# NAVAL AVIATION NEWS

40th Year of Publication

AUGUST 1959

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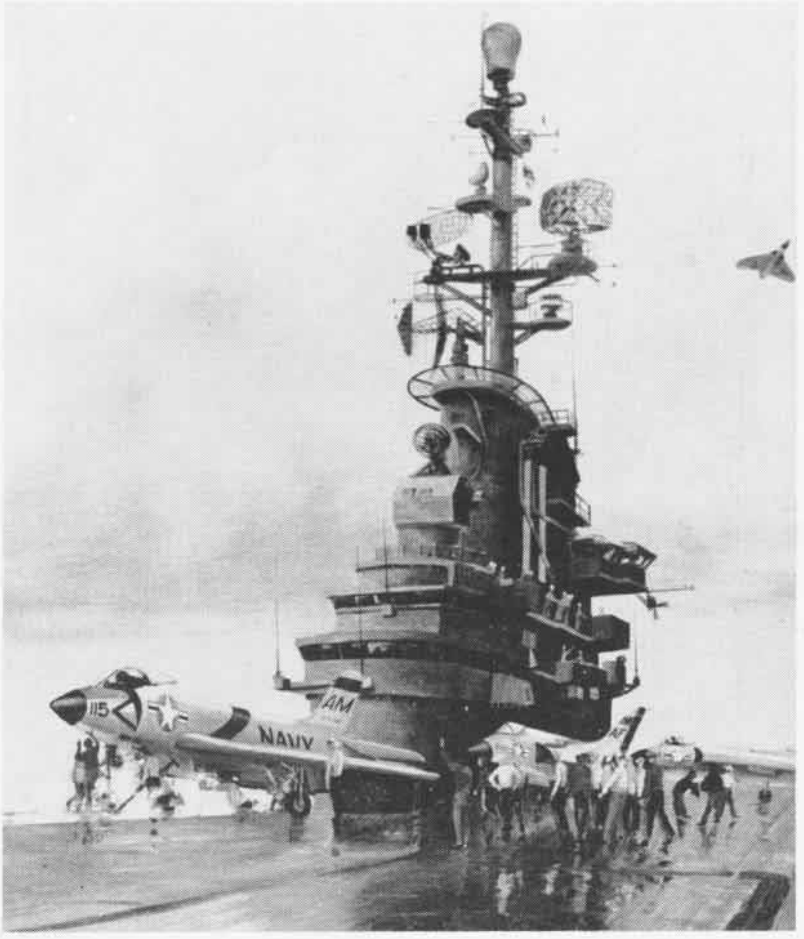




# ARTS & CRAFTS

Navy Combat Artist, Lt. Richard A. Genders, shows a Demon ready for catapult on USS Intrepid (left); an aircraft catching the #6 wire (below). 'Early Morning Flight Preparation' depicts men in action; they are readying an A4D Skyhawk.

# NAVAL AVIATION NEWS

OUR FORTIETH YEAR OF CONTINUOUS PUBLICATION, AUGUST 1959


## Whiting Student Names T2J
### Wins 'Name the Trainer' Contest

Ens. Gordon O. Prickett, flight student at BTG-2 Squadron Four, was the winner of the "Name the Trainer" contest. His name for the T2J-1 is *Buckeye*.

Four other entries were submitted bearing the name *Buckeye*. Ens. Prickett's entry, submitted in March while he was stationed at Saufley, had the earliest postmark.

Ens. Prickett toured the North American Aviation Plant in Columbus, Ohio, early in June where he was presented a $500 savings bond by the general manager, Mr. G. M. Yahn. RAdm. Joseph M. Carson, Chief of Naval Air Basic Training Command, presented Prickett with a model of the T2J-1.

## Oriskany Again in Action
### San Diego is to be Home Port

San Diego is the new home port of the newly recommissioned aircraft carrier, USS *Oriskany*, CVA-34. Her two-and-a-half-year face lifting cost $53 million.

She joins three other carriers at San Diego, the *Lexington*, *Bennington* and *Shangri-La*. The skipper of the *Oriskany* is Capt. James Mahan Wright.

**OLD AND NEW** *in military aviation are joined at Smithsonian Air Museum as A3J Vigilante model is presented in shadow of WWI Spad. (L to R) Paul Barber, curator; Phil Laub, North American; P. S. Hopkins, museum director.*

**BAKER,** *one-pound squirrel monkey, who rode a nose cone into space, shows Cook, AA, a volunteer human subject at the School of Aviation Medicine, Pensacola, how to stay calm. ASPCA conferred Medal of Honor on Baker.*

## Cadets Observe Seapower
### Watch Amphibious, Air Units Work

Six hundred West Point cadets visited Norfolk for indoctrination.

After watching amphibious demonstrations at Little Creek they visited NAS OCEANA for orientation in Naval aircraft and saw a demonstration of carrier landings.

Following a tour of Norfolk-based ships, the cadets embarked in the attack transport *Rockbridge* for shipboard indoctrination as the ship steamed for Bayonne, N. J.

VAdm. George C. Towner, Commander Amphibious Force, Atlantic Fleet, was in charge of indoctrination.

## Two Out on the Double
### Pilots Use Martin-Baker Ejection

Two aviators from Advanced Training Unit 212 have become the latest members of the "Caterpillar Club."

Ltjg. Ben Woodworth and his student, Capt. G. Ratzlaff, USMC, employed the latest operational ejection system used in the Navy, the English-made Martin-Baker ejection seat.

The F9F-8T aircraft was in the pattern at NAAS KINGSVILLE, North Field, when they elected to eject at below 300 feet. It was calculated that from the time they pulled the face curtain to the time they touched the ground in their fully deployed chutes was six seconds.

Ltjg. Woodworth's only comment: "It has the kick of a Georgia mule!"

## VS-36 in Summer Training
### ASW Squadron Hosts Midshipmen

Air Anti-Submarine Squadron 36, with 20 S2F *Trackers*, 60 pilots and 250 men, deployed aboard the *Valley Forge* July 1st for its first intensive exercise since earning an "outstanding" rating in spring operational readiness inspection.

In addition to extensive ASW exercises, the Task Group Alfa squadron will visit Halifax and Bermuda. Naval Academy midshipmen are also aboard.

**ADM. ARLEIGH BURKE,** *CNO, receives the grand order of Leopold II from MGen. Baron Antoine Paul del Marmol of the Belgian Embassy. King Baudouin named Adm. Burke for the award on his recent United States visit.*

## 'Twin Peaks' Trains 25,000
### Marines Use Jets, Helos, Ships

Jets of the Third Marine Aircraft Wing provided close air support to the 15,000 Marines making an amphibious force landing at Oceanside, Calif.

At the same time the amphibious force was making its beach landing, helicopters from Marine Air Group 36 were heli-lifting more than 1000 other Marines in vertical envelopment.

Termed "Twin Peaks," the exercise included approximately 25,000 Marines of the First Division and Third Wing, plus 60 ships of the U. S. Pacific Fleet.

The fleet steamed under cover of darkness to within 4000 yards of the beaches. Ships had already bombarded San Clemente Island for 24 hours the day before, softening up the 'enemy.'

San Clemente was used for the firing exercise because of the non-availability of the bombing ranges in the exercise area.

For the exercise, a hypothetical country known as *Aggressor Nation* invaded another hypothetical country known as *Bilton*. The event supposedly happened last January. Two days later, the U. S. declared war on the aggressor country and the months of planning brought about the current, successful amphibious landing.

USS *Princeton* saw action for the first time since being converted to her new role of amphibious assault ship.


**ENGINE** *of Ford plane RAdm. Richard E. Byrd used to fly over South Pole in 1929 is admired at Ford Museum, Detroit, by Cdr. L. R. Schwabe, Recruiting/ONOP Detroit, RAdm. G. F. Beardsley, and F. R. Davis, Curator.*

## HU-2 Angels Get Workout
### Nine Men Rescued in One Week

Nine persons were rescued at sea in a single week by Helicopter Utility Squadron Two detachments in June. One was a triple rescue, another was quadruple, and two were singles.

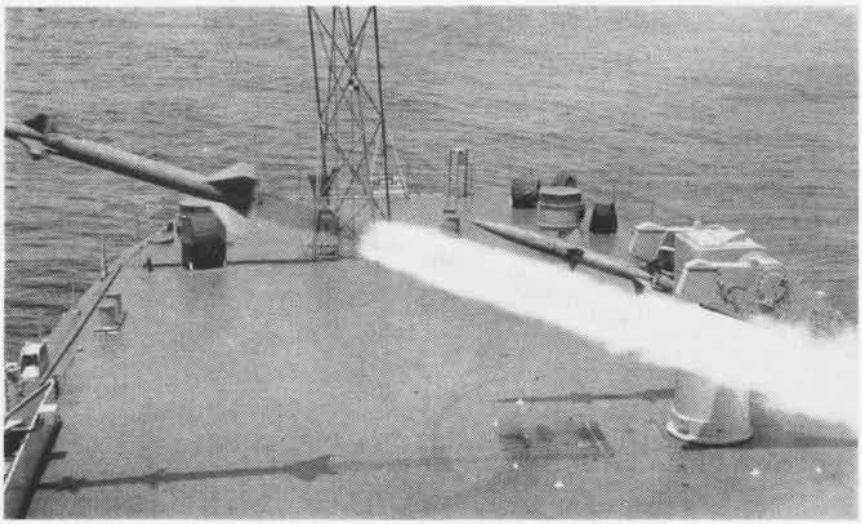
The first was staged from USS *Intrepid* in the Mediterranean. A Douglas AD *Skyraider* had just taken off when the pilot got an indication that his engine was malfunctioning. He made an immediate turn and headed back to the ship where preparations were being made for an emergency landing.

Just seconds short of reaching the flight deck, the plane's engine quit completely, causing the pilot to ditch. Helicopter pilot Ltjg. William J. Hoffman and crewman A. L. Shaw picked up the pilot and his two crewmen and returned them safely to their ship within seven minutes of the crash.

Four members of an anti-submarine helicopter which ditched at sea in the Atlantic were rescued by Ltjg. Harold R. Greene and crewman Joseph S. Daughtry.

In the western Atlantic, the pilot of an F4D *Skyray* was rescued by Ltjg. Gerard E. Barry and crewman George Bloomer after the jet crashed into the Atlantic off the *Essex*. Crewman Bloomer jumped from the hovering helicopter to free the pilot who was being dragged under the surface by his sinking plane. The jet pilot was unconscious but Bloomer managed to get him on the rescue seat so he could be hoisted into the helicopter.

The week's fourth rescue was performed by Ltjg. Donald Dunne, pilot, and crewman William Schrack when a sailor fell overboard from the *Valley Forge*. With flares marking the spot where the man fell from the flight deck, he was located quickly, picked from the water, and returned to ship.



**THE COUNTDOWN** *went, "three, two, one . . ," then with a big swoosh a Terrier guided missile roared off the deck of the USS Norton Sound in a blast of yellow flame. The occasion was a visit of 120 members of the American Rocket Society who were guests of the Navy on the final day of their four-day convention in San Diego. Also aboard were some 60 military guests, among them VAdm. Alfred M. Pride, Commander, Naval Air Force, Pacific Fleet, and RAdm. A. E. Jerrell, head of the Pacific Training Command. The missile shot was fired 50 miles off the Southern California coast. Note shadows on the deck (left). A Terrier is loaded by Navy crew on launching rack (right).*

## Copter Rescues Civilian

### Heart Victim Saved in Choppy Sea

After suffering a heart attack in a fishing boat off the Jersey coast, a civilian was rescued by a helicopter of HU-2. Ltjg. Fred Bierschenk and Frank H. Ingle, AD1, acting on a request from the Coast Guard, flew a HUP helicopter 30 miles offshore to perform the rescue.

They avoided rain and hail while flying, without navigational aids, to the distressed man. On arrival, they found the fishing boat's antennas to be so high that they interfered with normal rescue procedures.

Keeping the helicopter considerably higher than normal to avoid crashing into the bobbing boat's antennas, the helicopter crew lowered a hoist and successfully rescued the civilian.

He was flown to Lakewood airport and transferred to an ambulance which carried him to Lakewood for treatment.


**BIG BOOST** *(Department of Understatement) to Recruit-Attend-Retain Program at Dallas was given by a visit from Jayne Mansfield. She presented Weekend Warriors, Long and Manney, station awards for recruiting success.*

## BuOrd's Computers Ready

### Missile, Ammo Flow Controlled

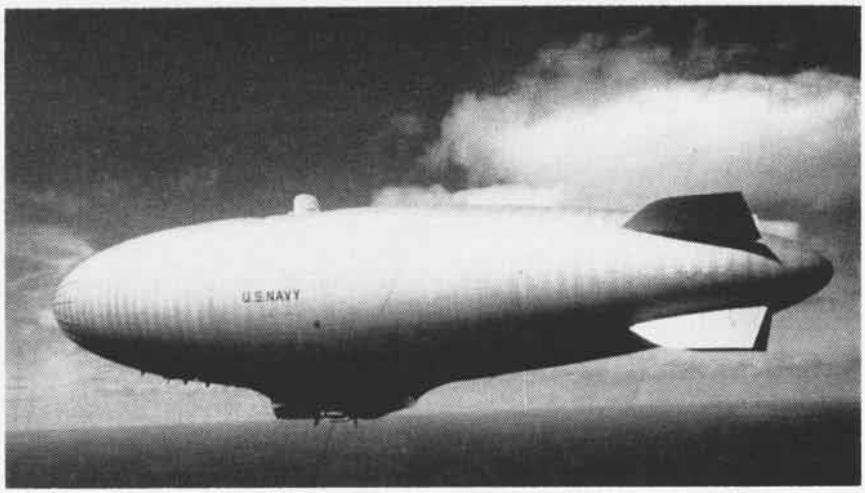
In July the Navy put into operation a new electronic data processing system to keep track of its missiles and ammunition throughout the world.

The method, which was devised by the Bureau of Ordnance, will use an all-transistor, high speed system developed by the Radio Corporation of America.

As the initial step in a five-phase logistics program, the RCA 501 is expected to provide high speed inventory control of missiles, mines, torpedoes, bombs and bullets from the time they start through the production line until they are expended in training exercises or actual warfare.

Eventually, the system will be employed for overall logistics control on non-expendable items—such as guns, gun mounts and missile launchers—as well as for financial management, quality evaluation, and research project management.

BUORD has trained specialists to operate the equipment which was installed in June in the Main Navy Department Building, Washington, D. C.




**WORLD'S LARGEST** *non-rigid airship, the Goodyear ZPG-3W, flies from Akron to Lakehurst for delivery to the Navy. One of four blimps built at a total cost of $48-million, the first ZPG-3W will enter service with ZW-1 on the Atlantic Barrier in October. The other three will join the squadron by late spring next year. The -3W's have 1½-million-cubic-foot helium envelope, use two 12-man crews, measure 403 feet overall, and cruise at some 70 knots plus.*

## Piasecki Signs Navy Pilot

### Lt. Kennedy Will Test Fly ZV-8P

A former Naval Aviator has been hired as test pilot by Piasecki Aircraft Corporation to fly the company's revolutionary wingless ground-and-air vehicle, the ZV-8P *Sky-Car* which was developed for the Army.

Robert James Kennedy, a reserve lieutenant, completed a three-year tour as helicopter flight instructor at Pensacola this spring. During his active duty with the Navy, beginning in 1943, he logged 2434 flight hours which included 1300 hours as a helicopter flight instructor.

He has received awards from the Naval Air Training Command for 1000 and 1500 accident-free flying tours.

## The Tables are Turned

### Student Becomes the Instructor

On 25 May 1951, a young Naval Aviator-to-be, Jerry S. Bassett, swung himself into the cockpit of an SNJ at NAAS WHITING FIELD, Pensacola, for his "A-1 HOP" in his training syllabus. The instructor in the back seat was Lt. James R. Langford.

Eight years later to the day, 25 May 1959, Cdr. James R. Langford, received his A-1 HOP in an F9F-8T jet trainer at the Jet Transitional Training Unit, NAS OLATHE, Kansas. Cdr. Langford's instructor? His old student.

The Jet Transitional Training Unit is skippered by Cdr. C. N. Seaver.

**LT. FRANK E. ROEHL** *(L) of VRF-32 is welcomed to Moffett by Cdr. J. F. Sands, XO of VF-124 as he delivers first F8U-2 to CVG-12, West Coast Replacement Training Group; he'll train pilots to use fast Navy fighter.*

# GRAMPAW PETTIBONE

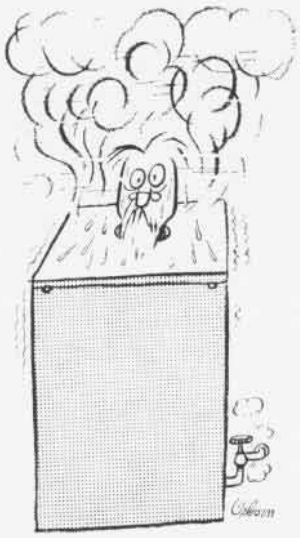
## Who's Got It?

It was a fine clear morning, high scattered clouds and visibility 15 plus, but gusty surface winds running 16 knots, gusts to 21, made it just a little bumpy and uncomfortable down at landing pattern levels.

After about a half hour of airwork for a first pilot check, an SNB-5 entered the pattern, right hand turns, for a landing. There was a strong gusty crosswind about 45° from the left. An experienced (over 100 hrs. in model) instructor was in the right seat; the student, an experienced jet pilot but with only 60 hours in the SNB, in the left seat and flying the Beech. Two passengers rode in back.

The pilot made a good approach and using full flaps, touched down on the centerline in the first third. The SNB had a tendency to drift left on the rollout and full right rudder didn't help much, so the instructor yelled, "I have it," but the pilot yelled back "No, I have it! I have it!"

They continued angling left as the tail wheel was lowered to the deck and the instructor again yelled "I have it." The pilot being checked again yelled back, "No, I have it!" and applied a little port throttle and took it off again. The instructor got on the controls with him and attempted to correct the situation, but the pilot was still on the controls and applying right brake. As



they went off the edge of the runway, the student pilot locked the brakes and the SNB nosed up and stayed there.

***Grampaw Pettibone says:***

**The little old SNB sure causes a lot of trouble for our jet men, them being used to machines with a nose wheel attached. Just 'cause its top speed is lower than the landing pattern speed of a fighter with everything down and dirty is no reason to get complacent about this tricky little beast. Old Beech hands say, NEVER use full flap with 45° of strong crosswind on the usual length of runway, or she'll nail you sure. You MUST use differential throttle for directional control on a crosswind takeoff or landing. Rudder and brake just don't do the job.**

**When an instructor says "I've got it,"—that's it,—or the C.O. should have a big old carpet session prepared for the stubborn one. There should be a clear understanding of this before a check-out or instruction hop even leaves the chocks.**

**There were two passengers in this jobbie. OPNAV Instruction 3710.7A specifically forbids passengers on fam or check-out hops. The reason is obvious.**

## Cat Shot

Early one fine clear California morning, an A4D-2 buddy tanker was lined up on the starboard catapult of a CVA in position for the shot. During the interval between the time 100% power was added and the cat was to fire, the holdback pulled out of the deck. This allowed the plane to roll forward full bore as the bridle fell off. Cutting his engine and hitting full brakes, the pilot managed to stop the A4D ten feet short of the round down at the bow! While he was rolling forward the catapult had fired, the shuttle striking the nose wheel.

The A4D was struck below and squadron maintenance personnel checked it over for visible damage. None could be found, so some two and a half hours later it was again spotted on the catapult for launch. Turn up was O.K., the pilot gave the salute and waited for the shot. The initial stroke and acceleration felt good and gave him a brief instant of relief (he admitted he had more than the usual ration of concern about this shot being a good one). His moments of relief were brief! The nose dropped suddenly and he was looking straight down at the deck. His nose wheel and fork had both sheared off. He was 'riding' down the cat on the bare strut!!

He knew the plane was going too fast to stop *this* time and recalled thinking three more distinct thoughts.

First, "I hope the bridle stays on." Second, "I better get this nose up as soon as I can." The third thought was relative to the ancestry of the starboard catapult.

The A4D continued down the deck nose low and became successfully airborne with an endspeed of 124 knots. The pilot smoothly rotated, cleaned it up, got a few hundred feet of altitude, and checked all the gages. Everything O.K.

His wingman joined up, checked him for damage, reported it didn't look too bad, so they decided to proceed as planned to China Lake and put it in there.

The airfield tower had been alerted by the ship and was busy foaming down the runway in the vicinity of the arresting gear. Things were looking good and advice from the tower was excellent, reassuring, and most welcome.

