F-15 C, D, E & I EAGLE

OPERATIONS MANUAL

Just Flight™

Operations Manual

Please note that Microsoft Flight Simulator (Standard, Deluxe or Premium Deluxe edition) must be correctly installed on your PC prior to the installation and use of this F-15 Eagle simulation.

CONTENTS

INTRODUCTION

The F-15 Eagle is an American all-weather tactical fighter aircraft designed by McDonnell Douglas (now part of Boeing). First flown in July 1972, the aircraft entered service in 1976 and has since served in almost every major conflict involving American forces.

It is among the most successful air-superiority fighter aircraft ever built, recording over 100 aerial combat victories for no loss, and has been successfully converted into an all-weather strike fighter, the F-15E Strike Eagle, with both types being exported to numerous foreign countries, including Israel, Japan and Saudi Arabia. Continuous enhancements and innovation have ensured the aircraft's continued service for many decades to come.

Included aircraft

F-15C Eagle

- 493rd Fighter Squadron, RAF Lakenheath
- 173rd Fighter Wing, Oregon Air National Guard
- 144th Fighter Wing, California Air National Guard
- 1st Tactical Fighter Wing, Langley AFB, Virginia

F-15D Eagle

- 493rd Fighter Squadron, RAF Lakenheath

F-15E Strike Eagle

- 336th Fighter Squadron, Seymour Johnson AFB, North Carolina
- 391st Fighter Squadron, ‘Bold Tigers’, Mountain Home AFB
- 391st Fighter Squadron, ‘Tiger Meet’ 2005
- 90th Fighter Squadron, Elmendorf Air Force Base, Alaska

F-15I ‘Ra’am’ Eagle

- N 69 Squadron ‘Patishim’ (Hammers)

Aircraft specifications

General characteristics (F-15C Eagle)

Crew	One
Length	63 ft 9 in (19.43 m)
Wingspan	42 ft 10 in (13.06 m)
Height	18 ft 6 in (5.64 m)
Wing area	608 sq ft (56.5 m^2)
Empty weight	28,000 lb (12,701 kg)
Gross weight	44,500 lb (20,185 kg)
Max. take-off weight	68,000 lb (30,844 kg) (F-15E Eagle, 81,000 lb)
Fuel capacity	13,455 lb (6,103 kg) internal (F-15E Eagle, 17,000 lb)
Powerplant	2 × Pratt & Whitney F100-PW-220 afterburning turbofans, 14,590 lbf (64.9 kN) thrust each dry, 23,770 lbf (105.7 kN) with afterburner

Performance

Maximum speed	Mach 2.5 (1,650 MPH, 2,655 km/h) at high altitude
	Mach 1.2, 800 kts (921 MPH; 1,482 km/h) at sea level
Combat range	1,061 NM (1,221 mi, 1,965 km) for interdiction mission
Ferry range	3,000 NM (3,500 mi, 5,600 km) with conformal fuel tanks and three external fuel tanks
Service ceiling	65,000 ft (20,000 m)
G limits	+9, -3
Rate of climb	50,000 ft/min (250 m/s)
Wing loading	73.1 lb/sq ft (357 kg/m2)
Thrust/weight	1.07 (1.26 with loaded weight and 50% internal fuel)

Armament (all types)

Guns

1× 20 mm (0.787 in) M61A2 Vulcan rotary cannon, 412 rounds

Hardpoints

11 in total, with a capacity of 17,750 lb (8,050 kg) external fuel and ordnance

Missiles

Air-to-air missiles:

- 4× AIM-9 Sidewinder
- 6× AIM-120 AMRAAM

Air-to-surface missiles:

- 6× AGM-65 E/F Maverick
- 4× AGM-84H/K Standoff Land Attack Missile Expanded Range (SLAM-ER)
- 6× AGM-88 HARM Anti-Radiation Missile (ARM)
- 4× AGM-154 Joint Standoff Weapon (JSOW)
- AGM-158 Joint Air-to-Surface Standoff Missile (JASSM)

Anti-ship missile:

- 2× AGM-84 Harpoon

Bombs:

- JDAM, up to 10× GBU-32/35/38/54 or 4× GBU-31
- Paveway series of laser-guided bombs
- Mk 80 series of unguided iron bombs
- CBU-78 Gator
- Mk 20 Rockeye II
- Mk-62/63/65 Quick Strike naval mine

INSTALLATION, UPDATES AND SUPPORT

You can install this F-15 Eagle software as often as you like on the same computer system.

To re-download the software:

1. Click on the 'Account' tab on the Just Flight website.
2. Log in to your account.
3. Click on the 'Your Orders' button.
4. A list of your purchases will appear and you can then download the software you require.

Accessing the aircraft

To access the aircraft in Microsoft Flight Simulator:

1. Click on 'World Map'.
2. Click on 'Aircraft Selector' (main menu, top left).
3. Select 'Jets' as the aircraft type.
4. Select the desired F-15 Eagle variant and livery.

Uninstalling

To uninstall this product from your system, select the appropriate option for your version of Windows from the Control Panel:

- 'Add or Remove Programs' (Windows XP)
- 'Programs and Features' (Windows Vista or 7)
- 'Apps & features' (Windows 10 or later)

Select the product you want to uninstall and then select the 'Uninstall' option, following the on-screen instructions to uninstall it.

Uninstalling or deleting this product in any other way may cause problems when using this product in the future or with your Windows set-up.

Updates and Technical Support

For technical support (in English) please visit the Support pages on the Just Flight website.

As a Just Flight customer, you can get free technical support for any Just Flight or Just Trains product.

If an update becomes available for this aircraft, we will post details on the Support page and we will also send a notification email about the update to all buyers who are currently subscribed to our Newsletter and emails.

Regular News

To get all the latest news about Just Flight products, special offers and projects in development, subscribe to our regular emails.

We can assure you that none of your details will ever be sold or passed on to any third party and you can, of course, unsubscribe from this service at any time.

You can also keep up to date with Just Flight via Facebook and Twitter.

WALK-AROUND

The F-15 Eagle is one of the most recognisable aircraft in the world, incorporating the classic, sleek lines of a fighter and utilising some of the latest advances in computer-controlled aerodynamics. The aircraft is also one of the largest fighters in modern service and often referred to as a 'flying tennis court' due to its visibility at long range during air-to-air engagements. However, this size has not dented the aircraft's combat record, with over one hundred air-to-air victories for no loss during 40 years of combat service.

The nose carries the forward landing gear, several sensors and, hidden inside the cone, a powerful Raytheon APG-70 radar. Operating in conjunction with USAF Boeing E3-D Sentry airborne-early-warning aircraft, the Eagle is able to use datalink communications to share tactical information emitted from powerful over-the-horizon radars, giving the crew unprecedented battlefield orientation while operating in-theatre.

The Eagle's broad wings and fuselage provide immense lift during high-alpha flight, while automatically controlled variable-incidence air intakes regulate the flow of air into each engine, ensuring maximum performance under heavy-G manoeuvring and high-alpha flight. Each wing carries three hardpoints on a single mount for short- and medium-range missiles as well as external fuel tanks, while the lower fuselage can carry a central fuel tank and four AIM-120 AMRAAM medium-range missiles.

The F-15E Strike Eagle differs slightly from the C variant in that it is configured with large side-mounted conformal fuel tanks and is designed to carry a far greater range of ordnance than its air-superiority cousin.

The F-15E Strike Eagle can carry a huge array of air-to-ground munitions, as well as counter-ECM and FLIR mounts on the forward lower fuselage. The extra ordnance gives a greater maximum take-off weight of 81,000 lb and an associated reduction in manoeuvrability compared to the C model. Flight surfaces are computer-controlled fly-by-wire in all variants and operate in concert with pilot input to provide the best performance possible throughout the flight envelope.

The Eagle features a twin-tail arrangement, with twin rudders above all-moving 'tailerons'. A pair of immensely reliable Pratt & Whitney F100-PW-220 afterburning turbofans are centrally positioned, thus minimising asymmetrical thrust in the event of an engine failure.

With each engine delivering an astonishing 23,770 lb of thrust in maximum afterburner, the F-15C Eagle has a thrust-to-weight ratio of above unity even at combat weight, yielding tremendous performance in the close-combat arena despite the aircraft's size. It is one of the few aircraft ever built capable of accelerating while in a vertical climb.

