NAVAL AVIATION

NEWS

1970 NAVAL AVIATION IN REVIEW

FEBRUARY 1971

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Aircraft carriers are naval airfields on the high seas — highly efficient, packing tremendous punches worldwide. The Nixon Doctrine requires these naval airfields. The number of U.S. aircraft carriers will decrease from 24 in 1969 to 15 by mid-1971. Naval Aviation has the best combat aircraft in the world. Without a large number of carriers to base them on, their strength cannot be applied in sufficient measure when needed. We should start construction of a new carrier every other year. — VAdm. T. F. Connolly, DCNO (Air)

NAVAL AVIATION NEWS

FIFTY-SECOND YEAR OF PUBLICATION

FEATURES

THE STAFF

COVERS

The front cover shot of the F-14A Tomcat was taken by Grumman during the second flight of the Navy's newest fighter aircraft. The back cover shot of a pilot and RIO checking the after section of an F-4B is the work of PH2 W. R. Curtsinger, PH1 P. A. Kopp snapped the carriers Saratoga and FDR as they steamed together in the Mediterranean, above.

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EDITOR'S CORNER

In researching feature material one frequently stumbles onto an interesting story which, though not usable within the context of the planned article, is nevertheless worth retelling for the benefit of all those with aviation interests. During the past year while gathering material for our recent special edition, Space and the United States Navy, we uncovered quite a few fascinating facts and humorous anecdotes. One of these, related to us by Vice Admiral T. G. W. "Tex" Settle (Ret.), we enjoyed not only for its lively description of earlier, less sophisticated days of aerial derring-do, but also because it explained an unusual and uncaptioned photograph, tucked into our historical files, which had been the subject of much speculation over the years. The photo appears at the top of the next column.

It seems that in May 1930, as part of the program being planned to thrill the crowd assembled to watch the annual Curtiss Cup Seaplane Race at NAS Anacostia, the airship Los Angeles was to fly overhead and release a German-built Prufling training glider. The glider was to spiral down and land at Anacostia. The pilot who had originally been scheduled to perform the feat became ill, and LCdr. Settle, then serving as a Navy inspector during construction of the airships Akron and Macon at Goodyear's Akron, Ohio, plant, was contacted and asked to fill in. (It was known that he belonged to a local glider club.)

Though the Los Angeles had pioneered in launching powered aircraft, for which it had received much publicity, launching of a glider was a relatively new project. Admiral W. A. Moffett, then Chief of the Bureau of Aeronautics, was interested in the flight since he was considering the use of gliders for primary flight training at Pensacola and personally selected "Tex" Settle

to replace the ill pilot. LCdr. Settle arrived at Lakehurst and, at midnight the night before his performance, he departed aboard the Los Angeles which had the glider slung beneath it. Around noon the following day, the airship arrived over Washington, D.C., after a smooth and leisurely trip; however, flying conditions by now were becoming a bit bumpy. As even more rough air was encountered, a tear developed in the fabric on the glider's starboard wing and VAdm. Settle recalls that he "watched it with some concern." The airship's C.O., fearing greater damage to the glider if he maneuvered any closer to the field in the turbulent air, talked the situation over with Settle and they decided to go ahead from their position at 1,600 feet and a bit downwind from NAS Anacostia. The glider was released and LCdr. Settle began maneuvering to utilize thermal updrafts in order to stretch his flight to the landing field while at the same time trying to clear the bluffs overlooking the field. As the craft descended, it became obvious that unless some thermals were found, the glider and its pilot would probably come to roost in the treetops atop the bluff. A quick look around disclosed a spacious "courtyard" next to a large building which he presumed to be a school of some sort. Settle decided that he would have to land in the courtyard where "many people had come out and were waving at me." Just then he picked up lift from air currents flowing up the face of the bluff, just enough to allow him to pass clear of the trees and make it to the edge of the landing field.

Later, when relating his experience to station pilots, he was informed that he had selected as his alternate landing site the grounds of St. Elizabeth's Hospital — an institution for the mentally ill, whose inmates had greeted his approach so warmly.

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VMFA-251 Wins Hanson Award for 1969

WASHINGTON, D.C. – Marine Fighter Attack Squadron 251 has been named the 1969 winner of the Robert M. Hanson Award as the most outstanding Marine fighter squadron of the year.

Flying F-4B *Phantom II's*, VMFA-251 was cited for furthering fighter tactics in the Marine Corps while continuously maintaining the high state of combat readiness necessary to fulfill any contingency.

During 1969, VMFA-251 flew 5,180 hours as it completed its fourth consecutive accident-free year. The squadron completed five separate missile firing exercises during the year and was also tasked with providing operational support to the North American Defense Command and to ComFAirKey West. In addition, it provided several trained aircrews to combat squadrons operating in the Republic of Vietnam.

New Zealand Visitors

DA NANG, RVN – A six-man detachment from Squadron 75 of the Royal New Zealander Air Force recently visited MAG-11 to observe Marine Corps A-4 *Skyhawk* maintenance procedures.

Headed by Flight Lieutenant Sean C. Robinson and Avionics Officer Rod A. Sudlow, the contingent from Ohakea AFB was attached to VMA-311.

In order to observe the work performed in his own specialty, each man went to the squadron area where work in his specialty was being conducted.

Because they had only one month, the New Zealanders did not participate in the actual maintenance, but they learned a great deal by observing.

"We have had the A-4 *Skyhawk* in our Air Force for nine months," said Lt. Robinson, "and we wanted to see the maintenance operation as the Americans run it because they have had the aircraft so much longer. We have learned a great deal and we like to feel that we have been able to give as well as receive."

Last RA-5C Accepted

WASHINGTON, D.C. – The Navy has accepted its last RA-5C, the reconnaissance version of the A-5A *Vigilante*. The 140th plane marked the end of a program which gave the Navy its advanced tactical reconnaissance system.

The RA-5C's, which deploy on all Navy attack aircraft carriers and have seen extensive service in Vietnam, were built by North American Rockwell at Columbus, Ohio. The prototype go-ahead was given ten years ago, and the aircraft was first operationally deployed in 1964. Nine operational squadrons are home-based at NAS Albany.

RA-5C's have a multi-sensor reconnaissance capability, with most of the sensors contained in a "canoe" attached to their belly. The system operates in conjunction with an integrated operational intelligence center, at the plane's home base or carrier, which permits rapid processing, interpretation, display and storage of collected intelligence.

Main defense for the aircraft is its speed, which exceeds 1,400 mph. It is powered by two J-79 turbojet engines with afterburners and has all-weather, night-and-day intelligence gathering capabilities.

High resolution cameras permit 20 times magnification without appreciable loss of quality. All photos are imprinted with latitude and longitude, accurate to the nearest tenth of a minute.

Air Drop for Xmas

SAIPAN, Marianas – For the second year, personnel from naval activities in Guam joined with Anderson AFB personnel for the annual Christmas air drop.

This 19th annual air drop was conducted within a 1,000-mile radius of Guam including some outer islands in the Marianas chain as well as islands in the Ponape, Truk and Yap districts. Articles collected for the drop included toys; candy; gum; pencils; crayons; school, coloring and story books; jerseys, shorts and ponchos; kerosene lanterns and flashlights; and harmonicas, ukes and flutes.

The air drop was held during the Christmas week.

29,000 Combat Sorties

DA NANG, RVN – Marine Fighter Attack Squadron 115 recently logged its 29,000th combat sortie in support of Leatherneck ground troops in the Republic of Vietnam.

The F-4B *Phantom* which flew the mission was piloted by the squadron's commanding officer, Lt. Col. Michael Mura. 1st Lt. George W. Eckhardt was the radar intercept officer.

This is the squadron's third deployment to Vietnam. In addition to the 29,000 combat missions, it has logged 32,900 flight hours.

New Catapult System Installed at Lakehurst

PATUXENT RIVER, Md. — The Technical Support Division of NATC is currently installing a prototype Catapult Data Acquisition System (CDAS) at NATF Lakehurst, N.J. The system is a possible forerunner of a completely automated catapult launching system.

CDAS is designed to be used on steam catapults aboard aircraft carriers for monitoring and recording purposes. Currently, all necessary data associated with a catapult launch are manually recorded on log sheets, a process which is time consuming and error prone. CDAS records data quickly, accurately, and automatically, and makes it available in a neat, printed log-sheet form immediately after the launch.

One CDAS system is capable of monitoring two catapults simultaneously. Separate recording devices are used, but both catapults share the computer's capability.

Future plans call for expansion into a central control system which will then be integrated into a completely automatic catapult launching system. When this becomes reality, there will be few, if any, personnel on the flight deck during launch operations. The aircraft will taxi to the catapult, be weighed, hooked up and launched, all under automatic control. The catapult officer will monitor launch operations from an air-conditioned, soundproof bubble mounted in the flight deck.

Installation of the prototype CDAS system at NATF is another step in a long, complex and determined effort to make the Navy faster, more efficient and more effective.

VAdm. Flately Honored

NORFOLK, Va. — In recent ceremonies, three buildings occupied by FAETULant and NAMTra, were named Flatley Center, in honor of the late Vice Admiral James H. Flatley, Jr., former NAS commanding officer and prominent Naval Aviator.

"It is extremely fitting to dedicate the buildings to VAdm. Flatley because his career was devoted to the training of the young men of the Navy," Vice Admiral Robert L. Townsend, ComNavAirLant, told an estimated 150 guests.

Attending the dedication were Mrs. Flatley; her sons, Cdr. James H. III and Lt. Brian A. Flatley; and the late admiral's brother, Dr. John A. Flatley.

"Of the many fine tributes paid to my father, the dedication of Flatley Center is one of the most pleasing," said Cdr. Flatley in a brief speech after the plaque was unveiled. "I hope the buildings will serve as an inspiration to young men, to strive to improve themselves as individuals."

Dedication of Flatley Center at NAS Norfolk was approved by the Chief of Naval Operations after the closing of NAS Olathe, Kan., and Flatley Field earlier this year.

Blue Angels Leader in OYMA Edition

PENSACOLA, Fla. — Commander Harley H. Hall, leader of the *Blue Angels*, has been selected for inclusion in the 1970 edition of *Outstanding Young Men of America*.

The annual awards volume, sponsored by leading men's civic and service organizations, recognizes and honors men between 21 and 35. Criteria for selection include service to others, professional excellence, business advancement, charitable activities and civic and professional recognition.

Cdr. Hall entered the Navy as a Naval Aviation Cadet in 1957. He was commissioned an ensign and received his wings in April 1959. A veteran of two combat tours in Vietnam, he reported as officer in charge of the Navy's Flight Demonstration Team in November 1969.

VMO-2 Logs 100,000 Flight Hours in RVN

DA NANG, RVN — Marine Observation Squadron 2 has logged its 100,000th flight hour of reconnaissance support in the Republic of Vietnam.

The crew of the OV-10 *Bronco* logging the milestone consisted of Colonel Albert C. Pommerenk, commanding officer of Marine Aircraft Group 11, and Major Carl B. Olsen, squadron executive officer.

VMO-2 had accumulated flight time in the UH-1E *Huey* and *Cobra* gunships as well as the OV-10 in compiling the 100,000 combat hours. Since December 1969, however, the squadron has flown only the *Bronco*.

VMO-2 is currently the only Marine observation squadron in SEAsia.

Lt. Brian A. Flatley, Mrs. James H. Flatley, Jr., and Commander James H. Flatley III, admire the plaque honoring the late Vice Admiral James H. Flatley, Jr., at NAS Norfolk.

Physiologist Honored

BARBERS POINT, Hawaii – Lieutenant John F. Greear III has been named the Outstanding Naval Aerospace Physiologist for 1970 by a committee of Naval Aerospace Physiologists.

Lt. Greear reported to NAS Barbers Point in April 1968 as the station's only aviation physiologist. He immediately revised the operation of the unit and restored the facilities with the assistance of his men.

His primary duty is to train Naval Aviators and aircrewmen to cope with the flight hazards that may be encountered in high performance aircraft. To prepare the fliers, devices such as the low pressure chamber, ejection seat and night vision trainers are utilized.

Using his facilities, Lt. Greear is able to train 6,000 persons – including Naval Aviators and Air Force, Marine Corps and, at times, commercial pilots – in a three-month period.

Greear joined the Naval Reserve in 1959 as an airman recruit while attending Georgia State University and advanced to HM3 while there. In 1963, he graduated from Georgia State with a BS, and then served two years on active duty at NAS Atlanta, where he advanced to HM2.

After completing his Reserve active duty, Greear decided to remain in the Navy and attended Aviation Officer Candidate School at Pensacola, Fla.

Jet Service in Naples

NAPLES, Italy – Distinguished visitors to the Naples area are now afforded the luxury of "jet" transportation across town, from NAF Capodichino to Headquarters, Allied Forces Southern Europe, with three UH-2C *Seasprites* recently received at the NAF.

