

NAVAL AVIATION

# NEWS



41st Year of Publication

MAY 1960

NavAer No. 00 75B 2





## **LONGER LEGS FOR LEATHERNECKS**

Mobility is a key word in U.S. Marine Corps amphibious doctrine. Troop transport, provision of supplies and round-the-clock, all-weather support have become specialties of Marine Aviation. In carrying out training exercises like the one shown, helicopter landing forces operate from Fleet carriers and test new methods of vertical envelopment. The higher order of mobility gives these forces a greater flexibility and versatility than ever before.



# NAVAL AVIATION NEWS

FORTY-FIRST YEAR OF PUBLICATION, MAY 1960

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## ■ THE STAFF

<b>Cdr. E. G. Colgan</b>	Head, Aviation Periodicals Office
<b>Cdr. George F. Rodgers</b>	Editor
<b>Izetta Winter Robb</b>	Managing Editor
<b>Lt. B. T. Sullivan, Joseph E. Oglesby, JOCS</b>	Associate Editors
<b>Cdr. Oliver Ortman, Cdr. G. L. Knight Harold Andrews</b>	Contributing Editors
<b>Ardis Pitman</b>	Secretary
<b>James M. Springer</b>	Art Director

## ■ COVERS

An excellent view of a portion of the United States Fleet Activities, Yokosuka, Japan, shows the attack carrier, USS Lexington, CVA-16, at the Piedmont Pier. This busy facility in the western Pacific supports the famed Seventh Fleet. Back cover shows former C.O. of VF-84, Cdr. R. T. Hoppe on USS Independence.

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

Published monthly by Chief of Naval Operations and Bureau of Naval Weapons to disseminate safety, training, maintenance, and technical data. Send mail to Naval Aviation News, Op 05A5, Navy Department, Washington 25, D. C. Office is located in 3413 Munitions Bldg.; Telephone Oxford 61755 or 61880. Annual subscription rate is \$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 copy, \$.25.



# NAVAL AVIATION NEWS

## ASW Forces Reorganized HS, VS Squadrons to be Air Groups

Replacement carrier air group training, which has paid handsome dividends for attack carrier operations, is being expanded to the field of anti-submarine warfare.

Simultaneously, all operational VS and HS squadrons are being merged into carrier ASW Groups (CVSG's) in an effort to insure maximum effectiveness against the current and future submarine threat.

Formerly independent carrier-based VS and HS squadrons will be used to establish replacement ASW squadrons and air groups. At the same time, land-based patrol ASW (VP) replacement squadrons are being established.

These units, in turn, will provide operational training of replacement pilots, crewmen, and maintenance men for fleet ASW squadrons and groups in

much the same manner that is being used to train personnel for attack carrier operations.

Each deployable air group will consist of a CAG staff, two VS squadrons, one HS squadron, and a VAW detachment, both while deployed and while in training for deployment. Replacement CVSG's will consist of a CAG staff, one VS squadron and one HS squadron.

VS and HS squadrons within each air group will have the same permanent duty station, or permanent duty stations within close proximity.

When the program is completely implemented, an ASW carrier group consisting of two VS and one HS squadron, and a VAW detachment, will be assigned to each ASW carrier.

Benefits expected to result from replacement training for ASW squadrons and air groups include:

Reduction in the basic training load of operating squadrons,

Reduction of aircraft accidents, Formalized ASW training, Standardization of procedures, and Improved material and manpower readiness in the operating squadrons.

ASW replacement groups will be established by June 30 on each coast to train ASW groups and squadrons for Atlantic and Pacific ASW carriers.

Replacement Air Group 50 (CVSG-50), comprised of VS-30 and HS-1, will be stationed at Key West. Replacement Air Group 51, comprised of VS-41 and HS-10, will be at San Diego.

Replacement VP squadrons are being formed at NAS JACKSONVILLE (VP-30) and NAS NORTH ISLAND (VP-31). These stations were chosen as sites for the VP squadron because each has landplane and seaplane facilities.

## Pt. Mugu Gets Phantom II To be Used in Sparrow III Tests

Plane number five in the F4H Phantom II series has arrived at Point Mugu to be used in a research and development program designed to bring a new weapon system to the fleet.

LCdr. Paul S. Johnson, Naval Missile Center pilot assigned to the Sparrow III management branch, ferried the aircraft from the McDonnell plant in St. Louis.

LCdr. Johnson has been working with Sparrow III for more than a year, firing the missile in R&D flights from F3H's. He will work with Cdr. H. T. Ewing, LCdr. Kenneth W. Stecker, and Maj. Dan Githens in the F4H Sparrow III project.

Using the armament system concept, McDonnell engineers incorporated the built-in missile capability in the F4H from the drawing board stage. The Phantom II will be able to carry other modern weapons in addition to Sparrow III, adding even deadlier defense potential.

The McDonnell F4H plane to be used in the R&D project is on bailment to Raytheon, maker of Sparrow III.



**FRIENDLY FOES** meet as the U.S. Navy's Lockheed-built YP3V-1 and its underwater "enemy," USS Capitaine (SS-336) engage in an exercise off the Southern California coast to demonstrate the YP3V-1's low-level, high-speed attack capabilities. Flashing in at whitecap height, the prop-jet patrol plane makes a mock torpedo run on the surfaced submarine. Attacks can be delivered to target areas at more than 400 mph cruising speeds, twice that of the famed P2V-7 Neptune.

## Combat Training Required Change in Marine Recruit Schedule

Effective this month, Marine recruits enlisted for aviation duty will be required to undergo Individual Combat Training at Camp Lejeune or Camp Pendleton.

Since June 1958, Marines enlisted specifically for aviation duty—about 250 a month—have been assigned directly after boot camp to Aviation Fundamentals School, Jacksonville, Fla.

All other Marine recruits have been and will continue to be required to undergo four weeks of Individual Combat Training on completion of recruit training.

In the phase-in stage of the new set-up, about 200 aviation duty Marines who completed recruit training in April will undergo Individual Combat Training. About 260 others who graduated from boot camp in April will be assigned directly to the Aviation Fundamentals School. This insures an uninterrupted flow of recruits into Marine aviation units.

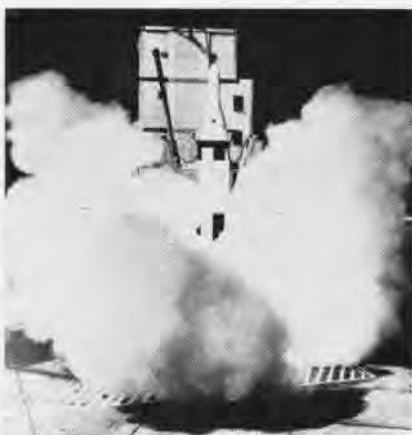
## Adm. Boone's 'Last Flight' Ranking Naval Aviator Retires

It was the fitting way to sign out. On his last day of active duty, 29 February, Adm. Walter F. Boone, third ranking admiral in the Navy and the senior Naval Aviator, concluded his active duty career by flying an Anacostia *Beechcraft*.

He was appointed to the Naval Academy in 1917. Early in his career, he had sea duty in the USS *Texas* and USS *California*. Standing first in his class, he was designated Naval Aviator No. 3255 at NAS PENSACOLA in April 1926 and had an unbroken succession of aviation assignments until December 1945. He was skipper of USS *Yorktown* as hostilities ended.

During the postwar period, the Admiral served as Chief of Staff to the Commander Seventh Fleet. Later assignments included duty as Assistant Chief of Naval Operations, Commander of Carrier Division Five, membership on the Joint Strategic Survey Committee of the Joint Chiefs of Staff. From 1954 to 1956 he was Superintendent of the Naval Academy.

Since 1958, he has been U.S. representative to the Military Committee and Standing Group, North Atlantic Treaty Organization, Wash., D. C.



**SEVENTH SUCCESSFUL** firing out of the past eight of *Polaris* test vehicle A1X14 took place at the Atlantic Missile Range the beginning of March. The nose cone was instrumented, and range was in excess of 900 miles.

## Intrepid Trains Students Antietam Gets 2 Months Overhaul

More than 170 students, instructors and enlisted men from Advanced Training Command bases at Corpus Christi, Chase Field and Kingsville flew to Jacksonville in late March for carrier qualification training aboard USS *Intrepid*.

This is the first time in history that a fleet attack carrier has been used for carrier qualifications of student aviators.

USS *Antietam*, which has been operating under control of the Chief of Naval Air Training for the past two years and has been responsible for conducting carrier training for students of the Naval Air Training Command, went to Norfolk for overhaul.

## New Officer School Opens It will Instruct Aviation Officers

A new Basic Naval Aviation Officers' School, which opened in April, will increase the Pensacola Naval Aviation Trainee input by 50 per cent, according to RAdm. Clifford Duerfeldt, Chief of Naval Air Basic Training.

The school will train a new non-pilot category of aviation officers for the fleet. Some 40 officers and Aviation Officer Candidates began their training April 18 and a new class of approximately 40 will arrive every two weeks.

Total additional input into the Pensacola Naval Air Training program will be approximately 1000 officer trainees per year.

In addition, some 150 personnel will be brought into the area to train the new students. Existing facilities will be used.

The course will last approximately 24 weeks; 16 weeks at Pre-Flight and eight weeks at the new NAO school to be set up at Sherman Field. On completion of their six-month stay in Pensacola the new aviation officers will go to Corpus Christi, Memphis, and Glynco to complete their training as anti-submarine warfare officers, navigators, bombardiers, electronics specialists, and maintenance officers. Some will fly as crew members. Others will be assigned to units as ground officers.

A portion of the students will be trained as radar crewmembers for the Navy's newest supersonic night fighter, the F4H-1 *Phantom II*, which will carry a pilot and a radar officer.



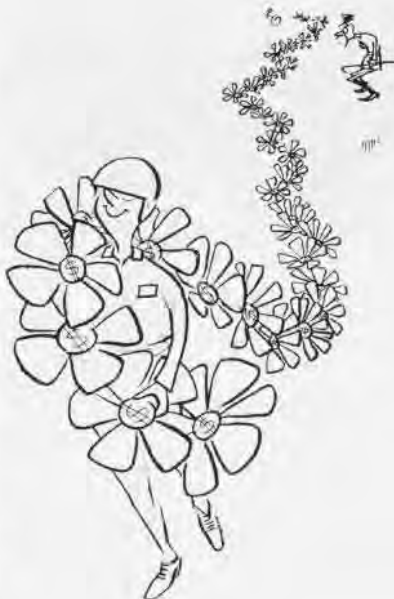
# GRAMPAW PETTIBONE

## For Lack of a Switch

A trio of ferry pilots, scheduled to deliver three brand-new T2J's, took off from the airfield at which the factory was located and headed South for a running join-up. Preflight had been a little hurried owing to an hour or so delay in the plane's being made available for flight, but it had included the items usually covered in a pilot's preflight—speed brakes, flaps, flight controls free and easy, fuel full up, all access doors locked, tires, etc.

Immediately after take-off, the third man found that he had no aileron boost, and a quick look at the hydraulic gauge showed him zero pressure. Since the aircraft had no other obvious discrepancies and he had no trouble controlling it, No. 3 man proceeded to join on the leader, switched radio channels to squadron common, and heard the No. 2 man telling the leader his plane was "flying like a truck." No. 3 now reported his own "boost out" condition. The leader switched channels again and told the factory tower of their troubles. He was requested to return to base.

Now at 13,000 feet, the flight made a 180-degree turn and headed back.



The No. 3 man overran the other two aircraft as they settled down on course and ended up approximately one-half mile ahead and 1000 feet above the others.

Looking back over his left shoulder to keep the flight in sight, he retarded

throttle, flicked the speed brakes out momentarily and then reclosed them. He was at 240 knots, using nose up trim as he slowed down.

Suddenly, although no movement could be detected, it felt to him as if the stick went to a full nose-down position! The T2J did a smooth, but rapid, nose-over and continued on over to an inverted position in an outside loop! The pilot pulled as much back stick as he could and rolled in back trim, but was floating off the seat, hanging in his integrated harness, his helmet scraping on the canopy.

Realizing it was out of control, he ejected. The T2J was at this time inverted with the nose about 30 degrees below the horizon on a reciprocal heading to his original course.

The seat functioned perfectly, but as the chute opened, the rocket jet fitting attached to the left parachute riser opened and released the riser, leaving him dangling by only one fitting! Since the risers are interconnected in the NB-7 chute, it remained inflated and took him safely down, uninjured. The other members of the flight landed without incident.



**Grampaw Pettibone says:**

Sufferin' catfish! The T2J boost on-off switch is located ONLY in the rear cockpit. With a pilot flying solo in the front seat, preflight MUST include a check on this switch! If this is overlooked on preflight, the boost system can be activated from the front cockpit by turning the DC power control switch (battery-generator switch) to battery only. This is on the check-off list and clearly stated in the handbook. The boost check prior to take-off is a simple one; it involves lookin' at the hydraulic pressure gauge. After take-off is too late! This man had only 5.6 hours in the T2J, although he had over 400 jet hours. He obviously wasn't ready to ferry the T2J, for he didn't know the airplane.

When you accept a plane for ferry: Look it over as though you were buyin' it! You are! For lack of at most an extra hour at one end, the home base maintenance crew might spend two





weeks workin' the gripes off a real dog at the other end, or unlike this lad, you might not ever make it at all.

Runaway trim tab caused this accident. Lack of boost made it impossible to overcome. Lack of a proper pre-flight started a real and mighty expensive "daisy chain."

## Explosive Decompression

An F8U-1 *Crusader* was cruising at 45,000 feet. On this flight, the pilot was testing the flight capabilities at V-max speeds with yaw and roll stabilization systems inoperative.

Accelerating in burner to 1.05 indicated Mach, he pushed over a power-on descent to 37,000 feet, leveled off at 1.38 Mach and accelerated to 1.5 indicated Mach. Without warning, the canopy plexiglas failed, and explosive decompression occurred.

The pilot was momentarily confused by noise, change of pressure, and ram-blast air factors. His first assumption was engine disintegration. Following an instinctive reaction, he cut afterburner, retarded the throttle to idle, and ducked his head forward and down. Plexiglas fragments rained down on his hard hat and onto the cockpit floor. The wind noise was pitched in a shrill scream.

He decelerated rapidly, the front and side windshield panels offering considerable protection against the ram-air blast. He lowered his helmet visor and, for the first time, raised his head to glance at the instrument panel. The altimeter was unwinding through 24,000 feet. The pilot realized from his instrument scan that his engine was O.K. and no warning lights were showing. He extended his speed brakes to check further acceleration and began a controlled descent.

His greatest concern at this time was the dislodgement of the ejection seat face curtain from its housing. Until the airspeed was slowed to below 250 knots, the curtain was alternately flapping up and down, in and out of the wind stream. At one time, the up travel of the face curtain appeared to be eight or ten inches! The shrieking wind stream discouraged any attempt to catch hold of the curtain and secure it. Not letting the curtain distract him, he concentrated on let-down.

He leveled off at 3000 feet at 220 knots and headed for home, the wind noise pitch now reduced to a tremen-

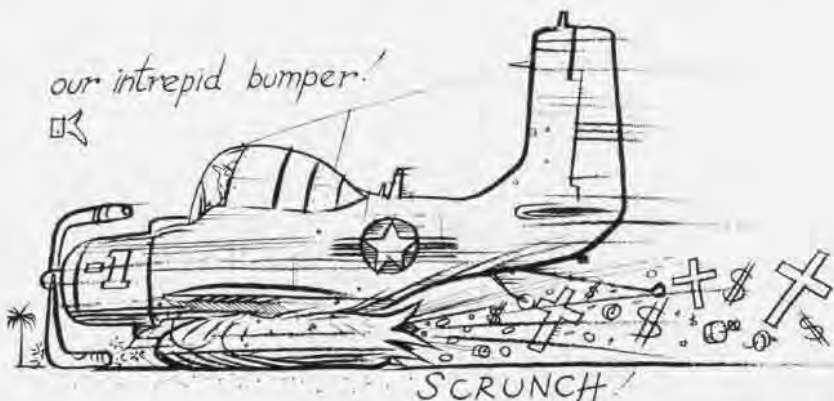
dous but dull roar. Although the noise was disconcerting, landing was uneventful. Medical examination revealed the pilot had suffered no ill effects whatever.



*Grampaw Pettibone says:*

Brother!! This is the third case of explosive decompression in the F8U-1 since July. One took place at 48,000 and another at 40,000, but this is the first at over Mach 1. In one case, a loose connection between the static port and cabin pressure regulator allowed excessive cabin pressure to build up. The static sensing line for the air safety valve is tied into this same line.

You gotta watch that cabin altimeter! Too great a differential doesn't mean you've got a good cabin compressor, bub, you've got a downing gripe instead. This lad's trouble was suspected to be "aging" of the plexiglas canopy. He did an outstanding job, he's a "real pro." Ol' Gramps would be glad to have this kind of sharpie aboard any time.



