NAVAL AVIATION NEWS

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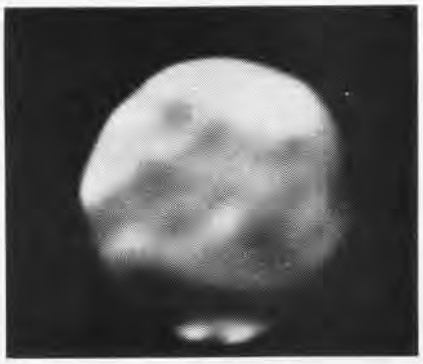
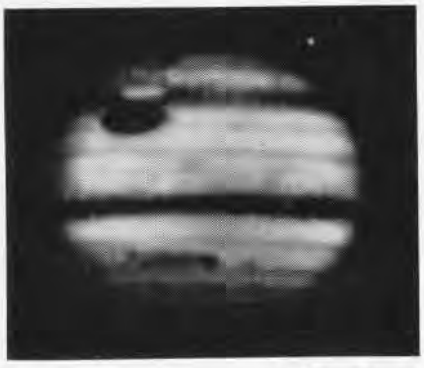


NEXT STOP ????



JUPITER

MOON, REGION OF CLAVIUS

A new heavenly body is to be added to the firmament—the man-made satellite. Man's quest for further knowledge of our own and neighboring planets will reach a most significant plateau when the satellite provides information which has been sought by scientists since history began. What will be the next stop? Will it be the moon (shown here in the region of Clavius), Mars, Jupiter (note the satellite Gannymede, upper right), or Saturn (with its three rings of dust)? Will the vehicle be manned or unmanned? The International Geophysical Year may provide answers to these questions. For more information on IGY and its objectives, see the next page. Photos courtesy Mt. Wilson and Palomar Observatories.

DURING THE INTERNATIONAL *Geophysical Year, Earth Satellites will be rocketed into outer space, where they will orbit the globe. The pictured satellite is artist conception of NRL designs by William R. Pringle. Background is photo made from a Viking rocket in 1954.*

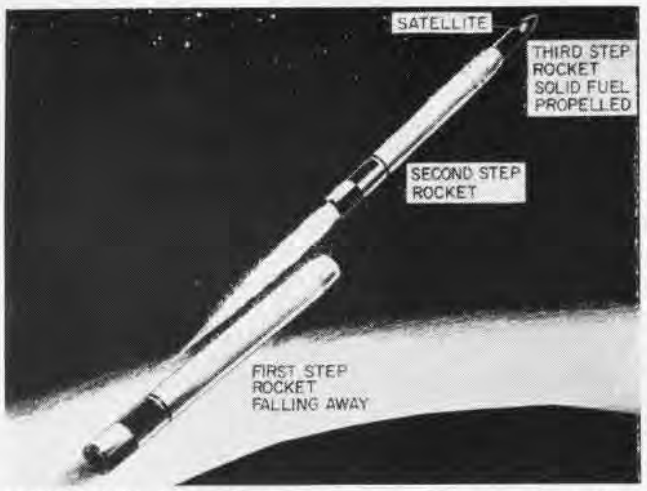
MAN'S CHALLENGE TO OUTER SPACE

THE OPENING of the International Geophysical Year, 1 July 1957 to 31 December 1958, marks a new era in upper atmosphere research. New, once unforeseen, horizons are unfolding in the realm of outer-space travel. The idea of manned space vehicles is no longer restricted to the comics. In fact, several scientists maintain that interplanetary travel will be a reality within the next 40 years.

International Geophysical Year (IGY) is the name given to a cooperative, scientific program involving about 58 nations. Working together, their scientists propose to learn more about this planet Earth and the atmosphere surrounding it.

An important project in United States participation in IGY is the Earth Satellite Program. Unmanned satellites will be rocketed into space and placed in orbits where they will circle the earth. By means of these satellites, scientists hope to learn more about the upper atmosphere and its effect upon future space travel. The results of these experiments will also contribute to many other fields of scientific knowledge.

The U. S. Navy, specifically the Office of Naval Research, is responsible for the technical program of launching the satellite into its orbit. This particular phase of the Earth Satellite program goes by the code name, PROJECT VANGUARD.



SATELLITE WILL BE *propelled into the outer atmosphere by a three-stage rocket. The second stage contains the complete guidance system.*

DR. J. P. HAGEN *of NRL is director of Project Vanguard. He is shown explaining the proposed schematic trajectory of the satellite.*

THERE HAVE been other International Geophysical Years, but these scientific programs were called Polar Years. The first was in 1882-1883; the second in 1932-1933, 50 years later. Experiments conducted during these periods were limited to specific geographic regions and to certain limited fields of scientific knowledge.

So rapid has been the advance in the fields of science since 1933 that the world could not wait another 50 years for the next international scientific year. The program for this present International Geophysical Year, set up in 1954 under the general jurisdiction of a *Comite Special de L'Annee Geophysique Internationale*, will cover almost all facets of the earth sciences (geophysics) over all parts of the globe. Plans were undertaken to carry out research even to the upper reaches of the earth's atmosphere.

The U. S. Earth Satellite Program is under the direction of the National Committee for IGY, which was organized by the U. S. National Academy of Sciences in cooperation with the National Science Foundation. The responsibility of the National Committee is to plan, direct, and execute U. S. participation in the program, not only of the satellite, but of the many other scientific activities connected with IGY. Funds necessary for the success of the program were obtained from the United States Congress through the National Science Foundation.

In purpose, the Satellite Program is strictly a scientific venture, part of an over-all plan to extend knowledge in the fields of geophysics. However, because of the vastness of the project and the technical work involved, the Department of Defense was asked to lend aid. As a result, the Navy, Army, and Air Force are giving logistic and technical support. RAdm. Rawson Bennett, Chief of Naval Research, has a dual responsibility. He is both manager for Department of Defense participation and director of the Navy's activities in the Satellite Program. The technical resources and trained personnel, not only of the Government, but also of Industry, will support the effort.

The Naval Research Laboratory is responsible for the design, construction, and test of the satellite launching system. It will launch the satellite and place it in its proper orbit. Dr. John P. Hagen (NRL) directs *Vanguard*.

The Army and Air Force maintain their areas of responsibility. The Army with teams trained by NRL scientists will operate most of the tracking stations from which IGY scientists will obtain data from the satellite itself as it circles the earth. The Air Force is contributing to the effort of the National Committee for IGY by supplying a launching site for the satellite at its Missile Test Center, Patrick AFB, Cape Canaveral, Florida.

According to C. C. Furnas, former Assistant Secretary of Defense (R&D), "The objective of the program is to launch an instrumented body, scientifically useful in obtaining physical measurements, in an orbital path above the sensible atmosphere of the earth. . . . The program, as it now stands, encompasses the use of six preliminary rocket systems for test purposes, to be followed by six complete rocket guidance-and-control systems which will have as their objective the launching of a satellite on orbit at least 200 miles above the surface of the earth."

The satellite will be about 20 inches in diameter with a weight of approximately 21.5 pounds. About half the weight is required for the satellite itself; the balance is made up of the instrumentation within it. The satellite skin and its inner supporting structure are made of magnesium alloy, a light, yet rugged metal.

The man-made "moon" will probably carry aloft such scientific instruments as solar cell mercury batteries, ion chambers, thermistors, erosion gauges, a Minitrack transmitter, meteorite collision memory devices, telementary coding systems, and Lyman alpha storage units.

The satellite will be so launched that the inclination of the orbit to the equator will be around 35°. This will result in an orbital path over temperate latitudes where density of scientific population and equipment is high.

When the satellite is separated from its launching vehicle, it becomes a separate entity and exists in space with an orbit of its own, traveling by sheer momentum and independent of the earth's rotation about its axis. However, the orbit remains a part of the earth system in its revolution around the sun. Estimated time for the satellite to circle the globe is 90 minutes.

The chosen orbit is a nominal circle 300 miles above the

earth. In order to keep in track, the satellite must have a velocity of at least 25,000 feet per second. Because of probable errors in the exact calculation of height, angle, and velocity, the "moon" is expected to assume an elliptical orbit. It is intended that the satellite come no nearer than 200 miles to the earth and no farther than 1500 miles.

Based on present estimates of atmospheric densities, if the satellite would orbit the earth at a 300-mile altitude, following an actual circular course, the vehicle might remain in orbit for about a year. However, the orbit is expected to be elliptical, coming as close to the earth as 200 miles. Lower altitudes will produce higher resistance to the "moon" because of increasingly higher air densities and its life-span will be proportionately shortened.

No one, at present, is predicting just how long the satellite is expected to remain aloft. The power supply for the telemetering equipment is expected to work for about two weeks, but the satellite may remain in its orbit for six weeks, or maybe months. When the satellite leaves its orbit and descends into the earth's atmosphere, the heat generated by friction will disintegrate it.

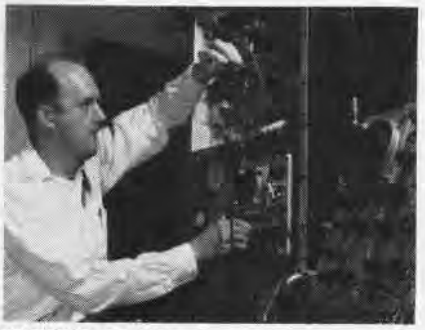
According to the National Advisory Committee for Aeronautics, at least one of the launching vehicles will carry "sub-satellites." These will be fabricated from aluminum-coated plastic. They will be automatically inflated after projection from the third rocket stage that gives the satellite itself its maximum velocity.

The sub-satellite will be about the same size as its parent, but will weigh only ten and one-half ounces. The device will be especially valuable in measuring the density of air in the extreme outer limits of the earth's atmosphere and in determining the amount of drag the satellite will encounter.

Project *Vanguard* requires probably the most complex, and certainly the fastest, rocket system ever built. Taking into consideration the present state of rocket art, scientists at NRL decided that nothing but a three-stage rocket launching system could lift the satellite 300 miles high and give it the required orbital velocity.

The launching of the earth satellite is to go off in a one-two-three order; that is, the first stage provides most of the energy to push the earth satellite in its orbit; the second stage contains the complete guidance system and carries the satellite to its ultimate height, while the third stage carries the satellite and gives it the remainder of the orbital velocity.

In this composite vehicle, the first two stages are guided, and the third stage is maintained in a fixed orientation while it is firing. The cylindrical rocket has no fins. About 72 feet long, it is 45 inches at its greatest diameter and weighs with its liquid and solid propellants approximately 11 tons.

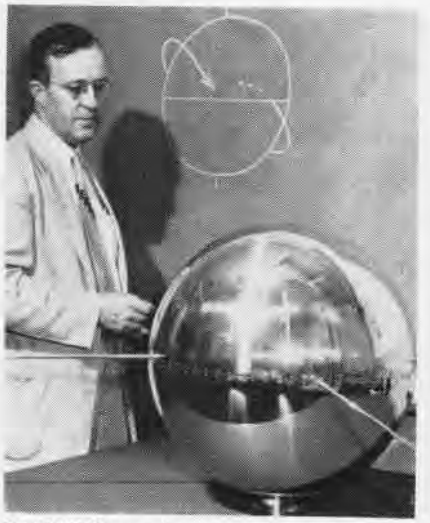


SCIENTIST AT NRL *adjusts Minitrack equipment to be used in ground tracking stations.*

A MINITRACK *transmitter and battery pack which will be installed inside each satellite.*

IGY SCIENTISTS *discuss the transmitter which will send signals to earth from the satellite.*

TESTS ARE *made of erosion gauge which will record effect of particles on "moon's" skin.*



DR. HAGEN *uses drawing to show approximate path of satellite's orbit around the earth.*

PLASTIC FOAM-*encased electronic package is inserted into gold plated container at NRL.*

FIRST STAGE, a liquid-fueled rocket, will be an improved *Viking*, developed by the Glenn L. Martin Company. It will be powered by a General Electric 27,000-pound thrust rocket motor which can be tilted to control the vehicle's orientation and flight path. Electro-hydraulic controls that position the motor have the necessary response to stabilize a finless airframe in pitch and yaw, and roll control is provided by small auxiliary jet reactors. The two main propellant tanks, containing oxygen and kerosene, are integral with the airframe's skin.

This first stage, essentially a booster, provides most of the energy to raise the remaining stages to orbital height and about 15% of the required orbital velocity.

Also a liquid-propellant rocket, the second stage is attached to the forward end of the first. It carries in its nose the third stage and the satellite payload. As in the first stage, the motor is gimbal-mounted, free to turn in any direction. Electro-hydraulic controls are designed to keep the vehicle on course.

The second stage contains the "brains" for the entire launching vehicle—the complete guidance system which will be used during flight. The Minneapolis-Honeywell Regulator Company has already built the three-axis reference system. It consists of gyroscopes that indicate the launching vehicle's orientation at any given moment in regard to roll, pitch and yaw.

A magnetic-amplifier autopilot will take its instructions electronically from the gyro reference system. It will keep the *Vanguard* vehicle on its predetermined course by moving the rocket motor on its gimbal mounting. In this way, the thrust of the motor will push the entire vehicle in the desired direction. A gimbaled motor, moving its thrust rapidly under the direction of its control system, keeps the rocket balanced in much the same manner as a trained seal balances a ball.

The second stage carries the master sequence controller that times the major in-flight operations, such as ignition and cut-off of the various stages. It also houses the mechanism for spinning the third stage. Its nose cone protects the more delicate satellite sphere from aerodynamic heating during the first two stages of ascent. The cone is

NRL TEAM MAKES *last check on Viking rocket which was launched from Patrick AFB in December. This was a prelude to satellite launching.*

THIS VIKING *is the first test rocket of the Earth Satellite Program. It soared to a height of 125 miles before falling into the Atlantic.*

jettisioned during the second stage burning. This stage supplies the remaining energy required to reach orbital height and about 32% of the orbital velocity.

The third stage is an unguided, solid-propellant rocket. It is maintained during burning in a stable orientation roughly parallel to the earth's surface by spinning it about its longitudinal axis. It is spun while in the second stage, and then separated and ignited. This last stage is fired at orbital height and provides the balance of the required orbital velocity. The payload, attached to the front end, will be separated when orbital velocity has been attained. When separation occurs, the last stage itself becomes an uninstrumented, temporary satellite.

After taking off vertically under first stage power, the launching vehicle ascends in a smooth curve. It tilts gradually from the vertical in the direction (southeast) of the intended orbit. At first stage burn-out, the vehicle is about 36 miles above the earth, traveling at an angle roughly 45°. Then the first stage separates and falls to earth about 230 miles from the launching point.

The second stage ignites upon separation from the first. It proceeds under its own power to an altitude of about 140 miles. During this time, its path is approaching level flight. At burn-out, it has a vertical velocity sufficient for ascent to about 300 miles, and a horizontal velocity that is about half the orbital velocity required.

Midway in the second stage of powered flight, the nose cone is jettisoned. No separation occurs at second stage burn-out. The remaining two stage combination coasts forward a distance of about 700 miles in ascending to the 300-mile third stage projection altitude.

During this coasting period, the two-stage vehicle is brought to a position, roughly parallel to the earth's surface, for projection of the third stage. The third stage is given the rotation necessary for stable flight. At this point, the vehicle is, so to speak, fully committed. No further control can be exercised. Separation of the payload will occur after third stage burn-out.

Because of the probability of slight human and mechanical error in calculations, the orbital path is not expected to be a perfect circle at 300 miles altitude. Moreover, the vehicle is being designed to have a final velocity in excess of that rquired for a circular orbit. Although 25,000 feet-per-second (18,000 miles per hour) is required, the vehicle is powered for about 27,000 fps.

Project *Vanguard,* the launching of the vehicle, is only one phase of the Earth Satellite Program. The next task is to follow the little "moon" around the earth, and to predict its future orbits by tracking.

Radio angle tracking was developed at NRL, and is called "Minitrack." The Minitrack system will enable scientists to follow the launching, direction of launch, and movements of first and second stage rockets. The system will enable them to localize the time of arrival of the satellite over any given ground location within six minutes, and its position to within several hundred miles, during the initial orbit of this man-made, little satellite "moon."

