DC DESIGNS F4 PHANTOM II

OPERATIONS MANUAL

Welcome to the *DC Designs* F4 Phantom II. This manual will guide you through the operation of the aircraft, and ensure that you enjoy flying the airplane.

It should be noted that although this rendition of the F4 Phantom II is not "*study-level*", it is sufficiently complex to require some training to master the airplane. To get the best out of the F4 Phantom II, it is required to read this manual in full.

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GENERAL PERFORMANCE TABLE

- **Crew:** 2
- **Length:** 63 ft 0 in (19.2 m)
- **Wingspan:** 38 ft 5 in (11.7 m)
- **Width:** 27 ft 7 in (8.4 m) wing folded
- **Height:** 16 ft 5 in (5 m)
- **Wing area:** 530 sq ft (49.2 m^2)
- **Aspect ratio:** 2.77
- **Empty weight:** 30,328 lb (13,757 kg)
- **Gross weight:** 41,500 lb (18,824 kg)
- **Max takeoff weight:** 61,795 lb (28,030 kg)
- **Maximum landing weight:** 36,831 lb (16,706 kg)
- **Fuel capacity:** 1,994 US gal (1,660 imp gal; 7,550 L) internal, 3,335 US gal (2,777 imp gal; 12,620 L) with 2x 370 US gal (310 imp gal; 1,400 L) external tanks on the outer wing hardpoints and either a 600 or 610 US gal (500 or 510 imp gal; 2,300 or 2,300 L) tank for the center-line station.
- **Powerplant:** 2 × General Electric J79-GE-17A after-burning turbojet engines, 11,905 lbf (52.96 kN) thrust each dry, 17,845 lbf (79.38 kN) with afterburner

Performance

- **Maximum speed:** 1,280 kn (1,470 mph, 2,370 km/h) at 40,000 ft (12,000 m)
- **Maximum speed:** Mach 2.23
- **Cruise speed:** 510 kn (580 mph, 940 km/h)
- **Combat range:** 370 nmi (420 mi, 680 km)
- **Ferry range:** 1,457 nmi (1,677 mi, 2,699 km)
- **Service ceiling:** 60,000 ft (18,000 m)
- **Rate of climb:** 41,300 ft/min (210 m/s)
- **Lift-to-drag:** 8.58
- **Wing loading:** 78 lb/sq ft (380 kg/m^2)
- **Thrust/weight:** 0.86 at loaded weight, 0.58 at MTOW
- **Take-off roll:** 4,490 ft (1,370 m) at 53,814 lb (24,410 kg)
- **Landing roll:** 3,680 ft (1,120 m) at 36,831 lb (16,706 kg)

The F4 Phantom II is one of the most famous aircraft in the world, with a service life that has now exceeded 60 years in countless air forces around the world. Originally developed as a Mach 2 interceptor, the airplane was eventually adapted for use in a multitude of rolls, and served in many of the worlds' major armed conflicts.

Note: Weapons are only available on versions of this aircraft purchased *outside* of the Marketplace, i.e, from third-party stores. This is due to Microsoft Terms and Conditions for sale on the in-game Marketplace.

AIRCRAFT FAMILIARISATION

The F4 Phantom II package by DC Designs contains three variants – the F-4J, F-4E, and the FGR2 variant of the Royal Air Force and Fleet Air Arm. Each variant differs slightly from each other externally due to the different requirements and demands of their respective operators. The F-4J was the original upgraded variant, while the F-4E was an upgraded version with an internal gun for the United States Air Force which was widely exported to international operators. The British Phantom FGR2 was upgraded with more powerful Rolls Royce Spey engines, to enable the big Phantom to operate off the smaller British aircraft carriers then in service with the Royal Navy.

The Phantom FGR2 in the Royal Navy's Fleet Air Arm colours.

The cockpit of the F4 Phantom II is devoid of many of today's familiar digital displays. The glass "HUD" is in fact a reflector gunsight only. The radar screen has several different modes and will track both air and ground targets within MSFS multiplayer.

