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Special Report:

The Bronco After One Year

50th Year of Publication

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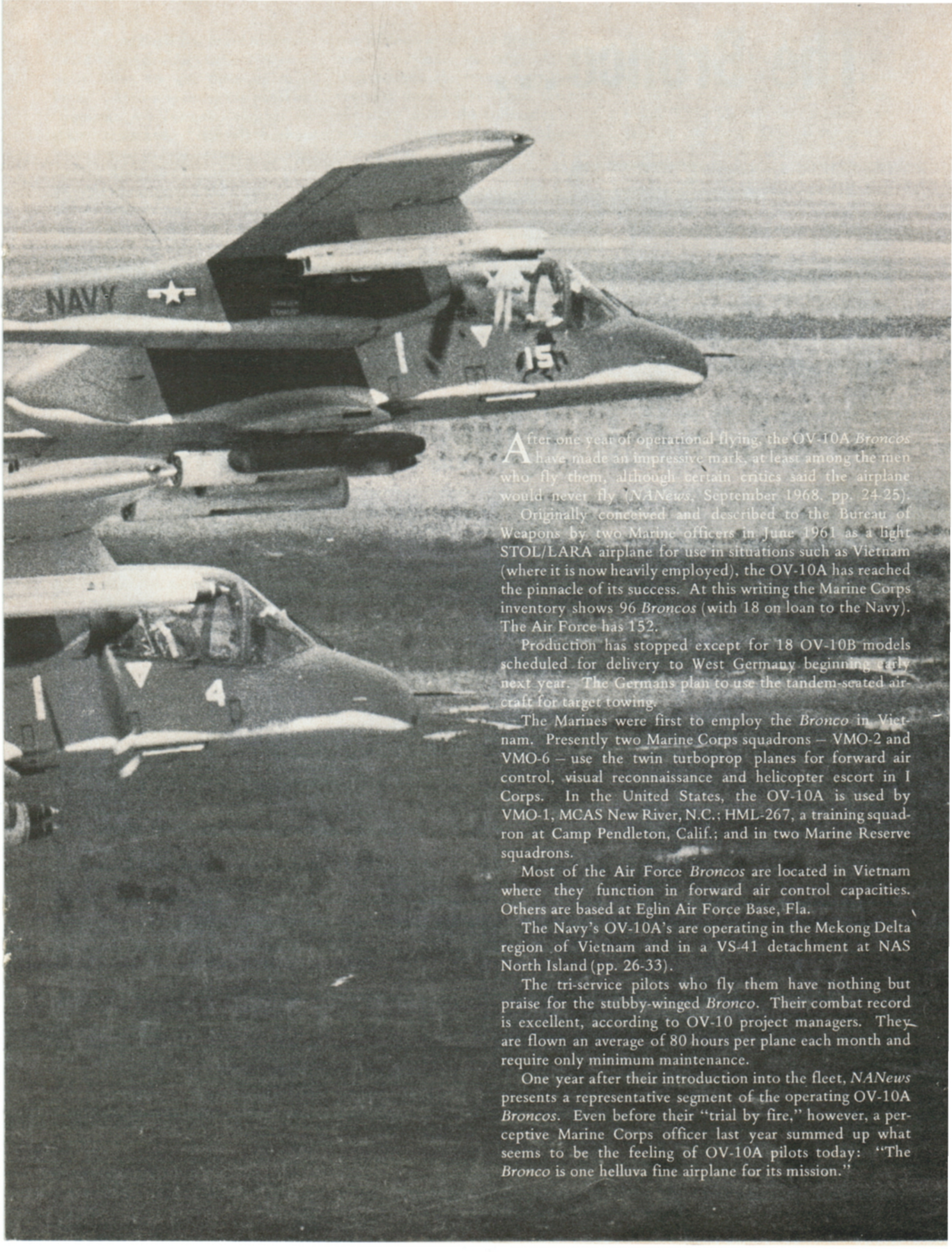


After one year of operational flying, the OV-10A *Broncos* have made an impressive mark, at least among the men who fly them, although certain critics said the airplane would never fly (*NANews*, September 1968, pp. 24-25).

Originally conceived and described to the Bureau of Weapons by two Marine officers in June 1961 as a light STOL/LARA airplane for use in situations such as Vietnam (where it is now heavily employed), the OV-10A has reached the pinnacle of its success. At this writing the Marine Corps inventory shows 96 *Broncos* (with 18 on loan to the Navy). The Air Force has 152.

