NAVAL AVIATION NEWS

38th Year of Publication

FEBRUARY 1957

NavAer No. 00-75R-3

SHARE THIS COPY

WORLD GUARDIANS OF FREEDOM

North, East, West and South, the Navy covers the world. In the Arctic, where the fury of the elements rage, is the DEW line.

Each remote spot of the earth is visited, sooner or later, by Uncle Sam's white-hatted ambassadors of good-will, our sailors.

Wherever the spark of freedom glows, eyes of oppressed peoples look to the West, where the Goddess of Liberty promises succor.

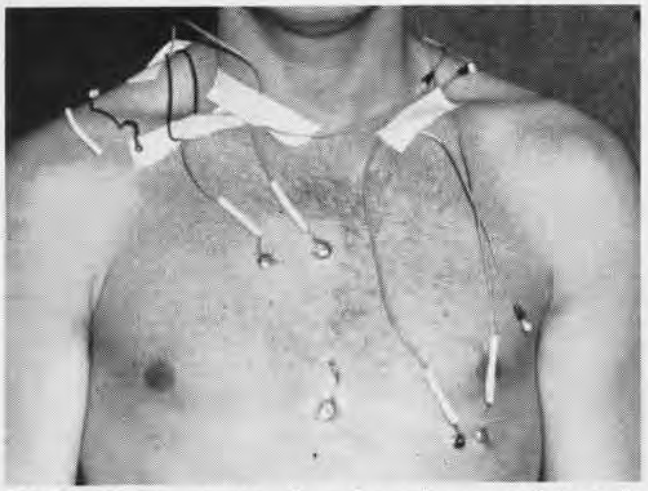
Silent, mysterious land at the bottom of the world, the Antarctic's secrets are being probed by sturdy men of the U. S. Navy.

RESEARCH AVIATION MEDICINE

WHAT WILL a Space Man look like? What problems will he face? To turn science fiction into science fact, men dress to keep their blood from boiling at the low pressures of the stratosphere and fly to once unscalable heights.

In August and November of 1956, LCdr. M. Lee Lewis of the Bureau of Aeronautics and LCdr. Malcolm D. Ross of the Office of Naval Research manned a balloon to go aloft and learn more of the special properties of the upper atmosphere. These flights were part of Project *Stratolab.*

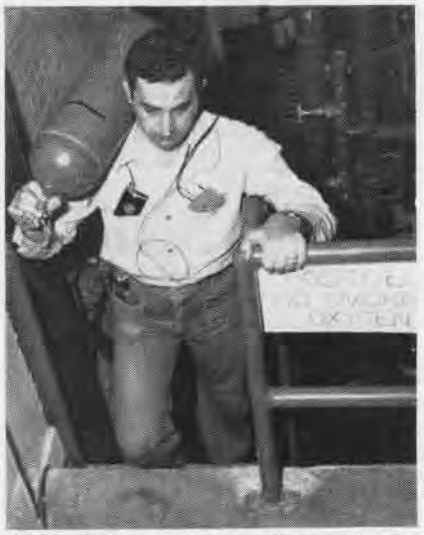
Still another program—Project RAM—was involved in these flights. The three letters of its name stand for Research Aviation Medicine, and its program is designed to study problems of man and flight. The flights of Lewis and Ross to gather atmospheric data afforded Project RAM data on men's reaction to high altitude.



TO GET *physiological data, electrical impulses are picked up by small electrodes fastened to pilot and fed by cable to transmitter.*

CHIEF WARRANT *Officer Philip Gustafson fastens electrodes on LCdr. Malcolm Ross, balloonist in charge of ONR's Stratolab Project.*

LTJG. KUBE *makes the final adjustments on a walkie-talkie radio electrocardiogram.*



GREEN, HM1, *goes about work as equipment gives pulse rate, heart beat, respiration.*

RICHARD LESSON, *AD1, of RAM, can go about air station while instruments relay data.*

INSIDE THE GROUND *laboratory of project RAM at Anacostia, Capt. Barr and CWO Gustafson study recordings of pilot's heart action.*

BEFORE IMPORTANT *flight, RAM technicians check their equipment and take reading of Ross's heart beat to make sure of instrumentation.*

PROJECT *Stratolab*, sponsored by the Office of Naval Research, and Project RAM, sponsored by the Bureau of Aeronautics and the Bureau of Medicine and Surgery, are a part of the Navy's continuing program of research to solve some of the problems the jet age poses. At one time, stresses on airmen and aircraft were nearly incalculable, but now measuring devices and electronics, recordings and analysis open up a vast field of research. Rapid progress in telemetering has made it possible for scientists to observe from a specially equipped aircraft or ground laboratory what is going on in a plane or balloon in terms of the pilot's well-being. The balloon flights of Lewis and Ross afforded exceptional opportunity for putting into operation these techniques.

RAM's main mission is to supply airborne facilities and support to projects that are of interest to BUMED and BUAER. In the nearly eight years Project RAM has been at work, it has supplied support to a long series of projects.

"Project RAM is unique in the Navy, and we do not know of any comparable laboratory in other government agencies," says Capt. Norman Lee Barr, head of the program. Dr. Barr, 21 research technicians—all military—one flying aeromedical laboratory and two laboratories on the ground are the core of the program. An R4D was used until April 1956 when an R5D was put in service. This aircraft and nine men from RAM were in Germany last fall for the Berlin Scientific Exposition. They created such interest that it appears likely the group will again go abroad this spring to another scientific exposition at Munich.

Dr. Barr himself is admirably equipped by experience and training to direct Project RAM. He is the only officer in the Military Service, so far as is known, entitled to wear five separate aviation wings: Air Force Observer, Air Force Aviator, Naval Aviator, Air Force Flight Surgeon, and Naval Flight Surgeon.

And this is how it happened. In October 1929, he was graduated from the USAAF Flying School at Kelly Field, Texas, and designated an Airplane Pilot and Airplane Observer. After two years with the Air Force, he was chief pilot for the Isthmian Airlines for two years and engaged in chartered flights in Central and South America. In 1933, he entered Georgetown University Medical School and received his medical degree in 1937. Commissioned in the Navy in 1938, he attended the Navy post-graduate medical school. After a course at the AAF School of Aviation Medicine in 1939, he was designated an Air Force Flight Surgeon. He attended the Navy School of Aviation in Pensacola in 1942 and received his Navy wings.

The WW II years were spent as a Flight Surgeon and Medical Officer with various aircraft carriers and fleet activities. Assigned to BUMED in 1946, he became officer-in-charge of the Special Activities Branch. In 1950, he became head of the Aviation Medicine Division of the Naval Medical Research Institute. He is now Director of Aviation Medicine Research and Deputy Director for Medical Research.

Dr. Barr has spent more than 8000 hours in the air as first pilot. When his hours as second pilot, observer and passenger are added, this total goes to 12,000 hours. An authority in the field of aviation medicine and research, he has contributed many devices that make flying safer. He has engaged in a wide range of research in various fields

IN THE R5D *flying laboratory, Ltjg. Kube makes a last minute check as Sikes, ET1, sits at desk, and CWO Gustafson studies equipment.*

GUSTAFSON *and Mullins, ET1, install miniature transmitter in open gondola which will transmit physiological data during balloon flight.*

PROJECT RAM *men check equipment worn by Ross (left) and LCdr. Lewis prior to their first Stratolab flight from Minneapolis last August.*

KUBE AND GUSTAFSON *work out the design for a new electronic component on a "bread board" which they built to speed development.*

related to flight safety; for example, his measuring the effects of various kinds of light on night vision. Not only Dr. Barr, but the whole team of RAM officers and men, is characterized by imagination and skill. They make a powerful research group in aviation medicine.

WHERE DO you buy needed devices when you embark on a new field of research? The answer is you don't. RAM technicians had to start from scratch. While they used as many commercial components as possible, again and again they had to construct devices they needed. Ltjg. Cleo J. Kube, Naval Aviator, master designer, and Dr. Barr's right hand man, designed and built a great deal of equipment.

Other members of Project RAM are: Ltjg. John J. Morgan, Ltjg. Anthony Mediate, Ltjg. Bryan E. Shepp, Ens. Mathew Yarczower; P. E. Gustafson, CHRELE; Harry M. Fischer, ADC/AP; Charles J. Cabaday, ADC; Michael G. Green, HM1; Richard Carl Kutchara, TD3; Robert H. Larkin, DM2; James Ledbetter, AGC; Charles P. Miller, ADC; James T. Mullins, ET1; Thomas V. McGuire, AD1; Richard P. Lesson, AD1; John G. Werz, AM1; John E. Sikes, ET1; Stanley E. Solinski, AD1; Leonard Williams, HM2; Peter C. Held, TD2; Doyal E. Wall, AT1; and Jerome Zoota, AD3.

These men do some of their work in a "temporary building" at NAS ANACOSTIA. Though little larger and scarcely more durable than a shack, it holds a wealth of electronic equipment. RAM used this equipment when they participated in Project *Stratolab* to gather physiological data on Lewis and Ross in flight.

Not only does RAM supply airborne facilities and services to projects of special interest to BUMED, but personnel assigned to Project RAM conduct independent studies. Usually these investigations are done in cooperation with other research activities such as the Naval Medical Research Institute and the Office of Naval Research. Actually, any government agency may have work done by RAM so long as it is of interest to BUMED. Special studies are done at the request of CNO, BUMED, BUAER or ONR.

Two permanent ground stations are home territory for RAM: one at the Naval Medical Research Institute at the Naval Medical Center, Bethesda, Maryland, and the other at NAS ANACOSTIA. The wonderfully equipped laboratories at these locations make it possible to receive, record, and evaluate physiological data from an airborne source. The equipment in the laboratories is relatively mobile and can be transported by plane and set up at other locations. But in addition to this ground laboratory gear, there is a fully equipped receiving station inside the flying laboratory in the R5D. Physiological information is received, while the flying laboratory is in the air, and recorded.

The possibilities of using this kind of radio transmission, in medical research, particularly in cardiac cases are evident. Just turn the patient into a walking radio station by means of small instruments contained in four packages, each about the size of a cigarette pack, and the doctor can study the patient engaged in routine activities. In the clinic, the doctor can hear heart and respiratory sounds and observe the electrocardiogram while his patient is miles away. As of now, this system has been used more on normal people than on heart patients, but it offers promise as a valuable clinical instrument for heart specialists to use.

CAPT. BARR *and Sikes observe the pulse rate and electrocardiogram on a subject who is doing his regular work at a remote location.*

CHIEF CABADAY *looks on as Solinski, AD1, mills a small part for use in constructing physiological test apparatus needed for Project RAM.*

A KITE-BALLOON, *used as a target to study visibility range problems, is readied for launching by Chief Ledbetter and his crew. Balloons in various shades are used.*

ENS. YARCZOWER *and Ltjg. Mediate carefully calibrate RAM's brightness-measuring equipment.*

IN THE R5D, there is, in addition to instruments for recording physiological data, a variety of special equipment for studying the physical characteristics of the environment in which the aviator is working. Temperature, humidity, pressure, illumination, brightness, etc., can all be studied. RAM has collected data on the optical properties of the atmosphere, the brightness of the sky, the brightness of the atmosphere, as well as the influence of temperature, moisture, latitude, and season on these properties.

This data is not collected for the simple joy of amassing data. It has very practical use. It has helped Navy scientists like Dr. Barr to develop theories with respect to the response of the human eye to targets of interest such as runways and landmarks. Which is a complicated way of saying that the pilot must identify fast—or else! From that point, scientists have gone on to discover systems of measuring how far individuals can see specified objects.

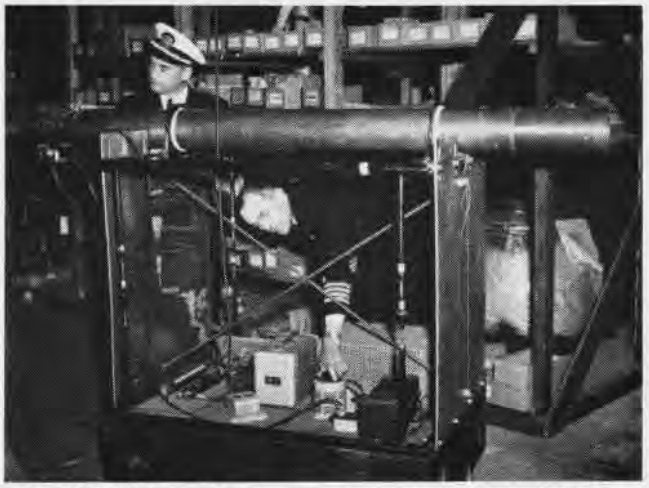
Electronic eyes look out at the runway at Anacostia and its adjacent terrain from a nearby truck and analyze the optical properties of the scene that will be viewed by the approaching pilot. Another such eye looks out across the field and senses the amount of haze or fog that is present. These electric eyes have been calibrated and corrected to make sure they respond to both light and color in the same way human eyes do. At the same time a "light gun", which looks like, and is named after, a six-inch bazooka, shoots six-inch cylinders of light which chase each other in an endless chain into a "light bucket" on the opposite side of the field. The intensity of the light is measured at the gun. Then, all of the light is caught in the bucket and measured again after it has crossed the airport.

Only one more measurement is necessary before the distance that the pilot can see can be calculated. What is the smallest amount of brightness that the human eye can see? To determine this, the RAM men built a 20-foot tunnel in which long paths through the atmosphere can be simulated by trick optical illusions and where subjects can be tested as the delicate light and brightness measurements are made.

Data from all of these measurements are combined in calculating the visibility range. An electric computer near the light bucket gives the distance at which the pilot can see the runway on his final approach.

The "light bucket" got its name one sunny August day when the RAM men were projecting a thin shaft of light across the Naval Hospital grounds at Bethesda, Maryland. The comparatively dim light of the projector would not show up on the white cardboard target in the bright sunlight. "Bring me a bucket," Dr. Barr called in desperation. It took only a few minutes for a newly acquired striker to fetch one.

Dr. Barr folded his white handkerchief neatly into the bottom of the scrub pail and shoved the whole thing into the hands of a curious CPO with the instructions: "Catch the light in the bucket." The chief slapped the bucket's



THE LIGHT GUN *which projects impulses to "light bucket" across the field at NAS Anacostia is calibrated by Capt. Barr and Ltjg. Kube.*

CLOSED GONDOLA *and balloonists go for trial run in General Mills' "bean pot," a low pressure chamber simulating high altitude conditions.*

AS FLIGHT HOUR *nears, an Air Force scientist, Lt. Pinc, adjusts Lewis' helmet as a stand-by balloonist as well as co-partner Ross look on.*

HERE IS ONR'S *Stratolab balloon before its flight from Rapid City, S. D., on November 8th. Project RAM was one of groups assisting.*

bottom against his stomach, faced the light projector and commenced to jump from side to side and do knee-bends. Soon the sought-after light illuminated the handkerchief in the dark recess of the bucket's bottom.

"That man is screwy," a spectator said as he walked away shaking his head. "He is pouring it out as fast as he catches it."

At supersonic speeds, pilots are going to have to be faster in perceiving the landmarks which guide them. Consequently, in the construction of the airports of the future, the optical properties of runways and buildings will be of great importance.

The ways in which visibility can be controlled by selecting various types of building materials, as well as the amount of visibility-increase possible in various types of weather, have been investigated and reported by Project RAM. The RAM plane was taxied along the runways of 30 East Coast airports while electric eyes studied the characteristics of the runways and their surroundings. Automatic electronic instruments recorded what the artificial eyes saw.

Back in the laboratory, the optical characteristics of the atmosphere in various degrees of good and bad weather were selected. Next, the airport data and weather data were combined with the seeing ability of human eyes to determine how far away the various runways can be seen by approaching pilots in many kinds of weather. Later, the same instruments were used to study many sorts of runway surfacing materials, and calculations indicated how far these materials could be seen. Dr. Barr suggests that the visibility of an airport may be an important factor in establishing approach minimums. Under conditions of emergency, the same data might be used in reverse for camouflage.

The RAM system for making physiological measurements by radio could be put to very good use where pilots are making test flights of new and untried airplanes. All kinds of instruments tell the pilot what needs adjusting; and if his corrective measures fail, he can guide the airplane to a safe landing. But there are no dials to measure the physical and functional changes that may be taking place in the body and the mind of the pilot himself.

He has no one to guide him down and bring him home if his mental and physical functions become impaired. His only guide to his condition is his sense of well-being which characteristically gives him an exaggerated sense of bodily health in the presence of the oxygen want and pressure deficiency that wait at high altitude to ensnare pilots in a trap of death. Impending unconsciousness caused by oxygen or pressure failure is accompanied by body comfort and a rise in spirits. Like a drunk, he feels no pain. The pilot's life is dependent upon his recognizing his own impairment, but the impairment destroys his perceptive abilities.

