

COMBAT-AIR-PATROL 2



FLIGHT MANUAL

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Purchasing CAP2

CAP2 is a digital download from the 'Steam' store. Once downloaded and installed, the Steam platform will keep your CAP2 install updated.

If you don't yet have a Steam account, create one at <https://store.steampowered.com/>

You can purchase CAP2 in either of the following ways:

1. From our website
 - a. Buy a license key from our website here: <https://combatairpatrol2.com/buy-now>
 - b. Redeem the license in the Steam Store here: <https://store.steampowered.com/account/registerkey>
2. From the Steam Store
 - a. Log into your Steam account
 - b. Search 'Combat Air Patrol 2'
 - c. Click 'Buy'





Installation

Using the Steam client, download the default branch of CAP2

Steam Release Channels

CAP2 utilises three Steam release channels for game updates. After purchasing CAP2 you start in the default channel for game updates. If you wish to switch to another channel, follow the guide below.

You can select a release channel by:

right clicking on CAP2 in your Steam Library

select 'Properties'

Select the BETAS tab

Select one of the following entries in the beta dropdown

NONE - Opt out of all beta programs (Default Channel)

This is the default stable build of CAP2 which is updated as the Beta build completes development milestones.

beta - Faster release branch (Beta Channel)

This is the most active build of CAP2 which introduces new features on a regular basis.

vrbeta - (VR Beta Channel)

This is a build which receives VR specific updates together with standard Beta updates.



Getting Started

From the Steam client, run CAP2.

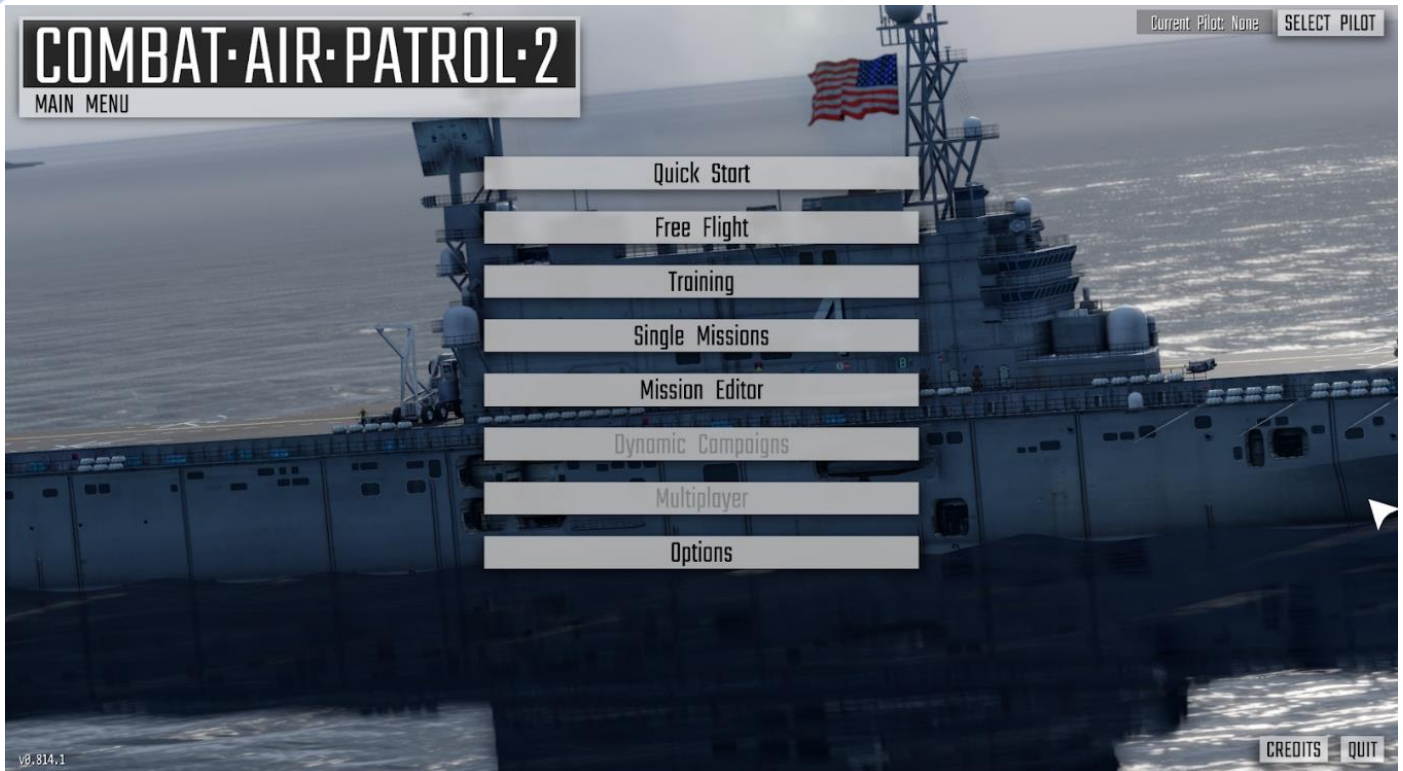
If you have a VR headset you will be given the option to run in Steam VR mode or Oculus VR mode. If you have an Oculus Rift, we recommend using the Oculus native mode for better performance.

The first time CAP2 runs it will start in windowed mode.

We recommend you go through each of the following steps to setup CAP2 on your PC.

1. Set your video options
2. Set your video lighting levels
3. Setup your controllers

Once your controllers are setup let's get flying! From the main menu select QuickStart, Free Flight or Training to get into the cockpit and begin to familiarise yourself with the AV-8B II.



Main Menu

The main menu contains the following options:

- Quick Start
- Free Flight
- Training
- Single Missions
- Mission Editor
- Dynamic Campaigns
- Multiplayer
- Options

Each sub menu is detailed below



Menu: QuickStart

Fly some easy to get into missions.

STOVL Take-off

You start on the deck of LHA-4 USS Nassau near MCAS Kaneohe Bay, Hawaii. Wait for your wingman to take off then you're next. Set flaps to VTOL, nozzles to 30deg, close the canopy. Throttle up to 30%, check engine is nominal, release the brakes and throttle up to 100%. Once you have a positive climb select gear up and flaps to auto

Vertical Landing

You start lined up on approach to LHA-4 USS Nassau near MCAS Kaneohe Bay, Hawaii. Transition to vertical flight by first setting nozzles to 60°. Use your airbrake to reduce speed. As your speed drops you transition from wing borne to jet borne flight. Set nozzles to 90°. If you want to fly with vertical flight aids, enable them now (default mapping Key V).

Vertical Flight Aids

- Off

You are fully in control of engine, nozzles and attitude. This is extremely difficult!

- Medium

You are in control of nozzles and attitude. Throttle position is now a demand for vertical speed from +5m/s to -5m/s.