Production has stopped except for 18 OV-10B models scheduled for delivery to West Germany beginning early next year. The Germans plan to use the tandem-seated aircraft for target towing.

The Marines were first to employ the *Bronco* in Vietnam. Presently two Marine Corps squadrons — VMO-2 and VMO-6 — use the twin turboprop planes for forward air control, visual reconnaissance and helicopter escort in I Corps. In the United States, the OV-10A is used by VMO-1, MCAS New River, N.C.; HML-267, a training squadron at Camp Pendleton, Calif.; and in two Marine Reserve squadrons.

Most of the Air Force *Broncos* are located in Vietnam where they function in forward air control capacities. Others are based at Eglin Air Force Base, Fla.

The Navy's OV-10A's are operating in the Mekong Delta region of Vietnam and in a VS-41 detachment at NAS North Island (pp. 26-33).

The tri-service pilots who fly them have nothing but praise for the stubby-winged *Bronco*. Their combat record is excellent, according to OV-10 project managers. They are flown an average of 80 hours per plane each month and require only minimum maintenance.

One year after their introduction into the fleet, *NANews* presents a representative segment of the operating OV-10A *Broncos*. Even before their "trial by fire," however, a perceptive Marine Corps officer last year summed up what seems to be the feeling of OV-10A pilots today: "The *Bronco* is one helluva fine airplane for its mission."

The Bronco...

CARRIER QUALIFICATIONS

By Major J. M. Dye, USMC, and Mr. J. M. Rebel

The small, twin-boomed, prop-driven airplane known as the OV-10A is no longer a stranger in the sky. Some pilots have not only "fammed" in the aircraft but have accumulated many hours, some in combat. For this group, the name *Bronco* may seem misplaced, for a more gentle, easier to fly airplane would be hard to imagine. However, the name is particularly appropriate if you have seen the airplane traverse the takeoff and landing obstacle course set up by the Naval Air Test Center (NATC) at Webster Field, Md. The results of these torture tests reflect the ability of the OV-10A to absorb the punishment of operations in rough terrain. Not as well known is the fact that a pilot and engineering team from NATC have also demonstrated another facet of the airplane's ability – carrier landings and launches without the aid of catapults and arresting gear.

It may seem like a big step from an unprepared field to a modern aircraft carrier, but the OV-10A is a very versatile airplane. The story began in August 1968 when the senior member of the Board of Inspection and Survey (BIS) at Patuxent River requested that NATC examine the feasibility of operating the OV-10A from carriers. BIS has the responsibility for inspecting and evaluating all new ships and aircraft prior to introduction in the fleet. The board, in a sense, acts as the government's final inspector to assure that the Navy receives a product which performs up to the specifications and guarantees of the contract. The contract for the *Bronco* required that it be capable of operating from an LPH-4-class carrier; BIS asked NATC to prove that this could be done. Since extended carrier operations were not envisioned at the time, the actual test requirement was limited to a very simple configuration – sponsons with guns and an external fuel tank on the centerline station.

Landing aboard a carrier had to be accomplished much as on a field: brakes and reverse thrust. Carrier takeoff would be a free deck launch.

The airplane used in the tests was modified to include instrumentation and recording equipment which measured and recorded performance parameters, such as altitude, speed, pitch, yaw, roll or power settings. These parameters were used to determine handbook data and to verify visual observations made during tests.

When the Carrier Suitability Branch at NATC starts testing a new airplane, the first thing it must determine is the Minimum Speed that the machine can be flown in the landing and takeoff configuration and still have Acceptable Flying Qualities (MSAFQ). In the case of the *Bronco*, the evaluation was made for no flap, half flap and full flap configurations, with either one engine or two engines running. It was no surprise when the data indicated that MSAFQ with both engines was considerably lower than that for single engine control (MSE). (MSE speed is the speed at which loss of control occurs with one engine at military, one feathered.) Since the wing of the airplane is largely bathed in the airflow from the props, the elimination of one engine allows the affected wing to stall at a higher indicated airspeed than the other wing, causing a roll, yaw and pitch downward. For safety, subsequent landing and takeoff tests were limited to airspeeds above MSE.

When the NATC team began the evaluation to determine an optimum carrier recovery technique for the *Bronco*, the paramount thought was to

land and stop as quickly as possible in order to avoid any chance of dribbling off the deck. The ground work for these tests had been built up over a period of years; it was the responsibility of NATC to confirm the data obtained by contractor and NavAirSysCom analyses, Navy Preliminary Evaluation teams and Naval Air Engineering Center feasibility studies. The team designed a series of tests to measure stopping distances with various gross weights, flap settings and pilot techniques. A wet carrier deck was simulated by flooding the SATS runway and performing full stop landings with this less-than-desirable braking surface.

