



# ***F-15 C, E & I EAGLE***



**OPERATIONS MANUAL**

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# ***F-15 C, E & I EAGLE***

## **Operations Manual**

Please note that Prepar3D or Flight Simulator X must be correctly installed on your PC prior to the installation and use of this F-15 Eagle simulation.

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# 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-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 <sup>2</sup> )
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	3,455 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/m <sup>2</sup> )
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 nose-mounted 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
- 12× 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 Prepar3D:**

1. Select Aircraft > Select Aircraft from the menu bar.
2. Select the 'Publisher' filter mode and then select 'DC Designs' from the list of publishers.
3. Choose one of the F-15 Eagle variants and click on 'OK'.

**To access the aircraft in Prepar3D v2 or later:**

1. Click on 'Vehicles' in the menu bar.
2. Type 'Eagle' into the Search bar or select 'Group by Publisher' and scroll down the list to locate 'DC Designs'.
3. Choose one of the F-15 Eagle variants and click on 'OK'.

**To access the aircraft in FSX:**

1. Click on 'Free Flight'.
2. Select 'DC Designs' from the 'Publisher' drop-down menu.
3. Select 'Boeing' from the 'Manufacturer' drop-down and choose one of the F-15 Eagle variants.

Tick the 'Show all variations' box to see all the available paint schemes.

## 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.

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# 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 hard-points 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 can be divided into seven main areas:

- Main panel
- Up Front Control Panel
- MFD
- Radar / TEWS
- 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 use the hat switch on your joystick, hold down the [Space] bar on your keyboard while moving your mouse around and also use your keyboard keys.

### Virtual Cockpit views

Press the [A] key to cycle through the various preset views and the [+] and [-] keys to zoom in and out. Pressing the [Backspace] key will reset the zoom level to the default setting, while [Ctrl] + [Space] will re-centre the viewpoint.

You can also alter your viewpoint using these keys:

[Ctrl]+[Shift]+[Backspace]	Left
[Ctrl]+[Shift]+[Enter] (Return key)	Right
[Ctrl]+[Backspace]	Forward
[Ctrl]+[Enter] (Return key)	Back
[Shift]+[Backspace]	Down
[Shift]+[Enter] (Return key)	Up



## F-15C main panel



1. Arrestor hook
2. Multi-Function Display
3. Radar screen
4. IAS, AOA and 'G-Force' indicators
5. Transponder and communications Up Front Control Panel
6. Artificial Horizon
7. TEWS threat warning scope
8. Altimeter, VSI and clock
9. Engine instruments
10. Fuel contents indicator
11. Warning lights panel



