NAVAL AVIATION NEWS

45th Year of Publication

NOVEMBER 1963

THE STRENGTH AND RESOLUTION

'Ours is a maritime nation. . . . We, and the other nations of the world must use the sea. It must be kept free. We have too long taken for granted the doctrine of "Freedom of the Seas." It is not a natural condition and no divine authority guarantees the sea's continued use to us. Actually, the sea is free only because free men have chosen to make it so, and it will remain free only so long as free men have the strength and resolution to keep it so.'

—Vice Admiral J. S. Thach, USN, Deputy Chief of Naval Operations (Air)

■ COVERS

Front cover shot of the Intruders was taken by Grumman's Harry Burns. Story of the operational introduction of the A-6A appears on pages 11-13. . . . Above is a picture of one of CVSG-52's Sea Kings. Other photos of the air group, based on USS Wasp, are on the inside back cover.

NAVAL AVIATION NEWS

FORTY-FIFTH YEAR OF PUBLICATION NOVEMBER 1963

■ IN THIS ISSUE

■ THE STAFF

Issuance of this publication was approved by the Secretary of the Navy on 3 April 1961

Published monthly by Chief of Naval Operations and Bureau of Naval Weapons to disseminate data on aircraft training and operations, space technology, missile, rocket and other aviation ordnance developments, aeronautical safety, aircraft design, power plants, aircraft recognition, technical maintenance and overhaul procedures. Send mail to Naval Aviation News, OP 05A5, Navy Department, Washington 25, D.C. Office located at 3704 Main Navy Bldg.; telephone Oxford 62252 or 61755. Annual subscription rate is $2.50 check or money order ($1.00 additional for foreign mailing) made payable and sent to Superintendent of Documents, Government Printing Office, Washington 25, D.C. Single copy costs $.25.

NAVAL AVIATION NEWS

New Syllabus Graduates

Four Get Wings at Corpus Christi

The first students to graduate under the Naval Air Advanced Training Command's re-vamped syllabus received their wings at Corpus Christi in September. Prior to July 1st, when the new program began, transport and patrol plane students received limited training in S-2A *Trackers* before progressing to P-2 or P-5 aircraft.

The new course, taught at Corpus Christi squadrons VT-28 and VT-31, is designed to complete a student's training in 20 weeks. *Neptune* and *Marlin* patrol planes, no longer used in the training command, have been replaced by the *Tracker*. Pilots receive their wings after finishing the S-2A syllabus, then remain at Corpus for navigation instruction in T-29 *and* C-117D aircraft.

The four first graduates are: Ensigns William J. Boehmer, Julian O. Gregory, William D. Hipps and Indonesian Naval Aviation Cadet Sjamsudin.

AVIATION PILOT *Ralph E. Carr, AMC, is reenlisted by VRF-31 C.O., Cdr. Billy Carroll, as he returns to Norfolk after a helicopter ferry hop. One of the few AP's still on duty, he has logged 9520 hours since 1944.*

AND AWAY THEY GO! *Since 1924, students and instructors at NATTU Lakehurst have completed more than 19,000 parachute jumps without a single incident of parachute failure. The 19,000th was made by B. J. Anzini, PRC.*

VP-23 Arrives in Gitmo

Will be Using Neptunes on Patrol

Personnel and aircraft of VP-23 arrived at Guantanamo Bay September 4 to relieve VP-45 of its patrol duties in the Caribbean. VP-23 will be using P-2H *Neptunes*.

The change in squadrons also marks the end of an era for the giant "flying boat", the Martin *Marlin*. VP-45, home-based in Bermuda, has the distinction of being the last squadron to use the *Marlins* in the Atlantic Ocean for patrol duties.

Early in 1964, VP-45 will commence to transition to the P-3A *Orion*, but until then they will continue to operate seaplanes out of Bermuda.

VP-23's home base is NAS BRUNSWICK, Maine. This squadron was involved in the search for the missing submarine *Thresher*.

VP-23 has operated previously in the Caribbean waters. The squadron was among the first to locate and track the hijacked cruise liner, *Santa Maria*, in the early spring of 1961.

For their effectiveness in anti-submarine operations and other patrol duties, the squadron proudly displays the Fleet Air Wing Three Battle Efficiency E and the Commander ComNavAirLant Safety Award for 1963.

FAA Adds Radar Service

Positive Control Areas Expanded

The Federal Aviation Agency's New York and Washington Air Route Traffic Control Centers began radar positive control separation service to high altitude aircraft in September. They join 18 other centers already providing this service to flights operating above 24,000 feet in the U. S.

The additional coverage puts more than two-thirds of U. S. airspace under area positive control (APC). Another four centers are expected to join the APC program by mid-1964.

Washington Center's control area covers 100,000 square miles. New York Center's domestic control area encompasses 41,000 square miles, but its Oceanic Control facility serves North Atlantic flights operating in an area covering some 1,500,000 square miles.

NAO Wings Go to 1000th

Sept. Graduate Marks Milestone

The 1000th graduate of the Naval Aviation Observer program, begun in early 1960, received his wings September 10th from the Naval Air Advanced Training Command at Corpus Christi. Ens. Ronald M. Slauter of San Antonio, Tex., was recipient of the wings.

A graduate of OCS at Newport, Ens. Slauter joined the NAO program at Pensacola in April of 1962. He has been assigned to VR-7 which flies *Hercules* aircraft as a Military Air Transport Service unit at Moffett Field.

Record Polar Flight Made

Reedy Sets Trans-Antarctic Mark

RAdm. James R. Reedy, commanding Operation *Deep Freeze*, arrived at McMurdo Station in the Antarctic on Oct. 1, after a trail-blazing 14-hour 31-minute transpolar, non-stop flight from Capetown, South Africa.

Traveling in a ski-equipped C-130 *Hercules*, operated by Air Development Squadron Six, the admiral landed at 0431 GMT, after a smooth flight.

The 4700-mile flight was made by two C-130's assigned to VX-6. The plane carrying the admiral was piloted by Cdr. George R. Kelly, C.O. of the squadron. The second plane was piloted by LCdr. William B. Kurlak.

For the flight, special 3600-gallon interior fuel tanks were installed. This gave them a total of 9600 gallons of fuel each, enough for 17 hours of flight. The added load gave the planes a takeoff weight of 145,000 pounds, 10,000 more than usual.

Adm. Reedy's arrival at McMurdo officially inaugurated *Deep Freeze 64*, the Navy's support of the U.S. Antarctic research program. He had been at Capetown for a meeting of the Scientific Committee on Antarctic Research (SCAR), of which he is a member.

LYLE PARSONS, AC1, VIEWS A-4 LANDING AT LAKEHURST ON TOWER TV SCREEN

TV is Used at Lakehurst

Monitor Set Up in Control Tower

The Naval Air Test Facility (Ship Installations) at Lakehurst, N. J., has installed a closed-circuit television system on its newly extended 12,000-foot runway. Because of a roll in the terrain, control tower operators previously were unable to observe landings from their positions 5000 feet down the runway.

Now, a television camera, mounted on a 20-foot tower at the 10,000-foot mark, records approaches, landings and roll-outs with a 14-inch, 350mm lens. The camera is controlled by switches in the tower and can view any point on the runway.

Two 16-inch TV screens are monitored in the tower by controllers on the top deck, and engineering and NATF personnel on the second level. Conditions of the runway are also studied.

Used primarily for safety, the TV circuit may be used later for engineering purposes during test and evaluation activities conducted at Lakehurst.

THE COMMAND SHIP, *USS Wright (CC-2), formerly an aircraft carrier (CVL-49), represents a new concept in command at sea. As "the voice of command," it can be heard by ships, aircraft and stations throughout the world. Wright's command spaces, designed for theater type presentations, are equipped with projection equipment and motion picture screens. Room is amply provided for command operations, plotting, charts and graphics, briefings and conferences. On the antenna deck are arranged the largest, most powerful transmitting systems ever installed on a naval vessel. The largest antenna towers 114 feet above deck. Wright's carrier days are not wholly a thing of the past; there is room for helicopter landings aft of the "trees."*

VMA-225 Awarded Trophy

Selected for Performance in 1963

Marine Attack Squadron 225 has been selected to receive the "Commandant's Aviation Efficiency Trophy" for fiscal year 1963. The 2nd Marine Aircraft Wing squadron was chosen on the basis of "excellence in performance of all missions assigned and professional competence demonstrated throughout the year."

The Commandant sent a message to the unit extending his congratulations.

GRAMPAW PETTIBONE

Butt-Buster

Seems like we've been warning pilots for years to watch those sink rates and hard landings or they'd "bust their backsides" or words to that effect. This tale illustrates the point.

A young pilot, during his sixth FAM flight in the A-4C and with a grand total of 3.7 hours in this model of aircraft, was making a practice precautionary landing approach (PPLA) to the duty runway at his home field. He had been cleared for a circling precautionary approach to a low wave-off. All seemed well until he reach the 45° position turning on final.

At this point he was high, just a little too much altitude too close in, so he reduced power below the 85% normally carried in a PPLA. An extremely high rate of descent was immediately apparent and he shoved the throttle to 100% power and LOWERED the nose slightly to pick up airspeed. By now he was over the approach end of the runway and at about 100 feet of altitude and at 170 knots.

The additional power didn't seem to stop the sink rate even a little bit, and the A-4C slammed down HARD on the runway, knocking the wind clean out of the pilot and became airborne again!

Gasping for breath and ignoring a tremendous ache in his back, the young pilot kept his wits about him and climbed out straight ahead. His instructor, who had been following at a distance, joined up and inspected the A-4C for damage. Finding none evident, the pilot was again cleared to land and made a fine, power-cushioned landing.

Medical examination later showed a fractured vertebra, way low down. It will take about 90 days to heal.

Grampaw Pettibone says:

Loose shoulder straps, a habit of hunched-over posture in the seat, and about a 20 G touchdown (estimated) did the trick for his backside. Easing power and then improper wave-off technique set him up like a duck in a shootin' gallery. This same mistake could buy him a piece of the ramp on a shipboard approach. The most important part of a flight is that last bit of the landing approach. Mistakes here leave little or no margin for corrections. You've got to *know* what to do and do it *right* from the very first ride on. Modern aircraft seldom give second chances to the unwary pilot.

Who's Got It?

Two young Marine pilots with little or no pre-flight briefing manned their T-28 for a routine flight on a bright Carolina morning—just perfect for flying. The pilot in the front cockpit needed flight time and was to be the safety pilot for the lad in the rear cockpit who needed instrument time.

Pre-flight inspection, engine run-up and takeoff were normal with the rear cockpit pilot going under the hood immediately after takeoff. The safety pilot trimmed the aircraft in a climbing attitude and passing through 2000 feet called to his friend. "You have it." This transmission was not acknowledged, so he told him a second time and relinquished positive control.

Not realizing that he was supposed to be flying the bird, the gent under the tent watched his instruments as the little aircraft struggled through several assorted maneuvers in getting itself to approximately 4500 feet. Unaided, the T-28 did a fair wingover to port, but got a little too steep and slow. The only thing to do in this situation was to roll and split "S" out.

The two young aviators suddenly realized that this aircraft really needed help, so they both grabbed the controls and pulled out at 700 feet MSL. Neither pilot had thought to reduce power up to this point.

ILLUSTRATED BY Oslon

Both pilots noted that they pulled eight G's in getting the aircraft out of the dive. They visually inspected the wings for wrinkles and popped rivets (from the cockpit, yet) and, as none could be seen, decided to continue the flight. They proceeded to a nearby air station and practiced instrument approaches prior to returning to home base.

After landing, the pilots looked the plane over and noticed no damage, but they did down it because of the high accelerometer readings. Two days later maintenance personnel found the wrinkles and popped rivets.

Grampaw Pettibone says:

This one not only brought tears to these tired ole eyes but made me want to sit down and bawl. It's gosh darn hard to see how these lads could get themselves into such a confused mess. OpNav Instruction 3710.7A is mighty clear on the proper way to transfer control of an aircraft. There certainly is no law against the use of common sense.

These intrepid gents really tried to corner the "poor judgment" market when they continued the flight after exceeding the max allowable limits of this little bird by over 50%. There are a few thousand more well chosen words to be said on this one, but I'll bet the reporting custodian has already said most of them.

Flat Hatter

On a beautiful July morning, a young ferry pilot departed El Paso International in an AF-1E he had accepted at NAS ALAMEDA the previous day. A VFR flight plan was filed direct to NAS DALLAS at 21,000 feet. The pilot reported his position to Wink radio then proceeded to the Dyess AFB area.

At this point, however, he deviated from his planned route and a short time later crashed the *Fury* in a plowed field. Witnesses report the aircraft made several extremely low passes in the vicinity prior to the crash landing. It may be hard to believe but these passes were near or over his father-in-law's home.

Luckily several residents of the area saw the aircraft crash-land and rushed to the pilot's aid. They were unable to remove the canopy, but cut a hole in it and pulled the flat hatter out. He received a cut above the left eye and a cerebral concussion. The aircraft sustained strike damage.

Grampaw Pettibone says:

Oh, my achin' back! Any description of the cause factors involved in this needless accident other than plain ole FLAT HATTING would be wasting words. Witnesses' statements verified that the pilot was making unauthorized maneuvers at an unauthorized altitude. How many times have I read these overworked words!

There isn't a pilot flying today who hasn't been warned about "flat hatting" at least 100 times, yet this guy thought he could beat the odds. I'll admit he's rather lucky in one way—most FLAT HATTERS end up a very unhealthy kind of *statistic*.

Cool

Three F-8C *Crusaders* took off from MCAS YUMA, Ariz., for an air-to-air gunnery exercise. The flight was briefed to make individual afterburner departures with a 1000' interval between aircraft. During climb-out, the flight leader reduced power to 90% after reaching 300 knots and began a climbing right turn to start a running rendezvous.

The leader's fire warning light came on at about the same time the wingmen were checking in and he asked his number two man to check his aircraft for smoke. The wingman could not see smoke or fire but informed the lead aircraft that his tail hook was down. Just then the lead pilot saw his utility hydraulic pressure drop to zero and the low pressure warning light come on. As the wingman closed in, he saw flames around the tail pipe shroud and tail hook assembly area.

Yuma tower was contacted and the pilot advised them of his intention to return to the field. He requested the number two man to escort him back. The third aircraft was instructed to proceed to the gunnery range and wait for the second aircraft. The pilot calmly advised the tower of his condition. At the same time he told them he would attempt a straight-in-approach to a landing and after touchdown would shut down. Crash equipment was requested.

The wingman informed the pilot that the fire was out, but shortly thereafter a mild explosion was heard. The wingman saw the fire starting again. This fire went out but a second explosion, more severe than the first, was heard; again the fire started. Yawing the aircraft had little effect, but again the fire went out. Shortly thereafter, the pilot landed the aircraft, secured the engine upon touchdown and rolled into the arresting gear.

Grampaw Pettibone says:

Singe my old grey whiskers, but this lad was mighty cool in a tight situation that had every indication it could get tighter fast. A good amount of this coolness was a result of his absolute faith in the "spring seat" he was riding and the confidence that it would operate as advertised. You have to know your machine and its emergency procedures thoroughly, then professionally evaluate all factors before deciding to bring a wounded bird home versus getting it to an area considered safe for ejection. This gent handled things like a "Real Pro."

Memo from Gramps

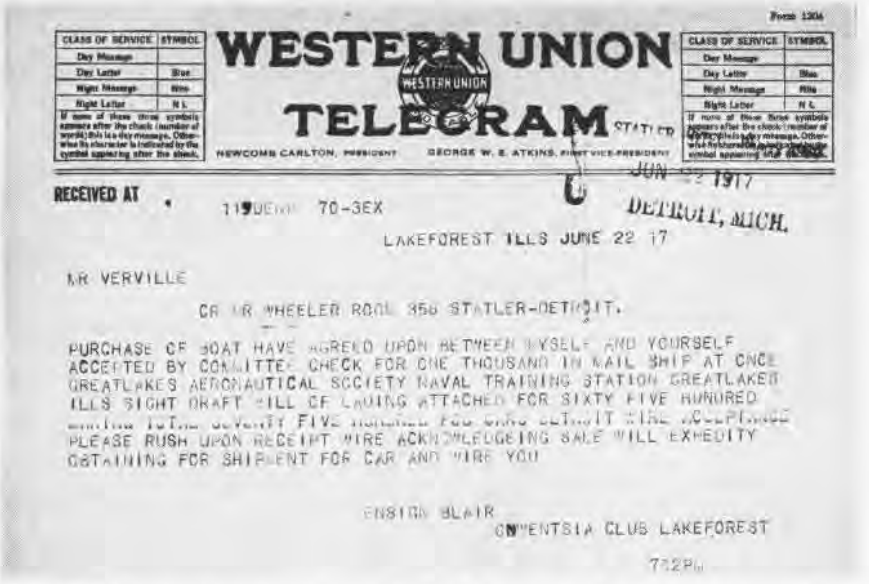
Aviation safety doesn't depend on new and smart ideas—safety is the result of the mature pro sluggin' along day in and day out. It's doin' what you're supposed to do when you're supposed to do it the way you're supposed to do it. If you do, flying is basically safe; if you don't, it ain't. *It's just that simple.*

People who go in for safety as an end objective, leave me cold. The best accident preventer I know of is the best airplane driver, period. He is the pilot who, with the help of a professional ground crew, has reduced the hazards to an absolute minimum. A safe flight is not accomplished by accident.

SYSTEMS MANAGEMENT

CHANGING TIMES AND THE HAWKEYE

By Gerard M. Maurer
Grumman Program Management



Form 1206

CLASS OF SERVICE | SYMBOL
Day Message |
Day Letter | Blue
Night Message | Nite
Night Letter | N L

If none of these three symbols appears after the check (number of words) this is a day message. Otherwise its character is indicated by the symbol appearing after the check.

WESTERN UNION

TELEGRAM

NEWCOMB CARLTON, PRESIDENT — GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT

CLASS OF SERVICE | SYMBOL
Day Message |
Day Letter | Blue
Night Message | Nite
Night Letter | N L

If none of these three symbols appears after the check (number of words) this is a day message. Otherwise its character is indicated by the symbol appearing after the check.

RECEIVED AT

JUN 22 1917

DETROIT, MICH.

119DETROIT 70-3EX

LAKEFOREST ILLS JUNE 22 17

MR VERVILLE

CR OR WHEELER ROOM 356 STATLER-DETROIT.

PURCHASE OF BOAT HAVE AGREED UPON BETWEEN MYSELF AND YOURSELF ACCEPTED BY COMMITTEE CHECK FOR ONE THOUSAND IN MAIL SHIP AT ONCE GREATLAKES AERONAUTICAL SOCIETY NAVAL TRAINING STATION GREATLAKES ILLS SIGHT DRAFT BILL OF LADING ATTACHED FOR SIXTY FIVE HUNDRED [illegible] SEVENTY FIVE HUNDRED FOR SAME DETROIT WIRE ACCEPTANCE PLEASE RUSH UPON RECEIPT WIRE ACKNOWLEDGEING SALE WILL EXPEDITY OBTAINING FOR SHIPMENT FOR CAR AND WIRE YOU

ENSIGN BLAIR
CHIPPEWA CLUB LAKEFOREST

752P

When builder-designer Fred Verville received the above telegram on June 22, 1917, he shipped, as directed, a seaplane to Great Lakes Naval Training Station. Verville had produced the aircraft in his Detroit plant. He recalls that he later had to go to Illinois to personally "troubleshoot" problems. Today's aircraft manufacturer no longer finds it quite so simple to fill his orders. To show how the production process has changed, *Naval Aviation News* reprints, with permission, an article written for Grumman *Horizons* setting forth the evolution that has taken place in the aircraft industry.