PANEL GUIDE

The F-15 Eagle is a complex aircraft and this simulation contains two distinct cockpit layouts, representing the two different types. This first section will deal with the F-15C Eagle, while the next will detail the F-15E Strike Eagle's twin-seat arrangement.

The cockpit of the F-15E Strike Eagle

The F-15C cockpit can be divided into six main areas:

- Main panel
- Up Front Control Panel
- MFD
- Engine controls
- Head-Up Display
- Side panels

The following pages will guide you through these areas.

Moving around the cockpit

To move around the cockpit, you can set Microsoft Flight Simulator to use the hat switch on your joystick, move the mouse while holding the centre button down or use your keyboard arrow keys.

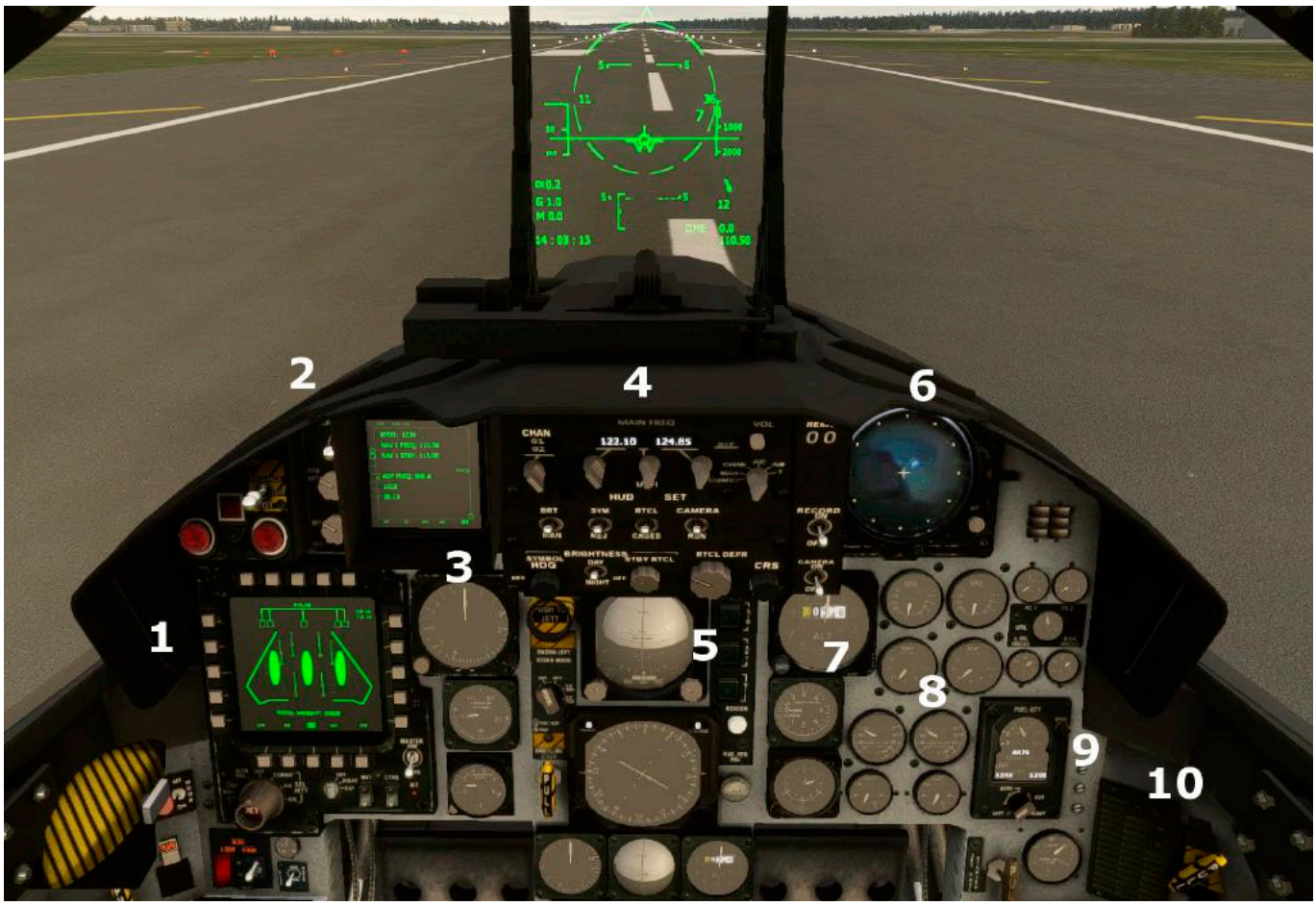
If you look behind you when in the pilot's seat of the F-15D, E and I, you will be able to see your WSO scanning the skies. Likewise, in the WSO seat you will be able to see your pilot flying the aircraft. These figures disappear when you're in their seats so that you can see all of the controls more easily.

The DC Designs F-15 Eagles have been tested for use with Virtual Reality using the Oculus Rift CV1 and have been found to operate normally under all circumstances. To active VR mode, use [Ctrl]+[Tab] on your keyboard.

Virtual Cockpit views

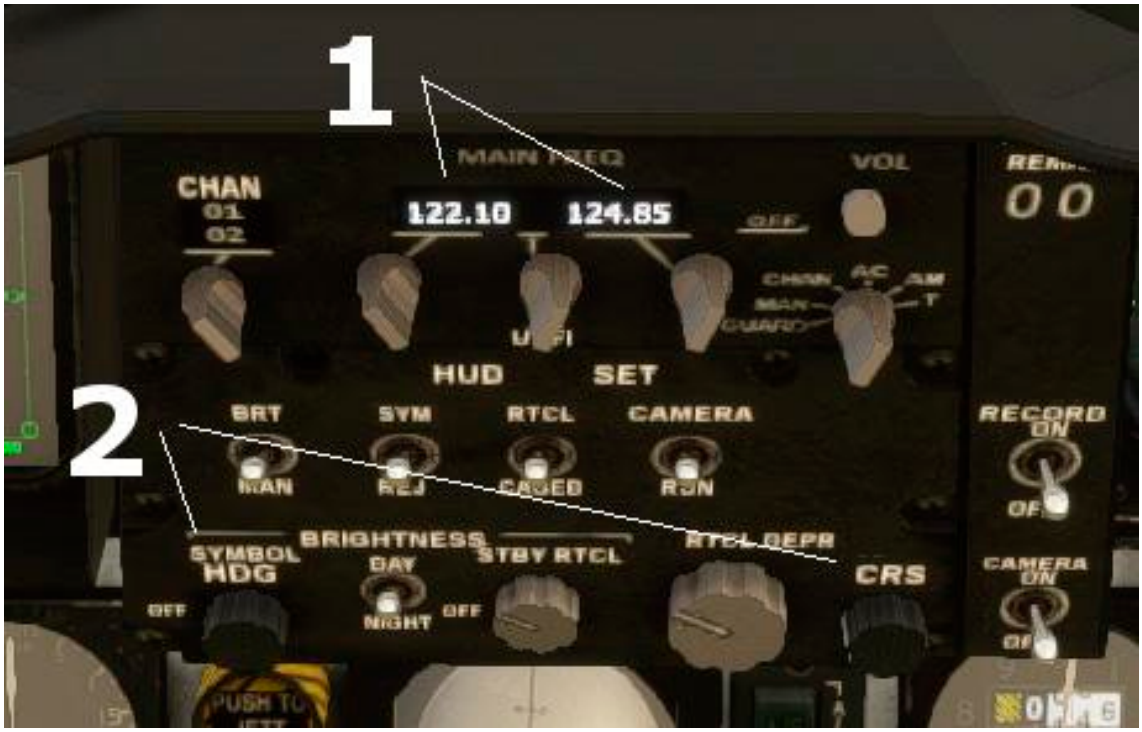
The default pilot view for all Eagle versions is the same, presenting a clear view forwards and also of the primary flight instruments. Use the simulator's Camera menu to access the rear-seat 'Co-pilot' position.

