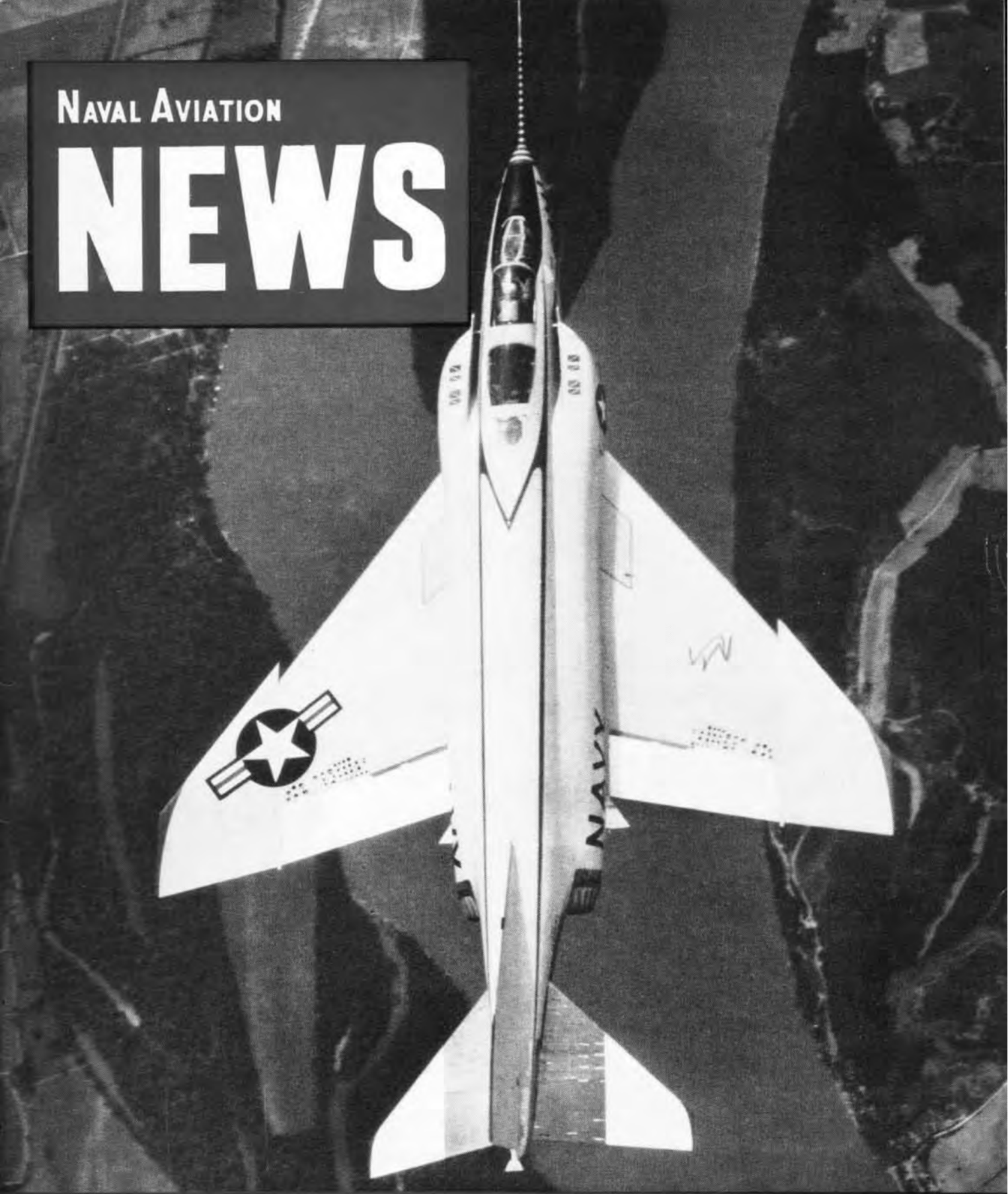
NAVAL AVIATION NEWS



40th Year of Publication

APRIL 1959

NavAer No. 00-75P-3

U. S. MARINE MISSILEMEN

Marine Missilemen of GMTU, stationed at China Lake since 1950, are charged with wringing out all missiles which interest the Corps. Here they launch and monitor the flight of twin-mounted *Terriers*, their principal occupation.

NAVAL AVIATION NEWS

OUR FORTIETH YEAR OF CONTINUOUS PUBLICATION, APRIL 1959

Weather Awards Planned

Four Meteorology Fields Covered

A Naval Weather Service Awards program has been established by the Secretary of the Navy to give recognition to commands demonstrating outstanding services in four fields of meteorology. The fields are surface observations, upper air observations, general performance, and improvement in Naval weather services.

The improvement award may be awarded to a command or an individual.

The Office of the Chief of Naval Operations will soon issue rules and regulations concerning the awards which will be named the Excellence in Surface Observations Award, Excellence in Upper-Air Observation Award, Outstanding Performance Award, and Outstanding Contribution Award.

It is anticipated that annual presentation of the awards will be made in the fall to cover each fiscal year.

Airman Gets VIP Routine

'Savage Sons' Show Appreciation

A non-rated cook has been accorded VIP treatment by members of Heavy Attack Squadron Five.

Cdr. I. M. Rowell, Jr., squadron commander, had just led a flight of three A3D *Skywarriors* back to the USS *Forrestal* in the Mediterranean. As the plane taxied forward on the flight deck it was surrounded by photographers and a reception committee.

When the jet engines stopped, Cdr. Rowell and his crew members, Ltjg. George Kaseote and Eugene Zak, AT1, stepped from the aircraft. But it was the fourth man in the plane that the photographers were waiting for; Robert Vincent, a 19-year-old Airman.

It was *Savage Sons* Appreciation Day, declared in special recognition of the men in the squadron whose work is far removed from the actual flying of aircraft but still very necessary to the successful accomplishment of the squadron's flight operations. Vincent operates the flight crew galley where coffee, soup or chile may be obtained by the pilots and crew members for long hours of flight.

VINCENT (C) ENJOYS VIP COFFEE BREAK

After the plane ride, Vincent proceeded across a red carpet into the island structure and down the Admiral's Ladder to the squadron ready room where he was given the seat of honor.

Cdr. Rowell then presented him with a special squadron certificate usually reserved for dignitaries and expressed his appreciation of the more than 300 men symbolized by Vincent.

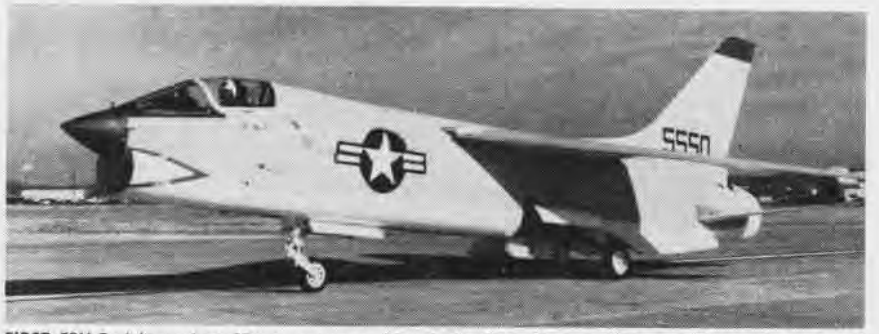
MACS-9 Stars in Exercise

Unit Practices Air Defense Role

As part of a training exercise, Marine Air Control Squadron 9 of MCAS El Toro assumed operational control of the 864th Air Control and Warning Squadron, USAF, stationed at Yuma, Arizona. The simulated emergency replacement, a first in Air Defense Control procedure, was designed to test MACS-9's ability to serve as an emergency unit of the Air Defense Command. During the nine hours of the problem, the squadron underwent a three-hour combat exercise supplying intruder information to the Air Defense Command.

BGen. P. M. Spicer, USAF, Commanding General of the 27th Air Division, in commending MACS-9 for its performance, stated that MACS-9 had justified expectations.

MGen. T. G. Ennis is Commanding General of the Third Marine Air Wing.



FIRST F8U-2 *delivered to Navy arrives at Naval Air Test Center, Patuxent River where it will be given further testing. Crusader was flown by Lt. J. J. Chambers. Two long ventral fins below rear fuselage and twin airscoops atop tailpipe are main external recognition features. Still another version of the Chance Vought supersonic, carrier-based fighter, the F8U-2N has been ordered by the Navy for limited all-weather and night operations.* *(See story, page 3.)*

FLYING MORE THAN 100 *North Atlantic Barrier Missions in the past two and a half years, these members of Airborne Early Warning Squadron Fifteen have each logged more than 1400 hours of flight time. Separation from their families, the erratic working hours and the notoriously poor weather conditions are but a few disadvantages of the job they do. From left, rear: Ltjgs. R. L. Scharinger, M. K. Leach, N. A. Rao, J. L. Lightsey, Edward Levine; front: J. A. Walsh, Ralph Wood, H. J. Luning, W. D. Ferebee. Officers with the same record not shown are: Ltjgs. J. W. Glick, F. W. Richards, J. E. Simpson, J. R. Eifert, O. M. Hartley and H. Johnson.*

New Rocket Engine Control

Developed at NOTS China Lake

Engineers Marshall Klein, D.D. Ordahl and E. Rutkowski of Naval Ordnance Test Station, China Lake's Propulsion Development Department, have developed and tested a new type of rocket engine control. A lever, either manually or remotely operated, adjusts the injector, which is solely responsible for missile control flexibility and is the only moving component of this system. An engine equipped with this control is capable of repeated starts and stops, acceleration or deceleration from zero to full throttle, and programmed thrust during launching and flight of a rocket or missile.

The new control has demonstrated, in static tests conducted at China Lake during the past year, that some of the problems of flexibility of control of space vehicles may have been solved. Several rocket motors varying in size from 250 to 10,000 pounds thrust were utilized. This rocket engine was made possible through NOTS earlier development of liquid propellants and liquid rocket engines.

Pre-packaged liquid propellant rocket engines have been perfected to a point which permits the storage of corrosive material in sealed containers for instant action. Many of the widely used cryogenic propellants (such as LOX) demand a great deal of care in handling and are difficult to store in closed containers for a long period of time. The new packaged liquid propellants permit instant readiness, thus avoiding long countdowns.

Both programs have been sponsored by the Bureau of Ordnance. The new prepackaging principle has been adopted by private industry for production.

Blankets Help Vigilante

Wool is Used in Molding Canopies

Woolen blankets are providing a vital link in the creation of vision-perfect canopies for the A3J attack plane, according to North American.

When specifications were given for the A3J, a thickness of five-eighths inch was prescribed for the plexiglass canopies. Thinner shields could be whipped into shape by vacuum forming, but pressure is needed for the heavier glass, called Plex 55.

When plexiglass is pressed down on a contact drape die and forced into shape, the glass will pick up tiny marks on the surface of the die. This is known as "mark-off" and has the disadvantage of creating spots in the canopy which would distort the pilot's vision.

Industrial Engineering and Plastics men at NAA tried various materials as insulation between the glass and the die. Some produced too much static when the glass was moved back and forth on the die immediately prior to the pressure-forming. On others the nap was too heavy. Still others offered fibers that were too stiff.

Then ordinary wool blankets were suggested. A shopping junket was made and three gay-hued bed covers were bought at a total cost of less than $16. The woolen blankets did the job.

LTJG. R. A. STRATTON *at Fleet Air Gunnery Unit, El Centro, California, scored the best average ever attained by a student in six over-the-shoulder loft bombing maneuvers. He was flying a Fury. He used Mk. 76 practice bombs.*

Chief Wins AF Laurels

Rated Top Student, NCO Academy

Chief Petty Officer William M. Opava, the only Navyman enrolled in the Second Air Force NCO Academy at Barksdale AF Base, topped all classmates in the five-week leadership course.

Opava was one of a handful of Navy men picked for training since the school was started to groom Air Force enlisted leaders in 1950. He was the first student from Naval Air Technical Training Command to attend.

Stationed at Memphis, Opava's regular assignment is supervisor of planning and testing at Aviation Machinist's Mate School.

For finishing on top, Opava received the Commandant's Award for leadership, a gold medallion for general excellence, a certificate as an honorary master sergeant, and a cigarette lighter.

Buy Chance Vought F8U-2N
Has New Radar, Instrumentation

A limited all-weather version of the Chance Vought *Crusader*, the F8U-2N, has been ordered by the Navy. Scheduled for delivery to the Fleet in 1960, the number of aircraft involved was not disclosed.

Basically a development of the F8U-2, the new version will afford increased capability for detecting and destroying targets in darkness and inclement weather.

Some of the installations to be featured in the F8U-2N are push-button operated controls, radar, revised interior and exterior lighting systems and improved instrumentation. The push-button controls will perform many of the pilot's routine tasks such as holding an altitude and heading, selecting a new heading or orbiting over a given point.

Other changes have been incorporated which will permit the carrying of heat-seeking *Sidewinder* and also *Sparrow III* missiles.

The speed of the all-weather *Crusader*, which will be powered by the Pratt & Whitney J-57 P-20 engine, will be nearly twice the speed of sound.

T-28 Rear Seat Landings
Students Get 'Feel' of Landing

Carrier qualification landings from the rear seat are being evaluated as part of the Basic Training Group Five syllabus. The first rear seat landing was made by Lt. James F. Whittier. Acting as student pilot was Lt. David C. Coe, Jr.

The training course under evaluation is actually a carrier qualification demonstration course for flight surgeons and other personnel not actually required to fly the aircraft but who must understand carrier operations.

On previous flights of this nature the student has been in the rear seat with his instructor piloting the T-28 from the front seat.

But actually to give the student the "feel" of a carrier landing, it was considered necessary to place him in the front seat where the maneuver can best be simulated.

After returning from the carrier, Lt. Whittier was asked how it felt to take the "cut" from the rear seat.

"It takes perhaps just a little more precision than from the front seat, but it was a maneuver that any Naval Aviator should be able to perform," he said.

Lt. Coe, who simulated the student in the front seat, was asked the inevitable: "Were you scared?"

His reply: "You bet your life!"

This Cat is Real Tiger
Growing Mascot Poses Big Problem

In one of the few tiger hunts ever staged in Japan, two pilots from Marine Attack Squadron 212 discovered a live mascot to fit their "devil-cat" insignia. They brought to Atsugi a 45-pound tiger cub.

VMA-212 DEVIL-SAN 'AT HOME' IN A FURY

For some months the cub has basked in the favor of men in the squadron and has brought chagrin to waitresses in the clubs he has entered.

Named Devil-San, the tiger greets all visitors in a red and gold robe. He eats two pounds of meat and drinks eight ounces of milk daily. A special Doctor of Feline Medicines degree has been bestowed on Lt. William Helvey, MC, USN, who supplements Tiger-San's diet with necessary vitamins.

But Devil-San's future is uncertain. Up to now, he has been berthed in the VMA-212 ready room. As his size increases, the question arises: How will squadron members know when the cat has reached man-eating size?

"That's easy," says a member of the squadron. "When the mascot turns up his nose at food on a pan and reaches for food on the hoof, he's too big."

ON A 'RED CARPET' *that stretched from Washington to Portsmouth, Va., some 70 Civil Service employees from the offices of DCNO(Air) were given the opportunity to see for themselves items which, in most cases, were familiar to them through correspondence. The tour, made at the suggestion of RAdm. C. S. Cooper, was arranged through ComNav AirLant. Flown from Anacostia to Norfolk (for some, the first flight), guests were taken to Portsmouth to board the Intrepid. The one day tour aboard the carrier familiarized all hands with such terms as deck-edge elevator, catapults, mirror landing system and arresting gear. A wardroom lunch was followed by a mock briefing in two of the ready rooms during which guests received certificates appropriately designating them as "Honorary Crewmen of the Second Fleet."*

GRAMPAW PETTIBONE

Memo from Gramps:

My desk has completely vanished in its quiet corner under a deluge of letters from whirly-bird pilots who regularly use a road atlas, oil company road maps, and just plain "hoss sense" to travel from point to point.

Judging by the volume of mail from irate private citizens complaining of mink eating their young, chickens dead in pile-ups at the hen-house door, unauthorized low flight and hovering over congested national shrines, this is all too true.

OPNAV Instruction 3710.6A DOES state that when ferrying helicopters OFF airways that they should be navigated primarily by reference to prominent landmarks and should normally follow major highways or railroads. It also states that except in emergencies they will be landed ONLY at established airports or heliports while in a ferry status. The flight in question in my "Born Too Late" story was via Red 30 JAX to Tallahassee with a fuel stop at Lake City, which is approximately 18 miles south of the airway.

Specific rules for the conduct of helicopter flights are virtually non-existent and for the most part are contained in "exceptions" to the regulations of CAR-60.

The helicopter accident rate has gone crazy and we've already lost eleven whirly-birds this fiscal year through collisions with trees, wires, vehicles, and other structures. Ol'

Gramps could write a book on the subject, but my gal Friday threatens to quit if I answer you all, so I'm ahoisting the truce flag till I get this thing bore-sighted.

Whoops!

A short 35 minutes after being catapulted in an F11F *Tiger* from an attack carrier cruising off Okinawa, a fighter pilot noticed excessive engine vibration, followed shortly by complete power failure.

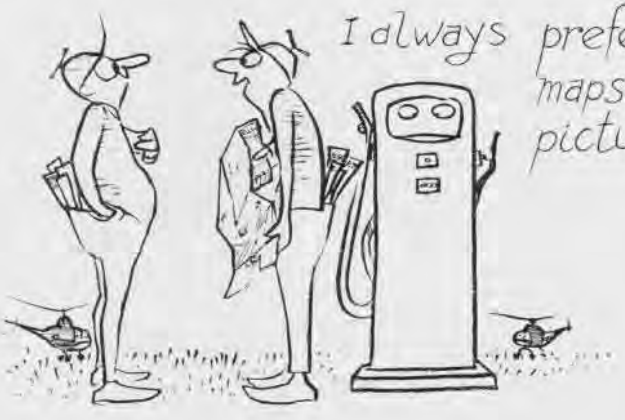
He was at an altitude of only 9500 feet, so he quickly trimmed the aircraft in a *nose down* position, wings level, speed 260 knots, and prepared for ejection.

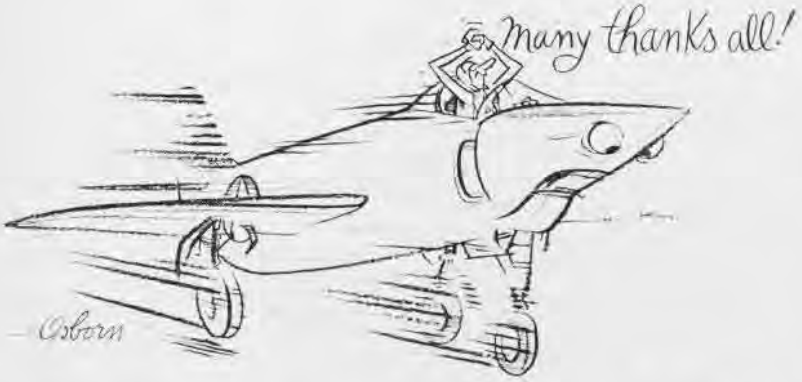
The first pull of the face curtain fired the canopy, but not the seat. A good hard second pull fired the seat, to his immense relief, and from there on, the automatic lap belt and barometric chute release functioned.

