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Skyhawk

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SKYHAWK

THIS TOUGH LITTLE PLANE CONTINUES TO PLAY A BIG ROLE IN NAVAL AVIATION

For 12 years now, a small jet plane with a large reputation for doing everything asked of it has been a mainstay of the U. S. Navy's attack air wings. Even though there is a new aircraft in the Fleet designed to supplement and eventually replace it, the A-4 maintains its importance.

By JOC John D. Burlage, USN

THIS IS A short tale about a little airplane with a big reputation. It's being written to commemorate more than a decade of service to the U.S. Navy by this plane. It's also being written to inform readers of *Naval Aviation News* that the aircraft in question is going to be around for a good many years to come.

The name of the plane is the A-4 *Skyhawk*. Anybody who knows anything about Naval Aviation knows the *Skyhawk*; there is hardly a U.S. aircraft carrier operating anywhere that doesn't have at least a few copies of

this particular airplane on board.

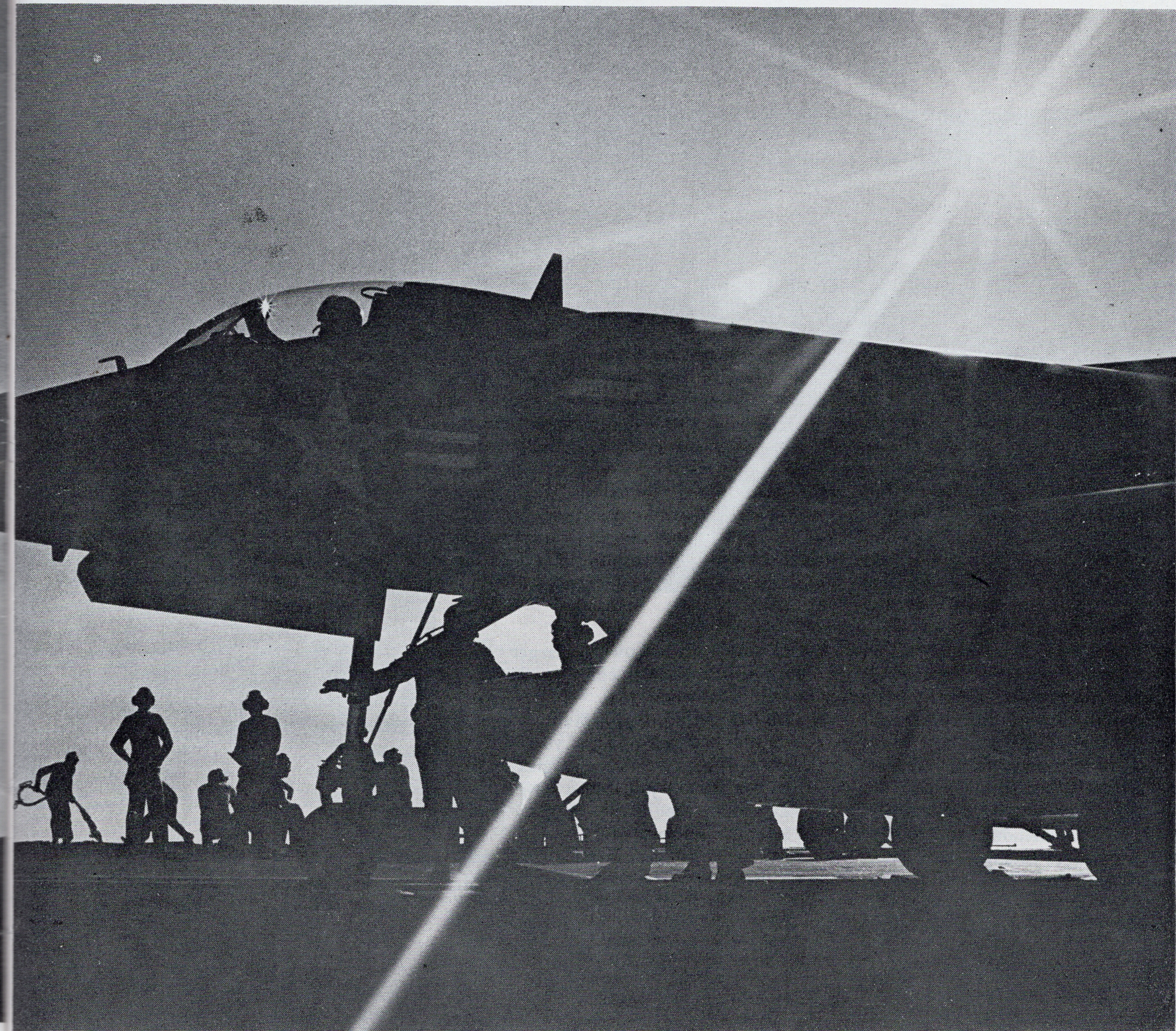
The *Skyhawk* is living proof that good things come in small packages. That's because, as jet-powered military aircraft go, it's far and away the smallest jet plane ever launched operationally from an aircraft carrier.

The word "smallest" is, of course, relative. In its latest configuration, the A-4 measures a bit over 41 feet long and stands a trifle more than 15 feet high. Its weight—less ordnance, fuel and pilot—is almost 10,450 pounds. That makes it much bigger and heavier than, say, a Volkswagen.

But these dimensions and weight also make it less than half the size and far lighter than any other jet plane the Navy operates. So, in that sense, any reference to the "little" A-4 is not inaccurate.