The UH-2C's can carry five passengers with a crew of three and will replace the UH-34 *Seahorse* as primary sea-air rescue vehicle for NAF.

The first two helicopters were received in mid-July, and work was begun immediately by ComFAirMed to add VIP configurations to the interiors. With the aircraft came the requirement for specialized training for pilots and maintenance personnel at NAF under the supervision of Kaman factory representatives.

During the transition period from the UH-34 to the UH-2C, the *Seasprite* flew several mercy flights, evacuating Italian civilians from the islands of Ischia and Capri, and responded to emergency calls from Sixth Fleet ships.

AN OV-10A BRONCO FIRES A ROCKET IN SUPPORT OF ALLIED FORCES IN THE MEKONG DELTA

Lemoore's Gold Bomb

LEMOORE, Calif. – Attack Squadron 192 outscored its competitors to capture the ComFAirLemoore Gold Bomb award.

Commander R. L. Kiehl, Lt.'s Larry Pickett and Jerry Palmer, and Ltjg. Bill Shelton scored a combined total of 1,103.5 points to gain top honors for the *Golden Dragons* as the best overall squadron in the bombing derby.

In a tight race for second, VA-113 totaled 1,061 points, with VA-97 only one point behind. Other competing squadrons were VA's 195, 56, 93, 27, 164, 25, 125, 215 and 122.

Flight plan for the derby called for the pilots to take off from NAS Lemoore, fly to the target at NAAS Fallon, drop their bombs – inert 500-pounders – and return home.

Takeoff and target arrival times were critical with ten points deducted for each minute of variance. Only two pilots lost points at takeoff and no one was penalized on target arrival time.

"I think everyone learned something," said Captain J. M. Tully, ComFAirLemoore. "I learned, the judges and observers learned, the pilots learned, and the maintenance people learned.

"It was especially gratifying to me to see the inspiration and interest shown by the maintenance personnel, the way they performed their jobs and then turned out to give their pilots moral support."

Lt. Surpasses 1,000 Hours in OV-10A

BINH THUY, RVN – Lt. Dean D. Davis, attached to VAL-4 since last April, has surpassed 1,000 hours in the OV-10A. He has been flying the *Bronco* since December 1969 when he was attached to VS-41, the replacement training squadron for VAL-4.

VAL-4, which arrived in the Republic of Vietnam two months after it was commissioned in January 1969, is the only Navy fixed-wing combat squadron in Vietnam. The *Black Ponies* fly more than 1,400 hours per month, combining day and night patrols with 24-hour-a-day scramble readiness, and cover all of IV Corps and the southern III Corps in support of Allied forces in the Mekong Delta.

GRAMPAW PETTIBONE

Goodnight Ladies!

Flight time for many these days is anyway you can get it. Two young lieutenants, junior grade, recent graduates of the Navy's jet flight training program, found themselves stationed at one of our overseas island air bases with no jets to fly and very little to challenge their blooming enthusiasm. The station U-11A was available. Although the *Aztec*'s ADF was out, leaving it with a VOR receiver only and the attitude gyro and gyrocompass precessed a great deal more than normal, they briefed for a night IFR ground controlled approach practice mission. The plan called for about ten GCA touch and goes. After about a 30-minute delay for the duty forecaster to get back from supper and give them their IFR weather brief, they launched VFR with local weather 1,800 broken, 8,000 broken, 15,000 overcast, and visibility eight miles.

Immediately after takeoff, the GCA controller advised them that there was a large intense thunderstorm extending across both the downwind leg and the final approach course and he would be unable to vector them around the storm. Apparently both pilots had been to "hackit" school for the reply was, "That's why we filed IFR."

The J.G. in the left seat, the least qualified, made the first two approaches. He was waved off each time because he was far too far left of centerline – in the direction of the mountains which paralleled the field. The GCA operator, from his experience with the plane on previous occasions, surmised that the directional gyro must have varied from 20 to 50° off heading.

The pilot-in-command took control of the *Aztec* for the next approach, reading the instruments – which were mostly on the left side – from his right seat position. Because of an ill-fitting right-hand cabin door, both pilots wore sound attenuators to reduce the noise. As the plane turned on final, the GCA controller reported that Center had advised that they could not be cleared for continued IFR approaches since they did not have the capability of executing any lost communication procedure. They were advised to maintain VFR, if they could, and return to the field.

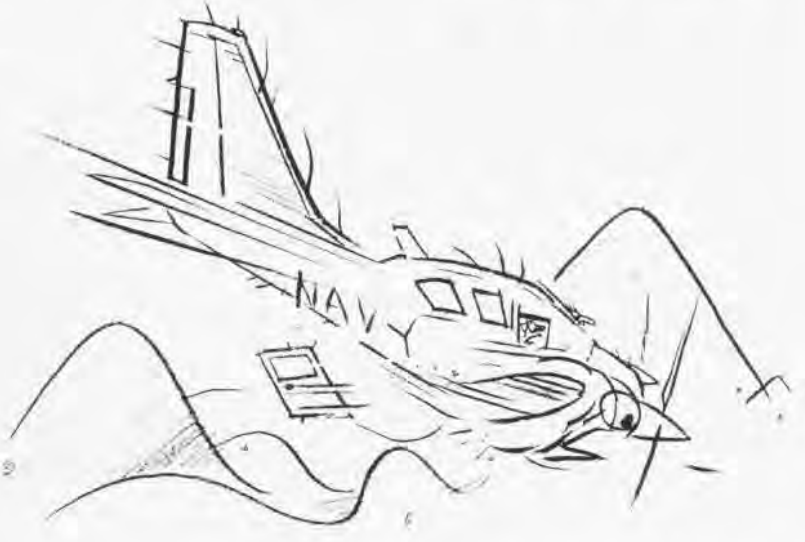
They could then see the ground and accepted the clearance, but right after switching to tower frequency, they went into the clouds. The pilot-in-command immediately began to climb, hoping to break out VFR on top. Because it was difficult to read the wet compass, he decided to climb in 360° turns – to avoid flying in the wrong direction. GCA was still monitoring their progress and, after calling the tower operator on the phone, advised that they were heading for the mountains and to "turn right and pull up immediately."

The pilot increased his angle of attack and the airspeed dropped rapidly toward zero. The aircraft stalled and entered a left spin. They were still above 4,000 feet, but the altimeter began unwinding rapidly. Completely on the gauges now, the "p.i.c." neutralized the stick, applied right rudder and then, as the turn needle centered, began to pull the nose up. Considerable excess G's were encountered during the recovery and the starboard cabin door ripped off, damaging the right engine cowling as it went.

The copilot watched the altimeter level at 1,500 feet and, with GCA still vectoring them via the tower controller, they proceeded out over the ocean, soon broke out VFR, descended and made an uneventful landing.

Grampaw Pettibone says:

Holy Hannah! Purty durn narrow squeak! N' now you know why Gramps has white hair – from livin' through all these hairy experiences with Naval Aviators for so many years. My knees still feel a little weak. Only their laundryman knows how scared



ILLUSTRATED BY Osborn

those two were that night. Whew! The GCA controller estimated that, in the area where he plotted the spin, the terrain rises to 1,325 feet msl.

Why must most pilots learn a healthy respect for thunderstorms and night IFR conditions the hard way? Was this mission really advisable in the first place? Hardly.

Night Beach Party

Gramps recently heard a true tale from an old friend which, though it happened many years ago, proves a point or two. The squadrons at North Island in those days were two VF, two VS, two big boats (F-5L's) and the station planes consisting of a little bit of everything from trainers to one or two current types.

The *duty* pilot was assigned from all attached aviators (a pilot was supposed to do everything, anytime and no foolishness – like qualifying in type). Wings meant you could fly, period. There was no such thing as a utility squadron – that came several years later. There were over 60 pilots on the ready pilot watch list and few emergency calls, so the duty was not particularly onerous. Just be on telephone call (15 minutes).

One Saturday afternoon, a call came in that a man had been injured at Catalina Island and to please send a flying boat to take him to the hospital. The hour was late, but the station prepared an F-5L and called the duty pilot and standby – two young J.G.'s from one of the VF squadrons.

Flight plans had not been invented yet, but a quick estimate of the situation by the two pilots was about one hour up, one hour to load and one hour back. The weather was perfect, but who knows when the fog will come pouring over Point Loma. And sometimes the ground mist gets bad and for sure the landing on the return would be after dark. The pilot said certainly he was qualified for night flying. (He had over 10 hours at night.) The copilot said he only had a few turns around the field after dark but he was confident he could make it, and brightly said, "How about the moon?" Unfortunately, investigation proved it was no help.

After heaving out the pet seal kept by the crew of the plane (no use carrying extra weight) and checking a full 300 gallons (enough for the round trip and a reserve – there were no fueling facilities at Catalina – they took off and had a fine trip up. They landed at Catalina, took the injured man aboard from a small boat, and were off in the twilight for home.

Then it got dark. Very dark, very suddenly. The pilot used his head, though. By riding his left rudder, he picked up the coastal lights and followed them down the coast at seven or eight hundred feet for a very smooth flight. They passed over La Jolla and the lights of San Diego flared into view.

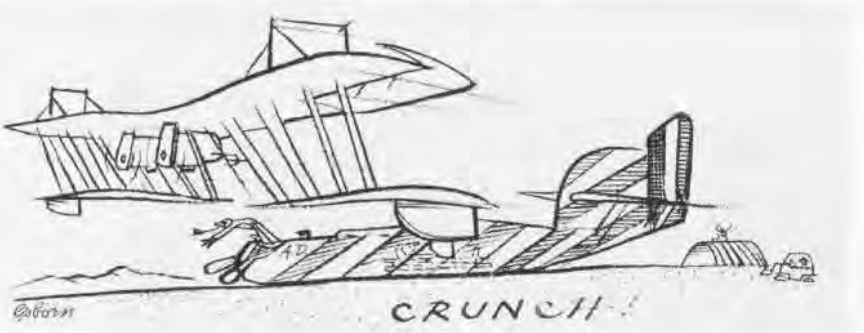
A conference between the pilots identified San Diego, Point Loma, Coronado and North Island. The black areas were water. They decided it would be easy to miss the ships anchored in the bay – they were lit up – but the pilot remembered the harbor was cluttered up with a lot of buoys and platforms on stilts which could be deadly if hit, and he was afraid some of the ships might light up their searchlights and blind them.

Then they remembered that the sea had been a flat calm on takeoff from Catalina and probably was here. It had been calm all day. The decision was made to head north past the Hotel del Coronado, an excellent landmark, at 100 feet, do a power-stall landing toward Point Loma and then taxi in.

The hotel passed close aboard the starboard wing. The lights from the houses on Ocean Boulevard were an excellent reference. Easing down on the throttles at a bare 50 kts, they suddenly made contact. WHAM! It was hard and sudden – almost like an arrested landing on the *Langley*. Quickly they chopped throttles and turned switches off. A look over the side verified the fact that they had landed on the sand on North Beach, between North Island and Coronado!!

Now, let's go over to the naval air station. Back then, there was no control tower, but the duty officer had stationed an experienced chief in the tower of the administrative building and a man on top of the balloon hangar. The chief in the tower had access to a telephone and duly reported the plane coming over Point Loma and circling south of Coronado. "It looks like he is landing in the ocean off Coronado!!" and, finally, "Looks like he cracked up in the Spanish Bight, but he ain't on fire."

The duty officer, right on his toes, pulled the crash alarm. Two ambulances and the crash truck – ever on the ready – roared away from the sick bay to the crash site on North Beach. The duty officer jumped in his own car and halfway to the Army side of the field, he almost hit the first ambulance. It had run out of gas and was stalled in the middle of the road. At North Beach, he found the second ambulance stuck in the sand and the crash truck, trying to pull it out, was also stuck. He immediately sent for a tractor from the patrol squadron. It quickly freed both.



Meanwhile, the crew of the plane walked up to the rescue party and reported in with no injuries. The OOD, being very thorough, ordered them into the ambulance. At sick bay, they were pronounced fit for duty. The flight surgeon then casually asked, "Where's the injured man we have been standing by for all evening?" "Holy mackerel, he's still on the stretcher in the tail of the plane – let's GO!!"

Grampaw Pettibone says:

How about them apples! That's really the old tiger spirit. Talk about NATOPS. What's that? Bet those two fighter pilots were really qualified in that twin engine seaplane. They made a successful landing though. It only took two days to get it back afloat. But the poor patient got the short end of the stick. Hope the other ambulance didn't run out of gas going after him.