- High

You are in control of nozzle angle. Pitch and Roll inputs are now a demand for forward and lateral speed. Centring the stick will bring the aircraft to a stop. Throttle position is a demand for vertical speed from +5m/s to -5m/s.



InFlight Refuelling

In this mission you attempt an inflight refuel with a KC767 over MCAS Yuma.

DogFight

In this mission you defend the fleet from an ERF low level surprise attack.



Menu: Free Flight

There are four Free Flight regions which each contain several areas:

Persian Gulf

Khasab

Start in flight heading towards the friendly airbase Khasab in Northern Oman

Northern Oman

Start in flight high above Northern Oman

Straits

Start at 20,000ft over the Straits of Hormuz

Bandar Abbas

Start at 20,000ft over the Iranian military port Bandar Abbas

Abu Musa

Start at the heavily fortified island Abu Musa



Arizona

Yuma Apron

You start on the apron at MCAS Yuma

Yuma Take-off

You start on the runway at MCAS Yuma

Yuma Approach

You start lined up for approach to MCAS Yuma

BMGR West

You start over the western edge of 'Barry M. Goldwater Range'

BMGR East

You start over the western edge of 'Barry M. Goldwater Range'

Chocolate Mountain Range

You start over 'Chocolate Mountain Range' in Arizona, USA





Hawaii

Kaneohe Bay Apron

You start on the apron at MCAS Kaneohe Bay

Kaneohe Bay Runway

You start on the runway at MCAS Kaneohe Bay

Kaneohe Bay Approach

You start lined up for approach to MCAS Kaneohe Bay

Honolulu

You start above the city of Honolulu, Hawaii

UK

Mach Loop

The 'Mach Loop', named after the Machynlleth Valley it traverses, is the foremost low-level flight training area in the UK. You enter the loop from one of the three following locations:

East

You start at low level heading west over the village of Bala

North

You start at low level heading south east over the town of Caernarfon

West

You start at medium level over the Irish Sea to the west of the Machynlleth valley

Lake District

Fly a low-level route through the rugged terrain of the UK's Lake District.

HMS Queen Elizabeth

This is the first of the Royal Navy new class of super carrier. Designed to operate VSTOL aircraft from her ski jump equipped deck.

Deck

Start from the deck and experience a ski jump take-off.

Fly-By

Overfly the Queen Elizabeth



Menu: Training

Pick from a selection of flight training missions then progress to weapon training missions.

Flight Training

Take-off

Practice carrier take-offs.

Landing

Practice carrier vertical landings

Basic Manoeuvring

Fly with your flight leader, practice flight navigation

Wingman

Weapons Training

Air to Air

Guns

Attack F4 drones in flight near MCAS Kaneohe Bay

AIM-9

Using AIM-9 Sidewinder missiles engage manoeuvring F4 drones near MCAS Kaneohe Bay

AIM-120

Using AIM-120 AMRAAM missiles engage manoeuvring F4 drones at long range near MCAS Kaneohe Bay

Air to Ground

Guns

Practice ground strafing attacks using your GAU-12 Equalizer at the Hawaiian target range.

MK-82,83,84 Bombs

Practice delivery of MK-82,83,84 free fall slick bombs. Roll in at 12,000ft, get the CCIP on the target and release at 8000ft. Release chaff then climb above 10,000ft to escape simulated AAA and IR Missile threats.

AGM-84

Use the AGM-84 Harpoon anti-ship missile to engage target ships off the coast of Hawaii.

AGM-88

Employ the AGM-88 HARM anti-radiation missile against dummy radar emitters on the Hawaiian target range.

AGM-65

Practice using the AGM-65 Maverick against targets within the Hawaiian target range.

LAU Rockets

Practice low level attacks with the LAU 5003 rocket pod with 19x CRV7 rockets per pod.



Menu: Single Missions

There are 4 types of single mission:

- CAP2 Missions

These are 10 missions included with CAP2

- User Missions

Missions created by you using the mission editor

- Steam Workshop

Missions created by other players downloaded from the Steam Workshop

- Challenges

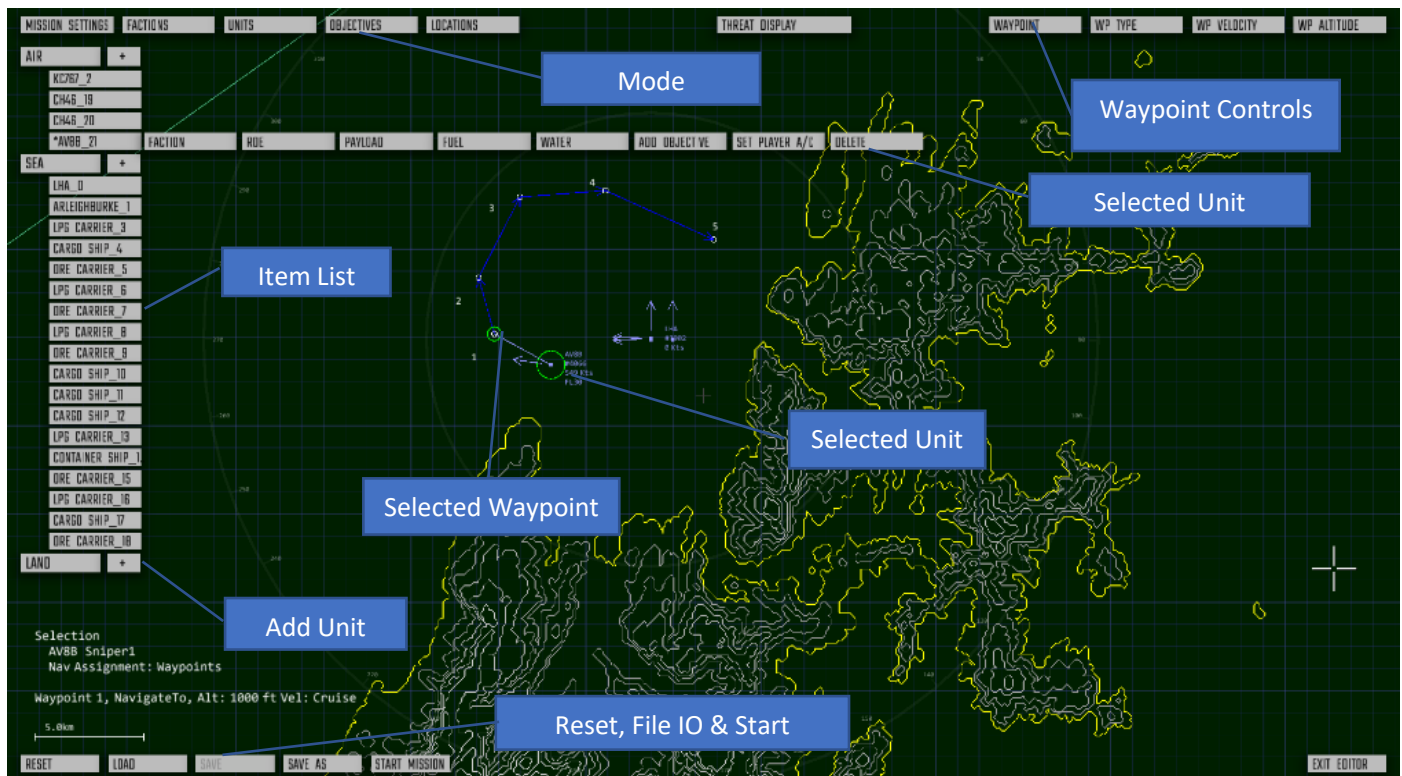
Score or time-based missions with an associated Steam leader board

Select the type of mission then choose a specific mission. Click 'Start Mission' to view mission details then pre-flight options.