## F-15C Up Front Control Panel

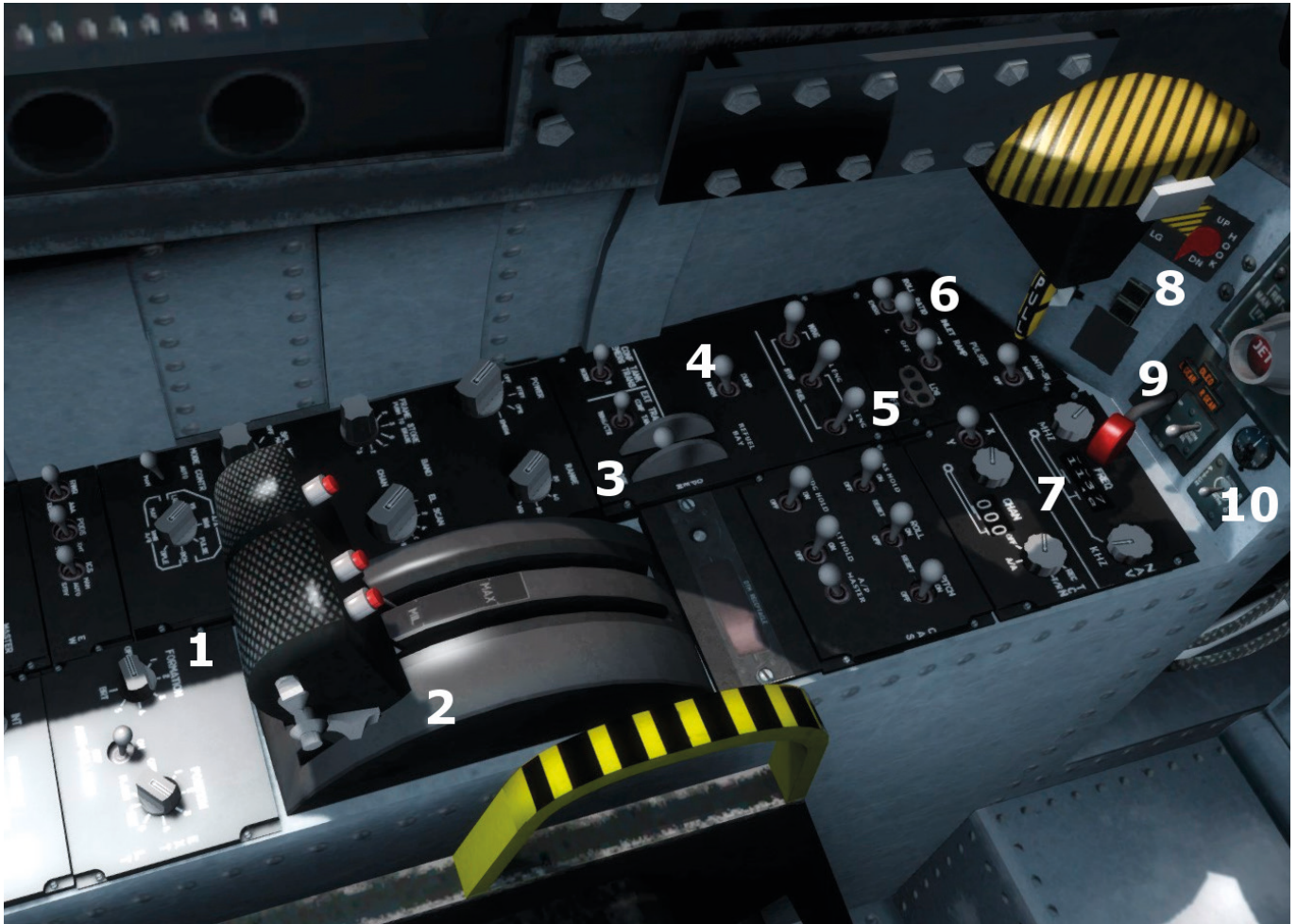


From top:

1. Transponder dials
2. Communications frequencies (active on left and standby on right)

Frequencies for communications channels and the transponder can be changed by scrolling the mouse-wheel up and down over the numbers themselves, while the active channel can be switched over using the CHAN 01/02 switch to the left of the frequency windows.

## Left console



1. Formation (slime light), 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. Navigation frequency read-out
8. Flap position indicator lights
9. Landing gear lever and position lights
10. Elevator trim indicator

## Right console

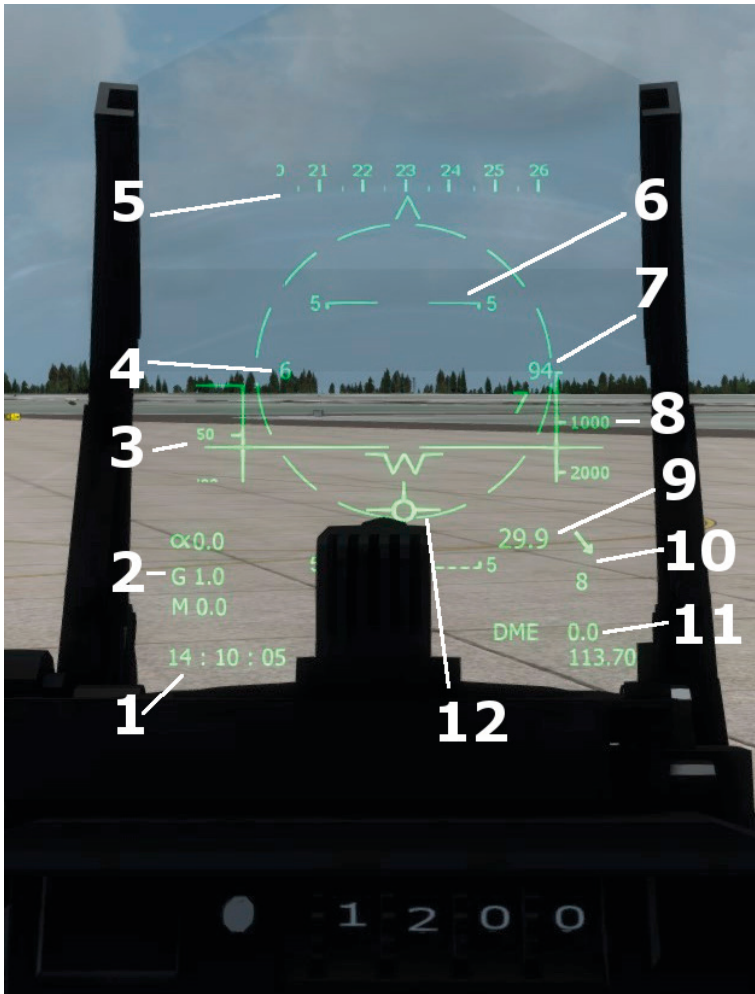


1. Pilot visibility button + parking brake handle (black and yellow 'PULL')
2. Generator switches
3. Battery and avionics switches
4. De-icing/pitot switches
5. Engine starter and Master Starter switches
6. Hydraulic system switches
7. Canopy open/close lever
8. Navigation/autopilot panel
9. Lamp test switch
10. Panel night lighting switch

Both the F-15C Eagle and the F-15E Strike Eagle share functionally identical side panels, reflecting the commonality between the two aircraft. However, the WSO stations in the Strike Eagle have less functionality and some switches are in slightly different positions.



## F-15C Head-Up Display



- |                                     |                                                    |
|-------------------------------------|----------------------------------------------------|
| 1. Clock (local time)               | 7. Barometric altitude (radar altitude just below) |
| 2. From top: AOA, G-Force, Mach No. | 8. Barometric altitude bar                         |
| 3. Airspeed indicator bar           | 9. Barometric pressure (inches of mercury)         |
| 4. Digital airspeed indicator       | 10. Wind velocity and direction arrow              |
| 5. Heading strip                    | 11. Navigation frequency and DME read-out          |
| 6. Pitch ladder                     | 12. Velocity vector                                |

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 their 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.



The TEWS (Tactical Electronic Warfare Screen) presents a 'God's Eye' radar detection and threat analysis system to warn the pilot of potential threat aircraft within the sphere of operations. Slaved to the radar, the screen allows the pilot to slip undetected between other aircraft operating over enemy territory.