Are the pilots working harder at high altitudes? Are pilots naturally more tense at high altitude? Or, more important, are our oxygen supplies and pressurization schedules adequate? The answers to these questions and others, such as the amount of stress imposed on heart and lungs during a fighter tactical operation, must come from further work in which the physician rides the pilot piggy-back by means of radio.

Project RAM has just begun to use the physiological information telemetering system to determine the adequacy of the oxygen supplies and pressurization schedules in high

altitude aircraft. On three such flights the heart rates and breathing rates of experienced pilots were found to increase above 40,000 feet. One pilot whose heart runs at a rate of 84 per minute at low altitudes has a heart rate of 104 above forty thousand feet. He, like the others, breathes faster and deeper too.

This telemetering system gives a variety of measurements all at the same time. Body temperatures, skin temperatures, electrocardiograms, heart sounds, electroencephalograms, respiratory rate and breath sounds can be recorded. The pilots may be thousands of feet in the air, far above the electronic-loaded R5D or the ground laboratory, but the physician reading the instruments can give a very accurate picture of his physiological state. Not only does the doctor get vital data on the individual, but he is also in voice communication with him and gains some idea of the pilot's emotional response, particularly in an emergency.

Nowhere was the use of this ability for pilot and physician to communicate more dramatically illustrated than in the *Stratolab* balloon flight over South Dakota, November 8th. Quite unexpectedly Project RAM had a chance to record the reactions of two pilots as they struggled with an emergency that began at 76,000 feet. Danger of the first order threatened Lewis and Ross.

Project RAM had assisted in a previous open balloon flight in August as part of ONR's *Stratolab* in order to safeguard the health and lives of the balloonists and gather basic physiological information. Physical examination and clinical laboratory tests indicated the pilots' physiological state before, during, and after flight.

Both Lewis and Ross, Navy aerologists, had had extensive experience in balloon operations. They were hooked up with electronic instruments which virtually turned them into human broadcasting stations. The air waves carried physiological information—their heart sounds, respiratory sounds and electrocardiograms.

Two receiving stations received the data, one in the R5D flying thousands of feet below the balloon, and the other at Pierre, S. D. The RAM plane, not equipped for prolonged flight above 10,000 feet, flew below that level.

Lewis and Ross were riding a spherical, pressurized aluminum gondola, a veritable "space" cabin and looking for all the world like something out of Buck Rogers. When the *Stratolab* vehicle reached 76,000 feet—an unofficial record, Lewis and Ross were ready to study the atmosphere in which they found themselves and use the small crowded gondola laboratory for recording data. But hardly had they begun when the balloon started to go down erratically.

There was not a minute to lose and Lewis and Ross went to work. From 76,000 to 17,000 feet, they demounted every possible piece of equipment. When they reached 17,000 feet where the hatches opened automatically, they were ready to throw out the gear.

The balloonists needed to know whether they should keep the balloon in the air or break away and descend by cargo parachute. Dr. Barr in the R5D told them that the balloon was over the Badlands, a very poor place to land. On learning this, the balloon pilots made every effort to stay with the balloon in the air and hold on until they were in a less hazardous area to come down in greater safety.

ANXIETY *is reflected in Capt. Barr's face as flying in R5D he learns of emergency as balloon starts down suddenly from 76,000 feet.*

HAPPY ENDING *of flight comes as Ross and Lewis land safely in Nebraska after an exciting descent which they handled with great skill.*

To do this, they threw everything overboard to lighten the balloon. They were determined to stay airborne long enough to get them over rolling terrain.

In the R5D, Dr. Barr observed the tone of their voices, the rapidity of their speech, and their responses to questions. It was clear to him that they were making accurate observations and responding appropriately to the emergency. They were perfectly calm, and no evidence of panic appeared in their radio transmissions.

Finally they radioed, "This will be our last transmission. We are going to——." They had thrown the radio transmitter overboard.

It was actually a triumph of balloon operation. Lewis and Ross were able to bring the balloon down without going to their first escape facility, the safety parachute for the gondola. Last resort would have been their parachutes.

Participation in such projects as the balloon flights of Lewis and Ross are only part of the program of Research Aviation Medicine. Project RAM continues to study problems of man and flight in order to make flying safer in the jet age.

GRAMPAW PETTIBONE

Fingered

Two instructors were taxiing out to the runway in a T-28 for take-off on an instrument familiarization hop. When the pilot closed the canopy as he approached take-off position, he inadvertently left his right hand in the path of the canopy. The canopy mashed his right forefinger. He checked the finger, and since it seemed only somewhat skinned he proceeded to take-off.

After they'd climbed to 1500 feet, the co-pilot went under the hood and took control of the aircraft. At that point, the pilot felt as though he might pass out so he told the co-pilot to take the plane back to the field. True to his word, he passed out. The co-pilot came out from under the hood and headed back for the home field.

After three minutes, the pilot regained consciousness to find that his feet had slipped under the rudder pedals and were caught. Action of the pedals on his ankles caused such severe pain that he again lost consciousness as the plane turned on the downwind leg.

He regained consciousness as they taxied in from the runway.

Before his feet could be released, it was necessary for two men to lift the rudder pedals with a lever.

Grampaw Pettibone Says:

Sounds like this lad really suffered from his mashed finger and pedal-chafed ankle-bones. I'm glad there was another pilot along to save his neck.

Closing the canopy on his finger didn't show optimum use of the headbone, but most of us have pulled enough darned fool stunts to recognize that it could happen. However, this lad might have been spared the raw ankles if he'd worn boondockers instead of low street shoes. In case of bailout, the odds are that both these boys would have tripped barefoot through the boondocks.

The Case For Ejection

OpNav Instruction 3750.12, now reaching the field, is chock-full of ejection pointers for jet gents. During a recent 33-month period, engine failures in Navy jet aircraft produced these vital statistics: Three-tenths of the water ditchings were fatal. One-fifth of the flameout landings in the boondocks were fatal. Of 136 attempts to shoot flame-out landings on runways, half resulted in strike or major damage, with 1 in 14 fatal. *Of 33 ejections following engine flameout, only 1 was fatal.*

In the old days a pilot just plunked his machine in the pea patch. Not so today's jet driver. To retain your right to life, liberty and the pursuit, if flamed out and re-light fails, you'd best shun the pea patch by heeding these neck-saving hints:

1. When you can't reach a runway, if altitude is sufficient—EJECT!
2. If you've not currently demonstrated the capability of making successful simulated flameout approaches in model being flown—EJECT!
3. If you're down to high key altitude and still in the soup—EJECT!
4. If faced with a night flameout approach, unless you're a highly skilled pilot and conditions are nothing short of ideal—EJECT!

And remember, a peek at the poop-sheet shows if a forced landing on unprepared surfaces is unavoidable, for Pete's sake, get that landing gear UP!

Hung his Head

Two SNJ-5's constituted a two-plane, free-cruise, solo formation flight with an ensign as the assigned instructor and chase pilot, and a NavCad in the lead. After falling slightly behind while performing a modified wingover, the instructor over-corrected while turning inside and closed the gap too rapidly. On turning to the outside to avoid the leader, the instructor lost sight of the other aircraft and a collision resulted.

After impact, the airplanes separated and began to spin individually. The NavCad managed to recover from the spin, but the poor performance characteristics of his crippled J-bird prompted his bail-out at 800 feet. He was uninjured.

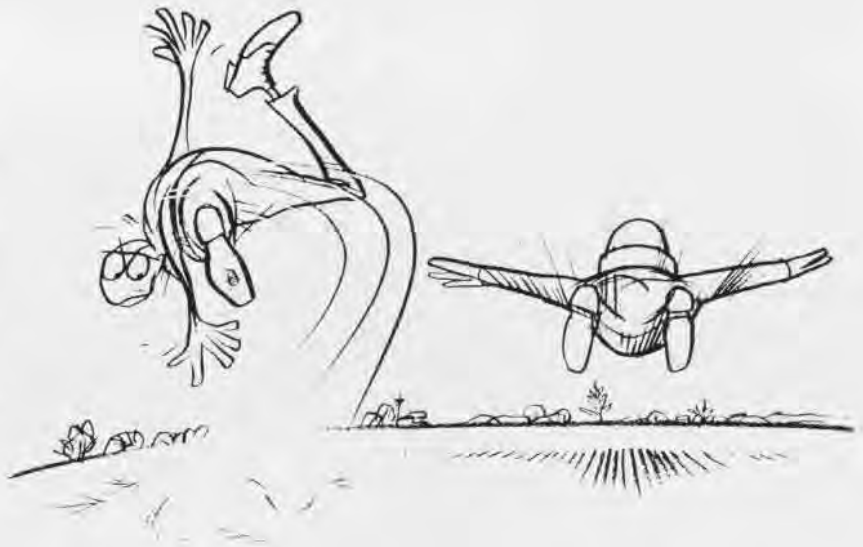
The ensign attempted to go over the left side, but was thrown out to the right. He struck some part of the disabled aircraft, causing injury to his back and damaging the seat-type parachute. These are the pilot's own words:

"Once I had cleared the plane, I pulled the ripcord after some difficulty in locating it. The chute opened promptly and I found myself hanging by my right ankle which was entangled in the parachute harness. I pulled myself up and sat in the harness. As there were trees below, I crossed my legs and covered my face. Fortunately I fell between trees and landed smoothly with my feet just touching the ground."

Grampaw Pettibone Says:

Maybe if a few more pilots were subjected to hanging head-down held only by an entangled leg strap, they'd remember that keeping other aircraft in sight *at all times* is a *must* during formation flying. The statistics show that *seventy per cent of the Navy's mid-air collisions occur during formation flight and that one-third of these collisions result in fatalities.*

It's a well known fact that a mid-air collision can ruin your whole day.



A Turn for the Worse

Following take-off for a local VFR dart tow flight, a *Panther* pilot returned parallel to the runway for the dart pick-up, snatched up the loop, and pulled up in the normal manner to lift the dart off the cradle and into the air.

Near the top of the pick-up flight path, the pilot reported that he was losing power. Releasing the tow, he commenced a nose-high left turn. The tower cleared him for a runway landing. He couldn't make it.

Upon impact the *Panther* slid approximately 150 feet. The engine and tail broke loose and landed ahead of the wing and cockpit section. Fire and explosion followed.

The pilot actuated the pre-ejection mechanism, but the canopy opened only six inches so he ejected through the canopy. The ejection was dampened by the partially opened canopy, so that the pilot and seat landed just behind the main wing in the ruptured fuel cell area. Unconscious, the pilot died immediately from severe body burns.

Grampaw Pettibone Says:

Ejection through the jammed canopy of a crashed and burning jet was the best action this unfortunate pilot could take *at this point*. While it's true that, normally, serious injury is the best a pilot can hope for from an on-the-deck ejection, in this case the limited arc taken by the seat might have let him off with only minor injury. His death resulted from the fact that he landed in the middle of the burning fuel.

Dealt a power loss at a very critical time, this Ltjg. made the fatal mistake of going into a slow speed, nose-high turn at minimum altitude in an attempt to get back to the field. It was bound to be a turn for the worse.

Since he had not yet reached a safe ejection altitude, the best action he could have taken in this situation was to follow the old rule: *Level the wings and then land straight ahead.*

LT. R. A. SAVAGE, *exchange pilot with the AF, is congratulated by LCol. J. E. Popham, his CO, upon completion of his last indoctrination flight in the F-86D at Geiger AFB, Wash.*

Missile Developers Honored

First Guided Missile Used in '43

The nine men who developed the first guided missile ever launched in wartime against an enemy are receiving official recognition for their efforts. Recognition comes 13 years after their early missiles were fired in the Pacific.

Security restrictions at the time, as well as the overshadowing of the accomplishment by rapid missile development prevented the nine Naval officers from earlier awards. In the spring of 1943, these pioneers started work on a small, wooden, pilotless aircraft, with a television camera and transmitter mounted in the nose. About 30 feet long and carrying a 2000-pound bomb, it was powered by two 220-hp Lycoming engines. Guided by a "mother" plane, it was brought on target by the operator who watched its progress on a television camera.

Late in 1943, and in 1944, the missiles were placed in combat against the Japanese land bases. They had a top speed of 140 knots and a range of about 450 miles. Although they were used only to a limited extent, they were very successful.

For this pioneering work, SecNav Charles S. Thomas has authorized awards to: Commodore Oscar Smith, Capt. R. F. Jones, RAdm. D. S. Fahrney, LCdr. Fred Wallace, Lt. William C. M. Bowlin, LCdr. J. E. Burrell, LCdr. William C. Bailey, Capt. S. E. Jones, Capt. G. E. Merrill.

Award Given Scientist

Sidewinder Designer Wins $25,000

At a dinner sponsored by the American Ordnance Association, held at the Waldorf Astoria in New York on December 5, Dr. William B. McLean, Technical Director of the U. S. Naval Ordnance Test Station, China Lake, California, received a cash award of $25,000 under the Government's Incentive Awards Program for his role in developing Navy's new air-to-air guided missile, *Sidewinder*. The presentation of the award was made by Adm. Arleigh Burke, CNO.

Dr. McLean earned this top cash award not only because of the impressive monetary savings to the government, but also because of the successful development of the *Sidewinder*.

RAdm. F. S. Withington, Chief of BuOrd, stated that Dr. McLean's efforts have saved the government an estimated $46,000,000 the first year. At least $5,000,000 was saved through economies achieved in the development program and an estimated $41,000,000 in the production of *Sidewinder* missiles.

MCLEAN PROVIDED SIDEWINDER CONCEPT

Dr. McLean evolved the basic idea for *Sidewinder* in 1949 while employed in the Aviation Ordnance Department. In 1951, it was accepted as a research and development project. Under Dr. McLean's technical guidance, civilian scientists and engineers at NOTS China Lake converted the original theories into today's operational weapon with a minimum of research.

Dr. McLean has been employed at NOTS since 1945 and has made numerous contributions to naval ordnance fire control in addition to his achievement in the *Sidewinder* project. He was made Technical Director of the station in July 1954. During WW II he was a research physicist for the National Bureau of Standards, Washington, D. C.

FASTER, LONGER-RANGE *successor to guided missile, Regulus I, the Regulus II is currently under test. It will reach the Fleet far ahead of the originally scheduled time, according to Mr. Garrison Norton, Asst. SecNav(Air). The new missile will be operational from ships and subs.*

Radioman Leaves VP-26

Makes Use of NavCad Program

Jackie C. Davis, AT2, has bade farewell to the northlands and Argentia. A former air crew radioman with VP-26, he is now preparing to become a pilot under the NavCad program.

Lt. Jack Stevens, Davis' patrol plane commander and former NavCad Procurement Officer at NAS Dallas, helped the enlisted man to make his big decision.

Davis is scheduled to report to Pensacola after taking some leave at his home in Waco, Texas.

VP-26 is presently deployed to Argentia, Newfoundland, in support of MSTS Arctic Operation, 1956. Its home base is at NAS Brunswick, Me.

ALAMEDA'S NOGUCHI MEMORIAL

AS MR. THURSTON, *Capt. Turner and Capt. C. B. Jones look on, Kanji Takasugi, Japanese Consul, congratulates sculptor Huff on his work.*

THE IMPRESSIVE *ceremony of unveilling the bronze bust of Dr. Hideyo Noguchi took place in the Alameda station theater on November 3.*

MEMORY of a great scientist and humanitarian, Dr. Hideyo Noguchi, prompted the Alameda Naval Air Station Association to give a special memorial to the people of Japan. The bronze bust of the famous Japanese scientist was given as a token of esteem and friendship at a ceremony at the air station on 3 November 1956. Another formal presentation took place a week later, on 9 November, in Tokyo.

Before a crowd of 1000 in the Alameda station theater, Mr. Art Thurston, NAS association president, presented the sculptured head of Dr. Noguchi on behalf of the American people to the Honorable Mr. Arkira Nishiyama, Japanese Consul General.

Guests were welcomed aboard by Capt. Frank Turner, CO of NAS ALAMEDA. He paid tribute to Capt. L. E. French, former commanding officer of the station, now retired, who "sparked the project and saw it through." Mr. William Gordon Huff, a civilian employee of the Alameda O&R department, was the sculptor. His eleven-year-old son Colin and a little Japanese girl unveiled the memorial.

The eulogy was delivered by Dr. Richard J. Stull, vice president of Medical and Health Sciences for the University of California. He emphasized the fact that Dr. Noguchi "overcame insurmountable obstacles to become . . . a great man of the world."