Main Menu: Mission Editor

The CAP2 mission editor enables you to create missions in each of the four regions included with CAP2. Missions created within the mission editor can later be selected from Main Menu: Missions: UserMissions

Mission Editor Display Overview



map navigation

Click and drag on an empty area of the map to adjust map position

Use the mouse wheel to zoom in/out

Item Selection and Manipulation

Selectable items include Units, waypoint nodes and locations.

selecting an item is done with the left mouse button. Zoom in or out with mouse wheel to easily pick an item from a group.

When an item is selected a green circle will be displayed around it. After selection the item can be clicked and dragged to reposition it. To change its heading click and drag its heading arrow which is now 'live'

Units

Left Click on a unit or one of a unit's waypoints to select it. You can also click on a unit from the unit list to select and centre the view.

Left Click on a unit and drag to reposition it. A unit may be positioned on a carrier if the carrier has available attach points. Zoom in to position a unit onto a specific attach point.

Left Click and drag on a selected unit heading symbol to adjust heading.

Shift Drag a unit to adjust its initial velocity.

Control Drag an aerial unit to adjust its initial altitude.

Waypoints

Left Click on a waypoint node to select it and its associated unit.

Left Click & drag to move the waypoint node.

Control Drag a waypoint node to adjust its altitude

Press Delete key to delete a waypoint node

Locations

Left Click on a location centre to select it.

Left Click & drag to move the location.

Shift Drag to adjust the location radius.

Control Drag to adjust the location altitude

Main Options are located top left of the screen. They include mission settings, faction settings and three mode selectors; Units, Objectives and Locations



Mission Settings

The following mission text can be entered by clicking the relevant button

Mission Title

Mission Location

Mission Description

Mission Notes

Mission Completion Criteria

Mission Region

Select the region for your mission. Changing the region resets the mission state.

Extra regions will be made available as downloadable content. After purchasing a region, it will become selectable here.

Environment Options

Select the atmosphere state (clear, hazy etc)

Select Cloud levels, wind speed and turbulence

Start Time

Select the default mission start time

Faction Settings

There are 3 factions. They are:

Blue - Friendly combative forces

Red - Adversary combative forces

Green - Civilian non combative vehicles, ships and aircraft

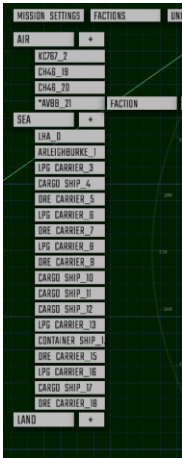
Each unit added to the mission will belong to a faction. This can be changed via the unit settings.

Factions can be renamed within the Factions menu.

Each faction has an R.O.E. (Rule Of Engagement) which controls how units within that faction will react to opposing faction units.

Item Lists

Clicking the buttons labelled Units, Objectives or Locations will show a list of their items to the left of the screen. Also clicking an on-screen unit or location will display their items list and select the relevant item.



Units Item List

This list shows all units added to the current mission. Units are grouped into 3 types; Air, Land and Sea.

Adding a unit

To add a class of unit, click the + button next to each unit class then click on a specific unit type. It will be added to the centre of the display. The display centre has a cross hair symbol to aid unit placement.

Selecting a unit

In addition to directly clicking on a unit in the map you can select a unit by clicking on its entry in the unit list.

Unit Options

After selection, Unit specific options are displayed. These include:

Faction

Change the unit faction

ROE

Override the unit's faction ROE. Rules of Engagement control how forces react to adversaries and whether battle is initiated. ROE is set at faction level and can be overridden on a unit by unit basis.

Objective

Add an objective to this unit such as protect this unit, attack this unit. To edit the objective, select Objectives from the top left buttons

Delete

To delete this unit, click this button then confirm

Selecting an AV8B adds the following options

Pilot

Choose a pilot from the pool for this aircraft

Payload

Choose a pre-defined payload for this aircraft

Fuel

Pick a fuel level for this aircraft

Water

Pick a water level

Set Player AC

Selecting this identifies which plane the player will fly. The unit name will start with an asterisk (*) to show the player aircraft

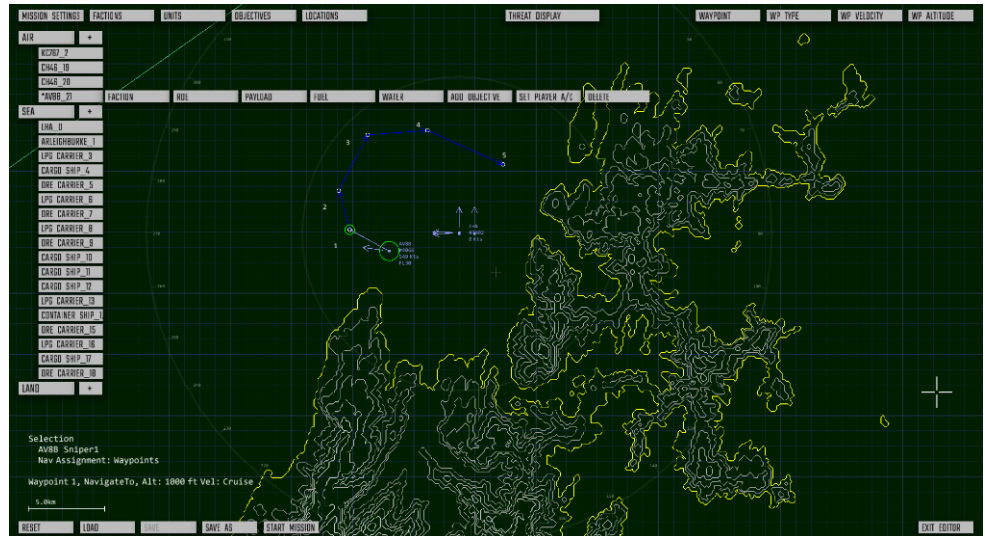
Unit Editing

After a unit is selected you can:

Alter a unit's heading by clicking and dragging its direction arrow.