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. This is a touchscreen design that allows the user to select which ordnance they would like to be displayed on the aircraft. In the image above, the pilot has selected three of the available pylons (ticks in boxes at the top of the screen) and has then assigned three fuel tanks to those pylons and also four AMRAAM medium-range missiles to the fuselage mounts. No AIM-9 Sidewinder missiles have been selected.

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



## Navigation/autopilot panel

The F-15C and E share the same navigation and autopilot input panel on the right-hand side of the cockpit. This arrangement is shared in the Strike Eagle's WSO rear-seat position, with the WSO panel slaved to that of the pilot. Either crew member can input autopilot and navigation data.

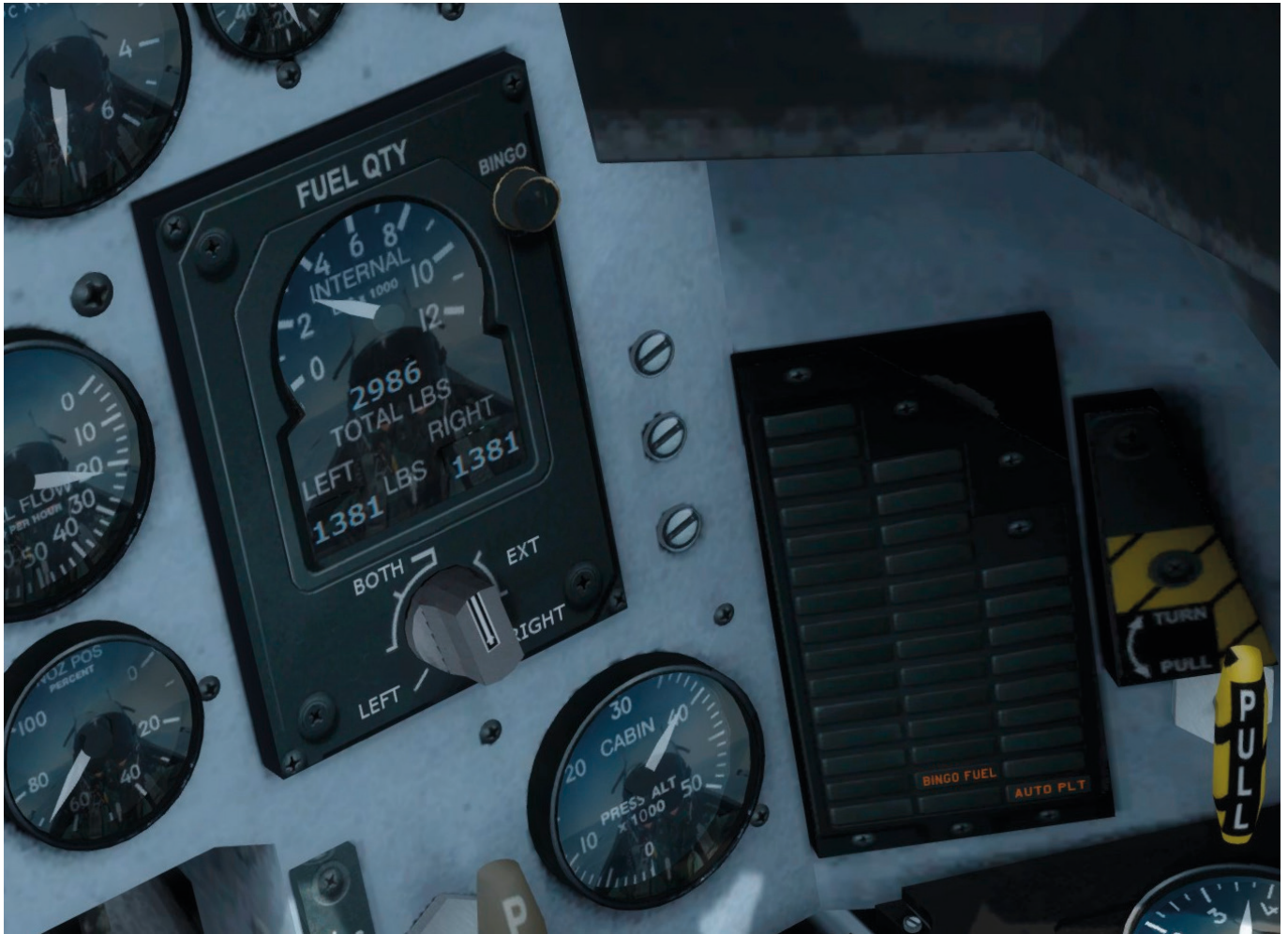


The navigation frequencies and autopilot settings can all be selected by hovering the mouse over the white digits and scrolling the wheel up or down to increase or decrease the relevant selection.

In the above image, the NAV 1 frequency of 114.80 is selected, along with an ADF frequency of 484.0. The autopilot altitude setting is 4,500 ft and the climb/descent rate (V/S) has been set at 2,500 fpm. The autopilot (A/P) is selected as 'On' and is tracking both Altitude and Heading settings. The Flight Director (FD) is also engaged.

Further options present but not engaged in the image include SPD (Indicated Airspeed Hold), GS (Ground Speed Hold), MCH (Mach Hold) and NAV (to track the active navigation frequency beacon).