The vast majority of displays and instruments are analogue in nature, and there is no fly-by-wire system in the F4 Phantoms. Everything is "old school", requiring greater airmanship on the part of the pilot to get the best out of the aircraft.

FLYING THE F4 PHANTOM II

The DC Designs F4 Phantom II is not designed to be "*study level*". However, it is intended to be as accurate in terms of aerodynamics as we can make them in MSFS. We also like to include the "*quirks*" of any aircraft we build, in order to try to give the user some idea of what it might be like to fly these aircraft in real life.

It is required that you learn the limitations and systems of this rendition of the aircraft in order to master it. The Phantom is a product of the Cold War and as such may require an adjustment on the part of the pilot to appreciate its finer points.

The Phantom is very stable in the landing configuration, but has a tendency to depart controlled flight at low speed and high alpha (Angle of Attack). Later versions of the Phantoms were modified to reduce this tendency, but none of the variants in this package feature those modifications. Pilot caution is advised when flying below 250 knots indicated while attempting high-G manoeuvres.

CHECKLISTS

The F4 Phantom II comes with a comprehensive Interactive Checklist inside the simulator, which you can use to ensure the proper start-up procedure. Just move your mouse up to the top of the screen and select the “Checklist” option. Be certain to check your fuel quantity to make sure you have enough for your flight.

The checklist will also highlight many of the secondary switches that have important functions, ensuring that you will know where everything is in the cockpit prior to your flight.

Aircraft weight is something that is important to *all* aircraft. All aircraft have a *maximum take-off weight,* which if exceeded can cause the airplane to fly poorly or, at worst, not fly at all and crash. For this reason, it is advised that you select both fuel and ordnance individually and not using the menu’s “payload” slider, as this can easily put the aircraft beyond its maximum take-off weight.

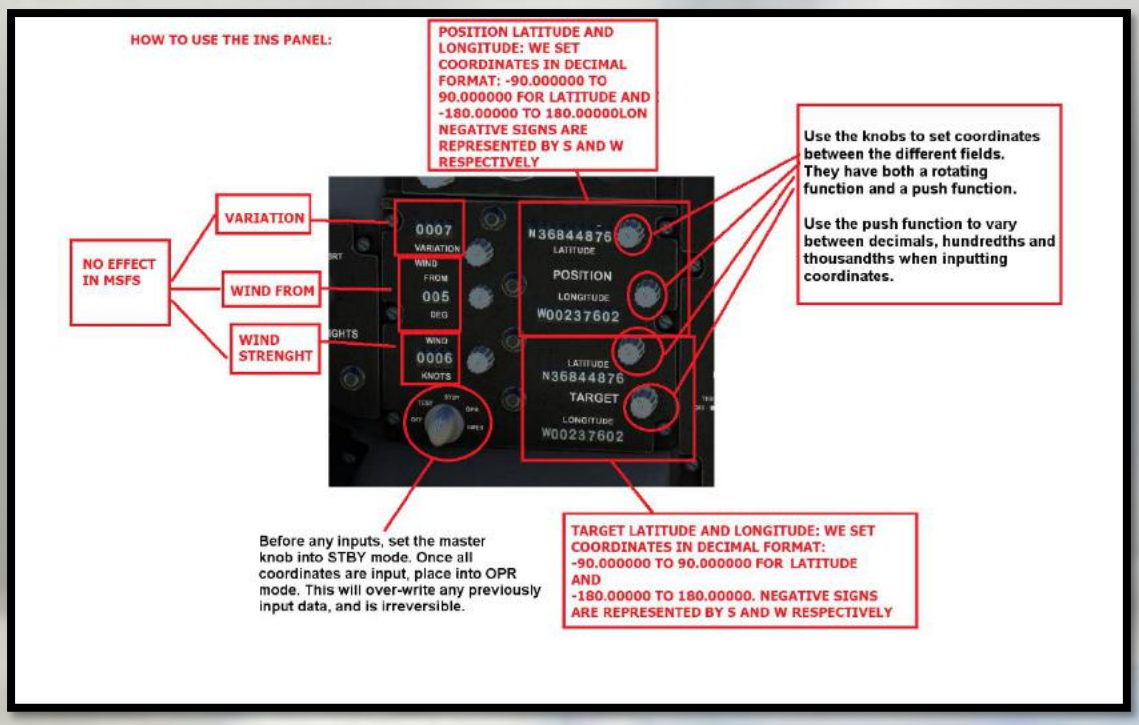
If you select a full load of ordnance on the F4 Phantom II, you must then sacrifice fuel-load to keep the weight below the maximum take-off weight. F4 Phantom II can take-off with external tanks, the required ordnance for the mission, and a low fuel-load before then

