

F-4 Model Guide

The F4H-1 was the initial production version of the Phantom for the United States Navy. Since the J79-GE-8s originally intended for the Phantom were still not available, the first 45 F4H-1s which had been ordered were powered by a pair of 16,150 lb.s.t. afterburning J79-GE-2 or -2A engines. In order to distinguish these planes from later models powered by -8 engines, on May 1, 1961 they were redesignated F4H-1F, the F indicating the use of a special powerplant.

Among the external changes introduced on the F4H-1 was the introduction of a pair of plain pitot inlets for the air-conditioning system, which replaced the flush-mounted recessed ram intakes of the two prototypes. These were mounted on the forward nose just behind the radome. They stood away from the fuselage skin, producing more drag than the flush-mounted units of the two prototypes. However, the increased pressure recovery was deemed to be worth the extra drag.

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During test and evaluation, numerous changes were progressively incorporated in the F4H-1. Blocks 2 and 3 were regarded as pre-production, with the remaining 24 being production machines. The standard engine for both blocks was the J79-GE-2 or -2A.

Among the most significant of the changes incorporated during the production run of the F4H-1 was a change in the geometry of the air intakes. This new intake geometry was first fitted to F4H-1 BuNo. 145307, the first Block 2 aircraft. The upper air intake lip extension that had been employed by earlier Phantoms was eliminated. The outer lip of the inlet now appeared straight from the side view, but sloped forward from bottom to top. The fixed splitter plates were replaced by a combination of a ten-degree variable ramp mounted aft of a fixed five-degree ramp. The inner splitter plate was made much larger and now stood 3 inches away from the wall of the fuselage. The inner splitter plate had 12,500 tiny bleed air holes on its surface through which boundary layer air was sucked by aft-facing ejectors.

Boundary-layer control was achieved via compressor air blown over the leading- and trailing-edge flaps. This system was first tested on BuNo 143392 (the fifth and last pre-production F4H-1F) and was later adopted as standard for production F4H-1s. From BuNo 145307 onward, the high-pressure blowing system along the wing leading edges and

flaps was made fully operative, and was retrofitted to two earlier aircraft.

The radar fitted to the early F4H-1F was the I/J-band APQ-72, but initially still with the 24-inch reflector. This radar was sometimes referred to as the AN/APQ-50 (Mod). Attachments for five (and later 9) of the original 11 pylons were restored, with the inboard wing pylons each carrying either an extra Sparrow or a pair of Sidewinders (one on each side of the pylon).

An AAA-4 infrared search and tracking sensor was added in a prominent bulge underneath the radome. It was fitted (or retrofitted) from F4H-1F number 5 (143390) onward. This sensor was only the second IR sensor to enter service outside the USSR. It required radar data for range information.

A retractable inflight refuelling probe was added to the right side of the cockpit. When retracted it was almost invisible, but when extended it protruded out about four feet to the right of the windshield. The mounting of this probe required the elimination of the right console in the rear cockpit and the redistribution of some instruments.

360 degree steering capability for the nose landing gear was introduced. The AJB-3 weapons delivery set incorporating a loft/toss-bombing computer was fitted, as well as the Collins ASQ-19 communications/navigational/identification package. However, these early aircraft were not capable of achieving full operational capability with these systems.

Production block 3 introduced a new cockpit and a new and larger nose. In the interest of aerodynamic efficiency, the top line of the rear-seat canopy of the Phantom was initially flush with the top of the rear fuselage. This arrangement was found to offer inadequate forward view for the pilot, a critical requirement for a carrier-based aircraft. In response to crew complaints about poor visibility, McDonnell redesigned the cockpit and raised the seats 23 inches higher and fitted new and more capacious cockpits. This raised the canopies over the top line of the fuselage and improved forward visibility for the pilot and increased headroom for the radar intercept operator sitting in the rear seat. In addition, a revised and larger radome was fitted in order to provide space for the new 32-inch dish that was fitted to the Westinghouse AN/APQ-72 radar in place of the AN/APQ-50 Mod and its 24-inch dish. The AAA-4 infrared sensor and its characteristic undernose pod were retained. This AN/APQ-72 radar incorporated an APA-157 CW illuminator to provide AIM-7 Sparrow

compatibility. Both the new radar and the revised cockpit were initially fitted to F4H-1F BuNo 146817, the first example of production block 3.

BuNo 145310 (the ninth F4H-1F and the fourth production machine) was fitted with multiple bomb racks which enabled it to carry as many as 22 500-pound bombs underneath the fuselage and inner wing sections. However, the Phantom was at that time viewed primarily as a shipboard interceptor with only a secondary attack capability, and this system was not adopted for production F-4As or Bs. However, it led later to the F-4C tactical fighter for the USAF.