A graduate of the Tokyo Medical College in 1897, Dr. Noguchi did post-graduate work in the United States and Europe. In 1904, he joined the Rockefeller Institute for Medical Research in New York. His work on syphilis, tuberculosis, yellow fever and other diseases brought the Japanese bacteriologist world-wide fame.

One of the first to recognize the tuberculosis bacillus, he also discovered the parasite of yellow fever in 1918 and prepared a preventive vaccine and curative serum for what was then a widespread virulent disease in many tropical parts of the world. While in British West Africa conducting yellow fever investigations, Dr. Noguchi contracted the disease and died on May 21, 1928.

SCULPTOR HUFF *and his handiwork, the bust of the world famous Japanese bacteriologist.*

In the thirties the original idea for the monument came to the late Dr. Charles A. Kofoid of the University of California. A great admirer of Dr. Noguchi, Dr. Kofoid who had been a visiting professor to Japan, hoped that such a memorial would improve relations between the United States and Japan. Dr. William H. Brown, one of Dr. Kofoid's students, suggested that Mr. Huff could do it.

But WW II came and the project was shelved until the Naval Air Station Association undertook financial sponsorship of the project. The Association is an employees organization for the advancement of special programs.

AFTER THE presentation, the bust was carefully packed and airlifted by the Navy to Japan. RAdm. Fitzhugh Lee, Commander Fleet Air Japan, made the presentation in a program at Tokyo's International House commemorating Dr. Noguchi's birth date. Mr. Saburo Ishizuka, Chairman of the Hideyo Noguchi Memorial Association accepted the bust and its bronze plaque before a distinguished group of officials representing the Japanese Ministries of Foreign Affairs, Education and Welfare. Sculptor Huff and Mr. Thurston attended the ceremony.

The bronze likeness of Noguchi will be put in the garden of the school in Japan where he studied as a child.

THE CAMEL (TU-104) IS A TWIN JET TRANSPORT VERSION OF THE BADGER BOMBER WITH THE SAME WINGS, NOSE, TAIL AND ENGINES

SOVIETS BID FOR NAVAL AIR POWER

THE SOVIET Union is deeply committed to a strong program of air sea-power. At one time, Russia had tremendous naval strength, and the USSR is headed once more on a program of increased seapower. Although today the USSR lacks a carrier, naval aviation is a significant part of its expanding navy.

The phenomenal growth of the modern Soviet Navy has behind it a history of ambition of many Russian leaders. Peter the Great, two and a half centuries ago, saw a need for Russian naval power in the Baltic if he were to gain a superior position in his rivalry with Sweden.

In 1769 Catherine the Great sent a Baltic squadron all the way around Europe to fight against the Turks, and the Battle of Tchesma is celebrated to this day as a famous victory. It was during Catherine's reign that John Paul Jones served in the Russian Navy as an admiral. In 1795 Russia's navy held second place among the world's navies and remained a major sea power for the next century.

In recent years her naval ambitions have not been generally recognized because war has interrupted her naval programs on three occasions. The disaster to her Baltic Fleet at the Battle of Tsushima in 1905 halted an ambitious policy of expansion. A naval development program begun in 1912 on a broad scale was interrupted by World War I with its aftermath of revolution.

By 1933 the Soviets were ready to start anew to build a navy. They had completed the Stalin Canal linking the Baltic and the White Seas, and Stalin had personally approved the location of new naval sites in the northern area. The vast new shipyard of Molotovsk, near Archangel, was begun and eventually became among the largest in the world. The yard was named after Molotov who had boldly advocated that Soviet Russia should have a navy corresponding to her position as a world power. But for a third time, war intervened and Soviet resources were thrown into a war of survival against the German armies.

Today the Soviets speak often of strengthening their navy. They are now returning to an ambition which has never fully impressed itself on Western thinking, because this purpose has been constantly interrupted while still in the planning stage. With an adequate and broadening industrial base, the Soviet Union is once again in a position to implement its earlier plans.

The Soviet Navy has autonomy under a separate Ministry of the Navy which is responsible for naval aviation. The present Commander in Chief of the Soviet Navy is Adm. S. G. Gorshkov, who succeeded Adm. N. G. Kuznetsov. Kuznetsov is believed to have been the driving force behind the postwar buildup of the modern conventional Soviet Navy. His apparent retirement occurred simultaneously with a reduction in naval membership in the Central Committee of the Communist Party of the Soviet Union. These events may foreshadow a change in emphasis in the naval construction program toward more advanced types of ships. Conventional ships are being spoken of as obsolete, and newer ships may soon be started to replace them. Plans have been announced concerning the construction of an atomic icebreaker during the sixth Five-Year Plan. The introduction of atomic power and guided missiles into the Soviet Fleet is an expected development.

Total personnel strength of the Soviet Navy is 825,000 to 850,000 officers and men. Of this total, 450,000 to 460,000 are what is termed general service personnel—those officers and men who man the ships at sea and the establishments ashore which service the fleet. Between 270,000 and 280,000 officers and men are attached to the coastal defense forces and the naval infantry, according to recent reports.

The Navy's air arm is a large organization with about 90,000 to 95,000 officers and men. In addition to the above and available to the navy in time of war are the security elements afloat, or the MVD, numbering 5,000 to 10,000 men.

The Soviet Navy maintains four separate main fleets. Each bears the geographic name of its maritime area: the Northern Fleet, Baltic Fleet, Black Sea Fleet, and Pacific Fleet. The wide separation of these fleets, only partially alleviated by the inland waterway system and the Northern Sea Route, constitutes a strategic weakness of the Soviet Navy and requires that each fleet be trained for independent operations.

The main strength of the Soviet Navy is the large submarine force, trained and well-equipped. New submarines are being built for worldwide operations. However, lacking an aircraft carrier, surface warship operations must be limited to available air cover. Surface ships are also being built at a fairly constant rate, which, when coupled with submarine construction now, gives the Soviets the second largest navy in the world.

The navy has placed tremendous emphasis on the strength of its undersea arm, and, since World War II, has built up a peacetime submarine force of over 450 submarines, the largest in naval history. Today's submarine fleet is about eight times the size of the German strength at the start of the war. Still the Soviets are building more and more new submarines. Current production may be almost 100 a year.

NOTE MAE WESTS WORN BY NAVAL PILOTS

SOVIET ARTIST DRAWS A PICTURE OF FUTURISTIC TYPE OF NAVAL TORPEDO BOMBER

Today's undersea force is apparently "ready to go," and is a threat to United States shipping both overseas and along the North American Continent. The nucleus of this vast fleet is the large ocean-going submarine, a definite transoceanic threat. Medium-range attack submarines for intermediate-range duty, and short-range submarines, provide the Soviets with not only a large aggressive fleet, but also a powerful weapon for homeland defense.

In the past few years the Soviets have to a considerable extent unwrapped the secrecy which has covered their impressive program of postwar naval construction of surface ships. Western observers have now concluded that the Soviet surface navy is an extremely powerful force, made up of new, native-designed, rugged, and fast ships, capable of not only defensive but offensive operations in all the oceans adjacent to the great land mass of the Union of Soviet Socialist Republics.

The surface ships around which Soviet naval power is built consist of three battleships (all of prewar construction), modern heavy cruisers of the *Kirov* Class, light cruisers of the modern *Chapayev* and *Sverdlov* classes, a former Finnish armored ship (useful in coastal waters), several light cruisers used for training purposes but which maintain combatant capability (two being acquired from the demobilized German and Italian Fleets), over 200 modern destroyers and escort vessels, over 1,000 patrol ships and craft, 25 minelayers and substantially over 500 minesweepers, at least 200 seagoing amphibious vessels, and over 200 fleet auxiliaries.

In speaking of the light cruisers, it must be remembered that the term "light" applies to their armament, and that their tonnage is considerably heavier than might be expected. The Soviets officially state their tonnage is 12,800 tons; western observers estimate they actually displace about 17,000 tons.

Naval aviation in the Soviet Union is still enjoying a period of revitaliza-

tion initiated just after the reorganization of the Soviet Armed Forces in 1950. As a result of a program of expansion, training, and modernization, Soviet Naval Aviation today comprises approximately one-sixth of the air power of the Soviet Union. Of a total of approximately 3,500 aircraft, over one-half are jet fighters, one-fourth are jet light bombers, and the remainder are transports, reconnaissance, and miscellaneous aircraft.

Soviet Naval Aviation is an integral part of the Soviet Navy and is administered separately from the other components of the air forces. Overall technical and administrative control is vested in the Commander in Chief of Soviet Naval Aviation with headquarters in Moscow. He is subordinate to the Commander in Chief of the Soviet Navy who in turn is responsible to the Minister of Defense. Operational control over a fleet air force is vested in the fleet commander.

The organization, composition, and numerical strength of each air force varies in accordance with its assigned task and the scope of its operations. Air divisions are the tactical organizations assigned to naval fleet air forces, and air regiments are the basic tactical unit. Authorized strength of the regiment varies according to its role, but each air division normally comprises three regiments which are based on airfields adjacent to division headquarters.

Naval aviators, like all specialized officers of the Soviet Navy, have army type rank titles. However, naval air personnel wear naval uniforms with appropriate insignia and markings, whereas personnel in other specialized categories wear army type uniforms.

In modern warfare, the Soviets recognize that Naval Aviators as a rule will have to carry out combat missions in close coordination with surface vessels, submarines, and coast artillery. It has been stated that Naval Aviators must know in detail both the technology of the navy and its tactics; in short, must be schooled in naval warfare.

The Soviets have stated that their "mine- and torpedo-carrying naval aviation is a formidable combat power in battle against the enemy on the sea. Soviet Navy pilots during the Great Patriotic War [World War II] showed courage and bravery in combat and, by competent use of mine and torpedo weapons, delivered crushing blows to enemy ships and transports and were successful in laying minefields. Navy pilots boldly attacked and torpedoed enemy ships while on missions distant from friendly shores. Complex meteorological conditions were frequently encountered, not to mention the necessity for flying through heavy enemy antiaircraft fire. Navy pilots of torpedo-carrying planes sank many enemy ships and transports."

More significant, however, are statements to the effect that during the postwar years the military might of the Soviet mine- and torpedo-carrying aviation has grown yet more. "It is equipped now with modern jet torpedo-carrying planes and the latest types of mines and torpedoes."

The Soviets' interest in all-weather fighter interception is evidenced by statements to the effect that "interception at night is possible under any condition, provided ground countrol interception (GCI) is accurate and well-coordinated, and the pilot is well-schooled in such operations."

Description of ramming tactics has been included in postwar Soviet military literature. World War II examples have been described. A Soviet article points up the danger of single enemy bomber penetration and that "all other fighter tactics failing, the Soviet pilot, by his military oath, must use the ram attack."

The Soviets point out that ramming tactics are entirely feasible with today's military aircraft. Even though the nose structure of a jet aircraft is not strong enough to withstand the impact of a ramming, it is noted that the *Fagot* carries an armament pod which renders that portion of its structure rigid enough to take the basic

AIRMAN READY TO ARM A MIG FIGHTER

HERE SOVIET NAVY ENLISTED MEN INSTALL A 1000-POUND BOMB ON BEAGLE AIRCRAFT

TECHNICIANS WORK ON HOUND HELICOPTER

A 76 MM. CANNON IS LOADED ON A HOUND HELICOPTER THROUGH CLAMSHELL DOORS

strain of an impact. Technically, the Soviets imply that the execution of ramming tactics is easier now.

The Soviets have the immediate asset of large numbers of available aircraft and a high rate of production. The USSR with its present air strength has about five times the number of aircraft with which Germany launched World War II (3,650). In fact, the estimate of 20,000 Soviet aircraft is about triple the maximum reached by the Luftwaffe during the war (approximately 6,000 in June 1943).

Although the Soviets remain essentially a land power, they appear to recognize the importance of enemy sea communications and to be prepared to attack these communications in case of war. Bulganin has said: "I have been continually concerned with the strengthening of the Navy, for the valiant Navy, together with the Army and Air Forces, is the reliable defense of the sea borders of the Soviet government."

The ability of Soviet Naval Aviation to carry out its antishipping missions unaided is limited by its size and the type of aircraft currently assigned. However, any of the USSR's vast fleet of aircraft assigned to other air forces, including long-range jet and turboprop aircraft (*Badger*, *Bison*, *Bear* and *Bull*), conceivably could be assigned to antishipping operations by the High Command, even as planes of the German Luftwaffe were ordered unexpectedly on antishipping missions in World War II.

The Soviets today possess air bases from which they could launch attacks by conventional light bombers on Allied shipping in the English Channel, the North Sea, the Norwegian Sea, and upon every port in northwestern Europe. Most formidable, in respect to present shipping lanes, are the bases in Eastern Germany. A number of air bases are operational there, of which many have runways of 6,000 feet or more, capable of sustained operations by jets and *Bulls* as well as older types. Five of the six busiest ports in northwestern Europe (London, Rotterdam, Antwerp, Le Havre-Rouen, and Hamburg-Bremen) could be reached by jet bombers from these bases in the Soviet zone of Germany. Three of these ports (Rotterdam, Antwerp, and Hamburg-Bremen) could be reached by escorting jet fighters.

From existing bases the Soviets could, if they committed sufficient aircraft, harass Allied shipping in the English Channel and North Sea lanes and ports, and possibly reach the ports of western France.

As in Europe, the Soviet and Communist Air Forces in Asia, provided they wish to commit sufficient forces to the harassment of Allied shipping, have the capability of making a major battle area of the approaches to the South China Sea, East China Sea, Japanese Islands, and the Bering Sea. The entire island group of Japan, for example, could be reached by jet light bombers.

Soviet Naval Aviation is known to have an interest in the Arctic approaches to the USSR and to have developed some capability for Arctic reconnaissance. Soviet naval units composed of both piston and jet aircraft have operated under severe Arctic all-weather conditions. In Arctic areas Soviet naval aircraft have been pictured operating from rolled snow runways. However, the operation of airfields in the Arctic is a complicated and costly matter. Snowstorms, fogs, and freezing weather make air operations difficult.

Longest range Soviet naval light bomber in general use is the twin-jet *Bosun*, capable of a range of approximately 1,400 nautical miles. In the same class, the *Beagle* (IL-28) twin-jet has slightly less range. These jet bombers are the backbone of naval aviation's light bomber force. Both the *Bosun* and the *Beagle* carry suitable ordnance loads for their designed mission. This capability undoubtedly has been further aided by the exploitation of German designs of pattern-running and homing torpedoes and air-to-surface missiles.

Progress displayed by naval aviation during the past six years indicates that the Soviets recognize air power as an integral and vital component of naval power. With the conversion to jet aircraft, Soviet Naval Aviation has greatly improved its capability for defense of seaward areas and shore installations against enemy naval, amphibious, or air attacks. It is apparent therefore that during this period the Soviet air threat to Western control of the sea has not abated and to date there is no indication of a decrease in that trend.

LATEST ADDITION *to the Navy's jet instrument training program is the T2V. It will supplement the TV-2, now in service, with the first deliveries set for early 1957. The plane above was used as part of an instrument evaluation program at Moffett Field. Greatly improved low speed stability is provided by a boundary layer control system. It is equipped for carrier operation.*

ComNavFE Gives Warning
Reveals Russian Naval Strength

In a speech to a group of American-Japan Society visitors to the Yokosuka Naval Base, VAdm. R. F. Good said that Soviet Russia's new and modern Navy is second only to that of the United States.

"The free world must remain in front," the Admiral warned. "The first prize in the contest for sea power is survival of the free world. There is no second prize."

The ranking Naval officer in the Far East stressed the fact that the Navy's role in defense of the free world is more important now than ever before. He pointed out that the nations of the free world are basically maritime nations, and called them "an oceanic consideration."

"If a general war should begin with a surprise atomic attack, the ability to retaliate quickly might well depend on Naval forces which have been well-dispersed at sea."

48 States in 46 Hours
VMF-114 Pilots on Extended Flight

Forty-eight states in 46 hours is the record of two fighters of Marine Fighter Squadron 114.

Starting on their extended cross-country flight from MCAS CHERRY POINT, N. C., the two pilots, Capt. James W. Snavely, USAF exchange pilot, and Marine Capt. T. E. Fish headed their F9F-8B *Cougars* toward the west over a northern route. Flying southward down the west coast and across the southern part of the United States on the return trip, they crossed over every state in the Union before landing at MCAS CHERRY POINT.

PILOTS FISH AND SNAVELY PLAN FLIGHT

On this navigational training flight, nicknamed the "Big 48," these two pilots covered over 7500 miles, flying eight hours between rest periods.