## 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) but the pilot can choose to select left, right or 'all' internal tanks, using the fuel selector switch at the bottom of the display.

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 of which the pilot needs to be aware. 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.

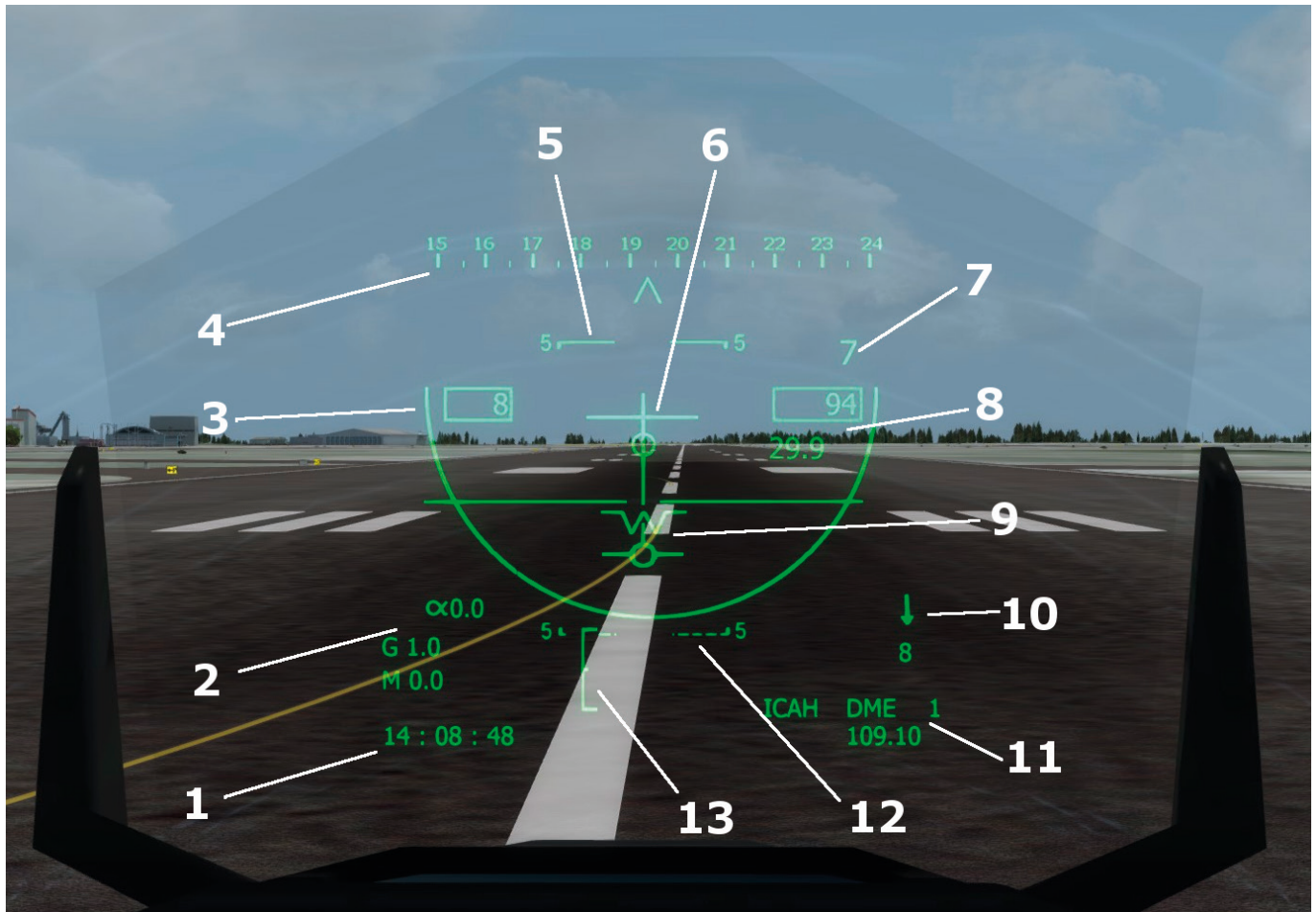
## Pilot's position



1. Master safety switch
2. Analogue flight instruments
3. Left MFD
4. Warning annunciator lights
5. Up Front Control Panel
6. Navigation selection panel
7. GPS / Moving Map display
8. Warning annunciator lights
9. Right MFD
10. Clock and AOA indicators
11. Engine parameters display
12. Oil pressure indicators
13. Fuel gauges



## F-15E Head-Up Display



1. Clock (local time)
2. AOA, G-Force and Mach read-outs
3. Indicated Air Speed read-out (knots)
4. Heading strip
5. Pitch ladder
6. ILS bars and centre marker
7. Altitude (radar)
8. Barometric altitude and Kollsman setting (inches of mercury)
9. Velocity vector
10. Windspeed reading and direction arrow
11. Navigation frequency selected, DME range and IDENT code
12. Negative pitch ladder
13. AOA bracket