At 8,000 feet the pilot *inflated his Mae West* in preparation for a water landing and tried to pull himself up to sit in the sling of the chute, but found he was unable to do so. He oscillated gently as he floated down. The inner parts of his thighs seemed extremely sore, so he released his leg straps to relieve the pain. Immediately, to his horror, he slid down in the harness; the chest strap coming up to his chin and finally catching on his NOSE!

With new-found strength, he seized the chest strap with both hands, pulled it back down to chest level, and maintained this hold until hitting the water some 6,000 ft. later.

The pilot collapsed his chute with difficulty after being dragged 300 feet over the extremely rough water and inflated his pararaft, retaining the chute as a sea anchor. For the next 1½





hours he had a rough time, being tumbled into the water periodically and having great difficulty keeping the raft upright and pointed into the oncoming waves.

Flares contained in the survival kit were rusted together, but one did work. He was finally able to attract the attention of a searching destroyer, which threw him a line and hauled him aboard.

Grampaw Pettibone says:

Whew! What a hairy experience! A few more like this, and you'll be strikin' for old Gramp's job. They say "If it isn't fatal, Gramps has done it," but this is a new one on me!

A few quick comments

1. When you gotta eject, if the aircraft is under control, *zoom* off the excess speed or at least try to get it level. No use losin' valuable altitude while you're pullin' the curtain.

2. If you'd had a tight chest strap (and I'll bet you really wear 'em cinched up now), the Mae West inflation woulda turned you purple.

3. Lucky you had a long nose.

After you get through beatin' the parachute riggers to death for the rusty flares you found in your kit, a review of Bail Out and Ejection Sense, coupled with your experience, ought to make you the hottest survival man in the business, a real *Tiger!*

Perilous Chatter

An F3H pilot had returned to his West Coast base after the completion of a night round robin training flight. He had completed one GCA to a touch and go and was cleared for a second GCA pass to a final landing.

This second approach and landing progressed normally and the *Demon* touched down 800 ft. from the approach end of the 8000-foot runway at 135 knots. During the rollout, GCA cleared the pilot to shift to tower frequency and then continued to comment on the last approach. Still rolling, the pilot thanked them for their assistance, looked down to switch to tower frequency and suddenly realized he was passing the arresting gear (the 6100-foot mark) with 90 knots of speed!

He immediately applied heavy braking, but soon realized his deceleration was inadequate and attempted to make a 90° turn onto the taxiway at the runway end. The starboard wheel locked, the tire blew, but the *Demon* failed to complete the turn, going approximately 60 feet off the taxiway into soft dirt. The starboard landing gear collapsed, and the aircraft came to a stop with its right wing tip dug into the soft ground.

The pilot had elected to turn off at the taxiway rather than hit the 4000-foot hard-packed overrun because there had been considerable construction activity on the overrun for the past several months, and he was afraid of the possible presence of heavy equipment or ditches in the area.

Grampaw Pettibone says:

Sonofagun! When will people learn that the flight isn't over as soon as the wheels touch down! Our aircraft today represent a lot of iron rolling down that runway and roll out faster than any locomotive can travel wide open. Only trouble is, they ain't on a track. Every single word spoken on a *control* frequency has gotta be *strictly business!*

When shore based, every outfit should procure an airfield scale drawing from Public Works, stick it under plexiglass, mark obstructions or unusual conditions on it in grease pencil, and either brief from it daily or make SURE every pilot KNOWS the airfield condition *all the time!* This lad woulda come out of this smellin' like a rose if he'd of had the word on the newly completed overrun.

Good Head

On a wave-off after an attempted landing on a carrier in the Atlantic, an S2F pilot lost power on his port engine. As the RPM unwound from 2800 to approximately 1000, he raised his gear, bled his flaps up from full down to ⅔ and controlled the aircraft by use of emergency rudder assist and the starboard engine.

In the process of feathering the port engine, the mixture control was pulled back to idle cut-off. At this point the engine caught and delivered 30 inches HG at 2200 RPM. When the pilot moved the mixture back to normal, the engine quit again.

The pilot put his engine back in idle cut-off, got his 30 inches HG again, called the carrier and secured approval for a precautionary single engine approach.

Using what he could get from the port engine, a mirror approach and landing was made, with a cut given by the LSO. The hook caught No. 1 wire. As power was reduced at the cut, the port engine failed completely.

Grampaw Pettibone says:

Son, you handled your emergency just fine, analyzed your problem, kept a cool head and caught that wire. Lots of experienced S2F men will disagree with you and say you should have feathered the engine, trimmed up and made an actual single engine pass, especially if you were light.

Most of us feel that the best bet is to use any power you have available as long as oil temp, oil pressure and fuel pressure are within limits and it looks like you might keep it for use in a possible bolter or wave-off. I know of only one S2F bolter on single engine and that was at night and was successful.

PRODUCTIVE WORK HONORED

CDR. GEORGE HOOVER, Manager of Weapons Systems in the Air Branch of ONR since 1952, was awarded the Legion of Merit just before he retired from the Navy.

In the 25-year career that encompassed every rate and rank from Apprentice Seaman to Commander, Cdr. Hoover made the following contributions to Naval research:

- A new concept of aircraft instrumentation (the integrated cockpit) that will permit safe and efficient all-weather flying, with increased performance capabilities, and with a relatively small amount of training. The same system has been applied to submarines and surface ships and it is expected to result in improved operational capabilities for ships while permitting reductions in complements.
- Early leadership in Project *Orbiter*, a joint Army-Navy effort to place an earth satellite in orbit, which later led to the development of *Explorer I*, first U. S. satellite.
- The human centrifuge project now located at Johnsville, Pa. He was first project officer.
- *Skyhook*, the high altitude plastic balloon project.
- Design of the standard Link trainer and the first operational flight trainer.
- Leadership in the establishment of Human Engineering.
- Leadership, as project officer, in the field of high speed/high altitude flight, from early 1945 to 1949.
- The standard ejectable capsule for high-speed jet aircraft.

Cdr. Hoover enlisted as an apprentice seaman February 17, 1934. He became an aviation machinist's mate and served aboard the *Lexington* and *Saratoga*.

In 1937 he completed flight school at Pensacola and was designated a Naval Aviation pilot. Between 1937 and the beginning of World War II he served as an AP with Torpedo Six aboard the *Enterprise* and at the Naval Air Station Pearl Harbor. He was at Pearl when the Japanese attacked.

He made chief just after the Pearl Harbor attack and was promoted to Machinist in March 1942. By June of that year he was commissioned Ensign and progressed to Commander in January 1955.

CDR. HOOVER HOLDS SCALE ANIP COCKPIT

In 1942 he was assigned as Head of the Flight Section, Special Devices Division, in the Bureau of Aeronautics. He was transferred to the Special Devices Center in 1945 and remained there until 1949 when he was ordered to attend the University of Nebraska. He was graduated with a B.S. degree in physics in 1951.

During 1951 he was stationed at Patuxent River and in 1952 reported to the Office of Naval Research.

He holds Navy Helicopter pilot designation number 10 and was responsible for bringing the Martin-Baker ejection seat from England to the United States.

'DOWNTOWN WITH THE LEX' *might well be caption for this unusual shot which was made while USS Lexington staged an open house at San Diego's Broadway Pier. The public was welcomed, especially many youth groups.*

BuAer Expert Paris Bound

To Give Paper at Research Meet

Mr. L. A. Wilson, a BUAER expert in Power Plant Maintenance, will be in Paris June 18-22 to address the 1959 Congress of the Associations for the Encouragement of Aeronautical Research.

For the use of foreign scientists, his paper, entitled "Requirements for a Jet Engine Analyzer," is being translated into seven languages.

Mr. Wilson stresses the importance of finding ways to detect engine malfunctions, describes the kind of data that is needed and recommends tape recordings which would yield actual engine operational figures.

The Army, Air Force and Navy are jointly engaged in determining the kind of jet engine analyzer which will meet the need of the three services.

RP's Fly from Shangri-La

206 Landings Logged in Four Days

Ten aviators of VF-124 became the first Fleet Replacement Pilots to operate the F8U *Crusader* on an *Essex*-class carrier when they qualified aboard the *Shangri-La*.

LCdr. George W. Ellis, officer in charge of the detachment, landed first. The group made 206 landings in four days of operations.

Of the FRP's, only one had participated in a previous carrier deployment. One had never made a carrier landing, while five had become carrier-qualified in prop aircraft and three in jet trainers.

The 10 pilots averaged less than 100 hours each in the *Crusader*.

According to VF-124, the operation helped to demonstrate that the Replacement Air Group (see NANEWS, January, pp 7-11) can train inexperienced pilots to operate aboard any of the Navy's attack carriers in four months, increasing the flexibility and improving the combat readiness of fleet units.

VF-124 is commanded by Cdr. F. X. Timmes, former commanding officer of VF-154, the first F8U squadron to deploy in the Pacific.

FRP's who operated from *Shangri-La* are Lt. H. L. Ertman, Ltjgs. L. E. Renner, R. S. Wood, H. F. Hoffman, J. D. MacDonald, D. S. Ingalls, J. M. Caldwell, P. J. Crahan, H. H. Smith, and Ens. C. C. Williams.

NAVY'S SEARCH FOR SILENCE

HIGH DECIBEL *output of F8U-1P during static turnup at NAS Jax is attenuated in various ways. Man under wing wears ear muffs while three crewmen in area of peak noise intensity cover ears with hands. Blast fence in rear diffuses energy waves, disrupts spread of noise.*

FOR THE BETTER part of a quarter of a million years, man has had to contend with an acoustical entity known as the *decibel* (db.).

In small amounts, the dimensionless decibel has lulled him to sleep, charmed him and even regulated his speech.

Taken in larger amounts, man discovered that odd things could happen. Tensions and fears sometimes resulted from an unexpected visit of too many decibels. A thunderclap, the cave kids next door crying at midnight, or a heavy-footed dinosaur passing by were sufficient to jar his ganglionic machinery and put him in motion.

As he evolved, man ingeniously offset some of his decibel problems while adding others. He invented the gun and then sought a silencer for it. For the horseless carriage he devised mufflers. Then he added a horn and finally, two horns.

The minuet gave way to jazz so he promptly came up with soundproofing.

Conceiving the radio, he foresightedly included volume control. The wily decibel was aware of the fact, however, that he couldn't control that of his neighbors.

Other manifestations of his progress have provided unassailable rendezvous points for increasingly large numbers of decibels. Use of dynamite, trains and the giant machinery of industry represents the types of sound sources considered aggravating prior to man's venture into the air/space age.

Now, some ten years into the latter era, having invented the turbojet engine, he is faced with the most annoying decibel dilemma of all. In the turbulent, gaseous wake of thousands of jet engines, he finds he has literally flipped the lid of an acoustical Pandora's box.

What is a decibel? It is a unit of measurement of the relative loudness of sound. For example, 40 decibels mark a very soft whisper while a passing train will count around 110 db. A 75-piece orchestra may hit 140 db. in full wind—about 20 decibels shy of the discomfort level.

Above this level, the turbojet comes into its own. A 7000-pound thrust engine at full power counts 170 db.; with afterburner, 180 db. Jet engines above 15,000 pounds thrust and some rocket engines are expected to reach as high at 200+ decibels.

This alarming proposition has touched off a vast effort to muffle the source of the disturbing, and sometimes destructive, decibel.

The effort is being shared by military and commercial jet users and manufacturers. Governmental agencies like the National Aeronautics and Space Administration, a prime contributor to research in the field of jet engine noise suppression methods and devices, are exploring myriad possibilities in the hunt for a solution. While some success has been achieved, nothing has been developed to date that is acceptable to military users.

This temporary inability to efficiently muzzle the turbojet hasn't spelled defeat in the Navy's war with the decibel however. Other measures have been taken which are generally applicable and have proven successful in a variety of situations.

A few of these "before/after" cases—the result of a survey conducted by NANEWS—are worth noting:

Three years ago, a mid-western naval air station was experiencing serious switchboard troubles. The troubles coincided with its weekend jet flight operations. With disheartening regularity, each launch of its jets brought a jamming rush of telephone complaints. An aroused community was reacting to the effects of turbojet noise.

Now the same station conducts an equally intensive flight schedule with minimum criticism from its neighbors.

In the east, a major naval air activity, confronted by organized community resistance to jet operations, had reached the "towel-tossing" stage. Officials in Washington

were bombarded with emphatic community demands to "do something." A year later, flight operations are conducted with little opposition.

Down south, a huge jet aircraft manufacturing corporation found itself faced with a decibel Dunkirk. Lengthy ground turn-ups of powerful jet engines, a vital operation in the production phase, rattled and shook people, places and things for a considerable distance encompassing heavily populated areas. The same anchored afterburner operations today pass unnoticed.

How did these relatively happy endings come about? The solutions engineered did not involve mass land purchase, airfield relocation, engine attachments or even total curtailment of flight operations. They did involve *suppression, attenuation* and *education*—three key words in most noise abatement programs.

In the cases of the naval air activities, a positive public information program was fired up and executed. The all-important WORD was spread on necessary noise—its cause, effect and the corrective measures taken and planned.

Once the *surprise* factor attending noise was dissolved in the community, a reasonable peace was attained.

A more expensive solution was sought and obtained by the manufacturer. Static noise suppressors or exhaust attenuators (mufflers) were installed on the company's ramp. Costly and huge—some are as big as a ranch house—the concrete attenuators reduced the sound output of the high thrust jet engines to a level comparable to that of automobile traffic on a city street.

To understand better the nature of the "beast" in the story, some definitions are in order. Noise, itself, is simply "unwanted sound."

Sound has a twofold aspect: a mechanical action and a physiological and psychological response. For example, a vibrating bell sets up waves of compression and rarefaction in the neighboring air which travel surprisingly fast. On reaching the ear, the compressions and rarefactions push and pull on the eardrum and set up a series of vibrations that affect the auditory nerve and generate a hearing sensation.

Regular disturbances of the air usually result in musical sounds while irregular or random disturbances of the same medium are referred to as noise.

From a physiological/psychological standpoint, adverse effect is realized when the noise disturbance is loud, high pitched, unexpected, inappropriate to one's activity and intermittent or irregular.

A present day airshow featuring jet aircraft may be used as an illustration of these effects. An audience of thousands of people will voluntarily expose itself to a localized bombardment of maximum intensity jet sounds for a prolonged period without registering critical reaction.

The sounds are wanted and expected.

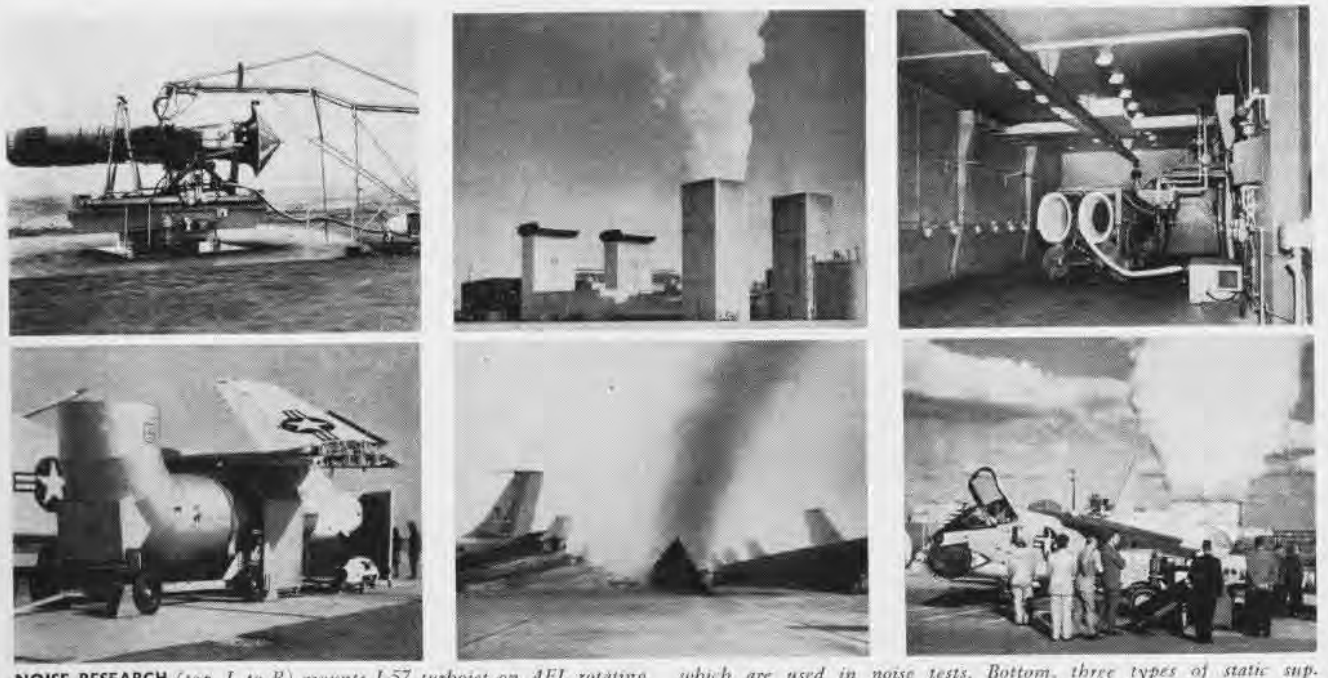
However, the same jets making routine departures after the air show pass over homes of members of the audience and stir up tensions, even fears, and complaints follow.

Unwanted and unexpected, the sounds become noise.