1970

NAVAL AVIATION IN REVIEW

In 1970, the year before its 60th anniversary, Naval Aviation recorded a wide range of accomplishments. They cover the spectrum through air operations, special missions, training, scientific and technical contributions, humanitarian acts and, above all, personal and group achievements by the men and units of Navy and Marine Aviation.

This capsule review attempts to provide an idea of the major trends and events on the eve of a new decade in Naval Aviation.

By Clarke Van Vleet, Historian, DCNO(Air)

Personnel strength in the active aviation community dropped nearly ten percent during FY 70. At the end of the fiscal year, the aeronautical organization had been reduced by 14,000, to just over 160,000 officers and men.

Officers in a flying status were fewer by some 800, with pilots representing three-fourths of this category. There were approximately 3,400 officers in non-flying status in June 1970, 1,500 less than the previous year.

Slightly more than 10,000 enlisted personnel were on flying status in mid-1970. This was some 1,000 less than the previous year. The total enlisted force was down almost 11,500 men from the 1969 figure.

Naval Air boasted 107 admirals in FY 70, nearly all in a flying status. The number of enlisted pilots, a dwindling breed, was reduced by five — to 15.

Personnel retention posed problems during the year, particularly in the experienced pilot category, the critical six to 14-year experience group. Three years ago, the retention rate among experienced aviators was about 60 percent; in 1970, it approached a low of nearly 25 percent.

As authorities pointed out, this "experience shortage" could not be solved merely by stepping up the procurement of new pilots, i.e., increasing the number of students in training. What was needed was the experienced pilot.

Invitations to rejoin the service were sent to many recently released aviators and flight officers, mainly lieutenants and lieutenant commanders. The majority contacted were regulars who had resigned and reservists who had completed their obligated service. Maximum consideration as to preference of assignments was promised and, by year's end, the situation appeared to be improving.

Retention was a problem in other sectors as well. For example, the first term re-enlistment rate aboard Atlantic Fleet carriers was only three percent. In the highly technical aeronautical arm — which becomes more sophisticated and complex with each delivery of new ships, aircraft and weapons systems — ways and means to retain qualified personnel became increasingly important.

People-oriented programs gained increasing attention during 1970. More emphasis was focused on upgrading the quality of life for the individual and his family — in training, recreation, advanced educational opportunities, housing and numerous other areas.

One important development was Navy-proposed legislation, signed into law February 27, 1970, extending to Naval Flight Officers the same sea and shore aviation command eligibility afforded Naval Aviators.

In the enlisted category, transfer orders for aviation fire control technicians (AQ's) were issued directly from Washington — a switch from field control — in an attempt to improve placement and to increase re-enlistment rates; and a senior AQ was assigned to BuPers' Avionics Rating Control

Unit as an advisor and detailer. Enlisted men and commanding officers alike were encouraged to correspond directly with him.

A new schedule for 1971, reducing Atlantic carrier deployments to a maximum of six months, rather than the previous eight or nine, was announced in November.

More liberal leave and liberty policies were formulated. Extra leave hours – for officers and men en route to their families – were gained with the elimination of the 16-knot speed limit for ships returning from deployment.

Typical of improved recreational facilities was the installation in *Kitty Hawk* of a TV system which beams color broadcasts throughout the carrier. The network also serves as a valuable training aid and communications medium.

In the field of education, revised correspondence courses were made available and the first group of 21 students completed the new Master's Degree Program at NAS Corpus Christi in January. Before the end of the year, three more groups graduated under the Navy/University of West Florida program.

Reserve Reorganization

The Selected Air Reserve underwent significant change in its organizational and command structure which gave Naval Air Reserve squadrons an improved combat readiness posture. The reorganization placed all carrier type squadrons in two Reserve carrier air wings (CVWR's) or two carrier ASW groups (CVSGR's). VP and VR squadrons joined the carrier squadrons, under the control of Commander Naval Air Reserve Force, reporting directly to CNO instead of the Chief of Naval Air Training.

Internally, the squadrons altered their organization and were re-equipped to parallel active duty units. Where appropriate, squadrons have been stationed aboard fleet air stations to take advantage of modern support facilities (*NANews*, March and June 1970).

Operations

The strength of the Sixth Fleet was temporarily increased by two additional carriers in September when Palestinian commandos attempted to unseat the monarchy in Jordan: *John F. Kennedy* and *Guam* joined *Saratoga* and *Independence* in the Mediterranean. During this period, President Nixon visited *Saratoga* off Naples, touching down on the flight deck on September 28th. The President was on a five-nation tour of Europe.

U.S. naval movements in the Mediterranean watched by overflights of Russian-built Egyptian Air Force-marked planes provided one assignment for Sixth Fleet aviators who maintained surveillance of these aircraft.

Security requirements limit available information from the Pacific, but some trends and developments are apparent.

Constellation, Hancock, Ranger, Coral Sea, Bon Homme Richard, Shangri-La, America and *Oriskany* all served varying periods on Yankee Station with TF 77.

After a nine-month overhaul, *Kitty Hawk* also took her turn on station late in the year. (Before she deployed, a *Phantom* of VF-213 made the first "hands off," fully automatic arrested landing attempted on a West Coast carrier by an operational squadron. The F-4 used SPN-42.

The A-7E, the latest in the *Corsair* series, made its com-

Intercepted near the Sixth Fleet, a Soviet-built Egyptian Badger is escorted by a VMA-331 Skyhawk and a VA-33 Phantom, both from Independence.

bat debut when members of VA-146 and VA-147, operating from *America's* flight deck, demonstrated the *Echo's* versatility during strikes on communist targets.

During the year, carrier aircraft continued interdiction of the Ho Chi Minh Trail and other supply routes, slowing the flow of communist material to the south.

Flying an F-4 off *Constellation,* Lt. J. E. Beaulier and Ltjg. S. J. Barkley, VF-142, downed the first MiG-21 since November 1968, while escorting an unarmed Navy reconnaissance plane.

The first carrier to make six combat deployments, *Bon Homme Richard,* completed her last WestPac cruise in November. The three-war veteran is scheduled for decommissioning in June 1971 at Bremerton, Wash.

Hancock, the oldest attack carrier in the fleet today, began and ended 1970 in WestPac. The first carrier to win the Navy Unit Commendation for both WW II and Vietnam, CVA-19 was awarded the battle E in February 1970 while on her fifth WestPac deployment.

Another carrier that began and ended the year on station

was *Ranger*. During seven months on the line in early 1970, CVW-2 flew over 9,000 combat sorties and dropped 17,500 tons of ordnance on enemy targets.

As part of the U.S. withdrawal from Vietnam, two Marine squadrons, VMFA-542 and VMA-223, returned to the States in February 1970. The same month, VMA-211 and MAG-12 moved to Japan.

In September, VMFA-122, VMFA-314 and VMA (AW)-242, as well as two aviation support units, H&MS-13 and MABS-13, returned to the States. In October, the last Marines left Chu Lai and turned command of the base over to the U.S. Army. They had been there since May 1, 1965.

Aircraft

Principal aircraft programs, in varying stages of development, included:

The swing-wing F-14A fighter which completed its first flight on December 21. Production models are scheduled to replace the F-4 *Phantom* in the mid-70's.

Ranger, with two WestPac tours in 1970, far left, moves in for underway replenishment in the South China Sea. Above, ships of Task Force 77 cruise in formation in Far Eastern waters and, left, an A-7E, making its combat debut, is recovered aboard America.

The latest — an R. G. Smith painting of the A-4M which was delivered to the Marines in November and, below, the last — Navy's only advanced aviation base ship, Tallahatchie County, decommissioned in January.

The electronic warfare EA-6B, for tactical jamming of enemy defense systems, is a modification of the A-6A and is planned to replace EKA-3B's as they are phased out.

The antisubmarine, carrier-based S-3A, to meet the Soviet submarine threat in the 70's, has completed its first year of engineering development, with fabrication started and more than 2,000 hours of engine test time accomplished.

Prototypes of the E-2C, planned to replace the aging E-1B's, have been undergoing modification to the C configuration, with test flights scheduled in early 1971.

The first of the versatile V/STOL AV-8A, for close air support in assault operations, were built and began pre-acceptance test flights in England in late 1970.

The U.S. Marine Corps, scheduled to receive delivery of its first AV-8A *Harriers* in April 1971, took delivery of the new A-4M in November. Shortly thereafter, the newest *Skyhawk* was flown to Patuxent River for Navy Bureau of Inspection and Survey (BIS) trials.

BIS trials for the AH-1J were also held at Patuxent River. Production deliveries of the *Sea Cobra* to the Marines were planned for Spring 1971. Flight tests of the new UH-1N, twin-*Huey*, multi-mission helicopter continued at Bell. First deliveries are scheduled for early 1971.

Aircraft deliveries to units during 1970 included: TA-4J *Skyhawks*, T-2C *Buckeye* trainers, UH-1L *Huey* utility helicopters (for the Navy in the Pacific), HH-1K *Hueys* which replaced the Marines' UH-34D *Seahorses* at all major Marine Corps air stations for SAR purposes, the WP-3A *Orion* for hurricane tracking, and P-3C's. (VP-49 was the first squadron to deploy overseas — to Iceland in July — with the new *Orion*.)

In February 1970, the prototype of the A-6E *Intruder* made its first flight. In May, an A-6A, equipped with an AN/ARC-146 Airborne Satellite Communications Terminal, operating from *Independence*, demonstrated the potential of satellite communication in expanding the mission capabilities of carrier-based aircraft.

In October, the Naval Air Systems Command accepted the first of two *Hercules*, designated DC-130A's, converted for service as target drone launch planes. In the same month, NavAirSysCom awarded a contract to Kaman Aerospace Corporation for conversion and reconfiguration of ten H-2 *Seasprites* as interim light airborne multi-purpose system (LAMPS) vehicles.

Awards and Decorations

Individuals and many men who collectively make up units of the highest caliber were recipients of awards and decorations for deeds and services to their fellow men, their country and Naval Aviation.

During 1970, seven individuals were presented the Navy Cross, the second highest award for valor: Colonel Eugene R. Brady, Maj. Robert G. Mitchell, Capt. Laurence R. Adams III, Lt. Joseph P. Donovan, MSgt. Robert L. Cover and LCpl. Alan C. Lefler, all USMC, and AD Lloyd T. Williams, Jr., USN.

Col. Brady, commanding officer of HMM-364 in Vietnam, on May 15, 1969, brought his transport helo into an extremely confined area of a battle zone being raked with heavy enemy fire. With his helicopter damaged, he still managed a difficult landing and then came under intense mortar bombardment which further damaged the helo.

With four previous recoveries to its credit — Apollos 8, 10, 11 and 12 — HS-4 prepares to make its fifth as a Sea King hovers above the astronauts of the ill-fated Apollo 13.

Showing superb airmanship, he executed evasive maneuvers in lifting off eight wounded Marines whose lives were saved by his action.

Aviation Machinist's Mate Williams received his Navy Cross on February 5, 1970, for acts the previous year in Vietnam while crew chief in an HA(L)-3, Det. 3 helicopter. The craft was struck by enemy fire and forced down. He made two trips through an open field under blistering enemy fire to another downed plane to rescue injured crewmen. While returning fire to hold the enemy at bay, he helped the injured aboard a rescue helo, then climbed aboard and gave first aid to the wounded.

Some other awards for the year were:

CNO's highly competitive, coveted Readiness Through Safety Trophy – won by the men of Marine Aviation.

The Orville Wright Achievement Award – to Ltjg. John D. Taylor, VP-6, for his achievements while serving with VT-28.

The Alfred A. Cunningham "Marine Aviator of the Year" – to Captain John J. Barrett, now with HMMT-302,

The emphasis was on individuals in 1970 as Admiral E. R. Zumwalt, Jr., CNO, talks with galleymen aboard Forrestal, top; and victims of the Peruvian earthquake, above, and Vietnamese floods, right, received aid from Navy and Marine airmen.

for his courage, contributions and performance in Vietnam and later in the U.S.

The new Admiral "Jimmy" Thach Award – presented for the first time to the outstanding carrier-based ASW squadron, VS-32.

Safety

To win the CNO Readiness Through Safety Trophy, competitive among all fleet units, the Marine Corps reduced its accident rate from 1.76 to 1.51 accidents per 10,000 flying hours during FY 70.

General Lewis W. Walt, Assistant Commandant of the Marine Corps, wrote the Marine Aviation community: "Considering that on top of training and fighting you have flown medical evacuees in the Andes, operated on LPH's, ferried the Pacific, transitioned to new aircraft and carrier qualified, it is clear that a large number of Marines have done a large number of things right."

For a summary of individual squadrons and ships which won the CNO Safety Award and the Admiral James H. Flatley Memorial Award see page 4 of the October 1970 issue of *Naval Aviation News*.