These landing tests resulted in the decision that the airplane could be brought aboard safely by using a normal mirror approach. The configuration decided upon was full (40°) flaps and the MSE airspeed for a particular gross weight. In addition, the technique called for achieving full reverse thrust at touchdown, followed by maximum braking. To have the necessary reverse thrust at touchdown, the sequence was initiated while airborne – just prior to touchdown – upon receiving the "cut" signal from the landing signal officer (LSO). Directional control on rollout was maintained by nosewheel steering and differential braking. The stopping distances measured when this technique was used ranged from less than 400 feet with light weights with a 20-knot wind over the deck to more than 700 feet with heavy weights and no wind. These distances are comfortably short of the distance available on an actual flight deck. A word of caution: this technique involves the best efforts of a highly qualified pilot and an LSO using optimum speeds and a Fresnel lens for glide path and touchdown point control. Attempting to judge airplane height from inside the airplane and initiating thrust reversal without an LSO would be courting disaster, owing to the high sink rate.

What goes up must come down was tested in reverse. Once the team was assured that the *Bronco* could make it aboard the carrier, the next requirement was to get it off again without the use of a dockside crane. Pilot techniques and airplane configurations were evaluated to determine the optimum flap setting and rotation point needed to achieve the shortest run. As with the landing tests, lift-off speeds above MSE were a safety requirement. One of the more interesting techniques tried was commencing the takeoff roll with flaps up to reduce drag, then dropping the flaps to the full down position at 30 knots prior to the desired lift-off point. Although the method was promising, it was discarded for the carrier trials, again because of overall safety requirements. (With further refinement through testing, it could become a useful tool in tight situations.) The final outcome of the shore-based takeoff tests showed takeoff runs from 400 to 1,000 feet, again depending on weight and wind. The best method appeared to be a no gimmick 20° flap takeoff with rotation about five knots prior to the desired lift-off speed.

Last, but not least, emergency procedures were evaluated. These included such possibilities as brake failure, inability to obtain reverse thrust and wave-off characteristics. It was determined that it was not feasible to recover the airplane aboard a carrier without reverse thrust on both engines and with both brakes working as advertised unless a barricade or some other means of halting the aircraft was provided. Tests for wave-off performance were considered particularly important in establishing pilot techniques in the event of engine failure at low airspeeds and altitudes in the landing pattern. In all cases, with one engine or two engines turning, it was determined that the best wave-off technique was to apply full power while arresting the rate of descent by adjusting the pitch attitude. Then, the pilot had to raise the landing gear as soon as possible and the flaps as airspeed allowed. Again a word of caution, if the airplane is below MSE speed and an engine is lost, the application of full power on the good engine will result in an uncontrollable pitching, roll and yaw into the bad engine. To either fly away or execute a safe landing, the aircraft must stay above the MSE speeds for the gross weight and flap configuration. Get below that speed and the loss of an engine means probable loss of the airplane and crew.

The proof of the tests was the actual carrier work conducted aboard USS *John F. Kennedy* (CVA-67). Although there is quite a difference between the overall size of the *Kennedy* and an LPH-4-class ship, the NATC team used only the angled deck which is actually some 50 feet shorter than the axial deck of an LPH. Only a limited amount of deck time could be taken for the OV-10A trials, and only an abbreviated program was conducted. With the flight deck cleared to provide margin for error and the cross-deck pendants removed (locked brakes crossing the pendants almost insures a blown tire), the ship headed into the wind to provide the necessary headwind for extremely slow closing speeds.

The time had come to put the *Bronco* to the real test. Flying out from its shore base, it appeared behind the ship looking rather small and insignificant. All eyes focused aft as the aircraft slowly churned into view, its twin props droning on with a steady hum. The first three passes were touch-and-go landings "on-speed and on-target." At last the word was passed, "This is it." Again the touchdown was right on the money, reverse thrust was initiated right at touchdown, and the 10,000-lb. airplane came to a quick and sudden stop in the area where the number four arresting cable was strung.