F-15C main panel



1. Multi-Function Display
2. Radar screen
3. IAS, AOA and ‘G-Force’ indicators
4. Transponder and communications Up Front Control Panel
5. Artificial Horizon with HSI below it
6. TEWS threat warning scope (non-functional in MSFS)
7. Altimeter, VSI and clock
8. Engine instruments
9. Fuel contents indicator
10. Warning lights panel

F-15C Up Front Control Panel

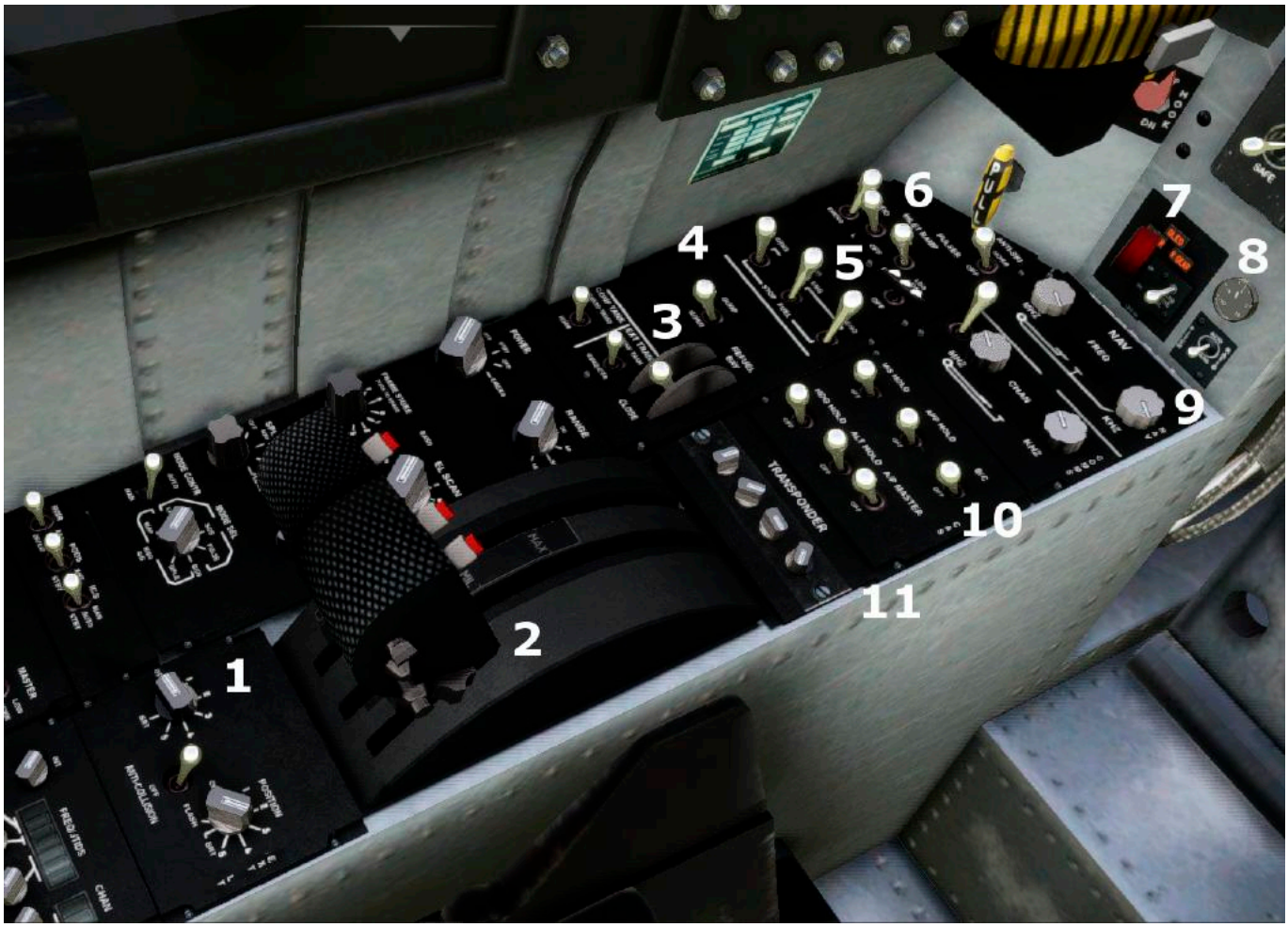


1. Communications frequencies (active on left, standby on right)
2. Heading (HDG) and Course (CRS) selector knobs at bottom left and bottom right respectively.

The CHAN 01/02 switch on the upper left-hand side can be used to switch between active and standby channels. Standby frequency changes are conducted on the pilot's left-hand side panel.

The autopilot Heading and Course selectors for the HSI are used to direct the aircraft when the autopilot is on and to select VOR radials in the HSI for navigational purposes.

Left console



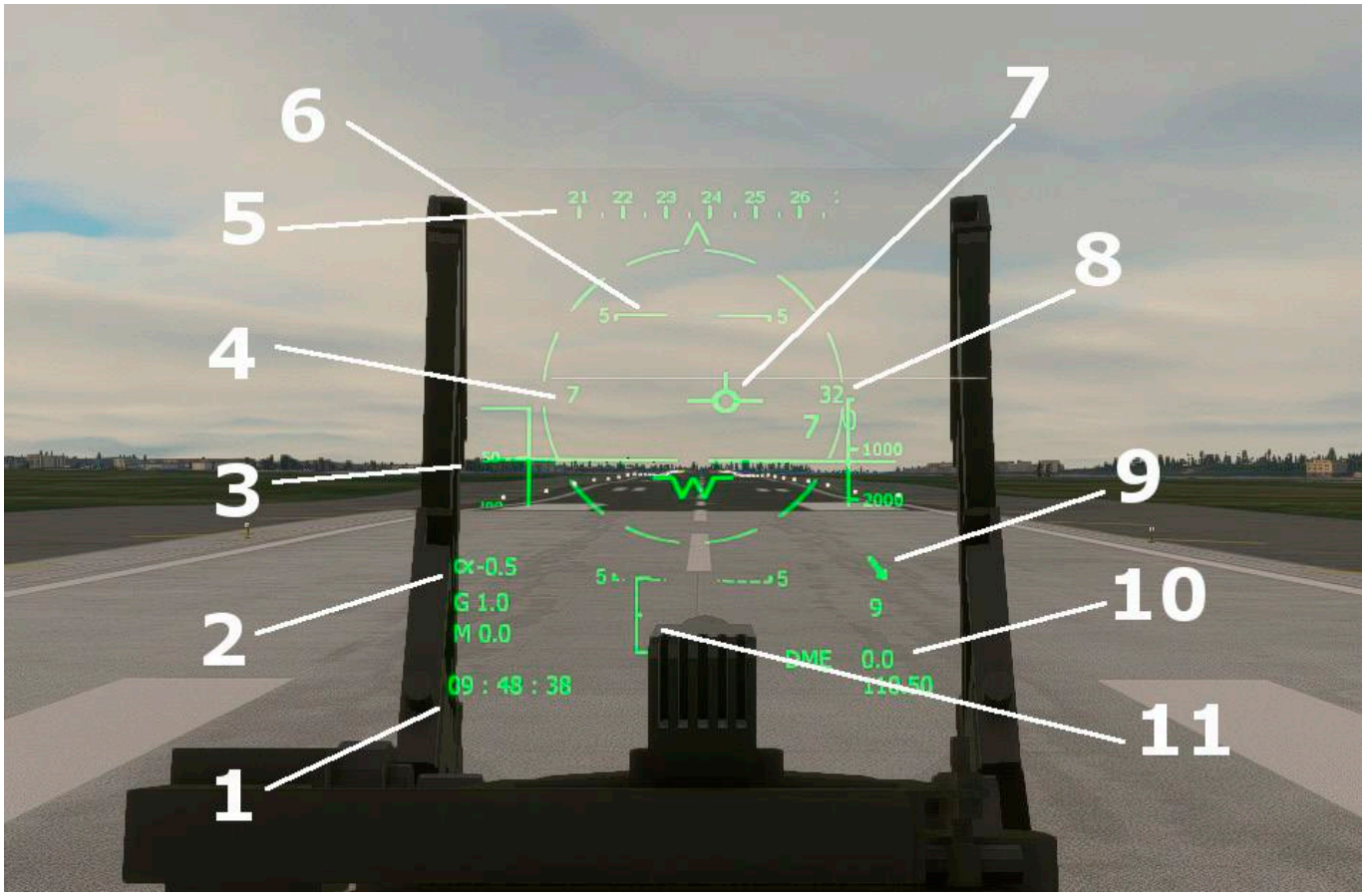
1. Formation (slime lights), strobe and navigation light switches
2. Throttle bank
3. Refuel probe switch
4. Fuel dump switch
5. Landing light switch / engine fuel valve switches
6. Inlet ramp switches
7. Landing gear lever and position lights
8. Elevator trim indicator
9. NAV and COMMS radio channel selectors
10. Autopilot control switches
11. Transponder control knobs

Right console

1. Generator switches
2. Battery and avionics switches
3. De-icing/pitot switches
4. Engine starter and Master Starter switches
5. Canopy open/close lever
6. Panel and night lighting switches
7. Autopilot annunciator lights bank
8. ADF control knob

Both the F-15C Eagle and the F-15E Strike Eagle share functionally identical side panels, reflecting the commonality between the two aircraft. All switches are labelled.

