

F-4 PHANTOM II

in action



DON GREER '84

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Aircraft Number 65

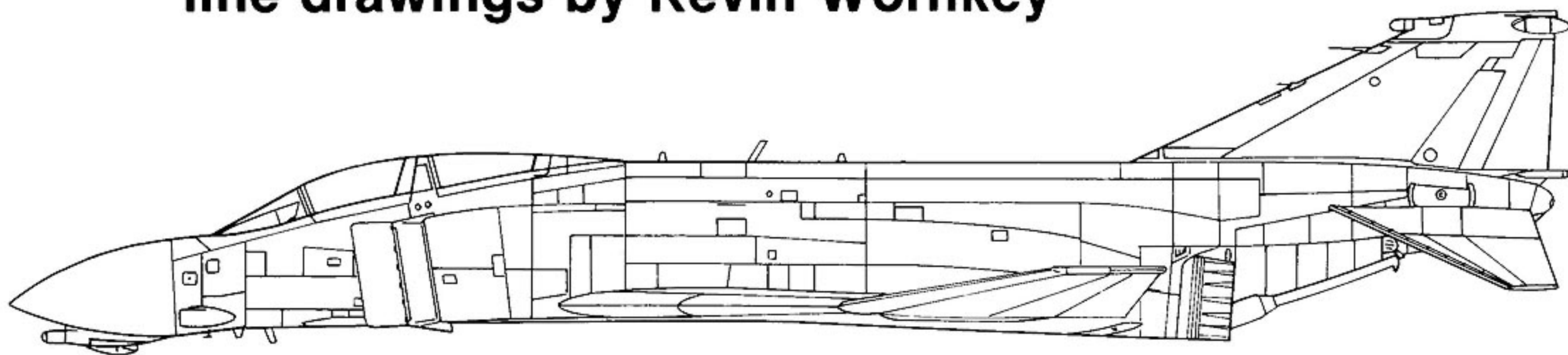
F-4 PHANTOM II

in action

by Larry Davis

illustrated by Don Greer

line drawings by Kevin Wornkey



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"LITTLE CHRIS" and "Li'l Buddha", a pair of F-4Es from the 388th TFWg at Korat AB, Thailand, enroute to a target in South Vietnam in 1969.

Special thanks to Phellow Phantom Phreaks Mick Roth, Tom Brewer and Bob Ulrich.

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A sharkmouthed F-4E from the 34th TFSq sits armed and ready in its revetment at Korat. (USAF)



Introduction

F-4 PHANTOM II: to anyone involved in the Vietnam War it meant American airpower. To the Grunts and Mud Marines on the ground it was the "...big, screaming, 'fast mover' dumping napalm on OI' Charlie to save your neck". To the F-105 and A-6 strike crews, Phantom IIs meant that the MiGs were off your back. And to the North Vietnamese, the Phantom II was an elusive spirit that first gave their MiG pilots a target, then skillfully took the target away. Today the F-4 is regarded as the mainstay of the Western Alliance air forces. No less than a dozen Free World air forces count the F-4 as their primary weapons system, either as a defensive weapon, or as an aircraft to strike deep into the heartland of an enemy. The design is now over twenty-five years old, and is rapidly being replaced by the newer F-15 Eagle and F-16 Falcon. But it is still, and will remain for many years, a very effective weapons system. It was THE fighter aircraft of both the 1960s and 1970s. It will take its rightful place alongside the Spad, Fokker, P-51 Mustang, Spitfire, A6M Zero and F-86 Sabre, in the Warplane Hall of Fame.

James S. McDonnell created the McDonnell Aircraft Company on 6 July, 1939. The "factory" was on the second floor of a small building adjacent to the St. Louis Municipal Airport, now called Lambert Field. The rent was high — 100 bucks a month — and the staff was small — McDonnell and his secretary. They had no contracts and no design teams, but McDonnell did have ideas, a great many ideas. And by 1943 he had sold enough of his ideas to various engineers to build a very creditable staff. He had also sold enough of his ideas to the US War Department to maintain a nice profit margin with which to expand. During World War Two, the McDonnell Aircraft Company's prime effort was subcontract work for the major aircraft manufacturers such as Grumman and Vought, who had a lock on all the major Navy warplane designs. McDonnell's only designed and built aircraft was the shortlived XP-67 bomber-interceptor in 1944.

But McDonnell and his crew were working on the one concept that they felt (no, they knew) was going to revolutionize the aircraft industry — jet propulsion. The US Navy let their first contract for a jet-engined, carrier-based aircraft, not to Grumman — builder of the famous 'cat series of fighters, not to Chance Vought — builder of the equally successful Corsair, and not even to Bell Aircraft or Lockheed, both of which already had operational jet aircraft in use by the US Army Air Force. The contract went to McDonnell Aircraft Company, due equally to their continued research in the jet engine field, and their close ties with the Navy. The result of this contract was the McDonnell FH-1 Phantom, the first operational carrier-based jet fighter in history. It typified the McDonnell approach to everything — unique! Where contemporary jet fighters had a high stance and low tail fin, tall cockpit and single engine, the FH-1 sat very low with an even lower cockpit, the tail was very high, and the aircraft had two engines. It looked like a rocking chair. McDonnell built sixty FH-1s for the Navy.

With the knowledge and capital gained from the FH-1 design, the McDonnell team set about improving the basic design. The FH-1 Phantom simply wasn't competitive with the newer Grumman XF9F Panther. The FH-1 fuselage was stretched and streamlined with the cockpit sitting high, high enough that the McDonnell team redesigned the nose gear to "kneel" down for easier pilot entry. A pair of the more powerful Westinghouse J34-WE-22 engines replaced the two J-30-WE-20s in the FH-1. The result was the F2H Banshee, which remained a mainstay within the US fleet until the mid-1950s. The Banshee was a major success, with McDonnell building 895 examples. Navy F2H-2 Banshees and Marine F2H-2P Photo Banshees saw a great deal of action during the Korean War.

But it was the action in the Korean War that sounded the deathknell for the straight-wing, subsonic jet fighter. It was a simple fact that the Navy had nothing to compete with the Soviet swept-wing MiG-15 in the combat arena over North Korea. The MiG was light, cannon-armed, and could reach a top speed near Mach 1, almost 100 mph faster than anything the Navy had. The Navy needed a quick solution, both in time and aircraft speed. One answer was navalizing the North American F-86 Sabre design, resulting in the FJ Fury series. Navy also had Grumman build a swept-wing version of the F9F Panther, which



The McDonnell FH-1 Phantom was the Navy's first jet-powered carrier-based fighter. (W.J.Balogh)

became the F9F-6 Cougar. Both were very successful designs and exactly what the Navy needed in 1953. But newer MiG designs rapidly eroded these temporary advances. What the Navy needed was an entirely new design, one that would remain competitive for many years with anything the Soviets could build.

McDonnell's answer to the Navy request became the F3H Demon, a single-seat, single-engine day fighter. The Demon was the first aircraft designed to carry the new Raytheon Sparrow III radar-guided air-to-air missile. It had large air intakes on both sides of the cockpit, and the tail was upswept and sat much to the rear of the engine exhaust. Both of these features would return in later McDonnell designs. Although the fuselage design had supersonic capabilities, the Westinghouse J40-WE-6 engine with 7200 lbs. of thrust never performed as it should and the F3H Demon remained a transonic aircraft. McDonnell built 521 Demons for the Navy. In 1953, McDonnell met and lost a contract battle with Chance Vought for an all-new multi-mission aircraft. The Chance Vought F8U Crusader design had defeated a twin-engined, missile-armed version of the Demon, the F3H-G.

During this frustrating period, McDonnell was also busy trying to land an Air Force contract. They had successfully designed and built the first jet aircraft which could launch and be recovered by an aircraft mothership — the XF-85 Goblin. They had also challenged the North American F-86 Sabre with the ultra-sleek XF-88 Voodoo. The XF-88 was much larger than the Sabre, and with twin J34 engines was much faster. It had a 20mm cannon armament and a better fire control system than the Sabre. Why did it lose the competition? It was, quite simply, not what the Air Force wanted. It was too complex and expensive for the time. Five years later, the Air Force and Navy were both seeking these features for the new Century Series designs.

The F-101 Voodoo was McDonnell's entry into the Century Series fighter race. It was the biggest and most powerful of all the original Century Series aircraft. The F-101 was 67 feet long and had two of the most powerful engines in the world — the Pratt and Whitney J57 with 11,700 lbs. of thrust. Armament for the F-101 Voodoo day fighter was to be four M39 high-speed 20mm cannon. When the USAF Tactical Air Command accepted the F-101A as its primary daylight and escort fighter, Air Defense Command began looking at how the new McDonnell aircraft could be modified to fly the all-weather interceptor mission. The F-101 seemed to be the ideal aircraft for this role. It was big enough to house all the latest electronics and radar equipment without paying a stiff penalty in speed. It had two engines, a definite plus when operating over the great expanses of Canada and the Arctic. If McDonnell could build the F-101 with a second cockpit for a Radar Intercept Officer, and be capable of carrying missile armament, ADC would buy it. McDonnell came up with the F-101B: a two-place, all-weather interceptor equipped with a rotating missile bay under the nose. Armament was to be either the Hughes AIM-4 Falcon heat-seeking



A McDonnell F3H-2N Demon of VF-124. There is a strong family resemblance to the eventual F4H-1 Phantom II design. (Krieger via Menard)

missile, or the MB-1 Genie missile with an atomic warhead. Other variants on the F-101 airframe would include the first supersonic reconnaissance aircraft, the RF-101A/C. With success in both the F3H Demon and the F-101 Voodoo, McDonnell Aircraft Company had a firm position in the military aircraft business in the US. Their next effort would become THE fighter aircraft of the Free World for the next two decades.

From all these previous aircraft designs would come the "next generation fighter". The Navy wanted a do-all aircraft for its next fighter, one that could meet and defeat the latest MiG threat at all altitudes and speeds. And one that could do so and still carry ordnance by the box-car load. The F3H-G, which had lost the previous competition to the F-8 Crusader, would be the basis for the new design. The twin-engine concept, carried over all the way from the original FH-1 Phantom and the newer F-101 Voodoo, was retained, but with two Wright J65 Sapphire engines. The landing-gear design and Sparrow III missile capabilities were carried over from the Demon. The new aircraft would have eleven external hard points for carrying various types of ordnance. The new design retained the single-seat cockpit, large air intakes, and four 20mm cannon from the Demon. In the late Fall of 1954, the Navy inspected the mockup of the new fighter. The admirals were duly impressed and the Navy immediately signed a Letter of Intent authorizing McDonnell to build two prototype aircraft based on the mockup. The date was 18 November 1954, and Navy designated the new aircraft the McDonnell AH-1, with the prototypes being designated YAH-1s.

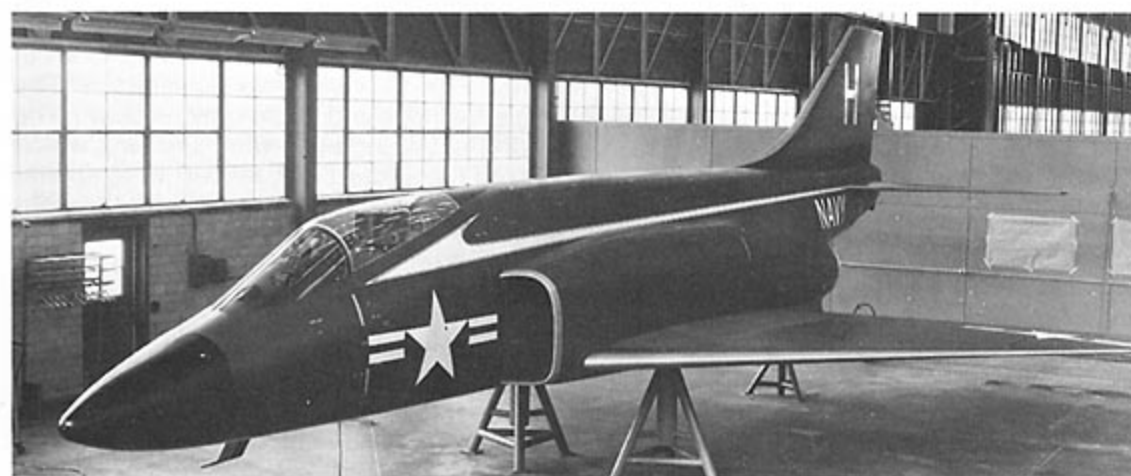
During the next four weeks many changes were sent down from the Navy's Bureau of Aeronautics (BuAer). On 14 December 1954, the entire design was modified in a new letter from BuAer. Gone were the two J65 Sapphire engines, which would have given a top speed of at least Mach 1.5. Gone were the four 20mm cannon. Gone, too, were the eleven hard points for external carriage of weapons. The J65s were replaced by the much more powerful General Electric J79, rated at over 16,000 lbs. of thrust. The J79 was just beginning its development, and promised to be the most powerful engine in the West. And it was entirely US-designed and built; the J65 had been British-designed and American license-built. The 20mm cannon armament was replaced by an entirely new concept in air-to-air weaponry — all missiles.

The F-86D, F-89D, and F-94C had been armed strictly with rockets, but they were defensive weapons used against bomber aircraft attempting to penetrate US airspace. The AH-1 was going to be an offensive weapon system, carrier-based, and its mission would take it to all corners of the globe. The missiles would be Raytheon Sparrow III types, which would be carried semi-recessed in troughs on the underside of the fuselage. The eleven hard points for carrying external ordnance were replaced by a single centerline hard point for carriage of a 600-gallon centerline fuel tank. The Navy no longer wanted an all-purpose

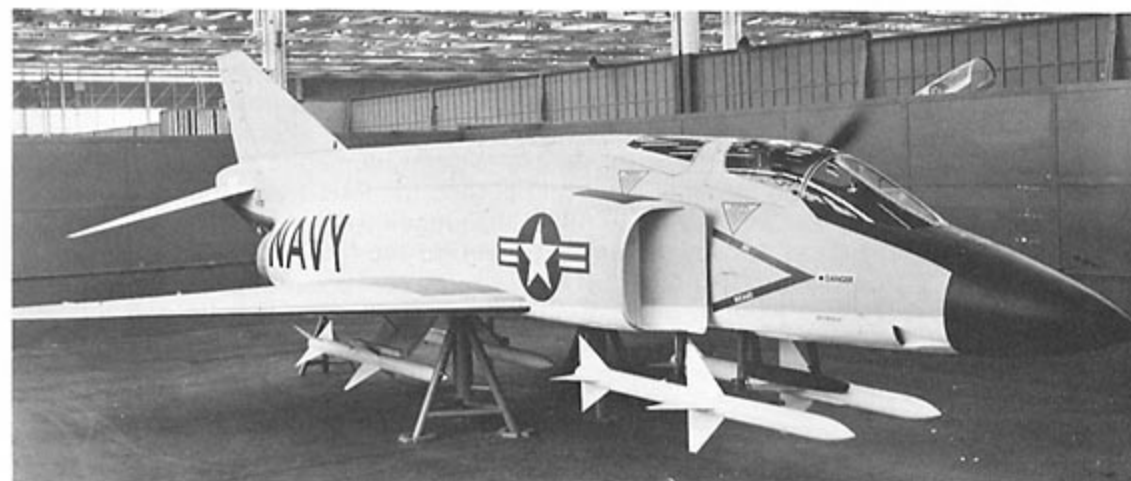
aircraft — they wanted a "fleet defense interceptor". An aircraft that could meet the enemy 250 miles from the carrier, fly a 2½-hour Combat Air Patrol, and bring the crew safely home.

Two days after receipt of the new letter from BuAer, McDonnell had two concepts ready for evaluation — a single-seat version and a two-place version based on the F-101B design which had been selected by Air Force Air Defense Command (ADC). The Navy selected the two-place design so as to maximize the crew's ability to find, and then destroy, a target. The pilot would fly the airplane to the target area while the Radar Intercept Officer (RIO) would pinpoint and lock the aircraft systems onto the target. Again, it was not a novel approach; the Douglas F3D Skyknight, the Northrop F-89 Scorpion, and the Lockheed F-94 Starfire all-weather interceptors used the two-man concept.

The basic design underwent still more changes before a "final configuration" was accepted by Navy in July, 1956. First the designation was changed from AH-1 to F4H-1 to indicate the aircraft's new fighter mission. This was then changed to F4H-1F as the aircraft evolved through its all-missile armament stage. Wind tunnel tests revealed some stability



The proposed McDonnell F3H-G was a single-seat, twin-engine development of the F3H Demon series. It had multiple nose sections which could be removed to change its basic mission from that of fighter to reconnaissance, to strike, or even to a two-place all-weather interceptor. (McAir)



The McDonnell AH-1 mockup in February, 1954. The AH-1 was to be powered by a pair of J65 Sapphire engines and armed with Sparrow radar guided missiles. (McAir)

problems, which the McDonnell team cured by giving the outer wing panel a 12-degree dihedral (the outer wing was bent up at a 12-degree angle). Along with this, the chord of the outer wing panel was increased by some ten percent. These changes occurred right at the wing fold joint, so no further wing strengthening was needed. The horizontal stabilizer was a one-piece slab which combined both the horizontal stabilizer and the elevators. It was called a stabilator. Again, wind tunnel tests revealed some problems. The McDonnell team solved the problems by angling the stabilator down at a fifteen-degree angle. This was later changed to twenty degrees for still better control. Angling down the stabilators effectively cured the rolling effect caused by the up-tilted outer wing panels.

The new wing design suffered greatly in low-speed characteristics, something you simply had to have in carrier deck landings. The McDonnell team again came up with an entirely new approach to the problem. They used something called Boundary Layer Control. Excess air, sometimes called bleed air, from the engine compressor, was piped along both the leading edge of the wing and just forward of the trailing edge flaps. This bleed air was then vented across both the leading edge and trailing edge flaps, creating added lift. The wing "THOUGHT" the aircraft was going faster than it actually was.

The new wing design also had something McDonnell called "flaperons" in place of the conventional flaps and ailerons. When a conventional aircraft wishes to roll to either side, one aileron tilts up and the opposite aileron tilts down, causing the aircraft wing to lift in the direction of the attempted roll. With the new F4H-1, there were no ailerons. The ailerons were tied in hydraulically with the trailing edge flaps and could only tilt down. The McDonnell team tied the trailing edge flaps in with the trailing edge wing spoilers, which always tilted up. When the F4H-1 pilot wanted to roll the aircraft left, the left wing spoiler would tilt up, while the right outer flaperon would tilt down. This would cause the right wing to lift and the aircraft would roll to the left.

Internally the F4H-1 was like no other aircraft. A Westinghouse Aero 1A fire control system utilizing the Westinghouse APQ-50 radar was mounted in the nose. The larger radar dish of the APQ-50 necessitated a slight fattening of the radome design. The radar package itself was mounted completely on rails so that maintenance could be performed without removing the entire package from the aircraft. The F4H-1 was the first fighter to have full 360-degree nosewheel power steering. The intake ramps were variable and tied into an onboard air data control computer which measured the amount of air necessary for maximum performance and either altered the area of the intakes through the variable ramps, or bled off excess air through the many venting systems. Easy access was the key word regarding maintenance of the F4H-1. The engines could be completely removed by opening two huge doors under the aft fuselage; it was not necessary to remove the entire aft fuselage as was the case with other contemporary fighter designs. All the various "black boxes" and mechanics were easily accessible through the many doors and compartments built into the F4H-1.

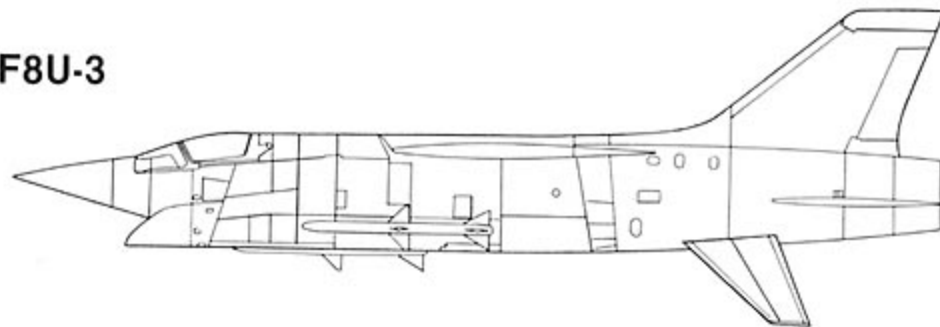
In May, 1958, the F4H-1 prototype was rolled out of the McDonnell facility at Lambert Field. It was huge for a fighter aircraft. And it certainly was not a pretty bird. Someone said it looked like someone had stepped on its nose and kicked it in the butt! The nose was bent down while the tail surfaces jugged way up behind the aircraft. The wings were bent up and the tailplane was bent down. This was certainly someone's idea of a joke. One military gentleman remarked that in a wind tunnel test, the F4H-1 was found to be more aerodynamic flying backwards! On 27 May 1958, McDonnell's Chief Test Pilot, R. C. Little, lifted the big fighter off the runway at Lambert Field for the first time. In spite of its appearance, the F4H-1 certainly could fly.

Although the Navy was very impressed with the F4H-1 throughout its development period, they correctly decided that they had to have an alternate aircraft in case the F4H-1 didn't prove out. Their choice was McDonnell's old nemesis — the Chance-Vought F8 Crusader. It was really a totally new design, but called the F8U Crusader III. The F8U-3 had one 24,500-lb. thrust Pratt and Whitney J75-P-5A engine and one crew member. The new design was equipped with all the latest in electronics, was missile-armed, and was very fast. It was an exceptionally fine aircraft for its time. But the F4H-1 was better, and it had two engines and crew members, something the Navy really wanted. The twin engines and two-man crew were the main reasons that the F4H-1 won the flyoff against the Crusader

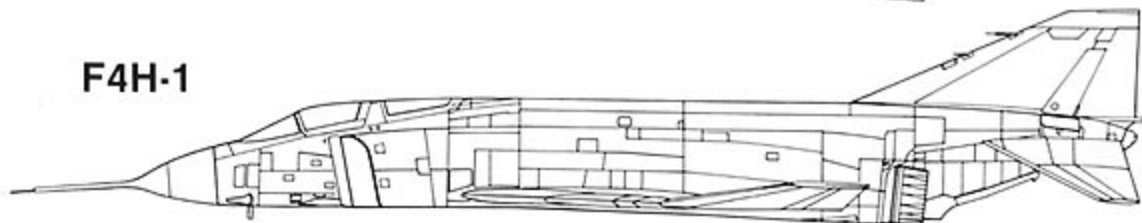
III. In December, 1958, BuAer contracted for twenty-three development aircraft and twenty-four production aircraft. Twenty-one years, and 5063 Phantoms later, the last Phantom II would roll off the McAir production line.

Having won the flyoff against its only real competition, the Navy and McDonnell were anxious to show the world what their new aircraft could do. World records were the way to do it. First to go was the World Absolute Altitude Record because it was currently held by the Russians. OPERATION TOP FLIGHT took place on 6 December 1959. Commander

XF8U-3



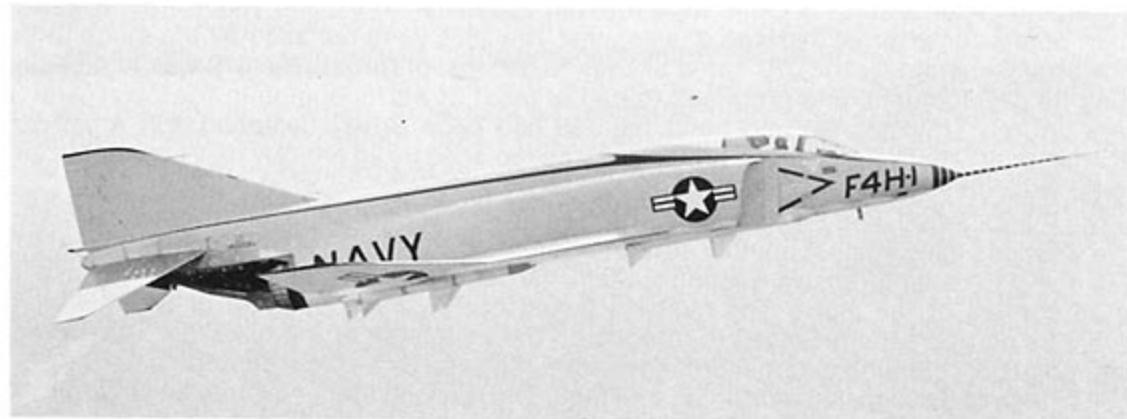
F4H-1



Lawrence Flint lifted off the Edwards AFB runway in the No. 1 YF4H-1 prototype, serial 142259, which was fitted with a certified barograph to measure altitude gained. Forty minutes later he returned to earth. The barograph read an amazing 98,557 feet, topping the previous Soviet effort by over 4000 feet. In 1960, F4H-1s set both the 100-Kilometer and 500-Kilometer Closed Course Speed Records.

1961 was the 50th Anniversary of Naval Aviation, and the Navy planned to be on everyone's minds with the record-breaking F4H-1. In May they set a new cross-country record in a flight from Los Angeles to New York in 2 hours, 49 minutes, 9.9 seconds. In August, the SAGEBURNER YF4H-1 set a new low-altitude Absolute Speed Record of 902.769 mph — a record that still stands today. On 22 November, OPERATION

McDonnell's Chief Test Pilot, R. C. Little, at the controls of the first F4H-1 Phantom II on its maiden flight — 27 May 1958. (McAir)



SKYBURNER took place. It was an attempt on the World Absolute Speed Record. Marine Corps Lt. Colonel Robert Robinson left Edwards AFB, zoomed to 33,000 feet, dropped his tanks, lifted the nose and lit the burners. The Mach meter read 2.5 when he entered the speed course at Pt. Mugu. When Colonel Robinson exited the speed course for the second and last time, he and the F4H-1 owned the World Absolute Speed Record at an incredible 1606.3 mph. And this was done in the No. 2 YF4H-1 prototype, serial 142260 — a completely standard aircraft except for adding water injection to help cool the engines. Between 1959 and 1969, YF4H-1s set sixteen world records in various classes. With the exception of the SKYBURNER aircraft, all records were broken by unmodified production aircraft.

While the YF4H-1 prototypes were busy setting record after record, others of the twenty-three development aircraft were busy at Edwards AFB Flight Test Center and the Navy test center at Patuxent River, ironing out all the growing pains that come with any new aircraft. The J79-GE-2 engines were replaced by -2A engines, which added over 1000 lbs. of thrust. The more powerful engines required a minor redesign of the air intakes by removing the faired-in upper intake lip. An ACF Electronics AAA-4 infra-red seeker was mounted in a slender fairing under the nose. Inflight refueling capabilities were added with the addition of a folding refueling probe in a compartment on the right side of the fuselage next to the rear cockpit. This feature required a redesign of the rear cockpit area since it intruded into the right console area, virtually eliminating it. Nine of the original eleven external hard points were returned for carriage of external ordnance. And the in-board wing pylons were modified to carry either a pair of AIM-9 Sidewinder heat-seeking missiles, or an additional Sparrow III.

Beginning with the 19th development aircraft, YF4H-1F serial 146817, the basic fuselage was modified into the familiar F-4 design of today. Flight crews had been complaining about a lack of vision, both forward and to the rear. McDonnell answered their request by raising the entire cockpit floor several inches, giving the pilot much greater forward vision during taxi and other ground maneuvers. The rear cockpit floor was raised an additional six inches above the front. The canopy was then bulged to clear the seats, resulting in better, but still only minimal rearward vision. In addition, the new Westinghouse APQ-72 radar was installed. The APQ-72 had a 32-inch radar dish antenna in place of the 24-inch dish found on the APQ-50. This necessitated an eight-inch increase in the diameter of the radome. The distinctive bulbous nose was created. Finally, the air conditioning intake scoops were changed from recessed NACA-style scoops to small scoops protruding into the airstream just behind the radome.

On 3 July 1959, McDonnell named their new fleet interceptor. McDonnell had always

SAGEBURNER was the code name for the F4H-1 that set the World Three Kilometer Low Altitude Speed Record at 902.77 mph at an altitude of 125 feet! Flown by a crew from VF 101 Detachment A, the aircraft has been preserved by McDonnell and is shown on the St. Louis ramp in 1968. (McAir)



named their aircraft after supernatural beings — Phantoms, Goblins, Banshees, and Voodoos. The new aircraft would follow suit. Since it was also the company's 20th Anniversary, it only seemed fitting to name the new, and easily most successful, aircraft after the first truly successful McDonnell design. On this day, the new aircraft became officially the McDonnell F4H-1 Phantom II, with the first twenty-three development aircraft being designated F4H-1Fs.

In December, 1960, the initial production batch of F4H-1 Phantom IIs began rolling off the St. Louis assembly line and would be used in transitional training, VF-121 "Pacemakers", at Miramar Naval Air Station, California, receiving the first F4H-1s. Within a few weeks both VF-121 and Detachment A of VF-101 at Key West NAS, Florida, were both training in the new aircraft. It was a VF-121 crew that set the new transcontinental Speed Record on 24 May 1961 — barely five months into the training program. A VF-101 crew had flown one of the preproduction Phantoms in setting the SAGEBURNER records.

The production F4H-1 was identical to the last five F4H-1Fs. They had the larger APQ-72 radar and fatter radome. The raised cockpit and new canopy were also standard on the F4H-1. All the F4H-1s had the hard points for external stores found on the last few F4H-1Fs. These included the LAU-17/A inboard pylon with both Sparrow and Sidewinder missile launchers; an Aero-27A centerline ejector rack, and an additional pair of MAU-12 pylons under the outer wing panels. On these five hard points, the F4H-1 could deliver almost every ordnance type, including tactical nuclear weapons, in the US arsenal. Powerplant was the J79-GE-2A, rated at 16,150 lbs. thrust. Fire control system was the Aero-1A, comprised of the APQ-72 search and track radar, and the APA-157 continuous-wave illuminating radar for guidance of the Sparrow III missiles. Ejection seats were British-designed Martin-Baker Mk 5.

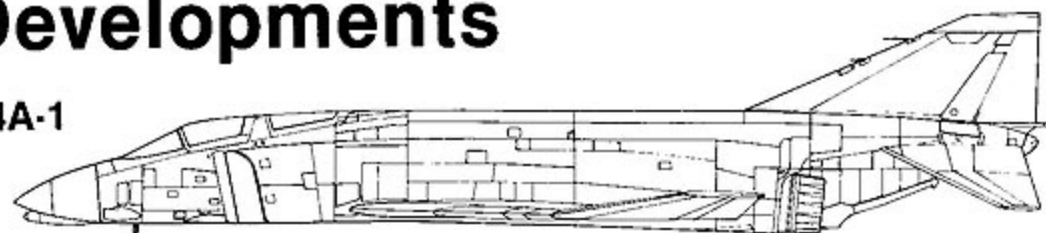
From these beginnings until well into the mid-1970s, the F-4 Phantom II would be the primary fighter aircraft of the Free World. A grand total of 5195 Phantoms would be built in seventeen major variants. The F-4 would be used in every conceivable role: fighter, interceptor, fighter-bomber, reconnaissance, tanker, drone. F-4s would also assume several specialized attack roles such as Wild Weasel defense suppression and laser designator bombers. By 1982, F-4s would have fought in five major conflicts — for nine long years in Southeast Asia, twice over the deserts in the Middle East with Israel, in the Iran-Iraq conflict, and in the Greek-Turkey conflict over Cyprus in 1977. In four of these fierce air campaigns, F-4s fought and defeated the best that the Soviets could provide. The Greek-Turkey conflict pitted F-4 against F-4, as the US had supplied arms, including F-4Es, to both sides prior to the conflict. It was the only time that the F-4 came out a consistent loser — and then only to another F-4!