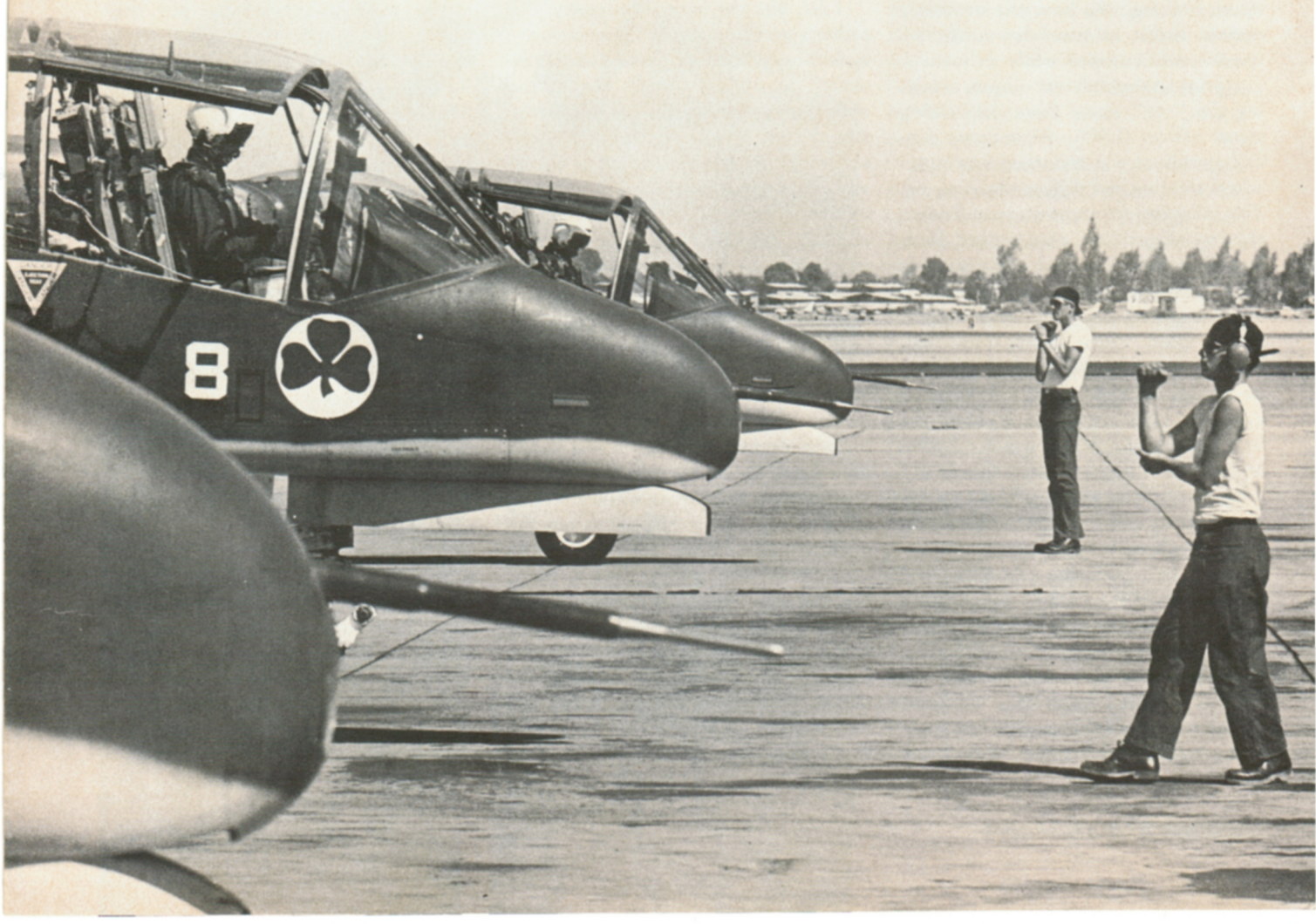
The airplane taxied to the far aft end of the deck and began its takeoff run. Lift-off was accomplished without any excessive effort well before the end of the available deck.

The remaining tests seemed almost anti-climactic, but three more touch-and-go's, another landing, and finally a takeoff and bingo to the beach were accomplished.

No tailhook, no catapult gear! The *Bronco* had demonstrated once again that it is one of the more versatile of the new airplanes in the inventory.

The Bronco

By PHC John Gorman



...In VS-41: Replacement Pilot Training

Pickle at 2,400 feet and 240 knots, then pull up straight ahead. Make the first shot count. Charlie won't give you a second chance," said LCdr. J.M. "Mick" Herring, officer-in-charge of VS-41 Detachment Yuma, as he briefed five pilots for an afternoon gunnery exercise at the target area in the desolate Arizona desert. Charlie is the Viet Cong.