## Gear Check

Two AD-5W pilots took off one fine morning from a Pacific island base on a scheduled two hour instrument—GCA flight. The first 30 minutes of the flight were spent in routine formation work, carrier break-ups, and rendezvous, after which the section leader released his wingman for an island FAM and returned to base for a few practice GCA approaches.

For the next hour, he made five GCA's, each to a touch-and-go landing. On the last touch-and-go, he felt a severe shimmy during the landing roll and found he had "unsafe" indications on both main gears when he retracted his wheels. He also noted his air speed was low for the power setting. A quick check by another aircraft confirmed that the right main gear was trailing,

The pilot then lowered his gear and made a low pass for a control tower check. It appeared down and locked, so he received permission for a "hot touchdown" and a go-around. On the "hot pass" a noticeable shimmy was felt, but the gear indicated safe, so he tried another with the same results.

The tower now requested that he make a final landing, utilizing the runway arresting gear to shorten the roll-out.

The pilot complied and a smooth touchdown was made. After 1000 feet of roll-out, the port gear collapsed. The pilot cut the engine and used full right rudder to bring up the left wing. As the wings came level, the starboard gear collapsed. The AD-5W then slid another 600 feet on its radome and stopped 400 feet short of the arresting gear, substantially damaged but intact.



*Grampaw Pettibone says:*

Great balls of fire! Why so many young sprouts and old fuds insist on a "hot touch-down" to check their gear down and locked and even attempt to jar a jammed gear down with a hard bounce is beyond Ol' Gramps' comprehension.

On the AD-5W, if the gear folds, it folds quickly, and there isn't a man goin' who can catch it and wave off before the prop turns to a club. Then that man's C.O. is liable to be lookin' up the next-of-kin.

This type of maneuver is plumb foolishness! Go through your emergency procedures exactly as outlined in the flight handbook for your craft, alert the base and get all the emergency equipment set up, and then set it on as though it WAS going to fold. You'll live longer that way. Come to think of it, there's nothing sadder than the family of an unsuccessful wheel bouncer.

## Reception Center Opened Memphis Gives Useful Information

The Navy at Memphis is a complex organization consisting of ten separate commands and about 13,500 military personnel. The 395 buildings are spread over 3,264 acres. In the past it has been difficult for the newcomer or visitor to find his way around.

A Reception Center, commissioned in January by RAdm. Fitzhugh Lee, Chief of Naval Air Technical Training, eliminates many of the problems. Designed with the newly arrived in mind, it also answers oldtimers' queries. A crew of three is on hand to pass the word on housing, medical care, religious services, education and recreation facilities, baby sitters, as well as hotels, motels and special events in the area. A locator service shows the position of each building on the base and the best route to get to it. An airline ticket office, a notary public and the Red Cross are also available in the Center.

A large mural, painted by William T. Elder, YN1, Basic Training Group 7, adorns the wall behind the reception desk and depicts the Battle of Memphis which took place in 1862. Chosen from a number of applicants because of his ability and originality, Elder took leave and spent a week completing the historical painting to adorn the room.



**NAVAL AVIATOR**, Ltjg. W. N. Straughan, now at CIC School, NAS Glynco, took his first jet plane into the air, an F2H Banshee. He has flown 28 different fixed wing aircraft, five helicopter types and three airships.

## Ends Basic in 130 Hours NavCad Madala Praises T2V, BTG-9

NavCad John L. Madala completed Basic flight training with less than 130 syllabus hours. Reporting to Basic Training Group Nine directly from the School of Pre-Flight, with no previous flight experience, Madala's first flight was in the Lockheed T2V Seastar jet trainer.

He completed the basic course without a "down" or an extra flight.

In only 13 instructional flights, NavCad Madala flew his first solo with a total of 20 hours flight time. Although he had never seen a landing pattern or any of the maneuvers flown

before, Madala was able to achieve his first solo flight in the same amount of flights allowed students who have had previous experience in other types of aircraft before reporting to BTG-9.

Remarking on his rapid completion of training in BTG-9, NavCad Madala said, "I doubt that this type of training could be done any better than it is being done right here. In the first place, the T2V is a real sweet bird. Secondly, the instructors are always ready to help the student."

## Charitable Aid Undertaken NAS New York Men 'Adopt' Girl

A blonde five-year-old Belgian girl has been adopted by 12 sailors at Floyd Bennett Field, NAS NEW YORK.

The men from the Aircraft Maintenance Q-3 Electric Shop have become her "foster parents."

Richard Skelly, AE1, introduced the idea after he learned of Foster Parents Plan, Inc. He broached the idea to his shipmates at a coffee break, and the answer was "yes."

Under the Plan, a person or group may select a needy child in practically any country in the world. They send the organization a monthly check which is used for food, clothing and medical expenses of the child. Grateful letters are the welcome dividends.



**ALLEZ OOP, Etc.** The date is sometime in October, 1943. The carrier is the USS Yorktown somewhere in the Pacific. The photos (USN nos. 470539, 540) allege it's a "TBF coming in for a landing . . ." but we know it's an F6F. Beyond this we have to go to



our readers: Anyone remember this incident or a similar one? If so, we'd appreciate a rundown. In case you didn't notice, the Yorktown is making knots astern and there used to be a frightening lack of wires right where the Hellcat seems to be heading for a pancake.





**AIRBORNE AGAIN**, a recently grounded F8U and a sister Crusader from VF-124 wing over San Francisco's Golden Gate Bridge. They illustrate the efficiency and thoroughness of the Moffett Field Supply Service. "No Aircraft out of Commission" is their steady goal.

## 'ZERO' IS THEIR GOAL

**M**OFFETT FIELD'S Commanding Officer said: "We are going to get all our planes up and keep 'em up."

At first it seemed impossible. But was it? Someone said: "It's tough for a master jet station." Another said: "We could never get the parts to the squadrons fast enough—even with our speed runs." Yet another said: "We have too many planes."

The seed of the idea was planted, though, and from it came ideas—"Why don't we expand the Supply Service Centers?"

"Which parts cause most AOCs?"

"Could we talk to other Air Stations

By *LCdr. William E. Luck, SC,*  
and *Ltjg. Dale E. Basye*

on the TXR and find out what spare parts they have?"

"Why can't we do it?"

From ideas came action and enthusiasm, and when the smoke of battle finally cleared, the Supply Department of NAS MOFFETT FIELD, in trying to keep all its planes up, had blasted existing master jet air station AOC records into obscurity.

To keep all the planes up, the AOC (Aircraft Out of Commission for lack of Parts) problem had to be beaten down to absolute zero and kept there.

The big push for the first Zero AOC week was started in August, 1959 and on 11 September the seemingly "impossible" goal was achieved. It didn't stop here, though. Once the range was found and the first Zero AOC week was hit, the Supply Department unlimbered its big guns and began knocking off Zero weeks as regularly as Babe Ruth once smashed home runs.

The extra time and effort of all involved—and there were many—paid big dividends. By 19 March 1960, Moffett had chalked up a record of 22 out of 28 Zero weeks, of which the last 13 were in a row. This broke

all existing records for master jet air stations. During this same period, Moffett Field's Supply Department also received eight honorable mention citations for low AOCPC rates from the Aviation Supply Office in Philadelphia, the "Big Daddy" behind the AOCPC operation.

To receive honorable mention, a station must support an inventory of at least 100 aircraft and have an AOCPC rate of three per cent or less. The rate is determined by dividing total aircraft on board into total aircraft down for parts. If three aircraft out of a hundred are down, the rate is three per cent—if none are down, it is Zero.

Hitting Zero might sound easy, but it isn't—not for a station supporting

rate was approximately 10 per cent—a very good rate considering the large number of complex aircraft the station supported. A million dollar jet grounded for parts meant a loss of several hundred dollars a day in training and maintenance time as well as loss of a ready aircraft in event of emergency. With these thoughts in mind, Moffett Field's Supply Department as a part of its "Keep 'Em Up" Project, launched a campaign to drop the AOCPC rate to Zero and, in every way possible keep it there.

Even before the Zero campaign was started, the Supply Department had developed and put into operation several highly effective procedures which had markedly reduced the AOCPC rate.

which can transmit and receive data on IBM cards at a rate of 10 to 12 cards a minute. ASO then screened the part requests and availability data, and directed shipments from various air stations for the AOCPC aircraft.

Moffett Field played a major role in the development of the SAM Program. It began as an experimental operation among several West Coast Air Stations, and its value was recognized by the Aviation Supply Office in Philadelphia. Now it operates on a nationwide air station network. Almost all parts requested by Moffett Field through the SAM program were, and are, received within three days from supply points scattered over the United States. Implementation of the SAM program na-



**CAPT. J. W. PARKER**, Supply and Fiscal Officer (right), and his staff study statistics and make plans for keeping Moffett's AOCPC rate low.



**AN F8U CRUSADER** is out of commission, awaiting parts. At once, word is passed to Supply Department and a parts canvass begins.

an average of 230 planes of 14 different types. It can be done, though, and here is how Moffett Field did it.

The vital and catalytic element in the success formula for Moffett Field was a simple one—teamwork. Everyone concerned with the AOCPC Program became interested and cooperated fully—not just Supply Department personnel, many of whom are on TAD assignment from squadrons, but also the operating squadrons, Aircraft Maintenance Department, Aviation Supply Office, Bureau of Naval Weapons Representatives, Aircraft Factory Spare Parts Representatives, and even supply and O&R personnel of nearby NAS ALAMEDA and other West Coast Air Stations.

When the drive began last August, Moffett Field's average weekly AOCPC

In addition to the AOCPC Section, Supply Service Centers, which stocked and issued high demand, low value items, such as gaskets, screws, bolts, and small tools, were established in the hangars near squadron maintenance spaces. High speed delivery runs shuttled between the main supply warehouse and the squadron areas to deliver parts.

Parts that were not available in stock and which could not be located in the local area (NAS ALAMEDA and Aviation Supply Depot, Oakland) were reported on the SAM (Screening of AOCPC Material) Program to the Aviation Supply Office in Philadelphia. Requests for parts and information on part availability from a nation-wide network of air stations were sent to the Aviation Supply Office over transceiver units—business machines

tionwide gave the AOCPC effort a much needed "shot in the arm."

As a first step in the new program, "troublemaker" parts which were regularly in short supply and caused AOCPC aircraft were singled out. Acting on the advice of squadron maintenance and material personnel, the Supply Department ordered these parts in quantities considered necessary to supply squadron requirements, and thus to eliminate some AOCPC aircraft.

The "troublemakers" were not the only parts considered, though. Aircraft factory spare parts representatives at Moffett Field were asked to draw on their past experience and recommend procurement of any parts peculiar to the newer type aircraft based at Moffett Field which, in their opinion, might cause AOCPC aircraft.

On the basis of these recommendations, additional potential AOCPP parts were procured direct from the aircraft contractors, through the Emergency Procurement Program, and rushed into stock.

Factory representatives also assisted in obtaining technical information on substitute and interchangeable part numbers. This helped identify additional parts which were available to satisfy AOCPP requests.

The Supply Department Technical Section also was given attention. This section screens all incoming material for correct stock numbers and provides information on substitute and interchangeable parts. To provide for faster and more detailed processing of incoming material requests, the Technical Section was expanded.

At the same time, in other sections of the Supply Department, more vigorous follow-up action on deliveries of material due under outstanding contracts and shipment requests were instituted and more thorough searches were made for items misplaced in the warehouse. Material began to come in faster, and once in stock, it was not misplaced or lost as often.

Personnel interest in the drive was not neglected. Publicity was given to the progress of the drive and the importance of departmental teamwork was emphasized through the use of posters in department spaces.

The program was working and enthusiasm was high, but something was still lacking. The AOCPP rate was moving down, but it was moving too slowly. To find out why, further studies were made. These studies resulted in some new procedures being developed and instituted.

In the Program Management Branch, which includes the AOCPP Section, increased emphasis was placed on repairing defective parts instead of replacing them with new parts from stock. Assistance was requested from local Bureau of Weapons Representatives, and a program was established for repair of defective parts by the Customer Service Section of NAS ALAMEDA Overhaul and Repair Department. These items were delivered, expedited, and picked up by L. J. Singleton, ATC, on TAD to Supply from a Moffett-based squadron.

The possibility of increased local repair of parts by the aircraft mainte-



**AOCPP STUB** indicating part unavailability is received and checked against stock cards.



**A. K. McCLURE, AKI,** checks West Coast stations to see if anyone has critical part.



**CAPT. DALE** brings back needed part from North Island he visited on other business.

nance department also was investigated. As a result, all requests submitted by fleet squadrons for repair work by customer service at NAS ALAMEDA were reviewed initially by the Aircraft Maintenance Department to determine if the job could be done on the station.

The Aircraft Maintenance Department helped in other ways. Some complete major assemblies, which were in short supply, were built up by maintenance personnel from parts drawn from local stock. These assemblies were then issued on a turn-in basis, and the turned-in items were repaired.

Items which could not be repaired by the Maintenance Department or NAS ALAMEDA were sent to O&R, NAS NORTH ISLAND for repair.

These additional changes and procedures upped the availability of Moffett Field's AOCPP aircraft by approximately 25 per cent.

The repair program was particularly effective, so all new steps which would cut down the time between the removal of a defective part and its replacement—by minutes or hours—were considered.

One procedure was adopted for parts available in stock that required incorporation of an aircraft service change before they could be installed. On the advice of local BUWEPs Representatives, special "Change Kits" for these parts were made up from other parts ordered from local stock. The Aircraft Maintenance Department incorporated the change, and the part was returned to stock. Result: No squadron time lost in making service changes on these parts prior to installation.

The local BUWEPs Representatives also began checking on overhaul schedules at NAS ALAMEDA and NORTH ISLAND for items in short supply at Moffett Field which could be overhauled and returned to stock. To increase availability of some of these items, a spare unit was requisitioned. When this unit was issued, the defective unit was sent in for overhaul, and, when completed, held for future AOCPP requirements.

This rotational issue procedure was found to be necessary for several critical items, such as rate-of-climb indicators, C-8 compass amplifiers for A4D's, and roll gyros for the F8U.

The AOCPP rate dropped even further, but it still wasn't down to





**SUPPLY DEPARTMENT** high speed delivery truck is ready to take a part to the squadron needing it. Paperwork check-off insures accuracy.



**G. H. COOK, AD2, W. A. McNeil, AD3, of Aircraft Maintenance, Tom Canty and Frank Waller, BuWeps reps, check the final installation.**

zero. Further improvements were needed. As a last step in the new program, the Supply Service Centers, the speed runs, and the SAM Program, which were in operation when the drive for a Zero began, were studied to see if they could be improved. They could.

The range of items stocked by the Supply Centers was increased, as were the services rendered by them to the squadrons, so squadron time spent in obtaining parts was cut down.

High speed run schedules were stepped up, so that an item available in station stock was delivered to the requiring squadron in four hours or less after submission of a request for material.

Speed was also emphasized in all other AOCPS operations. On receipt of an AOCPS stub requisition from the warehouse indicating that an AOCPS part was not in stock, the stub was treated as if no previous action had been taken on it. An immediate screen of the stock cards was made to make certain that the part was not in local stock. If the cards showed a balance on hand, the warehouse was asked to search for the part. If needed, inventory teams were called in to help with the search.

At the same time, Naval Air and Supply activities in the area were called to see if they had the item in stock, and factory spare parts representatives were requested to determine if there were interchangeable or substitute parts.

Items located off station in the local area were picked up by civilian and

military duty section personnel on a 24-hour schedule.

If a part could not be found in the local area, a request for it went out on the SAM Program to ASO.

The speed up and expansion of these operations brought the AOCPS rate closer to Zero, but even with all that had been done there were still some problem areas. It was a case of "So near and yet so far."

Well worn thinking caps were put on once again and more ideas were tried.

After requests were submitted on the SAM Program for parts particularly difficult to obtain, and for which Moffett Field had experienced repeated demands, squadrons were required to turn in the old part. The old part was then processed for repair through NAS ALAMEDA O&R Customer Service Section.

If the SAM Program came through with the part first, the work request for repair was immediately reduced in priority and the repaired unit, when completed, was held in ready-for-use condition for the next AOCPS. If the repaired part arrived first, the SAM request was immediately reduced in priority.

In the event the part could not be repaired locally, it was sent to a designated overhaul point on a work request for repair. The overhaul point was advised by dispatch of the urgent need for the item, and Bureau of Naval Weapons Representatives were requested to expedite repair as long as the plane remained out of commission.

By using all of these procedures, Moffett Field pulled closer to its goal on Thursday, 10 September 1959—only three items were left on the AOCPS list. If they could be found, the Zero could be attained.