An F4H-1F from the Naval Air Test Facility at Patuxent River, Maryland. Beginning with the 19th pre-production F4H-1F, the Phantom II gained its now famous bulbous nose and enlarged cockpit configuration. (Baker via Menard)

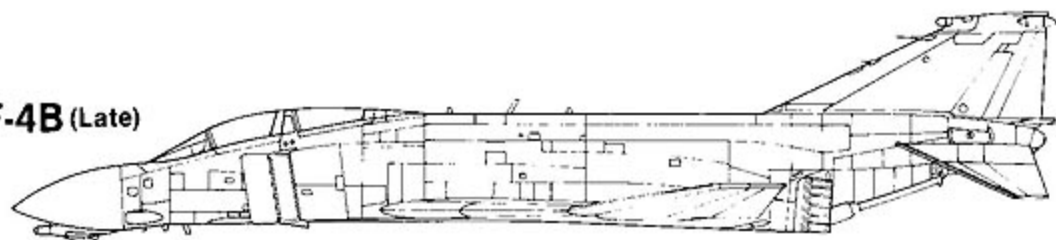


Developments

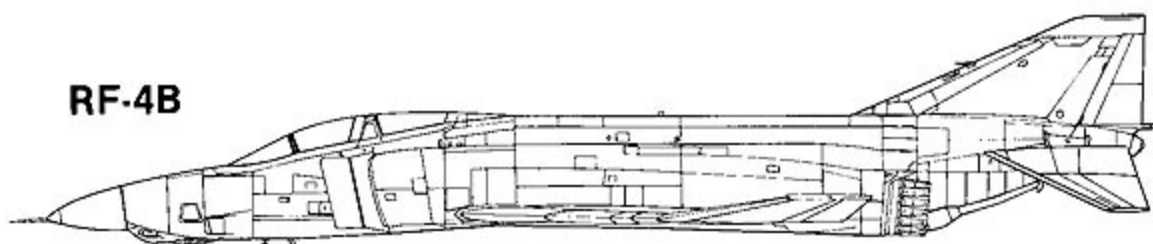
F4A-1



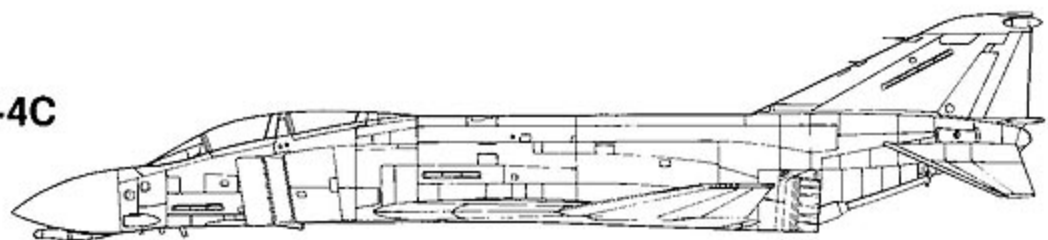
F-4B (Late)



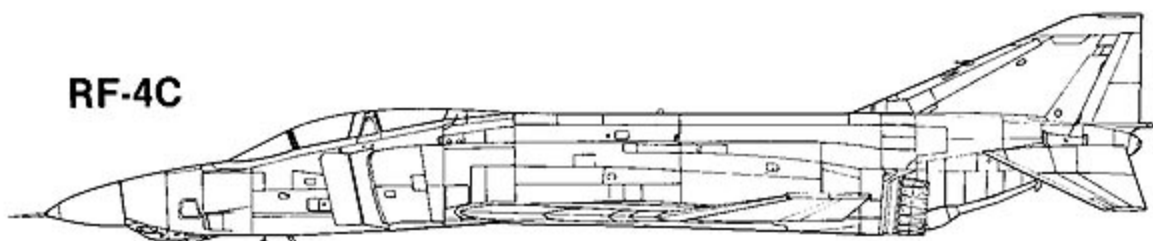
RF-4B



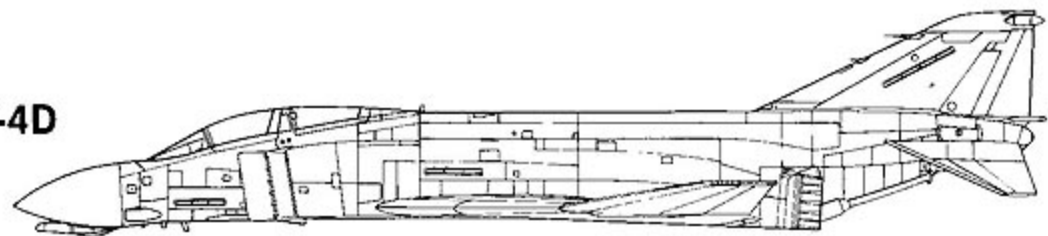
F-4C



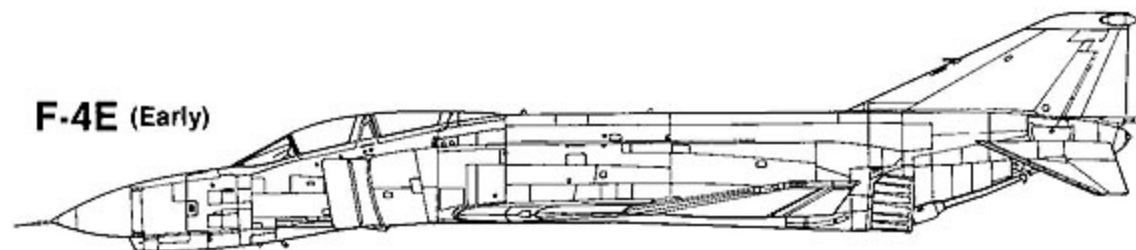
RF-4C



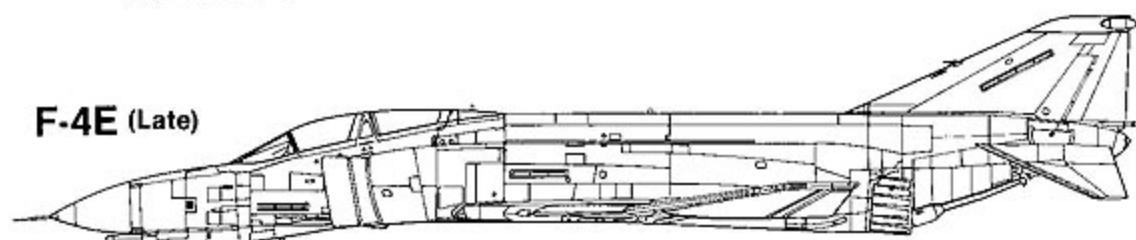
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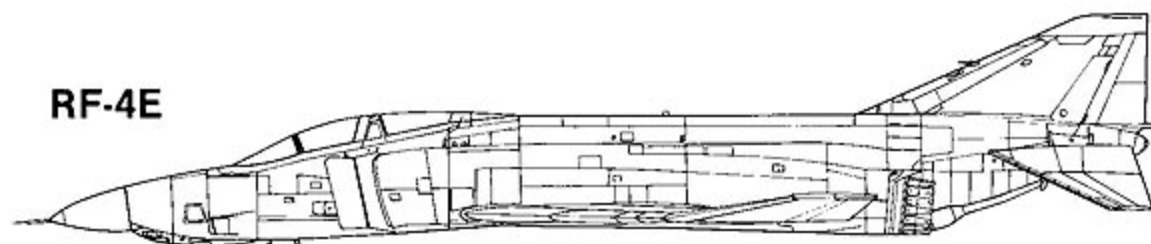
F-4E (Early)



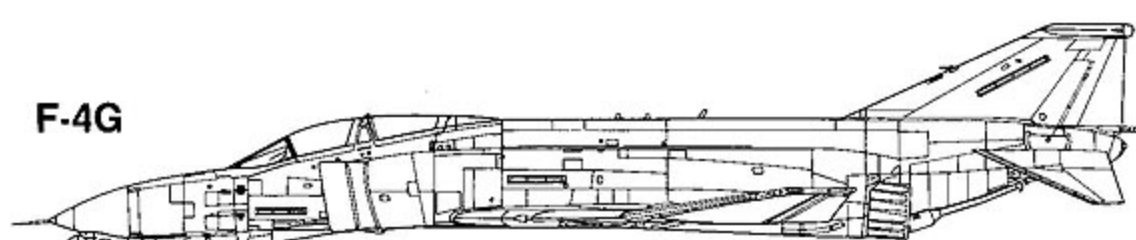
F-4E (Late)



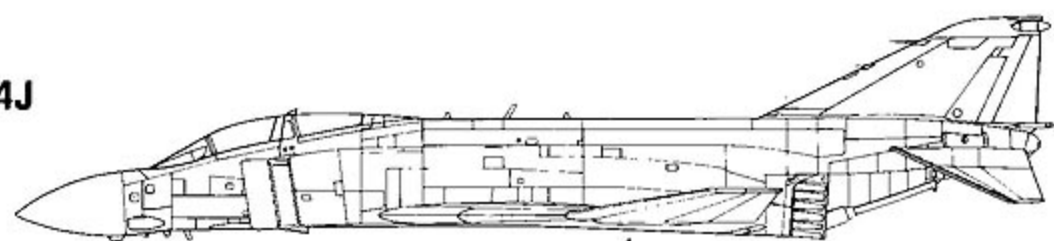
RF-4E



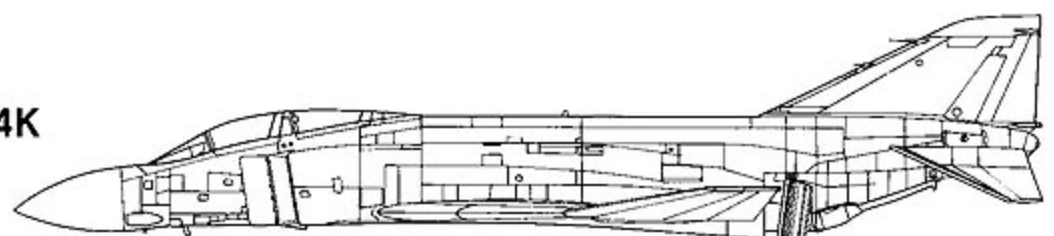
F-4G



F-4J



F-4K

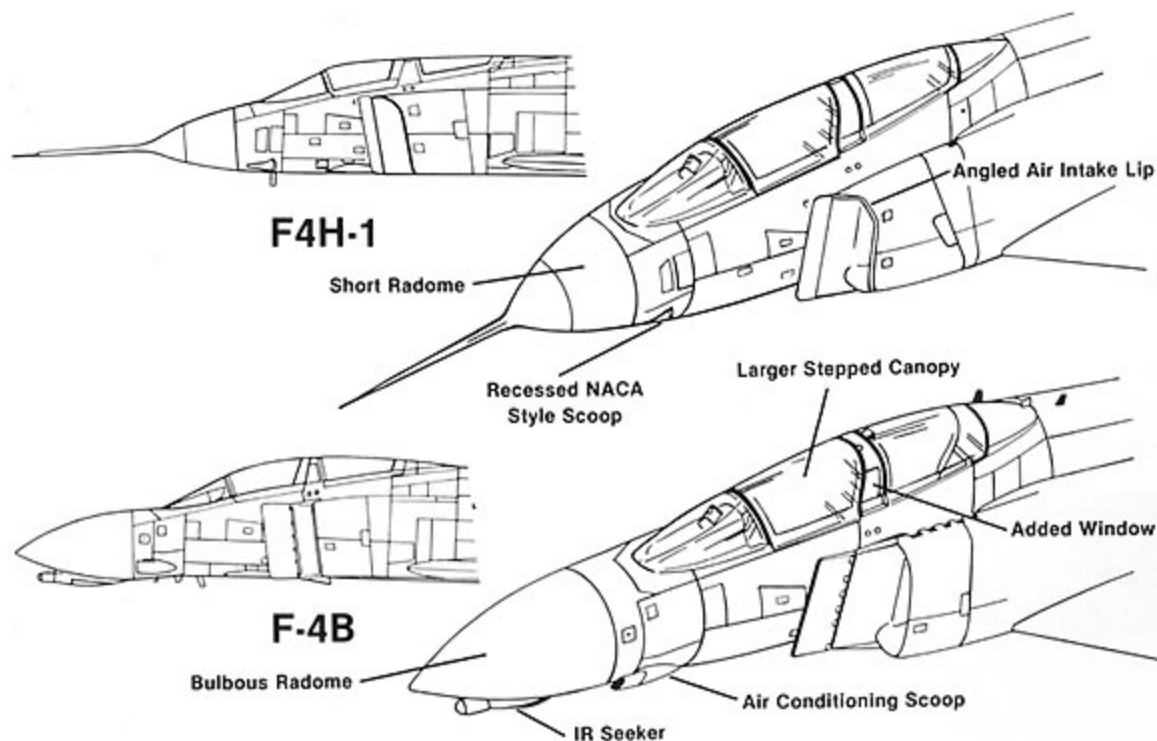


F4H-1 (F-4B)

The F4H-1 Phantom II was the first production variant (aircraft No. 24 to 47). The F4H-1 production aircraft differed from the earlier F4H-1F preproduction aircraft mainly in the engine department. The F4H-1 was powered by the General Electric J79-GE-8, rated at 17,000 lbs. of thrust in afterburner. This was an increase of 850 lbs. of thrust over the -2A engine in the early F4H-1F. The -8 engine allowed the gross takeoff weight to climb to an amazing 56,000 lbs. The F4H-1 was equipped with the same Aero-1A fire control system as the preproduction F4H-1F. The F4H-1 had five external hard points for carrying fuel tanks and ordnance, plus the four recesses in the underside of the fuselage for Sparrow III missiles. Other electronics included the General Electric ASA-32 autopilot, Lear AJB-3/3A bombing system, and the ACF AAA-4 infra-red detector under the nose. Experience in the Vietnam War would see the addition of the APR-30 Radar Homing and Warning System in a small bullet-shaped fairing on the trailing edge of the vertical fin being retrofitted to early production Phantom IIs.

Full production of the definitive F4H-1 began in 1961 (aircraft No. 48 onward), with the first flight taking place on 25 March 1961, and deliveries to operational units, VF-74 and VF-114, coming during the Summer of 1961. VF-74 became the first carrier-qualified Phantom II unit in the Fleet in October of 1961 aboard USS Saratoga. Several F4H-1s from the Operational Test and Evaluation Force took part in Project HIGH JUMP, which broke every existing time-to-climb record in the world. On 29 June 1962, the US Marines began conversion to the new McDonnell interceptor when VMF(AW)-314 received brand-new F4H-1s. In September, 1962, when the Department of Defense redesignated all Phantom IIs to the "all-service" designation of F-4 Phantom II, the Navy F4H-1 Phantom II was redesignated to the F-4B Phantom II. A grand total of 649 F-4Bs were built between March, 1961, and 27 January 1967.

Nose and Canopy Development



VF-121 "Pacemakers", the first squadron to equip with the F4H-1 on board USS Ranger during June of 1962. Since Day-Glo paint was a Department of Defense requirement at the time for all aircraft, VF-121 carried Day-Glo Orange vertical tail and outer wing surfaces as part of their unit markings. (Brewer)



This F-4B from VX-5 at the China Lake Naval Weapons Center carries the revised infra-red seeker housing under the nose and the ECM fairing on the fincap, both of which housed APR-30 RHAWS antennas. The tail band is Kelly Green with White trim. (Lock via Brewer)

A Marine F-4B from VMFA-323 at Ubon RTAB in July, 1968. Marine F-4s were based in South Vietnam and flew mainly close support missions for "Mud Marines". Note the Fletcher-style wing tanks. (Piccirillo via Brewer)

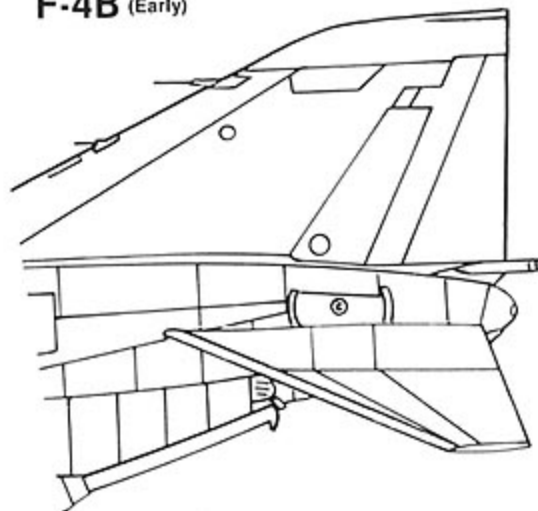




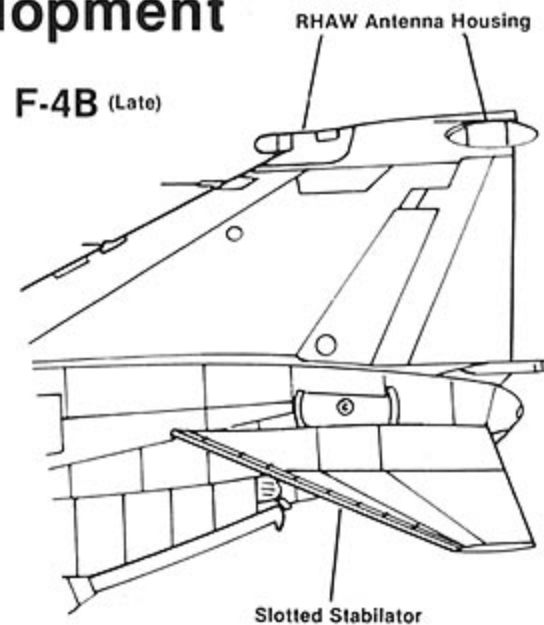
(Above) A VMFA-531 "Gray Ghosts" F-4B on the ramp at McChord AFB in 1971. The tail and wingtips are Black with White trim and a Yellow lightning bolt. The second aircraft has been fitted with the fincap leading edge APR-30 RHAW antenna. (Brewer)

Tail Development

F-4B (Early)



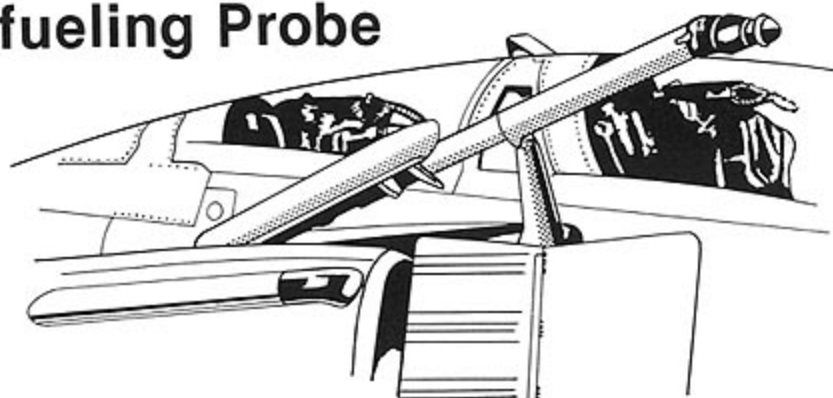
F-4B (Late)



If the F-4 was the most photographed aircraft of all time, then VF-111 Sundowners was certainly the most photographed squadron. This, the CAG aircraft, is at Miramar NAS in November, 1975. The familiar rising sun tail stripes have been modified with a multi-color stripe to signify the CAG aircraft. The colors on this stripe are, from top — Red, Yellow, Orange, Blue, Green, Black. (Lock via Brewer)

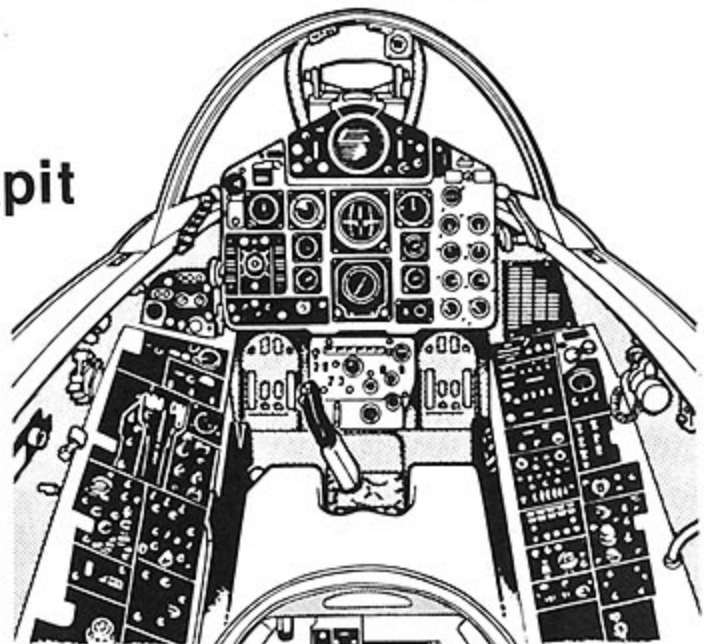


Navy Refueling Probe

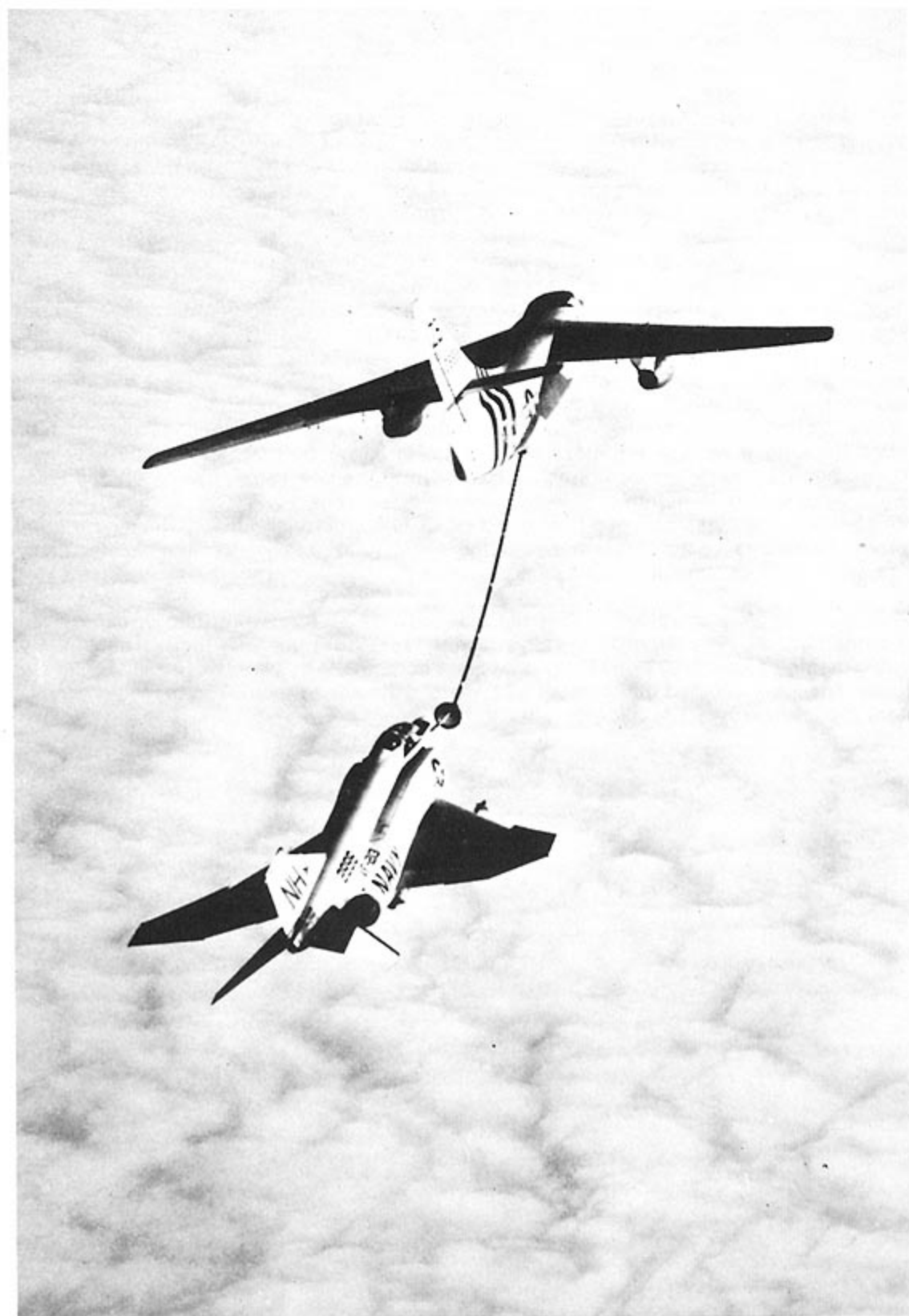
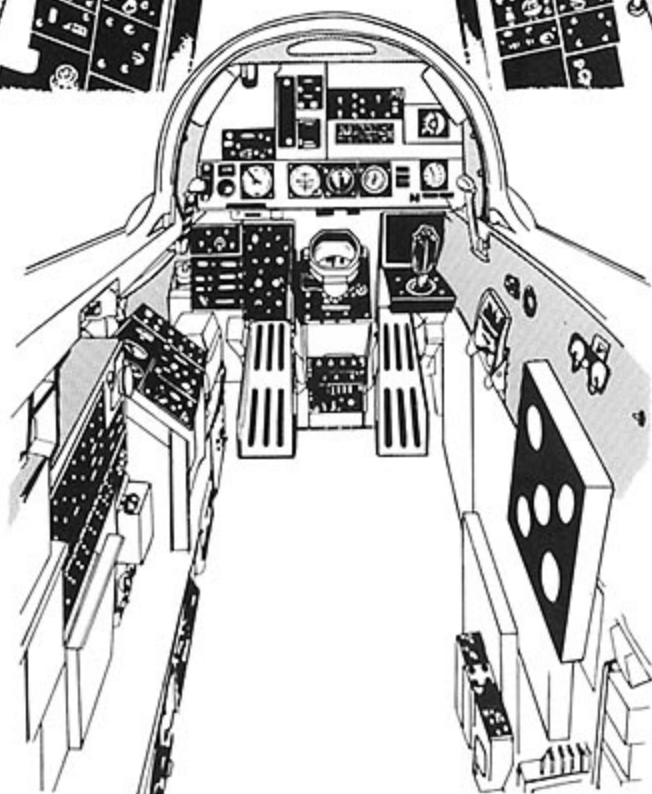


F-4B Cockpit

Front Cockpit



Rear Cockpit



F-4B of VF-213 Black Lions is refueled over the Gulf of Tonkin by a KA-3B Skywarrior. (DOD)

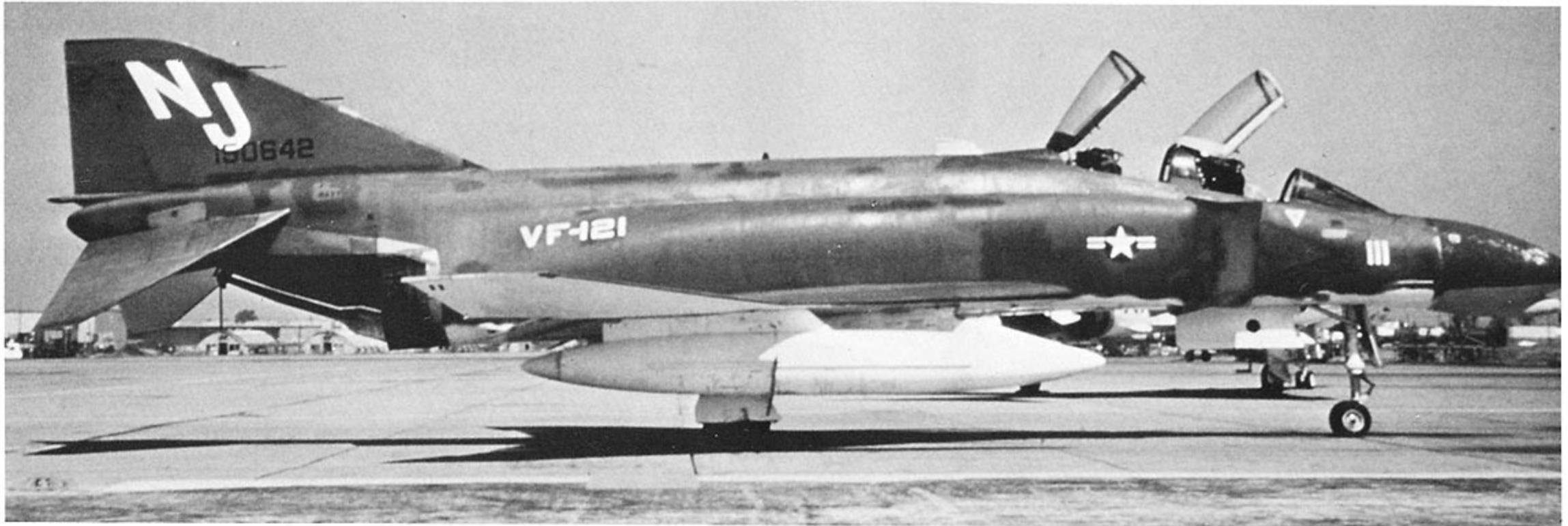
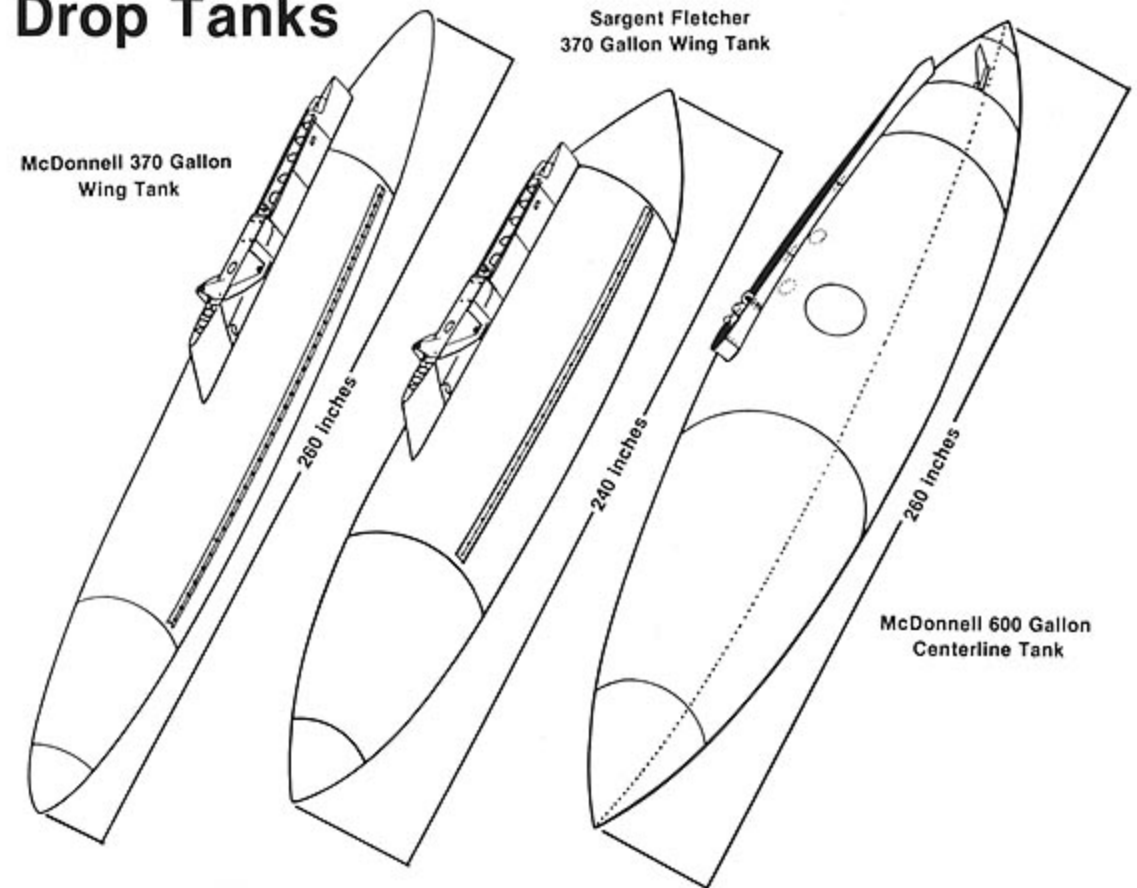
F-4G

In March, 1963, twelve F-4Bs were pulled from the McDonnell assembly line for the addition of special equipment. These aircraft were to test the new AN/ASW-21 air-to-ground data link. The new communications system and an approach power compensator were installed just aft of the rear cockpit in place of the No. 1 fuselage fuel cell. The twelve modified aircraft were redesignated F-4Gs. The data link system and approach power compensator were the only changes to an otherwise standard F-4B airframe.