He orbited for an hour, both drop tanks being burned dry and the buddy store dumped. His internal fuel was burned down to 2000 pounds, the recommended landing weight.

As he circled he thought over the possibilities open to him. Gear down and on the stub? No. The strut might ram up through the cockpit deck and pin him to the seat. Gear up, hook down, on the empty buddy store and 300-gallon drop tanks, coming around the horn on touchdown, seemed best and he advised the field tower of his intentions.

He turned on final approach for the landing at 125 knots, slowed to 110 over the end of the runway and held this speed, dragging the hook up the runway until he was over the foam, then chopped the power to off and set it on. The hook grabbed the wire and the A4D skidded to a stop with no further damage at all.

***Grampaw Pettibone says:***

**Jumpin' Jehosophat! Any comments I might make on this real pro's performance are strictly superfluous! He had a couple of purty narrow squeaks for one day's operations and sure don't hafta back up to the pay window to draw his dough after the way he handled 'em both!**

**I wrote this one up not only because it was hairy, but to point out that the shuttle striking a nose gear assembly on a cold shot or misfire CAN damage the gear, and it takes a little more than a good visual inspection to determine the extent of damage. Zyglo penetrex or dye penetrant inspection is just about the only answer.**

## Hot Stuff

A student pilot was busily engaged in a preflight inspection of his F9F-8B *Cougar* prior to scheduled departure on a DR navigation hop. As he crouched in the port wheel well to inspect the landing gear, the lineman in order to facilitate the pilot's preflight inspection, climbed on top of the port wing to open the access doors and gas gaps.

As he opened the main fuselage fuel cap, fuel overflowed from the cell due to expansion of the JP-4 in the heat of the day. The overflow drain is located in the port wheel well and fuel poured on the pilot's back. As it trickled on him, the pilot immediately crawled out of the way and asked the lineman how much was on his flight suit. Assured it was only a "small spot" he departed on a two-hour hop. It was hot and he perspired profusely and felt completely uncomfortable.

After landing the pilot reported to the dispensary. He was found to have first and second degree chemical burns on most of his back and was hospitalized.

***Grampaw Pettibone says:***

**My old hide's pretty tough and thick, but JP-4 spilled on me gets a durned sight more than a quickie eyeball check. You gotta get out of those clothes and scrub with soap and water RIGHT NOW and then check in with the Doc. This stuff burns and burns and burns. A fella's back or hands can feel as hot as the inside of those burner cans after the stuff is ignited. For lack of a half-hour cleanup, this lad was grounded for eight days. This was just plain fuelishness.**

## *Gramps' Advice to the Airborne*

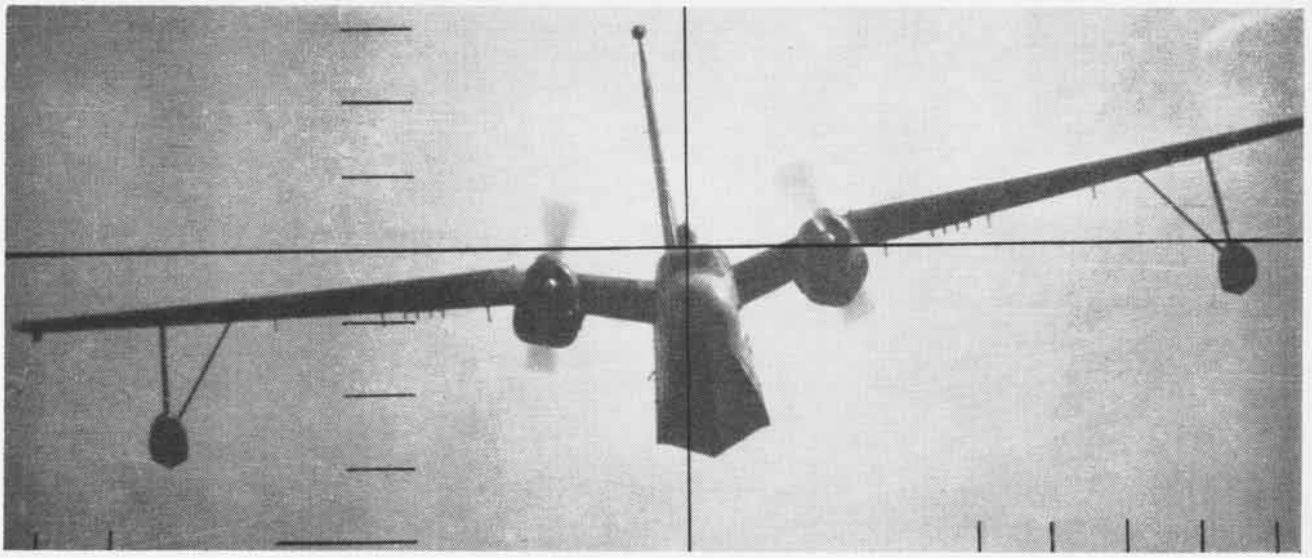
***Ever watch a bunch of pilots preflight their aircraft? Some of 'em never look up the tail pipe or check for leaks around the hook, a real fire hazard, but almost ALL of 'em kick the tires! Must be a holdover from the old days when on a preflight we usta just kick the tires and twang the wires, or maybe it's just a savage urge to show the beast who's boss!***

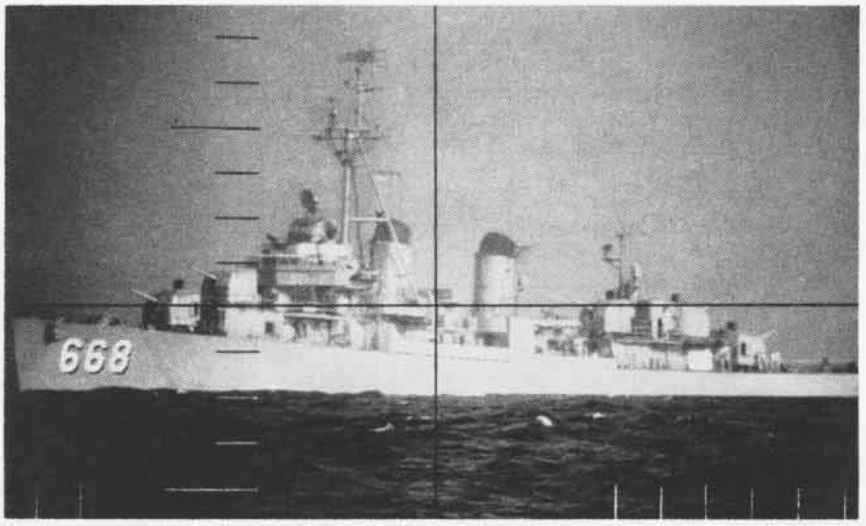
## Sleepy

An F8U-1P was spotted on the hangar deck of a large CVA and the plane captain, sitting in the cockpit, had fallen asleep. A buddy, who had a little work to do in the cockpit, pounded on the fuselage and shouted "Open the canopy." The plane captain was immediately awakened. Thoroughly startled but still pretty groggy, he pulled the canopy emergency jettison handle! The canopy blew, shearing the hinge bolts and causing about 75 man-hours of damage.

***Grampaw Pettibone says:***

**The canopy safety pin was not in place or this wouldn't a happened. NO ONE should sleep in a parked aircraft! A sleeping man in an uncomfortable position could kick the gear handle to the up position or trip any number of switches with possible major damage. If you've gotta grab 40 winks, grab 'em someplace else!**







**A**nti-submarine warfare is a many-sided art, and also a many-sided story, depending on where you sit. Here's how it looks through the periscope of a submarine taking part in Atlantic Fleet ASW training.

**S**taring down his throat is a P5M, top. Next, he has a destroyer in the crosshairs. In shot three, a hovering helicopter lowers its sonar to pinpoint the submarine.

**W**hen the problem is over, the sub surfaces, right, to tally up the statistics. Then the problem is run and re-run to sharpen the seek, find, and kill capability of the ASW units.

## INTERPRETIVE REPORT ON ASW . . . . .

# ALPHABET CONSPIRACY AGAINST ENEMY SUBS

### Part Two

*Last month we began the story of Anti-submarine Warfare as seen by Commander Anti-submarine Defense Force Atlantic, and RAdm. John Thach, Commander of Task Group Alfa. The story continues.*

WHEN WE left Admiral Thach in his flag cabin we were escorted into the captain's quarters to interview Capt. W. M. McCormick, commanding officer of the *Valley Forge.*

**Q. Captain, what are some of the more unusual aspects of ASW as seen through the carrier people's eyes?**

A. Mainly, it's the fast pace. We often operate around the clock, launching planes early in the morning and recovering them late at night. Some of our flight deck crews are up at 0430 and they don't secure until 0200 the next day.

**Q. How do you combat crew fatigue?**

A. We try to spread the workload as much as possible. In many ways we rob Peter to pay Paul. We have a cook standing watches in CIC and a baker who's up for a change in rate to radioman. In some cases, though, we can't borrow from one division to staff another. It takes too high a degree of skill on the flight deck to use just any rate.

**Q. What else is most unusual?**

A. The logistics jobs we must do as the largest ship in the force. The carrier must be tanker, tender, repair ship, hospital ship and air terminal to the other ships.

Even internally, the logistics problems are unique. We feed breakfast to some men at 3 p.m. and supper to others at 5 a.m.

**Q. A lot is being said about the physical readiness of ships which have been in service since World War II. What is the condition of the Valley Forge?**

A. We do need more money for overhaul and modernization. This ship was built for duty in the Pacific. In the North Atlantic, we keep operating in weather so bad that on occasion the *Queen Mary* turns back into port. The destroyers take a worse beating from the weather than we do. But the men understand our need to keep operating and they make repairs as they are needed. You could say we keep going with baling wire and chewing gum fixes, but we keep going.

BEFORE calling on the submarine, destroyer and air squadron people, we stopped off at the ASW Tactical School and got a tour by LCdr. W. L. Aydelott.

There was an ultra-modern lecture room with the latest in training aids, a tactical floor where scale models could be maneuvered to simulate night operations by use of black light, and a complete trainer with mock-up rooms designed to simulate every aspect of anti-submarine warfare.

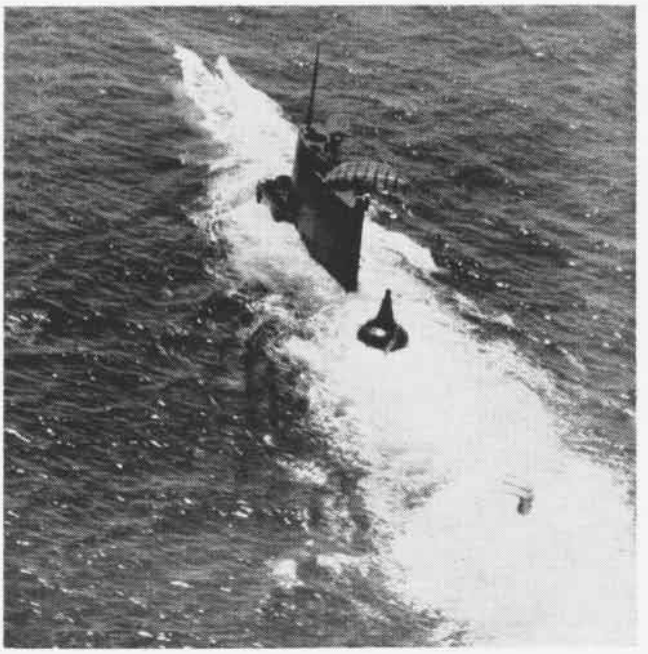
Men of the ASW force arrive at the tactical school to solve their problems on dry land before deploying with Alfa, Bravo or Charlie. The school has the most complete ASW library to be found anywhere in the nation.

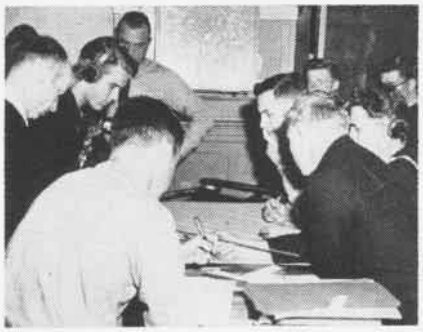
A second and perhaps more important service provided by the school, explained LCdr. Aydelott, is that teams from the school staff go to sea with the ASW groups and monitor their efforts. At the conclusion of the exercise the school holds critiques from overlays of charts that were used during the problem.

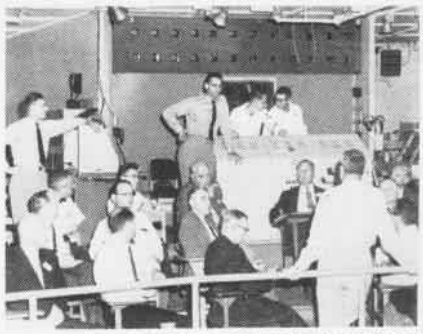
Next call was USS *Sea Leopard,* where this interview with Lt. John Hemann, executive officer, was conducted.

**Q. What needs do the subs best serve in Alfa?**

A. Our best service is providing target classification. We alone can operate on the enemy's own terms. We can latch onto him in the minimum depths and follow him down. On one exercise, *Cobbler* was the target. She had







AT ASW TACTICAL SCHOOL, SUB IS PLOTTED, AIR AND SURFACE SEARCH CONSOLES ARE MANNED, AND INDUSTRY REPS STUDY PROBLEM

evaded the force for three days and there were only six hours remaining until the training problem would come to a close.

The *Sea Leopard* made contact and told the P2V's of VP-8. The sub didn't know it had been spotted until Alfa's weapons had been fired. When he broke the surface he found planes, helicopters and destroyers surrounding him.

Another time, the ships and planes thought they had a contact. They classified it as a sub by all available methods. We got there, verified the contact as non-sub, and the problem ended.

**Q. How did you ever come to a meeting of minds with the aviators who have traditionally been as outspoken as the submariners have been secretive?**

A. At first we did cringe at what we considered their lack of circuit discipline. But as time goes on, we have come to look forward to hearing their radio transmissions. Now when they talk we know that another member of the team is nearby and that together we can work better.

IN THE SAME vein of exploring unit identity, we interviewed Capt. C. J. Vanarsdall, Jr., Commander of Destroyer Squadron 36, aboard the destroyer USS *New*. He spoke for destroyermen aboard the *New, Holder, Rich, H. J. Ellison, R. L. Wilson, Basilone,* and *Damato.*

**Q. What do destroyers contribute to Task Group Alfa?**

A. We have facilities to stay on a contact as long as may be required. Further, we have facilities and capabilities to coordinate the efforts of all members of the ASW team.

We recognize that our search horizon, both surface and underwater, is limited. We use other members of the team to expand this horizon.

We have a definite and positive kill capability.

**Q. How are the destroyers of DesRon 36 standing up in the rough weather of the North Atlantic and the fast operating pace followed by Task Group Alfa?**

A. We are having great difficulty maintaining ships in a really ready status because of repeated material failures, most of which can be attributed to the high tempo of operations and the limited upkeep time and funds we have. The storms have had their effect, too.

In the last six months the destroyers have faced the discouraging situation of bad weather at sea and constant repairs in port but we have met every challenge. We have deployed with Alfa on schedule.

**Q. What is your opinion of the aircraft and crews who operate with you in Alfa?**

A. Destroyermen in Alfa have witnessed some of the finest demonstrations of ASW work, under all weather circumstances, that could be found anywhere. I refer to both carrier-based and land-based aircraft.

We have served as controllers for aircraft under such miserable weather conditions that it appeared impossible to keep planes in the air. We especially admire the P2V fliers who come out here under those conditions and stay with us for hours. Those pilots must either be eager young bachelors or very brave men.

OPERATIONS AREA, MOCKUPS HELP GIVE STUDENTS PERSPECTIVE

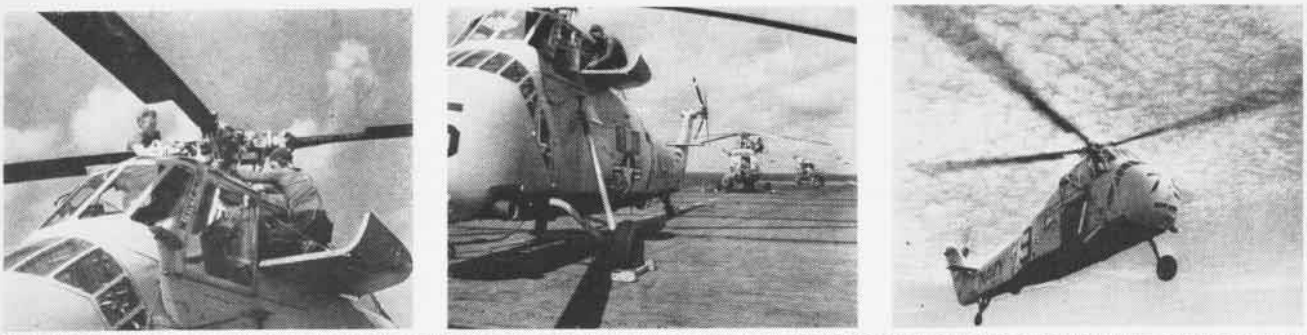
WITH CAPT. Vanarsdall's compliments to the fliers ringing in our ears we next reported to Cdr. Ben C. Tate, then Commanding Officer of VS-36. Of him we asked:

**Q. How do the Trackers of VS-36 fit into Task Group Alfa?**

A. Our greatest service is checking out the destroyers' contacts by MAD gear. On vectored attacks we have held contacts up to 24 hours, using our MAD equipment in concert with their sonar equipment. There is no mission our pilots would rather fly than a VecTac because to them, this is training with a purpose.

**Q. In actual operations, what schedule do you follow?**

A. We try to keep four S2F's over the contact at all times. With 19 to 22 planes available we can keep four on station and still give the crews adequate rest between missions. Administration ends when flights begin. We con-



HS-7 MAINTENANCE CREWS SWARM OVER HELICOPTERS ABOARD VALLEY FORGE IN ORDER TO KEEP ONE HELO CONSTANTLY OVER CONTACT

centrate on finding and holding the sub, not writing reports.

**Q. How is pilot morale in VS-36? Do you find that your S2F pilots would rather be in jet squadrons?**

A. On the contrary. In Alfa our pilots perform a greater variety of tasks than most. Not long ago, VAdm. W. L. Rees, ComNavAirLant, said he thought ASW was one of the best possible tours for a new pilot. In one year every VS pilot becomes thoroughly qualified for day and night missions. Each gets plenty of hours and plenty of instrument time. Our criterion for launching aircraft is that if the LSO can see the island, we can fly.

Next we visited Cdr. G. F. Nasworthy of VP-8.

**Q. We have seen the tail-hook side of airborne ASW. How do the land-based P2V-5F Neptunes serve Task Group Alfa?**

A. We have learned several things. First we have developed a new-found respect for the tail-hook people as they have for us. More important, we have proved that the P2V can work effectively with surface ships and HUK groups.

**Q. What in particular do you contribute?**

A. The P2V helps to make up for some of the other units' deficiencies by its rapid arrival over the target and its long endurance on station. You might say it provides important continuity of service in the overall operation.

The *Neptune's* size for plotting purposes, its greater number of crewmen, its sophisticated equipment, and its greater choice of weapons make it a superior airplane.