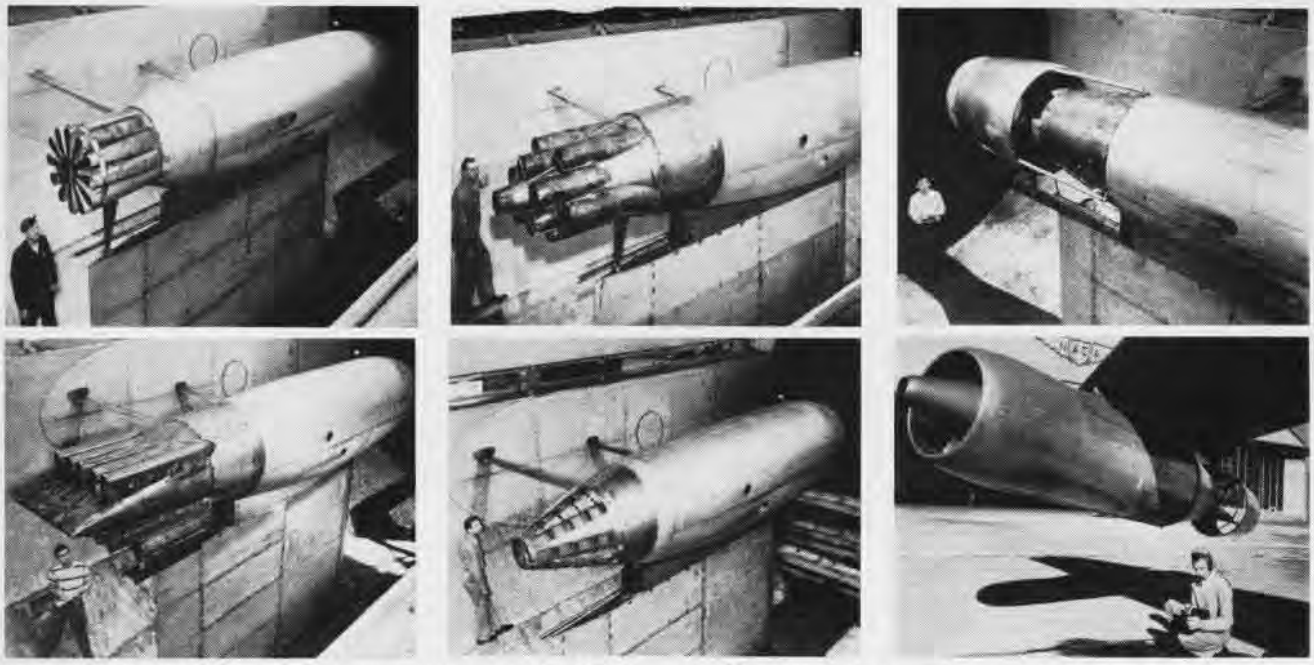
To deal with the problems of jet engine noise in the Navy, a coordinated program encompassing all divisions of the Bureau of Aeronautics was begun in 1953.

Research projects were also established at Patuxent River, Maryland and the Aeronautical Engine Laboratory (AEL) at Philadelphia to investigate the nature and suppression of jet engine noise.

AEL began to conduct model tests in 1955 in noise research and made free field jet engine noise surveys. The AEL installation is considered unique in that it makes use of a 25,000-pound thrust table mounted on a 40mm. quad gun mount, permitting rotation of a test engine in an arc of 270° past microphone positions. Engines up to 25,000



NOISE RESEARCH *(top, L to R) mounts J-57 turbojet on AEL rotating stand. Next, two views of huge San Diego sound pen and chamber which are used in noise tests. Bottom, three types of static suppressors, portable, blast fence and permanent (concrete), muffle noise.*



EXPERIMENTAL TURBOJET *noise suppressor nozzles tested by NASA. These are designed to rapidly mix jet exhaust and ambient air more smoothly, thus reducing peak sound levels at certain frequencies. Nozzles impose severe drag, weight and engine performance penalties.*

pounds of thrust can be tested on the rotating stand. Prior to this development, accurate noise survey was hampered by calibration changes made necessary when microphones were moved about.

Currently AEL is studying the possibility of incorporating noise suppression capabilities into carrier blast deflectors. The high levels in the catapult area are the major noise problem encountered on carriers today.

Research results to the present time indicate the penalty paid for a relatively small decrease in noise levels is prohibitively high. For example, to an aircraft operating at a cruise Mach number of 0.9, a sound power level reduction of eight decibels would impose a propulsive net thrust loss of three to seven percent. Translated into terms of payload for an aircraft with a range of 3500 miles, the percentage decrease in range due to use of a suppressor would be 10 to 20 percent.

The suppression problem becomes more acute when it is realized that a reduction of at least 30 decibels is required to reduce the noise levels of current afterburner aircraft to tolerable levels.

Five basic methods of reducing jet engine noise have occupied the BuAer researchers. Any practical solution will depend on one or more of the following principles.

- Absorb the noise by increasing the distance between the aircraft and the receiver since the atmosphere absorbs and converts sound energy and causes a corresponding decrease in sound power level or decibels. Noise levels are reduced approximately six decibels when the distance from the noise source is doubled.
- Decrease the total sound power radiated by the source.
- Modify the directional characteristics of the source.
- Alter the frequency spectrum by changing or shifting low frequency noise to the higher frequencies thus shifting part of the noise to the inaudible range as in the pitch of a dog whistle. Atmosphere suppresses high frequency noise more readily than it does low frequency noise.
- Cancel the noise by superimposing another noise source 180° out of phase with the original jet source. This method is by far the most difficult to accomplish since noise is a random condition both in frequency and loudness.

At present the most practical method of noise reduction is atmosphere absorption—increasing the distance between the source and the receiver.

Since a high percentage of the noise energy produced by a jet engine occurs in an area five to ten tailpipe diameters in length aft of the tailpipe, most of the mechanical devices considered as source suppressors have been designed to mix rapidly the highly turbulent, high temperature exhaust gas stream with the ambient air surrounding the jet.

Research has been conducted on various nozzle shapes, some of which will lessen the noise level substantially by reducing the peak sound levels at certain frequencies. Difficulties have been encountered in the design of such nozzles in keeping drag, weight and engine performance penalties at a minimum while accomplishing the desired noise reduction.

A small reduction in jet velocity is another method which will produce a substantial reduction in noise. However, today's engines, designed to provide the maximum requirements of the military, cannot operate efficiently at lower jet velocities.

Mechanical devices, most of which are of the nozzle type of varying design and purpose, have afforded up to seven-decibel reduction in noise level, and certain types are being used on commercial jets like the *Comet* and Boeing 707. From a military standpoint, the prohibitive thrust loss, in addition to range, maximum altitude and rate-of-climb penalties experienced by such use, renders present suppressors impractical. Others must be sought.

PILOT REMINDERS *in form of runway "billboards" are used at some activities to ensure compliance with course rules. Designation of such inbound/outbound corridors over least inhabited areas assisted noise abatement programs. These measures were publicized widely.*

The hunt for a usable noise suppressor is still in progress. Naval Aviation's search for silence has not been confined to research agencies. Noteworthy success has been achieved at the Navy's many activities operating high performance aircraft by concentrating on methods involving *attenuation* and *education*.

The advent of jet aircraft aboard naval air stations created a general noise problem which had no "book" solution. Whereas prop aircraft, like the familiar fast freight train, had been accepted by the adjacent community, the increasingly powerful turbojet crescendo, which began replacing most of the low-pitched prop sounds, caused widespread reaction.

Mainly, this reaction was directed at three categories of jet aircraft operations—static or preflight engine run-up, sonic booms, and low-level flight, such as take-off or landing.

Early success was gained in reducing or eliminating ground noise problems. Adherence to regular operating hours, designation of remote turn-up areas, employment of the noise source's directivity pattern, use of special meteorlogical or terrain conditions and existing field structures as "shadow" or sound buffers cut the decibel count and complaint level considerably.

In addition to use of the absorption method of noise control—putting maximum distance between the source and the receiver—some attenuation is obtained by installation of blast fences or exhaust deflectors.

Generally available to activities operating high performance aircraft, some of these structures resemble giant venetian blinds suspended from steel frames. When activated by direct jet blast, the metal slats pivot to cause an upward deflection of the turbulent exhaust gases thereby reducing the lateral spread of noise during ground run-up.

Portable sound suppressors, which are being distributed presently to Naval Air activities, are expected to decrease jet noises significantly. Also under development are "Advanced" portable suppressor units which are predicted to be capable of decreasing the noise level by 45 to 55 db. According to some contractors, a decibel reduction of this magnitude will be equivalent to a possible sound reduction impact on the human eardrum of as much as 90 per cent.

The portable types vary in size from 12 to 16 feet in length and are up to 12 feet in height. Weighing about 9500 pounds, they will be mounted to fit against the exhaust of jet engines which are to be turned up.

Still another suppression device in limited use is the "sound pen." Designed to house the entire aircraft, the costly structure cuts to a minimum all noise disturbance associated with maximum intensity static engine operations. Axiomatically, it is noted that with the decrease of decibels, suppression equipment costs increase radically.

The second category of aircraft noise disturbance, the sonic boom, continues to be a serious problem. An acoustical phenomenon associated solely with supersonic flight of aircraft, rockets and missiles, it is of two varieties. One type of boom occurs as a result of level supersonic flight while the other is generated in accelerated or decelerated flights, such as a diving maneuver.

Control of the phenomenon is solely in the hands of the pilot and the adoption of rigid regulations pertaining to this type of flight operation has largely reduced boom occurrence in areas other than those designated for test or supersonic flight. (See "Profile of a Sonic Boom," p. 32.)

In a survey of all of the naval air stations operating jet aircraft, some significant guidelines are noted which have contributed largely to the Naval Air's successful struggle for airfield-community peaceful co-existence.

These are mostly applicable to noise control as it relates to takeoff, landing and low flight operations; and place a particular emphasis on the absorption method of noise control in the absence of a militarily feasible source suppression device.

Noise Abatement Organization. A formal organization of a noise abatement group preceded almost all of the reportedly successful programs. Besides the Commanding Officer, key personnel usually included the Operations Officer and the Public Information Officer. In some cases, specialized personnel such as the station Air Traffic Control Officer and the Industrial Health Officer were added to strengthen committee research into specific problems.

A typical mission, extracted from a station order, charged the committee "to continually review aircraft operating procedures, recommend revisions for noise reduction, establish and prosecute a vigorous public relations program, and to establish a system for recording, investigating and following through on complaints relative to aircraft noise."

Besides the assignment of station personnel to such committees, the inclusion of external membership may be considered. In one case, a joint military-civilian noise control committee was headed by the chief production test pilot of a nearby aircraft corporation. In addition to Navy, Air Force, Marine and National Guard representatives, active membership included the CAA regional director, Airlines Pilots Association, CAA Tower controller, five commercial airlines and two private flying services.

At the same activity, a supporting information committee consisted of a military PIO, aircraft corporation public relations coordinator, executive director of the state aviation board and the general manager of a local radio station.

Thus the joint nature of the organization gave both the aircraft operators and the general public participation in reducing the local noise problem. Its success was reported in a matter of a few months and has had lasting effect.

Corrective Measures. The corrective measures considered feasible in the assault on noise were readily defined and, in most cases, proved very effective. Varying with the local situation, all have been adopted with due consideration for safety of flight requirements.

Since the primary causes for complaints occur during take-off and landing operations, considerable relief was gained by local flight pattern changes. In most cases it was possible to establish departure and approach corridors which afforded passage over the least inhabited areas.

Altitude in the pattern for jet aircraft was upped and a speed restriction imposed. At one station a substantial reduction in jet noises was reported after changes limiting jets to 2000 feet altitude at the break position and 250 knots on entering the local pattern.

Complaint frequency was reduced in some cases when formation take-offs and touch-and-go landings were prohibited.

Where possible, field carrier landing practice was moved to isolated locations.

One station, situated in a heavily populated area, banned night flying after 2400 and placed a restriction on afterburner climb-outs. In addition, engine check run-ups were discontinued after 2200.

Once corrective measures were adopted, the pendulum of action swung in the direction of the pilot and the public.

Pilot Education. In the case of the pilot, the corrective measures were ground into a pointed educational program designed to ensure full spread on the new word. Station instructions, squadron safety briefings, flight plan inserts and even runway billboards were some of the methods employed to hammer home the information.

NAS MOFFETT *problems, corrective steps were explained to community officials by the commanding officer, and civic opposition lessened.*

PUBLIC INFORMATION *officer responds to noise complaint with personal visit. Explanation of jet mission, noise cause is welcomed.*

At another station, transient pilots received briefings regarding take-off and climb-out regulations by the Operations Duty Officer prior to clearance.

The matter of pilot observance is also strengthened by two ancient and honorable methods: continuous harping and swift, punitive action in the case of offenders.

Public Education. The process of acquainting the community with noise problem recognition and corrective efforts follows established lines. The main points made clear in the overall effort were those of *positive* and *continuing* education programs.

Major emphasis was placed on the following as effective means of presenting local noise causes and abatement procedures for public appraisal and understanding: news releases, radio and TV presentations, community service club speech programs, open houses, and visits to complainants.

Command influence was of prime importance. The commanding officer of one air station delivered more than 200 speeches before civic clubs and interested groups in a two-year span on the subject of his command's critical jet noise problem and its efforts to overcome them.

At another activity, it was SOP for the commanding officer to usually handle all complaint calls and visits. Both reduced strong opposition to jet operations in their areas.

Internal Information. Programs of this nature are also vital to the noise abatement effort. Since the station complement is itself a part of the community after working hours, the necessity for local effort indoctrination is evident.

The future prospects for mechanical noise suppression depend on the concerted effort being made to trap sound disturbance at its source without reducing engine efficiency. Once achieved, the muffled Mach machine will be able to run into the wind without drawing more than a passing glance from an airport neighbor.

Until that halycon era arrives, and with the chance that the sound power level may become even more pronounced, the Navy's present procedures seem to hold an interim answer to noise problems where they exist today.

Suppression, attenuation and *education* are key words in noise abatement and Naval Aviation's search for silence.

MANY HANDS BUILT X-15

NAVY PILOT IN X-15 MANNED SPACE RESEARCH PROGRAM IS LCDR. FORREST B. PETERSON

SOMETIME this spring, an extraordinary airplane, the North American X-15, is expected to make its first flight.

Conceived by the National Aeronautics and Space Administration, the project has been jointly supported by NASA, USAF and the Navy.

In the making for more than six years, the manned flight of the research air vehicle will culminate one of the most prodigious joint efforts in the history of American aviation.

The entire story of the project is replete with Hollywood adjectives. *Colossal, stupendous, fantastic* are words which may be applied not only to the end result—the flight—but to the planning, development and manufacture of the space bird itself.

Particularly in the development phase, the production of the Mach 7, 15-ton, rocket powered airplane became a national effort. North American Aviation's Los Angeles Division, the prime contractor for the X-15, utilized more than 300 firms, large and small, located in every section of the country, in building the airplane.

One of these, the Reaction Motors Division of Thiokol Chemical Corporation of New Jersey, was given the job of developing the power plant, a liquid propellant rocket engine, the *Pioneer*.

Weighing little more than a 300 hp V-8 automobile engine and small enough to fit into the space of a household freezer, it has been claimed that the *Pioneer* engine is capable of producing more than a half million horsepower. This is roughly equivalent to three times the total horsepower produced by the Grand Coulee Dam.

Propellants for the *Pioneer* XLR-99-RM-2 engine are liquid oxygen and liquid ammonia and are fed by a pressure system causing flow in excess of 10,000 pounds per minute. For comparison, the rate of fuel flow in a modern jet fighter with afterburner is from 30,000 to 40,000 pounds per hour—thus the X-15 will consume propellants approximately 20 times as fast.

Another unusual requirement was generated by the expected "outer space" environment of the X-15. Normally, pressurization and cooling systems of conventional aircraft utilize outside air surrounding the aircraft.

The solution to the problem of nonexistent air was provided by the Garrett Corporation's AiResearch Manufacturing Division of Los Angeles which took a radical departure from known methods.

Using liquid nitrogen contained at approximately —300° F., a self-contained element was developed to take over all jobs formerly done by pressurized air. It will be used in vital areas to maintain adequate environmental pressure and to act as a cooling deterrent to excessive temperatures.

Among reasons for use of liquid nitrogen in the AiResearch system in addition to its refrigerant qualities, are its lack of fire or explosive characteristics and the relative ease of maintaining it in a liquid state.

Applications include pressurizing and ventilating the cockpit and the pilot's flight suit, inside of which he

FIRST FLIGHT OF X-15 THIS SPRING WILL CAP A SIX-YEAR JOINT NATIONAL EFFORT

breathes pure oxygen; cooling and pressurizing electronic equipment and inerting its environmental atmosphere, cooling the plane's nose cone and operating pneumatic equipment.

Directing the pilot from the instant of launch through the high velocity acceleration phase and during the critical period of re-entry into the earth's atmosphere will be unique equipment developed by the Sperry Gyroscope Company.

An extremely precise inertial system —labeled one of the most advanced airborne flight data systems ever made— it is able to withstand accelerations of more than 10 G's. In addition to withstanding extreme G-loads, the system must function perfectly in the weightless environment the X-15 may encounter.

Heart of the Sperry inertial system is a compact, three-gyro stable "platform" which will provide critical attitude, velocity, distance and altitude sensing. The platform, which incorporates outstanding advances in electronic miniaturization, contains all its own power supplies and amplifiers.

A lightweight computer digests and interprets this data and displays it pictorially for the pilot on specially-developed cockpit instruments. Despite the small size and low weight of the system, it meets rigorous specifications of ruggedness and reliability.

In addition to providing inertial information for the cockpit instruments, the system's sensors and computer will feed data to specialized airborne and ground-based recorders for permanent charting of each flight.

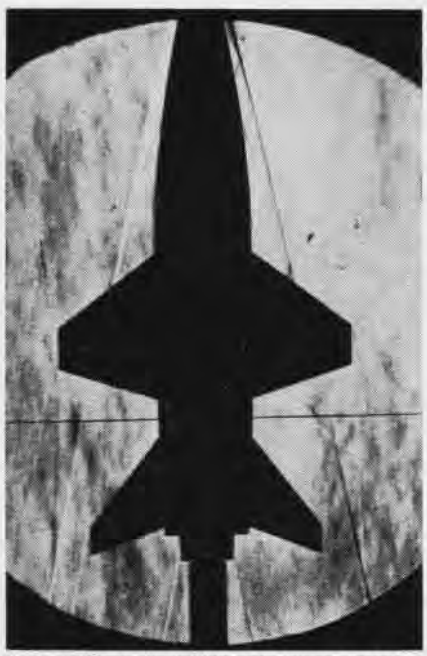
A new nickel alloy—Inconel X— was developed by the International Nickel Company in order to handle the searing heat expected on the X-15's flight at speeds in excess of 3600 miles per hour.

Capable of withstanding temperatures ranging from 1200° F. to minus 300° F. which would be encountered during the flight, the new steel alloy proved difficult to handle.

In working with Inconel X, North American not only developed unique and specific techniques of making structural and leakproof welds, but also developed a vast array of specialized welding and handling equipment. One special tool fixture needed for control of contour during the heat treat cycle of a wing skin, for example,

MOCKUP OF ARM GUARDS, FOOT CLAMPS

15-TON 'MANNED MISSILE' AFTER ROLLOUT



X-15 MODEL IS TESTED IN WIND TUNNEL

weighed 4300 pounds while the skin it held weighed 180 pounds.

Despite the fact that X-15 will wear a complete external armor of Inconel X, other metals are also used. A primary structure of titanium and stainless steel will meet any heat that soaks through the nickel alloy outer covering. Aluminum, the old standby of the aviation industry, is used internally where high heat and high loads are not a problem. About 65% of the X-15 is welded structure and 35% fastened, compared to current operational aircraft which are 100% fastened.

Suppliers for the metals, the wiring, lubricants, gears, paint and ball bearings are located throughout the country—some representing plants with five employees, other with 50 and a few with more than 500.