Change a unit's position by selecting it and dragging with the left mouse button held.

Change an air unit altitude by pressing CTRL + left mouse and moving the mouse vertically



Unit Waypoints

Selecting an onscreen waypoint will also select the unit that has the waypoint assigned to it.

Drag the waypoint with the mouse to reposition it.

Alter the waypoint altitude by CTRL dragging it vertically.

Alter the waypoint velocity by SHFT dragging it vertically.

Change a waypoint type by selecting the waypoint type UI dropdown at the top right of the screen.

Locations Items List

Click the button labelled 'Locations' or select an onscreen location to display the locations list.

Locations are points within the current region with an altitude and radius. A location can have an objective attached to it such as fly to this location, attack this location or defend this location.

To add a location:

Position the cross hair where you want to create the location

Click 'LOCATION' on top left menu

Click '+' to add a new location

To edit a location

Click a location in the map

Edit the location name by clicking on its entry in list

Move the location by dragging it around the map

Adjust the location altitude CTRL + dragging the location up and down the display

Adjust the location radius by SHFT + dragging the location up and down the display

Objectives Items List

Click the button labelled 'Objectives' to display the Objectives list.

Each mission objective is required to be completed by the player.

There are the following mission objective classes:

1. Avionics/Flight controls
 - a. These are suitable for training missions where the player must complete actions such as 'close canopy' or release brakes.
2. Flight Path
 - a. The player must follow his waypoint or fly to predefined locations
3. Attack units
4. Attack locations
 - a. The player must damage or destroy specific units or impact weapons within predefined locations
5. Protect units
6. Protect locations
 - a. The player must protect specific units or prevent impacts within specific locations

The mission will be complete once all objectives are complete.

The mission will be failed if an objective such as 'protect unit' or 'protect location' is not complete.

Objective sequences

Objective sequences ensure objectives are evaluated in a specific order.

Objectives in sequence 0 are constantly evaluated.

New objectives are created in sequence 0.

Multiple objectives can share a sequence index.

At mission start, in addition to sequence 0, objectives in sequence 1 are also evaluated. Once all objectives in sequence 1 are complete, evaluation will start for sequence 2 and so on.

If you do not require objective sequencing, set all objectives to sequence 0.

Unit Types

Air

AV8B

CH46

SH60

F4

F4 Drone

KC767

Mig21

Sea

LHA – Tarawa Class

QE Class Carrier

Oliver Hazard Perry Frigate

Arleigh Burke Destroyer

Type 45 Destroyer

DDG-1000 Zumwalt

Gunboat

Patrol Boat #1, #2

Submarine

Mini Submarine

Tanker

Cargo Ship

Container Ship

LPG Carrier

Ore Carrier

Land

ZSU-23 Mobile AAA gun

SA-2 SAM

Hawk SAM

P-15 FlatFace Mobile Radar

P-12 SpoonRest Mobile Radar

HY-2 SilkWorm Anti Shipping Missile Launcher

Main Menu: Campaign

Currently Disabled

This screen allows you to start or continue a campaign. You can have multiple active campaigns.

Main Menu: Multiplayer

Currently Disabled



Main Menu: Options

The Options Menu contains the following sub menu's

- Controls
- Game
- Graphics
- Audio
- VR
- Realism

This menu can also be displayed in game by pressing [ESC]



Options: Controls

There are 8 sub menus' leading to groups of controls sorted by the following categories

1. Flight
2. Engine
3. Weapons
4. Avionics #1
5. Avionics #2
6. Radio
7. View
8. Misc

Within each sub menu is a separate class of controls

For a detailed description of each control, go to the section 'Control Reference'

The final sub menu is 'SET DEFAULTS'. Select this menu to set default controls for Keyboard, GamePad or FlightStick

For a list of controls assigned for each control method, see Default Control Mappings'

Mapping a Control

You can map any game control to a key press, joystick/throttle/pedals (button, axis, slider or pov hat), xbox controller (button, axis) or mouse button.

The procedure to map a control is:

1. Select the menu page for control you wish to map. ie for Pitch Up/Down select Controls->Flight.
2. Select the control from the list. ie for Pitch Up/Down select Pitch.
3. Select the control again to begin mapping it.

4. Press or move the required input. i.e. for Pitch Up/Down move your flight stick forward. The change in state is detected and the control is mapped. To cancel the mapping state press 'ESC'.

You do not need to save your changes as the configuration is saved whenever an adjustment is made. To revert to the configuration used when your current CAP2 session was started, select 'Revert'.

Axis Sensitivity

You can adjust the sensitivity of an axis input by first selecting it in the control list then clicking on its response curve modifier at the bottom of the screen. The modifier cycles between Linear, Exp1, Exp2, Exp3, Exp4, Exp5. Each step progressively flattens the response around the axis centre.

Axis Null Zone

You can adjust the null zone of an axis input by first selecting it in the control list then clicking on Null Zone + or Null Zone - at the bottom of the screen. The null zone is displayed as a percentage.

Re-Scan Devices

Select 'Re-Scan Devices' if you have connected a new device since starting CAP2.

Keyboard

At the simplest level you can fly using keyboard cursor keys for pitch and roll. Rudder is controlled by comma and period. Shift and cursor keys adjust trim.



Options: Game

These menu options allow you to change the following 'In-Game' options:

- Cockpit FOV
 - Adjust the cockpit view width in degrees. Typical values are in the range 80°-90°
- Cockpit Transition
 - Enable or disable a camera animation when switching to cockpit view.
- Cockpit View Levelling
 - Set a rate of 'auto head levelling' when in cockpit view



Options: Graphics

You can adjust the video output from CAP2 to match your monitor/TV display with the following options

Display Adapter Settings

Select to enter the Display Adapter Settings sub menu

Rendering Settings

Select to enter the Rendering Settings sub menu

Gamma Boost

Gamma is the primary brightness adjustment control. Decrease the Gamma value to darken shadow areas, increase it to brighten.

Brightness Boost

Click to adjust display brightness

Contrast Boost

Click to adjust display contrast

Saturation

Click to adjust display saturation

Lens Flare

Toggle drawing lens flare

Lens Particles

Toggle drawing lens particles



Options: Graphics Rendering Settings

These options adjust how CAP2 draws the environment. An LOD setting adjusts the 'Level Of Detail' of a rendering component. Higher LOD's improve visuals but use more GPU power.