For some 12 years now, several versions of this delta wing, light attack plane have accounted for quite a large slice of the Navy's aircraft inventory. Last July, for instance, the 2,000th model of the plane to be accepted by the Navy was delivered by the manufacturer, Douglas Aircraft Co., Inc., of Santa Monica, Calif. (part of the





McDonnell-Douglas complex), at its nearby Palmdale facility.

The event, Douglas reported, made the A-4 one of only a handful of U.S. military aircraft to reach that level of production since WW II.

Swell. But both man and nature have spawned other small creations in large numbers, too, and they haven't made any monumental contributions to the scheme of things. The lemming is a good example. This furry, little rodent probably feeds a lot of wildlife, but it is best known for reproducing so prolifically that nature is forced on

occasion to send huge numbers of it on mass migrations to the sea. Once there, it jumps in and drowns.

Like the lemming, the *Skyhawk*—again, as military jets go—is little and comes in relatively large numbers. It also migrates to the sea. But there its resemblance to the lemming ends. In the first place, it isn't furry. In the second (and more important) place, it doesn't jump into the ocean and drown. Instead, it is launched from aircraft carriers on a variety of missions; if the comments of pilots who fly it are any criteria, it performs

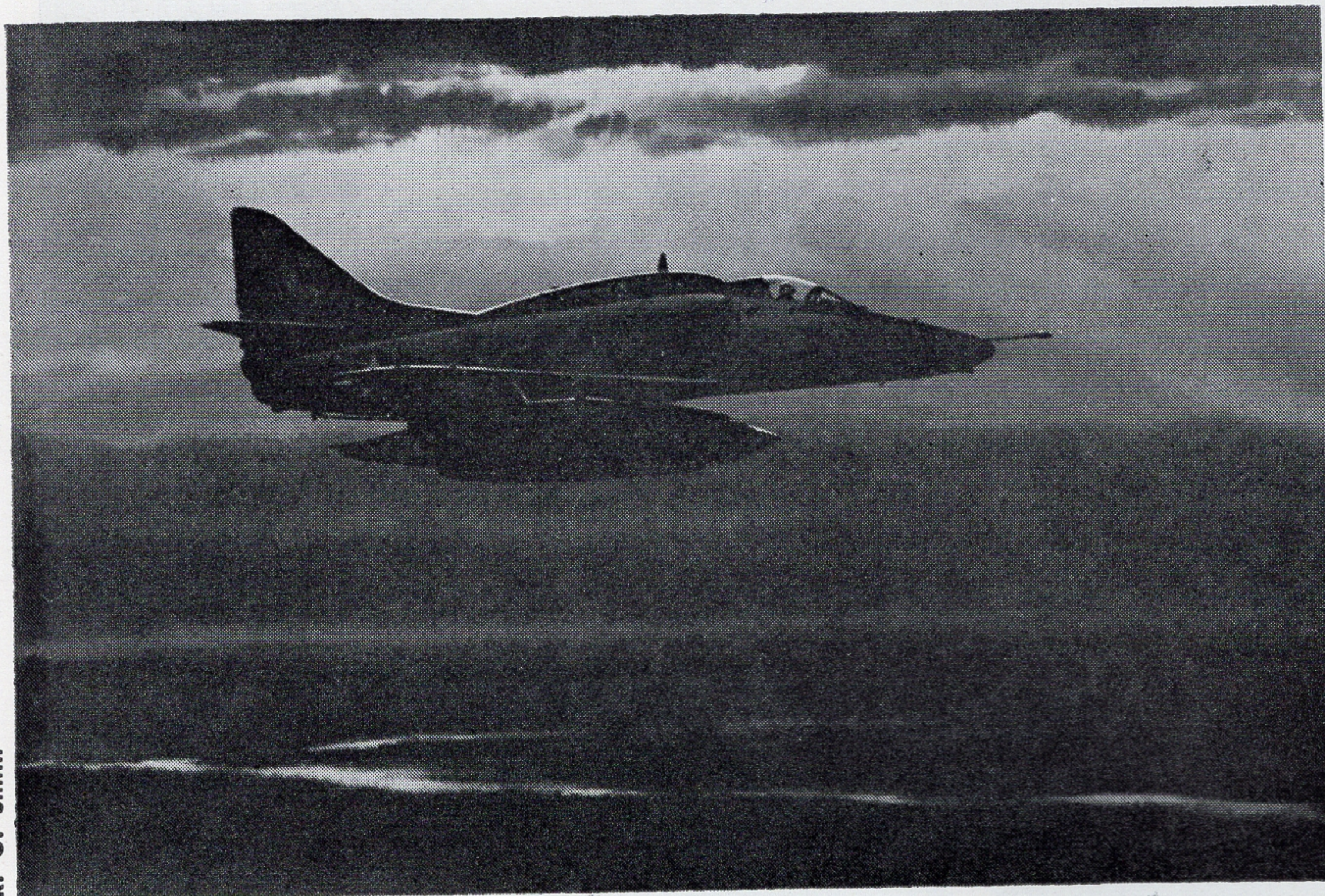
those missions quite well, thank you.

The *Skyhawk*, you see, is specifically designed for carrier operations. Because it is small (so small it is the only carrier-based aircraft which doesn't require folding wings), it can be fitted nicely into the confined spaces of a carrier's hangar and flight decks.

The *Skyhawk* is also a very tough little bird. And it's as versatile as it is sturdy.

THE CONCEPT for a small, strong and relatively inexpensively light attack jet aircraft for the U.S. Navy

The latest of the Skyhawk series is the A-4F, noted for the upper avionics compartment atop the fuselage which gives this version a "humpbacked" look.