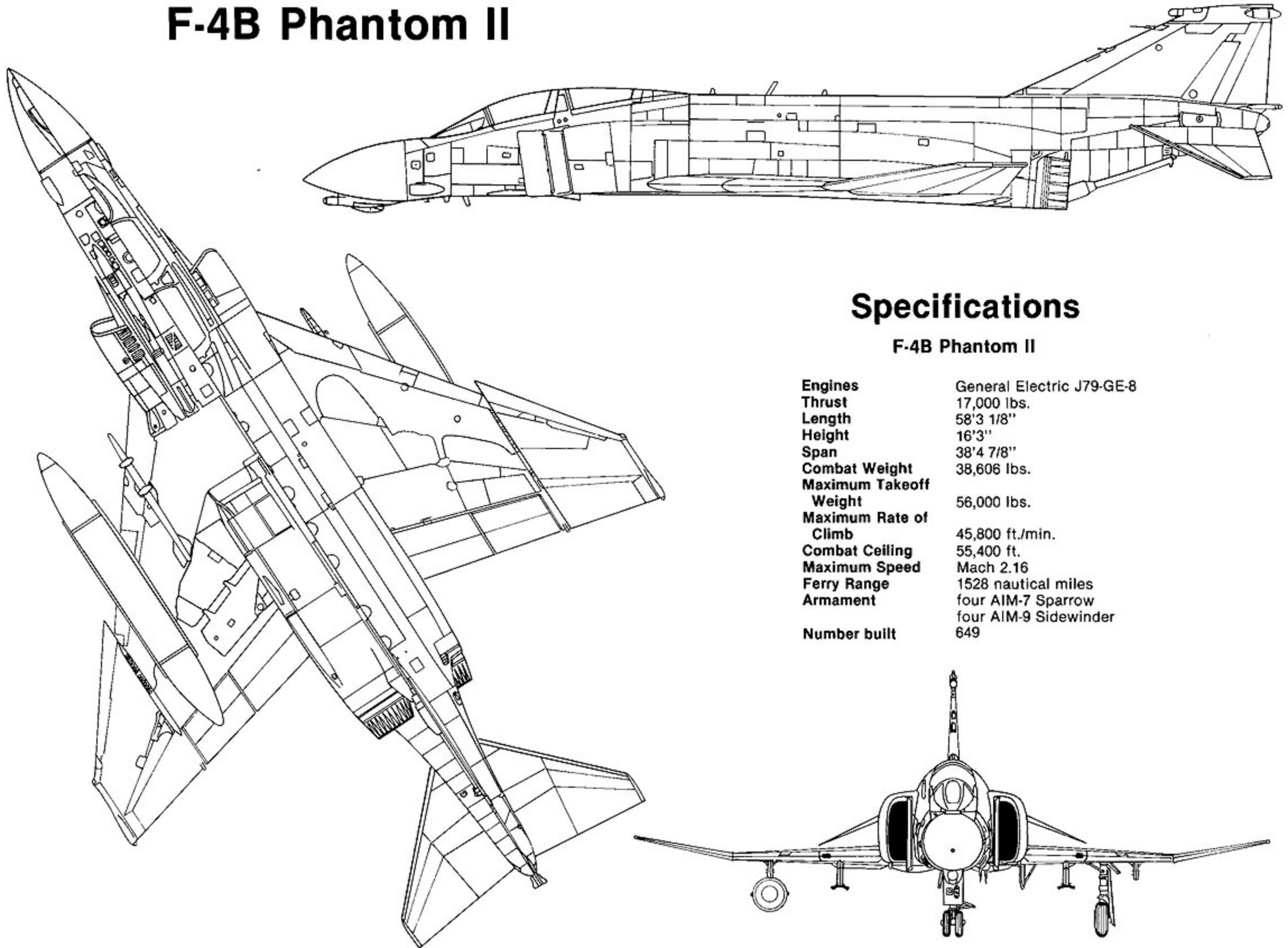
When the US Navy went to war in Vietnam, the F-4Gs were assigned to VF-213 "Black Lions", flying their first mission from the deck of USS Kitty Hawk in December, 1965. In 1966 the Navy used the twelve F-4Gs to test a new tactical camouflage for Navy aircraft. The upper surfaces were painted overall in either 34102 or 34079 Green, or a combination of both; the undersurfaces remained White. Several other aircraft types were also tested, the new camouflage colors including A-1s and A-6s. However, Navy decided that camouflage paint did not hide the aircraft to any great extent, and was found to be a negative factor when attempting to move an aircraft around the carrier deck at night. Navy aircraft would remain in the standard scheme of 36440 Gull Gray upper surface, with Gloss White undersides and control surfaces, until the late 1970s. Eventually the F-4Gs were returned to the United States and converted back to F-4B specifications. The designation F-4G was dropped but would be used again much later to designate a full-production model of the Phantom II, and the AN/ASW-21 data link system became standard equipment on the F-4J.

Twelve F-4Bs were modified to test the new ASW-21 air-to-ground data link under the designation F-4G. The aircraft were also used to test a possible Navy tactical camouflage being painted either 34079 or 34102 Green, or a combination of the two, on the upper surfaces. The Navy decided that camouflage was of little or no benefit and disdained its use until the late 1970s. (JEM Slides)

Drop Tanks



F-4B Phantom II



Specifications

F-4B Phantom II

Engines	General Electric J79-GE-8
Thrust	17,000 lbs.
Length	58'3 1/8"
Height	16'3"
Span	38'4 7/8"
Combat Weight	38,606 lbs.
Maximum Takeoff Weight	56,000 lbs.
Maximum Rate of Climb	45,800 ft./min.
Combat Ceiling	55,400 ft.
Maximum Speed	Mach 2.16
Ferry Range	1528 nautical miles
Armament	four AIM-7 Sparrow four AIM-9 Sidewinder
Number built	649

F-4N

In the early 1970s, both the Navy and McDonnell expressed concern over the age and condition of the F-4B fleet. Many were still in front-line service, including everyday combat over Vietnam, even though some of the airframes were up to ten years old. A program was begun to rebuild and modernize the F-4B aircraft. Under Project BEE LINE, 178 F-4Bs, from serial blocks 12 through 28, were sent to North Island NAS, the Naval Air Rework Facility for the F-4, where they were tested for any kind of structural fatigue. The aircraft were then completely rebuilt. If a part could be replaced with a newer design that would result in longer service life — it was. This resulted in an airframe with a service life that extends well into the 1980s. Along with structural beefing, the latest in electronic gear was installed. The helmet-sight Visual Target Acquisition System (VTAS), Sidewinder Expanded Acquisition Mode (SEAM), Auto Altitude Reporting, a dogfight computer, air-to-air IFF, and one-way data link were all added. All electrical wiring and connectors were brought up to industry standards. Finally, the inboard leading edge flaps were fixed closed.

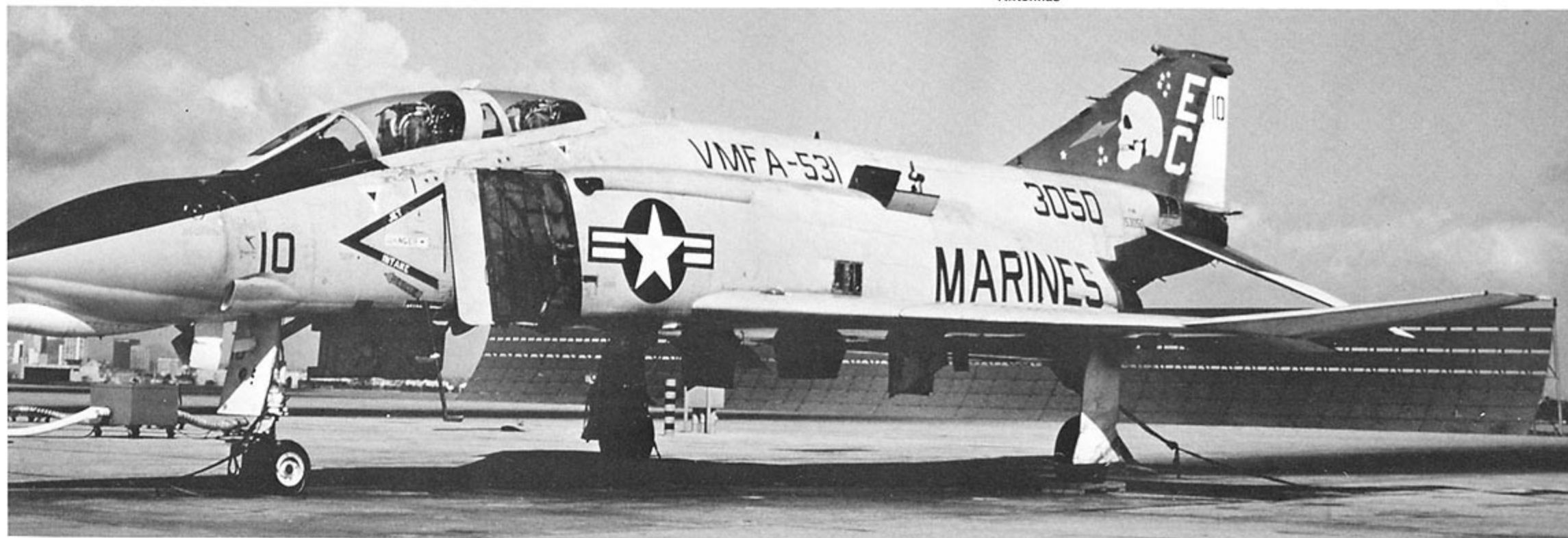
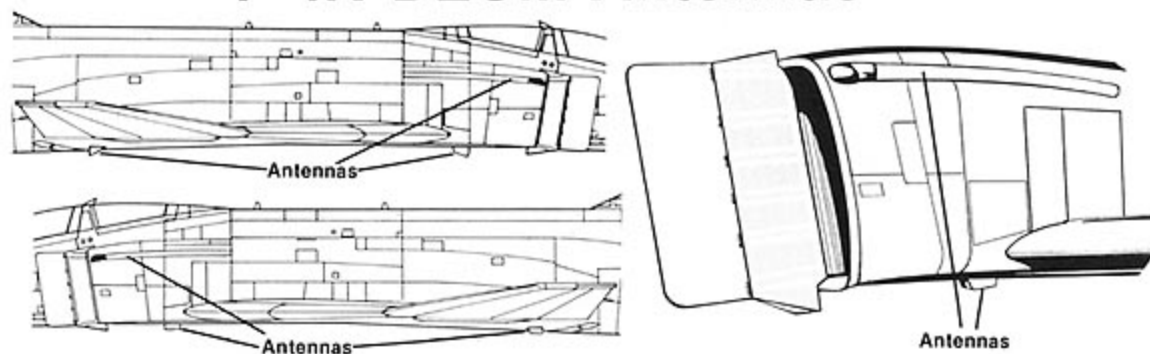
The renovated and updated Phantoms were returned to service under the designation of F-4N. Externally, the F-4N could be distinguished by long antennas horizontal mounted on the air intake shoulders for the Sanders AN/ALQ-126 Deceptive ECM system. However, the very first F-4Ns did not have the Sanders system nor the intake antennas. There were also antenna fairings added to the undersides of the intakes and undersides of the wings just aft of the main landing gear bays, which were tied into the fincap antennas from the Radar Homing and Warning portion of the AN/ALQ-126 system. The first F-4N flew on 4 June 1972, with the first renovated aircraft being delivered to the fleet in February, 1973. The Navy slated 301 aircraft for modification to F-4N standards.

An F-4N from VMFA-531 "Gray Ghosts" at El Toro in June, 1978. The aircraft has the full array of RHAW antennas on the fincap, and the APS-127 DECM antennas on the intakes and under the wings. Of special note is the open bay with Ram Air Turbine extended. (Roth)



The F-4N was the result of Project BEE-LINE, a Navy program to update and rebuild the ageing F-4B fleet. Early F-4Ns, such as this example from VMFA-323 "Death Rattlers", did not have the AN/APS-127 DECM antennas on the intake shoulders. (Mills via Brewer)

F-4N DECM Antennas





(Above) An F-4N from VF-201 "Boomers" based at NAS Dallas. The tail is Red and White with Black letters, while the nose treatment is Black. The "Boomers" were at Miramar NAS on 7 May, 1978, for the Reserve Fighter Derby competition. (Roth)

Everything is "down and dirty" on this VF-301 "Devil's Disciples" F-4N. Note that the in-board leading edge flaps have been fixed in the closed position, which was standard on the F-4N. This aircraft is overall 16440 Gull Gray, which was one of the Navy's first attempts at toning down their paint schemes. (Jacobs)



F-110A (F-4C)

With the Navy in the headlines seemingly every day with their new super-hot interceptor, the Defense Department ordered competitive tests be flown between the best aircraft in the US Air Force inventory — the Convair F-106A Delta Dart — and the new F4H-1 Phantom II. Under Project HIGHSPEED, the Phantom II and the Delta Dart competed. The Phantom II easily won in top-speed, low-level speed, altitude reached, unrefueled range, and radar range. Maintenance manhours for the F-4A was 70 percent that of the F-106A. But the decisive factor in the competition was when they loaded twenty-two 500-lb. bombs under the Phantom II and the aircraft still flew! The F-106A, being a point defense interceptor, had only two underwing hard points for external ordnance carriage, and these were needed for underwing fuel tanks. Much to the chagrin of top Air Force Brass, it was decided that their next generation fighter would be a Navy design. Not only could the new Phantom run away from the best fighter in the Air Force, it could do so with a full load of ordnance. The Phantom II would first supplement, then replace the F-100, F-101, F-102, F-104, and F-105 strike and interceptor fleet.

Under the designation F-110A the Air Force Phantom II was basically an F-4B airframe incorporating many new features over its Navy cousin. The main landing gear was reinforced and equipped with a much wider tire, causing the wheelwell to be enlarged and the upper and lower wings to be bulged outward. A complete second flight control system was added so that the Weapon System Officer (WSO) could fly the aircraft from the back seat, something the Navy Phantom could not do. In addition, the rear instrument panel was lowered for better WSO forward vision. The inflight refueling system was changed from a probe and drogue type to a receptacle on the fuselage spine, which would accept the Boeing Flying Boom refueling system found on SAC tankers. The J79-GE-15 engines were identical to those found in the Navy Phantom II, except for a cartridge start system and the alternator being moved to a small bullet fairing on the nose of the engine. The Litton AN/ASN-48 Inertial Navigation System was added along with an AJB-7 bombing system. Finally, the F-110A Phantom II would have the electronics and pylon modifications to fire the new AGM-12 Bullpup air-to-ground missile.

In January, 1962, two Navy F4H-1s, BuAer serials 149405 and 149406, were delivered to Tactical Air Command Headquarters at Langley AFB, Virginia. They were painted the standard Navy Gull Gray and White, but carried the logo "US Air Force" on the intakes. On the nose was "McDonnell F-110A Phantom II", and the tail bore the shield of Tactical Air Command. They were the first of thirty Navy Phantom IIs that were loaned to the Air Force for transitional training purposes. In April, 1962, McDonnell received a letter contract to build 280 F-110A Phantom IIs for the Air Force. In September, 1962, the Department of Defense ordered that all Phantom IIs would henceforth be designated F-4; the Navy F4H-1 became the F-4B and the Air Force F-110A became the F-4C. On 27 May 1963, the first F-4C rolled to the end of the taxiway at Lambert Field, turned onto the active runway, and took to the air for the first time. The first production F-4Cs were delivered to the 4453rd Combat Crew Training Wing at McDill AFB, Florida. In January, 1964, the 12th Tactical Fighter Wing became the first combat wing to convert to the F-4C. The 12th TFWg took their F-4Cs with them when they deployed to Cam Rahn Bay AB, South Vietnam, in 1965. Eventually, the contract for 280 F-4Cs was increased to 583, with the final aircraft coming off the assembly line on 4 May 1966.

F-4Cs were among the earliest Air Force aircraft to deploy to Vietnam. Almost immediately after deployment the new aircraft developed problems from the heat and humidity. Moisture barriers built into the aircraft were not sufficient for the extreme humidity of the Vietnam climate. A quick fix was incorporated but it cost the Air Force \$41,667.00 per airplane. Problems aside, the F-4C entered combat in June, 1965, with the 555th "Triple Nickel" Squadron. They were used in both the classic fighter interceptor role (MiGCAP), and the fighter-bomber role as a supplement to the F-105 force. On 10 July 1965, the F-4C was blooded when two 45th TFSq F-4Cs each shot down a North Vietnamese MiG-17. It was in 1965 that the Air Force decided to abandon the Gull Gray over



One of the F-110As on the ramp at Langley AFB, Tactical Air Command Headquarters, in January, 1962. These Phantoms marked as F-110As were actually two Navy F-4Bs on a 120-day loan to the Air Force for orientation and evaluation purposes. (USAF)

White paint scheme shared with the Navy in favor of a new tactical camouflage more suitable for the jungles of Southeast Asia. The upper surfaces were painted Tan (30219), Olive Green (34079), and Dark Green (34102), over Light Gray (36622) undersides. All Air Force tactical aircraft would be painted in this scheme.

Throughout its career, the F-4C was constantly updated to incorporate new weapons and systems. One of the weapons added was the General Electric SUU-16/A 20mm Vulcan gunpod. This was a feature designed for use in the fighter-bomber role as a ground attack weapon. But in Vietnam it was discovered that the gunpods were needed for dogfighting with the agile MiGs. The SUU-16/A pod was hung from the centerline hard point. Although the installation left a little to be desired as far as sighting was concerned, and it often shook so badly that 20mm cannon shells went all over the sky — many kills were credited to the gunpods.

The F-4C was also the basis for the Wild Weasel 4 project, a follow-on to the F-105F/G Wild Weasels that successfully defeated the North Vietnamese SAM threat. F-4C Wild Weasel 4 aircraft incorporated the ER-142 and APR-25/26 threat systems, with the ability to launch an AGM-45 Shrike Anti-Radiation Missile. In 1972, the 67th TFSq took a detachment of F-4C Wild Weasels to Ubon Royal Thai Air Base to begin combat operations in support of the strike aircraft trying to blunt the North Vietnamese Easter Offensive. They were successful, although not nearly as successful as the venerable F-105G, partly due to the fact that the F-105G had the capability of launching the AGM-78 Standard ARM, a much better anti-radiation missile than the Shrike. At least thirty-six F-4Cs were modified for the Wild Weasel role. Externally they can be identified by a small black antenna dot on each air intake just above the wingroot leading edge, and a pair of button antennas on the former infra-red seeker and parachute housing door. After the Vietnam War wound down, the F-4C Weasels were returned to the United States, except for one squadron based in Europe, to form the cadre of the new Wild Weasel force at George AFB. The aircraft themselves would eventually be replaced by production Wild Weasel aircraft, the F-4G, after which the F-4C Wild Weasel aircraft were de-modified and sent to Air Guard fighter units.

In 1972, the Air Force began releasing the F-4C from active service. Thirty-six were sold to the Spanish Air Force, equipping two squadrons at Torrejon Air Base. Spain is the only nation other than the US to operate the F-4C. Also in 1972, the United States Air National



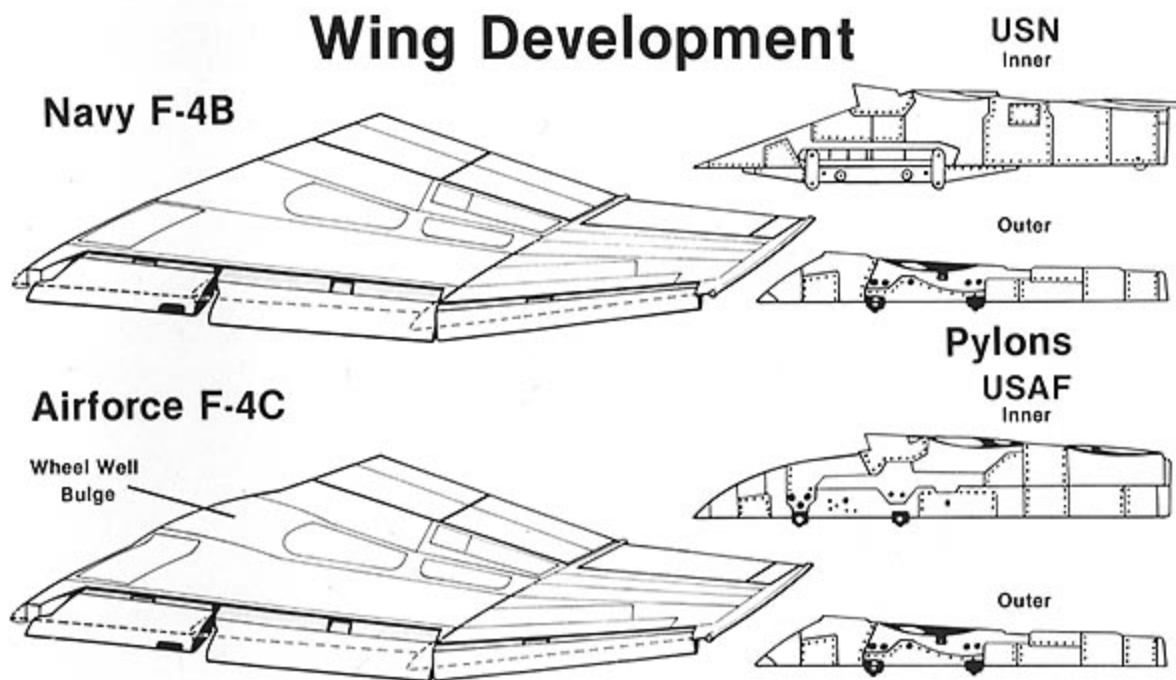
The F-4 became the "all-service" fighter in 1962 when the US Air Force adopted it as their primary fighter aircraft. Differences between the Navy and Marine F-4B, and the Air Force F-4C, were many including much heavier landing gear, inflight refueling systems, and extensive cockpit changes. (AFM)

Guard received its first F-4 fighters when the Illinois Air Guard converted to F-4Cs at Springfield Airport. Today, all F-4Cs are in Air Guard service except for a few retained for test purposes and chase aircraft.



The 366th TFWg deployed their F-4Cs to South Vietnam in March of 1966, taking up residence at DaNang AB. The Air Force was just beginning to camouflage their aircraft in the new Southeast Asia tactical camouflage scheme of 30219 Tan, 34079 Dark Green, 34102 Medium Green, over 36622 Pale Gray undersides. Missions were flown in both schemes until the Wing could repaint all aircraft. (USAF)

Wing Development



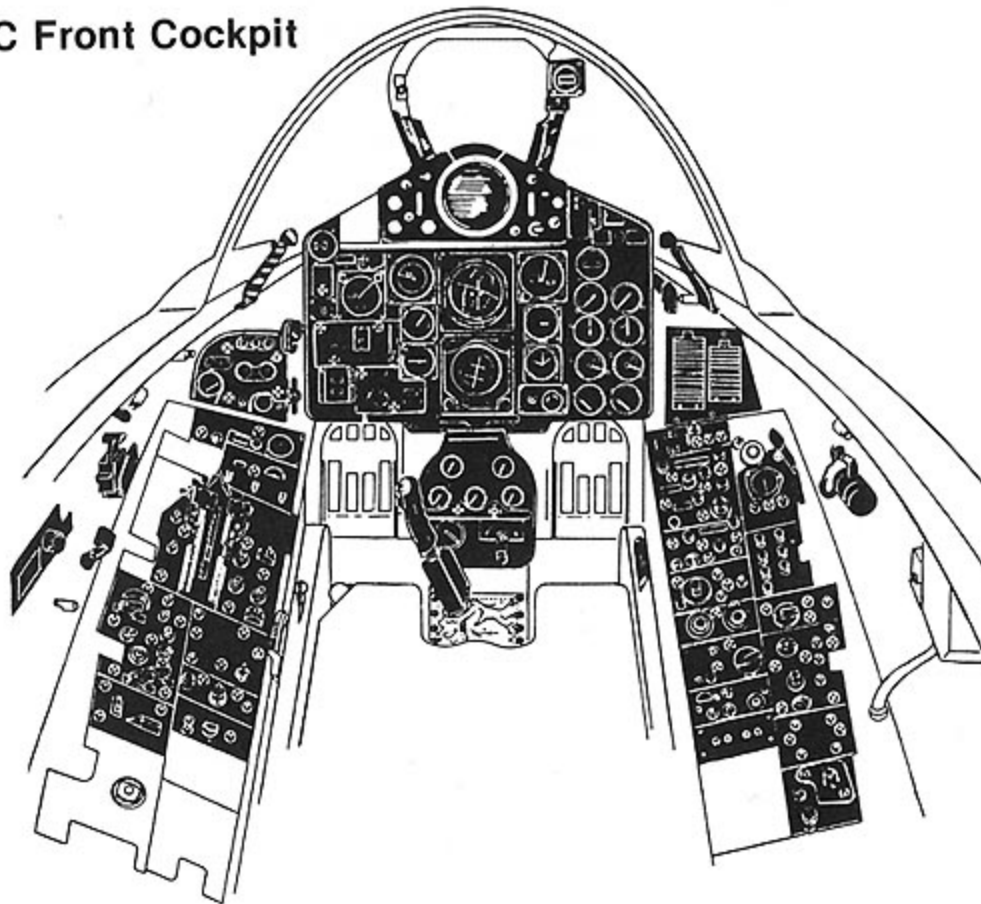


Ever wonder what a natural metal F-4 would look like? This aircraft from the Eglin AFB weapons test unit has had all its paint removed revealing the multi-tone skin that results from using many different metal types and composites, plus fiberglass parts in their natural color. It was this multi-tone skin that led to an Air Force decision to paint the Thunderbird team aircraft in an overall Gloss White. (Brewer)

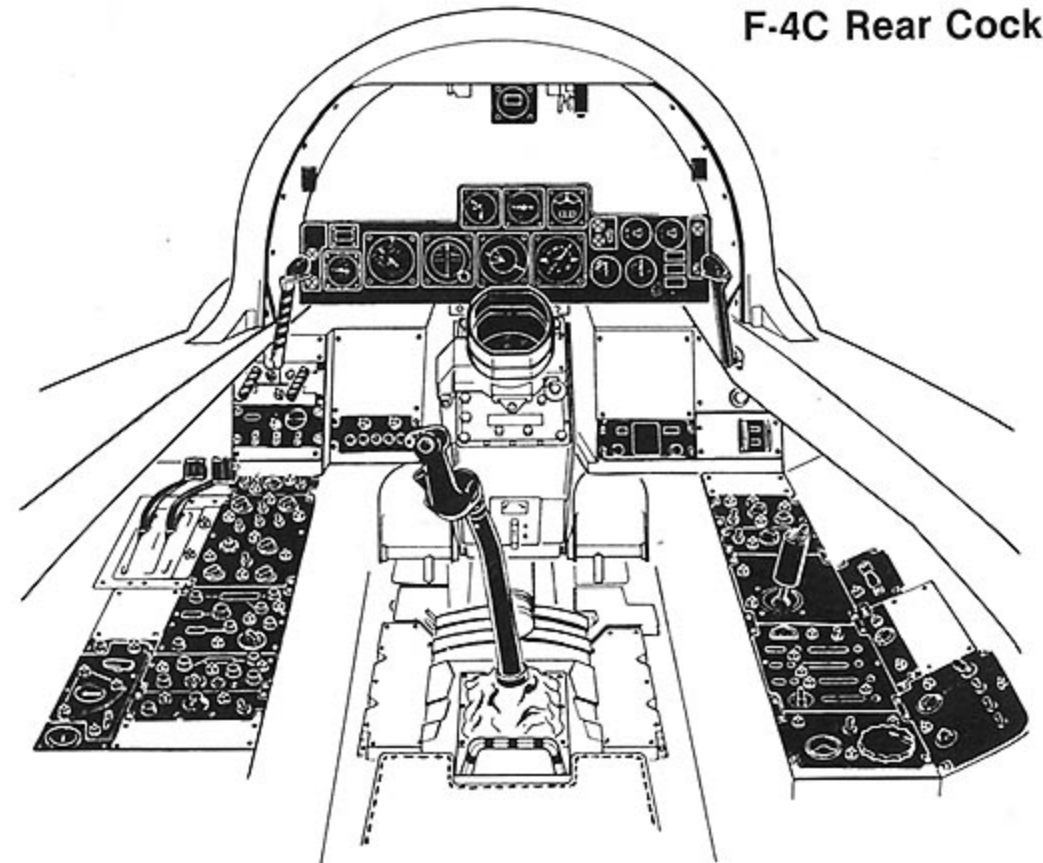


The same aircraft is seen after being painted Gloss White and assigned to the Eglin test force. Note the addition of the so-called "tape" formation lights. They have been added to the fin and fuselage sides. (Brewer)

F-4C Front Cockpit



F-4C Rear Cockpit





This F-4C of the 366th TFWg, landing at DaNang, carries the new Southeast Asia scheme. The three-section leading edge flaps are in the full down position. (USAF)

Open radome on a Triple Nickel (555th TFSq) F-4C at Ubon, revealing the massive 32-inch radar dish of the APQ-160 fire control radar. The large size of this radar dish is the reason for the distinctive bulged nose of the Phantom II. (USAF)

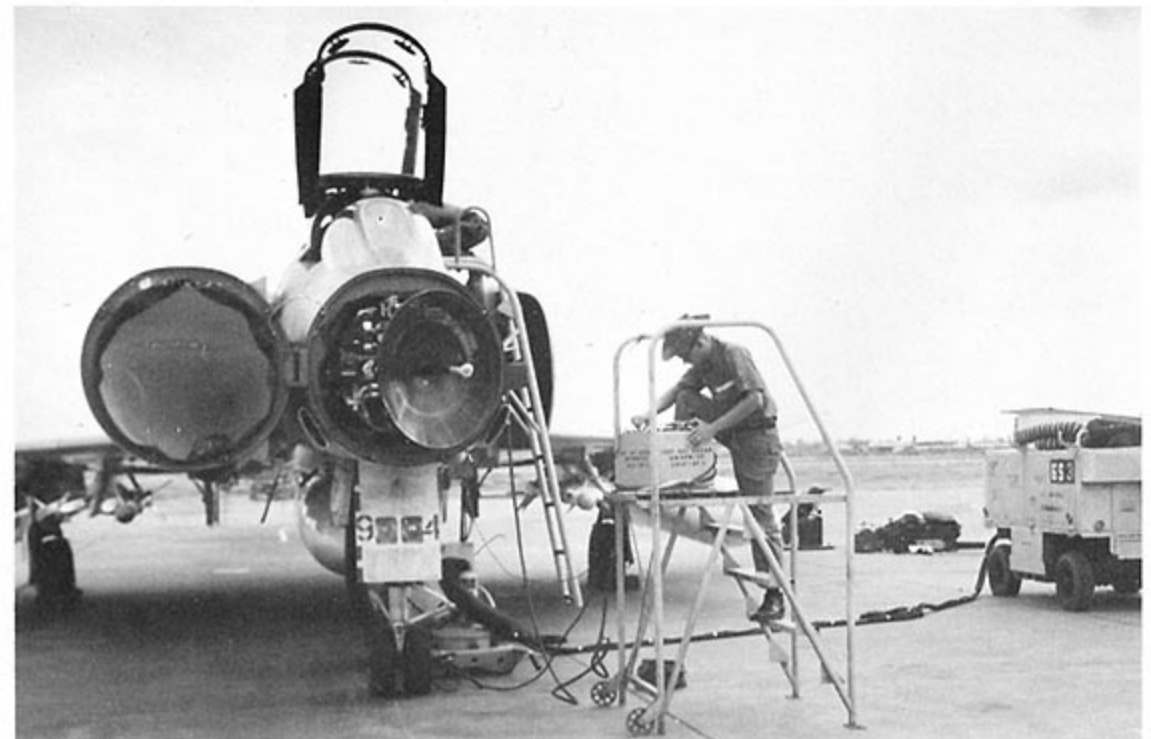
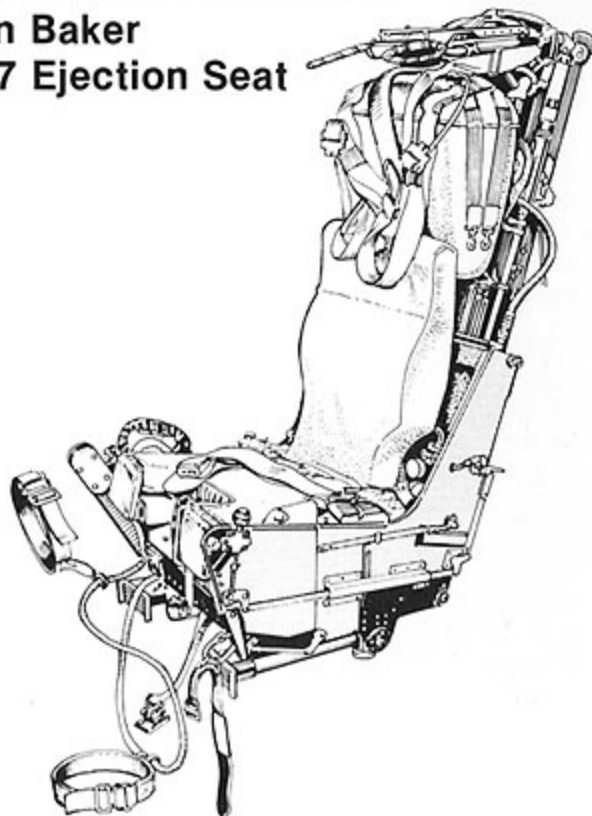
Martin Baker Mk H7 Ejection Seat