Cut-off time for the weekly report to the Aviation Supply Office in Philadelphia was noon on Friday, 11 September. Time was short—but maybe there was enough.

The needed parts might just as well have been at the North Pole, for O&R at NAS ALAMEDA had already reported they wouldn't be ready until the next week—much too late for the Friday deadline.

It was after midnight, and ASO had finished with its transceiver transmissions for the night. All of Moffett Field was asleep—all but the Supply sailors who were thinking hard. Then the IDEA popped—the transceiver has a telephone line too, so why not call NAS NORTH ISLAND and see if they have the parts in stock?

Frantic hands grabbed the transceiver phone and a sleepy North Island sailor answered.

"Yeah, we got 'em, but how we gonna get 'em to you by noon tomorrow?"

Now it was a problem of transportation.

Moffett Field Operations was called. Yes, a *Beechcraft* was flying down, but it wouldn't be back in time. High hopes tumbled, but the battle wasn't lost yet. It was just beginning.

Up early next morning, the AOCPS Section burned up the wires. All jet

squadrons on board were called to find out if any training flights were going to North Island. There had to be a hop, and there was. VF-124 had an F9F-8T *Cougar* going that way, and the pilot was glad to help.

He was back in a few hours, and as he taxied in, L. E. Ott, AKC, leading CPO of the Supply Department and AOCPS section supervisor, was waiting to receive the parts from North Island—parts that gave Moffett Field its first Zero AOCPS rate as a master jet air station.

The goal had been reached but no one rested. Instead, Moffett Field's Supply Department kept going and began to rack up Zero rates with regularity. The experience and momentum gained in attaining the first Zero AOCPS rate helped the Department carry on.

The after-midnight transceiver screen of the local area proved so effective in obtaining urgently needed AOCPS parts that it was set up on a regular weekly schedule with North Island, Miramar, Alameda, and Moffett Field as charter members.

Now, each Wednesday and Thursday nights at 2400, these stations come up on the transceiver telephone circuit. Each station reads off its requirements by stock number and quantity, and records the requirements of other stations. Then each station makes a stock and warehouse check for parts needed



H. N. WELCH, ADAN, John McKenney, CVA rep, and LCdr. W. E. Luck, check parts manual.

by the others. After about an hour, all stations come back on the telephone circuit and read their lists of AOCPS parts available.

If a part is located on the midnight screen, the request for it sent on the regular SAM Program is cancelled, so that duplicate shipments are not made. Available AOCPS items are issued, packed and delivered to the air terminal for shipment via Opportune Airlift or other available flights. Parts are usually delivered to the requesting activity by the following afternoon.

With only a four-man crew in the AOCPS Section, Moffett Field does not have an AOCPS night crew. Duty section personnel, many of whom are on TAD from squadrons, handle routine AOCPS transactions after working hours.

The after-midnight screen isn't just

routine, though, and it is manned on a volunteer basis by military personnel of the AOCPS Section.

A great factor in achieving Moffett Field's AOCPS record was the enthusiastic cooperation of Fleet squadrons based at Moffett Field in making use of training flights to pick up critical AOCPS parts up and down the West Coast. Within regular training requirements and schedules, squadron flights scheduling officers daily took every opportunity to advise supply of outgoing flights into air stations where AOCPS items might be available.

Top officers also pitched in. Moffett Field's Commanding Officer, Capt. R. H. Dale, helped out with Opportune Airlift of AOCPS material. As he was taxiing out for take-off from NAS NORTH ISLAND on a return training hop to Moffett, the captain was called by the tower and requested to return to the line. He taxied back and was surprised to find an AOCPS item for delivery to his command. Needless to say, the Captain was happy to oblige.

The record-breaking AOCPS rates scored by NAS Moffett Field during the past few months are a source of pride to military and civilian personnel of the Command. But Moffett Field and its neighbor Air Stations are not content—they have their sights set on an even higher goal—a Zero AOCPS rate for all West Coast Air Stations.



TEAMWORK DOES IT! The magic ingredient in the formula for Zero AOCPS rates is simple—teamwork. Everyone, on station and off, from the Supply Officer down to the Seaman, cooperates to get the job done quickly, smoothly and accurately to score again a "Goose Egg."

# SOVIET ANGLE ON ANGLED DECK

*Editor's Note:* This article, originally titled "Aviation-Technical Equipment of U.S. Aircraft Carriers," appeared in *Soviet Aviation*, a daily publication of the USSR Defense Ministry. The comments of Capt. (3rd Rank) A. Bul', who purportedly authored the article, may be taken with considerable salt and some surprise by knowledgeable carrier men.

While we refrain from grasping numerous opportunities to set the record straight, we couldn't stop Pettibone who literally saw red when confronted with Ivan's crash estimates. Gramps says, "Great blazing balls of fire! Naval Aviation's total of all accidents in 1959 was 987. Less than a third of these were carrier accidents."

AS IS WELL KNOWN, the U.S. military command gives more and more attention to the construction of atomic submarines which are supposed to be equipped with the widely publicized *Polaris*-type ballistic rockets.

At the same time the Pentagon and the U.S. Navy Department continue to count on heavy aircraft carriers as the fundamental attacking power of the fleet. The importance of the role of carriers, according to the judgment of high placed military personalities on the Joint Staff, is a defense capability over a relatively protracted period. "Carrier formations," the Deputy CNO of the U.S. Navy, VAdm. Beakley recently announced, "will be, as before, the fundamental element of our attack potential."

On that very same subject he says the so-called "prospective program" of construction for the American Fleet will include 12 attack carriers, of which there will be six *Forrestal* types and six atomic, in 1966.

Atomic aircraft carriers in their construction details will be a further development of ships of the *Forrestal* type, according to the American press. Therefore, their aviation-technical equipment can be studied using the *Forrestal*-type carrier as an example, taking into account, of course, the fact that during the years spent in building atomic carriers several changes can appear.

What is the aviation-technical equipment of a modern American attack carrier really like?

First of all, it must be said that the main armament of carriers are jet aircraft. Normally one aviation group is based on a ship of the *Forrestal* type, which consists of 90-100 craft, including carrier attack-bombers A3D *Skywarrior*, A4D *Skyhawk*; fighters F11F-1 *Tiger*, F8U-1 *Crusader*, F4D-1 *Skyray*, F3H-2N *Demon*, A3J-1 *Vigilante* attack-bombers are intended for atomic

carriers. All of these aircraft are capable of carrying nuclear weapons.

The aircraft are located on the carrier's flight deck and also on its hangar deck (capacity of about 50 craft). Hoisting aircraft from the hangar to the flight deck is accomplished by four aircraft elevators of the cable type, which are located on the sides of the ship (three are on the starboard side, one is on the port.)

*Forrestal*-type carriers have an angle deck, which projects out on the port side and forms an angle to the center line of the ship equal to 12°. An island superstructure is located on the starboard side of the deck, in which radars, a radio beacon and navigation equipment are found. The main station for control of aircraft take-offs and landings is located on the after end of the superstructure.

On the deck there are three landing strips 35 meters wide and about 204 meters long. Take-offs and landings can be accomplished simultaneously.

Nevertheless, even the comparatively long take-off strips of heavy carriers are found to be insufficient for unassisted take-off by jet aircraft. Therefore, they are most often equipped with catapults. And although the catapult method of launching aircraft is not as reliable, in the course of events it has become the only possible way.

Four steam catapults of two kinds are installed on the attack carrier. Two catapults, C-11, are located in the vicinity of the angle deck and they are intended mainly for launching fighters and light attack aircraft. The other catapults of the XC-7 type are disposed on the fore part of the ship. Heavy carrier aircraft are launched with the assistance of these.

A launch by means of a catapult (so-called *forced start*) is accomplished in the following manner. The aircraft, using the power of its own engines, taxis to the catapult where it is placed

in the proper position by means of an automatic centering device. The aircraft is then secured with a bridle (steel cable) to the catapult's shuttle and by special stops to pads in the flight deck. Securing is done manually.

After the maintenance crew goes for cover, the catapult launches the aircraft. At the moment of launching, the stops break away, and the bridle falls overboard during the aircraft's take-off.

Despite a number of advantages, launch by catapult has several serious shortcomings which are acknowledged in the American press. One of these is the frequent *misfire* of the catapult, when it cannot give sufficient impulse to the aircraft for the initial take-off velocity. In such cases, as a rule, the aircraft suffers a catastrophe.

Braking is accomplished on the carrier during aircraft landings by means of an advanced type of hydropneumatic arresting gear, the cables of which are placed across the landing strip. In all, there are 4-6 cables at intervals of 9 meters. The first cable is located at a distance of approximately 35 meters from the after end of the angle deck.

The arresting gear provides for the arresting of jet aircraft weighing up to 32 tons at landing speeds on the order of 160 kilometers per hour in a distance of about 50 meters.

The pilot shuts off the engine when he feels the impact of landing and the engagement of the aircraft landing hook on the arresting cable. In the event that the cable is not engaged, the pilot increases speed and takes off for another circuit.

In order to prevent accidents to aircraft during landing, a crash barrier is also used. On angle deck carriers there are no permanently installed crash barriers. The barrier (usually one) is set up on request of the pilot in cases where the aircraft has a damaged landing hook. The reason for set-



ting it up is to prevent the aircraft from going overboard. The barrier consists of nylon ribbons, stretched vertically between upper and lower nylon shrouds. When the aircraft hits the barrier, the vertical ribbons hold it back by the leading edges of the wings.

By use of the crash barrier, serious damage to the aircraft is prevented, but minor damage does occur as a rule.

Up to recent times the landing of aircraft on the carrier's deck was done under the guidance of a control officer. Orders for the conduct of landings were passed to the pilot by means of signal rockets. Such a method had not been perfect for a long time and had often led to accidents. If, for instance, the order to cut the engine is given late even by half a second, the aircraft, moving by inertia, frequently crashes into the aircraft that are arranged on the fore part of the ship, and no kind of crash barrier can hold it back.

At present an optical landing indicator is used, which is otherwise called a mirror indicator.

The basic purpose of this instrument is to point out the correct glide path to the pilot who is approaching the carrier.

The mirror indicator is an optical system, which consists of a concave mirror and several points of light. The instrument is mounted on a small cart which can be moved about on deck.

The use of the mirror indicator

makes a landing semi-automatic. During landing no earlier established maneuvers are required of the pilot except for the simple holding of a lighted line.

At the present time the U.S.A. is carrying on intensified research for the future development of landing systems. In particular, the American firm, Bell Aircraft Corporation, worked out an electronic apparatus for the automatic landing of aircraft. The system's equipment includes a radar and a computing-resolution device located on the carrier, and a receiving apparatus and autopilot on the aircraft.

It is believed possible that the new landing system will be employed on U.S. aircraft carriers in the near future.

**F**ORRESTAL-TYPE carriers are also provided with various auxiliary equipment necessary for the maintenance of carrier aircraft.

Thus, for instance, there is a special electrical installation provided for the preparation of aircraft for take-off. It consists of two 600 KW turbo-generators. Power from the electro-energized installations is transmitted to the aircraft by means of portable cables fastened to detachable connections on the flight and hangar decks.

For the storage of oxygen which is used by aircraft operating at great heights, the attack carrier has oxygen equipment available.

The basic means of communications between aircraft carriers of the *For-*

*restal* type and its aircraft are radio links for distant operations in a decimetric range band. Two-way communications between the ship and carrier aircraft can be maintained at maximum altitudes of the latter.

Communications between the carrier and other ships and ship-to-shore are maintained through the use of medium and short-wave apparatus.

In conditions of poor visibility, the return of aircraft to the carrier is accomplished with the aid of Tacan-type radio beacon. The antenna system of the radio beacon is located on the top of the mast. It consists of a central vertical vibrator and eight vertical vibrators arranged around it. The system rotates at a speed of 15 revolutions per second.

Impulses from the antenna are picked up by special equipment aboard the aircraft, which automatically indicates its polar coordinate position with respect to the moving carrier.

Besides that, more than ten short-range radars are mounted on U.S. aircraft carriers.

Generally speaking, modern U.S. aircraft carriers have complicated and very expensive armament and aviation-technical equipment intended for the conduct of attack operations with nuclear weapons.

Nevertheless, the great shortcomings of carriers, which in marked degree decrease their military usefulness, are noted among military specialists and the U.S. press.

Above all, among the number of such shortcomings is the great vulnerability of the hull, flight deck, and the aviation-technical equipment aboard the carrier to ordinary weapons and moreover to atomic weapons.

Besides that, the landing of aircraft on the carrier deck, as before, depends on the direction of the wind and the condition of the sea. Aircraft cannot land on the carrier deck in the presence of large waves. Arresting gear and crash barriers are useless in such cases. Several serious problems remain respecting the high damage to carrier aircraft. The number of various flying accidents involving U.S. carrier-borne aircraft reaches 1300-1500 per year, according to the Western press. A marked number of them end with loss of the aircraft and crew. Most accidents and catastrophes occur during carrier aircraft take-offs and landings.



USS FORRESTAL, CVA-59, FIRST OF ITS CLASS, IS PART OF POWERFUL ATLANTIC FLEET

# SAND, SWEAT AND SCHOLARS



**HEADQUARTERS BUILDING** at Marine Corps Educational Center is typical of Quantico, Virginia base which houses five permanent schools. Inset is BGen. J. C. Miller, Jr., Director. Marine Corps Schools system, started shortly after World War I, was reorganized in 1950.

**A** LONG STONE'S throw south of Washington, D. C., all hell is scheduled to break loose regularly and purposefully during most of the working year. Nuclear weapons, missiles and the conventional devices are employed freely by military personnel of our own and nine other nations. Jets—a few of which have never been seen before—and waves of helicopters are routine performers of close air support and assault missions. Invariably statistics are grim. In one recent engagement, not far from the banks of the placid Potomac, thousands of casualties were recorded in a two-hour period.

Hastily, it must be pointed out that the casualties were imaginary. The weapons and missiles were simulated; the fierce troop engagement confined to an 83' x 83' amphitheater called Ellis Hall at Quantico, Virginia—the Marine Corps Educational Center.

The "Ed Center" is the home of

By **Col. D. C. Wolfe, USMC**  
Chief, Air Section, MCEC

Marine officers' training and education, the Marines' Annapolis and Naval War College rolled into one. This unique institution, part of the Marine Corps Schools Command, has come to be recognized by military organizations the world over as one of the producers of high caliber military officers and the fountainhead of information on amphibious operations. Not only have the schools trained Marine officers of all ranks, but in the years between the two great wars, they have also devised and tested the tactics and techniques for the eminently successful amphibious campaigns of World War II.

The Marine Corps Educational Center, commanded by a general officer, is composed of five permanent schools; Senior School, Junior School, Communications Officers School, Basic School

and the Extension School. All are supported by instructional sections, such as the Air Section, which present instruction in all of the schools, and an Instructor Training Section which trains newly assigned officers in the proper methods of instruction.

In this age of almost instantaneous communications, television, and the lunar probe, the men fighting wars still know very little of what is happening beyond their own sight and hearing. This situation has been a guiding consideration in determining the method of preparation and presentation of aviation instruction in the various schools at the Center at Quantico. Of course, the old standbys, lectures and student application, still make up a good part of the course, but in the belief that, "if a picture is worth ten thousand words, a demonstration is better," the Air Section of the Educational Center has built much of its

instruction around showing the student how wars are fought.

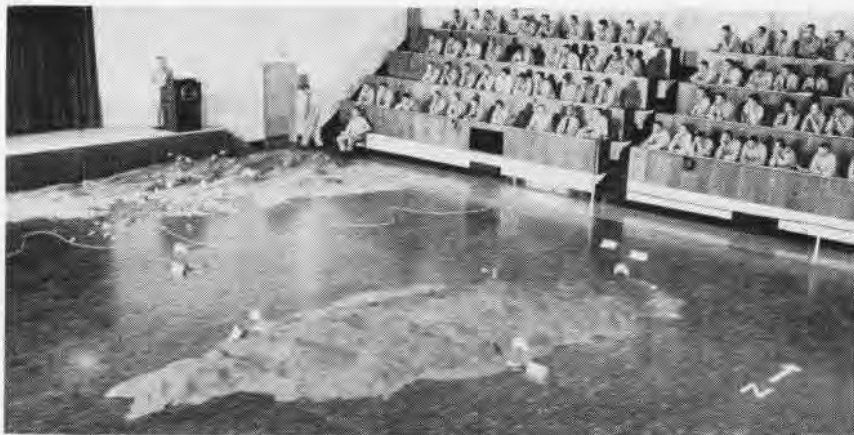
In Basic School, the second lieutenants in one period of instruction view all of the equipment of a Battalion Tactical Air Control Party, all of the armament actually loaded on an aircraft, and then act as air controllers of aircraft with live ammunition.