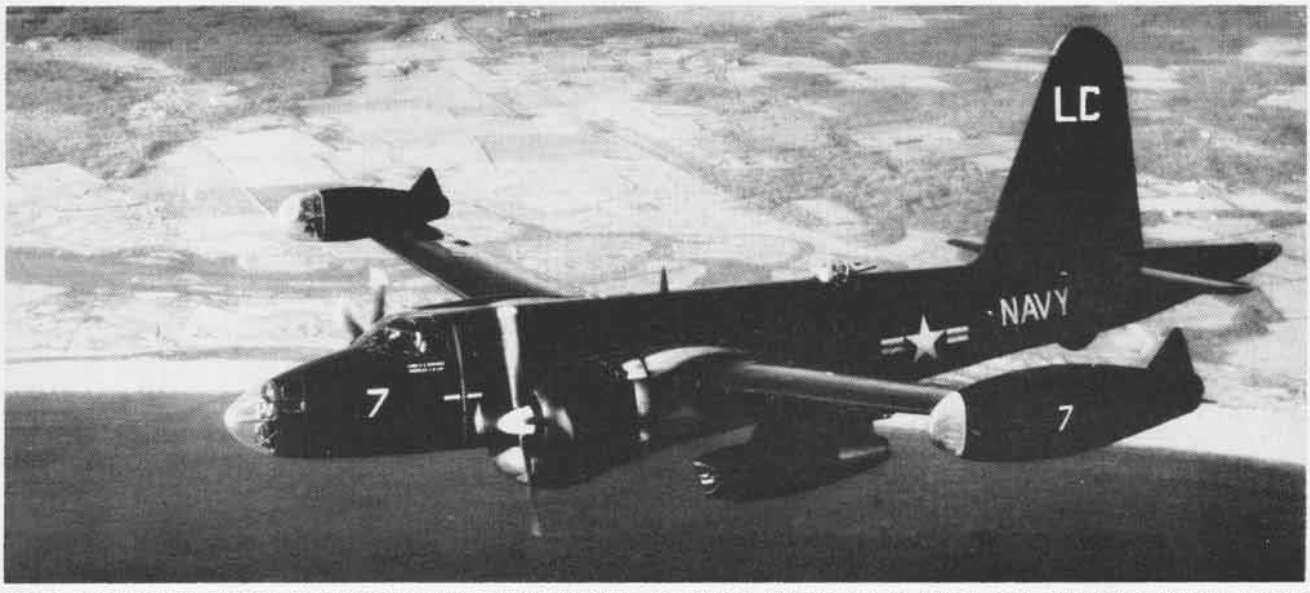
Last stop was Helicopter Anti-submarine Squadron Seven, commanded by Cdr. William C. Dixon. We asked:

**Q. Has the helicopter come of age in ASW?**

A. We think so, even though there is still a lot of room for progress. Except in the most severe sea and wind conditions we can keep three helicopters on a contact during hold-down. Now that we have received the first HSS-1N's, we have a night capability.

We can hover over a contact with sonar gear streamed. Then, when contact is lost, we can retract our sonar, and quickly maneuver into a new search area. We can shift search areas much faster than surface ships. In addition to sonar, we carry two torpedoes.

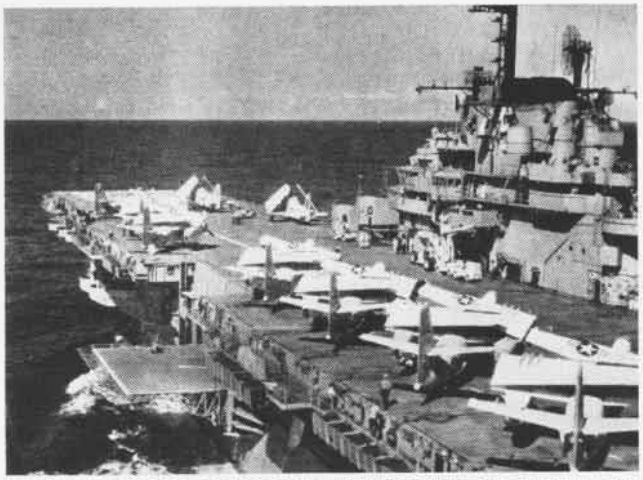
This, then, is the story of Anti-Submarine Warfare today, as told by the men who are writing the book. To explore the subject further, NAVAL AVIATION NEWS has approached members of the aviation and electronics industry to learn, within security limitations, what part industry is playing in ASW. That story will be published in another issue.

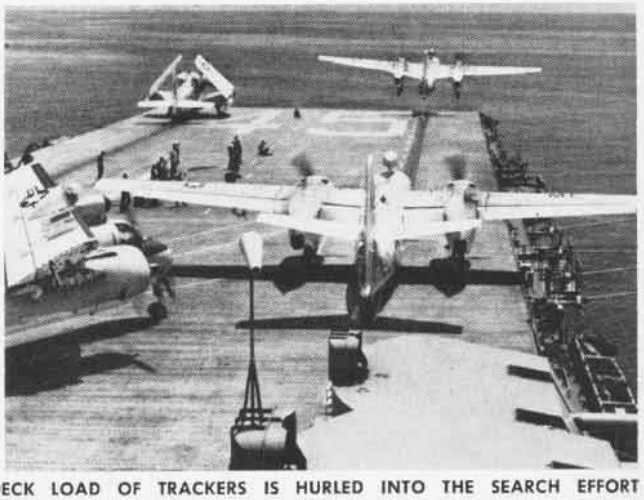



P2V-5F NEPTUNE OF PATROL SQUADRON EIGHT LEAVES VIRGINIA COASTLINE BEHIND AS IT HEADS OUT FOR LONG RANGE SEARCH

S2F TRACKER PILOTS OF VS-36 PAY CLOSE ATTENTION TO BRIEFING, THEN RELAX UNTIL THEIR TIME COMES TO MAKE ASW FLIGHT

WHEN THE ALERT COMES, VS-36 PILOTS HASTEN TO THEIR PLANES. RELIEVING ON STATION, SQUADRON KEEPS PLANE OVER SUB





AS VALLEY FORGE APPROACHES THE DETECTED SUBMARINE, THE DECK LOAD OF TRACKERS IS HURLED INTO THE SEARCH EFFORT

AD-5W GUPPY LEADS THE WAY AS S2F TRACKERS AND HSS-1 HELICOPTERS TAKE OFF FROM USS VALLEY FORGE IN CONTACT AREA

# NAVY/FAA AIR CONTROL PLAN

THE NAVY is pooling its manpower and equipment with the Federal Aviation Agency for safer and more efficient use of air space. Nine of the 17 Radar Air Traffic Control Centers (RATTC's) at Navy and Marine Corps Air Stations are already, or soon will be, manned jointly by military and FAA personnel.

Now under joint operation are RATTC's at NAS MIRAMAR, NAS MOFFETT and NAS PENSACOLA. Scheduled for joint manning this calendar year are MCAAS BEAUFORT, NAS CORPUS CHRISTI and NAS QUONSET POINT. MCAS EL TORO will become "joint" next year.

Two other centers, approved and funded by Congress but not yet completed, will be jointly manned. They are NAAS MERIDIAN, Mississippi, and NAS LEMOORE, California.

Eight Navy/Marine RATTC's not scheduled at this time for joint manning are NAS CECIL FIELD, MCAS CHERRY POINT, NAS JACKSONVILLE, NAAS KINGSVILLE, NAS OCEANA, NAS PATUXENT RIVER, NAS WHIDBEY ISLAND, and Naval Station, Argentia, Newfoundland.

FAA has statutory responsibility for control of all IFR traffic. The Navy has worked closely with FAA (formerly CAA) controllers where Navy and civilian aircraft shared the same airways.

Under the joint operations concept, FAA will operate surveillance radar equipment and military operators will provide final approach guidance. The Navy will also operate area monitors and some height-finding radars.

In the nine stations where responsibilities are being shared by military and FAA controllers, the military plane will be launched under control of the RATTC at its base. As it leaves the local control area it will be under FAA control.

If the plane is headed for a military operating area (away from Federal airways) it will be under RATTC or other military radar surveillance for the period of operations.

On its return, the military plane will be under FAA control until it reaches a pre-determined point near its home base. When that point is reached, the plane will be turned over to military controllers in the RATTC for its final approach and landing.

A typical joint RATTC is Forrest Sherman Field, NAS PENSACOLA, which became operational in March. The FAA staffing consists of one facility chief and 40 controllers to operate the Pensacola Approach Control and Hagler Tower section. The Navy provides a commander as RATTC officer with five officers and 56 men to operate the radar precision approach, Sherman Control Tower, the clearance desk and the flight planning room.

Through their joint efforts, more safe and expeditious movement of the vital Navy air traffic in the Pensacola area is expected by all concerned.

## A4D Alignment Jig Built
### Speeds Skyhawk Repairs in Japan

An aircraft alignment "jig," valued at approximately $27,000, has been completed by members of Marine Aircraft Repair Squadron 17, MCAS IWAKUNI, Japan, at a cost of 11 days labor and scrap metal parts.

First Marine Aircraft Wing mechanics, faced with the prospect of shipping a damaged A4D *Skyhawk* out for overhaul and repair—with resultant loss of time and money in shipment—decided to build the alignment structure and do the air frame repair work at Iwakuni.

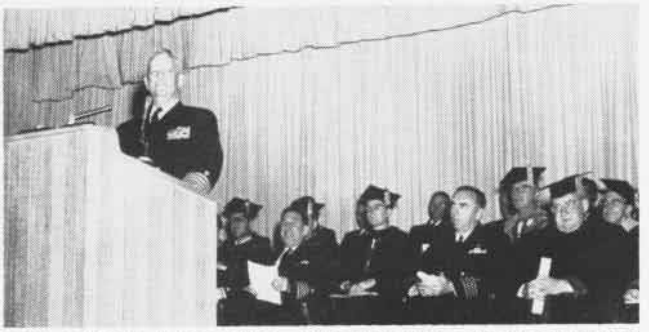
With technical advice furnished by C. W. Keenan, Douglas Aircraft Field Service Representative, a team of four Marine machinists and metalsmiths from MARS-17 put in 332 hours producing the jig.

The completed jig is believed to be the only A4D alignment structure in southern Japan. It enabled the Marines to return the one damaged aircraft to duty quickly and it can be used for any future *Skyhawk* air frame repairs.

Besides assuring correct alignment of air frames during structural repairs, the jig allows more men to work on the frame at the same time, fulfilling the squadron's mission of getting aircraft back into the air as soon as possible with the certainty that top maintenance has been performed.

**VADM. F. N. KIVETTE,** *Com7thFleet, left, and RAdm. W. A. Schoech, ComCarDiv 3, receive Mr. Charles Murphy, military editor of Fortune magazine, and Adm. H. G. Hopwood, CinCPacFleet, for a visit.*


**VADM. C. E. EKSTROM,** *Com6thFleet, presents "E" awards to Cdr. M. G. O'Neill and VF-14 pilots who fired Sidewinder and Sparrow 3 missiles from F3H. RAdm. W. A. Sutherland, Jr., ComCarDiv 2 looks on.*



ADM. ARLEIGH BURKE, CNO, ADDRESSES 459 OFFICER-GRADUATES

# NAVAL POSTGRADUATE SCHOOL

SINCE SPUTNIK went spinning into space, education in this country has been re-evaluated, re-emphasized and re-encouraged. The Navy was far ahead of the game. It has always been aware of the fact that improvement of the mind is the chief tool for betterment of the service.

Prime example of this policy is the Naval Postgraduate School, which is celebrating its fiftieth anniversary. Now located in Monterey, California, it started in 1909 with the enrollment of 10 officers in a Marine Engineering Curriculum at the Naval Academy. With the passing years other curricula — Mechanical, Electrical, Ordnance, Aerological and Aeronautical Engineering—were added as the need for officers with technical knowledge in these fields became apparent. Today, space technology is taught.

In 1927 the General Line course was established within the Postgraduate School to acquaint junior officers with new developments. Discontinued during WW II, it was re-formed in Newport in 1946 and remained there until 1952. An additional General Line School was established in Monterey in 1948. The nine and one-half month course offers integrated subjects in Naval science to broaden the professonal knowledge of Regular officers.

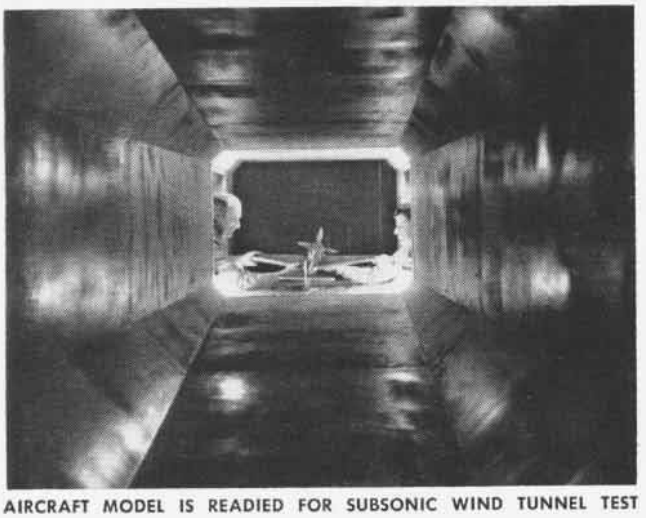
The physical growth of the school and its increase in importance were recognized by Congressional action. From 1945 to 1951 legislation was passed permitting continued expansion in a new location with modern facilities. The school was authorized to confer bachelors, masters and doctors degrees in engineering and related subjects. Accreditation was granted by the Engineering Council for Professional Development and the Western College Association. Graduation exercises this spring were highlighted by the conferral of a Doctor of Philosophy degree for the first time.

On 22 December 1951, the United States Naval Postgraduate School was officially disestablished at Annapolis and moved to Monterey. New buildings, with facilities for research as well as student training, have been erected to house the Engineering School. For example, the aeronautics laboratory includes a transonic and subsonic wind tunnel, shock tube, jet and turboprop rigs and a 600,000 pound structures testing machine.

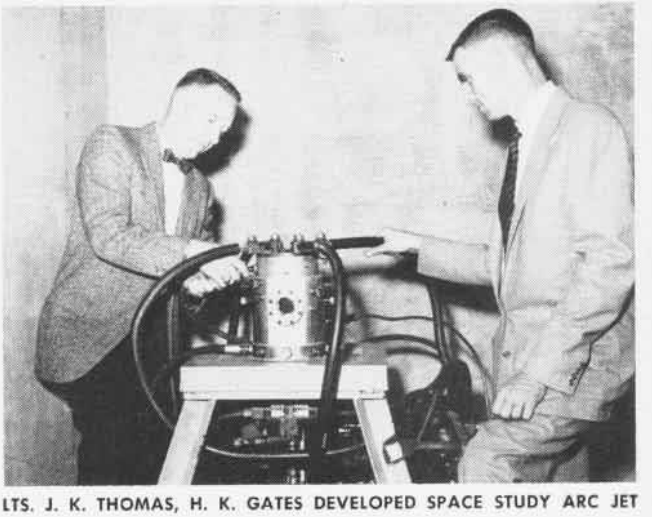
Three years ago a Management School was added as a component. Both Line and Staff Corps officers are eligible to attend the five-month course aimed at increasing efficiency and economy of operations within the Navy.

The Chief of Naval Personnel, in October 1957, approved the concept of a composite Five Term-General Line School program and specified the designation to General Line and Naval Science School. Qualified officers may take a course for a B.S. degree.

This is part of the story. BUPERS Notice 1520 of 22 May 1959 gives the whole picture for FY 1961. Many phases of PG training are open to 13XX officers. Advanced education is of value to the individual and to the Navy.



AIRCRAFT MODEL IS READIED FOR SUBSONIC WIND TUNNEL TEST



LTS. J. K. THOMAS, H. K. GATES DEVELOPED SPACE STUDY ARC JET

# OPERATION HANDCLASP

**RELIEF GOODS** *now loaded on junks in Hong Kong were collected by CVA-38 and CVG-11.*

**CHURCH GROUPS** *nd charitable organizations gave generously for people in the Far East.*

**FR. W. T. MULCAHY,** *Fr. J. F. Smith, Maryknoll fathers (L), and Rev. Dr. Hobart, Church World Service, talk to chaplain and CVA-38 exec.*

**TOY AIRPLANES,** *tractors, cars, panda bears, sporting equipment, and even chairs were among the items being given to destitute thousands.*

At Hong Kong USS *Shangri-La*, commanded by Capt. Keith Taylor, delivered the first load of 50 tons of supplies distributed under the name of Operation *Handclasp*, the Navy's latest part in President Eisenhower's People-to-People program.

LCdr. Donald M. Hanson, currently serving with the Staff of Commander Naval Air Force, Pacific Fleet, started clothing drives over ten years ago. This one, the sixth organized by him, will operate on a continuing basis. Future ships sailing to the Far East will be carrying similar relief items.

**CDR. C. A. HERALD,** *CHC, ship's chaplain, works out on one of the larger tricycles.*

**NAVY MEN** *gladly worked on the heavy job of delivering piano to Hong Kong Orphanage.*

**WASHING** *machines and sewing machines were high priority loads the big ship brought.*

AFTER TRAINING, PILOT FLIES REAL THING

# CVG-12 PIPELINE FOR PROFESSIONALS

*By Carson M. Smith, JO2*

DOES Replacement Pilot training pay off? According to Carrier Air Group Twelve, it does. CVG-12, which is the title of the giant West Coast complex of replacement training squadrons, is in charge of pilot instruction which takes approximately 20 weeks.

CVG-12 cites Attack Squadron 113 —a hot A4D outfit—as an outstanding example of what replacement training does. VA-113, which deployed in March aboard the USS *Shangri-La*, was made up almost entirely of pilots who had been in the outfit four months or less, but who were all thoroughly trained. VA-113 was living proof of CVG-12's value in providing ready replacements.

During the three-week period of Operational Readiness Inspection in Hawaii, the squadron flew a total of 430 hours, 110 of which were at night. One hundred per cent of all scheduled sorties were flown. These included strikes of more than four hours duration, on targets more than 800 miles out, with subsequent return to the carrier. All pilots received their night carrier qualifications. All told, 329 carrier landings were made during the ORI *without an accident*.

Since the proof of a carrier aviator rests largely with his ability to get on and off the carrier successfully, these facts speak for themselves. They witness to CVG-12's effectiveness as a training pipeline to the fleet.

With headquarters at NAS MIRAMAR, CAG-12 is responsible for the precombat indoctrination and training of all pilots assigned to operational squadrons of the Naval Air Force, Pacific Fleet, whether they are young graduates of Pensacola sporting brand-new wings or combat veterans returning to the fleet from shore duty. The parallel program on the East Coast is conducted by Carrier Air Group Four (see NANEWS, Jan. 1959, pp. 7-11).

Before the replacement air groups were formed, assignment of replacement pilots was pegged to fit a particular carrier's deployment schedule. Ships, upon return from an extended overseas cruise, often found their air groups disbanded to such an extent that only a few thoroughly trained pilots were aboard for the next deployment.

This meant that a majority of the pilots in the new air group had to get their real training after the ship had deployed again. Readiness naturally suffered, and the introduction of new high performance aircraft models caused accident rates to soar.

Pilots who graduate from CVG-12's intensive training program are proficient enough in tactics, instruments, weapons equipment and carrier landings to be "emergency deployable" in combat aircraft. With this training as a foundation, squadrons assigned these replacement pilots after return from a cruise have from five to seven months to smooth off rough edges and mold them into well-knit combat air units.

FUNCTIONS OF THE FJ-4B OPERATION TRAINER ARE EXPLAINED


VA-113 PILOT EMERGES FROM FJ-4B OPERATIONAL FLIGHT TRAINER

Carrier Air Group 12 is divided into four major squadrons: Fighter Squadrons 121 and 124, and Attack Squadrons 125 and 126.

At NAS MIRAMAR, VF-121 is responsible for training the fleet's F11F and F3H pilots and maintenance personnel. Typical of CVG-12's squadrons, this unit has an aircraft complement the size of an entire conventional air group. A recent count showed more than 80 aircraft, most of them F3H's and F11F's.

A highly complex organization, as its size indicates, the giant fighter training unit could be called an air university for it has a faculty of more than 100 officers, most of whom are instructor pilots, and some 700 enlisted personnel.

In addition to giving instruction in the various phases of flight orientation, weapons employment and carrier operations, the squadron provides all-weather instrument training for all CVG-12 jet trainees. This was facilitated by the consolidation with the main squadron of VF-121's Detachment Alfa which until last March conducted jet instrument training as a separate unit at NAS NORTH ISLAND.

Fighter Squadron 121's contemporary, VF-124, conducts a similar training program for F8U fliers and technicians at NAS MOFFETT FIELD. VF-124 was the first West Coast squadron to receive the F8U-2. Like its sister squadron, VF-124 provides jet instrument training for fighter and attack units.

The training of pilots in attack aircraft is also split between Miramar and Moffett Naval Air Stations. FJ-4B and AD pilots and their maintenance men are readied by VA-126 at Miramar, while instruction in weapons loading


THE F9F-8T IS USED BY FIGHTER SQUADRON 124 IN TWO-WEEK INSTRUMENT SYLLABUS


VF-124 USES THIS F8U-1 CRUSADER IN ITS TRAINING OF PILOTS FOR THE PACIFIC FLEET

O. L. KJENSMO, AD1, EXPLAINS DUMP VALVE OF A J57 ENGINE

INSTRUCTOR (R) SHOWS PILOT PLOT OF HIGH ALTITUDE FLIGHT

VA-113 STUDY THEIR STRIKE ON THE HAWAIIAN ISLANDS MORE THAN 800 MILES AWAY

for ships and squadrons in Southern California is given by a VA-126 detachment at North Island.

VA-125 at Moffett trains A4D pilots in special weapons delivery as well as providing AD maintenance training for mechanics. It also trains weapons loading crews of Pacific Fleet ships and squadrons in the northern area.

