the station safety department tested various types of safety belts, a belt tested at 4000-pounds breaking strength was adopted and made available to all in the Navy Exchange.

IN FOREIGN SKIES

JAPANESE PILOTS TRAINED

THROUGH THE combined efforts of American and Japanese personnel at MCAF IWAKUNI and other installations in Japan, well trained pilots are being readied for the Japanese Maritime Self-Defense Force's task of patrolling Japan's shoreline.

An advanced flight training course for Maritime pilots is now in operation under the guidance of Lt. Edward L. Grady, USN. The Iwakuni installation pools Japanese and American know-how and equipment to teach instrument flying to the Maritime Force's growing air arm.

INSTRUCTOR GIVES STUDENT A POINTER

Twenty-five to 30 pilots are undergoing a three-month course, and the Iwakuni Flight Training Unit is expected to graduate from nine to 11 finished pilots each month.

Students arrive at Iwakuni after completing 14 months of preliminary and basic flight training at various JMSDF installations. Heading the Flight Training Unit is Capt. Shoichi Ibuki, and his executive officer, Cdr. Keiichi Eto.

Assigned through the U. S. MAAG located at Tokyo, Lt. Grady handles liasion details between American and Japanese military officials and "checks out" the students on the Maritime unit's SNB Beechcraft planes furnished through the Mutual Defense Assistance Program.

Lt. Grady accompanies Japanese flight instructors and their students on training flights to check progress.

FLIGHT MANEUVER IS SHOWN ON NOTE PAD

The Flight Training Unit is planning to train about 108 pilots a year. The training is handled almost exclusively by Japanese personnel.

The three-month course at Iwakuni is followed by a tour at Kanoya Air Base for familiarization with the Navy type S2F antisubmarine search planes or the P2V patrol craft. Once training is completed, the pilots are assigned to S2F and P2V-7 Japanese Maritime squadrons at various stations.

MCAF IWAKUNI was designated as the advanced training site for the patrol and search plane pilots when an agreement on the Facility's joint use was signed by RAdm. William M. Nation, Commander Naval Air Bases, Japan, and RAdm. Yoshimori Terai, Commander of Kanoya Air Base.

The extensive training program, covering nearly two years, qualifies the flying members of the Maritime's air arm for their important task of watching over Japan's rugged coast.

ATU–206 Teaches Argentines

Argentine naval personnel are being trained in the maintenance and upkeep of *Panther* jet aircraft by members of Advanced Training Unit 206 at Forrest Sherman Field, Pensacola.

Argentina is scheduled to receive a dozen Grumman F9F-2 *Panthers* to inaugurate the first jet Naval air arm in Latin America.

Instruction covers air frames, electronics, hydraulics, power plants, armament and emergency procedures.

ETENDARD IV, *formerly the Mystere IV was designed for light attack and interceptor missions for NATO use and was built by Marcel Dassault. On its initial flight, July 24, 1956, it was powered by an Atar 101E-3 turbojet of 8160 pounds thrust. In the nose of the fuselage is an AIDA radar ranging unit which indicated target elevation, azimuth and range. Fuselage length of the aircraft is 46 feet, and its maximum gross weight is 14,300 lbs. in ground attack role. In extensive tests throughout its speed range, the Etendard IV achieved Mach 1.1 in level flight.*

AF Has a New Parachute

Permits Safe Low-Level Ejection

The Air Research and Development Command has developed an improved parachute which enables jet pilots to eject with perfect safety at low altitudes. Accepted as standard equipment, the "Guide Personnel" parachute will soon be in service throughout the Air Force.

To get a chute which would open faster, yet slow down the pilot's fall after ejection, ARDC researchers fabricated a quarter bag deployment system, strengthened the parachute bridle and main canopy, then incorporated an automatic time delay release to slow the pilot's fall prior to parachute opening. The lower edge of the canopy is scalloped to give the pilot greater control over his descent.

Project engineer for the new parachute was CWO I. Rosenberg of the USAF Flight Center, Edwards AFB.

VICE ADMIRAL *Robert Burns Pirie, Commander U. S. Second Fleet, is buckled in for take-off as he prepares to get in some flying time as pilot of an A3D Skywarrior during his one day visit at Port Lyautey, Morocco.*

Terrier Contract Awarded

BuOrd Orders Guidance Systems

Convair has been awarded a new $26-million contract by BuOrd for the production of guidance and control groups for *Terrier* guided missiles.

Work will be done at the Naval Industrial Reserve Ordnance Plant in Pomona, Calif. The plant is Navy-owned and has been engaged in missile engineering and production since 1952.

Terrier is an all-weather, surface-to-air guided missile. It is suitable for shipboard use or beachhead operations with the Marine Corps.

One Marine anti-aircraft battalion is now using the *Terrier* in conjunction with mobile trailers. Ships armed with the *Terrier* are the *Boston, Canberra* and *Gyatt*. Ships under conversion or construction which are scheduled to use *Terriers* include the *Kitty Hawk, Constellation, Topeka, Providence, Springfield, Long Beach, Farragut, Luce, MacDonough, Coontz, King, Mahan, Dewey, Preble* and *Dahlgren*.

Shipboard *Terriers* are selected from their magazine and loaded on a launcher which is trained, elevated and fired. The entire operation is automatic and takes only seconds. Radar guides the missile to its target.