NOT SINCE the days of small, simple engines and seat-of-the-pants flying has any manufacturer had the facilities and capability to produce an entire airplane single-handedly.

Until the emergence of complex electronic systems, powerplant manufacturers were the heaviest contributors to the airframe manufacturer, who integrated the powerplant and the airframe. Later, the airframe prime contractor became dependent on the electronics industry, as well, for components and subsystems.

Today, the pie is cut into a multitude of slices. In a manned space flight program, for example, a dozen functional subsystems from many sources must be integrated in order to produce the spacecraft which will perform a given mission. These include guidance, attitude control, communications, tracking telemetry, life support, environmental control, re-entry protection, and recovery systems. All of these subsystems must be compatibly accommodated in an overall structure.

But one needn't look to so exotic a field as space flight to document the increasingly obvious fact that today's prime manufacturer can no longer maintain the in-house capabilities to produce more than a few subsystems if they are widely divergent. Today, his most important task is to develop complete integration capability for peak performance of the total article. As air travelers, most of us are frequently reminded of the growing complexity of that familiar workhorse, the airliner. A dramatic example is provided by S. L. Higginbottom, Trans World Airlines Assistant Vice President, whose statistics are the basis for the accompanying graphs. "Aircraft," Higginbottom says, "have progressively grown in overall complexity from the DC-3 days, with the increase being more nearly quadratic than linear on the jets."

But even the electronic complexity of the jetliner is dwarfed by that of a military airplane roughly one-third the Boeing 707's size—the Navy's E-2A *Hawkeye*. For ground control of as many as 250 simultaneous flights of jetliners and other aircraft between Norfolk, Va., and Boston, Mass., the Federal Aviation Agency's Air Traffic Control Center at Idlewild Airport has some 100 persons using dozens of radar consoles and other electronic devices. But the Navy's *Hawkeye*—with two pilots and three men at three airborne radarscopes—has the capability to handle all the air traffic described above. Almost all of the collection, evaluation and remembering of facts is done automatically—with lightning speed and flawless accuracy—by one of the most compact and advanced electronic early warning and intercept control systems ever produced.

This computerized sky sentry automatically searches out, identifies, and keeps constant track of all aircraft and surface ships within its radar range. The system also controls friendly aircraft, directing these to intercepts with enemy weapons systems. This system, called ATDS (Airborne Tactical Data System), computes immediately and automatically which are the best friendly weapons systems to do the particular jobs by providing facts about armament, position, performance, fuel reserve, etc. *Hawkeye* must keep this information updated, minute by minute, and it must know exactly where it is and other weapons systems are, and where friendly headquarters is.

Hawkeye must keep the flagship constantly and automatically informed, relaying to similar computerized equipment data which is displayed in the Combat Information Center—supplying the tactical information and air control which enables the task force commander to employ his offensive surface and air units most effectively.

In addition to these capabilities, the system's 10,000

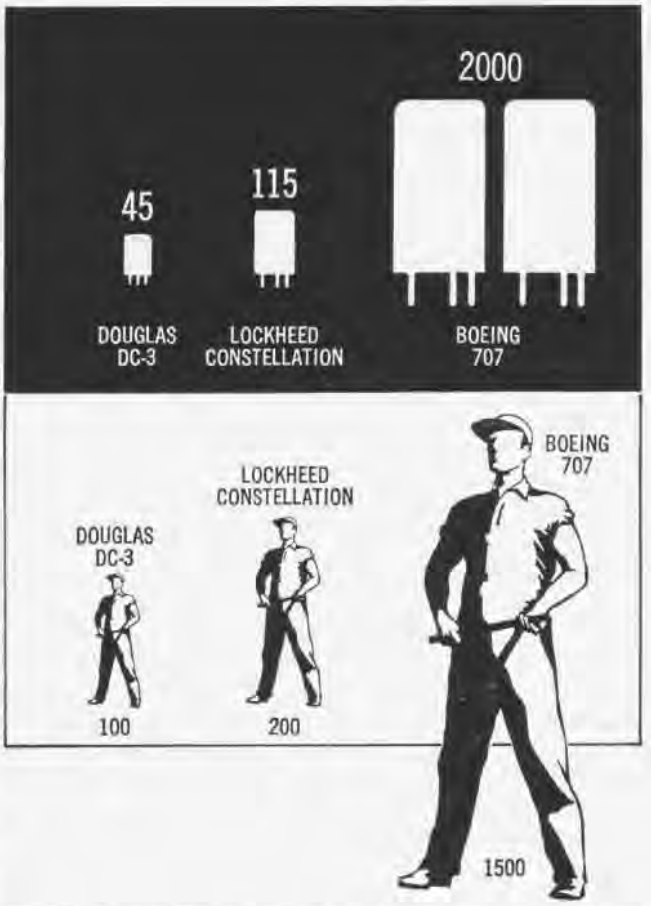
pounds of electronic equipment had to be compact enough to fit aboard a carrier-based aircraft of limited size, and rugged and reliable enough to take the shock of catapult launchings and arresting hook landings.

The *Hawkeye* with its ATDS system posed the question: Could such a system be assembled using airframe sections and subsystems that had not been designed from inception to fit together mechanically and electronically, and to operate compatibly?

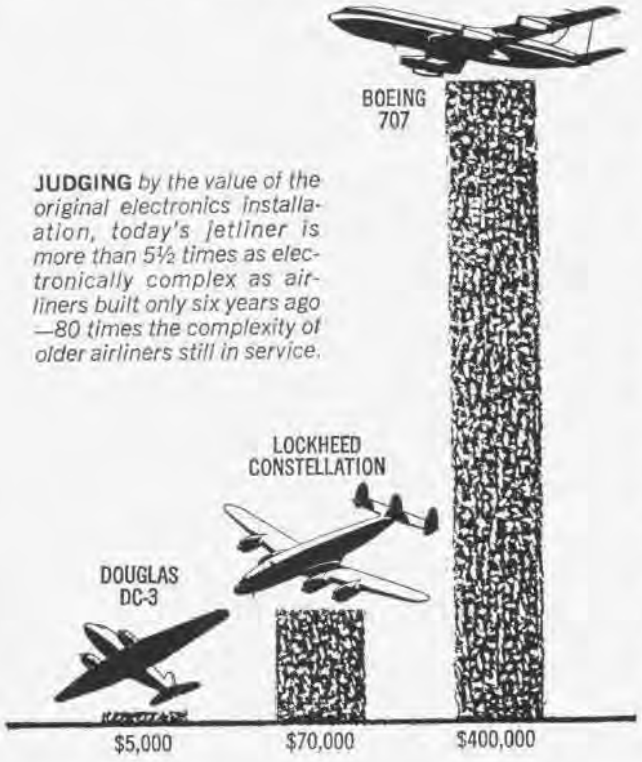
Obviously, the answer is no. Each part affects every other part and therefore must be designed or carefully modified to reflect the influence of all the other parts. This is a problem of integration. It dictates the need for complete understanding of all the disciplines involved, flight environment, and ground handling conditions to be able to peak the performace of all the parts and make them operate compatibly in the overall system under the predicted operating conditions.

As weapons systems became more complex, the "systems management" concept gradually evolved among aerospace companies. More and more complexity meant that a greater percentage of the work, often of an electronic nature, had to be subcontracted. It became a specialty job in itself to manage the development, design and production of multifarious subsystems or parts.

But, even though an airframe manufacturer is not staffed for the detail design and production of many of the individual parts of subsystems, it is necessary for the systems manager to staff his organization with engineers capable of thoroughly understanding the design of every part that goes into the aircraft system. How else could the systems manager monitor and evaluate the work being performed by outside manufacturers for him? These experts must know how a system can be designed, tested, and produced; what items and subsystems various firms in each field are capable of producing; and the state of the art in fields as diverse as radar and propulsion for which the engineers are designing.



NUMBER OF ELECTRONIC TUBES *and semiconductors in airlines has risen from 45 on the DC-3, through 115 on 1957 Constellations, to nearly 2000 on today's jetliners. Similar evidence of skyrocketing complexity is the fact that to qualify an average mechanic to completely handle the electronics system took about 100 man-hours of training for the DC-3, more than 200 for the Constellation, 1500 for the jetliner*



JUDGING *by the value of the original electronics installation, today's jetliner is more than 5½ times as electronically complex as airliners built only six years ago —80 times the complexity of older airliners still in service.*

Grumman's *Hawkeye* program is a good example of the systems management role in the production of today's advanced aerospace systems. Perhaps no other aircraft program in the American arsenal has ever employed to a higher degree this technique of integrating complex electronics into an airframe.

To satisfy the requirements initially specified by the U.S. Navy, the preliminary design phase of the integration of *Hawkeye's* many electronic subsystems was accomplished by Grumman engineers in consultation with Navy technical and laboratory personnel, scientists, and vendor engineers. These meetings gave birth to the "systems concept." Next, the group, working closely with the airplane designers, specified the electronic and physical criteria for the new designs. Grumman then determined what production facilities were available and selected subcontractors.

The time schedule for the development of this Airborne Early Warning (AEW) system precluded the use of the traditional "series" development effort. This type of effort

AS SYSTEMS MANAGER, *Grumman integrated equipment produced by Litton Systems, Dalmo Victor, G. E., and other companies into the Hawkeye airframe. The Litton firm designed the indicator's memory drum to handle 750,000 bits of information, compatible with fuselage.*

progresses from the breadboard stage to the service test model and then to preproduction model. Preproduction testing is accomplished before the first production hardware is accepted for use in the aircraft, at which point avionic flight development begins.

In the case of the E-2A *Hawkeye* system, an engineering judgment was made to start a parallel development effort, allowing simultaneous testing and laboratory and flight development, in order to meet a tight Navy schedule which dovetailed with other Navy systems under development, such as the F-4B *Phantom II* and the Naval Tactical Data System, the shipboard counterpart of *Hawkeye.*

The operational phase of overall integration began when a set of prototype production equipment from all the suppliers was assembled in one place, connected to a power source, and tested. Here is where the crucial results of "interface" management, a major integration task of the prime contractor, were proven. Each part, made by different manufacturers often thousands of miles apart, must work or be made to work together compatibly without downgrading the peaked performance of every other part.

In the case of the *Hawkeye,* Dalmo Victor in the San Francisco area was picked as the specialty company best qualified to produce the rotodome. This giant rotodome contains an advanced radar antenna design that marks a step forward in the state of that art. In addition to electronic compatibility, overall weapons system integration required that the radar be packaged in an aerodynamic shape which permits it to bear its own weight in flight. This was done.

The heart of the overall system is a high resolution radar and its associated computer-detector, made by General Electric in Utica, N.Y. The power and form of the energy produced by the radar, which is beamed out by the antenna array in the rotodome, was specially created for this system and also represents an advance in the state of the art of electromagnetic projection-reception. The receiver portion of the radar is designed specifically to handle the unique form of the reflected energy from the targets as received by the antenna. The computer-detector assimilates this signal into meaningful form that eliminates sea clutter, computes target height, and weeds out false targets.

Litton Systems' specialized knowledge in digital computer techniques was called upon to produce the airborne computer-indicator. This is the electronic brain and memory system which constantly records, analyzes, translates what the airborne radar and computer-detector have processed, and then displays this information for the operator. The Los Angeles firm designed the indicator's memory drum to handle 750,000 separate bits of information and packaged the whole to be compatible with the weight distribution, operation, and other special requirements of the compact E-2A fuselage.

To start the complete operational phase of the integration of these advanced subsystems, a full-scale physical test facility, called the "Copper Queen," was set up in Utica. Its electronic and dimensional environment exactly duplicated the fuselage midsection of the *Hawkeye.* This is where the total AEW electronic system was tested as a preliminary to final integration of the whole E-2A system at Grumman.

Parallel with these efforts, the ground phase of the overall electronic system integration began with the checking out of individual subsystems and components, connecting them together one by one until the complete system could be operated as a unit. This part of the integration process uncovered incompatibility and reliability problems. Each was corrected until a reasonably reliable peaked operational system was evolved. This work was done in Grumman's $5 million Electronic Systems Center in Bethpage, N.Y. The Center, built at Grumman expense, reflects the Company's conviction that the full application of integration techniques in facilities tailored for this type of work is the key

to producing the most efficient aerospace systems. The Center is another reminder of the passing of that era when an aircraft company could excel merely by building superior airframes that were tough, swift, and reliable—an era when the government bought the electronics and accessories and the airframe company just installed them.

In its test labs, Grumman creates as much of the actual operational environment as possible. An "Iron Monster," for example, tests *Hawkeye's* flight control system with almost total duplication of actual flight, saving much flight test time.

Simultaneously with the checkout and integration of the electronic subsystems, the aircraft itself was developed, underwent rigorous testing, and was proved out in flight tests.

Integration of the electronic system with the airplane system was started before either had been fully proven. All unpredictable effects of one system on the other became evident as each system was integrated into a unit completely compatible in the flight and ground handling environment. Many hours on the ground and in flight were required to find and correct incompatibilities in order to "peak" the overall system in compliance with contractual requirements.

The *Hawkeye* is a classic example of why an airframe manufacturer with an electronic system integration staff and facility must assume the role of systems manager.

The systems management organization must, through experience, understand the flight phenomena and environment as well as electronic design and packaging. The systems manager must have the authority to compel recognition of the effects of the flight environment in terms readily understood by the electronics designers. For, aside from the problem of adjusting interfaces between equipments so that they will perform as a system, an even more formidable problem exists in marrying the basic electronic system to the airframe.

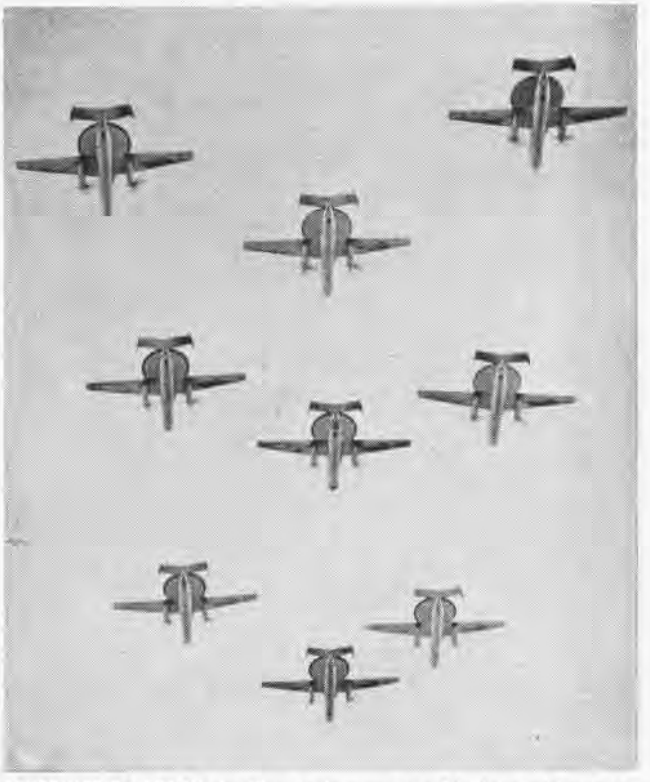
For instance, every airframe design is sufficiently different, one from another, to require extensive integration work if the electronic system were to be taken in its entirety from one and installed in another. Considerable electronics redesign probably would be required before the system would give peaked performance in an airplane design other than the one with which it was originally integrated.

Rotodome antenna performance, for example, was degraded when the antenna was first flight tested on the *Hawkeye* despite favorable results in the isolation of the laboratory. Grumman discovered during flight testing that radio frequency energy transmitted and received by the antenna was being distorted by reflections from the E-2A's airframe.

Data on these aberrations were organized and presented to the antenna manufacturer, who redesigned the antenna accordingly.

The aviation industry has acquired flight environment experience that has been paid for with long hours of hard work and much trial and error. This experience is dynamic in that something new is added every day and much of the unknown that is learned is discovered in flight. No earth-bound laboratory can truly simulate the actual flight conditions in their entirety. No piece of mechanical or electronic equipment is going to perform reliably in the flight environment if the pertinent influences of this environment are not accommodated in the design. Only experienced people daily engaged in analyzing the continuing flow of flight data, and in designing advanced flight machines, can really know what is to be known about the true flight environment. The airframe manufacturer must anticipate this environment (the gusts and turbulence, once in a while hitting the ground harder than expected, and other variables), or find himself face to face with a failure he must fix after his oversight causes trouble in the flight environment.

The know-how to conceive, design, develop and finally produce an aerospace product cannot be acquired overnight. This is not to say supervision of a program can't be performed by some other element of the aerospace industry other than airframe companies. It is to say that it can't be done as cheaply, as precisely on schedule, and it can't be done without consequent loss of reliability and performance.



SCHEDULED TO REACH *the Fleet in January, the Hawkeye will give carrier aviation tremendous surveillance advantages with its 5-man crew.*

Does the dawning of the space age change all this? Not a bit. In or out of the earth's atmosphere, manned flight employs a vehicle which must be controlled by a human being sustained by an artificially created environment. More than ever before, the vehicles carrying man are called upon to perform with almost fantastic reliability. They must be designed with complete concern for the man inside, from life support systems to human factors considerations.

In short, the skills needed to design, develop, and produce a manned space vehicle are extensions and additions to the skills perfected by what was once called the aviation industry. ★ ★ ★

THIS HELICOPTER *with its special "Fly Navy" slogan was the smallest ever to land at NAS Seattle. On landing, it was welcomed by a committee of onlookers. For further information on this aircraft, turn to page 30.*

'Redcocks' Score First

Bullpup Fired at Night by VA-22

The *Fighting Redcocks* of VA-22, based at NAS LEMOORE, Calif., claim to be the first Navy squadron to fire the *Bullpup* air-to-surface missile at night. Cdr. E. W. Abbott, C.O., launched the weapon from an A-4C *Skyhawk* at the Naval Ordnance Test Station, China Lake, in August.

The event marked one phase of VA-22's extensive night conventional weapons training program. Night rocket and bombing deliveries were also included in the training.

Marine Logs A-4 Record

VMA-224 Pilot Flies 1000 Hours

Maj. Joseph R. Donaldson of VMA-224, who logged his 1000th hour in the A-4 *Skyhawk* on July 26 at MCAS IWAKUNI, Japan, is believed to be the only Marine currently serving with MAW-1 to reach that mark. At a later date, he will be presented with a plaque commemorating the achievement of this milestone.

Maj. Donaldson reported to MAW-1 September 1962, following duty with MAW-Two at Cherry Point, N.C.

Vans Used for P-3 Orions

Provide Electronic Maintenance

Three transportable, Fleet-manufactured shops were displayed in September at NAS NORFOLK's MATS terminal prior to being shipped for use by P-3 units at Kindley AFB, Bermuda. Ltjg. J. M. Schneider, avionics material officer for ComFAirWings-Lant, supervised the project with assistance from VP-44 and VP-8 *Orion* squadrons, based at Patuxent River.