The replacement pilots were in their 13th week of a 16-week course in preparation for deployment to VAL-4 in Vietnam. The three-week weapons training at Yuma is the last phase of VS-41's curriculum in which replacement pilots learn the ins and outs of the OV-10A *Bronco*.

When VAL-4 deployed to Vietnam in March, four *Broncos* were transferred to VS-41 at NAS North Island, and the ASW squadron was assigned the responsibility of training pilots for VAL-4.

The OV-10A replacement program begins at NAS North Island with one week of maintenance systems familiarization and one week of VS-41 ground school. Then the pilots begin a ten-week flight syllabus, progressing through four familiarization flights, one instrument and one solo flight. The remaining familiarization program includes nine hours of instruments, nine hours of formation flying and 13.5 hours of navigation.

The six weeks at North Island are followed by three weeks of weapons training, normally at MCAS Yuma. Each pilot gets 21.5 hours of weapon delivery techniques. Then he goes back to North Island for six hours of tactics, tying the previous training into a comprehensive package.

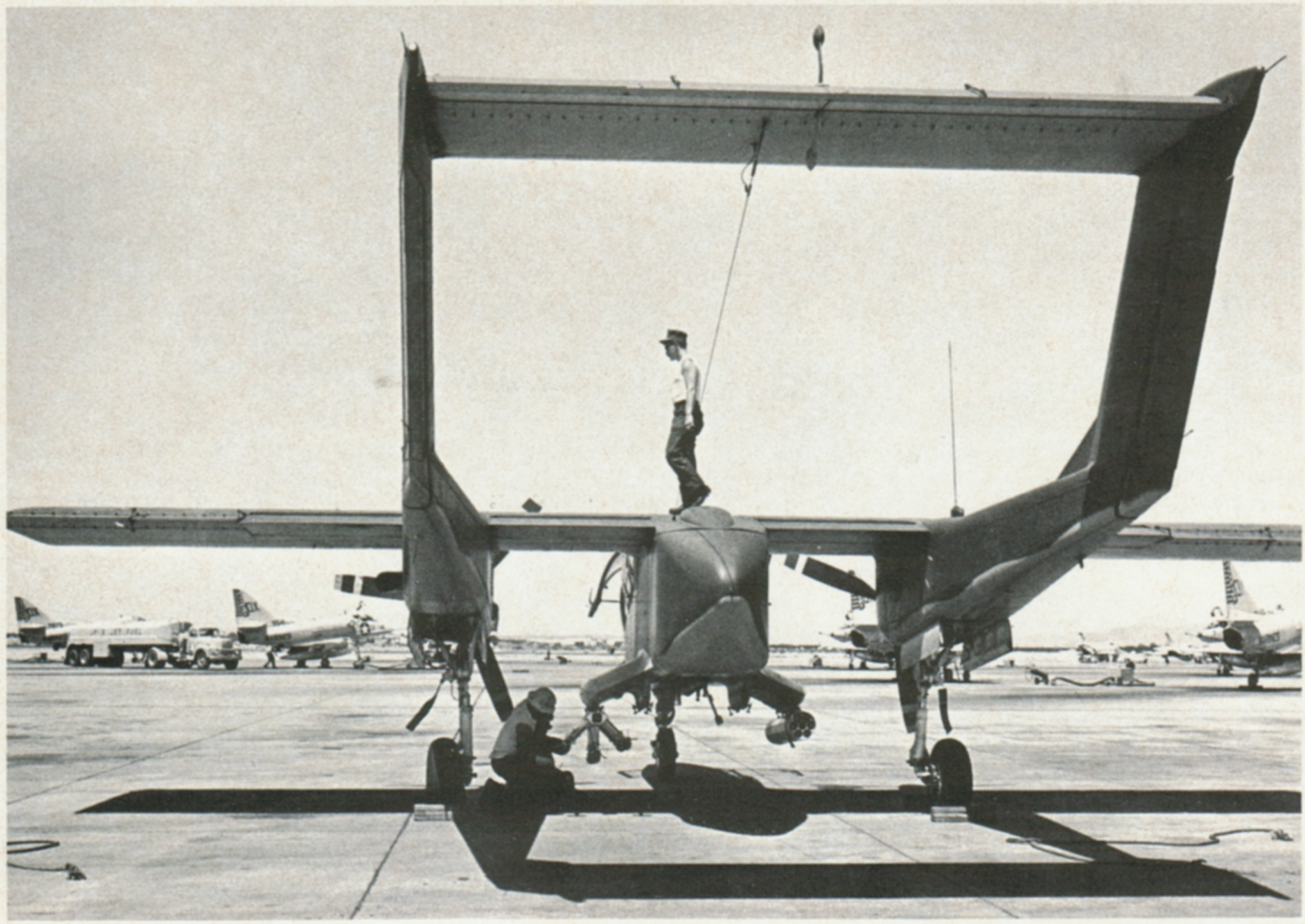
After *Bronco* training, the pilots have four more weeks of formal school before deploying to Vietnam: three weeks of survival, escape and resistance, counterinsurgency, and self-protection, followed by a week in Vallejo, Calif., for a PBR orientation course.