Control Sticks

Front Cockpit



Rear Cockpit



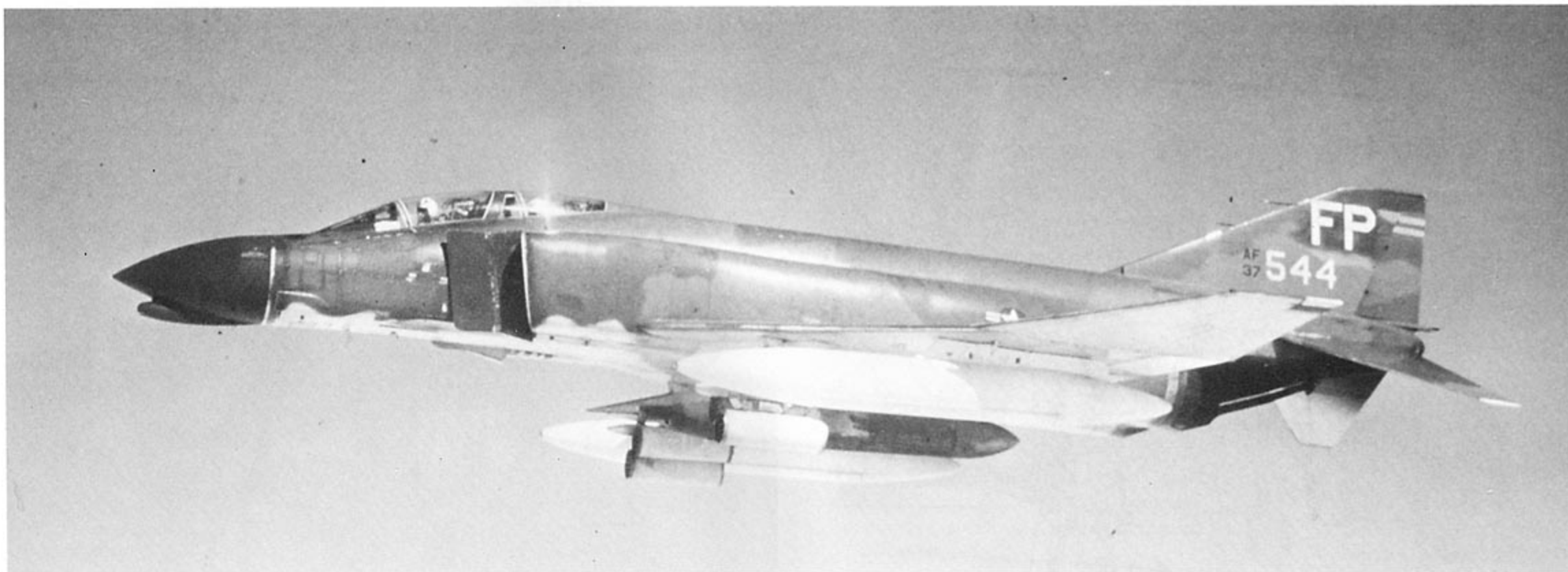


"SHEHASTA", F-4C serial 64-704, the 12th TFWg CO's aircraft at Cam Rahn Bay in April of 1969. The intake and tail stripes are, from the front and fin tip, Blue, Red, and Yellow, while the tank noses are Blue and the name is in White. (Brewer)

An early F-4C from the 8th TFWg "Wolfpack" on its way to hit a Viet Cong position in South Vietnam. One can usually tell whether a mission was to North or South Vietnam by the ordnance carried, in this case rocket pods and the 20mm gunpod, not normally seen on northbound aircraft. The flatter McDonnell-designed wing tanks can clearly be seen. The rudder stripes are Blue and Yellow, wingtip and stabilator tips are White, the two-inch color band behind the radome is Red, and the small lion on the intake is Red. (USAF)

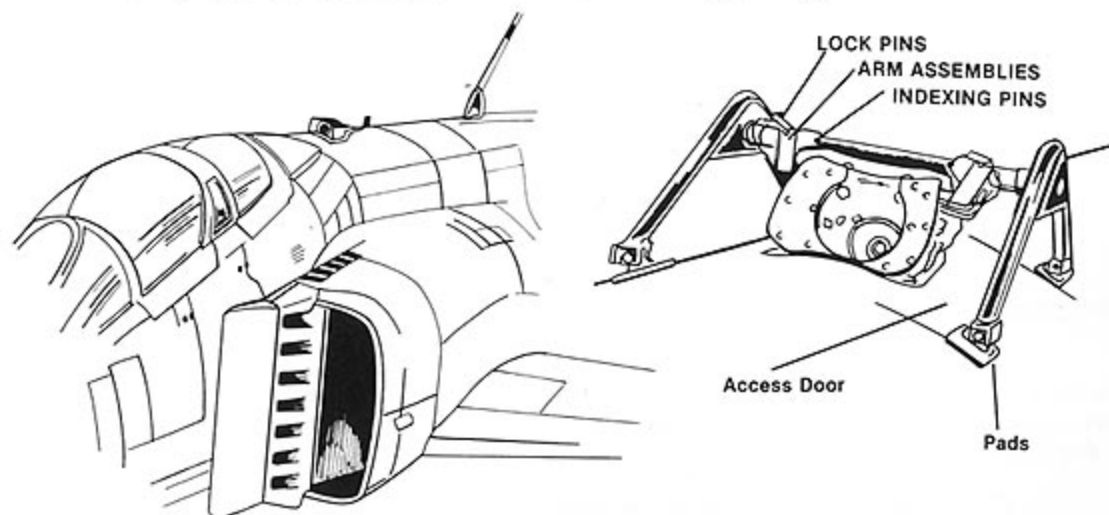


During the US Bi-Centennial celebration in 1976, many Air Force and Navy aircraft received very colorful, patriotic paint jobs. This F-4C belonged to Brigadier General Fred Haeffner, CO of the 58th TFWg at Luke AFB. The vertical fin and wing outer panels are Red, White and Blue, with Bi-Centennial markings on both travel pods carried on the in-board wing pylons. (Roth)



The Air National Guard received its first F-4s in 1971 when the Indiana Air Guard scrapped their tired old F-84Fs for F-4Cs. Some Guard units had ADC missions, while others, like this Texas Air Guard F-4C, had tactical missions and retained the Tan and Greens camouflage scheme. The tail band is Red with White trim. Note the highly polished radome. (Dienst)

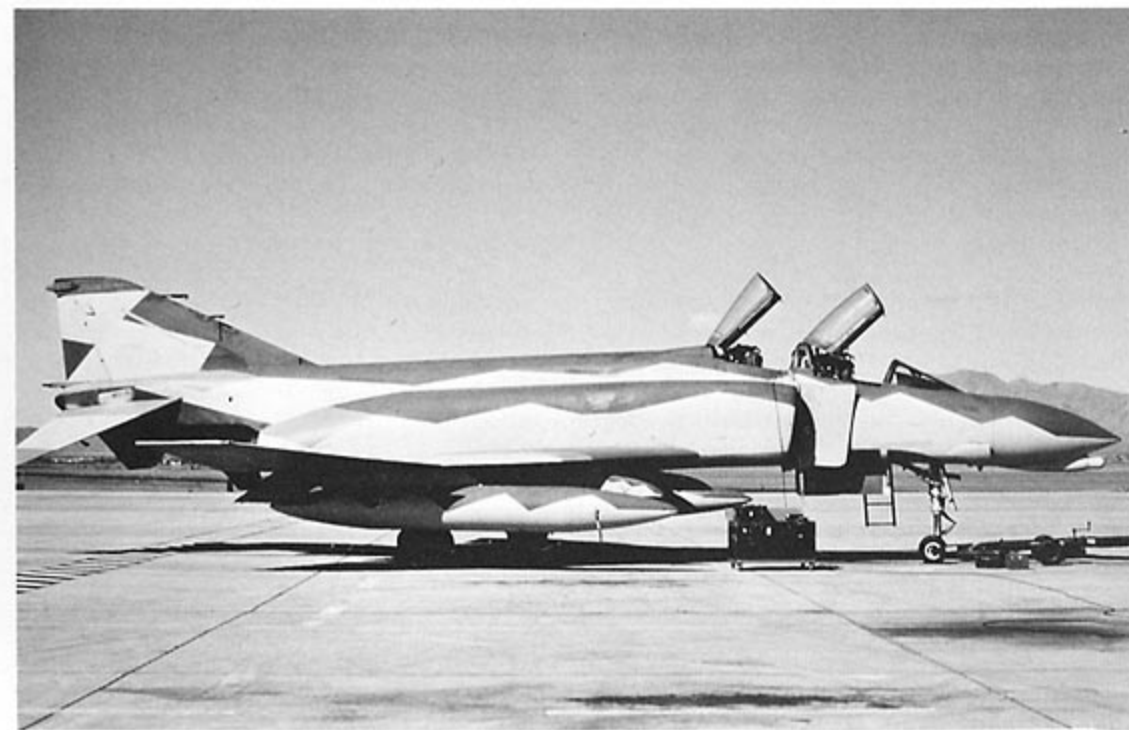
Air Force Refueling System



Because of the Vietnam War, Air Defense Command did not begin replacing its ageing F-106 Delta Darts with F-4C Phantom IIs until the early 1970s. At first the aircraft retained their tactical camouflage, but eventually all ADC F-4s were painted in Gloss Aircraft Gray (16473), and began acquiring some very colorful unit markings. This F-4C is from the Air Defense Weapons Center at Tyndall AFB, Florida, home of the William Tell Weapons Meet. (Barbier)



The US Air Force began camouflage experiments on tactical aircraft in the mid-1970s. A pair of F-4Cs and several F-15As, from the 58th TFWg at Luke AFB, were painted in a splinter-type scheme of Grays that was designed by the famous aviation artist Keith Ferris. The scheme included a fake canopy on the underside of the fuselage in the belief that during a dogfight, an enemy pilot would not know which attitude the aircraft was in. (Roth)



RF-4C Reconnaissance Phantom

The reconnaissance Phantom grew out of an Air Force requirement to replace the McDonnell RF-101 Voodoo and Douglas EB-66, which were the primary reconnaissance aircraft then in service. A Letter of Intent ordering reconnaissance Phantoms was issued on 29 May 1962, two months after the Letter of Intent which authorized the building of the first Air Force Phantom IIs. The new reconnaissance Phantom was designed around the F-110A (F-4C) airframe. The main fuselage, engines, and wings were all from the F-110A. The difference between the two aircraft was in the nose area. Since the reconnaissance Phantom was to have very little offensive weapon delivery capability, its only strike capability being that of a tactical nuclear strike aircraft, there was no need for the complex, and quite large, fire control radar needed on F-4 fighters. Also, without the radar, there was no need for the Sparrow III missiles, which were deleted along with their ejection equipment. Air Force reconnaissance aircraft had long been without armament of any kind, either offensive or defensive. Without defensive weapons the reconnaissance pilot had to run for home rather than stay and fight it out with a potential enemy.

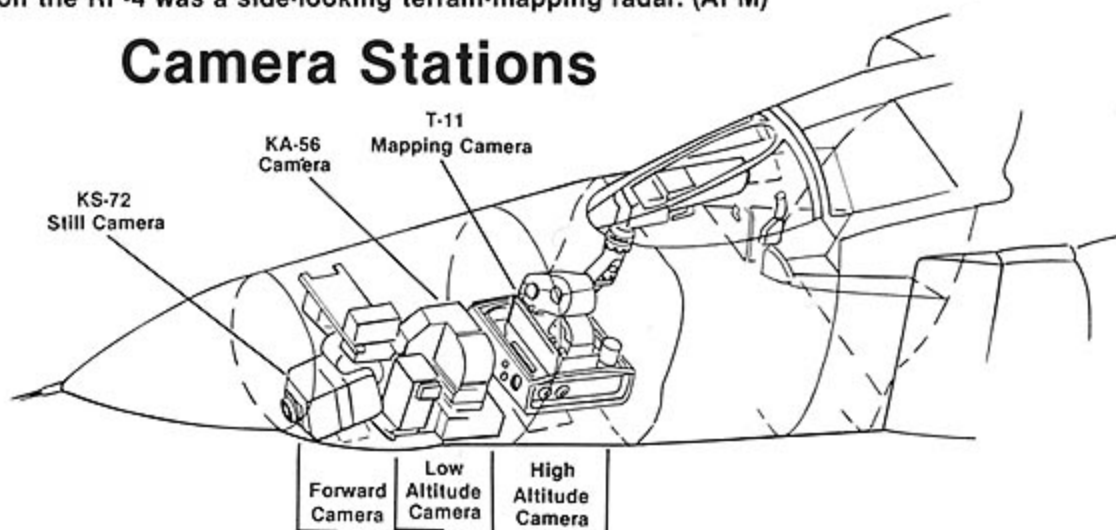
In place of offensive weapons systems and radars were added some forty new systems. An AN/APQ-99 terrain-following, forward-looking, mapping radar was installed. The APQ-99 had a much smaller, elliptically shaped radar dish, which meant that the nose of the RF-110A could be much more slender than the bulbous nose of F-110A fighter aircraft; but with forty new systems to be installed, the nose had to be extended 33 inches. Under the new nose, in a shallow bay, were mounted a KS-87 forward oblique camera, a KS-56 vertical or panoramic camera, and a KA-55 vertical or panoramic camera. On the sides of the nose were mounted a pair of KS-87 side oblique cameras. Other reconnaissance systems included the AN/APQ-102 side-looking aircraft radar, which painted radar pictures of the land along both sides of the flight path, and the AN/AAS-18A infra-red reconnaissance system. Night or foul-weather operations were augmented by a built-in photo-flash cartridge ejection system on both sides of the aft fuselage near the vertical fin. Initially, the RF-110A also had the capability to eject the exposed film cartridge while still in-flight, but this was later deleted. The RF-110A designation was changed to RF-4C on 18 September 1962, when Department of Defense changed all Phantom II designations. In May of 1964, the RF-4C took to the air for the first time.

The war in Vietnam had pointed up the many deficiencies in the RF-101 Voodoo, and RF-4Cs soon began replacing the ageing RF-101 fleet. This brought a few more changes such as the small "button" antennas on the nose, and a bullet fairing on the vertical fin, which housed the AN/APR-25/26 RHAW antennas. ECM pods were mounted on the in-board pylons, and Long Range Navigational (LORAN) "towel rack" antennas were mounted on the fuselage spine just forward of the vertical fin. This was later replaced by the AN/ARN-101 "bump" on both the RF-4C and the later F-4E. The basic shape of the nose camera bay was altered with the introduction of the RF-4EJ. The new nose was much smoother and rounder in appearance. Both noses are in use today on RF-4Cs. The RF-4C began phasing into Air National Guard service in 1972, first replacing the ancient RF-84s of the Alabama ANG. The final RF-4C came off the McAir assembly line on 16 January 1974; it was #505.



The Air Force developed the RF-4C Phantom II as a replacement for their RF-101 Voodoo fleet which suffered from a lack of speed. One of the most interesting new features found on the RF-4 was a side-looking terrain-mapping radar. (AFM)

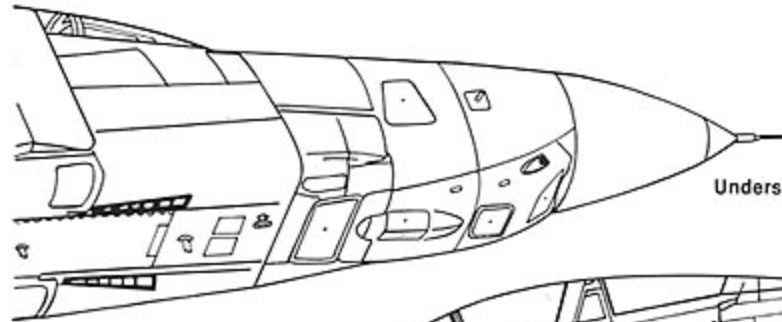
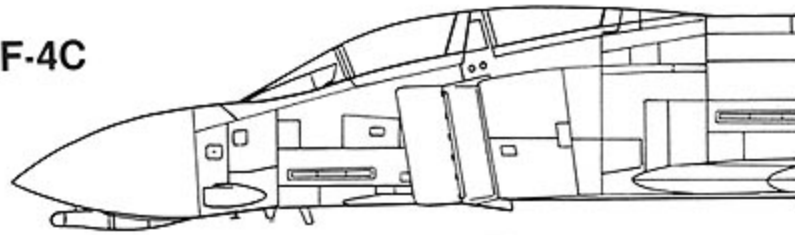
Camera Stations



An early RF-4C from the Flight Test Center at Edwards AFB carries a long instrumentation test boom in the nose. The light-colored panel on the forward edge of the vertical fin is a shunt antenna panel. (USAF)

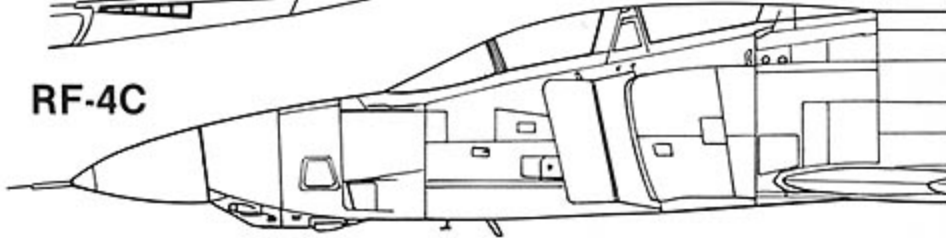
Nose Development

F-4C



Underside of RF-4C

RF-4C



When a new wing commander was assigned to the 432nd Tactical Fighter Reconnaissance Wing (TFRWg), several members of his new staff fixed up an RF-4C for his personal use — with bombs instead of cameras! He was shocked, to say the least, since the RF-4C had no delivery systems. Note the six-foot fuze extender on the M-118 3000-lb. bomb. (Tanner)



An RF-4C in a revetment at Tan Son Nhut AB near Saigon in April, 1966. Damage to the vertical fin was from a VC mortar attack. Note the much smaller radar dish of the APQ-99 radar. As with the fighter counterpart, the F-4C, RF-4Cs arrived in Vietnam in both the Gray/White and camouflage paint schemes. (USAF)





An RF-4C from the 10th TRWg in front of one of the hardened shelters at Ramstein AB, West Germany. The RF-4 is the most numerous reconnaissance aircraft in the Free World. (Hughes via Brewer)

A LORAN-equipped RF-4C from the 432nd TFRWg heads north for a rendezvous with a waiting tanker and a run over a North Vietnamese target area. Portions of the vertical fin have obviously been replaced with those of another aircraft. Although the RF-4Cs were much faster than the RF-101s they replaced, they still had to have both MiGCAP and Wild Weasel escorts to counter enemy opposition. (USAF)



RF-4B

Satisfied with their RF-8 Crusader and RA-5C Vigilante reconnaissance aircraft, the Navy did not order a reconnaissance version of the F4-B Phantom II to be developed. However, when the Air Force developed the RF-4C the Marine Corps ordered a batch of twelve reconnaissance Phantoms under the designation RF-4B. The RF-4C's reconnaissance systems, deleting the ALR-17 ELRAC and adding rotating mounts to the side oblique cameras, were essentially packaged and added to F-4B airframes on the assembly line. The RF-4B's first flight took place on 12 March 1965, nearly a full year after the Air Force's RF-4C flew for the first time. The first of an eventual total of forty-six RF-4Bs was delivered to VMCJ-3 at El Toro MCAS in May of 1965. The last twelve RF-4Bs were built on Air Force RF-4C airframes which had the larger tires, wheel wells, and bulged wing.

An RF-4B of VMCJ-3. The Marines handled all RF-4 reconnaissance missions since the Navy opted to retain its RF-8 Crusaders. Note the rounder Fletcher-style wing tanks. The vertical fin is White with a Kelly Green chevron and Black TN. (Brewer)



An RF-4B from VMCJ-2 "Playboys". The RF-4B was developed for the Marines nearly a year after the RF-4C had been developed for the Air Force. (Brewer)



F-4D

The F-4D was the first Phantom II specifically designed to meet Air Force needs. Based entirely on the F-4C airframe, the F-4D had many improvements in its air-to-air and air-to-ground capabilities. The air-to-ground capabilities were greatly enhanced through the addition of an AN/APQ-109 radar system which had an air-to-ground ranging capability not previously available. An AN/ASG-22 lead computing optical gunsight was installed together with an ASQ-91 weapons release computer. The improved ASQ-63 inertial guidance system was also added. All this new equipment went into a bay replacing the No. 1 fuel cell, the same as the Navy had done with its F-4G. Initially, the AAA-4 infra-red detector was deleted from the radome of the F-4D. But while later production versions appeared to have re-installed it, actually, only the fairing was re-installed. Instead of the infra-red detector, the fairing now housed antennas for an APR-25/26 RHAW system and its pre-amplifier. The pre-amp was housed in an added bump at the rear of the former IR seeker fairing. Externally, it is very hard to discern an F-4D from an F-4C since some F-4Cs were retro-fitted with an F-4D-type IR seeker housing. Both F-4C and F-4D radomes were identical in size and shape.

The "improved Phantom", as the F-4D was called, first rolled off the assembly line in December, 1965, making its first flight on 8 December. Production aircraft began arriving at Bitburg AB, Germany, home of the 36th TFWg, in March of 1966. It was unusual, with the Air Force fully committed to a rapidly escalating conflict in Southeast Asia, that the first F-4Ds would be sent to Europe. It wasn't until the Spring of 1967 that the first F-4Ds arrived in the combat zone. The 8th TFWg "Wolfpack", with Colonel Robin Olds leading them, was the first unit to take the F-4D into combat. On 5 June, 1967 an 8th TFWg F-4D scored its first kill when Major Everett Raspberry/Pilot, and Captain Francis Gullick/WSO, shot down a MiG-17 near Hanoi. On 28 February 1968, the last of 793 F-4Ds was delivered to the US Air Force. In addition, thirty-two F-4Ds were supplied to the Imperial Iranian Air Force, and eighteen had been sold to the Republic of Korea.

In addition to all the armament found on previous F-4 variants, the F-4D was designed with AIM-4 Falcon missile capability. The SUU-16/A gunpod, later replaced by the improved SUU-23/A gunpod, was also added to the F-4Ds systems. It was the F-4D that brought the term "smart bombs" into American household terminology. During the Vietnam War, weapon technology took a giant step in accuracy when airborne laser range finders, called designators or illuminators, were used to guide bombs fitted with a laser seeker in the nose, and guidance fins on the rear, to fly the bomb onto a target. Known as PAVE KNIFE it was incorporated into the F-4D aircraft systems. PAVE KNIFE aircraft carried a pod shaped like a sharp edged-banana under the inboard left pylon. Inside the pod was the laser designator which "looked" out a window on the side of the pod. The Weapons System Officer (WSO) simply held the laser beam on the target, released his bomb, and the laser seeker on the head of the bomb "rode" the beam down to the target. The F-4D was also fitted with small television devices in the rear cockpit that "looked" through the seeker head of another modified bomb called the GBU-8 Hobo. The WSO simply watched his TV screen and flew the bomb onto the target. The Paul Doumer Bridge, on the outskirts of Hanoi, had withstood countless attacks by F-105 and F-4 strike aircraft armed with standard ordnance — called "iron bombs" or "dumb bombs". One flight of four F-4Ds dropped one M-118 3000-lb. bomb, equipped with a PAVE KNIFE system, and neatly cut the bridge in half.

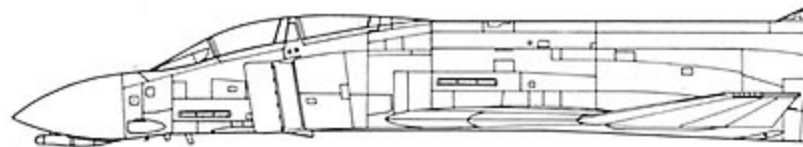
F-4Ds accounted for more aerial victories over the North Vietnamese MiG force than any other aircraft type in Southeast Asia, with the 555th "Triple Nickel Squadron" being referred to as the "largest distributor of MiG parts in Southeast Asia"! F-4D aircrews shot down forty-five MiGs, including the last NVAF MiG-21 on 8 January 1973. Included among them were the Air Force's three aces — Captain Chuck DeBellvue/WSO with six victories; Captain Steve Ritchie/Pilot with five kills; and Captain Jeff Feinstein/WSO with five kills. The F-4D, which at one time was the most numerous aircraft in the Air Force inventory, is now the mainstay of Air Force Reserve and Air National Guard units.



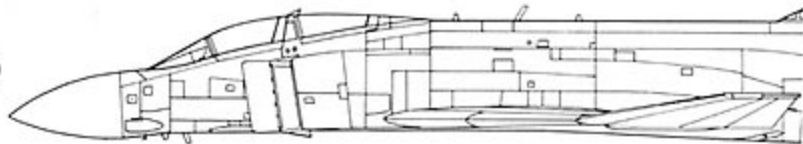
An early F-4D without the infra-red seeker housing beneath the nose. Later aircraft had the housing added but instead of the IR seeker, the housing contained RHAW antennas. This aircraft is from the 53rd TFSq, 36th TFWg based at Bitburg AB, Germany. (Hughes via Taylor)

Nose Development

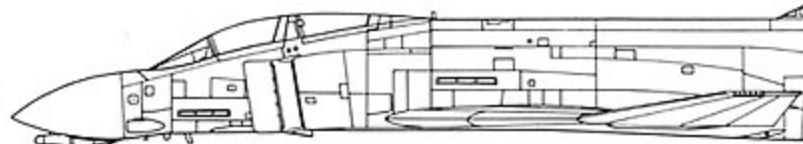
F-4C



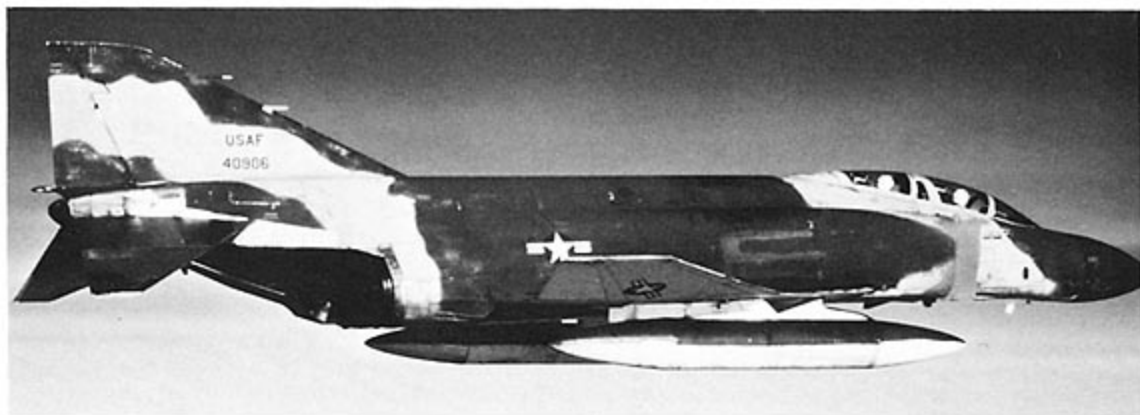
F-4D
(Early)



F-4D
(Late)

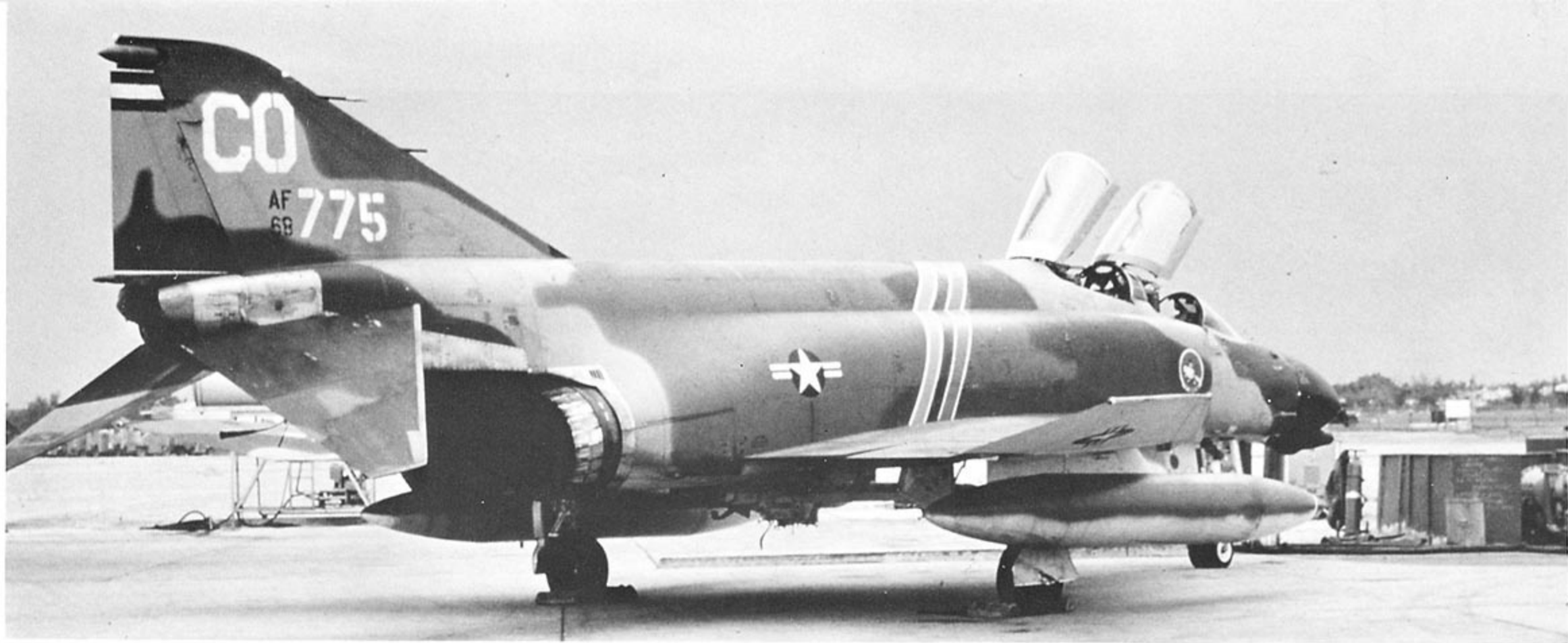


Another early F-4D, this time from the 12th TFWg at Cam Rahn Bay. The aircraft carries no tail codes, which means the photo was taken early in 1966. The SEA camouflage deteriorated rapidly in Vietnam and had to be constantly spot painted. (JEM Slides)