R. G. Smith

was spawned in the early 1950's at a time when America's peacetime economy was being jolted by the impact of the Korean conflict and the U.S. military was having a tough time transitioning from piston-driven to jet-powered flight.

Those jets then flying were mostly fighter types. Although they boasted such advantages as superior speed and altitude performance, they were consistently inferior to propeller-driven aircraft in range and payload-carrying capability.

They were also substantially heavier than their piston-driven counterparts. They cost more to build. And they gave maintenance men nightmares.

It was against this background that the Navy received a proposal for the construction of a light, jet-powered fighter-interceptor in 1952. The Navy liked the idea all right, but wanted the airplane for an attack role instead; the thought was to create a replacement for the propeller-driven A-1 (then designated AD) *Skyraider*.

What the Navy wanted was a high-performance, subsonic jet attack aircraft capable of carrying large, externally-mounted loads of ordnance over long distances. Amplifying the problem was the requirement to come up with an airplane that would do everything expected of it, yet re-

verse the trend toward larger airframes, increasing complexity and spiraling costs.

To call such a task difficult may be the understatement of the year.

Even so, Navy and Douglas engineers tackled the job with a vengeance. They knew the key to success was, in a word: "Simplify!"

Simplify they did. Using experience they had gained from company design simplification studies held in 1950-51—which had, in fact, first aroused the Navy's interest in the possibility of producing a truly *light* jet attack aircraft—Douglas engineers built an airplane that was so trim it was soon being called "Heinemann's Hot-Rod" after the chief engineer who supervised its creation.

The efforts to simplify resulted in an airplane that was just over 39 feet long, with a wing span of 27 feet and a height of 15 feet, two inches. Officially, it was described as a "single-seat attack bomber, with cantilever, low-monoplane wings and semi-monocoque fuselage structure." That was the official description. But the wags were right: Because it was a sleek-looking bird, and because it was designed to set slightly tail-down on its high, tricycle-type landing gear, it *did* look for all the world like Naval Aviation's answer to a souped-up

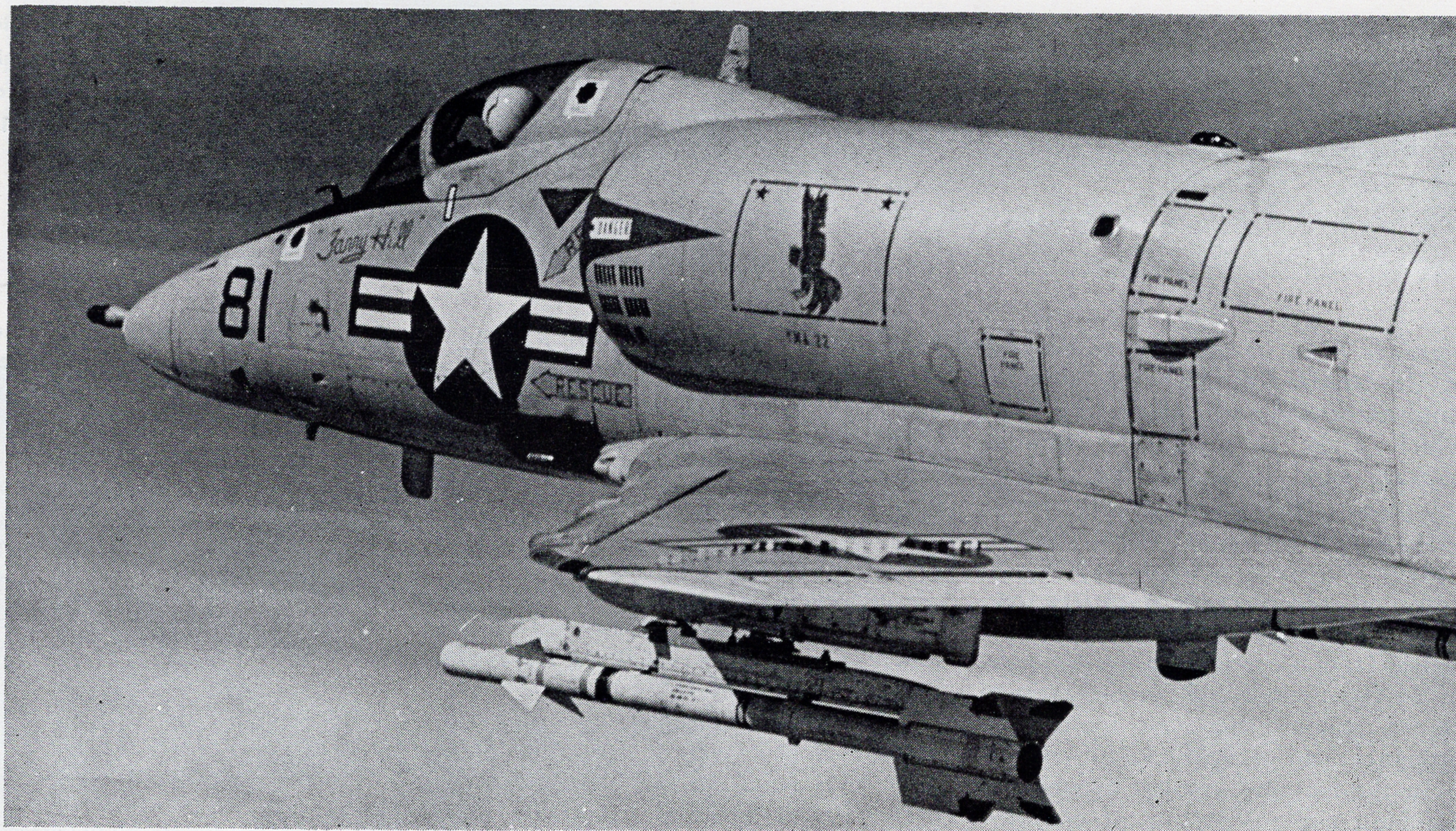


Skyhawks fly in formation (top) while another of the little jets is displayed with some of the ordnance it can carry (above). Ordnance includes bombs, rockets, missiles.