Two more squadrons have joined CVG-12 this summer to bring the number of major squadrons in the giant training organization up to six.

The first of the new squadrons, VA-122, has been handling CVG-12's instrument flight training syllabus for non-jet aircraft under the designation of All Weather Attack Squadron 35 at NAS NORTH ISLAND. It will continue the AD night training and take over the standard AD training now being conducted by VA-126 at Miramar.

The other is Heavy Attack Squadron 123 from NAS WHIDBEY ISLAND. Formed from Heavy Attack Training Unit, Pacific, it is charged with pilot and maintenance indoctrination training. A3D's and P2V-3B's are used.

Lessons include lectures from expert pilots and sessions in the Operational Flight Trainers in which every conceivable emergency is simulated time and time again. Even the peculiar noises the RP will hear in flight are simulated. By the time he is ready to fly, the RP will know how to cope with any emergency which might arise.

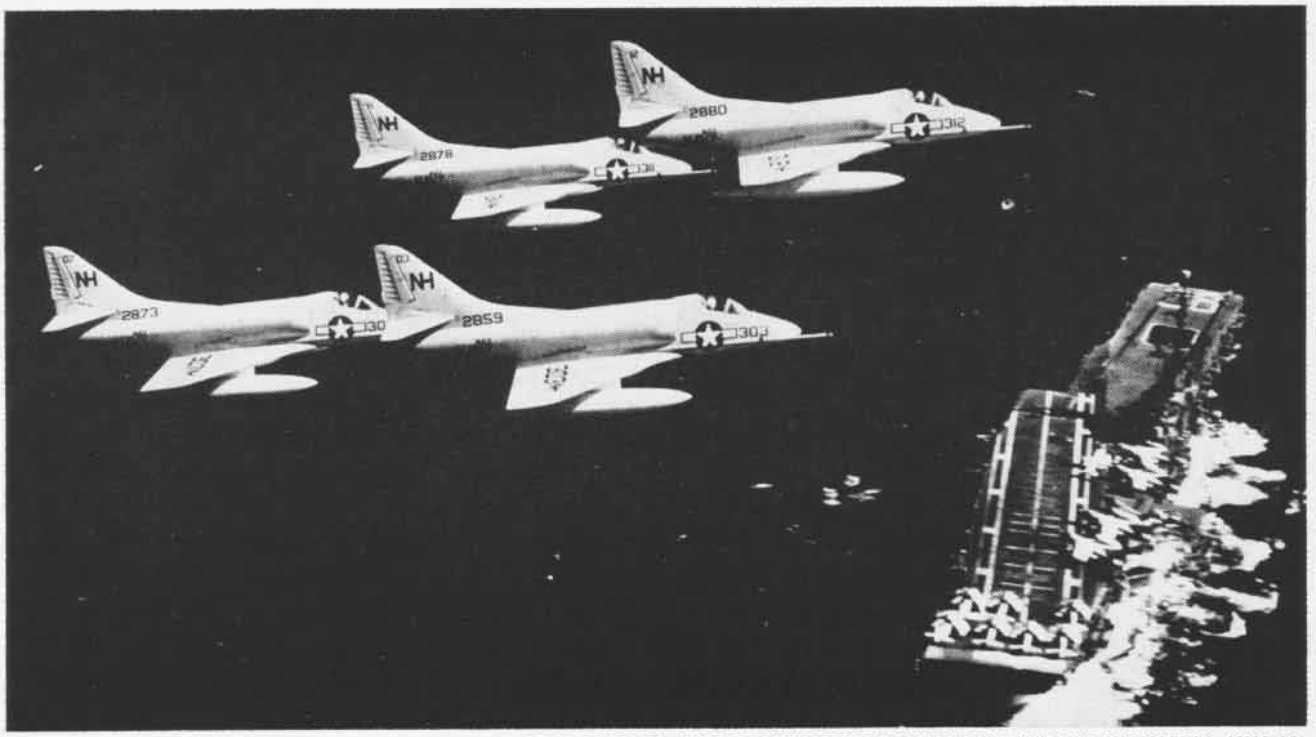
To get the feeling of his airplane, the RP spends some time taxiing around the air strip under the close scrutiny of his instructor. Finally, when he is ready to solo, his instructor follows him closely in a chase plane and coaches him in climbs, level flight, approaches and landings. The RP is swiftly and thoroughly apprised of any mistakes made during the solo.

Prospective group or squadron commanders receive the same training as their junior contemporaries.

Along with pilot instruction in CVG-12's program is the all-important factor of maintenance training. This course for rated enlisted men normally lasts from six to eight weeks.

The problems of implementing so extensive a program as CVG-12 conducts have been attacked with vigor by CVG-12. Though some remain to be solved, the operation on the whole has been of genuine benefit to Naval Aviation.

As experience is gained, the "pipeline" is bound to be increasingly valuable as a significant booster to the aircraft readiness program in the Fleet.




COMMANDER H. S. MATTHEWS, VA-113 COMMANDING OFFICER, LEADS STINGER QUARTET IN FORMATION OVER USS SHANGRI-LA (CVA-38)

# SOMETHING NEW IN CARQUALS

CARRIER QUALIFICATIONS of attack carrier air groups preparing for deployment present a number of problems. While it hasn't solved all of them, the USS *Randolph* has come up with a workable solution for one of them.

This is the problem: The design of combatant jet aircraft is stressed for a very small landing fuel load as compared with the heavy fuel load upon take-off. In addition, a fuel reserve sufficient to divert the aircraft to a landing field in event of emergency has to be maintained. This limits the qualifying planes to such a light fuel load that only three or four passes are possible before refueling.

Another thing, the switching of pilots has to be done in a way that gives the new pilot time to get squared away in the cockpit without hurry or pressure. Efficiency requires that refueling and pilot switching be arranged so as not to interrupt or impede landing operations.

The *Randolph* solution was tried out in connection with carquals for Carrier Air Group Ten, commanded by Cdr. E. L. Fightner, and consisting of VMA-225, VF-13, VF-176, VA-106, VF-62 and detachments of VFP-62 and VAW-12. These units required approximately 1600 day and night carquals.

The *Randolph's* answer to the problem was the cyclic concept. It works like this: The aircraft are put in the pattern to begin qualification landings, four in the air, and one waiting on the catapult. This number normally insures that a landing aircraft will not arrive at the ramp before the previous aircraft has cleared the landing area, thus reducing foul deck wave-offs to a minimum.

During the carquals, when a landing aircraft reached the minimum fuel state or required a pilot switch, the aircraft was taxied forward and dropped to the hangar deck via #1 elevator. Adjacent to the passageway were parking spots into which an aircraft that required major maintenance could be swung. An aircraft coming from the flight deck would be pushed aft through the open passageway to receive oxygen, fuel, tire changes and other minor repairs, preparing for the next flight.

The Air Department and Air Group personnel were able to service the aircraft so rapidly that none of these aircraft had to be "sidetracked" but remained within the open passageway. During this time, pilots were switched and preflight checks performed. When the aircraft was refueled and ready to go, it came up #3 elevator and waited to take its turn in the landing cycle.

At night for speed of handling, safety and realistic indoctrination, positive radar control of all aircraft was set up. Only four aircraft were used in the process under these conditions with three in the air and one on the catapult. CCA assured control of aircraft immediately after it became airborne. After gauging proper interval, CCA turned the aircraft downwind at the proper distance abeam, off the 180° position, and monitored the approach until the pilot reported himself in visual contact with the mirror landing aid.

Excellent coordination and radio discipline among CCA and primary fly, LSO and the pilot, were required. In view of the fact that this was the first time CCA pattern control has been attempted during carquals, the success of the operations was remarkable. For example, this method made it possible for a total of 31 night carquals landings in 20 minutes by pilots of VMA-225 flying A4D's.

The cyclic concept permitted aircraft to be kept above the divert-fuel minimum while still obtaining the maximum utilization of the fuel load. Utilization of time available for carrier qualifications remained high because no loss was caused by the absence of planes and mass refuelings.

Cdr. William A. Kiernan, Air Officer, whose officers and crew masterminded this operation, explained that there are several factors required to make the cyclic concept a success. Among these are:

- An adequate number of aircraft should be kept in the pipe line. Eight to 12 are considered optimum for this type ship.
- Aircraft should be kept well above diversion fuel. Pilots cannot be carrier qualified if diverted ashore.
- Squadrons must maintain a high rate of availability.
- Several spots for dud aircraft must be readily available to keep downed aircraft from clogging the pipe line.
- Excellent coordination between flight deck crews and hangar deck crews must be obtained. Sound powered circuit discipline must be of the highest order.
- Pilots must be well trained and fully ready for actual carrier landings.

**RAFT OF RAIN** *fell on Naval Air Station, Anacostia on 3 June, and these three NARTU stalwarts broke out a goodly sized one to head for flight line: Charles Wrenn, AMS-3; Paul Rasmussen, AMS2, and Robert Lambert, YN3.*

## 10,000th Safe Hour Flown

### HS-6 Claims New West Coast Mark

Helicopter Anti-submarine Squadron Six claimed a new safety record for West Coast helicopter squadrons when the unit flew its 10,000th accident-free hour in a 27-month period which included a tour in the Far East aboard the *Philippine Sea.*

Cdr. Earl V. Oglesby, squadron commander, piloted the helicopter which made the record flight. Other crew members were Ltjg. Sherman E. Adamson, Wilkie Dunn, AMC, and Electronics Technician Robert Young.

## F4D Rework at O&R Jax

### S2F Overhaul Goes to Pensacola

Major overhauls of the F4D have replaced the S2F in interim rework at the 5200 Branch Assembly Division at O&R JACKSONVILLE.

The division is composed of 250 civilian employees, including 20 supervisors and foremen. This is the only department handling this type of work in the Navy.

Overhaul of the F4D fighter replaces that of the S2F which has been transferred to NAS PENSACOLA.

Since its beginning in the spring of 1955, the division has handled a total of 650 twin-engine S2F *Trackers.*

# LET'S LOOK AT THE RECORD

LTJG. SMITH MAKES 76,000TH LANDING

## Busy Month on USS Midway

### High Landing Total is Chalked Up

The wire grabbers and archivists had a busy time aboard the USS *Midway* (CVA-41) during the merry month of May. Two records were claimed and four landing milestones passed in less than 15 operating days.

With Carrier Air Group Two embarked, the 62,000-ton carrier, while operating from her homeport at Alameda, ran up a total of 1143 arrested landings in one four-day stretch.

Historic hooks were lowered by Lt. F. M. Adams, VAH-8, in an A3D *Skywarrior* in making landing #73,000; Ltjg. J. D. MacDonald, VF-24, in a *Crusader* for #74,000; and Ltjg. J. L. Seller, VA-63 logged #75,000 in an FJ-4B *Fury*. The 76,000th landing was made by Ltjg. H. H. Smith, VF-24, in a *Crusader*. All four occurred in the same two-week period in May.

## Supersonic GCI's Made

### 2000 mph Closing Speeds Recorded

Marine Air Control Squadron Five and Marine Fighter Squadron 122 have completed their first supersonic Ground Controlled Intercept (GCI) competitive exercise at MCAAS BEAUFORT, scoring 100 percent success in both high altitude broadcast control intercepts and low altitude close control intercepts.

At high altitude, the simulated enemy (squadron F8U's) streaked toward Beaufort, S. C., flying at 1000 miles per hour. Other squadron *Crusaders* were launched for the intercept before the bogeys could reach their normal point for releasing bombs.

With friend and foe both flying at 1000 mph, a closing speed of 2000 mph or 33⅓ miles per minute, was achieved.

Controllers on the ground could see both planes on their radar long before pilots in either plane made visual contact.

The ground controllers vectored the interceptors toward the bogeys by radio until they reached a point where they could launch their *Sidewinders*.

**THE 100,000TH** *radar approach by RATCC #13 was made at Patuxent River, Md., when W. W. Decker assisted Cdr. Don Engen of Flight Test Division, Naval Air Test Center, to come in for a perfect landing in an F11F.*

## 808 Hours Logged in a Day

### Whiting BTG-3 Breaks Own Record

Basic Training Group Three, NAAS WHITING FIELD, flew a record-breaking 808 hours on 14 May. The 808 hours were all syllabus time in the T-28. The previous high for BTG-3 was 747 hours flown on 2 April.

Night navigation accounted for 129 of the total hours flown; the other 679 hours were flown on day hops.

## Flight Hours Increased

### VF-124 Boasts New Monthly Totals

VF-124 reports that the squadron flew 6000 accident-free hours in three months and set a monthly flight time record for the F8U *Crusader* by flying 1145.9 hours in May.

The replacement air group squadron at Moffett Field hit 1972.2 hours in March, 2087.2 in April, and a whopping 2149.2 hours in May. F8U operations account for about half the time.

VF-124 claims it was the first squadron to fly more than 1000 F8U hours in a single month, 1026 hours in March. This record was shattered in May when pilots flew 1145 hours.

Cdr. Francis X. Timmes is skipper.

## NavCads Score a 'First'

### Land T2V's Aboard USS Antietam

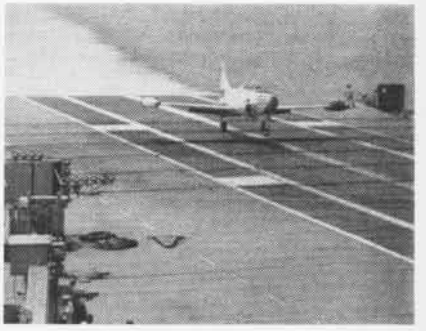
Three Naval Aviation Cadets from the Basic Training Command in Pensacola became the first basic flight students to land jets on a carrier at sea in qualification tests. They landed their T2V's aboard USS *Antietam*.

They were Cadets Loren Luna, Robert Babis and Jack L. Omer.

Carrier qualifying is part of the training of every Navy flight student. It comes at the end of basic flight training in Pensacola. Until June 4, all carquals were made in conventional prop-driven planes.

Most carrier qualifications will continue to be done in prop planes but the jet landings were part of the all-jet syllabus evaluation program which started last year in Basic Training.

NavCads Luna, Omer and Babis were three of a cross-section of basic flight students selected for training in the jet evaluation program.



NAVCAD OMER TOUCHES ON THE ANTIETAM

## 121 Hours Flown in Day

### VMA-121 Claims Record for A4D's

Pilots of Marine Attack Squadron 121 logged 121 flight hours in Douglas A4D *Skyhawks* in a single day's operations to claim a record.

All flights were made between dawn and sunset on the last day of the squadron's 12-day deployment at Yuma.

During the same day, 121 successful in-flight refueling hook-ups were made by the West Coast squadron.

Twenty-three VMA-121 pilots took part in the day's achievement, flying the squadron's 11 aircraft. Each pilot averaged more than five hours flight.

# 'KOOL, MAN, KOOL, DADDY-O'

"We were scratching along about 35 when three goofy loopers jumped us about 4 o'clock high. I called, 'Blow Man Blow' and started to yo-yo. We were soon looking up their tailpipes closing fast. I called 'Kool, Man, Kool' and we started riding just above their wash.

"We closed in and found out they were up on an IFR, so we plugged in for a practice drink from the Buddy. It wasn't easy as we were riding the backside of the curve. Soon as we finished we dropped the boards and headed for the ramp. I picked up a low meatball, rode over the top and boltered on on my first pass, but came right down the glide slope and trapped on the second."

If you overheard a club conversation similar to this and haven't been exposed to jet types, angle deck carriers or mirror mechanisms which have made their debut in the Fleet during the past few years, don't panic. The beatniks and 'cats' haven't taken over —and you're just a little bit square. Catch up on a few of these terms and everything will be George man—real George.

*Scratching.* Leaving contrails.

*35.* 35,000 feet, of course. Some of the old terms are still used.

*Goofy Loopers.* From the bomb delivery of the same name used by light attack pilots. Aircraft is pulled up into a 4 G loop and bomb is released at a predetermined point.

*Blow, Man, Blow.* Also *Go, Man, Go.* Terms are used to inform wingmen of afterburner application.

*Yo-yo.* A form of clover leaf scissors executed while ascending or descending and used in jet tactics.

*Kool, Man, Kool.* Cut out afterburner.

*IFR.* Not Instrument Flight Rules in this case, but In-Flight Refueling.

*Plugged in.* Insertion of probe into drogue as hook up is made with tanker aircraft.

*Buddy.* Light attack refueler aircraft are known as Buddy tankers.

*Boards.* Speed brakes.

*Boltered.* A "go-around" as they say in some flying circles.

*Trapped.* Arrested landing.

(Editor's Note: The CVG-19 artist who submitted the foregoing, stated he had merely scratched the surface. NANEWS will be happy to hear from "Tigers" everywhere regarding singular lingo in use in their units.)

**OPERATION FLYING BROTHERS,** *in which 11 allied nations participated, featured fighter aircraft weapons. The project was sponsored by the Philippine Air Force and the USAF at Clark Air Base, the Philippines. The Far East meet, which featured classroom seminars, aerial demonstrations, aerial missions, covered two weeks of activities. Representatives and observers arrived at Manila from Thailand, the Republic of China, Republic of Korea, Cambodia, Japan, Vietnam, Great Britain, New Zealand, Australia, as well as the United States and the Philippines. Demonstration teams of six nations flew over the Manila International Airport where the Philippine Air Force was commemorating its anniversary. Below, a Sidewinder missile is fired from a Navy F8U Crusader during one of the many aerial demonstrations of the meet.*

## Rocket Lifespan Stretched

### Rubber, Asbestos Insulation Used

A new, low-cost insulating material, which is expected to extend the burning time of present high performance solid fuel rocket motors two or three times their present burning periods, has been developed by the Astrodyne Corporation for BUORD. It is composed of rubber and asbestos.

In recent successful test firings, solid propellant motors using the new insulating material produced significant thrust levels for more than three and a half minutes. Normally, burning time would have been one minute or less.

Although the high performance propellant generated a flame temperature of more than 5500°F., the new insulation held the exterior of the rocket motor case to approximately 200° at the end of three and a half minutes.

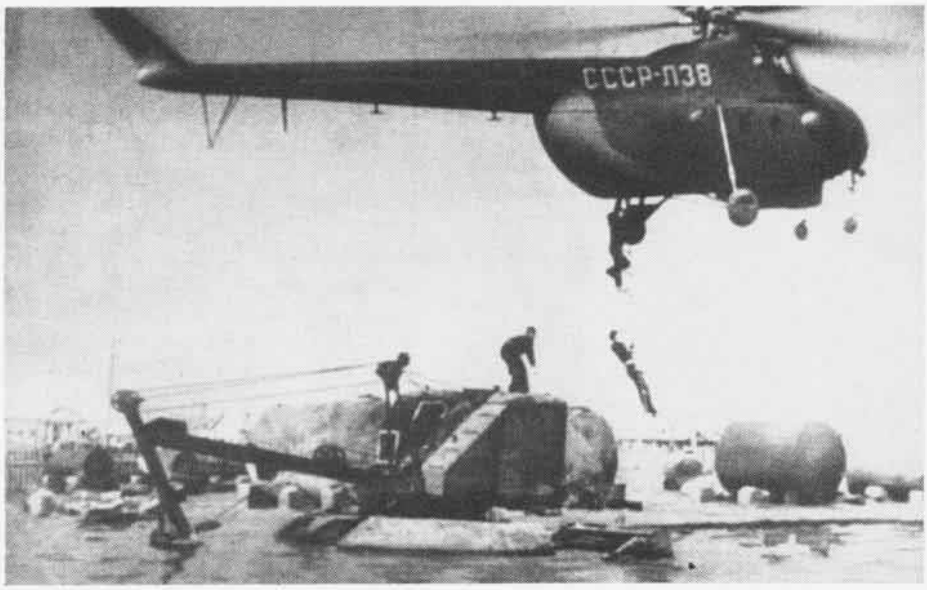
The new material is lighter, cheaper, and provides improved high temperature insulation properties when compared to high-cost reinforced plastic insulation currently used in some of the rocket motors. This accomplishment extends the versatility of solid propellant rocket motor propulsion systems for missile and space applications.