## F-15E Up Front Control Panel



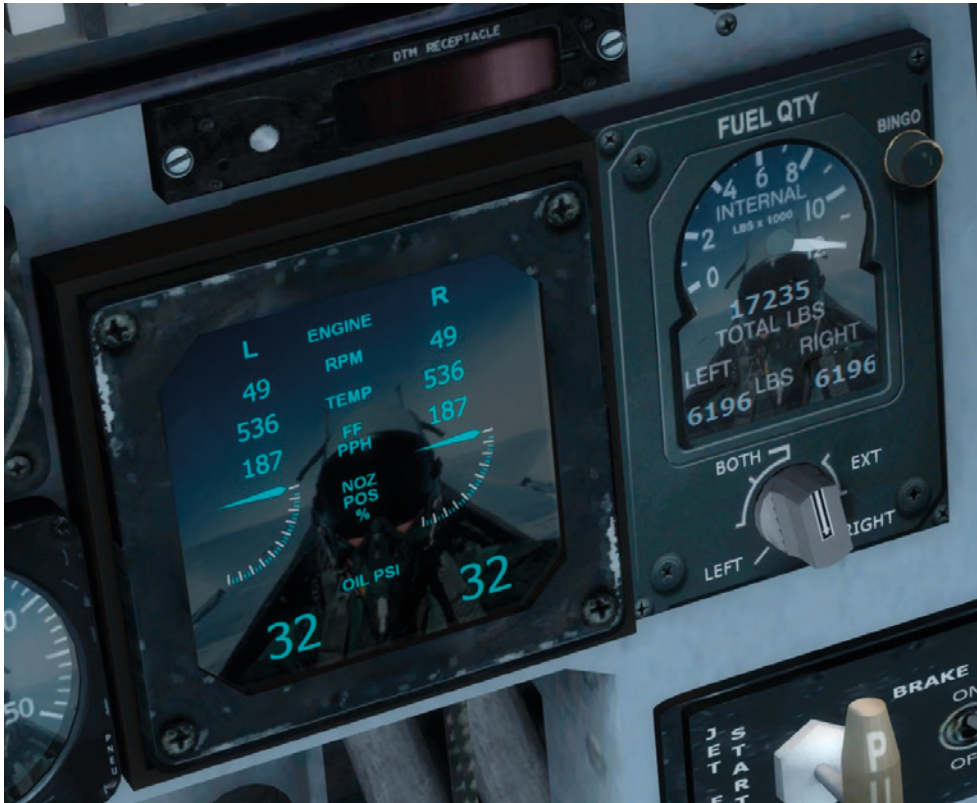
### From top down:

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 and course selector dials

The red digital read-outs can be altered by hovering the mouse over the relevant figures and scrolling the mouse-wheel up and down, allowing the pilot to reset navigation, communication and transponder frequencies at will.

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 the left and right main tanks just below. The fuel tank selector switch allows the pilot to select between Left, Right and 'All' internal tanks. The aircraft will always draw first from any exterior tanks that are fitted.



## Weapons System Operator's position & MFDs



1. MFD # 1
2. MFD # 2
3. MFD # 3
4. MFD # 4
5. Analogue flight instruments
6. WSO Up Front Control Panel

The WSO position can be accessed using the [A] key when in the virtual cockpit. The MFD instruments featured here can all be controlled independently, so as to allow the WSO the maximum amount of simultaneous flight information possible.

The WSO's UFCP is a fully functional repeater for the pilot's UFCP, allowing the sharing of navigational duties when using shared-cockpit mode in Multiplayer.

## F-15 Eagle Multi-Function Displays

The F-15 Eagle's various Multi-Function Displays provide a wealth of tactical and systems information. Each screen is comprised of five displays, accessed by clicking on one of the five buttons at the bottom of the display. The options are arrayed across three slightly differing screen layouts:

### **MFD Type 1**

1. Checklists (CHK)
2. Horizontal Situation Indicator (HSI)
3. Ordnance loadout selector system touchscreen (WPN)
4. Head-Up Display repeater (HUD)
5. Engine display parameters (ENG)

### **MFD Type 2**

1. Checklists (CHK)
2. Horizontal Situation Indicator (HSI)
3. Engine display parameters (ENG)
4. Forward Looking Infra-Red (FLIR) (P3D v4/v5 only)
5. Radar display (RDR)

### **MFD Type 3 (WSO station MFD # 4)**

1. Checklists (CHK)
2. Horizontal Situation Indicator (HSI)
3. Engine display parameters (ENG)
4. Forward Looking Infra-Red (FLIR) (P3D v4/v5 only)
5. Global Positioning System display (GPS)

Each screen can be selected independently of those on other MFDs, allowing the crew to select and display functions based on personal preference.

## Checklist screen

The Checklist screen displays a complete series of checks for the start-up, take-off and landing phases. To the lower left is an elevator trim digital read-out.