BANTAM BOMBER *pilot, Ens. J. G. Stoker, is welcomed by Cdr. B. J. Robison, as he delivers an A4D Skyhawk for VA-172 at Jacksonville. Skyhawks will replace F2H-2 Banshees formerly flown by the Blue Bolt pilots of VA-172.*

VA-42 Scores 22 'E's'

Also Has High Flight Hour Total

VA-42 at NAS Oceana, under the command of Cdr. C. R. Largess, Jr., awarded 22 individual "E's" following the competitive exercises which climaxed four weeks at Guantanamo Bay.

The squadron was also tops among Atlantic Fleet Air Group carrier squadrons in total flight hours for the month of January. VA-42 logged 931 hours of flight time during that month which included day and night carrier qualification aboard the USS *Intrepid* and ordnance instruction.

ONE-O-WONDER *describes Lt. W. L. Mumma, the first Navy flier to achieve "operational capability" in the F-101A Voodoo. Lt. Mumma is serving with the 522nd Fighter-Bomber Squadron at Bergstrom Air Force Base, Texas.*

Canadians Visit Norfolk

Part of Their Country-Wide Tour

Members of the faculty and student body from the Canadian National Defense College, Kingston, Ontario, visited NAS Norfolk as part of their country-wide tour of military installations. MGen. J. D. B. Smith, CBE, DSO, CD, Canadian Army, headed the group.

The group made a thorough tour through the O&R Department. They were welcomed by Capt. P. H. Harrington, O&R officer.

A tour of a P5M-2 Martin ASW Search and Rescue plane from VP-44 followed. The group was accompanied by Cdr. M. E. Haller, squadron skipper.

ROCKET-POWER-*augmented FJ-4F Furies, featuring a new North American Aviation rocket engine, the AR-1, are currently being tested at the Naval Air Test Center, Patuxent River. The AR-1, which operates in conjunction with the Fury's standard turbojet engine and burns hydrogen peroxide and conventional JP-4 fuel, gives significant increases in speed and altitude. The Fury shown is standard FJ-4, modified as an experimental aircraft to test rocket power.*

DR. ARNSTEIN RECEIVES NAVY PUBLIC SERVICE AWARD FROM ASSISTANT SECNAV BANTZ

AIRSHIP DESIGNER IS HONORED

DR. KARL ARNSTEIN, one of the world's foremost designers of lighter-than-air craft, has been awarded the Navy Distinguished Public Service award for his outstanding contribution to the Naval Establishment in the fields of scientific research and development.

The award was presented by Assistant Secretary of the Navy (Material) Fred A. Bantz in Washington.

As vice president in charge of engineering for Goodyear Aircraft, Dr. Arnstein conceived and directed the development of a unique installation of radar within naval non-rigid airships.

First flight of a modified airship (ZPG-2W), containing the radar antenna, was completed in 1957 and several test flights since then have indicated the practicability of such installation.

Dr. Arnstein specialized in theory, design and construction of aircraft and related structures. His 40-plus years in this field enabled him to direct the construction of more than 150 non-rigid airships, including virtually all those built for the Navy since the 1920's as well as the rigid Naval airships USS *Akron* and USS *Macon*. The L, G, K and M type airships of World War II were produced under his direct supervision.

Under Dr. Arnstein's direction, Goodyear became the tenth ranking U. S. concern in airframe production. More than 4000 complete *Corsair* fighter planes were produced and delivered, as were important components for such aircraft as the VP *Ventura*, the B-24 *Liberator*, the B-29 *Superfortress* and many others.

In more recent years Dr. Arnstein was responsible for the direction of projects which included an ejection seat capsule, surface-to-underwater type missiles and other pilotless aircraft, guidance system for missiles, development of lightweight rocket booster cases for missiles, a one-man helicopter, various types of large radar antennas for shipboard and shore installations, the world's largest airborne antenna installed inside an airship envelope, flight training devices, canopies and windshields for supersonic aircraft, plastic nose cones for missiles, ground handling tools for airships, a light amphibious plane, cross-wind landing wheels, and analog computers for the Navy and U. S. Air Force.

VP–18 Gets Commendation

Helped Recover Famous Nose-Cone

Adm. Arleigh Burke, CNO, commended Patrol Squadron 18 for "performance contributing significantly to the achievement of a milestone of national importance." Specifically, VP-18, commanded by Cdr. R. H. Gillock, participated in the recovery of a *Jupiter* nose-cone.

The cone received universal attention on President Eisenhower's radio and television report to the nation on the status of our missile development. As a result of the successful recovery, the United States was able to announce it had made a break-through on the problem of missiles reentering the earth's atmosphere.

VP-18, attached to Fleet Air Wing 11 at NAS JACKSONVILLE, was one of several Naval units participating in the exercise, along with the Army and Air Force. The squadron also received praise from MGen. D. N. Yates, Commander Air Force Missile Test Center, Patrick Air Force Base, for "excellent coordination with the Test Center."

CDR. RIEF IS WELCOMED BY CDR. DOUGLAS

'Springboard' 1958 Opens

VA(HM)-13 Begins ASW Training

Operation Springboard 1958 commenced when VA(HM)-13 arrived at NAS ROOSEVELT ROADS, Puerto Rico. Cdr. C. F. Rief, skipper, and his officers and men were welcomed by Cdr. J. T. Douglas, commanding officer of Fleet Aircraft Service Squadron 105.

The 12-plane heavy mining squadron, flying P2V-5F *Neptunes*, is trained in the use of rockets, mines, depth charges, sonobuoys and other ASW equipment. VP-5, VP-10, VP-21, VP-23, and VP-26 are also participating in this training operation.

Each squadron will spend two weeks in Puerto Rico where the Caribbean climate provides ideal flight time.