Relief and Rescue

Naval Aviation continued to assist in various relief and rescue missions around the world throughout the year. Following are some that brought high praise:

Six pilots of HS-6 were awarded Tunisia's *Order of the Republic, Degree of Chevalier* on February 17, 1970, for the relief missions they flew in flood-stricken regions of that country in 1969.

The 26 persons rescued by a VC-8 helicopter from a Dutch Antillean Airlines DC-9 ditched in the Caribbean May 2, 1970, represented an unofficial record for rescue hoists at sea by a single helicopter.

In June, the men of USS *Guam* (LPH-9) provided earthquake-torn Peru with over 200 tons of relief supplies and transported over 1,000 evacuees and medical patients on 800 mercy flights. As one airman said: "We won't forget Peru – nor will the Peruvians forget the *pajaros* (birds) and men of HMM-365."

In the fire-swept regions of California – declared a disaster area by the President – forestry officials estimated that the relief provided by Navy helicopter flights to inaccessible areas probably saved 5,000 acres of timberland.

A Navy-Marine team aided thousands of Filipinos left homeless, hungry and injured by Typhoon *Joan* in the Republic of the Philippines last October. Over 300 tons of rice, flour, blankets and fuel were airlifted by HMM-164, while bakers aboard USS *Okinawa* turned out 5,000 loaves of bread and, inland, medics worked by flashlight to aid the injured.

Helicopter forces of MAW-1 in October brought relief to 9,000 South Vietnamese when the worst floods since 1964 inundated over 144 square miles of the Mekong Delta.

Considering what the men of Navy and Marine Aviation are doing for their country and others, a remark made by an old flying Admiral to a group of midshipmen seems appropriate. He said not to worry about those who say "make love not war" because "you all belong to a fraternity whose members are men enough to do both."

MAJOR CHANGES-1970

COMMISSIONED	DECOMMISSIONED
SHIPS	
Inchon (LPH-12), June 20	*Bennington* (CVS-20), January 15
Midway (CVA-41), recommissioned January 31	*Hornet* (CVS-12), June 26
Ticonderoga (CVS-14), conversion to CVS	*Kearsarge* (CVS-33), February 13
Dwight D. Eisenhower (CVAN-69), keel laid August 15	*Princeton* (LPH-5), January 30
	Tallahatchie County (AVB-2), January 15
	Yorktown (CVS-10), June 27
AIR GROUPS/WINGS	
Light Attack Wing 1, June 1	CVW-4, June 1
Fleet Air Reserve Wing, Atlantic, October 1	CVW-12, June 1
Fleet Air Reserve Wing, Pacific, October 1	CVSG-51, June 30
CVWR-20, April 1	
CVWR-30, April 1	
CVSGR-70, May 1	
CVSGR-80, May 1	
SQUADRONS	
VA-34, April 17	VA-23 *Black Knights*, March 21
VAH-10, redesignated VAQ-129 September 1	VA-36 *Roadrunners*, August 1
	VA-44 *Hornets*, May 1
	VA-95 *Skyknights*, April 1
	VA-216 *Black Diamonds*, August 1
	VSF-1 *War Eagles*, January 2
OTHER UNITS	
	FAW-4, April 4
	NASU Chu Lai, February 15
STATIONS	
NAS Bermuda, July 1	NAS Olathe, May 28
	NAS New York, November 1
	NAS Seattle, June 30
	NAS Twin Cities, June 30

MASTERING V/STOL

By JO3 Dan Lichtenstein
Photos by PH1 Bob Woods

After months of instruction, preparation and testing, the Marine Corps is about to begin flight operations using the world's first operational V/STOL jet, the Hawker-Siddeley AV-8A *Harrier*. VMA-513, MCAS Beaufort, S.C., will become the Corps' first *Harrier* squadron in April.

The first American *Harrier* was the 59th off Hawker-Siddeley's production line, and the first of 12 to be delivered in the Marine Corps during 1971.

Congressional approval has been received to procure the first 30.

The *Harrier* is the product of a British program in vertical takeoff and landing jets that began in 1959, with purely experimental models. The aircraft underwent three development stages culminating in the first production model late in 1967.

Operationally, the *Harrier* can best be visualized as a combination of the A-4 and a helicopter. Primarily an attack aircraft, once it is airborne, its mission is similar to that of the A-4 *Skyhawk*.

But what makes the *Harrier* truly unique are its V/STOL capabilities. It can do almost anything a helicopter can do except land in a rough, unprepared area. It can hover like a chopper, turn a full 360 degrees with no forward or backward motion, then sprint away at low level, at subsonic speed. Similarly, the AV-8A can slow down and come to the hover position for a vertical landing within seconds.

The aircraft does have its limitations, however. It can land vertically only if its total weight is less than the engine thrust. Ideally, it performs best when a vertical rolling landing – to avoid ingestion of foreign objects – of about one plane length is executed. Normal operations usually involve short takeoffs and rolling vertical landings.

The AV-8A's unique capabilities provide the key to the Marines' concept of the aircraft's primary mission. They envision the plane as a means of

On the flight line, a Hawker-Siddeley Harrier is readied for a morning flight by U.S. Marines. Wearing Marine markings and camouflage paint, an AV-8A rolls out over the English countryside.

Hawker—Siddeley

providing immediate support for ground troops — before conventional airfields can be built: maximum capability with minimum preparation.

Its flight capabilities make it ideal for maritime operations; fully armed it can take off from a carrier without the aid of a catapult, and then land vertically on a clear or fouled deck.

The Marine Corps began participating in the *Harrier* testing and conversion operations in the summer of 1968. At that time, the Corps sent two test pilots, Brigadier General Thomas H. Miller, then a colonel, and Lieutenant Colonel Clarence M. Baker, to England to get a first-hand report on the V/STOL aircraft.

That fall, Gen. Miller became the first American to fly the *Harrier*, and he and Col. Baker returned to Washington full of enthusiasm for the new jet. Shortly thereafter, the Marine program began in earnest.

By mid-1969, the Corps had a *Harrier* liaison team in England.

The team was headquartered in London, in the Ministry of Aviation Supply. There, Lt. Col. Baker, who is slated to become VMA-513's commanding officer, served a dual role as Officer in Charge, Marine Corps Harrier Liaison Team, United Kingdom, and Project Manager, United Kingdom Branch of NavAirSysCom's Harrier Project Office. Two other main bases for the team were at RAF Wittering, and the Aeroplane and Armament Experimental Establishment at Boscombe Down, both located approximately 100 miles from London.

At RAF Wittering, Maj. Jacob E. Iles, an exchange pilot and the first American to complete the *Harrier* pilot conversion course, taught other Marines how to fly the jet, and helped consolidate operational and maintenance data.

The American personnel at Boscombe Down were concerned primarily with tests and evaluations of the *Harrier's* ordnance capabilities. Maj. William J. Scheuren headed a team consisting of one enlisted ordnance technician and two civilian engineers from NATC Patuxent River, Md. They assisted the British and monitored the tests for the Marine Corps.

Harrier BIS trials began at Patuxent River in January and will last 90 to 120 days. In April, exactly two years after the establishment of the first RAF *Harrier* squadron, VMA-513 will commence operations. Because of the other services' interest in the *Harrier*, one Air Force and two Navy pilots will be assigned to the squadron.

Like most of the American pilots in the liaison team, Maj. Scheuren compares the new jet with the *Skyhawk*.

"It's more of a pilot's machine," he says. "It's smoother handling."

The *Harrier* is similar to the A-4 in size, weight, internal fuel, ordnance delivery and flying qualities. Even its flight control layout, visibility and pilot's seat are much the same.

'the Harrier can best be visualized as a combination of the A-4

According to Lt. Col. Baker, all but three U.S. weapons were tested on *Harriers* at Boscombe Down. The team concentrated on three basic ordnance tests: weapons compatibility, electrical systems and flight trials.

Maj. Scheuren and his group found that the *Harrier* easily adapted to the standard American ordnance.

"A few of our rockets will require slight modifications," he says, "but we anticipate no problems. For the most part, the small changes that are necessary are being built into our models at the factory."

Among the changes will be a modification of the *Harrier's* wiring system to accommodate the *Sidewinder*. Also, the altimeter in the heads-up display in the Marine AV-8A's will read in inches of mercury, rather than millibars.

Because the *Harrier's* exhaust blasts from four nozzles along the fuselage instead of from one aft tailpipe, the aircraft presents some unique safety hazards. Among these are the heat and debris danger within a 50-foot radius of the aircraft. The likelihood of the nozzles kicking up foreign objects is especially great when it is operating from aging concrete and unprepared airfields. Ground personnel will have to learn the jet's "hot points" and make maximum use of eye and ear protectors.

The ideal *Harrier* pilot has experience with high performance fighter/attack aircraft but does not have extensive helicopter time, according to Lt. Col. Baker.

"We don't want helicopter pilots because the *Harrier* is a high performance aircraft," he explains. "Its thrust-to-weight ratio is the best of any airplane that we have; so, for a helicopter pilot, it would be just like jumping from a chopper into an F-4."

But as new pilots in VMA-513 convert to the AV-8A, they will have to get a few hours of helicopter training to learn the visual cues necessary during hovering, and to get used to the concept of rapid deceleration into the hover position. This familiarization will take place at MCAF New River, N.C., and Lt. Col. Baker estimates it will take no more than three or four hours of practice in a CH-46.

"It isn't difficult to learn to fly the *Harrier*," he adds. "It's very simple. And we've had surprisingly few problems in pilot transition, especially since it's an entirely new concept."

Marine pilots now qualified in the *Harrier* received their training in the British conversion course at RAF Wittering. Maj. Iles, who served as an instructor for both Marine and RAF personnel, was in the second class of the *Harrier* conversion program, and now has about 100 hours in the aircraft. He compares the program to safety officer and test pilot courses.

"The whole idea is to build up the workload progressively," he says. "We start with conventional material, then gradually introduce students to the V/STOL concept. Finally, we get to the fast stuff. Because of the *Harrier's* V/STOL capabilities, it takes off and lands much faster than conventional aircraft, and the pilots have less time to make decisions."

A preflight brief in the *Harrier* conversion program sounds much like a conventional fixed-wing brief, but with the addition of the terms "nozzle position" and "hover." Nozzle position is expressed in degrees and, during one of Iles' training briefs, this concept seems to slip easily into his instructions – as if V/STOL flying were normal practice.

But hovering is not a normal practice for jet pilots and, among other things, Maj. Iles stresses the importance of maintaining a tight attitude during V/STOL operations. He adds that piloting the AV-8A during a hover can be like "flying a ball bearing."

The optimum hover altitude is 50 to 100 feet, depending on the ground surface.

"If you're too low, you can suck foreign objects up into the engine," he explains. "And if you're too high, you can't see if you're drifting. This is where a few hours of practice in a helicopter pay off."

The pilot conversion program at Wittering usually consisted of four-man classes and, because of the costs involved, progressed much faster than conventional pilot training courses. At MCAS Beaufort, Iles, Baker and other *Harrier*-qualified pilots will be teaching new pilots as they join the squadron. The teaching staff at VMA-513 will also include an RAF exchange officer.

While some Marines were learning how to fly the *Harrier*, others at Wittering were learning how to service the aircraft. Captain Manuel Gonsalves spent 18 months at the RAF base preparing to become VMA-513's maintenance officer. With him were four technicians who will be the senior non-commissioned officers in his department – MSgts. Harry G. Davenport and Jimmy J. Brown, and GySgts. Samuel K. Mayo and Arthur K. McMahon. They observed and evaluated the British maintenance techniques and suggested maintenance plans for the squadron.

"Basically, we looked for maintenance problems and observed how the British solved them," says Gonsalves. "Then we evaluated their methods and figured out how we would do the same jobs. And, of course, everything was put into logs for future reference."

The groundwork for VMA-513's maintenance operations is now complete and ready for adaptation into the standard U.S. service and supply systems. Each *Harrier* part has a federal stock number and will be ordered through standard channels.

"We're ready to go with straight U.S. maintenance philosophy," adds Gonsalves. "But for the first year, we'll use about 20 percent of the British methods to fill in the gaps. We'll be using British publications until we can get our own printed."