A Worcester, Mass., firm, the David Clark Company, produced the new pressurization suit required for the extreme altitudes expected to be reached by man for the first time.

Bell Aircraft supplied the ballistic control rockets used for out-of-the-atmosphere control while Lear Incorporated provided a specially designed three-axis indicator to help keep the pilot on his pre-planned flight path.

A firm in Van Nuys, Calif., manufactures the grips for the control sticks in the X-15 while a plant in Middletown, Conn., produces the electrical heating element for the nose probe. From Vandalia, Ohio, a supplier manufactures an inverter used for the X-15 ground support electrical system. In Union, N. J., a plant makes the motion picture film which will be used to photograph instrumentation in the X-15 while in flight.

A heat and vent system valve is made by an Inglewood, California, company while a specialized voltmeter used for checking the X-15 electrical system is manufactured in Plainview, Long Island. A small company in central California—Hollister—makes a special explosive bolt used for separation of the lower vertical stabilizer from the X-15 prior to landing.

What began as a joint study between the NASA, USAF and the Navy in 1952 became a nationwide project. America, its government, industry and people, in a remarkable combined effort have readied the North American X-15 for an unprecedented manned probe into the reaches of space.

IT'S ALL IN A DAY'S WORK

LTJG. D. R. McKEE, *VF-211 Crusader pilot aboard Midway, checks all flight gear for hop.*

KNEE BOARD *in hand, McKee goes through individual briefing in squadron ready room.*

JUST BEFORE *take-off, Neil Stone, AD3, Plane Captain, double-checks aircraft with pilot.*

FIVE CRUSADERS *of the Checkerboard Squadron are off on a routine mission. VF-211, commanded by Cdr. W. A. Golden, is part of Carrier Air Group Two, embarked on the Midway in the Pacific. Ltjg. McKee, flying F8U #102, brings up the rear of the tight formation.*

DAY'S OPERATIONS *completed, Crusader #102 makes an arrested landing aboard the CVA-41. Evaluation of the flight is yet to come.*

DEBRIEFING *covers all aspects of the mission. Ltjg. R. G. Hubbard, the LSO, discusses the landing with McKee. It's been a full day.*

AIR VIEW SHOWS PREVIOUSLY COMPLETED TRACK, LEFT, AND FOUR NEW TRACKS. NAS IS IN BACKGROUND, OUT OF VIEW AT TOP

TEST SITE PLACED IN SERVICE

THE NAVY has accepted from civilian contractors a $5-million test site at the Naval Air Test Facility (Ship Installations), NAS LAKEHURST.

One of the Navy's newest activities, NATF's purpose is the testing and evaluation of arresting gear and catapults systems used to launch and land aircraft aboard modern carriers.

The recovery systems test site just dedicated is composed of four concrete tracks, each more than a mile long, which resemble the outstretched fingers of a hand.

The tracks are used to guide jet-propelled cars, and the wheeled deadloads the cars push, until the necessary speed is reached for arrestment of the deadload.

The jet car is stopped by special brakes of its own while the deadload continues into and is stopped by the arresting equipment under test.

The track and its jet car can hurl a 50,000-pound weight at a velocity of 175 knots. Lesser weights can be accelerated to 200 knots.

The jet engines are operated remotely from a small control building until proper exhaust temperatures and rpm are achieved. Then, upon receiving a signal that the recovery area is clear, the operator releases the jet car and its deadload.

As they race along the 7300-foot track enroute to the arresting gear, the jet car and deadload are guided by two 10-inch-wide I-beams near the center of the concrete strip.

After traveling approximately 6300 feet, the jet engines are "cut" by a tripping device located beside the track. The jet car and deadload coast for another 400 feet before the car is stopped by means of trailing brakes. The brakes are spring-loaded and are actuated when they contact the brake section of the track.

The brake section consists of 600 feet of half-inch plate bolted onto the top of each guide beam. Brakes which have been pre-set for a certain spring force clamp onto this section, abruptly but safely stopping the jet car. The deadload then hurtles into the arresting gear.

Engagement of the deck cable by the aircraft arresting hook pulls together two banks of pulleys, called sheaves, like a block and tackle. This action forces the ram into the cylinder, squeezing the contained fluid through a valve. Resulting forces transmit the energy from the aircraft to the fluid, bringing the aircraft to a dead stop.

The deadload is a flat, rectangular cart which has removable weights. Any weight combination from approximately 10,000 to 90,000 pounds may be achieved for the five different types of deadloads used in tests.

When tests have been completed to the satisfaction of engineers at the recovery sites, the arresting engine is moved to the runway site where actual aircraft arrestment tests are conducted.

By testing the arresting engines in this manner, it will be possible to land larger and faster aircraft aboard carriers with greater safety and efficiency.

As aircraft become faster, heavier and more complex, the need arises for more powerful catapults and arresting systems. The safety of aviation personnel and of costly aircraft demands that these systems be carefully evaluated to insure safe performance under actual conditions.

Gear receiving the greatest test activity at present is the hydraulic ram type developed for the carrier *Independence*. It is identical in principle to other smaller types currently in service, but will have greater capacity for high speed arrestments demanded by present and future aircraft.

AS FAR AS THE EYE CAN SEE, ROW UPON ROW OF RETIRED AND RESERVE AIRCRAFT BASK IN THE SUN AT NAF LITCHFIELD PARK

IN THE VALLEY OF THE SUN

WHEN YOU THINK of the Navy, you think of the sea. Paradoxically, there is a naval activity which can carry out its unique mission for the very reason that it is far removed from any traces of the briny deep.

Twenty miles west of Phoenix, Arizona, in the "Valley of the Sun," the Navy is storing thousands of reserve and outdated aircraft at the Naval Air Facility, Litchfield Park.

The warm, dry salt-free climate is ideal for preserving surplus planes, in the interest of serving the taxpayer.

NAF LITCHFIELD PARK, which is commanded today by Capt. Reed K. Henderson, was established in October 1943 as an Auxiliary Acceptance Unit. By 1944 the unit had moved into improved quarters, but the end of WW II brought expiration of contracts and a general standstill to new production. Since diminished requirements left the Navy with many aircraft in excess of its operational needs, it was decided to use the Arizona facility for stowage.

In early 1950 the station had a total of 2000 flying machines of 18 different types in keeping. Then, came the Korean crisis. Suddenly, the Navy and Marine Corps needed aircraft immediately. The foresight reflected in the preservation program at Litchfield Park proved its worth. Most of the planes found their way to the fighting front in short order, and the Naval Air Facility's successful all-out efforts were commended by CNO.

The function of preservation and storage is still the primary reason for the existence of the station, which is the largest of its kind in the Navy. However, the main mission has increased in importance in direct proportion to the rising costs of aircraft, because processing now includes current as well as outdated models.

The Bureau of Aeronautics has types of aircraft in service valued from $100,000 to more than $1,000,000. Assume that a typical combat plane costs, at the time of acceptance from the manufacturer, in excess of $200,000. This figure does not include electronic devices, communication and navigational gear, ordnance and other items which fall under the heading of Government Furnished Equipment (GFE). Often, this material equals the price of the plane and the total package represents a big sum of money.

BUAER may assign this aircraft directly to NAF LITCHFIELD PARK for storage in a "ready-for-issue" category awaiting operational requirement by the fleet. Even if sent

to a squadron, at the end of its service tour, the plane may be pegged for the Arizona activity in an "awaiting overhaul" status, until such time as one of the major naval air stations can accommodate it. Aircraft fly into the facility at an average monthly rate of 90, and during 1958 alone more than 1,100 were logged in. Such a sizeable investment must be adequately safeguarded.

Extensive research and development have resulted in the adoption of preservation procedures which permit aircraft stowage with a minimum of mechanical and structural depreciation, thus allowing the Navy to maintain substantial inventories in operable condition. However, the cooperative climate cannot be overlooked. With an annual rainfall of less than eight inches and a mean humidity of 42%—the lowest in the United States—rust and corrosion are held to a minimum. As a matter of fact, climatic conditions are so favorable that, in many instances, methods have been simplified. For example, the Materials Engineering Laboratory at Litchfield, determined that, because of the weather, it is not necessary to remove fabric-covered surfaces to prevent deterioration. Rather, they may be treated with a sprayed coat of flexible preservative and left on the aircraft.

The laboratory has streamlined both the original preservation and the periodic maintenance. The present cost of keeping a plane in a ready-status has been reduced to less than one percent per year of the original price tag.

Because of the facility's unique position in the preservation field, NAF LITCHFIELD PARK is looked upon as an authority on the subject. BUAER sponsors an annual conference, which gives Litchfield the opportunity to "pass the word" on current preservation procedures to representatives of aviation activities of all the armed forces.

Litchfield also runs a preservation school. Each month a two-week course is held for about 15 Fleet and Naval Air Training Command maintenance personnel to acquaint them with the need for preservation, instruct them in procedures and familiarize them with applicable directives.

The hub of the maintenance and preservation department can be found in two hangars. "The Plant," as it is called by station personnel, employs 513 civilians and 50 military to perform the job of keeping a good sized fleet of Naval aircraft ready to fly when needed. Depreservation processing is, of course, also carried out daily. The result is that about two dozen planes a month are placed in the hands of ferry pilots for delivery to the Reserve Training Command, the fleet, other governmental agencies and friendly foreign nations.

Many aircraft that no longer meet the stringent operational requirements of today's modern Navy, have many years of flying life remaining. In the past three years, under the Military Defense Assistance Program, planes have been sent to Denmark, the Netherlands, Japan, France, Honduras, Cuba, Portugal, Bolivia, El Salvador and Argentina. The types transferred include the SNJ, F4U, P2V, PBY, P4Y-2, TBM, AU-1, JRB, SNB, FG and PBM.

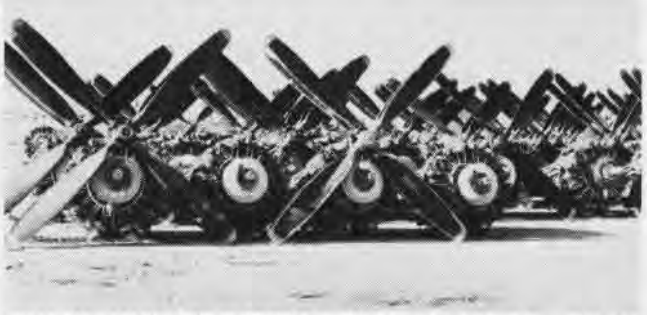
In addition to the primary function of preservation and storage, the Navy Department has found that the versatile plant can economically produce top-quality modification work on the latest aircraft, with a minimum of lost service time. About 30% of the total workload is devoted to direct support of fleet and Naval Air Reserve operating units. Planes undergoing the work remain in the custody of their parent squadrons, which usually find that the job done at Litchfield Park exceeds anticipation. "Bugs" in the aircraft quickly succumb to trained exterminators. Minor repairs, which the squadrons normally handle, are usually taken care of in the course of modification, as an added customer service.

AN AD GUPPY DISPLAYS THE LATEST IN PREFAB PROTECTION

The salvage and recovery program is another increasingly important function. Before 1958, most of the surveyed aircraft at Litchfield were of the WW II variety. A major increase in direct fleet support occurred last year. For the first time parts recovery included planes which were early models of types still in service. These seemingly useless aircraft have tremendous value as a source of spares which are short in the supply system. Salvage crews glean from doomed aircraft thousands of expensive parts that can be used again. Recoverable material runs to about 20 engines and 130 tons of miscellaneous items each month. In addition, about 700 parts are shipped in each 30-day period directly to operating units. Dispatch requests for Aircraft Out of Commission Parts (AOCP), and emergencies are given top priority.

Residual aircraft from which all useful items have been removed are sold through sealed bid procedures. Income from these sales comes to about $1,750,000 a year. About twice as many planes are sold as are received, so that the storage inventory is gradually being reduced to a suitable contingency reserve level.

It's good to have an activity like NAF LITCHFIELD PARK. It's just like having a lot of money in the bank.



LINES OF SALVAGED PROPELLERS FORM A SYMMETRICAL DESIGN

SSGT. CHARLES FLEMMING *(R), directs operation of liquid oxygen plant on Marine airstrip in southern Formosa. LOX plant was airlifted to Formosa where it is used for jet aircraft high altitude breathing apparatus.*

Shangri-La to Carry Aid
Needy in Far East Will be Helped

When the aircraft carrier *Shangri-La* sails from San Diego for the Orient, it will carry items of clothing, medicine and other necessities for many destitute people in the Far East.

"Operation Handicap," a People-to-People program that has been growing swiftly in the San Diego area, was started by LCdr. D. M. Hansen, operations officer of Carrier Air Group Eleven.

LCdr. Hansen said, "There are about a half-million people starving in Hong Kong alone. These are the people who crossed the border from Communist China for freedom's sake.

"It seems to me that the least we can do for them is to take the trouble to give them something we might otherwise want to throw away." Churches in the San Diego area cooperated in the drive to secure help for the needy.

Samaritan Work Continues
Duxbury Men Improve Hospital

Crewmen of USS *Duxbury Bay* (AVP-38) are continuing the People-to-People work begun by USS *Greenwich Bay* (AVP-41) in the Middle East. The project is a long range program of improving the American Mission Hospital at Manama on Bahrain Island in the Persian Gulf.

The Hospital was old and in bad state of repair when "adopted" by the *Greenwich Bay*. Volunteer workers repaired screens and painted a nursery. They started a hospital fund aboard ship and used the money to buy paint and repair materials and a set of baby scales.

Since arriving at Bahrain in November, the *Duxbury Bay* has added money to the fund and has increased the list of things to be done. Volunteers have painted a kitchen and a ward, repaired roof leaks, built shelves and cabinets, and purchased additional items.

FRAT FOUR-UM *is met at NAAS Chase Field as four members of Sigma Alpha Epsilon compare notes on F9F-8. Left to right are Second Lt. G. G. Kemp, Ens. T. W. Reynolds, 2nd Lt. R. E. Richardson and Ensign H. B. Humphrey.*

VS-30 Pilots Aid Yacht
Canadian Pilot Assists in Rescue

LCdr. Robert C. MacLean, RCN, and Ltjg. Max D. Persels of Air Anti-Submarine Squadron 30, recently turned a routine training hop into a rescue mission. They were operating about 10 miles southeast of Cape Henry when they spotted personnel on a small private yacht waving an inverted American Flag as a distress signal.

LCdr. MacLean radioed the vessel's position and plight to VS-30 base radio at NAS NORFOLK, who relayed the information to the local Coast Guard station. A Coast Guard cutter investigated and towed the yacht "Fleurette" to Little Creek.

LCdr. MacLean, Royal Canadian Navy, is on temporary duty with VS-30.

VA-145 Had Banner Year
Swordsmen Earned 62 E's in 1958

After setting a new CVG-14 flight time record of 1142.1 hours with the AD-6 in January 1958, VA-145 went on to complete a full year of achievements. In February, 20 of 24 pilots earned Navy E's at NOTS CHINA LAKE and established a Pacific Fleet record in medium angle loft bombing.

The summer months were busy ones for the *Swordsmen*. They participated in the annual fleet air gunnery meet at El Centro. In June, the squadron, based at NAS MIRAMAR, flew to Norfolk and boarded the *Ranger* for the ocean-swapping trip around the Horn.

Since returning from the cruise, VA-145, although reduced to 20 pilots, has run up a total of 62 E's, an average of three to each man. Cdr. W. H. Alexander is skipper of the outfit, which is now deployed in the Pacific.

SIDEWINDER *developer, Dr. W. B. McLean of Naval Ordnance Test Station, China Lake and Cdr. J. T. O'Neill, XO of VF(AW)-3, study model and discuss F4D as Douglas Aircraft's E. H. Heinemann, Skyray designer, looks on.*

Lakehurst Blimp Crippled
Helped by Cherry Point Marines

A Navy blimp from NAS LAKEHURST made a successful emergency landing at MCAS CHERRY POINT after one of its oil lines developed a leak.

When the leak was discovered, Lt. Lundie Moore, the pilot, radioed Cherry Point and requested permission to land. Fifty eager Marines volunteered to assist in the emergency operation. Two lines, manned by 25 men, were used to keep the airship from swaying while it was attached to a mooring mast. With a 12-man crash crew, they were able to secure it in 25 minutes.

As a gesture of appreciation, Lt. Moore took the Marine rescuers on a tour of the ship. The oil line was repaired in a few hours and the blimp continued on its airborne early warning mission 150 miles out at sea.

THE BIG SHOTS OF THE HOT SPOTS

By Jim Russell, JO1

MB-1 DISPERSES 12,000 GALLONS OF FOAM IN THREE MINUTES

IT WAS about 0930 when I walked into the crash house at NAS MIRAMAR. Suddenly, the "crash horn" went off. As if motivated by a single master control, 25 men went into action. Quickly, but without panic, they did the jobs they've learned so well—in the classroom, at drills and in actual performance.

With permission, I climbed in the MB-2, one of the smaller vehicles. Two huge MB-1's are stationed in the "hot spots" on each end of the runway during all flight operations, and were already standing by to go into action.

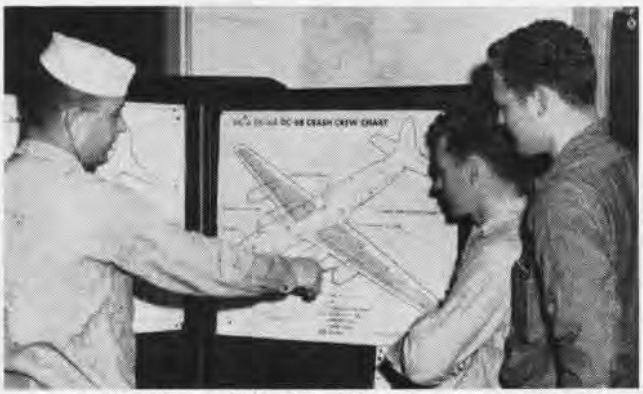
In a matter of a few minutes, the entire crew was on the field, ready to do the right job at the right time to save a life. Fortunately, this time the pilot brought his plane in without incident. There was no crash, no fire, and no one to rescue. In past months, however, they have proven their efficiency often when pilots were not so lucky.

The unit now stands at 50 enlisted men, on port and starboard watches. Civilian members of the Miramar Fire Department drive the vehicles, and train and supervise the men. Fire Captains F. M. Oliver and F. C. Camp head up the crash fire fighting operations, but discipline, liberty and other military matters are handled by Navy Chief H. E. Lester. It takes about three months to get a new man thoroughly checked out for each must master every job for peak performance at the scene of the crash.

The men do not think of themselves as heroes, but they do have a warm feeling of satisfaction every time a pilot walks away from a crash.