The vans, approximately 30 feet long and 12 feet high, weigh 10 tons each and act as portable shops in which electronic maintenance of the complex P-3 *Orion* systems can be conducted.

P-3A MAINTENANCE VANS AT NAS NORFOLK

Need for the vans was prompted when P-3 anti-submarine aircraft were sent to Bermuda where permanent support equipment was not readily available.

UNVEILED *at the Lockheed-Georgia Company, Marietta, Ga., USAF's C-141 StarLifter dwarfs predecessors, C-47 and C-130, in background. Global transport has 160-foot wing span, four fan-jet engines, can airlift 90,000 pounds, carry 154 troops and fly at 550 mph. President Kennedy called the plane's debut "a good moment for the United States." He also referred to the C-141 as the world's fastest cargo-carrying airplane. Flight tests on the aircraft begin in December.*

Typhoon Trackers Return

'Carmen Escorts' Honored at Guam

When the *Typhoon Trackers* of Airborne Early Warning One returned to Guam, they were met by a large crowd, a brass band and a "Welcome Home" banner. The crew had tracked typhoon *Carmen* 1600 miles in five days.

The plane, piloted by LCdr. Jackson B. Reavis, flew a total of 53 hours on five consecutive nights, fixing *Carmen's* position as the storm travelled through the Philippine Sea, across the Philippines, and into the South China Sea. The typhoon was tracked continuously between the hours of 1900 and 0200 each night. Hourly positions were forwarded to Fleet Weather Central/Joint Typhoon Warning Center at Guam. Ltjg. R. L. Eshom was the weather reconnaissance officer.

On several occasions, the aircraft actually penetrated the eye of the typhoon while gathering information. At times, winds exceeded 120 knots.

As *Carmen* passed through the Philippines, the *Typhoon Trackers* moved from NS SANGLEY POINT to a new base of operation in Okinawa while still providing the nightly fixes.

The Fleet Weather Central/Joint Typhoon Warning Center sent a "Well Done" to the crew over the weather reporting circuit as it neared completion of one of the later flights.

In addition, LCdr. Reavis received a "Well Done" from the USS *Coral Sea* for an extensive search and rescue mission, and from Commander Pacific Missile Range for a special mission. (For more on VW-1 operations, see p. 22.)

FIRST A-6A SQUADRON PREPARED FOR FLEET

THESE INSTRUCTOR PILOTS OF ATTACK SQUADRON 42 CARRIER-QUALIFIED ABOARD USS FORRESTAL ON AUG. 24, 1963, IN THE INTRUDER

By Lt. W. A. Caldwell

THE FIRST operational A-6A *Intruder* squadron is now being trained at NAS OCEANA by the *Green Pawns* of Attack Squadron 42. The *Sunday Punchers* of VA-75, a former A-1 *Skyraider* flying member of Carrier Air Group Seven, commenced formal training in September of this year and will be the first squadron to deploy with the Navy's newest all-weather light attack bomber.

VA-42, commanded by Cdr. Jack Herman, is a component of Combat Readiness Replacement Air Group Four, which has its headquarters at NAS CECIL FIELD, Fla. Formerly assigned the task of training replacement pilots for Fleet A-1 squadrons, VA-42 now has the responsibility of training the first A-6 squadrons prior to their deployment with the Fleet, and later to train pilots, bombardier/navigators, and maintenance personnel for replacement in these squadrons on a continuing basis.

On August 24, 1963, instructor pilots of VA-42 completed carrier qualifications in the Navy's newest attack aircraft, the Grumman A-6A *Intruder*. Utilizing three aircraft, a total of 75 arrested landings were accomplished aboard USS *Forrestal* (CVA-59) in a brief five-hour period, attesting to the performance capabilities of both pilots and aircraft.

[Editor's Note: Lt. Caldwell, the author, is credited with being the first Fleet pilot to make a carrier-arrested landing and to be catapulted in the new aircraft. Lt. J. F. Roth was the right seat occupant during the initial catapulting and landing.]

CDR. HERMAN TALKS WITH GRUMMAN REP

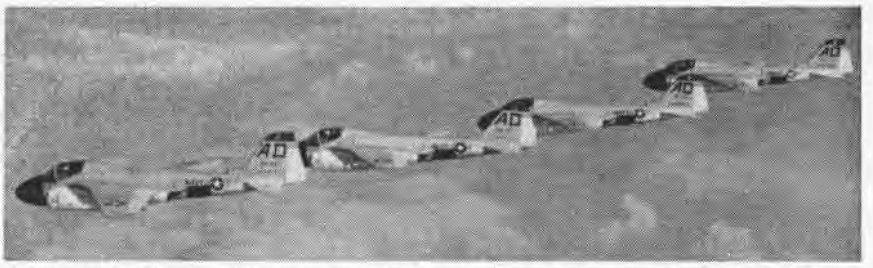
The training syllabus for pilots and bombardier/navigators [NAO(B)'s] will require approximately five months. During this training period, a scheduled 265 hours of formal lectures will be given to the replacement pilots and 490 hours to the replacement B/N's. The syllabus presently calls for approximately 71 flights and 140 flight hours for pilots and 38 flights and 88 flight hours for the B/N's.

NAS OCEANA, the largest master jet base on the East Coast, is ideally located for A-6 mission training. The "long legs" of the *Intruder* will enable the crew to proceed out to sea for coastal penetration training, fly at low level on approved routes through the coastal states, and penetrate the mountainous areas of North Carolina, Virginia and West Virginia for more exact training in radar terrain clearance. Three target complexes are within easy striking distance of NAS OCEANA where live ordnance drops can be made and where hits are recorded by Navy personnel

stationed in spotting towers in the target vicinity.

Formal training for the maintenance personnel is under the direction of VA-42 FRAMP (Fleet Replacement Aviation Maintenance Program) personnel, who assign all quotas and monitor A-6 training. The training is being conducted aboard NAS OCEANA by NAMTraDet 1003, a component of the Naval Air Maintenance Training GROUP, whose headquarters is NAS MEMPHIS, Tenn.

One entire wing of NAS OCEANA's new training building is assigned to the A-6A training detachment, and consists of approximately 26 classrooms. These classrooms are virtually loaded with mock-ups of A-6A systems, display boards, wiring diagrams, and electronic components. Pilots, bombardier/navigators, and maintenance personnel can see actuation of landing gear, flaps, slats, and all control surfaces on hydraulically operated "iron monsters." One room houses a J-52-P6 Pratt & Whitney turbojet engine which is daily subjected to the wrenches of aviation jet mechanics under the watchful eyes of NAMTraDet instructors.



SYMBOLIZING POWER AND SPEED OF ATTACK, A-6A'S ADD TO CARRIER STRIKING POTENTIAL

Presently NAMTraDet 1003 consists of 52 instructors under the supervision of W. T. Shoemaker, AMECS. Additionally, there are approximately 20 Grumman personnel assisting Chief Shoemaker and his instructors in the highly technical aspects of training. These technicians will eventually be replaced by NAMTraGru personnel as they gain a thorough knowledge of A-6A *Intruder* component operation.

Eighteen formal courses are currently being taught on A-6A systems, encompassing two levels of maintenance—C and D level maintenance and E and F level. These courses range in length from short one-week courses in such as transistor fundamentals to a 19-week course in the ballistics computer, the heart of the A-6A weapon system. Pilots and bombardier/navigators attend a two-week familiarization course prior to their first A-6A hop.

The Navy Enlisted Classification

ONE INTRUDER IS ON A FORRESTAL CATAPULT WHILE ANOTHER STANDS BY. NEW CRAFT WILL REPLACE A-1 SKYRAIDER AS ATTACK BOMBER

Code NEC-8331, signifying A-6A systems maintenance training, is assigned to enlisted personnel who successfully complete prescribed courses under FRAMP. The assignment of NEC's supplements the rating structure for distribution, detailing, and expression of special training requirements.

The 12 pilots who are now assigned to VA-42 as instructors are qualified A-4 *Skyhawk* Fleet pilots. Already well versed in jet light attack work from attack carriers, they have been better able to concentrate on all-weather tactics utilizing the versatile components present in the *Intruder*. One of their most difficult assignments is to learn the operation of the A-6A from the right seat, so that they will be able to assist prospective bombardier/navigators on training flights.

Far more difficult, however, is the job assigned to the B/N instructors in VA-42. These 12 officers were handpicked from heavy attack squadrons on both the East and West Coasts for their vast working knowledge and experience level in equipment similar to that found in the A-6A. They are also well versed in the pilot-B/N team concept, having reported from A-3 squadrons. In a very real sense, the B/N is the heart of the new attack system, for it is his responsibility to operate the radars, inertial and Doppler navigation systems, and feed information into the complex digital computers. His ability to distinguish targets on radar and furnish accurate steering information to the pilot plays the largest role in making the A-6A the first true all-weather attack aircraft to be introduced into the Fleet.

NEW INTRUDER OF VA-42, FULLY LOADED, SHOWS ONE OF MANY PAYLOADS IT CAN CARRY

For obvious reasons the heavy attack squadrons will be unable to furnish B/N's for the new A-6 Fleet squadrons without depleting their own ranks and seriously affecting their own mission capability. The majority of the officers who will be trained to man the right seat will, of necessity, report to Attack Squadron 42 directly from NAO Schools.

The prospective NAO undergoes four weeks of pre-flight training and eight weeks of Basic NAO School at Pensacola, Fla. Prior to departing the Pensacola area, he makes a selection of one of two duties—Radar Intercept Officer/Combat Information Center training at Glynco, Ga., or Navigation training at Corpus Christi, Tex. Those selecting the NAO(N) pipeline receive 16 weeks of advanced navigation training and approximately 70 flight hours at Corpus prior to being designated NAO(N), and upon completion are designated for VR, VP, VAH, or VA(A-6A) squadron assignment.

The NAO(N) assigned to A-6 training reports directly to VA-42 at Oceana, Va. After approximately four months of classroom and flight training, and prior to departing for an A-6 Fleet squadron, he will be designated NAO(B), signifying qualification as a bombardier/navigator. His collateral and primary duties in the Fleet squadron will be assigned on the same basis as those assigned to the pilots of the squadron.

Four squadrons have thus far been designated to receive the new aircraft, and these squadrons will replace A-1 *Skyraider* squadrons aboard the attack carriers in the Fleet. ★ ★ ★

AN INTRUDER, USING ITS 'NOSE-WHEEL TOW,' IS HOOKED UP FOR LAUNCH ON CATAPULT

BAGMANSHIP

How to Get Ahead in Carrier Landings Without Being Obnoxious

'Bagmanship must be exposed!'

By LCdr. M. Staser Holcomb

Illustrated by
Lt. Neil F. O'Connor

Today, the milder forms of Bagmanship are disappearing and its more aggressive features are coming to the front. Every carrier squadron has in its midst one or more practitioners of the subtle art. As long as Naval Aviators are permitted to feel any satisfaction in the successful mating of tailhook and arresting wire, as long as they are allowed any sense of pride in their accumulated total of carrier landings, then Bagmanship will be found in relentless and devious operation in the Fleet. It is imperative that Bagmanship be exposed and held in check before it is too late.

To begin with, one must collect and examine such facts and characteristics of baggers and Bagmanship as are known and knowable. Years of research and experiment have given the author a basis for this analysis.

The bagger is closely related to the golden-striped, thrush-throated Landingsnatcher described by the author in an earlier work. His habitat is the open sea. His flight is nearly always at low altitudes in a characteristically circling, purposeful track up the wake of an aircraft carrier. He appears to be equally at home in the Atlantic and Pacific Oceans. He has even been sighted in remote stretches of the North and South China Seas.

He seems to prefer solitary flight. Daylight and darkness are equally meaningful to his operation. What daylight offers him in repeated opportunity, darkness makes up in obscurity. Obscurity and anonymity are essential to the bagger, for when he is exposed he must flock like the other birds.

"Line-up, Airspeed, Meatball . . . all mine every time!" is the bagger's creed. He is insatiable. Each new conquest serves only to whet his appetite for what he regards as his predestined Larger Number of carrier landings.

No particular physical appearance marks the bagger. His coloring and

EUGENE ELY was the first bagger in history. His successful landing of a Curtiss biplane on the "flight deck" of the cruiser *Pennsylvania,* January 18, 1911, marked the advent of the tailhook era in Naval Aviation. That arrested landing also gave rise to a powerful struggle which has run unchecked for more than 40 years, a struggle which today threatens the very livelihood of unwary Naval Aviators everywhere.

In pioneering the arrested carrier landing, Eugene Ely was also the first exploiter of Bagmanship. He, in fact, had a unique monopoly on carrier landing operations (being the *only* qualified pilot) which lasted for several weeks, a feat that many a pilot has tried unsuccessfully to emulate through the years. Beyond a doubt, Ely was the Grand Master Bagger. Monopoly was the secret of his success, and it is still the secret in this decade.

'His habitat is the open sea.'

'Sympathy is what a bagger craves.'

garb tend to blend with those of the other aviators around him (except when the costuming techniques of Bagmanship are in play, as will be touched upon later.) His voice call is distinct, however, both for its frequency and content. Baggers tend to be very loud, very quiet, or very senior. Invariably the bagger's cry is low; that is to say, it deals with lowness—*his* lowness—*in carrier landings.* The bagger argues long and loud to anyone who will listen to him (and especially to the Schedules Officer) that he is *low* in carrier landings—low for the month, low for the cruise, low for the training cycle, or low for the tour. W. J. Scott-Bagdabatch, a past master, successfully argued "low for the career" when he set his record in the late Fifties.

It can be seen that sympathy (based on lowness) is what a bagger craves—sympathy and inconspicuousness. Proficiency pilots who return to Fleet squadrons after a period of Beechcraft flying become naturally suspect, deserving as they are of sympathy and lacking as they are in recent carrier experience. Patrol plane pilots, newly beginning tours in carrier squadrons, are prime suspects, too. While rarely inconspicuous, they resoundingly meet the other special qualifications.

Landing Signal Officers come as close to being *natural-born* baggers as any bird going. Clearly the LSO deserves sympathy, both for what he is and for what he does. He is always low in flight time, and is usually near lapsing in day or night carrier qualification. He is often *urged* by the Commanding Officer to leap into an airplane for a few turns around the pattern "just to keep him even." Here is Bagmanship at its subtlest.

If one is to keep alert to the workings of Bagmanship, one must never overlook the squadron's Operations Department. Being schedule-maker as he is, and being senior as he is, the Operations Officer often becomes addicted to bagging without realizing it. Then, to cover his own weakness, he draws others in his department around him and they begin to dominate the schedule. He does. They do.

Other department heads and the Executive Officer must be closely watched as well. Here, inconspicuousness, seniority, and sympathy blend to make a dangerous combination. Busy as these birds usually are, the shipboard environment (or even the possibility of it) interrupts their flock-tending and demands their participation in the joys of flight and the landing therefrom.

A common fallacy in cursory examination of the problem of Bagmanship is to rule out the newly-winged aviator as a bagger. While he is too junior to effectively dictate the schedule, and while he generally is a walk-aboard for carrier qualification periods, his limited experience and urgent need of training earn him an inestimable amount of sympathy. He usually has some difficulty in early carrier work, necessitating immediate build-up landings and frequent refreshers. Or if he turns out to be a smooth, competent carrier pilot, the old hands insist on flying him more to watch for the bad habits he is sure to develop. Either way, the young aviator is likely to be an accomplished bagger. Mute testimony to the unvarying success of gentle Bagmanship is the fact that the young ones are rarely exposed.

One is naturally led to ask at this point: Is the bagger a good pilot? The answer is difficult. Inevitably, one must conclude that the bagger is a preeminently successful carrier pilot. He is usually pretty darn good. About as good as they come (allowing for inter-Fleet comparisons). But he doesn't *look* that good around the ship. Remember that Bagmanship thrives on sympathy. A string of "O.K." passes might well jeopardize the bagger's needy status.

The accomplished bagger rarely flies two "O.K." passes in any one week. He will never leave the onlooker with any doubt as to the eventual outcome of his approach, but he must give the LSO something with which to debrief him. Some small correction, so that he can quietly reply, "I'll work on that next time." For there will always be a next time in applied Bagmanship. (The present writer has always favored the "fair pass, came back left and a little late line-up" or the "high start, late set-up" gambit. On the other hand, J. Fowler Hazalot, the illustrious craftsman of West Coast fame, has worked the "wavy line and PNUAR" [Pull Nose Up At Ramp] ploy successfully for several months.)

Whatever else can be said about the bagger, it must be acknowledged that he is an outdoorsman who loves to feel the wind in his face—about 30 knots, right down the angle.

Clothes make the bagger. This tru-

'I've got more time at cut. . . .'

ism derives directly from the sympathy requirement elucidated earlier. The discerning anti-bagger will note that the bagger's costume generally is calculated to make him appear both deserving and inconspicuous. If the squadron as a whole wears fresh orange flight suits, the bagger will appear in the Ready Room in a soiled tan one, reminiscent of Ely's tattered coveralls. If shined flight boots are the norm, the bagger will be shod in scraped field shoes or even flight deck shoes, the old-fashioned brown ones.

Conversely, if the squadron tends to exhibit well-used flight gear, the bagger will apologetically appear in a dazzling new flight suit and shined boots in an effort to appear untried and insecure. But ready. Most baggers sleep in full flight gear, it is suspected, so as to be ready to man aircraft at a moment's notice. The reader is referred to Willy C. Echo's book *The Double Centurion* for autobiographical material on refinement of costuming techniques to include hardhat-battering and hair-styling.

"I've got more time at the cut position than you have total flight hours" —this was R. F. Craig's rallying cry at the Bagger's Convention in 1955. While the slogan is incredible, its message is clear. Baggers are birds driven by forces beyond control. What are simple everyday decisions to the unwary become critical pawns in the Great Game of Bagmanship. Consider, for example, the choice of seats in multi-piloted carrier aircraft. No bagger could long operate by assuming permanent occupancy of the left seat *unless*, of course, the copilot were not yet carrier-qualified. Rotation between seats tends to be the Fleetwide practice *unless*, of course, a copilot who is not carrier-qualified can be snagged. Unpalatable as rotation may be to the bagger, he learns to work even this untoward circumstance to great advantage *unless*, of course, his copilot is, in fact, not experienced enough to fly a crew aboard.

Even a flyaway to the beach is important to the true bagger. Highly unlikely, but always possible, is the necessity of returning to the ship with some emergency for an immediate landing. A bagger thinks ahead.

It has been said, and truly, that the longer the flight the less interested the bagger. Frequency of landings is important in Bagmanship, and, frankly, the four-and-five-hour flights are a drag. Refresher landing periods, mail runs and flyouts are the bagger's delight *unless* he is trying to bag flight time, too. Flight time bagging is beyond the scope of this paper.

One further point needs to be cleared up. Despite his desire for anonymity, every bagger needs another bagger or two around him, preferably amateurs. The true bagger knows if he can clamor loudly over the more obvious efforts of another pilot to get ahead in the landing game, his own program is more certain to succeed. He needs a target for the generation of a personal smokescreen. The author has, on occasion, witnessed the futile efforts of two Master Baggers to outmaneuver one another. While this awkward encounter is in progress, no one can discern the Past Master Bagger quietly about his business.