Captains and majors in Junior School (excluding Naval Aviators) spend a period of several days at Marine Corps Air Station, Cherry Point, N.C., to familiarize themselves with all of the aircraft, control facilities and capabilities of a Marine Aircraft Wing. The aviation officer students visit such installations as the Test Center at Naval Air Station, Patuxent River, Maryland, NASA Laboratory at Langley Field, Virginia, and the Washington Air Defense Sector Direction Center at Fort Lee, Virginia.

The Senior School instruction for lieutenant colonels and colonels includes full scale operations in miniature, such as an air defense system, a helicopter assault from LPH, and even an attack with atomic weapons, using a miniature A4D with an "idiot loop" delivery and miniature burst.

The Air Section of the Educational Center is staffed by 12 Marine Aviators who teach aviation in all of the resident schools with particular emphasis upon air operations which support the landing force mission in amphibious operations. In order to stay several years ahead in teaching, the section is now phasing such aircraft as the F4H, W2F, and the GV-1 into the instruction along with the F8U, A4D, and F4D.

The historical background of the

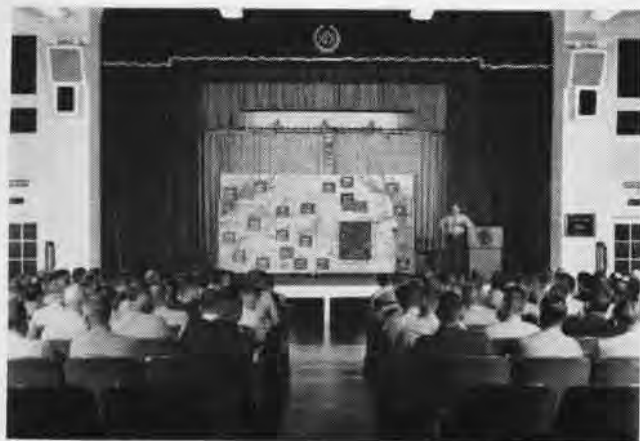


**AMPHIBIOUS ASSAULT TRAINER** at Ellis Hall seats 376; can display graphically all aspects of combat including landing of reinforced Marine division. The floor model above is of Taiwan.

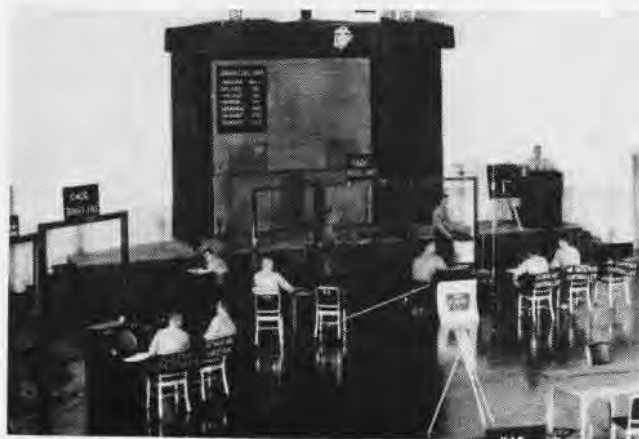
Quantico story is an interesting one. In WWI, the Marine Corps as a result of its operations as a part of the American Expeditionary Forces, was orientated toward Army techniques of land warfare. However, immediately after the conflict, some thinking began to assert itself in the Corps as to the future needs of our country and the future shape of the Marine Corps operations. Among the early prophets of the naval war was Maj. Earl Ellis. As a result of personal study and reconnaissance in the Pacific Islands, Ellis became convinced that the Japanese had a design for the Pacific which excluded every nation except Japan. As early as 1919, he voiced this conviction in studies and foretold a Pacific War that would start with a terrible disaster to the United States. He also prophesied that the Pacific campaign would be one of island hopping. He went so far as to predict some of the campaigns

which must be fought and some of the amphibious requirements and tactics that must be used to win the war. Maj. Ellis' thought, and that of other prophets, first appeared in War Plans approved in 1921 by MGen. John A. Lejeune. This plan launched many years of study by the Marine Corps Schools, by this time firmly entrenched in Quantico, in order to orientate the Marine Corps toward fighting in Naval campaigns that were to come.

The Navy, too, realized the necessity of having a naval force to seize and defend advanced naval bases. To meet this necessity, the Fleet Marine Forces were formed in the early 30's. In the shadows of the ghosts of Gallipoli, the instructors and students of Marine Corps Schools, working with the Fleet Marine Force, devised tactics and techniques and tested equipment for amphibious operations. They thought about boats and equipment for launch-

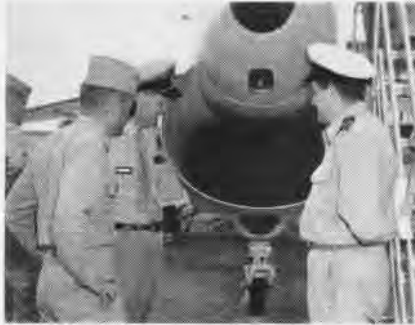


**AIR CONTROL** lecturer at Senior School uses visual aid to explain communications junctions and procedures. Classes average 125 officers.



**PRACTICAL DEMONSTRATION** of air control theory in Ellis Hall employs live equipment, realistic models. Students man their positions.





**AT CHERRY POINT**, officers from Greece and Sweden are introduced to the Crusader.



**ROYAL MARINE**, LCpl. R. B. London, ruefully views U. S. Marine ration of "must" reading.



**NAVAL SECTION Chief**, Capt. B. S. Forrest with LCdr. A. R. Sears (L), Cdr. T. W. Kennedy.

ing the assault, loading and unloading ships of the Navy, coordinating the big-gun firepower of naval ships to support troops on the beach, and coordinating the firepower of the fledgling airplane, in support of the landing.

In 1935, despite many interruptions in which the schools had to be closed so that both instructors and students could fight small wars all over the world, the *Manual for Naval Operations Overseas* was published. This was the first formal document which told the "how" of modern amphibious operations. In 1938, this document, revised, was published as Fleet Tactical Publication 167. It was to become an important blueprint for victory in the Pacific in World War II.

After the war, in which Marine Corps Schools trained thousands of officers for combat, the position of the Marine Corps within the armed forces was clearly defined. In line with this, the Marine Corps Schools were reorganized in 1950. Two major divisions emerged: the Marine Corps Educational Center assumed the duties of providing instruction, and the Marine Corps Development Center (now Landing Force Development Center) was charged with the Corps' developmental activities.

Newly commissioned second lieutenants who enter the Quantico Basic School are either college graduates, graduates of one of the Service academies—mainly U. S. Naval Academy—or meritorious noncommissioned officers of the Marine Corps who have passed a college equivalency test.

Leadership, weapons, and tactics, the basic tools of the rifle platoon commander are emphasized. At the outset of his career, the new lieutenant is introduced to amphibious warfare which will become the most important subject in his professional life.

After about ten to twelve years of active service, in a variety of command and staff duties up to squadron and battalion level, the officer returns to Quantico in the rank of captain or major to attend the Junior School. This intermediate level school of nine months duration convenes annually. The size of the class averages about 200 officers, including Marine ground officers, Marine aviators and officers from other branches of the United States Armed Services. In addition, officers from Brazil, Nationalist China, Colombia, Greece, Haiti, Indonesia, Iran, Japan, Korea, Norway, Spain, Sweden, Venezuela and Vietnam attend.

The instruction places primary emphasis on command and staff duties in the coordinate employment of naval, ground and aviation elements in modern amphibious operations on a regimental landing team—Marine Air Group level.

All other instruction, such as supporting arms, intelligence, and communications, is designed to augment the development of knowledge in the amphibious specialty. Aviation and ground officers follow the same basic curriculum, which serves the dual purpose of increasing their proficiency in their own particular skills, while at the same time, providing familiarity with the problems of the other fellow.

For approximately six to seven years, the graduate of the Junior School is given the opportunity to acquire more experience in operational units. He then returns to Quantico as a lieutenant colonel or colonel to complete his formal Marine Corps education in the Senior School, a nine months course which convenes annually. Classes average 125 officers, including Marines, officers from other U.S. Armed Services, and about nine allied officers.

Instruction includes an orientation in the broad aspects of the current



**TRAINING AIDS** from charts and movies to aircraft models are made at Center.



**FIELD TRIPS** augment classroom presentations. Group here visits SAGE center.



**MANY ALLIED** nations are represented at MCEC. Four above study a Talos missile.

world situation; Marine Corps doctrine and policies in selected fields; a study of the fundamentals of warfare to include the principles of war, strategic concepts, and tactical principles; the study of capabilities, limitations and principles of employment of currently available weapons and forces; a detailed study of amphibious doctrine and the application of principles relating to Marine Landing Forces, at the Division, Wing and Corps level; and the study of the projected employment of Marine Corps forces in future amphibious warfare with emphasis on vertical amphibious assault.

Each year the Senior School course and that of Junior School culminate in

allied and combined staffs, and other U.S. and allied services schools as well as the schools at Quantico. It might be said that this section is the deliberate pioneer in amphibious operations. The problem being presented at this time is projected to the year 1963.

Composed of five U.S. Navy officers and headed by a Captain, U.S. Navy, the Naval Section presents instruction concerning operations of naval forces and participates in teaching the inter-relationship of naval forces and landing forces in amphibious operations.

The Special Instructor Liaison Section is composed of one lieutenant colonel, U.S. Army, one lieutenant colonel, U.S. Air Force, and one lieu-

skeletonized version of the entire Marine Air Control System, which, in combat, would be dispersed over hundreds of square miles. Appropriately named Ellis Hall, this trainer has a seating capacity of 376 persons. For lectures approximately 600 can be accommodated.

The trainer includes a model of the Gaeta Beach area of Italy which offers a wide variety of terrain, a major port facility, offshore islands, a number of good landing beaches and other desirable features.

Ship and aircraft models and other normal military miniatures, sufficient in number to simulate an amphibious landing of a reinforced Marine division,



**VERTICAL ENVELOPMENT** is a Marine Corps specialty, organized at Quantico. Students plan, then execute trial assaults during the course.



**MARINE SCHOOL** techniques, proven in past wars, are demonstrated under mock combat conditions. Tank-air team is typical of realism.

a realistic amphibious assault exercise, Operation Packard, the highlight of the academic year. In this exercise, the students of both schools act in various command and staff assignments at every level of the landing force, and actually plan for an amphibious operation with the naval officers from the Amphibious Forces, Atlantic Fleet, who are their opposite numbers during the exercise. The execution of the plan is then performed in the Camp Lejeune-Cherry Point area of North Carolina, where a helicopter and surface landing is made.

The Advanced Base Problem Section consolidates the advance thinking concerning amphibious operations and presents the Marine Corp ideas of the amphibious operation of tomorrow to high level U.S. service and joint staffs,

tenant colonel, Royal Marines. This section provides liaison with the military service represented and instructs personnel in the organization and function of those services.

One of the unusual equipments of the Marine Corps Educational Center is the Amphibious Assault Trainer, a naval training device. Constructed in 1952, its operations floor can be used as a stage upon which the air, sea, and land aspects of combat can be graphically displayed by placing upon it the ship, aircraft and terrain models required for the operation. Here the student can see an entire amphibious operation in miniature, including the many innovations devised by instructors for the realism, such as atomic attack mentioned previously. The trainer has even been used to depict a

are painted with different colors of florescent paint to facilitate identification. Black light, which causes models, signs, and symbols to glow, is used when it is desired to depict darkness and still have operational visibility. House lights can be controlled to depict nearly every condition of daylight.

The end-product of the Marine Corps Educational System is skilled leadership—officers who are well-grounded in modern, and even future warfare principles and techniques.

The value of this system is reflected in an incident which occurred in WW II. A Marine officer surveying the battered beaches of Tarawa after the Pacific island had been taken in November 1943, remarked: "This is all very familiar. I landed on the same beach at Quantico in 1935!"

## BTG-7 Hits 50,000 Hours No Mishaps in Last 29,837 Hours

Basic Training Group Seven has logged its 50,000th instructional flight hour. The instrument training group was formed at Memphis, June 1, 1958.

Lt. Clifton E. Majoue, Jr., and his student, 2nd Lt. Robert W. Hart, III, flew a T2V-1 trainer to record the 50,000th hour.

An average of 54 primary flight instructors and 87 T2V-1 and T-28 aircraft have been flown in all-weather conditions by BTG-7 in setting the record. The group has flown 29,837 accident free hours since April, 1959.

## Smooth Sailing for Hancock 260 Landings Made in Single Day

Capt. F. E. Bakutis, skipper of the 45,000-ton aircraft carrier, USS *Hancock*, CVA-19, agrees with the old saying, "Records are made to be broken."

On 24 February off the coast of California between 0800 and sunset, 245 landings were recorded aboard the happy "Hanna" by pilots of CVG-11. It was a new *Hancock* record for jet landings in one day.

Nature gave a real assist, for the ship continued on an easy full circle during the day. Not once did the ship have to stop air operations to run down wind. The only breaks in operations

were the result of a damaged A4D landing gear and two ordered coffee breaks of 20 minutes.

Five days later, the feat was repeated, this time without even a minor mishap and with weather to order. In ten hours of operations, 260 landings were made for still another record.

## Endurance Records Tumble ZW, ZP Airships Hold to Stations

On its first operational early warning barrier flight, a Navy ZPG-3W airship of ZW-1 established a record for time spent on continuous patrol.

From NAS LAKEHURST, the 1.5-million cubic foot airship flew to its assigned sector off the New York, New Jersey coast and stayed aloft for 49.3 hours.

The same airship, on a subsequent flight, remained airborne for 58 hours on an operational mission.

Not to be outdone by its "big brother," a Nan-type airship of ZP-3 completed the longest airship anti-submarine operational training flight on record. The Nan ship remained airborne for 72 hours while operating more than 100 miles at sea.

The Nan ship, commanded by LCdr. Casmir J. Sucheicki, was a fleet configured ship with no special equipment aboard for sustained flight. Its 20-man crew rotated watches on the flight.

## Sparrow III to be Better Raytheon Awarded a New Contract

The Navy has awarded Raytheon a \$4.3-million contract for extending the range and high altitude capabilities of the *Sparrow III* air-to-air guided missile. The money covers continued research, development and production of the missile.

*Sparrow III* is operational in the Sixth and Seventh Fleets, as armament for the F3H-2 *Demon* fighter. It will be the primary missile armament for the F4H-1 *Phantom II* fighter.

## An 'Airborne' Press Box? NAA Meets Needs of U. of Indiana

North American Aviation, normally associated with the design and manufacture of flying machines, has been commissioned to build a press box for the new stadium at the University of Indiana.

The three-deck press box of glass, aluminum and decorative panels will be ready for the first kick-off this fall. It will be 150 feet wide with a front surface viewing area of about 5000 square feet, and will be perched 160 feet above the field.

The three-level press box will have an elevator. Newspapermen will use the first floor, radio and television newscasters the second, and television and still cameramen the third.



**HIGH ALTITUDE SAMPLER** test vehicle (HAS) is shown before and during launch from the U.S. Naval Missile Facility, Pt. Arguello. The two



stage rocket reached a height of 250 miles. Missile Facility is an operational launch and tracking unit of Navy's Pacific Missile Range.





FOURTEEN YEARS AFTER PHANTOM I PIONEERED CARRIER JET OPERATIONS ON FDR, PHANTOM II STARTS TRIALS ON USS INDEPENDENCE

## PHANTOM II IN CARRIER TRIALS

ALMOST 14 years after another McDonnell aircraft, the *Phantom I*, became the first jet in Naval history to demonstrate carrier suitability, its highly regarded offspring—the F4H *Phantom II*—staged an equally successful and impressive repeat performance. The initial carrier trials which involved both day and night operations commenced 15 February aboard the USS *Independence* (CVA-62).

Piloting the F4H in its first launch and recovery was LCdr. Paul Spencer of the Naval Air Test Center, Patuxent River. Some of the subsequent flights were made by Cdr. Larry Flint, back-up pilot, who set a world altitude record of 98,560 feet in the *Phantom II* last December.

The *Phantom II* is the Navy's new supersonic two-seat, twin-jet, all weather interceptor. It carries *Sparrow III* and *Sidewinder* missiles, giving it the greatest firepower of any Navy fighter. It is also capable of long-range delivery of conventional and nuclear bombs. Powered by two

GE J-79 engines which give it a total thrust in excess of 30,000 pounds, the F4H features a 45-degree swept back wing and a horizontal stabilizer with negative dihedral to provide superior handling characteristics at all speeds. The F4H is 56 feet long with a wingspan of 38 ft. 5 in.

It bears a faint family resemblance to another McDonnell product, the *Banshee*, because of its low wing, twin engines tucked alongside the fuselage, and wide tricycle gear. A comparison of the two from a performance standpoint provides some astonishing facts. The F4H is three times as fast, has a rate of climb approximately 12 times as great, and zooms to altitudes double that ever attained by the venerable "Banjo."

