F-4 Phantom Guide for the Masses

The various F-4 versions in a nutshell

US Navy Fighter Phantoms

F-4A: post 1962 designation given to the first 47 Phantoms produced originally as the F4H-1. These were essentially pre-production planes and prototypes with the later ones getting some features of the F-4B. The first 15 airframes retained the original F4H-1 cockpit shape and smaller radome nose while the remainder got the classic F-4 cockpit and radome. The earliest F4H-1s (first five or six I believe) also had intakes that swept back on the upper curve before going straight down on the sides just behind the intake ramp (shaped sort of like an oversized F-5A/B intake) while later ones utilized intakes that became standard on production Phantoms. The F4H-1 Phantoms were used to set and break the majority of aviation records in the early 1960s, although some Bs were used as well.

F-4B: First major production variant. Main features: thin wing with no bulges above and below, unslotted stabilizers until very late production batch (1966?), short burner cans, thin gear tires, IR seeker bulge below the nose. All Navy Phantoms mount a retractable NATO style fuel probe that folds cleanly into the right side of the nose next to the rear seat. Since some model kits use the same fuselage for USAF and Navy types, there might be fuel probe door lines that have to be removed/filled. Similarly for a Navy cockpit, there is a left side wall bulkhead that needs to be added to the rear pit (because the fuel probe mechanism sits behind it). Navy Phantoms also have a rectangular shaped bump on the top of each wing (represented in 1/48 Hasegawa kits, although a bit too pronounced, so they should be reduced or replaced) and catapult launch bridles. Inboard wing pylons on Navy Phantoms are straight edged, not curved like USAF pylons.

F-4G (Navy version): About a dozen F-4Bs were retrofitted with a two way data link system with automatic carrier landing mode. Equipment stored in a bay with room made by sizing down one of the fuel cells and creating an acess hatch on top of the fuselage to access the equipment. Aircraft converted back to F-4Bs, although the hatch still remained in them.

F-4J: Improved model with many refined features. Main changes from B was the inclusion of bulged wing to house larger size 11.5 inch tires, No IR seeker bulge under the nose (a couple VX-4 test birds mount them though), slotted stabilizers and longer burner cans. Aircraft also gained a pair of ECM antenna fairings on the intakes.

F-4N: Refit of F-4B to more closely match improvements of the F-4J. Slotted stabilizers fitted and ECM antenna fairings on intake sides. The ECM fairings on the N model are longer then those found on the F-4J. Aircraft retained thin wing, short burner cans and IR

seeker housing under the nose.

F-4S: Refit of F-4J. Main difference was the incorporation of a slatted wing, similar (but not identical) to that found on F-4E. The F-4S was also the ONLY Navy Phantom type to mount rectangular yellow Slime lights, like what USAF Phantoms in the 1970s received.

US Air Force Fighter Phantoms:

F-110A Spectre: Original designation for Air Force Phantom until USAF was mandated to standardize name and type designation with Navy type (becoming the F-4C). First couple dozen Phantoms (reports say 29) sent to the Air Force were essentially F-4Bs and used for training until the first F-4Cs came on line. These planes were identical to F-4Bs except for the USAF titles.

F-4C: First major USAF production variant. Main features: bulged wing top and bottom, unslotted stabilizers, short burner cans, larger main wheels and gear tires (from 7.7 inch Navy high pressure tires to 11.5 inch wider tires), IR seeker bulge below the nose (no IR seeker mounted though), short burner cans, flight controls for rear seat. In flight refuelling boom recepticle in spine of aircraft, resulting in a cover door being mounted there (standard to all USAF F-4 variants). USAF based Phantoms do not have the rectangular bulges on the wings found on Navy Phantoms (see Navy F-4B description) and they do not have catapult launch bridles either. Nose gear front door also equipped with different landing lights then Navy Phantoms, which featured colored lights as part of the carrier approach system for Navy jets. Rounded leading edge weapons pylons for the inboard wings also introduced on the F-4C around 1966 (RF-4C and Navy variants utilize straight leading edge pylons, as did C models prior to 1966-67 Nam deployments).

F-4C Wild Weasel: A small number of F-4Cs were equipped with special radar detection and jamming equipment for SAM hunting. Differences include RWR blisters mounted in the IR seeker bulge below the nose, two radar detection blisters just behind the nose at 10 and 2 o'clock positions, an additional pair of RWR antenna ports on the intakes just behind the leading edge of the wings, and two antenna blisters mounted on the dragchute door. Unofficial designation for the planes was EF-4C and it is referred as that in some publications.

F-4D: Second major USAF variant optimized for more capability and externally very similar to F-4C, hence most F-4C kits out there are designated F-4C/D. Bulge under nose different shaped to house elements of an ECM unit. Some early Ds were delivered without the bulge, but it was soon retrofitted. Iran also got F-4Ds without the bulges at all.