THE U. S. NAVY CLAIMS SIKORSKY HSS-2 AS

LOOK-ALIKES BETWEEN THE USA AND USSR LEAD OFF WITH THIS PIASECKI TURBO TRANSPORT

HORSE (YAK-24) COPTER HAS SIMILAR




HOUND (MI-4) IS USED FOR MILITARY AND CIVIL ROLES: HERE IT TRANSPORTS WORKERS


MARINES USE AN HRS HELICOPTER TO

WORLD'S LARGEST AMPHIBIOUS HELICOPTER

HOOK (MI-6) IS REPORTED TO BE ROUGHLY TWICE AS BIG AS LARGEST WESTERN HELICOPTER

S BUT IS POWERED BY RECIPROCATING ENGINES

HEN HAS BEEN USED ON DD TYPE SHIPS

KAMAN BUILT TWIN TURBOROTOR COPTER

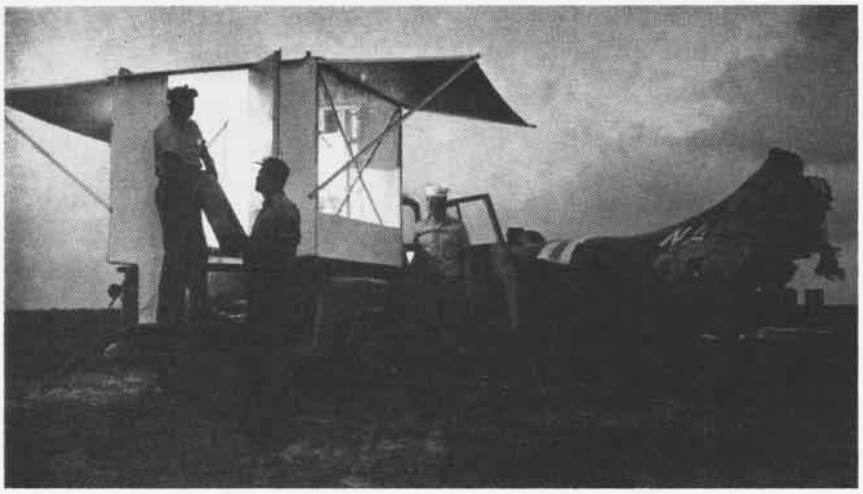
USSR'S COAXIAL 3-BLADED ROTOR COPTER

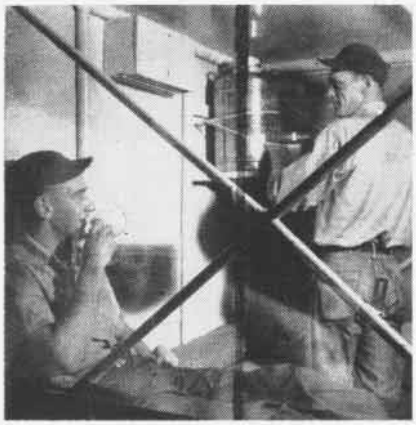
GYRODYNE IS MARKED BY COAXIAL DESIGN

THEIR TROOPS ON SUBMARINE, THE USS SEA LION

A KELLETT DESIGNED ONE-MAN TRANSPORT

THIS IS RUSSIAN VERSION OF SAME THING





**A PIGGY BACK TRAILER** *brings "a home away from home" for the men who guard aircraft wreckage day and night until investigations are complete. Designed by NAAS Chase Field, Beeville, Texas, and made by "C" Maintenance unit under the direction of LCdr. Edwin van Biesbroeck, the piggy back provides guards with an "on-the-scene" coffee lounge and sleeping quarters. It was made of scrap pipe and aluminum sheeting. Besides the quick mounting, the trailer hut features open-side screen ventilation, two bunks, and a mounted two-gallon thermos jug.*

## Quick Engine Change Made

### VMF(AW)-114 Claims New Record

Six members of Med-cruising Marine All-Weather Fighter Squadron 114 performed a quick engine change in the field on one of their F4D *Skyray* jets in 20 hours. They believe this to be a new record.

The six-man team, led by ActMSgt. D. L. Montgomery, was called upon to get the job done under adverse conditions. The plane developed engine trouble on a routine mission from the USS *Franklin D. Roosevelt* and was forced to land on Sardinia. The "114" maintenance crew was flown there aboard a TF-1.

The crewmen worked from 1400 to 2400 the first day. At 0600 they were again on the job installing a J-57-P8 engine and AC generator which had been delivered to Sardinia by one of the Marines' *Flying Boxcars*. They completed the job by 1600.

In addition to MSgt. Montgomery, the team included jet engine mechanics, ActSgts. W. H. Babb, G. C. Vrooman, E. D. Whiteman, J. M. Zubia; jet aircraft electrician ActSgt. W. C. Hargis.

## Systems Manager Named

### Sperry Will Outfit Polaris Subs

Responsibility for providing navigation systems to be used in the new 608-class *(Ethan Allen) Polaris* submarines has been contracted to Sperry Gyroscope Company.

The *Ethan Allen* class will be larger and of better design than the 598-class *(George Washington) Polaris* subs.

The initial increment of Sperry's contract as navigation systems manager amounted to $2-million. It is the first time such a contract has been awarded. Sperry will have authority to design, draw up specifications, integrate, deliver, install and purchase *Polaris* submarine navigation equipment for other contractors.

The *Polaris* submarines must be equipped navigationally to fire missiles accurately during long periods of submergence. Blind, underwater navigation depends on inertial guidance, backed up by a series of devices that measure ocean currents and allow underwater star fixes through the sub's periscope.

## Study Anti-Collision Aid

### Device Gives Range, Closure Rate

A new technique to probe mid-air collision problems will be flight tested by the Fairchild Astrionics Division under an agreement with the Federal Aviation Agency and the Air Force. The $28,000 award covers a series of flights to investigate the applicability of Fairchild's patented PADAR system for proximity warning and collision prevention program.

According to a Fairchild announcement the flight tests are expected to measure the ability of the PADAR principle to furnish the range between aircraft in danger of collision. The system already has been tested extensively for several military applications. The flights to be conducted for FAA will check the performance of the system over water, flat and rolling terrain and over mountains to simulate the route conditions of the airlines.

PADAR, a passive detection and ranging system developed by Fairchild, was patented by an Astrionics Division engineer in 1958. In principle, it permits an aircraft pilot, without transmitting a signal (such as a radar beam), to detect another aircraft, and to determine its range and assess danger of collision. The Fairchild system accomplishes this by receiving electromagnetic emanations from a small radio transmitter in the other aircraft via two paths—one in a direct line and the other as reflected from the surface of the earth or water. By measuring the time difference in the two signals and combining this with known altitude PADAR provides range and closure rate.

# 'FREE' PRISONERS ENTERTAIN FLOYDS BAY

GUITARIST E. W. BROWN, SN, JOINS THE VISITING BANDSMEN

CAPT. GAY AND CDR. NICK BRANGO, XO, ENJOY HOLIDAY DINNER

THE *Prisoner's Song* is no longer in a totally minor key, at least in the Philippine Islands. That's one conclusion the officers and men of the USS *Floyds Bay* (AVP-40) reached after they were entertained by members of the Station Lucia Sub-Colony at Puerto Princesa, Palawan.

For the USS *Floyds Bay*, the prisoners had arranged a program of singing, dancing and orchestra numbers. This proved a welcome break after four days of extreme heat and strenuous work tending the patrol planes of VP-42 from Sangley Point near Manila. The ship's crew found the background of their entertainers of great interest.

The Station Lucia Sub-Colony from which these guests came is one of three sub-colonies on the island of Palawan, and part of a most unique and interesting penal system. The sub-colonies are open in the true sense of the word. The prisoners, or "colonists" as they are called, live in relative freedom. Absent are the high walls, the prison bars, the locked doors, the rifles, pistols and machine guns usually associated with a penal institution.

Over 4000 colonists live and work together in an area of more than 4000 acres of virgin forests, grasslands, swamps, and cultivated farmland. These colonists are not serving for minor or petty offenses alone. About one-fourth of their number are convicted murderers, another fourth are serving terms for robbery and others are guilty of a wide range of crimes.

Aside from work supervision, a bed-time check of colonists is the only form of security used. Each group of some 50 colonists is supervised by a petty officer or "mayores," a colonist who has attained this position upon evidence of good behavior and leadership ability as well as skill in a given type of work. Petty officer colonists in turn are under the supervision of civilian employees who carry only a swagger stick as a symbol of authority. This authority is almost never questioned. In the first 50 years of its unusual existence, only one civilian employee has ever been assaulted. It is a strange sight to see a group of colonists—some murderers, kidnappers or robbers in the past—head off into the dense jungle to work, many carrying long sharp steel machettes at their sides, accompanied by a "guard" armed with a swagger stick.

An American, R. J. Shields, founded and developed this unique penal system in 1904 shortly after the islands became a possession of the United States. The penal colonies are now under the direct control of the Philippine Government through a superintendent, who represents the Director of Prisons, and a staff of assistants. Each colony is composed of working divisions in various special fields: farming, animal husbandry, engineering and construction, forestry, fishing, coconut and coffee industries, and handicrafts.

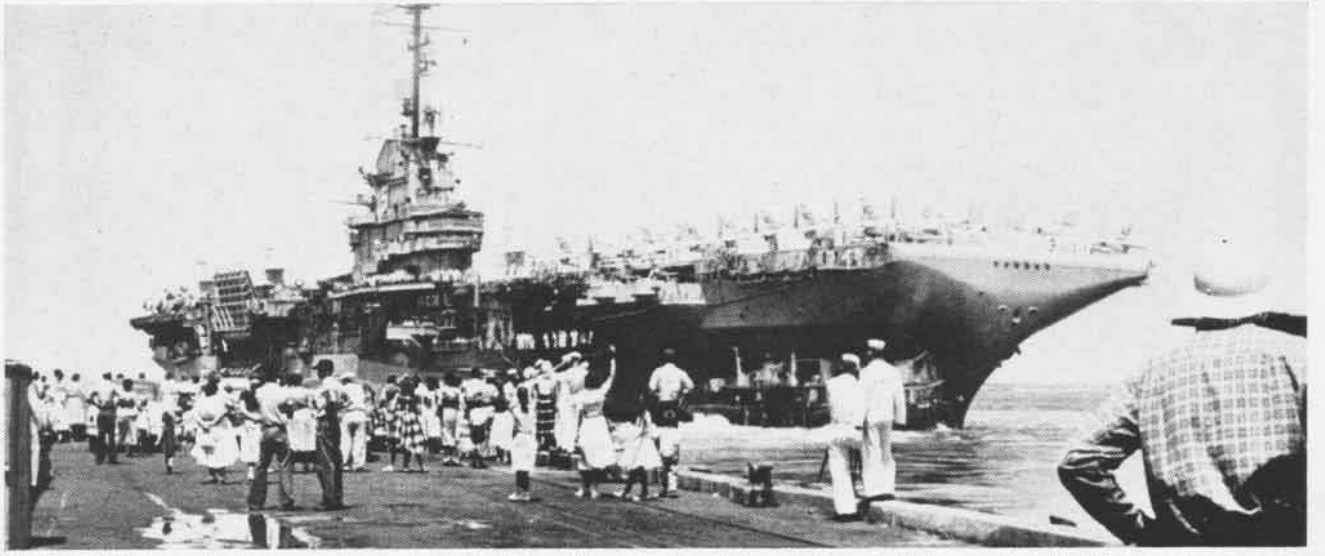
Central aim of the colony is rehabilitation of the criminal rather than punishment. Rehabilitation is focused toward each colonist in five areas—academic training, job or vocational training, production, physical and recreational activities, and social, moral and personality adjustment. An atmosphere of free community life is nurtured and cultivated with care. Inmates are given the privilege of having their wives and children live with them in the colony. There are schools for both children and colonists. All illiterate colonists are given seven hours of instruction each week by teachers who themselves are colonists. Each year about 250 colonists become literate. Each colony has its own churches and a hospital is available for medical care. Some colonists are paid small daily wages depending upon the skill they attain and the work they perform. Others earn money through the sale of handicraft and art.

Without walls, armed guards and tight security, one would expect the percentage of escapees to be high. On the contrary, less than one percent of the colonists run away. Of those who do, about 60% return of their own free will; eventually more than 95% are re-captured. One colonist was heard to remark, "Anyone who would run away from here must be crazy."

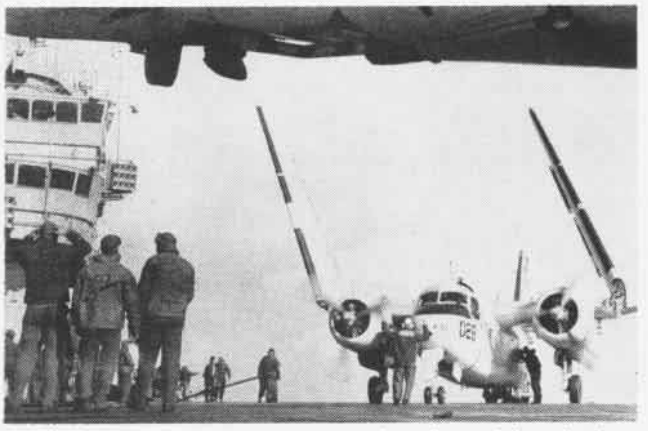
The interesting guests, many of whom never before had had the opportunity to visit aboard a U. S. Navy ship, were served ice cream and orangeade, and afforded a tour of the ship.

Thanked by the Commanding Officer, Capt. Donald Gay, Jr., for bringing the band and entertaining the crew, the guests were asked to return again for another visit, if and when the *Floyds Bay* returns to Puerto Princesa.

# IN TIME OF NEED, THEY ARE THERE



**DEPLOYMENTS** *to the Mediterranean start from the U. S. Naval Base at Norfolk, Virginia. Families of the crew members on board the USS Randolph were there to bid them farewell. The composition of the ships in the Sixth Fleet changes regularly every four to six months.*



**HIGH PRIORITY** *supplies, passengers and mail are delivered almost daily. Folding its wings, a TF-1 approaches its deck parking spot.*


**FLIGHT DECK** *crews work with precision as they ready an FJ for catapult launching. The Fury can deliver atomic or conventional weapons.*

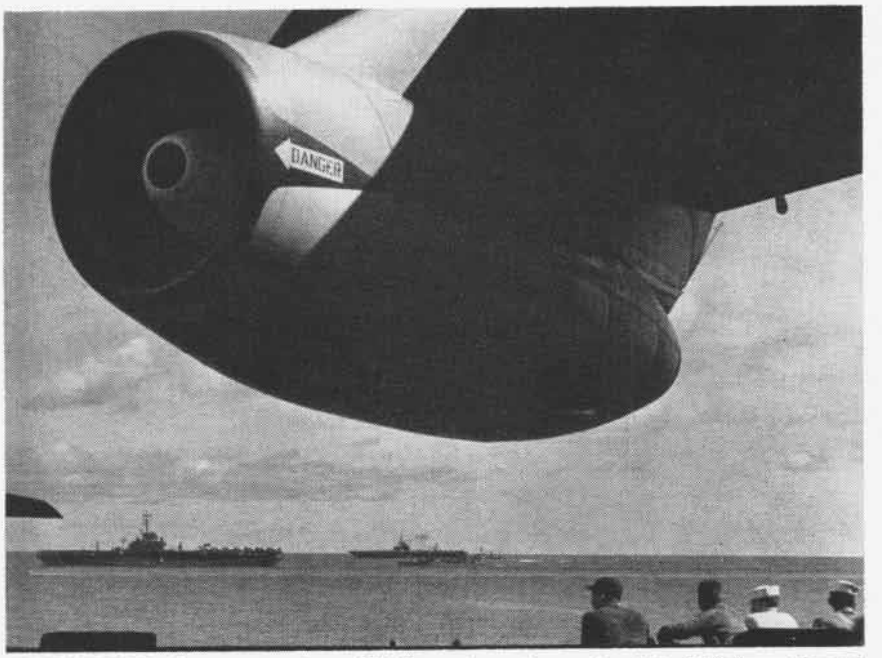
**AFTER** *an operating period at sea, the Forrestal enters the port of Naples. Nearly 3000 men of the ship's crew will become tourists.*

**FOUR CATAPULTS** *make Forrestal launchings faster than on small carriers. Here an A4D is catted as two F11F aircraft are readied for launch.*

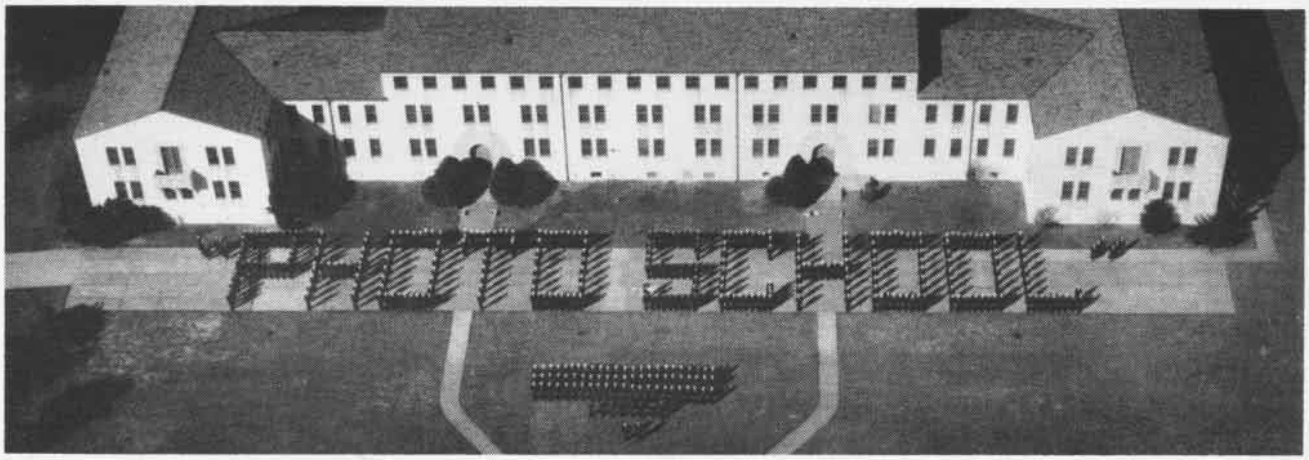

**THE ATTACK CARRIER** *striking force normally contains two large carriers and about 200 aircraft. These four F8U Crusaders are shown as they make their approach to the Forrestal prior to landing. The Crusader lands on Forrestal's 720-foot landing runway at about 140 mph.*

**The major role of the U. S. Fleet is now being played by her aircraft carriers which have helped to prevent the outbreak of local military actions and have encouraged our allies and neutral nations to stand firm against aggression. In 1956 off Egypt, in 1957 off Suez, and in 1958 off Lebanon, the Sixth Fleet carriers responded to disorders that threatened the peace. High speed fighters and attack aircraft have a striking radius in excess of 1000 miles and are capable of operating in all kinds of weather. This series of photos shows operations aboard USS Forrestal (CVA-59) and USS Randolph (CVA-15) in Mediterranean.**


**ENVELOPED** *in steam, the catapult officer gives final launch signals to the A4D pilot.*




**STANDING NEAR** *the jet engine of an A3D Skywarrior, sailors on board the USS Forrestal watch the USS Champlain (CVS-39) and the USS Intrepid (CVA-11) during replenishment operations.*




AT NATTU INSPECTION, A HELICOPTER SHOT IS MADE AS PERSONNEL SPELL OUT THE NAME 'PHOTO SCHOOL,' AN NAS PENSACOLA ACTIVITY

# SPOTLIGHT ON PHOTO SCHOOL

IN THE WINTER of 1915, W. L. Richardson, SC3/c, began taking pictures of various operations at the flight school at Pensacola. So successfully did he capture film scenes at the air station that he was designated "Official Photographer."

His cigar-box type camera and a broom closet dark room, which, of course, at that time was a hobby, became a full time job. Soon the young man found himself commissioned as ensign and directed to the task of organizing a Division of Photography under the supervision of the Bureau of Aeronautics.

Once the whole arrangement was informal. But with the years, there came to be a need for training men to do what had only been a hobby with Richardson. The School for Naval Photography opened at NAS PENSACOLA in 1923, and from that humble start it has expanded in size, curriculum and mission. Cdr. S. E. Mendenhall is the Commanding Officer of Naval Air Technical Training Unit.

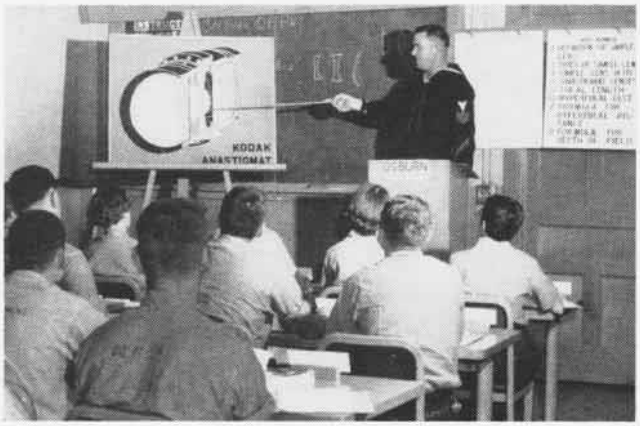
The Basic Photography School provides instruction for personnel who have selected photography as their career. Most of the students have had an average of six months Naval service prior to reporting for the 15-week course of instruction.