## HSI screen

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



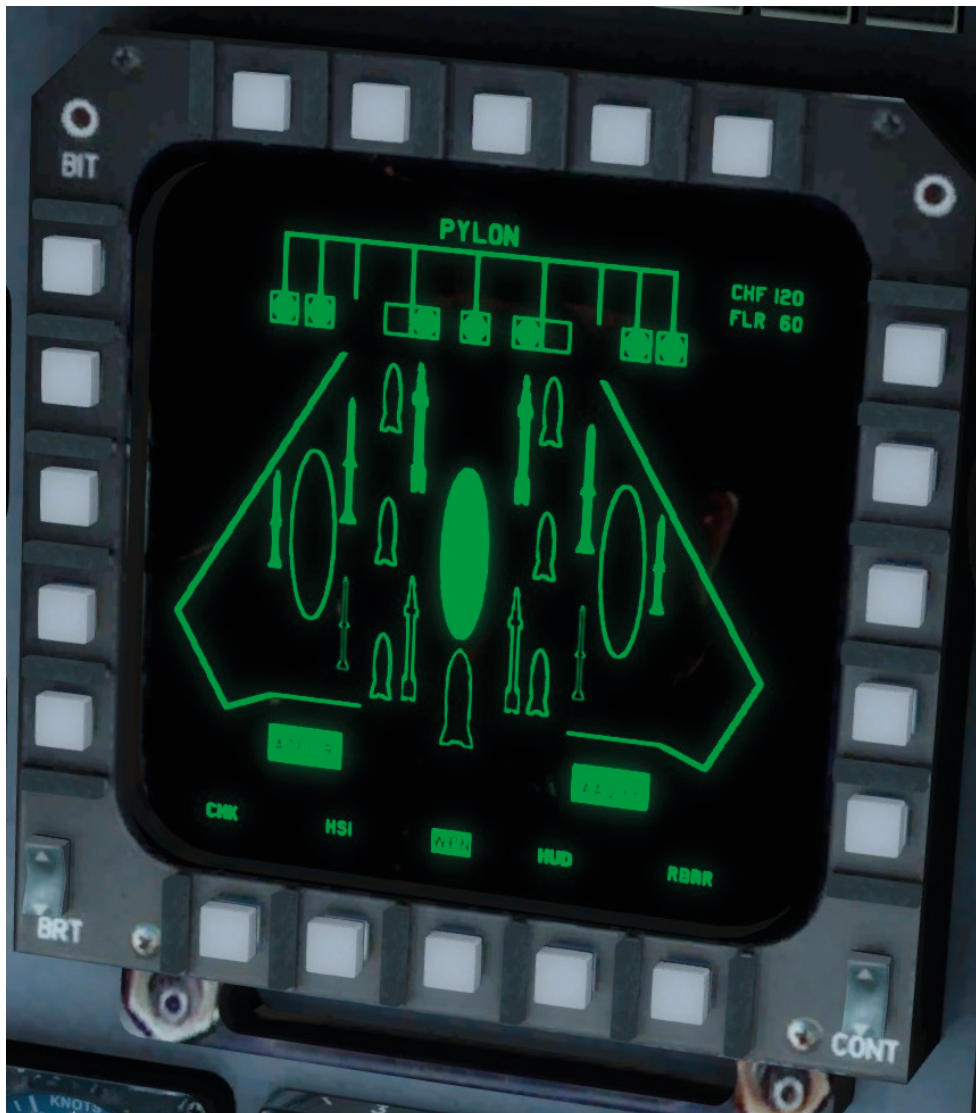
Distance Measuring Equipment and selected frequencies are displayed in the lower right corner of the display, while the central arrow icon is directed using the NAV/OBS dial on the autopilot panel.

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're 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.

## Ordinance loadout selector (WPN) screen

The Ordinance loadout selector (WPN) screen is a touchscreen interface that allows the pilot to load whichever ordnance they wish to carry. Weapons are selected by clicking inside the empty weapon positions below their respective hard-point pylons.



Weapons can only be mounted when a pylon has been activated, which is indicated via a green disc for each respective hard point. 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. The fuselage rails dedicated to 500 lb bombs are not mounted, and as such no ordnance is fitted to them.

Only one weapon type can be selected per pylon at any one time. Attempting to select another weapon over another already-active weapon will disable both weapon types, requiring the second to be de-activated in order to display the first.

## 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.



## Forward Looking Infra-Red (FLIR) screen

The Forward Looking Infra-Red (FLIR) screen (P3D v4/v5 only) displays a high-resolution infra-red image of the flight path ahead of the Strike Eagle. This screen is only available in the F-15E Strike Eagle.