Enroute they made 8 fueling stops.

Service for Reservists
New Section Set Up in BuPers

A new section entitled Retention and Recall (Pers B15r) has been established in the Aviation Liaison Branch of BUPERS. One of its jobs is to assist Reserve aviation officers by providing current, factual information on active duty retention opportunities, special training available, and to advise officers who wish to return to active duty. Information will be sent to commands, groups, or individual officers.

Starting with WW II, the Navy experienced two periods of expansion and contraction. Large fluctuations in requirements during these years produced an uneven distribution by grade and seniority of officers on active duty. One effect of this unevenness is a shortage of officers beginning with the year group 1948. Consequently, there is an opportunity for Naval Reserve officers up to the rank of Lieutenant (with the rank for the Lieutenant not earlier than 1 July 1953) to return to active duty. Those Reservists within this "valley" of the grade distribution curve have improved opportunities for promotion, special training, and indefinite retention on active duty.

In order to meet national policy requirements that the active officer strength be made up of only 50% regular officers, large members of young Reserve officers must be retained on active duty after their original obligated service.

Any officer or group desiring information may write to the Bureau of Naval Personnel (attn. Pers B15r), Navy Department, Washington 25.

A LARGE GROUP *of pressmen wait below the gangway of a MATS plane for the first of 58 Hungarian refugees to leave the plane after their trip from Munich, Germany, to McGuire AF Base and Camp Kilmer, New Jersey. The airplane was piloted by Capt. Robert M. Milner, Commanding Officer of Naval Air Transport Squadron Six, a unit of MATS' Atlantic Division.*

INITIAL SITE OF MCMURDO BASE WAS HUT POINT, ROSS ISLAND. TENT CITY FORMS SEMICIRCLE AROUND CAPT. SCOTT'S HUT (LEFT)

NAVAL AIR BASE, ANTARCTICA

VX-6 AND AIR FORCE PLANES PARKED ON MAT ALONG 6000-FOOT SEA ICE RUNWAY CLEARED DURING THE ANTARCTIC WINTER NIGHT

DRILLING A WATER WELL IN ANTARCTICA

LCDR. DAVE CANHAM JOINS WATER LINE

CREVASSE ON TRAIL IS FILLED WITH WATER

P2V ON BAY ICE REFUELS FROM NESPELEN

LAYING FUEL HOSE FROM AOG TO TANKS

A FUEL HOSE ALMOST FOUR MILES LONG!

It was Christmas week, 1955, here in the United States, Christmas with its hurry, its last minute chores, its ice, snow and cold.

Down at the bottom of the world it was Christmas week, also. There was hurry there, and many last minute chores. There was cold, and much ice and snow. There was a span of thousands of miles between that White Continent and this continent. There was yet another span, an entire world of difference between the Christmas gaiety at home, and the dedicated seriousness there of men facing hard tasks.

When the USS *Edisto* steamed into McMurdo Sound, Antarctica, on 20 December, she carried the advance party of a group of men with an assigned mission unlike any most of us have ever known. It was the task of the 13 officers and 80 men of the Mobile Construction Battalion (Special) and the detachment from Air Development Squadron Six to build an Air Operating Facility at McMurdo Sound, with a runway capable of accommodating the Air Force C-124 cargo planes scheduled to arrive in October, 1956. These 93 men were to unload tons of equipment and materials from Task Force 43 cargo ships. They were to break out this equipment, repair or replace any damaged. They were to pack it for air drop for a South Pole station, and for an auxiliary base which was to be established. They were to support flight operations of VX-6, who landed two P2V's and two R5D's on bay ice Christmas Day. They were to work on a 12-14 hour day, seven-day week basis. And they were to winter over in the Antarctic night while accomplishing these tasks. All these things the 93 men faced as they climbed onto the bay ice around Ross Island, McMurdo Sound.

Hut Point, at the lower tip of Ross Island, was selected for the Air Facility site. This location has played an important part in the history of South Polar exploration. Here, in 1902-04, Capt. Robert Scott's group erected the hut that, still standing in perfect condition, gave Hut Point its name. Here, atop Observation Hill, a cross was erected to the memory of Scott and his polar party when they perished in 1912 on the return trip from the South Pole. Here the MCB personnel established their tent city around Scott's hut and experienced camp life in freezing temperatures.

When the main body of Task Force 43 arrived at McMurdo the day after Christmas, ice fields forced the cargo ships to halt some 35 miles from Hut Point. A tortuous trail was flagged across bay ice, cut by open leads that had to be bridged before any traversing could be done. During this early trail work R. T. Williams, CD3, lost his life when the heavy tractor he was driving broke through the bay ice. The Air Operating Facility is named for him.

Through combined efforts of the icebreakers *Glacier, Edisto* and *Eastwind*, a narrow channel was broken through the ice and the distance to camp was halved. Within a month this distance was reduced to five miles.

Offloading of the cargo ships was double work. The icebreakers alternated taking loads from the AK's, then proceeded down the channel they had broken. In turn, they were offloaded onto waiting sleds which were pulled by tractors over the trail to camp or to the supply dump. This tractor train operation was conducted around the clock for over a month before the last load of cargo was hauled. The resulting supply dump, of some 10,000 tons of stores, covered about 90 acres.

An aviation supply dump was built up separately. Included in this were all aviation stores, part of which were 6,500 barrels of fuel. This had to be handled four barrels at a time.

And all the time the men had been plagued by machinery breakdowns. For some pieces of machinery, a loose estimate was—for every day they were in operation on the trail and on subsequent tasks, they were in the garage

two days for repairs. The big garage, known as the "Home for Broken Down Cats," was one of the first buildings set up. Presided over by C. M. Slaton, CMC, the garage was manned by mechs of many ratings — by aerographers, air controlmen, steelworkers. These men were kept busy all during the Antarctic winter night maintaining 35 pieces of huge transport equipment, tractors, bulldozers, weasels and twenty-ton sleds.

Difficulties with the trail itself added problems. Polar ice is not the smooth sheath envisioned by the uninformed. Strained by great tensions, it cracks and buckles, forming ridges and open leads—cracks or crevasses—of varying sizes. But large or small, a crevass must either be circumvented or bridged.

To fill in these cracks, the McMurdo "roadbuilders" used water! Well diggers with portable rigs drilled through the bay ice for water. Line handlers

THE YOG'S MOORED FOR WINTERING OVER

laid long water lines from well to crevasses. Others of the road gang dammed trail-wide sections of the crevasses with snow, and then thousands of gallons of water were pumped to fill the sections. The Antarctic cold soon froze the water into a solid "patch" of ice. But this was not a one-time job. It was never-ending.

In addition to the unloading and sorting of the millions of items of supply, to the maintenance of trail machinery, the "city" itself had to be built. Under the most adverse conditions in the history of construction, this modern, self-sufficient station, capable of housing 200 men in comfort was created. Over a period of six months, four of which were in total darkness, 38 buildings were erected in temperatures of 40 below zero, and in 60-knot winds. Fourteen of the buildings were steel quonsets. Some of the builders maintain that, even dressed in cold weather gear like men from Mars, the coldest seat in the world is astride a quonset, nailing down the roof.

The other 24 houses at Williams Air Facility were constructed of prefabricated, insulated panels. Lifted into place by the "Pettibone," these panels are literally clipped together. In less than a month after landing, the builders had the first permanent house ready for occupancy, and 26 enlisted men moved into Nimitz Hall.

SINCE THE REASON for the Air Facility's existence is to support air operations, fuel for planes was a major concern at Williams. More than 200,000 gallons of avgas had to be transferred from the oiler *Nespelen* to permanent fuel tanks at Hut Point. This could be accomplished only through a fuel line. For laying this line—three and a half miles from oiler to tanks, over rough snow and ice—a group of Marines especially trained in hose handling had come down from Camp Lejeune. These men, together with several of the MCB's, laid the three-inch line with its several pumping stations. Battling with constant freeze-ups in the line, they completed the fuel transfer by the time the rest of the cargo had been unloaded.

During the first phase of *Deepfreeze*, two YOG's, containing half a million gallons of aviation gasoline, had been towed to the Antarctic. They were now anchored almost in the exact location along Ross Island where, 50 years ago, Capt. Scott's flagship lay beset in the ice for two years. Moored by "dead men" to the adjacent hilltops, these YOG's were soon frozen fast in the ice.

CLIPS, NOT NAILS, HELD PANELS FAST

CWO Harold Fisher, who captained one of the ships to McMurdo, was responsible for their safety. With the help of Harold Lundy, MM1, he maintained a constant watch over the ships during the long winter night. As the ice shifted and pressure ridges formed, the ships listed and strained at their anchors. Bow and stern lines and anchor chains frequently had to be lengthened to relieve the strain. As tons of crushing ice slid down onto the ships these lines and chains often snapped like thread under the tremendous force. That these ships with their valuable cargo survived the Antarctic winter can be attributed to the 3500 hours watch over them with the difficult and dangerous adjustments to chains and lines.

When the non wintering-over personnel left in March, and the last ship, the *Glacier*, sailed, Williams AIROPF men realized the isolation facing them.

But Officer-in-Charge, LCdr. D. W. Canham, and his McMurdites settled down to a work routine that allowed no time for dwelling on that subject. All the many tasks connected with building this Air Facility at the bottom of the world had to be done at the same time. Every man on board, regardless of rank, rating or rate, was given full time employment—full time and more.

LIFTING PANEL IN PLACE WAS HEAVY WORK

THE PETTIBONE LIFTS HEAVY ROOF PANEL

FIRST MAIL AFTER WINTER NIGHT INCLUDED ABSENTEE BALLOTS

THE LINE FORMS TO THE RIGHT AT ANTARCTIC BARBER SHOP

AMONG THE BEST of the water line handlers was LCdr. Canham. Helicopter pilot, LCdr. Donald Nash, was chief supervisor of the construction of his copter hangar—a quonset—tilted 45° and attached, lean-to-style, to the aviation garage roof. LCdr. Nash and his Aviation Department, men from VX-6 and a few from MCB, were known as the Gophers Club, with good reason. Day after day, during the long period of darkness, aided by a huge searchlight, this group dug and shovelled away huge blankets of snow, as they worked to excavate the tons of supplies in the dumps now buried by the Antarctic blizzards.

One of the unorthodox assignments was that of "water-hauler," S. F. Pastor, CD3. Four times daily he mounted his huge carry-lift and guided it to the virgin snow fields. There, in its gaping jaw, he gathered enough snow for melting to supply McMurdites with 1500 gallons of water a day. Despite sub zero weather, 60 knot winds and blinding blizzards, he was to be found, regularly, with his Antarctic version of the old oaken bucket, as he hauled 'water' into camp.

From the very first day the MCB men were ashore at McMurdo, there was an urgency about the work to be done. October 1956, the date set for completion of McMurdo's runway, seemed a long time away in the preceeding December. But work-filled days and weeks began to tick off with disturbing rapidity. Week after week went by in the winter darkness as the men worked at completion and operation of the camp, breakout of equipment and material, and the preparation of personnel, equipment and material needed to establish the South Pole Station, and the Beardmore Auxiliary Base.

Located midway between Williams and the Pole, near the base of Beardmore, the world's largest glacier, this auxiliary base will serve as a refueling site and air navigational aid center. Ltjg. N. D. Eichorn and a crew of

THESE NATIVES STARRED IN MANY A REEL

UNSUSPECTED TALENTS ADDED GAIETY TO THE MONTHLY PARTIES

MEMBERS OF 'BEARDED BEAVERS' CLUB MEET ONE REQUIREMENT

ICE COATS GLACIER'S BOW AS SHE SPEEDS ON RESCUE MISSION

ICE BARRIERS ARE SOLID WALLS AROUND MUCH OF ANTARCTICA

eight will man Beardmore Base until the South Pole Station is in operation.

AN EMPEROR MAKING LIKE A TOWN CRIER

Packing, assembling and rigging for aerial drop the 530 tons of material for the South Pole Base was no small job. Sizes of chutes to be used for this ranged from 24 to 100 feet in diameter.

Plans called for the runway to be built of compacted snow. Up until mid July, snow compaction experiments were conducted, but the results were not satisfactory for C-124 operation. On 20 July the alternate plan went into effect—to remove six feet of snow from a 6000 foot strip of bay ice. This 'crash program' for the runway called for a 24-hour day, seven-day week through the winter night, with temperatures around minus 65°.

After an unbelievable 100,000 man hours and countless breakdowns of equipment, the strip was completed, and water flooding, to smooth off the ice was done. But a king-size blizzard dumped five feet of snow on the runway, wiping out in three days the work of many weeks. This time there was no alternative. The heartbreaking work on another strip was begun. By almost superhuman effort, a 5000 foot-strip was ready by mid October for the R5D's of VX-6. Another 1000 feet of runway had been added by the end of October when the Air Force *Globemasters* arrived at this, the only runway for wheeled landing in Antarctica. Shortly after the first polar landing on 31 October, flight operations were stepped up.

In addition to those men already mentioned, there are many others who share the credit for a difficult task accomplished: the utilitymen, radio operators, the aerologists, GCA men, the chaplain—to list them all would be to give a roster of the entire group. Though faced with discomfort, with boredom, loneliness and even danger, every one of the 93 men has, through his individual, and team efforts, contributed greatly to the future exploration of this silent continent.

DRAMATIC VIEW OF FIRST AIRCRAFT LANDING AT SOUTH POLE

ON DECK AT SOUTH POLE, SOUGHT BY MANY, REACHED BY FEW

Old Banshee 'Re-enlists'

Veteran Goes to O&R, Cherry Point

The Navy's second oldest F2H-3 *Banshee* left VF-71 at NAS QUONSET POINT, to report to O&R, MCAS CHERRY POINT. Known as "103" at Quonset, the plane rolled off McDonnell assembly lines in 1951.

One-zero-three flew over Korea from the carrier, USS *Hornet*. While with VF-71, she made 152 carrier landings. Most of these were in the Formosa Straits area in 1955 with CVG-7.

First production *Banshee* built for the Navy is now serving a tour of duty at NAS ALAMEDA, California.

Navy Aids Polio Victim

Flies in Iron Lung for Emergency

NAS PENSACOLA responded to a call for help to transport an iron lung needed by a nine-year-old polio victim in Escambia General Hospital, Pensacola. A Navy plane and pilot flew to Marianna, Fla., about 120 miles away, and returned with the lung.

From the hospital's administrative office to the National Foundation at Tallahassee, the chain of calls began. The message was relayed to the Naval Hospital at Pensacola, and then to the operations department of nearby Sherman Field where the mercy flight immediately left for Marianna.

J. W. Bancroft, administrative officer of the hospital, commended the Navy for its decisive action, and its continued service to the community.

Marine Trophy Competition

Commandant Sets Up New Award

Gen. Randolph McC. Pate, Commandant of the U. S. Marine Corps, has established an Aviation Efficiency Trophy to be awarded annually to a Marine aircraft squadron.

Competition for the award, to be conducted on a fiscal year basis starting July 1, 1956, will be judged on squadron performance of designated mission, flight safety and accident prevention.

Squadron standing in various competitive events will be used in deciding the winner. These include fleet air gunnery and wing gunnery-bombing meets, evaluation exercises, operational and administrative-material inspections and aviation safety competition.

Only Marine fighter, fighter (all-weather), attack, and composite reconnaissance squadrons will enter the competition for the award initially. Other Marine squadrons will be included later when comparable exercises for them are developed.

Scores received during these competitive exercises will be sent to Headquarters Marine Corps prior to August 1 of the fiscal year ending the competition. The selection of the winning squadron and arrangements for presentation of the award will be made by Headquarters.

The Commandant's Aviation Efficiency Trophy, to be awarded each year, will be retained by the winner.

FOR TWO WEEKS *in December, LCdr. Robert B. Meyner, USNR, left his civilian job as Governor of New Jersey for training duty with the Sixth Fleet. One of the ships he toured was the Randolph CVA-15. Here he and his party watched flight operations of both prop-driven and jet planes, some of which carried Sidewinders, air-to-air missiles. Climax of his visit aboard was a helicopter flight to observe pilots land, as they used the carrier's deck mirror landing system.*

PRACTICE SESSION FOR CAC REQUIREMENTS

VQ-1 Crewman Training

Syllabus Geared to CNO Standards

A combat air crewman training program is in full-swing with VQ-1, based at Iwakuni, Japan. From CNO requirements for CAC designation, the P4M and A3D patrol squadron has developed a 37-period syllabus.

Upon completion of the training, qualified crewmen are presented with a certificate and CAC wings. More than 16 have already completed the course, and others are expected to qualify in the near future.