DECK HANGAR MADE TEST CELL

At the U. S. Naval Ordnance Test Station, China Lake, Calif., something new has been added to the desert scenery at Camel T Range—the deck hangar of the troop transport submarine *Sealion*.

It took some doing to get the hangar to the station. The story began when B. A. Breslow, head of the Pyrotechnics Branch of the Propellants and Explosives Department, learned he could obtain the *Sealion's* deck hangar which was stored at the Philadelphia Shipyard.

The deck hangar, that part of the transport submarine that carries a troop landing boat and other equipment, was just what Breslow's branch needed. It is watertight and is built to withstand the great pressures that exist in ocean depths. But getting it to China Lake posed many problems because of the size of the hangar—34 feet long, 16 feet wide, and a weight of 52 tons.

Rail travel was impossible because of its width, so the hanger was shipped from the East Coast to Long Beach via the Panama Canal, a three-weeks trip. From Long Beach, it was trucked to NOTS China Lake on a double trailer. A special permit was required to transport such large equipment on the highway, and travel was limited to the hours between midnight and 5:00 A.M.

The truck was routed through the San Fernando Valley on U. S. 99. But before the trip started, certain transcontinental telephone wires had to be cut. Finally all was in readiness. The trip was finally made in one grand move as permission was given at the last minute for the journey to be completed right on to China Lake.

The deck hangar is being converted into the Station's second high-altitude chamber. It will be used to test ignition and combustion of new propellants at extreme altitudes as well as pyrotechnics.

Because the new test chamber is larger and can simulate higher altitudes than the old one, it will be possible to test larger pyrotechnic items at altitudes which are becoming increasingly important.

The new test chamber will greatly aid scientists of the Pyrotechnic Branch in their efforts to develop new and improved pyrotechnic equipment.

● An aircraft parts maker has built an electronic gauge delicate enough to measure the depth of a mouse footprint on a strand of wire.

WORKMEN LAY *the first keel section of the world's first nuclear-powered aircraft carrier, the Enterprise (CVAN-65), at the Newport News Shipbuilding and Dry Dock Company. According to the Secretary of the Navy, the Honorable Thomas S. Gates, Jr., the name perpetuates the WW II carrier and her six predecessors. The new ship's eight reactors will give her a normal steaming period of more than two years before replenishment of her nuclear fuel.*

Shangri-La Marks Landing
VAH-4 Pilot Makes Lucky 13,000

LCdr. J. K. Burton and R. M. Breen, AD1, of VAH-4's Detachment C, made CVA-38 history when their A3D-2 *Skywarrior* came to a halt in the arresting gear after a day of carrier qualifications. It marked the 13,000th landing on board the Shangri-La since recommissioning in January 1955.

LCdr. Burton commented, "I was very much pleased at making the 13,000th landing, and I'm not supersitious about the number 13 at all."

Breen remarked, "It came as a complete surprise to me. We knew nothing about it, and were only trying to make our landing a real good one."

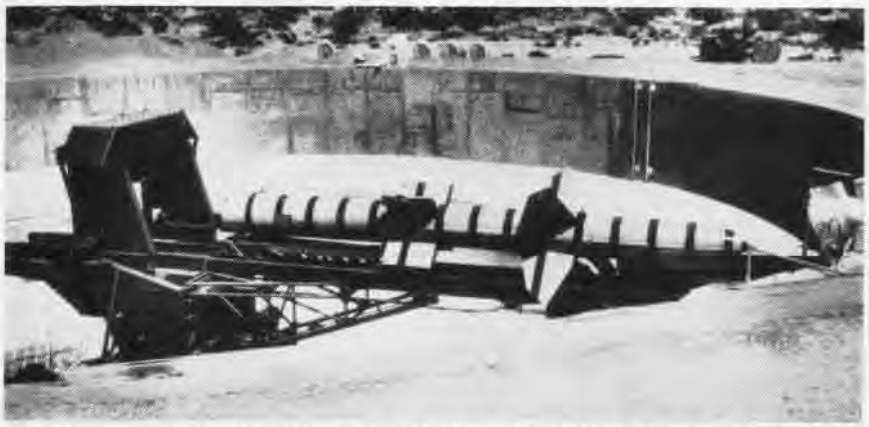
A DREAM *come true. Del Brown, four year old leukemia victim, wanted to see a helicopter up close. Arrangements were made at Ellyson Field. Lt. John Burley explains the HTL-6 controls. Del soon overcame shyness.*

Rescue Trainer Designed
Airmen are Taught to Seek Sling

Alarmed by reports that airmen were drowning after plane crashes because they did not know how to get into rescue slings lowered from helicopters, Capt. Frank M. Slater asked the officers of FAETU Atlantic, Detachment Three, to start thinking about ways to train men how to use the slings.

Six months later Detachment Three produced an electrically-run winch, mounted to a girder over the station swimming pool, that lowers the sling into the water by button control.

Purpose of the device is to train airmen to "react automatically" when rescue slings are lowered to them, despite cold, shock or injury.



PROTOTYPE OF AUTOMATIC LAUNCHER FOR LAND-BASED TALOS IS NOW BEING TESTED

TALOS EQUIPMENT DESIGNED

A PROTOTYPE of the first automatic missile loading and launching equipment for firing a series of ground-to-air defense missiles of the *Talos* type has been completed, according to the American Machine and Foundry Company.

The launcher is part of the fully automatic *Talos* Defense Unit which has been developed for the Department of Defense by the RCA missile and surface radar department.

The prototype automatic loading and launching equipment has been delivered to the White Sands Proving Ground in New Mexico where it is installed in the *Talos* Defense Unit.