Global LOD – Overall LOD. Change to set all other LODs in one step

Individual LODS

Terrain LOD – Sets terrain detail level

Terrain Distance – Terrain draw distance in km

Buildings LOD – Building detail level

Vegetation LOD – Vegetation density level

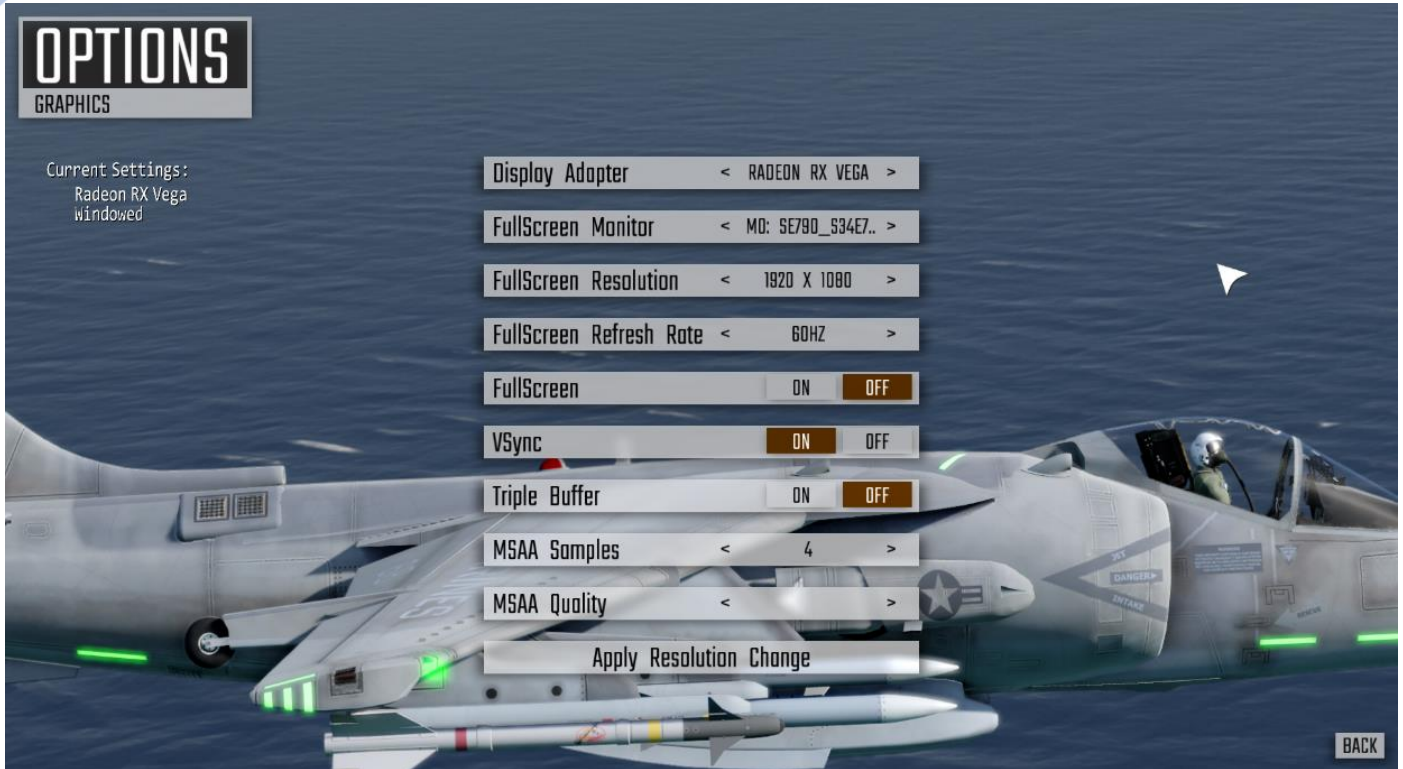
Reflections LOD – Water reflection detail level

Shadows LOD – Shadows detail level

Object LOD – Object detail level adjusted by distance

SSAO Settings – Select to adjust 'Screen Space Ambient Occlusion' settings

Depth Of Field – Toggle 'depth of field' distance blur effects



Options: Graphics Display Adapter Settings

These options let you configure how CAP2 uses your graphics processing unit (GPU)

Display Adapter – If you have more than one GPU you can select which one CAP2 will run on

Full screen mode options

Full-Screen Monitor – If you have multiple monitors select which monitor CAP2 will run on

Full-Screen Resolution – Choose a resolution for the full-screen display

Full-Screen Refresh Rate – choose a screen refresh rate. Default is 60hz

Full-Screen Mode – toggle full-screen mode on/off. Also done via Alt-Enter

V-Sync – Toggle V-Sync on/off. Prevents ‘screen tearing’ when on

Triple Buffer – Enable to potentially improve performance when V-Sync is enabled

MSAA Samples – Increase value to smooth edges of rendered objects. Higher values use more GPU power

Apply Resolution Change – Click this after changing screen resolution or rate when in full screen mode



Options: Audio

In this menu adjust the following volume levels

- Master Volume
- FX Volume
- Radio Volume
- Music Volume



Options: VR

This menu allows access to the following VR settings:

Cinema Mode Aspect Ratio

Changes the size and shape of the cinema mode used for non-pilot view. Choose whichever you prefer.

Mirror VR Output to Desktop

Select Yes to draw the current view to the computer desktop. This is useful to show the current view while you are not wearing the headset or for spectators to see your view. This incurs a slight performance hit so if you don't require it, disable it.

Reset Head Position

Use this option to reset the headset position. In you feel in pilot mode you are too high/low, forward/backward, left/right or rotated left/right then select this option. Sit comfortably, looking straight ahead and select. For convenience this option can be mapped to an input through the menu Settings->Controls->View.

Pixel Scaling Factor

Adjust this figure from 100% to 150% to increase the quality of the image within the headset. Increasing this figure will increase the workload on your GPU so you may experience jitter with higher settings. The updated scaling factor is applied after restarting CAP2.

VR Gamma

Adjust the gamma (brightness) setting used for VR rendering. 1.0 has darker shadow areas.

VR Saturation

Adjust the saturation (Colour Intensity) used for VR rendering.

IPD (Interpupillary Distance) is read from the headset settings (adjusted with Vive rotary knob or Rift CV1 slider).

VR Compatibility

The current implementation uses the OpenVR API to support HTC Vive and Oculus Rift headsets and a native Oculus API implementation for direct Rift support. For Rift users we recommend using the Oculus VR Mode for better performance.

Starting VR

When running CAP2 you will see three launch options:

Play Combat Air Patrol 2

Plays CAP2 in standard 2D Display mode

Launch Combat Air Patrol 2 in Oculus VR Mode

Plays CAP2 in VR using Oculus API (Rift & Rift S)

Launch Combat Air Patrol 2 in Steam VR Mode

Plays CAP2 in VR using OpenVR API (HTC Vive, Valve Index, Windows Mixed Reality, Rift & Rift S)

Through your headset you should see a 'cinema mode' view of the start-up screens and game UI. This is how everything apart from pilot view will be displayed. If you start a mission and switch to pilot view you will see a full VR view.