"hot-rod" built for speed and style.

In point of fact, it was souped-up. It incorporated one of the most advanced jet engines of the day, the Curtiss-Wright J-65-W-4. On top of that, its low wing and engine installation combined with its over-all design enabled it to cruise nicely at high subsonic speeds with big external loads, yet it was extremely maneuverable.

Its avionics gear came in easily removed "packages"; besides further reducing weight, this made maintenance a much simpler process. The fact that it came with a manual backup for the hydraulic flight control system has greatly increased the "survivability" of subsequent models in combat situations. Now, if the primary system is knocked out—by antiaircraft fire, for



Deadly A-4C, loaded with missiles, flies on CAP mission from a carrier. Each bomb painted on the air intake denotes a bombing mission over Vietnam. Although the Skyhawk is best known for its ordnance-carrying capabilities as a light attack bomber in CVA's, it is also used as a defensive weapon and for close support of troops in the combat zone.

instance—the pilot could still maintain control of the aircraft.

And, since it was built with just the attack mission in mind (as a "hot-rod" is built for speed), the first Skyhawk—then dubbed the A4D-1 and today labeled the A-4A—met or exceeded most requirements placed on it.

It had a combat radius of 460 miles with a small load, considerably more than any other jet. On a shorter haul, it could deliver more than 6,500 pounds of ordnance—including both nuclear and non-nuclear bombs, rockets and guided missiles. It had its own 20mm cannon, too.

It weighed empty just over 8,400 pounds. Yet it was so strong it could be loaded with almost 12,000 pounds of fuel, ordnance and pilot and still

perform its assigned mission well.

In February 1954, the first Skyhawk was completed by Douglas. Tagged the XA4D-1, it made its first flight June 22, 1954.

On August 14, 1954, a production model made its initial flight; it flew from Los Angeles National Airport to Edwards AFB, Calif., on a hop that lasted an hour and 20 minutes.

A little more than a year later, on September 12, 1955, a Skyhawk was landed aboard an aircraft carrier—the USS *Ticonderoga*—for the first time. Carrier suitability trials were successfully completed a week later.

And, a year after that first carrier landing, the first Skyhawks assigned to operational squadrons were delivered to VA-72 at NAS QUONSET POINT, R.I., and to VF(AW)-3 at NAS MOFFETT FIELD, Calif.

The Skyhawk had joined the Navy.

SINCE THE DAY the first A-4A rolled out of the Douglas plant, five additional models of the Skyhawk have been built for the Navy. In order of appearance, they include:

- The A-4B, which incorporated an improved tail, a better engine and an inflight refueling capability.

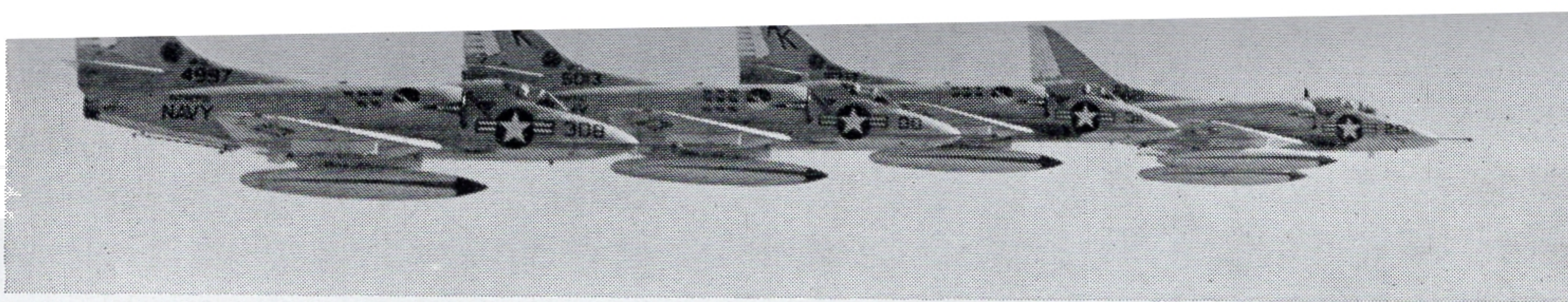
- The A-4C, with more sophisticated radar gear (resulting in a bigger nose) and an autopilot, which made it the

first with some all-weather potential.

- The A-4E, capable of a larger payload and a greater range primarily because of a new Pratt & Whitney J-52-P-6/8 turbojet engine.

- The TA-4F, a two-seat trainer that is 28 inches longer than the A-4E. Although developed as an advanced jet trainer, with dual controls, it can fulfill an attack mission as well as any other A-4. It was first flown June 30, 1965, two months ahead of schedule. It has a maximum speed of 675 miles per hour and a cruising speed of 500 mph. Its maximum range, with external fuel tanks, is about 2,000 miles. Manufactured on the same production line as other A-4's, it also includes such similar features as the ESCAPAC zero-zero ejection seat for both instructor and student. Its Pratt & Whitney J-52-P-8A engine has a ten percent greater thrust than the power plant of the A-4E, and 21 percent more thrust than the engines of earlier A-4's.