Periods of instruction cover aircraft recognition, code, survival, ordnance, radar, and plane captain procedures. Officers and qualified combat air crewmen serve as instructors.

The squadron's goal is that every crewman become a qualified CAC.

New Wrench Devised

Makes Tightening Job Much Easier

At NAAS CORRY FIELD, J. W. Gay, ADC, has designed a new wrench that will help mechs working on T-28's. It will yield enough turning power to tighten the hold-down nuts on the carburetor flange.

Gay designed the new wrench by adding a steel spool and cable to the broken-back wrench previously used on the job. The old wrench simply did not have torque enough to tighten the hold-down nuts. If the nuts on the carburetor are not absolutely tight, the vibration of the engine tends to loosen them and there is danger of air leakage, poor fuel mixture, rough operation and fire.

Gay's device not only increases the efficiency of the mechs' work, but eliminates danger from fire.

Two A3D's to Iwakuni

First of Their Type in Far East

Two Douglas *Skywarriors* were welcomed aboard at NAS IWAKUNI. Assigned to VQ-1, these planes are the first of their type in the Far East.

When the aircraft landed, it also marked the first time that a deceleration chute was used at Iwakuni. Piloting the planes were LCdr. J. H. McIlmoil and LCdr. L. T. McHugh.

Okinawa's Stormy Welcome

VP-4 Kept on Move by Typhoons

Two days after eight *Neptunes* of VP-4 landed at their new home, Naha, Okinawa, they had to make a hurried departure. Typhoon "Babs" was angrily approaching. All flyable aircraft had to be evacuated to other fields.

"Babs" turned out to be not such a hard-boiled hussy, and soon passed into limbo. So the planes of VP-4 returned home, a home not yet completely ready for occupancy. But hardly had the *Neptunes* returned, than typhoon "Emma" made her windy, watery approach. "Emma" was no soft touch, and the planes had to scatter again.

A short breathing space followed for the squadron, and things began to shape up. Other interruptions came in the form of a search for a missing P4M shot down off the China Coast and typhoon "Harriett." In a short six weeks, VP-4 had become well indoctrinated into the ways of the Far East.

Things look better now, a few months later. Cdr. J. E. Mishan, CO, is breathing easier. Some of the squadron's families have arrived, and VP-4's Okinawa house is in order.

TWO SQUADRON CARS BURIED BY 'EMMA'

FROM THIS 'CAT', YOU'RE REAL GONE

A REGULUS MISSILE IS LAUNCHED FROM THE USS HANCOCK, AIDED BY STEAM CATAPULT

FROM SCATTERED corners of our Navy has come the question, "How does a steam catapult work?" One correspondent with a mechanical bent suggested that it might work like a zipper, with the zipper opening in front of the catapult shuttle and closing in back of it. Actually, that is just about how the trick is done. To satisfy our readers' requests, here is an authoritative description of the "big push."

The steam catapult is a twin-cylinder, direct-drive, slotted-cylinder aircraft launching device. Energy for the "push" comes from high pressure steam, which is stored in accumulators located on the ship's hangar deck. Before each launching, the steam is fed into the accumulators from the ship's boilers, enough in each case to take care of the weight and desired end speed of the plane in position.

The mechanics of hog-tying the plane for launching are the same as in the standard "cat," with the plane at full throttle, and shearable link holdback attached. The aircraft bridle is attached to the catapult shuttle.

When the launching valves open, steam hits directly upon the twin pistons to which the shuttle is attached, driving pistons, shuttle, and the plane forward. The T-shaped shuttle is directly connected to the pistons through a slot near the top of each cylinder, covered by a sealing strip and cylinder cover. The cylinder cover clamps over the slotted cylinder. Pressure between the cylinder, cylinder cover, and sealing strip keeps the cylinders sealed.

And now comes the "zipper." As the pistons move through the cylinders, a cam on the piston assembly forces the steel sealing strip out of the way of the shuttle-piston connection, and cams the seal back in place aft of the shuttle, but forward of the steam piston face.

A catapult brake, located at the end of the steam cylinders, consists of two horizontal chambers through which water circulates. Spears on the forward end of the pistons enter the water chambers, and, hydraulically, stop the pistons. The attached shuttle stops also. Of course, but the plane is real gone.

Then the launching valves are closed, and the exhaust valve is opened to let out the steam remaining in the cylinders. The retraction engine is started, and it sends the grab forward to retract the shuttle and pistons for the next big bird.

More TF-1's are Ordered

Traders Used for Carrier Supply

Grumman Aircraft Engineering Corporation has received a 24-million dollar re-order from the Navy for production of TF-1 *Trader* cargo-passenger planes. Delivery schedule calls for three aircraft per month starting in November 1957. The *Trader* is used largely for ferrying passengers and cargo between carrier and shore.

The original contract, dated 30 September 1952, called for 45 *Traders*.

HIGH OVER THE FLORIDA COUNTRYSIDE, THIS NAVCAD IS BEING TAUGHT PRECISION MANEUVERS BY HIS INSTRUCTOR IN A T-34

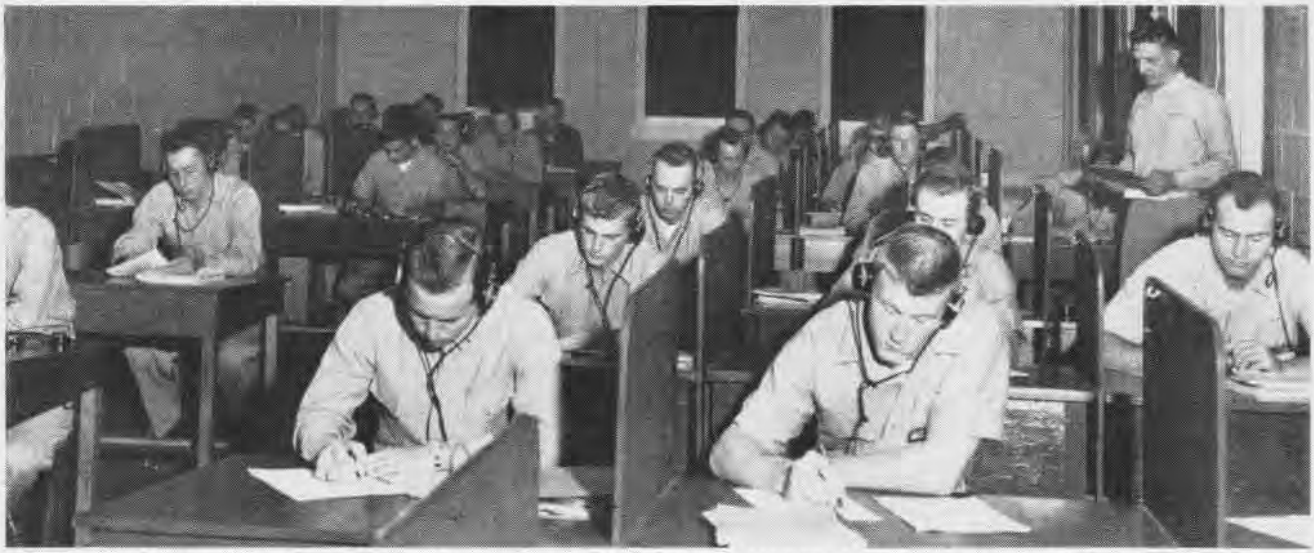
FLIGHT TRAINING FOR JET AGE

A NEW PATTERN for jet age flight training is now emerging at Pensacola. It was no simple task to develop the right kind of program. At times, it seemed to the planners as if they were trying to assemble a jigsaw puzzle with some of the pieces missing, but finally everything began to fit together. Designed to produce a pilot for advanced type aircraft at minimum cost, the new program is the fruit of thoughtful planning and careful preparation.

The transition to a new concept and a new syllabus was carefully prepared.

IBTU INSTRUCTORS TAXI THEIR T-34's OUT FOR TAKEOFF

ALOFT ARE MORE ADVANCED T-28'S IN DIVISION FORMATION



STUDENT AVIATORS PRACTICE SENDING AND RECEIVING CODE IN A SAUFLEY FIELD GROUND TRAINING UNIT CLASS ROOM

Last July, the staff of the Naval Air Basic Training Command completed their work and had in hand a detailed, scheduled plan. They were ready to make it work.

The introduction of the T-34, with its simplified operation, made it feasible to reduce the Primary phase, a step which had been impracticable as long as the SNJ was used. Primary flight instruction, now being integrated with Pre-flight, is truly a Primary or elimination phase. It makes possible the earlier transition of students into a heavier, more demanding trainer, such as the T-28, and eventually, into basic jet trainers.

Student pilots who are being trained for certain types of fleet operations, such as patrol and anti-submarine missions, will continue to fly propeller trainers. It would be unsound and uneconomical to train these students, 44% of the total Basic Training output, in basic jets.

The new syllabus provides for a short T-34 Primary stage for all students. During this period, the primary students make their choice between flying VA/VF aircraft or VP/VS planes.

"Moving Day" or start of the transition to the new syllabus, was 22 October 1956. Target date for its completion is 10 June 1957. At that time, all Primary training, eight weeks in T-34's, will be done at Saufley Field.

Upon the completion of primary training, the students are channeled into two pipelines, as nearly as possible in accordance with their choice. It is planned that approximately 56% of all students will be entering the fighter/attack pipeline for basic jet training.

Those slated for VF/VA will then go to Whiting Field to fly T-28's. Their fighter and attack training will include radio instruments, acrobatics, tactics, navigation, and night flying. After 18 weeks, they will go to Barin Field for five weeks of carrier qualification and gunnery training.

Meanwhile, the VP/VS students will go to Corry Field for 16 weeks. There they will transition into SNJ's and SNB's to be taught precision, tactics, instruments, and night flying.

After this phase, the VP/VS students will also go to Barin Field. For eight weeks, they will get radio instrument and day and night navigation. In addition, the USN students will receive carrier qualification training.

After finishing at Barin Field, the pipeline splits once more, and the VP/VS students proceed to advanced multi-engine training. The VA/VF Cadets move into advanced jet aircraft.

The changing world of jet flight makes it essential to streamline the pilot program with each phase of training coming in orderly procession.

The new syllabus for the Basic Training Command should prove to be an efficient and realistic program. It was designed to make for economy without loss of effectiveness, and to pave the way for introducing jet trainers in the early stages of student instruction.

FORMATION BREAK-UP IS IN THE PRIMARY STUDENT SYLLABUS

SOLO STUDENT PILOTS PRACTICE MANY APPROACHES, LANDINGS

CINCLANT, *Adm. Jerauld Wright, flew out to the USS Saratoga in an A3D to witness readiness training operations. He was greeted by RAdm. R. B. Pirie and Capt. R. J. Strobl, CO.*

Yorktown Gets WW I Vet
Still Going Strong at 61 Years

Campbell G. (Pop) Duncan, Sr., MMR1, reported aboard the USS *Yorktown* ready for anything which might come, despite his 61 years. Duncan is a veteran of World War I and 12 years of naval service.

He began his military career during WW I as a hospital corpsman in the Canadian Army. After four years of service, he was discharged and came to the United States and acquired citizenship. Early in 1943, he joined the Navy, accompanied by his son, Campbell, Jr. They spent their time in the war together in a Seabee Battalion, seeing action at Normandy, Okinawa, among other places.

In 1946, Pop switched to the active Reserve, but was recalled two years later. He helped put the USS *Oriskany* in commission and served aboard her for six and a half years before transferring to the *Yorktown*.

Duncan is a living example of the old motto: "You're only as old as you feel." Duncan plans to ship over again soon.

CDR. J. A. LOVINGTON, *CO of VF-61, congratulates Chief R. G. Blackman on maintenance enabling squadron to fly 478 hours the first month of operation in the F3H-2M.*

WATER TUBE INSTALLATION IN DELAWARE

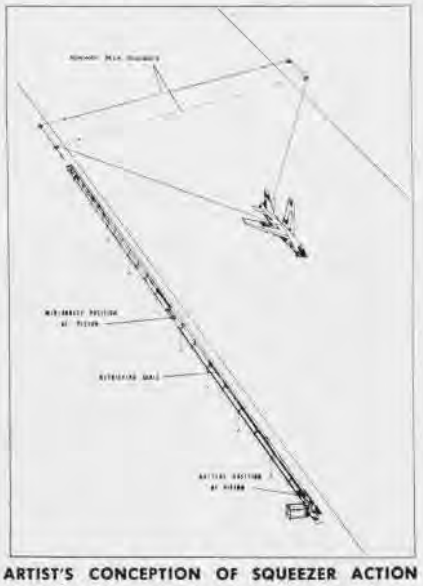
New Field Arresting Gear
Water Squeezer Makes Navy Debut

The Navy has announced the development of a new revolutionary device for arresting aircraft at high engaging speeds. Dubbed the "Water Squeezer," it was developed by the All American Engineering Co., Wilmington, Del., for BuAer.

The new gear is essentially a piston pulled by a cable through a stationary tube of water. Its small moving mass and simplicity promise to provide equipment which will improve speed and weight capabilities of arresting gear for use on aircraft carriers.

Test and evaluation of the equipment is being carried on at the developer's testing grounds at Georgetown, Del. If the tests prove successful and the new gear adopted, the old sight of high speed aircraft landing on airfields, engaging a deck pendant and pulling many fathoms of anchor chain behind them, will become a thing of the past.

The equipment is portable.



ARTIST'S CONCEPTION OF SQUEEZER ACTION

CAPT. THOMAS *B. Payne, CO of the USS Valley Forge, accepts his ship's second consecutive "E" award from RAdm. Allen Smith, Jr., ComCarDiv-16, for high battle efficiency.*

More about FUR Reports
FASRon-117 Simplifies Methods

Filing Failure/Unsatisfactory Reports has been greatly simplified by the planning of Lt. A. P. St. John and E. S. Perry, ADC, of FASRon-117's maintenance office.

A FUR center has been constructed around a post office type table, with all necessary information within arm's reach. An information panel above the table has a sample FUR form with lines running out to blocks which contain instructions for forms.

Removable files are mounted below the center panel. These contain pertinent information about power plants, air frames, electronics, electrical and ordnance systems.

Boxes are attached to the left side of the table to hold a supply of FUR forms, window envelopes, and blue screen tags. An automatic eyeleter is mounted on the desk top. Other equipment includes an FUR log and Navy code of manufacturer's names.

Use of the FUR center has resulted in a more thorough understanding of the system and has reduced errors.

VF-122, *training at NAS Miramar, is the second West Coast squadron to receive the all-weather fighter, F3H-2N Demon. The skipper, Cdr. C. E. Mulligan welcomes the ferry pilots.*

New Type Radar, TV Tubes

One Wrap Covers Many Parts

Covers have been taken off a radically new type of cathode-ray tube for radar, television, and other visual electronic equipment. Called "Wamoscope," this new tube was developed by Sylvania Electric Products Inc., under Naval Research Laboratory contract.

Officially designated as Tube Type 6762, the Wamoscope derives its name from the technical term "wave-modulated oscilloscope." Not exactly an all-in-one tube, it does combine the most essential functions of a microwave receiving set in a single tube envelope, eliminating many of the tubes and components required by conventional receivers.

In operation, microwave signals go directly from the antenna into the Wamoscope tube, where, in this single envelope, the signals are amplified, detected, and displayed on the tube's fluorescent screen.

Dr. Robert M. Page, associate director for electronics at NRL, said of the newly developed tube: "Compared with a conventional radar receiver, this means that the local oscillator, mixer, intermediate frequency amplifier, and their associated circuitry are eliminated."

An important feature Dr. Page cited was the wide selection of channels possible in Tube Type 6762, which operates over a microwave frequency band of 2000 to 4000 megacycles.

The Type 6762 Wamoscope is just under two feet in length, and has a screen diameter of five inches. Sylvania's research director, Dr. R. M. Bowie emphasized, however, that there was no practical limit to the size of the tube face or the type of screen—this will be determined by the application of the tube.

"Initially," Dr. Bowie said, "the Wamoscope will undoubtedly be used in radar and in military closed-circuit television." And he added a prediction for future industrial and commercial applications of this new development in non-military fields.

● The wings of a new U.S. supersonic jet fighter are proportionately thinner than a double-edged razor blade. So sharp are its wing leading edges that they must be covered with rubber "gloves" to prevent ground crews from cutting themselves while the plane is being serviced. A new problem in safety!