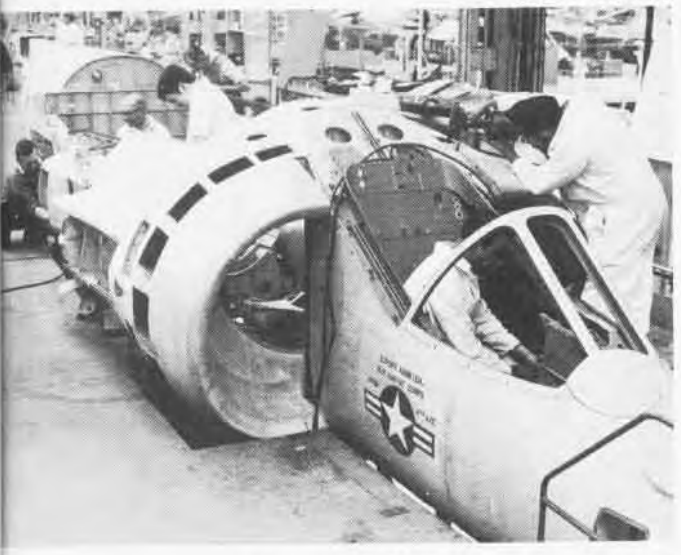
In addition to the work Gonsalves and his men did at Wittering, 45 other Marines received specialized training in *Harrier* maintenance in London, the Rolls-Royce plant in Bristol, and the Hawker-Siddeley plant in Dunsfold.

"It's an amazing airplane," says Iles. "There's no doubt about that. But V/STOL does have a long way to go."

"It's an outstanding aircraft for the first of its kind," Gonsalves adds. "It still has certain bugs – it doesn't carry as big a load as we'd like it to – but I think the second *Harrier* will be bigger and better. We'll have certain problems, but after all, you don't get V/STOL for nothing."

and a helicopter'

Hawker—Siddeley



At top left, Major Iles gives classroom training to USMC pilots who are transitioning to the Harrier. At top right, he gives a cockpit checkout to another Marine. Above photo was taken at the Harrier factory. At right, the finished product.

HA

In August 1969, USS *LaSalle* (LPD-3), while anchored in Hampton Roads, became the demonstration site for a new concept in ship-based aircraft. Before high ranking naval and other military officers, a fixed wing, transonic light attack plane, after making several high speed passes, approached and landed on *LaSalle's* 82x188-foot landing platform. It took on a load of bombs, lifted 30 feet into the air, turned and departed for nearby NAS Norfolk where it continued the demonstration of its unique capabilities.

The aircraft was the British-built Hawker-Siddeley *Harrier,* designated the AV-8A by U.S. forces. The Marine Corps, long experienced in providing its own air support for ground troops and interested in an aircraft that can be operated from unprepared landing zones close to the combat area, saw the obvious advantages of a plane capable of using roadways, metal mats or dirt fields as its base of operations.

After delivery to NAS Patuxent River in January 1971, for BIS trials now in progress, the AV-8A's will be assigned to VMA-513 at MCAS Beaufort where they will be used to develop tactical concepts.

The USMC version of the *Harrier* will differ little from those currently in service with the RAF in close support and reconnaissance roles. The Marine AV-8's will feature a somewhat more powerful engine and will have provisions to handle *Sidewinder* and all U.S. air-launched rockets. Two under-fuselage mounted 30mm guns and hard points, for attaching various bomb and rocket loads under the fuselage and wings, give the *Harrier* great versatility in weapons delivery. The hard points may also be used to carry two jettisonable combat fuel tanks or two large ferry tanks.

Enabling the plane to achieve its unique flight performance is the system of using a high by-pass twin-spool turbofan engine and vectoring its thrust through four rotatable exhaust nozzles. A jet reaction control system using bleed air is ducted to nose, tail and wing tips to control pitch, roll or yaw in hover.

Design characteristics of this revolutionary aircraft provide for surprisingly easy maintenance in the field, interchangeable wing tips for combat or ferry missions, a navigation computor feeding a moving map display, and a heads-up display of all primary flight information as well as weapons aiming data.

RRIER

AV-8A

Length	45'8"
Height	11'3"
Wing span	
combat tips	25'3"
ferry tips	29'8"
Engine	Rolls-Royce Pegasus 11
Thrust	21,500 lbs.
Maximum speed	625 kts.
Service ceiling	45,200 ft.
Ferry range	1,800 nm.
External load	
STOL	4,500 lbs.
V/STOL	3,000 lbs.

PH2 J. J. Urciuoli, Jr.

DEEP FREEZE

PH2 J. J. Urciuoli, Jr.

PH1 Bill Galligan

PH1 W. C. Hamilton

The U.S. Navy is now in its 16th year of support to the scientific research program in Antarctica, Operation *Deep Freeze*. In supporting the scientific team, VXE-6 is using two C-121J *Super Constellations*, five LC-130 *Hercules*, and several LH-34D's and UH-1D's. An unusual sight on the ice this year was an MAC C-133, which airlifted three *Hueys* from NAS Quonset Point to the frozen world below.

PH1 W. C. Hamilton

PH1 W. C. Hamilton

SELECTED

Carquals

Norfolk-based VAW-207, an E-1B squadron attached to CVWR-20, traveled to NAS Jacksonville recently for carrier qualifications aboard *F. D. Roosevelt* (CVA-42). Commander J. R. Flowers, commanding officer of VAW-207, and two other squadron officers requalified in carrier landings, while another squadron pilot, LCdr. K. C. Sanders, requalified as squadron LSO. A total of 39 landings was logged by VAW-207 aircraft during the cruise.

Simulator Graduates 1,000

"Decision," "Liftoff," "Gear up" were called as the C-118 *Liftmaster* climbed into the sky and slowly turned eastward. Despite numerous mechanical ground delays, BuNo 33223 was airborne from NAS Glenview with a USO All Girl Band, on their way to a two-night engagement at NAS Bermuda. The climbout continued normally except for an inverter failure, pilot's gyro horizon failure and a double shorted secondary on #2 engine. After a few strong well-chosen words by the crew, the decision was made to feather #2 engine and request fuel dump area and clearance to the nearest suitable field, in this case NAS Glenview.

A hard decision to make, but flying Chicago to Bermuda on three engines in a four-engine Navy prop aircraft is not exactly SOP.

With the plane on the return leg, the situation got a little more sticky. First, a wing heater fire broke out and was quickly extinguished by a shot of CO2. Then, the weather dropped below GCA minimums at Glenview, and a back course ILS approach to runway 22 at Chicago's O'Hare International was commenced.

A fuel leak was now evident in number one engine and it was quickly secured before it caught fire. With two engines feathered on one side, preparations were made for an emergency landing. Approaching minimums, they broke out just in time to get the gear and flaps down and complete a smooth landing without activating the crash circuit on the simulator which flashes lights, rings a buzzer and makes a metal crunching sound before all goes quiet again. As the crew stepped out of the simulator, the flight crew plane captain, AMH1 Edmund A. Richardson from NAS Dallas, Texas, was congratulated as the 1,000th student to successfully complete the C-118 Simulator/Ground School Course.

CAPT. W. J. DYCKMAN, C.O. OF NAS GLENVIEW, PRESENTS PLAQUE TO AMH1 RICHARDSON

Mercy Mission

NAS Atlanta's VA-205 demonstrated immediate response capabilities as it undertook a life saving mission one December evening. Commander Virgil R. Tedder, executive officer, flew a live kidney from Atlanta to a waiting patient in Charlottesville, Va.

A patient at Grady Memorial Hospital in Atlanta had donated his kidneys for transplant in others. One kidney was sent, via commercial aircraft, to the University of North Carolina Medical Center. The second was to be used for a patient at Grady but complications developed preventing that transplant, and the Regional Nephrology Center at Grady then located a needy and well-matched recipient in Charlottesville. Racing against time, the clinic attempted to find commercial transportation but learned that none was available. Since NAS Atlanta had previously expressed its willingness to assist the center in emergency situations, its director contacted Cdr. Tedder. As the kidney was transported to the naval air station, squadron personnel prepared one of their A-4L *Skyhawks* for the mission. With the kidney safely stowed in the jet's storage compartment, the plane received priority clearance from FAA and took only one hour to deliver the organ to Richmond, Va., where a Virginia highway patrolman rushed it to the Charlottesville patient.

AIR RESERVE

VFP's Aboard FDR

"Riptide six-zero-one, *Crusader* ball, fuel state is three point one, will land manual."

One mile from the aircraft carrier, *Roosevelt*, a *Crusader* reconnaissance plane banked hard to the left and, when aligned with the carrier, leveled off on final approach for landing.

Aboard the carrier, the landing signal officer watched the sleek 1,000-mph aircraft as it flew toward him and the ship's flight deck. "Roger ball," returned the landing officer, clutching his headset with his right hand while scanning the flight deck. "Clear deck."

Commander Robert R. Smiley, a lawyer and part-time Navy pilot, watched the carrier as it seemed to grow before him, recalling the first time he had landed on a carrier after completing basic flight training at the Naval Air Training Command in Pensacola, Fla. How little the ship had seemed. But, landing after landing on the pitching decks had increased his skill, and his confidence in the equipment and men that make Naval Aviation work.

He'd be on the *Roosevelt's* deck within seconds. He braced himself.

The impact with the carrier, although noisy, wasn't as jarring as he had anticipated. The tail hook grabbed the number two wire and sent his body pushing hard against his flight harness.

Cutting power to idle, he taxied out of the arresting gear to the catapult area as the deck crew rushed about performing its tasks. Within seconds his RF-8G was streaking along the carrier deck and then climbing quickly skyward.

For the first time, Naval Air Reserve Light Photographic Squadrons 206 and 306 were operating from the deck of an aircraft carrier. Their reason for being there – to requalify pilots in carrier landings and shipboard routine.

Commander Smiley, a Reservist, commands Light Photographic Squadron 306, home-based at NARTU Washington, D.C. Commander Frank R. Dunne, a commercial pilot with Eastern Airlines, is the commanding officer of Photo Squadron 206. His *Crusader* was already on deck and taxiing for relaunch in Cdr. Smiley's wake.

COMMANDER SMILEY, C.O. OF VFP-306, LANDS AN RF-8G CRUSADER ABOARD USS ROOSEVELT

Both pilots would see the deck of *Roosevelt* rise to catch their aircraft ten times before the day's flying was completed.

It all started in November when ten pilots and 60 enlisted men gathered their equipment together for two weeks of carrier qualification training. Six of the pilots delivered the planes while the others climbed aboard a Navy C-118 and headed for Cecil Field.

For nine days, the pilots flew practice carrier landings at Cecil Field. The landing signal officer, who would work with them on *Roosevelt*, observed each pilot's performance as he touched his jet carefully within marked boundaries which simulated the deck of an aircraft carrier.

Maintenance men, under the guidance of veteran chiefs, worked ten-hour days to keep the planes airborne.

During the two weeks, the pilots logged over 260 flight hours and 91 carrier landings. Each flew at least four practice flights each day. The maintenance crews spent over 7,800 man-hours fueling and preparing the aircraft for flight.

1970's Top Photos

PH1 R. C. Spell

Each year, selection of the annual Best Picture Award becomes more difficult. The difficulty this year lay in the fact that we received an increasingly larger proportion of truly excellent photographs. While this aesthetic abundance has been a boon to the magazine each month, at the end of the year it makes choosing a winner a hotly debated process – but an effort well worth the cerebral efforts of our staff.

This year's first place award goes to PH1 R. C. Spell for his photograph taken after the decommissioning of the USS *Hornet* (CVS-12) at Bremerton, Wash. His photograph graced our December back cover and captured a bittersweet moment, the end of faithful service for a carrier and her crew.

PH2 William R. Curtsinger, a special category winner for 1968, won second place for his shot of the end of an *Intruder* mission which appeared as part of the photographic essay "A Day in the Life" in March.

A first place winner in 1968, PH1 Robert E. Woods' third place award-winning photograph for 1970 appeared on our May front cover. The dramatic picture caught S-2 *Trackers* from VS-33 on patrol.

Those are the top three, but we feel two individuals deserve special attention. For almost two years, ending in August, with his last cover shot and feature, JOC James Johnston, former associate editor, greatly enhanced the pages of *NANews* with his consistently excellent photographs. We knew that Johnny's black and white work was of the very highest quality, but the final proof of his photographic expertise is evident in the November color special, *Space and the United States Navy*.

Chief Johnston left in August, and we worried and fretted about a successor.

Shortly after the Chief had left, we received a photographic essay on the Jungle Environmental Survival Training School in the Philippines. We knew a good thing when we saw it, and we ran the feature in October. As luck would have it, our sterling contributor and Chinfo Photojournalist of the Third Quarter 1970, JOC Dick Benjamin, became Chief Johnston's successor. We lucked out and so did you.

The list of outstanding contributions by no means ends here. They are evident in every issue of *NANews*, and our "Well Done" goes to the photographers who submitted them.

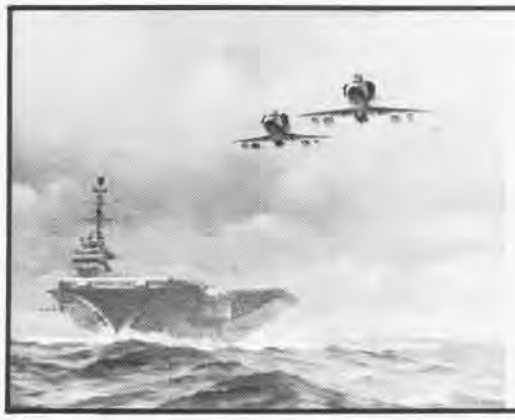
To the winners and our past contributors, keep the photographs coming.