F-15C Head-Up Display



1. Clock (local time)
2. From top: AOA, G-Force, Mach No.
3. Airspeed indicator bar
4. Digital airspeed indicator
5. Heading strip
6. Pitch ladder
7. Velocity vector
8. Barometric altitude (radar altitude just below)
9. Wind velocity and direction arrow
10. Navigation frequency and DME read-out
11. AOA bracket (visible when landing gear is down)

The F-15C Eagle's Head-Up Display is the instrument which the pilot uses the most during operational flying duties. Mounted directly in a line-of-sight position atop the glareshield, the HUD contains a large volume of information pertaining to the aircraft's flight environment, allowing the pilot to maintain flight without having to take his eyes from the world outside, immensely important during both air-to-air and air-to-ground operations.

In addition to the indicators present in the image, an Instrument Landing System indicator appears whenever the aircraft's navigation frequency detects an active ILS signal. This indicator consists of horizontal and vertical lines, which centre upon the HUD when the aircraft is correctly aligned with the ILS glideslope, to facilitate landings in low visibility.

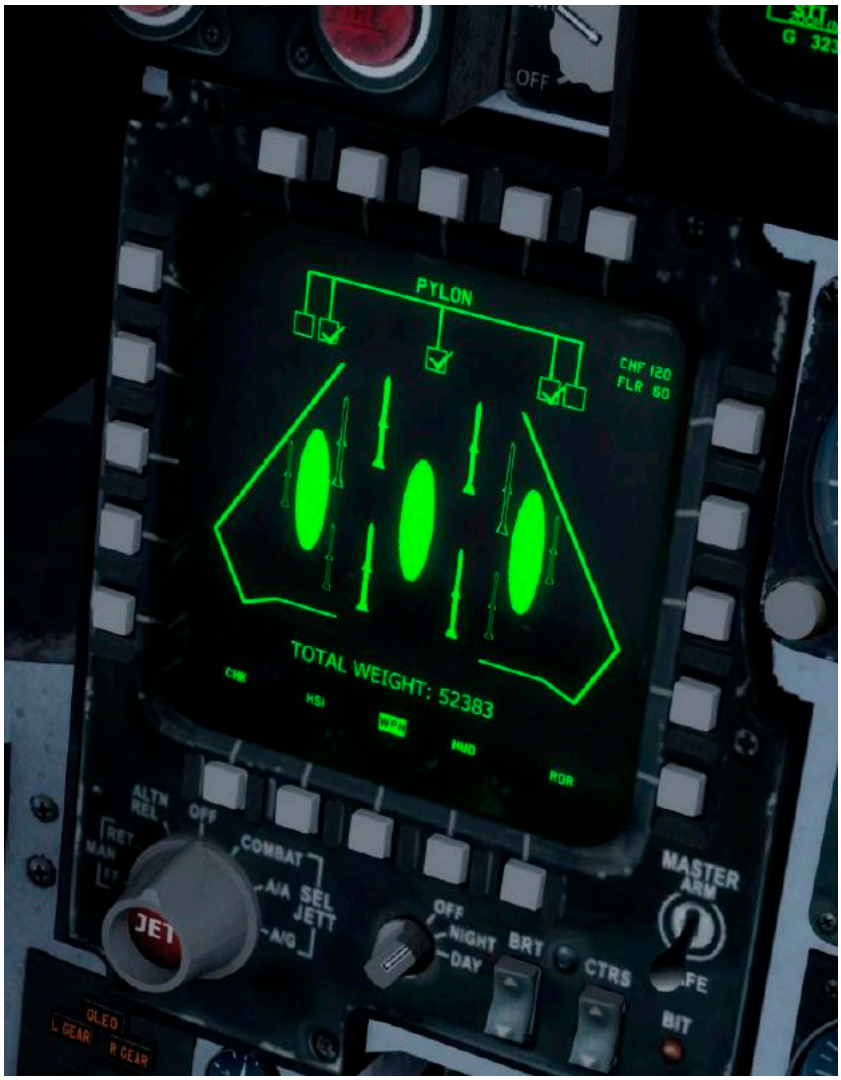
F-15C radar screen

The F-15C radar is not functional at this time in Microsoft Flight Simulator. Instead, the radar display contains easily-seen navigation data to assist the pilot in general flying duties.

Listed data, from the top:

1. Transponder code
2. NAV 1 active frequency
3. NAV 1 standby frequency
4. NAV 1 IDENT code
5. ADF frequency
6. Barometric air pressure (millibars)
7. Barometric air pressure (inHg)

F-15C MFD



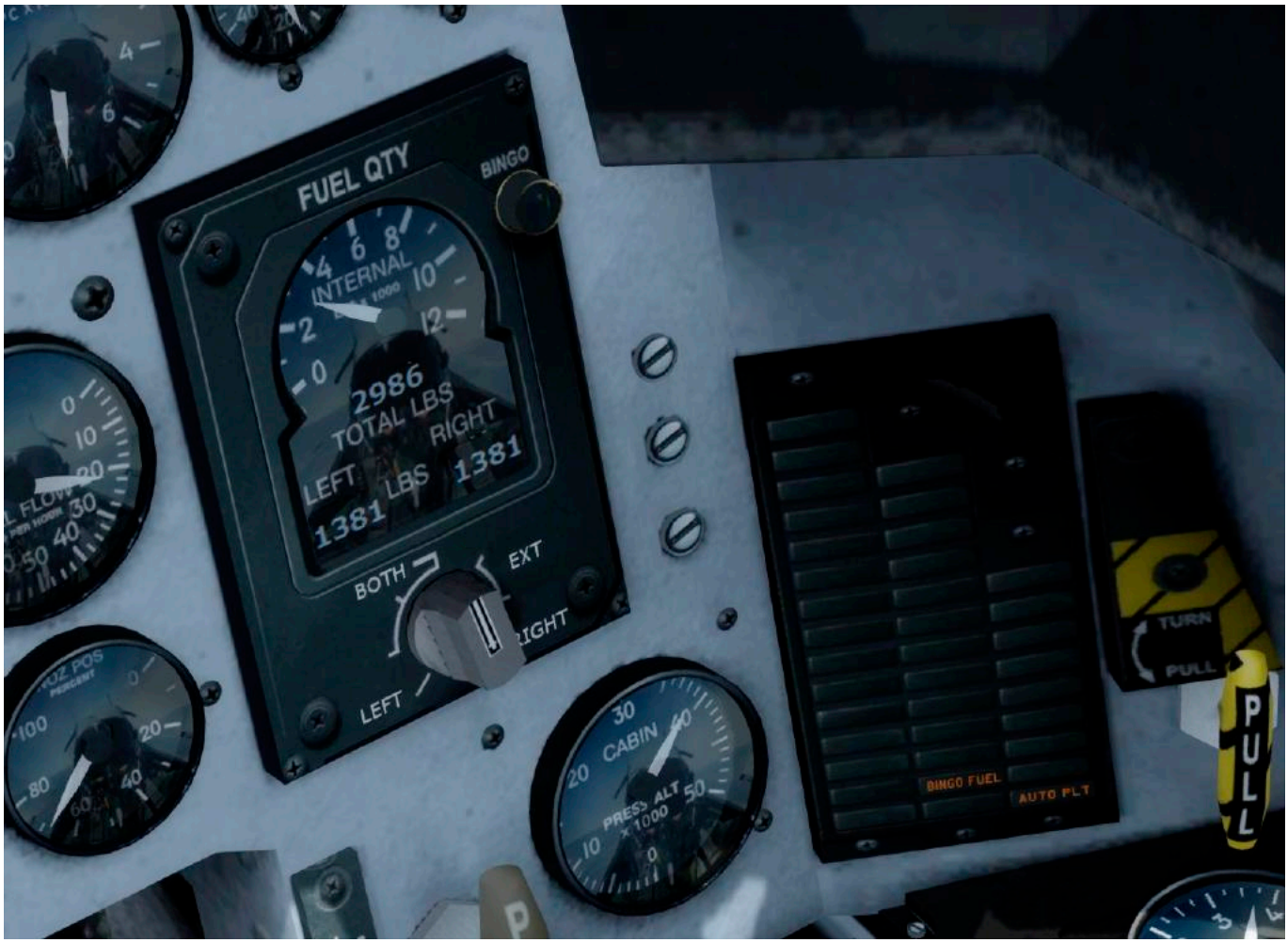
The F-15C's Multi-Function Display shares characteristics with those of the F-15E and will be detailed on the following pages. However, the F-15C weapons selector screen (WPN) has its own layout relevant to the type. The pilot has selected via the simulator's payload menu both external fuel tank options and four medium-range air-to-air missiles on the fuselage mounts.