The launcher, as well as the entire unit, is undergoing extensive testing.

Talos Defense Units include a missile handling and assembly area and two automatic launchers, each supported by a circular missile storage magazine which resembles a railroad roundhouse. Capable of handling missiles with high-explosive or nuclear warheads, the launchers can fire either single missiles or salvos to engage a number of different targets simultaneously and can continue to fire at a high rate over an extended period of time.

On command from electronic computers in the control station, the launcher turns toward the cell in the circular storage magazine which contains the desired type of missile for the tactical mission. A cart runs out to the automatically pre-selected cell, picks up a missile and returns to the launcher.

The missile is then positioned in the launcher where it is elevated and rotated to firing position. When the firing signal is received, the missile is fired automatically and the launcher recycles for the next round. If for any reason it is desirable to unload the launcher, this operation can be accomplished automatically.

Aviation Gas Experiment

Arctic Ice Storage Improves Gas

Aviation gasoline improves when stored in pits carved out of ice in the tunnel which the U. S. Army Corps of Engineers has driven into the Arctic Icecap to a distance of nearly 1,200 feet.

The fuel, which evaporates rapidly and takes on other impurities under normal climatic conditions, can be stored indefinitely in the pits under the icecap, according to scientists employed by the Snow, Ice and Permafrost Research Establishment, Wilmette, Ill., a Corps of Engineers laboratory. The scientists have determined that the fuel not only retains all of its properties but is even improved after an extended storage period.

The gasoline was put into pits four feet wide and five feet deep at several points in the ice tunnel from 150 to 400 feet back from the entrance. Each pit was covered only with plywood board and sealed by ice slush when the Engineers suspended work on the Icecap in the fall of 1956.

When work was resumed in the Arctic in the spring of 1957, scientists found the fuel, none of which had evaporated, in even better condition than it had been when placed in the pits seven months before. They said the fuel contained less moisture because of the low constant temperatures.

CVA-11 Landing Tests Over

Increases Carrier Flexibility

The USS *Intrepid* and her crew played an important part in certain phases of Operation *Crosswind*.

Working side by side with civilian technicians, engineers and naval personnel from NATC PATUXENT RIVER, they fulfilled the special mission in four and a half days.

The purpose of the operation was to determine how far from the wind line a carrier can deviate and still launch and land aircraft successfully. After many tests were made, it was found that carriers can safely conduct flight operations without turning the ship into the wind. Also the carriers can launch aircraft downwind. This greatly increases the flexibility of carriers.

Much of the necessary data needed was obtained from motion picture films, stills, and electronic devices which were set up at various places on the ship.

These Naval aircraft were used for the tests: T2V *Seastar*, F4D-1 *Skyray*, A3D *Skywarrior*, F8U-1 *Crusader*, FJ4B *Fury*, F11F-1 *Tiger*, F9F-8B *Cougar*, AD-7 *Skyraider*, TF-1 *Trader*, F3H-2N *Demon*, FJ-3 *Fury*, A4D-1 *Skyhawk*.

Safety at Saufley Field

Over 26,000 Accident-Free Hours

Basic Training Group One, Saufley Field's primary flight training unit, has set a mark of 26,544 consecutive accident-free hours of syllabus or instructional time.

Of the total accident free hours, VT-14 commanded by LCdr. Frank Davey flew 11,216; and VT-15, led by LCdr. Charles Farrell, flew 10,771 hours.

Since the T-34 *Mentor* arrived as a primary trainer in 1955, flight students and instructors at Saufley Field have flown more than 285,000 hours. Both instructors and students like the aircraft, especially its safety features.

Under the leadership of Cdr. M. C. Friedman, BTG-1 Group Commander, and Cdr. William Davidson, Saufley's Aviation Safety Officer, a thorough safety program has taken hold. In every possible way, safety consciousness is developed and maintained.

CRASHED PILOT IS RESCUED BY COPTER WITHIN THREE MINUTES

SAR COPTER DELIVERS INJURED OIL MAN TO NAAS KINGSVILLE

CHOCK TO CHOCK IN 3 MINUTES

THE TIME was 1116 when word flashed into the Search and Rescue center at NAAS KINGSVILLE. An F9F *Panther* had ditched off the end of runway 13. Marine Capt. W. G. Langley scrambled into his helicopter with crewmen Coleman and Clements and Dr. John P. Heileman, flight surgeon.

At 1119 Capt. Langley touched down in front of Operations. A waiting ambulance rushed Dr. Heileman and the rescued pilot to the base dispensary for checkup. Medical treatment began two minutes later.

The incident was logged: "Chock to chock (take-off and landing) in three minutes." Capt. Langley and has crew returned to SAR to stand by for possible MAYDAY calls.

This rescue is one example of the work done by SAR KINGSVILLE. The log book contains many other entries of military and civilian rescue missions the unit has flown.

When MAYDAY sounds, SAR goes into action. In many instances the helicopter is airborne and waiting for instructions before the tower can provide directions to the scene of a crashed aircraft.

If the distress concerns an injury or crash, SAR takes a flight surgeon for on-the-spot first aid. Two stretchers and first aid supplies are always on hand. Three helicopters are kept ready for instant use; two HO4S models and one HO3S. All three, fully gassed and ready to go, are parked on a landing apron less than 25 feet from the SAR office.

The Kingsville SAR unit usually operates in the local area, but it can go as far as 150 miles for a rescue. On occasion, the unit joins the Navy and Coast Guard SAR units at NAS CORPUS CHRISTI, 51 miles away.