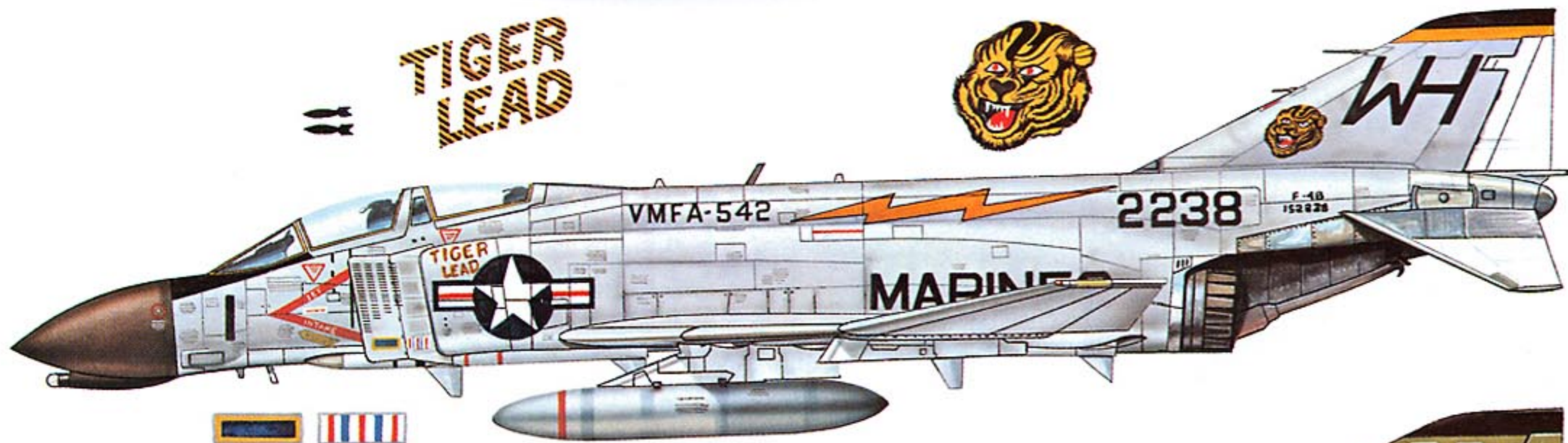
A trio of 8th TFWg F-4Ds on their way to hit an industrial target near Hanoi. All three are configured differently — FG-705 carries a guidance pod for smart weapons and a pair of ECM pods; FO-234 carries a pair of 2,000-lb. Mk 84 Pave Knife laser-guided bombs, ECM pods, and wing tanks, while the third aircraft again carries Mk 84 LGBs, but with a 600-gallon centerline fuel tank, and has the LORAN antenna fitted. (USAF)



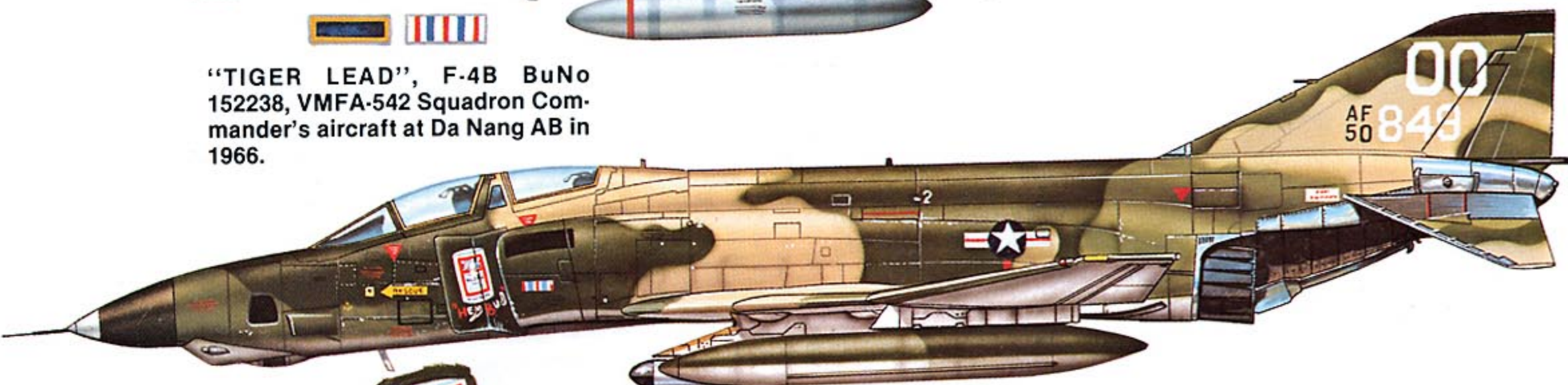
(Above) Wing commanders in the combat zone were not averse to colorful markings. This aircraft, "The Saint", was the personal mount of the CO of the 366th TFWg, Colonel Paul Watson, who even took the letters CO for his tail code. Early tail codes throughout the Air Force were the first letter assigned to the Squadron, and the second letter assigned to the plane-in-squadron. This was later changed to a two-letter system which also identified the base the aircraft was assigned to. (Below) Captain Carmen Luisi and Lt. Colonel Ray Girard flew "THE SAINT" to victory. Although "THE SAINT" was assigned to Colonel Watson, many crews flew her. In the Vietnam War, no crew actually had an aircraft of their own. (Menard and USAF)

(Below) In the center is the Air Force's third ace of the Vietnam War, Captain Jeff Feinstein, who scored his fifth victory on 13 October, 1972. Captain Feinstein was a Weapons Systems Officer (WSO). Leading scorer of the Vietnam War was Captain Chuck DeBellvue, another WSO, who scored six victories. (USAF)

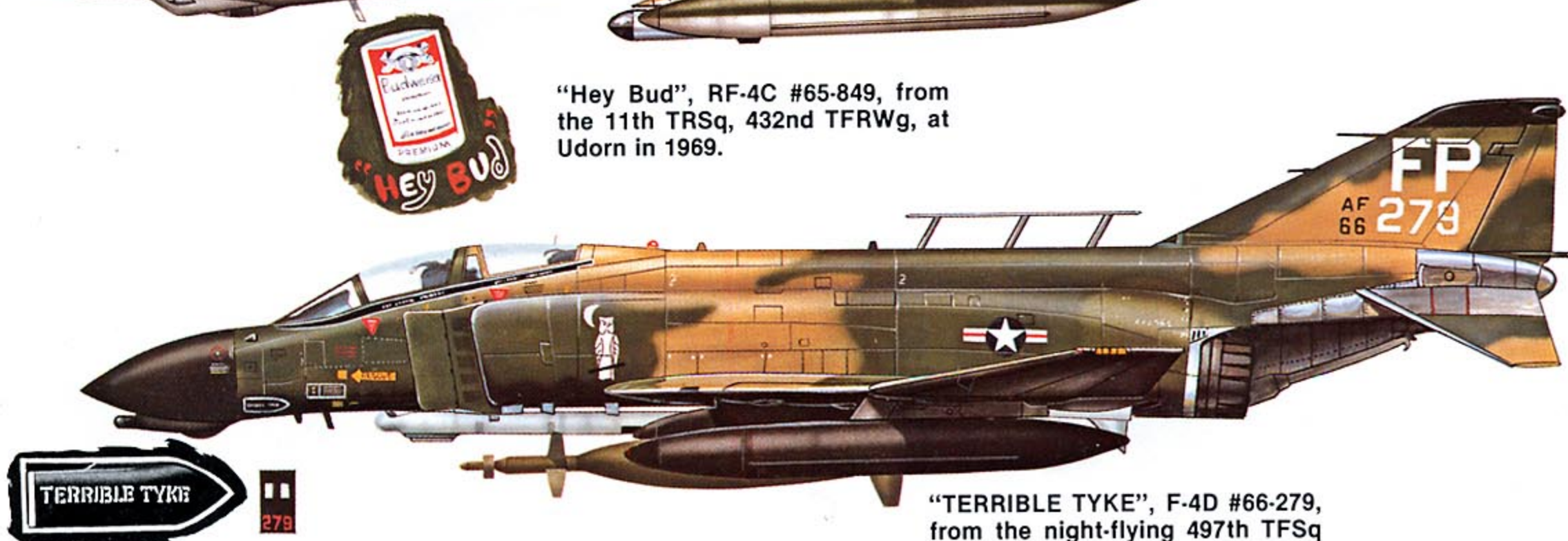




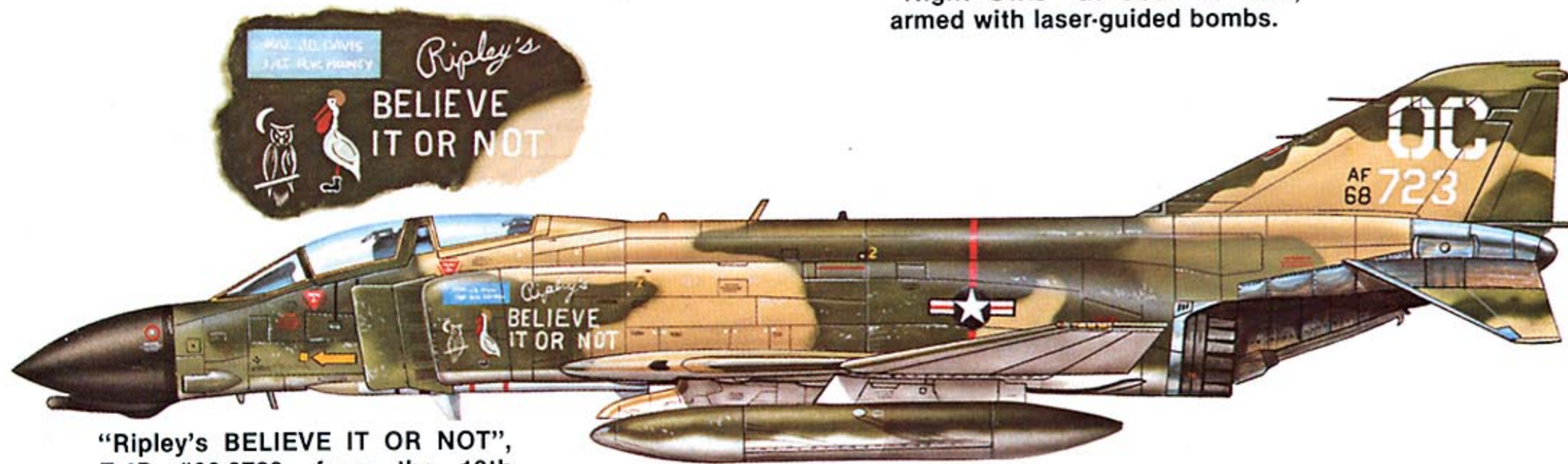
"TIGER LEAD", F-4B BuNo 152238, VMFA-542 Squadron Commander's aircraft at Da Nang AB in 1966.



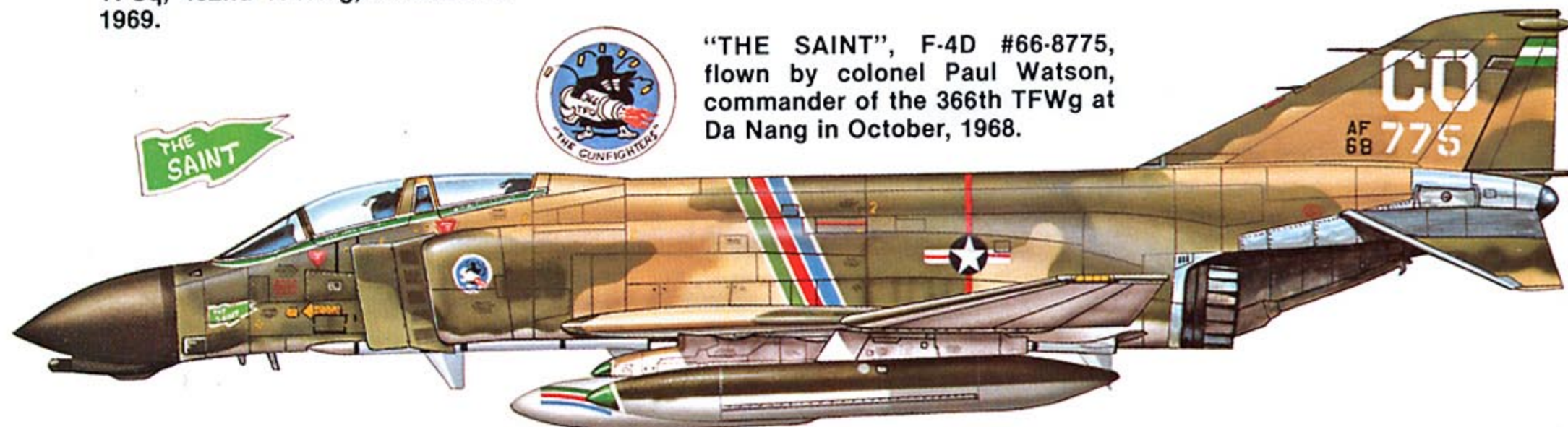
"Hey Bud", RF-4C #65-849, from the 11th TRSq, 432nd TFRWg, at Udorn in 1969.



"TERRIBLE TYKE", F-4D #66-279, from the night-flying 497th TFSq "Night Owls" at Ubon in 1969, armed with laser-guided bombs.

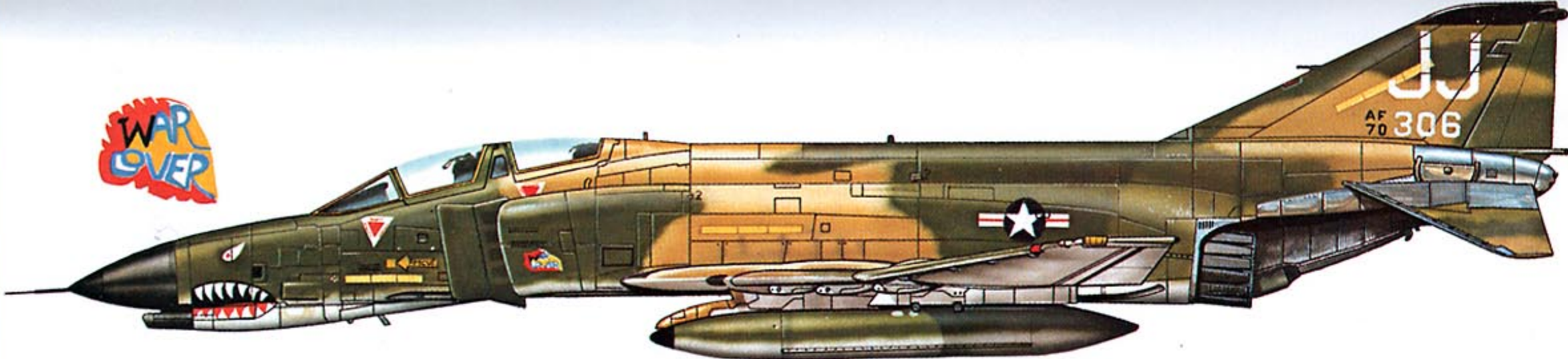


"Ripley's BELIEVE IT OR NOT", F-4D #66-8723, from the 13th TFSq, 432nd TFRWg, at Udorn in 1969.



"THE SAINT", F-4D #66-8775, flown by colonel Paul Watson, commander of the 366th TFWg at Da Nang in October, 1968.

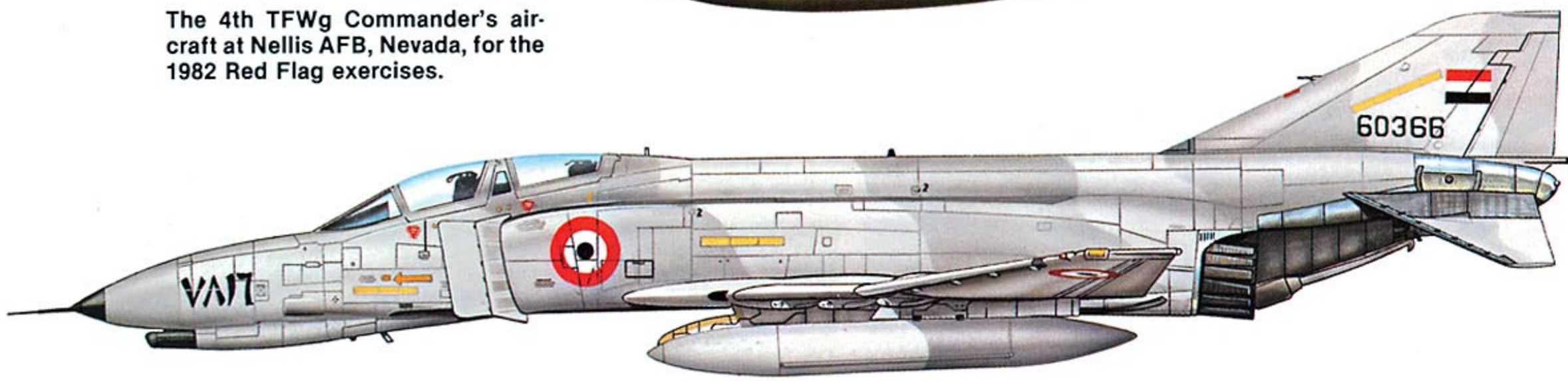
WAR
LOVER



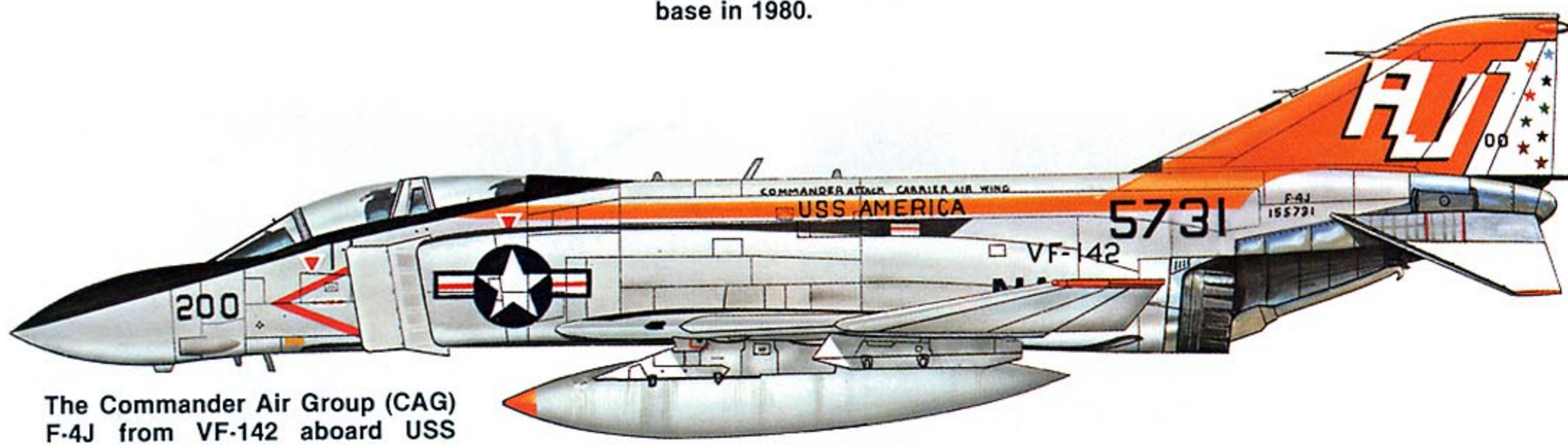
"WAR LOVER", F-4E #70-306, a slat-winged aircraft from the 34th TFSq, 388th TFWg at Korat in 1972.



The 4th TFWg Commander's aircraft at Nellis AFB, Nevada, for the 1982 Red Flag exercises.

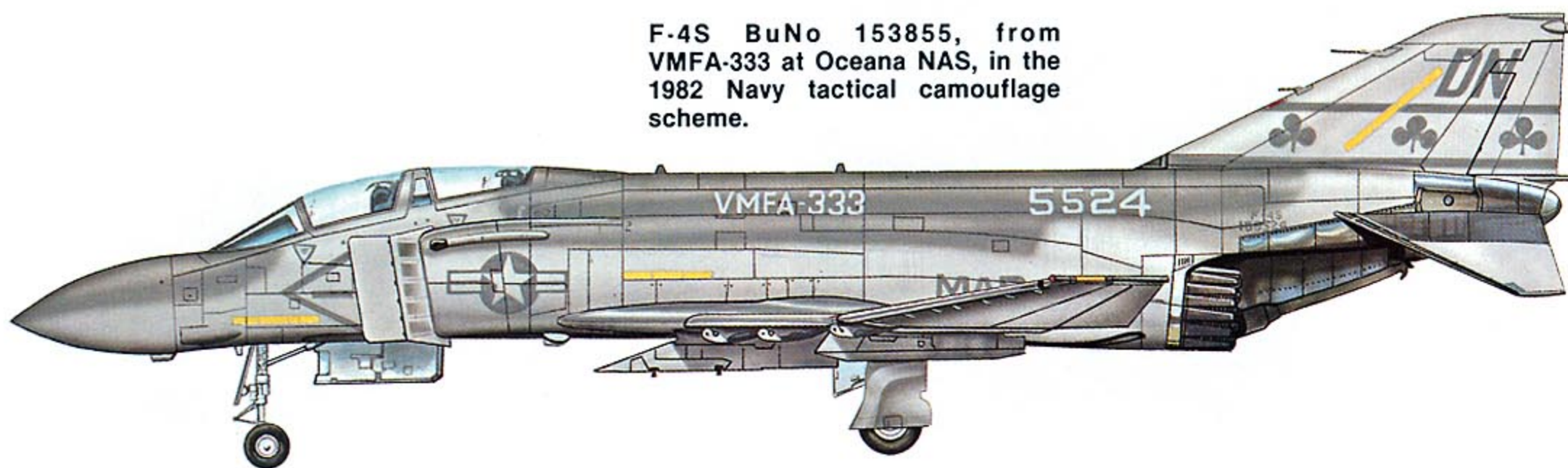


F-4E #76-0366 from the Egyptian Air Force based at Cairo West air-base in 1980.



The Commander Air Group (CAG) F-4J from VF-142 aboard USS America in 1972.

F-4S BuNo 153855, from VMFA-333 at Oceana NAS, in the 1982 Navy tactical camouflage scheme.

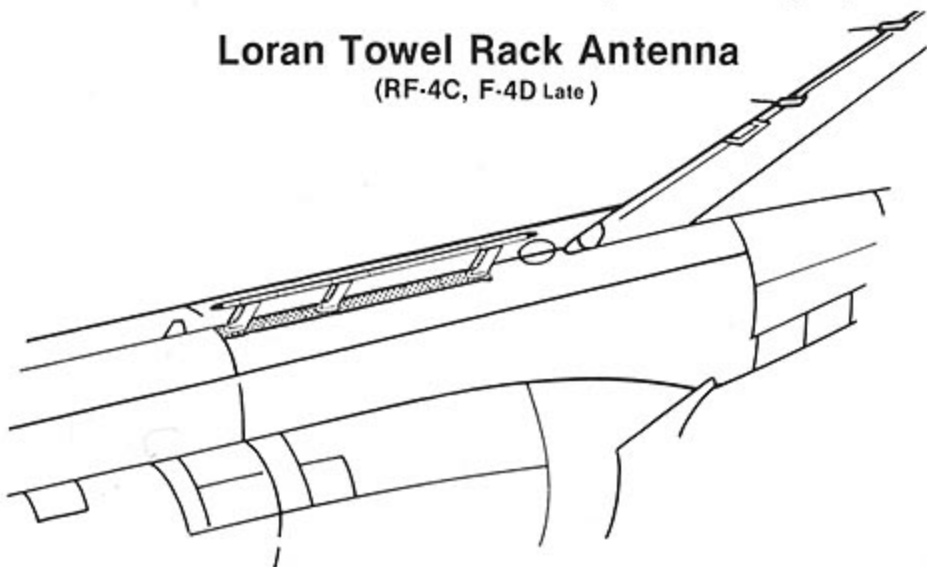




F-4D serial 66-7681, flew with the 433rd TFSq, 8th TFWq, and was one of six aircraft modified with the Pave Knife guidance pod and instrumentation. Their mission was very hazardous as they had to orbit over a target area in a distinct pattern while guiding, or "illuminating" the target with a laser beam for the bomb to home on. The KMU series of laser seekers could be fitted, and was, to almost every type of standard bomb in the US arsenal. (Larsen/Remington)

Loran Towel Rack Antenna

(RF-4C, F-4D Late)



An F-4D MiG-killer from the 432nd TFRWg at Udorn. It is carrying an ALQ-101 ECM pod with an additional counter-measures canister and two Mk-84 2000-lb. LGBs. The 432nd became the largest wing in the Air Force during 1972 when it had seven squadrons attached to it. (McNeil)



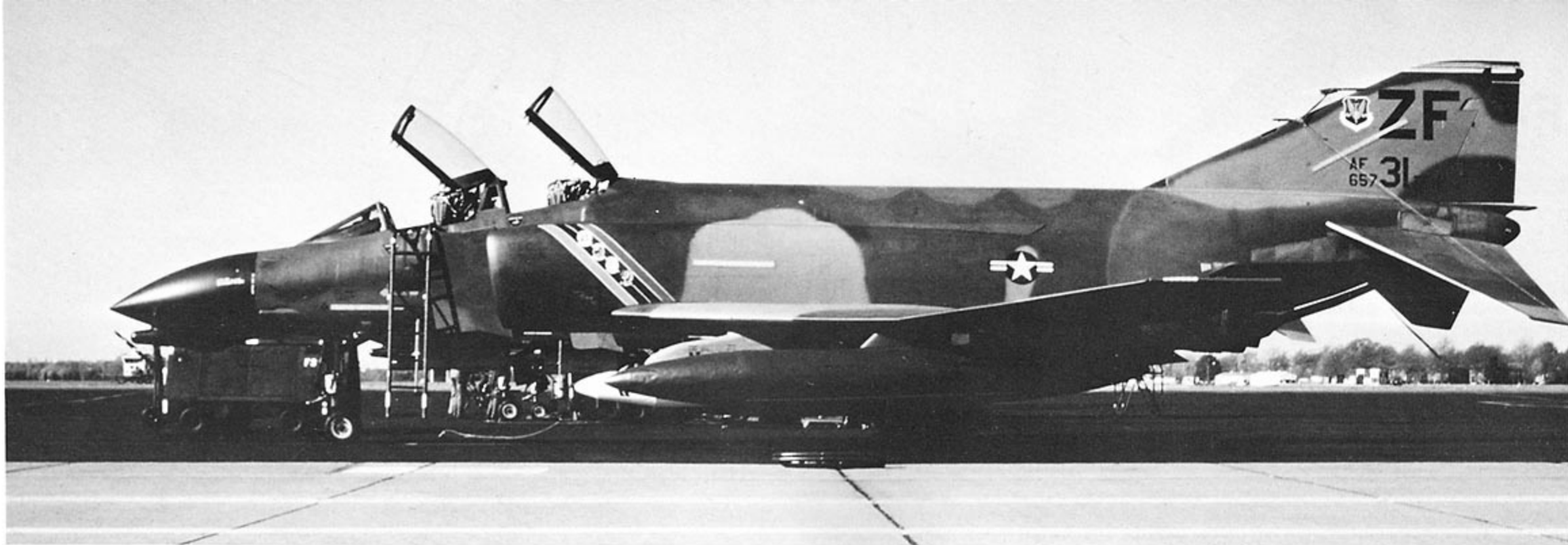


“Sex Machine”, F-4D serial 66-8806, from the 555th TFSq, 432nd TFRWg. The aircraft has had both the LORAN (LONG RANGE Navigational) radar antenna and formation tape lights added. These formation lights were screwed on and gave off an eerie, soft Yellow Green glow for night formation flying. It is carrying Mk 82 500-lb. bombs, both with and without 36-inch fuze extenders. (Larsen/Remington)

This 13th TFSq, 432 TFRWg F-4D is armed for a strike against a VC position in South Vietnam. On the outer pylons are Mk 82 Snakeeye bombs, while each of the inboard pylons carry dual napalm canisters. On strikes in South Vietnam, the forward missile bays carried neither ECM pods nor Sparrow missiles since the threat was very low. (Larsen)

“Trapper John”, F-4D serial 66-7554, from the Triple Nickel Squadron. “Trapper” is armed with AIM-4 Falcon missiles — a rarity in Southeast Asia. (Foote)





The wing commander of the 31st TFWg at Homestead AFB, Florida, flew this very colorful F-4D to the TAC Wing Commanders Meeting at Langley AFB in December of 1980. The aircraft is in the new wrap-around Southeast Asian camouflage scheme adopted by Air Force in the late 1970s for all tactical aircraft. The stripes are Yellow, Red, Green, and Blue — repeated on the fincap but in a different order: Red, Blue, Green, and Yellow. All four squadrons within the 31st TFWg are represented by their squadron badges painted on the left side of the aircraft, while a large 31st TFWg badge adorns the right side of the aircraft in a similar position. (Rotramel via Brewer)

An F-4D from the Texas Air Force Reserve squadron based at Fort Worth. The aircraft carries the new wrap-around camouflage scheme with subdued national insignia. The checks at the top of the tail are Black and White for the 93rd TFSq. Although the aircraft is in the new camouflage, the underwing drop tanks are still in 36622 Pale Gray, and the wing pylons are Gloss White.



F-4E

The thinking of aerial warfare "experts" during the late 1950s and early 1960s was that "dogfighting", as it had been known during World War Two and Korea, was gone for good; the new radar and air-to-air missile systems had obsoleted the gun in aerial combat. The new missiles could shoot down an opponent 10-15 miles away. The F-4 Phantom II was built under this theory. Machine gun or cannon armament was desirable for air-to-ground attacks, but guns for this role could be added in the form of underwing gunpods. The weight of a built-in gun and ammunition was thought to be not worth the cost in lost performance. However, someone forgot to inform the North Vietnamese Air Force.

When USAF or Navy aircraft ventured into North Vietnamese air space, a strange thing happened. The NVAF did not perform to the liking of the various missile systems employed by US aircraft. A missile attack has certain parameters that must be met before an attack can be successful. The target cannot be too close, nor can it be too far away. Also, the target can evade the missile through certain violent maneuvers. The F-4 aircrews, when their mission was that of MiGCAP, had only eight shots maximum — four Sparrows and four Sidewinders. The total was reduced by two Sparrows when the 7th Air Force decreed that all tactical aircraft venturing into North Vietnam would carry ECM pods in the forward Sparrow missile bays. An extremely heavy ordnance load usually meant that the Sidewinders were left on the ground. There were times, many times, when Air Force F-4s went to targets in the Hanoi region carrying only two Sparrows as their total defensive armament! Add to this a very large quality-control problem with the missiles during the mid to late 1960s, whereby missiles simply fell off the aircraft, or when launched chased the sun, or made a 180-degree turn and chased the launching aircraft. The aircrews wanted a gun added to their aircraft.

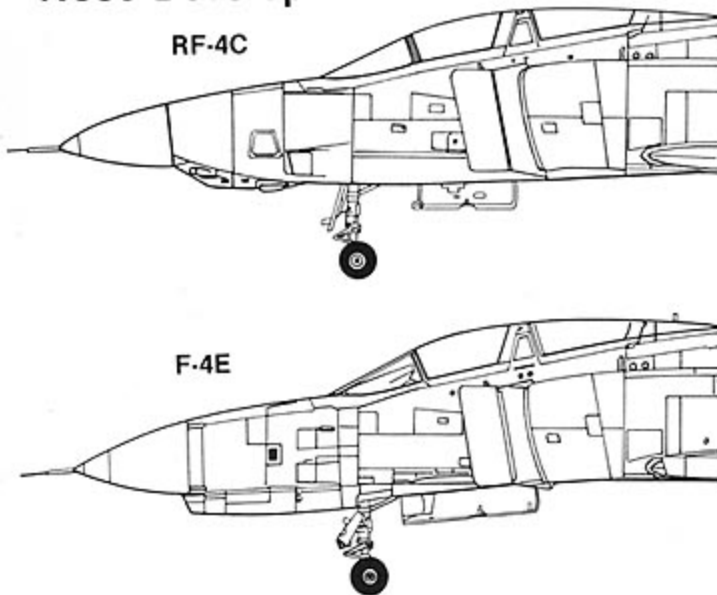
The question arose time after time, "What do you do when you use up your supply of missiles, or the enemy is too close to get a good 'lock-on'". The answer was simple: you break off your attack and attempt to get into a better attack position, or go home to fight another day. There was another scenario which unfortunately was the scenario repeated far too often — you got your ass shot off! The answer was the underwing gunpod. F-4Cs and Ds used the SUU-16/A gunpod mounted on the centerline hard point quite successfully during the 1967-68 period. But the pods were not a stable enough gun platform for accurate air-to-air fighting. They wobbled and shook when fired, causing cannon shells to spray all over the sky instead of in a concentrated stream at the target aircraft. The McDonnell proposal was to mount a General Electric M61-A1 20mm Gatling cannon internally in the aircraft. With Vietnam experiences and recommendations in hand, McDonnell engineers began work on the gun-armed F-4E in 1966.