To our future contributors, it's a new year and a brand new contest.

PH2 W. R. Curtsinger

JOC Dick Benjamin

PH1 R. E. Woods



at Sea with the Carriers

ATLANTIC FLEET

Forrestal (CVA-59)

Captain Leonard A. Snead, former C.O. of the ammunition ship, USS *Diamond Head* (AE-19), became the 16th commanding officer of *Forrestal* when he relieved Captain Charles F. Demmler. The latter, now with OpNav in Washington, D.C., was presented the Meritorious Service Medal by Rear Admiral George C. Tally, Commander Carrier Division Four.

During the change-of-command ceremony, guest speaker Vice Admiral Gerald E. Miller, Commander Second Fleet, spoke about the program of Chief of Naval Operations Admiral Elmo R. Zumwalt, Jr., to bring "fun and zest" back into naval service.

Recently, an otherwise normal carrier arrested landing had special significance when Lieutenant Colonel Clifford Allison and Maj. George Weeks landed a Navy F-4B *Phantom* on *Forrestal*. Both are Air Force officers on exchange duty with the Navy.

Saratoga (CVA-60)

After completing her tenth tour of duty with the Sixth Fleet in the Mediterranean, *Saratoga* has returned to her home port of Mayport.

C.O. Captain Dewitt L. Freeman and crew members were understandably proud of the result of *Sara's* Combined Federal Campaign – 183 percent of the goal.

Wasp (CVS-18)

Just one day after *Wasp's* 27th birthday, the Boston Naval Shipyard provided the background for a change-of-command ceremony when Captain Kenneth H. Lyons relieved Captain John F. Gillooly as commanding officer. Capt. Lyons came from the staff of Commander, Naval Air Forces, U.S. Atlantic Fleet. Capt. Gillooly's new assignment is in BuPers.

Independence (CVA-62)

This is the saga of Captain Leslie Herman, Marine Corps pilot, as he was launched in an A-4E *Skyhawk* from *Independence*, experienced mechanical failure, ditched, was picked up by a helicopter and stepped back onto CVA-62's deck – seven minutes from beginning to end – an eternity. Soon after, Capt. Herman, back in the squadron ready room, was busy making his entry in the log and checking the flight board. Everything was routine.

A Med cruise offers many new experiences, but often the Navy man on liberty has a yen for a good old American hot dog or hamburger and all that goes with it. During three visits to Athens, CVA-62 teamed up with the local USO and put cooks and the yearned-for food ashore daily, with other ships supplying galley helpers and miscellaneous items. The USO canteen became a popular stopping point for liberty parties.

In ceremonies aboard *Independence*

Commander Jack F. O'Hara, CAW-11, sets his A-7E Corsair II down after completing the first strike mission flown from Kitty Hawk on her current deployment to the South China Sea.

USS Shangri-La crew members spelled an appropriate greeting to citizens of the "land down under" when they entered Sydney for a two-day refueling stop. Carrier was on its way home.

off Naples, Commander Edward O. Buchanan, formerly executive officer of HS-2, became its commanding officer when he relieved Commander Joseph M. Purtell.

PACIFIC FLEET

America (CVA-66)

Attack Squadron 165, commanded by Commander R. A. Zick, returned to NAS Whidbey Island after an eight-month deployment to SEAsia aboard *America*. It was the first time a Navy attack squadron deployed with three models of the *Intruder* — the A-6A, A-6B and A-6C.

Shangri-La (CVS-38)

Local citizens and CVS-38 crewmen made the most of a refueling stop in Sydney, Australia, with *Shangri-La* crew members hosting Australians on board, and Australians hosting the crew for dinner, sightseeing and shopping tours.

Shangri-La visited Australia while on a 16,400-mile trip home to Mayport after a Seventh Fleet deployment.

Her homecoming in December marked the end of *Shangri-La's* last cruise, which took her around the world, stopping at seven ports on three continents. The 26-year-old carrier — decommissioned twice before in 1947 and 1952 — is to be decommissioned again by mid-summer.

CVS-38 was built through a special bond drive in WW II to replace the lost *Hornet* (CV-8).

Oriskany (CVA-34)

The sound of eight bells, followed by the traditional call of "Pacific Fleet, departing," echoed throughout CVA-34 as nearly 1,000 officers and men gathered informally to bid farewell and pay a personal tribute to Admiral John J. Hyland, Commander in Chief, Pacific Fleet, who was being relieved by Admiral Bernard A. Clarey. *Oriskany* served as the flagship for the change-of-command ceremony.

Ranger (CVA-61)

While observing Seventh Fleet operations, Vice Admiral Leslie Derrick Empson, RN, Commander of the British Far East Fleet, visited *Ranger* as a guest of Vice Admiral M. F. Weisner, Commander Seventh Fleet.

Ranger, on her sixth deployment off the coast of Vietnam, is missing some vital repair parts, parts so important that her commanding officer, Captain Joseph L. Coleman, has posted a reward. Without them, the doughnut machine cannot function nor can Rangermen maintain their lead in doughnut consumption. What is the reward? Why, doughnuts, of course.

Hancock (CVA-19)

During training exercises off the Philippine Islands, Lt. Paul Nelson, VA-164, logged *Hancock's* 143,000th landing in an A-4 *Skyhawk*.

Kitty Hawk (CVA-63)

Before *Kitty Hawk* left San Diego for her fifth combat deployment to SEAsia, commanding officer Captain F. Godfrey and crewmen donated $1,262.53 to help plant trees in the burned out areas of San Diego County. This amount, with money secured from an aluminum can collection, provided over $6,000 for re-forestation.

Command of VA-52 passed to Commander Douglas R. McCrimmon from Commander Robert H. Kobler while *Kitty Hawk* was at Pearl Harbor.

CVA-63 is back on Yankee Station after nearly a year and a half of overhaul and retraining. On her second day of strike operations, she marked her 106,000th arrested landing, made by LCdr. "Smoke" Arnold and Ltjg. Dave Nimmer in a VF-114 *Phantom II*.

Constellation (CVA-64)

After an overhaul period at Bremerton, CVA-64 is undergoing sea trials prior to her next deployment to WestPac. She will sail under Captain Harry E. Gerhard who relieved Captain John M. Tierney in January. Capt. Gerhard came from command of the ammunition ship USS *Great Sitkin*. Capt. Tierney has been assigned to NavAirSysCom.

CVA-64's boilers have been converted to the use of the Navy's new distilled fuel, a cleaner burning, time-saving propellent which means cleaner air, working spaces and aircraft, and a smaller workload for the boilermen, and reduces the cost of overall operations. The single-fuel concept has spurred the conversion of older steam-propelled, gas turbine and diesel ships to distillate fuel operation.

CHAINS AT THEIR SIDES

By JO3 Gene Romano
Photos by PH3 John Moore

High above the flight deck – in a place known as vulture's row – a small group of Navy men anxiously watch as the carrier's aircraft are shot off the flight deck.

They stand abreast of the island, straining to see the troubleshooter give the aircraft a thumbs-up and seem to hold their breath as the giant birds speed down the catapult. When the planes are airborne, the men slowly walk away, chains at their sides.

These men are plane captains aboard USS *Kennedy* (CVA-67).

Usually a non-rated man with six months to a year in the Navy, the plane captain is in charge of a multi-million dollar machine, and must know everything about the aircraft. He monitors all work done to the plane, holds daily and preflight checks, performs minor maintenance, washes it, and chains it down after a flight.

One three-year veteran sums up his job saying, "It's long hours, wash planes, and carry chains." "But," says another, "it's a great feeling to be able to say that that's my plane."

With his job comes a closer relationship with a pilot; the plane captain is his link with maintenance personnel and is at least partially responsible for his life.

"When I walk across the flight deck before a launch," explains a pilot, "the first person I usually check with is the plane captain to be sure everything is working properly."

After the pilot boards his aircraft, the plane captain makes sure he is strapped in securely. Then they begin a conversation without words. Communicating with hand signals, the plane captain checks all movable parts of the aircraft while the pilot monitors the instruments. A salute from the pilot says "thank you and goodbye," as the plane taxies to the catapult.

When the recovery begins, the plane captain is on the flight deck with chains at his side. He watches and waits as the aircraft return home. After each aircraft is chained down, its plane captain greets the pilot with a smile and "how did everything go."

For a plane captain it is long hours, wash planes and carry chains – and much, much more.

Hooking up the power connection, the plane captain prepares his aircraft for launch, above. The pilot and plane captain use hand signals as they check the aircraft's movable parts, below. Before and after each launch, the squadron plane captains can be seen dragging chains at their sides, below left.

U.S.N.T.P.S.

Test Pilots of Tomorrow

By JOC Dick Benjamin

Testing complex modern military aircraft is exacting and demanding. This is easily realized when one considers what the F-14, now undergoing manufacturer's trials, is designed to do (*NANews*, January 1971). To evaluate supersonic aircraft such as the *Tomcat*, the test pilot needs proficiency in specialized flight test techniques and a comprehensive knowledge of flight test engineering coupled with a high degree of piloting skill and considerable operational experience.

The U.S. Naval Test Pilot School (TPS) at NATC Patuxent River, Md., trains selected aviators in the first two requirements and sharpens the third.

"Our concept," says LCdr. R. M. Shields, assistant director for administration and a flight instructor, "is to provide experienced aviators with flight test technique instruction on how to identify aircraft parameters — or why aircraft fly as they do.

"After graduation, the pilots will normally be assigned to a test division at NATC. Our up-coming graduates will probably be testing the F-14."

Normally a TPS class consists of ten Naval Aviators; two Naval Flight Officers; an Air Force, two Marine and three Army aviators; a civilian test pilot; one or two foreign military pilots; and several civilian or military engineers. Civilian contractors repay the cost of the course by providing an engineer or a test pilot for a year's sabbatical instructor duty. An engineer from Grumman is presently teaching a weapons system integration course.

The average student is an experienced aviator with 1,500 hours who has finished his first tour in a squadron and has an engineering background.

Graduating aviators are the next engineering test pilots, and are primarily oriented toward investigation of flying performance qualities such as how the plane handles, how fast it goes at sea level and at altitude, how high it climbs and how fast it gets there. While in school, they spend about 500 hours in ground instruction — about half their day. The remaining half is taken up by flying, followed by a full evening of study.

Naval Flight Officers become the test engineers for weapons systems. They go through the same course, except they spend considerable time studying weapons systems and evaluating them, in the lab. During a weapons test, an NFO is concerned with systems performance: navigation and communications systems and radar intercept capabilities.

Test project engineers — naval officers, foreign officers or civilians — go through the basic ground syllabus, receive certain demonstration flights, and are normally involved in aircraft testing from the engineering standpoint.

The school is oriented around two basic phases, a flight syllabus and a ground school which supports the flight phase. At the start of the course, students are given a cram course in calculus. They also receive courses in aeronautical physics — why air flow does what it does to an airplane; a broad background in aerodynamics — why does an airplane fly; and courses in jet engines — what are the air flow characteristics over blades, what happens to the engine at supersonic speeds, and what kind of duct is required to make it supersonic.

During the first half of the eight-month course, the student is concerned primarily with learning aircraft performance test techniques. In numerous performance tests, he learns to determine a plane's proper climb schedule, cruise and maximum speeds, and fuel specifics, such as how much fuel it takes to climb to 45,000 feet and how much it uses to go .9 at 25,000 feet.

They learn planes by numbers

After a demonstration by an instructor, the test pilot-to-be flies a few practice flights in an assigned aircraft. He then flies an actual test hop and compiles a report for grading. He will do this about 30 times in as many aircraft.

He must also learn about flying qualities. Here he is concerned with such things as what the airplane does when it stalls — does it spin, what are the spin characteristics, and how does the pilot get out of the spin; and its approach and landing characteristics. This is followed by nose-tail, side-to-side and dynamic stability courses.

The student test pilot develops a new jargon during these months; it becomes even more pronounced as he progresses. He learns to develop the equations of motion of an airplane in a steady state, and to write these equations in determining all the forces on that plane. When an engineer talks about the F-14 — or any aircraft — in mathematical equations, the test pilot can understand him and relate the numbers to his actual experience in the aircraft.

At this point in the 16-hour-a-day, six-day-a-week schedule, the test pilot trainees have been checked out in about eight types of aircraft, including the Air Force T-38 and OV-10, and the Army YO-V1. Mixed in the training schedule structure is cross-training between rotary and fixed-wing craft.