When a major search and rescue operation is in progress, all the helicopter units work as one. Each helicopter takes an assigned sector of sea or land. Crewmen and pilots are especially trained to watch for various indications of life, scattered remnants of aircraft, and distress signals.

On the average mission, a pilot flies his helicopter at an altitude between 200 and 500 feet, depending on the amount of area which is to be covered in the search.

Search sectors are defined on a chart similar to a highway map except that it has a number-letter arrangement superimposed to form a grid. By making criss-cross bearings on his map with information provided by search central, the pilot can establish his sector over a large or small area.

While operating in a sector, pilots become detectives, following such SAR clues as roads, railroad tracks, telegraph lines and waterways. An example of such detective work proved successful in August last year.

A pilot from NAAS CHASE FIELD, Beeville, Texas, had bailed out of his aircraft when it flamed out. The crash was located near a small south Texas town not far from Beeville. The pilot was not at the crash scene.

Enroute to their assigned sector, Lt. J. H. Algermissen and Ltjg. H. C. Barton of the Kingsville SAR team located the pilot 14 miles from the crash. Instinctively, the downed pilot, was following a telegraph line—but in the wrong direction.

Lost pilots are not the only cases confronting SAR Kingsville. Many cases of distress concern stranded fishermen, hunters, ranchers or oil men injured or lost in remote areas which can be reached only by air. Evacuations accounted for 25 rescue missions by Kingsville last year.

Residents in the remote area have learned to depend on the Kingsville unit as a rapid source of transportation and first aid in times of distress. The phone number of NAAS Kingsville is posted conspicuously in homes and coastal business firms.

In November 1956 a commercial fisherman operating in the Intracoastal canal near Padre Island was seriously burned when a stove exploded on his boat and ignited his clothing. He dived into the water to extinguish the flames, then made his way to the Sun Oil camp some 25 miles from NAAS Kingsville.

The oil company contacted Kingsville and a helicopter was dispatched immediately. Dr. M. R. Diekmann administered emergency treatment at the oil camp, then the patient was rushed to Kingsville for hospitalization.

LET'S LOOK AT THE RECORD

Saufley VT-12 Honored

Tops Basic Training Group One

Training Squadron Twelve at Saufley Field won by the narrow margin of one point the title of Top Squadron of Basic Training Group One for the six-month period ending December 31. VT-12 captured 24 points and edged out its closest competitor, VT-14, who had 23 points.

Points were awarded each of BTG-1's six squadrons each month according to their standings in squadron competition. Until December, VT-14 was leading the race for honors 21 to 20. In December, however, VT-12 won four points by virtue of a third place finish while VT-14 had to settle with only two points after a fifth place wind-up.

In amassing its six-month total, VT-12 won "Squadron of the Month" in September and November.

Flight safety figured heavily in winning the award for VT-12. Currently the squadron has flown 67 days or 4,109 "accident free" syllabus hours without a mishap.

Squadron leader is LCdr. G. D. Ickes, his assistant, Lt. W. F. Schelb, and safety officer, Ltjg. H. S. Boyd.

VA-63 Pilot Scores High

Makes Two-Year Loft Bombing Hit

VA-63 proved its combat readiness at China Lake when 16 pilots flying the FJ-4B *Fury*, scored 20 Navy "E's" in loft bombing competition.

Highlight of the competition was the hit scored by Ltjg. S. O. Sherman who lofted a bomb from 20,000 feet out that hit 12 feet from dead center of the target. Range operators credited him with the best hit scored in more than two years.

Pilots winning "E's" for "over the shoulder" bombing were Cdr. J. R. Bowen, Carrier Air Group Commander; LCdr. J. B. Dunn, Lt. K. E. Ent, Lt. W. L. Hughes, Lt. J. R. Buys, Ltjg. K. A. Webster, 1st Lt. M. A. Schalk, USAF, Ens. J. H. Vogt, and Ens. H. R. Healy.

Scoring "E's" in "medium angle pitch-off" were LCdr. W. C. Chapman, VA-63 CO; LCdr. Dunn, Lt. W. J. Spence, Ltjg. O. Z. Gentry, Ltjg. L. O. Conner, 1st Lt. Schalk, Ltjg. Sherman, Ens. K. H. Webb, Ens. Healy, and Ens. Vogt.

The squadron's enlisted men, led by "Pappy" Warren, ADC, and J. T. Crockett, AM1, kept the *Furies* flying by providing outstanding service.

Squadron 7 Has Good Year

BTG-3N Unit Records No Accidents

A year without an accident and a record of 15,353 hours flown by students and instructors marked the first anniversary of Squadron Seven, Basic Training Group 3-N at NAAS WHITING. Lt. C. S. Craig, an instructor, has passed the 1500-hour mark of accident-free flight.

Since the squadron was formed in February, 1957, 247 students have completed basic training.

The squadron's shoulder patch is a four-leaf clover on a white circle bearing a large numeral 7 and a pair of dice also showing a seven.

VA–12 Has Another Record

Makes First Jet Landing on Ranger

Attack Squadron 12 chalked up another "first" in its history by making the first jet landing aboard the USS *Ranger* (CVA-61).

During a shake-down cruise in Caribbean waters, Cdr. M. P. Deputy, squadron skipper, became the first Naval Aviator to land a jet aboard the new carrier.

VA-12 received their A4D's last year. After a training period, the squadron returned to Cecil Field following a successful cruise.

The *Flying Ubangis'* tour aboard the USS *Ranger* makes it the first squadron under ComNavAirLant to deploy A4D *Skyhawks* for an extended period aboard an aircraft carrier.