Fresh Homemade Apple Pie

Sgt. Takes Delivery in Japan

MRS. VEDA *Harris, mother-in-law of Sgt. J. R. Barnett, cooked pie in California home. He'd written he missed eating her pies.*

COL. A. H. *Weinberger, bound for Iwakuni, agrees to deliver pie while on official trip. He told Mrs. Harris he was glad to do it.*

MOUTH WATERING, *Sgt. Barnett accepts pie in Japan. Col. Weinberger went on to his meeting after his happy mission was done.*

Germans Train at Corry

Will Return Home as Instructors

Among the foreign students assigned to NAAS CORRY FIELD, there are two officers and two cadets from the German Navy. They are Ens. Horst Ludwig, Ens. Bernd Schaefer, Cadets Heinrich Stocks and Lothar Krull. These are among a group of 20, selected to come to the U. S. for flight training.

Ludwig and Schaefer, both graduates of the German Naval Academy, entered the German Navy in 1943. The latter is an escapee from an East German prison. The two cadets entered the Navy in January 1956.

Before completing the flight program, the German students will learn to fly jets. When they return to their homeland, they are slated to instruct in the Naval air arm.

It's a Topnotch Encore

Father, Son Serve on Saratoga

"A family tradition" could well describe the Blaisure family, two of whom are stationed aboard the USS *Saratoga*, CVA-60.

Larry Blaisure, FA, recently reported aboard the *Sara* for duty at Guantanamo Bay, Cuba, and joined his father Chief Machinist Mate Lloyd Blaisure. Chief Blaisure, with 27 years service, is the senior chief aboard the carrier while Larry is very nearly the junior sailor.

The young Blaisure is following in his father's footsteps as "the Chief" hopes he will, as far as a Naval career goes. The elder Blaisure's first duty station was the *Saratoga* (CV-3) of the 1929 era.

Asked if he considered the Navy as a possible career, Larry said "It sounds really good to me."

Outstanding Instructor

Corry Field Names Year's Best

Lt. D. G. Lambert, flight instructor at NAAS CORRY FIELD, was selected as the Outstanding Instructor-of-the-Year at that installation. He was chosen in part for his ability to motivate students, his capacity to give careful and correct instruction, his meticulous attention to details, and his excellent safety record.

Lt. Lambert flew 604 accident-free syllabus hours during the first ten months of 1956, and instructed or checked 132 different students.

RESERVES TRAIN FOR READINESS

TRAINING, earnest, intensive training is the all-essential element in keeping the Naval Air Reserve on its toes. A backlog of manpower, a vital safeguard of national defense, the Reserves must be ready, and *will* be ready whenever the United States needs them.

A LITTLE *bit of "body-english" plus proficient use of the tongue should produce the desired results for Troy Jaramillo, AA, of VF-878, during active duty cruise at NAS Miramar.*

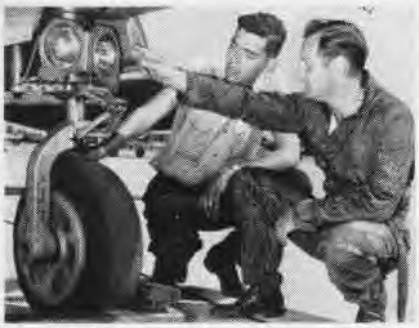
'Warriors' at Miramar

Reservists of VF-878, based at NAS OAKLAND, came through their active duty training cruise at NAS MIRAMAR with flying colors. Cdr. E. M. Wilson, squadron skipper, commended the 25 pilots, four ground officers, and 56 enlisted men for a job well done.

Flying the *Banshee*, pilots piled up 744 jet flight hours, in spite of the fact that the air station was plagued with bad weather during the two-week tour. Using prop planes, the squadron chalked up 90 more hours.

It was a safe cruise, with no accidents or injuries to any personnel.

Almost all pilots qualified in night



LT. RONALD *Ottesen shows features of TV-2 to Vincent Fisher, AA, during Miramar tour.*

section tactics, in dead reckoning navigation at 35,000 feet, leading three ground controlled intercepts at 25,000 feet, and in division and group tactics. The aviators made five GCA's and scored enough instrument time to qualify for their Navy standard instrument card.

Pilots received close air support lectures and training at the Naval Amphibious Base, Coronado, Calif. The course included fighter support of amphibious landing and front line support of the infantry.

A total of 676 ground school hours were logged. Lectures included safety, all-weather instrument flight, navigation, fuel economy and control, engineering, high altitude physiology, proper use of oxygen, simulated jet Link training, ejection seat check-outs, and extensive briefing on latest Russian fighters and bombers.

The enlisted men were not neglected. They received 1058 total hours of supervised aircraft instruction, and

CDR. E. M. WILSON, *commanding officer of VF-878, climbs aboard his F2H-2 Banshee jet.*

4814 hours of in-service training, during their active duty at Miramar.

Scouts at NARTU Jax

NARTU JACKSONVILLE played host to several members of Sea Scout Troop No. 7, from the Jacksonville area.

Receiving the "red carpet" treatment, the scouts were taken on a guided tour of the NARTU area and its training facilities. Highlight of the visit was a flight in an R5D transport.

Rugged Survival Training

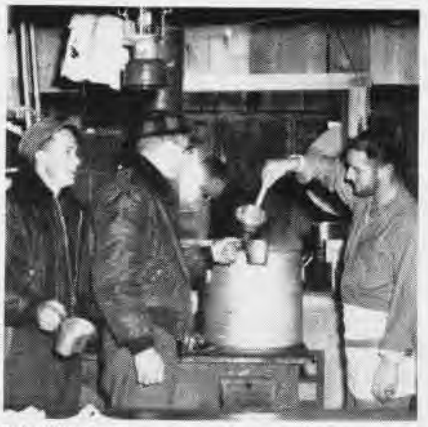
Navy volunteers, based at NARF SPOKANE, took part in maneuvers amid the wilds of the Northwest. They were led by Lt. J. D. Page.

Purpose of the two-week "campout," was to teach the men, by actual practice, the methods of the Naval Emergency Ground Defense Forces.

SEA SCOUTS *from Jacksonville board an R5D Douglas transport for an orientation flight.*

VOLUNTEERS *from NARF Spokane start out on a new day of maneuvers during their two-week long survival training in Northwest woods. Practicing survival techniques in the mountainous terrain, the men will be tired and hungry before pitching camp at the end of the day.*

MEN IN *the field pitch tents and stow gear before they start eating their evening chow.*



THE CREW *eats morning chow at the base camp before departing for day and night maneuvers.*

TWO-MAN *detail gets a supply of fresh water for main camp from a cold mountain stream.*

The men were completely outfitted with survival gear so that they could cope with the mountainous terrain and thick undergrowth they would encounter. They studied, and put into practice map reading, use of small arms, first aid, general survival, and search and rescue tactics.

The crew learned how to guide themselves to a downed aircraft, and how to give first aid to those who need it. They practiced the handling of stretcher cases on the trek back through dense woods to safety. Instruction also included radio procedure and proper handling of equipment. They were orientated in the use of the "walkie-talkie," and utilized the gear in their search and rescue problems.

Although the weatherman gave the men no cooperation and it rained for most of one week, the team won over nature and the elements, and successfully completed its tactical problems.

CAPT. W. A. *Hood, Jr., skipper of NAS New Orleans, presents T2V-1 model to Mr. Garroway.*

TV Star at New Orleans

Dave Garroway of NBC-TV was welcomed aboard NAS NEW ORLEANS by Capt. W. A. Hood, Jr., for an orientation flight to Detroit.

Capt. Hood presented Garroway with a model T2V-1 jet and made him an honorary *Weekend Warrior*. This was followed by a station tour and an explanation of the Naval Air Reserve.

Flying from New Orleans to Pensacola, Garroway boarded an F3D for his hop to Detroit. He returned to New Orleans following the same route.

While commenting on the flight during a coast-to-coast telecast, Garroway stated that the Naval Air Reserve Training Program was top-notch.

IN FOREIGN SKIES

RATO in Reverse

The Royal Norwegian Air Force has developed a special mounting bracket for its F-84G jet aircraft, which makes it possible to use Rocket-Assisted-Take-Off in reverse to check the landing roll.

The use of RATO in such a position allows the F-84G to land on a runway and be completely stopped within 2000 feet. Heretofore the RNAF has had to land its F-84G's at Gardermoen, dismantle them, and truck them to the maintenance depot at Kjeller which has a very short runway (3758 feet). It is now possible for the Air Force to fly all of its F-84G's directly to Kjeller and land without any difficulty whatsoever.

The expense of RATO units is high, but when tallied against the savings in manpower and effort, it is clear that the cost is not impractical.

Lancasters Visit U.S.

Week Tour for Antisub Training

Nine four-engined *Lancaster* patrol planes had a week of duty with Fleet Air Wing 14 at NAS NORTH ISLAND. The veteran aircraft from the Royal Canadian AF base at Comox, British Columbia, devoted their time to antisubmarine training and routine patrols.

Designated the 407th Maritime Patrol Squadron under the command of Wing Commander W. D. Foster, officers and men enjoyed the hospitality of San Diego. Cdr. Foster praised highly supporting units at the air station, speaking in particular of FASRon-110.

Foster said the squadron's tour indicated the ability of the USN and RCAF to conduct their operations using identical tactics and techniques.

CANADIANS CHECK A LANCASTER ENGINE

French Order 90 Cessna's

Cessna Aircraft Company of Wichita, Kansas, has received two contracts from the French government for the purchase of 90 L-19 observation-reconnaissance airplanes.

Dwane L. Wallace, President of Cessna, said that he anticipated some of the aircraft would be used in the North Africa area. Initial deliveries are scheduled to begin at once.

U. S. NAVY'S *Lt. K. F. Herrington, NATO exchange officer, is XO of Canadian Navy's VF-870 at Nova Scotia. Lt. L. J. Veronneau, RCN (1), received some gunnery training at Pensacola from Herrington while earning wings.*

Exercise 'Nimble Bat'

The first Canadian squadron using completely Canadian-designed and built aircraft has arrived in Europe for active service with NATO. The transfer was designated "Operation Nimble Bat."

Pilots, navigators and ground crewmen of 445 Fighter Squadron RCAF were given a big send off by VIP's, including Louis St. Laurent, Canadian Prime Minister, and a flypast of aircraft in brilliant sunshine at Uplands, near Ottawa.

"The CF-100 planes were designed and made in Canada," said Defense Minister Ralph Campney. "The Orenda engines which power the planes were also developed and manufactured in Canada. The squadron is therefore 100% Canadian, men and equipment."

Avro Aircraft, part of A. V. Roe Canada Ltd., built the CF-100 all-weather fighters. Range, with wing-tip tanks, is in excess of 2000 miles and endurance is said to be more than five hours at altitudes of above 45,000 feet. Mach 1 can be exceeded in a shallow dive.

The only stop the squadron made before touching down at Marville in France was at Keflavik, Iceland.

RADM. CLARKE PINS ON COTTON'S WINGS

End of a Program

The last two British pilots to receive their flight training in the United States were presented their "Wings of Gold" at NAS CORPUS CHRISTI. They were Sub-Lieutenants Timothy R. Spencer and Hugh F. Cotton, RN.

Col. E. E. Spencer, Royal Army (Ret.), father of Lt. Spencer and guest of RAdm. R. S. Clarke, Chief of Naval Air Advanced Training, pinned on his son's wings, while Mrs. Henley, wife of Commodore J. C. C. Henley, did the honors for Lt. Cotton. After receiving their British Aviator insignia, Adm. Clarke pinned on the U. S. Navy Wing insignia.

In all, a quota of 298 British student pilots had been trained in this country during the past year.

● In a hundredth of a second, a tiny device, smaller than a man's hand, used in a midget cooling turbine, drops temperatures hundreds of degrees, cooling the volcanic jet engine blast sufficiently for air-conditioning the plane.

MISSILE SHIP COMMISSIONED

MR. NORTON, RADM. W. F. RABORN INSPECT WITH SPERRY MAN

CDR. J. A. DARE, CO, SPERRY REP., AT ANTI-ROLL CONTROL

EXACTLY 181 years after the commissioning of the first ship of the U. S. Navy, a ballistic missile launching ship was put in commission. Like the first one, commissioned by Lt. John Paul Jones on December 3, 1775, the new USS *Compass Island* is a converted merchantman. But there the resemblance ends.

The experimental vessel is being equipped with a fantastic array of navigation instruments. Its mission is to speed evaluation of new aids for precise mid-ocean navigation and to expedite launching of the Fleet ballistic missile.

Key to its all-weather, all-latitude, day-and-night capability is the ship's inertial navigational system. This system, which also includes celestial trackers, is a development of the Special Projects Office of BUORD and Sperry Gyroscope Company. Fundamental investigations and research for the system were performed for the Navy by Dr. Charles S. Draper of MIT. The system determines ship position (latitude and longitude), true North, and the ship's speed. Naval aircraft may soon take advantage of the inertial navigation system.

Assistant SecNav(Air), Mr. Garrison Norton, said at the commissioning of the *Compass Island*: "We know the ballistic trajectory our missile will follow; we know the location of the target. But to achieve success, we must know the location of our launching point to a degree of accuracy never hitherto attained at sea. The dome on the navigation tower resembles a small observatory. That is exactly what it is. The telescope requires no observer, however. Where the human eye would normally play its part, we find instead a photoelectric cell so sensitive that stars become visible to it in daylight."

The telescope sits on a stabilized platform which will remain precisely level, regardless of rolling and pitching of the ship. It will automatically align itself with a star, and the operator will be able to read the bearing and elevation angle to greater accuracy than ever before possible with a sextant.

FINS CAN RETRACT INTO HULL RECESSES

"All this is only the beginning," said Mr. Norton. "Soon the Navy will be testing, in this ship, tracking devices which will be able to see the sun, moon, and a few special stars known as radio stars, by detecting the radio signals given off by these heavenly bodies. Celestial navigation will then be possible even when the sky is entirely covered with clouds. We even expect this ship to be locating its position by taking radar ranges on the moon."

Another innovation *Compass Island* brings to the Navy is the use of Sperry Gyrofin ship stabilizers. They work something like the ailerons of a plane on automatic pilot, when correcting for turbulence. The *Compass Island* will roll less than one-tenth as much as her sister ships in the same seaway. Currently in use for passenger ships, this stabilization is of extreme importance to the launching of missiles. While sister ships may be rolling 15 degrees, *Compass Island* will roll about a degree-and a half. This is accomplished by underwater fins, one on each side, approximately amidships.

Action of the fins is automatically controlled from the bridge by instruments which measure roll rate, roll angle, and roll acceleration. The instruments transmit the required anti-roll signals to hydraulic actuators which operate each fin shaft.

Sperry scientists who have worked on the project will also be aboard during equipment evaluation tests.

HIGH SPEED BOGEY AT 40,000

IN THE SILENT upper reaches of the atmosphere, a tiny aircraft streaks through space at near-sonic speed. Visible only to the electronic "eyes" of radar, the lonely air traveler is deftly guided down a selected track by a man on the ground with a small black box.

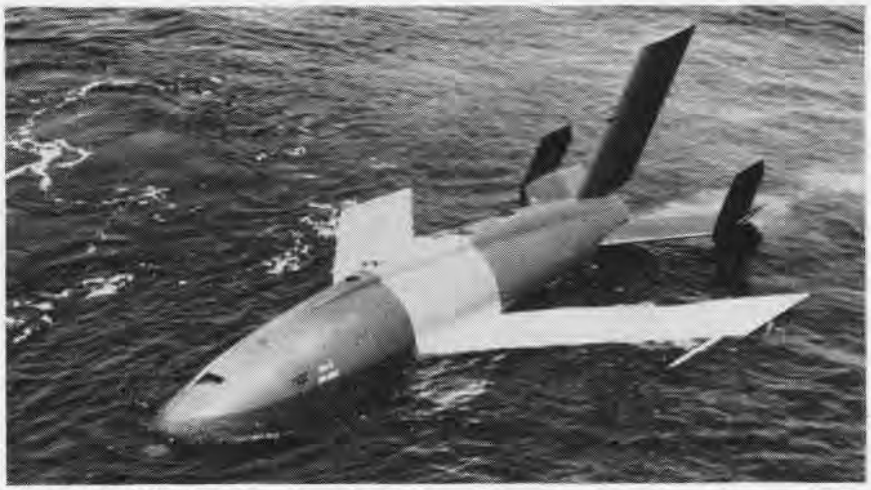
To an observer, the operation appears simple even when the operator commands the uninhabited drone missile to maneuver 150 miles away. Mission for the day—"Bullseye"—is an evaluation of an airborne weapons system. Target: the Ryan *Firebee* jet drone.

The Ground Control Intercept station (GCI) vectors the intercepting fighter aircraft within range of the speeding drone. Its fire control radar "sees" the target and "locks on." The Range Safety Officer carefully scans the surveillance radar to pick up any stray object that may be in the firing range. Clearance is given the fighter to fire its missile.