Photographer's Mate A (Aerial Cameraman) School trains photographers who will be assigned to photo units where aviation is concerned. The nine-week course accepts 19 Naval personnel and two Marine personnel every four weeks. The last weeks are devoted to training in aerial cameras, processing of aerial film and layout of mosaics.

The PH 'B' School provides advanced training in still, motion picture, and aerial photography for enlisted personnel that are PH2 or above. In addition, officers who are to be assigned to photographic billets also attend this instruction.

Instruction in all types of still cameras, portraiture and public information, administration of Naval photography, motion picture shooting and processing with rather extensive study in electricity and aerial photography, keeps the students busy for 22 weeks.

A new class of six Naval officers and one Marine officer enters the training cycle each four-week period. The enlisted segment has eight Naval personnel and one Marine entering at the same intervals. This small number of




O. R. OSBURN POINTS OUT OPTICAL SYSTEM OF A LENS BARREL

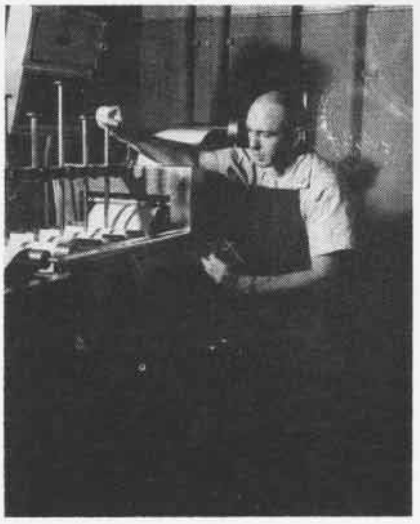
INSTRUCTOR GIVES INSTRUCTIONS ON AERIAL MOSAIC MAP LAYING

ENS. WADE THOMPSON MIXES DEVELOPER

students insures a high degree of individual instruction.

One of the most valuable departments is the Camera Repair School. Although the average mechanic may be able to perform some of the camera repairs, other parts are so delicate as to require the skill of a watchmaker. Graduates of the Camera Repair School are photographers first and repairmen second. In addition to basic repair, an extensive course in electricity is given to enable students to maintain and service electrical components. In each class there are 20 students and classes enter at 19 week intervals.

The Motion Picture School provides training to all grades of PH petty officers. Trainees are taught construction and operation of several types of



RECON STUDENT USES PAPER PROCESSOR

PRACTICE MISSIONS HELP TO DEVELOP THE SKILL OF PHOTO PILOTS

STUDENTS LAY OUT THEIR PHOTOGRAPHS TO MAKE MOSAIC MAP

TSGT. GAUZMAN WORKS ON RANGE FINDER

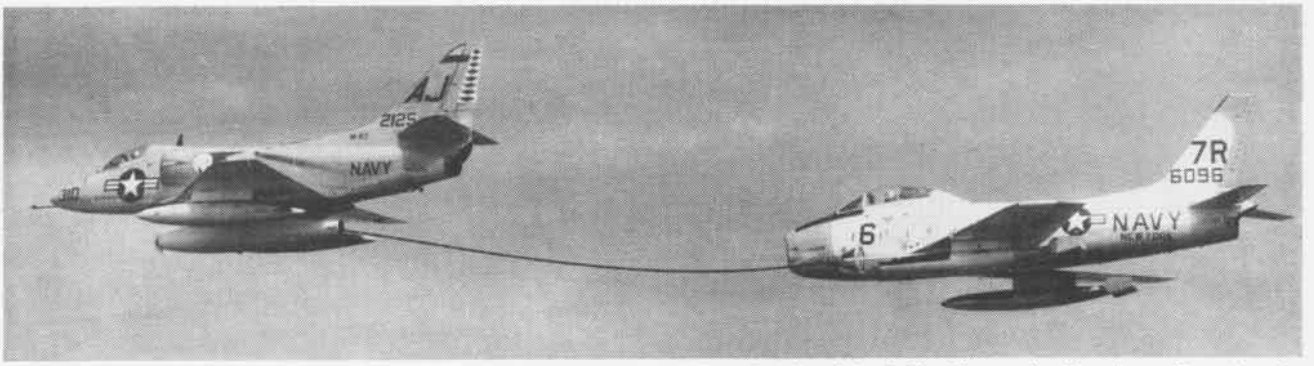
motion picture cameras, both professional and semi-professional, including high speed and sound recording cameras. Students are required to do their own film processing, lighting, script writing and editing. Newsreel techniques are carefully studied. This course convenes every 12 weeks.

Faculty members of the school have a wide and varied background in photography. They aim to turn out officers and men who can take pictures that will be invaluable in recording history in the making, yielding intelligence data and informing the public and Naval personnel of Naval progress.

Through the efforts of officers and men well trained in photography, the Navy is able to maintain a complete record of its widespread activities.

INTRICACIES OF MOVIE PRINTER STUDIED

# Weekend Warrior NEWS




**MID-AIR REFUELING** *practice during Attack Squadron 832's training cruise at home base, NAS New York, was given with assist of Oceana A4D's. Led by Cdr. I. H. Silvert, the Fury-flying Reservists also carried out strafing missions and conducted navigational flights.*

Two Naval events each year overshadow all others in the military life of a Naval Air Reservist—Annual Military Inspection and the two-week active duty for training period. The pomp-and-circumstance of the former rekindles patriotism and refreshes identity with the organization. The rugged cruise schedule puts to test lessons learned in weekend drills and renews association with the fleet.

Weekend Warrior News this month highlights these important phases of Reserve activities. Variations of the themes occur at each of the 18 components of the Naval Air Reserve Training Command.

### Annual Military Inspection

Prime purpose of AMI, of course, is to bring to light any deficiencies in the training set-up that impede combat readiness, so that they can be remedied. Year-round efforts are geared toward this goal. During the weeks immediately preceding the event, the pace is feverish.

The inspection sequence is fairly standard. RAdm. Allen Smith, Jr., arrives at the air station with members of his staff from NAS Glenview. After the rendering of honors, he reviews the active duty Reservists. A press conference is held by the Admiral, followed by a check of the facilities by the cognizant Glenview officers. Climax of the proceedings comes when the Weekend Warriors pass in review.


**TRADITIONAL** *honors, unusual entertainment are given RAdm. Smith during AMI periods.*

As soon as the official ceremonies are concluded, formality is replaced by camaraderie at a large social gathering. Adm. Smith is entertained and the officers and men have the chance to take part in a well-earned celebration. Each command makes it a gala affair.

The photographs in the center of the page give glimpses of the important occasion at three different Reserve activities: NARTU Anacostia, NAS Oakland and NAS Seattle (top to bottom), commanded by Capts. James A. Masterson, Wallace H. Weston and Richard R. Ballinger, respectively.

When RAdm. Smith entered the room of the Washington, D. C., hotel in which the reception was held, he was greeted by an individualized 24-sheet poster donated by the General Outdoor Advertising Corporation. In Seattle, he and RAdm. Frank T. Watkins, Commandant, 13th ND, were made Honorary Seafair Pirates.

Wherever he inspects, CNAResTra is the recipient of the best, professionally and socially. The Naval Air Reserve is a first-class organization.

### Training Cruise News

Whether the two-week active duty period is spent at the home base, another air station or in foreign climes, it is marked by long hours of hard work. Through practice and drill, often with fleet units, skills, tactics and techniques are honed to peak proficiency. Realistic maneuvers afford the oppor-

**COMMANDING OFFICER** *of VF-878, Cdr. Pat Dennes, briefs his pilots in the ready room at NAS Jacksonville during two weeks active duty.*


**MISSION OF TV-2** *is quick hop for parts for downed VF-878 plane. Lt. Paul Congleton and Martinchick, SKG1, are assisted by AN Jeffery.*

tunity to perfect performance of the hundreds of individual tasks that go into carrying out the prime missions.

Attack Squadron 832 stayed at Floyd Bennett Field, New York. A *Skyhawk* from VA-83, NAS OCEANA, acted as tanker for drill in refueling the squadron FJ-3 *Fury* jets. There were also navigation flights to Miami, Fla., and strafing missions off Montauk.

A Glenview squadron, VF-727, was assigned to "protect New Orleans against enemy attack" during its training stint. In addition to making intercepts the 17 *Cougars* of Cdr. J. F. Mulder's outfit practiced instrument tactics, instrument flying, ground control approaches. Ground crews did their share.

Port Lyautey, Morocco, was the cruise site for NAS ATLANTA's Patrol Squadron 672, flying P2V *Neptunes* and skippered by Cdr. R. J. Dellenback. ASW patrols and simulated warfare exercises were conducted throughout the Mediterranean area. In addition, squadron personnel took part in the People-to-People Program. Moroccan children received 4000 Scripto pencils from the Atlanta firm.

**TONGUE** *for tongue, Bonner of Seattle's VR-893, mimics Chinese dragon on SanFran cruise.*

A *Banshee* unit from NAS OAKLAND, VF-878, flew clear cross country for its 14-day active duty tour. Each of the 17 pilots in Cdr. Pat Dennes' organization logged over 43 hours of flight time in the Jacksonville area. LCdr. Dick Morrison, Lt. Bill Busses and Ltjg. Joe Smith had a rare experience while night flying at 30,000 feet three miles west of Cape Canaveral. From their vantage point in the sky, they were unexpected witnesses of a successful *Jupiter* missile launching.

It isn't all work and no play. When the liberty call is sounded, the Weekend Warriors can go sightseeing in the French Quarter of New Orleans, the beaches of Miami, or European cities—wherever they might be training.


**COUGAR JETS** *of Fighter Squadron 727 from Glenview fly in formation over NAS New Orleans while on 14 days annual training duty.*


**PARTS OF SIX** *photos make one composite showing NARTU Lakehurst's mission. Greenwood, PH1, carried out idea of Capt. I. W. Condit, CO.*

# A LIFE OF UPS AND DOWNS

**NAVCAD** *Jim Cade bounces with Starflights in exhibition at Times Square, New York City.*

**LTJG. ZIPPERER** *and WAVE Wilcox perform a double number atop Best & Company Store.*

**NEWSPAPERMEN** *who saw this show unfold heartily applauded Zipperer's special solo act.*

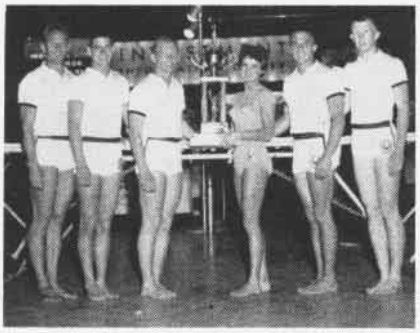
To the flight instructor, a WAVE and student aviators from the Naval Air Basic Training Command who comprise an exhibition team known nationally as the *Starflights,* Navy life is sometimes a series of ups and downs. They like it that way however and spend a goodly portion of their leisure time displaying the advantages of their specialty for the edification of horizontally-minded audiences.

The *Starflights* are a trampoline exhibition team. Their breath-taking performances are designed to demonstrate the type of training given students at the U. S. Naval Aviation School, Pre-Flight, thus emphasizing the need for unusual degrees of coordination and timing in modern aviation. By use of the trampoline for this purpose, confidence and skills are developed for coping with "unfamiliar attitudes." It is believed to be especially valuable in preparing flight students for acrobatics and gunnery manuevers.

Organized in 1955 by Joseph Lowder, a civilian instructor in the Physical Fitness and Survival Section of Pre-Flight, the team has captured more than 300 awards in athletic competition in the past four years.

One of the major problems faced by Coach Lowder, who is still an active team member, is the constant turnover of team personnel because of transfers. To the *Starflights* this is just another challenge and their ability to regularly surmount this "down" is made evident by the fact that they are constantly ranked by experts as one of the outstanding trampoline teams in the nation.

In addition to Coach Lowder, the current team consists of three flight students, one of whom is a Canadian, a flight instructor and a WAVE. The WAVE, Sally Wilcox, RM3, who supplies glamour for the group, won the Southeastern Senior Women's AAU Trampoline title after only one year of competition.



**COACH JOE LOWDER** *(left) and his team pose before their exhibition in Grand Central.*

Ltjg. William Zipperer, a Whiting flight instructor and senior member of the *Starflights,* claims five awards. Sub-Lieutenant R. B. Edey, Royal Canadian Navy, a flight student, specializes in difficult hoop maneuvers.

Ens. Karl Kostenbader, a student aviator, and NavCad James Cade complete the *Starflight* roster. Both are experts, with Kostenbader acknowledged as the "low-level" performance champ on the tramp. He holds the national record for "Back Codys" (consecutive back flips from a drop position) at 20.

Next time the *Starflights* are in your area, you might keep an eye peeled for these stellar stylists in the art of vertical virtuosity. If you're a man who thinks for himself, you might even pull on your old sweatshirt (hard hat, knee pads, backbrace optional) and join in the fun.

They say its a sure cure for vertigo!

# UNDERWATER ESCAPE TESTS

WHAT HAPPENS to a jet and its pilot after it crash lands in water? Why don't some pilots escape? Can a pilot open a canopy 20 feet under? Would a pilot drown trying to swim to the surface from a depth of 100 feet? What happens when he fires his ejection seat underwater?

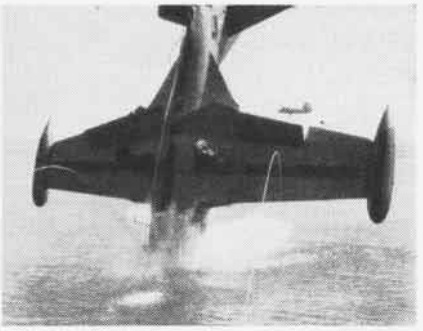
A Navy project team has found the answers to these questions and more in a series of unusual underwater tests off Key West, Florida. Composed of scientists from the Engineering Development Department (EDD) of the Naval Air Development Center, Johnsville, Pennsylvania, the research group included top specialists in the fields of aerodynamics, physics, aircraft structures, electronics and hydrodynamics. Physiological interpretation of damage imposed on an anthropometric dummy, "Sierra Sam," was provided by Navy medical groups.

A number of obsolete, straight wing and swept wing aircraft, completely instrumented at Johnsville, were used in the tests. These were crashed into the water from a height of 50 feet to simulate an inadvertent fall from a carrier deck—a type of accident in which a pilot should have a good chance of survival. Special underwater cameras and the instrumented dummy were installed inside the aircraft to obtain a record of water impact forces acting on the pilot.

The instruments recorded information as the aircraft sank to a depth of 130 feet. A team of underwater photographers from the Navy Photographic Center were positioned to take additional underwater movies and pictures. Salvage divers and members of a Navy underwater demolition team recovered the aircraft following the test in order to remove recording equipment and permit visual inspection of structural damage.

These tests revealed that at water impact, the pilot will, in all probability, be stunned and most probably not be capable of rapid decision. Little time is available to escape on the surface and the aircraft normally sinks rapidly in a tail first attitude. Sink rates up to speeds of six knots were recorded.

At a depth of about 20 feet, the canopy which covered the cockpit was crushed by the water pressure. To prevent this implosion of the canopy, a valve arrangement has been designed which gradually allows the water to fill the cockpit and reduce the pressure on the canopy.



A SPECIALLY INSTRUMENTED F9F 'CRASHES'

Since the onrushing water during sinking is directed against the canopy in a majority of cases, it tends to prevent the canopy from opening and allowing the pilot to escape. A series of tests was performed with a jet aircraft cockpit section mounted on the deck of a submarine to determine what force was needed to push the canopy open and to find out if a volunteer diver dressed in standard flight equipment could swim free of the cockpit.

The submarine submerged to simulate a sinking aircraft while the underwater television cameras and instruments relayed information to the engineers inside the submarine. It was found that the test subject, who was in good physical condition, could push his way out and swim free of the plane.

DUMMY RIGGED FOR EJECTION SEAT TEST

Would the pilot drown while swimming to the surface from a depth as great as 100 feet? This question was answered by research tests performed in the Naval Diving Research Tank at New London, Connecticut. Divers tested the latest pilot bailout oxygen system to see if it would function under water. This equipment is normally used by pilots to obtain oxygen after parachuting out of their aircraft at high altitudes.

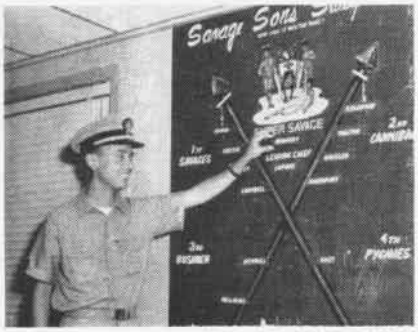
This particular oxygen system had previously been modified as recommended for underwater use and it proved to be satisfactory even to a depth of 100 feet. Pilots will now be able to breathe under water as well as at high altitudes.

All of the research tests have pointed out that it is necessary to develop a special system which will automatically remove a pilot safely from his aircraft after it crashes into the sea. These tests, as well as actual accidents, have indicated that most pilots are stunned or rendered unconscious by a water crash.

After such an accident occurs, even a well-trained jet pilot is not able to perform the necessary steps to remove himself from his aircraft. It was hoped that an interim solution to this problem of water crash escape might be supplied by the pilot ejection seat until an automatic system could be developed.

Human and dummy underwater ejection tests were conducted at the Key West test site to evaluate the ejection seat. Preliminary tests indicated that the seat would not operate under water unless certain modifications were made. Even though the seat could be made to function mechanically under water, it was not suitable as a safe means of escape, since it travels through the water at such great speeds a pilot can be injured by the water drag forces.

The Key West research effort was performed under the joint direction of Cdr. F. E. Moan and T. C. Bennett. With the completion of this program, it is expected that an automatic system will soon be developed which should almost eliminate pilot fatality caused by drowning following water crashes.



LTJG. KENNEDY, WINNER OF COMPETITION

## Advice to the Lovelorn

### Marriage Keens Bombardier's Eye

It was the last day of intra-squadron pinpoint bombing competition for bombardiers of Heavy Attack Squadron Five. The mark of excellent earned on the first day by Harold King, AM1, looked as if it would stand up.

Then Ltjg. Bob Kennedy returned from leave. He had flown his Cessna 170 from Sanford to New York to meet his fiancee of Nice, France.

They had been married during his leave period.

On the last day of the exercise, the 18th crew got airborne early in the morning; LCdr. Hugh O'Hara, John Nasipak, AT3, and Ltjg. Kennedy.

Just before noon that day, scores for the competition were radioed to VAH-5 operations. Ltjg. Kennedy had registered the best score ever compiled in a pinpoint competition. Heavy Attack Wing One rated his bomb drops as outstanding.

When news of Kennedy's feat spread throughout the squadron, his fellow bombardiers looked for him to shake his hand. But Kennedy had gone home.

**JIMINY CRICKET-SAN!** *At Yokosuka Naval Base a young visitor aboard the USS Bon Homme Richard (CVA-31) discovers magic in the mighty carrier's landing mirror. Some 17,000 Japanese were welcomed aboard.*

## Sinkankas' New Book Out

### Earlier Work in Third Printing

Capt. John Sinkankas, USN, Director of Airborne Equipment Division, Bureau of Aeronautics, does not confine his interests solely to aviation. He is the author of a 700-page book entitled "Gemstones of North America," published in July by D. Nostrand Company.

An acknowledged expert in the field of gemology—he is a Certified Gemologist of the American Gem Society—Capt. Sinkankas published an earlier book entitled "Gem Cutting, a Lapidary's Manual." This authoritative work is now in its third printing.

Capt. Sinkankas, who won his Navy Wings at NAS PENSACOLA in 1937, has pursued his Navy career in many capacities, including skipper of VP-43, executive officer of the USS *Saipan*, and safety officer for Staff ComAirPac.

He first became interested in gems thirty years ago, but it was not until 1947 in Norfolk that he took up stonecutting. He achieved recognition for his meticulous work and was called upon to cut a number of stones for the Smithsonian which are now on exhibit. One of these is a 580-carat oval aquamarine covered by several hundred facets.

Capt. Sinkankas' book on gems covers every significant gemstone from Greenland and Alaska to Panama and the West Indies. It took ten years of work to accumulate the data for the book and two years to write it.