IT WILL NOT be easy for visual observers to locate the satellite as it speeds in its orbit over their stations. Unless they know where to look ahead of time, the satellite will have passed unobserved. To lick this problem, radio angle tracking stations have been set up to measure the angle of position and rate of the satellite, and then to inform visual observers along the line of orbit.

The Minitrack system makes use of established radio interferometric principles. It uses a transmitter of minimum size and weight within the satellite to send a beam of radio energy to receiving antennas at ground stations. By comparing the path length from the transmitter to one antenna with the path length from the transmitter to a second antenna, it is possible to locate the satellite in its orbit, determining its angular position by radio phase-comparison methods. Similar measurements with another set of antennas, at right angles to the first set, help to fix the satellite accurately. Seven antennas will be used in the actual ground tracking stations.

According to present plans, the Minitrack transmitter, designed to operate under battery power, will be a simple, minimum-weight (three pounds or less) oscillator, with a power output of 20-50 milliwatts at an operating frequency of 108 Mc. Transmitter operating life is about 15 days.

ANOTHER VIKING *unloaded at Patrick in April, where it was prepared for launching to test equipment for the actual satellite attempt.*

MEMBERS OF THE *Earth Satellite Project staff confer with Dr. J. P. Hagen, director (center), at the U. S. Naval Research Laboratory.*

PATTERN OF THE Minitrack antennas will be fan-shaped, with the axis of the beam pointed to the zenith and the plane of the fan along the north-south plane. At satellite heights, the beam will be several hundred miles wide. In this way, a chain of stations distributed roughly along the 75th meridian and stretching from latitude 35° North and 35° South could intercept the satellite at each passage.

At present, ten such stations are located as follows: Blossom Point, Md.; Fort Stewart, Ga.; Batista Field, Havana, Cuba; Coolidge Field, Antigua Island, British West Indies; Mt. Cotopaxi, Quito, Ecuador; Ancon, Lima, Peru; Antofagasta, Chile; Peldehue Military Reservation, Santiago, Chile; the Navy Electronics Laboratory, San Diego, Calif.; and Woomera, Australia.

Optical tracking will play a large part in the Earth Satellite Program. Depending upon the sun's reflection upon it, the small "moon" will have a brightness of the order of a fifth or sixth-magnitude star. If the location is known exactly, under very clear atmospheric conditions,

SCIENTISTS ALL *over the world are anxiously awaiting results of Satellite Program. This model was exhibited in New York last September.*

it may be observable with a good pair of binoculars. Twelve prime astronomical observatory stations are being planned in different parts of the world, with some 200 secondary stations. Volunteer astronomers are urged to participate. Such optical observations will best be made at twilight or before dawn when the "moon" is illuminated by the sun, but the observer is in darkness.

Equipment in the instrument-packed little "moon" will emit a radio signal to be picked up as the satellite passes each radio tracking station. Within 20 minutes, three sets of data will be relayed from the Minitrack stations to the Earth Satellite Communications Center in Washington, D. C., and from there via teletype to the Computation Center, located in the same area. Here, an IBM-704, a high-speed electronic computer, will calculate and predict the orbit of the satellite as it speeds around the earth.

The giant 704 will process this data at electronic speeds. Results of the computation will be transmitted back over teletype to the communications center. From there they will be flashed to alert the Minitrack station next in the path of the satellite. The orbital computations will also be passed along to optical observers.

Scientific instruments carried in the little "moon" will be limited to a little over 10 pounds. Only those experiments which require lightweight gear can be conducted. The U. S. National Committee for IGY is the final authority on the instrumentation question.

A few of the instrumented experiments being considered by the Committee indicate the scope of scientific inquiries: Temperatures on and within the satellite; pressure checks on possible leakages and meteoric effect; measurement of light from the sun in the ultraviolet and X-ray wave lengths, by means of photon counters. If the sun could be observed in the Lyman alpha region, and simultaneously the same radiation from outer space recorded, then it might be possible to determine the density of hydrogen atoms and ions in space. A magnetometer flown in the satellite could provide a time record of the earth's magnetic field above the ionosphere, information helpful both in determining the cause of magnetic storms and in studying the disturbances of radio communications. With Geiger counters, scintillation counters, and Cerenkov detectors, it should be possible to study the lower energy cosmic rays which do not penetrate our atmosphere.

Careful measurement of the "moon's" orbit will afford a more accurate measurement of the earth. A second output of the tracking program will be the drag experienced by the satellite at orbital altitude. From this it should be possible to deduce the density of the atmosphere.

Such a complex operation as the launching of a satellite

THIS MODEL *of the satellite shows some of the delicate instrumentation by which scientists hope to learn more about outer space.*

DR. HAGEN SHOWS *a model of three-stage rocket which will propel the satellite into the earth's upper atmosphere and put it in its orbital path. Arrow shows probable orbit of the "moon" and the markers designate locations of the various radio tracking stations.*

requires a great many dress-rehearsals. Last fall, scientists from NRL and the Martin Company moved into the Missile Test Center at Patrick AFB. Launch pads, gantry crane, and the blockhouse were readied for test firings which would culminate in a satellite attempt.

The first test rocket of the Earth Satellite Program was launched from the test center at 0103 on 8 December 1956. The rocket, 13th in the series of *Vikings* built for the Navy by Martin, was fired for the purpose of testing instruments and gathering information necessary for the actual earth satellite launchings.

After taking off from the launching platform, the rocket ascended vertically a short distance. From that point on, it was turned slowly toward the horizontal. It reached a peak velocity of 4,000 mph and climbed to an altitude of 125 miles. It ended its flight in the Atlantic about 180 miles from its launching site.

A Minitrack transmitter was ejected from the *Viking* at an altitude of 50 miles and was tracked by scientists at the missile test center. The rocket also carried telemetering equipment and tracking beacons similar to those planned for the rockets used in the actual satellite attempt.

After 450 seconds of flight, the instrumented nose cone was separated from the rocket. It was allowed to descend independently, telemetering information on the temperatures and pressures it encountered.

Although the 45-foot *Viking* fired was not a prototype of the 72-foot *Vanguard* rocket, the first stage of the satellite launching will be a modified *Viking*. Hence, launching operations are similar in many respects.

The Office of Naval Research, since its foundation in 1946, has been engaged in supporting the very basic research that unearths new knowledge. This is the starting point for every major advance in material development. This concern with basic research has necessarily included development of the research tools needed to make new advances.

The U. S. National Committee for IGY found ONR equipped to provide technical assistance in the satellite program, through its long experience in rocketry.

Navy participation in the International Geophysical Year will contribute knowledge in many fields—particularly in nuclear physics, astrophysics, geodesy, and geophysics. It should find long range applications in transportation, communications, weather, navigation, and cartography.

GRAMPAW PETTIBONE

Couldn't Believe It

Following an RON at NAS . . . the pilots of an SNB-5 filed for an IFR return to MCAAS BEAUFORT. They estimated three hours and 30 minutes enroute to destination, 50 minutes to alternate field of NAS JACKSONVILLE, and gave fuel aboard as four hours and 30 minutes.

Well before reaching their destination, the pilots requested a let-down in order to descend below the cloud layer and switch to visual flight rules. However, ATC advised them to pick up the requested change at the next reporting point. This continued at each succeeding reporting point until the aircraft arrived over its destination, whereupon the pilots—now a little concerned about the amount of fuel remaining—effected an off-airways let-down.

Breaking into the clear at 1600 feet and recognizing their position, the pilots headed toward MCAAS BEAUFORT nine miles away. Unfortunately, the fuel gave out. The *Beech* bellied into the mudflats just six miles from their home base.

Both pilots stated that no fuel checks were made enroute although when over Charleston they noted that on'y .3 of a tank of fuel remained. However, they still believed they could make it to Beaufort.

The flight was planned for a total of four hours and 20 minutes (to destination and alternate), leaving only a 10-minute fuel reserve. The high fuel consumption which caused the aircraft to exhaust its complete fuel load of four hours and 30 minutes in three hours and 30 minutes at the normal cruise settings reported by the pilots remained unexplained since an extensive check of fuel lines and fuel tanks failed to reveal any leakage. However, the engines are under O&R test.

Grampaw Pettibone Says:

Looks to me like these boys just couldn't believe what was happening. They were lulled into a feeling of over-confidence because they had made a number of prior flights between these two points, including the previous day's uneventful VFR hop. They assumed they'd have enough fuel as usual and didn't bother to keep a fuel log or make any attempt to compute the fuel consumption rate.

Durned poor judgment went hand in hand with over-confidence when these lads finally discovered over Charleston that they had only three-tenths of a tank of fuel showing on the indicator and then still continued their IFR flight instead of declaring an emergency and getting on the deck at Charleston.

The pilots failed to comply with the provisions of OpNav Instruction 3710.7A when they allowed only a 10-minute fuel reserve beyond the alternate field and also erred in filing IFR to a destination that lacked approved navigational aids for an instrument let-down. While these items were primarily the pilots' responsibility, the clearing authority—NAS Operations at the point of departure—also slipped up.

For the latest word on fuel reserve required for VFR or IFR flights, a careful reading of Section VII of OPNAV Instruction 3710.7A is highly recommended. I'm advised that similar up-to-the-minute dope will be contained in the applicable section of OPNAV Instruction 3720.2A when it reaches the field in the near future.

Dear Grampaw Pettibone:

Two recent helicopter rescue attempts at sea were unsuccessful. Two pilots and one helicopter crewman were drowned.

The failure of the rescue missions can be attributed to the most severe complicating factor which can be introduced into any helicopter rescue attempt—an open parachute attached to the downed pilot.

A parachute is a lifesaving device. A

helicopter is a lifesaving device. But a mixture of the two during a helicopter rescue is a deadly mixture.

Everyone who flies should be thoroughly indoctrinated and rebriefed at frequent intervals to GET THAT PARACHUTE OFF!

CDR, USN HU-2

Grampaw Pettibone Says:

A hearty Amen to all your comments!

Thorough indoctrination and frequent rebriefing are absolute necessities in licking this rescue problem. The Dilbert Dunker—a very useful gadget—can't provide the complete answer. Pilots and crewmen need to make an occasional wet dry-run. Wearing normal gear for a dip in the drink is durned nigh as informational as a real emergency and provides experience with problems not otherwise foreseen. For example, one try at unfastening a parachute harness with water-soaked flight gloves presents a strong argument for baring those meathooks prior to water entry.

Short Minutes

The following minutes of a monthly Aviation Safety Council meeting recently crossed Gramp's desk:

"The meeting was called to order at 1025 by Capt. ———, USN, Senior Member.

1. The minutes of the preceding Aviation Safety Council meeting were read and approved by all members.
2. Old business: None.
3. New business: None.
4. The meeting adjourned at 1055."

Grampaw Pettibone Says:

Judging by the length of the meeting and the little business that was transacted, I figger that (a) the previous meeting must have been a whopper, (b) the recorder was a slow reader, (c) somebody had a heck of a lot of new stories, or (d) one of the members just happened to have a deck of cards.

I hope I never see seconds on this kind of minutes—my blood pressure couldn't take it! If the accident rate *isn't* zero, there should be plenty of business; and if the rate *is* zero, there should be plenty of business to make durned sure it stays that way.

Fooled Though Fueled

During the first hour of a training flight, the pilot of a P2V-5F made four GCA runs using both reciprocating and jet engines for climbouts. After reaching an altitude of about 1000 feet following the fourth GCA run, the starboard fuel flow fluctuated rapidly. The engine began to surge and was subsequently feathered. At this time the jets were not developing power.

An emergency was declared and the pilot initiated a slow left turn back toward the airfield. Three minutes later, when two miles from the air station, the port engine failed. The crew was ordered to ditching stations and a Mayday was broadcast.

The airplane bellied its way through a chain link boundary fence and slid to a stop in a plowed field with overhaul damage and NO injuries!

Post-accident investigation revealed that the aircraft was started, warmed up and flown with the fuel selector valves set on the left and right center section tanks instead of on the main tanks. When the fuel was exhausted in the center section tanks, three engines went out in fairly rapid succession.

In the three-minute interval before the last engine quit, the pilots did not observe that they were attempting to operate the aircraft on dry gas tanks. The main tanks held *1400 gallons* of readily available fuel had either the pilot, copilot, or plane captain determined the cause of the trouble and turned the valves.

Grampaw Pettibone Says:

Great Balls of Fire! Son, you gotta give it that go-juice or it jist won't stay up there in the blue! The position of the fuel selector valves was not altered at any time prior to or during the flight.

It seems that when the emergency occurred the pilot took no effective action to restart the engines, because he had a fixed notion that the selectors were on the main tanks which could not have been run dry in the short length of time the plane was airborne.

Well, bub, I'll grant that you were probably all hands and feets and busy as the well-known cat when the engines started going out, but gosh, man, your mind must have been shut mighty tight. The nature of the engine failures should have busted your mental block and clued you to make a positive check on your pushwater.

For the lack of help you got from your copilot and plane captain, you have my sympathy. But with a crew set-up such as yours, all the more responsibility necessarily rested on your own broad shoulders which you should have squared away.

Good Scout

The pilot of a TV-2 initiated a precautionary flame-out approach when the engine instruments began giving erratic readings and the engine started vibrating.

At the 90-degree position during the approach, the engine flamed out, and the pilot made an uneventful forced landing on his home field.

Grampaw Pettibone Says:

Routine? Not at all! This lad was saved by a "Don't Wait—Anticipate" philosophy and his past Boy Scout-type training that taught him to be prepared. A professional pilot, he knew his onions and plane—and came out smelling like a rose.

LET'S LOOK AT THE RECORD

Yorktown Gunners Praised

Six Up, Six Down is Their Record

Gunners of the *Fighting Lady* received a "Well Done" for their job of firing at drone targets during operations in April.

The compliment came from LCdr. James Jolly, O-in-C of KD Unit 21, who described *Yorktown* gunnery as outstanding.

When the eight-man KD unit reported aboard the CVA-10 for gunnery practice, it brought eight drones with it. When the unit left for its Barber's Point home base, it had only one drone to take back. *Yorktown* gunners had destroyed six of the eight. LCdr. Jolly pointed out, "If we hadn't recovered one of the two drones that crashed because of mechanical failure, we might not have taken any back with us!"

He continued, "I was particularly impressed by the teamwork between the batteries and directors. In one afternoon the shooting teams knocked down two of the drones in succession in their first pass over the ship."

KD6C-1 drones, though slower than jets, are very maneuverable. Their small size makes them harder to knock down than many planes. About 10½ feet long with a wingspan of 11½ feet, they travel about 200 knots. According to LCdr. Jolly, firing at drones from a distance of 4,000 yards is the same as firing at jets eight miles away.

100,000 GCA's at Corpus

TV-2 Trainer Makes the Approach

Ltjg. Morton D. Newman, instructor in ATU-101, and his student, 1st Lt. Robert D. Reid had the signal honor of making the 100,000th Ground Controlled Approach to be made at NAS CORPUS CHRISTI. Flying a TV-2 jet trainer, they were talked down by Richard E. Hughes, AC2.

The 100,000 figure attained by GCA Unit 16 is the highest of any U. S. Navy Unit in the world. A staff of four officers and 16 enlisted men operate the Unit which has been installed at NAS CORPUS CHRISTI since 1946.

LCOL. W. D. *Armstrong, CO of HMR-162, Oppama, Japan, shows CNO safety award won by his squadron for FY 1956 to Operations Officer, Maj. George Mottl (center) and maintenance chief, MSgt. Philip K. Mackert.*

'Grim Reapers' Set Record

Pilots Qualify on Carrier FDR

On board the USS *Franklin D. Roosevelt*, CVA-42, VF-101 pilots were qualified for carrier operation in their F4D-1 *Skyrays* in three days. In view of the fact that 85% of the *Grim Reapers* had never operated jet aircraft off a carrier before, the squadron is proud of this feat. The *Reapers* claim that they are the first AirLant squadron to be completely day-qualified in the *Skyray*.