Students also do written and oral training Board of Inspection and Survey (BIS) Trials reports on certain planes as part of their routine.

As final exam time approaches, the working day gets longer.

For his final, the soon-to-be-engineer

The 17 types of aircraft used by the Naval Test Pilot School at Patuxent River are parked in formation in front of the school's academic building.

test pilot does a Navy preliminary evaluation in an airplane he has never flown. When he reports to TPS, his record is screened to determine which type of aircraft he has not flown, and he is purposely kept away from that particular type until his final exam. Now he makes four flights in that plane – by himself – and prepares a 20-plus page report on the unfamiliar aircraft.

"Planning is the key," says LCdr. Shields. "A student test pilot prepares for this flight for three weeks. He can't waste any time, because he has only six hours – four flights – with the plane."

In his preparations, the student must keep the purpose of the airplane in mind and consider all details. He first writes a detailed description of the controls, because he can basically tell how an airplane will respond by looking at the airframe plan form and control system. He also digs out all general and detailed specification requirements for the plane.

He lays out his flight plan in order to determine if the airplane meets those specs and, if so, what other areas must be considered to make sure the Navy wants to buy it.

Considerations he must keep in mind, for instance, include: Can the plane taxi in close quarters as it will have to on a carrier; is the ejection seat comfortable; can he reach the ejection seat handle; and does he have to look down at the radio when switching frequencies or is the switch positioned so he does not have to take his eyes off the instruments? He must also plan the takeoff and climb phases, and decide what areas to look at for air combat maneuvering – 5,000 feet or 25,000 feet.

His completed outline tells him: "This is how I'm going to approach it; how I am going to find out if this aircraft will perform."

Certain restrictions are put on the trainee because the instructors know the aircraft is vulnerable in certain areas; however, the student is encouraged to go to the full limits of the envelope which have already been established by other Navy test pilots.

Naval Flight Officers – the non-pilots – evaluate weapons systems during their final exam, and will climb into an airplane such as the A-6 as bombardier-navigator and evaluate that system. The engineers must compile all the information given during the oral BIS reports and write their own test report.

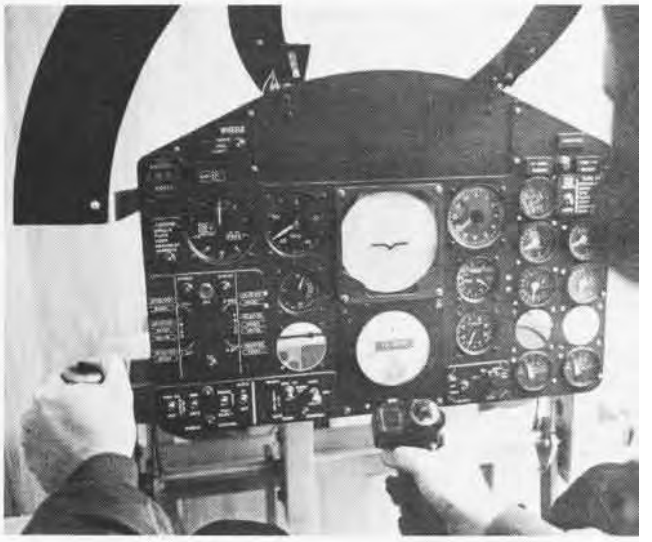
To round out the training, the school uses 38 planes of 17 types.

"Originally most of our aircraft were sent to NATC as test projects," adds Shields. "They were prototypes, in most cases, and were sent to NATC with a lot of instrumentation for BIS trials. It wasn't economical to send them back to the fleet, so we got them."

When deciding to accept or reject an airplane, several things must be considered. Although TPS has its own aircraft maintenance branch, staffed with 130 enlisted personnel led by Lt. H. R. Errington, thought must be given to whether an aircraft can be reasonably maintained, its cost to operate, and most important, its characteristics.

"We don't necessarily want the good aircraft," Shields continues. "We like to have some that have unusual characteristics, to really try the students."

The old F4D, now the F-6, has some "great" bad flying characteristics, according to Shields, "and we thought it would be great at the school because it gives the students a chance to fly a bad airplane. In the days of the F4D *Skyray*, when you had a high performance airplane, you almost had to make



Academic instructor Robert Miller feeds information to a TR-48 analog/hybrid computer, as student, LCdr. James Quinn, uses a flying qualities demonstrator to check a flying problem, top left and right. LCdr. Walter W. Davis and his classmates listen intently during one of their 500 classroom sessions.

Bad planes are good planes

it bad to make it supersonic."

Also on the bad list – but not all that bad – is the F-8, which has poor glidepath stability in the landing configuration, and unusual oscillations in a stall.

But the school also likes to have good airplanes for the same basic reason. The T-38 is considered "quite a nice, simple airplane." And the A-4 "is a good airplane from the pilot's standpoint; the flying characteristics are quite nice."

Also in the inventory is a modified B-26, provided by Cornell Aeronautical Lab, that allows the instructor to vary the control characteristics and the longitudinal and lateral-directional response characteristics of the basic plane. Inflight simulation of control and response action can be varied from high performance fighters to slow transports.

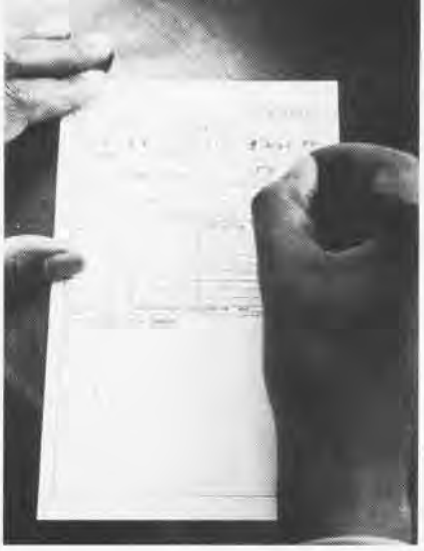
The TPS graduates are assigned to other test facilities at Pax River, or to other billets that require their skills.

"Ideally," adds Shields, "we like to have the graduate complete a tour here, go to the fleet, return for a second time around, and then go back to the fleet as a C.O. or X.O. Then we like him back, as a program manager here or at NavAirSysCom; thus rotating him between the fleet and aviation test."

TPS will most certainly change in the coming years.

In its long-range plans, the school has two basic programs. High on the priority list are increased emphasis on weapons systems and a broadening of the scope of some dynamic stability areas. Also under consideration is lengthening the course from eight to 11 months. "Not necessarily increasing the number of subjects," comments Shields, "but their depth and scope. This will give the students a break. We really work them hard."

Next on the list is finding a method of awarding the graduate a degree on the masters level. TPS competes with the Naval Post Graduate School for



LCdr. Davis prepares for one of his many test flights, left and below. Opposite top, Davis confers with his plane captain, ADJAN Craig A. Hubbell, before takeoff. The school's NTF-8 is put through a test flight over NATC Patuxent River, Md., opposite bottom.

its top talent, and officials feel the degree would make the school more attractive.

Under consideration is the possibility of sending the prospective student (with an engineering degree) to a civilian university for three quarters – or nine months – followed by TPS. University courses would be oriented toward the broad spectrum of research, development, test and evaluation. In addition, the university would provide the requirements for ground testing, such as wind tunnel testing, and give the student some insight into effective management techniques.

After attending the university and graduating from TPS, the student would receive a degree in aerospace engineering, with a sub-specialty as a test pilot.

"We feel that in the next decade," continues Shields, "flying qualities and performance are going to be very refined. At the same time, weapons systems are getting much more complex, and we must stay abreast by providing methods and means for our test pilots."

With the revolution in test techniques brought about by today's higher performance aircraft, "pilots will need to know more and fly better" to handle the job.

This same reasoning was used when

the test pilot program was established at NATC Patuxent River 25 years ago. Only then, the reference was to the high performance aircraft of World War II.

After World War I, fleet aviators tested the Navy's aircraft at Pensacola and Anacostia. Other test facilities were established at the Naval Proving Ground, Dahlgren, Va., Hampton Roads, Va., Washington, D.C., Navy Yard, and the Naval Aircraft Factory in Philadelphia. With the advent of WW II, NAS Pax River, commissioned in April 1943, soon became the major testing facility for naval aircraft.

Although aviators were highly trained in operations, strategy and maintenance, they knew little about the specialized methods of flight testing. Consequently, when the Test Center reached the peak of its expansion under the load of wartime contracts, in late 1944, it became evident that a test pilot school of some sort was necessary.

The origins of the present-day school were laid out by a committee from the Flight Test Division at NATC in February 1945. It recommended a tentative "Flight Test Pilots' Training Program" which began that May. This three-afternoon-a-week course evolved into the Test Pilot School Training Division in 1948, when a formal six-month course of instruction was inaugurated through the efforts of Rear Admiral F. M. Trapnell, NATC commander, and Commander Sydney S. Sherby, the school's first director.

The course was lengthened to eight months, and the name was changed to U.S. Naval Test Pilot School in 1958. At the same time, the present policy of convening a class every four months was started. Three years later, the helicopter flight syllabus was added and, in 1966, NFO's were admitted.

TPS is presently one of four such schools in the Free World. Others are the U.S. Air Force Aerospace Research Pilot School at Edwards AFB, Calif.; the Empire Test Pilots' School in Great Britain; and the Ecole du Personnel Navigant d'Essaie et de Reception in France.

The main difference among the four is that TPS concentrates on more different types of flying, and it has the only rotary wing – or helo – test pilot course. TPS and Empire are oriented along the same basic lines, but the U.S. Navy school concentrates more on academic study. The French use a team concept (flight officer, engineer and pilot), and the pilot does little academic work.

It is believed that the Russians also have a test school of some sort.

Many TPS grads are on top

More than 1,500 students have graduated from TPS since its inception. Many are well known, and some, famous.

Twelve of America's leading astronauts, including the all-Navy *Apollo 12* crew, are graduates of the school.

In addition to the astronauts (*Space and the United States Navy*, November 1970), the distinguished list includes such people as Admiral Ralph W. Cousins, VCNO; Admiral John F. Hyland, CinCPacFlt until his retirement; Vice Admiral Thomas F. Connolly, DCNO(Air); Vice Admiral William I. Martin, Deputy and Chief of Staff, CinCLantFlt; Vice Admiral Turner F. Caldwell, Jr., director of ASW operations in OpNav; Vice Admiral Frederic A. Bardshar, commander of the Seventh Fleet's carrier strike force; and Major General Marion E. Carl, Inspector General of the Marine Corps.

Admiral Connolly was the school's second director when he was a commander, serving from December 31, 1948, until March 23, 1951.

Other graduates include nine rear admirals, four rear admiral selectees, and many leaders in civilian aviation.

As long as new aircraft are being built, highly competent test pilots will be needed to evaluate them, and the U.S. Naval Test Pilot School at NATC Patuxent River plans to lead the way.

Staff

There are presently 11 flight instructors at TPS in addition to the school's director, Commander R. J. Sample, a graduate of Class 35, October 1963. Four civilian instructors have charge of the academic courses.

The military instructors are:

Commander G. L. Scott, deputy director and chief flight instructor, Class 31 of June 1962; LCdr. R. M. Shields, assistant director for administration and maintenance, Class 38 of October 1964; LCdr. D. P. Dunbar, Jr., aviation safety officer, Class 54 of February 1970; LCdr. C. R. Kizer, flying qualities testing officer, Class 45 of February 1967; and Lt. T. H. Hoivik, performance testing officer, Class 52 of June 1969.

Also LCdr. P. I. Normand, Royal Navy, Head, Flight Test Branch; LCdr. R. V. Sallada, operations officer, Class 40 of June 1965; LCdr. S. M. Small, performance testing officer, Class 51 of February 1969; Lieutenant Colonel H. G. Smith, USA, Army liaison officer, Class 53 of October 1969; Lt. W. A. Stevens, weapons systems ground instructor and NFO flight instructor, Class 54 of February 1970; and Lt. M. M. Kemple, flying qualities testing officer, Class 53 of October 1969.

Army SP5 John R. Sowers, foregound, shows Pvt. Michael Vandiver, left, and ADJAN William Del Guidice how to adjust Army UH-1D tail rotor control pedals. Four Army mechanics are at TPS.

The then "latest model aircraft" are parked in rows on the flight line at NAS Anacostia for the commanding officer's inspection.

Before Patuxent River

By Rear Admiral J. R. Tate, USN (Ret.)

In the early 1920's, a board of senior officers – the General Board – met in Washington and decided what types of ships and how many were needed by the Navy and, on these recommendations, the Secretary of the Navy went to Congress and asked for them. Plane procurement was almost as simple a matter.