Since the first F4H was flown 27 May 1958 at St. Louis, an exhaustive flight development program has been underway to prove-out all aspects of the basic design and equipment functioning, as well as of changes that have been found necessary. For example, some 75 flights by company pilots were required to show the airplane capable of satisfactory operation to adequate speed and altitude limits for the first Navy Preliminary Evaluation (NPE). The NPE was undertaken in September 1958 by eight NATC pilots headed by Capt. R. M. Elder.

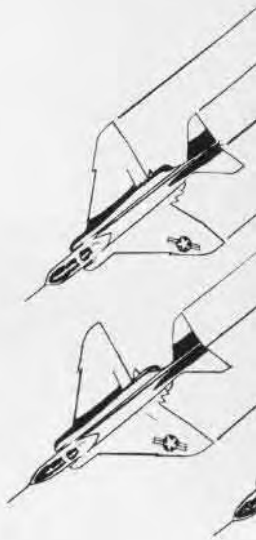
Following this NPE, evaluation of more complex equipment was begun, including the armament system and missile firing, the autopilot and the wing boundary layer control system. Stores drops, structural demonstration, spin tests and flight testing of all other aspects of the airplane's operation are currently underway.

Describing the F4H's performance aboard the *Independence*, LCdr. Spencer said: "The F4H is a big airplane. It is twice the weight of the F11F and nearly three times the weight of the A4D. Yet with all this bulk, it handles better than any of our modern Navy fighters.

"Former single engine pilots will find the responsiveness of the two J-79 engines somewhat close to sensational," said the NATC test pilot, who is checked out in 35 types.



F4H LOGS FIRST CARRIER LANDING AFTER 15-MINUTE FLIGHT



NATC PILOT, LCDR. PAUL SPENCER, MANS MACH TWO PHANTOM II PRIOR TO FIRST CAT LAUNCH

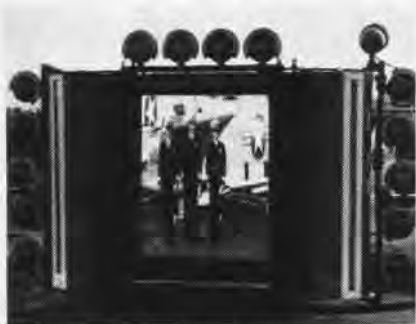




CARRIER-CERTIFIED, PHANTOM II NOW GOES TO B15 FOR FINAL TESTS, THEN TO FLEET SQUADRONS







REFLECTIONS 'MIRRORED' ON USS SARATOGA

## Old LSO's Never Die . . . They Rise to Command of Fleets

Three former landing signal officers, who have gone on to achieve a degree of prominence along other lines, got together to discuss their earlier profession. They met when the attack carriers *Forrestal* and *Roosevelt* relieved the *Saratoga* and *Essex*.

Recalling routine and harrowing landings of the Thirties were VAdm. George W. Anderson, Jr., Commander Sixth Fleet, who was LSO aboard the old *Yorktown*, CV-5, in 1937; RAdm. Robert E. Dixon, Commander Carrier Division Four, whose LSO tour was on the old *Saratoga*, CV-3, also in 1937; and RAdm. Ralph S. Clarke, Deputy Commander Naval Striking and Support Forces, Southern Europe. RAdm. Clarke was LSO aboard USS *Lexington* CV-2, in 1935 and 1936.

Shortly after the turn-over, USS *Essex* returned to the States to be converted to a support carrier for ASW.

## Jet Engine Patent Asked Designed for Subs, Surface Craft

A patent application on a nuclear jet engine that may propel both submarines and surface craft at speeds of more than 100 miles per hour has been filed with the U.S. Patent Office by Boeing Airplane Company.

The inventor, L. J. McMurtrey, said that operation of the underwater, nuclear jet engine would be somewhat similar to propulsion through air except that water would replace air and that no fuel would be used.

McMurtrey is U.S. Navy systems manager in the Boeing engineering department's advanced design section.

With the new engine, water would be passed under ram pressure through a nuclear heat exchanger, then through a turbine and out the nozzle of the engine. High exit velocity of the steam

and water provides very high thrust.

Either a turbojet or ramjet type of engine would be used, McMurtrey said. With a two-foot-diameter nozzle a submarine could be propelled through the water at speeds of more than 100 miles per hour, according to McMurtrey's patent application.



HR25 HELICOPTER lowers HRS search and rescue craft to deck at MCAAS Yuma after airlifting it 37 miles from California desert. HRS (at 5600 pounds dead weight) was damaged. Pilot of lift helicopter is Maj. Alfred Garrotto.



PLAYBOY, 85 hp, 18-foot single seater, with a 22-foot wingspan and a 300 mile range at 132 mph, was built by Chief Commissaryman Charles Garrison at NS San Juan. It cost about \$2600 and took eight months to build.

## Jet Engine Logs High Record 210 Hours with Original Parts

Achieving a total operating time of 210 hours on a jet engine is a feat in itself, and even more so when the original parts installed at the factory are retained on the engine during its usage period.

Operating at high RPM and subject to extremes in temperature, pressure and weather conditions, the Westinghouse J34 jet engine which came to NAS PENSACOLA from the factory as number 220033 in a T2J provided satisfactory service for nine months with its original factory-installed parts.

## Tartar, Terrier Improved Better Gas Generators Developed

A compact solid propellant gas generator which provides sufficient horsepower to generate electrical power and to drive the hydraulic system on *Tartar* and *Terrier* missiles has been developed by Rocketdyne.

The Mark 2 gas generator, and its twin unit, the Mark 3, are identical except for slight variations in size and performance. They are paired up to power the electrical and hydraulic system turbines in the two missiles.

The generators have a "boost disc" of fast burning propellant which is cemented to the starting end of the main propellant charge. The disc provides the instantaneous burst of power needed to start the hydraulic and electrical system turbines.

Both units use a clean burning extruded ammonium nitrate propellant which leaves no detrimental deposit on turbine blades. The units can be stored for long periods without special care.

Control of the high boost pressure, and its leveling off within .8 seconds of firing, has been achieved in the design of the propellant charge. The compression-molded boost disc uses a combination of nitrate-perchlorate oxidizer. The cool burning main stage propellant is an adaptation of the JATO ammonium nitrate propellant.

The Mark 2 unit boosts the electrical system on both *Tartar* and *Terrier* missiles to rated output in approximately a half-second. The Mark 3 boosts the hydraulic turbine to rated speed within one second.

Cases for the two gas generators are made from 4130 steel. The propellant charge is covered with an inhibitor,



CAPT. R. M. HARPER, C.O., NAS Dallas (C), meets Mr. Maurice Teter (L) and Mr. Russ Nichols, Director, Academy of Model Aeronautics, to talk over the 1960 National Model Meet to be held at Dallas next July.

# THE ART OF FLYING BACKWARDS

By LCdr. J. D. Langford

YOU'VE HEARD the terms *subsonic*, *transonic* and *supersonic*, but have you heard of anything being *retrosonic*? Yet this is the best word to describe the third crewman of the A3D's, who flies at near sonic speeds while *riding backwards*.

The third crewman of a *Skywarrior* rides facing aft, so that he has the



J. A. GREENWOOD, AE2, IN TUNNEL HATCH

proper perspective while employing the aircraft's defensive system against intercepting enemy aircraft or missiles.

The term "Third Crewman" inadequately describes his duties, but so do other suggested designations. Each of such designations as weaponer, flight engineer, or assistant navigator refers to only one of his many functions.

He must be acquainted with all components of the aircraft. If a primary system fails, it is usually the third crewman who must actuate the secondary, or emergency, system. The needed handle, solenoid or circuit-breaker may be near his seat, in the companionway of the escape hatch or in the far reaches of the bomb bay.

There are few third crewmen who have not found themselves standing on the bomb bay doors at a time when their inadvertent opening would find them dangling in the air a few miles above the earth. (Third crewmen are noted for always being on the best of terms with their pilots and bombardiers.)

As crew ordnanceman he is well acquainted with all weapons, nuclear or non-nuclear. He gets his weapons



ACES BACK TO BACK! LCDR. G. G. ZIMMERMAN (PILOT), R. N. SHELLY, THIRD CREWMAN



SHELLY CAREFULLY CHECKS THE BOMB BAY

training along with hydraulics, electronics, celestial navigation and airmanship.

As assistant navigator, he pre-computes celestial observations that will be made during the flight. Airborne, he operates the sextant and determines the azimuth and intercept of observed celestial bodies.

On all bombing missions, high or low altitude, he is in possession of the master time schedule. This facilitates coordination and completion of the exacting tasks of the three crew members who are participating in the flight.

Obviously, the third crewman of the A3D must be a fast-thinking, intelligent and dedicated airman. The quality of third crewmen was indicated by last year's selection of limited duty officers. Of the 11 men selected for LDO's from Heavy Attack Wing One, over half had been third crewmen of all weather attack aircraft.

Like to go retrosonic? Here's a suggestion. Next time you are around where A3D's are operating, strap yourself in the third crewman's seat. At that point picture yourself at the top of a loft bombing run *riding backwards*.



E. P. SZELLER, NOW ENS., CHECKS SEXTANT



LAST OF VCP-61'S AJ-2P SAVAGES, LINED UP FOR FINAL MISSION IN SEVENTH FLEET. THEY HAVE BEEN REPLACED BY A3D-2P'S

## VCP-61 DEPLOYS 'DOWN UNDER'

LATE LAST year, Guam-based Composite Photographic Squadron 61 was directed to send a photo detachment to New Zealand. The task was to map 5000 miles of North Island and South Island coastline.

Operation *Coastcrawl* was to be a joint Royal New Zealand Air Force-U.S. Navy project, with the U.S. Navy furnishing aircraft, equipment, supplies and men; New Zealand the facilities of its jet base at Ohakea, plus the photo lab and personnel.

Thousands of feet of film, cases of processing chemicals, aircraft spare parts, maintenance equipment, records, and trained men were required. Lists were checked and rechecked to see that no small item would hamper the efficiency of the detachment located 4000 miles from its source of supplies.

A week after receipt of orders, VCP-61 detachment Zulu launched a mass migration of the Seventh Fleet's remaining AJ-2P *Savages*, with Cdr. J. F. McDaniel, squadron C.O., in the lead.

Port Moresby was the first stop. Fuzzy Wuzzies were servicing the aircraft minutes after they landed. Crews were welcomed and feted in fine style by the people of this outpost located only a few minutes travel time from some of the world's most forbidding jungle.

The next day's flight to RAAF Station Richmond, near Sydney, Australia, was uneventful, but an extra day was spent there to effect maintenance and crew rest. Aussie crewmen

By Ltjg. D. E. Blackwood

purged and welded a wing tip fuel tank for an AJ in one day.

Weather delayed the take-off to New Zealand until early afternoon. As the flight progressed across the Tasman Sea, the sky cleared and a bright moon lighted the area. Mount Egmont, New Zealand's Fuji, welcomed the crews and landings were made at the RNZAF Station Ohakea before midnight.

Fleet Tactical Support Squadron 21 delivered ground support crews and equipment, enabling the first photo mission to be flown the morning after the detachment's arrival.

Base facilities were on a small scale, but efficient. Aerology observers devised a system of getting immediate reports on clear areas for good photography. Squadron Leader P. L. D. Cummins, RNZAF Photographic Officer, acted as liaison officer and helped solve the problem of using U.S. processing equipment on 250-volt, 50-cycle current. Reveille at 0430 and after dark landings meant extra work for the cooks.

Flight crews ran into thunderstorm and icing conditions. Targets stretched 600 miles away, and were open only a few hours on a few days.

Maintenance crews had to wait for the late flying aircraft and then work through the night to have them ready for morning launch.

Processing crews began work when the first aircraft landed with film.

Photo interpreters grabbed the film as it came from the dryer and they could be found titling and plotting the same film the following day.

Unexpected lighting conditions caused consternation among photo lab personnel and extra work for the photo interpreters who had to inspect each of the several thousand negatives to see if they met the rigid standards for aerial photography.

High test 115 145 aviation fuel was scarce. After burning all available avgas on North Island, the detachment refueled in South Island and almost burned the barrel dry before an overdue tanker arrived.

As the project neared completion, weather became the major problem. Certain areas had been checked regularly for weeks by searching photo crews, but still persisted in hiding from the sunlight under thick layers of clouds.

While socked in by weather, crews were able to hunt deer, fish for rainbow trout in Lake Taupo, observe fuming volcanos and the geothermal novelties of North Island.

VCP-61 detachment Zulu could be proud, though. The four outdated *Savages* kept running at such a pace they flew 310 hours the first three weeks and obtained 80 per cent completion. In a third of the predicted time and at considerable savings to the taxpayers, Cdr. J. J. Crowler, who had relieved Cdr. McDaniel as Officer in Charge, reported 100% completion.



# VS-30 PUTS STRESS ON TRAINING



**THE INTERNATIONAL SET:** Cdr. N. R. Charles, VS-30's CO, stands with 15 U.S. and Dutch Tracker pilots aboard HMNS Karel Doorman.



**SEVEN S2F TRACKERS** of VS-30's complement of 20 await their turn for takeoff from carrier during ASW exercises in the Atlantic.

**T**RAINING is a never-ending process for Air Anti-submarine Squadron 30. VS-30 has the "hunter-killer" capability in each of its 20 Grumman S2F Tracker aircraft. The S2F carries modern search and localization equipment to seek out the submarine, as well as the weapons necessary to destroy it.

Each member of the four-man crew—two pilots and two crewmen—must know how to operate his particular equipment and must know also how to coordinate his activity with other members of the plane's crew.

VS-30 flies more than its assigned number of hours each month in an effort to make the squadron a smoother working team. Training in every field, from rockets and bombs to courses in typing, are required to make every man a contributor to the ASW team.

Since its commissioning in April, 1953, VS-30 has taken part in many operations, ranging from two-week training and ready duty cruises to



**MAINTENANCE CHIEF** L. Kniper, Jr., ADCS, explains progress to LCdr. R. L. Woolam.

five-month deployments aboard eight different carriers. In addition to working with other U.S. Navy units, the squadron has worked with the Royal Canadian Navy and the navies of other nations, in Atlantic, Caribbean, European and Mediterranean waters.

The squadron's most recent cruise was a five-month deployment aboard USS Lake Champlain. Qualifying and training were followed by an operational readiness inspection.

VS-30 also has had the opportunity to assist the National Aeronautics and Space Administration at Wallop's Island. Prior to most rocket launchings, a plane and crew from the station has been sent to patrol the seaward area from Wallop's Island.

On many occasions the squadron has been chosen to act as host squadron for training of reserve VS squadrons.



**QUARRY OF VS-30** ASW pilots is this unidentified U.S. submarine, used in training problem to simulate tactics of enemy in wartime.



**GRUMMAN S2F Tracker** is now the standard ASW plane of U.S. Navy and has been adopted or is being evaluated by many of our allies.



**CLOTHING FOR MOROCCAN** orphans is loaded aboard a Navy R4D at NAS Atlanta to be flown to Charleston, S. C. for further shipment.



**COLUMBIA, S. C.,** Reserve Training Center and Recruiting Service men add donations from their area to cargo aboard Reserve plane.

## 'ANGELS FOR AGADIR' AIRLIFT

**I**N THE DAYS and weeks that followed the horror of Agadir, the people of the United States opened their hearts and their pocketbooks to help the survivors of the disaster. All were homeless; many had lost family and friends. Tent cities were set up to provide shelter for the refugees.

The drive resulted from a Navy-wide appeal by the Commander-in-Chief, U.S. Naval Forces, Europe. Throughout the country, Navy and Marine Corps personnel contributed generously themselves and then sought support from their civilian counterparts. The response was overwhelming. Schools, churches, storekeepers, organizations

and individuals contributed tons of food and clothing. The operation was aptly named "Angels for Agadir."

Aircraft from every Naval Air Reserve activity participated in the mercy mission. Some Reserve transports flew the vital commodities to Morocco; others barnstormed, gathering donations and delivering the precious cargo to central shipping sites. Oakland-based VR-871, commanded by Cdr. George F. Klicka, brought relief goods to Africa in conjunction with a training cruise at Port Lyautey.

By pre-arrangement, the homeless children received the lion's share of the gifts. Immediately following the

earthquake, orphanages were created and placed under the patronage of King Mohammed V's six-year old daughter, Princess Lalla Amina. Her 26-year-old sister, Princess Lalla Malika, as President of the Moroccan Red Cross, supervised all of the welfare services for the refugees. "You have brought what we need most, food and clothing for the babies," she said upon receiving one shipment. "Two thousand orphans have already been processed and established in permanent homes. There are many more to be cared for. . . . My heart breaks for the poor babies—there is just so much to do and so very little to do it with."