The F-4E design was built around the all-new Westinghouse solid-state AN/APQ-120 radar, which featured a much smaller radar antenna dish. This meant a much smaller, more streamlined nose area and radome. When the decision came to add an internal gun to the aircraft design, it meant a complete redesign of the entire nose area. The gun was to be mounted under the nose, with the ammo drum mounted just forward of the front cockpit. The installation was flight tested in a modified RF-4C, with the Gatling cannon barrels firing through the forward-looking camera window. The gun installation meant an increase in the length of the nose and gross takeoff weight. The nose was lengthened by 4 feet, 9.8 inches, including the pitot boom, which had been moved to the nose from the leading edge of the vertical fin. The gun was mounted in an enclosed trough under the nose. The added weight in the nose area upset the aircraft's center of gravity so an additional fuel cell, making a total of seven fuselage fuel cells, was added at the rear of the fuselage. All this extra weight was offset by additional thrust provided by the new J79-GE-17 engines, rated at 17,900 lbs. of thrust each. The new F-4E also incorporated the Martin-Baker H Mk7 ejection seat with "zero-zero" capability — the seat could safely be used at zero speed and zero altitude. Low-speed control problems were alleviated by use of a slotted leading edge on the stabilators. On 30 June 1967, months ahead of schedule, the first production F-4E made its maiden flight at Lambert Field.

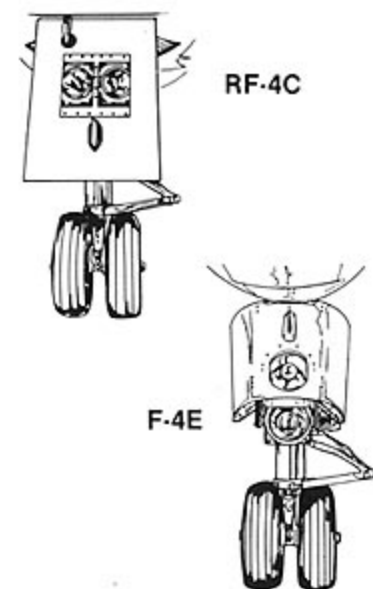


"Father of all Phantoms", 62-12200, after being modified to YF-4E prototype specifications and equipped with a 20mm M61-A1 Gatling cannon that fired through the forward camera bay opening. The air scoops atop the nose dissipated gun gases in the breech area. (Brewer)

Nose Development



Landing Gear

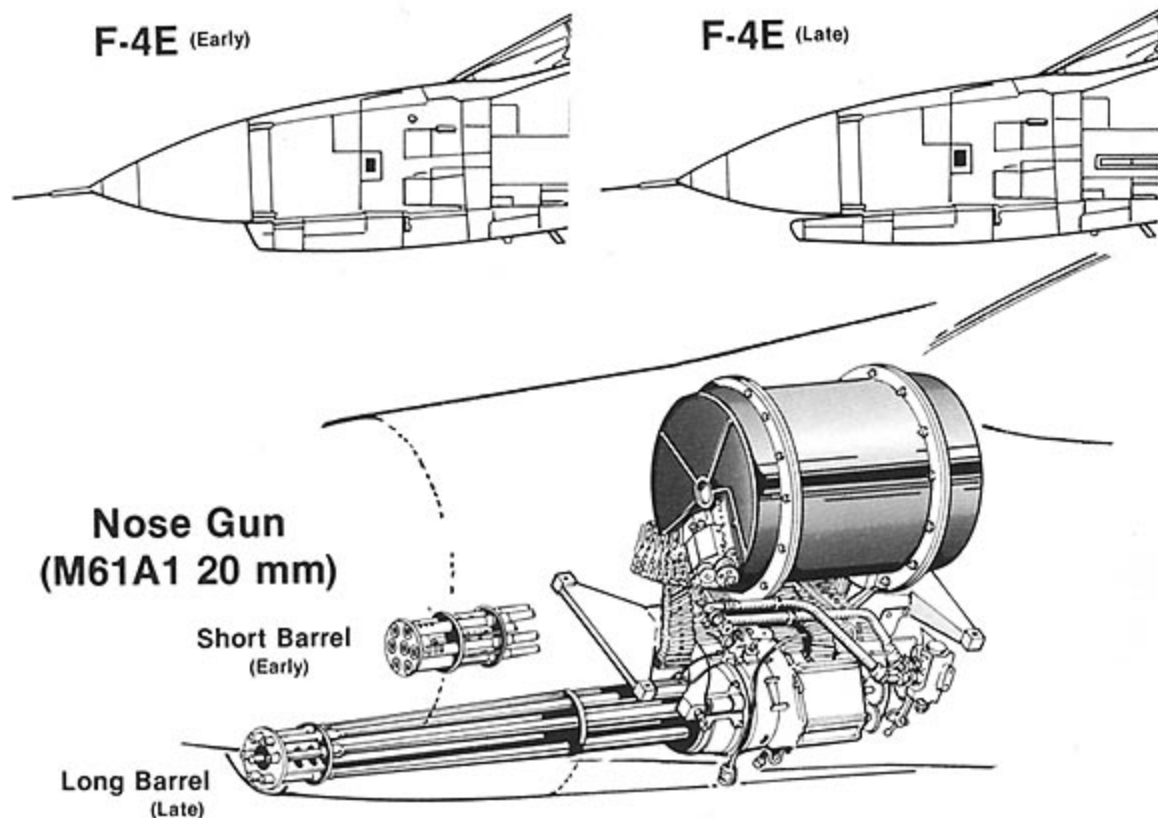


One of the first production F-4Es was used for spin tests. The large housing added to the aft fuselage area contains parachutes which are used to both create and control various spins to see how the aircraft will recover. (Brewer)





An F-4E from the 469th TFSq, 388th TFWg, at Korat RTAB. Each pylon carries a different store, which was not unusual for a mission in Vietnam. From the left to the right: Mk 84 2000-lb. bomb, three Mk 82 500-lb. bombs with 36-inch fuze extenders, 600-gallon centerline fuel tank, CBU-24B/B cluster bombs, and six Mk 82 500-lb. bombs fitted with Snakeye fins. (USAF)



Deliveries of the new "gunfighter" Phantom began on 3 October 1967, with the 57th Fighter Weapons Wing at Nellis AFB receiving the first aircraft. Tests and training seemed conclusive — the F-4E was the answer to the MiGCAP problems encountered in Vietnam. In 1968, the first F-4Es went to Southeast Asia for the final test — combat. The 388th TFWg at Korat, then flying the venerable F-105 Thunderchief, was the first unit to receive the new F-4E. Colonel Paul McDonald led a full squadron of F-4Es from Hickam AFB to Korat. Somewhere along the way, the new fighters acquired a sharkmouth painted on the nose. The F-4E's stepped-down nose and gun chin made the sharkmouth marking a natural. By 1970, both the 388th and 366th TFWg at DaNang had completely transitioned to F-4Es and several stateside F-4E-equipped squadrons were rotated to SEA for duty in the combat zone.

The new aircraft was not perfect, and combat pointed up several areas that needed to be improved. It was discovered that a long burst from the cannon created a large amount of gun gas, which, when ingested into the engine air intakes, caused a flameout. This could create a tough situation if you happened to be deep inside North Vietnam with MiGs and SAMs flying around. McDonnell engineers cured this by extending the gun muzzle tube and cutting additional vents into the bottom, allowing gases to escape so as not to cause the engines to stall. Improvements in maneuverability finally came about when McDonnell engineers installed maneuvering slats in the leading edge of both the inner and outer wing panels. Beginning with F-4E serial block 48 aircraft (F-4E-48), the leading edge slats were factory-installed prior to delivery. All previous serial blocks had the slats retrofitted. In addition to the slats, many of the newer block F-4Es also had a device called Target Identification System-Electro Optical (TISEO). It was a TV camera, with a telescopic lens mounted on the leading edge of the port wing. The camera sent a picture to the WSOs radar display which was used for visual identification of a possible target many miles away. However, as with anything of a visual nature, it depended on clear weather to be accurate.

The F-4E became the backbone of Western Alliance air forces. F-4E-equipped air forces include West Germany, Greece, and Turkey in NATO; Israel, Iran, and Egypt in the Middle East; Japan, South Korea, and Australia in the Far East. The designation was sometimes changed; an F-4EJ is a Mitsubishi license-built F-4E without leading edge slats; the F-4F was an F-4E with leading edge slats, but without the slotted stabilator. The F-4F initially had no Sparrow capability, but the West German Air Force is now reconsidering this option since they plan to retain the F-4F as their primary interceptor well into the 1980s.



"HERE COME DA JUDGE", an F-4E of the 34th TFSq, being rearmed with a full load of CBU's. Artwork flourished on Korat-based F-4Es until 1970 when 7th Air Force ordered the practice to cease. They even ordered the removal of the shark teeth as it made their "friendly fighter-bombers" appear "too fierce". (JEM Slides)

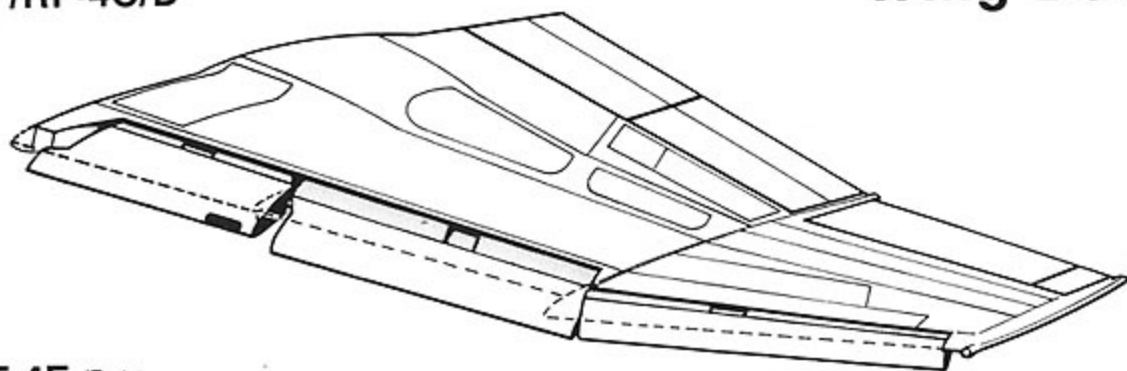
CBU-armed F-4E from the 469th TFSq at Korat. Northbound F-4E strike aircraft always carried two different ECM pods in the forward Sparrow bays. MiGCAP F-4s also carried ECM pods but were armed with a full load of AIM-9 Sidewinders. (USAF)

F-4Es have appeared in every possible paint scheme from standard USAF South East Asia camouflage, to West Germany's Green and Gray splinter scheme, the Desert Tans of Israel and Iran, the Ghost Grays of the South Korean and Egyptian F-4Es, and the brand-new "European One" wrap-around Dark Green and Dark Gray found on the latest USAF aircraft. But certainly the most colorful were those used by the US Air Force Thunderbirds. Thunderbird F-4Es were never standard aircraft that had been stripped and refitted for the aerobatic team role as has been claimed. They were specially built by McDonnell specifically for the Thunderbirds. Everything that had to do with combat flying was left off of the aircraft on the assembly line. Thunderbird F-4Es underwent a complete weight redistribution program to gain back the very critical center of gravity. On 19 April 1969, the first Thunderbird F-4Es were delivered to the team at Nellis AFB. They flew their first show on 4 June 1969, at the Air Force Academy graduation, with President Nixon in attendance. In 1974, following several disastrous accidents, the Thunderbird F-4Es were replaced with T-38A Talon trainers. Anyone that has seen a Thunderbird F-4E airshow will never forget it. It was the most awesome airshow ever! After retirement from the team, the aircraft were relegated to use as chase aircraft, unit hacks, or used as trainers.

The F-4E has seen combat in four wars: the last five years of the Vietnam War, both the 1973 and 1982 Israeli conflicts in the Middle East, the Turkish-Greek clash over Cyprus, which pitted F-4E against F-4E, and the Iran-Iraq Holy War which still goes on today. The F-4E was the Best of the Best — at least from the late 1960s to mid-1970s.

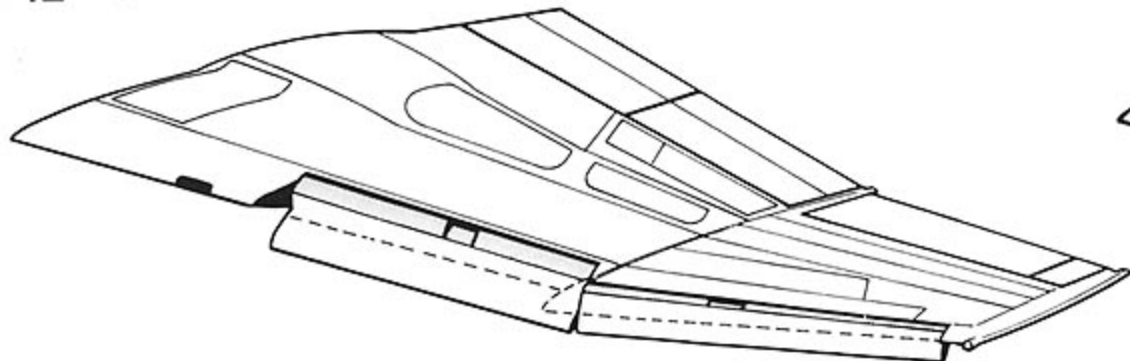


F/RF-4C/D

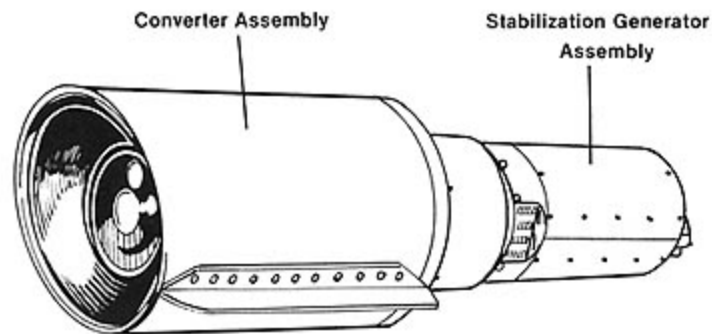


Wing Development

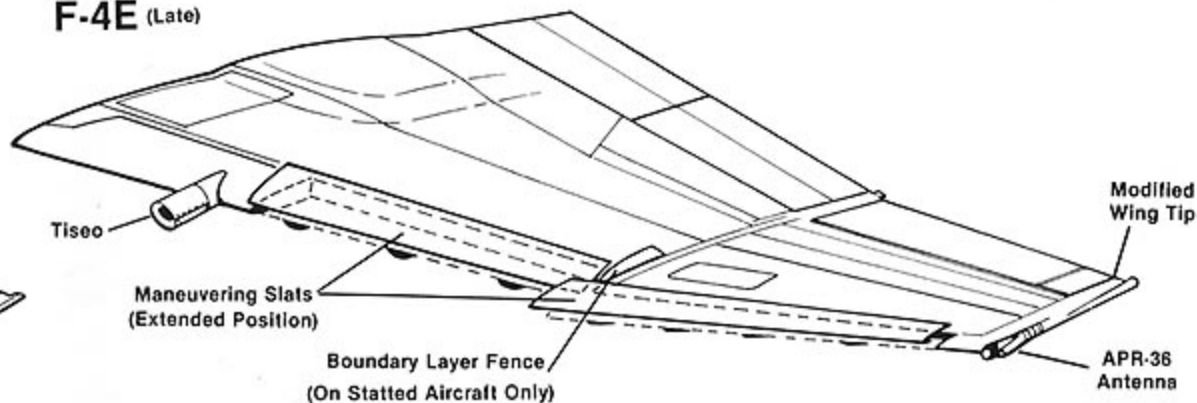
F-4E (Early)



Tiseo



F-4E (Late)

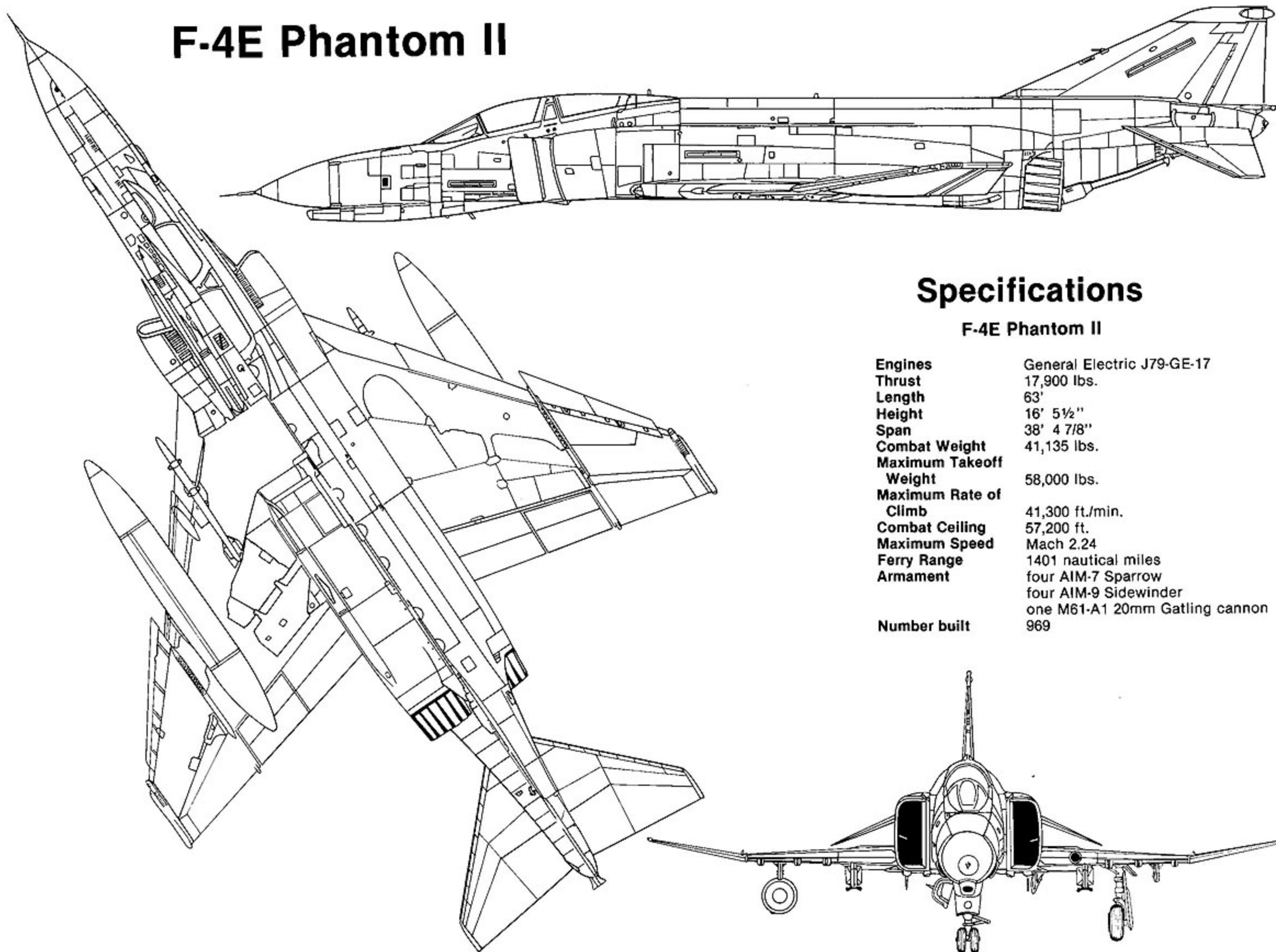


An F-4E configured for a MiGCAP mission from the 421st TFSq, taxis to the active runway at DaNang. The sharkmouth decoration was a natural for the F-4E with its underslung gunbay. Note the open in-flight refueling door on the spine of the fuselage. (USAF)

TISEO stood for Target Identification System, Electro-Optical, and is simply a telescopic camera mounted on the leading edge of the port wing, and tied into a TV receiver in the aft cockpit. This TISEO-equipped F-4E is from the 421st TFSq at DaNang. (JEM Slides)



F-4E Phantom II



Specifications

F-4E Phantom II

Engines	General Electric J79-GE-17
Thrust	17,900 lbs.
Length	63'
Height	16' 5 1/2"
Span	38' 4 7/8"
Combat Weight	41,135 lbs.
Maximum Takeoff Weight	58,000 lbs.
Maximum Rate of Climb	41,300 ft./min.
Combat Ceiling	57,200 ft.
Maximum Speed	Mach 2.24
Ferry Range	1401 nautical miles
Armament	four AIM-7 Sparrow four AIM-9 Sidewinder one M61-A1 20mm Gatling cannon
Number built	969

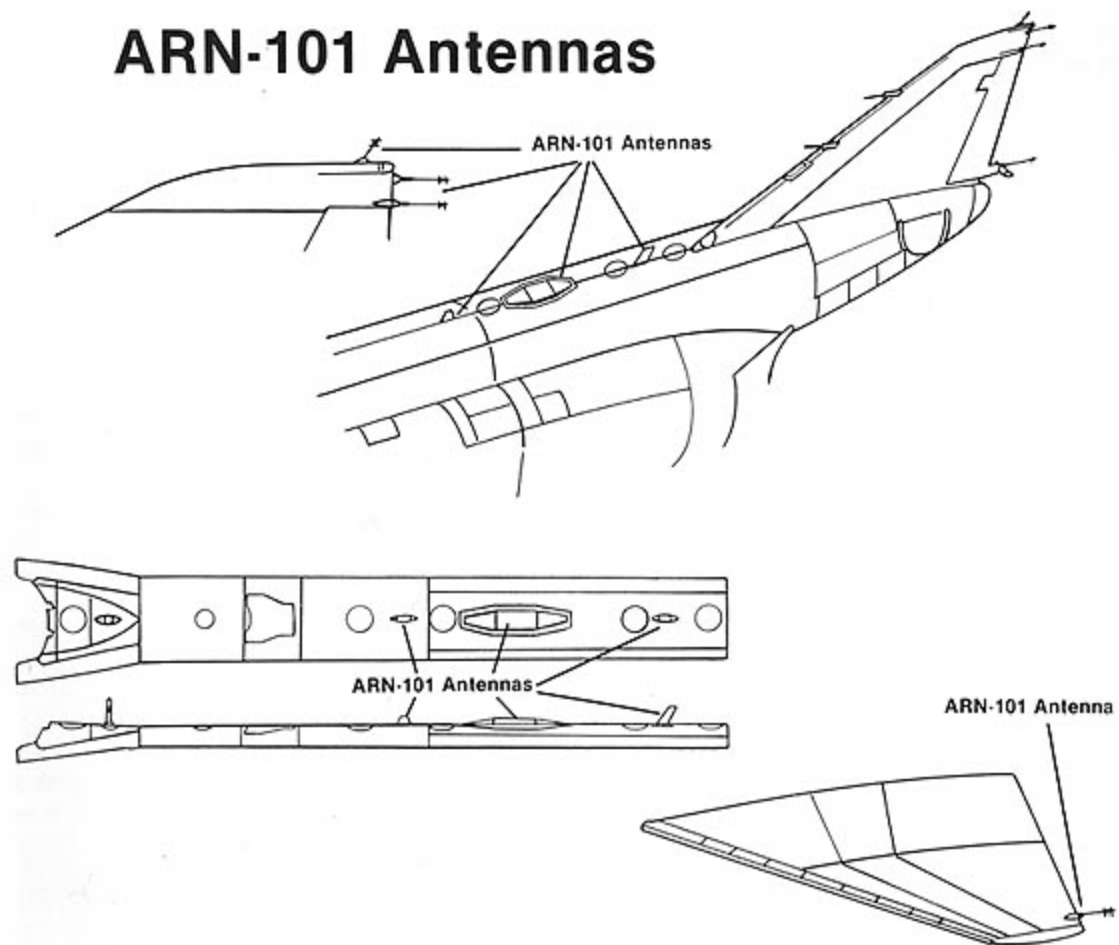


The 57th TFSq, based at Keflavik, Iceland, was the first Air Defense Command unit to convert to the F-4E. A pair of 57th F-4Es escort an E-3A AWACS aircraft enroute to a European deployment. Arriving at Keflavik in the standard Southeast Asia camouflage, the new aircraft were soon stripped and repainted in Air Defense Gray 16473. (USAF)

The nearest F-4E belongs to the wing commander of the 4th TFWg based at Seymour Johnson AFB, North Carolina. It carries the new wrap-around tactical camouflage with subdued national markings. The fuselage stripes are, from the front: Blue, Green, Yellow, Red, all bordered in White. The fin cap is Black. The very colorful stripes would seem to defeat the purpose of the subdued national markings. (Kaston)



ARN-101 Antennas



Under Operation PEACE PHARAOH, the Egyptian Air Force was equipped with older model F-4Es from US Air Force inventories. The aircraft went through the F-4 rebuilding facility at Hill AFB, Utah, where they were updated and re-equipped with the latest avionics and flight controls. These included leading edge maneuvering slats and AGM-65 Maverick air-to-ground missile capabilities. The paint scheme is a shadow-shading scheme in the two Compass Ghost Grays (36320 and 36375). (Campbell via Brewer)



F-4EJ

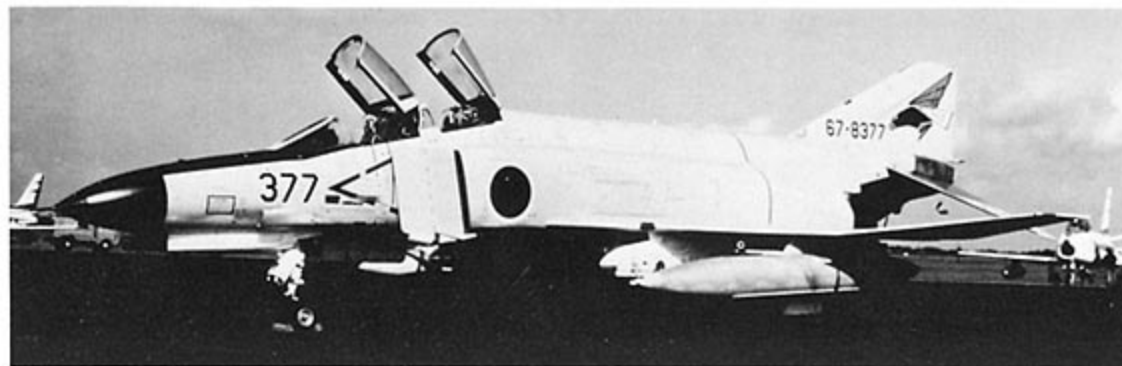
The F-4EJ is unusual in that it is the only Phantom II to be built at other than the McDonnell St. Louis factory. Selected in 1968 by the Japanese Self-Defense Force to replace some 200 Lockheed F-104 Starfighters, an initial contract was signed calling for 104 Phantom IIs to be built. The first two were built in St. Louis to serve as pattern aircraft, and kits were supplied for eleven Phantoms to be assembled in Japan with the balance to be built from 178 sub-assemblies manufactured in Japan and 37 manufactured in the United States. Mitsubishi was the primary contractor and was supported by some seventeen sub-contractors.

Under the designation F-4EJ, the Japanese Phantom II differed little from the USAF's F-4E. The inflight refueling system was deleted, and a Japanese-made rear warning radar was installed. Configured as a self-defense fighter, no bombing equipment was installed; however, provisions were made for the installation of Mitsubishi AAM-2 missiles.

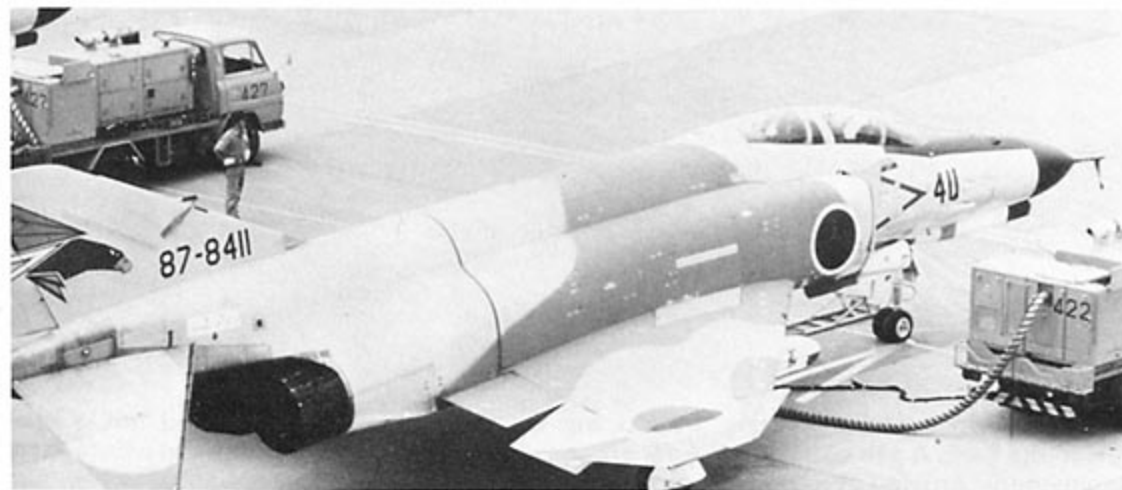
The St. Louis-assembled pattern aircraft were received by the 301 Hikotai which was formed in August of 1972; the first Mitsubishi-assembled aircraft having flown in the previous May. Orders were subsequently increased to 140 aircraft and additional squadrons formed.

The reconnaissance version of the Japanese Phantom, designated RF-4EJ Phantom II, were all built at the McDonnell facility at St. Louis. Delivered during 1974 and 1975, they equipped the 501 Hikotai of the Teisatsu Kokutai (Tactical Reconnaissance Group) at Hyakuri AB.

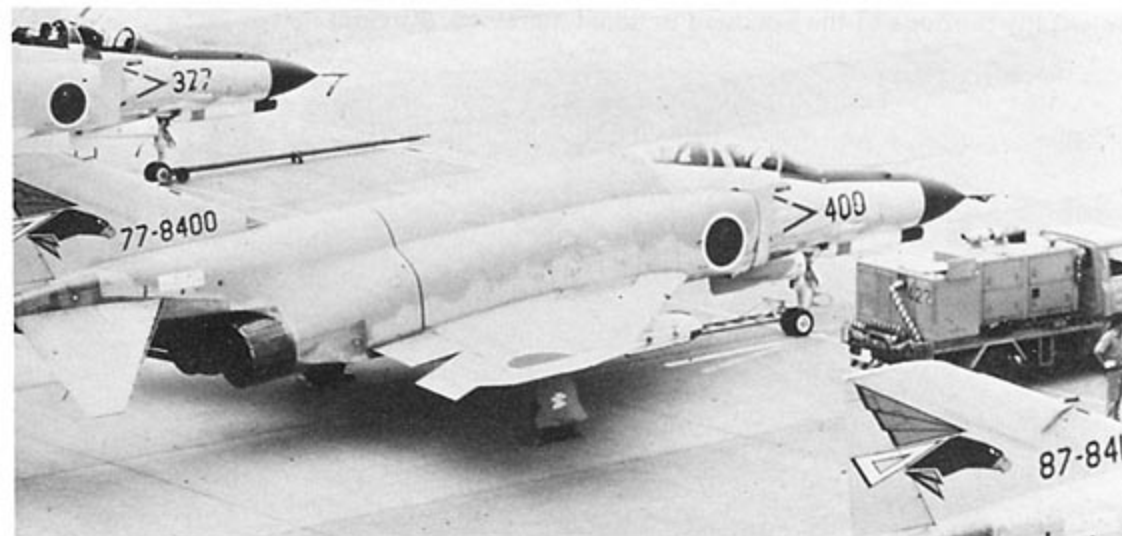
An F-4EJ on the ramp at Gifu AB, Japan. The first two F-4EJs were assembled and tested at the McDonnell plant in St. Louis. All subsequent EJs were assembled by Mitsubishi in Japan. (Kudo via Roth)



This F-4EJ of 302 Squadron, Japanese Air Self Defense Force (JASDF), carries launch rails for AIM-4 Falcon missiles. (Roth)



(Above and Below) In the late 1970s, the JASDF was among the many nations that began a program to increase the survivability of their fighter pilots in a dogfight; aircraft were camouflaged in an attempt to help conceal them, and aggressor programs similar to the US Navy's Top Gun program were begun. These 302 Squadron aircraft at Chitose AB have had a pattern of Medium Blue sprayed on their upper surfaces. (Roth)



F-4F

Already having equipped Luftwaffe reconnaissance units with RF-4E Phantom IIs, a second version of the Phantom was selected by the Luftwaffe in March of 1971, when the West German Defense Committee chose a single-seat version of the Phantom II. Designated F-4E(F), it was intended to be an interceptor and was the same aircraft McDonnell had submitted to the US International Fighter Competition. However, before production of the single-seated fighter got under way, the Luftwaffe decided to purchase the basic two-seated Phantom. Armed with a 20mm gun in the nose and APQ-120 solid-state multimode radar, the new fighter, designated F-4F, was some 3300 lbs. lighter than the USAF F-4E. This weight reduction was accomplished by deleting the boundary layer control system, the leading edge flaps, the Sparrow III missile installation, the No. 7 fuselage fuel tank, and the in-flight refueling system. The F-4F was equipped with leading edge maneuvering flaps that McDonnell had developed for Project Agile Eagle.