The VR Beta channel will receive VR specific updates first.

Creating a Pilot

Creating a pilot allows you to save statistics between sessions of CAP2.



To create a pilot:

- Select MainScreen->Pilot
- Click on an empty slot
- if there are no free slots, select then delete an unneeded pilot
- Enter your pilot name
- Click 'Create'

Cockpit View & Interaction

Looking around the cockpit

Adjusting the cockpit pilot view can be done in several ways:

- Gamepad: Right ThumbStick
Stick movements adjust cockpit view angle
Stick click to toggle zoom
- Mouse: MouseLook Mode
MouseWheel click to enter and leave 'MouseLook' mode.
Mouse movements adjust the view.
MouseWheel adjusts zoom level.
Left & right mouse buttons adjust highlighted controls
- Mouse Pointer Cockpit Display Zoom
Moving the mouse pointer over cockpit displays such as MFDs changes the pointer to a magnifying glass. Left click to zoom into the display. Right click to zoom out.
- Look Forward / Look Aft / Look Left / Look Right Inputs
can be mapped to:
 - Keys
 - Joystick buttons
 - Joystick POV hats
- TrackIR head tracking
- VR head tracking
When looking into the cockpit a small circular icon is displayed in the centre of the view. As this icon moves over switches it becomes orange.
Adjust the switch using the following controls:
 - 'Adjust Cockpit Item+'
 - 'Adjust Cockpit Item-'

AV-8B II HARRIER



The AV-8B II Harrier 2 is currently the main plane flown in CAP2.

The Harrier is a single-engine ground-attack aircraft capable of vertical or short take-off and landing (V/STOL).

Harriers typically operate from small aircraft carriers, large amphibious assault ships and simple forward operating bases.

The Harrier is due to stay in USMC service until 2025.

The following AV-8B II specific sections include:

AV-8B II Cockpit Tour

- Front Panel
- Lower Left Panel
- Lower Right Panel

AV-8B II HOTAS Controls

- Stick
- Throttle
- A/A Weapon Select Switch
- Sensor Select Switch
- TDC - Target Designation Control
 - TDC Assignment

AV-8B Advanced Controls

AV-8B II Avionics Guide

- MFD display panels
- Standby Instruments
- HUD controls
- HUD
- UFC – Up Front Control
- ODU – Option Display Unit
- Engine panel
- Fuel panel
- Exterior Lights
- Cockpit Lights
- Autopilot
- Air to Air Refuelling

AV-8B II 'Master Mode'