going to join with a tanker to air-to-air refuel. Once airborne, the aircraft could then fill up with fuel. You can do the same after taking off and climbing out, by extending the refuel probe – doing so will gradually increase your total fuel load.

In the above image, the pilot has selected an external centreline fuel tank, has fuel of 13,226 lbs, and has also loaded AIM-9 and AIM-7 missiles by typing in the relevant weights as listed in the stations on the right of the menu. Total weight is 46,794 lbs.

Inertial Navigation System

The Phantom comes with an INS system that allows the pilot to navigate to specific coordinates anywhere on the planet. Normal MSFS flight plans are also supported, but the INS simply gives the pilot a more realistic method of navigation, depending on requirements. The pin-point nature of the INS allows for navigation to a precise target on the landscape for instance, handy for simulating attack profiles on unsuspecting ground targets.



With your payload set, fuel checked and your flight plan set up, you're ready to fly.

AIR COMBAT MANOEUVRING

For the DC Designs F4 Phantom II, here are the basics of how to get the best out of your aircraft should you encounter a willing adversary in multiplayer;

Keep your energy up

Don't go into the fight at 900 knots with an eyeballs-out-G break into the enemy. Aim for 6-7Gs and maintain 'corner velocity' (460-500 knots). This will ensure the F4 Phantom's tightest turn *radius*, against its best turn *rate*, as you try to out-turn your opponent and gain the advantage by sliding into his 6 o'clock position. The Phantom pilot's motto was "*speed is life*" – stay out of the low airspeed regime to survive against a tighter-turning adversary, and try to keep the fight in the vertical.

The F4 Phantom II has a high thrust-to-weight ratio, making it an energy fighter, and using the vertical can also force an opponent to lose situational awareness.

On that note, last but not least, try to keep your eyes on your opponent…

"LOSE SIGHT, LOSE THE FIGHT"

INTERNAL LIGHTING

The F4 Phantom II cockpit comes with full night-lighting options, which can be dimmed using the control knobs near the lighting switches on the pilot's right-side panel.

LANDING THE F4 PHANTOM II

CONVENTIONAL LANDINGS

A recovery to the airbase is conducted with the aircraft entering the overhead pattern on the active runway heading, at 1,000ft and 350 knots. At mid-field, the aircraft conducts a 4G break into the downwind, slowing to 170 knots while lowering gear and full flaps. The pilot should check fuel and also calculate aircraft weight to ensure the F4 Phantom II is not too heavy to land, and trim the aircraft to be light on the stick at 170 knots.

Rely upon the AoA indicator to ensure correct glideslope – a green circle is what you're looking for. At this AoA, the aircraft's airspeed will take care of itself, based upon the All Up Weight at landing. Thus, there is no specific landing airspeed – it is variable with weight. AoA is all that matters.

A curved, descending finals approach is conducted, with the aircraft rolling out onto the final at the correct airspeed and angle-of-attack. Over the threshold the power is cut to idle, and the F4 Phantom II allowed to sink before touchdown at around 150 knots. Apply braking once all wheels are down.