The airborne radar operator switches to "automatic mode." Within seconds, he reports "missile launched" at the invisible "bullseye." Long seconds pass. At intercept time, the airborne observer reports a "near miss." The missile continues on to self-destruction. At point of closest approach, the missile was so near to the target drone that a "kill" is scored. The mission is completed.

Because of its small size in relation to the aircraft which it simulates, the fast "bullseye" has escaped destruction this time. The ground operator maneuvers the drone to the recovery area. The automatic parachute system lowers it safely to the ground where it will be picked up to fly again.

In its current operational status, the Ryan *Firebee* turbojet drone missile has taken its place as a precision tool in the building of accurate, reliable weapons systems of the future and the training of personnel in the use of present weapons. The regularity and reliability of the many missions performed by the *Firebee* veil the complexities of the systems it contains and the time and effort spent in its development. The design, fabrication, wind tunnel test and static test of the airframe were major tasks. Similarly, selection, installation and ground test of the power plant provided a singular challenge. But the systems unique to this type of aircraft account for a majority of the time spent in arriving at its present operational state.



SINCE THE NAVY *KDA-1 version of the Firebee will see extensive use over water, special flotation devices were incorporated in this model to insure recovery after parachuting into sea.*

Parachute recovery of the 1800-pound "bird" required many months of individual flight tests using dummy "bombs" to simulate the drone's weight. The command system took years of patient development work before it became ready to "fly."

The *Firebee's* automatic stabilization and control system permits the *Firebee* to maintain stable flight and to follow the commands of the remote control operator.

PROVISIONS are incorporated in the airborne part of the control system to receive and decode command control signals by means of a radar control receiver and decoder unit. In some applications, the transmitter is a conventional radio type, employing frequency modulation. These command control signals actuate the control surfaces through the autopilot and control engine throttle setting to accomplish flight maneuvers.

In the drone, the command is received, de-modulated, and decoded. Thus the on-off switch function at the remote station is repeated by the on-off operation of a relay in the drone. The limited intelligence of the on-off switch function is transformed to give the desired drone maneuver. These maneuvers are initiated manually at the remote control box which is provided with the necessary control stick and momentary switches, and is capable of flying the drone on a predetermined flight path. The guidance loop is closed by means of a radar plotting board which gives a continuous display of plan-position and altitude of the drone.

The flight stabilization or autopilot system accepts the remote signals from the radar control receiver and decoder unit to perform maneuvers commanded by the remote operator. In some applications, a telemetering data link is provided to give the remote operator indications of selected aerodynamic and engine variables.

Stabilization and control of the drone in flight is accomplished through the three conventional control axes, i.e., ailerons for roll, elevators for pitch, and rudder for sideslip. Automatic stabilization is provided about the roll and pitch axes. The sideslip or rudder trim control is commanded at the discretion of the remote operator. The autopilot system is so designed that in the absence of command signals from the remote control station, any disturbances which cause deviations from a stable attitude, or from the

commanded altitude, produce error signals in the autopilot data system.

Roll and pitch attitude error signals are provided by a gravity-erected vertical gyro. Rate signals for damping in roll are provided by a rate gyro. Altitude error signals are provided by a barometric altitude controller. Signals from the gyros and altitude controller are mixed with control surface positioning signals in their respective axes. The combined signals are amplified through roll and pitch amplifiers whose outputs actuate aileron and/or elevator servos. The servos position the control surfaces to stabilize the target in accordance with the flight path chosen by the remote control operator.

The functions of the autopilot and remote control system are best illustrated by a typical mission. After release from the mother plane, approximately five seconds is allowed for the drone to pick up sufficient flying speed and to damp out initial launch disturbances. The remote operator then transmits a "straight and level" command. In the drone, the altitude controller is automatically engaged and will function until a "climb" or a "dive" command is received.

In the drone, the "climb" signal is used to actuate a motor, which in turn drives a potentiometer. The potentiometer is in the pitch data system containing the vertical gyro and introduces an "error" voltage. Balance in the data system is achieved when the drone assumes the commanded pitch attitude. During climbs, the altitude controller is rendered inactive. After a climb of approximately 10,000 feet, a turn is made to keep the drone within required range boundaries. Prior to transmitting a "turn" command, the remote operator commands "straight and level." This allows the drone to level out and regain airspeed lost during the climb. The motor-driven potentiometer is automatically returned to center, and the altitude controller is engaged.

A "left turn" command is transmitted by momentarily holding the control stick to the left. In the drone, the left turn relay is locked electrically through the "climb," "dive," and "straight and level" relays. In the event that the pilot does not command "straight and level" before the turn, the altitude controller will be automatically engaged.

The angle of bank is pre-set to result in 45 degrees at altitudes below 30,000 feet and 30 degrees above 30,000 feet. An additional control is provided by which the remote operator may override the 30 degree bank and obtain 45 degrees when necessary. The bank angle is normally selected automatically by a barometric switch in the drone. The turn will continue until a "straight and level," "climb," or "dive" command is given. A "dive" command creates functions in the drone similar to those described for "climb" but in the opposite direction.

Through a series of such maneuvers, the drone can be directed over any selected track up to the present operating ceiling of 40,000 feet. And it can be done with the regularity and reliability demanded by the fast growing family of guided missiles now in service or being developed.

ONE BASIC design philosophy, which guided the latter stages of development of the autopilot system, was the use of high autopilot gains. High gains mean large control deflections for small angular and altitude errors of the drone and, hence, greater accuracy in flight control. For example, it was found that with "tight" control about the roll axis, it was possible to eliminate automatic control of the rudder with attendant reduction in overall system complexity and cost. Since the *Firebee* can be recovered by parachute for re-use, a "tight" control system means reliable control and stabilization for flights despite the sizable airframe misalignments which can occur as a result of ground and water landings. Larger tolerances in airframe alignment also cut costs and simplify production.

The *Firebee* stabilization system of today has proved to be operationally suitable, as evidenced by the high flight frequency of the drones. But the struggle goes on for more capabilities, greater speed and higher altitude. New improvements are being flight tested to give the *Firebee* a 50,000-foot ceiling capability and greater maneuverability. A realistic target to test missile systems is invaluable in the jet age.

JUST BEFORE *a Firebee mission, the autopilot system is given a complete functional check while drone is attached to the parent aircraft.*

AN EMPLOYEE *of Ryan Aeronautical Company hoists a KDA-1 into position on the wing rack of a JD-1 launch plane at NAMTC Pt. Mugu.*

PHOTO PRINTER 'READS' NEGATIVES

THE BEST photographer cannot get good pictures all the time. And in aerial photography, so important to military intelligence, haze, cloud shadows, and other uncontrollable elements, often cause light and dark spots on a negative. Much detail is lost through these factors.

BUAER has finished evaluation of an automatic-dodging photographic printer which controls weakness in a negative electronically. Called the Log-Etronic printer, it uses as a light source, a cathode ray tube similar to that used in television, oscilloscopes, or radar. In such a tube, fluorescent material bombarded by a beam of electrons acts as a point source of blue light. The light point is moved across the face of the tube by electronic sweep generators so as to trace out a rectangular pattern, called a raster, of light.

The raster is projected to the negative, where the spot of light itself is one-half inch in diameter. The light of the raster penetrates both negative and paper to some degree, and a multiplier phototube measures the density of the negative at the position of the spot of light. This information is fed back to the cathode ray tube, which automatically brightens the spot for dense portions of the negative, and dims it for thin portions.

UNDODGED *print (right) of an original negative shows under-exposure in background, over-exposure in foreground. It should be noted all detail tends to be lost in the foliage.*

DODGED *contact print of the same negative has the background exposure in proportion to the foreground. Use of the LogEtronic printer brings out detail in foliage and ripples in water.*

Two models of the LogEtronic printer were evaluated. The second, improved model features an automatic roll paper transport. It will accept negatives up to 14 x 18 inches, as compared to a ten-by-ten inch limit on the earlier model. The controls were improved, and the roll paper accessory allows quantity production, where multiple prints from the same negative are required. In addition, the roll paper permits processing on continuous, auto-processing machines.

LET'S LOOK AT THE RECORD

VF-73 Makes Fine Record
Returns from Guantanamo Training

The six-week gunnery deployment of VF-73 and its *Furies* at Guantanamo Bay was highly successful. Led by Cdr. W. J. Ruefle, the squadron has returned to NAS QUONSET POINT.

During the training period, all of VF-73 pilots qualified in air-to-air gunnery and field carrier landings. In addition to qualifying at both 15,000 and 25,000 feet, many of the pilots earned "E's" in the Atlantic Fleet Competitive Exercises at Leeward Point.

Average aircraft availability was 88 percent. Over 1300 flight hours were logged for the six-week period.

Unit's 15,000th GCA Run
Made By Air Force Plane at Naples

GCA Unit number 23, attached to U. S. Naval Air Facility, Capodichino Airport, Naples, Italy, went over the 15,000 run marker in November. An Air Force officer, Capt. S. D. Deffendall, made the scoring run in a C-47.

GCA Unit 23, commissioned at NAS COLUMBUS, Ohio, was moved to Naples late in 1951. O-in-C of the Unit is Lt. G. L. Lamere. Final controller for the run was AC1 R. D. Ginn.

Tracker Endurance Flight
VS-30 Pilots Believe Record Set

Two pilots of VS-30 believe they have set an endurance record for the S2F *Tracker*. Airborne shortly after sunrise, Ltjgs. Robert Zapalac and Curtis Miller watched the evening sun go down before bringing their plane in for a landing. They had been airborne ten hours and six minutes without refueling.

Lt. Miller estimated that he and Zapalac had covered about 1200 miles during the flight. Squadron leaders gave permission for the experimental flight, believing it would demonstrate to all pilots in the squadron, that the S2F could, if handled properly, stay in the air a long time.

The flight was made in a standard squadron aircraft, with a normal gas load. Routine operational flights are much shorter, but the capability of long endurance was ably proved.

MILLER AND ZAPALAC SMILE AT SUCCESS

Perfect Safety for CVE
Thirteen Months Accident-Free

The USS *Siboney*, CVE-112, has a perfect record for 13 months without an aircraft accident. During the period, S2F and helicopter operations by Navy and Marine pilots from ten different squadrons took place. Evaluation of new types of aircraft, and carrier qualifications by new pilots were followed by ASW and Marine airlift operations.

Siboney pilots have ranged the seas from Boston to the Caribbean, and from Panama to Turkey. Hundreds of troops and tons of equipment were airlifted in day and night operations. The HSS-1 and HOK-1 were pushed to the maximum during evaluation.

In spite of whirling blades and props, no pilots, crewmen, troops, or flight deck personnel were injured. All aircraft returned safely, including the shore-based *Siboney* SNB.

During the period, which ended with the ship being inactivated at the Philadelphia Navy Yard, Capt. R. B. Moore was in command. He now commands the largest carrier, *Saratoga*.

SAFEST FLIGHT DECK, THE USS SIBONEY

ATU-102 Safe Hours Mark
Accident-Free Training Record

NAAS KINGSVILLE's ATU-102 has again set an accident-free training hours mark for other squadrons to shoot for. In just 120 days, officers and men completed 10,000 hours of flying without an aircraft accident.

Normally, the squadron flies over 100 hours a day, including night flying and actual instrument weather hops. On weekends, cross-country training flights are made to military fields all over the country.

A similar accomplishment was made by ATU-102 last year, when in a little over six months, the unit flew 14,000 accident-free hours. Cdr. R. Linwick, Jr., was O-in-C of the unit during the period of the 10,000-hour record.

LCDR. DIGIUSTO CONGRATULATES JONES

2,000th 'Copter Landing
John Paul Jones Scores on Boxer

A famous name re-entered naval annals when Ltjg. John Paul Jones, of HS-4, landed his Sikorsky HSS-1 on the USS *Boxer* (CVS-21).

The landing was noteworthy in that it was the 2,000th helicopter landing on that attack carrier. Co-pilot on the flight was LCdr. Patrick J. King.

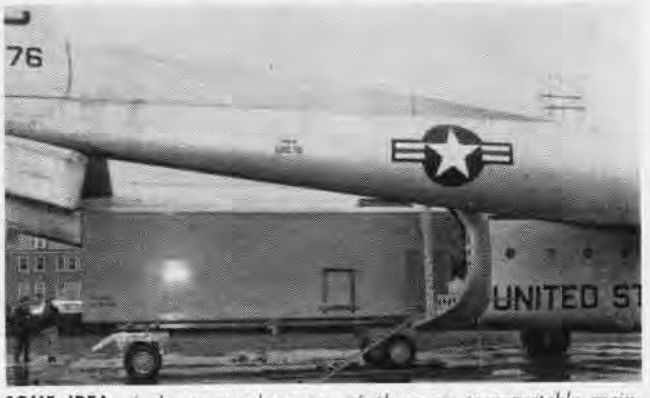
GCA Approaches Totalled
Units Scattered Over the World

The U. S. Navy and U. S. Marine Corps have 55 Ground Control Approach Units and seven tactical control units scattered all over the world.

From November 1955 to November 1956, 281,484 practice approaches were made by Naval and Marine aircraft, and 37,054 under actual IFR conditions.

AIRBORNE SHOPS FOR ADVANCED BASES

AIRBORNE SHOPS *are being carefully and efficiently unloaded in first trials of shipping special units in Navy R4Q transport aircraft.*



SOME IDEA *of the tremendous size of these air transportable maintenance units is gained by studying loading operation into an R4Q.*

LIFE IS ROUGH at an advanced base of operations. Seabees can rip out an airstrip in jungles, snow and ice, or desert sands. Building operations huts, living quarters, and sketchy shelters for routine aircraft maintenance work is usually no problem. But when delicate, precision work needs to be done, an advanced base just does not have the facilities.

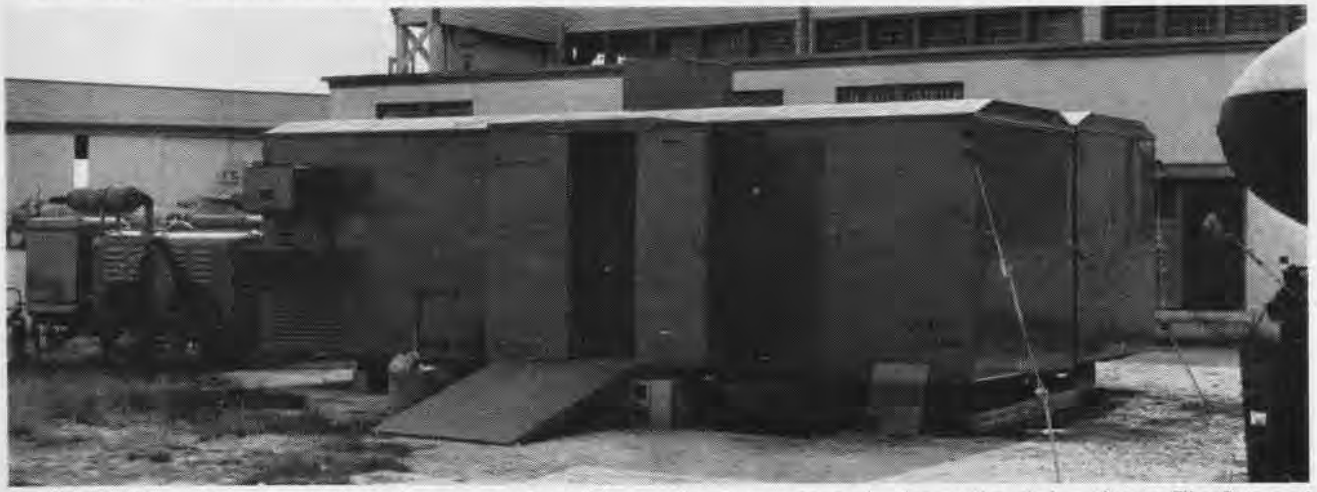
The need for a controlled atmosphere in which to repair or maintain equipment such as bomb director sets with the extremely high tolerances required in their parts, was apparent years ago. It was impractical, expensive, and slow to crate the sights and ship them to repair facilities. Yet a bomber lacking the equipment to do its job was next to useless.

The answer was clear. Carry air-transportable, controlled atmosphere, to the advanced base. BUAER went to work on the problem. A bomb director set is sizable, awkward to dismantle, difficult to handle. An air-tight room, small enough to fit into a transport plane, large enough to contain fire control equipment and working space, sturdy enough to be durable and light enough to be transported by air, had to be designed. Power units also had to be incorporated.