**NAS SEATTLE** pilot, Cdr. Robert Whitelaw (left) discusses drive with Capt. L. B. Burke, Oakland C.O., before going to Los Alamitos.



**FRIENDSHIP FOOD** goes into VR-871 R5D at NAS Oakland. Cdr. Klicka supervises. Squadron saw it distributed during AcTraDu in Africa.



**A RESORT TOWN** one day was a scene of utter destruction the next as this grotesque view of earthquake-stricken Agadir starkly shows.



**BACK FROM** the grave, a survivor of the terrible tragedy emerges from the rubble with the assistance of Moroccan rescue workers.

## NAVY SPEEDS AID TO STRICKEN

**W**ITHIN HOURS of the tremor that razed Agadir, naval personnel were flown to the scene to render all possible assistance. Seabees and Ma-

rines from Port Lyautey, with tools and bare hands, searched for those buried alive; Navy transport planes shuttled supplies into the city and evacuated

the injured; doctors from the FDR, CVA-42, augmented medical forces. All labored tirelessly to bring some measure of comfort to the afflicted.



**JUICE IS** offered to an injured native girl awaiting her turn to receive medical care.



**EAGER HELPING** hands reach out to assist the evacuees in deplaning at NAS Port Lyautey.



**CHARLES YOST**, U. S. Ambassador to Morocco, comforts an evacuee aboard a Navy aircraft.



**EMERGENCY FOOD** rations are loaded on a Navy transport flying to Agadir by a man whose intensity reflects the tempo of the times.



**HUGE R5D'S** from Lyautey-based VR-24 were used. Led by Capt. A. W. Hood, the squadron was in the midst of ORI when the news came.



# F8U-2N IN FIRST FLIGHT



F8U-2N SITS ON LINE, READY FOR TEST PILOT JOHN KONRAD TO MAKE THE FIRST FLIGHT

THE F8U-2N *Crusader* made its first flight from Hensley Field, Dallas, Texas, three days ahead of schedule.

With Chance Vought's chief test pilot John Konrad at the controls, the red-tailed -2N climbed rapidly, executed a slow roll over Mountain Creek Lake, and disappeared into the blue sky. The first flight, made on 16 February, lasted an hour and 24 minutes.

The F8U-2N is nearly identical in outward appearance with the F8U-2, now on duty with Atlantic and Pacific squadrons, but under its metal skin are changes that make it a vastly improved fighting machine.

Built into its fuselage is an improved, angle tracking radar system which incorporates much greater capability for acquiring and tracking targets. It has a larger internal fuel supply than earlier *Crusaders*, which have remained aloft nearly four hours without refueling.

The F8U-2N is equipped with an autopilot which relieves the pilot of

many routine duties and allows him to concentrate on his mission. Like the F8U-2, the -2N has ventral fins for better stability at high speeds.

Its Pratt & Whitney J57-P-20 engine gives the new airplane considerably more thrust than the J57 engine furnished with its predecessor, the F8U-2. And, by the time the airplane deploys with the fleet, it will be firing, in addition to the heat-seeking *Sidewinder*, advanced missiles now under development.

The -2N is also the first aircraft to incorporate a "hard harness" wiring system. More than a third of the miles of wires needed to operate its system are encased in a tough, rigid covering of resin-impregnated fiber glass, saving weight and space and greatly increasing reliability.

Other improvements include revised interior and exterior lighting systems as well as new instrumentation.

On a subsequent flight, the -2N flew with four *Sidewinder* missiles. Earlier *Crusaders* carried only two.

## Nine Radio Sources Located Radio 'Scopes Used for Sighting

In its first two months of operation, a Navy twin-radio telescope has located nine extra-galactic radio sources, ranging to one billion light years away.

This compares to five radio sources from other galaxies previously identified by all radio telescopes in the world up to December 1959.

The instrument is part of the radio astronomy program of the Office of Naval Research. It was built and is operated by the California Institute of

Technology in a remote valley 250 miles from Los Angeles.

It consists of two 90-foot parabola antennas mounted on a 1600-foot long railroad track which runs in an east-west direction.

Working in tandem as a radio interferometer (an instrument that uses light interference phenomena for measurement of wave lengths), the twin dishes produce a resolving power greater than any radio telescope in operation or under construction.

The work at CalTech is under the direction of Professor John G. Bolton. He is now attempting to identify more than 100 extra-galactic radio sources which have been detected by various radio telescopes, including his own, but not located precisely.

An extra-galactic radio source is identified by correlating its direction from the earth with visual observations made by an optical telescope. Some of these sources are so faint they are mere pin pricks of light on a photographic plate.

Each of the twin dishes can be used separately to study planets and other large celestial bodies where the precise resolving power of the interferometer is not needed. Two such programs could be conducted simultaneously.

Professor Bolton also plans to use the extra resolving power of this instrument to resolve the conflict of opinion over what surrounds Jupiter.

One group maintains that Jupiter has a corona around it much like our sun but on a smaller scale, while others believe a vast Van Allen type radiation belt surrounds the giant planet. By determining which it is, the CalTech twin dish will therefore increase our knowledge of Jupiter.



AFTER 84-MINUTE FLIGHT, F8U-2N LANDS



MARINE HR25 lifts XM-70, first U.S. automatic field artillery weapon, considered most significant improvement in conventional artillery since 1940. Operational by 1962, it weighs 3000 lbs., fires 12 rounds in 5 seconds.

# ACTIVE LEADERSHIP IN RESERVE

**A**LARMED by the apparent deficiency in the moral fibre and the lack of *esprit de corps* among many of the people who make up America's defense team, the sea arm set about remedying the situation two years ago.

Through General Order 21, the Secretary of the Navy passed the word to all hands to revitalize and re-emphasize leadership within the Naval service. VAdm. Robert Goldthwaite, Chief of Naval Air Training, was one of the first to implement an effective



**EDWIN KOCH, AMC, Chief Elsberry, William Patton, ATC, "dress right" before inspection.**

program throughout his far-flung command.

Following guidelines established at Pensacola, RAdm. Allen Smith, Jr., Chief of Naval Air Reserve Training, directed leadership training at the activities under his cognizance.

Naval Air Station ATLANTA, commanded by Capt. John A. Horton, Jr., complied by setting up a two-week course for petty officers. Since classes started last December, all CPO's on the station have been graduated, and there have been two POI groups. According to Cdr. W. J. Wilson, special assistant to the commanding officer for leadership, the school will continue until all petty officers have successfully completed the curriculum.

The Georgia course is a condensation of the Navy's professional five-week school at NAS PENSACOLA and covers: naval customs and courtesies, principles of management, military justice, democracy versus communism, effective



**EXAMS ARE** sure to toughen moral fibre. Fred Elsberry, ADC, NAS Atlanta, racks his brain.



**EFFECTIVE SPEAKING** leads to better communication. Chief Elsberry works on gestures.



**GRINS ON** most of the 21 faces bear out theory that you're never too senior to learn.

speech and military bearing. The instructors, Raymond O. Cobb and Marvin Wingo, both AMC's, and Paul O'Krinisky, ACC, are graduates of the Florida school which was set up to provide a core of trained personnel.

Adm. Arleigh A. Burke, Chief of Naval Operations, has this to say about the program: "The word 'Leadership' is usually associated with one who possesses admirable traits—one who exposes benevolent doctrines. Almost all treatises on leadership, particularly those written in recent years, emphasize



**CDR. CLAUDE C. Schmidt, executive officer, inspects the CPO's just before graduation.**

such words as 'integrity,' 'steadfastness,' 'understanding,' 'honesty,' 'faith,' and 'high principles'—all these which connote the 'good' that is in man.

"America's most important role in the world, almost from the day our country was born, has been the role of moral leadership . . . Teach our young people to believe in the responsibility of one to another; in their responsibility to God and to the peoples of the world. Teach them to believe in themselves; to believe in their place in leading the world out of the darkness of oppression. Teach them to believe that no one owes us a living, but that we owe so much to others. Teach them to believe in their priceless heritage of freedom, and that it must be won anew by America. The hope of the world has been in our physical power, our moral strength, our integrity, and our will to assume the responsibilities that history plainly intends us to bear."

# VA-72 STAGES 'LONGHAUL'



CDR. J. K. BELING, VA-72 squadron commander, indicates readiness to take off on record A4D strike of 2250 miles non-stop. He took off from Oceana, delivered shape in the Caribbean.

**I**N WHAT IS believed to be the longest over-water A4D attack training mission flown to date, a strike plane and "buddy" tanker of Attack Squadron 72 were launched from NAS OCEANA to simulate a carrier-based attack against a distant target.

After conducting in-flight refueling several hundred miles at sea, the tanker aircraft returned to Oceana while the strike plane continued almost due South over the Atlantic to the Bahamas and on to its target somewhere in the Caribbean.

The strike aircraft delivered a full scale inert bomb on the target by loft bombing, with successful results, then turned homeward without further fueling to land at Oceana five and a half hours after takeoff.

Particularly significant in Operation *Longhaul* were the tests of operational realism and training safety.

While based ashore, relatively little opportunity exists for high altitude, visual dead reckoning navigation unencumbered by the artificialities of airways clearances and instrument requirements for continental flight. Also, the wartime problem of extended over-water flight followed by dead reckoning landfalls can only be faced in training conducted over the Atlantic.

Removed from the navigational aids and frequent electronic position checks, the full impact of accurate flight planning and cruise control become readily apparent.

Pilot performance in the A4D under the fatiguing conditions of an extended strike also was studied. Cdr. J. K. Beling, squadron commander and pilot of the strike aircraft, wore the standard Mark 4 exposure suit and simulated maximum realism during the prolonged flight.

The demands of high altitude refueling from Lt. L. T. O'Toole's tanker, accuracy of weapon delivery, navigation by DR pilotage and finally, an LSO-monitored mirror approach at home base set the mission against a background of the most demanding carrier strike.

Now that the initial test of its practical application to pilot training has proved its value, VA-72 plans to incorporate this and similar missions into the squadron's regular flying program. VA-72 feels that, far from being a "gimmick" flight, a very tangible contribution to pilot combat readiness will be the result.

• On a ship the size of the USS *Forrestal*, approximately 300,000 gallons of paint are used per year, enough to paint 30,000 homes.

## Temco to Make P3V Parts Lockheed Places the Initial Order

An initial order for components of the P3V-1, the Navy's newest anti-submarine patrol plane, has been received by Temco Aircraft Corp. from Lockheed Aircraft, Burbank, Calif. The dollar value was not announced.

The P3V-1 is the ASW adaptation of the commercial prop-jet *Electra*, for which Temco manufactures ailerons, flaps, wing leading edges and tips. Production for the Navy version will consist of similar parts.

Temco has been building P2V parts since 1950 and has received a \$2 million follow-on order from Lockheed.

## Corvus Flight Successful Guided from A3D to Range Target

A test version of the supersonic *Corvus* air-to-surface missile made its first guided flight March 15 from Point Mugu. The flight was described as completely successful.

The missile was launched from an A3D at a surface target in the sea test area of the Pacific Missile Range.

## First MarCad is Honored Ripley Named Drill Team Master

MarCad Michael J. Ripley, first Marine chosen as a Marine Aviation Cadet when the program was revived, has been named Drill Master of the Naval Air Training Command drill team.

He has received personal congratulations from Secretary of the Navy Wm. B. Franke and VAdm. Robert Goldthwaite, Chief of Naval Air Training.

On graduation from Pre-Flight, Ripley was selected to proceed directly into jet flight training and became the first MarCad to fly the T2J.



MARCAD RIPLEY DURING BASIC TRAINING





AFTER SQUADRON MOVEMENT TO NORFOLK, A DOZEN VS-32 TRACKERS WORK WITH LAKE CHAMPLAIN IN ATLANTIC FLEET SUB HUNT

## VS-32 MAKES MASS FLIGHT **HUNTER/KILLER WORK SCHEDULED**

**A**IR ANTI-SUBMARINE Squadron 32 took advantage of OpNav Instruction 3722.21 for a mass movement of squadron aircraft from Quonset Point to Norfolk where hunter-killer training was scheduled.

VS-32 contacted the Federal Aviation Agency a week before departure time, filing for a group movement flight plan under instrument flight conditions. FAA granted clearance for the flight two days before departure.

Earlier weather forecasts proved

correct, for the day of the exodus turned out to be IFR weather. The enroute forecast included icing conditions, low ceilings and poor visibility, with the weather deteriorating when a severe warm front reached the Norfolk area in the afternoon.

The first of 19 *S2F Trackers* departed NAS QUONSET POINT at 1000, followed at 10-minute intervals by the others. All flew on instruments.

Fourteen planes were on the ground at NAS NORFOLK by 1630, each plane

having executed a GCA landing through the overcast. Five of the 19 were forced to divert to enroute fields because of increased head winds, heavy icing and equipment malfunctions. The diversions were in accord with proper safety features.

The five stragglers arrived in Norfolk early the following day. A total of 86 flight hours, 62 of which were actual instrument hours, was required to complete the movement. Eighteen GCA landings were made.

## A3D Simulator Sets Mark 108% Utilization in 35 Hour Week

A3D operational flight trainer serial number 2046 completed its 5000th hour of actual training operation at NAS SANFORD. Capt. F. G. Edwards, commanding officer of VAH-3, hit the mark.

Commissioned in December 1955, the *Skywarrior* simulator has a total number of operational hours in excess of 10,000 with utilization averaging 108%, based on a 35-hour week. During 1959 more than 1900 hours of training were logged with only 22 hours cancelled owing to maintenance difficulties. The 12-hour course, which ranges from cockpit check-out to GCA practice, has been completed by close to 300 pilots.

A large variety of flight situations are carefully covered by each student under the watchful eye of a skilled operator. Complete mastery of each phase must be demonstrated before progressing to the next. The primary duty of the personnel assigned to the trainer is to teach. In addition they must also possess detailed knowledge of the aircraft systems and their functions, since modifications are made and maintenance accomplished by them.

The normal work day for the jet trainer starts at 0730 with an exacting pre-flight inspection and power application. Classes commence at 0800 and continue until 1600 when the night crew takes over until midnight. The simulator is manned and available on weekends and holidays as required.

In the photo, Capt. Edwards is extending a well done to D. E. Coleman, TDC, and his crew, standing left to



CAPT. EDWARDS COMMENDS TRAINER CREW

right: J. E. Lillie, TD3, R. M. Braasch, TD2, and R. M. Slone, TD2; kneeling, H. C. Nolan, TD1, and M. L. Slone, TD2. Chief Coleman has been with trainer 2046 from delivery to the present and has trained three groups.

## Marine Hawk Unit Ready Replaces Conventional AA Battalion

The Marine Corps activates its first *Hawk* missile battalion this month at Twenty-nine Palms, California, according to Gen. David M. Shoup, CMC.

It will replace a conventional anti-aircraft gun battalion and will be called the 1st Light Anti-Aircraft Missile Battalion. Organizationally it will be formed as part of Force Troops, Fleet Marine Force, Pacific.

Completely helicopter-transportable, the battalion will be equipped with 24 launchers and will be manned by about 600 Marines organized into four firing batteries plus a headquarters and service battery.

The *Hawk* missile system, developed by the Raytheon Company, Waltham, Mass., is fired from a light, two-wheeled launch platform mounting three 1275-lb., 17-foot, solid propellant

missiles. The system can engage single, massed, or widely separated targets.

The new *Hawk* battalions will increase the capability of the Marine Corps for air defense of fast-moving divisions in amphibious operations. A second *Hawk* battalion, is scheduled for activation sometime next fall.

## Polaris Fuel Mix Improved Navy and Aerojet Develop Process

A new process for manufacturing solid propellant fuel for the *Polaris* fleet ballistic missile, which produces a more uniform quality with greater safety and lower cost than previous methods, has been developed by the Navy and Aerojet-General.

In the new process, small quantities of the propellant ingredients are measured carefully and mixed continuously. Only 20 to 25 pounds of the propellant are under preparation at any given moment. The solid fuel was formerly mixed in batches of approximately 2200 pounds.

RAdm. William F. Raborn, Jr., Director of the Special Projects Office in BuWeps, said the continuous propellant processing facility is being operated by Aerojet-General at its solid rocket plant near Sacramento. The facility represents the first large-scale application of the continuous mixing process, which has been termed superior to batch mixing.

The facility is designed specifically for *Polaris* fuel, but the process could be applied to other solid rocket fuels. It went into full production ahead of schedule, having been set up in less than a year, and motors cast from the new process have been tested with highly satisfactory results, said RAdm. Raborn.