Initially, three VS-41 pilots – LCdr. Herring, Lt. S. F. Chappell and Lt. D. D. Davis – were qualified as instructors in the *Bronco*. They designed the format for the VAL-4 replacement pilot program.

In April, the three pilots began training three additional VS-41 pilots. When the first nine replacement students arrived in mid-May, VS-41 had six qualified instructors, with more than 1,400 hours total in the *Bronco*.

Lt. F. W. Lynch, VS-41 instructor, and Commander V. W. Klein, prospective executive officer of VAL-4. flew

BRONCO *instructors and student replacement pilots check details for training flight, top left. Line crewmen, far left, direct pilots on taxiway. A plane captain helps instructor strap in, at left, and another instructor briefs students for a weapons training flight.*



VS-41 PLANE *captains check a Bronco for discrepancies following a training flight at MCAS Yuma, top. Lt. F. W. Lynch, instructor pilot, and Commander V. W. Klein, prospective VAL-4 executive officer, return from a training hop. The black stetsons have been adopted by VS-41 Bronco pilots as a squadron symbol. At right, a last-minute check.*

the first training flight May 26. Since that flight, the syllabus has been slightly modified several times in accordance with recommendations from VAL-4 pilots in Vietnam.

VS-41 also trains most of the enlisted men ordered to VAL-4. Their training course varies from eight to 15 weeks, depending upon their experience level and rate. They receive formal classroom study and on-the-job training.

ADC Harold Sneed, training chief, says, "The can-do spirit among maintenance and support personnel in the VS-41 program is among the highest in the Navy. Since the initiation of our replacement pilot training program, we have had 95 percent availability of aircraft at all times.