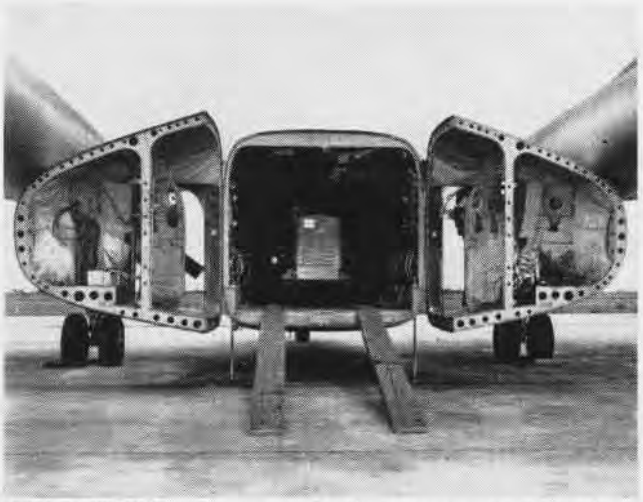
As is the case with almost all of BUAER purchases, once this was established and the requirement fully described, a request for bids was issued. Two complete transportable maintenance units have been completed and delivered by the Fred S. Gichner Iron Works, Inc., of Washington, D. C.

Each air transportable unit consists of two box-like shops, each with its collapsible dolly and power unit. A unit is carried in three R4Q's. Two of the planes each carry a shop and its collapsible dolly, while the third carries the two power units. The load for each plane is approximately 10,000 pounds. The shops are installed at the advance base side-by-side. A bellows connecting the shops permits movement by the men and equipment from one to the other without losing the conditioned air. Entrance from the outside is effected through an airlock. Power units are stationed near one end of the shops.

Loading and unloading of the air-transportable shops is no small task itself. However, when certain changes are made, it will probably take, normally, about an hour and a half, without overstraining men or gear.



THE COMPLETED *establishment of the trailers at an advanced base makes it possible for intricate and delicate work on highly complex instruments to be done under ideal conditions. The Bureau of Aeronautics believes that airborne units will meet special problems.*



ONCE A SERVICE *power unit is in place, it appears easy to do it, but actually crews must be trained to handle such units easily.*

GETTING *the maintenance service unit in place requires careful coordination of many men as they move it up the ramps in the plane.*

UNLOADING *the power unit must be done meticulously and brakes are used as the unit comes down when handlers signal a need to slow it.*

THIS GIVES *an excellent view of one of the dollies. Here it is folded up so that it can be carried in the space for it on the R4Q.*

THE COLLAPSIBLE *dolly is loaded into the airplane by a fork lift as men look on. A place for everything and everything in its place!*

THE JOB *of loading complete, the men are satisfied the load the R4Q carries will go swiftly and safely to its distant destination.*

NRL Develops Transmitter

To be Used with Earth Satellite

A tiny transmitter has been developed at the Naval Research Laboratory. It will be used in sending signals from an earth satellite to radio tracking stations located on the ground. The satellite will be launched sometime during the International Geophysical Year.

The Minitrack transmitter weighs only 13 ounces. It has a 10 milliwatt output and operates on a fixed frequency of 108 megacycles.

Numerous tests are being conducted with the transmitter at NRL to see how the gear will operate under all kinds of adverse conditions. The satellite is expected to orbit the earth at altitudes from 200 to 1500 miles.

The over-all research, development, and launching of the satellite has been given the name, *Project Vanguard*. Development of the earth satellite is the responsibility of the Navy. July 1, 1957 to December 31, 1958 is the International Geophysical Year.

Alameda Disassembles A4D

FIRM Program Underway at O&R

NAS Alameda's O&R Department has started disassembly of the A4D *Skyhawk*, under provisions of the fleet introductory replacement model aircraft plan (FIRM).

The plan is designed to facilitate adequate parts provisioning of new type aircraft released to Fleet units, and to provide complete provisioning of small parts for aircraft overhaul. FIRM covers a period from the first contractor trials of any new plane to its introduction to the Fleet.

Thomas Canty, O&R A4D project planner, said the operation of disassembly, provisioning review and reassembly will take about 160 days.

IFR-IQ?

With reference to navigational equipment in his aircraft, what must a Navy pilot indicate under "Remarks" on an IFR flight plan?

Answer on page 40.

'Jim Dandy' at Lakehurst

Aids in Teaching Added Course

Numerous changes and additions have been made in the last year at the Parachute Rigger School, NAS LAKEHURST. Most notable is the course in the maintenance and repair of full pressure suits.

This suit, designed to protect pilots and crewmen at high altitude, is a complicated piece of equipment which air-conditions the wearer and gives him 100% oxygen in the face piece only. In an emergency, the suit is pressurized with air.

Since no instruments existed to test various controls, regulators and valves on the suit, instructors rolled up their sleeves and constructed a device they called the "Jim Dandy." But the great bulk and high cost of the tester made it impractical since the "Jim Dandy" would be required in every oxygen shop in the Navy.

With the technical assistance of engineers in the Air Crew Equipment Laboratory in Philadelphia, two instructors succeeded in simplifying the testing equipment. TSgt. R. D. Willadson and J. R. Mehelich, PR1, used an oxygen regulator test stand, standard equipment in every oxygen shop, and modified it with a few comparatively inexpensive items. The resulting test device for full pressure suits does not impair other uses of the test stand.

It is estimated that the personnel of any oxygen shop can make the modification in 15 to 18 hours for $125.

Pre-fab Hangars Ordered

Mass-Produced and Standardized

BUDOCKS has awarded a new contract for mass-produced, standardized hangars. The same type of hangars have been produced for the Navy by their designers, Luria Engineering Co., since 1953.

Each hangar covers almost an acre of ground. It is 122 feet wide and 242 feet long, and has a 20 x 200 feet lean-to on each side. The gable roof is 55 feet high at the ridge, sloping down to 38 feet at the eaves.

Along the outer wall of each lean-to are 38 windows glazed with unbreakable plastic panels. Sliding doors at each end of the hangar expedite aircraft movement.

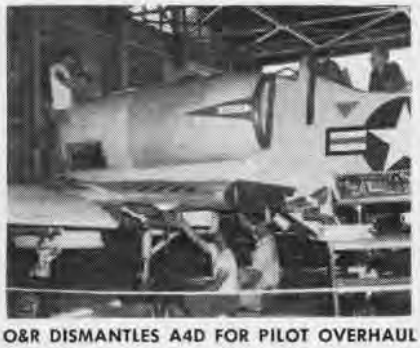
Norfolk Training Device

Simulates Special Weapons Loading

Two stricken AJ-2 aircraft were diverted from a trip to the salvage yard at Norfolk and converted by O&R to mobile special weapons loading training devices.

At a nominal cost, the planes have been restored to service as mobile classrooms for use in training squadron and shipboard personnel in the handling and loading of stores carried in the bomb bay. A fully operative ordnance and electrical system with latest service changes incorporated is provided in the devices to simulate actual operation of their flying counterpart.

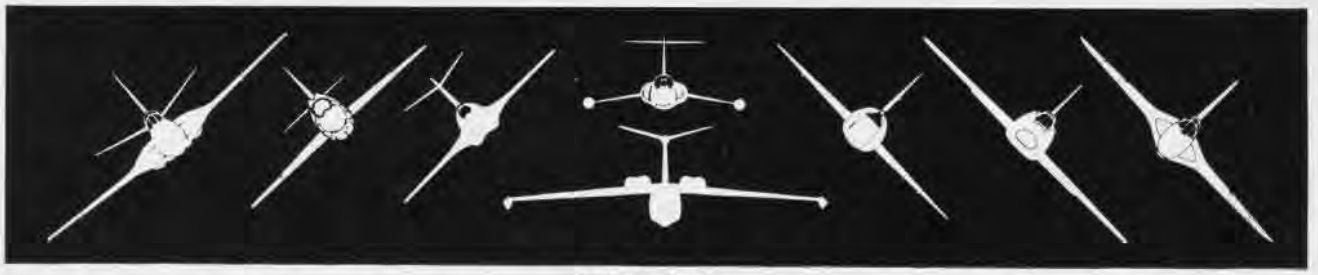
The trainers have been assigned to FAETULant, where they will be part of the activity's training equipment.



O&R DISMANTLES A4D FOR PILOT OVERHAUL

DESIGNERS TEST SUIT ON 'GUINEA PIG'

SPECIAL WEAPONS LOADING TRAINER USED



● F2H-3 Banshee ● F3H Demon ● F-101 Voodoo ● F-104 Starfighter P6M Seamaster ● F-102 Machete ● F-100 Super Sabre ● F4D Skyray ●

MASTER LIST OF MILITARY AIRCRAFT

NAME	AIR FORCE	ARMY	NAVY	MANUFACTURER
Fury			FJ	N. American
Globemaster	C-74-124			Douglas
Goose	OA-9		JRF	Grumman
Grasshopper	L-4, 0-59		NE	Piper
Grasshopper	L-3, 0-58			Aeronca
Grasshopper	L-2, 0-57			Taylorcraft
Guardian			AF-2W-2S	Grumman
Gunner	AT-21			Fairchild
Harpoon			PV-2	Lockheed
Harvard (Br.)	AT-6		SNJ	N. American
Hellcat			F6F	Grumman
Helldiver	A-25		SB2C, SBF, SBW	Curtiss
Hercules	C-130			Lockheed
Hornet		YH-32	HOE-1	Hiller
Hoverfly	R-4		HNS-1	Sikorsky
Hudson	A-29, C-63, AT-18		PBO	Lockheed
Hustler	B-58			Convair
Invader	B-26 (formerly A-26)			Douglas
Jaguar			F10F	Grumman
Kansan	AT-11		SNB	Beech
Kaydet	PT-13-17-18-27		N2S	Boeing
Kingcobra	F-63			Bell
Kingfisher			OS2U, OS2N	Vought-Sikorsky
Kittyhawk (Br.)	F-40			Curtiss
Lancer	F-43			Republic
Liberator	B-24, C-87-109		RY, PB4Y-1	Cons. Vultee
Liftmaster	C-118A		R6D	Douglas
Lightning	F-38			Lockheed
Lodestar	C-56-57-60		R5O	Lockheed
Marauder	B-26, AT-23, TB-26		JM	Martin
Mariner			PBM	Martin
Marlin			P5M	Martin
Mars			JRM	Martin
Mauler			AM	Martin
Mentor	T-34A		T-34B	Beech
Mercator			P4M	Martin
Mitchell	B-25		PBJ	N. American
Mustang	A-36, F-51			N. American
Navigator	AT-7		SNB	Beech
Neptune			P2V	Lockheed
Nightingale			GH	Howard
Norseman	C-64		JA	Norduyn
Owl	O-52			Curtiss
Packet	C-82-119			Fairchild
Panther			F9F-2-5	Grumman
Phantom			FH	McDonnell
Pirate			F6U	Chance Vought
Privateer			PB4Y-2	Cons. Vultee
Provider	C-123			Fairchild
Raider	C-125			Northrop
Recruit	PT-21-22		NR	Ryan
Reliant	AT-19			Cons. Vultee
Reporter	F-15 (F-61)			Northrop
Rescuer			HRP	Vertol
Retriever			HUP	Vertol
Sabre	F-86			N. American
Samaritan	C-131A			Cons. Vultee
Savage			AJ-1	N. American
Scorpion	F-89			Northrop
Scout	L-15	L-15		Boeing
Sea Dart			F2Y	Cons. Vultee
Sea Hawk			SC	Curtiss
Seamaster			P6M-1	Martin
Seamew			SO3C	Curtiss
Seastar			T2V	Lockheed
Seawolf			TBY	Cons. Vultee
Sentinel	L-5	L-5		Cons. Vultee
Shooting Star	F-80, T-33		TV	Lockheed
Sky Hawk			A4D	Douglas
Sky Lancer			F5D	Douglas

LETTERS

SIRS:

In your October issue, on page 19, the caption beneath the picture of the *Panther* states that it is an F9F-6. Has maintenance erred in a wing replacement, or is it just a simple misprint?

EARL S. BATES, ENS.

¶ Those "boo-boos" do creep in, don't they? Wish we had a sharp-eyed ensign in the office to read galley proofs.

Disabled B-26 is Landed

Chemical Foam used on Runway

Test Pilot Thomas Tate and a flight engineer from the Fairchild Aircraft Corporation, St. Augustine, caused some excitement at NAS JACKSONVILLE when they circled the station in a B-26 for four hours with the plane's nose landing gear jammed.

Tate finally came in for a safe landing on the plane's two landing wheels. The B-26 nosed over into about six inches of chemical foam that Navy crews had spread over 2000 feet of runway.

No one was injured and the plane incurred only minimum damage. The twin-engined attack bomber is now in custody of Operations, awaiting claim by the Air Force.

The foam technique, which prevents fire and eases the skid, is out of the experimental status and has now become SOP in emergency landings.

LCDR. O. R. TOON, *BTG-3N Safety Officer, accepts CNABaTra monthly safety award presented by Cdr. Delatour for the Group's 12,872 accident-free hours flown at NAAS Whiting.*

JON ENJOYED GETTING PILOT'S HARD HAT

Special Flight is Made

Leukemia Victim Helped by Pilots

Up and beyond the tinsel and Christmas lights of Oakland, three Navy jets roared through the night as a dying boy watched. The pilots did it for him.

Jon Susmann, stricken with leukemia, did not live to celebrate Christmas. One of his last pre-Christmas gifts was a Navy "hard hat" from CAG-19 of NAS ALAMEDA. Jon enjoyed the visit of the "fellows who flew over" as he watched from the darkened hospital room.

The aviators, Ltjg. John Stevenson, Ens. D. C. Fitzgerald, and Ens. Mark Noble heard about Jon from his nurses. Because Jon dreamed of being an aeronautical engineer, the pilots tried to make it up to him by bringing aviation to him.

The last week of Jon's life, they sat on the edge of his bed, dog-fighting with their hands, explaining the latest flying techniques and telling him about Navy aviation.

"We didn't do much," they said. "We wish we could have done more."

IFR-IQ?

According to OpNav Air Traffic Control Procedures Section, pilots must indicate under "Remarks" when receivers necessary for utilization of marker beacons and low frequency homers are inoperative or not installed in their aircraft.

Ref: OpNav Instruction 3720.2.

CONTENTS

● **COVER**

The Super Constellations of VW-2, Early Warning Squadron at Patuxent River, present a striking pattern against the fleecy clouds. With their electronic eyes, they extend by thousands of miles the perimeter of defense of the United States.

● **SUBSCRIPTIONS**

Naval Aviation News is now available on subscription for a $2.25 check or money order made payable to Superintendent of Documents, Government Printing Office, Washington 25, D. C.

● **THE STAFF**

Cdr. Bart J. Slattery, Jr.
Head, Aviation Periodicals Office

Cdr. William A. Kinsley
Editor

Izetta Winter Robb
Managing Editor

Lt. Moriece Gleason
James K. Ready, JO3
Associate Editors

James M. Springer
Art Director

E. L. Barker
LCdr. Warren E. Johnston
Contributing Editors

Jan C. Burns
Editorial Assistant

● Printing of this publication has been approved by the Director of the Bureau of the Budget, 12 April 1955.

NAVAL AVIATION NEWS

Published monthly by Chief of Naval Operations and Bureau of Aeronautics to disseminate safety, training, maintenance, and technical data. Address communications to Naval Aviation News, Op-05A5, Navy Department, Washington 25, D. C. Office located in room 5E573 Pentagon; Telephone extensions 73685 and 73515.

SQUADRON INSIGNIA

THE POTENTIAL of Electronic Countermeasures Squadron One is illustrated by the bat atop the world. 'Blind as a Bat' doesn't apply here, since the science of electronics provides a far-seeing eye. Guided Missile Group Two, at Chincoteague displays a horned death's head, symbolizing its mission of death and destruction to enemies as the end result of its training. VA-76 chose emblems of the 'Minute Men' to show its readiness to fight against any odds. At MCAF Santa Ana, Marine Helicopter Transport Squadron 363 sports world-circling helicopter rotors super-imposed on an atomic blast rising from the sea, to dramatize its special role.

ECMRon-1

GMGru-2

VA-76

HMR-363

LIVE MODERN-KEEP SHARP

NAVAL AVIATION NEWS

JOIN THE NAVAL AIR RESERVE! Keep up with modern developments in your nation's defense. Never in all history has technological knowledge advanced so fast and effectively. In the Naval Air Reserve you have an opportunity to observe and take part in these advances. You will be helping your country by keeping ready, and yourself by adding to your income. One weekend each month and two weeks each year is not too much time to devote to keeping your country free. And you will be building a legacy of retirement income. Go to the nearest Air Reserve activity.