In reviewing the salient points of the analysis here completed, one can only give tribute to the civilian whose dedication and perseverance gave the world the rudiments of Bagmanship. Whether or not one shares the drive toward arrestment which he fathered, one must acknowledge the consummate skill with which Eugene Ely hoodwinked the world and became for a time the only bagger in the race.

(Editor's Note: Any resemblance of any descriptive material to any Naval Aviator, living or otherwise, is purely coincidental. Author and editor hide behind the only defense in a libel action: the truth.)

AUTHOR HOLCOMB'S *own squadron offers visual proof of Bagmanship. Top photo shows VS-35's C.O., Cdr. C. S. Williams, handing symbolic bag to Lt. C. E. Williams after the latter bagged his 200th landing in USS Hornet. Lower photograph shows Lt. Williams sandwiched between Cdr. Hubler and Cdr. Zeigler, only other members of the Hornet's Double Centurion Club. Latter two, now attached to the carrier as ship's company officers, may get the chance to reach the 300-landing mark. "Department heads and the X.O. must be watched closely . . . inconspicuousness, seniority and sympathy blend to make a dangerous combination. . . ."*

FLORIDA SKYDIVERS' RECORD JUMPS

TED SERGENT, *first to land, was closest to the target—within 75 yards of dead center.*

FLORIDA JUMPERS *Ted Sergent, center, and Sheila Kavanaugh, Wave, broke local records.*

By Marc Whetstone, J01

SEVEN MEMBERS of the Jax Navy Sport Parachutist Club soared through cloudless skies September 8 and unofficially set two Florida state high altitude jump records.

Future skydivers out to break the men's jump record in the Sunshine State will have to travel upward in excess of 24,964 feet. Women are faced with an altitude greater than 20,764 feet.

The women's record was set by Sheila Kavanaugh, RM1, assigned to NAS communications. Accompanying the Wave chutist on her jump was Robert Etheridge, an airman, first class with the Air Force's 679th Squadron based at Jax. He was the first male skydiver in Florida to exceed the Deland, Fla., Falling Angels Parachute Club record of a reported 19,600 feet.

Etheridge's record stood only about 26 minutes, however, as five remaining Jax parachutists reached the near 25,000-foot height and began their descent.

Leading the group was club president Miles Gibson, AO1, of VP-30. Following him were Harry Wood, PR2, from VA-44; Rick Marini, HM3, from the dispensary, NATTU, Jax; Larry Parmer, AE3, also from VP-30; and Ted Sergent, PR1, from VF-14, NAS CECIL FIELD.

Like the two jumpers before them, the five-man team went into a free fall which lasted two minutes. They were travelling at better than 200 mph when they pulled their ripcords. Although Gibson was the first to leave the aircraft from the record height, Sergent was the first to land.

The C-117 which carried the jumpers was piloted by LCdr. John Brown, Jax recruiting officer, and was copiloted by Ens. William E. Bronson, a replacement pilot undergoing training with Patrol Squadron Thirty at Cecil Field.

HOW IT LOOKS *from 25,000 feet over Jacksonville is studied by the sport parachutists.*

THE JUMPERS *are each equipped with helmet, hightop boots, sun and wind glasses, and oxygen supply. Left to right are Wood, Sergent, Marini, Parmer, Gibson, Etheridge, and Kavanaugh.*

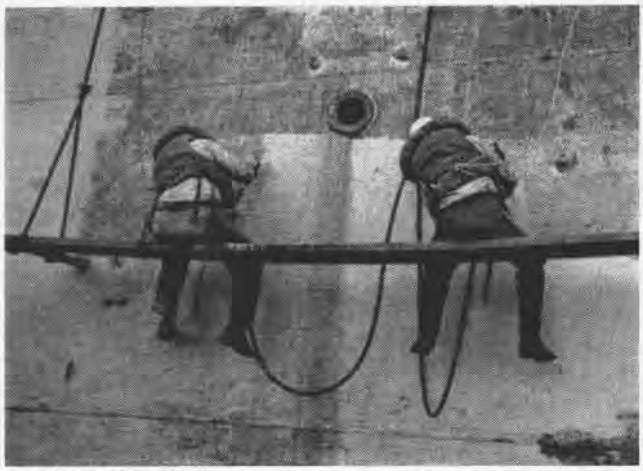
THE POETRY OF A SHIP IN DRY DOCK

ON A MISTY MORNING *in April three yard workers watch USS Lake Champlain (CVS-39) move into dry dock at Boston Navy Shipyard for a four-month overhaul. Photographs were taken by Daniel Bransford, PH2, based aboard the 40,000-ton anti-submarine aircraft carrier*

By D. H. Boxmeyer, J03

IF STEEL could feel, the aircraft carrier USS *Lake Champlain* would have howled; she would probably have cringed at the welder's hot touch, and shrugged off the intravenous lines and hoses sharply needling her exposed side.

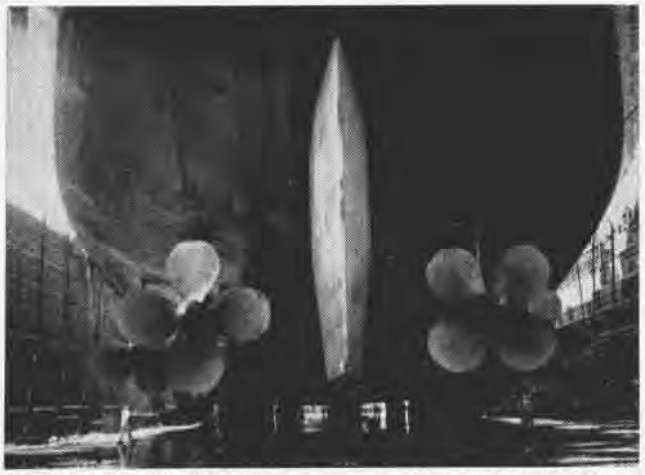
Slung in the dry dock at Boston Naval Shipyard, the 40,000-ton ship looked awkward and disabled. Scaffolds and platforms lined her sides, cargo nets hung in corners for the men who chipped and scraped her paint, and her flight deck was littered with tools,



DOWN TO THE METAL, *chippers hammer and scrape away sea-worn paint from side of CVS-39. They remove hundreds of pounds each day.*

SAFETY-CONSCIOUS CHIPPERS *are lashed to their staging, wear goggles to protect eyes from flying chips of paint. Pulled-down hats protect hair.*

THERE'S NOTHING MUSICAL *about an air hammer as Yeoman Third, Gary White, finds out. Work must be done despite unnerving noise.*



WORKERS ARE DWARFED *by the huge cloverleaf props and rudder of Champ as arrangements are made to start sandblasting her bottom.*

boxes, boards and wire cable. Down in the dry dock area, men were calmly sandblasting her skin. In the hangar bay, other men were finishing the removal of a large section of deck.

For four months, from April to August, *Lake Champlain* silently consented to the operation. In the dry dock at South Boston annex, and at pierside at the main Navy Yard at Charlestown, the carrier was the workshop of hundreds of civilian yard workers and the home of many weary sailors. As the tick-tick-tock of the stateroom clock dragged along the calendar of days, it was drowned by the incessant tap-tap-tapping of the wrist-weary chippers.

And who were the chippers? They were the men who crawled in corners, hung in cargo nets, and climbed bulkheads to scrape, hammer and chip away the tired, caked paint.

How much paint did they chip away? The carrier's Damage Control Assistant, Lt. R. F. Erni, estimated 60 tons. He weighed a one-foot square sample of the paint and found it to be 12.5 ounces and this represented an average of 32 coats of paint. The chippers found some areas sporting an estimated 80 coats of paint which, when pealed, revealed old battleship gray not used since 1946.

"Of course, the average 32 coats does not represent the whole ship," Lt. Erni said. "Most exposed, heavily-weathered areas had one or two coats of recent paint. The overall average is high because of places often painted but seldom chipped." This information was contained in a report to the carrier's C.O., Capt. Andrew L. Burgess.

The ship's work went on. Harried yeomen were sometimes driven from their offices as the air hammers and paint chippers pounded. Conversations were shattered by sonics and men made a fad of cotton-battened ears.

Hardest hit were the hardy ship's quartermasters who suddenly found themselves reacting to the immobilized ship as a fish yanked from water. During the dry dock period, many were sent to schools, and some time was filled by on-the-job training with the mechanical aspects of the rate.

"But," said William F. O'Brien, QM3, "no matter how much we train, there usually comes a time when the inactivity gets us. I don't think any of us can stay in port very long without wishing we were at sea again. After all, that's our real job."

Eventually, the dry dock period came to an end and *Lake Champlain* was ready for sea again. She sports a new coat that covers considerable improvements to the ship's interior, making her more efficient, more functional, more modern, more habitable.

As the ship returned to sea, those aboard regained serenity. The chippers were silenced, at least temporarily, and the only intrusion comes from the carrier's intercom: "Now hear this. Now hear this. All hands turn to. Sweepers, man your brooms, clean sweepdown fore and aft. . . ."

A CIVILIAN WELDER *closes a hole in the hull, cut for access to obscure voids.*

THE AUTHOR INSPECTS *Champ's 15-ton starboard anchor resting on bottom of dry dock.*

AIR SHOW MARKS WEYMOUTH ANNIVERSARY

Several hundred thousand people helped Naval Air Station, South Weymouth, celebrate its 10th anniversary on the weekend of Sept. 14-15. The visitors, mostly from the New England area, saw a spectacular exhibition of modern aviation which featured static displays in the huge hangar, aerobatic flights by expert civilian pilots and impressive demonstrations by the Navy's 'Chuting Stars' and 'Blue Angels.' One of the country's biggest annual air shows, South Weymouth's Open House entertained viewers and gave them a good look at Naval Aviation.

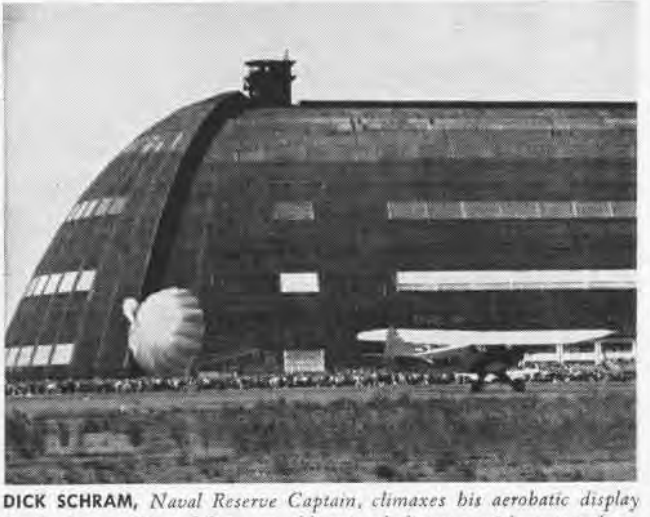
THE BLUE ANGELS *streak by at low altitude in a perfect six-plane formation. Feature performers wherever they appear, the Blue Angels climaxed each day's flight demonstration program at Naval Air Station, South Weymouth, with their awe-inspiring aerial tactics.*

OPENING DAY *ceremonies featured a parade of the colors, high school and Navy bands.*

CHUTING STAR *makes perfect descent to land in front of throng at South Weymouth.*

THE STARFLIGHTS, *Navy's rebound tumbling team, performed each day at the air show.*

THE CHUTING STARS *line up in front of their Skytrain. A few days later at the Oklahoma State Fair, they made their 5000th jump.*



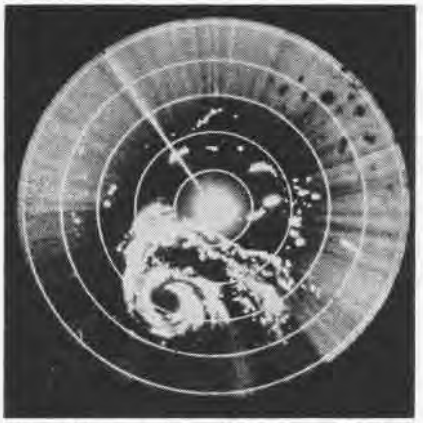
DICK SCHRAM, *Naval Reserve Captain, climaxes his aerobatic display by landing a Piper J-3 in an abbreviated distance with a parachute.*

THE INCREDIBLE *Bevo Howard, a civilian pilot, flies his inverted Jungmeister to pick off the lower of two ribbons held by poles.*

BILL FORNOF, *also a civilian pilot, thrilled the Weymouth crowd with aerial maneuvers in an ex-Navy fighter, the F8F Bearcat.*

VW-1 HUNTS TYPHOONS IN THE PACIFIC

VW-1 EC-121K'S *are equipped with special radar gear, can track storms at night. In 1962, the squadron located and tracked 24 typhoons, made 216 weather flights, logging some 2180 hours.*



THE 'EYE' *of typhoon Olive, an early 1963 storm, appears on the airplane's radar scope*

CHINESE LITERATURE calls them, quite simply, "great winds," but typhoons deserve a more awe-inspiring definition. They strike with relentless violence, leaving in their wake a swath of destruction, death and injury. As a force of nature they cannot be controlled although units like Airborne Early Warning Squadron One at NAS AGANA, Guam, commanded by Cdr. Ralph N. Dannettell, Jr., do their professional best to prepare people for the onslaught. Last November's typhoon *Karen* demonstrated the need for VW-1 and its mission in the battle against the "great winds."

Three days prior to *Karen's* arrival, the Joint Typhoon Warning Center (JTWC) on Guam alerted VW-1's *Typhoon Trackers*, the only Navy weather air reconnaissance group in the Pacific. Immediately, *Warning Star* EC-121K's proceeded to the Truk-Ponape area, 500 miles southeast of the island and began plotting *Karen's* "eye," storm pattern, direction and speed. JTWC issued warnings.

Equipped with special radar gear capable of tracking storms at night, VW-1 flew 'round-the-clock. The flow of data indicated that *Karen* would be Guam's mightiest typhoon.

Alert Condition One was set on November 11th. Island personnel readied their homes, stored loose equipment and brought supplies to typhoon-proof buildings where they would wait out the storm. VW-1 moved its planes from Guam but continued surveillance and had one aircraft high above the island to observe *Karen* as she struck with winds increasing from 58 to 200 mph. Later the next morning, the bulk of her fury released, Guam was left in shambles. Nine people died, hundreds were injured and damage in the amount of 200 million dollars was incurred.

Despite the devastating effect, Guam's 76,000 civilian and military personnel considered themselves lucky. VW-1's hard-working crews had accurately predicted the typhoon and her probable effects.

Officials stated that without these warnings of *Karen's* approach an incalculable number would have perished.

SENIOR *weather reconnaissance officer of VW-1, LCdr. John W. Kidd, and an enlisted aerographer's mate plot data of Pacific typhoon.*

'TYPHOON TRACKERS' *hangar area was not exempt from Karen's attack. The 200-mph winds left 45,000 people on island of Guam homeless.*

USS ENTERPRISE *(CVAN-65), the most powerful aircraft carrier, operates here with the nuclear-powered missile cruiser USS Long Beach (CGN-9) while in the Mediterranean. The nuclear-powered aircraft carrier is the first and only such carrier in any Navy of the world*

Evolution of Aircraft Carriers

CVA'S BUILT TO MEET MODERN NEEDS

'Events of October 1962 indicated, as they had all through history, that control of the sea means security. Control of the seas can mean peace. Control of the seas can mean victory. The United States must control the seas if it is to protect our security and support those countries which, thousands of miles away, look to you on this ship and the sister ships of the United States Navy.'—President John F. Kennedy, addressing the crew of USS *Kitty Hawk* (CVA-63) on June 6, 1963

By Scot MacDonald

THE DRAMATIC EVENTS of October 1962 to which President Kennedy referred were the missile build-up in Cuba and the immediate U.S. reaction to this threat. This was one of a series of incidents occurring since World War II that endangered the democratic way of life, incidents effectively neutralized by the presence of powerful U.S. carrier forces in the area.

The versatility of the current U.S. carrier fleet is largely due to the operation of what the press has labeled "super-carriers," heavy duty aircraft carriers of the size, power, and potency of the *Forrestals* and the nuclear-powered *Enterprise*. They had a difficult birth.

In April 1945, owing to lessons learned from their experience in combat, Carrier Task Force Commanders requested heavier and larger aircraft to accomplish war missions. An informal board was appointed to consider the carrier requirements of the U.S. Navy. The hulking CVB's of the *Midway* class, which were readying for commission and combat duty, provided a stopgap supply to the needs of the Task Force commanders. The Ship Characteristics Board made various studies of the problem, and it was decided that the project should be made a design study for the 1948 shipbuilding and conversion program. Given the designation "6A Carrier Project," one of the carriers was slated to be built in the 1949 construction program.

Between 1945 and November 1948, some 78 different designs were made before final acceptance. On June 24, 1948 Congress passed the Naval Appropriations Act of 1949. This provided funds for construction of the carrier. The contract was awarded Newport News Shipbuilding and Dry Dock Company.

In the planning stage, the new carrier was to weigh 65,000 tons and have a 1030-foot flight deck, a 130-foot waterline beam, and four catapults. Architects went back to original *Langley, Ranger* and *Long Island* designs by sweeping the flight deck clear of an island structure. Instead, the carrier was to have had a small island on an elevator apparatus, to be lowered during flight operations. This was one

answer to a BuShips objection to the flush deck design, predicated on the fact that a satisfactory method of disposing of stack gases had not been developed.

All elevators were to be along the sides of the ship, with a large elevator at the extreme after end of the flight deck. Added strength of the flight deck was to be made possible by reducing the openings in the hangar sides, so that the ship, from the keel to the flight deck, could be considered as a unit, from the standpoint of strength. This would permit the operation of aircraft well over 100,000 pounds. Adm. Marc Mitscher greatly influenced formation of the project, having been one of the Task Force commanders who recommended heavier, more versatile carrier aircraft.

In July 1948, construction of the carrier was approved by Congress and President Truman. In March the following year, the President authorized the name for the new carrier; when commissioned, she would become USS *United States* (CVB-58).

The events of April 1949 occurred with stunning swiftness and to this day are subject of discussion in some military and political circles. On April 13, funds were approved by the House of Representatives. Two days later, Secretary of Defense Louis Johnson wrote to General Eisenhower, then temporary presiding officer of the Joint Chiefs of Staff, requesting that the Joint Chiefs review the need for a new aircraft carrier. At that time, criticism of the entire concept of carrier warfare was again voiced by some military leaders. The carrier's keel was laid at Newport News on April 18. On April 23, the views of the Joint Chiefs were sent to SecDef and on that same morning Secretary Johnson ordered work on the carrier stopped. Secretary of the Navy John L. Sullivan resigned in protest the next day.

There was no new carrier construction in 1950. However, mid-year events caused Navy planners again to renew requests for heavy-duty carriers. On June 25, 1950, North Korean forces invaded the Republic of Korea. Two days later, President Truman announced he had ordered sea and air forces in the Far East to give support and cover to Republic of Korea forces and ordered the Seventh Fleet to take steps to prevent an invasion of Formosa. On July 3, carrier aircraft went into action in Korea. USS *Valley Forge*, with Air Group Five, and HMS *Triumph*, operating in the Yellow Sea, launched strikes on airfields, supply lines and transportation facilities around Pyongyang, northeast of Seoul.