In service, most late F-4As incorporating all of these changes were re-engined with J79-GE-8 engines rated at 10,900 lb.s.t. dry and 17,000 lb.s.t. with afterburning. This increased thrust more than made up for the increased drag produced by the higher canopy. The Phantom had a thrust/weight ratio that had never before been achieved by any fighter, and a ratio exceeding unity was often achievable in practice, enabling the aircraft to continue to accelerate while traveling straight up.

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As early as 1960, the US Navy began to form the first Phantom-equipped Replacement Air Group (RAG), a squadron designed to train future pilots and backseat radar interception operators. The first RAG was VF-101, based initially at Key West, Florida then transferred to NAS Oceana in Virginia. Since the Navy had not operated a two-seat fighter since the Douglas F3D-2 Skyknight of Korean War vintage, several Skyknights were rescued from the boneyard at Litchfield Park in Arizona and converted to the training role under the designation F3D-2T-2 (later changed to TF-10B in 1962). The other early Phantom RAG was VF-121 based at NAS Miramar in California. When serving with the VF-101 and VF-121 replacement squadrons, the F-4As were sometimes designated TF-4A to reflect the fact that they were not considered as being up to combat standards.

On September 5, 1960, Marine Lt.Col. Thomas H. Miller used F4H-1 BuNo 145311 to set a new 500-km closed-circuit speed record of 1216.78

mph. On September 25, 1960, Commander John F. "Jeff" Davis averaged 1390.21 mph over a 100-km closed course 45,000 feet over the Mojave Desert.

The Navy also launched a project known as *Sageburner*, designed to set new speed records at low altitudes with their Phantoms. Initial efforts ended in tragedy. On May 18, 1961, Commander J. L. Felsman was killed when his F4H-1F BuNo 145316 crashed while attempting to set a new low-altitude speed record. Pitch dampener failure led to pilot-induced oscillations, causing his Phantom to break up in flight and explode in a fiery crash. The Navy was more successful in its next attempt to set a new low-altitude speed record on August 28, 1961, when Lts Huntington Hardisty (pilot) and Earl De Esch (RIO) flew F4H-1F BuNo 145307 at an average speed of 902.760 mph over a 3 km low-altitude course at the White Sands Missile Range in New Mexico. The maximum altitude reached during this flight was only 125 feet, fully living up to the name of the project--*Sageburner*. 145307 was later turned over to the National Air and Space Museum. I don't know where it is currently displayed--presumably it is sitting in one of the hangars at the Paul Garber restoration facility at Suitland, Maryland.

On May 24, 1961, the US Navy launched Project *LANA*, where the initials stood for "50th Anniversary of Naval Aviation", the L standing for the Roman numeral 50. This was a transcontinental Bendix Trophy Race speed dash from California to New York. Five F4H-1Fs took off at timed intervals from Ontario, California and set out for NAS Brooklyn (formerly Floyd Bennett Field). They made four supersonic dashes, separated by three subsonic mid-air refuellings by tanker-configured Douglas A3D-2 Skywarriors. Three of the Phantoms finished the journey, shattering the record set back in November of 1957 by a USAF McDonnell RF-101C Voodoo. The top speed, set in aircraft 148270 piloted by Lt. R. F. Gordon and Lt(jg) B. R. Young, was an average of 869.73 mph.

On September 18, 1962, the J79-GE-2/2A powered F4H-1F was redesignated F-4A in accordance with the new Tri-Service designation system. The J79-GE-8 powered F4H-1 was redesignated F-4B.

Only 45 F-4As were built before production switched over to the F-4B. Most of the 45 F-4As built served in research and training roles, and very few ever reached squadron service as they were not considered fully operational. Aircraft from Block 3 onward served in the East Coast and West Coast RAGs to train crews and to perfect operational techniques.

Only a handful of F-4As remain in existence. 143388 is in the US Marine Corps Museum and 148275 (the last F-4A built) is at the US Naval Academy. 145307 is presumably kept at the Paul Garber facility, awaiting a suitable display location.

Serials of F-4A:

143388/143392	McDonnell F4H-1F (F-4A-1-MC) Phantom II
145307/145317	McDonnell F4H-1F (F-4A-2-MC) Phantom II
146817/146821	McDonnell F4H-1F (F-4A-3-MC) Phantom II
148252/148261	McDonnell F4H-1F (F-4A-4-MC) Phantom II
148262/148275	McDonnell F4H-1F (F-4A-5-MC) Phantom II

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