F-4E: Definative USAF variant. Nose profile changed extensively to fit internally mounted M61 Vulcan cannon and different from earlier Phantoms. Gun muzzle shape changed from early to late F-4E versions (to help prevent gun gas injestion during firing of the gun, all planes eventually retrofitted with late style). Early birds had same wing as F-4C and D versions (also known as the Hard Wing). Other feature difference included

longer burner cans and slots on the horizontal stabilizers.

In June 1972, a slatted wing became standard on the F-4E with pretty much every early F-4E still flying being retrofitted to this configuration by the late 1970s. Pretty much all birds that fought in Vietnam had the hard wing. Israeli Phantoms that fought the Yom Kippur war and engagements prior to this also had the hard wing and so did a few Iranian (IIAF) Phantoms delivered in the early 1970s. Other main external feature mounted from the mid 1970s and 80s was TISEO, an optical tracking camera port on the left wing root for visual ID of distant aircraft targets. USAF and IIAF (later IRIAF) F-4Es mounted TISEO, not sure about Israeli ones.

F-4G (USAF version): Based on the F-4E and optimized for Wild Weasel anti-SAM strikes. Major change was replacement of the internally mounted Vulcan cannon with special ECM and detection equipment giving the plane a very different looking nose. Tail also has a distinctive bulge antenna at the top. F-4Gs have slatted wings.

Recon Phantoms:

RF-4C: USAF Phantom variant with new nose design mounting recon cameras. Early RF-4s featured a squared off lower camera bay while later ones (with some intermeshing of noses during production) featured a lower nose with a slightly more rounded appearance. Main features: Short burner cans, flight controls for the aft cockpit, unslotted stabilizers and two enclosed bays on fuselage in front of tail for ejection of photo flash cartridges. All camera nose Phantoms have NO recesses in the fuselage for Sparrow missiles, meaning that any ECM pods mounted have to be carried on pylons and not sem-recessed in a Sparrow bay. RF-4C and B models use straight Navy style inboard wing weapon pylons.

RF-4B: US Navy Phantom variant ordered after success of the USAF version. All RF-4Bs flown by USMC units. Main distinguishing features are the short burner cans and slotted stabilizers along with carrier specific equipment (catapult bridles etc.). Most versions mounted the square nose lower camera bay and the thin wing of the F-4B. Last ten jets off the production line (with 157xxx numbers) featured the bulged hard wing found on the F-4E and J variants to house the larger main gear and tires. Last three jets also featured the more rounded RF-4 lower nose. Retrofitted RF-4Bs included bulges on the intakes for ECM equipment in a manner similar to those found on F-4Ns. Additional retrofit later included longer burner cans and slotted stabilizers. The late RF-4B with the J style wing is the version done by Hasegawa in 1/48 scale and requires wing mods to make it a thin winged RF-4B.

RF-4E: Externally almost identical to RF-4C. Main distinguishing difference from the C are longer burner cans like those found on the F-4E. RF-4Es also utilize F-4E style inboard wing pylons with curved leading edge to mount ECM pods from time to time (depending on operator). All RF-4Es used by export countries.

Initial production batch (mostly delivered to West Germany) featured square shaped

lower nose while most of the production run featured rounded nose bay. Most planes utilized hard wing, although very late production batch delivered to Turkey and Greece was done with slatted wings as the production line in St. Louis was set up for it. Turkey and Greece also flew hard wing Recon Phantoms as well, so check references. Israeli RF-4Es supposedly wired for Sidewinder missile capability, making them the only RF-4s equipped this way (although the USAF retrofitted a few RF-4Cs with this capability around Desert Storm).

"Phoreign" Phantoms:

F-4K (FG-1): Delivered to Royal Navy. Very similar in features to F-4J, except aircraft fitted with Spey turbofan engines in place of J79s, resulting in a different center fuselage profile. The intakes were larger and the fuselage around the engine exhausts was wider and deeper as well. Aircraft featured hard bulged wing and slotted stabilizers of F-4J. Unique feature on the K includes an extra long extending nose strut to raise nose by 40 inches for cat launches off of Royal Navy carriers, a folding radome and catapult bridles (like other Navy Phantoms). Aircraft sent to RAF when RN got out of fixed wing operations (until Sea Harrier came on line anyway).

F-4M (FGR-2): Delivered to Royal Air Force. Very similar to F-4K, except for deletion of carrier specific equipment, such as the extra long extending nose strut. M model also had an unslotted stabilizer. Externally the K and M models are almost identical as both were used side by side in the RAF. The nose strut on the K model is the big giveaway. Many aircraft of both the K and M types (but not all) got a squared off RWR antenna housinng on the tip of the tail fin and this is one easy identifier for British Phantoms. British Phantoms utilize UK style harness and buckles on their cockpit ejection seats.