"And I'll tell you one thing," he continues, "if these 120° afternoon temperatures on the runways at Yuma don't prepare these pilots and men for Vietnam, nothing will."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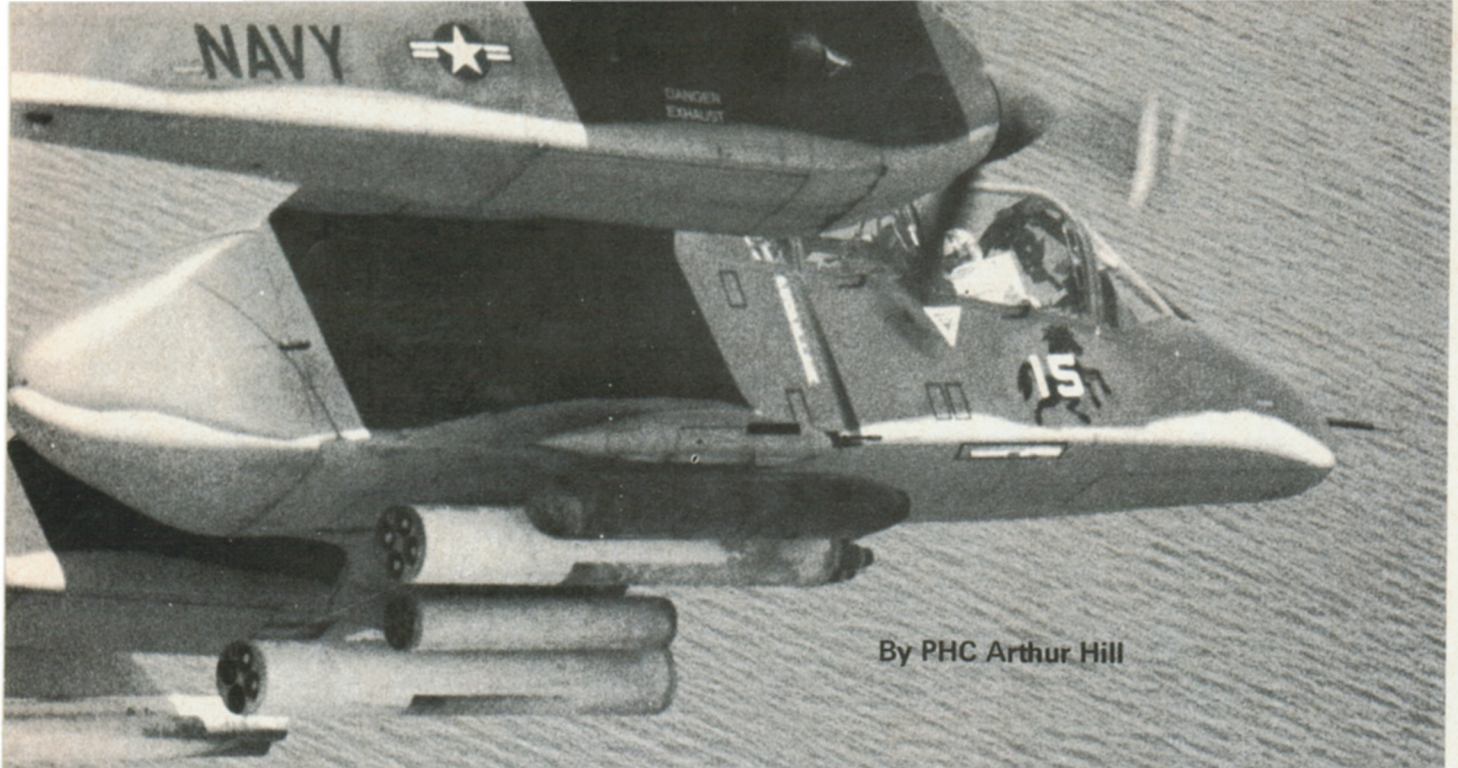
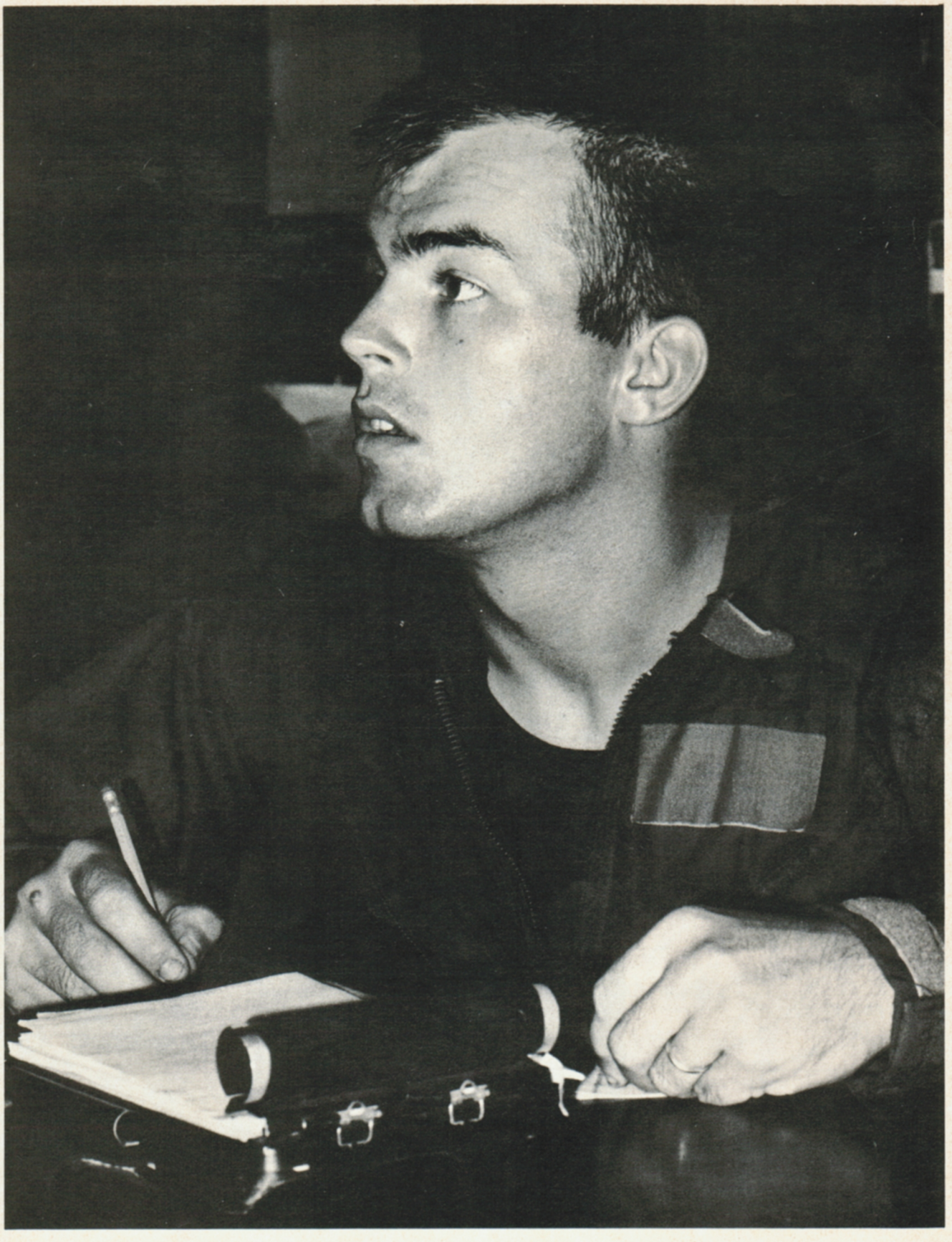