Cdr. R. M. Witmer is VF-101's CO.

VF-32 Pilots Fly the F8U

Ten Join Exclusive 1000 mph Club

VF-32, based at NAS CECIL FIELD, has added ten new members to the 1000-Mile-Per-Hour Club, according to Cdr. Gordon C. Buhrer, squadron skipper.

Those qualifying in the *Crusader* are shown below (standing, left to right): LCdr. Roy Johnson, Lt. Billy Phillips, Cdr. Buhrer, LCdr. Don S. Bedsole, Ltjg. Robert J. Nork; and (kneeling, left to right): Ltjg. James P. Allen, Lt. John C. Glore, Lt. Howard E. Rutledge, Ltjg. Marvin G. McCanna, and Lt. David D. Davison.

PILOTS ARE QUALIFIED IN THE CRUSADER

To qualify for membership in the "One Grand Club," as it is called, a pilot has to reach a speed of 1000 miles per hour in level flight.

Record Marked up in Demon

'Felix the Cat' Squadron is Proud

Members of VF-31, the famed "Felix the Cat" squadron, announce that they are the first fleet unit to fly the F2H-2N *Demon* more than 500 hours in one month. The grand total of 527 hours was achieved by a maximum utilization of the 12 aircraft assigned. Of this total, night time operation accounted for 136 hours.

This accomplishment was achieved at a time when new aircraft were being accepted and old aircraft transferred. At the same time, the squadron had not yet received its full allowance of personnel. Special credit goes to the maintenance department.

Based at NAS CECIL FIELD, VF-31 is skippered by Commander J. E. Tefft.

100th Landing on CVA-59

Hill is Carrier's First Centurian

In the eastern Mediterranean, four McDonnell needle-nosed F3H *Demons* climbed from the *Forrestal's* night-shrouded flight deck on an intercept training mission.

About two hours later, they settled back aboard. At the controls of the lead plane, Cdr. John S. Hill landed for the 100th time and thereby became the first pilot to qualify as a member of the traditional "Centurians" on a *Forrestal*-class carrier.

Cdr. Hill is the commanding officer of Carrier Air Group One.

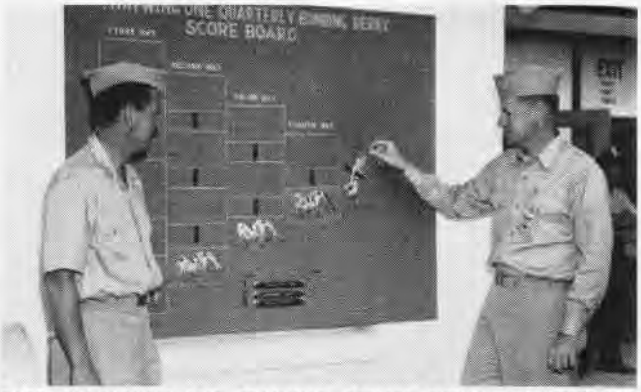
VF-141 Aboard Essex

Makes Night Landings with Skyray

VF-141, under the command of Cdr. Dalce C. Klahn, made the first night landings of the F4D *Skyray* fighter aboard the USS *Essex*. This was still another first for CVA-9.

VF-141 is part of CVG-5 which is commanded by Cdr. Ralph A. Bagwell.

WINNING VAH-5 CREWS WITH CDR. TULLY, CO, STANDING ON LEFT



CAPT. BLACKBURN AND TRAINING OFFICER FITTON POST WINNER

VAH-5 WINS BOMBING DERBY

THERE's a new Derby that's more exciting than a horse race. It's run off in Florida with fast planes manned by sharp shooters.

The *Savage Sons* of Heavy Attack Squadron Five won the first quarterly Inter-Squadron Derby. Their victory followed a month of concentrated practice bombing missions and ground training. Then they entered the race and won the coveted crown.

Symbol of their victory is the beautiful silver bowl designated the Conover Trophy by the donor, North American Aviation. This award is named in honor of the North American test pilot who lost his life in the XAJ-1.

First established in December 1956, the Derby was created in order to stimulate morale and improve proficiency of squadrons belonging to Heavy Attack Wing One.

With the backing of Capt. J. T. Blackburn, Commander of HAW-1, LCdr. C. F. Fitton originated the derby. Each participating squadron was designated by a horse at full gallop until the unit was eliminated. Then the nag sagged.

Competing in the exercise were four Heavy Attack Squadrons based at NAS SANFORD: VAH-5, VAH-7, VAH-9, VAH-11, and one squadron from NAS JACKSONVILLE, VAH-3. Five, Seven and Eleven flew the North American AJ *Savage*, while Three and Nine vied for honors in the twin jet Douglas A3D *Skywarrior*.

Jacksonville was chosen as the "bombing range" for the exercise with certain bridges and buildings designated as targets. All scoring was accomplished by a radar bomb plotting detachment of FASRon-51 at NAS JACKSONVILLE which tracked the aircraft as they streaked towards their targets. The accuracy of this method of scoring has been developed to such a degree that the expense of dropping actual bombs is never incurred nor were any released during the operation.

Three outstanding tactical crews, consisting of a pilot, bombardier/navigator and radioman/weaponeer, were chosen to represent each competing squadron. As the citizens of Jacksonville went about their daily routine, the heavy bombers wove their vapor trails thousands of feet overhead. No range or danger area was required for the operation.

BLACKWOOD WAS VAH-5'S BEST BOMBARDIER

The process of elimination took its toll as one squadron after another bowed from the race. On the final day when Heavy Attack Squadrons Nine and Five remained for the showdown, VAH-5 emerged the victor.

THE THREE tactical crews which brought the trophy to VAH-5 were composed of Cdr. Joseph M. Tully, Jr., flight leader and aircraft commander of the first crew, Bombardier Ltjg. Art McAdams, and Robert Ackerman, AL2, radioman-weaponeer. Cdr. Tully is commanding officer of VAH-5. The second crew consisted of LCdr. Charles O. Donnaud, pilot, William Foulk, AOC, bombardier, and Lenox Fay, AQC, crewman. LCdr. Charles R. Tucker was the pilot for the third crew with Ltjg. Robert Blackwood, the bombardier, and Edward Yaw, AD3, flying as the third crew member.

Ltjg. Blackwood earned laurels as the VAH-5's leading scorer, but individual honors go to J. E. Valinski, AL1, VAH-7 bombardier, whose outstanding scores astounded the competition and brought him and his crew personal trophies for maintaining the best bombing record during the entire Derby week.

The Conover Trophy will remain in the possession of VAH-5 until the next Derby. It will be awarded each quarter until a unit wins three consecutive contests and retains the prize.

IN 1918 LOUGHEAD BROTHERS BUILT HS2L FLYING BOAT, FIRST LOCKHEED-NAVY PLANE

LOCKHEED AIRCRAFT

This is the seventh in a special series of feature articles on companies which have built and are building aircraft for air arm of the United States Navy.

"Look to Lockheed for Leadership," the company slogan, condenses the spirit of an entire international aircraft company into a succinct phrase. From the day in 1912 when Lockheed's founders built their first wood and fabric seaplane, right up to the present and to the company's Mach 1 plus planes, the name Lockheed has symbolized aviation progress.

Allan and Malcolm Loughead, whose Scottish name was later changed to Lockheed, the way it was pronounced, established the company when they built on San Francisco Bay, a single-engine seaplane that would accommodate two passengers and the pilot.

Operations subsequently moved to Burbank, Calif., and the Lockheed Airplane Company began, during 1927, to manufacture their cabin monoplane that was a radical departure from standard designs of the time. Named *Vega* for the first magnitude star, this plane was the first of many Lockheed planes named for a celestial body.

A novel method was used for the production of the *Vega's* fuselage, which looked like a monocoque, but actually was a bivalve. The two halves of the shell were made of spruce veneers glued together with casein glue, and pressed to shape in a mold under 150 tons pressure. These halves were then assembled on a series of oval laminated spruce formers. Cantilever wings on *Vegas* were plywood covered.

Powered by a Wright *Whirlwind* engine, this plane seated four to six passengers, and because of its unusually clean lines, was able to claim remarkably good performance.

A modification of the *Vega* known as the *Air Express*, produced in 1928, was used by Western Air Express on their early West Coast air mail routes. It later made transcontinental records.

An air magazine of early 1929 quoted Lockheed as announcing a production schedule of 200 airplanes for 1929. The company turned out seven planes in 1927, during the first year, and achieved a capacity of eight to ten planes a month by the start of 1929.

Much of aviation history has been made in Lockheed planes. It was a Lockheed *Vega* that took Sir Hubert Wilkins and Lt. Ben Eielson across the North Polar Sea from Point Barrow, Alaska to Spitzbergen in April 1928. This historic flight, the first across the top of the world, opened the way for many that soon followed their lead.

Other great figures in early aviation also flew Lockheeds. Amelia Earhart in her *Vega* set women's speed records in 1929 and 1930. Later she made trans-ocean flights in a Lockheed twin-engine *Electra*, a special production model built for her.

Ruth Nichols achieved her 1931 altitude and speed records in a *Vega*.

In their Lockheed "Winnie Mae," Wiley Post and Harold Gatty made their record breaking round-the-world flight in June 1931. Post flew the "Winnie Mae" the following year for the first solo circling of the earth. He later used the plane, with a supercharged engine, for high-altitude study of the wind channels at these levels.

WW II PV-2'S FOUGHT OVER TWO OCEANS

20 OF THE HUDSONS BECAME NAVY PBO-1'S

FIRST ANTI-SUB DETECTION GEAR ON P2V-4

The Lindberghs used Lockheed's twin-float, low-wing monoplane *Sirius* for their 29,000 mile world aerial survey in 1933. This craft was then presented to the American Museum of Natural History where it was on display in New York until about 1956 when it was moved to the Air Force Central Museum at Wright Patterson.

Lockheed points with pride to contributions its planes made to still other achievements in the development of aviation. Other great names follow in quick succession: Goebal and Tucker, coast to coast record in a *Vega* "Yankee Doodle;" Major Jimmie Doolittle whose *Orion* traced the historic routes of George Washington; LCdr. Frank Hawkes, transcontinental records in an *Air Express;* Howard Hughes, three day round-the-world flight in a Lockheed "14" monoplane in 1938.

The present Lockheed management assumed direction of the company in 1932 when there was a general reorganization of the company. On assuming active leadership at that time, Robert E. Gross began to turn Lockheed production to all-metal, twin-engine passenger planes. The first *Electra* was followed in fairly rapid succession by the Model 12, the Model 14, Super *Electra*, the *Lodestar*, all of which were soon in use on the world's air lines. Constantly expanding production of these civil planes during the thirties put the company in position to supply military aircraft to us and our allies when that need became urgent in the next decade.

Lockheed realized that to produce the airplanes which would be required in the almost inevitable armed conflict, it was first necessary to increase the production capacity. The momentous task meant new buildings, selecting and installing new equipment.

A part of Lockheed's expansion was the establishing of a subsidiary unit, Vega Airplane Company, which in addition to developing the *Vega Airliner*, manufactured component parts for the parent company. Lockheed's laboratory that tested and inspected aeronautical structure and materials was greatly expanded. New X-ray and photographic equipment, with special testing apparatus, was installed, and a wind tunnel was constructed in 1940.

ELECTRONICS LOADED SUPER CONNIES ARE FAR EXTENSION OF THE EYES OF THE FLEET

THERE WAS NO reservoir of experienced aircraft workmen to draw upon so Lockheed set about training thousands of them. During 1939 an apprenticeship program was instituted to prevent shortage of trained manpower.

When war came and the shortage developed just as predicted, Lockheed and Vega tapped a new labor market by using "boy power" on assembly lines. About 400 boys 16 and 17 years old became half-time aircraft builders under a "four-and-four" plan started by the companies with full cooperation of the Burbank and Pasadena school systems. Each boy attended school for four weeks, then built airplanes for four weeks, and 200 jobs along the assembly line were filled. The plan called for a 12-month school year, and the boys had to keep up their scholastic grades to hold their factory jobs. The intention was that every boy would earn his high school diploma, and earn regular wages for his war-work.

When war was threatening Europe in 1938, the British ordered large numbers of the Lockheed *Super-Electra* Model 14, to be converted into a medium reconnaissance bomber. This plane became known as the *Hudson* bomber. The first of many airplanes to be ordered by America's allies, this twin-engine plane did brilliant work for the Royal Air Force in its job of coastal defense and anti-submarine warfare. It was also used for dive bombing, and even as a fighter. Later it was used by the Canadian and Australian air forces. The Aussies nicknamed it "Old Boomerang" for its ability to come back through thick and thin in spite of heavy damage.

ELECTRA, ALL-METAL PLANE BUILT IN 1934

TV-2, T-33 JET TRAINER ASSEMBLY LINES

CONSTITUTION HEADS HOME TO MOFFETT

On 25 September 1941, CNO directed BuAer to obtain from production allocated to the British a full squadron of landplanes of Lockheed *Hudson* or similar type. During October, 20 *Hudsons* were delivered and placed in service. Designated PBO-1, they were assigned to VP-82.

Out of the war years also came the *Ventura* and *Harpoon* bombers. Adapted from the twin-engine *Lodestar* transport, a few of which were used by the Navy early in the war, the PV-1 *Ventura* was described as "fiercer, farther and faster" than the *Hudson* which it replaced. Equipped to carry depth charges or a standard torpedo in the enlarged bomb bay, this anti-submarine plane was heavily armed with machine guns both for defensive and for strafing or attack purposes. Droppable gas tanks and fuselage tanks gave the PV-1 unusually long range for its patrol duties.

By 1945 Lockheed was producing the PV-2 *Harpoon* search bomber. The Navy procured a total of 2,162 of these patrol planes in the PV series and used them in many ways with telling effect against the enemy both in the Atlantic and in the Pacific Theatres.

The graceful four-engine *Constellation* transport was first flown in 1943. Its wartime use is indicated by an early description of its capabilities: "It will carry 62 passengers and a crew of five at a speed beyond that of a Jap *Zero*. Three of its 2,200 hp Wright *Cyclone* engines will maintain 26,000 foot altitude, sufficient to cross the Himalayas, and two will hold the plane at 16,500 feet." The first of these planes delivered to an operating unit of the Navy went in November 1945 to VPB-101, in the Atlantic Fleet. At that time Lockheed was at work on the development of the still larger and more powerful *Super Connie* for the Navy.

Lockheed accomplishments for the Navy in 1946 included delivery of the first P2V *Neptune* patrol bomber, first of a long series of the twin-engine long-range plane, designed for high speed over great distances.

Most famous member of the *Neptune* family is the P2V-1 "Truculent Turtle." This plane made aviation history when it flew non-stop 11,235.6 miles from Perth, Australia, across the Pacific, and two-thirds across the United States to Columbus, Ohio in Sept. 1946. The *Neptune* was in the air 55 hours and 15 minutes to set this non-refueling record, still unmatched.

Commanded by Cdr. (now Capt.) Tom C. Davies, the "Truculent Turtle" made a JATO take-off, loaded with 8,600 gallons of fuel, grossing a load of 85,500 pounds (this plane was designed for a gross load of 58,000 pounds). Following the great circle route, the plane crossed many belts of weather, including all the equatorial weather belts as well as those of both the southern and northern hemispheres.

The Turtle bucked headwinds clear across the Pacific; fought 250 miles of bottled-up disturbance in the Equatorial front, and hit freezing weather which once put an estimated 1,000 pounds of ice on the wings. Cdr. Davies found only 25 gallons of gasoline left in the tanks when he landed the plane.

For some years this famous plane has been located at the Naval Air Station, Norfolk. It may be seen on exhibit there in a prominent location on the field.

The year 1946 also saw the completion and first flight of the *Constitution*, R6O-1. This plane, first of two sister ships, was the Navy's largest landplane, grossing 95 tons. Four Pratt and Whitney *Wasp Major* 3,500 hp engines powered this leviathan. It could carry its crew of 12 and 168 passengers on its two decks a maximum range in excess of 6,000 miles. Top speed exceeded 300 mph.