'CHERRY PICKER,' A 50-TON CRANE, IS USED TO LIFT PLANES

FIRE FIGHTING POSITIONS SHOWN NEAR CARDOX, CO^2 TRUCK



H. L. DARBY, AB1, POINTS OUT VITAL AREAS ON DC-6 CRAFT

CHIEF LESTER USES 'GERTIE' PHONE IN SPECIAL RADIO NETWORK

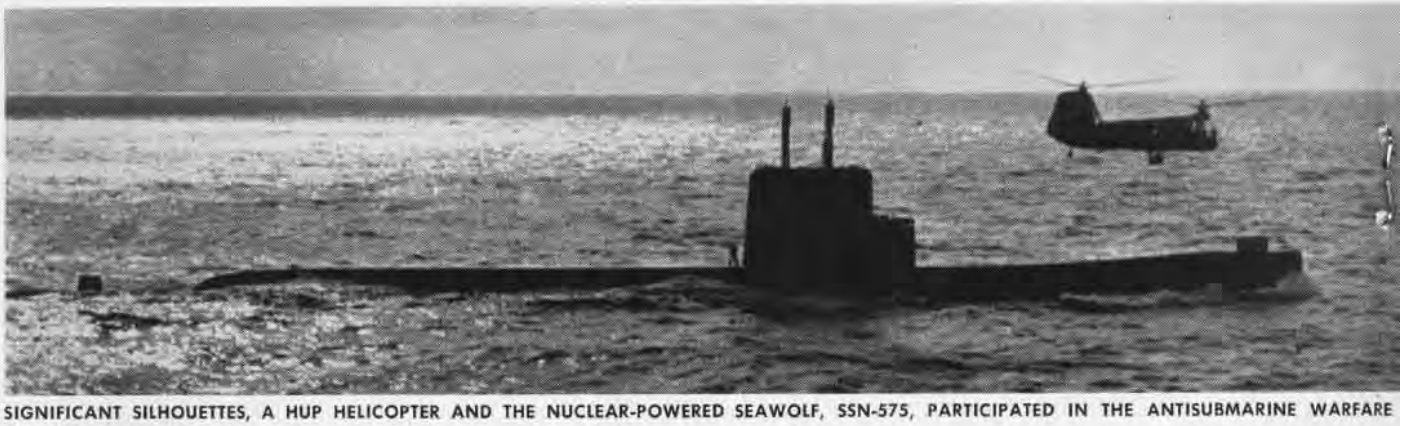
LANTF

INTREPID, CVA-11, REFUELS FROM NEOSHO, AO-143. BOSTON, CAG-1, FOLLOWS AFT

AIROPS DIRE

Atlantic Fleet Exercise . . . Three weeks of intensive operations; of realistic war games; of close coordination with other units of the greatest Navy in the world. At intervals during the year, mighty men-of-war, powerful aircraft and essential support ships, gather under Commander, Second Fleet, VAdm. B. L. Austin, to put into practice the latest naval offensive and defensive tactical doctrines. Hundreds of planes, dozens of ships, many submarines cover the Western Atlantic-Caribbean area in the operation known as LANTFLEX!

ONE OFF, SCORES TO GO. AN A4D-2 LEAVES INTREPID'S DECK. ANOTHER SKYHAWK IS POSITIONED FOR RAPID CATAPULT LAUNCH



SIGNIFICANT SILHOUETTES, A HUP HELICOPTER AND THE NUCLEAR-POWERED SEAWOLF, SSN-575, PARTICIPATED IN THE ANTISUBMARINE WARFARE

LEX

ECTED FROM FDR CONTROL POST

AWESOME ARMADA MADE OF UP THE VALLEY FORGE, CVS-45, AND SIX DESTROYERS, MOVES IN FORMATION

WITH TRIGGER-LIKE PRECISION, AN F11F TIGER LANDS ABOARD THE CARRIER INTREPID DURING AN ATLANTIC FLEET EXERCISE

E PHASE

THEY PUT THE PINCH ON BOGEYS

By Carson M. Smith, JO2

IF A SURVEY were conducted of all jet squadrons in Naval Aviation to determine which has the most unusual job in the Navy, the honors most probably would go to All Weather Fighter Squadron Three, based at North Island Naval Air Station in San Diego. The interceptor squadron is the only jet fighter outfit in the Navy that works exclusively for the Air Force.

Headed by Capt. H. P. Ady and his executive officer, Cdr. J. T. O'Neill, VF(AW)-3 stands ready around the clock to answer air defense alerts from an Air Force radar site at Mt. Laguna. The radar station and the Navy fighter squadron work together as part of the continental air defense system called NORAD (North American Air Defense Command).

VF(AW)-3 assumed its role in December 1955. A contingent of what was then called Fleet All Weather Training Unit Pacific, the group was committed by the Navy to the Air Force to become a part of the 27th Air Defense Division of NORAD. At that time the squadron was comprised of Douglas F3D *Skynight* jet fighters. Now VF(AW)-3 has replaced almost all its old F3D's with newer, faster Douglas F4D *Skyrays* — all weather, transonic jets that can fire *Sidewinder* missiles and *Mighty Mouse* rockets with deadly effectiveness.

Several factors contributed to the selection of VF(AW)-3 for the job. Chief among these was the fact that the Air Force's closest base to San Diego—Norton AF Base in San Bernardino—is almost 100 miles away. By using a San Diego-based Navy squadron, the 27th Air Division has a far more effective defense potential for its southernmost sector. With VF(AW)-3 there, unidentified aircraft, or "bogeys," entering that particular area can be intercepted and identified within minutes.

The 27th Air Division, whose headquarters is located at Norton, is comprised of VF(AW)-3 and two Air Force squadrons operating out of Oxnard and George AF Bases. Collectively, these squadrons are responsible for intercepting any unidentified aircraft in the southwestern corner of the United States. The 27th Division's area of responsibility reaches northward from the Mexican border to Paso Robles, Calif., and eastward to Las Vegas.

The task of keeping tabs on all aircraft in the North American skies requires the highest degree of teamwork among radar stations and squadrons in the Air Defense Command. The Laguna site, whose code name is Anderson, never for a moment takes its electronic eyes off the Southern California skyways. Like similar stations all over the country, it must know the identity, location and flight plan of every aircraft in its sector of responsibility, at any given minute of the day or night.

If an aircraft is detected which cannot be correlated with flight plans obtained from the Federal Aviation Agency, or if the aircraft in some way deviates from known flight plans, Anderson has exactly one minute to confirm identity before calling VF(AW)-3 into action.

If identity of an aircraft in question cannot be confirmed within one minute, Anderson designates the aircraft as an unknown and sets off a "scramble" alarm that simultaneously alerts the Air Defense Division headquarters at Norton, VF(AW)-3, the North Island control tower, and FAA.

Often Anderson calls off the alert before the scramble has a chance to get well underway. The reason is that within the next few minutes after the alert is sounded, Anderson may have verified the bogey's identity with FAA. But until the word comes from Anderson recalling the scramble, everything is carried out as though the bogey were an approaching enemy.

At North Island, while VF(AW)-3 aircrews are manning their planes, the scramble instructions are copied by the base tower for relay to the interceptor pilots when they are taxiing out. Two interceptors are scrambled for each bogey; the first is usually airborne within three minutes with the second about 40 seconds behind.

Because of VF(AW)-3's effective pilot standby-recall system, the entire squadron of 25 F4D's can be airborne

READY PICKUP TRUCK HURRIES SCRAMBLING PILOTS TO PLANES


CLOSING CANOPY, PILOT WILL BE AIRBORNE IN THREE MINUTES

within two hours at any time if necessary. This was proved several months ago when a practice alert was sounded on a Friday evening. Within an hour, more than the necessary number of pilots and men were on hand to get all jets in the air.

VF(AW)-3 has four six-pilot sections, organized so that during non-working hours four of the pilots in the on-duty section are at the squadron in an immediate ready-to-go status while the remaining two are at home subject to one-hour recall. The rest of the pilots theoretically are on a three-hour recall.

When two interceptors take off to chase a bogey, the Anderson radar site is relayed to the Mt. Laguna radar site, which in turn recalls the interceptors, ending the scramble.

VF(AW)-3 intercepts its quarry in such a way that the bogey has very little chance of slipping by into another sector. If, however, the bogey should manage to get by VF(AW)-3 before being identified, the Navy interceptors would keep right after it until it was identified or until recalled by Anderson.

Although assigned a specific defense sector, VF(AW)-3's responsibility is not strictly confined to that area. "In a broader sense, the entire United States is our responsibility," Cdr. O'Neill explained, "considering the fact that each

BOGIES BEWARE! THESE TWO F4D SKYRAYS, LOADED FOR BEAR WITH ROCKETS AND SIDEWINDER MISSILES, ARE READIED FOR LAUNCH

vectors them to within 30 miles of the target. The F4D's normally complete the intercept using their airborne radar.

The first interceptor closes on the bogey for visual identification while the second assumes a position of observation behind and above the target, from which it will be able to deliver an attack if the identification should so warrant. The interceptions usually are effected so smoothly and quickly that few of the subject bogeys are even aware of the *Skyrays'* presence.

It has been estimated that more than 80 percent of the "unknowns" never see or hear any signs of being sighted by VF(AW)-3.

If a bogey were to show signs of hostility or attempt to elude the interceptors, the F4D pilots would take immediate steps to counter the bogey's evasive actions.

When the bogey is identified as a friendly aircraft, pertinent information NORAD sector overlaps the one next to it. This system," he said, "is our guarantee that the chances of an enemy aircraft slipping through our defense lines are virtually nil."

VF(AW)-3 maintains a fast, heavy pace in fulfilling its Air Defense commitments. This is reflected by the fact that over the past 18 months the squadron has averaged one and a half unknown scrambles every day, plus a daily average of two or three practice scrambles for training.

In the face of these operational statistics, VF(AW)-3 boasts an enviable safety record. To date, no major casualties have been suffered since the squadron became an Air Defense unit.

As the only Navy interceptor squadron in NORAD, VF(AW)-3 has more than its share of glamour and appeal in the eyes of the curious public. However, Air Force and VF(AW)-3 officials do not let the squadron's popularity compromise security. Regardless of rank or title, every visitor must check in with the Duty Officer upon entering the squadron area, and check out with him before leaving.

To insure that security standards are properly enforced and maintained, the squadron has organized and trained a large group of its non-rated enlisted men to act as security guards. They are posted at various strategic positions in the squadron area 24 hours a day.

With its popularity as a public attraction by virtue of its unique job, VF(AW)-3 unfortunately has also incurred a degree of notoriety for the same reason. Scrambles may occur at any time of the day or night; the squadron has no control over their timing. When the F4D's cut in their powerful afterburners on takeoff, they create considerable noise. Consequently, a scramble at night means that people in nearby residential areas may be awakened.

Because of this unfortunate situation, VF(AW)-3 has been the target of vigorous complaints from certain quarters of the local public. To these complaints Cdr. O'Neill has a ready answer:

"The local citizens would be more tolerant if they realized just how important the job we are doing is to the safety of their homes and loved ones. In the final analysis, they have a choice between the sound of our afterburners at odd hours of the night and the possible sound of a hydrogen bomb exploding.

"The choice shouldn't be a difficult one to make," says the Commander.

LIKE OLD TIMES, *RAdm. W. S. Butts, NATO Deputy Chief of Staff, visits former command, NARTU Norfolk. Capt. R. S. Rogers is CO.*

FIRST AIRCRAFT *to land and take-off from USS Independence was an NAS New York copter flown by LCdr. Thomas and Lt. Snyder.*

THE VERSATILE RESERVES

WHETHER ENGAGED in Fleet Operations, training duty at a foreign base, community affairs, or a routine weekend drill, Naval Air Reservists exhibit versatility. From all parts of the country and from the Mediterranean area come stories of Weekend Warriors in the news.

News from New York

Not only was a Floyd Bennett HSS-1 the first aircraft to make a landing and take-off from the USS *Independence*, newest of the *Forrestal*-class attack carriers, but an NAS NEW YORK helo was also first with the ship underway.

LCdr. George E. Thomas and Lt. Orville H. Snyder, both on the staff of the air station, landed their copter during commissioning ceremonies on 10 January, at the New York Shipyard. The second "first" occurred unexpectedly. LCdr. J. J. Dunsieth and Lt. J. J. Powell, HS-832, on annual training duty, were conducting "channel sweeps" to spot any objects in the ship's path. They were near Ambrose Lightship, 25 miles out of the city.

The carrier radioed the helicopter to come aboard and airlift a civilian shipyard worker who had been notified of an emergency ashore. The mission was duly performed. Appropriately, Mr. Dunsieth is a New York City police lieutenant, and Mr. Powell is a member of the New York Fire Department.

Floyd Bennett personnel have also been very active in school circles. Capt. J. H. Newell, the commanding officer, addressed the 2200 student body of the new Aviation High School in Long Island City, and made awards to eight students for outstanding scholastic achievement. He then toured the building, which includes a 25,000 sq. ft. hangar. The school, with a faculty of 140, meets the FAA requirements in qualifying students for a certificate of competence in airframes and power plant maintenance and their upkeep.

BEFORE DEPARTING *on annual training duty, officers and men of Fleet Tactical Support Squadron 872 had a group photograph taken with a squadron R5D at their home base, NAS Oakland.*

NAVY LEAGUERS *watch pencils they donated loaded for delivery to Morocco by VR-872.*

CLAIRMONT *Little League Officials honor Capt. R. E. Steiler, C.O., and all hands at NAS Atlanta for furnishing a baseball diamond.*

IT'S TWO *in a row for Anacostia's MACS-24 as area's best. George Gilman, Navy League, gives King Trophy to Maj. L. A. Harris, C.O.*

VR-872 Serves Sixth Fleet

Fleet Tactical Support Squadron 872, based at NAS OAKLAND, deployed a quarter of the way around the world on ACTRADU, and proved once again that the Weekend Warriors are ready to carry out assignments with the operating forces on short notice.

Operating from NAS PORT LYAUTEY, the pilots flew 660 hours, working with VR-24 in support of the Sixth Fleet in the Mediterranean. Parts, cargo, and supplies were flown around-the-clock to 14 ports-of-call, under the able leadership of Cdr. George Hubert, VR-872 CO, and Lt. Jack McDonnell, VR training officer.

In keeping with the President's People-to-People program, members of VR-872 served as emissaries of good will. They delivered 28,000 pencils, donated by Bay Area high school students and Navy League Chapters, to Moroccan children, as well as blood bank equipment to the Red Cross.

"The gifts, in helping to build friendship, have aided Uncle Sam in the vital Mediterranean area," stated Capt. Jack Counihan, CO Naval Activities, Port Lyautey, Morocco.

Memphis Man Merits Award

A Department of Defense Reserve Award was given to Mr. Henry T. Winkelman, President of Tri-State Armature and Electrical Works, Memphis, Tenn. Capt. E. M. Snowden, commanding officer of NARTU MEMPHIS, presented the pennant and certificate on behalf of the Secretary of Defense, Neil McElroy, for "outstanding cooperation with the Armed Forces Reserve."

In order to be eligible for this high honor, a firm must be nominated by one of its employees who is a reservist. In this case, the recommendation came from LCdr. C. F. Weigandt, a pilot and patrol plane commander attached to VP-791. Mr. Weigandt is a sales representative at Tri-State.

Mr. McElroy wrote to Mr. Winkelman: "You have encouraged and assisted your reservists in fulfilling their military obligations. Such patriotic foresight provides real assistance to the success of our defense effort, and the Department is deeply grateful."

The pennant is similar to the Navy E's given to civilian firms in WW II.

SPECIAL RESERVE *award, Department of Defense pennant and certificate, are admired by Mr. Weigandt, Mr. Winkelman, Capt. Snowden.*

CDRS. SUMI, *Harrington, Means, Kopshaw, Manson and Kenton, have just attended technical training lecture by Cdr. H. A. Edsall, (C).*

IT PAYS *to advertise in the best places. Anacostia is very well displayed in air terminal.*

ABOUT HALF-MILLION *people a month will get the word on Washington Weekend Warriors.*

REINS *is a member of the National Council of the Professional Photographers of America.*

Wing Staffers Train in D. C.

Five reserve air stations were represented by six Air Wing Staff officers during the semi-annual training stint held in Washington under the auspices of Coordinator, Naval Air Reserve on the staff of DCNO(Air).

Cdrs. B. L. Means, NAS DALLAS; G. S. Kopshaw and R. H. Kenton, NAS NEW YORK; A. G. Manson, NAS NIAGARA; P. H. Harrington, NAS SOUTH WEYMOUTH and H. W. Sumi, NAS GLENVIEW, spent two weeks in the nation's capital getting an inside view of high-level planning and operations specifically related to the reserve program. In a very tight schedule, they visited pertinent sections of the Bureau of Naval Personnel and Bureau of Aeronautics. However, most of the program was carried out in the Pentagon, where officers received indoctrination in training aspects, budgetary matters, mobilization planning, air intelligence and long-range air reserve planning.

Activities at NAS Atlanta

The big news down south is the move of the NAS from Chamblee, where it has been located for 19 years, to its new location in Marietta, adjoining Dobbins AFB. Decommissioning the one and dedicating the other will occur simultaneously and are scheduled for 18 April.

Transfer of operations has been phased in over a period of time, but most of the civilians and active duty personnel moved in February. The P2V *Neptunes* started flying from the new site last August when the aircraft ramp area was completed.

GCA Unit #2, commanded by LCdr. C. A. Seward, moved in September. Four months later the 50,000th approach was celebrated. Indicative of the fine feeling between the two armed forces, Capt. R. E. Steiler, commanding officer of NAS ATLANTA and Col. W. M. Bowers, CO of Dobbins, flew the R4D-8 that made the record. The Colonel enjoyed his introduction to traditional Navy cake-cutting ceremonies.

Anacostia Photographer Honored

The senior photographer at NARTU ANACOSTIA, David F. Reins, PH1, has been appointed to the National Council of the Professional Photographers of America. He will act as a liaison officer for state and local groups of professionals in the Washington area. In addition, he will be among the delegates to the 68th Annual Exposition and National Photographic Conference in Los Angeles, California, this coming July.

Reins, a Navy veteran with more than 13 years of service, is not only good at shooting with a camera. He is equally adept with a gun and was awarded the Expert Pistol Shot Medal.

End of a Long Career

The first Naval Air Reserve enlisted man to be retired from NARTU JACKSONVILLE is the distinction held by Thomas Matthew Burns, AKC. He served the Navy for 35 years and 9 months, 13 years of which were on active duty.

In his 22 years as a Weekend Warrior, Pop Burns has never missed a drill, or even been late for one, and has attended every two-week cruise on schedule. Since December 1950, he has been a member of Air Wing Staff 74.

DICK SANDERSON *made 100% on the AQT at NAS Seattle. M. Palmer, PN1, smiles approval.*

CHIEF BURNS, *35-year veteran, tells Hartman, AN, also of AWS-74, all about the old Navy.*

THIS COUPLE *serves at NAS Oakland. J. C. Miller, ATC, shows shop to Mrs. Miller, SKC.*

LET'S LOOK AT THE RECORD

JG Wins Britannia Award
ATU-202 Instructor Krebs Honored

Ltjg. Dickson E. Krebs, flight instructor in ATU-202 at NAAS KINGSVILLE, has been named winner of the Britannia Award for 1958.