"Gemstones of North America" has 175 illustrations, maps, photographs, some of them in color. The book includes not only the latest technical data on the gemstones themselves, but also on deposits and contains information on over 2000 localities, many of them personally visited by the author who is an inveterate field tripper and collector.

Capt. Sinkankas has just completed a beautiful sea-green gem cut from the rare mineral spodumene, a silicate of lithium, sometimes found in the gem mines of California and Brazil. Weighing 750 grams and looking like an irregular etched chunk of green glass, it turned out a magnificently polished emerald cut gem of over 1800 carats. It was cut to order for the Royal Ontario Museum. It is believed to be the largest faceted spodumene in the world.

**"I FELT AS IF** *I were right at heaven's door," said Ltjg. Barbara Thompson, a nurse at Pensacola Naval Hospital, after a ride in a T2V jet trainer. She was the first woman to fly with BTG-9. Lt. A. S. Beaver was the pilot.*

## Story Stirs Alameda Men

### Navy Unit Makes Blood Donation

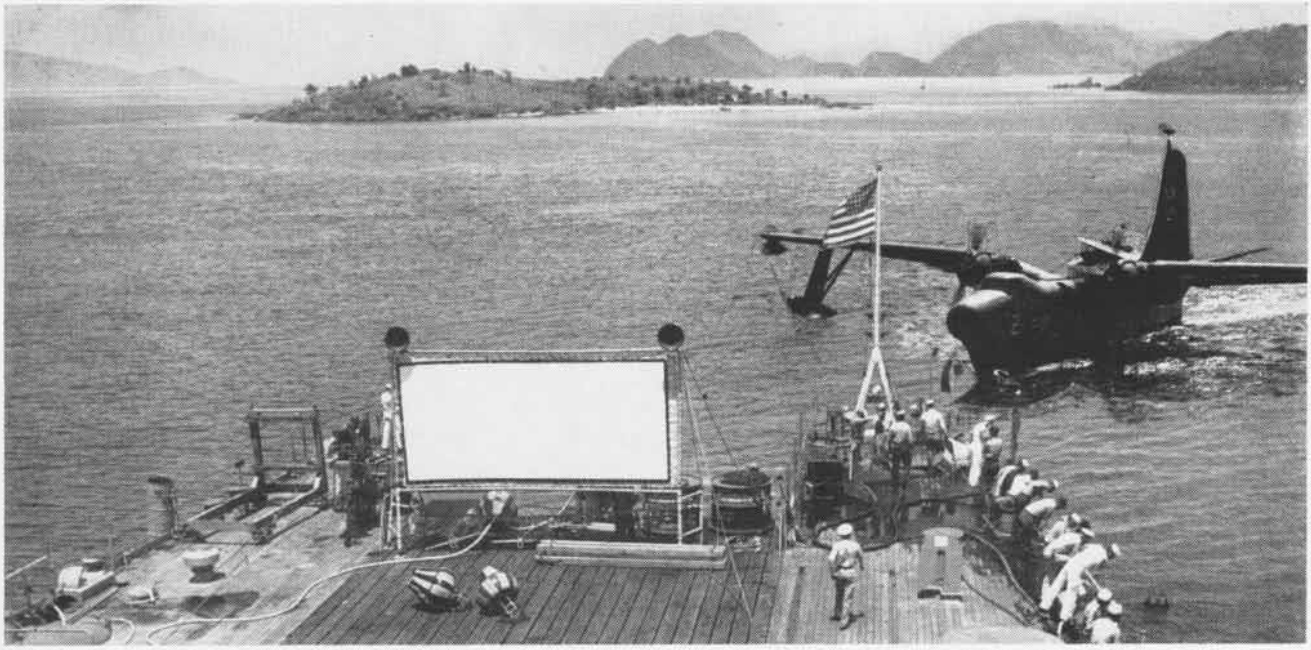
An act of mercy on the part of 40 officers and men of a 65-man unit was prompted by an article in *Look* magazine about a little girl in New York who has to have regular transfusions.

On reading of Susanna Giardina's plight, FAETU Detachment One, NAS ALAMEDA, headed by Cdr. John I. Leonard, decided to donate blood to the New York 12-year-old who is suffering from Cooley's or Mediterranean anemia.

The blood was given at the Alameda Contra Costra Medical Association and applied to the credit of "Susie" a continent away. Arrangements had been made with the Roosevelt Hospital in New York City through the American Red Cross. The Red Cross has furnished most of the 175 pints of blood for Susie's transfusions in the past ten years.

**DONALD NELSON,** *ABC, J. N. Beatty, AB2, and B. E. Driggers, AB3, of Fleet Tactical Support Squadron 21 inspect several of 129 boxes of school supplies donated by people of Hawaii during "Schools for Laos" campaign.*

# VP-45 DEMONSTRATES MOBILITY



THE SEAPLANE, ALBEMARLE AND VP-45 WORKED TOGETHER TO STRIKE THE KEYNOTE OF THE ENTIRE OPERATION, SELF-SUFFICIENCY

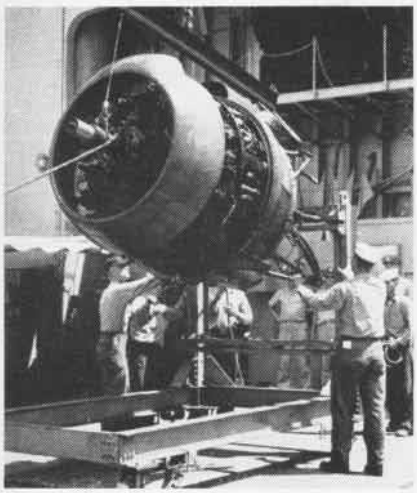
ONE EVENING, Pillsbury Sound which separates the Virgin Islands of St. Thomas and St. John, was disturbed only by sports fishermen. By sunset of the next day, the U. S. Navy had established there a remote, self-supporting base of operations, and the P5M *Marlins* of VP-45 had arrived.

The operation began in the morning hours with the arrival of the tender *Albemarle* (AV-5), commanded by Capt. V. P. duPoix. By noon two sea lanes, their marker buoys anchored, were ready.

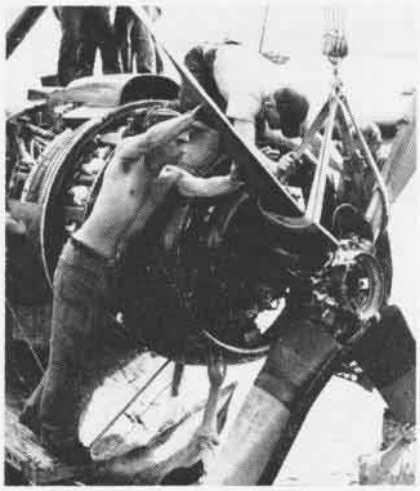
At 1500 the first of the Bermuda-based *Marlins* arrived and were guided into the new seadrome on practice "tender controlled approaches." Those landing were maneuvered into position for refueling astern. Re-arming, maintenance and personnel boats were shuttling from the tender to the "buoy patch." Training was in full swing.

During the excellent flying weather, VP-45, under Cdr. H. M. Durham, ranged the Caribbean from Trinidad to Guantanamo. Instrument flying was conducted in the San Juan area. Rocket tactics, low altitude bombing, and radar mining were conducted in the target area east of San Juan.

When VP-45 returned to Bermuda, they had flown a total of 440 hours in 10 days, experienced open-sea technique, and demonstrated once again the mobility of the tender-seaplane team.



MAINTENANCE MEN HAD A REAL WORK-OUT



AGILITY AND EXPERTNESS WERE REQUIRED

ALBEMARLE ANCHORED IN PILLSBURY SOUND


FOR AS LONG as he has had the intelligence to think about it, man has dreamed of penetrating the rind of atmosphere which surrounds his planet and of exploring the vastness of the universe which lies beyond. It is a magnificent dream, compounded of his inherent spirit of adventure and his insatiable thirst for knowledge.

Full realization of the dream remains for future generations, but those now living in this era of explosive technology are privileged to witness the early steps toward the goal. Man-made objects are this moment orbiting about Earth, companions to the natural moon which has been circling the planet for millions of years. Others have been thrust away from the Earth to roam the solar system forever, mute testimony to human capabilities for fulfillment of the Great Dream.

And even as these objects course silently through space, their creators are preparing to send man himself outside of the Earth to which he has been bound since life began.

These fantastic accomplishments of contemporary science challenge the imagination, but they pale to feeble ventures in contemplation of the enormous task which lies ahead.

Among the nine planets which revolve about our sun, Earth ranks only fifth in size. Pluto, a "neighbor" in our solar system, is more than three and a half *billion* miles distant, yet it is held in its orbit by the massive gravitational attraction of the sun, which is 100 times as massive as the largest planet in its family.

Yet this sun itself is only a minor star. Its nearest neighboring star is so far away that even billions of miles are too puny a measure of distance. We must use instead the "light year," the distance traveled in one year at the speed of light, which is 186,300 miles per *second*. Proxima Centauri, the star nearest our sun, is four and one-third light years distant.

These two stars are members of a galaxy we call the "Milky Way," a grouping of an estimated 200 billion stars so immense it would take 100,000 years at the speed of light to traverse its length. And this galaxy is but one of uncountable galaxies moving through the universe.

Viewed in man-terms of time and distance, the challenge might seem insuperable. Yet one has only to review the technological accomplishments of mankind in the twentieth century and the "impossible" becomes merely "difficult."

Space will not submit readily to conquest. The exploration of space will follow the pattern by which man mastered flight within the atmosphere, each new development providing a platform from which to take the next step and each step adding an increment of scientific knowledge and technological skill. The first goal will be the exploration of our own solar system, in itself an assignment of awesome dimensions, but one which few in a position to evaluate doubt can be accomplished.

There is more involved in space exploration than satisfaction of man's natural curiosity. The scientific data to be gained can be translated into benefits to man's peaceful existence on his own planet. There are specific applications which already are obvious: expanded world communications through the use of extra-terrestrial satellite relays; intercontinental television; advances in meteorological science; navigation, geodesy, mapping.

The long term benefits are less tangible. They lie in knowledge. The modern world in which we live is the product of the accumulated knowledge of centuries. Solution of the mysteries of the universe cannot fail to elevate man's status on Earth and bring a world standard of existence beyond anything we can now imagine.

To quote the President of the United States:

"The opportunities which a developing space technology can provide to extend man's knowledge of the earth, the solar system and the universe . . . reinforce my conviction

that we and other nations have a great responsibility to promote the peaceful use of space and to utilize the new knowledge obtainable from space science and technology for the benefit of all mankind."

### DEFINITION OF SPACE

The question of just where outer space begins permits no simple resolution. It depends on what we use as a basis.

First, one might argue that space begins at the point where man can no longer obtain enough oxygen by breathing air. In that case, the dividing line is about six kilometers (between three and a half and four miles) above the Earth's surface.

Another point of view might feel that space begins at the level below which 99 per cent of the atmosphere lies. This would be at an altitude of 30 kilometers (20 miles).

We might also use the point at which aerodynamic vehicles can no longer be supported by the atmosphere, a non-specific, because it varies with the type of vehicle. We could use the level at which meteors first appear; about 120 kilometers (75 miles.) Or it might be logical to take the point at which Earth's ionosphere terminates, an unknown level tens of thousands of kilometers above the surface.

For purposes of this introduction to space, it is necessary to be arbitrary in definition. Therefore, the term "space research" will embrace research of the Earth's upper atmosphere and the regions beyond, upper atmosphere being the portion above the 30 kilometer level, or the outer one per cent.

Space flight will include flight that reaches beyond the altitude of 100 kilometers (60 miles), below which lies all but one one-millionth of Earth's atmosphere.

### ACCESS TO OUTER SPACE

Until recently, our access to outer space lay entirely through light and other radiations that penetrated Earth's atmosphere from the vastnesses of the universe. With the advent of the modern rocket, great new vistas opened before us, because it became possible to send observing equipment above the obscuring and distorting atmosphere to observe the universe in all the wavelengths that reach the *top* of our atmosphere. As technology advances, more and more of the solar system will become accessible to direct observation by means of instruments carried in rocket-powered vehicles.

The rocket makes all this possible, not only because of its ability to hurl objects away from Earth, but also because it can operate in a vacuum. As long ago as 1865, these abilities of the rocket were recognized by French author Jules Verne, who included in his fictional account of a "Trip to the Moon" rockets for steering the space ship, although, oddly, he elected to launch his vehicle from a cannon rather than by rocket.

At the turn of the 20th Century, Constantine Ziolkowsky, a Russian mathematics teachers, wrote of the possibility of traveling in space by means of rocket vehicles.

Between 1914 and World War II, Dr. Robert H. Goddard, an American physicist, conducted extensive research on rockets, his principal motive being provision of a means of exploring Earth's high atmosphere. Goddard's early analyses of the problems of rocket propulsion were complete and remarkably accurate. In 1926, he conducted the first successful test of a liquid fuel rocket, but his efforts and those of other rocket enthusiasts went largely unheeded.

Considerable interest in rocketry arose in Germany in the early 1920's. In 1928, Hermann Oberth published the important work "The Rocket into Interplanetary Space." Starting on an amateur basis, the German effort eventually secured Government support and during World War II brought forth the V-2 missile. The V-2 marked a tremendous advance in rocket technology and clearly established the possibility of future space flight.

Since World War II, rocket engineering has advanced rapidly. With greatly improved launching vehicles, both the Soviet Union and the United States have been able to place artificial satellites in orbit above the Earth and send instrumented packages to the moon and beyond.

## THE SPACE EXPLORATION VEHICLE

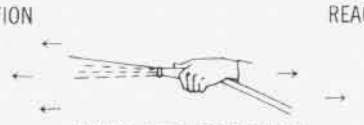
A space exploration vehicle, whether manned or unmanned, consists of a propulsion system, a guidance and control system, a payload and a frame which unites these components. The rocket is the only power system currently capable of propelling vehicles through space, because it can function outside Earth's atmosphere, it can produce the necessary very high velocities and it can develop great power in a small package.

The rocket engine is a form of jet propulsion. In the 17th century, Sir Isaac Newton expressed three laws of motion which are fundamental to any discussion of jet propulsion:

1. A body remains at rest or in a state of motion in a straight line unless acted upon by an external force.
2. A force acting upon a body causes it to accelerate in the direction of the force, the acceleration being directly proportional to the force and inversely proportional to the mass of the body.
3. To every action, there is an equal and opposite reaction.

The *third* Newtonian law contains the basic principle of jet propulsion. In any type of jet, the *action* is a stream of mass escaping through an exhaust nozzle. In the process of escaping, it creates a *reaction* in the opposite direction, that is, in the direction in which the vehicle is flying. The degree of force provided by this reaction is measured in pounds of thrust.

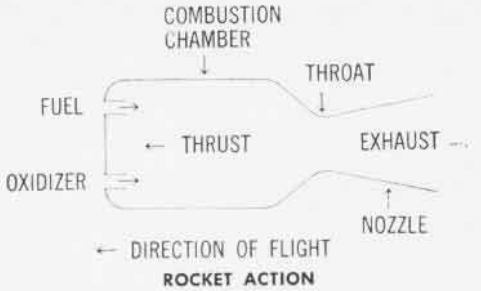
In a turbojet engine such as those now powering commercial airliners, the escaping mass is a stream of gas created



THIRD LAW OF MOTION

by burning a mixture of fuel and air, the air serving as the "oxidizer," or the substance which provides the oxygen needed to burn the fuel.

The rocket engine differs in that it needs no outside air for combustion. Instead, it carries its own fuel and oxidizer, which are burned in a combustion chamber, producing hot gases which are exhausted through a nozzle at temperatures of several thousands of degrees Centigrade. In thus expel-



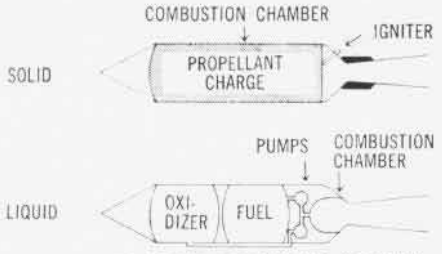
**ROCKET ACTION**

ling the mass as a "jet," the rocket recoils in the opposite direction in exactly the same way that a gun recoils when a bullet is fired from it. In the case of the gun, however, the recoil is due to the sudden single impulse caused by the ejection of the bullet. In the rocket engine, the recoil is spread out over the period of burning of the rocket's propellants. This continuing thrust provided by the rocket jet is balanced by an equal and opposite thrust on the rocket itself, causing the rocket to move in the direction opposite to that of the jet and accelerating it in accordance with the *second* of Newton's laws.

## ROCKET PROPELLANTS

The rocket propulsion system is usually based on the use of chemical propellants, which may be either liquid or solid.

In a liquid propellant rocket, the propellants are stored in tanks and fed into the burning chamber either under the driving force of a high pressure gas or by means of high speed pumps. Ordinarily, liquid propellant rockets are "bipropellant" vehicles; that is, they use two different liquids, one (such as gasoline or alcohol) as a fuel, the other (such as nitric acid or liquid oxygen) as the oxidizer. There are, however, monopropellant liquid rockets, in which a single propellant is decomposed to produce the jet.



**SOLID AND LIQUID PROPELLANT ROCKETS**

A solid propellant rocket is one in which the fuel and oxidizer are mixed in solid form, usually as a powdery or rubbery mixture known as the "grain" or "charge." The grain is packed in the rocket casing, which serves as both storage and burning chambers.

In general, liquid propellant rockets are considerably more complex than solid propellant rockets. However, it is possible to control the combustion in liquid propellant rockets with the simple closing or opening of a valve.

Liquid rocket engines are easier to keep cool, since one of the liquid propellants can be circulated through the engine walls to protect the metal of the walls from the high combustion temperatures. Such a process is known as "regenerative cooling" by scientists in the trade.

It is also possible to allow some of one of the propellants to run into the combustion chamber through small orifices around the sides of the chamber, thus forming a thin cooling film over the surface of the chamber and nozzle. This is known as film cooling.

Solid rockets are simple in construction, requiring no pumps or valves. They can be loaded with propellant and stored for long periods of time, but it is difficult to terminate the burning of the solid rocket without resorting to drastic steps such as destroying the rocket burning chamber.

Operationally, liquid propellant rockets are the more difficult to handle. They require long periods of servicing in which the propellants are loaded into the vehicle and the propellant feed systems are readied for operation. This operation requires the handling of chemically active and sometimes dangerous liquids.

In general, it is desirable to launch a liquid propellant rocket as soon as possible after servicing. The solid propellant rocket may be set up on its launcher and held in readiness over a long period.

## ROCKET ENGINE PERFORMANCE

There are a number of measures of rocket performance which need definition here. They include:

**Thrust.** This is the reaction force exerted on the vehicle by the rocket jet, or the "push." Two major factors determine the amount of thrust: the rate at which the propellants are burned and the velocity at which the resulting gases are exhausted. Thrust is measured in pounds.

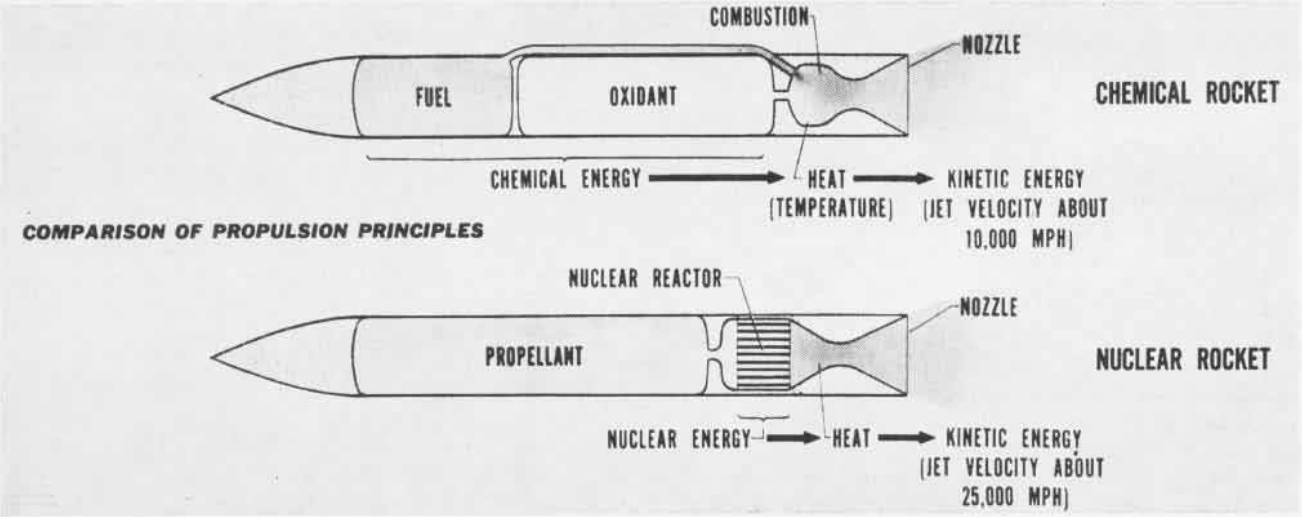
The thrust of a rocket vehicle launched from the ground must be greater than the loaded weight of the vehicle. Thus, if large masses are to be lifted from the ground into an orbit about the Earth or ejected farther into space, correspondingly large thrusts are required. When a specific job permits a small payload, a low thrust will suffice to accomplish the mission.