The *Constitution* went on active duty in Feb. 1949 when, after being commissioned into service with VR-44, it flew from Moffett Field to Washington, D. C. in nine hours and 35 minutes. These two planes returned to service just at the time when the Berlin Air Lift requirements had taken many transports from their regular assignments.

Two ski-equipped P2V-2-N's were trail-blazers in the initial Operation Deepfreeze in 1955-56. The longest Antarctic exploration flight on record was made in one of the *Neptunes* in January 1956. Flown by LCdr. J. H. Torbert and Capt. Wm. "Trigger" Hawkes, the P2V-2 took off from bay ice at McMurdo Sound for a transcontinent run. Nineteen hours later it had completed a 3,400 mile round trip across the South Pole and beyond, to the Weddell Sea, and back to land again on the bay ice. On this signifi-

THE 'TRUCULENT TURTLE' IS ONE OF THE NAVY'S FAMOUS PLANES

EQUIPPED WITH JATO ASSIST, SKI-FITTED P2V-7 LEFT FOR ANTARCTICA

SUPER CONSTELLATION RADAR PLANES MARCH DOWN THE LINE

THE T2V-1 IS THE FIRST JET TRAINER DESIGNED TO GO TO SEA

cant flight, mountain and plateau discoveries were made which are being cited as proof by the proponents of the one-continent school of thought.

Production of the P2V series has been continuous for more than a decade. Newest is the P2V-7, combination jet and propeller driven. Longer than its predecessors, the P2V-7 houses magnetic detection gear in its tail extension. This adds underwater detection to its sub-hunting capabilities.

P2V-7's are now coming off Lockheed's assembly lines armed with 20 mm cannon. Replacing .50 caliber machine guns, these turret-mounted cannon increase the *Neptune* firepower 70 percent. Adapted for rocket attack, night torpedo attack, mine laying, mast-level bombing, as well as sub-detection, the dash seven is well equipped to carry out the many anti-submarine missions assigned, and to block atomic back alleys of the seas.

As a result of the oustanding performance of the two *Neptunes* on *Deepfreeze I*, two new P2V-7's were fitted with similar skis and participated in the 1956-1957 phase of *Deepfreeze*. These are the first planes to use jet power in Antarctica.

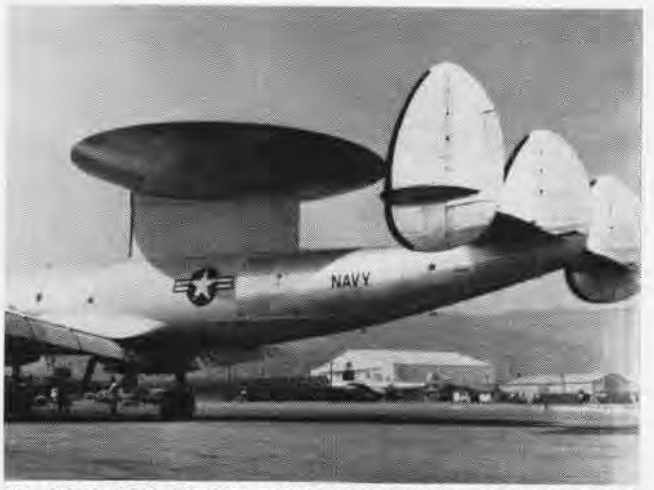
In the jet field, Lockheed's *Sea Star* T-V, the two-seat all-purpose jet trainer holds two "firsts." Widely used in the Training Command in the Navy, it is the first U. S. airplane to be ordered into production with boundary layer control as standard equipment. It also was the first jet trainer to be assigned to pilot training operations in seagoing carriers as well as from land bases. Actually an internationally utilized jet trainer, this plane, according to Lockheed, is the one in which nine out of 10 of the free world's jet pilots trained.

Though basically similar to the early *Constellations*, the *Super Connies* incorporate many improvements that result in greatly increased performance. Primary mission of the WV-2 planes is Aircraft Early Warning and Control (see NANEWS, May 1957). Flying the Early Warning Barriers over the Atlantic and Pacific oceans, they serve as high-altitude reconnaissance and early warning intelligence aircraft, and also as coordinating centers for search information for communication to ships, bases, and other aircraft.

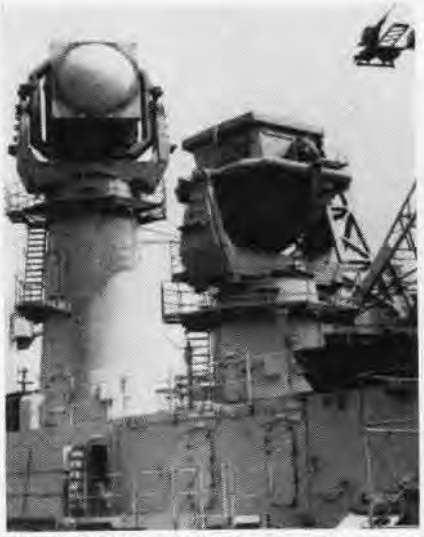
Loaded down with the most highly developed electronic detection gear in existence, these planes are ever on the alert for intruders by air or by sea, any of whom might prove to be potentially dangerous to the United States.

The *Super Constellations* are only one step further in the ever advancing cycle of research, development and accomplishment that is Lockheed's story.

GIBRALTAR IS NO STRANGE SIGHT TO THE WIDE-RANGING WV-2'S



THE DISC-SHAPED RADOME IS NEW IN AIRBORNE RADAR DETECTION



SUPER RADARS *(AN/SPQ5) for guidance of Terrier missiles are installed on the guided missile Cruiser Canberra (CAG-2). The radars have huge, turret-like antennae resembling giant searchlights (see picture on left). The super systems can guide missiles whether fired singly or in salvos at individual or multiple supersonic attackers. They are also used for early warning.*

THIS FRENCH *light interceptor, Trident II, is a military version derived directly from an experimental, supersonic aircraft, Trident I. It made its first flight with jet engines only on 19 July 1955, and a few months later it flew with rocket engines cut in. This aircraft has completed about 100 flights, including a number of flights at speeds greater than speed of sound. Its ceiling is restricted at this time only by survival conditions at altitude of the pilot.*

BELIEVED TO BE *the largest radar antenna ever flown in an aircraft, this cutaway view shows how the envelope of the ZPG-2W blimp serves as a radome for the antenna. This in no way interferes with the operation of the radar. A significant increase in signal strength over that of the former radome attached to the gondola has been noted in Goodyear tests for the Navy.*

Linguist Proves Ability

'Talks' Plane to a Safe Landing

Air controlman Clifford E. Overton, of NAS NEW YORK, is credited with saving the lives of 25 people. During foul weather, with visibility only 200 feet, he "talked" (in Spanish) a Guatemalan Air Force pilot to safety at Floyd Bennett Field.

The twin-engine C-47 was enroute to New York from Miami with a group of entertainers. Owing to excessive static, foul weather, and the language barrier, the pilot was unable to maintain contact with Idlewild. A landing attempt at Mitchel AFB also failed.

From the radar truck parked at the end of Floyd Bennett, Overton was preparing to go off duty. Through the static, he heard the pilot, LCol. Fernando Juarez, plea for landing instructions. He had only 20 minutes of fuel remaining.

Over the air came a clear, calm voice the Guatemalan could understand. Overton, born in Panama and speaking precise Spanish, guided the plane foot by foot to safety through the storm to the Navy field.

The entertainers, representatives of the Guatemalan government, were scheduled to appear on a TV show. To show their appreciation to the Navy after their landing, they staged a special show in one of the hangars.

Historic Naval Review

Many Nations Well Represented

The International Naval Review held in Hampton Roads in mid-June surpassed, in the number of nations represented, any such review previously held in the world. It was the first International Review staged in U. S. waters in 50 years.

The event was sponsored by the U. S. Navy, the Virginia 350th Anniversary Commission, and surrounding Virginia port communities. Invitations to participate were limited to those nations which might have a special reason to celebrate the Jamestown founding and the colonization of North America. The list included the nations of the Americas, those European countries which participated in the exploration and settlement of the U. S. via the Atlantic, and nations of NATO.

Many ships of the Atlantic Fleet attended, ranging from aircraft carriers to submarines and minesweepers.

KILLING SUBS IS A BREEZE TO THE HIGHLY TRAINED MEN OF VS-31

HOME AGAIN, ALL DOWN, NO. 14'S SET TO DROP ON TO THE DECK

VS-31 SUB KILLERS RANK HIGH

ON THEIR LAST tour to the Med, VS-31 hunter-killers, flying S2F's, piled up a fine record. Achievements during their Operational Readiness Inspection earned the grade of Outstanding for all hands, when, led by Cdr. J. R. Rutledge, they made the highest score on AirLant records for two years.

The ORI tactical mission involved a 24-hour attempt of a submarine to attack the "force." The squadron's task was to destroy the sub. Within three hours, the submarine had been killed by the first wave of VS-31 search planes. Successive sections of planes totalled four more kills, forcing the sub to surface early and report, "Out of action." This operation proved there is no substitute for training.

In addition to hunter-killer activities, the squadron demonstrated the capabilities of the S2F's to more of our allies in the Mediterranean. They staged air demonstrations for the Italian, and the Royal Hellenic Navies. They also visited cities in France, the Netherlands, Greece, and Italy.

IN NO. 20, CDR. RUTLEDGE, SQUADRON CO, LEADS THE FIRST WAVE OF SEARCH PLANES ON ORI TASK. MISSION: DESTROY SUB

HOURS BEFORE THE APPOINTED TIME FOR PROBLEM'S COMPLETION, THE SUB SURFACED. FIVE KILLINGS BY VS-31 WERE ENOUGH

ANOTHER CHAPTER IN AD STORY

WEIGHT-LIFTING CHAMP! THIS AD TOOK OFF WITH A TOTAL WEIGHT OF 26,739 POUNDS, EQUAL TO AN R4D WITH 24 PASSENGERS

When Douglas Aircraft Company's El Segundo division delivered the last of 3,180 AD *Skyraiders* to the Navy this year, it was occasion to pay tribute to these reliable multipurpose airplanes.

During informal ceremonies at the Los Angeles International Airport, Douglas' T. E. Springer and E. H. Heinemann turned over the final plane, an AD-7. Accepting the plane for the Navy were RAdm. J. B. Pearson, BuAer's western general representative, and Cdr. R. J. Thompson, assistant BAR at Douglas.

Adding a fitting touch, Capt. J. A. Thomas, who had accepted the original *Skyraider* for the Navy in 1945, was there to fly away the last of the "Able Dogs." Also present was his opposite number, El Segundo's recently retired chief test pilot, La Verne Browne, who first flew the AD.

Although 12 years of continuous production of this, the world's most powerful single engine, propeller-driven airplane, has come to a halt, the Navy will continue to use the AD for almost every type of mission that an aircraft can fly. Produced in seven series, AD-1 through AD-7, the venerable

DIVE BRAKES VISIBLE ON THE EARLY AD-3'S

AD'S HEAD HOME FROM NORTH KOREA RAID

Skyraider in its 28 variations has performed, and continues to perform, a multitude of tasks. Its missions have included, to list a few, day and night attack, anti-submarine search and kill, radar counter-measures, and airborne early warning.

First flown in March 1945, two weeks before the U. S. invaded Okinawa, the *Skyraider* was designated XBT2D-1. The Navy changed the designation to AD, and service deliveries began in June of that year. This single-place torpedo and bombing plane was 50 miles an hour faster than any wartime predecessor. Instead of bomb bays such as were used in the TBF and SB2C, the AD-1 was to carry its torpedoes, bombs and rockets externally. When operating as a dive-bomber, it was to use external dive brakes on the sides and belly, aft of the trailing edge of the wing. This was a departure from the accustomed dive flaps on the wings.

Within a year, the *Skyraiders* had passed their carrier qualification tests, flown by pilots of VA-3-B and VA-4-B, operating at that time from the CVA *Sicily*. The next three years saw fleet squadrons operating in AD's.

Three days after the start of hos-

POWERFUL HUNTER-KILLER TEAM IS ADDED EYES FOR THE FLEET

THIS SKYRAIDER IS LOADED WITH 156 MIGHTY MOUSE ROCKETS

tilities in Korea, *Skyraiders* from the *Valley Forge* were blasting targets in Korea. From then on, hardly a day passed that the AD's didn't strike. RAdm. John W. Hoskins, commander of Task Force 77 was quoted as saying at that time, "I am convinced that the *Skyraider* is the best and most effective close support airplane in the world."

Operating from carriers close offshore, the AD's furnished close air support to Army and Marine ground troops. They also ranged far behind the North Korean lines as they searched for targets. Bridges, factories producing war materials, railroad trains, trucks and tanks bore the brunt of their attack.

Ground-air coordinators, who were first introduced to the AD's as they furnished close air support, were astonished at the devastating load they carried. These single engine planes, with their 1500-mile range, could make run after run on enemy installations, and still have enough load to handle all targets in the area. Normal armament of the AD's then included four forward firing 20 mm guns mounted in the wings, and various arrangements of five-inch HVAR rockets and 11.75 *Tiny Tim* rockets, making the *Skyraider* an aerial arsenal. The AD that now carries eight Aero-7D rocket launchers, loaded with 19 *Mighty Mouse* rockets each, has an added punch.

Designed originally to carry a 1000-pound bomb load, the AD's regularly carried 4000 to 8000-pound loads during Korean operations. It also carried torpedoes, mines, depth charges and napalm bombs.

Early in 1955 AD's were again doing their part in a ticklish situation in the Far East. When the Chinese Nationalists were evacuating the Tachen Islands, AD's were among the U. S. planes flying daily low level air patrols.

Of the 3,180 AD's delivered to the Navy, 670 were the all-purpose AD-5's, produced in three basic configurations: the AD-5 day attack, AD-5N night attack, and AD-5W airborne early warning. Special kits made possible quick conversion even aboard a carrier, of the day attack version into a 2000-pound capacity cargo plane, six-place personnel transport, four-litter ambulance, or long range bomber capable of carrying atomic weapons.

The AD-7 is the latest series of the "pedigreed pulverizer," a name earned in Korea. In addition to an improved engine, this version has beefed-up wings which increase the plane's fatigue life under high tactical load conditions. Although the *Skyraider* looks today to be the same airplane it was in 1945, its interior equipment and structures have been changed almost completely.

As the speedy A4D jet attack bomber joins the fleet in numbers, AD's will be retired, but there is many a mission yet to be accomplished for the Navy by these all-purpose *Skyraiders*.

SNOWSTORM IN KOREAN WATERS TEMPORARILY GROUNDED AD'S

FINAL SKYRAIDER LEAVES DOUGLAS EL SEGUNDO ASSEMBLY LINE

BRIEFING SESSIONS *aren't always brief. Ens. Richard Dieterich and LCdr. Robert A. Clark discuss the day's assigned photo targets.*

VITAL IMPORTANCE *of the F9F-8P tailhook which helps arrest forward thrust of several tons of bucking airplane is emphasized by Clark.*

ONCE A NAVCAD GETS HIS WINGS

WHAT HAPPENS to a NavCad after he gets his wings? Many stories leave the NavCad right at that point. The reader may assume not only that "he lives happily ever after," but also that the most exciting part of the story has been told. Actually, it's only the introduction—although a good one. The ceremony of pinning the wings on a NavCad is not an end, but a beginning. The best is yet to be!

Let us watch the progress of an ex-NavCad assigned to Light Photographic Squadron 62. This squadron flies the F9F-8P *Cougar* and the F2H-2P *Banshee*. These carrier jet fighters have been modified to carry camera equipment for photo-reconnaissance.

Based at NAS JACKSONVILLE, VFP-62 with VAP-62 (Norfolk) provides the Atlantic Fleet with the planes, trained pilots and personnel it requires. The two squadrons also supply aerial reconnaissance for the Sixth Fleet in the Mediterranean. Their mission is accomplished by deploying small units of planes and men on attack carriers where they are readily available.