By PHC Arthur Hill

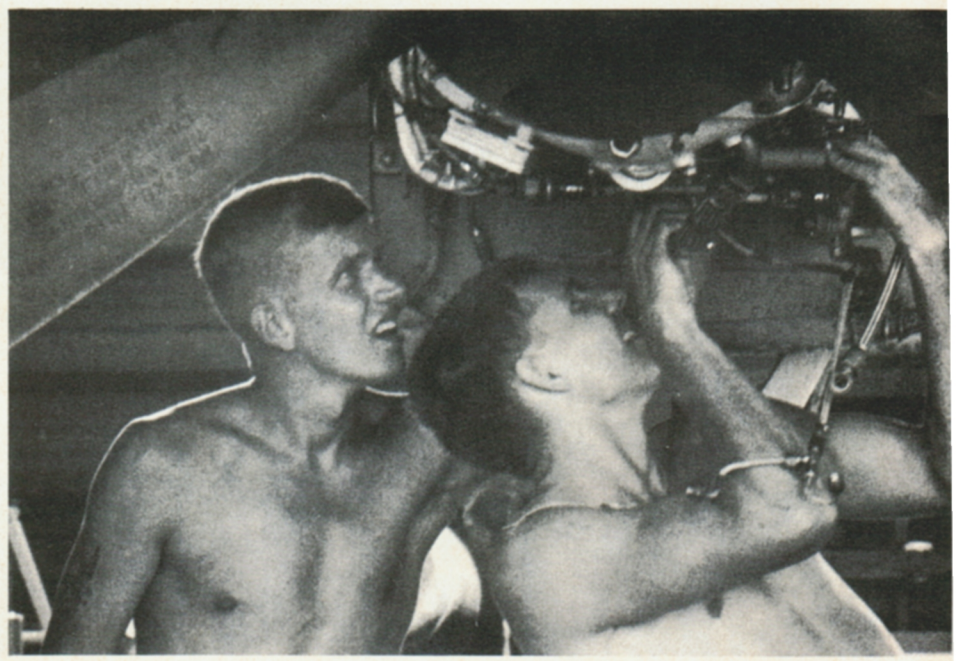
...and in Vietnam

A new word has been added to the Navy lexicon in Vietnam — *Bronco.* Navy units operating in the Mekong Delta gained added muscle this spring with the arrival of the twin-engined OV-10A *Broncos.* The two-seated aircraft are designed to fill the performance gap between jets, which are too fast for some warfare situations, and helicopters, which are slower and more vulnerable to ground fire. The versatile *Broncos* came to Vietnam with the Navy's newest aviation unit, Light Attack Squadron Four. VAL-4, the only Navy squadron to fly the OV-10A in Southeast Asia, was commissioned late last year in San Diego, Calif. Now an important part of the "brownwater Navy," the squadron operates from two airfields in the Delta, providing direct support for U. S. and Vietnamese Navy Riverine operations. To the brownwater sailors, the *Bronco* and VAL-4 are welcome additions.

A Bronco pilot is briefed.



A Bronco returns to Binh Thuy after an early morning mission. At right, VAL-4 mechanics hold a maintenance check on an OV-10A. An aviation machinist's mate, far right, strains to turn an OV-10A propeller.



"The Bronco is One Helluva Fine Airplane for its Mission."

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