The F-4F flew for the first time on 18 May, 1973, with the first of the fighters being built with dual controls and was delivered to George AFB where West German crews were trained under the auspices of USAF's 35th TFW. The first F-4Fs delivered to Germany equipped JG 71 at Wittmundhafen in May of 1974.

When the West German Air Force began receiving F-4F Phantoms, their first aircraft went to the USAF's 20th Tactical Fighter Training Squadron at George Air Force Base, California, where they carried USAF markings. The 20th was attached to the 35th Tactical Fighter Training Wing and was responsible for the training of all West German Phantom aircrews. (Brewer)

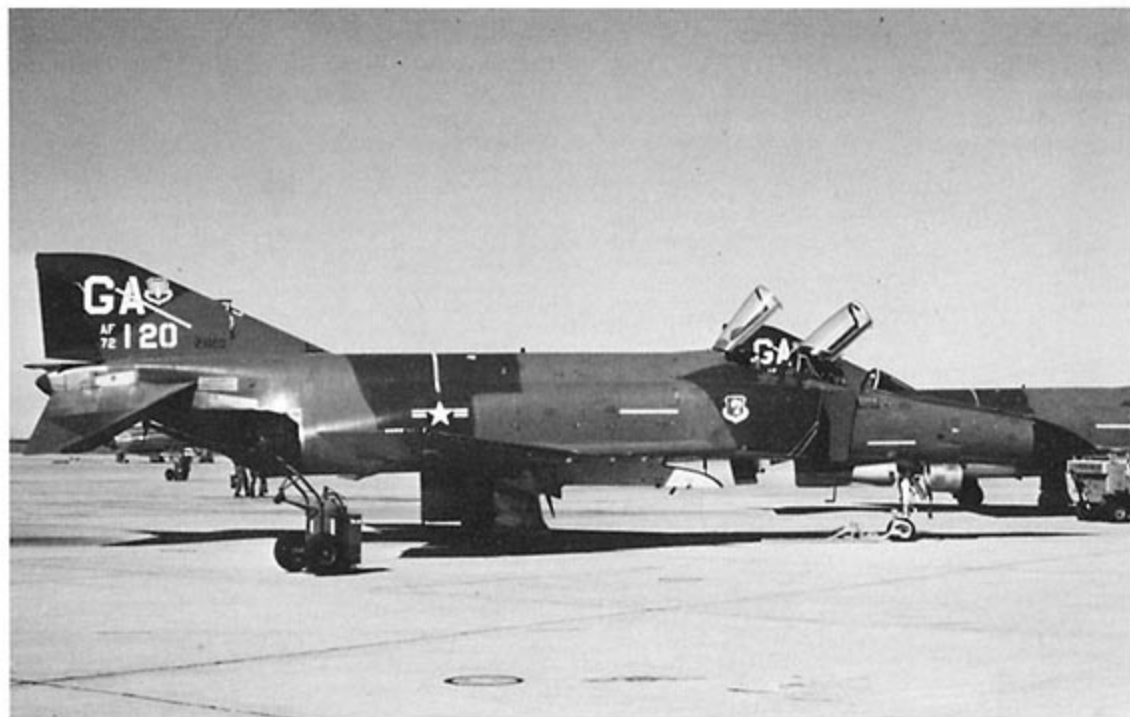
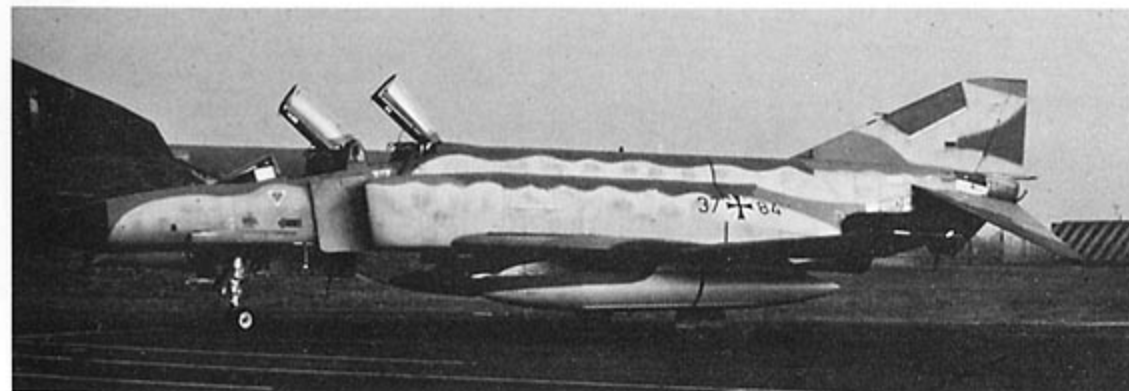


Another F-4F from the 20th TFTSg at George AFB. Note the open Gatling gun access door just in front of the nose gear. (Roth)



The lack of a slotted stabilator can be plainly seen on 37 + 34, the F-4F prototype. The aircraft belongs to JG 71 "Richtofen" which was the first operational F-4F unit in the West German Air Force. (Centurian Enterprise)

An F-4F from JG 74 "Molders" in one of the experimental camouflage schemes tried by the BundesLuftwaffe in the late 1970s. The colors of overall Light Gray, with Dark Gray and Olive Green splinter over the upper surfaces and Medium Gray splotches on the fuselage sides are similar to those used by the Luftwaffe during World War II and are especially fitting for the Grayness of the German weather during their long winter months. (Roth)



RF-4E

The RF-4E was a mating of the RF-4C nose and systems with the engines and airframe of the F-4E. It was built primarily to meet the reconnaissance requirements of foreign air forces. As such, the RF-4E does not include many of the systems found in US Air Force and US Marine reconnaissance Phantoms. West Germany was the prime contractor for the RF-4E, with 88 being built. Many of the *pieces* of the RF-4E were built by West German firms, but the aircraft were assembled in St. Louis. Other nations that equipped their reconnaissance arms with the RF-4E included Israel (12 aircraft), Iran (10 aircraft), and Japan (14 aircraft). The Japanese RF-4EJs were all built by McDonnell in St. Louis, whereas many of the F-4EJ fighters had been license-built by Mitsubishi in Japan. The Israeli RF-4Es have AIM-9 Sidewinder capabilities; the Hey'l HaAvir does not believe in the US reconnaissance motto of "Alone! Unarmed! Unafraid!"

The RF-4E was developed for use by the West German Luftwaffe and mated an RF-4C nose and systems with an F-4E airframe and engines. This example is from AG-51. (Miller)



When the Japanese Air Self Defense Force (JASDF) was re-equipped with the F-4EJ Phantom II as their primary air defense weapon, they also replaced their very tired RF-86F Sabre reconnaissance aircraft with RF-4EJs. JASDF RF-4EJs were the first RF-4s to have the more rounded nose area. Arriving in the same Gull Gray (36440) over White scheme as their fighter cousins, the JASDF RF-4EJs were camouflaged in Dark Green (34097), Medium Green (34108), and Stone (30372) upper surfaces over Pale Gray (36622) undersides. This RF-4E is from No. 501 Squadron based at Naha AB, Okinawa. (Kudo via Roth)

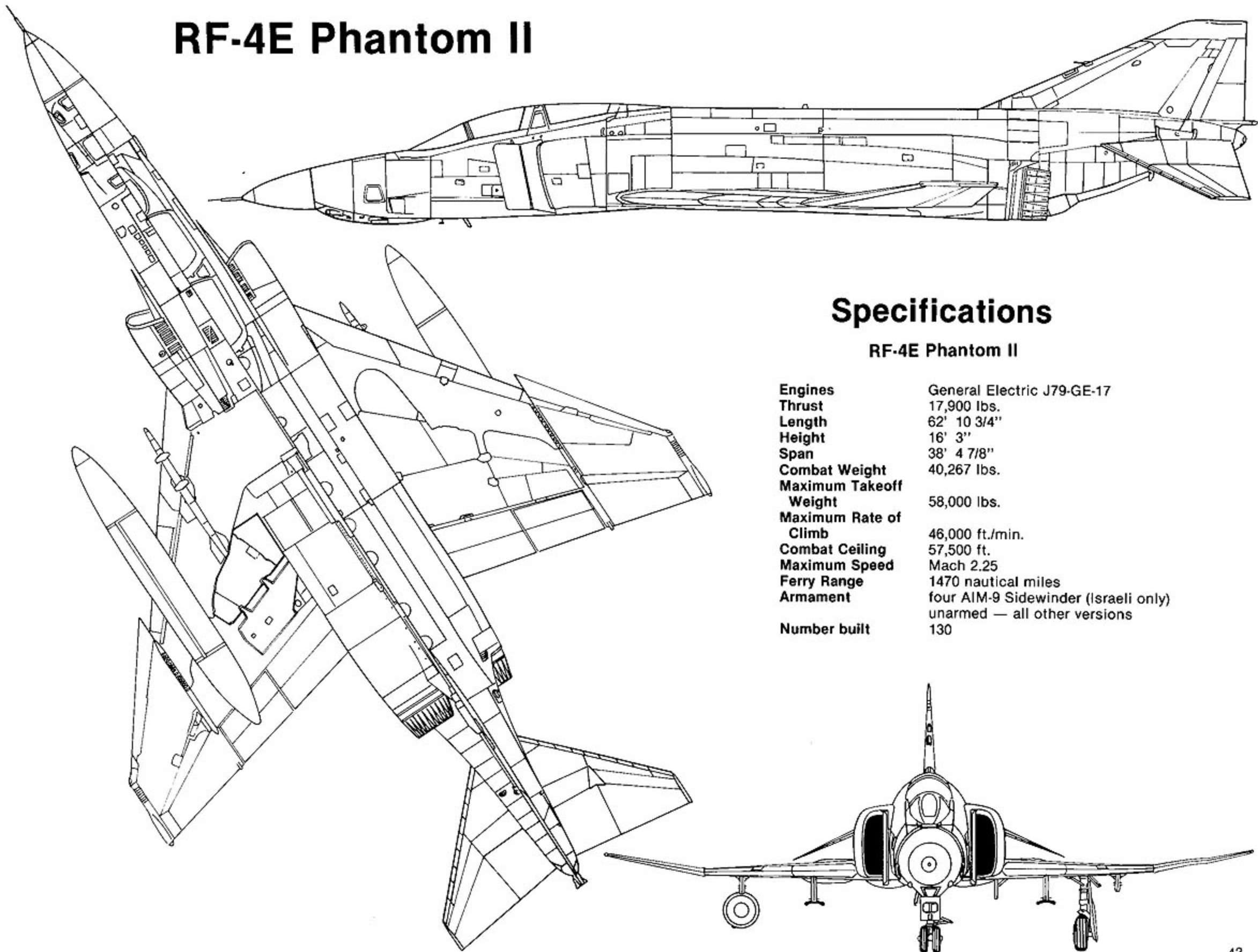


One of the most unusual reconnaissance Phantoms was the Project PEACE JACK RF-4X aircraft built for a special, and very secret, mission of the Israeli Air Force. The RF-4X was essentially an F-4E fitted with the General Dynamics HIAC high-resolution, high-altitude reconnaissance camera in place of the M61-A1 Gatling cannon. Three examples were built in 1975. (Jenkins via Roth)

An RF-4E bound for the Hey'l HaAvir, Israel's Air Force. A pair of RF-4Es are assigned to each Israeli F-4 squadron. This example is in the new Compass Ghost Gray paint scheme, found on F-15 Eagles, which is much more suitable for high altitude reconnaissance missions than the previous Israeli camouflage scheme of Desert Tans and Green. Israeli RF-4Es are the only RF-4s in service with an offensive capability; they have full air-to-air capabilities with either AIM-9 Sidewinder, or the Israeli-built Shafir dogfighting missiles. (Roth)



RF-4E Phantom II



Specifications

RF-4E Phantom II

Engines	General Electric J79-GE-17
Thrust	17,900 lbs.
Length	62' 10 3/4"
Height	16' 3"
Span	38' 4 7/8"
Combat Weight	40,267 lbs.
Maximum Takeoff Weight	58,000 lbs.
Maximum Rate of Climb	46,000 ft./min.
Combat Ceiling	57,500 ft.
Maximum Speed	Mach 2.25
Ferry Range	1470 nautical miles
Armament	four AIM-9 Sidewinder (Israeli only) unarmed — all other versions
Number built	130

F-4G Wild Weasel

The F-4G was a direct outgrowth of the Wild Weasel program that was so successful against North Vietnamese Soviet-built SAM sites. While the F-105F/G was about as good a SAM killer as could be wanted, it suffered from one insoluble problem — if one was shot down it could not be replaced since the F-105 production line had long ago been shut down. The Air Force needed a new airframe for the Weasel mission, one that was still in production. The obvious answer was the F-4.

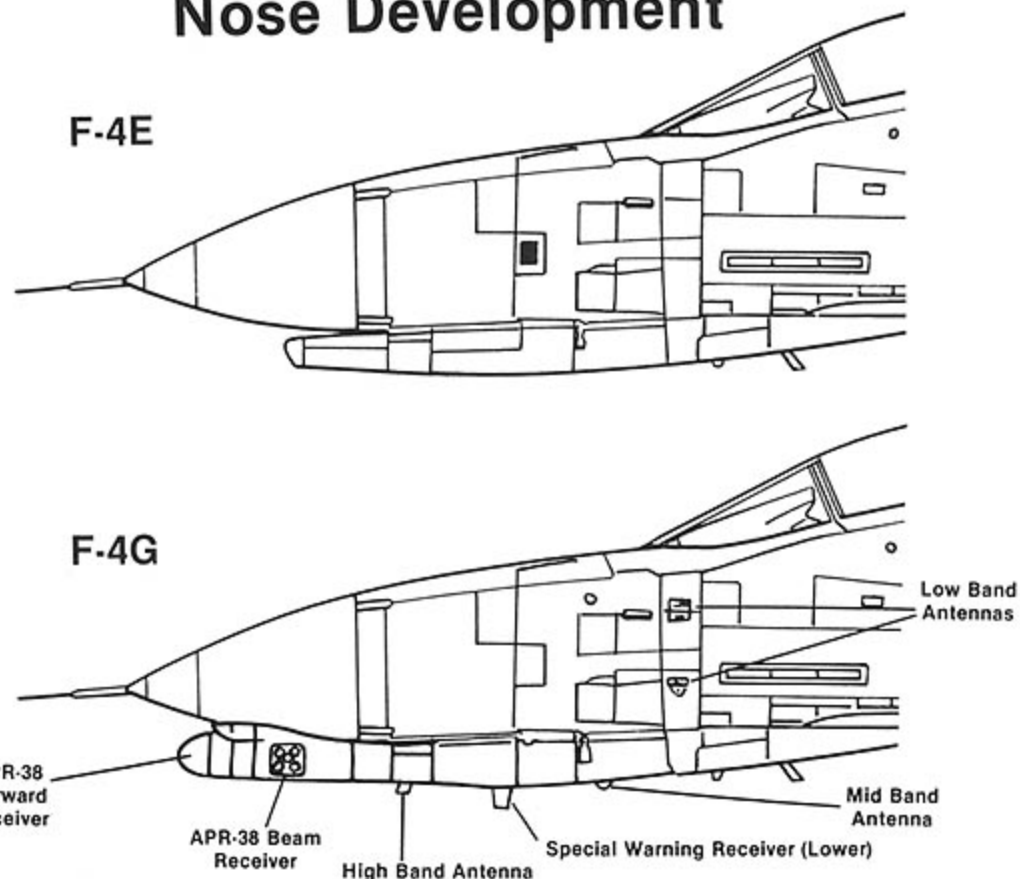
Wild Weasel 4 was the program that put some of the Wild Weasel systems into an F-4C airframe. The F-4C Wild Weasel had many qualities that were liked by the aircrews over those same qualities in the F-105. First it was twin-engined, a nice safety factor in combat. It was more maneuverable and much more stable at lower altitudes — another plus when fighting the elusive SAM. But, while the F-4C Wild Weasel operated successfully during OPERATION LINEBACKER II, the Air Force decided against the F-4C in favor of a much modified package based on the F-4E.

The new Advanced Wild Weasel building program was based on low-time, 1969-model F-4Es, all coming from blocks 42 through 45 airframes. One hundred sixteen aircraft were rotated through the F-4 maintenance facility at Hill AFB, Utah, to have Wild Weasel equipment installed as well as being brought completely up to date as far as the latest avionics were concerned. Designated F-4G, the Wild Weasel retained the AN/APQ-120 intercept radar of the F-4E and similarly the weapons-release computer and navigational equipment. Wild Weasel equipment that was added included the APR-38 Radar Homing and Warning system. The RHAW antennas were mounted in a pod atop the vertical fin, and in place of the gun under the nose. The F-4G also had the latest F-4E flight-control systems added, including the maneuvering slats on the wing leading edge. Weapons systems include the AGM-45 Shrike anti-radiation missile, the AGM-78 Standard ARM (which was not included in the original Wild Weasel 4 F-4C package), and the new AGM-88 HARM. All other F-4E weapons can be delivered by the F-4G, including full air-to-air capabilities with AIM-7 Sparrow and AIM-9 Sidewinder missiles. The only weapon system lost was the internal 20mm Gatling cannon.*

The first Advanced F-4G Wild Weasel was delivered to the 35th Tactical Fighter Training Wing at George AFB, California, on 28 April 1978. The 35th TFWg was responsible for training Wild Weasel crews in the Air Force, and was equipped with both the F-4C and F-105G Wild Weasel aircraft. They also had standard F-4Es to help in transitioning into the F-4G. When the F-4G was phased in, both F-105G and F-4C Weasels were phased out. Today, the Air Force has three squadrons of F-4Gs within the 37th Tactical Fighter Wing at George AFB, that took the place of the 35th TFWg. One squadron, the 90th TFSq, is at Clark AB in the Philippines; and one squadron, the 81st TFSq, is at Spangdahlem AB in West Germany. They are expected to remain in place as the prime Wild Weasel aircraft well into the 1990s, or until a new weasel, based on the F-15E Strike Eagle, is chosen to replace them.

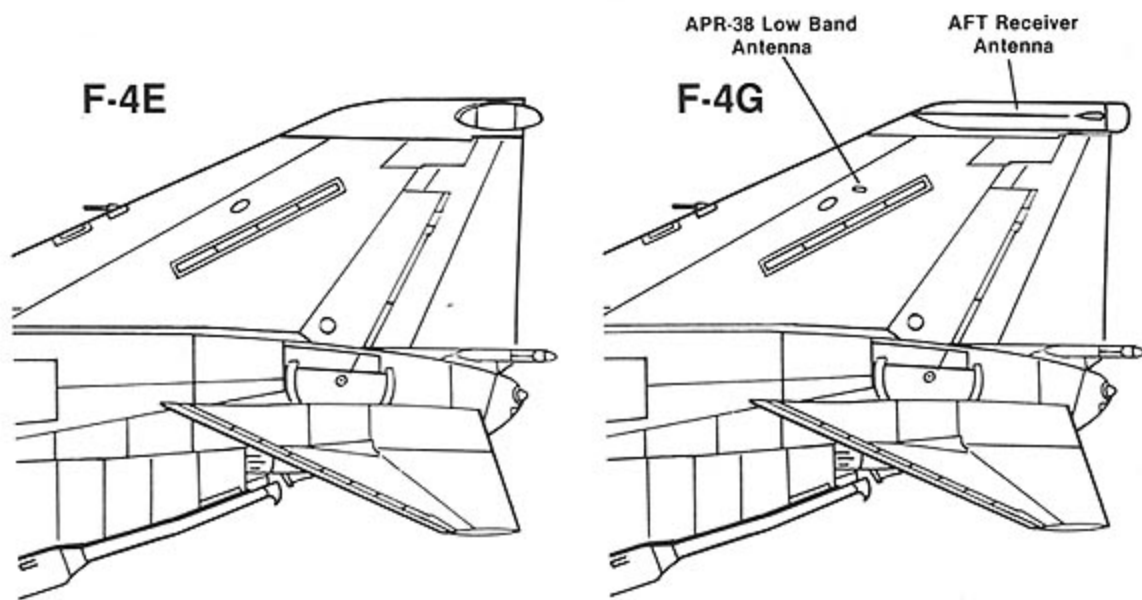
*A full explanation of these Wild Weasel systems will be found in the forthcoming Squadron/Signal title WILD WEASEL — THE SAM SUPPRESSION STORY.

Nose Development



The F-4G Wild Weasel 4 prototype aircraft on the ramp at Edwards AFB. The F-4G was a development of the F-4E for use in the defense suppression role. The M61-A1 Gatling cannon was removed and various ECM systems, all part of APR-38, were installed in a redesigned nose bay and tail tip fairing. (Isham)





Major source of Wild Weasel activity within the US Air Force is the 37th TFWg at George AFB, California. F-4Gs are now being repainted in the new wrap-around tactical camouflage and will soon appear in the "European I" camouflage of Greens and Dark Gray. This F-4G carries an F-15 centerline tank in place of the standard McDonnell 600-gallon F-4 centerline tank, since the F-15 tank can be subjected to more Gs. (Rogers via Brewer)



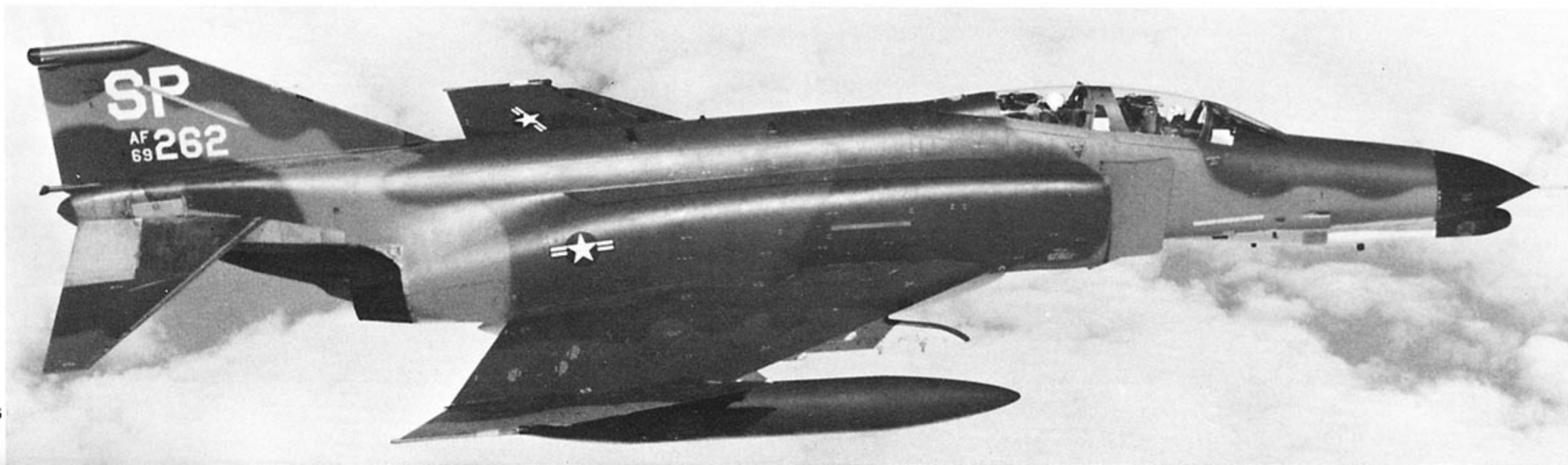
The APR-38 radome and antennas on an F-4G Wild Weasel 4 aircraft. (Knowles)



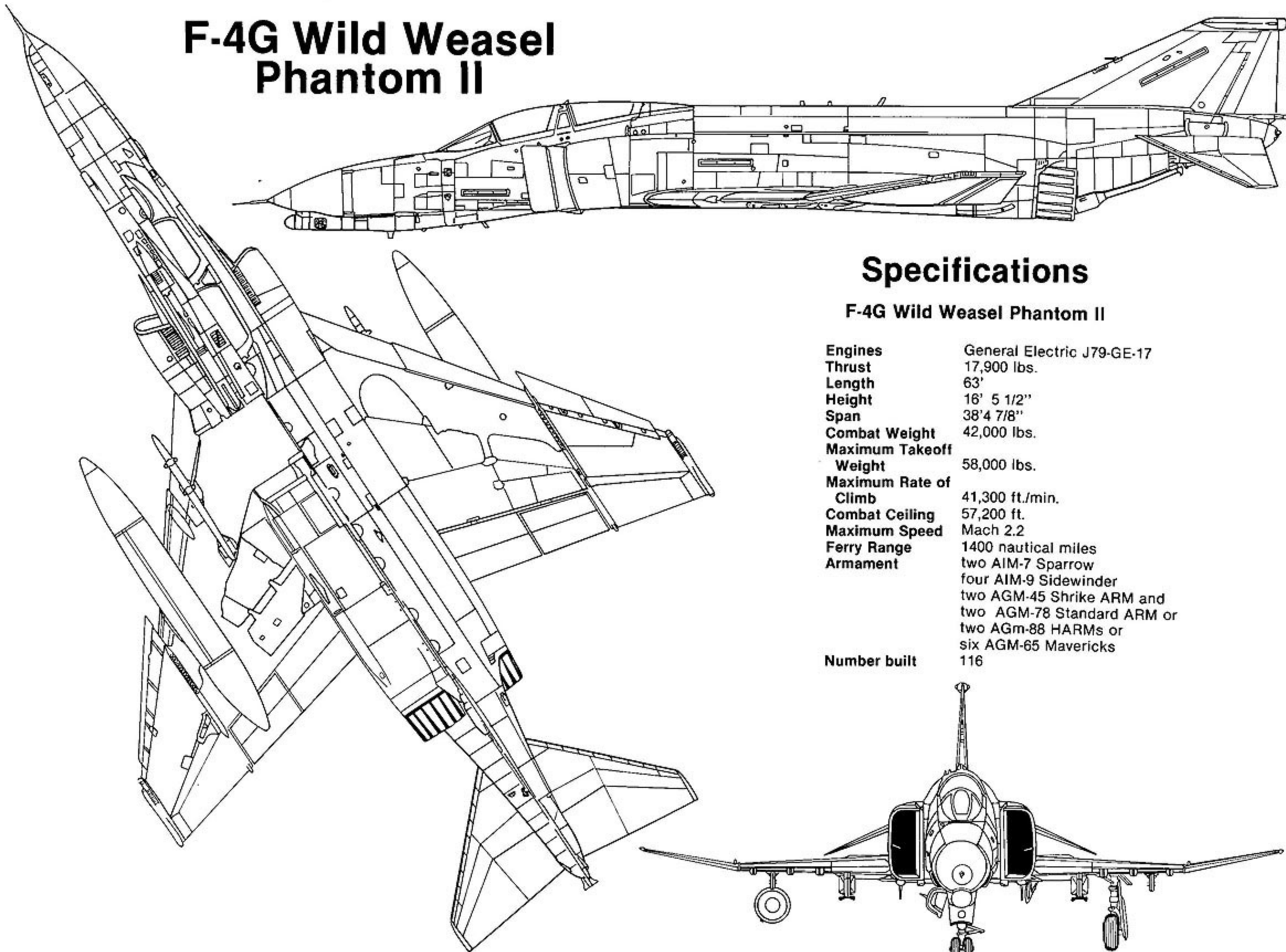


This 35th TFTWg F-4G shows the many upper fuselage antennas found on Wild Weasel Phantoms. Of special note is the blackout curtain partially drawn on the rear cockpit. The curtain is closed when the WSO, or "Bear", needs maximum brightness from his scopes to spot any and all possible threats. (USAF)

An F-4G of the 81st TFSq, 52nd TFWg, in flight over Germany during 1981. Based at Spangdahlem AB, Germany, the 81st TFSq is one of two Wild Weasel squadrons now based outside the continental US, the other squadron being the 90th TFSq at Clark AB, the Philippines. (Barr)



F-4G Wild Weasel Phantom II



Specifications

F-4G Wild Weasel Phantom II

Engines	General Electric J79-GE-17
Thrust	17,900 lbs.
Length	63'
Height	16' 5 1/2"
Span	38'4 7/8"
Combat Weight	42,000 lbs.
Maximum Takeoff Weight	58,000 lbs.
Maximum Rate of Climb	41,300 ft./min.
Combat Ceiling	57,200 ft.
Maximum Speed	Mach 2.2
Ferry Range	1400 nautical miles
Armament	two AIM-7 Sparrow four AIM-9 Sidewinder two AGM-45 Shrike ARM and two AGM-78 Standard ARM or two AGM-88 HARMs or six AGM-65 Mavericks
Number built	116

F-4J

The F-4J was the follow-on aircraft to the Navy's F-4B and incorporated many of the systems and structural changes found in Air Force Phantoms. The landing gear was beefed up and the wider tires found on Air Force Phantoms were used which meant that the upper and lower wings had the characteristic "bulge" found on Air Force F-4s. A slotted stabilator was incorporated on production F-4Js, which reduced the landing speed by almost 12 knots. The latest electronic gear was installed, including the all-new missile-control and radar system — AN/AWG-10. The AN/AWG-10 incorporated the AN/AWG-59 radar which used the same size dish antenna as the F-4B. Therefore, the radome remained exactly the same size and shape. However, the infra-red seeker and its fairing were removed from under the nose. The AJB-7 bombing system, another system from the F-4C, was also fitted to the F-4J. ECM equipment such as the AN/APR-32 RHAW system was installed with the antennas being mounted in the fairing on top of the fin and under the nose. Other changes included addition of Martin-Baker Mk 7 ejection seats with the "zero-zero" feature, the addition of a #7 fuel cell, and a pair of updated J79-GE-10 engines, with 17,900 lbs. of thrust. These engines were the same as those installed in the F-4E with the exception of the cartridge-start capability. Also similar to the F-4E, the wing leading edge had the innermost sections of the leading edge flaps fixed shut for additional control at lower speeds.

The F-4J first flew on 27 May 1966. Deliveries of the upgraded Navy Phantom began in June of 1966, with the first production aircraft reaching the fleet on 27 December 1966, when VF-101(KW) traded in their F-4Bs for the new F-4J. Eventually 522 F-4Js were built for the US Navy between June, 1966, and 7 January 1972. Included among these were seven aircraft modified slightly for the aerobatic team role and flown by the Navy's Blue Angels. Unlike the Thunderbird F-4Es, Blue Angel F-4Js were essentially combat-ready aircraft and could be used in that role if necessary, as was done with Blue Angel aircraft during the Korean War.