Take, for example, Ens. Richard Dieterich, as he arrives at Fighter-Photo-62. He is first assigned to the maintenance department for his collateral duties and to an F9F-8P for flying. To help Dick in transition to swept-wing jets, LCdr. Robert A. Clark is detailed to act a buddy pilot.

Under the "buddy" system which the squadron uses to indoctrinate new pilots, an older, more experienced pilot provides close personal assistance and supervision for the new aviator. The system makes available to the young

TIME FOR A COFFEE *break is welcome to Ens. Dieterich and LCdr. Clark. The coffee mess is maintained by A. V. Brailey, steward first class.*

BEFORE FLIGHT, *Plane Captain David P. Olson makes sure that Ens. Dieterich is securely strapped to his parachute and ejection seat.*

ALONG THE BLUE *Mediterranean, Navy's "good will ambassadors" enjoy liberty. In distance is part of task force Dieterich will join.*

THE LIGHT-COLORED *planes on deck are Banshee photo jets. They are gradually being replaced by the newer, more efficient Cougar F9F-8P8s.*

pilot the technical experience and "know-how" which years of flying have given the senior pilot. It is the kind of knowledge that is not in textbooks, a kind that will prove valuable to Dieterich.

LCdr. Clark is well qualified. He has been flying since 1944, logging a total of 2500 hours in the air, of which 1000 hours have been in jet aircraft. He has made 230 landings aboard Navy aircraft carriers.

By having a senior photo pilot as advisor, Dick learns faster than he would otherwise. He will one day assist another pilot as LCdr. Clark has assisted him.

As the weeks progress, with a full schedule of lectures and training flights, Dick is well on his way to becoming a qualified photo pilot and Naval Aviator. Sometime this fall, he will board one of the fleet's carriers as part of a squadron detachment headed for the Mediterranean. He is looking forward to the new experience of flying from a flattop with the Sixth Fleet as well as to visits to such ports as Lisbon, Portugal; Cannes, France; Naples, Italy; Athens, Greece; and Istanbul, Turkey.

Nor does liberty necessarily begin and end in ports. Many times on a few days leave, he will be able to venture farther into the heart of Europe to explore her ancient, beautiful cities. And he will also be acting as one of our unofficial diplomats.

But until the opportunity for this new experience abroad arrives, Dick will be flying and training in Jacksonville.

Whatever the future holds for Dick as a Naval Aviator, he is sure to become a vital part of Naval air power so urgently needed to maintain the peace of the world. The expert tutelage Ens. Dieterich is getting and the personal guidance LCdr. Clark gives him are important parts of his training.

The day his wings are pinned on him is a proud day for the NavCad. With additional training he will be well equipped to do a very special job.

SIX SILENT SENTINELS *await their turn on the flight line. The only weapons these F9F-8P Cougar planes carry are photographic equipment. Because photographic aerial reconnaissance is a vital need of the Fleet, Dieterich and pilots like him are trained for that special mission.*

AEROMEDICAL CENTER ORGANIZED

ACOUSTICS LAB *makes tape by radio from plane in study of voice communications, codes.*

THE NAVAL Aviation Medical Center, in Pensacola, was commissioned on 30 April 1957. First of its kind in the United States, it marks a milestone in the development of the Navy's aviation medical training and research.

The medical center was formed to integrate, under one command, clinical, training, and research functions of the U. S. Naval School of Aviation Medicine and the Pensacola Naval Hospital, both located at NAS PENSACOLA.

Work at the center will include the training of officer and enlisted naval aviation medical personnel, varied research projects, and the care of Navy patients in the Pensacola, Florida, area.

The unified command is expected to bring about operating economies, provide better utilization of medical personnel by creating a "pool" of specially trained doctors and technicians, and make possible more effective administration.

At the center, student flight surgeons, who are being trained to attend the medical needs of the Navy's pilots, will have the clinical care of patients as a significant part of their graduate training. Unusual or problem cases among aviation personnel throughout the Navy will be referred to the center for consultation or for hospitalization to be treated and studied by specialists.

Capt. L. E. McDonald, MC, a veteran Navy flight surgeon and a Naval Aviator since 1937, is commanding officer of the center. He is under the immediate supervision of CNATRA and under the direction of BUMED.

Serving under Capt. McDonald are Capt. J. V. Land, MC, skipper of the hospital, and Capt. J. C. Early, MC, CO of the School of Aviation Medicine.

The flight surgeon's course covers a period of 23 weeks. The academic phase is completed in 17 weeks and the remaining six weeks are devoted to indoctrination flight training. Student flight surgeons who qualify are authorized to solo in trainers.

Research at the School of Aviation Medicine is organized under nine

ACCELERATION *testing unit of the center investigates the problems of seat ejection.*

parent projects: Stress due to acceleration and deceleration; stress due to high altitude; stress due to high intensity noise; physical and psychological standards for aviation personnel; aviation safety, escape and rescue; training and re-education of aviation personnel; studies in psychophysiology, including sensations and illusions; problems in human engineering; and miscellaneous problems involved in aviation medicine.

This new aviation medical center at Pensacola, considered the "cradle of Naval Aviation," is just another instance of the emphasis upon the safety and well-being of the pilot and his crew.

PATIENT IS CHECKED *by nurse and corpsmen in a ward of the U. S. Naval Hospital, Pensacola, part of the Naval Aviation Medical Center.*

CORPSMEN OF THE NAVAL *Hospital examine slides. These laboratory facilities in the hospital are available to the entire medical center.*

Top NACA Medal Awarded
Scientist H. J. Allen is Honored

A stub nose is better than a sharp nose when it comes to ballistic missiles. For making this discovery, Mr. H. Julian Allen, chief of the high-speed research division of NACA's Ames Aeronautical Laboratory, has been awarded NACA's Distinguished Service Medal.

Allen's configuration was a radical departure from the sharp pointed nose missile that had prevailed as late as 1952. Purpose of the streamlined nose was to hold aerodynamic drag to a minimum. The NACA scientist found that the deceleration of the missile, as it enters the atmosphere, is determined only by its entry speed and flight path angle, rather than by the physical characteristics of the missile.

The difficulty with the sharp nose configuration was that aerodynamic heating could destroy the missile par-

DOOLITTLE AWARDS NACA MEDAL TO ALLEN

ticularly at the point where the missile entered the earth's atmosphere. What Allen discovered was that a blunt, rounded nose rejected up to 99 percent of the frictional heat generated by the missile by simply deflecting it into the atmosphere away from the missile.

The citation, read by NACA chairman, James H. Doolittle, pointed out that "by his analysis of the motion and heating of missiles upon re-entering the atmosphere, (Allen) discovered that blunt shapes of missiles would greatly reduce the heat input and impart inherent stability to the warhead. This analysis and discovery contributed importantly to the solution of the re-entry problem of long-range ballistic missiles."

Mr. Allen has been employed by NACA since 1936. He is an authority both on the aerodynamics of long-range ballistic missiles and test facilities.

TURBO-CAT OFFERS MOBILITY

TURBINE-POWERED CATAPULT BUILT BY ALL AMERICAN ENGINEERING LAUNCHES BANSHEE

A REVOLUTIONARY method of launching high-speed aircraft from short airfields has been introduced by All American Engineering Company under contract to BuAer. Currently in use by the Marine Corps, the world's first turbine powered catapult launches both piston engine and jet aircraft.

Powered by six jet engines, the turbo-catapult develops 60,000 hp, or enough to supply electricity to a city of 50,000 people. Despite this enormous power output, the jet power plant is mobile. It can be dismantled with comparative ease and transported by air to fields where needed. The equipment can launch aircraft in less than one-fifth normal take-off run.

Bi-directional in design, the six jet engines are arranged in a circle with the exhaust gasses flowing into the central launching turbines that drive a drum cable system mounted on the same drive shaft. With the jet engines set at a predetermined RPM, the flow gate is actuated, diverting the mass flow of exhaust gasses into one of the launching turbines. These supply power to the aircraft through the drum cable system. The drum cable drives a shuttle guided in a track in the runway. The plane is attached to the shuttle by means of a bridle such as those used on aircraft carriers.

The turbo-catapult offers several advantages over steam catapults and other land-based launching equipment. Only one-fifth the weight of a comparable steam catapult, it is powered by readily available jet engines. These can be maintained by already trained jet mechanics. Economical in operation, the turbo-cat uses jet fuel or low grade gasoline. The device can launch any aircraft fitted for carrier operation. Without clutches or complicated gear boxes, the launching system is basically simple.

First pilot to be launched from the turbo-cat was Joseph Barkley, an All American Engineering test pilot, flying an AD-4NA. Barkley has had extensive experience with all types of launching equipment. He is a Navy combat veteran of WW II, and is now a lieutenant commander in the Naval Air Reserve, serving as XO of VF-936 at NAS WILLOW GROVE. The Reservist states that the turbo-catapault method is smoother than others he has used.

The first jet, an F2H-2 *Banshee*, launched from the turbo-cat was piloted by David McCallister, Chief, Engineering Flight Test for All American. He too found that the system produced a smooth launch, and also removed considerable uncertainty from the take-off characteristics of jet aircraft. Long before the point of no return is reached on a runway, a pilot knows whether or not he will be capable of getting airborne safely.

The All American system was the result of five years' research work. It has been developed primarily for use by Marine aviation in the early stages of amphibious operations. The catapult, coupled with arresting gear, can transform almost any landing strip to a potential jet aircraft field.

● A "quiet room" used in reducing equipment noise of a U.S. aircraft manufacturer is so sound proof you can hear your heart beat.

THESE TWO CANADIAN AVIATION T-33 JET TRAINERS FLY OVER ANGUS MACDONALD BRIDGE BETWEEN DARTMOUTH AND HALIFAX, N. S.

ROYAL CANADIAN FLEET AIR ARM

AN RCN AVENGER TRAINS FOR ONE OF THE CANADIAN NAVY'S PRIMARY MISSIONS AS IT FLIES OVER A SUBMARINE, THE ARTFUL

During WW II, the Royal Canadian Navy found itself confronted with the enormous task of protecting its coastlines, shipping and Atlantic convoys without naval air forces. (The error in neglecting naval aviation had unfortunate results in the cases of Germany and Italy.) Lack of a naval air force placed extra burdens on the surface fleet.

Determined to remedy this situation, the Royal Canadian Navy Fleet Air Arm was set up in 1946. The support group is based at NAS Shearwater while the operational group, which is composed of one fighter and one antisubmarine squadron, is based aboard the *Bonaventure*.

The RCNFAA conducts antisubmarine warfare operations and provides aerial protection of convoys. Types of operational aircraft provided to date have centered on Avenger aircraft for ASW, and Sea Fury fighters for convoy defense.

GRUMMAN TRACKER WILL OPERATE ON NEW CARRIER, BONAVENTURE

TO BE MOTHBALLED OR USED AS SECOND CARRIER, HCMS MAGNIFICENT HAS BEEN REPLACED BY ANGLED DECK CARRIER, BONAVENTURE

THE F2H IS TO BE USED FOR CARRIER-BASED FIGHTER OPERATIONS. RECENTLY A CANADIAN SQUADRON WAS IN KEY WEST WITH BANSHEES

CANADIANS FIND HELICOPTER EXCELLENT FOR UTILITY MISSIONS

The RCNFAA is currently entering into a modernization program, designed to provide the RCN with a greatly improved ASW capability. This includes the acquisition of a modern light carrier, jet carrier-based fighters, and new ASW aircraft.

In January of this year, the Canadian Navy took delivery of a new carrier, HMCS *Bonaventure*. This carrier was purchased from the United Kingdom. Delivery of McDonnell Banshee jets has also commenced.

This year will see the formation of the first Tracker (S2F) squadrons and the employment of the *Bonaventure* with her angled deck, a modern mirror landing system and Banshee jet fighter squadron.

THE SIKORSKY HO4S HAS EARNED A REAL PLACE IN UTILITY LINE-UP

IT'S THE RIGHT KIND OF CANOPY FOR AN OBSERVATION PLANE

MOVE OVER, YOU ALL, AND LET ME ABOARD

Lt. Has a Bzzzzzzzy Day

Bee Swarm Takes over his Cockpit

Lt. Tom P. Stewart of NATTU PENSACOLA found the seat of his F9F-6P already occupied by a crowd of other fliers one day when he was starting on a routine photographic flight. Not being checked out on defense procedures in a case like this, he beat a hasty retreat, in search of another aircraft.

The call went out for a beekeeper, or at least someone familiar with the little stingers. Wallace C. Goode, AM1, of ATU-206 answered the call. He climbed into the cockpit gingerly and began sorting through the insects for the queen bee. The search was fruitless. Eventually the bees died.

Goode, who has kept bees as a hobby, figured the swarm flew through a jet blast and the queen was killed. Leaderless, the bees swarmed on the nearest place, Lt. Stewart's cockpit.

Whiting Personnel Cited

Honored at a Meritorious Mast

At Whiting Field, efforts of five personnel were recognized at a Meritorious Mast conducted by the CO, Cdr. D. J. Harrington. Four men were cited for extinguishing a fire in a T-28 aircraft and a Wave was commended for her interest and work in Whiting's basic education program.

Willie B. Sharrit, AD2, Albert E. Marsh, Jr., AD3, James R. Campbell, AD3 and John E. Sims, AMAN, were repairing a T-28 when a gasoline fire broke out as the engine was being started. The men quickly manned fire extinguishers and put the fire out before any damage was done. Within two hours, the T-28 was back in the skies.

Alice Davies, the Wave, a first class Teleman, was commended for voluntarily teaching a class of twenty members for more than eight months.

RUB-A-DUB-DUB, *eight men in a tub! This is a "swimming-pool-sized" lower radome for a WV-2 Early Warning Constellation. The radar it houses can detect distant planes and ships.*

Another Rescue for HS-9

Injured Man Picked up from DD

An emergency call from the USS *Herman* (DD-532) sent an HS-9 helicopter skimming over the Narragansett Bay area to rescue a seriously injured crewman. His head injury required immediate medical attention.

The injured sailor was hoisted aboard the Quonset Point-based copter on a Stokes litter and flown to the Naval Hospital, Newport. The delivery was made in less than an hour from the time the request for assistance was made.

The helicopter crew members were Ltjg. E. A. Perez, pilot; Ltjg. C. L. Jackson, co-pilot; and crewmen F. B. Rose, AD1, and B. A. Schoenrock, AT3.

'THE FIRST 20 ARE THE HARDEST,' THEY SAY

CPO's Have Served Long

Nearly Century and a Half Total

The five men pictured here, all based at NAS IWAKUNI, have served the Navy for an aggregate of 132 years. Lawrence W. Murphy, ENC, Ernest Willey, ADC, Milton Pursel, ABC (standing), William A. Healy, CSC, and Joseph Krimm, AMC, range in length of time served from Krimm's 30½ to "boot" Wiley's 22.

Iwakuni's Disbursing Officer also reported a "second team" with over 118 years in, and a total of 27 Iwakuni CPO's with more than 20 years of service. Iwakuni Marines also reported five sergeants with over 130 years' service. The reports were made as a challenge to similar claims by Itazuke, Itami, and Komaki AF Bases.

● The fire control system of a combat plane contains more than 70,000 solder connections.

● Floor space used in production of one of the latest air transports by one U.S. aircraft company would accommodate 20 battleships, 69 submarines, as well as 24 PT boats.

OFFICERS AND MEN *of VMF(AW)-115 gave the benefit of their experience in the F4D Skyray to five officers and 18 enlisted men of VMF(AW)-114 during a month's training at El Toro. Cherry Point-based trainees returned to squadron headquarters to check out the balance of their squadron in the planes being delivered to them. Kneeling fourth from left is LCol. R. H. Spanjer, CO of VMF(AW)-115, and next is LCol. J. W. Ireland, CO of the Tarheel outfit.*

MARINES TEACH COPTER CRAFT

MEMBERS OF a Naval Air Maintenance Training Detachment (NAMTD) aren't guaranteed a tour of the world in 80 days, but their job carries them all over the globe, wherever there are Navy or Marine air stations.