**Thrust-to-weight ratio** is a comparison of the engine thrust with the vehicle's total weight. The German V-2, for instance, weighed about 28,000 pounds and had a thrust of 56,000 pounds. Thus, its ratio was two to one.

**Total impulse** of a rocket engine is the product of its thrust multiplied by the time of propellant burning.

**Specific impulse** is the amount of thrust derived from each pound of propellant in one second of engine operation. It is expressed in units of time, to date in seconds. Specific impulse means to the rocket engineer much the same as does miles per gallon to the motorist; it is a measure of the efficiency with which the rocket propellants are being used to generate thrust. To use the V-2 as an example again, its specific impulse was about 200 seconds at sea level, which means that it obtained one pound of thrust for each pound of propellant over an operating period of 200 seconds. This is not particularly good performance today; sea level specific impulses of about 250 seconds are the current norm. With chemical propellants, specific impulses up to 400 seconds are theoretically possible.

**Exhaust velocity** of a rocket denotes the speed at which the jet gases are expelled from the nozzle. This exit speed depends upon propellant burning characteristics and overall engine efficiency. The V-2's exhaust velocity was about 6,000 feet per second; present engines are capable of 7,500 feet per second and higher at sea level, about half the




***COMPARISON OF PROPULSION PRINCIPLES***

theoretical maximum attainable by chemical propellants.

**Mass ratio** is the relationship between a rocket vehicle and the propellant it can carry, obtained by dividing the total mass at take-off by the total mass remaining after all propellants are consumed. High mass ratio, and high exhaust velocity or specific impulse, are the most important factors in determining the velocity and range of a vehicle, hence the most important goals of rocket research.

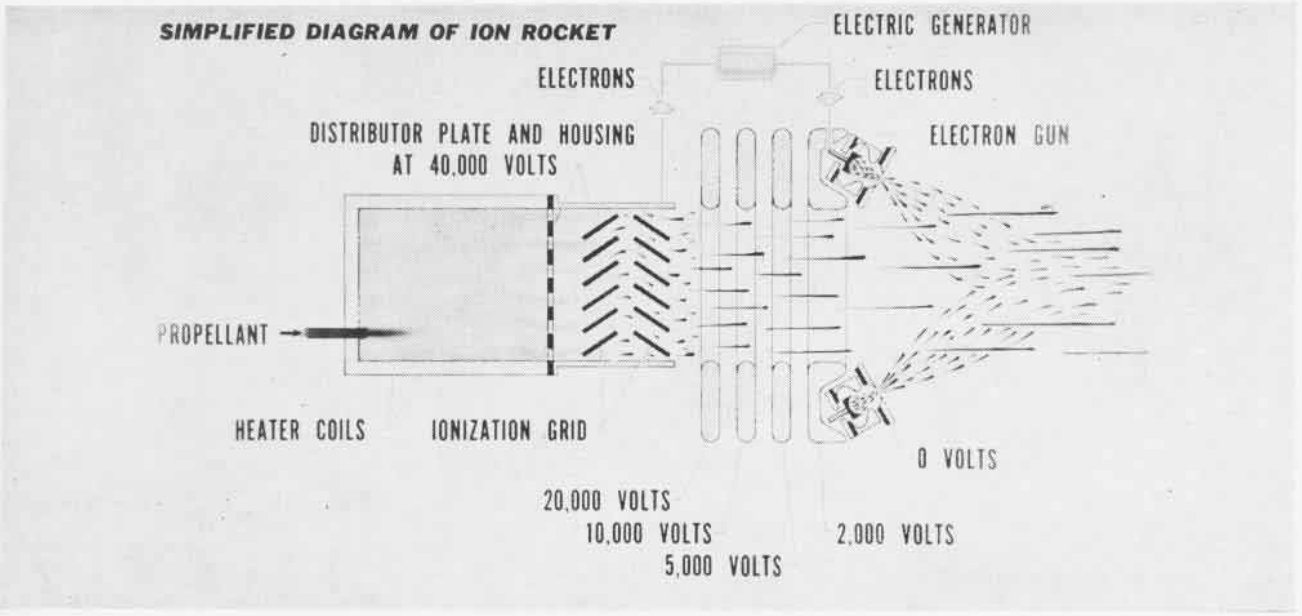
Excluding the effects of gravity and air resistance, a rocket vehicle with a mass ratio of 2.72 to 1 will achieve a speed equal to its exhaust velocity. A 7.4 to 1 mass ratio, considered feasible for single stage rockets, will produce vehicle speeds of twice the exhaust velocity. A 20 to 1 ratio would produce speeds three times the exhaust velocity, but this would require a structure, including payload, amounting to no more than five per cent of the total take-off weight and it is not likely that such a structure could stand up under the stresses of vehicle operation.

Inasmuch as the improvement of mass ratio improves the total rocket vehicle performance, then any device by which useless mass can be gotten rid of as soon as it is no longer needed should improve the performance of a rocket. This is the idea behind the so-called "step" or multistaged rocket.

In such a vehicle a series of rockets are joined in tandem. The first rocket fires, carrying the remaining rockets up to its terminal velocity. At the end of its burning, the first rocket is discarded, thereby reducing the overall mass of the combination, and the second rocket is ignited. After the end of the burning of the second rocket, it is discarded in turn, and the third rocket is ignited.

This is continued for as many stages as are used in the combination. By this device the overall mass ratio of the combined system is improved far beyond that obtainable in single stage vehicles. Roughly, the mass ratio of the combination is equal to the product of the mass ratios of the individual stages.

It is obvious from the foregoing that design of a vehicle for space exploration is an extraordinarily complex task.




***SIMPLIFIED DIAGRAM OF ION ROCKET***

The designer must take into consideration the weight, volume and energy potential of a propellant; the weight, shape and volume of the vehicle structure; the weight and volume of the payload; the weight and power potential of the engine or engines; and the effects of atmospheric resistance and gravity.

Most of these considerations are contained in a basic equation, the most important elements of which are exhaust velocity and mass ratio. An increase in either one automatically increases the speed of the vehicle.

## FUTURE PROPULSION

The performance available to chemical rockets is clearly limited by the roughly 400 seconds specific impulse that constitutes the theoretical maximum and by the mass ratios obtainable with best engineering practice. In order to obtain vehicles with performance great enough to carry out long term and extreme distance space missions, it will become necessary to develop new propulsion systems with performance capabilities superior to those of the chemical rocket. The most promising new systems, now under study, include:

**Nuclear fission,** a power plant which uses a nuclear reactor to heat a "working fluid," which might be hydrogen, helium or ammonia in liquid form. This heated fluid would then be channeled through a nozzle in the conventional rocket fashion. It is estimated that specific impulses ranging from 600 to 1,500 seconds can be obtained with this system.

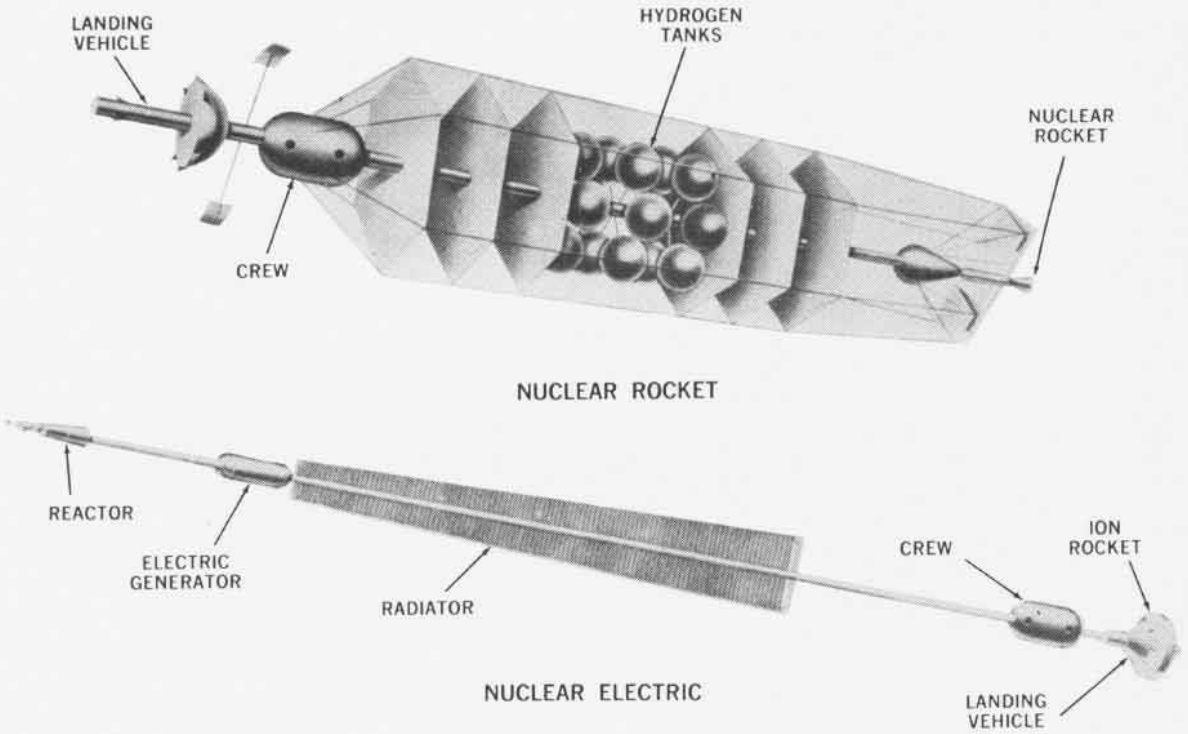
**Nuclear fusion,** a type of rocket in which light atomic nuclei are fused or united to form heavier nuclei. Very high specific impulses measured in millions of seconds should be obtainable, but the system presents a massive problem of containing the incredibly hot gases which would result. For example, to fuse deuterium (a form of hydrogen), temperatures of hundreds of millions of degrees would be needed, and no known solid materials could contain such a gas. One possibility is channeling the jet by means of appropriately shaped magnetic fields, a technique which requires a great deal more laboratory study.

**Ion power,** in which ions (atoms unbalanced electrically by the removal of one or more electrons) would form the rocket jet. The ions would be formed by passing a propellant through an ionizing device and accelerated to high speeds by electrical fields. The ions would derive their energy from either a nuclear reactor, batteries, or a solar radiation system.

Exhaust velocities obtainable would be very high, but it would not be practicable to eject large quantities of ions. Thrust would of necessity be very low, not adequate for launching vehicles from rest at the surface of the Earth, which would have to combat both the retarding pull of the Earth and the resistance of Earth's atmosphere. Ion systems would be most useful for operations in space after chemical or nuclear rockets had provided the initial boost from the ground.

A more remote possibility is the *photon rocket*, wherein photons, or light particles, would provide the thrust. Such rockets would be capable of extremely high specific impulses, but would require radiation of tremendously intense beams of light. It is not known how such intense beams could be generated, so for the time being such rockets must be considered only speculative. *(To be Continued)*

### SPACE SHIP STRUCTURES



# VETERAN XF8U-1 STILL FLIES

XF8U-1 WAS PILOTED ON FIRST AND 500TH FLIGHT BY CHANCE VOUGHT PILOT KONRAD

THE "grand old man" of the *Crusader* fleet, the first XF8U-1 built by Chance Vought for the Navy, has made its 500th flight, but is still far from being a candidate for the Smithsonian air museum.

Now used mostly as a chase plane while its newer "children" make their test flights, old "One-X" made its maiden flight from the dusty lake bed at Edwards AF Base, California, on 25 March 1955. John Konrad, Vought's chief test pilot, flew it supersonic that day and it was the first Navy fighter to achieve such speed in straight and level flight. Konrad also was the pilot for the 500th flight, made from Hensley Field, Dallas.

"One-X" still sports the big red arrow and airscoop it had on its initial flight, but its silver sides show the wear and tear of its four years of service. The red arrow has been painted several times, but the gold "Chance Vought" below the cockpit is still the original paint, now weather-worn.

Its present rear fuselage and tail surfaces were grafted on from another plane. They follow the current gray paint scheme and do not match the aluminum of the fuselage. To fulfill requirements for today's test aircraft, the veteran plane has flame red wingtips and vertical tail to make it more visible in the air. The wing itself was replaced long ago. Seventeen different J-57 jet engines have been used in "One-X."

Not only was the XF8U-1 the first high-wing Navy fighter aircraft, but it was also the first operational fighter to use successfully a two-position (variable incidence) wing for takeoff and landing. More than 500 of its descendants have been delivered to the Navy.

Six months after its first flight, "One-X" passed its 100th flight milestone with CVA pilot Harry Brackett at the controls, on September 20, 1955. LCdr. Jeff Davis, Navy flight test pilot, made the 200th flight at Dallas on May 3, 1956, little more than a year after the initial hop.

Bob Rostine, company experimental test pilot, piloted the veteran plane on its 300th flight November 12, 1956, and also was at the controls, wearing a pressure suit for a high altitude hop, for its 400th flight August 29, 1957. With test programs slacking off, the last 100 hops took two years to attain.

As more and more *Crusaders* became available for test flights, "One-X" continued to be used on "crash" programs. When control system problems developed in the *Crusader* program, changes were made in "One-X" and tested in flight. Various new versions of the J-57 engine were installed and flight tested. The plane was loaded with instruments. Cameras were installed on the wings and tail and inside the fuselage and cockpit to record flight test information.

Control system experience gained from these flights was built into later models of the F8U-1 and into its successors, the F8U-2 and F8U-3. Old "One-X" was the guinea pig called upon whenever pesky problems arose.

During its four years of service, the plane probably burned nearly a half million gallons of jet fuel and flew through the California and Texas skies enough to circle the earth 10 times.

Its nearest competitor, "Two-X," the second *Crusader* built by Vought, is not far behind, being over the 400-flight mark. Its black-striped tail has been replaced by a new aft section bearing a beefed-up structure and parabrake used to spin-test the F8U-1.

The same plane, with the ventral fins of an F8U-2 added and painted fire red underneath and pure white on top, went to Muroc with Don Schultz at the controls to conduct spin tests of the F8U-2 configuration. But despite the flashy paint and borrowed tail, it still is "Two-X", the sister ship to "One-X."

## 5387 CVA Landings Made

### CVG-12 Pilots Use Six Plane Types

In the first 11 months of Carrier Air Group 12's existence, replacement pilots made 5387 carrier landings. Number 5000 was made by Lt. K. L. Carlson in an F3H aboard USS *Hancock*.

In carrier-qualifying Navy pilots, CVG-12 used F8U's, F3H's, F11F's, FJ-4B's, A4D's and AD's. Three hundred pilots have been carrier-qualified and 225 have had refresher training.

## Airsick Doctor Finds Cure

### Will Power, Marine Tour Credited

A Navy doctor who once diagnosed his own case as "nausea, vomiting and a desire to die" has cured himself of air sickness by sheer will power and has been designated a Naval Flight Surgeon. Aiding the will power was a tour with the Second Marine Aircraft Wing at MCAS CHERRY POINT.

Completing his aviation medicine training at Pensacola, Lt. Aaron Medow was designated an Aviation Medical Examiner. Air sickness prevented him from logging the required flight time to qualify as a Flight Surgeon.

But Dr. Medow was determined to overcome his problem. Starting out slowly he resumed his flying career. Since 1958 he has flown AD's, twin-engine transports, *Flying Boxcars*, TV-2's, and helicopters, logging 132 hours.

# LETTERS

SIRS:

Hey! You left me suspended. Or rather, you have left a tail hookless F8U-1 in the air far at sea. I refer to your breath-taking series of photos on page 26 of the June issue. Did he lower his auxiliary tail hook?

Pray, take me and the rest of your readers off the anxiety seat and tell us what became of him.

LARRY L. BOODA, CDR.

Washington, D. C.

P.S. Say, it is a wonderful feeling to be on the giving instead of the receiving end.

¶ Cdr. Booda is a former editor (1949-52) of NANEWS.

SIRS:

Can't rest easy—where did Deasy finally land?

JAMES MCPHEAT
Pratt & Whitney Aircraft

SIRS:

This is in reply to your note requesting information as to what happened after I didn't go in the drink after the double wire engagement on the *Ranger* a couple of months ago. Happily enough, all of this took place about 90 miles from NAS ATSUGI and after I finally opened my eyes and came out of burner, I headed in there and landed.

We had had several of these engagements, but none of those previous had come as close to a complete stop before the hook point broke off. Mine did the trick, and the powers that be got hot and before too long the new "stubby" hook points arrived and were installed. During the interim, we had been operating with alternate wires removed.

CHARLES J. DEASY, LCDR.
Fighter Squadron 142

SIRS:

The Beechcraft 4711, written up in your July issue, immediately rang a loud bell in the grey matter above my ears. A quick check in my flight log reveals many hours logged in 4711 while C.O. USS *Antietam* '55-'56. At that time, I knew it was old but did not realize it was as ancient as NATTC Jax's history of 4711 indicates.

Unfortunately my flight log for the 1941 era appears to have been misplaced. However, TAD orders in my personal archives indicate that I took delivery of a Beechcraft at Wichita 26 May 1941 delivering it on 27 May to Anacostia where I was then attached to Operations.

I am sure the Beech I ferried was the Navy's first as I spent a week in Wichita while the installed solid engine cowls were modified to the present cowl flap arrangement. The company test pilot was dissatisfied with the engines overheating on take off and while taxiing.

If the log books indicate that 4711 was accepted at Anacostia in May 1941, it is in fact the Navy's original JRB/SNB.

F. E. BARDWELL, CAPT.
OPNAV, Op-53

SIRS:

The cover of the May issue is a *great* cover. Congratulations to the photographer and to the Art Editor of NANEWS.

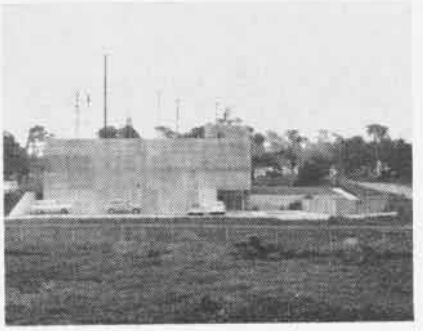
ROBERT OSBORN

Salisbury, Conn.

## SPACE FEATURE

The article, "Space Mystery and Mastery," starting on p. 34 of this issue is the first of three parts. Future issues will contain a rundown on celestial mechanics, space environment, and man in space.

**ASST. SECNAV** *(Material) C. P. Milne, second from left, visits Lockheed Missiles and Space Division's Sunnyvale plant on tour of Polaris facilities. Capt. W. A. Hasler, Naval Inspector of Ordnance, stands behind the Secretary.*



**THIS NEW** *concrete structure houses one of the finest land-based CIC's. It is the Naval Air Intercept Training Facility, Point Pinos, Calif., near Monterey which gives special training to squadrons in the San Francisco area.*

NAVAL AVIATION NEWS

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## ● IN THIS ISSUE



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

## ● COVER

In the new Mark IV "space" suit developed by B. F. Goodrich and the Navy, a rider readies himself for a 19-G run. Test is made on 145-foot tower at U. S. Naval Air Material Center, Philadelphia. M. E. Meyers, HM1, is the test rider.

## ● 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.

## ● THE STAFF




## VS-39

**Wise in the ways of submarine hunting, Air Anti-Submarine Squadron 39, flying S2F Trackers, is based at NAS Quonset.**

NAVAL AVIATION

# NEWS

## THREE MEN ON A WING

Meet NavCad's Luna, Omer and Babis. They're the first basic flight students to make carrier qualification landings in jet aircraft. The big event took place on 4 June 1959 and marked another milestone in Naval Air Training. . . . Elsewhere, at Langley, Virginia, four of their predecessors at Pensacola are vying for the honor of being the first man into space. Keep posted on men and milestones in the pages of Naval Aviation News. Your family and friends might also like to read the News. Subscription information is on page 40.