The aircraft's total weight is 52,383 lb (including fuel).

Navigation/autopilot panel

The F-15 has a simple three-axis autopilot, which can be activated using the labelled switches on the pilot's left-hand side panel. Annunciator light banks on the right-hand side panel will show when the autopilot is engaged.

Fuel panel and warning lights



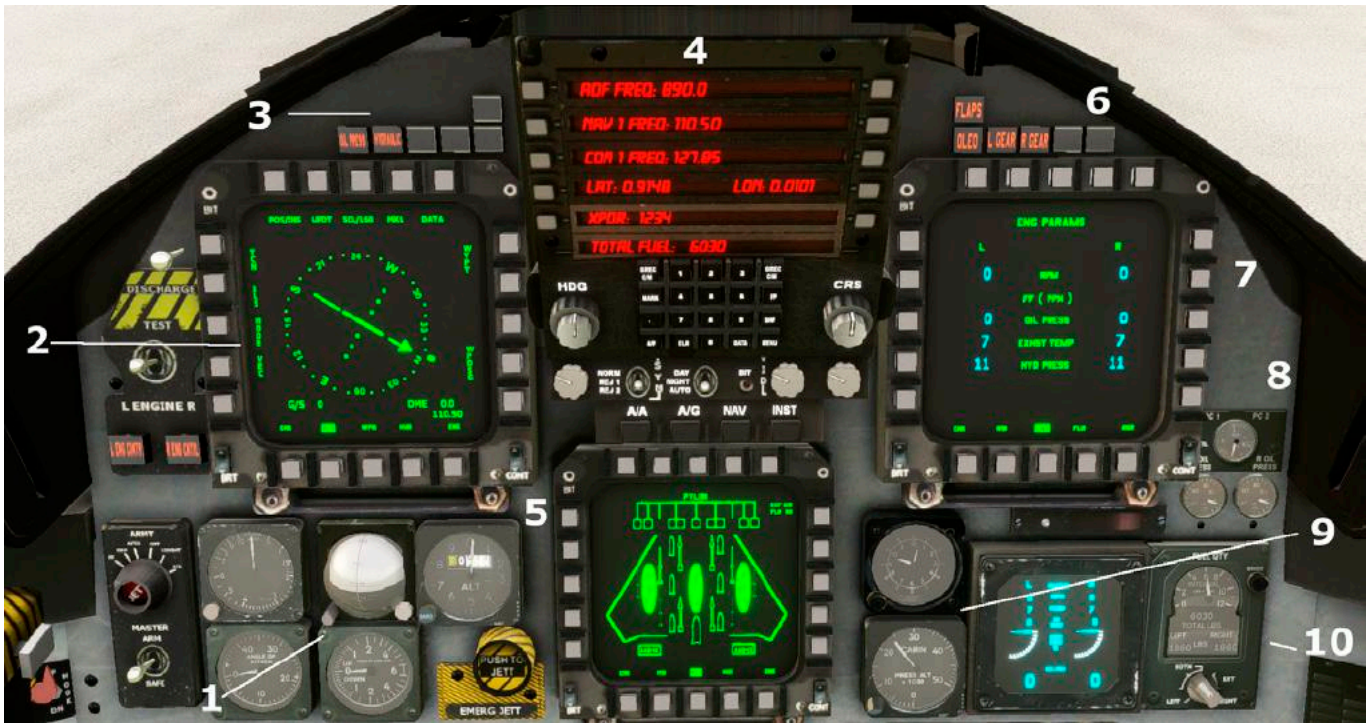
The fuel panel registers the fuel contents of the left and right main tanks and also the total fuel on board (pounds). The difference between the totals yields the total external fuel available. The aircraft will always draw automatically from external tanks first (if fitted).

The warning light panel to the right of the fuel panel lists any failures that may have occurred with the aircraft or any important warnings that the pilot needs to be aware of. In the image above, the 'BINGO FUEL' lamp is illuminated due to the total fuel remaining being less than 3,000 lb, a state confirmed on the fuel panel. The autopilot is also engaged. This panel is identical in the F-15E Strike Eagle.

F-15E STRIKE EAGLE COCKPIT

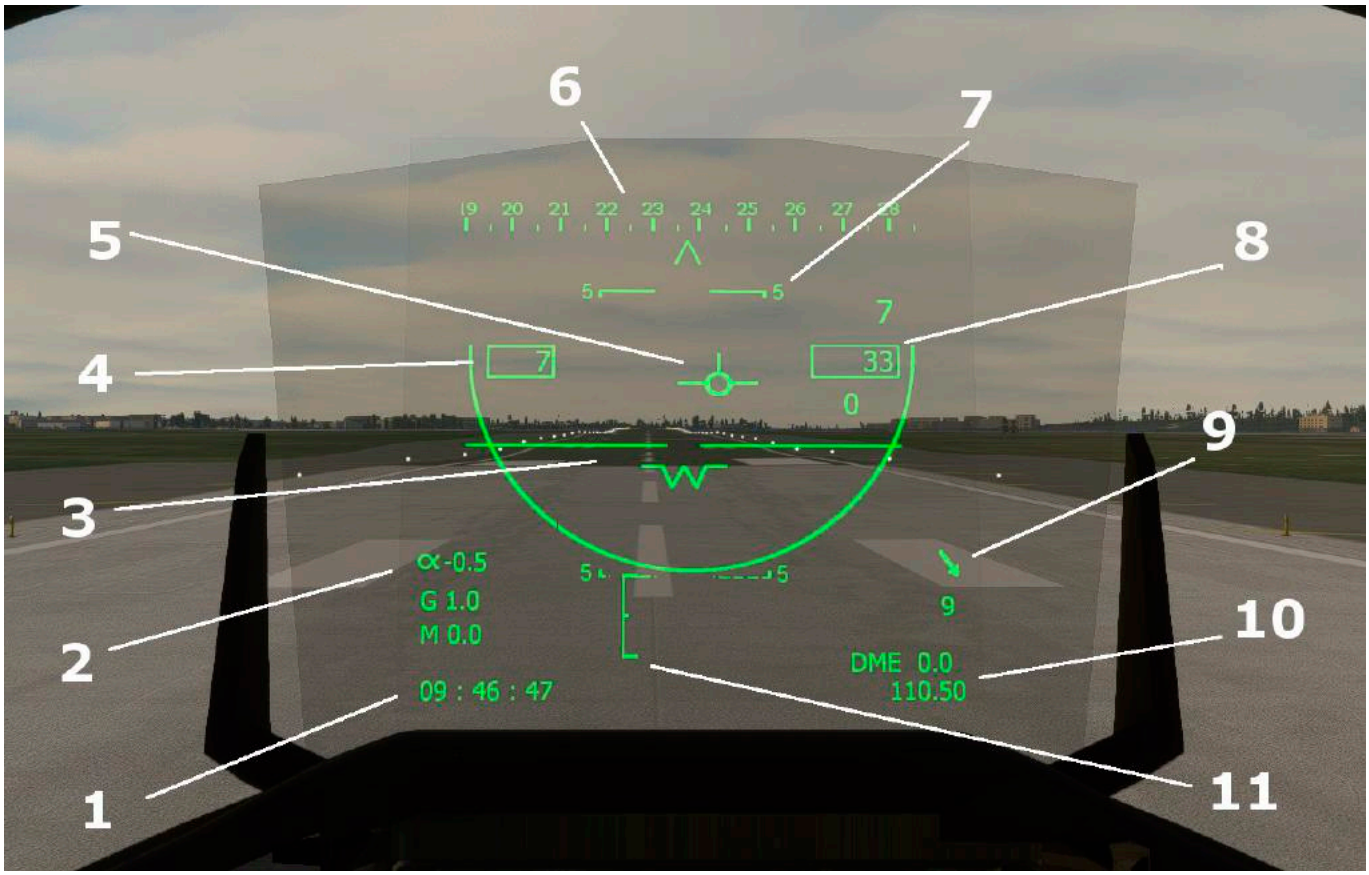
The cockpit of the F-15E Strike Eagle is more advanced than that of the C version, in that it is equipped with multiple digital display screens that can relay vast amounts of information to the crew far more easily than the older, analogue instruments in the original aircraft. Used together, these displays can provide comprehensive threat analysis and situational awareness for the modern strike-attack crew operating over enemy lines.