On July 12, 1951, the Navy Department announced a contract for a new large aircraft carrier (CVB-59), to be built at Newport News. On July 30, Congressional action approved the contract. A joint resolution from Capitol Hill proclaimed:

"Be it resolved that when and if the United States completes construction of the new aircraft carrier known as the *United States*, the construction of which was discontinued April 23, 1949, or the aircraft carrier authorized in Public Law 3, Eighty-Second Congress, first session, it shall be named the *Forrestal*."

At Newport News, the new carrier was designated Hull Number 506. Her keel was laid on July 14, 1952.

Mr. Charles P. Roane, Supervising Naval Architect, Aircraft Carrier Type Branch, BuShips, commented on the *Forrestal* in the November 1952 issue of BuShips *Journal:*

"The *Forrestal* incorporates all of the developments from the other carriers, plus those learned from the *United States*. The increase in size of the *Forrestal* over the *Midway* class comes about as a normal development in aircraft carrier design. With four catapults instead of the usual two and four airplane elevators instead of the usual three, aircraft operations from this ship will be greatly improved.

"The new design was planned to meet added requirements, such as the servicing and starting of jet aircraft, maintaining the electronic appliances on the aircraft in a ready-to-go condition while the plane is on the deck, blending of aircraft fuels to get a fuel which can be used in jets without sacrificing the gasoline capacity, and a flush deck where the navigating bridge can be lowered or raised to suit operating conditions. Stacks comparable to the *Ranger* will be used. New type steels, the result of years of development, will go into the construction."

THE FIRST *of her class, Forrestal profited from lessons learned from post-war designs, particularly from the cancelled CVB-58.*

A CRUSADER *is launched by a powerful catapult system installed in Forrestal. Angled deck resulted from experiments in USS Antietam.*

USS SARATOGA, *sister ship to CVA-59, was designed to have greater hp than Forrestal.*

The flush deck design barely left the drawing board before it was changed. This design was advanced to provide optimum landing area and to eliminate the hazard of island superstructure offered by the axial deck. At the end of W.W. II, however, the British developed the angled deck concept and operated lightly constructed twin-engine attack planes from the marked-off deck of a British carrier. U.S. Navy pilots conducted similar test on the *Franklin D. Roosevelt* and the decision to modify the flight deck of a U.S. carrier was made. Accordingly, the *Antietam* was reconfigured, landings and takeoffs were made using a variety of aircraft, and a final detailed report on the evaluation of the "canted" or angled deck revealed that the operational trials met with a high degree of success. As a result of these experiments, the Navy ordered a redesign of the deck and operating arrangements on the *Forrestal* and all future carriers, as well as reconfiguring many of the existing carriers during scheduled modernization periods.

When Secretary of the Navy Dan A. Kimball announced the awarding of a contract to Brooklyn Naval Shipyard for the construction of USS *Saratoga* (CVA-60), he said it would be similar to the *Forrestal*. But design improvements in machinery since *Forrestal* installation were ordered to give *Saratoga* a somewhat higher speed.

"The importance attached to this carrier [*Saratoga*] by the Navy Department," Secretary Kimball said, "is emphasized by the Navy's sacrifice of other combatant ships in the 1953 program in order that a second large carrier can be added to the Fleet.

"Although the ships sacrificed are urgently needed to augment the battle readiness of the Fleet, the Navy decided that the need for the large aircraft carrier is even more urgent in terms of national security."

Forrestal was launched on December 11, 1954, and christened by Mrs. James Forrestal. The ship was commissioned at Norfolk Shipyard on October 1, 1955. The carrier had an overall length of 1036 feet, a width of 252 feet, and nearly four acres of flight deck. She displaced 59,650 tons and had a horsepower rated over 200,000, and a speed over 30 knots. Four steam catapults were installed. She had a complement of 3500 officers and men, including the air group.

Assistant Secretary of the Navy (Air) James H. Smith, Jr., spoke at the commissioning ceremonies. "If our way of life is to survive," he said, "we must maintain these two alternate military postures: the first is to maintain a powerful and relatively invulnerable reprisal force which will signal a potential enemy to stop, look and listen before he risks an all-out atomic war. The second is to insure that we ourselves will not be forced to change the character of a limited war because of fear of ultimate defeat in a series of them. Fortunately, we need not maintain a completely separate set of forces for each posture. In this ship and the variety of aircraft she can service we combine the two, and we add the multiplier of the ability to appear quickly at any one of the many far-flung trouble spots. This is economy of force, achieved without sacrifice of our objectives."

USS RANGER'S *after flight deck was altered slightly to provide a longer overall length.*

USS *Saratoga* was christened at New York Naval Shipyard on October 8, 1955. A few token feet of water were splashed into the new ship's dry-dock to "launch" her officially. She was essentially similar to *Forrestal* but was designed to develop considerably more horsepower. She was commissioned April 14, 1956.

Sister ship *Ranger* (CVA-61) had one outstanding exception to distinguish her when she was commissioned August 10, 1957. The angle of the after flight deck was altered slightly, giving her an overall length of 1046 feet, as compared to the 1039 of *For-*

USS INDEPENDENCE *was commissioned at New York Naval Shipyard, the fourth aircraft carrier of the Forrestal class. This aircraft carrier had increased arresting gear capability installed.*

restal. Another innovation, an all-welded aluminum elevator, was installed on the port side, replacing the conventional steel types used on other *Forrestal*-class carriers. To expedite her building, work was started in a smaller dock. About four months later, when the *Forrestal* was launched, the partially completed *Ranger* hull was floated into the larger facility.

CVA-62, the USS *Independence*, was constructed in Drydock 6 at New York Naval Shipyard, her stem at the head of the drydock to facilitate material delivery over a truck ramp leading from the head of the dock to the hangar deck at the stern. The island and associated sponson were not installed in order to avoid blocking off the large travelling crane. In August, the extraordinarily complex job of transferring her to Drydock 5 was accomplished smoothly and efficiently.

Independence was commissioned at the New York Naval Shipyard on January 10, 1959, the fourth carrier of the *Forrestal* class to join the Fleet.

Kitty Hawk (CVA-63) and *Constellation* (CVA-64) were essentially designed along the *Forrestal* lines but developed into a separate class, the *Kitty Hawk* class. The major difference is missile capability. Both CVA-63 and -64 are armed with *Terriers*. The fuel capacity in the *Kitty Hawks* is a little greater than the *Forrestals*, while avgas capacity is a little less. The angled part of the flight deck is some 40 feet longer and the catapults and elevators have greater capacities. USS *America* (CVA-66), now being built at Newport News, will have an even longer angled deck than any of the predecessors. Placed in the *Kitty Hawk* class, she is scheduled to be completed in late 1964.

USS KITTY HAWK, *with Terrier missile capability, became the first of a new class CVA.*

On February 4, 1958, Secretary of the Navy William B. Franke announced that the world's first nuclear-powered aircraft carrier was to be named USS *Enterprise* to perpetuate the WW II carrier and her six predecessors. On that same day, the keel of the carrier was laid at Newport News.

On September 24, 1960, Adm. Arleigh Burke, then CNO, delivered an address during launching ceremonies, in which he described the new carrier.

"This new *Enterprise*, the largest ship ever built, of any kind, by any nation, will be the eighth Navy ship to proudly bear that name. Her forbears have left an enviable record, a record of courageous, distinguished service.

"We are looking at a major advance in the art of nuclear engineering. . . . The problems which were solved, the know-how that was developed in order to build this ship, represent a tremendous contribution to our knowledge of the military and industrial uses of nuclear energy.

"Her eight powerful nuclear reactors would enable the *Enterprise* to cruise 20 times around the world without refueling. Her great endurance and her advanced hull design would allow the ship to make this extraordinary journey at sustained high speed, exploiting to its utmost the seagoing advantage of mobility."

From the very first, it was obvious that designers and builders of Newport's hull No. 546, the *Enterprise*, had hit the jackpot. For the first time, RAdm. F. S. Schultz, Assistant Chief BuShips, noted the customary builder's trials of a major combat ship were eliminated, and the ship was presented to the Navy for acceptance trials on her first trip to sea.

Enterprise returned to the shipyard after her six-day Navy acceptance trials in the Atlantic. A giant broom

USS CONSTELLATION *(CVA-64), sister ship to Kitty Hawk, fires a Terrier missile. Basic design of the Kitty Hawks is of the Forrestal class. The angled area of flight deck is some 40 feet longer than the Forrestals, and catapults and elevators installed have greater capacity.*

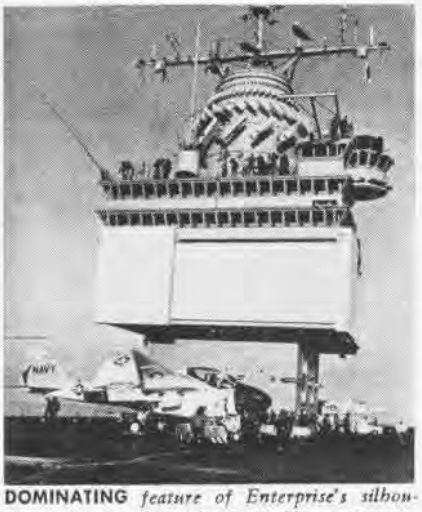
was affixed to her masthead to signify a clean sweep of the trials. Capt. W. M. Ryan, President of the Naval Board of Inspection and Survey, stated:

"The ship generally performed in an excellent manner. The cleanliness and upkeep were outstanding. The fine workmanship throughout the ship reflects great credit upon all hands concerned with its building. Like all new ships there are bugs which must be worked out, but we feel that there is nothing that cannot be overcome."

The plant for the nuclear-powered aircraft carrier was designed under supervision of VAdm. Hyman Rickover.

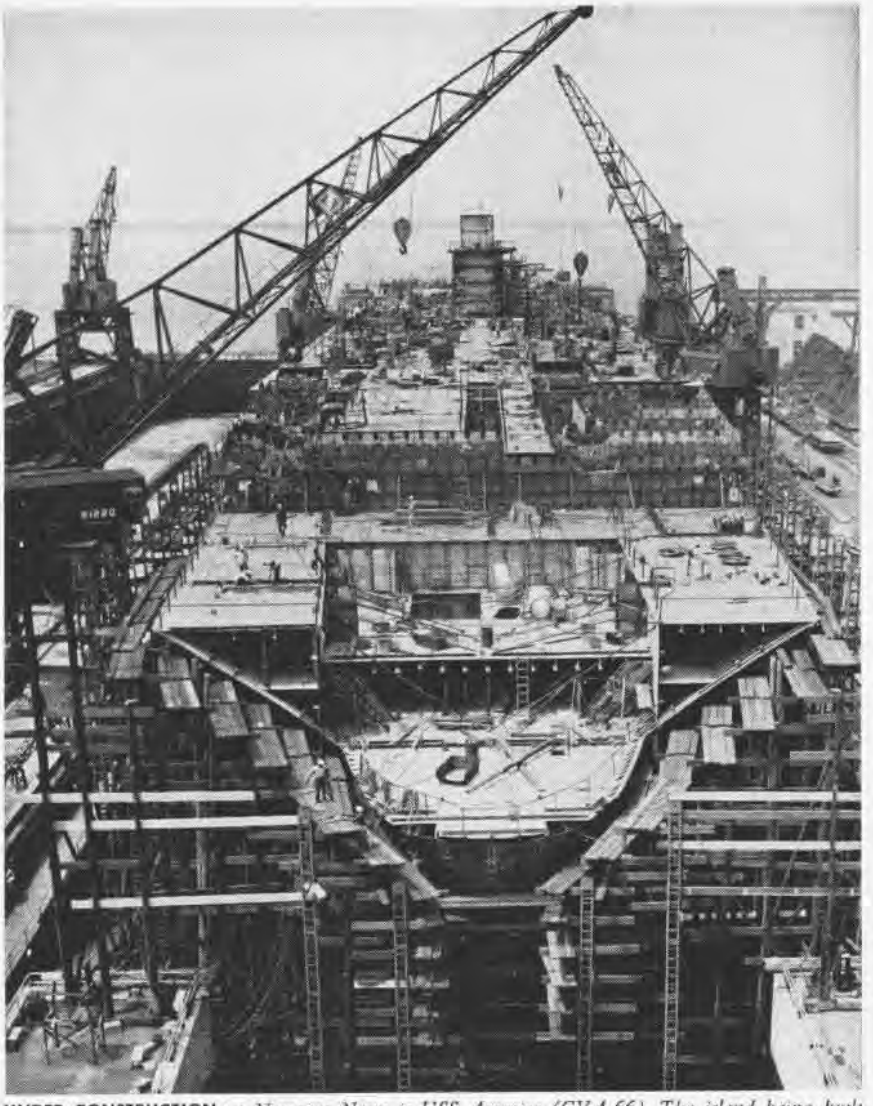
Designated CVA(N)-65, *Enterprise* was commissioned on November 25, 1961, at Norfolk, with Capt. V. P. dePoix commanding. The world's first nuclear-powered carrier has a length of 1040 feet between perpendiculars and an extreme breadth of 252 on the flight deck. Each of the four deck-edge elevators cover about 4000 square feet. *Enterprise* is the first carrier to have elevators for pilots in lieu of escalators. She displaces 85,350 tons.

The communications equipment on the carrier is believed to be the largest assortment ever assembled on any ship. Besides more than 1800 telephones, there is the complexity of numerous



DOMINATING *feature of Enterprise's silhouette is her box-like island, prickling antennae.*

radio circuits, teletypes, a pneumatic tube arrangement to carry messages from one station to another, and numerous announcing systems, several of which have speakers throughout the ship. She is the first ship of the U.S. Navy's Atlantic Fleet to have the Navy Tactical Data System installed.



UNDER CONSTRUCTION *at Newport News is USS America (CVA-66). The island being built midships, will be moved to the starboard side of the carrier when sponsons are attached to hull.*

The *Enterprise* is equipped with four type C-13 steam driven catapults with an energy potential of 60,000,000 foot-pounds. With this power, an aircraft weighing 78,000 pounds can be accelerated to 160 mph from a standing start, in a distance of 250 feet. All of the aircraft aboard can be launched at the rate of one every 15 seconds while using all four cats.

The size of *Enterprise's* island structure was dictated by the size of the two radar screens that flank each of its four sides. This newly developed radar system is the most powerful to be installed on a floating platform, according to Capt. de Poix. Its far-reaching, three-dimensional capability is enhanced by its height above the water line. The silhouette is distinctive.

"Propulsion and control characteristics of the ship offer great tactical flexibility," said Capt. de Poix in mid-1962. "There are four rudders, one almost directly astern of each propeller. This provides excellent maneuverability at all speeds as well as tactical diameters in turns which compare with much smaller ships. . . .

"Her ability to launch a strike on the enemy from one position, recover, and launch another 24 hours later from an unpredictable position more than 800 miles away from her previous strike position will constantly be a factor in causing the enemy to utilize protective forces that could be deployed elsewhere.

"If a show of force is required, *Enterprise* can be on distant station in a shorter period of time than any other ship in the Fleet."

MOREST Use Frequent

Records Made at Kaneohe, Atsugi

Marine units at Kaneohe Bay, Hawaii, and NAS ATSUGI, Japan, are successfully using Mobile Arresting Gear (MOREST) equipment designed to stop jet aircraft on short runways.

Second Lt. Douglas O. Barber of VMF-212 made the 10,000th "trap" at Kaneohe in an F-8B *Crusader* last August. The MOREST unit of MABS-11 in Atsugi chalked up its 25,000th "trap" when 1st Lt. Thomas M. Gibson of VMF(AW)-542 landed his F-6A *Skyray* recently. According to GySgt. Warren C. Smith, this is an all-time record for Marine Corps MOREST units. He also stated, "We are using the same equipment which was originally assigned to MAG-11 in the fall of 1958."

VW-11 Wins High Honors

Recognized by AirLant and Lockheed

Airborne Early Warning Squadron Eleven has been designated winner of the Lockheed "Meritorious Squadron Award" for excellence during the past fiscal year and has also been recognized by the Commander, Naval Air Force, U.S. Atlantic Fleet, for meritorious achievement in aviation safety.

The ComNavAirLant Safety Award certificate, signed by VAdm. Frank O'Beirne, stated that for Fiscal Year 1963, VW-11 had conducted its operations without a major aircraft accident.

Capt. W. J. Scarpino, Commander Airborne Early Warning Wing Atlantic, presented the award to Capt. J. J. Coonan, VW-11 C.O., at ceremonies held at NS ARGENTIA.

In FY 1963, VW-11 crews flew a total of 12,941 accident-free hours in the Lockheed *Super Constellation Warning Star* from Keflavik, Iceland, thereby providing a seaward extension of the Distant Early Warning Line.

Distinctive Mission Ends

VR-22 to Operate from Rota, Spain

As summer came to a close, a distinctive mission of Air Transport Squadron Twenty-Two ended. For the last 11 years, VR-22 has been flying to Port Lyautey, Morocco, supplying the Fleet with strategic supplies and delivering personnel and dependents to their overseas bases and returning personnel and cargo to the States.

The monthly schedule of VR-22 usually included daily flights leaving for Port Lyautey. Since the majority of United States Military Bases in Morocco are being closed and those remaining in operation are participating on limited scale, the commitments of VR-22 require the once scheduled Port Lyautey trips to land in Spain.

VR-22 will be operating at NS ROTA, on the southern coast of Spain, and Torrejon AFB, near Madrid.

PIASECKI'S SEAGEEP, *powered by Airesearch's 331-6 turbine, has been tested on Chesapeake Bay. The final phases of the flight test were performed at NATC Patuxent River, Md., with Piasecki's Chief Pilot, Stuart "Tommy" Atkins, at the controls. When taxying on the water, landing or taking off or hovering, the Seageep does not generate spray which would soak the aircraft or impair pilot's vision. Wide-tread floats and low center of gravity stabilize the Seageep.*

Marines Have Flying Club

Operations Started in September

The first Marine Corps-sanctioned private flying club began official operations at MCAS IWAKUNI, Japan, when a member made the initial flight in a Luscombe 8E, 85-horsepower airplane in September. The flight capped nearly a year of planning, spearheaded by Capt. John H. Cathcart, *USN*, station dental officer. Col. M. E. W. Oelrich, then station C.O., helped the club gain official approval.

The single-engine Luscombe was bought in Fort Worth, Tex., for $2600 and ground school instruction, led by club president, Marine Capt. Nick Colangelo, was inaugurated. Of the first eleven men enrolled in classes, nine passed the FAA examination, an above-average percentage.

The club is looking for an additional plane and has also submitted a requisition to BUWEPS for the loan of a T-34.

VP-2'S CREW ONE, *piloted by the #1 man of the squadron, Cdr. W. C. Kistler, won ComFAirWhidbey's quarterly ASW competition. Each member of the area's best aircrew was given his award by RAdm. W. S. Guest.*

Whiting's Division Chosen

Is Prototype for Proteus (AS-19)

NAAS WHITING FIELD'S Quality Control Division played host to two submariners, owing to strong recommendations by BUWEPS and the Special Projects Office. The division, started approximately two years ago, was selected as a prototype to be reproduced on the submarine tender USS *Proteus* (AS-19).

The Quality Control Officers of the tender were indoctrinated into the Whiting division and explored every phase of the quality control set-up. They then returned to Charleston, S. C.

Quality Control Officer at NAAS WHITING FIELD is Lt. R. M. Cleveland.