- The A-4F, latest of the A-4 series to be developed. Its first model was completed at the Douglas Palmdale facility August 3, 1966, flew for the first time August 31, 1966, and was used for evaluations that resulted in initial Fleet deliveries to the Pacific June 2, 1967. Powered by the same engine as the TA-4F, it differs in ap-



after being launched on a mission from a Pacific Fleet carrier. These belong to VA-15.

pearance from its predecessors because of the addition of an upper avionics compartment on top of the fuselage, which gives it a slightly "hump-backed" look. It has updated avionics equipment, nose-wheel steering, wing-lift spoilers and a zero-zero ejection system. Its speed is between 650 and 700 mph, and its range is greater than that of the A-4E. It can take off fully loaded from a carrier at a gross weight of 24,500 pounds, a 2½-to-1 ratio to empty weight that can include an ordnance load of up to 8,200 pounds.

In the first real combat in which it has been used—Vietnam, of course—the A-4 has been turning in a highly commendable performance. Pilots who have flown it on attack missions praise its strength, maneuverability, load-carrying capability, quick turn-around time and "survivability." It has indeed been a mainstay of the Naval Aviation arsenal, being used to strike at enemy targets in both North and South Vietnam. Until just recently, almost every attack carrier deployed to the combat zone had at least two A-4 squadrons—usually including some 28 aircraft—in the embarked attack air wing.

But attack carriers aren't the only CV's making use of the *Skyhawk*. The versatile little bomber is also found aboard ASW carriers; though they normally fly it as a defensive weapon for the ASW task group, CVS-based A-4 pilots are even able to help out in the ASW mission by making fast, visual daylight sweeps of a search area. The story is told, in fact, that one of the first Russian submarines ever detected and forced to the surface by U.S. ASW forces was initially spotted by an A-4 pilot from an attack carrier.

In addition to proving itself as a fine carrier-based aircraft, the A-4 is serving ashore in Vietnam.

The versatility and handling characteristics of the bantamweight bomber also permit its use as a tactical aircraft. Marine Corps pilots fly the *Skyhawk* in close support of ground

forces, operating from a Short Airfield for Tactical Support (SATS) facility and other bases in-country. The same carrier-type arresting gear and catapults used by the Navy at sea are employed for some shore-based A-4 sorties.

TO SPEAK in high praise of the *Skyhawk* these days may be to invite the natural question, "If the A-4 is so great, why is it being replaced by the A-7 *Corsair II*?"

It is true that the A-7 *Corsair II* was developed over a period of the last few years to supplement and eventually replace the *Skyhawk* as the Navy's primary light attack aircraft. Explaining why is reasonably simple: Although the steady modifications to the little A-4 over the years have helped to keep it abreast of the fantastic technological advances of aviation, officials decided that the time had come to build a new aircraft that would incorporate as many of the gains made in the state of the art as possible. The aircraft that evolved from those advances—many of them first made in the *Skyhawk*—was the *Corsair II*.

The *Corsair* is also being touted as a fine aircraft. It is even now being tested in combat; the first operational A-7 squadron has deployed to Vietnam aboard the USS *Ranger*, and more of the planes will be going into combat soon.

But Navy officials in Washington point out that it will be years before the last operational *Skyhawk* is launched from the flight deck of an aircraft carrier.

And, even after that day dawns, they say the A-4 will still have an important role to play.

One person who can quickly explain why is Commander Thomas H. Cooper, who has for some time been deputy A-4/TA-4 project manager for the Naval Air Systems Command.

"The A-4 series aircraft," he says, "will be operated by Navy and Marine Corps pilots for a number of years, along with the A-7 *Corsair II*, and will

—as they're phased out of the Fleet—be assigned to the Naval Air Reserve Training Command and the Naval Air Advanced Training Command.

"Recently, authority was granted by the Department of Defense to procure TA-4F aircraft for the advanced training command. These aircraft will be used, along with modified A-4B's, to train Naval Aviators, and will replace the F-9 *Cougars*, now in use, by late 1969."

Cdr. Cooper, who is deeply involved in management of the A-4, its procurement and the provision for its support in the Fleet, also points out that all of the remaining A-4A's (166 were originally built) have already been turned over to Reserve squadrons, as have many of the 542 "B" models that were constructed.