Pilot's position



1. Analogue flight instruments
2. Left MFD
3. Warning annunciator lights
4. Up Front Control Panel
5. Centre MFD
6. Warning annunciator lights
7. Right MFD
8. Oil pressure indicators
9. Clock and AOA indicators / engine display parameters
10. Fuel gauges

F-15E Head-Up Display



1. Clock (local time)
2. AOA, G-Force and Mach read-outs
3. Horizon bar and nose position indicator
4. Airspeed digital read-out
5. Velocity vector
6. Heading strip
7. Pitch bars
8. Radar altitude, barometric altitude, rate of climb/descent
9. Windspeed reading and direction arrow
10. Navigation frequency selected, DME range and IDENT code
11. AOA bracket

F-15E Up Front Control Panel

From top down:

1. ADF frequency
2. NAV 1 frequency
3. COM 1 frequency
4. Latitude and longitude dynamic position indicator
5. Transponder code
6. Total fuel remaining (pounds)
7. Heading (HDG) and course (CRS) selector dials

Below the digital displays are two large dials; HDG rotates the HSI heading bug and CRS rotates the HSI course selection.

Engine display

From top down:

1. RPM read-out
2. Exhaust temperature read-out
3. Fuel flow (pounds per hour) read-out
4. Nozzle position (per cent)
5. Oil pressure (pounds per square inch)

To the right of the engine display is the fuel quantity panel, which displays total fuel in pounds, plus read-outs for left and right main tanks just below. The aircraft will always draw first from any exterior tanks that are fitted.

Weapons System Operator's position & MFDs

The WSO position in the F-15E Strike Eagle contains fully operational flight controls and also four functioning MFD screens plus a UFCP repeater to the right. Below the main MFD screens are a series of back-up analogue flight instruments.

The WSO position can be accessed using the simulator's camera view menu to select the 'Co-pilot' position.

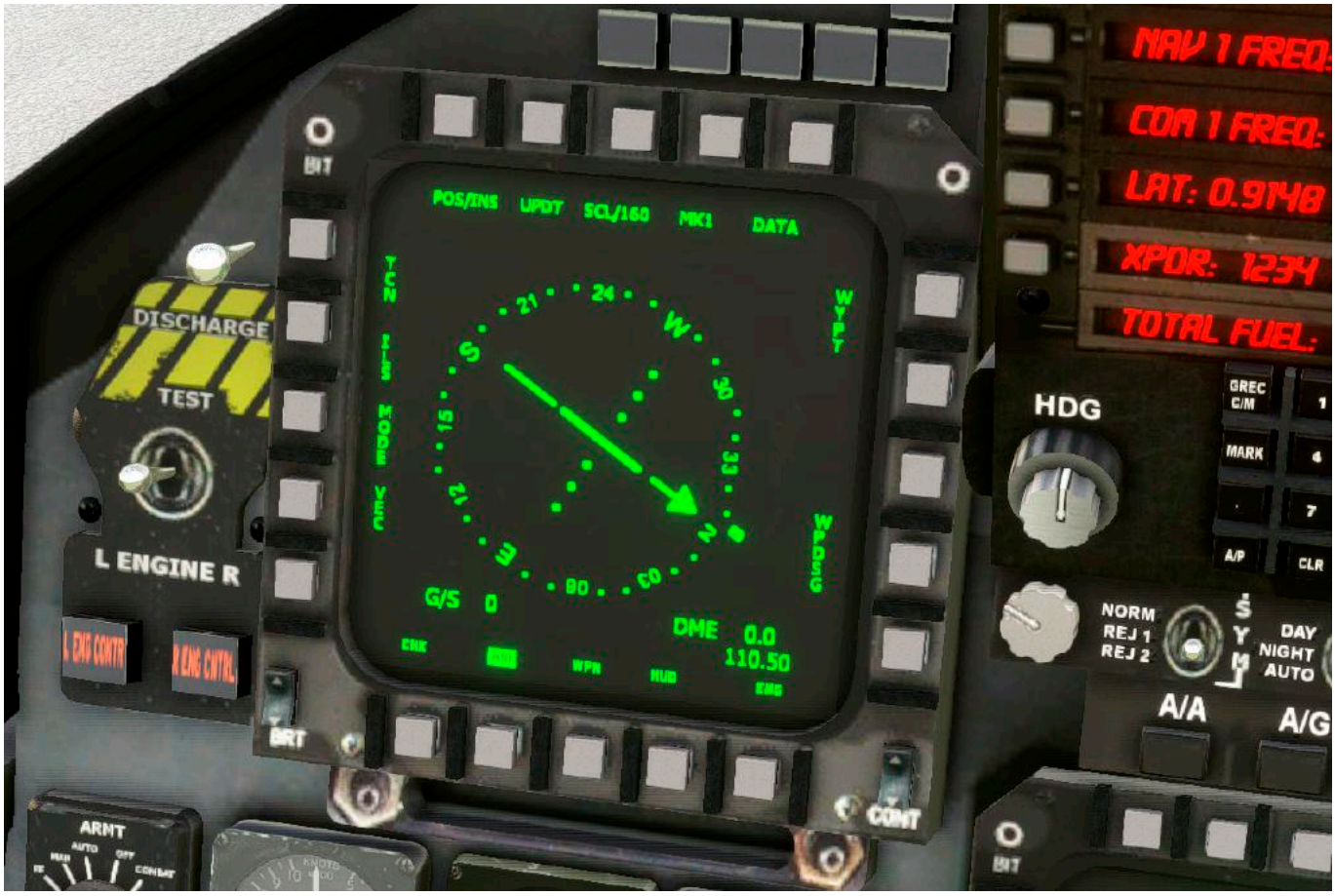
The F-15D variant also contains a rear seat with basic flight controls for instructional purposes.

F-15 EAGLE MULTI-FUNCTION DISPLAYS

The F-15 Eagle's various Multi-Function Displays provide a wealth of tactical and systems information.

HSI screen

The HSI displays a compass and radio navigation suite, allowing for precision navigation in all weathers using VOR/DME and NDB aids.



Distance Measuring Equipment and selected frequencies are displayed in the lower right corner of the display, while the central arrow icon is directed using the NAV/OBS dial on the autopilot panel.