NAMTRAGRU SETS UP NEW ASE PROGRAM

NAMTRADET 3033 *instructor at North Island, Richard B. Jones, AMS1, points out various parts of a high pressure air compressor used by line operations crewmen at Naval Air Stations.*

A NEW FIELD of maintenance training has been opened by the Naval Air Maintenance Training Group at NAS MEMPHIS. The NAMTraGru, commanded by Capt. Clyde A. Williams, designed the program in an effort to standardize procedures in handling aviation support equipment (ASE). Courses began in October of this year.

Five new NAMTraGru detachments are also being activated to join two already in operation at NAS NORTH ISLAND and NAS NORFOLK. They will be located at Quonset Point, Jacksonville, Alameda, Kaneohe Bay and Pensacola. Instructors for these units are trained by the two original ones and undergo a 60-day syllabus before reporting to the other detachments.

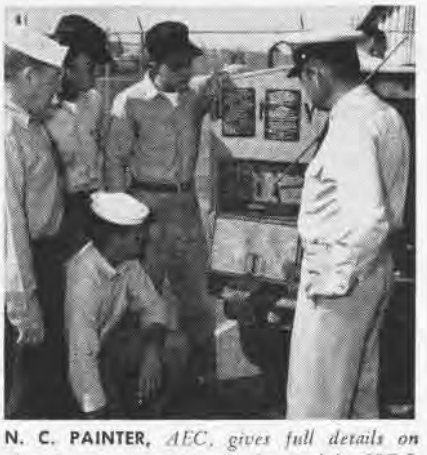
The program in ASE instruction uses three specially designed training kits. The first includes an instructor's manual and transparencies for training in mobile electric power plants. The second consists of material for instruction in portable hydraulic test stands, air compressors and liquid oxygen servicing trailers. The third kit applies to fork lifts, tow tractors and crash cranes. A team of technical writers at Naval Air Station, Memphis, works continually to keep these kits current.

Selected personnel in AE, AMH, AME and AGH ratings from ships and stations are trained by the detachments in a two-week course. Following this period, they return to their units and, using the training kits to ensure standardization, pass knowledge on to individuals in their own commands.

OPNAV Instruction 3500.26A of 5 July 1963, which establishes the ASE training program, also authorizes unit C.O.'s and OinC's to issue licenses required for those handling support gear.

MEN PAY *full attention as B. T. Lowrance, AMH1, demonstrates the Joy air compressor.*

HANDLING *procedures in moving a "canned" engine are checked by D. M. Hood, ABFC.*



N. C. PAINTER, *AEC, gives full details on the proper operation of the mobile NC-5.*

SELECTED AIR RESERVE

ROUGH BUT BEAUTIFUL *terrain provided excellent high altitude practice for HMM-770, NAS Seattle, while delivering construction materials for a shelter in Washington's Cascade Mountains.*

Training and Service

Marine Helicopter Squadron 770, NAS SEATTLE, combined high-altitude and rough-terrain training when they helped build a memorial shelter in the mountains of Washington.

While on two weeks active duty, the squadron's commanding officer, LCol. Vernon Clarkson, Jr., was asked if it would be possible to assist a church group in transporting cement and sand to a 7000-foot-high plateau in the Cascade Mountains.

Since the mission of a Marine helicopter squadron is "to take people and things places," four H-34 helicopters, manned by Reserve pilots and crewmen, left Seattle and flew approximately 100 miles south to an airstrip at Packwood.

The memorial shelter is being built in memory of a 16-year-old girl who died of exposure and cold while hiking with a teen-age group from the Bellevue (Washington) Presbyterian Church over a year ago.

During the same training period, HMM-770 accumulated more than 680 flight hours in two weeks to set a new squadron record. Flight hours for the squadron's 11 aviators averaged 61.2 during the 14-day period with another 7½ hours credited to a non-squadron pilot.

Most of 770's flights were conducted in the Washington area, but cross-country trips to Stead AF Base, Nevada, and NAS ALAMEDA, Calif., helped bring up the flight hour total. At Stead, the entire squadron underwent survival training, and pilots received high altitude flight practice with AF co-pilots in their H-34 helicopters.

NARTU Alameda Trains 100

Life aboard NAS ALAMEDA was far from dull the past summer when 100 young men enrolled in the Recruit to Airman program conducted by the NARTU.

The cram-packed 85-day Accelerated Training Program commenced June 15 for youths 17 to 21, selected from NAS SEATTLE, NAS LOS ALAMITOS and NARTU, ALAMEDA. The training was primarily designed to create rated personnel from recruits with great aptitude. Cdr. E. L. Bellizio was the OinC, assisted by Lt. A. Nielson and nine enlisted instructors.

Halfway through the program the recruits were advanced to Airman Apprentice. After graduation September 4, they returned to their home bases to affiliate with Weekend Warrior aviation squadrons and units.

Next summer, the Airmen will return for the second phase of training to become rated Petty Officers. All selected the rates for which they are striking. After the course, the young men will serve two years of obligated active Navy duty, then return to Selected Reserve status.

THE SCALE MODEL *"Fly Navy" helo, equipped with 18-inch rotor blades and a .049, Class A, engine, landed at NAS Seattle after a flight launched by its builder, Lt. P. C. Gaertner, a Weekend Warrior from Portland.*

Enterprising Navy Family

Michael Paul Belyan, YN1, in 1961 did two things: he married a Michigan girl and joined the Navy.

Moving with his bride to Washington, D. C., for active duty with NARTU ANDREWS, Belyan and his wife enrolled in the University of Maryland and Catholic University respectively. Their first son was born in April 1962, their second in April 1963.

Now after two years, Mr. and Mrs. Belyan can boast two degrees (one each), two sons, and Belyan's appointment to NAS PENSACOLA for Naval Aviation Officer Training.

WHEN VR-833 *stopped at Keflavik en route to Frankfurt, Germany, five aviation machinist mates had their stop recorded in the Iceland city.*

A FIRST *for Naval Air Intelligence Reserves was logged when Los Alamitos Units 771 and 772 arrived at Fleet Intelligence Center, Hawaii*

Los Al's NAIRU's in Hawaii

Two Naval Air Intelligence Reserve Units from NAS Los Alamitos, Calif., Units 771 and 772, staged a two-week mobilization type exercise recently at Fleet Intelligence Center, Pacific Fleet, at Ford Island, Oahu, Hawaii.

Twenty-six officers and enlisted men, with Cdr. George Englesby as OinC, participated.

Capt. Troy S. Guillory, Commanding Officer, FICPac, said that the exercise gives Reserve units the experience in the functions required of them in case of an actual wartime mobilization.

Jewish Chapel Dedicated

A new Jewish chapel was dedicated August 23rd at NAS New York, bringing to reality the dream of Rita Fajardo, wife of Sidney Fajardo, a third class petty officer stationed at the reserve base. The chapel, part of the station's main chapel, was constructed by personnel on their own time outside of regular working hours. Financial support for the project came freely from both Protestant and Catholic congregations.

While the main chapel was being completed last year, Mrs. Fajardo felt that a separate area should be set aside for Jewish services. She presented her idea to both civilian and military personnel. Full support was forthcoming, including that of base C.O.'s Capt. W. D. Bonvillian, and his successor, Capt. Jack J. Hinman III, who took command in July of this year.

An overflow audience, including Protestant and Catholic as well as Jewish personnel, attended dedication ceremonies which were followed by a reception at the Enlisted Men's Club.

VR-833 Makes Overseas Flights

Naval Air Reserve Fleet Tactical Support Squadron, VR-833, based at NAS New York and commanded by Cdr. Robert F. Roland, conducted scheduled cargo and over-water navigational training flights during its 1963 two-week, active-duty training cruise. The Weekend Warriors flew the C-54 aircraft and were under the operational control of MATS, McGuire AF Base, N.J.

VR-833 made flights to Frankfurt, Germany and Madrid, Spain. Since the C-54 is a propeller-driven aircraft, it takes 18 hours to fly to Frankfurt. The crew made refueling stops at Argentia, Nfld., and Keflavik, Iceland. For the Madrid flight, stops were made in Newfoundland and the Azores. Navigational training flights were also made to Bermuda and Puerto Rico.

THE 75,000TH *landing by GCA Unit 31 at NAS Willow Grove has been recorded. Lt. Jerry Allen (L) was the final controller, and Lt. Lawrence J. Britton, a member of Fighter Squadron 931, flew the approach in an AF-1E.*

Returns to Starting Point

When Capt. Robert F. Peterson, a native of Washington, relieved Capt William F. Dawson as Commanding Officer of NAS Seattle recently, he took command of the station where 22 years before he had begun his training as a prospective aviation cadet. After completing his preliminary training at Sand Point, he went to NAS *Corpus Christi* and was designated a Naval Aviator on March 25, 1942.

His career in the Navy included operations in WW II and the Korean conflict and an assignment in the Logistics Division of the Office of the Chief of Naval Operations. Most recently he has served as Executive Officer, then C.O., of VP-9.

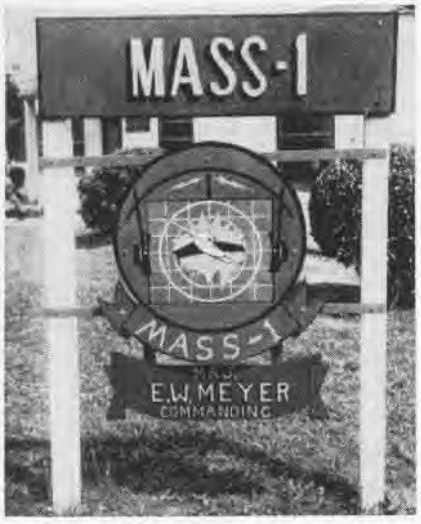
Back to Guantanamo

VS-861, NARTU Norfolk, went back to Guantanamo the end of last summer on training duty to work with the Fleet in ASW exercises.

The previous time VS-861 had been in Gitmo was in December 1961. The unit was called up at the height of the Berlin Crisis in October 1961. It was the only such Norfolk squadron to be recalled.

On that call-up, VS-861 was on active duty for ten months, this time, for the regular two-week period

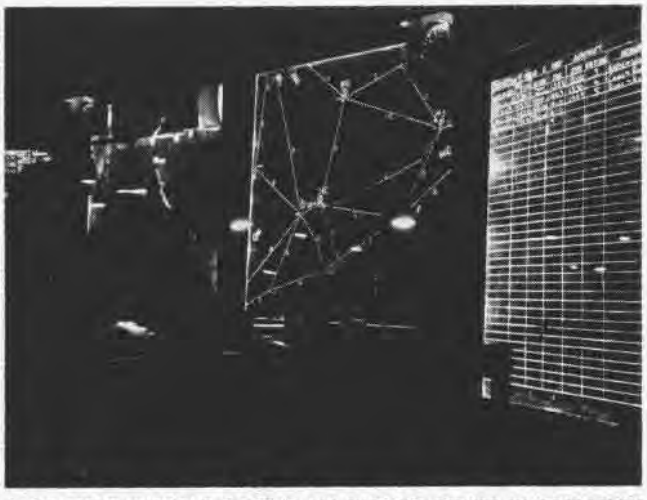
MASS-1 GUIDES PILOTS TO THEIR TARGETS



MARINES ON GROUND OR IN AIR SERVED

RADAR UNIT INSURES EFFICIENT AIR SUPPORT

AIR COMMUNICATORS AND AIR CONTROLLERS, HEART OF MASS-1



SAME SCENE WITHOUT FLASH IS AIR SUPPORT CENTER IN OPERATION

By SSgt. Les Burnett
Photos by Sgt. Burt Davidson

MISSION ACCOMPLISHED, target destroyed," the Marine *Skyhawk* pilot reports. "Roger," replies the controller in the Direct Air Support Center (DASC) of Marine Air Support Squadron One (MASS-1). "Check back to rendezvous point for next mission."

A Marine infantry company has seen the heavy bunker, which held up its advance, explode.

Later after dark, MASS-1's Air Support Radar Team (ASRT) receives another target—a large enemy fuel dump ten miles forward of the front lines. Again the controller directs the pilot, and a brilliant flash which the pilot sees marks the destruction of the enemy fuel dump.

MASS-1, based at MCAS CHERRY POINT, exercises virtually complete control of all types of aircraft and missions in support of a Marine division. Coordination and control is accomplished by DASC radio during daylight hours and ASRT radar at night and when visibility is limited.

Without assistance from MASS-1, aircraft would have difficulty finding their targets; helicopters could hardly pick up casualties or drop supplies to troops; fighter escorts and helicopters might be miles and minutes apart; observation aircraft would waste precious time in reporting sightings.

MASS-1 is commanded by Maj. E. W. Meyer; Capt. N. P. Fitzgerald, Jr., is Executive Officer and Capt. M. W. Dinnage, Operations Officer.

In the last year, squadron personnel have participated in amphibious landings, maneuvers and command post exercises in Vieques, Puerto Rico, Camp Lejeune and Cherry Point.

During an amphibious landing, MASS-1 is usually set up on D-Day. Debarking from an LST in 15 minutes or less and setting up an operations tent with as many as 10 radio sets in less than two hours is SOP.

Soon the DASC is in action. Walls are lined with status boards, frequency tables, charts and maps. Tables are cluttered with mikes and wires. Controllers begin talking. Repairmen climb under tables to ready splicings. The scene may be hectic, but the result is a smooth operation.

Like ASRT, the DASC operates swiftly and effectively. MASS-1 is ready for its mission: that of helping aircraft pilots and Marine infantrymen to fulfill their important duties.

NAVY, MARINES GRIND 'GEAR TEETH'

THE NAVY and Marine Corps joined forces last September for Operation *Gear Teeth*, an amphibious assault exercise conducted on Molokai, an island in the Hawaiian chain. More than a thousand Marines at Pearl Harbor, their equipment and 20 helicopters embarked on the USS *Iwo Jima* (LPH-2), in the first Navy ship designed from the keel up with the Marines in mind.

The Third Battalion, Fourth Marine Regiment, primary unit in the "attack" on Molokai, was reinforced by First Brigade support elements home-based at Kaneohe Bay. Marine Medium Helicopter Squadron 161, consisting of 150 Marines, helo-lifted the entire counter-insurgent force to the object area on D-Day. Brigade Recon and Engineer Companies joined the force along with the 4.2 Mortar Battery of the Brigade's 3rd Battalion, 12th Marines. Jets from VMA-214 provided close air support.

"Enemy" forces from the Marines First Battalion, were led by Capt. Joseph J. Smartz. He and his men had infiltrated Molokai several days prior to commencement of the 24-hour problem. The assault group was commanded by LCol. D. N. McDowell. RAdm. J. S. Coy, Jr., Commander, Amphibious Group 3, had overall command of *Gear Teeth* and supervised the exercise from aboard the carrier.

WAVE OF INFANTRYMEN *from the Marines' Third Battalion, 4th Regiment, charge from an HMM-161 helicopter on the island of Molokai. Over 1000 troops participated in Gear Teeth."*

The *Iwo Jima*, named after the famous World War II battle, was launched at Puget Sound in 1959. This exercise marked the first time it had operated with Hawaii-based Marines. Last year *Iwo* was scheduled for use by the First Brigade for Operation *Cross Bar*, cancelled by the Cuban crisis.

An ultra-modern ship, the carrier was built at a cost of 35 million dollars. It is capable of transporting more than 2000 battle-ready Marines across the seas at speeds in excess of twenty knots. All living spaces on the 592-foot vessel are air-conditioned. A crew of 48 officers and 480 enlisted men make up its crew.

EN ROUTE *to the battle zone, HMM-161 transport helicopters fly over the USS Iwo Jima, launching point for Operation "Gear Teeth." Helicopters carried troops and 40 loads of supplies to the objective area where the amphibious exercise was held.*

AT SEA WITH THE CARRIERS

CREW OF USS RANDOLPH *(CVS-15) form two E's on her flight deck, noting Battle Efficiency E's awarded. One is for best anti-submarine carrier and the second is her sixth consecutive award given to her Engineering Department, the first Atlantic Fleet ship so honored*

ATLANTIC FLEET

Randolph (CVS-15)

When the island's Department of Social Welfare at St. Thomas, Virgin Islands, requested painters for the Corneiro Home for the Aged, volunteers from *Randolph* stepped forward. Taking a day of liberty, the men painted the home, repaired the roof, and replaced rotted door sills and steps.

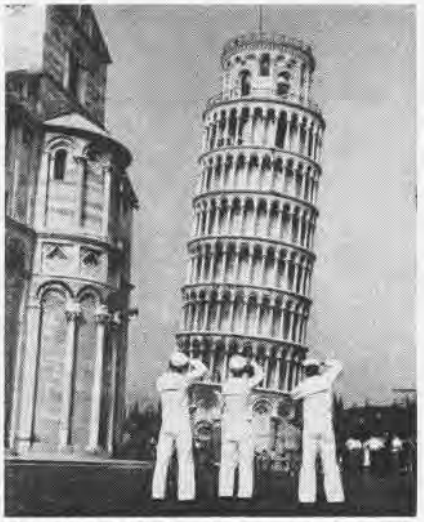
The carrier's 90,000th landing aboard occurred when the 72,000th fixed wing landing and the 18,000th helicopter landing were logged in a single day. The fixed wing landing was made by Ens. Charles McGary of VS-36 in an S-2D *Tracker*. The record helo landing was made by Cdr. George Cogswell, Commander Carrier Air Group 58, in an SH-3A *Sea King*.

Saratoga (CVA-60)

Off he went into the wet green under. Exchange Air Force Capt. James Metz, serving with the *Roadrunners* of VA-36 assigned to Carrier Air Group Three in the *Saratoga*, launched from the carrier, piloting an A-4C *Skyhawk*. During a low level strike training mission, he suffered an engine failure while less than 1000 feet above the water and ejected successfully.

This was a marvelous opportunity for the Air Force Captain; he is the squadron's Safety and Survival Officer. In the drink—while wingman LCdr. Ernest Laib orbited overhead and radioed position to *Sara*—Capt. Metz took full advantage of his emergency equipment. He ignited smoke flames, spread dye marker, boarded his inflated life raft, set up a solar still, signalled with his mirror, and started fishing.

A short time later, USS *N. K. Perry* (DDR-883) picked him up, dried him off and highlined him to USS *MacDonough* (DLG-8). This gave the guided missile ship a potential watchstander. After a 1200-1600 training session underway, he was heloed back to the *Sara*. Returned to the carrier, Capt. Metz was greeted by RAdm. W. I. Martin, Commander Task Force 60, as the "saltiest of all Air Force types."



SARATOGA SAILORS *take a candid shot of the Leaning Tower, Pisa, Italy, while on liberty.*

The 74,000th and 75,000th arrested landings were made aboard the *Sara*. The latter mark was scored by an A-3B *Skywarrior* of VAH-9.

Cdr. Walt Zebrowski "has done it again"—this time by night. For the fourth consecutive month, NANEWS has occasion to report one of his X00th or X000th landings. This time, the Commanding Officer of VA-34 in the *Sara* has logged his first 100th night arrested landing. A release from the carrier states that "Cdr. Zebrowski is not unknown to the crew of *Saratoga*. He has set quite a few records on *Sara*. It seems every time his tail hook hits the wire he makes another one."

Lexington (CVS-16)

A *Lexington* release reports that the carrier has smashed all previous records of past training carriers for landings accomplished in a single day while operating in the vicinity of Corpus Christi, Tex. The old record of 332 arrested landings, also made by *Lexington*, was superseded by 369 on the last day of August. The landings were made in approximately 12 hours of air operations.