NAMTD teams operate out of NATTC MEMPHIS to bring knowledge of the newest aircraft and latest changes in Naval and Marine aviation directly to the pilot, mechanic, and ordnance man in the field.

Initiated by the Navy in 1942, Marines were first assigned to instructor duty with NAMTD in September 1956. Since that time, 11 units manned by some 80 Marines have been assigned duty at various air stations.

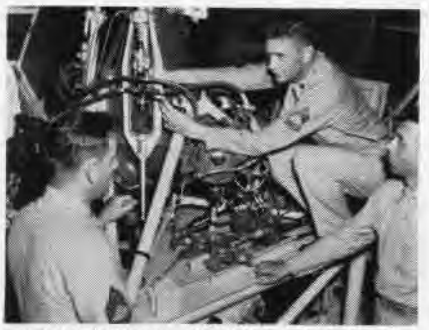
In May, a six-man Marine team finished a course designed to prepare them to take instruction on the Sikorsky HUS-1 helicopter directly to stations where the aircraft will be used. Leading chief of the team is MSgt. E. M. Doolin. Other members are MSgts. M. H. Katzmark, D. E. Kelley, TSgt. J. A. Ray, SSgts. L. E. Wolf, and S. W. Newell.

The team is comprised of three general groups: flight, maintenance and ordnance. Each member is an expert on some phase of aircraft mechanics. They carry with them, not only expert know-how of the Sikorsky HUS-1, but also life size models to demonstrate the actual aircraft operation. These models are completely portable, and are transported aboard trailer trucks.

Twelve weeks of training went into preparing the HUS team for its job. Members reported to NATTC late in January, and entered instructor training where they picked up the techniques of teaching their subject.

Next stop was Bridgeport, Conn., where they went through five weeks of training at the Sikorsky plant. Then back to NATTC for a shakedown of what they had learned. This included preparing lesson plans and presenting these lessons to selected men from various schools at the center.

First assignment for this NAMTD team is MCAF SANTA ANA. Here the Marines will put what they have learned into operation. When they have finished indoctrinating the men of the facility on what makes the HUS tick, they will be sent to some other unit.



DOOLIN (CENTER) EXPLAINS PARTS OF HUS

Marines may request assignment to NAMTD duty through the normal channels. However, they must possess the following requirements: (1) a GCT of at least 110, (2) good military bearing and deportment, (3) clearance to handle classified material, (4) a rank of SSgt. or above, although outstanding Sgts. may be recommended by CO's, (5) one of the following MOS's: 6412, -13, -31, -41, -81, 6511.

AF Honors Naval Aviator

Rededicated Base Named for Him

Seymour Johnson AF Base, Goldsboro, North Carolina, was rededicated April 25 as the newest facility of the Tactical Air Command. In WW II from April 1942 to March 1946, Seymour Johnson Field's responsibilities ranged from training enlisted personnel in maintenance and repair of light bombers to basic training for B-47 pilots. After the war, it was put on inactive status.

The base was named in 1942 for a local Goldsboro man, Lt. Seymour A. Johnson, USN. He had been killed March 5, 1941 while testing a Navy fighter. A graduate of the Naval Academy in 1925, Lt. Johnson was designated a Naval Aviator in 1930.

The base in recent years has been expanded and now covers 3000 acres.

Seymour Johnson AF Base is one of 16 major bases within the continental limits of the United States. The 83rd Fighter Day Wing is the Base's main unit. Col. Robert C. Richardson III is CO of the Wing.

KAMAN AIRCRAFT *is developing an STOL (short take-off and landing) aircraft for BuAer. The system will utilize two propulsive rotors driven by gas turbines. Small controllable flaps hinged in the trailing edges of the rotors will provide cyclic and collective control by changing lift characteristics of the blades. The pilot will have full control of the airplane at speeds under 50 mph. Above that speed, the flap system in the rotors will phase out and conventional controls (aileron, rudder and elevator) take over. Speed will range from 0 to more than 300 mph.*

NADC Scientist Honored

Given Highest Civilian Award

The Distinguished Civilian Service Award, the highest honor which SecDef can bestow on civilians, has been presented by Secretary Charles Wilson to Dr. Harry Krutter, Chief Scientist at NADC JOHNSVILLE. Dr. Krutter was given the Navy's Distinguished Civilian Service Award last fall, being among 18 service employees who had received it. The Navy's award made him eligible for the Defense Department recognition. Six of the 18 were chosen for the DOD honor.

Secretary Wilson recognized Dr. Krutter for "his outstanding scientific achievements in connection with the development of radar and electronic

DR. KRUTTER WITH HIS AEW EQUIPMENT

equipment now used in the country's AEW airborne equipment, and for providing the Nation with an important and timely improvement in its capability to defend itself." Dr. Krutter has been with the Center since 1949.

New Light Sets for FCLP

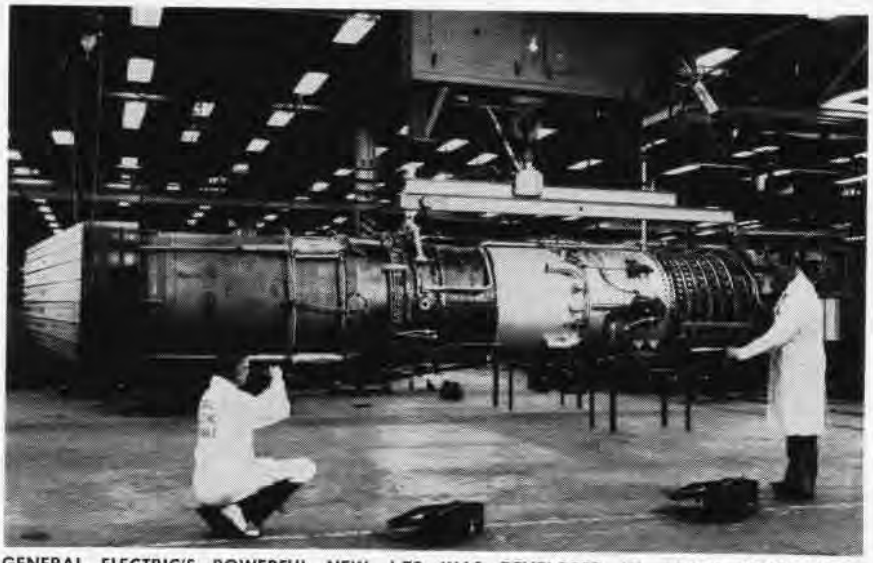
Simulated Carrier Decks at Night

New light sets for Field Carrier Landing Practice have been delivered to BUAER by the Falge Engineering Corporation. Two sets are required for lighting the two sides of a simulated carrier deck 100 feet by 350 feet, with lights spaced at 50 foot intervals.

Light lenses are designed to provide proper vertical and horizontal light distribution for FCLP. The light case is inclined toward the downwind leg of the approach pattern at 45 degrees with the side of the simulated carrier deck.

Two brightness levels are provided in the sets which include eight lights, eight spare lamps and carrying cases.

NEW JET POWERPLANT UNVEILED

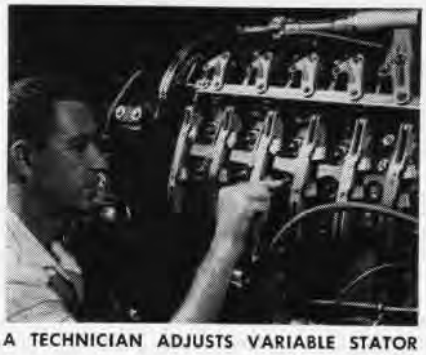


GENERAL ELECTRIC'S POWERFUL NEW J-79 WAS DEVELOPED IN ABOUT FOUR YEARS

THE J-79, General Electric's new jet engine capable of powering aircraft twice the speed of sound, has had the wraps of classification removed. Only exterior views have been permitted, however, and the "innards" are still covered.

In the 10,000-pound class, the engine, according to the manufacturer, produces more thrust per pound of engine weight than any other large jet engine in production today. It will be used in fighter, bomber, interceptor, missile and commercial transport applications. Although the Navy's *Regulus II* is, at present, powered by the J-65, it is planned to use the J-79 in the future production models. Grumman's F11F-1F has the J-79 as its powerplant, and the Air Force's B-58 and F-104 are using the new engine.

The most important feature of the J-79 is the use of variable stators to provide at all speeds a smooth flow of air inside the engine. This eliminates the "stall barrier" problem by changing the pitch angle of stator blades in the engine's compression section. In a conventional jet engine, the angle of the blades is normally fixed.



A TECHNICIAN ADJUSTS VARIABLE STATOR

The new jet powerplant is smaller than the J-47, but can produce more than twice as much thrust. It has a diameter of approximately three feet, a length of about 17 feet and has an extreme altitude capability of over 50,000 feet. It has good cruise economy at 35,000 feet.

A minimum of critical material is used. Because most parts are of steel alloy, it is possible to keep J-79 production potential high.

There are two separate fuel systems: the main fuel system and afterburner fuel system. Both are flow controlling type units.

The J-79 is a 17-stage, axial-flow, single-rotor engine. The first six stator stages and the inlet guide vanes are variable. For all-weather conditions, air inlet surfaces have anti-icing device.

- A new gyroscope of planes can detect motion 3000 times slower than the movement of the hour hand on a man's pocket watch.

- A tiny gas generator designed for guided missiles, no larger than a can of soup (4x3 inches) and weighing three and a half pounds, develops 850 jet horsepower—more than the total horsepower developed by three Cadillacs.

IN FOREIGN SKIES

Comet Tours Canada and USA

An RAF Transport Command *Comet* made a 17-day tour of Royal Canadian and USAF units the latter part of May. The tour was made to enable an RAF *Comet* to show its wings before American and Canadian pilots.

Passenger as far as Washington on a liaison mission to the USAF was Air Marshal Sir Richard Atcherley, Commander-in-Chief of the British Flying Training Command.

There were 25 officers in the main party including 12 students and nine staff. The tour was sponsored by Air Vice-Marshal G. D. Harvey, Assistant Chief of Air Staff (Training).

Canadian Ground Support Training

Two Royal Canadian Navy jet fighter squadrons from HMCS SHEARWATER, the naval air station at Dartmouth, N. S., have taken special training in Army ground support at the Canadian Joint Air Training Command located at Rivers, Manitoba.

Squadrons VF-870 and VF-871, both of which have been armed with all-weather *Banshees* in place of the *Sea Furies,* were the units involved. Twenty-two pilots and 120 ground personnel took the training.

From the end of April to the latter part of May, 11 pilots and 60 ground personnel from VF-870 were at Rivers. An equal number from VF-871 trained from the end of May to the beginning of July.

A Royal Canadian Air Force airlift carried the pilots and ground personnel to and from Manitoba.

All personnel took indoctrination courses to refresh their knowledge of the support role, and jets carried out armament firing drills.

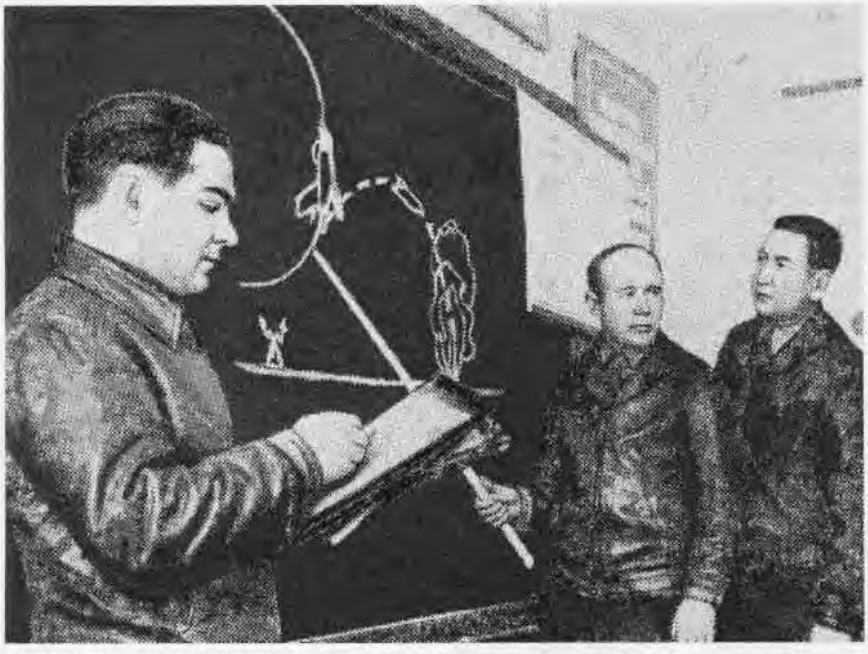
Commanding Officer of 870 Squadron is LCdr. R. H. Falls, and LCdr. R. A. Laidler is CO of 871 Squadron.

Firestreak for Vixen

Firestreak, the air-launched guided weapon designed and developed by de Havilland Propellers Ltd., is to be fitted to the de Havilland *Sea Vixen* all-weather fighter now being produced for the Royal Navy.

The *Firestreak* with its "unjammable" infra-red system of homing on the weapon is to be used on three of Britain's advanced fighters. It has already been announced as equipment for the Gloster *Javelin* and the English Electric P.1. Main facts about the *Firestreak* have just been released.

According to the manufacturer, the *Sea Vixen* is now fully able to exploit its outstanding range and operational flexibility. Once the approximate position of the enemy is apparent—and the two-seat *Sea Vixen* carries radar for this purpose—poor visual conditions and today's fantastic closing speeds become relatively insignificant factors. The *Firestreak* attacks from a distance and its heat-sensitive infra-red homing system is unaffected by radar countermeasures. These developments make this a valuable offensive weapon.



IN AN ISSUE *of a Soviet aviation newspaper is shown a picture of a classroom presentation of bombing techniques. The blackboard diagram indicates that the Russian student pilots are being instructed in the modern tactic of low altitude bombing for the delivery of nuclear weapons.*

CAPT. R. B. MOORE, *CO of the USS Saratoga (CVA-60), welcomed His Excellency H. C. W. Moorman, Secretary of the Royal Netherlands Navy when he came to visit the attack carrier.*

Operation Red Pivot

This spring ships of the U. S. Sixth Fleet and units of the British and Turkish forces participated in the second Mediterranean NATO exercises for 1957. The giant land, sea and air maneuver, called Operation *Red Pivot,* was highly successful.

It took place in the Aegean Sea and had for its immediate objective a counter offensive against the westernmost part of Turkey.

Pilots of the USS *Lake Champlain* and the USS *Forrestal* flew their various flights into the target areas under realistic conditions and obtained valuable training with other NATO units.

Soviets Practice Wash-Down

In a newspaper called "Soviet Aviation" has appeared an article illustrated with five photographs on the subject of wash-down of contaminated aircraft.

The entire article treats of a fall-out exercise. Use of instruments to measure contamination after a blast is shown as well as the methods of combatting radioactivity.

Decontamination workers are fully garbed for their work. They are shown working with radiation meters, sprays and multi-nozzled hoses.

Korean Seaplane

A Navy seaplane belonging to the Republic of Korea was recently displayed at the ROK naval academy graduation. As President Rhee and honored guests crowded around, three officers climbed aboard and took off.

KOREAN NAVAL OFFICER AND ROK SEAPLANE

The plane, except for the engines, was manufactured completely at the Chinhae Naval Shipyard. The engines are the same as those used on the Army L-19 reconnaissance aircraft. The plane configuration resembles the U. S. Navy's Grumman *Duck*.