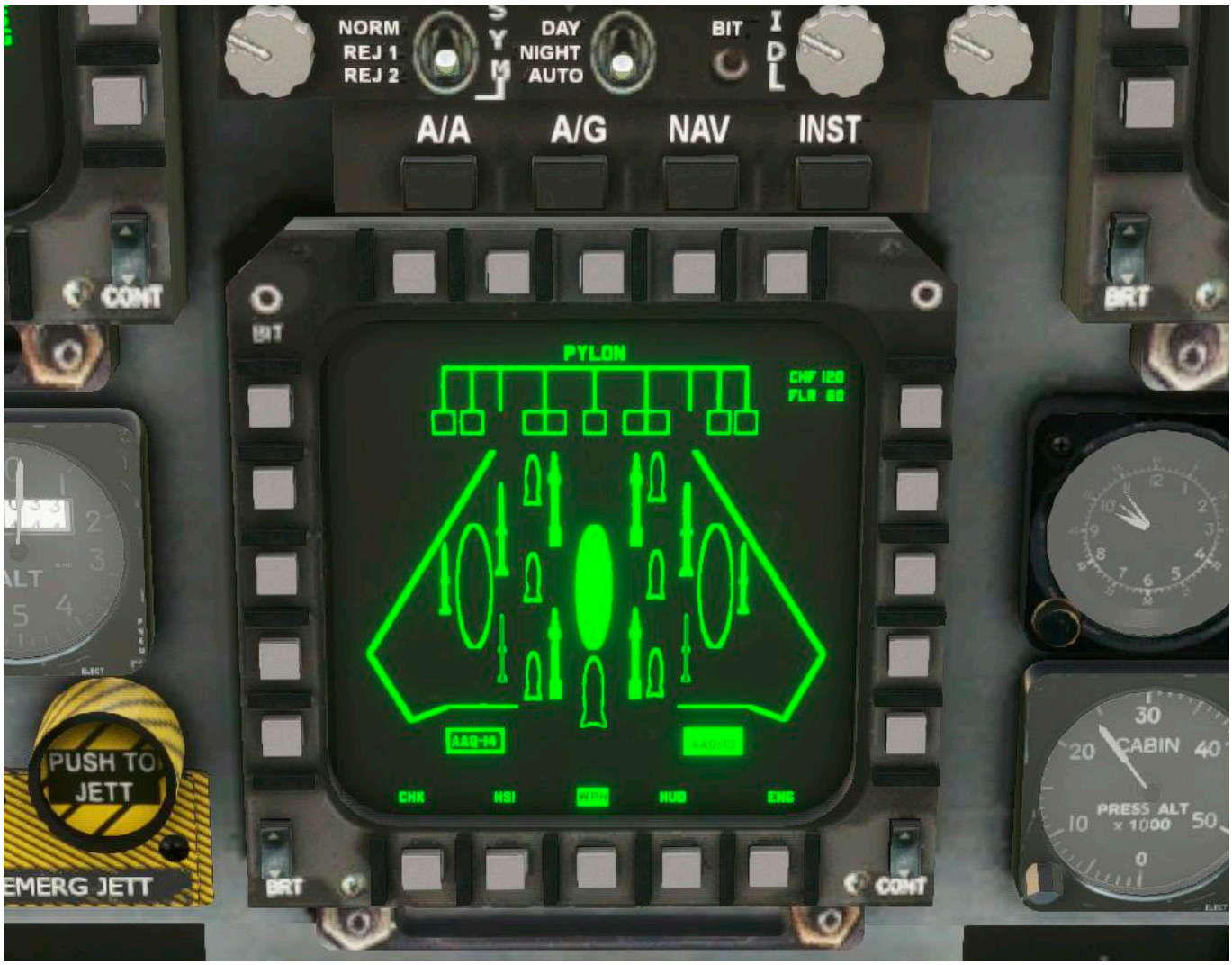
A Ground Speed (G/S) indicator occupies the lower left corner.

The dots either side of the aircraft icon represent degrees of deviation from track. When tracking a VOR or TACAN beacon, the central deviation needle should align with the arrow, and the direction marker should be a solid arrow pointing in the same direction as the aircraft icon. If you are heading directly away from your selected VOR (back course) then a hollow arrow will appear pointing in the opposite direction to the aircraft icon. An ADF indicator, if a valid station has been selected and is within range, appears in white and points directly to the navaid.

(The HSI in the F-15C/D Eagle works in the same way but is an analogue instrument in the centre main panel, below the artificial horizon.)

Weapons selector screen

The ordnance loadout selector (WPN) screen displays a dynamic visualisation of the current loadout of the aircraft.

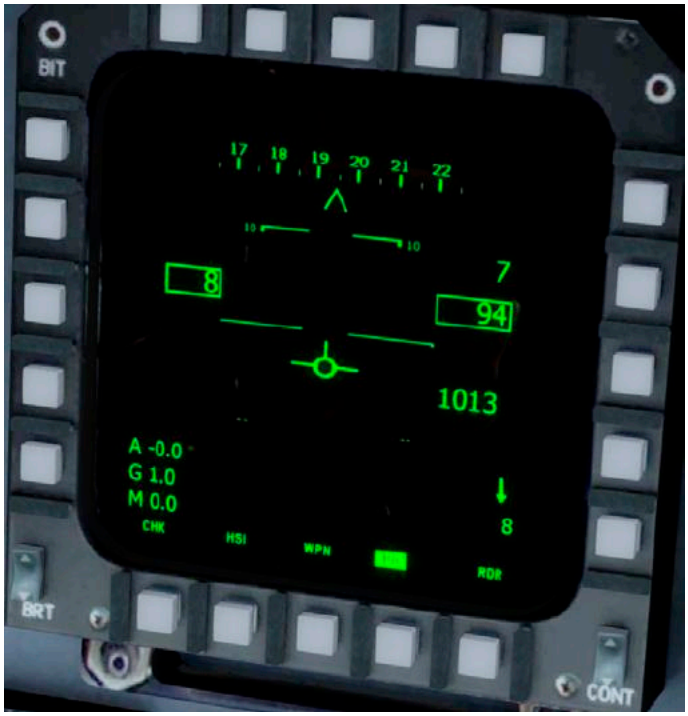


In the image above, seven pylons have been activated and mounted with two AIM-9 missiles, two AIM-120s and a pair of GBU-12 air-to-ground missiles. The AAQ-14 pod has been mounted, along with the AAQ-13 ECM pod and also a central fuel tank.

HUD repeater screen

The HUD repeater screen (HUD) displays a de-cluttered HUD image which uses the same layout but removes several icons for a clearer display.

The barometric pressure read-out on this display is in millibars, instead of inHg, to aid in effective navigation in countries using metric systems. It reads 1013 millibars in the image below.



Engine parameters display screen

The Engine parameters display screen (ENG) provides a secondary display of essential engine operating temperatures and pressures. This can be especially helpful if the WSO is forced to take control of the aircraft due to pilot incapacitation.

SYSTEMS GUIDE

Engine start

The F-15 Eagle is designed to be easy to start, which is especially important in an interceptor which may be launched rapidly as part of Alert flights.

There are two start-up options for the pilot. The first is to use the simulator's [Ctrl]+[E] auto-start sequence; this will switch on the battery, avionics, generator and APU, then crank both engines for you.

Normally the pilot will follow the standard 'cold and dark' start-up procedure:

1. Check gear down, parking brake on.
2. Battery switch ON.
3. Avionics switch ON.
4. Check the fuel gauges for sufficient supply.
5. Fuel flow switches to OPEN.
6. Intake ramps switches ON.
7. Throttle forward ONE INCH.
8. Crank engine 2. Wait for spool up and idle. Crank switch off.
9. Crank engine 1. Wait for spool up and idle. Crank switch off.

With both engines spooled up, check the temperatures and pressures before going through the pre-taxi and take-off checks. Remember always to switch off the crank switches once both engines are turning and providing power to the aircraft. Switch on lights as required.

Airbrake

The F-15 Eagle has a very large, upper ventral airbrake which is extended under the pilot's control. A small annunciator icon in the warning panel will light up when the airbrake is deployed and also on the main panel in the F-15E.

Flaps

The F-15 Eagle is equipped with two-stage flaps.

Flap airspeed limits:

- 20° – 250 KIAS
- 40° – 180 KIAS

The flap-position indicator lights are near the landing gear lever, on the lower left main panel.

Fuel

Fuel is contained in two main internal tanks and up to three externally mounted tanks. The maximum internal capacity is approximately 12,000 lb for the C and D versions of the Eagle, while the 'E' Strike Eagle's conformal fuselage tanks can carry an extra 3,000 lb of fuel. The exterior capacity is 3 x 480-gallon tanks, holding a total of 9,000 lb of fuel. Combined, this yields a maximum fuel capacity of 14,000 lb for the C and D Eagles, and a total of 18,000 lb for the Strike Eagle.

The Eagle's internal systems will automatically draw fuel from the external tanks first, then the main tanks. The flow can be monitored using the fuel gauge panel and is displayed as a numerical value (lb).

Lighting

The switches for the lighting system can be found tucked behind the throttle. Here, controls for navigation lights, strobes, formation lights and beacons can be found. In addition to these switches, on the right-hand side panel are switches for the internal cockpit panel light.

The F-15 Eagle can operate in total darkness in combat conditions, using formation lights only which are sometimes known as ‘slime lights’. These thin strips of light provide low-intensity illumination during night flying, allowing crews to see each other without alerting enemy aircraft and ground forces to their position.