CARRIER LAUNCHES AND LANDINGS

The F4J and FGR2 Phantoms are both capable of carrier launches and landings, on stock MSFS moving carriers as well as some commercially available add-on carriers. This is an evolving segment of aviation within MSFS at this time, so processes and procedures may change in the future. For launches, follow the instructions as presented by your carrier launch software.

For landings, the procedure is much as for landing at a normal airfield, except that this one is moving. Approach from astern the carrier, 800ft altitude with hook down, and after overflying the aircraft carrier to the starboard side, break left into the down wind and slow to 200 knots. Lower gear, full flaps, looking for 170 knots and 600ft altitude as you draw level with the carrier stern. Set Nose Wheel Steering to “High”.

Start a descending left turn toward the carrier, timing your turn to line-up behind the carrier at 450ft altitude. Look for the “meatball”, the landing lights system on the left side of the carrier deck, roughly amid-ships, and the line-up light on the carrier stern. Your process should be: AoA, line-up, ball, in that order – forget about airspeed, descent rate or any other factors. AoA, line-up, ball, over and over again all the way down until you

think you're about to hit the deck. Then advance the throttles to maximum afterburner in case you miss the wires.

If you catch the wires and land, quickly retract the hook and flap, and fold the wings before taxiing clear of the landing area.

The F4 Phantom II taxies best below 20 knots with slow turns. It can turn very tightly at slow speed to help moving around the crowded deck of an aircraft carrier.

As with all of our products, if a user wishes their aircraft to fly correctly, they must learn to fly that aircraft correctly. This rendition of the Phantom seeks to replicate that difficulty, but without removing the unique enjoyment of flying this remarkable aircraft in Microsoft Flight Simulator.

DEVELOPER NOTES

At the time of writing the manual for this aircraft's launch, Microsoft Flight Simulator is still in many ways a work-in-progress. Features that we expect to come to the flight simulator are not yet present, many variables are not yet active, and as developers we have not yet mastered all aspects of the simulator.

As time progresses, this and our other products will be continuously updated to match further advancements of MSFS. The new simulator has, we hope, many successful future years ahead of it, and as more features come on-line we will be keen to ensure that the Phantom remain at the cutting edge of what's possible for fighter aircraft. As with all launches by DC Designs, expect this rendition of the F4 Phantom II to get ever better as Microsoft Flight Simulator becomes more established at the forefront of flight simulation software.

CREDITS

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Manual	Dean Crawford
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CodenameJack447
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SOFTWARE PIRACY

This software is copy protected.

Recently, two commercial flight simulation developers purchased a clean computer and used it to download their own products from well-known piracy sites, so that they could see what had been done to them. Unsurprisingly, all of the products were bloated with malware – Trojans, data-mining software and others, some quite advanced and well-hidden from anti-virus software. Everybody who has ever downloaded pirated software from such sites now has those infections on their home computers. Anybody who thinks

otherwise, that piracy site owners create and pay for these sites out of the kindness of their hearts, is incredibly gullible.

A pirate, otherwise known as a thief, makes a profit from the sale of other people's hard work. In some cases he makes more profit than the publishers and developers make from the sale of an original title. Piracy is not just the domain of the casual domestic user in his or her back room, but is also a multi-million-pound business conducted by criminals often associated with the illegal drugs trade. Buying or downloading pirated copies of programs directly support these illegal operations.

Don't be fooled by a load of old tosh about file 'sharing'. The sites that host these 'shared' files cover their backsides with the excuse that they are simply a 'gateway' to the files. In fact, they actively encourage piracy and are often funded by advertising. Most of them are illegal money-laundering operations by another name.

The people who really suffer from game piracy are the artists, programmers and other committed game development staff. Piracy and theft directly affect people and their families. Loss of revenue to the games industry through piracy means many are losing their jobs due to cut-backs that have to be made to ensure developers and publishers survive. The logical outcome of this is that eventually the supply of flight simulation programs will dry up because developers think it is not worth the hassle.

It's not just copying software that is against the law. Owning copied software also constitutes a criminal offence, so anyone buying or downloading from these people is also at risk of arrest and prosecution.