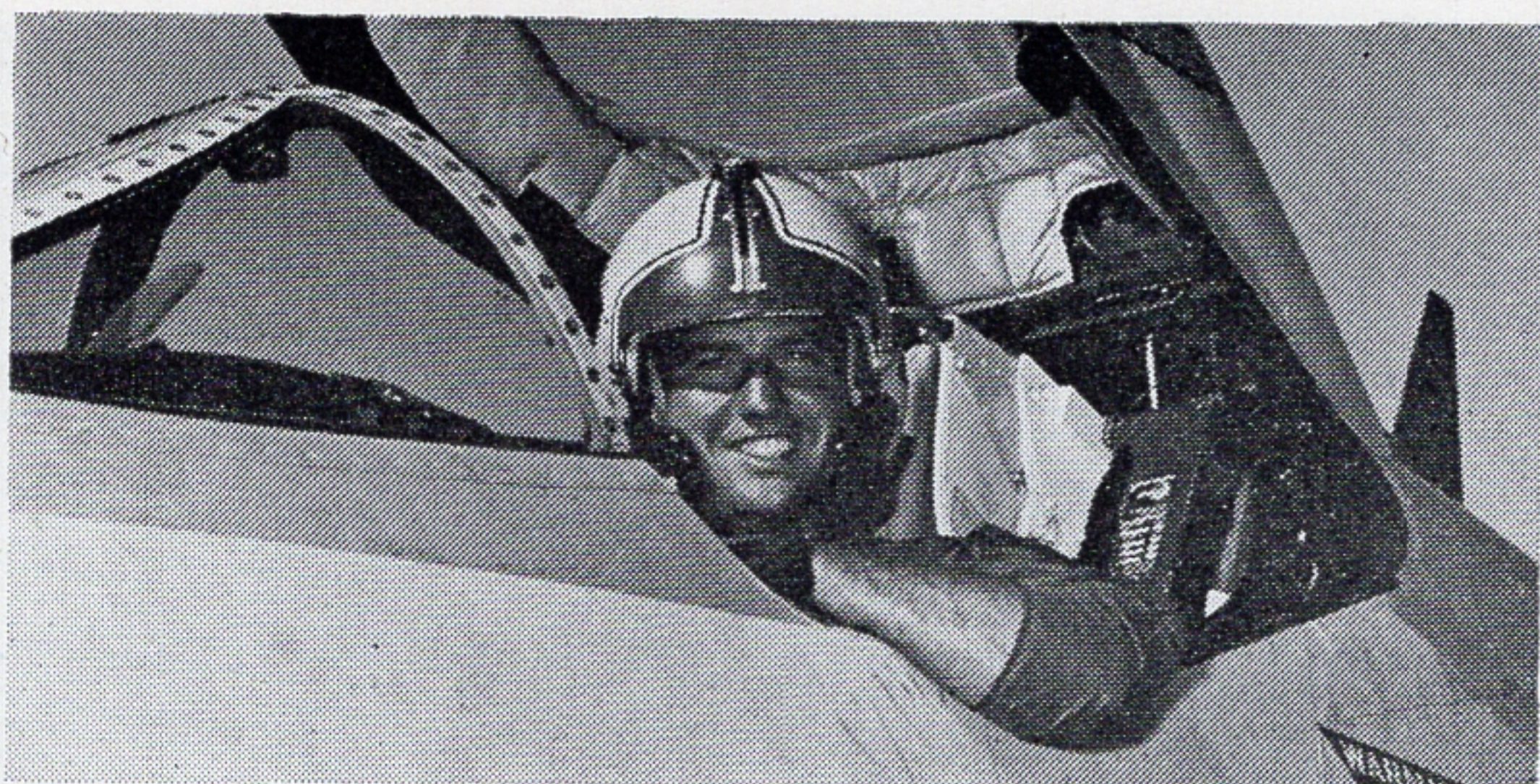
He adds that many of the 638 A-4C's turned out by Douglas will go to the Reservists as this model is phased out of the Fleet by the A-7. Still in active Fleet use are the "E" models, 500 of which were turned out.

As far as the newest versions of the *Skyhawk* are concerned, Cdr. Cooper says the Navy has been authorized to purchase 352 TA-4F's and 147 A-4F's. The delivery contract for the latter is scheduled to be completed in June of this year.

Aside from its primary mission with the U.S. Navy, the *Skyhawk* is already finding homes overseas. Douglas has sold some A-4's to foreign countries, and will undoubtedly sell more, and others have been made available to friendly nations through the Military Assistance Program.

It all comes down to the fact that the sturdy little *Skyhawk* is going to be with us for quite some time, even though it must one day go the way of all aircraft built in an era of such rapid technological advancements that weapon systems can become obsolete even before they become operational.

It is no small tribute to the little *Skyhawk*, then, to say its future couldn't be brighter.



Pilots Praise the Sturdy Skyhawk

By JOC Bill Case
and JO3 John Redmond

IT WILL DO anything you ask it to do. It just doesn't foul up on its own," is the way Lt. Richard A. Pennington of VA-94 describes the Douglas-built A-4 *Skyhawk*.

The A-4, a 12-year operational Navy veteran, is one of the major weapons in the Navy's aviation arsenal.

"The A-4 is great in combat," says LCdr. James Seely, maintenance officer of VA-93, until recently aboard the USS *Hancock* with the Seventh Fleet. "There are many reasons I prefer this plane. It's small and fast and hard to hit. I have great confidence in its ability to stay up there in combat. Besides, it's fun to fly."