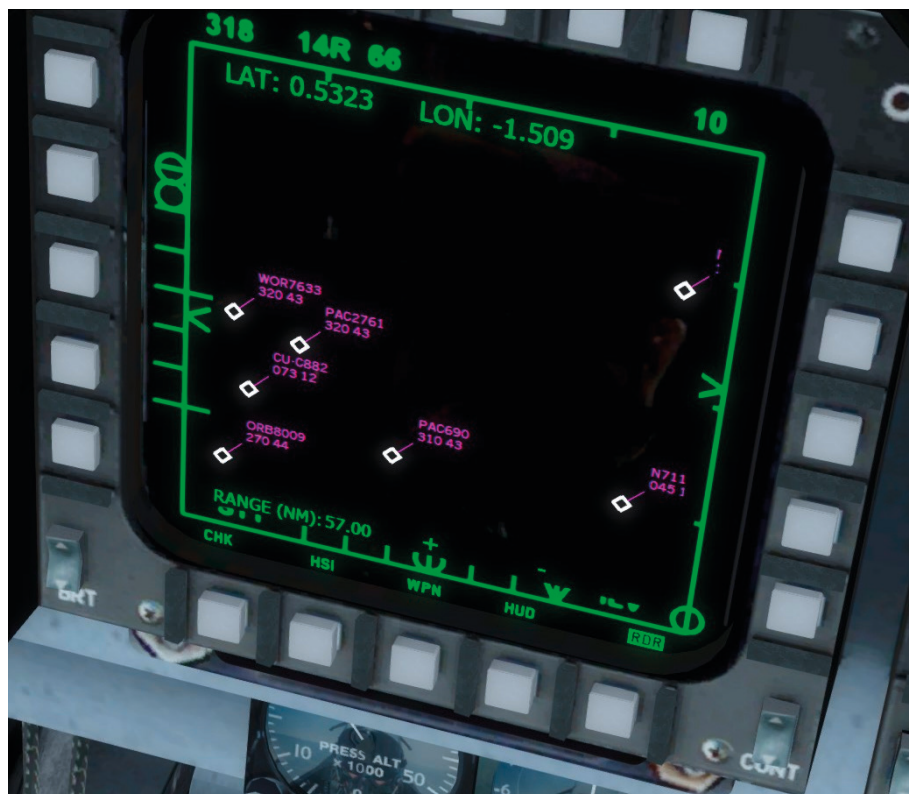


The image is projected in wide-field to allow a broad visual spectrum threat analysis in low-light and night conditions, with hotter surfaces projected in lighter shades and cooler surfaces in darker hues.

A latitude and longitude read-out occupies the upper edge of the screen.

## Radar screen

The radar (RDR) screen projects returns from the on-board APG-70 Pulse-Doppler radar system, which in turn can connect to Boeing E3-D Sentry Airborne Early Warning platforms via Link-11 technology. This provides the Eagle pilot with a 'God's Eye' tactical view of the theatre of operations and far greater range than the Eagle's internal radar alone.



The pilot can select the range of the radar display using the + (plus) and - (minus) touchscreen areas immediately below the radar display in the F-15C's upper radar display, and also via the GPS screen in the F-15E pilot's cockpit.

**Note:** The MFD radar display in the F-15C is a repeater to enable easier viewing for the user due to the dedicated radar screen's small size. To alter the range setting in the F-15C, use the dedicated radar screen + (plus) and - (minus) controls.

## GPS / Moving Map display screen

The GPS / Moving Map display screen features a dynamic GPS-based orientation screen that depicts local terrain, airports, intersections and other data, with the aircraft position at the centre of the display.



A latitude and longitude read-out dominates the top of the display, while below at the bottom are two icons allowing the pilot to zoom in and out of the display.

This display is only available in the F-15E Strike Eagle.

**Note:** The range/zoom function in the GPS display will also affect the radar display and vice versa.



## 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.



## Crew kneeboards

Both the pilot and the WSO are featured and can be activated using buttons in their respective cockpits, in both cases on the right-hand forward side panel area. Each crew member has interactive kneeboards, via which the user can select visibility conditions for support vehicles, armed-guard, intake covers, wheel chocks and boarding ladder.

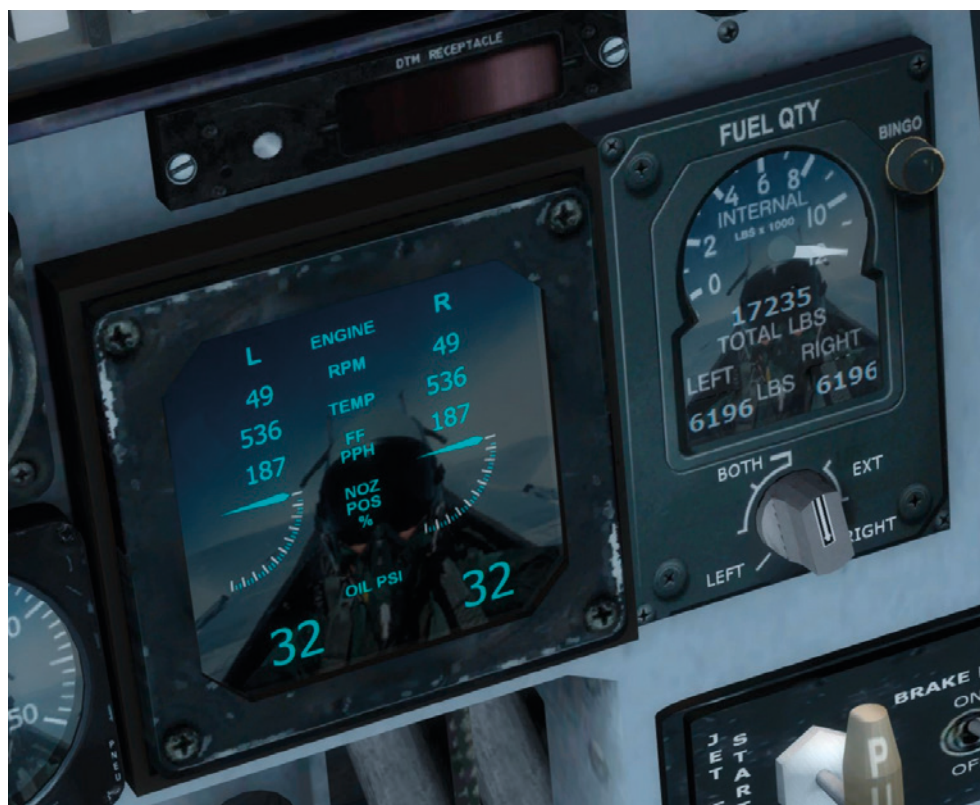


Please note that these can only be seen when the canopy is open and the battery switch is set to the OFF position, i.e. when the aircraft is shut down.

The kneeboards also dynamically display data such as the currently selected navigation, communication and transponder frequencies, as well as flight data such as recommended take-off speeds, landing weights etc.

## Cockpit instrument reflections

Many of the instruments within both cockpit types have custom glass reflections.