ATU-206 Shatters Records

Officer Student Artim fires 67.03%

Down in Texas, the following gun story would probably draw a query as to whether it was done "on his back or rightside up." But to the lads of Pensacola's Advanced Training Unit 206, Ens. Ronald N. Artim's remarkable feat will stand retelling anyway you look at it.

ENS. R. N. ARTIM SET NEW GUNNERY MARK

Artim, an officer student pilot, while flying a *Panther* during gunnery qualifications, expended 91 rounds of 20mm ammo on a banner being towed at 15,000 feet at a speed of 368 knots.

Sixty-one of the rounds scored hits on the 6x30' banner for an official mark of 67.03%.

In the Florida country, a five percent hit factor is required for qualification, 25% is considered outstanding, and a mark of around 47% had held the record for many years.

Artim's achievement was attributed by his instructor, Maj. J. A. Browne, USMC, to the fact that he "made every effort to better his work on each flight."

Two other ATU-206 officer students climbed on the record bandwagon during the same period. Ltjg. Jerry W. Fallin and Ltjgs. Gene L. Woodruff completed the jet fighter syllabus with the highest scores yet recorded. Their respective scores of 81.63 and 81.83 toppled the two-year high mark of 81.03.

An average score for both ground training and flight training ranges from 46 to 53. A score of 58 or above is considered excellent, and, according to Naval Air Training statistics, scores of 80 or above are of the "one in a thousand" variety.

Ltjg. Fallin has been assigned to fly the F4D *Skyray* with VF-141 at Miramar and Ltjg. Woodruff will report to FASRON 5 at Oceana while awaiting further assignment to a jet fighter squadron anywhere on the East Coast.

Design Contract Awarded

Contract Covers A-Sub Components

A contract for designing and furnishing reactor compartment components for three nuclear-powered fleet ballistic missile submarines has been awarded to the Westinghouse Electric Corporation. The total cost-plus-fixed-fee contract price is $18,630,000.

Material to be supplied under the contract includes all components for the reactor compartments of the three submarines except the reactor cores, and such items as may be furnished by the shipbuilders or Government.

INSTRUCTOR MAKES DEMONSTRATION RUN

Relative Motion Taught

Device Aids ATU-206 Instructors

An electrically operated "relative motion" demonstrator for jet air-to-air gunnery practice is being used to assist all students of ATU-206 in their final phase of flight training at NAS PENSACOLA.

The demonstrator consists of a model target aircraft, mounted on an aluminum tube which is connected to a "walking box." It allows the flight instructor to present an actual picture of relative motion involved when students enter the air-to-air gunnery phase of their training.

Flight instructors and the ground training department of ATU-206 conceived the idea of the demonstrator when they found that relative motion of a target could not be explained by merely using hands. The regional office of the Naval Training Devices Center at Pensacola was contacted and through cooperation between instructors, the details of the project were completed. The device was produced by the local Training Device Center.

The flight instructor can indicate the necessary angle of a student's aircraft as it enters the firing area of the target, while at the same time the target is proceeding electrically along a designated path.

At any time in the demonstration, the instructor can stop the demonstrator and explain details or answer questions. Once a point is cleared, the demonstrator continues on its course by the mere touch of a switch.

Regulus will Fly Overland

Missile will Approach from Sea

Plans to test-fly the *Regulus II* guided missile over land ranges in the near future have been announced.

Present plans call for setting up an inland range with mobile instrumentation to extend approximately 500 miles from the vicinity of San Nicolas Island to the Army's Dugway proving grounds in Utah.

Test launching of the missile took place at Edwards AF Base. Later launchings from Pt. Mugu and from ships in the Pt. Mugu sea test range will be controlled to bring the missile over the coast along a route which has not been disclosed.

All flights will be programmed over pre-inspected area so that the missile will never pass over or adjacent to populated areas. The missile will be under its own guidance system, but a chase plane will accompany it over land regions. The chase planes will be capable of taking direct control.

Purpose of the overland flights will be to test the accuracy of the missile's guidance system. Previously, in over-water tests, celestial navigation methods were employed. Over land, the flight of the *Regulus II* will be measured from vans parked at pinpointed geographical spots.

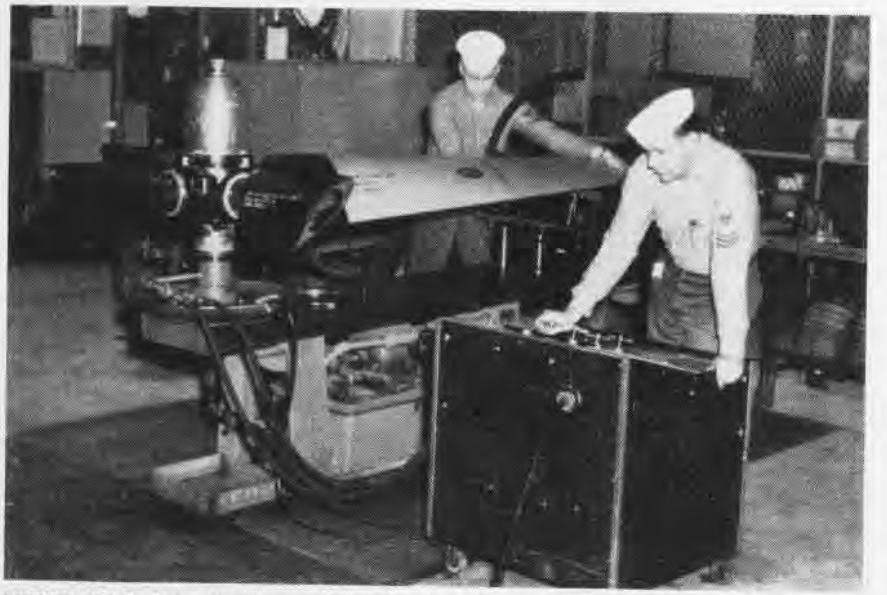
Cockpit Trainer Designed

Miramar Fury Crews to be Trained

An FJ-4B cockpit orientation trainer has been completed by North American for delivery to Miramar, Calif., where it will be used by Marines to train maintenance men and pilots in normal and emergency procedures associated with *Fury* jet operations.