The 60,000th arrested landing since recommissioning in August 1955 was made aboard CVS-16 in the Gulf of Mexico. Ens. R. D. Toombs of VT-5, based at Saufley Field, made the landing in a T-28 *Trojan*. Including WW II landings, *Lex* has logged 87,471.

Independence (CVA-62)

Independence is the second U.S. Navy attack aircraft carrier to be equipped with a ship's inertial navigation system (SINS) by the Autonetics Division of North American Aviation, Inc. The system is similar to that installed in the *Enterprise*.

SINS is used primarily to transfer precise starting position and velocity information into similar inertial navigation systems installed in carrier aircraft. Thus aligned by SINS, the aircraft's inertial equipment senses and measures any change in position. By keeping track of such changes, the aircraft's system automatically and continuously determines current position, speed, heading, and attitude.

Independence's 50,000th carrier landing was made by Ltjg. M. L. Hart of VF-84 during routine flight operations in an F-8C *Crusader* near the Azores. The carrier was en route to the Med for deployment with the U.S. Sixth Fleet. Lt. R. A. Ways of VF-41 made the 51,000th landing aboard in an F-4 *Phantom II* while the *Big I* was operating off the coast of Sardinia.

Independence hosted Adm. C. D. Griffin, Commander-in-Chief, U. S. Naval Forces Europe. He was escorted by VAdm. W. E. Gentner, Commander Sixth Fleet. The primary purpose of the visit was to acquaint Adm. Griffin with the commands that recently joined the Sixth Fleet. Later, the carrier anchored in the Bay of Naples.

Capt. James D. Ramage relieved Capt. L. V. Swanson as Commanding Officer of CVA-62.

Enterprise (CVAN-65)

A *Black Lancer* of Attack Squadron 64, Ltjg. Sidney Tucker Taylor, became the first Naval Aviator to qualify as a Double Centurion aboard the *Big E*. The squadron was deployed aboard the carrier while she operated in the Med. The proud pilot made both his Centurion marks aboard *Enterprise*. The first was made last November and was also the *Big E's* first Centurion. He flies an A-4C *Skyhawk*. While aboard the carrier, Ltjg. Taylor was LSO.

In the Med, the *Black Lancers* toted a buddy store of fuel while operating their A-4C's, providing in-flight refueling for other *Enterprise*-based aircraft. The squadron is commanded by Cdr. Francis E. Babineau. During its deployment with the carrier, the squadron recorded over 3000 hours flight time and made over 1550 landings aboard. In one day, pilots logged 96 hours.

Enterprise returned to Norfolk after a seven-month deployment to the Med. She had steamed more than 49,000 miles, launched nearly 12,000 aircraft, logged 23,680 hours of flight time, and successfully executed 11,447 arrested landings during this particular cruise.

While in Norfolk, *Enterprise* will operate with the Second Fleet.

Wasp (CVS-18)

He admits it was an interesting farewell when he departed *Wasp* and his duties as Executive Officer aboard, but Capt. William Teufer is still a little shaken by the experience.

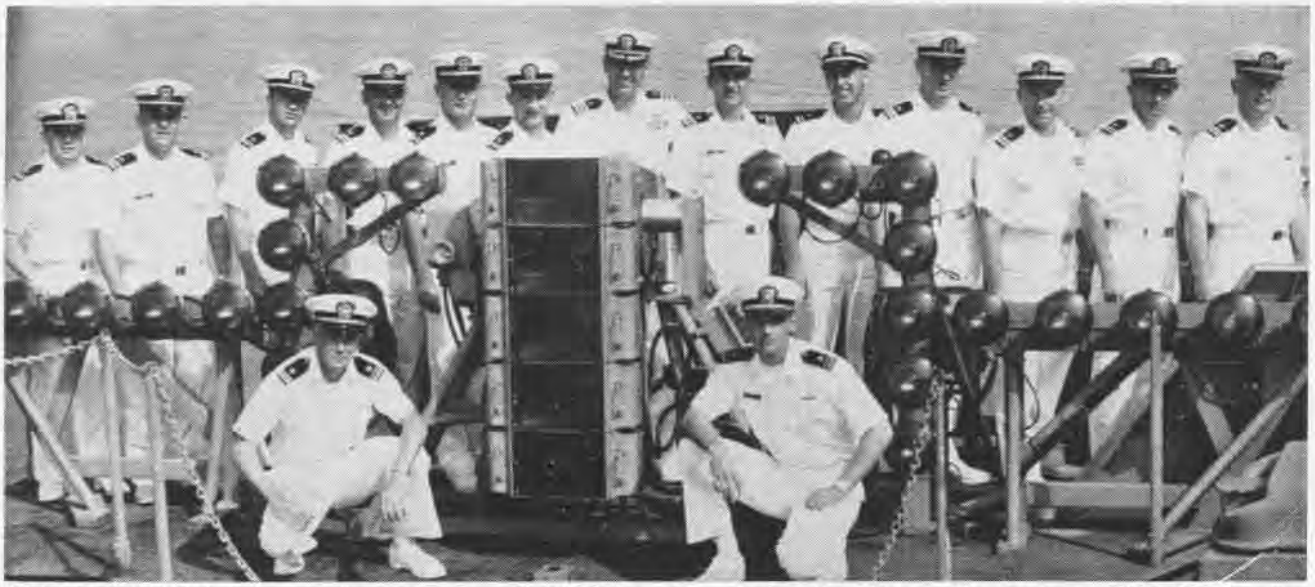
Ending the relief ceremonies, Capt. Tuefer marched smartly between two rows of senior officers comprising his farewell sideboys, and he held his salute until reaching the entrance of *Wasp's* C-1A transport plane. He climbed aboard, strapped himself into a passenger seat and readied for takeoff. Ahead, pilots were also strapped into their seats as they examined the instrument board.

Suddenly, both pilots looked back at their former X.O. and asked engagingly, "How do you start this thing?"

"Oh, *no!*" gasped Capt. Tuefer, snapping out of his seat and bolting from the plane.

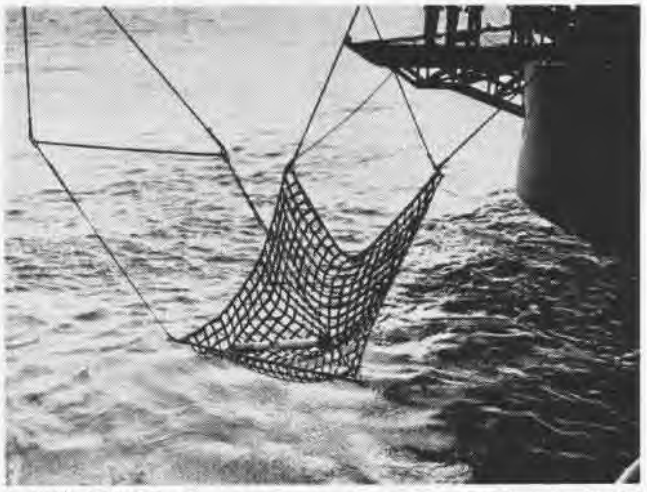
The pilots were ship's Engineering Officer Cdr. Claude Martin and Gunnery Officer LCdr. Carl Hokenson. Neither had sat in either seat before and were content with the blackshoe Navy.

Later, his equilibrium restored, Capt. Teufer returned to the plane, this time in the front seat, and flew off the carrier. He is a Naval Aviator.



BILLED AS "THE ONLY *Enterprise Centurion squadron," VA-76 has standing from left, Ltjg. Riley, Lt. Hudgins, Ltjg. Coss, Lt. Sisley, Ltjg. Boecker, Ltjg. Gasser, Cdr. Sanderson, LCdr. Cost, Lt. Randolph, Lt. Tobe, Lt. Baker, Lt. Byng; kneeling, Ltjgs. Dixon, Clark*

STEVE JASTRUNSKI *of New England Divers instructs potential members of Lake Champlain's SCUBA club how to don equipment under water.*



A NEW METHOD *of retrieving aircraft exercise torpedoes is devised by Intrepid, using boat and airplane crane and a 14-sq.-ft. cargo net.*

Lake Champlain (CVS-39)

"When I read in the paper that the *Champ* was in Boston," said Steve Puleo, "I knew I'd have to see her again. I was aboard when she earned her nickname, bringing the GI's home from Europe after the war."

With more than 5000 troops aboard, *Lake Champlain* averaged 32.043 knots in covering 3960.3 nautical miles. This was the longest speed run on record. This record held until 1952, but to Puleo she is still "the Champ."

Puleo served in the carrier during WW II as an aviation radioman-gunner first class. Since the end of the war, he has worked for the U.S. Post Office in Salem, Mass. He was welcomed aboard while the carrier was in Boston and was shown many of the spaces in which he lived and worked when he and the *Champ* were younger.

"A lot of it hasn't changed," he said. "We flew Curtis *Helldivers* then, but our mission was essentially the same. That chapel is the most beautiful space I've ever seen aboard a ship. That and the First Class Mess are the two things that I would have most appreciated having when I was aboard."

Last Friday the 13th, *Champ's* flight deck crew had cause for uneasy suspicion. After firing off 13 fixed wing aircraft, the starboard catapult broke down. Cat crew worked about 13 hours repairing it. (A ship's release reports a rumor that rabbit's feet might become a uniform item aboard.)

Capt. Clarence A. Blouin relieved Capt. Andrew L. Burgess as C.O.

CVS-39 proceeded to Gitmo for six weeks intensive training before resuming her normal ASW duties.

Essex (CVS-9)

The 114,000th arrested landing aboard the *Essex* was made by Lt. William S. Hodgkins of VS-39 in an S-2D *Tracker*. His copilot was LCdr. James R. Throop, also of VS-39.

Intrepid (CVS-11)

The coveted Red Rooster Award was presented Carrier Antisubmarine Air Group 56 aboard the *Fighting I* while the carrier was at South Annex of the Boston Naval Shipyard. This award—a large silver bowl— is presented annually by the Rhode Island Council of the Navy League to the most efficient ASW air group in the Atlantic Fleet.

The 77,000th arrested landing on the *Intrepid* was made in an S-2F *Tracker* piloted by Lt. Robert C. Shiffner and Ltjg. R. Stoakley, both of Air Anti-submarine Squadron 24.

Currently, the only officer assigned to VS-24 qualified for OOD duties underway is Lt. William T. Cain, a Naval Academy graduate of the class of 1959. He was embarked in USS *McGowan* (DD-678) as CIC officer and five months later earned the designation. In January 1961 he took flight training and was designated a Naval Aviator in April 1962. During deployments aboard *Intrepid*, he stood voluntary JOOD watches on the bridge to gain the knowledge and skill required. Last August, he earned his designation as underway OOD.

PACIFIC FLEET

Hancock (CVA-19)

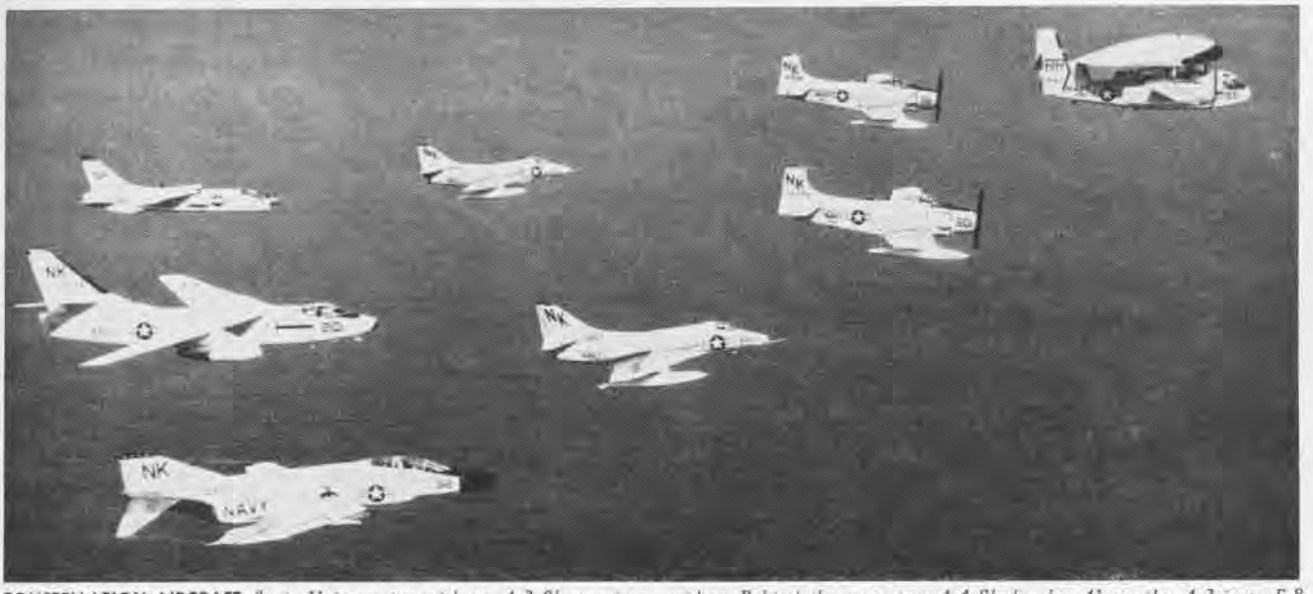
Hancock represented the U.S. Navy in a massive joint forces exercise code-named Operation *Nightmare* in September. Over South Korea, Navy units attempted to break through the defensive forces (represented by the Korean and U.S. Air Forces in order to aid the offensive ground forces of the U.S. Army. After the softening-up procedure conducted by naval aircraft, Army personnel moved in on the imaginary enemy behind the support of artillery.

Mission of the operation was to train Navy, Army and Air Force personnel in the development of improved air-ground support tactics under as realistic combat conditions as possible. It also enabled South Korean pilots to train under simulated battle conditions in U.S.-made aircraft.

The 59,000th arrested landing aboard *Hancock* was made by Ltjg. M. W. Knox of VA-215 in an A-1H *Skyraider*. The 60,000th landing was made by LCdr. R. L. Mock of VF-211 in an F-8 *Crusader*.

Kitty Hawk (CVA-63)

Completing a three-week mid-Pac cruise, *Kitty Hawk* returned to home



CONSTELLATION AIRCRAFT *fly in V formation with an A-3 Skywarrior in the slot. Leading is an E-1B Tracer, followed by two A-1H Skyraiders. Behind them are two A-4 Skyhawks. Above the A-3 is an F-8 Crusader and below it is an F-4B Phantom II, showing CVG versatility.*

port San Diego. During the at-sea period, Lt. Felix Templeton of VF-114 made the ship's 16,000th landing, with Lt. Ray Rigmaiden his RIO. Five days later, Ltjg. John H. Colle, flying an A-4C *Skyhawk* from VA-112, caught the arresting cable for the 17,000th landing. Marine Squadron VMF-232 from Kaneohe, Hawaii, contributed 101 landings to the last 1000 as they completed their carquals aboard without a mishap. *Kitty Hawk* is scheduled for a WestPac tour.

Constellation (CVA-64)

Excellent teamwork paid off when *Constellation* took on 8846 barrels of aviation fuel an hour from the fleet oiler USS *Ponchatoula*. The refueling, which took place off the coast of Japan, shattered existing Pacific Fleet records for this type of replenishment. Men on both ships had all fuel lines rigged and unrigged in only ten minutes, exceeding PacFleet's standard for excellence by a full three minutes.

The San Diego-based carrier returned to her home port in September.

Kearsarge (CVS-33)

More than 650 visitors, including Prince and Mrs. Takasada Shijo, brother-in-law and sister of the Japanese Empress, toured *Kearsarge* at Yokosuka. More than 50 officers and crewmen acted as tour guides during the activities. Postcard pictures of CVS-33 and a copy of the carrier's history—printed in Japanese—were given out as souvenirs.

Valley Forge (LPH-8)

It was moving day on the *Happy Valley* and the crew was overjoyed. Now at Long Beach Naval Shipyard, LPH-8 is undergoing FRAM II. The move was made to APL-18, so that workers could start improvements on the crew's living spaces. *Valley Forge* men will remain in the APL, berthed just aft of the amphibious assault ship, for about three months. The ship is expected to come out of the yard in January 1964, ready to rejoin the Fleet.

Bon Homme Richard (CVA-31)

His Excellency Braj Kumai Nehru, Ambassador to the U.S. from India and cousin of Prime Minister Jawaharlal Nehru, visited *Bon Homme Richard* while the ship was berthed at North Island. He was greeted by commanding officer, Capt. R. P. Kline.

Yorktown (CVS-10)

Leonard W. Short, ABE1, was presented a letter of commendation by Capt. J. P. Lynch, commanding *Yorktown*, in ceremonies aboard. Acting as catapult safety observer, he detected the failure of an S-2F catapult holdback unit and caused the catapult to be suspended. This prevented the possible loss of the aircraft and its crew.

The 91,000th landing aboard the carrier was made by Ltjg. F. M. Lund of VS-25 in an S-2F *Tracker*.

Yorktown hosted a group of 100 members of the West Covina, Calif., Toastmasters International Club, under the supervision of Mr. Tom Affrunti. Mr. Affrunti was a chief yeoman aboard when the carrier was commissioned in April 1943 and remained aboard until after the war in 1945.

A group of 218 members of the American Ordnance Association witnessed a firepower demonstration aboard CVS-10 in which ship-based aircraft, USS *Kyes* (DD-787), and aircraft from CVSG-55, including VAW-11 detachment, VS-23, VS-25, and HS-4 took part.

Frogmen also boarded *Yorktown*, but these were little ones. Two hundred members of Junior Frogman Association from the Los Angeles area, spent a day aboard the carrier.

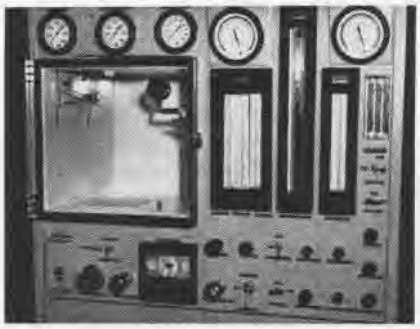
Coral Sea (CVA-43)

RAdm. John L. Gannon assumed command of Carrier Division Three aboard *Coral Sea* at sea. RAdm. Daniel F. Smith, Jr., relinquishing command, flew to Pensacola where he became Chief of Naval Air Basic Training.

O_2 Test Unit Developed

Operated by NATTU at Lakehurst

A new type of aircraft oxygen components test stand, the Firewel Model 62A116, was put into operation recently by the Parachute Rigger School



OXYGEN COMPONENTS TEST STAND READY

(Class B) of NAS LAKEHURST's NATTU. The unit is designed to provide the rigger with increased capabilities for testing the full range of gaseous and liquid oxygen system components including regulators, survival kits and full pressure suits.

Manufactured under the guidance of BUWEPS, Fleet Weapons Ground Support, the device underwent tests by the school's staff. Results were approved by the Naval Air Material Center's Air Crew Equipment Laboratory, Philadelphia.

A block course of instruction on operating procedures has been made available for commands receiving the new units.