These can be switched off, if you prefer not to have reflections, or can be switched for a second set of textures where the reflections are approximately half as vivid.

These textures can be found in the following simulator location:

*Your Drive: \Lockheed Martin\Prepar3D v4\SimObjects\Airplanes\DCD F-15 Eagles\texture*

The reflections are controlled by a texture named `Instrument_Glass.dds`. There is a second texture, `Instrument_Glass_Light.dds`, which has less reflectivity.

Make a copy of both textures and put them somewhere safe. Now rename `Instrument_Glass.dds` to `Instrument_Glass_Backup.dds`. Finally, rename `Instrument_Glass_Light.dds` to `Instrument_Glass.dds`. You will now have the softer reflections. Both F-15 master folders have these textures available to be altered as you wish.

If you prefer no reflections in the glass, simply remove both textures from the master folder.

# 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 MASTER START switch located on the right-hand side panel. This will switch on the battery, avionics, generator and APU, then crank both engines for you.



More normally, the pilot will follow the standard 'cold and dark' start-up procedure. A full list can be found on the Left MFD 'Check' page, and via the menu drop-down kneepad Checklists option.

1. Check gear down, parking brake ON.
2. Battery switch ON, check voltage.
3. Avionics switch ON.
4. Generator switches ON.
5. Check the fuel gauges for sufficient supply.
6. Fuel flow switches to OPEN.
7. Hydraulic switches to ON, check pressure.
8. Intake ramps switch ON.
9. Throttle forward ONE INCH.
10. Crank engine 2. Wait for spool up and idle. Crank switch off.
11. 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.



## 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 tanks and up to three externally mounted tanks. The maximum internal capacity is approximately 12,000 lb for the C version 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 Eagle, 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.



Both aircraft can operate in total darkness, in combat conditions, using formation lights only, 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.



# 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 different role, so the Strike Eagle is not required to be as manoeuvrable as its 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.

A complete set of checklists can be found on the aircraft MFD CHK pages and also in the aircraft's checklist and reference pages, obtained via the simulator's drop-down menus.

## 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 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 of elevator trim using the Checklist screen read-out. 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 – 130 knots
- V lift off – 150 knots

When a speed of 130 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 indicated, trimming as you go, while accelerating to the Eagle's climb airspeed of 320 knots indicated.

## 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.



Supersonic flying beyond Mach 1.0 requires the use of afterburner, which more than doubles fuel consumption. The F-15C Eagle is capable of reaching Mach 2.5 at altitudes in excess of 35,000 ft, for short periods of time, to carry out effective intercepts of hostile targets. It can also climb at a tremendous rate and is even capable of breaking the sound barrier while in a vertical climb.



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 90,000 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

The F-15 Eagle is extremely 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.

In order to ensure sufficient recovery time, do not carry out intended stall routines below 12,000 ft altitude.



## Navigation

The art of radio navigation is something that all pilots must master if they are to find their way around the world without constantly having to refer to the simulator's internal map. Reliance upon the GPS / Moving Map system results in sloppy flying as the GPS, despite its accuracy, can only display basic trends. It cannot account for wind drift, variation in barometric pressure and other meteorological changes that occur during a typical flight.

By planning your flights and using radio navigation beacons in conjunction with the F-15 Eagle's HSI, you will be able to find your way anywhere in the world, day or night, and in any weather.

The following picture depicts the F-15 Eagle's UFCP, HUD and HSI all working in conjunction to navigate towards an airfield.





The aircraft is tracking VOR 115.90. The DME reports the field as being 56.4 nautical miles away. Airspeed is 340 KIAS, ground speed is 364 knots – faster, because the aircraft is at nearly seven thousand feet in thinner, lower-pressure air. The bearing of the selected navaid is 015 degrees.

The HSI shows the aircraft to be very slightly to the right of the desired track (the deviation needle is just to the left of the arrow, but the aircraft is heading towards the field correctly, as per the solid triangular arrow in the top right of the digital HSI in the MFD).



*An F-15E lands with full flap and spoiler selected. The AOA when landing in this configuration is the same as standard, as is the airspeed, but a higher throttle setting is required to maintain 8 degrees AOA at 150 knots indicated.*

## 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 COMS 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 1,000 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 150 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 140 knots indicated, trim, and maintain the centreline as you approach the threshold. Just before the aircraft is about to touch down, ease the throttles to idle and raise the nose in a gentle flare.



*An F-15C pilot elects to land using aerodynamic braking. The nose attitude should be 12 degrees – note the position of the tailerons during this manoeuvre. Upon touchdown, with the throttle at idle, the pilot should maintain back pressure on the stick to hold approx. 12 degrees nose-up while the airspeed decays. The F-15's nose will eventually drop at around 80-85 knots.*





## Instrument Landing System (ILS)

The image below shows an F-15E Strike Eagle on final approach to an airfield while using that airfield's ILS landing system. The ILS is represented within the HUD as the horizontal and vertical crosshairs, transposed over a small circle.





The ILS crosshairs will appear automatically whenever you are within range of an active ILS system frequency that is selected in the Navigation panel.

The image represents a near-perfect approach example: 141 KIAS, crosshairs aligned, just a touch above glideslope, with the AOA bracket to the lower-left-centre of the HUD showing the aircraft AOA angle centred at 7.2 degrees, just a touch fast. The velocity vector is showing our touchdown point just beyond the 'piano keys' at the start of the runway.

## CREDITS

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

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