F-4J(UK): "Slightly" modified F-4Js (15 in number) sent to the UK to replace Spey engined Phantoms sent to the Falklands to beef up the island defenses there after the Falklands war. Externally almost identical to US Navy F-4Js in terms of equipment fit (down to the ECM pods on the engine intakes). Unlike the Spey engined Phantoms, the Js did not mount the square RWR antenna housing in the tail. From a modeling standpoint, the F-4J(UK) looks like a Navy Phantom in terms of external features with maybe an antenna mount or two changing.

F-4F: Detuned F-4E Phantom delivered to West Germany. Included slatted wing of the F-4E, but had an unslotted stabilizer. German F-4s also utilize the British style seat harnesses in the cockpit, not the US type.

Kurnass 2000: Israeli Phantom upgrade. Most changes internal and visible only in the cockpit (added CRTs I believe). IAF Phantoms prior to the 2000 refit also mounted a NATO style fixed refuelling probe on the right side of the fuselage just behind the cockpit (retrofit phased in during the 1980s). So having a probe doesn't necessarily mean that an IAF Phantom is a Kurnass 2000, but all Kurnass 2000's have the probe. Probe also fitted to IAF RF-4Es as well (not sure about the F-4E(S) models since they tended to favor low drag for high speed at altitude). Some Kurnass 2000 internal upgrades made

available by Israel to other countries (such as Turkey which had some of its F-4E fleet updated). Turkish RF-4Es and Spanish RF-4Cs have also been seen with the Kurnass style refuelling probe on the fuselage.

F-4E(S): Israeli Phantom mounted with special nose containing high altitude camera equipment. Mostly used for overflights of threat countries. Nose profile is very different from all other Phantom versions and only a few resin/vac companies have done them.

F-4EJ: Japanese produced variant manufactured by Mitsubishi under license to MDD. Essentially a hard wing F-4E with slotted stabilizers and some equipment differences.

F-4EJ Kai: Upgraded Japanese variant with many internal changes to give Japan's aircraft more multi-mission capability. Main distinguishing features that can be seen are reinforcement strips on the composite radome and some RHAW antenna fairings on the edges of the wings (forming a double blister shape at the front edge) and two small antenna blisters on tail fin tip. There are additional antenna changes as well from earlier F-4EJs. Recent Japanese RF-4Es (the ones with the camera nose) also mount the RHAW wingtip fairings and tail antennas of the EJ Kai as well.

A confusing thing is some of the F-4EJs not fully converted to EJ Kai standard are designated RF-4EJs, except they don't have the RF-4 nose and mount special recon camera pods on the centerline instead. Japanese RF-4Es are known as RF-4Es since they were built by MDD, not Mitsubishi in Japan like the EJs were. Another confusing thing is some publications call both the camera pod and camera nose equipped RF-4s the RF-4EJ Kai and make no distinction between the two types. When selecting a kit of a JASDF RF-4, look at the box art to make sure it is either a camera nose bird or one with a pod to avoid getting surprised.

Feel free to point out any mistakes or things I've missed and I will update this as needed.

This post has been edited by **Jay Chladek**: 26 November 2008 - 08:16 AM

Addendum:

External refuelling probe was fitted to all variants of IAF Phantoms, not just the Kurnass 2000. Biggest giveaways were the Hebrew script *Kurnass 2000* on the fuselage side and a large black rectangular shaped antenna under the nose gun fairing.

IAF Phantoms did still have the boom refuelling door on the spine, and the door actually raised even when the boom was fitted to allow the refuelling system to engage.

The F-4F were delivered with slatted (soft) wings, and remained slotless stabs throughout.

The Japanese recce nose Phantoms were designated RF-4E, and were built by MDD, the

later conversion of the F-4EJ to the recce role were designated RF-4EJ, a common misconception.

46 RF-4Bs were built, most of these with the tin/unbulged wings and square nose profile. Only the last **TEN** (not 12 as incorrectly quoted several places), i.e. the ones in the 1573xx BuNo series, had the bulged wings. The last three had the rounded nose profile. Retrofits also included slotted stabs and longer burner cans.

F-4J (UK) The 15 F-4J with some British specific equipment, sent to replace FGR 2's sent to the Falkslands after the 82 war. Served until 1991

How about the (E)F-4C, the Wild Weasel 4, of which 36 were produced (modified from standard F-4C's). 12 of these saw combat in the latter days of the Vietnam conflict with the 67th TFS, whilst 12 were stationed at Spangdahlem with the 81st TFS and the last 12 went to the 35th TFW at George AFB.