The trainer has two units; a cockpit and an instructor's section. The cockpit is a replica of the actual airplane pilot area.

The instructor's section consists of the necessary controls to give desired readings on the selected cockpit instruments. He monitors the student's progress which is indicated by tell-tale lights which go on to indicate completion of a procedure.



FASRON-103 *Propeller Shop personnel have found a way to save up to four man-hours in checking a propeller dome without removing the complete propeller assembly from the aircraft. Their solution was to take a scrapped prop, cut off three blades about 20 inches from the hub, and remove the fourth blade. A new blade is inserted into the missing slot to test pitch angle. Dome leaks, blade pitch angle and fuel flow can be tested in the shop before prop installation.*

LETTERS

SIRS:

I hope you have sent a copy of your February lead article ("Naval Air Station That Floats") to Gardnar Mulloy. He would be delighted to get it. He was a fine LST skipper and I picked him for special detached duty job of considerable importance prior to the invasion of Southern France when I was Commander LST Flotilla One.

CAPT. H. F. HOLMSHAW
USS Manatee, AO-58

SIRS:

I am a faithful reader of NAVAL AVIATION NEWS and would like to give a helpful suggestion.

On page 32 of the February issue, the caption for the top picture read, "The thrill that comes once in a life time is a fair description of of the NavCad's reaction to his first solo in the T-34 primary trainer." Can't this be corrected?

MORTON J. LEIF, YN3
USS Saratoga (CVA-60)

¶ We were thrilled, too, and got to to stuttering. Thanks. We'll try and watch it in the future.

SIRS:

Thanks kindly for the NANEWS and the story about my old command, LST-32.

Most of the credit for the fine preservation of the *Alameda County* should go to my engineering officer, Ted F. Storrs, as he was responsible for its good operation. I'm sure he'd like a copy.

Also, would you be so kind as to send me another copy of the February issue. I certainly did enjoy the *Alameda County* story and congratulate you for it. The 32 was a fine ship.

Coral Gables, Fla. GARDNAR MULLOY

¶ Forwarded with pleasure. NANews thanks Mr. Mulloy, as well as others from Pensacola to Washington and from Coral Gables to a tanker at sea for their kind remarks about the *Alameda County* story. If there is an unusual story in *your* ship or unit, we would like to publish it.

SIRS:

The tenth annual reunion of the USS Hornets (CV-8 and CV-12) will be held June 21, 1958 at the Pick-Carter Hotel, Cleveland, Ohio. Officers and men interested in further details should contact Thomas F. Laub, Pres., USS Hornet Club, 158 Sheffield St., Bellevue, Ohio.

THOMAS F. LAUB

OPERATION DOLLAR STRETCH is really rolling now! Launched by the Secretary of the Navy, it gives you the chance to send in your ideas for shortcuts and improvements that will benefit the whole Navy. These are critical times. We need suggestions to save money, manpower, materials.

Submit your Dollar Stretcher today in accordance with the procedures set up by your ship, station or squadron.

Men of VP-5 Get School
Attend NATO Course in Ireland

A P2V-5 and 13 *Neptune* crewmen of Patrol Squadron Five have been sent to the British Joint Anti-Submarine School in Londonderry, North Ireland. The school is staffed jointly by Royal Navy and RAF personnel.

The only one of its kind, the NATO ASW school is attended by various NATO-member nations on an invitational basis. The course lasts four weeks in all.

Veterans' Benefits Book

A new booklet entitled, "Federal Benefits Available to Veterans and Their Dependents," is on sale at the U. S. Government Printing Office, Washington, D. C. The price is 15 cents a copy, with a 25 per cent discount for 100 or more copies.

The booklet explains the nature of all major benefits, the eligibility requirements, and where to apply. It was prepared by the Veterans Administration.

An index arranged by wars and peacetime service provides a ready reference for anyone using it.

NAVAL AVIATION

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CONTENTS

● COVER

F11F-Tiger is made ready before it taxies up to catapult on the attack carrier, USS *Saratoga*.

● SUBSCRIPTIONS

Naval Aviation News is now available on subscription for a $2.50 check or money order ($.75 additional for foreign mailing) made payable to Superintendent of Documents, Government Printing Office, Washington 25, D. C. Single copies are 25 cents each.