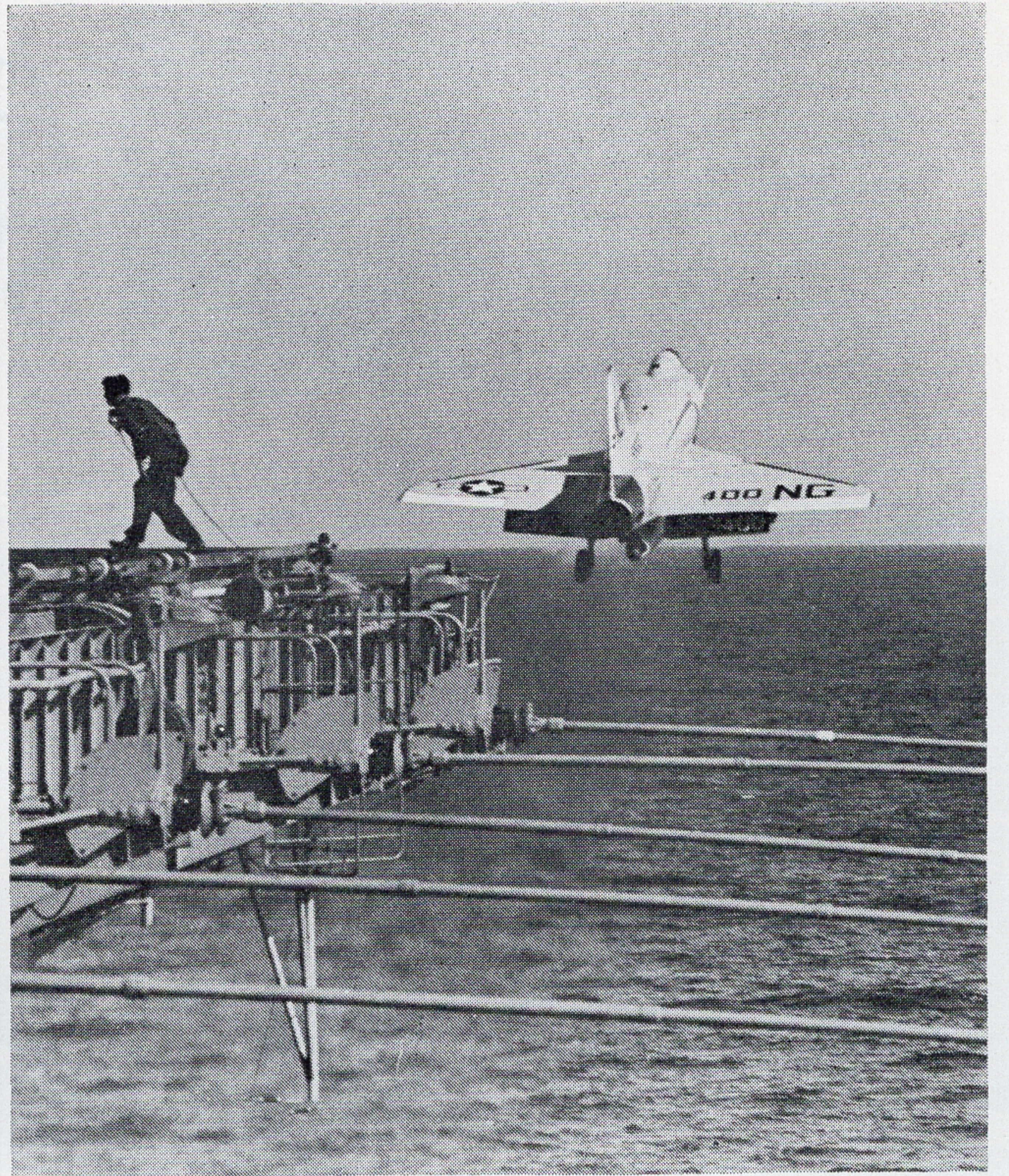
A special quality of the A-4 is its ability to take great punishment and still remain airborne. Admiring pilots believe the *Skyhawk's* stubborn desire to keep flying has saved many of them from a dunking in the ocean or, as they say, "a visit to the Hanoi Hilton."

During a strike over North Vietnam, a *Skyhawk* being piloted by Ltjg. Al Crebo, VA-212, was hit by ground fire; the plane's rudder went out and it began to burn from the base of the wings outward. Despite the serious damage, Ltjg. Crebo flew the burning jet to the relative safety of the Gulf of Tonkin before he bailed out near an aircraft carrier. He was soon rescued from the Gulf waters.

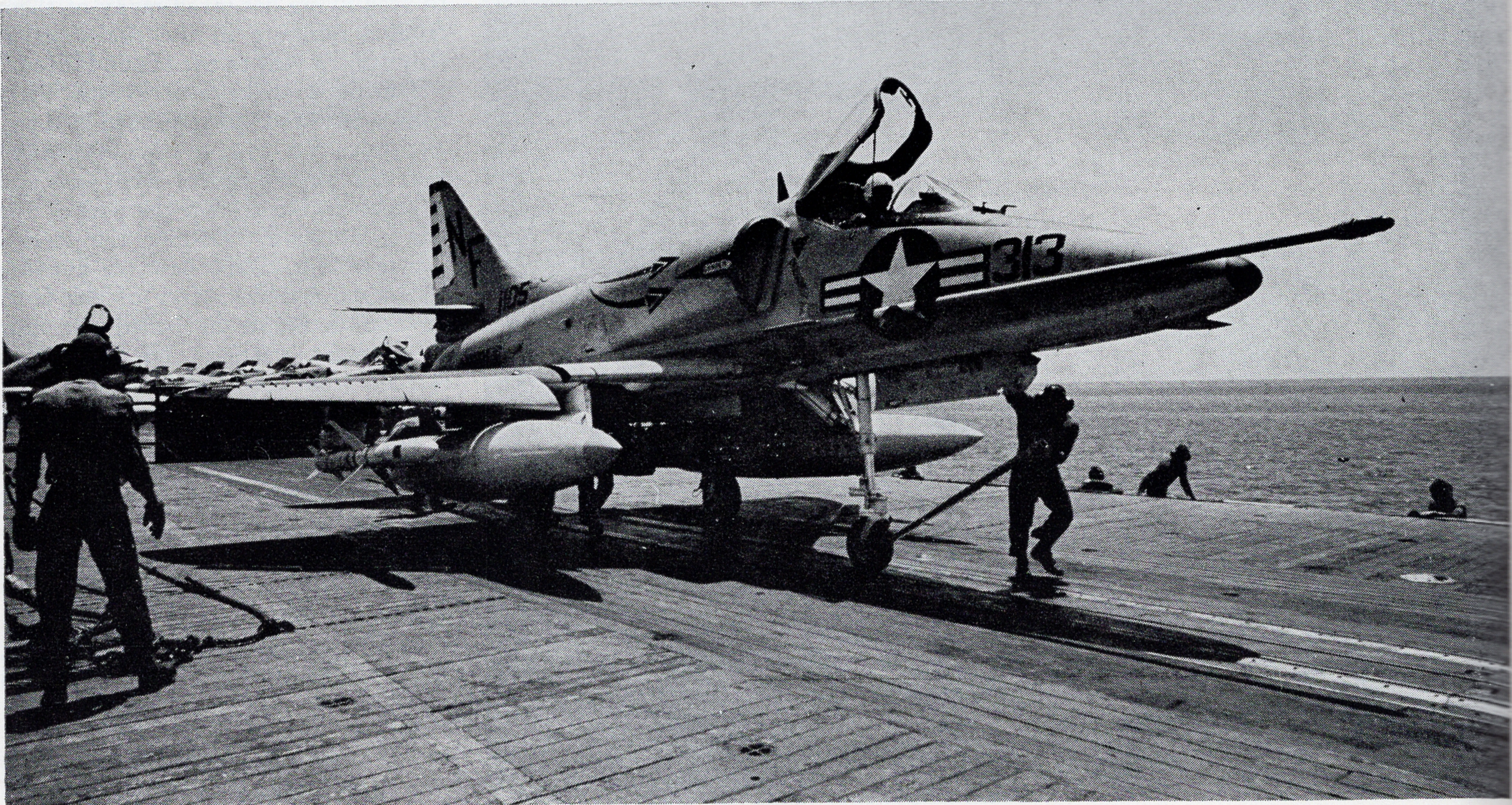
Such determination by the little A-4 is not uncommon. *Hancock* aviators like to tell of the time a pilot flew his *Skyhawk* back from a strike deep in North Vietnam and made an uneventful arrested landing aboard the ship. The plane was riddled with 34 flak holes.