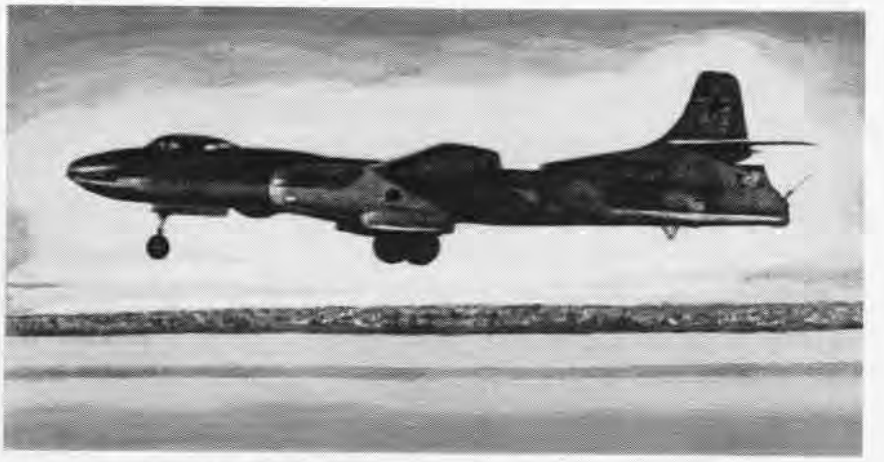
The aircraft is equipped with two rocket launchers under each wing, and a .50 calibre machine gun in the nose. Mission of the airplane is primarily reconnaissance.

West German at Kingsville

Lt. Hans W. Noack, the first West German naval officer to undergo flight training in the advanced training command, has reported to NAAS KINGSVILLE. He has been assigned to ATU-102.

Lt. Noack is one of some 70 West German Naval Officers who are scheduled to take advanced training in the next few months. Basic flight training is being completed at Pensacola under an agreement for the training of NATO forces.

In WW II, Lt. Noack served as an aerial navigator and saw action in the Baltic and other eastern front engagements. He holds the Iron Cross for missions over the North Sea. This is his first visit to this country.



THESE PICTURES *of the Bosun, an aircraft used by Soviet naval aviation, reveal a smooth high tailed configuration. Its performance is similar to the Beagle, another USSR Navy plane. The twin jet Bosun has a long, sleek fuselage, armament in the tail and a radome under the fuselage. In an article describing the Bosun and its crew, the Soviet reporter stated that the flyers "steadfastly work in the severe conditions of the north" and thereby "increase their flying mastery."*

Soviets Use RATO

Recently *Red Star*, a Soviet publication, described an aerial demonstration in which a jet fighter used a form of RATO to assist in a quick take-off and a brake parachute to slow its landing speed.

Brake parachutes have also been observed in use by the Soviet *Camel*.

Japanese NAS Anniversary

NAS KANOYA, largest Japanese Maritime Self Defense Force air station, celebrated its third anniversary this spring. It was commissioned in 1954 as a Japanese Coastal Security Force base with only two airplanes.

In 1955 it expanded rapidly and now bases over 60 planes and some 2,700 men.

Originally founded in 1936, the station served during WW II as a base for Japanese Navy *kamikaze* planes and other special attack elements.

Kanoya Naval Air Station is commanded by RAdm. Kiyoshi Sogawa.

RCAF Buys Firebee Drones

The Royal Canadian Air Force is acquiring Ryan KDA-1 *Firebee* jet target drone missiles similar to the model used by the U. S. Navy.

This marks the first time the Ryan *Firebee* has been adopted by a foreign nation for anti-aircraft training of its defense forces.

Lancaster mother planes will be used to air-launch the missile drones.

THIS DEMONSTRATION *at the Kaman plant started with setting afire a junk airplane soaked with 400 gallons of surveyed gasoline and jet fuel. In actual operation, fire engine helicopters with crews and equipment are on standby at military and civilian bases.*

AIRBORNE FIRE FIGHTERS

WHEN ALARM *is sounded, the copter hovers while equipment is attached to hoist cable.*

CARRYING THE EQUIPMENT *on its cargo hook, the helicopter flies to the scene of the crash, hovers, and quickly sets the fire-fighting equipment on the ground, releasing the pick-up cable.*

AFTER THE *landing is made, the crew jumps out and runs with all possible speed to get the hose out and rescue the endangered pilot.*

AS THE HELICOPTER *hovers overhead, it uses its downwash to beat down the flames. The crew goes into action with fire extinguishers.*

IT'S A FAR CRY from a horse-drawn, steaming fire engine, with its clanging bell and volunteer firemen, to helicopter with fire equipment and a crew of highly trained fire-fighters. But it has happened in the space of a lifetime.

The aerial fire engine pictured here, a Kaman HOK-1 copter, carries a pilot, a three-man fire-fighting team, and Ansul dry chemical fire extinguishers. The helicopter, in addition to transporting crew and equipment speedily to a perhaps otherwise inaccessible fire, aids in the fire-fighting and rescue by beating down the flames with its rotor downwash.

In the case of a crash fire that might be accessible to both helicopters and surface fire-fighters, one problem presents itself. The dry chemical used in this demonstration is incompatible with the foam generally used to smother aircraft fires. That is, when it is used in conjunction with the foam, the foam breaks down and the smothering effect is lost. Naval Research Laboratory, under contract to BUAER, has developed a dry chemical fire extinguishing agent which can be used with foam. Its description and directions for use are contained in BUAER Instruction 11320.1A, of 17 December 1956.

In addition to developing this compatible dry chemical fire extinguisher, NRL is working on an improved "fire extinguisher package" for transport by helicopter. At present, it can be described as a round sphere, weighing approximately 800 pounds, with a cargo hook for lifting. It has two nozzles for spreading the new dry chemical, which can effectively smother the flames, creating a path for a third crewman to make the rescue.

Speed in getting the men and equipment into action, and completing the rescue mission is the outstanding characteristic of the helicopter operation. A series of simulated rescues conducted by Kaman have shown that the elapsed time, from the arrival of the copter at the scene of the crash, is consistently under 45 seconds.

In actual operation, standby helicopters and crews at military and civilian bases could quickly reach a crash scene and go into action.

TWO OF THE *crew with the extinguishers, aided by the helicopter, have opened a path for the third to get to the engulfed cockpit.*

IN LESS *than 45 seconds from the time of arrival, the unfortunate pilot (a dummy in this case) is safely taken out of the flames.*

THIS NAVY HELICOPTER *and its crew, based at NAS Dallas, Tex., were on standby alert during flood emergency in Dallas-Fort Worth area.*

NAVAL AIR RESERVE *window display in the Chicago area plays an important part in all-out procurement drive at NAS Glenview, Illinois.*

NAVAL AIR RESERVES MAKE NEWS

Dallas Stands By

A Navy helicopter and crew at NAS DALLAS were alerted during April floods in the Dallas-Fort Worth area. Grand Prairie Police asked them to stand by in case of emergency.

Several vehicles and a rescue team were also placed on a stand-by basis for a call from Grand Prairie or other flooded areas. The station rushed 165 bed rolls to the Dallas Red Cross.

Crew shown above are: Lt. V. H. Wiegand, pilot; S. G. Palmer, AD1; J. B. Airhard, AB1; W. H. Stoye, AD2; A. E. Kraft, AD1; N. D. Sparks, AD2; and D. R. Lester, Seaman.

Glenview Recruiters

Hard work by Squadron Information and Recruiting officers is the key to Reserve recruiting at NAS GLENVIEW.

Beauty queens, contests, parades, using Glenview *Commodores* orchestra at high school affairs, a radio show, and news releases spark the drive.

"We have something to sell," says LCdr. K. F. Sanford, Information and Recruiting Officer, "and we're using everything at our command to sell a product for which we can be proud."

Atlanta Pilots to Rescue

LCdr. Saunders and Lt. E. S. Harris of FASRon-671, Atlanta, took part in saving the life of a Georgia druggist.

The pilots flew three pints of blood from Atlanta to Turner AFB, where it was picked up by police and taken by car to Donaldsonville, Ga.

Quick action saved the life of the hemorrhaging druggist, A. H. Mills.

LCDR. JACK *Pilgram (L) and LCdr. R. J. Dellenbach, CO and XO of VP-672 Atlanta, pose in front of a P2V Neptune bomber, after a nonstop flight from San Diego to NAS Atlanta which lasted seven hours 50 minutes.*

RANDY SPARKE, *SN, is a recording star who is presently assigned to the Shipmates Varieties Show from the USS Princeton. He recently sang at NAS Minneapolis in a show for benefit of the Cerebral Palsy Fund Drive.*

IRELAND'S *Lord Mayor, Robert Briscoe, dons shamrock bedecked crash helmet and flight gear with assist from Capt. C. H. Amme, Jr., CO of NAS Niagara Falls. Mayor made a scenic flight in station HUP-2 over the Falls.*

BARTU MEMBERS HOSTED BY BUAER

MEMBERS OF 15 *BuAer Reserve Training Units stand before an F8U Crusader, during tour of Flight Test at NATC Patuxent River, Md.*

WHILE ON A TOUR *of BuAer facilities at NAS Norfolk, Reserve Officers get a bird's eye view of flight operations from the control tower.*

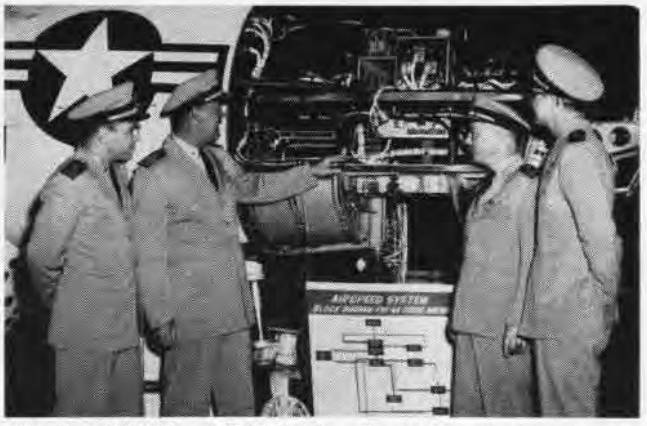
LECTURES BY foremost aeronautical experts and guided tours of BUAER installations in and around the Washington, D. C., area highlighted the second Bureau of Aeronautics Reserve Training Unit active duty cruise at the Bureau.

BARTU officers from the following air stations were on the two-week cruise in May: Akron, Anacostia, Columbus, Dallas, Glenview, Grosse Ile, Lakehurst, New York, Norfolk, South Weymouth, St. Louis, and Willow Grove.

Each member of a BARTU is an expert in some phase of aviation. In case of a national emergency, he will fill a billet either in BUAER or in a field activity.

There are 20 BARTU's now in commission. Several areas are being considered for new units, among them Jacksonville, Kansas City, and Indianapolis.

Those who are interested in the program should contact any of the air stations mentioned above in addition to NAS LOS ALAMITOS and OAKLAND for detailed information.



CDR. C. E. BREWER, *of NADC Johnsville, explains the intricate parts of the F9F-6K drone aircraft to Reservists on active duty cruise.*

PRODUCTION SPECIALIST *at NAAS Mustin Field shows BARTU officers a mock-up of landing system lights on table top aircraft carrier.*

TURBINE TEST *Center, at Trenton, N. J., was another stop in the itinerary of the BARTU officers during tour of BuAer installations.*

Clean-up Time on a CVA

Randolph 'Task Force' at Work

When the happy notes of the bugle sound out "liberty call" aboard the USS *Randolph* (CVA-15), it means "turn to" for the 14-man working party known as "Side Cleaners." It's time for the giant flattop to have her bath.

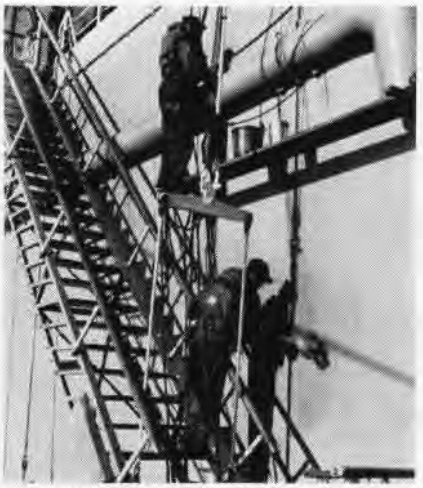
Sailors from the deck divisions aboard the ship make up this "task force." They keep the carrier shipshape by moving in quickly to battle rust and corrosion. A tour of duty for the seagoing "steeple jacks" is four months. All the work of washing down and painting the ship is done while the carrier is moored to a pier or when the anchor hits the mud.

The work is hard, and the hours are long. From dawn to dusk, sailors going ashore in liberty launches see the rigging and watch the Side Cleaners at work. As darkness descends on the carrier hull, the Side Cleaners can point to a job well done. Their reward is an open gangway and no watchstanding.

The force works under the gunnery Department of the *Randolph;* Cdr. C. P. Mason is the "gun boss." In immediate charge of the Side Cleaners are two boatswain mates, Robert W. Shaklee, BM1, and Leroy Hannah, BM3.

The leading seaman, Charles Patterson, BMSN, acts as line tender on deck while his shipmates are over the side. The petty officers are held responsible for the safety of the crew. While over the side at work, the men must wear their life jackets and safety lines.

It was a close call for one of the Side Cleaners at work while the ship was anchored in Guantanamo Bay. This sailor fell from a punt while painting at the water line and met a shark face to face. All *Randolph* swimming scores were broken as this member of the Gun Club made his way to the punt in Weismuller fashion.



HARD WORK KEEPS RANDOLPH SHIP-SHAPE

When the *Randolph* is underway for a period on the open sea, the Side Cleaners' work continues. Now the "acrobats of the sea" can be found below deck, for the work of rigging, making fenders, stowing lines, and sizing handrails is all done at sea.

Antarctic Bases Request

Hams Asked to Contact Deepfreeze

Capt. W. Mills Dickey, Commander, Naval Units, Antarctica, said in a message to TF-43 headquarters in Washington, "amateur radio had proven to be an excellent morale factor in the Antarctic during *Deepfreeze* operations." He recommended that Reserve training and electronic units be encouraged to contact the amateur stations in the Antarctic.

A Naval Reserve amateur network, according to Capt. Dickey, would be an excellent and reliable means of delivering personal messages and other traffic. "Ham" radio is the only personal contact with families and friends available to the 318 Navy men and scientists in the Antarctic.

The radio system works like this: An amateur radio operator in the U. S. contacts a station in the Antarctic, or vice versa. A telephone operator in the vicinity of the U. S. ham-set then is called to rig up a "phone patch." Through this patch, men in the Antarctic can call anywhere in the States.

The call letters for the *Deepfreeze* Navy bases are: KC4USA, Little America Station; KC4USB, Byrd Station; KC4USN, Amundsen-Scott IGY (South Pole) Station; KC4USV, Naval Air Facility, McMurdo Sound; KC4USH, Cape Adare Station; KC4USW, Ellsworth Station; and KC4USK, Knox Coast Station.

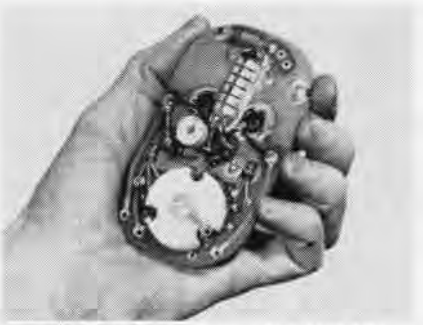
F8U-1 Contract to NAA

Columbus Plant to Make Fuselages

A contract to fabricate and construct fuselage mid-sections for the F8U-1 has been awarded Columbus Division of North American.

The mid-section of the fuselage is the portion aft of the cockpit area and forward of the tail section. It is that section to which the variable incidence wing is attached.