The award is presented annually by the Lord Commissioners of the Admiralty of the United Kingdom in appreciation of the assistance rendered by the Navy in training British Naval pilots in the period 1952-56. It is given to the Navy or Marine Corps student undergoing flight training who attains the highest mark in the advanced aerial gunnery during each year.

The Chief of Naval Air Advanced Training determines the recipient and nominates him to the British Joint Services Mission in Washington.

Ltjg. Krebs was nominated for the award on the basis of his excellence in aerial gunnery while he was a student aviator in ATU-202 during 1958. He shot an amazing 25.8% for the course and fired a high of 48% on a single flight. In three flights, he qualified for a Navy 'E' in aerial gunnery.

Blimp Pilots Designated
Wings of Gold Given at Glynco

Fourteen Naval Officers received their Wings as full-fledged Naval Aviators (Airship) in designation ceremonies held in the Airship Training Group Hangar at NAS GLYNCO, Georgia. RAdm. J. M. Carson, Chief of Naval Air Basic Training, presented the certificate to each pilot and offered his personal congratulations.

Nearly 18 months are required to qualify a student aviator for duty in the fleet. More than a year is spent at Pensacola for preflight, basic, primary and part of advanced training. When the students arrive at the Airship Training Group, they are given a 17-week course, including ground school instruction in the ZSG/ZS2G airship. Upon completion of the LTA phase, each aviator is designated for both heavier and lighter-than-air.

The Airship Training Group, with Cdr. L. B. Caine as Commanding Officer, is the only school of its special type.

71,000TH LANDING *aboard USS Midway was made by Marine Lt. Karl Albert (inset) in AD Skyraider. Winds of 55 knots blew across the deck as he touched down. The Midway was engaged in exercises off the coast of Japan.*

TWELVE PILOTS *from VMA-211 of the First Marine Aircraft Wing, located at Iwakuni, Japan, form an "E" with helmets to represent 17 "E" Awards won by them during a Marine Corps-wide competition in aerial bombing.*

Thunderbolts Hit the Spot
Earn 64 of Possible 74 Navy E's

Attack Squadron 176 returned from NAS MCCALLA FIELD, Guantanamo Bay, Cuba, after establishing what is believed to be three all-Navy bombing records. Sixty-four out of a possible 74 Navy E awards were earned during the two-week deployment. The *Thunderbolts*, flying AD *Skyraiders*, combined the talents of pilots and crew in chalking up remarkable scores in the loft, glide and night bombing exercises.

BENNET SHOWS LOCATION OF THE SEEKER

Of the 25 pilots competing in day glide bombing, 18 posted scores of less than 50 feet for three bombs. Lt. Al Headley, the admin officer, had a five-foot average, but was beaten by Ltjgs. Nelson Segars and Dick Lubberstedt who dropped three bull's-eyes each. In the picture, T. J. Bennet, AO2, is showing them where the "Bull's-eye Seekers," which contributed to such accuracy, are installed. The squadron average was 37 feet.

A three-bomb average of 100-feet or less is required for the night bombing E. VA-176 came in with 67 feet, and 21 of 24 pilots posted E scores. The loft-bombing compex resulted in a clean sweep for the *Thunderbolts*. The squadron recorded 100% E's with a 121-foot average, which falls well below the requirement of 250 feet for a single bomb.

VA-176 contends well-maintained aircraft, teamwork, and the Mark 8 eyeball, spell dependable delivery.

GCA Unit at MCAF Iwakuni
Completes 30,000th Safe Approach

When Marine Major William Irving touched the wheels of his SNB-5 to the concrete at MCAF IWAKUNI and taxied to a stop, he completed the 30,000th safe approach and landing guided by Marine Air Traffic Control Unit 60.

Sgt. J. Robinson of MATCU-60, controller on duty, had skillfully directed the procedure.

MGen. Charles H. Hayes, CG of 1st Marine Aircraft Wing, congratulated MATCU-60 on their achievement.

Col. James E. Neefus is the commanding officer of MCAF IWAKUNI; Capt. W. O. Ruroede is OinC of MATCU-60.

METG Cited for Safety
No Serious Accidents in a Year

The Multi-Engine Training Group stationed at Sherman Field, Pensacola, has received the Basic Training Command safety plaque.

METG trains student pilots in advanced instruments, using the SNB.

The group has not had a serious aircraft accident in more than a year.

THEY FIX 'EM FAST AT 202

ATU-202 PILOT SIGNALS OXYGEN MASK DIFFICULTY AFTER TAXIING JET TO 'PIT' AREA

CURRENTLY observing the second anniversary of a successful brain child, Kingsville's Advanced Training Unit 202 is beating a mean drum about it. Around the flight line, the object of the Texans' toasts is known as "The Pit"—a maintenance gimmick that has paid rather large dividends in aircraft availability and flight hours.

The "pit" is a conveniently located area on the ATU ramp which is staffed with personnel from each of the unit's maintenance shops.

ATU 202 pilots, faced with minor discrepancies either before or after a flight, taxi the aircraft to the "pit" area and on-the-spot action is taken which generally forestalls grounding of the ailing jet.

RADIO SQUAWK BRINGS QUICK ASSISTANCE

Prior to adoption of the "drive-in" service idea, almost all gripes on aircraft resulted in a trip to the maintenance hangar and cancellation of one or more scheduled flights.

While the "pit" is not a new idea, having been tried and abandoned by other activities, the Kingsville success story is based on a sound communications system. Radio contact between pilot and squadron duty officer has been made possible as well as telephone and interoffice communication equipment linking the duty officer with all shops and key supply points. In addition, the location of the service area and selection of well-qualified personnel are considered key factors in the successful undertaking.

During the past two years, 202 which is skippered by Cdr. Alex Vraciu, has compiled some impressive figures to support their claims. On an average 1500 aircraft a month have made "pit" stops with some 300 of these repaired and returned to service without further maintenance aid. According to ATU, this amounts to 7200 planes a year over a two-year period or 10,800 flight hours which otherwise might be lost.

The Kingsville jet unit recently logged its 10,000th accident-free hour.

Hercules Gets Navy Bid

Polaris Services to be Provided

Hercules Powder Company has been awarded a $1-million contract for architectural and engineering services at the Navy Propellant Plant, Indian Head, Maryland.

The contract calls for preparation of designs and specifications for structures and equipment which will provide facilities for pilot line assembly and loading of an alternate double-base propellant motor for possible use in *Polaris* missiles.

Construction is expected to start during the latter part of this year.

CAPT. DUFFY CONGRATULATES PILOT LUKE

ATU-203 Sets Jet Record

5000 Safe Hours Logged by Unit

Advanced Training Unit 203, NAAS CHASE FIELD, became the first swept-wing jet squadron in the training command to achieve 5000 accident-free hours of flight.

The string of safe-flight hours began October 13, the day Cdr. William T. Amen took over as officer in charge of the all-jet unit. That day an instructor went down in the Gulf of Mexico while shooting touch-and-go landings on the carrier *Antietam*.

Since then, instructors and students of ATU-203 have racked up safe hours, 1.5 at a time, with students accounting for 75 percent of the total.

Ltjg. Tom C. T. Luke scored the 5000th safe flight hour for the unit, right after he qualified on the *Antietam*. He was congratulated on landing by Capt. G. H. Duffy, Chase Field CO.

NAVIGATION MADE EASIER

A PORTABLE navigation board developed by Heavy Attack Squardon Two for use in the A3D *Skywarrior* has been approved by BUAER for installation in all A3D aircraft.

When the A3D was assigned to the fleet there were no provisions for a navigation table. Various methods were tried and none was found acceptable for the speeds and ranges within the capability of the *Skywarrior*.

The small cockpit precluded a permanent installation of any bulky navigation table, and it appeared there would be only one place a table would fit—above the emergency escape chute. This plan dictated that the board had to be jettisonable in a hurry.

LCdr. C. E. Dechow, squadron navigation officer, and L. C. Long, AMC, a navigator, designed a board that met all requirements for celestial navigation. (Celestial navigation is the only suitable method of navigating the A3D over large expanses of water inasmuch as the plane is not equipped with any other methods except Tacan and VOR.)

After the preliminary design was completed, a consultation was held with the metalsmiths from O&R, NAS NORTH ISLAND, and the prototype was built and installed in one of the squadron's planes for evaluation.

All crews in the squadron spent many hours testing the new piece of equipment and the board was pronounced a success by all who used it.

BUAER was asked to grant O&R NORTH ISLAND permission to produce the table in quantity. The bureau accepted the proposal and issued an official approval in Aircraft Service Change 190 which made the installation standard for all A3D aircraft.

Detachment Bravo of VAH-2, on board the *Bon Homme Richard*, was the first A3D unit to deploy to WestPac and the first to use the board operationally. It proved its worth on the TransPac of the A3D's and on the operation missions the detachment flew, both night and day.

Detachment Mike of the same squadron was the next detachment to deploy. Its pilots recommended no changes.

TICONDEROGA DETACHMENT, NAV TABLE

The board, 20 inches square and two inches deep, is equipped with two lockable rollers on which the desired strip of chart for the flight path is wound. As the flight progresses, the chart is wound from one roller to the other, exposing the present position area on a 320-square-inch work surface for plotting.

A lockable drawer is incorporated in the board for the stowage of plotters, dividers and other articles which, when adrift in the cockpit, would be a serious hazard on an arrested landing. The canvas carrying case that the board is carried in has pocket compartments for publications and charts necessary for aerial navigation.

On catapulting and arrested landings, the boards are secured in either the fourth seat, if it is vacant, or against the after cockpit bulkhead.

Midway Entertains Son

Chinese Lad was Adopted by Crew

Crewmembers of the carrier *Midway* got a chance to meet their adopted Chinese "son" when the ship visited Hong Kong for rest and recreation.

Eleven-year-old Pang Ia Iong (pronounced Aw Wing) was given a VIP's tour of the 62,000-ton ship as his 3700 fathers escorted him from flight deck to crew's mess.

Pang was adopted by *Midway* crewmen through the Christian Children's Fund. Money required for his needs is provided by the carrier's welfare fund.

PANG SALUTES FRIENDS FROM SEAT OF JET

Marines Aid Conservation

Seed Burned-Out National Forest

Marine helicopter crews from El Toro helped to re-seed 60,000 acres in California's Cleveland National Forest after the area was gutted by fire.

Maintenance men from HMR-462 designed a hopper from a large mess hall pot and installed it in one of their aircraft.

Five thousand pounds of rye grass seed, in 50-pound sacks, were poured into the hopper and flown over the burned out area on the first hop. In later missions the helicopter flew 20,000 pounds of seed over the area.

Lyautey Weather Unit Leads

Tops in Gathering Weather Data

The Rawinsonde Unit of the U.S. Fleet Weather Central, Port Lyautey, Morocco, led U.S. units round the world in gathering meteorological data from the stratosphere during the third quarter of 1958, according to a CNO report. The importance of such material was emphasized during the International Geophysical Year.

Twice daily at noon and midnight, a rawinsonde, which is a small radio transmitter, is sent aloft on a balloon and the radio signal is monitored by ground-receiving equipment. The signal is converted to pressure, temperature, relative humidity. By RDF tracking, the wind direction and wind speed at all altitudes up to the maximum altitude of the balloon are computed. After the balloon bursts, the transmitter falls back to the earth's surface by small parachute.

Measurements by the Port Lyautey unit were obtained to an average altitude of 99,813 feet or 18.9 miles. This high average has been increased from October 1958 through January 1959 to an average of 101,580 feet.

The present Commanding Officer of the U.S. Fleet Weather Central, Port Lyautey is Captain Edwin T. Harding.

IN FOREIGN SKIES

MOUNTED ON J-35 DRAGON, *a Royal Swedish Air Force fighter aircraft, the Navy's air-to-air missile, Sidewinder, is scheduled to become standard armament in the RSAF, according to MGen. Torsten B. Rapp, Assistant Chief of Staff for Air Materiel. Gen Rapp and Adm. Arleigh A. Burke, CNO, signed the purchase agreements. The Sidewinder will be carried on the RSAF's J-32B Lance, J-34 Hawker Hunter and Saab J-35 Dragon. Since the missile will not require major changes in these aircraft, it is expected to be operational in the near future.*

Swedish Navy Gets Alouettes

The Swedish Navy has ordered eight French *Alouette* II helicopters, of which four have already been delivered. Four are the product of the French manufacturer, Sud Aviation, while the remaining four are to be manufactured under license by the Swedish Saab Aircraft Company.

The *Alouette* holds the world's helicopter altitude record, 39,000 feet. It is also capable of carrying a French air-to-surface SS-11 missile.

In addition to the *Alouettes,* the Swedish Navy has four operational Vertol-44 helicopters and plans to purchase two more.

The Swedish Army helicopter units participated in their first field exercises in February. The exercise was conducted by the Home Guard and consisted of reconnaissance and transport supply by the helicopters.

The Swedish Navy plans to use its helicopter squadrons for ASW, reconnaissance, gunnery spotting, mine laying, and also mine sweeping operations.

Foreign Nations to get S2F-1

An "over $3 million" contract with the Grumman Aircraft Engineering Corporation to produce S2F-1 *Tracker* antisubmarine airplanes for the Netherlands has been made under the Mutual Defense Assistance Program.

Launching and arresting tests of the *Tracker* have been successfully completed aboard the Dutch aircraft carrier, the *Karel Doorman.*

Grumman has already delivered an undisclosed number of planes to Italy. At the same time, Grumman is producing the *Tracker* for the Japanese government.

Equipped with Magnetic Airborne Detection gear, it is the first carrier-based ASW airplane designed to detect, identify, track and destroy enemy subs.

Prince Constantine Visits the 'Lex'

Royalty took to the high seas when His Royal Highness, the Duke of Sparta, Crown Prince Constantine of Greece, paid a visit to the aircraft carrier *Lexington* during a tour of naval facilities in San Diego.

Piped aboard while the ship was operating off the coast of southern California, the Prince was accorded full honors and was then greeted by Capt. James R. Reedy, Commanding Officer of the carrier.

A sub-lieutenant in the Greek Navy (as well as lieutenant in the Greek Air Force and a captain in the Greek Army), he showed professional interest in many facets of the carrier, and was particularly impressed with a demonstration of air operations which he viewed from the bridge.

While aboard, Prince Constantine was introduced to one of his countrymen, Seaman Spyridon E. Tsantilis, formerly of Athens, Greece who has served aboard the *Lex* for almost two years.

Paris Air Show

The 23rd International Air meeting and the 50th anniversary of the Paris Air Show will be held in June. Special days will be set aside for commercial aviation, aviation medicine, helicopter flight, etc. The international air show will be held June 21.

Hong Kong Runway Extended

The British Crown Colony of Hong Kong has, at a cost of $22,000,000, enlarged and modernized its international airport at Kai Tak.

The building of a new runway 8350 feet long and 200 feet wide, opened officially last September, was a great engineering feat, for the entire length of the runway is laid on an artificial promontory reclaimed from the sea and extending for about 1½ miles into the waters of Kowloon bay. It covers 163 acres. Construction involved the building of 3½ miles of sea-wall, moving over 20 million tons of material and paving over 60 acres of runway and taxiways. Two hills were leveled.

GLIDER CLUBS OFFER FLIGHT RUDIMENTS

YOUNG CHICOMS POSITION SMALL GLIDER

ROCKET COMPETITION AFFORDS TRAINING

CHICOMS STRESS YOUTH TRAINING

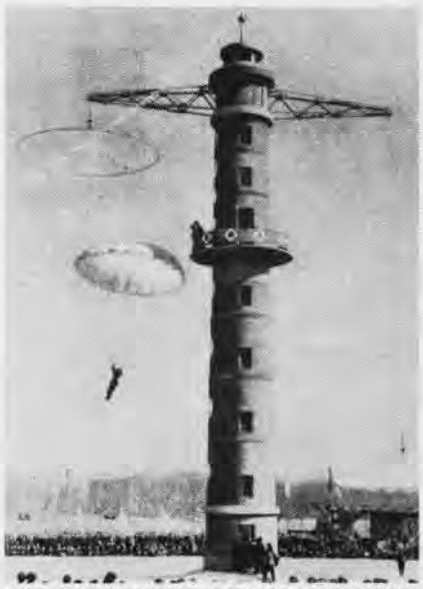
IN THE NEW WAY of things in Communist China, the development of the technical talents of the Chinese youth has not been overlooked. A system patterned on the Soviet plan for training youths from an early age is carried out in accordance with Party objectives. The ages range from nine to early twenties.

Organizations such as Young Pioneers encourage youthful interest in aviation and more recently in rocketry. Other activities sponsored by youth groups include flying of model planes, glider training and contests, parachuting, light plane flying, and courses in aeronautics and mechanics.

Communist China is bending every effort to prepare youth to fill the need for skilled personnel. The present program is designed to stimulate interest in aviation and the new space sciences. The youths who show an aptitude are, of course, earmarked for more formal training in the services or in the new factories now being built in China.

The ChiComs, aided by a pact with the USSR in 1950, initiated a training program that is now sufficiently developed to handle youths who serve their apprenticeship in the youth organizations. There has been a great need for well trained aircrews to man the aircraft of the growing air forces of the Communist Chinese. These forces, comprising the ChiCom Air Force (CCAF) and naval aviation, have grown in the brief span of nine years to the fourth largest air power in the world. With an air strength of approximately 3000 planes, Communist China ranks behind the Soviets, the United States, and United Kingdom.

CHICOM PARACHUTIST WEARS TWO PACKS



PARACHUTE PRACTICE TOWER DRAWS CROWD

As a result of their industrialization program, the production of aircraft has been undertaken. At the national aircraft center in Manchuria, the manufacture of MIG jet fighters, MAX trainers and gliders has been undertaken. While most of this work involves the assembly of these aircraft, some original work has been carried out. Recently the ChiComs unveiled a new light transport supposedly designed and built in China.

SINCE CHINA occupies one-sixth of the total inhabitable surface of the earth and approximately one out of every five people in the world is Chinese, it can be appreciated that the potential growth of the air forces is unlimited. In this respect, the need for a steady cadre of eligible manpower indoctrinated in youth organizations is mandatory, they feel. By feeding these candidates into the air services, a sizable force has been created.

However, in the ChiCom's haste, deficiencies have been exposed. Quantity rather than quality, has been their apparent aim. While past training was conducted under Soviet tutelage and guidance, it is apparent that the ChiComs have, in their haste to become self-sufficient, dispensed too quickly with Soviet training. Their lack of success against Chinese Nationalists during air engagements in September 1958 made this apparent. As a result, more Soviet instruction and later model Soviet aircraft can be expected in the Chinese Communist air forces.

PROFILE OF A SONIC BOOM

AS A PILOT of a Mach 2 airplane in the near future, some of the following questions may have a bearing on the welfare of you, your wingman—or more importantly, the good taxpayers who dwell beneath your flight path.