AV-8B II HUD Modes

AV-8B II MFD Pages

AV-8B II Radar

AV-8B II Sensor Pods

AV-8B II A/A Weapons

- MFD display
- HUD symbology
- Procedures

AV-8B II A/G Weapons

- MFD display
- HUD symbology
- Procedures

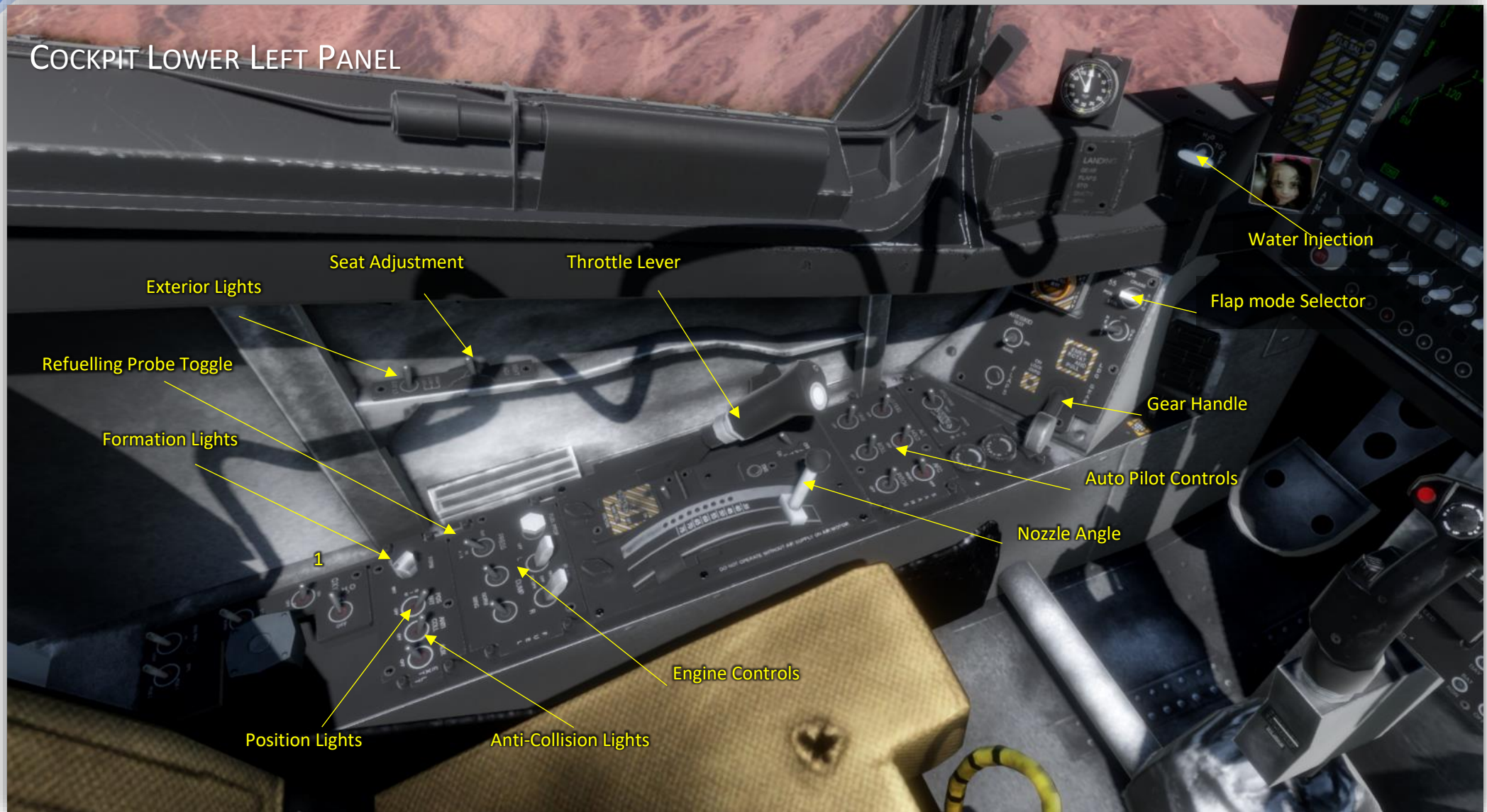
AV-8B II Cockpit Tour



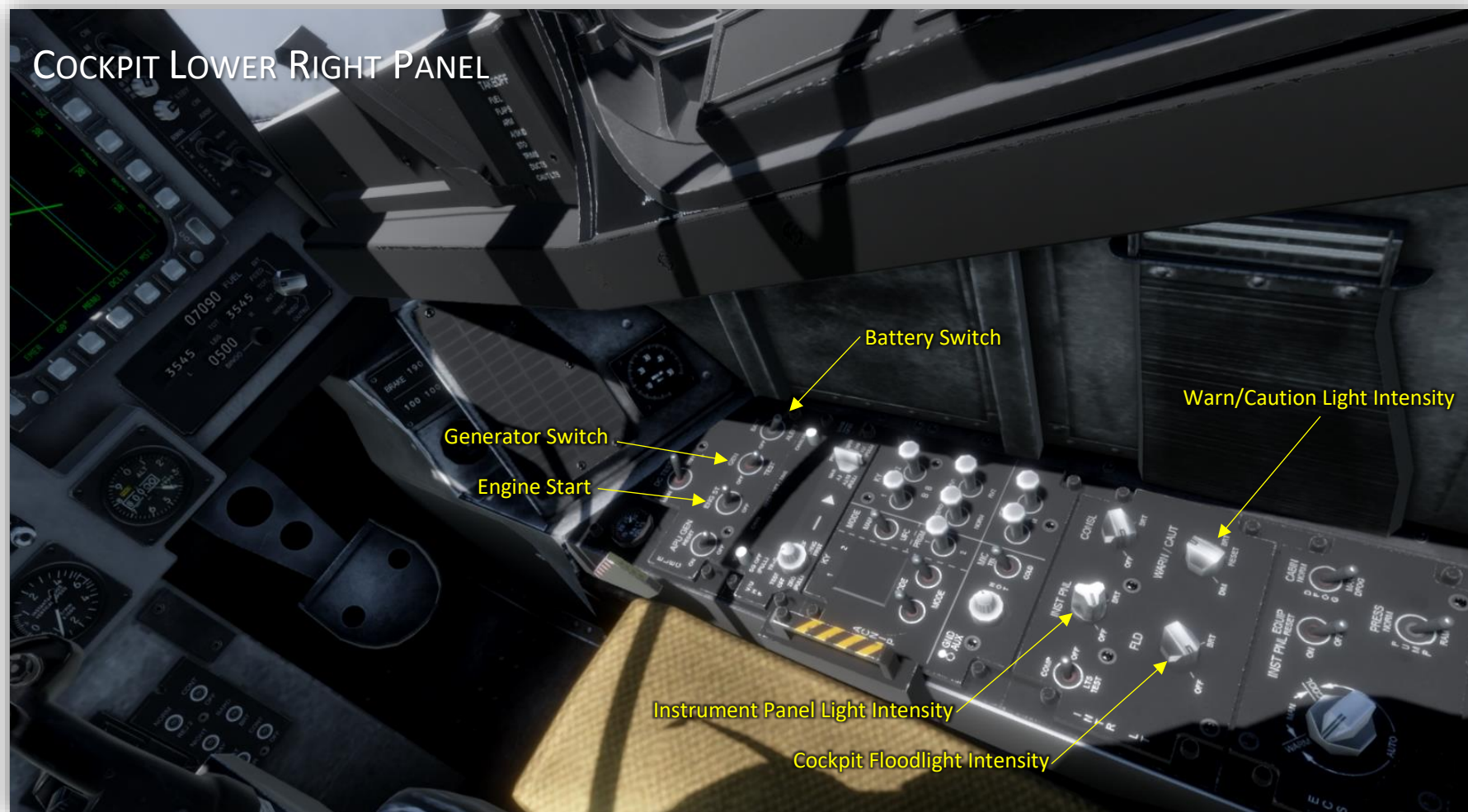
Cockpit Front Panel



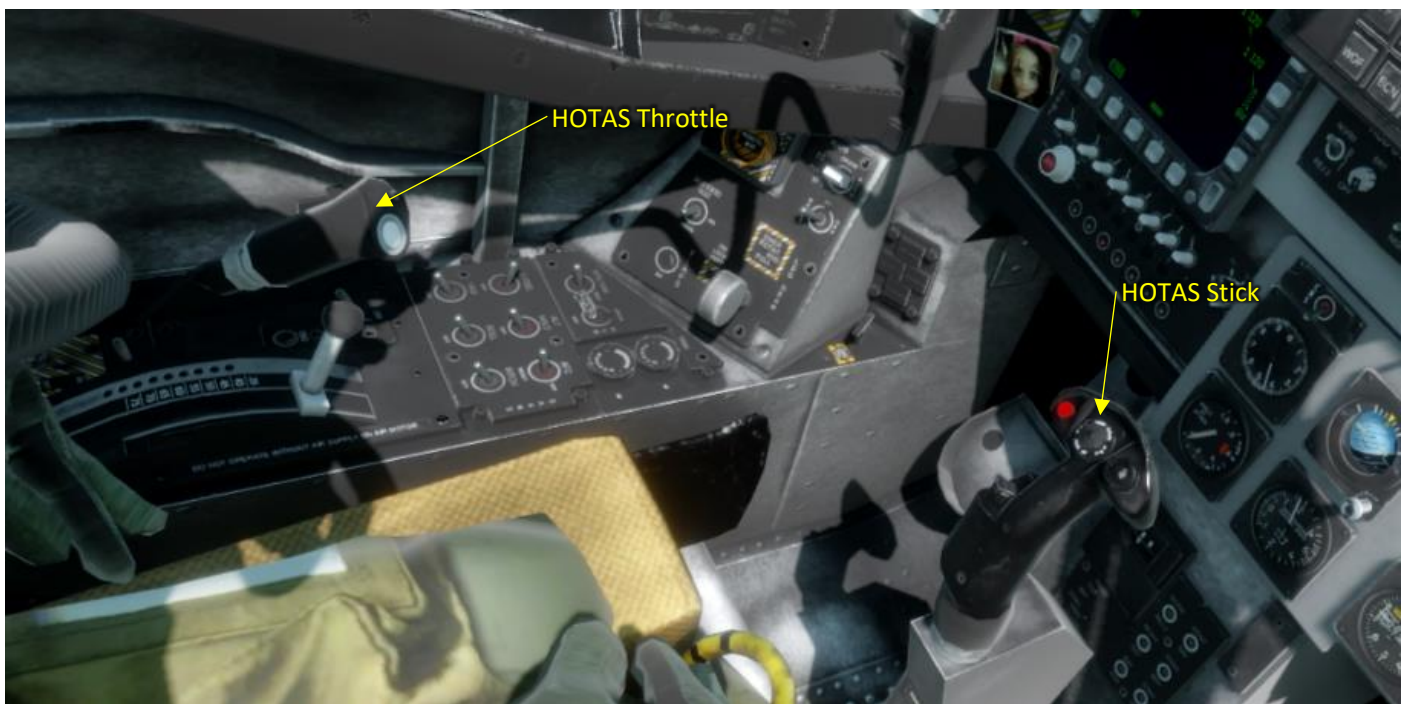
Cockpit Lower Left Panel



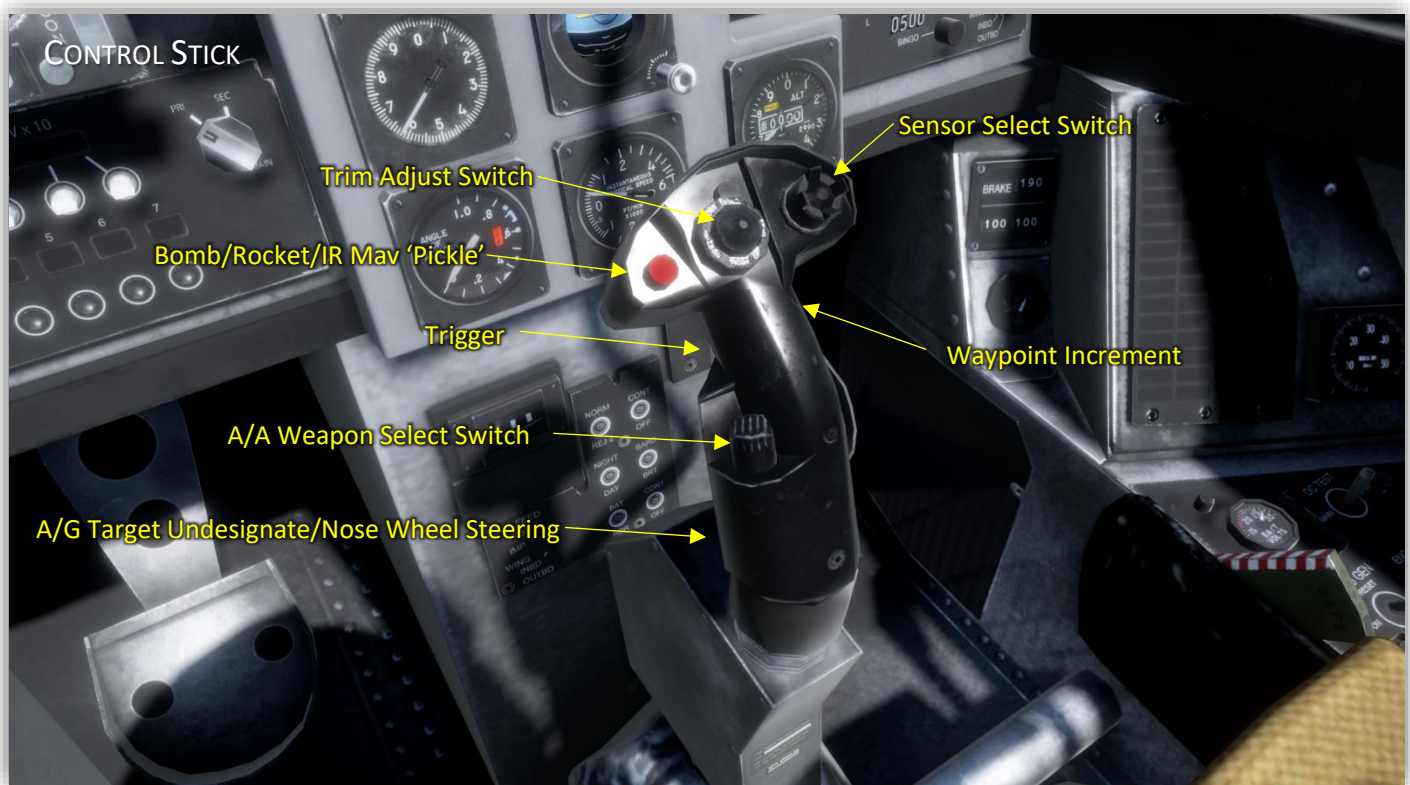
Cockpit Lower Right Panel



AV-8B II HOTAS Controls



The AV-8B II employs a HOTAS (Hands On Throttle And Stick) control philosophy. This means the pilot can adjust the most used or critical controls without removing his hands from the control stick and throttle control. Both the stick and throttle have numerous buttons and switches attached to them which control weapon selection, targeting and release, trim adjustment, navigation, comms etc.



HOTAS Stick Controls

- A/A Select Switch
4-way switch to select A/A weapon & radar modes
- Sensor Select Switch
4-way switch to configure sensors in A/A and A/G modes
- Waypoint Increment
Selects the next mission waypoint for navigation cues
- Trim Adjust Switch
Adjusts pitch and roll trim
- Undesignate / Nose Wheel Steering
With landing gear down selecting this switch selects nosewheel steering modes
 - Castor mode steering with anti-skid set to on
 - Low gain steering mode
 - High gain steering mode

HOTAS Throttle Controls

HOTAS Throttle controls are located in the lower left panel.

- Throttle
The throttle lever moves from idle to 100% via the mapped input.