RADM. COURTNEY *Shands, ComCarDiv-18, presents Antietam's first "Centurian" card to Ltjg. I. A. Jones, VS-31. Latter recently made his 100th landing aboard in an S2F. CVS-36 is skippered by Capt. W. A. Thorn.*



A COMPLETELY *transistorized UHF Beacon Transmitter the size of a standard sardine can has been announced by Fairchild Controls Corporation. It can send radio signals continuously for 25 miles for a period of 24 hours.*

PETER T. HOLDEN, *an airman, marches his company at NATTC Norman, Oklahoma, to the stirring strains of his bagpipe. He played the pipes while a boot at NTC Bainbridge where he was asked to provide the "cadence."*

ENS. WILLIAM *Newton, picked as NavCad of the year for 1956, meets VAdm. W. V. Davis, Jr., DCNO(Air). Selection for the DAR honor was based on his scholastic ability, flight aptitude, military bearing and personality.*

CAPT. R. B. MOORE, *Saratoga skipper, presents a check for $1000 on behalf of the ship's crew, to Mr. Justin Murphy, a chairman of Greater New York Fund. The carrier was in New York Naval Shipyard, Brooklyn.*

MARINE *helicopter pilots, Lieutenants R. L. Mills and J. A. Donaldson of HMX-1 have painted a map on their copter stabilizer to show routes they travelled during a five-month tour of duty with the Sixth Fleet.*

CAPT. W. W. HOLLISTER, *CO of USS Hornet, receiving donated boxes for Happy Mountain Korean orphanage from Lt. N. O. Putnam, aide Commandant 11 ND, as Chaplain J. P. Moorman looks on. Hornet was chosen for transport.*

A NEW VALUE *of the variable incidence wing of the F8U Crusader is demonstrated during refueling. At bottom is shown how a pilot can fly flat, staying behind the tanker instead of mushing as shown in the top picture.*

CAPT. J. M. *Farrin (L), CO of Philadelphia Naval Shipyard, Capt. R. B. Moore, CVA-60 skipper, pose before stern plaque of sloop Saratoga, launched in 1842. It was donated to its latest namesake by the shipyard.*

Essex Fireman Honored

Cited for Bravery by Carrier CO

Donald R. Kurtz, EMFN, has been honored for bravery at a Commendatory Mast by Capt. Earl R. Eastwold, skipper of the USS *Essex* (CVA-9).

Kurtz, with a companion, Franklin D. R. Ward of VF-141, witnessed a two-car crash near Compton, Calif.

One vehicle overturned and burst into flames. There was one fatality, but quick action by Kurtz and Ward saved seven people from the blazing inferno.

FJ-4B FIP at Moffett

First Program not at Patuxent

The latest in a long line of *Furies* is going through the Fleet Introduction Program at NAS MOFFETT FIELD. This is the first such program to be held at an operating naval air station. All previous FIP's have been conducted under the control of the Naval Air Test Center at Patuxent River, Md.

The FJ-4B has a dual purpose capability, that of an attack bomber and first line fighter, depending upon the ordnance load. It is powered by one Wright J-65W-16A jet engine and can operate above 45,000 feet and at speeds in excess of 600 knots. Actual performance figures are classified.

Upon completion of evaluation test flights at Patuxent River, the *Bravo Fury* was turned over to VF(AW)-3 for Fleet Introduction Program. Shown discussing FIP details are Lt. E. H. Schorz, Mr. T. C. Campell of North American, and LCdr. W. H. Hammett.

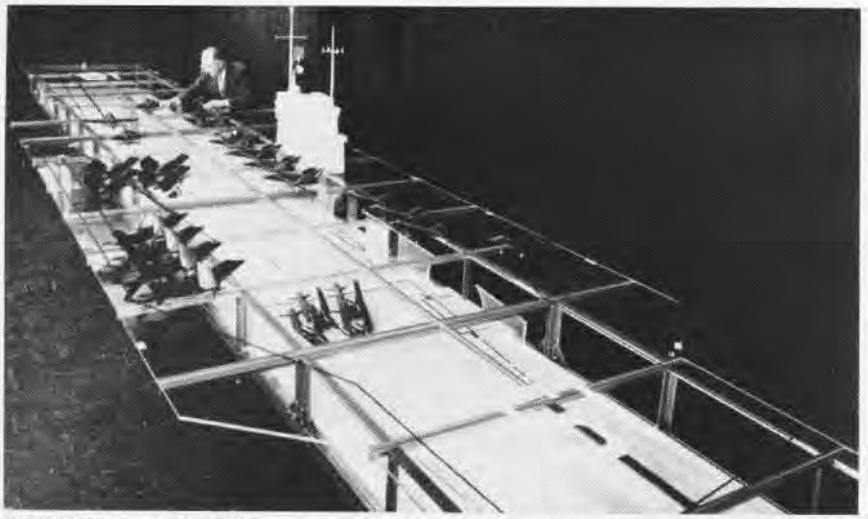
HAMMET (RIGHT) IS THE PROJECT OFFICER

Fire Fighters Meet

NADC Hosts Volunteer Firemen

More than 300 volunteer firemen from 18 surrounding communities participated in a fire fighting symposium and clinic held at NADC JOHNSVILLE. Fourteen pieces of equipment were displayed during the five-hour program. The men heard talks on fires and rescues, saw a service-made fire fighting film, inspected the latest equipment at the Center, and viewed a series of fire fighting demonstrations, including the rescue of a dummy from a burning fighter plane.

The civilian volunteers watched while crash trucks raced down the runway and opened their foam nozzles on a blazing plane. Only 21 seconds elapsed until the fire was extinguished.



ENTERPRISING ARMAMENT *engineers at the U. S. Naval Air Development Center, Johnsville, Pa., have built this 30-foot, clear plastic model carrier which permits simultaneous viewing of both decks of a carrier. In this way they can study flow problems of weapons and aircraft movements. Different colored lines on the deck areas help them to determine various handling and traffic problems. Models of carrier-based planes, complete with weapon suspension gear, are used.*

British Honor Spangler

Fellow in Aeronautical Society

RAdm. Selden B. Spangler, Commander, U. S. Naval Air Development and Material Center, Johnsville, Pa., has been accorded one of England's highest aviation honors.

He has been elected a Fellow of the Royal Aeronautical Society which is similar to this country's Institute of Aeronautical Sciences. RAS Fellowship carries with it international recognition. In accordance with the Society's by-laws, Adm. Spangler was elected on the basis of "having attained a considerable degree of technical eminence in the profession of Aeronautics."

To Adm. Spangler is credited the success of the Navy's gas turbine program which he headed from 1939 to 1946. He had a leading place in the development of the turboprop in this country and is responsible for the development of the turbo-compound engine. He has flown 5000 pilot hours and made major contributions in most of the aviation technical fields.

New Gas Turbine Engine

For Use in Copters, Transports

A Navy contract has been awarded the General Electric Company for development of what will be virtually two gas turbine engines in one. It will be convertible for use as a turboshaft and turboprop powerplant in helicopters, transports, and other support aircraft.

To be known as the T-64, it will have a basic power section to which individual units can be added to make it either a turboprop or turboshaft engine.

The new engine will be in the 2600 hp class. As a turboprop, it will be able to power advanced propeller-driven and STOL aircraft; as a turboshaft, helicopters and convertiplanes.

Ice Jam Bombed by VP-2

Floods and Evacuation Averted

An "ice dam" had backed up flood waters for nearly 20 miles on Alaska's Kuskokwim River and Civil Defense Authorities asked for assistance. Kodiak-based VP-2 flew two P2V *Neptunes* to the rescue, carrying 500-pound bombs.

Eight 500-pounders didn't demolish the dam, but they did inflict enough damage to allow "spring thaw" flood waters to pass and averted flooding and evacuation of five remote villages.

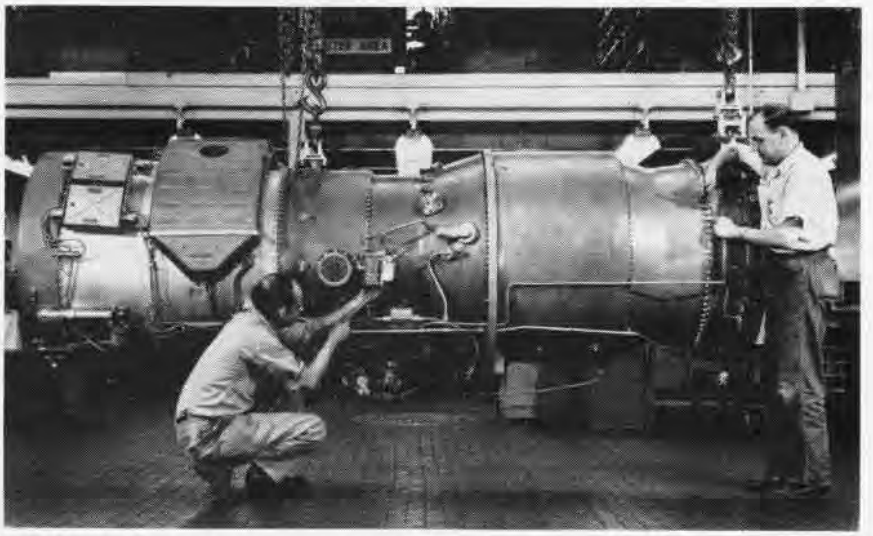
Safety Tip from BuOrd

Is That Gun Loaded? Take a Look

"Look Ma, no head!" BUORD passes on a tip to Ordnancemen and others who may be required to make an electrical check of the Mark 12 aircraft gun. Recent accidents involving serious personal injury have been caused by personnel failing to check the chamber of the gun before performing maintenance.

Owing to the inaccessability in most aircraft gun installations, there may be some reluctance to make that extra "insurance" check of the gun chamber and feed mechanism. But a man can literally lose his head by not using it.

A probe is inserted in the muzzle end of the gun. That *one* time, that the gun is not checked for a load, a big live round may be fired with the probe inserted and blooie, no head.



THE POWERFUL *J-75 turbojet is in production at United Aircraft's engine division, East Hartford, Conn. This Pratt & Whitney engine designed for supersonic speeds, develops 15,000 pounds of dry static thrust. The engine is only slightly larger than the J-57 but nearly 50% more powerful. The afterburner-equipped turbojet is going into production models of the Martin Seamaster.*

BULK FUEL FOR THIRSTY VEHICLES

LVTC (LANDING *vehicle, tracked) gets gas supply, first step of USMC bulk fuel system.*

MARINE FUEL TEAM *unloads aluminum chest which contains 10,000-gallon capacity collapsible bulk fuel tank. The LVTC will pump contents of its 850-gallon tank into this container.*

COLLAPSIBLE FUEL *tank is unfolded as Marines set up a beach unloading station. Bag is easily unrolled and can be filled in minutes.*

BEACH STATION *keeps up fuel flow from land craft, through tanks, to field units. Tanks measure 12 feet long, 2.5 feet in diameter.*

HRS HELICOPTER *is the first customer at the gas station. The amphibious assault bulk fuel system reduces, and often eliminates, the necessity of unloading fuel in 55-gallon drums.*

NAVY LANDING *craft, vehicle-personnel, hooks up fuel lines to a beach unloading station.*

LETTERS

SIRS:

The Naval Air Development Unit last month established two new world records in the field of lighter than air, i.e., distance traveled, 8,216 miles and total time, 264 hours, 14 minutes.

When the monthly report of total pilot flight time passed over my desk, I wondered if one of our pilots hadn't established a record of his own.

Lt. S. W. Dunton, who was navigator of the record-breaking airship is, also, a WV-2 aircraft commander. After completion of the airship flight, he accumulated additional flight time in WV-2's and ended up with a total of 306.5 hours for the month of March.

Has Lt. Dunton established a new record? Incidentally, he doesn't recommend this as a steady diet.

RALPH W. HART, CDR.

NAS SOUTH WEYMOUTH

SIRS:

The thought has probably occurred to others. However, in regard to the 2000 to 6000-foot altitude block assigned to the WV-2 flight in "Vigil over Barren Seas" in the May issue, in which the ice accumulation caused a Barrier abort, why can't AEW flights maintain their own separation?

J. P. EDWARDS, CDR.

¶ AEW flights are, like all overseas traffic, under the control of Overseas Traffic Control agencies which have assigned the 2000 to 6000-foot altitude block to Barrier flights. It is a matter of separating the AEW traffic from commercial and other military traffic which flies at higher altitudes.

SIRS:

I was very glad to see the write-up on Naval Air Facility, Oppama, Japan as I am stationed here. However, there is one mistake you made when you stated that we had four UF *Albatrosses*.

We only have 3 of them plus one PBM-5A, the last PBM-5A in the Far East and probably in the U. S. Navy. When the PBM goes, we probably will receive another UF to take its place. Right now we are trying to get a second extension on its tour. We naturally are very proud of this last PBM-5A.

HARLOWE A. SCHWARTZ

NAF OPPAMA

ATTENTION TEST PILOTS

All former graduates of Test Pilot Training Division, NATC PATUXENT RIVER, Maryland, should notify the Division of their present address to make certain of being notified of the alumni party to which they are invited.

SIRS:

Believe your "old musty files" will reveal that quite a few jet attack squadrons were commissioned as such on 1 June 1955. This squadron, VA-76, was commissioned on 1 June 1955 by our present skipper, Cdr. F. J. Gibson, and was equipped with F2H-2 *Banshees*. So it appears that the "Fighting Spirits of '76" must join the friendly rivalry. As to your question as to "who's on first?", it appears that first is going to be crowded. A check on VA-66 and VA-83 may reveal that one of these jet attack squadrons also came into being on 1 June 1955.

We are presently equipped with F9F-8B *Cougars* and deployed in the Med in USS *Forrestal*, CVA-59.

All in fun,

"SPENCE" MATTHEWS, LCDR.
Executive Officer

SIRS:

I greatly enjoyed the March 1957 issue of NANEWS, particularly the lead article on helicopters. Particularly interesting were the pictures of one-man helicopters on the inside front cover. I am [going] to contact the manufacturers for more information.

NANEWS is great. Your coverage of Naval Aviation leaves nothing to be desired.

WILLIAM A. OLSON
Midshipman, USNR

OPERATION *Deepfreeze's four-engine transports with conventional landing gear, flown by Navy and AF crews, manage to come in smoothly on comparatively rough runways.*

CONTENTS

● COVER

Launching of a Viking rocket from the USS Norton Sound (AV-11). The first stage of the launching vehicle to be used in Project Vanguard is a liquid propellant rocket similar to the Viking.

● SUBSCRIPTIONS

Naval Aviation News is now available on subscription for a $2.25 check or money order ($.75 additional for foreign mailing) made payable to Superintendent of Documents, Government Printing Office, Washington 25, D. C. Single copies are 20 cents each.

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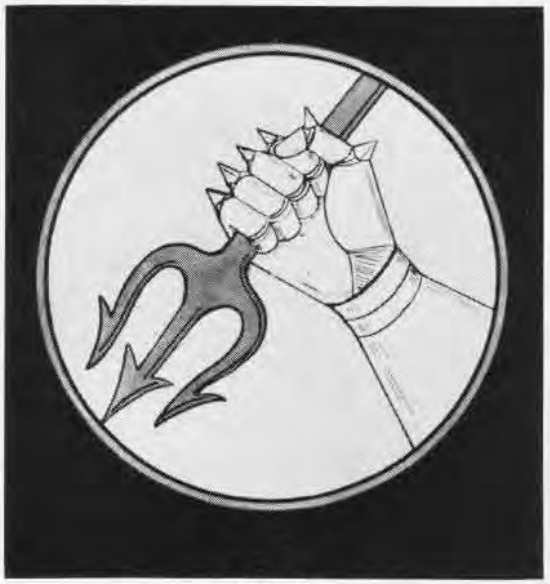
SQUADRON INSIGNIA

For its insignia, VP-46 inscribes a mailed fist clutching the trident to denote its strength and ocean-covering capabilities. NARTU Anacostia's VR-662, proud of its ability to fly to any part of the earth, uses for its insignia a globe-circling transport. The Washington Monument signifies the location of VR-662 in the Nation's Capital. For VP-861, Neptune mounts a porpoise and purposefully carries a bomb to demonstrate the squadron's mission. The sea god Neptune rides again with bomb and trident as VP-2 portrays its long overseas patrols.



VP-46

VR-662

VP-861

VP-2

NAVAL AVIATION NEWS

A tractor train operated by Navy Seabees proceeds on the 600-mile trek from Little America to Marie Byrd Land with construction materials for support of the IGY research in the Antarctic. See the feature starting on Page 1 of this issue, and keep abreast of the latest developments by reading Naval Aviation News. For twelve issues, send a $2.25 ($3.00 foreign) check to:

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