What causes a sonic boom?
What factors affect a sonic pressure wave?
Which of these factors can the pilot control?
Will a sonic boom normally cause damage?
Should you report your booms? Why?

The answers to these questions are provided in the following paper prepared by Cdr. Donald Engen, Flight Test Division, NATC, Patuxent River, Md.

THE PHENOMENA of the sonic boom have been widely publicized but it still remains a mystery to a majority of the general public. Many pilots, though aware of the cause of sonic booms, are not aware of their effect.

The sonic shock wave is a primary by-product of supersonic flight. Sonic booms have been generated by airplanes for the past nine years. At first these were made in screaming dives, then shallow descents, and we can now generate them in level or climbing flight. Navy airplanes, being tested by the Naval Air Test Center, are being flown beyond a Mach number of 2, and these aircraft will be in the fleet soon.

To create a sonic boom which will be heard on the ground, an airplane must be moving at a true airspeed in excess of the ground level speed of sound. The sound wave heard on the ground moves with the airplane at the same speed. It detaches from the airplane as the airplane slows below the speed of sound and continues in the direction of flight. The shock wave gradually diminishes with its main strength centered at the point of former attachment to the airplane.

Two primary pressure waves are formed by an airplane in supersonic flight, the bow wave and the tail wave. There are many others—on wings, empennage, etc.—but these two are the pressure waves generally heard on the ground. The sudden brief change in atmospheric pressure generated by the waves creates the boom or booms heard.

Initially the bow wave is saucer-shaped, but sweeps back as the speed is increased. The shape of this wave depends upon the shape of the nose of an airplane and its speed. The tail pressure wave is of lesser magnitude. A person or persons at any point where this conical shock wave touches the ground will hear two booms if the time interval between the two waves is .1 sec or greater, or one boom if the time interval is .1 sec or less.

The following significant factors affect the sonic pressure wave: Airplane fineness ratio, fuselage length, Mach number, altitude, and flight path; wind direction and velocity; temperature gradient; and atmospheric losses.

The airplane designer controls the fineness ratio and fuselage length. The pilot can control Mach number, altitude, and flight path, but aerological effects can alter his control in increasing or decreasing boom possibilities.

Some of these effects, such as wind direction and velocity, temperature, and their gradients, are generally known or predictable. Unfortunately, only the fact that some aerological phenomena aid and some hinder booms in reaching the ground is generally known. Further, aerological factors vary widely from day to day, even hour to hour. However, the graph opposite does present what we know now of the effect of wind on sonic boom generation in a standard atmosphere.

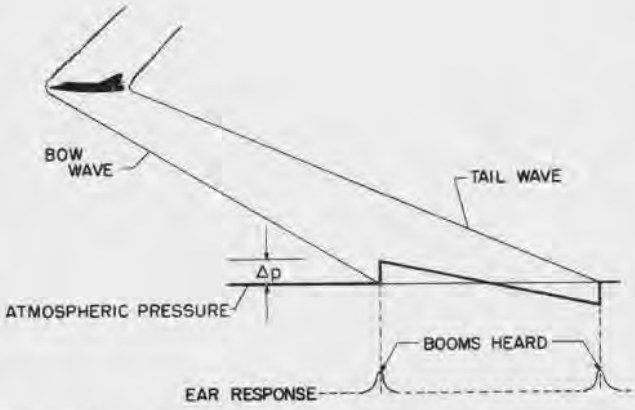
For example, 1.1 M at 20,000 feet under standard atmospheric conditions will generate a shock that can be heard on the ground. At the same altitude, flying with an improbable 150-knot headwind, a Mach number of 1.3 is required to create a boom heard on the ground. Conversely, a tail wind lowers the supersonic Mach number required to generate a boom heard on the ground.

Present knowledge indicates that temperature affects the wave propagation by reducing the magnitude as the temperature increases toward the ground (standard atmosphere) and by maintaining the magnitude under inversion conditions.

These aerological effects play a large part in the generation of explosive sounding sonic booms. In order to understand the pressures involved, consider the following analogy. A loud, close thunderclap produces a .3 to 3.0 psf pressure wave. The noise heard in a boiler factory is the result of a continual approximate 1.0 psf pressure wave. A sonic boom is created by pressures that can range from .1 psf to a maximum recorded 33 psf, dependent upon Mach number and distance from the source. This boom can generally be heard 15 miles on either side of the flight path regardless of altitude.

Its abrupt and explosive sound heard on a bright, clear day makes it reasonable to expect the non-boomwise population to react in a number of ways.

The shock noise phenomena table is self explanatory. In the case of window glass, installation often is completed with residual pressure points remaining. Thus, these pressure points cause unequal stress factors and the frequency and magnitude of the pressure wave may shatter

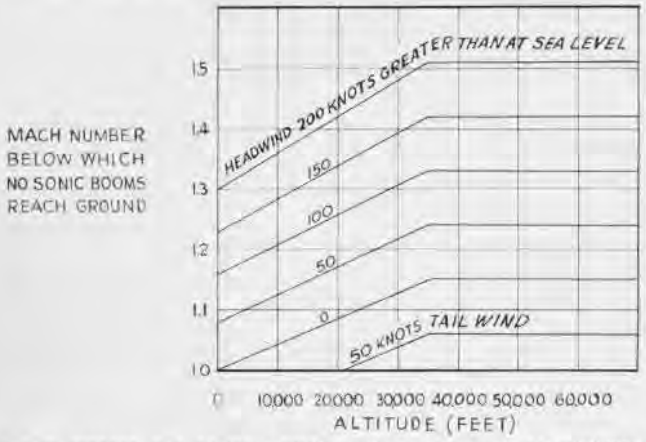


BOW WAVE AND TAIL WAVE ARE ILLUSTRATED IN THIS GRAPH

the glass more easily. Under present building codes, a pressure of the order of 70 psf is required to do major structural damage to 2" x 4" joists and to new plaster. Old cracked plaster can fall at much lower pressure.

The Navy is currently investigating and settling claims from sonic booms. Oddly enough, experience has shown that in a great number of cases, the cracks in walls and ceilings believed attributable to sonic booms are in actual fact old cracks that have been there unnoticed for some time. Unfortunately window glass is not in the same category. Glass claims are usually paid if necessary supporting facts of a boom incident can be established.

It is not known what magnitude of a sonic boom causes chickens to fly into fences and kill themselves; or live stock



WIND EFFECTS ON SONIC BOOMS FROM PLANE IN ATMOSPHERE

to abort, or caged predatory animals to eat their young, but each of the above has happened.

Generally, flying supersonic out to 1.8 Mach above 35,000 feet will produce booms of annoying, but not destructive, force unless flying at large downwind values. Supersonic flight above 1.3 Mach between 35,000 and 20,000 feet can produce loud and sometimes destructive booms, again depending upon wind values at the flight altitude. Supersonic flight below 20,000 feet and above 1.2 Mach will usually cause damage to some windows and sometimes to fowl or caged predatory animals.

Other airplanes in the local area of the airplane generating a sonic shock wave are subject to the changing pressures. No noise is heard, but rather an abrupt disturbance similar to clear air turbulence is felt. If two airplanes are flying in close formation and the wing man accelerates to pass the leader, or if he is in such a position that the changing shock wave sweeps back along his airplane, his airplane can noticeably be affected. As the shock wave touches the nose of his airplane, he becomes aware of a continuous burble, and as the shock moves aft of the cockpit to near the center of gravity, his airplane yaws normal to the shock wave (away from the leader) and upwards of 100 pounds rudder pedal force is required to offset this yaw, dependent upon the rudder control system in the aircraft.

The pilot feels as if his airplane is being "thrown" away from the leader. As the bow shock wave passes behind the rudder, the wingman's airplane abruptly yaws back to the original heading. The leader's airplane is then in a

SHOCK NOISE PHENOMENA

Δp, LB/SQ FT	Δp, DB	RESULTING PHYSIOLOGICAL REACTION	ASSOCIATED PHYSICAL PHENOMENA
0.1 TO 0.3	106 TO 118	NOT OBJECTIONABLE	BARELY AUDIBLE EXPLOSION
3 TO 1.0	118 TO 128	TOLERABLE	DISTANT EXPLOSION OR THUNDER
1.0 TO 3.0	128 TO 138	OBJECTIONABLE	CLOSE RANGE THUNDER AND SOME WINDOW DAMAGE
3.0 TO 10.0	138 TO 148	---------	DAMAGE TO LARGE PLATE GLASS WINDOWS
10.0 TO 30.0	148 TO 158	---------	DEFINITE DAMAGE TO SMALL BARRACKS TYPE WINDOWS

SHOCK NOISE PHENOMENA IN TERMS OF COMPARABLE EFFECTS

position to be affected in a similar manner. Extreme caution should be exercised in formation flight at Mach numbers over 1.5. It is difficult to penetrate this shock wave at 1.8 Mach unless sufficient excess thrust is available to accelerate on through at a firm constant rate.

Caution and courtesy must prevail in order that undue stresses will not be placed on other airplanes. It is safe to assume that 5000 feet between passing airplanes is sufficient to offer only the slightest interference up to 2.0 Mach, and that much smaller distances can be used between two tactical airplanes. While flying supersonic, it behooves the pilot to consider other airplanes in the air and the terrain over which he is flying. Investigation is continuing as airplanes capable of higher speeds are being produced in quantity.

It is suggested that individual commands maintain a sonic boom log when ashore, noting time, place, altitude, and direction of supersonic flight in order that the pilot and squadron can aid in controlling unexplained sonic booms and further aid investigators.

When claims for alleged sonic boom damage are received, it is usually necessary to contact the commands in the general area of the reported boom(s) to verify the reports. These commands usually report that their inquiries revealed that none of their aircraft was in the area when the boom(s) occurred. The Air Force experiences this same result. This is disconcerting, to say the least, in those cases where the evidence unquestionably proves that sonic booms have occurred.

This is not meant to be a log for disciplinary action. It should not be, since our present airplanes go supersonic very easily. Indoctrination of pilots must be fully utilized, and adequate tactical areas must be assigned to combat indiscriminate sonic booms.

It is further suggested that all major commands initiate continuous public information programs to publicize the sonic boom for what it is, annoying but only destructive in a limited amount only under abnormal conditions.

A BETTER understanding of the sonic boom by pilots and public will reduce its occurrence and effects. Sincere effort on both sides may even make the "Song of the Mach-ing Bird" a melody instead of a menace.

PATUXENT'S 'THIRD PARTY LOOK'

By Lieutenant Commander J. W. Entrikin

FOR MANY years industrial establishments have considered it a sound business practice to set up within their organizations an inspection department. The department evaluates the company's product on two questions: Does the product meet the requirements of the customer that the manufacturer has agreed to meet, and does it meet the requirements of the manufacturer? Such a system gives management a check on how well it is doing and it prevents putting out an inferior product, for this inspection department does not report to the production or engineering departments; it reports solely to the management. It is through this "third party look," someone who is responsible neither to production nor engineering, that top management is kept advised on how they are doing.

The Navy has followed this procedure since 1870 when Adm. David D. Porter was directed by the Secretary of the Navy, George M. Robeson, to inspect ships going to and returning from sea and to report on their efficiency. In addition, Adm. Porter was directed to "see that the trials (of Ships of War) under steam and sail, are so conducted that the Department (of the Navy) will be put in possession of all the facts necessary to remedy any imperfections in Construction, Steam Engineering and Equipment."

Throughout the following 12 years, inspections increased both in importance and in complexity, and in August of 1882 there was created, by an act of Congress, a Board of Inspection and Survey. The following month Commodore A. Semmes, as President, convened this board which has now been in session continuously for 77 years.

Wooden and iron clad vessels were the main concern of BIS inspections until WW I introduced the "aeroplane" as an orthodox weapon of war.

Before WW I, aircraft were tested by local boards of officers under the supervision of the Bureau of Steam Engineering and the Bureau of Construction and Repair. In 1916 it was proposed that a Flight Test Board be organized to function under the Board of Inspection and Survey. This was not approved at the time, but in 1919 the subject was reopened and the Chief of Naval Operations approved proposals which definitely assigned to BIS the task of conducting the trials of all aircraft.

EXACTING MISSION IS TO DETERMINE AN AIRCRAFT'S SUITABILITY FOR SERVICE USE

The Navy Department was now provided with an independent and impartial agency which would determine the aircraft's suitability for service use and whether contract guarantees of the Navy's aircraft were met. With this, industry's "third party look" was definitely inducted into Naval aircraft procurement.

During the passage of time the detailed nature of the tests and inspections have naturally changed. For example, in 1921, the Board of Inspection and Survey, in a letter to the Chief of Bureau of Construction and Repair, stated, "It is considered unnecessary to make two full speed runs at different altitudes as the variation of fuel consumption is negligible unless there is at least a difference in altitudes of 10,000 feet." Needless to say, this is not the way fuel curves are researched today.

The basic mission has nonetheless remained unchanged and that is to establish whether or not the fleet can do the job they need to do and expect to do with this airplane under the conditions in which the fleet will be operating. The President, Board of Inspection and Survey, at present, RAdm. R. F. Stout, with headquarters in Washington, carries out this task through the office of Capt. S. R. Ours, Senior Member, Board of Inspection and Survey, Patuxent River, Maryland.

BIS, by virtue of a precept to the Board issued by the Secretary of the Navy, is authorized "to assemble at such places as may be necessary and is authorized to obtain such assistance of government personnel and facilities of shore establishments as may be necessary for the performance of its duties."

As the Patuxent Office is small, the Board calls upon the Naval Air Test Center to assist it in the conduct of trials of aircraft as authorized by the SecNav precept. It also calls upon the Naval Missile Center and the Naval Air Special Weapons Facility for assistance in those phases of trials involving missile and special weapon installations. Trials of lighter-than-air aircraft are assigned to the Sub-Board of Inspection and Survey, Lakehurst, New Jersey. To facilitate this arrangement,

the Commander, Naval Air Test Center, the Test Directors, the Commander, Naval Missile Center and Commanding Officer, Naval Air Special Weapons Facility have additional duty orders to provide technical advice and assistance to the Board of Inspection and Survey.

Here briefly are the main steps in processing new aircraft through Patuxent. When the Chief of the Bureau of Aeronautics procures new aircraft, a number of them are assigned to the Board of Inspection and Survey. Generally seven aircraft of carrier types and four of patrol or helicopters are assigned to BIS.

The Board then assigns these aircraft to the various test activities who conduct electrical and electronic, armament, aircraft and engine performance, stability and control, carrier suitability, service suitability, aircraft special weapons, and aircraft guided missile phases of trials in accordance with BIS aircraft test directives.

Immediately upon arrival the aircraft undergo the 60-day BIS Initial Trial Phase. This is a crash program designed to "wring out" the plane to determine any major defects which will prevent it from doing the job. It is much better that the fleet keep an airplane that has some capability than to be given a newer, presumably much better, aircraft which has some serious defect that will prevent it from effectively accomplishing the mission. At the conclusion of these trials, recommendations are made to the Chief, Bureau of Aeronautics relating to any changes which the Board believes should be made prior to delivery of the aircraft to the fleet.

MARTIN TEST CHIEF, GEORGE RODNEY, CAPT. OURS, STUDY P6M COCKPIT ARRANGEMENT

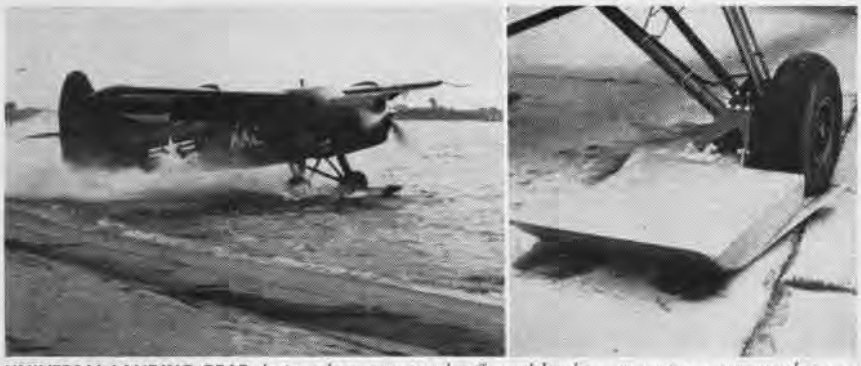
The aircraft is then given a longer, closer look. It is during these trials that the aircraft is inspected to see if it lives up to the contract guarantees and specifications. Generally, it takes about a year to run complete trials on a new airplane.

The test activities report the results of these evaluations to the Board of Inspection and Survey. The Board then reports the findings to the Secretary of the Navy with recommendations as to the acceptability of the aircraft for service use.

Although the airplane may be in fleet use by the time BIS trials are complete, settlement of contract awaits the final BIS report. The deficiencies of the aircraft, which it may or may not be feasible to correct, are the basis upon which final settlement of the contract is made.

Future projects to be assigned to BIS include T2J, P6M, F4H, A3J, A2F and P3V. Each of these aircraft will be thoroughly tested in accordance with detailed BIS directives as has every new model aircraft since 1919.

BIS PRESIDENT RADM. R. F. STOUT (L) CONFERS WITH CAPTS. S. R. OURS, J. B. H. YOUNG



UNIVERSAL LANDING GEAR *designed to permit takeoffs and landing on water, snow, mud, ice or normal runway surfaces has been successfully tested according to manufacturer. New gear, installed on 8000-pound Otter, features short, wide ski which flanks conventional wheel (right), permitting normal wheel operation on hard surface. During tests (left), pilot taxies aircraft over rough field to beach, enters water without slackening speed and became airborne after short run.*

Whidbey Capehart Housing

Units to be Ready in Late 1959

Bids have been advertised by the District Public Works Officer for the construction of a 550-unit Capehart housing project at NAS WHIDBEY ISLAND.

Allocated for the construction is approximately $9,100,000 with another $800,000 to be authorized later for the renovation of the Wherry Housing located near Ault Field.

Although it is estimated that 16 months will be needed to complete all the units, it is estimated that some units will be ready for occupancy by the late fall of 1959.

According to Capt. Charles C. Gold, Commanding Officer, the project calls for 390 single family homes for enlisted men and 160 single family homes for officers. All units are scheduled to be three or four bedroom houses and two stories depending on location.

Chip Detectors Installed

Warn T-28 Pilots of Malfunctions

Maintenance crews at Whiting Field have installed "magnetic chip detectors," designed to warn pilots of engine malfunctions, in T-28 aircraft. Whiting is the first station in Basic Training to get the kits.

The detector operates on the principle that if enough metal chips are thrown from a bad bearing or other moving parts inside the engine they will be attracted by a magnetic probe located inside the engine oil sump. Through an electrical wiring system, a warning lamp on the instrument panel is lighted when chips are detected.

The light indicates to the pilot that trouble exists in the engine even though it is not reflected by other panel instruments, and that he should land immediately.

The chip-detector idea was originated by Air Force maintenance men.