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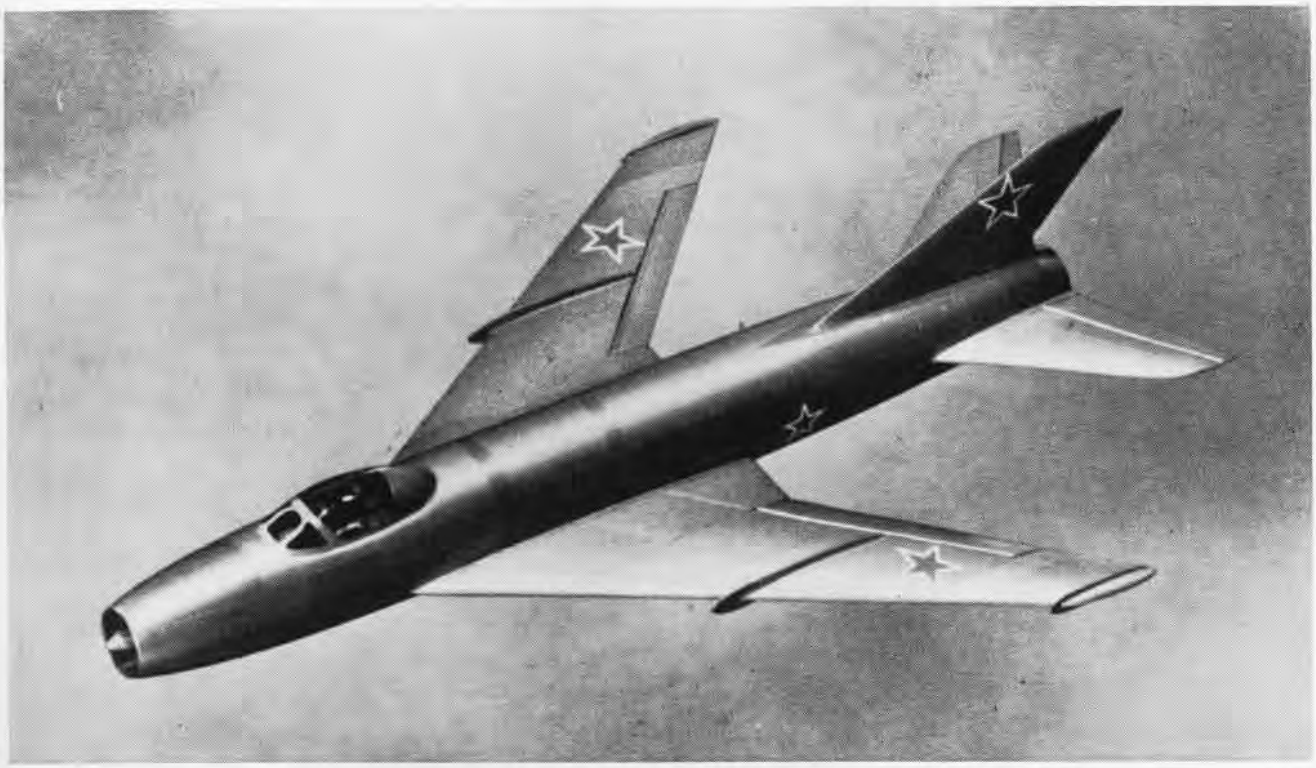
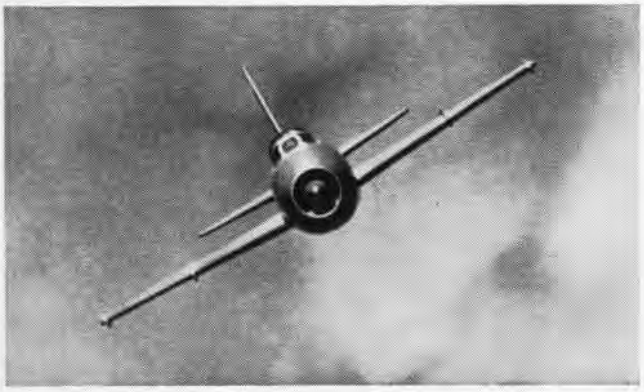
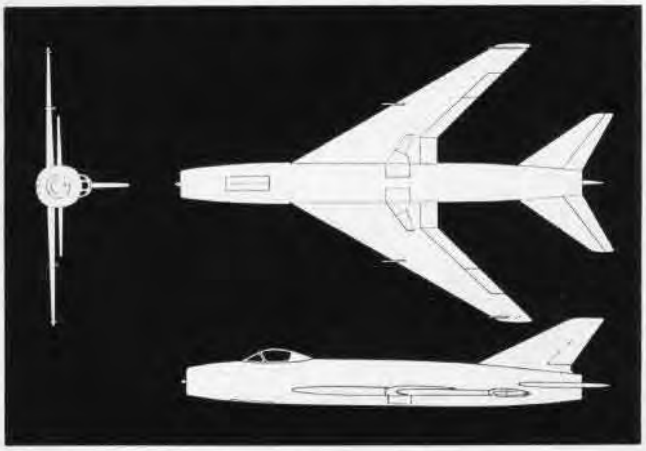




★ RUSSIAN FIGHTER ★

The 'Fitter' is another of the Soviet fighters with a sharply swept-back wing and tail. In a Mach 2 speed class, and with an estimated service ceiling of 50,000 feet, the swept-wing aircraft is powered by a turbojet with an afterburner.



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ANACOSTIA TO ATHENS

NAVAL AVIATION
NEWS

LES GIRLS who grace the portico of the Erectheum on the Acropolis at Athens point up the world wide training activities of today's Naval Air Reservists. During 14-day annual training cruise periods, Weekend Warrior patrol and transport squadrons from such cities as New York, Jacksonville, Anacostia, Niagara Falls, Columbus, Dallas, Memphis and Oakland have deployed to bases in the Med and Pacific to join Fleet units in overseas maneuvers. Thus the proficiency of our skilled reserve pilots and enlisted specialists is maintained in current procedures and tactics of our Global Navy. Visit your nearest Naval Air Station or Navy Recruiting Station. Serve your country and yourself as a Weekend Warrior.