Ordnance loadout selection screen

A large selection of weaponry can be loaded onto the F-15 Eagles using the in-sim Weights and Fuel payload menu.

Simply select the weapon station you wish to use and input the weapon's stated weight into the right-hand side of the screen. The weapon will then appear on the aircraft. Note that, in doing so, the weight of the aircraft will increase accordingly – a heavily laden F-15E Strike Eagle will handle very differently to a lightly loaded F-15C Eagle.

This weight issue must also be considered at take-off and landing. Although not a 'study level' representation of the aircraft, the DC Designs F-15 is aerodynamically quite realistic and so is the simulator. The maximum take-off weight for the F-15 Eagle is 68,000 lb and the aircraft will be somewhat sluggish at this weight. Likewise, attempting to land when too heavy will risk damaging the aircraft or even crashing it, as it will not respond as required when on the approach and will be difficult to control at low airspeeds.

Do not attempt to land with more than 6,000 lb of fuel on board when carrying ordnance of any kind.

FLYING THE F-15 EAGLES

Getting started

The F-15C and F-15E have notably different flying characteristics, due to the Strike Eagle's increased weight and the parasitic drag of its conformal fuel tanks. Each aircraft fulfils a differing role and so the Strike Eagle is not required to be as manoeuvrable as it's air-superiority predecessor.

The F-15 Eagle is designed to generally be an easy plane to fly and is highly forgiving, especially in high-alpha flight. However, it is nonetheless an extremely powerful aircraft. Following performance figures and procedures, otherwise known as 'flying on the numbers', will ensure the best possible experience and performance when flying this fighter.

Take-off

Tune your radios and obtain taxi clearance. Open the throttle gently, release the parking brake and taxi out to the runway. The F-15 Eagle produces sufficient thrust at idle to allow the aircraft to move slowly when it is lightly laden, so maintain a careful eye on throttle settings and proceed with caution.

When you reach the runway, hold your position, throttle back to IDLE and apply the parking brake. Set flaps to half and set 4.0 units (20%) of elevator-up trim. After obtaining clearance to take off, hold the aircraft on the brakes and ease the throttle forward to full dry power. Release the brakes and, if necessary, advance the throttles into full afterburner.

Take-off speeds at a routine weight of 55,000 lb are:

- V rotate – 140 knots
- V lift off – 150 knots

When a speed of 140 knots is reached, ease back on the stick and rotate the nose to 10-12 degrees, then hold that angle. The aircraft will lift off at around 145-150 knots indicated. At higher weights the lift-off speed will be proportionately higher, but the angle of attack and climb angle should always remain the same.

Retract the undercarriage as soon as you have a positive rate of climb in both the VSI indicator and the altimeter. Retract the flaps before 200 knots, trimming as you go, while accelerating to the Eagle's climb airspeed of 320 knots.

Cruise

Once you have reached your chosen cruise altitude, level off and adjust power to maintain the Eagle's cruise speed of 360 knots. Note that as altitude increases, so air pressure decreases, thus so does the indicated airspeed. Remember to refer to your ground speed to calculate times of arrival to navigational beacons equipped with DME data.

Performance

The F-15 Eagle's sleek aerodynamics and enormous thrust-to-weight ratio mean that it is a capable performer at all altitudes and in the vast majority of atmospheric conditions.

The type has successfully served over the frozen wastes of Alaska and the burning deserts of Saudi Arabia in a variety of roles, making it one of the most versatile and reliable military platforms in the United States' arsenal.

The F-15E, while not as manoeuvrable as the F-15C, is a more stable aircraft at low level, where its increased mass provides a buffer against the turbulence often experienced when 'moving mud'. This stable platform allows the Strike Eagle to weave down deep valleys and strike without warning against targets before racing away before the enemy can react.

The F-15C in light configuration (internal fuel only) can zoom-climb to 60,000 ft under the right conditions.

It should be noted, however, that in the rarefied atmosphere at these altitudes, control authority is greatly reduced. The standard maximum operating altitude for all variants of the F-15 Eagle is 65,000 ft.

'V' speeds for the **F-15C Eagle**, with internal fuel only, are:

- Stall: Undercarriage and flap up 140 knots
- Stall: Undercarriage down and half flap 125 knots
- Stall: Undercarriage down and full flap 115 knots
- V1 125 knots at half flap
- V2 135 knots at half flap
- Vmax Mach 2.4 @ 35,000 ft
- Vmax Mach 1.4 @ sea level

'V' speeds for the **F-15E Strike Eagle**, with internal fuel only, are:

- Stall: Undercarriage and flap up 140 knots
- Stall: Undercarriage down and half flap 130 knots
- Stall: Undercarriage down and full flap 120 knots
- V1 125 knots at half flap
- V2 145 knots at half flap
- Vmax Mach 2.1 @ 35,000 ft
- Vmax Mach 1.4 @ sea level

Spin recovery procedure

The F-15 Eagle is generally reluctant to spin, due in large part to the huge lifting area of its fuselage. The most likely result of a stall will be a 'mush in' of the nose, with the possible tip stall of one wing or the other. Use power to recover airspeed and pull out of the resulting dive. However, there is a tendency for increased adverse yaw with roll at low airspeed and high angle of attack – if you're too heavy with the stick and rudders, the Eagle will enter into a spin.

In order to ensure sufficient recovery time, do not carry out intended stall routines below 25,000 ft altitude.

If the F-15 is found to have departed controlled flight and is now spinning, observe the direction of spin. Set throttles to maximum dry power (not afterburner) and then apply maximum opposite rudder (against the direction of spin). Either push or pull the stick to bring the nose down. Try to keep the aircraft pointing at the ground until you see airspeed increase beyond 180 knots indicated. At that airspeed, control authority is restored and you should be able to accelerate and pull out of the dive.

If the Eagle is resistant to control authority and you cannot recover the spin, extend the spoiler (airbrake) and, if necessary, drop flaps to stage one. Both of these procedures will increase drag on the spin and help you to regain control.

Approach and landing

The F-15 Eagle is a military aircraft and, as such, military circuits are routine around air bases. Enter the frequency of your chosen airbase and navigate towards it using the HSI. Tune the COMMS frequency to ATIS and listen for the active runway direction, air pressure and local wind direction and speed. Set your altimeter to the local air pressure as dictated by ATIS.

Use the HSI to navigate so that you approach the airfield aiming down the active runway, at 1000 ft altitude and at 340 knots indicated. Fly down the length of the runway and at the halfway point conduct a level 4G break towards the downwind leg, cutting the throttle as you do so.

As you turn through 90 degrees, ease out into a gentler turn and, when downwind and below 250 knots indicated, lower the undercarriage. Check for the three undercarriage lights, then lower stage one flaps. Trim as required.

As you draw level with the runway threshold, lower full flap, trim and set the airspeed for 160 knots indicated. As soon as you feel comfortable and the aircraft is trimmed, turn in gently towards the airfield with 30 degrees of bank and a VSI descent reading of 500 ft per minute.

Time your turn so that you roll out onto the runway heading, lined up to land. Note wind speed and direction in the HUD to counter any crosswind component.

Gradually reduce airspeed to around 145 knots indicated, trim and maintain the centreline as you approach the threshold. Set the nose position for 8 degrees angle-of-attack using the HUD, then use the throttle to maintain airspeed. Watch the velocity vector and either reduce or increase power to place it on the required touchdown spot. Ride the throttle to maintain the glideslope, using the stick to maintain the centreline approach.

At 30 ft altitude, ease the throttles to idle and raise the nose in a gentle flare. Allow the main wheels to settle onto the runway. The Eagle generates quite a lot of ground effect and the nose-wheel will remain in the air for some time if you wish to use aerodynamic braking. To bring the nose down, push forward gently on the stick or, alternatively, extend the airbrake to reduce speed naturally until the nose-wheel touches down.

The image below shows an F-15C demonstrating the landing configuration: airspeed is 145 knots, AOA is 8 degrees and the velocity vector is centred on the AOA bracket. Descent rate is 205 feet per minute. In this configuration the pilot would use the throttle to control the velocity vector's position, and with a higher descent rate will be able to land the aircraft at any spot on the ground he chooses.

CREDITS

DC Designs F-15C, D, E & I Eagles

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Flight dynamics	Dean Crawford, DC Designs
Textures	Dean Crawford, DC Designs
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