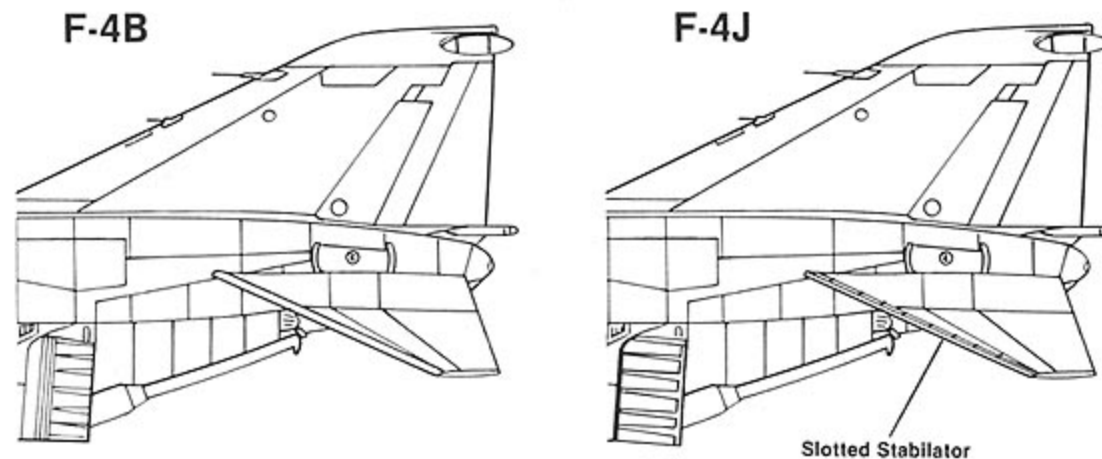
Later production F-4Js carried Sanders Deceptive Electronic Counter Measure (DECM) antennas on the shoulder of the engine air intakes. These antennas were similar to the DECM antennas found on the F-4N, but were much shorter.

One of the most famous F-4Js was BuAer No. 155800. It was in this aircraft that Lt. Randy Cunningham and Lt. JG Willie Driscoll became the first aces of the Vietnam War. After they scored their 5th kill, a MiG-17 flown by the top NVAF ace Major Tomb, their aircraft was struck by a SAM missile and destroyed. Both airmen were retrieved from the Gulf of Tonkin. (Lock via Brewer)



An F-4J from VMFA-334 "Falcons", based at DaNang, but seen on the Ubon ramp in 1969. The F-4J incorporated the Air Force bulged wing and updated J79-GE-10 engines, while retaining other standard Navy features such as the Probe and Drogue inflight refueling system. (Brewer)

Tail Development





Certainly one of the gaudiest unit schemes was that of VMFA-235 "Death Angels", based at Kaneohe Bay MCAS, Hawaii. The Red and White starred F-4Js were based at DaNang during the Vietnam War, flying combat missions in their colorful F-4Js. (Brewer)

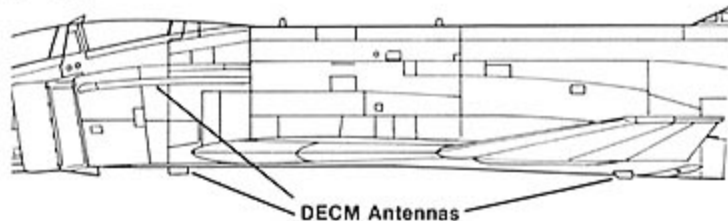
A VAQ-33 "Fire Birds" F-4J in the hangar at Oceana NAS in May of 1976. VAQ-33 is an electronic warfare unit using many different types of aircraft, including F-4Js to carry out their mission. Note the highly polished finish. (Leader)



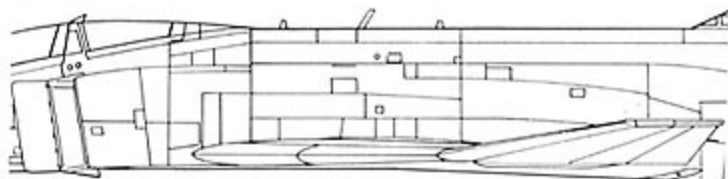
A trio of VF-114 "Aardvarks" F-4Js inflight near San Diego. Barely discernible on the upper starboard outer wing of NH-215 is a repeat of the tail code letters and plane-in-squadron number — a usual practice with Navy aircraft. The tailtip, fuselage band, tank and pylon tips and the Aardvark are in International Orange. (Trombecky)

F-4N

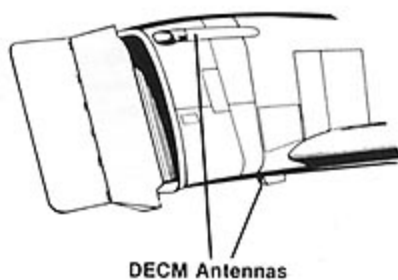
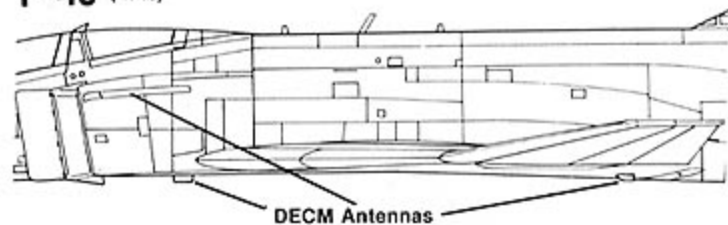
DECM Antennas



F-4J



F-4J (Late)



Later F-4Js had the addition of AN/APS-127 DECM antennas on the intake shoulders. These antennas are much shorter than those found on the F-4N. (Roth)

An early Marine attempt at subdued markings was seen on VMFA-115 "Silver Eagles" F-4Js. The aircraft were painted overall Gull Gray (36440) with all major lettering in White with a thin Black trim. This didn't work well since in the air the White letters became almost as distinct as the old Black letters. (JEM Slides)



F-4S

The F-4S came about as a result of the success of Project BEE LINE, the program that added life to the F-4B by updating them to F-4N standards. In 1978, after some ten years of service, F-4Js were slowly removed from service and sent through the North Island rework facility. The hydraulics, electronics, and wiring were brought up to the latest service standards. The AN/AWG-10A fire control system was added and the engines were replaced by the new lo-smoke J79-GE-10B which offered a much longer service life. Externally, the F-4S initially could not be discerned from the F-4J with similar modifications. Both aircraft types had the AN/ALQ-126 Sanders Deceptive ECM system with the long antenna bumps on the air intake shoulders and under the leading edge of the wing. They could only be discerned from a late F-4J by the BuAer number. A feature that was added to the later F-4S was the addition of leading edge maneuvering slats, similar to those added to late model F-4Es and F-4Fs. The F-4S slat differs slightly from those found on the F-4E by having a much longer vertical "fence" on the outboard wing panel. The longer fence offers still more low-speed control, which is critical for carrier deck landings. Although the early F-4S did not have the leading edge slats, they are presently being retrofitted to all aircraft.

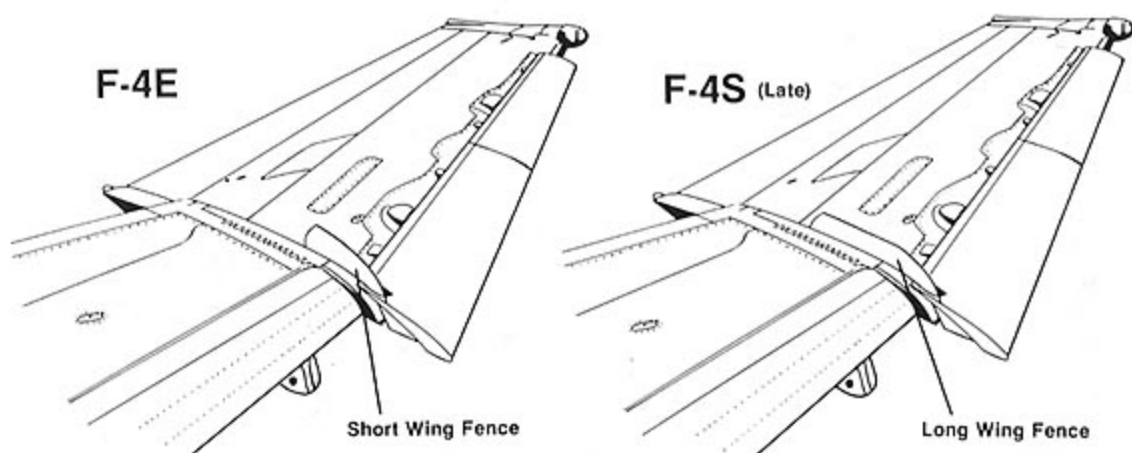
VF-301 "Devil's Disciples" F-4S over the desert near Fallon, Nevada. The longer wing fence can easily be seen. The aircraft is overall Gull Gray (16440) with Black nose treatment and a Red arrow on the fin. The walkway areas on top of the wings have been painted Gunship Gray (36118). (Jacobs)



The first F-4S with leading edge maneuvering slats sits on the ramp at Edwards AFB. The Navy slatted wing differs slightly from the Air Force version by having a much longer flow fence on the outer wing panel. (Roth)



Wing Development

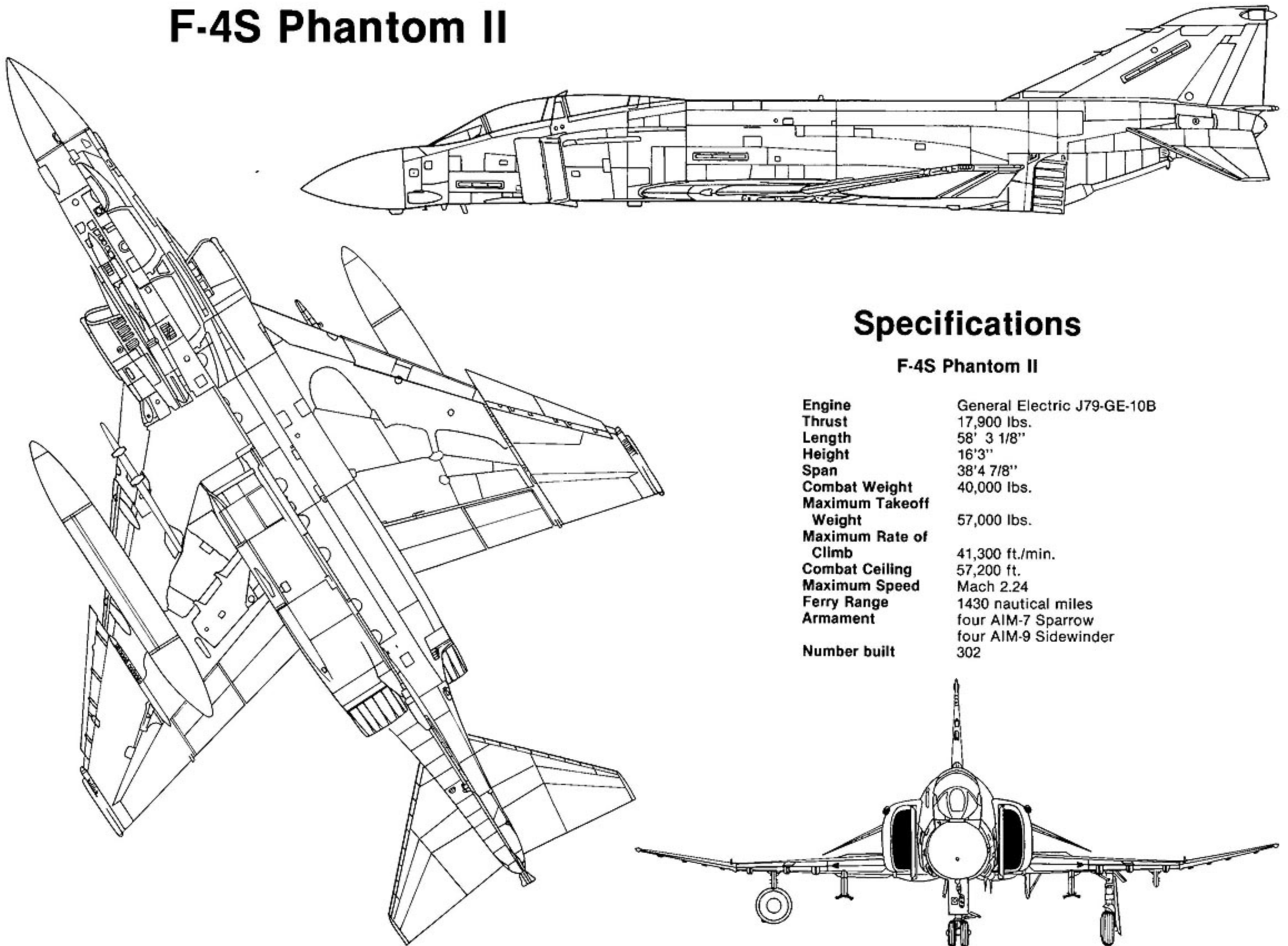


An F-4S in the new Navy tactical camouflage of Blue Gray (35237) and Dark Ghost Gray (36320), with Light Ghost Gray (36375) undersides. The aircraft is assigned to VF-171 and is seen on the ramp at Oceana NAS in October, 1982. (Starinchak)

A Marine F-4S of VMFA-451 "Warlords" on the Oceana ramp. Full wing fold capability was retained throughout the slat wing modifications. This is true of ALL F-4 models, no matter what wing they had, including Air Force types. The addition of tape formation lights was part of the F-4S modifications. (Starinchak)



F-4S Phantom II



Specifications

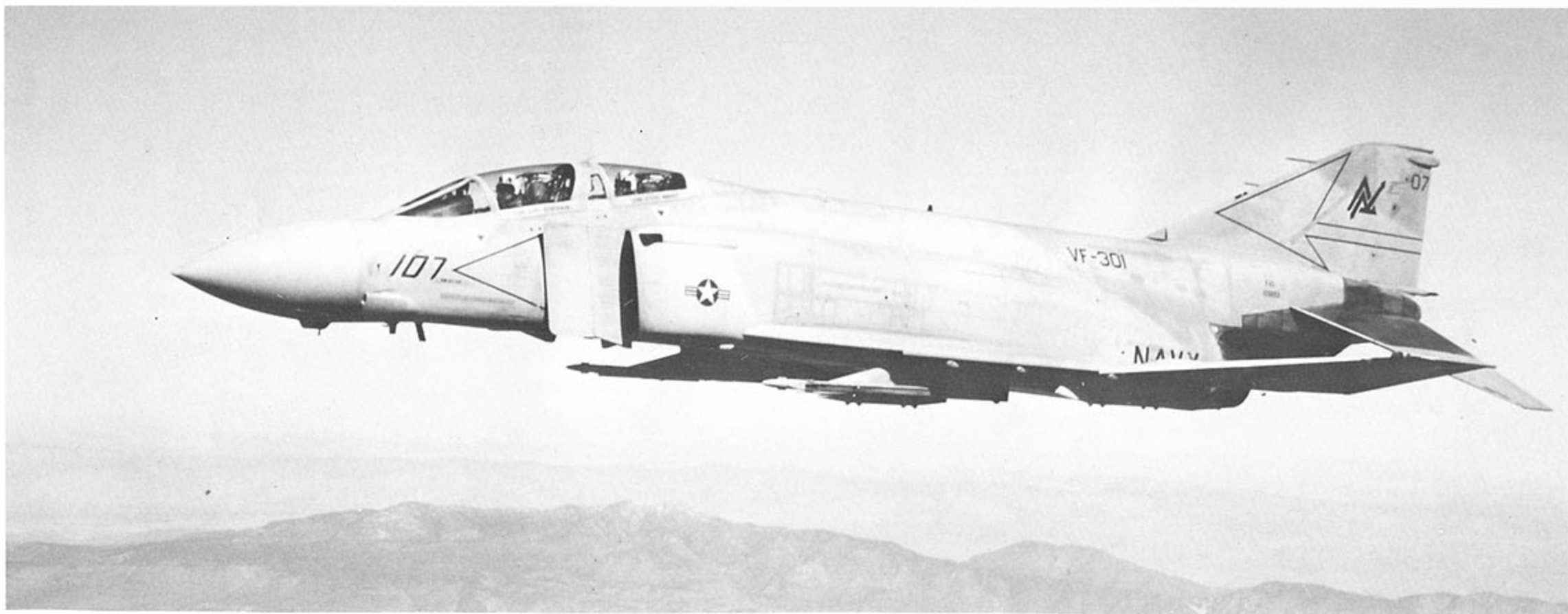
F-4S Phantom II

Engine	General Electric J79-GE-10B
Thrust	17,900 lbs.
Length	58' 3 1/8"
Height	16'3"
Span	38'4 7/8"
Combat Weight	40,000 lbs.
Maximum Takeoff Weight	57,000 lbs.
Maximum Rate of Climb	41,300 ft./min.
Combat Ceiling	57,200 ft.
Maximum Speed	Mach 2.24
Ferry Range	1430 nautical miles
Armament	four AIM-7 Sparrow four AIM-9 Sidewinder
Number built	302



(Above and Above Right) VF-301 F-4S painted in the experimental Heater-Ferris camouflage. The camouflage pattern and colors were the brainchild of LCDR C. J. Heatley with the addition of the painted-on canopy being the contribution of Keith Ferris. Note the very stained appearance of the underside in the engine bay area. (Jacobs)

(Below) The Heater-Ferris camouflage colors are Dark Gray (35164), Medium Blue-Gray (35237), Light Aircraft Gray (36307), and Light Ghost Gray (36375) on both the upper and lower fuselages. Arrow on the tail is finely outlined in Red; all other markings are in Black. Gray schemes weather very rapidly, especially in desert climates, as evidenced by the fuselage sides. (Jacobs)



British Phantoms

The Phantom FG-1 was the result of the Royal Air Force's decision to buy the Phantom II over the home-grown P.1154 RN. However, the British had one stipulation — a certain percentage of the aircraft had to be built in Great Britain. The result was a mating of the new F-4J airframe with a pair of Rolls Royce Spey 202/203 engines. Because the Spey engines were slightly larger in diameter than the American J79, the aft fuselage was quite a bit deeper in the engine bay area than the American Phantom II. Additionally, the Spey engine required more air so the air intakes were widened and deepened approximately six inches, with additional air for taxiing being drawn in through large doors on the sides of the fuselage. The air intakes, engine bays and tail assembly, outer wing panels, and of course, the Rolls Royce Spey engines, were all built in Great Britain, shipped to St. Louis, with the finished aircraft being flown to England. Other differences between an F-4J and the FG-1(F-4K) included an AN/AWG-11 fire-control system, Elliot Avionics autopilot and certain other avionics, an extendable nose-gear leg that extended twice as far as that of an F-4J nose gear (from 20 inches to 40 inches) for increased lift on takeoff, and a much stronger tailhook.

The Rolls Royce Spey (RB-168-25R) is a turbofan engine rated at 20,515 lbs. of thrust. It had originally been designed as an airliner engine and was later used to power the Hawker Siddeley Buccaneer attack jet. Restrengthened, and fitted with an afterburner, the Rolls Royce powered Phantoms are the quickest of all the Phantom variants; "quickest" — not the fastest. In "drag race" tests from USS Saratoga, the FG-1 could easily outclimb the F-4B or J. But any of the J79-engined variants were much faster at top speed. The first flight of the FG-1 (YF-4K) took place on 27 June 1966. A total of 52 FG-1s (F-4Ks) were built — 24 for the Royal Navy and 28 for the Royal Air Force.

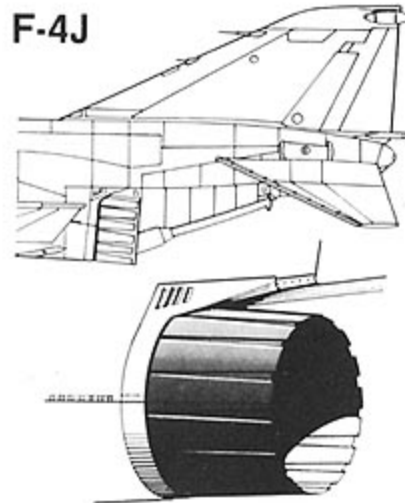
The FGR-2 (F-4M) was designed to meet requirements that the Royal Air Force deemed necessary for land-based operations. They differed from the FG-1 in that the FGR-2 (F-4M) did not have the extra extension in the nose gear leg, had no carrier deck catapult launch points under the wings, and did not have the slotted stabilator found on the FG-1 (F-4K). Other items specified by the RAF included anti-skid brakes, HF/UHF/VHF radios, IFF (Identification Friend or Foe) radar beacon, a new Ferranti navigation/attack system, AN/AWG-12 fire control system, and the latest in ECM electronics. The first flight took place on 17 February 1967. One hundred eighteen were delivered to the RAF with the final FGR-2 (F-4M) coming off the McAir assembly line in October, 1969. With the final FGR airframe coming off the line in 1969, the RAF faced a problem as attrition began paring down the size of the British Phantom fleet. With the British economy in dire shape, there was little chance of obtaining a newer aircraft type to replace the Phantom II as Britain's first-line interceptor. After the recapture of the Falkland Islands, the Thatcher government made the decision to send a squadron of Phantoms to the Falklands to deter any future aggressive moves on the part of the Argentines. But where were they to come from? Britain was fully committed to NATO, including its entire Phantom force. The answer was in the US Navy. With the US Navy re-equipping with the Grumman F-14 Tomcat, surplus F-4S aircraft became available. In March, 1983, the Thatcher government placed an order for fifteen F-4S aircraft. These aircraft, designated Phantom F Mk 3, will be delivered as manufactured for the US Navy — with J79-GE-10A smokeless engines. Avionics and some electronics will be replaced with British units. But the fire control system will remain the US AN/AWG-10. The Phantom F Mk-3s will equip one air defense squadron stationed in Great Britain, which will replace No. 23 Squadron now based at Stanley Airport in the Falklands. The new Phantom F Mk 3s are to be delivered by mid-1984.

Sitting on the Yeovilton RNAS ramp is an FG-1 from No. 767 Squadron. The entire aft fuselage area had to be redesigned to take the much larger Rolls Royce Spey engines. (Brewer)



A Royal Navy FG-1 (F-4K) on the ramp at Cecil Field NAS, Florida, in July, 1971. The FG-1 differed from their RAF cousins, the FGR-2 (F-4M), in having a slotted stabilator and a greatly extendable nose gear leg to gain a better angle of attack during carrier take-offs. (Morris via Brewer)

F-4J



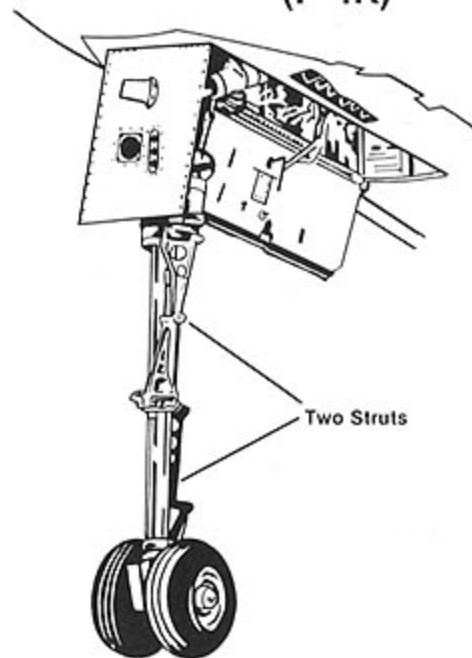
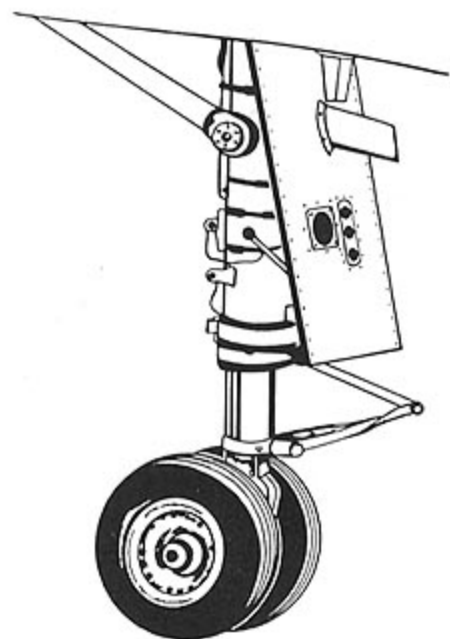
FG-1 (F-4K)



F-4J

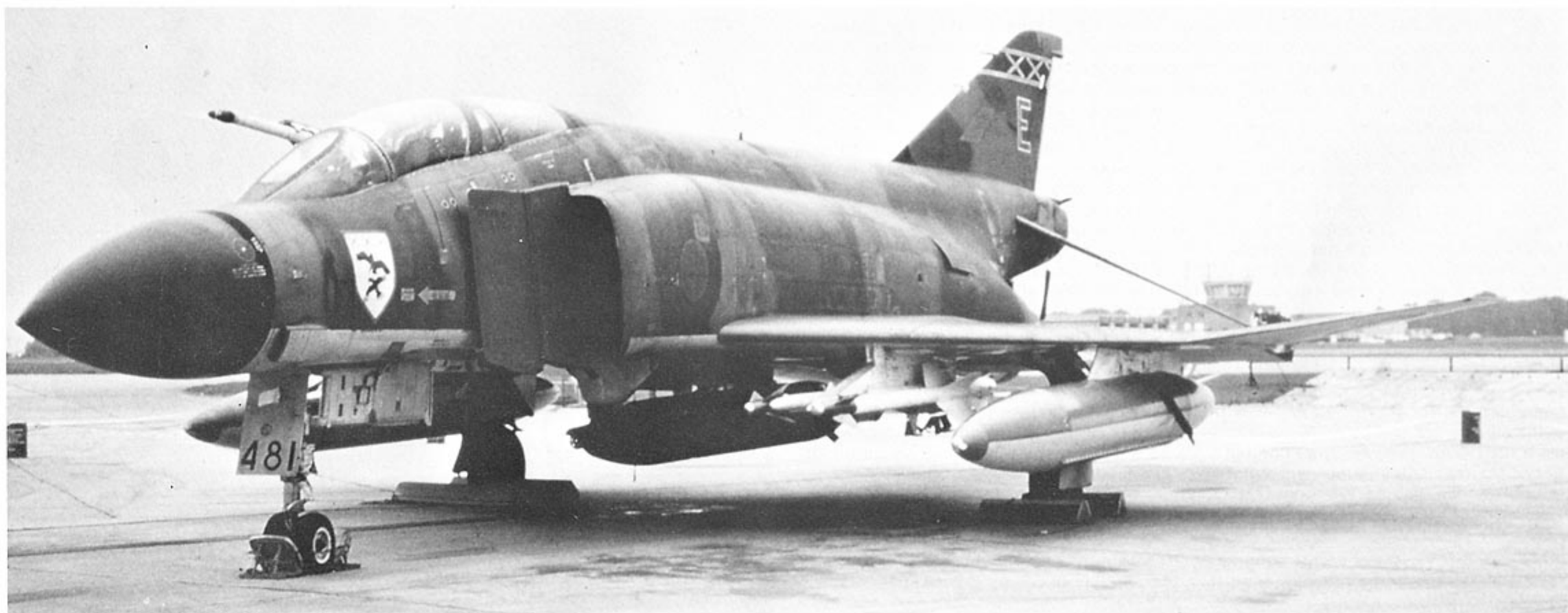
Nose Wheel

FG-1
(F-4K)



An FG-1 from No. 892 Squadron during a 1971 open house aboard HMS Ark Royal. The missiles under the wing appear to be AIM-7 Sparrows but are actually their British counterpart — Skyflash missiles. On the inboard pylons are a pair of Matra rocket pods. (Stranberg via Brewer)

An RAF FGR-2(F-4M) at Lyneham Airbase in 1975. RAF Phantoms carried many weapons compatible with their US Air Force counterparts, including the SUU-16A/A 20mm gun pod and AIM-9 Sidewinder missiles. Note the extended probe and drogue aerial refueling system near the canopy. (Miller)

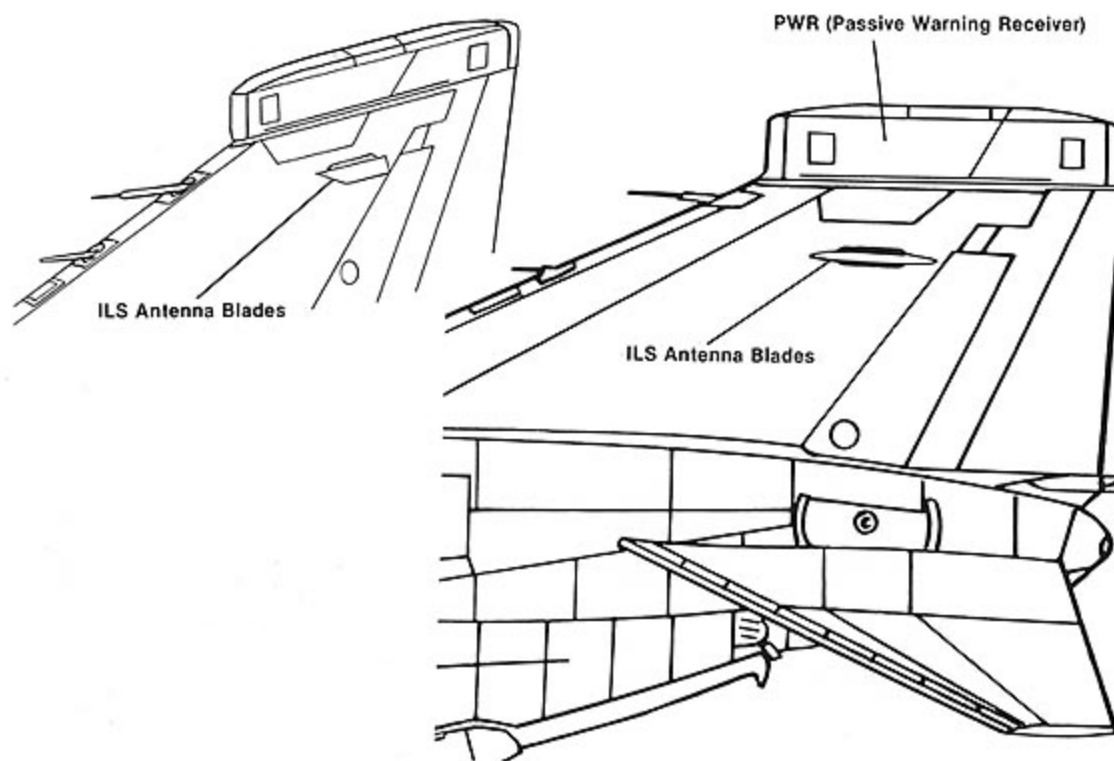




An RAF FGR-2 from No. 41 Squadron painted in the usual Northern Europe camouflage of Medium Green (34079), and Medium Sea Grey (36270) upper surfaces over Light Aircraft Grey (36357) undersurfaces. An EMI reconnaissance pod is being carried on the centerline station. Most NATO air forces, except for West Germany's RF-4Es, use some type of reconnaissance pod for intelligence-gathering missions. (Thomson via Brewer)

An RAF Phantom from No. 56 Squadron painted in the new Barley Grey camouflage scheme. All RAF Phantoms and other air superiority aircraft will be painted in this scheme. The Passive Warning Receiver (PWR) fairing can be seen at the top of the fin; the ILS blade antenna is on the side of the vertical fin. (JEM Slides)

FG-1/FGR-2 Tail (Late)





The famous 12200, sometimes referred to as the "Father of all Phantoms". Originally built as an F-4B, then modified on the assembly line into the first RF-4C. Almost every modification to an F-4 has originally been tested and flown on OI 12200. This is the final configuration — with non-closing leading edge maneuvering slats and canards added to the intake shoulders. The aircraft now rests at the Air Force Museum. (Stavrou)

line sits on the ramp at Lambert Field prior to delivery to the Republic of Korea Air Force. Subsequent information reveals that at least six more RF-4Es were built after this "last F-4". They were built for Iran but were not delivered due to the taking of the hostages. Their present whereabouts is unknown but the US Marine Corps is attempting to obtain them for their reconnaissance squadrons. The actual last F-4 built was an F-4EJ, serial 17-8440, assembled at the Mitsubishi plant in Japan in 1981. It was the 5195th and final F-4 built. The 5057th aircraft is painted in a two-tone Compass Ghost Gray camouflage.

(Below) Last of the breed? The 5057th, and final, F-4 to come off the St. Louis assembly — (McAir)