And then the were the 2 F-4D's converted to Wild Weasels under Project Wild Weasel IV-B, though neither of those made it to operational status.

The ECM fairings on F-4Ns were for the Sanders ALQ-126 deceptive jammer. It was more than a noise jammer, it could analyze the incoming radar signal and develop a return signal that would fool the receiver of the attacker's radar and break its lock by returning false range data. There were also antennae for the system on the bottom of the fuselage.

The IR fairing under the radome hadn't contained the AAA-4 IR seeker for eons by the time of the N upgrade. It contained the forward RHAWS antennae for the ALE-45 and the antenna for a radar beacon system.

I think the N upgrade also changed the search radar from the APA-157 to the APA-170. I'm not sure about the missile guidance radar, it might have been the APQ-72 in Bs too.

Another addition to Ns during the upgrade was the VTAS/SEAM system. Visual Target Aquisition System/Sidewinder Expanded Aquisition Mode. It was made by Honeywell I think. It had a computer that mounted on the floor between the RIO's boots, an IR transmitter on each side of the front canopy sills, four IR receivers and a target reticle projector in the pilot's helmet and controls. When it was turned on, a reticle was projected on the inside of the pilot's visor in front his right eye. The reticle would be calibrated to the pilot's line of site and his head motion tracked via the IR receiver/transmitter set. Either the radar antenna (VTAS) or the Sidewinder's seeker head (SEAM) could be slaved to the pilot's line of site. It was pretty cool, the radar would be in a normal scan and the pilot could look at a target anywhere inside a 120 degree cone and push the PLM switch on the stick and the antenna would instantly track to his line of sight. Pulling the PLM switch to the second detent would cause the radar's range gate to sweep in or out, depending on the position of a switch on the instrument panel, and lock on to the first target it detected.

SEAM could also act independently of the helmet sighting system. It allowed the Sidewinder seeker head to be scanned like a little radar dish. It scanned in a figure eight pattern of around 20 degrees I think. If it detected a heat source it would lock on and track it up to a wider off boresite angle. I don't know how far, but probably as far as they can now.

QF-4's are an odd bunch, especially the USN versions since they were used more for testing purposes instead of targets, unlike their USAF counterparts.

While some USN QF-4's were used as missile targets, it was common to use them as launchers and/or controllers for smaller-scale drones, or as carrier aircraft for new weapons, or to simulate a missile for radar/countermeasures work.

Note that test equipment would be added as needed for a particular program, so there is some variation.

External differences:

QF-4B - 2 Command and control antennae under forward fuselage, one on top behind radome.

QF-4N - 2 Command and control antennae under forward fuselage, may or may not have ejection seat in rear cockpit. Ma have other blade antennae on spine.

QF-4S - 2 Command and control antennae under forward fuselage, normally has both ejection seats.

The USAF ones had more 'lumps-n-bumps' than their USN counterparts, with scoring antennae on the wingtips, and control antennae on the spine and a disc-shaped one at the leading edge of the fin at the peak.

Here some notes on the grey schemes applied to USAF F-4C/D/E/G and RF-4Cs:

The "**early Hill I**" had 3 colors:
36118 Matt Gunship Grey (Uppersurfaces)
36270 Matt Mid Grey (Uppersurfaces)
36375 Matt Lt Compass Grey / Pale Grey (Radome and undersurfaces)
This last color varied considerably, as on some aircraft it was even similar to the Navy pale grey- you will see a radome painted in a much lighter shade, really contrasting with the other two greys.

The simplest way to see if a F-4 is painted in a Hill 1 camo is to look at her stabilizers. These were always painted in Mid Grey on Hill I but Gunship Grey on Hill II camouflaged F-4s.

Other features were (normally) the lack of an antiglare gunship grey surface around the canopy and a pale grey radome, but not always, as there were small modification at unit /airframe level.

Later, a "**modified Hill I**" camo appeared, with
36118 Matt Gunship Grey and
36270 Matt Mid Grey
being used for the uppersurfaces, the undersurfaces being now painted in **Mid Grey 36270**. Only the radome,and sometimes the underwing pylons and fuel tanks remained in **Pale Grey.**
Mid Grey stabilizators were still a "quick identifier"

Still later, the newer **Hill II** has been applied to the fleet.
The colors were now
26118 Semi Gloss Gunship Grey and
26270 Semi Gloss Mid Greywith a Gunship Grey pattern on the upper and **lower** surfaces of the fuselage and wings. The stabilizators were now Gunship Grey, and an standardized antiglare gunship grey surface around the canopy and, symetrically, under the forward fuselage, appeared.

The **Cloud Grey** scheme used the same semi gloss colors as Hill II, but with a more "disruptive" Gunship Grey pattern, the undersurfaces being Mid Grey only.