Lt. Hart ("Irish") Schwarzenbach, VA-94, tells of the close call he had

Photographed by
JOC Robert D. Moeser



The busy life of a carrier-based A-4 Skyhawk is well-depicted in these photos taken aboard the USS Hancock while the CVA operated with the Seventh Fleet in the Gulf of Tonkin. Photo on next page, taken by Harry Gann, shows every version of the plane flown by Navy.



while he was flying a combat mission over Vinh: "We were hitting a well-defended target and I was flying as the fourth man in the slot. Right after my roll-in, my plane was hit in the left wing; it inverted completely. All I could think about was the downtown dance in Vinh and how I was going to be a participant.

"It took a bit of strain to right the plane, but the *Skyhawk* was still up there and would not give in. I could see from the reflection on the ground that I was streaming a trail of fuel, making me a good target. An A-3 *Skywarrior* tanker picked me up at the coastline and pumped fuel to the engine all the way to the ship where, even with a hole blasted in the wing, I made a nice, easy landing."

Incident after incident has been recorded about the *Skyhawk's* desire to stay in the air. "In fact," Lt. Schwarzenbach says, "when A-4 pilots get together in the ready room and talk about missions and taking hits, someone always has a new story about an A-4 that stayed in the air when, in theory, it shouldn't have been able to fly."

BESIDES ITS ability to remain airborne, the *Skyhawk* has other good combat qualities. Because of its

small size and light weight, it makes sharper turns and comes out of dives faster. "It maneuvers like an agile cat," says one pilot.

The *Skyhawk's* maneuverability is praised by LCdr. T. R. Swartz, who is credited with the only MiG kill by an A-4 to date.

The kill was recorded May 1, 1967, during an attack on the North Vietnamese airfield at Kep. Swartz had just fired several of his rockets at two MiG's on the runway when he got a radio call telling him there were two MiG's at his "six o'clock position" (on his tail).

"I spotted the attacking aircraft and put my A-4 into a high barrel roll, dropping in behind the MiG's," Swartz recalls. "From this markedly advantageous position, I fired several air-to-ground rockets at the number two MiG and then got another call that there was a MiG at my six o'clock again. I was not able to see my rockets hit as I bent my A-4 hard, checking for the suspected third MiG."

LCdr. Swartz's wingman confirmed a MiG kill, however; he saw the enemy aircraft hit the ground.

"We have an advantage over some other planes," comments Lt. Richard Pennington when he discusses the A-4's maneuverability. "The A-4 has a high

rate of roll, enabling it to flip back and forth. We can change our 'jinking' patterns in a minimum amount of time. That good old Douglas fat wing can cut into the air and give us all the G's we want."

ANOTHER advantage of the *Skyhawk* is the visibility it permits the pilot. There are no line-of-sight restrictions from wings or hoods. *Skyhawk* pilots consider canopy visibility so good it's almost like riding in a convertible car. This lack of interference with a pilot's view of his surroundings is of great importance in terms of his survival.

Good visibility "is the reason we dodge flak as well as we do," Pennington says. "Maybe they don't know it, but when Douglas and the Navy created the A-4 they created a jet with a lot of special features."

Ltjg. Roger Van Dyke, VA-93, expressed an opinion common to his fellow A-4 pilots: "The A-4 is only 40 feet long and has a wing spread of less than 30 feet, but its weapon delivery system, its speed, its maneuverability and its determination to stay in the air under adverse circumstances—coupled with a pilot's own determination—is a great combination for combat flying in Vietnam."