GUIDED MISSILEMAN *John Schnepf holds model of B36-D which he constructed aboard USS Midway. He entered three-hp model in Midway's model flying meet while ship was in Yokosuka. Midway is ComCarDiv 5 flagship.*

Achievement Record Set

Marine Tops 2 Classes at Olathe

Marine MSgt. Wesley D. Johnson of the Third Marine Aircraft Wing established a new course record for the Air Controlman (Tower) Course at NATTU OLATHE, when he completed the 10-week course with a 98.5 average.

Six weeks later he finished the GCA controllers course with an average of 93.5 to head a class of 14 students.

PRE-COMMISSIONING *crewmen of USS Orisknay, 310 strong, completed a week-long course in "How to Operate an Aircraft Carrier" aboard USS Lexington as she conducted air operations off the California coast. Then they recommissioned the Orisknay in San Francisco. Every skill necessary to the operation of a carrier was carefully instructed by Lexington crewmen, as shown here. Of the 310 students, 11 were officers and 299 were enlisted. They ranged from commander to fireman apprentice. To some it was more of a refresher course than it was basic.*

BIG TOP VISITS FLAT TOP. *While USS Forrestal was anchored in Naples, the Italian counterpart of Ringling Brothers, Barnum and Bailey visited the ship in force. Some 80 artists, in Naples for a circus performance, visited the carrier. By crew demand, the acrobats performed at great length. Hit of the show was Georgi, the midget, who cavorted over, under and through the most unlikely aircraft spaces.*

8000th Landing on Ranger

Record Made Enroute to Far East

Ltjg. William J. Standridge, flying an AD-6 *Skyraider*, made the 8000th landing aboard the USS *Ranger*. He is a member of Attack Squadron 145.

The *Ranger*, enroute to join the Seventh Fleet, was undergoing training in Hawaiian waters when the record landing was made.

Captain Paul D. Buie is the Commanding Officer of the USS *Ranger*.

ROLE *of lighter-than-air in ASW and AEW is discussed by T. A. Knowles, Pres. of Goodyear Aircraft with guests, RAdms. H. A. Yeager and C. E. Weakly. The admirals saw new ZPG-3W, reviewed SUBROC missile program.*

Battlefield Peeping Tom

Drone Observes, Reports Targets

First flight tests of a new type of battlefield reconnaissance weapon, a flying *Snooper*, have been announced by Republic Aviation Corporation.

The *Snooper*, designated the SD-3, is powered by a 140 hp engine. It is being produced for the U.S. Army Signal Corps.

Weighing less than 1000 pounds, the remote-controlled *Snooper* is a rocket-launched from a mobile trailer by two *Arrow II* rocket motors. Once airborne, the reciprocating engine takes over and flight direction and parachute recovery are effected by pre-programming or control from a ground or air station.

The drone employs electronic and advanced sensory devices for guidance control and observation of enemy troop movements, fortification and battlefield installations.

Interchangeable nose units enable rapid change from one surveillance technique, such as photography, to a different type, like infra-red detection, radar or television, depending on the requirements of the mission.

Forty Gulls Clobbered

Neptune Pilot Unaware of Crash

Lt. John D. Rowe landed his P2V-5F *Neptune* at NAS ALAMEDA to discover that on takeoff some 11 hours earlier he had clobbered a flight of 40 seagulls. Apparently they, too, were in the process of taking off.

Three of the gulls were found in the starboard engine. The remaining 37 were picked up off the runway by maintenance crews.

With a 40-mph wind and driving rain buffeting the aircraft as it took off, Lt. Rowe did not realize anything was amiss until daylight when he returned to Alameda.

Lt. Rowe is attached to Patrol Squadron One, based at Whidbey Island. The squadron was taking part in *Skynet*.

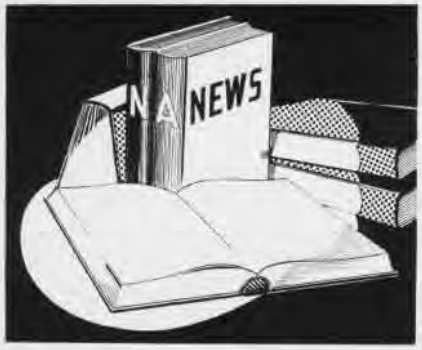
Logs 50,000th Landing

A3D Scores Feat at NAS Whidbey

The 50,000th ground controlled approach has been made at NAS WHIDBEY ISLAND. Cdr. Frederick R. Fearnow of VAH-8 touched down at Ault Field in an A3D *Skywarrior* to log the 50,000th controlled landing since Radar Air Control Center No. 1 began operations 13 years ago.

Cdr. Fearnow's landing was directed by H. J. Goodwin, AC3, RATTC No. 1.

FIRST RELEASED DRAWING *of Grumman's S2F-3 Tracker shows MAD boom extended, radome on belly. The new Tracker is longer than the S2F-1 to provide additional space for four crew members, and is equipped with the most modern developments in ASW electronics, armament.*



CNO Publications

Two new publications are being distributed by the Aviation Training Division of the Office of DCNO(Air).

Getting Your Hook In, NAVAER 00-80Q-48, is a pocket-sized pamphlet concerned with anchoring or mooring a seaplane. It describes the nature and causes of waves and the effect of currents; how to anchor a seaplane without damaging it; what three simple knots to use in anchoring; how to moor to a buoy properly; aircraft equipment; and lists complete anchoring procedures.

Meteorology for Naval Aviators, NAVAER 00-80U-24, is a shelf-sized volume which covers the fundamentals of meteorology, and the application of this fundamental knowledge to flight. Separate chapters on application deal with wide range of subjects:

Surface weather map familiarization, national facsimile network and NWAC, teletype weather reports, thunderstorms, fog and low ceiling clouds, icing, the jet stream and other high altitude phenomena; radar and weather, flight planning, operations at sea, world weather, flight problems, pressure pattern flight, and the role played by the Naval Weather Service.

BuAer Manual

The Bureau of Aeronautics calls the attention of maintenance officers to BUAER Instruction 5440.2 which provides an organization and procedures manual for use by all Naval Aircraft Maintenance Activities performing Class "C", "D", "E", and "F" aircraft maintenance.

According to BUAER, studies pointed out the urgent need for improvements in aviation logistic support, including aircraft maintenance, in order to accomplish a higher degree of aircraft readiness and flight safety.

The studies specifically recognized the need for a high degree of organizational uniformity within activities performing C, D, E, and F maintenance, if maximum improvements were to be obtained.

Recognizing this factor, the Chief of Naval Operations and various operating commands requested the manual. Though it was distributed in September, many aircraft maintenance officers appear unaware of its existence.

Each Jet Pilot Gets Jug

But Safety, Not Thirst, is Reason

There's a gallon jug for every jet aboard MCAS CHERRY POINT, and each jug is labeled so pilots or plane captains won't pick up somebody else's jug by mistake.

But don't jump to conclusions, says a Cherry Point spokesman. The jugs are not for thirst-quenching. They are used daily to take fuel samples from each jet aircraft.

Jet fuel must be filtered thoroughly so that no foreign matter larger than five microns in diameter—.000195 of an inch—will enter the engine. Fuel samples remain in the jugs for two or three hours, allowing water or dirt particles to settle to the bottom.

Thus crew members can determine by inspection whether or not their aircraft's fuel supply is contaminated.

People-to-People Program

Given Assist by Men of Midway

The men of USS *Midway* have given the President's People-to-People program a big assist in the Far East.

As part of a U.S. Seventh Fleet project, $1,000 went to rebuild a school in Japan; $700 was donated to a Japanese orphanage for food and clothing; victims of Typhoon Ida received $1,500.

In Hong Kong, 1500 lbs. of clothing were presented to the Hong Kong Standard for its annual drive to help the needy of that city.

Captain John T. Blackburn is the Commanding Officer of USS *Midway.*

WF-2 Tracers Purchased

Tracer is AEW Version of Trader

A $28.4-million "follow-on" production contract for WF-2 *Tracer* aircraft has been awarded to Grumman. The WF-2 is an early warning modification of the passenger-cargo TF-1 *Trader.*

The WF-2's primary mission is to provide information of impending attack by enemy air and sea forces to fleet units, and to control friendly task force defense fighters in the interception of such attacks.

Intricate long-range detection equipment is housed in a huge mushroom-shaped radome mounted on the fuselage.

ANGELS FROM ANGELES! *Split second timing and precision teamwork by helicopter pilots, airplane pilots and a cameraman made it possible to catch these fixed wing and rotary wing aircraft stepped in formation. While three Sikorsky HO4S-3 helicopters hovered in mid-air, four Grumman Albatross amphibians made a pass in tight formation. The seven aircraft comprise the air search and rescue fleet of the U. S. Coast Guard Air Station at Port Angeles, Washington.*

CLOSE-UP OF A 'SERGEANT-STRIPED' A4D-2 OF ATTACK SQUADRON 12, WITH THE 300-GALLON WING TANKS AND REFUELING GEAR

JUST A BIGGER GAS TANK

THE DOUGLAS *Skyhawk*, with 300-gallon external wing tanks and in-flight refueling capability, has particularly adapted itself to carrier life —as, of course, it was designed to do. During recent months, the A4D-2 has been fully evaluated and tested by Attack Squadron 12 aboard the USS *Forrestal* in the Mediterranean.

The increased range and "staying power" afforded by the configuration helped account for better than four-hour simulated strike flights. For a single-engine, single piloted aircraft, these routine operations broke endurance records for jets. Most encouraging of all, was the relatively small decrease in performance due to replacing the 150-gallon standard equipment by the larger tanks.

In-flight refueling was instituted on an operational basis by VA-12 on all long navigational flights. The Operations Officer, LCdr. W. H. Sells, had pioneered in one other facet of this art—qualifying all pilots in night air-to-air refueling. The progress from "buddy store" malfunctions on almost every flight, which were recorded right after the squadron had embarked in July, was dramatically demonstrated on 7 October 1958. During the NATO Exercise *Crescent Hinge*, seven out of seven buddy stores performed their functions without a hitch. This reliability continued.

Aboard the *Forrestal*, VA-12 also helped inaugurate the standby tanker, ready to be shot off with a full fuel load to aid an unfortunate cohort sweating out his Charlie time because of a low-fuel state.

But the bread and butter operations were the long-range flights. "As the world's smallest carrier-borne aircraft, the 'mighty mite' more than holds its own in the specialized light attack field," states the squadron CO, Cdr. C. A. Pendleton. "It's the little bird's ease of handling in the air as well as on the flight deck that has evoked sharp praise from pilots and plane handlers alike."

Simplicity of design and an "on the ball" maintenance crew accounted for availability approaching 80% during VA-12's recent deployment as part of CVG-10. However, extra effort usually pays off. During the same month that 705 flight hours were recorded during 16 operating days, the squadron received an AirLant commendation for an above average re-enlistment rate.

THREE VA-12 SKYHAWKS FLY PAST THE FORRESTAL SOMEWHERE IN THE MEDITERRANEAN

LETTERS

VA-104 AD WINGS HIGH OVER FORRESTAL

SIRS:

We have just received the January issue of your fine magazine. In its contents was an article "On the Line in '59." We enjoyed the article, but were very disappointed to note that this fine AD squadron was not mentioned in any manner.

At this time, we would like to say that the USS *Forrestal* is carrying the four type aircraft that you mentioned and we are flying the heck out of these AD's.

We have been aboard since 13 July 1958 and are now just short of seven months aboard. During this time, we have flown in excess of 4500 accident-free hours, gone 159 days without an AOCP. We have not lost a plane or a man.

Since you failed to mention the "workhorse" and the men that keep it flying, we only have one question that you have left unanswered. What are we doing aboard this floating hotel? We feel so unwanted.

VA-104 CREWMEN

D. L. Patton, AE1 — R. F. Martin, AD2
O. S. Garner, AM1 — C. R. Bishop, AK1
J. F. Muddock, AD2 — Chas. Blansett, AD1
John Elickard, AD2

¶ Tilt. "Hell's Archers" were featured in October; Alpha Deltas in eight major efforts in recent issues. NANews is proud of the Fleet's renowned workhorse, and of VA-104. Keep 'em flying.

SIRS:

The November 58 issue of your magazine contained a photograph (page 2) of my ship, the submarine *Thornback*, moored to *Saratoga* off Rhodes. The caption which states that we were "alongside for repairs and replenishment," impels me to a few remarks.

Thornback moored to *Saratoga*, not because repairs and replenishment were needed, but primarily because RAdm. George W. Anderson, USN, Commander Carrier Division Six (and SOPA), wanted to see if it could be done; and secondarily, to provide a comfortable and convenient berth for *Thornback* and *Pompon*. Depths of water in the anchorage area off Rhodes were too great, considering prevalent wind and current, to permit good holding with the limited scope of chain available to submarines. Nor do submarines carry boats. It was thus readily evident that mooring to *Saratoga* would offer many advantages.

Saratoga's hospitality to the submarines was unlimited. Her boats, fresh water, showers, multitude of ship's stores, movies, and other amenities were made available to the submariners. All departments were most eager to assist in any way possible, whether in liquidating travel claims (submarines having no supply officers), doing laundry and dry cleaning, or performing machine shop work. Some members of the crew were so impressed by the welcome that they declared liberty was better in "Sara" than ashore. Although *Thornback* and *Pompon* could never fully repay such kindness, we did open the two submarines to visiting. Ship's Company extended an invitation to *Saratoga's*, and in *Thornback* alone received about 2000 visitors.

Saratoga was by all odds the best "submarine tender" found by *Thornback* in the Sixth Fleet. Had we needed repairs and replenishment as your caption stated, I'm sure we'd have received them. My purpose in detailing the event is first to encourage other *Forrestal* class carriers to emulate *Saratoga* as a submarine "mother ship" and secondly to again express the very great appreciation of all in *Thornback* for the treatment accorded us by *Saratoga*, her Captain, and all her officers and men.

FRANKLIN G. BABBITT, LCDR., USN
Commanding, USS *Thornback* (SS 418)

AO Register at Jacksonville

The Aviation Ordnanceman School at NATTC JACKSONVILLE is establishing itself as the "AO's Home." It is instituting a personnel register to facilitate contact between old shipmates.

Active or retired AO readers of Naval Aviation News who desire to have their names in the register are invited to send a postal card with their name, rate, service number, permanent home, and present duty station to: NATTC, OA School Technical Library, NAS JACKSONVILLE 13, Florida.

CONTENTS

Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, 10 Feb. 1959.

● COVERS

An unusual shot taken of the Navy's newest addition to her air arsenal, the twin-engine, two-place, all-weather fighter, the McDonnel F4H-1. . . . Picture of the Intrepid on back cover was taken by Light Photographic Squadron 62, Detachment 33.

● CREDITS

Technical material for the article, "Navy's Search for Silence," was provided and reviewed by N. F. Rekos and H. D. Rochen, Research and Analysis Section, Power Plant Division, Bureau of Aeronautics.

● SUBSCRIPTIONS

Naval Aviation News is now available on subscription for a $2.50 check or money order ($1.00 additional for foreign mailing) made payable to Superintendent of Documents, Government Printing Office, Washington 25, D. C. Single copies are 25 cents each.

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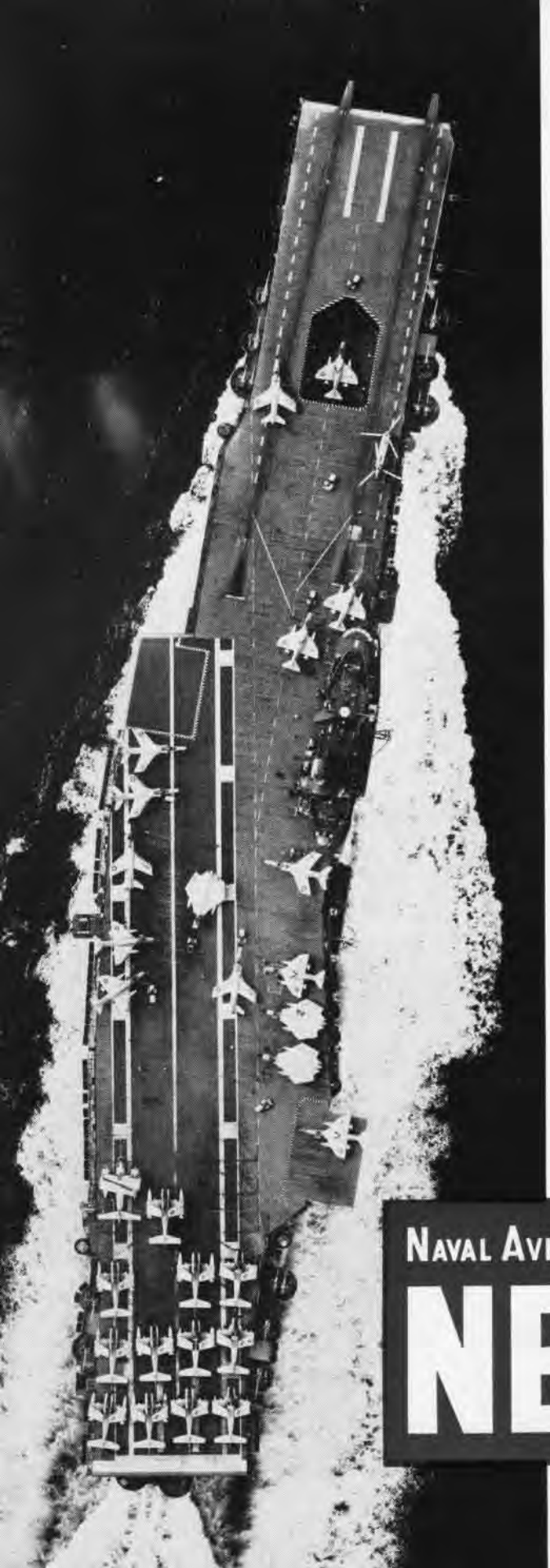
NAVAL AVIATION NEWS

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 5E629 Pentagon; Telephone extensions 73685 and 73515.

SQUADRON INSIGNIA

The Green Pawn of Attack Squadron 42 and the Proud Pelican of Utility Squadron 10 share the insignia spotlight this month. Participating the year 'round in training are the squadrons which wear the patches. VA-42, flying the AD-6, is assigned to CVG-4, and puts replacement pilots through their paces at NAS Oceana. VU-10, having completed the transition to the sonic FJ-3 last fall, tows for aerial gunnery operations at Guantanamo with increased efficiency.



WHAT'S A CARRIER?

Traditionally she is called 'covered wagon' or 'flattop'. In the beginning, which was some 48 years ago, a handful of men and one pilot jury-rigged cable, sandbags and axle hooks into the first shipboard recovery of an airplane and a new concept in seapower was born. Today, these floating airfields like the USS Intrepid (CVA 11) can launch and recover hundreds of supersonic jets carrying nuclear weapons or anti-submarine aircraft, making the carrier and her brood a formidable first line of defense in many limited war situations around the world. Come aboard these giant guardians of the world's waters in Naval Aviation News.

NAVAL AVIATION NEWS