WHEN THE USS CORAL SEA steamed slowly under Lion's Gate Bridge at Vancouver with only a few feet to spare, it marked the first time a United States Navy aircraft carrier had passed under British Columbia's famed bridge. She was welcomed by cheering thousands. At left,



Capt. James S. Gray, Jr., USN, commanding officer of the Coral Sea, and LCol. Ian Bell-Irving, commanding officer of the Seaforth Highlanders, inspect the colonel's regiment on the 13,000-ton carrier's flight deck. Right, the ship spelled "CANADA" in salute to the Dominion.

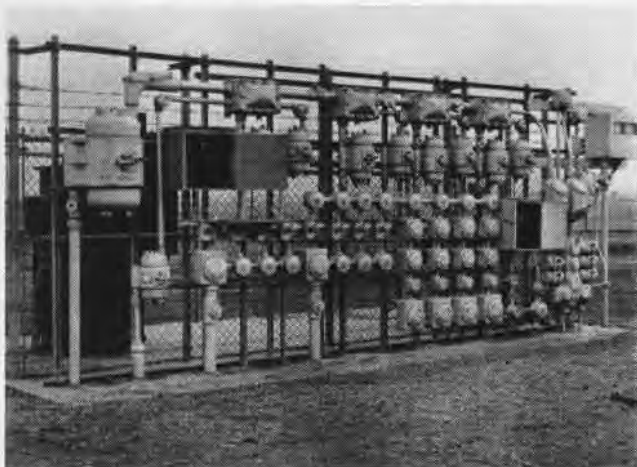
# UNDERGROUND TO AFTERBURNER



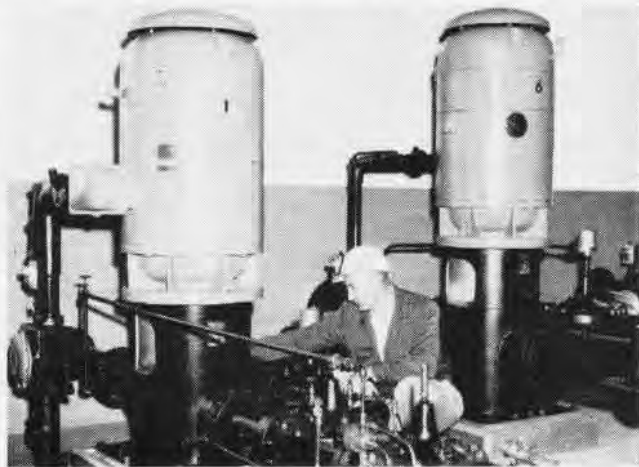
**AT FUEL PIT**, high pressure nozzle is connected to F3H Demon jet by A. A. Cassar, GP3.



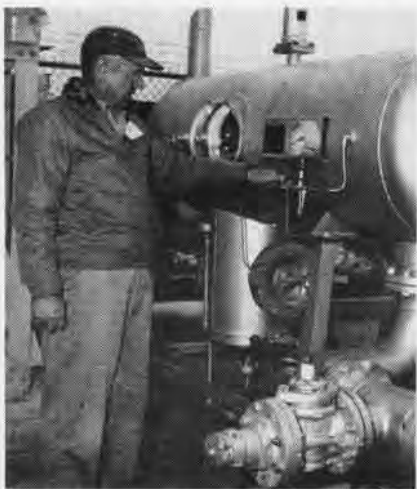
**FINAL STEP** and end purpose of the fuel system is realized as jet fuel is consumed by Demon jet high above California mountains. Underground pipeline has proved to be most efficient.



**ELECTRICAL SYSTEM** permits readings to be taken as JP-4 flows from tanks at Point Loma Navy Fuel Depot to storage area at Miramar.



**H. L. FERGUSON**, liquid fuels distribution system operator, checks a pump at Point Loma annex before piping fuel to tanks at Miramar.



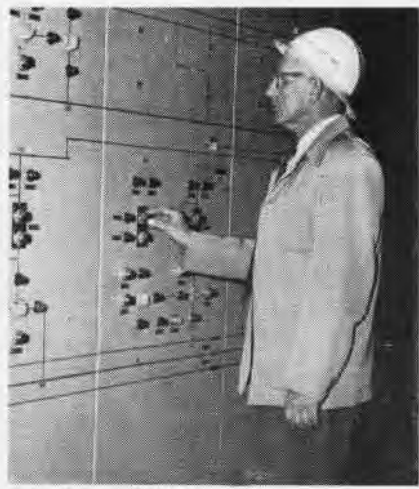
**OPERATOR H. H. Bull** checks pressure at the JP-4 receiving station at Naval Air Station.

THESE PHOTOGRAPHS describe the path of a given quantity of JP-4 jet fuel from the time it leaves the Point Loma Supply Annex until it arrives at NAS MIRAMAR, and finally, as it leaves a *Demon's* afterburner.

The underground jet fuel pipe line which services Miramar jets was put into service in 1954 at a cost of about three and a half million dollars.

Since commissioning of the eight-inch line, approximately 25 trailer truck loads of fuel have been pumped through it daily. Savings gained over the old method is substantial.

The pipe line itself ends at a receiving station on the air station. Another line takes it to underground storage tanks, then to eight fueling pits located on the Miramar aircraft apron.



**IN CONTROL HOUSE** at Point Loma, Foreman I. G. Coburn pushes button to start fuel on way.



# OXYGEN HAZARDS TAUGHT

GATHERED on a cold, windy hilltop near MCAF Iwakuni, Japan, were members of the station's crash crew, flight equipment men who service jets with liquid oxygen, welders, even corpsmen who work with oxygen. They were learning what happens to liquid oxygen when it is mixed with a hydrocarbon such as fuel oil.

The voice of Acting Gunnery Sergeant C. Roberts boomed from loud-



LIQUID OXYGEN IS SET ABOVE MOTOR OIL

speakers: "The purpose of this instruction is not to frighten you, but to make you aware of the dangers of careless handling of oxygen," he began.

"Liquid oxygen by itself is not combustible," he said, "but it supports combustion in all hydrocarbons and elements which are not inert. When combined with these other elements, a small spark or shock can set it off."

Members of the instructor team poured motor oil into a can rigged so that a second can of liquid oxygen could be dumped into it by pulling wires a hundred yards away.

"Liquid oxygen is pale blue, freezes at minus 361.8°F. and vaporizes at minus 182 degrees," said Roberts. "It seems cold and wet out here today, but to liquid oxygen it is red hot outside than can."

Wearing a protective suit and carrying an ice-covered five-gallon can, a man moved down to the demonstration area. White clouds rose as he poured the liquid oxygen into the second can which was perched on a wooden cross



VIOLENT EXPLOSION CREATES A MUSHROOM

just above the open can of motor oil.

"That white cloud you see now is the liquid oxygen boiling off into the warm air," Roberts said. "It vaporizes at minus 182° regardless of the pressure and it expands to 860 times its liquid volume.

"With that expansion rate, plus the fact that oxygen is the perfect fuel for burning when combustibles also are present, we have potential trouble when we handle this stuff," he told the group.

The men moved to better vantage points as the demonstration began. As they shifted position, Roberts said:

"We have about a gallon and a half of oxygen and a gallon of oil down there. Now we will show you what could happen if you had the same elements and a spark or shock came along."

He signaled a man in the demonstration crew to fire when ready. The man pushed a button which sent an electrical impulse down a wire which created a spark as the oxygen was poured into the motor oil.

WHOOOM! The explosion rocked windows in buildings half a mile away. A miniature mushroom cloud leaped fifty feet into the air. There was one fiery blast that left only wisps of smoke. Fragments landed in the water across the bay. One of the steel cans was driven four feet into the earth.

"That is why you must be careful," Roberts concluded. Heads nodded in emphatic agreement as the observers walked away through the rain. Back on their jobs they would be careful.

## Squadron Loaded with Kin Brothers, Father-Son in VF-142

Four sets of brothers and a father-and-son combination make VF-142 one of the most family conscious squadrons in Naval aviation.

There are brothers Richard and Gerald Blackburn, Edward and Phillip Ott, Merion K. Myers and son Larry who enlisted at 16-year intervals, brothers Stanley and Orville Dockter, both ADJ3's, and James and Thomas Rutter.



FOR ASTRONAUTS ONLY is this Earth Path Indicator for Project Mercury. Grapefruit-size globe, when viewed through window, matches earth's movement, supplementing navigational equipment in orbiting capsule.

## Charleston Facility Ready Polaris Assembly Unit Opened

On April 1, the Polaris missile assembly facility of the Naval Weapons Annex at the Naval Ammunition Depot, Charleston, S. C. commenced operations.

The 880-acre installation serves as a link between industrial producers of the Polaris missile and the Fleet. Missile components from contractors on both coasts are shipped to the Weapons Annex for assembly, check-out and loading into the Navy's nuclear-powered fleet ballistic missile submarines.

Construction cost for NWA totaled \$10½ million. Equipment, which covers a range of items from 25-ton handling equipment to delicate electronics repair and check-out devices, cost about \$16 million.

Officer-in-Charge of NWA is Cdr. H. C. Cox. Capt. Worth Scanland commands the Naval Ammunition Depot.

# MARINES 'SUITED' FOR SURVIVAL



FOR HEMMING, LCPL. WILLIAMS USES NOT THREAD AND NEEDLES, BUT WATERPROOF CEMENT

LANCE CORPORAL Norman J. Williams, attached to Fleet Marine Aircraft Wing, Iwakuni, Japan, runs a special kind of tailoring shop. He doesn't use flannel, camel's hair, tweed or herringbone, but his special kind of haberdashery is in great demand by the flying Leathernecks. In cold weather, Cpl. Williams fits them for Mark 4 Constant Wear Survival Suits.

Acting Gunnery Sergeant R. L. Brancadi, NCO in charge of the VMCJ-1 equipment shop, and LCpl. Williams do the fitting.

In full dress, Marines in the Mark 4 suit resemble the Eighth Astronaut. During the winter, they wear a suit of wool underwear, normal anti-black-out "G" suit, an inner liner of warm insulating material and finally the

waterproof outer liner of the Mark 4. The hose from the "G" suit to the aircraft air pressure system is fitted with a special cover which allows its use in the plane, but seals out any water if the pilot goes down.

Entry into the life-saving outer layer is a neat trick. The pilot climbs in a hole in the chest of the suit, grunts and squeezes one arm in at a time and then attempts the eye-bulging feat of shoving his head backward through the chest entry portal and up through the elastic neck band (roughly the size of a ten-yen piece). It's like trying to get an automobile tube around an elephant's neck with the beast inside an elevator. However, it gets easier with each fitting, and pretty soon the flight crews can do it efficiently.

Cpl. Williams does the fitting that makes each suit fit perfectly, yet allows freedom of movement and comfort in flight.

The final test comes when the suit is completely fitted, the boots are sealed on, and the neck and wrist elastic are tailored to the individual.

The pilots are taken over to the base swimming pool and leap into the water to see if there are any leaks. The chilly waters provide the information in about three microseconds and corrections are made if necessary.

They seldom are. The flight equipment sections of the Wing have competent tailors who do their job well.



LT. UMLAND, SSGT. COOKE PROVE FLOAT POWER



IN MK. 4 SUIT AND LIFE RAFT, MSGT. MAYHEW CAN WAIT RESCUE INDEFINITELY

# NOISE SUPPRESSED AT ALAMEDA

ON 16 MARCH, Capt. E. L. Farington, C.O. of NAS ALAMEDA, met with leaders of the San Francisco Bay communities he had invited to the air station to see what had been done to lick a problem that had plagued the area for years: Noise. Ever since the first FJ-1 Fury touched down at the station, noise had been a problem of the densely populated metropolitan area adjacent to the station. Citizens had frequently complained, and "the station that knows how" had done something about it.

Mayor William M. McCall of Alameda was there. Leading citizens of other communities, as well as press and TV representatives from Alameda, Oakland and San Francisco were also present to have explained and demonstrated the new sound suppressors the station had. Officials of the station were on hand to explain the sound suppression program and answer questions.

The current program got underway when an NAS Noise Control and Abatement Committee was established in 1958. Its present chairman is Cdr. H. C. Flateau, O&R production manager.

It was explained to the visitors that there are three major sources of jet noise: (1) operational noise during the landing, take-off, and flight operations of jet aircraft, (2) test cell noise from jet engines being run up and tested, and (3) run-up maintenance noise resulting from ground tests of jet air-



WITH SUPPRESSOR USED, THE FJ-4B FURY CAN BE RUN UP WITHOUT INTOLERABLE NOISE

craft. Each source of noise requires different methods of suppression.

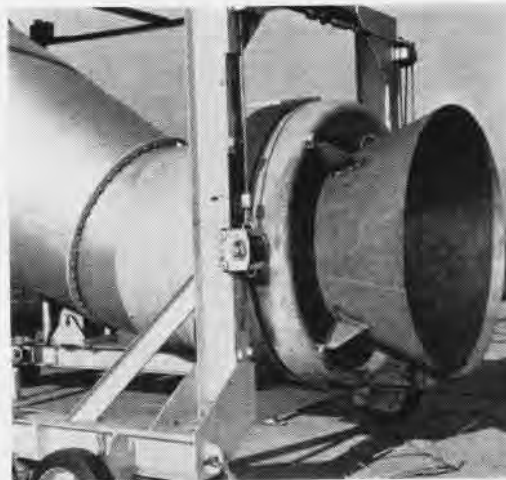
The noises resulting from operational aircraft present the most difficult problem of control. NAS ALAMEDA has gone far in reducing these noises by changing flight plans, routing, and take-off patterns, taking advantage of the prevailing winds to disperse these sounds.

As for test cell noises, these have been virtually eliminated by the construction and use of two new jet test cell buildings. These test cells are so efficient that the sounds of engines

being run up are barely audible outside the buildings.

Portable turbo-jet sound suppressors reduce run-up and maintenance noises. These suppressors were recently purchased by the Bureau of Weapons from the Curtiss-Wright Corporation. Some were delivered to NAS ALAMEDA for evaluation.

Preliminary tests proved that while the portable suppressors were effective, they were not as efficient as they could be. The suppressors were therefore modified by the O&R Department at NAS ALAMEDA. These noise suppress-



THIS PORTABLE SUPPRESSOR WAS MODIFIED AT THE NAVAL AIR STATION

ALAMEDA MEN DESIGNED THE AUGMENTER RING



sors, including installation and modification, cost about \$16,000.00 each.

At this point, the observers were taken to a listening post located 1500 feet distant from the two FJ-4B aircraft used in the demonstration.

The first run-up was made without using the suppressor, and the resulting sound was measured. During the second plane's run-up, the portable sound suppressor was used and the sound was measured again. The modified suppressor had reduced run-up noise by almost 75 per cent.

NAS ALAMEDA officials explained that the use of these sound suppressors, as modified by the O&R Department, will reduce run-up noises to a level tolerable to the local communities. During the day, jet run-up noises should become lost in normal background noises of the community, such as traffic noises, factory whistles, music, voices, etc. At night, when these background noises are at a minimum, a low, distant rumbling sound may be audible under certain atmospheric conditions, but this rumble will only be audible outdoors. It will not interfere with normal conversation or sleep.

In appearance, these portable suppressors resemble Popeye the Sailor's famed flexed forearm. They incorporate induced cooling air, primary/secondary air mixing, acoustical resonator chambers, airflow velocity reduction and air stream diversion. They are designed to accommodate a maximum rated thrust of 30,000 pounds. They can handle 330 pounds of air per second without back pressure.

As distances from the noise source increase, the reduction in noise becomes great. At 250 feet and at 45° from the exhaust axis (the angle of maximum noise production), the reduction is at least 20 decibels. This is equal to 100 times reduction in intensity and four times reduction in loudness.

### 25,000th Safe Hour Flown BTG-2 Sets a Mark on Birthday

On the third anniversary of its founding, Squadron Six of Basic Training Group Two logged its 25,000th accident-free hour of instructional flight from Whiting Field.

Squadron Six, under Lt. D. M. Wilson, instructs students in the transition, precision, acrobatics and basic instruments phases of training.



**GOVERNOR AND** Mrs. William F. Quinn of Hawaii were guests of Capt. Noel Gayler, commanding officer, and Cdr. A. L. Lewis, executive officer, USS Ranger, when the 80,000-ton ship visited Oahu between training and duty with the Seventh Fleet. Shortly after general visiting hours began on the carrier, the ship was covered with interested visiting islanders.

### More Terriers Purchased \$25-million Contract to Convair

Convair has received a \$25.2-million contract for additional production of advanced *Terrier* guided missiles at the Naval Industrial Reserve Ordnance Plant at Pomona, Calif.

The newest version in the *Terrier* series has improved effectiveness against low flying aircraft and multiple targets. It will extend the present anti-aircraft capability to provide defense against surface targets and land installations.

Advanced *Terriers* will have considerably more transistorization than did the original *Terrier* missiles.