Chance Vought, Glenn Curtiss, Grover Loening or Temple Joyce went to the Bureau of Aeronautics with information "about a new plane they had in mind that the Navy ought to have." Or sometimes the Navy put out the general idea of what it wanted and asked what was available, either off the shelf or on the drawing boards. The decisions were made in BuAer and the planes were bought, Admiral W. A. Moffett justifying their needs and setting up the funding.

In those days, planes cost only thousands of dollars and did not run much over ten bucks a pound. Special planes were bought for special purposes – Temple Joyce sold the Navy four Morane Saulnier parasol monoplanes – for use on the USS *Langley* (CV-1) – and a Parnall *Panther*.

This is not a story of procurement, however, but of what happened to the planes after delivery.

The aircraft were ordered to meet certain specifications – the modern engineer would marvel at some of those specifications. Facilities were set up at the Naval Aircraft Factory in Philadelphia, Pa., for certain tests, mostly catapulting. Another facility, at NAS Hampton Roads, was called Experimental and Test. It was mostly concerned with carrier adaptability and the rough water operation of seaplanes.

A facility headed by a lieutenant commander and called the Test Section was set up at NAS Anacostia. This unit was charged with testing all planes and engines to see that they met contract specifications.

By the early 1930's, an organization of sorts began to develop. BuAer would announce a fighter, VO or big boat competition and usually finance one plane for the two winners in the competition. In about a year the plane would be built and delivered to Anacostia for testing. Then it was delivered to Norfolk for arresting gear tests and carrier adaptability. At that time, the Norfolk Experimental and Test Section consisted of one lieutenant commander, five or six lieutenants and about 80 men.

A deck with one wire was set up in the northeast corner of the field. The original wire was the old Norden drum arresting wire. Later LCdr. A. M. Pride, who headed the section in 1931, designed the MK IV hydraulic gear as a replacement. The Norden gear was a large drum onto which the arresting cable was reeled. As the cable was pulled out, a pump attached to the axle of the drum built up pressure which operated a giant brake on the end of the drum. After run-out, the cable was retrieved and reeled back on the drum by an electric motor. It was a real Rube Goldberg device, and slow.

When a plane was received for testing, a schedule was set up and each pilot assigned was given five to ten hours for familiarization. Each made ten to 20 arrested landings to discover

The XP2Y took off faster with only two engines; the third created more drag.

any peculiarities the plane might have. And there were many. I remember a few. Grumman's first XFF had the tailhook installed in front of the tail wheel. On landing, there was an abrupt tail rise on the first pull of the gear. This tail rise was uncontrollable and so high that the prop ends would hit the deck. Grumman took the plane back to the factory over a weekend and rebuilt the tail, moving the tail wheel to the end of the fuselage and the hook back also. This eliminated the tail rise. If the XF7B stalled, it lost all aileron control and fell in hard on one wing tip. It took a little time to discover that we had a new problem with monoplanes — wing tip stall. Warping the wings corrected it, but the XF7B did not pass the test.

The XF11C-2 tailhook rebound from the deck was so heavy that it tore up the whole aft end of the fuselage — in spite of the bungee cord meant to protect it. Thus the hook rebound shock absorber evolved. The XF13C was unique in that it could be flown as a biplane or you could take off one set of wings and fly it as a monoplane. The XF5B had a parasol wing; it was an all-metal version of the F4B biplane. Increased weight and strut drag reduced expected performance.

After a plane had been debugged, a team of pilots made 100 to 200 landings and flew 100 hours of accelerated service testing, accumulating 12 to 14 hours a day. This was not a popular test with the pilots.

One of the first runs for a new plane was made to calibrate the air speed meter. These runs were made early in the morning, when the air was usually still. The measured mile was alongside the bulkhead in front of the commandant's quarters. (These tests were not very popular with the commandant.)

Seaplanes were also tested at Norfolk, especially for "rough water" landings and takeoffs. These tests required everything up to full load. They piled shotbags in to get the extra weight needed. (The rough water test consisted of five landings and takeoffs, into at least five or six-foot seas.)

It was a hairy job. It usually ended with washboarded bottoms and buckled bulkheads, and a sore bottom. Seaplanes had bugs, too. Some I remember. On the XPK, the pilot could not see the instrument panel without ducking his head. The XP2Y could be flown with two or three engines: two on the wing, the third on a tripod on the top wing. It got off quicker with the third engine off. Hull drag with third engine was too great during takeoff run.

Norfolk also tested all sorts of gear and equipment. Some of it was way out. A Frenchman built a tracked landing gear to replace the wheels. It was a beautifully built pair of aluminum shapes about six feet long, about a foot high in the center and slightly cut down

XF5B-1 was monoplane version of F4B. Increased weight and strut drag reduced plane's expected performance.

at the ends. On the outside was an endless chain with rubber pads. There were holes slightly forward of the center for the axles of the plane landing gear. The literature (in French) said it would "land, taxi and take off in the most savage terrain." It would taxi pretty good. We never did land it. On takeoff, at high speed it shed both tracks, and they came right up through the bottom wing of the O2U.

Mel Pride had felt for a long time that the old Norden gear was obsolete and far too slow, so he went to work on the design for a new hydraulic gear. He designed most of the gear, and the men in the ship built it from parts off the salvage pile. The plunger was an old piece of pipe, the accumulators were salvaged oxygen tanks. The valve was a boiler safety valve. We had an old MK-1 air catapult that we set up to fire a 10,000-pound car down a track. The car had an arresting hook on it and we rigged up the cross deck arresting gear to catch the hook at the end of the catapult run. We would thus fire the catapult into the arresting gear. We made several thousand shots with various loads and speeds, gathering data and making revisions on the gear.

At first we used a light ice machine oil in the cylinder. We had difficulty finding adequate packing to use on the plunger seal. Piping was a real problem; we found we were working with pressures up to 8,000 pounds.

Pride submitted the plans to BuAer who replied that after 1,000 actual landings they would consider the project. We set the gear up on the deck and three pilots were assigned to make landings – fast.

After repeated landings, the gear got hot and we experienced more and more "walk back" of the plane after the end of the arrested run. The oil would foam and air expansion would cause the walk back. We solved this by putting an automatic air bleed on the cylinder. When the required landings were completed, a party came down from Washington to see a demonstration. Pride himself made the landings in an O2U.

After each landing, Professor Meggars of the Bureau of Standards would say, "Marvelous." Someone replied, "Yes, and it is sure smooth, too."

Meggars shook his head, "No, it's marvelous that it doesn't blow up. You have a perfect diesel cycle – oil and high pressure – it should blow up."

We stopped all landings and went to gun recoil liquid for the fluid.

Hundreds of types of hooks were tested: wire hooks, half wire and half stiff shank hooks, hydraulic hooks, self-releasing hooks. We even built enough of the latter to equip a squadron in the fleet, and it immediately set a new squadron landing interval. Incidentally, after the Japanese attack on Dutch Harbor, we salvaged a Japanese *Zero*, almost intact. It had an almost identical self-releasing hook as the one we developed.

From this acorn grew a majestic oak – NATC Patuxent River, Maryland.

The XF11C-3 is put through aerial maneuvers by an early-day test pilot.

Letters

Space and the United States Navy

The professional staff of the National Air and Space Museum has just received a few advance copies of *Space and the United States Navy* prepared by Commander Ted Wilbur and the *Naval Aviation News* staff.

We are unanimous in our praise of this publication. The historical text and art work are superb. The evidence of painstaking research in obtaining historical photographs is obvious. The creative paintings by Commander Wilbur are powerful and impressive.

We would like to extend our congratulations to all concerned with this publication and are recommending its sale in the Smithsonian Museum shops.

F. C. Durant III
Assistant Director, Astronautics
National Air and Space Museum
Smithsonian Institution

Thanks for the advance copies of your *Space* edition. You have done a splendid job on it – including "Settle Up – Settle Down." Let me say a hearty Well Done.

VAdm. T. G. W. Settle, USN (Ret.)
6660 Thirty-Second Place, N.W.
Washington, D.C. 20015

I just looked through your special *Space* issue. It's a tremendous piece of work and I know I'll enjoy reading it page by page.

I hope the issue gets the widest dissemination. The Navy's part in the space history needs to be told and your documentation is a collector's item. And it's so beautiful to look at . . . .

Art Schoeni
LTV Aerospace Corporation
Dallas, Tex. 75222

From east of the sun, west of the moon, and from out where the morning stars sing together, I orbit Telstars sparkling with congratulations on the superb *Space* issue of *Naval Aviation News*.

Each of you who helped prepare this masterpiece should be both proud and happy with the dynamic results.

This booklet will prove most useful to me, both here in my science classes at Campion, and at Creighton University in Omaha, Nebr., where I teach summer school.

Rev. John M. Scott, S.J.
Science Teacher, Campion
Prairie du Chien, Wisc. 53821

Corsair II

I am 16 years old and hope to become a Navy pilot. I am helping in the preparation of a book on the operational markings of the A-7A and, in future years, hope to follow it by books on the A-7B and A-7E.

I am collecting slides and prints of the markings of the Navy and Marine squadrons that have been engaged in the Vietnam conflict. My specific interest lies in the different A-7 squadrons, and any help from your readers would be appreciated. I would especially like to hear from anyone who has been attached to VA-147 on *Ranger*, VA-82/86 on *America*. Material loaned will be returned. All help will be appreciated.

Thomas A. Ring
410 Ocean Spray Ave.
Satellite Beach, Fla. 32937

Pen Pal?

I am a fifteen-year-old high school student and very interested in Naval Aviation. I plan to become a Marine Corps Aviator and would like to correspond with a Naval Aviator on active duty.

Everton Pereica
2771 Couto Magalhae
Franca, Sao Paulo, Brazil

F4U

I would like to contact pilots and ground crewmen who were connected with the Vought F4U *Corsair* during WW II and Korea. I am gathering photographic material and other details on this aircraft for a large pictorial. Any information will be gratefully appreciated.

Jim Sullivan
764 Kenmore Road
Spartanburg, S.C. 29303

VP-871 Reunion

The officers and men of Naval Air Reserve Patrol Squadron 871 are planning to hold a reunion on the 20th anniversary of their recall to active duty during the Korean conflict. The squadron was activated at NAS Oakland on March 1, 1951, and remained on active duty for almost two years. The squadron aircraft was the P4Y-2.

The reunion is scheduled for February 27, 1971, in the Oakland, Calif., area. We are attempting to contact approximately 100 officers and men of the regular Navy who were assigned to the squadron. Inquiries should be addressed to:

Oliver L. Smith
Publicity Coordinator
239 Croyden Drive
Pleasant Hill, Calif. 94523

Naval Aviation Films

The following motion picture films are among the latest released by the Film Distribution Division, U.S. Naval Photographic Center.

MN-10944 (unclassified) *A-7 Familiarization – Carrier Landing Mishaps*. Causes and prevention of landing and flight deck accidents (25 minutes).

MN-10913 (unclassified) *The Pneumatic Retro Marine Marker Ejector – Preflight Loading, Unloading and Operational Procedures*. Description and operation of the Aero 1B and model AA477U retro-ejector used aboard ASW aircraft (19 minutes).

MN-10894 (unclassified) *Reciprocating Engines – Depreservation*. Unpacking and depreservation of reciprocating engines (10 minutes).

MN-10543 (unclassified) *Task Force 77*. The mission and importance of a Task Force and the various ships that make up the group. Duties of the officers and crew with emphasis on the teamwork and cooperation that must exist among them. Scenes of the men on duty and at leisure (28 minutes.) (The number for this film has been changed from MN-10534 to MN-10543. Adjust all records and film can labels to reflect the change.)

MN-10825 (unclassified) *Nothing for Granted* – The story of the Navy operational test and evaluation force and the procedures for testing and evaluating systems and equipment programmed for future Navy use (28.5 minutes).

MN-10763 (unclassified) *Intermediate Level Maintenance on Multiple and Triple Bomb Racks*. Operation of the MER 7 and TER 7 multiple and triple ejector bomb racks and guidelines for intermediate level maintenance and repair (30 minutes).

MN-10856 (unclassified) *Helicopter Rescue Net, Type X872*. Procedures and techniques for the helicopter crew and the person being rescued to follow when using the X872 Billy Pugh rescue net for pickup (13 minutes).

MN-10902 (unclassified) *A Day to Be Proud*. President Nixon pays tribute to all U.S. servicemen as he visits *Saratoga* to witness a firepower demonstration on Armed Forces Day (14 minutes).

Instructions for obtaining prints of newly released films are contained in Opnav Instruction 1551.1E.

SQUADRON INSIGNIA

Commissioned in November 1967, VA-105 was A-7A qualified and operational by March 1968. The 'Gunslingers' made their first WestPac deployment aboard Kitty Hawk in December of the same year. Home-ported at NAS Cecil Field, the squadron is led by Cdr. J. C. Perkins.

NAVAL AVIATION

NEWS