New Iberia Record Made

10,000th GCA Landing is Scored

The 10,000th Ground Controlled Approach landing was marked in August at NAAS NEW IBERIA, the Navy's training base for TS-2A *Tracker* pilots. Lt. C. A. Bastin, instructor, and NavCad B. A. Bailey, piloted a VT-27 *Tracker* in the record-making approch.

Controllers for the approach were H. E. Kamping and R. A. Copedge. O-in-C of the GCA unit is LCdr. V. V. Bell.

Record Set at Lakehurst

AG1 Scores NATTU's Best Grade

Joseph K. Campbell, AG1, graduated with the highest grades yet recorded at the Aerographer's Mate School (Class B), NAS LAKEHURST. His final grade was 94.06, two points higher than the previous best average. Robert H. Blaney, AG2, who placed second, also beat the previous high with a final average of 92.88.

Included in the NATTU aerographers' training courses are weather chart analysis, theoretical aspects of meteorology, radiosonde operating techniques and basic concepts of oceanography. Students also visit the RCA Space Center at Princeton, N. J., to learn the latest developments in *Tiros* and *Nimbus* weather satellite technology.

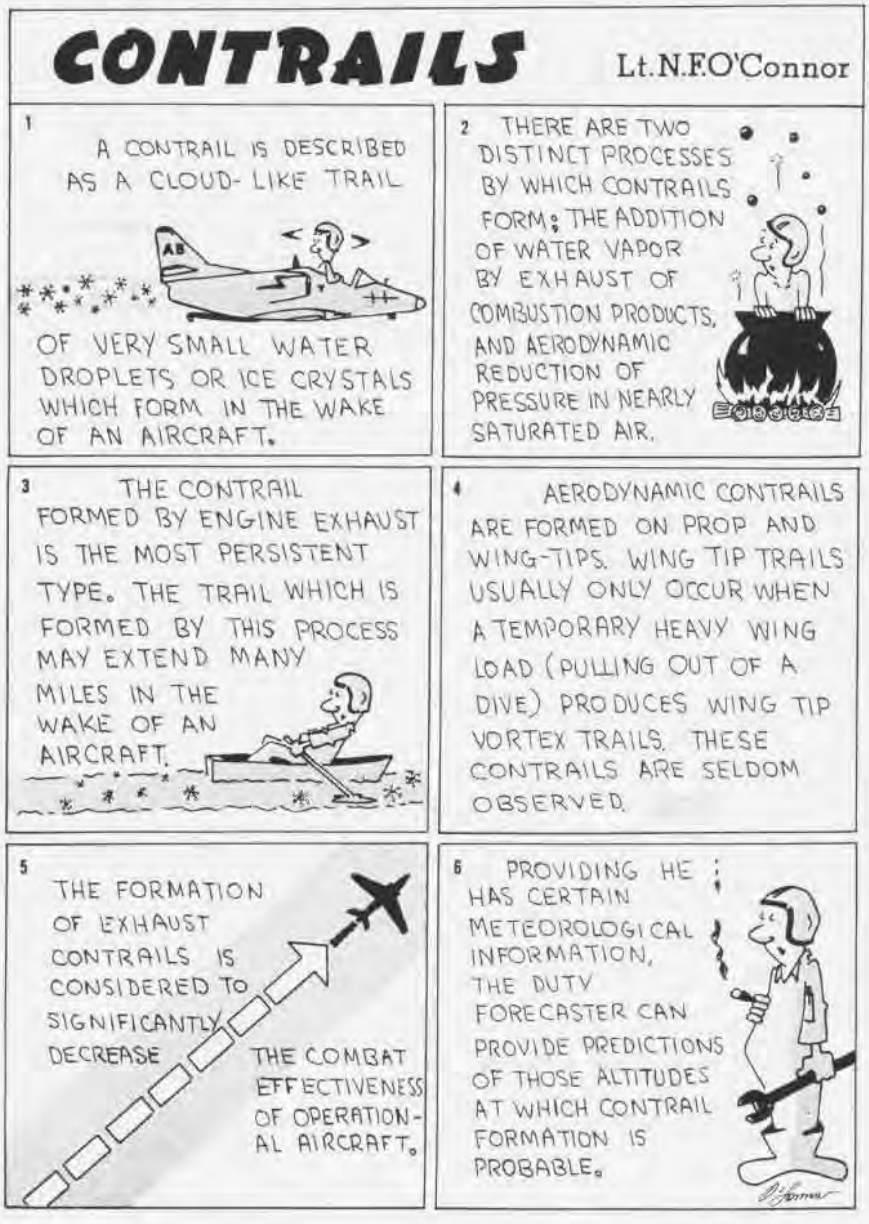
Campbell and Blaney each received a letter of commendation from their Commanding Officer, Cdr. J. E. Miller.

VT-23 Graduates 1000th

Squadron Also Wins CNO Award

VT-23 at NAAS KINGSVILLE, Tex., graduated its 1000th flight student in early September. Winner of the 1963 CNO Aviation Safety Award, the training squadron has flown over 15,000 accident-free hours. A unit of the advanced training command, VT-23 flies the F-11A, first high performance jet aircraft used in instructing students.

Ens. Richard W. Hastings, the 1000th student, was congratulated by RAdm. F. A. Brandley, Chief of Naval Air Advanced Training and Cdr. H. R. Padbury, VT-23 Commanding Officer.



Editor's Corner

Ambush for Sailors Ashore. While their ship was in the shipyard in Boston for overhaul, the USS *Lake Champlain's* crew learned of new hazards associated with their temporary shore assignment. While engaged in shipyard work, the *Champ's* crew used Boston streets for parking their cars. After a day's work in the yard, the men ran a new type of gauntlet to reach their parked vehicles. The *Champ's* PIO reported, "It seems that little girls in the neighborhood—possibly influenced by their nautical surroundings—have forsaken dolls and jacks to imitate the mythical sirens who traditionally lure seamen to disaster. They lie in ambush outside the shipyard gate, armed with garden hoses. Several *Champ* men have had to explain to their wives just why they came home drenched on sunny days. The news report adds, without comment, "The high seas will look mighty good."

INTEGRATION OF THE SERVICES. The station public works officer for MCAS Cherry Point, Navy Capt. William R. Boyer, CEC, received the Air Force Commendation Medal for his work on projects in the Republic of Vietnam. The medal was presented by Marine BGen. John Coursey. The award was earned for construction of three airfields for the U.S. Air Force and Vietnam during a 16-month period starting in January 1962.

Routine Training Flight. A news release from NAAS New Iberia, La., reports that Lt. Charlie Briegel (who has the number 13 tattooed on his left arm) took off on an instrument training flight at 1313Z on September 13th, flew two syllabus flights of 1.3 hours duration with two students in a TS-2A *Tracker* bearing side number 13. The squadron's commanding officer, the release stated, "viewed the flight with some discomfort." All ended well, Grampaw.

SHORT SPORT. Pooling their resources, a number of air group sailors from the *Hancock* bought themselves a gamecock in the Philippines because they had tired of being mere spectators at the ringside. Entered in its first fight, the fighting rooster was slashed by his opponent in just 15 seconds. The cock was named "Yakitori," which the sailors learned means "Fried Chicken on a Stick."

MEANER, MORE ALERT BULLDOG

Slimmer Dogface? Some 20 years after it was designed by Walt Disney, the "Battling Bulldog" insigne of VMA-223 has undergone a major change in appearance. The reason for the change? "It was just a little too fat, giving an overweight appearance, which is hardly complimentary to a Marine Attack Squadron." Artist for the re-modelling was Pfc. Bruce Palmer, who gave the "Battlin' Bulldog" a "meaner, more alert expression, a little larger chest and many more muscles." Anyone care to comment on whether today's Marines are "meaner, more alert" and have "larger chests and many more muscles" than the Marines of WW II?

NEW SAFE DRIVING SLOGAN. VP-48's Newsletter, the *Bell Ringer*, contains the following slogan and editorial:

"Help Stamp Out Depopulation. The automobile is a very effective but all-too-expensive means of controlling the population explosion. General carelessness and lack of education have aided the automobile as a means of population control. The next time you can't afford adequate insurance, are too broke to buy seat belts, or are in too much of a hurry to obey traffic laws, solve all your problems at one time—send your car abroad! I am sure it will bring a handsome price and the new owner will be thankful. But most important of all, the next time I drive to work I will feel much safer."

Puns from the Dark Room. When Philip Cobb advanced to Photographer's Mate Third Class, the USS *Randolph* reported, in all seriousness, "In accordance with ritual long established in the photo lab, Cobb was immersed in the film processing tank so that he might develop into an outstanding photographer." (They sent a photo to prove it.)

WHAT IS A CADET? He is a complex of vitality, vigor, ruggedness and refinement; a mixture of intelligence, wisdom, gumption and farsightedness, a respecter of his superiors, a guardian of his inferiors and a lover of his country. (Extracted from the Whiting *Tower*).

Legal Burial at Sea. While the *Lake Champlain* was in the yard in Boston, the ship's forces conducted extensive field days. In the ship's legal office files—"pressed below one of the drawers like an anniversary rose," according to a news release — sailors found a property chit dated February 27, 1946, entitling a crewman to keep as his property a Japanese sword. Said a yeoman, understatedly, "We sure were surprised to find it there. I guess that drawer hadn't been out since World War II."

Overheard on the bridge of the USS Bennington: "This is Mr. Genghis. I have the Khan."

BROTHER'S KEEPER. A pair of brothers on the *Bennington* recently went on shore leave. Ashore, they split up to scout up companions. Each thought of his brother and picked up an "extra" companion. Result: two sailors, four girls.

FOR SALE: BOA CONSTRICTOR. That advertisement, placed on the Exchange bulletin board at NAS Cecil Field recently, brought Don Spinella's unusual pet into the full spotlight of publicity at the Florida base. Seems that Spinella, an ATN3, has owned, progressively, a two-footer, a four-footer and lately the seven-footer he is now trying to sell. Asked why he was selling his pet, he said, "I want to buy a bigger and better constrictor, of course." Naturally.

LETTERS

SIRS:

An article in the August issue of NANEWS has stirred our journalistic blood and we challenge it. Page 23 carried a story on George Gray, HM1, who distinguished himself by qualifying for aircrew wings. He claims "the distinction of being the only corpsman in the Navy awarded aircrewman wings."

The TAR Program and NAS Los ALAMITOS will not be outdone. We have TWO aircrew corpsmen here, and one is a woman, to boot.

Alice "Joe" Puckle, HM2, and Don "Frenchy" Phelps, HM1, both earned their aircrew wings in the capacity of flight orderlies.

Joe got her wings last December and has logged a total of 70 hours flight time during her brief stint as an aircrewman.

Frenchy has flown 150 hours in an aircrew designation. Frenchy's aviation background doesn't end there, however. All told, the HM1 has logged close to 2000 hours in ten different types of aircraft (as nonaircrewman) from helicopters to jet trainers. He has made five trips in the centrifuge used for training astronauts at Pensacola, Fla.

There may be still other corpsmen who also wear the aircrewman wings. In any case, Los Alamitos boasts of having two.

LOUIS MAILLET, JO1

SIRS:

The photograph (below), published on page 23 of the September 1963 issue, is an *Asroc* (not a *Talos*) missile being loaded into the launcher.

W. L. HAYES, BUWEPS

ASROC *is the Navy's potent answer to the submarine threat. The payload of Asroc is either a homing torpedo or a nuclear depth charge. A solid propellant rocket motor boosts the payload to the target area where the homing torpedo is separated and lowered by parachute to seek its submerged target.*

SIRS:

We may not have the oldest "Super Navy Bomber" still on the active register, but we at NAAS CHASE FIELD, Beeville, Tex., are close. Reading Lt. Luehring's letter in your September 1963 issue sent me to the Aircraft Log Books for more information concerning one of our Beechcrafts (Buno. 04712). It had long been rumored that our beloved "Bug Smasher" was number four in the Navy and from Mr. Donato's letter (June 1963) it would appear that it is number four in Buno. block 4709-4729. It would be interesting to find out if any in Buno. block 2543-2547 are still flying today.

It is not normally ethical to tell a lady's age, but in this case she would probably forgive us. She was accepted by BAR WICHITA from the Beech Aircraft Corporation on 31 May 1941 and turned over to MCAS QUANTICO on 5 June 1941. Eight overhauls and many paint jobs later, she still zips along serving the Navy proudly and well with more than 22 years service and over 9000 hours flight time.

R. R. GORENA, LTJG.

SIRS:

In the September issue of *Naval Aviation News*, two pilots from VA-81 claim to be the first to fly the A-4E cross-country non-stop without refueling in flight. This is undoubtedly true and commendable. However, VA-172 takes issue with a sentence in the article which says: "Previously, *Skyhawks* required mid-air refueling to complete the cross-country journey."

On 27 May 1962, VA-172's Lt. Mac Gleim, who has what we believe to be a record 1665.1 hours in the A-4, flew from NAS MIRAMAR, Calif., to NAS CECIL FIELD, Fla., in an A-4B, non-stop, without refueling. The distance covered was 1900 nautical miles, and the hop took three hours and 45 minutes. To add a little interest to the story, it should be noted that Lt. Gleim executed an instrument departure over the Pacific to 15,000 feet, flew to Florida and made a TACAN approach at Cecil Field.

While this is the only such A-4B flight we know of, we are sure there are many others. It would be interesting to hear of them.

J. T. COOK, ENS.
Acting PIO, VA-172

SIRS:

RAdm. (Ret.) James C. Shaw and I have agreed with a New York publisher to produce a book on the first USS *Yorktown* (CV-5). Former crew members and members of *Yorktown's* air group, who served on board at any time from her commissioning through the Battle of Midway, are asked to write me, 11819 Charles Road, Wheaton, Md.

We would also like to hear from men present in USS *Vireo, Hughes, Gwin, Hammann, Benham, Balch* and *Monaghan* when *Yorktown* went down.

JOSEPH D. HARRINGTON, JOC, USNFR

SIRS:

The members of Heavy Attack Squadron 11 would like to point out a discrepancy in the article on p. 3, September issue, which lists the Navy E awards. According to NavAirLant message #66, VAH-11 is the recipient of the Navy E for the East Coast heavy attack squadrons. We hope this inadvertent mistake will be acknowledged, for the men of VAH-11 made great effort to achieve such a distinction.

A. R. BLUNDEN, LTJG., SIO

¶ComNavAirLant PIO reports to NANews: "We checked and VAH-11 DID win the E, not VAH-7. Sorry you weren't cut in."

SIRS:

We are forced to take issue with two of the three alleged SP-5B (P5M-2S) records mentioned by LCdr. K. S. Turner in your September issue.

On 19 October 1960, P5M-2, Buno. 135521, commanded by the late Lt. W. H. Freeland of VP-50, flew an operational mission in the Japan-Korea area which lasted 16.6 hours. The flight was a routine operational patrol from Iwakuni and was performed by VP-50 Crew Five with Lts. I. R. Johnston and J. F. O'Brien as co-pilots. The same crew set what we believe is a P5M altitude record, 25,300 feet, in late 1960.

As regards endurance, VP-47 set the record in Buno. 147929 on 27 September 1961 when VP-47 Crew One flew a squadron-generated patrol lasting 22.2 hours. Cdr. J. S. Musial, than C.O. of VP-47, was the PPC, and LCdr. G. A. Wilson and Lts. R. E. Narmi and J. E. Burgess were co-pilots. This flight was forced to land after 22.2 hours owing to deteriorating weather and fog with more than ½ hour of fuel remaining after landing at Whidbey.

After thus flaying LCdr. Turner so thoroughly, we bow respectfully to his undoubtedly solid record of 186.1 SP-5B Aircraft Commander hours in a single month. While the handbook for the P5M doesn't carry curves on pilot endurance, we believe he has established the E sub P max figure.

JOHN E. BURGESS AND
JOHN F. O'BRIEN

VT-27, NAAS, New Iberia

SIRS:

We noticed in the August 30 issue of the NAS OCEANA *Jet Observer*, that VA-81 recently flew their fascinating "new" A-4E *Skyhawk* non-stop, coast to coast, in four hours, 49 minutes without in-flight refueling. VA-81 seems to think that they are the first single engine jet types to perform such a feat.

VFP-62, NAS CECIL FIELD, flies this route several times annually in the RF-8A generally in three hours 45 minutes. (Write Lt. C. B. Wilhelmy, VFP-62, Det. 60, USS *Saratoga.)*

As a matter of interest, we've heard that a fighter pilot from VF-174, Cecil Field, did it in an F-8E. (Write Lt. T. R. Swartz, VF-174, NAS Cecil Field.)

There may even be a few others. Anyone care to comment?

A. S. WILHITE
OinC, Det. 60

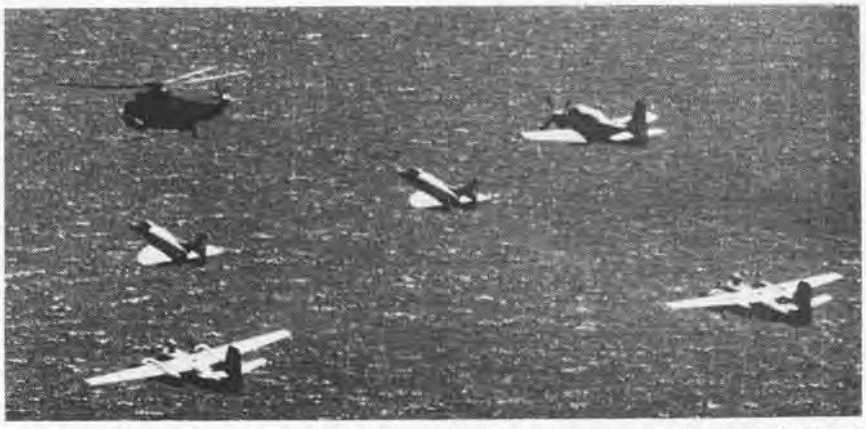
ANTI-SUBMARINE WARFARE DEMANDS VERSATILITY AS DEPICTED BY THIS FORMATION OF CVSG-52 S-2A'S, A-4'S, SH-3A AND EA-1E

★ ★ ★

CVSG 52

Carrier Anti-Submarine Air Group Fifty-Two flies by the credo 'search, identify and destroy.' Combining the professional capabilities of HS-11 (SH-3A Sea Kings), VS-28 and VS-31 (S-2A Trackers), VAW-33, Det. 18 (EA-1E Skyraiders) and VA-83 Det. 18 (A-4 Skyhawks), the air group provides a dynamic threat to enemy forces beneath the sea. Formed in 1960 at NAS Quonset Point, CVSG-52 is assigned to Wasp.

SH-3A RELEASES AN ANTI-SUB WEAPON



HS-11 HELO LEADS VA-83 SKYHAWKS, VS-28 AND VS-31 TRACKERS AND VAW-33 SKYRAIDER

YOUR WHOLE WORLD FLIPS . . .

. . . when you become one of the U.S. Navy's wearers of the Golden Wings. Within two years after start of flight training, you jump from Big Man on Campus to Naval Aviator in charge of a supersonic, multi-million dollar flying machine, an executive at 50,000 feet. College Men, can YOU qualify? For information about the Naval Aviation Cadet and Naval Aviation Officer programs, see your Navy recruiter or visit the Naval Air Station nearest you for a talk with the Aviation Officer Programs officer. Write to NAVCAD, Navy Department, Washington 25, D. C.

NAVAL AVIATION NEWS

NEWS NAVAL AVIATION