### Seeing Stars at FAETUPAC Night Sky Anywhere Simulated

Fleet Airborne Electronics Unit, Pacific, Detachment 1, at NAS ALAMEDA, now has ready a unique device for the highly specialized training of air crews in star and planet identification as well as in all phases of celestial navigation. The trainer was procured by the Naval Training Device Center, Port Washington, N. Y.

Like the huge planetariums in a few major cities, though smaller in size, the device gives the observer a simulated night sky as seen virtually from any place on the earth, including the polar areas. The device can re-create the night sky for any period—past, present, or future—and for any hour, whether it is day or night, clear or cloudy outside.

Patrol plane navigators find the

planetarium useful in learning the fine points of pinpointing navigation on long over-water flights. A typical flight from NAS ALAMEDA to Japan, to Italy—and any place else on earth, can be faithfully reproduced within the small space the planetarium occupies.

A novel feature of the trainer is the zooming satellite which races across the heavens at the direction of the instructor Ray Cordova, TD1. Anyone who has never seen a satellite can now satisfy his curiosity by an early visit to the Det. 1 facility.

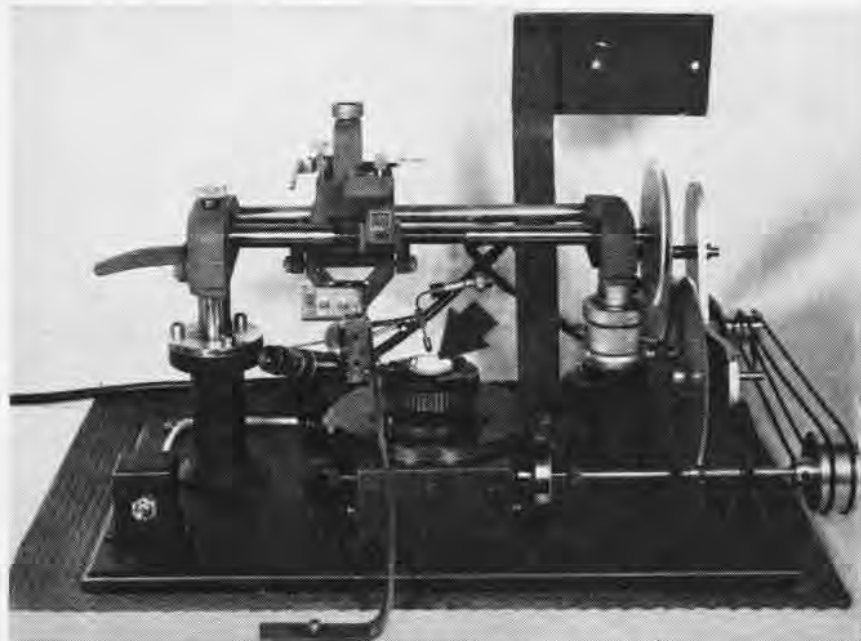
### Rocket Thrust Controlled X-15 Engine Reported to be Safe

The United States now possesses a fully throttleable rocket engine for use in manned rocket flight, with control exercised at the pilot's discretion, according to an announcement by Thiokol Chemical Corp.

All tests in Thiokol's pre-flight rating test program on the X-15 aircraft engine have been completed.

Designated the XLR-99-RM-1 liquid propellant rocket engine, the X-15's powerplant provides more than 50,000 pounds of thrust. It is reported to have safety features and concepts which provide complete assurance that the engine will operate and shut down without endangering the pilot even under conditions of a malfunction of any single component.

During tests of the XLR-99, every conceivable malfunction was artificially created in the engine's system to prove reliability of safety features.



ARROW POINTS TO IMPACT DETECTOR BEING MANUFACTURED AT NAVY WEAPONS PLANT

## NWP ANSWERS CHALLENGE

THE ENGINEER from the Naval Research Lab stated his problem to the foreman of the Optical Shop at the Naval Weapons Plant. NRL had designed an *impact detector* to gather information on cosmic dust particles which bombard missiles in outer space. He needed to know what materials would be best to use, how to make the detectors, and how to produce them.

Requirements were that the detectors had to be one inch in diameter and one-eighth of an inch thick. They had to have a finely polished surface with a highly conductive metal coating, two millionths of an inch thick. A spiraling groove had to be ruled in the metal coating. The groove was to measure  $2/10,000$ th of an inch in width.

After the problem was studied, the Optical Shop men chose glass for making the disc. Next came selection of the conductive metal for its coating. Gold proved too soft. Chromium was too brittle. Finally, aluminum was chosen.

Next problem: how to get a narrow enough groove in the coating. A ball point pen makes a  $7/1000$ th of an inch line, they discovered. Needles used to make red and blue lines on graphs mark up at  $4/1000$ th. By way of comparison, human hair is  $2/1000$ th inch.

To get a  $2/10,000$ th width, they adapted a record-making machine and used a diamond point as a cutting tool. Diamond was, of course, hard enough to plow through the aluminum, sharp enough to go through the metal, but not sharp enough to cut through the glass beneath the metal.

A major problem in the production of ten detectors was vibration. If the spiraling grooves were not spaced properly, because of building vibration, straight lines could extend up to 60 feet. But this hurdle was overcome as others had been, and the adapters were delivered on schedule.

The impact detector is placed on the surface of the missile. When a particle of cosmic dust hits the groove, it causes a short-circuit.

This impulse is transmitted to an electronic "brain" which records the information. The process could be compared to the human eye. When a particle of dust hits the eye, the information is transmitted to the brain which records it and forces the reflex action of tears and of closing the eye lids.

But science went Mother Nature one better. The impact detector can tell immediately the number of particles that hit it, and how large they are.

## Cruise Control Pays Off VP-18 Slices Flight Hour Cost

Cruise control practices instituted in VP-18 by Cdr. James H. McGhee, C.O., have paid off. In February VP-18 sliced its cost per flight hour down to \$41.00 in its Sicily detachment and to \$48.00 in its Keflavik division. Average cost per flight hour was \$45.00, with 1072 hours flown for the month.

To prove that cruise control pays off, one of the Keflavik, Iceland, crews planned to fly a P2V-7 nonstop from Keflavik to Jacksonville, Florida. This had never been done before in this type *Neptune*.

Crew 9, with LCdr. W. L. Strong as Patrol Plane Commander, completed the 3076 mile trip on 5 March. There were 2225 pounds of usable fuel remaining after landing. This is ample for 2 hours, 24 minutes and 24 seconds of flight. The 18-hour flight marked the first time this flight has been made with the weight required for a combat mission.

"Non-Stop Nine" grossed out at 79,108 pounds at the ramp. There were 11 crew members aboard, with all gear and baggage from a five month deployment to Iceland.

Economy measures included minimum safe use of jets for takeoff, pressure pattern navigation, maximum range power settings, maximum endurance power settings, and minimum heating.

Members of the crew in addition to LCdr. Strong were: J. E. Hickman, Ltjg., G. W. McDonald, Ltjg., J. C. Burris, AT3, M. A. Omar, AD3, J. F. Pancari, AD3, C. Rucker, AD3, L. M. M. Smith, AE3, M. Thomas, AD2, R. L. Young, AT3, and C. F. Ziemba.

## Navy Song is Available Provided by Texas Navy Admiral

Copies of the song, "Under, On and Above the Sea" are available to any member of the Naval establishment at no cost other than postage. Requests should be addressed to: Joseph Jefferson Burris II, Naval Aviator, Admiral, Texas Navy, 6200 Dashwood, Houston 36, Texas.

Composed by the Texas Navy, the song was set to music by Chief Musician Dexter H Reynolds, Jr., and has been granted Copyright Certificate EEP 137056 by the Library of Congress.



MAJ. SELMYHR HAS GEAR FOR BOTH JOBS

## The Major Wears Two Hats Ground Officer and Chopper Pilot

When he received orders to join the 1st Marine Aircraft Wing, Maj. C. L. Selmyhr, an infantry officer, assumed he would be with a jet outfit. To make certain he was prepared, he rode the ejection seat and went through the low pressure chamber tests.

When he arrived in Japan and reported to Marine Aircraft Group 16, he was informed that these steps had not been necessary since he would be riding helicopters. Last January Maj. Selmyhr received his designation as Helicopter Safety Observer which qualifies him for all the duties of a second pilot in the HUS-1 except carrying passengers.

One of three cross-training ground officers assigned to Marine helicopter units, he is assistant operations officer for the Oppama-based group. The purpose of cross-training is to acquaint ground officers with the capabilities of tactical aircraft in vertical assault.

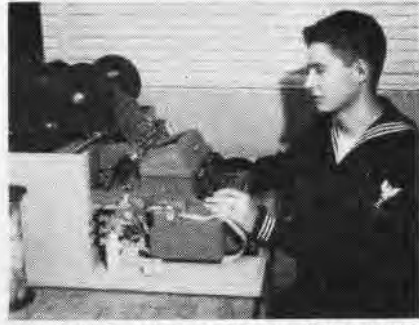


THE HONORABLE Cecil P. Milne (R), Assistant SecNav for Material, and his party were briefed by Lt. R. O. Louden at NAS Oceana. The Secretary's party was inspecting military installations in the Virginia Tidewater area.



CDR. L. R. HARDY, Jr. (R) ships over Raymond N. Gillette, ACCS, for a four-year hitch. This marks Gillette's third consecutive reenlistment as a VF-101 Grim Reaper. His first enlistment was 17 April 1940.

• The Japanese Defense Council has selected a modified version of the F-104C for its defense forces. Decision was announced after more than a year was spent in evaluating the Starfighter and competing aircraft designs.



WHESTONE, PHG3, OPERATES FLEXOWRITER

## VFP-62 Gets Flexowriter Negatives Marked with Pure Gold

VFP-62 at NAS CECIL FIELD has received a new Flexowriter which types impressions in pure gold.

Resembling a compromise between a typewriter and a teletype machine, the flexowriter is used to impose lettering on individual exposures of aerial strip-film negatives.

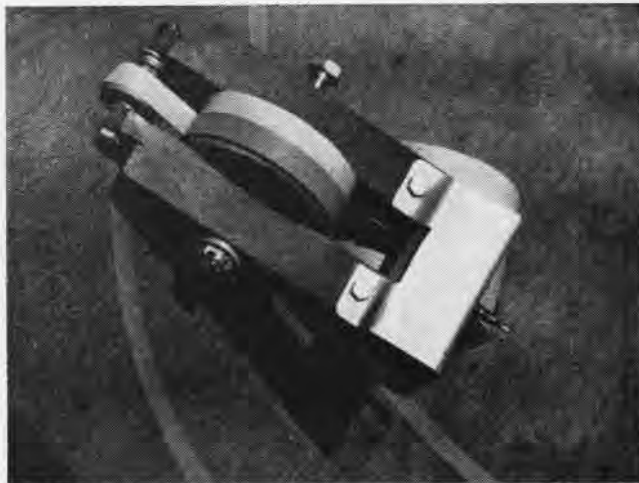
Such lettering is required for captioning, numbering, identification and classification purposes.

Pure gold is used instead of ink because the very thin film of gold adheres tightly to the negative. It does not disintegrate in the presence of photographic chemicals, and it restricts completely the passage of light to the positive prints made from the negative.

While the gold ribbon is more expensive than ink, the process saves so much time and is so much more effective that, used by mass-production units, savings are substantial.



A MASK-TAPE dispenser applicator is a novel device designed by an employee at Naval Air Facility, Litchfield Park, Arizona. Mr. Nicholas L. Mandigo (Painter, Finish and Insignia), Maintenance and Preservation Department, entered the idea via the Navy Incentive



Awards Program. The device functions so well that it has been used ever since at Litchfield Park. Irregular curves, arcs or patterns present no problems, simply require the addition of simple gages or trammel arms. Plans are to be made available to interested activities.



# LETTERS



VF-13's Ltjg. W. A. Kerr was rescued from sea after his F4D crashed into the Mediterranean.

SIRS:

The helicopter pick-up and exposure suit swimming drill mentioned on page 38 of February's *Naval Aviation News* turned out to be a valuable foretaste of things to come for one of the participants.

Ltjg. W. A. Kerr of VF-13, the gent in the upper right-hand corner of February's picture, soon had occasion to use the skills practiced in the drill in a case of actual survival. When he was unable to obtain a relight in his flamed-out F4D over the Mediterranean, Ltjg. Kerr was forced to eject. After a successful ejection, he entered the 58° water, separated easily from his chute, inflated and entered the raft, and minutes later was picked up by a helicopter from USS *Saratoga*. He was returned uninjured to the *Essex* within an hour of his ejection.

This "survival success-story" serves to illustrate again the old cliché that practice makes perfect. Has your unit practiced air-sea rescue procedures recently?

N. R. BERREE, CDR,  
Commanding Officer, VF-13

## Student Pilots Honored DAR Signals their Proficiency

Four young Naval Aviators were honored in March at NAS CORPUS CHRISTI as the outstanding student pilots graduated from the Naval Air Advanced Training Command in 1959.

Each of the four pilots, three Navy and one Marine, was given an engraved gold wrist watch by the Texas Society of the Daughters of the American Revolution. Mrs. Felix Irwin, Vice President General of the National DAR and former State Regent, made the presentations.

Pilots in four different areas of training were so honored: Second Lt. Jack L. Omer, jet training; Ens. Frank C. Riggs, antisubmarine training, Ens. Robert D. Mierau, propeller driven-attack, and Ltjg. W. R. Sutherland, patrol training.

## Vibration Effects Studied Boeing Carries Out ONR Study

Sixteen volunteers at Boeing Airplane Company, Wichita, Kans., have been selected for participation in special low frequency vibration tests in a U.S. Navy research program.

Purpose of the Office of Naval Research program is to study the effects of vibration on the performance of crewmen who will man aircraft and space vehicles of the future.

A specially designed vibrator, comprising an aircraft-type seat and pilot's controls, will be shaken up and down by a hydraulic cylinder. The frequency can be varied between 0.2

and 30 times per second with varying G force. Vibrations will be kept within the limits of human tolerance.

## Sikorsky Gets New Contract Navy Orders HSS-2 Helicopters

A \$45 million contract for turbine-powered HSS-2 helicopters, spare parts and associated items has been awarded the Sikorsky Aircraft Division of United Aircraft Corporation.

Deliveries are scheduled to start in December 1960 and end in December 1961.

The HSS-2 first flew 11 March 1959 and is in production for the Navy as an antisubmarine weapons system. The world's largest amphibious helicopter, it has a flying boat hull, all-weather capability, and is powered by two gas turbine engines. Like the HSS-1 and -1N, it can both search out and destroy enemy submarines.

## Corvus Gets More Funds Temco Given \$25-million Contract

Temco Aircraft Corporation has been awarded a \$25-million contract for continued development and flight test work on the *Corvus* air-to-surface attack missile.

Flight test work is centered at the Naval Missile Center, Pacific Missile Range, Point Mugu, Calif., where a test version of the *Corvus* was successfully air-launched by an A4D *Skyhawk* last July.

*Corvus* is being developed under the "weapon system" concept, with Temco being responsible for procurement of all components and support material.



PEOPLE-TO-PEOPLE projects produced positive results during USS *Bon Homme Richard's* latest deployment in the Far East. At left, selected crewmen spell out the Japanese equivalent of "Congratula-



tions" to honor the birth of a son born to Crown Prince Akibito as the ship arrived at Kobe, Japan. At right are some of the 5000 Japanese citizens who visited the ship during Open House.



SLEEK AIRCRAFT OF CARRIER AIR GROUP SEVEN BORDER THE FLIGHT DECK OF THE INDEPENDENCE. VF-84 CRUSADERS ARE ON THE PORT BOW



## SQUADRON INSIGNIA

Spirited is the word for Fighter Squadron 84. Flying F8U-2 Crusaders, it is part of CVG-7 aboard the USS Independence, CVA-62. Cdr. R. H. Jester is C.O. LCdr. F. T. Rooney is exec (second from right and far right, below). Commissioned in 1955, VF-84 took over the famed "Jolly Rogers" insignia about a year ago.

F8U'S ARE PREPARED FOR LAUNCH AMIDST ORDERLY CONFUSION



READY ROOM DEBRIEFING SESSION IMMEDIATELY AFTER RECOVERY



# **SURE, LET GEORGE DO IT . . .**



By all means and standards and by an extraordinary selection process which was originated in Naval Air, he's patently qualified to do it—whether it's shadowing a sub, flying from a global-ranging attack carrier, or conducting a mercy mission to Agadir. You might call all military aviators 'George' because they are doing the job, the most important job on earth right now—and shortly, in outer space. Of course, we think Naval Aviators are the best. Physically, mentally and morally they have to be to make the team—to perform the varied, exacting, exciting roles demanded daily of them. How about you? Are you a 'Let George Do It' type of American? If not, why not write NAVIATOR, Glenview, Illinois. Get the facts on Naval Aviation. And George, DO IT TODAY!

NAVAL AVIATION

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