- Nozzle Angle
The Nozzle angle lever moves from 0 (forward propulsion) to 92.5 (Vertical) to 98 (Vertical + horizontal deceleration)
- TDC - Target Designation Control
- Cage/UnCage Button



HOTAS - A/A Weapon Select Switch

The A/A Weapon Select Switch is a 4-way switch located on the HOTAS stick.

Pushing in each direction selects A/A Master Mode and the following functions:

- FWD – Select AIM-9 missile Boresight mode
- AFT – Select AIM-9 missile in SEAM mode
- LFT – Select Gun
- RGT – not assigned

HOTAS - Sensor Select Switch

The Sensor Select switch is a 4-way switch located on the HOTAS stick.

In A/A Mode pushing in each direction has the it is used to:

- FWD – Select Boresight A/A radar mode
- AFT – Select STT (Single Target Track) radar mode on current A/A target
- LFT – Select WACQ A/A radar mode
- RGT – Select VACQ A/A radar mode

In A/G mode:

- FWD – Select INS Lock via HUD view & assign TDC to the HUD. Dot is shown in velocity vector.
- AFT – Show A/G Radar view on right MFD & assign TDC to radar. Subsequent click command radar acquisition
- LFT – Show EHSD view on left MFD
- RGT – Show FLIR view right MFD

To lock on to a point ahead of the aircraft press Sensor Select Forward. The terrain point in the centre of the HUD is used as a lock. A target diamond symbol is drawn at the lock location. If the lock moves out of the HUD view it will flash at the HUD edge. Also, a direction to lock arrow is drawn at HUD centre.

HOTAS - The TDC (Target Designator Control)

Description

The TDC is a 4-way directional switch and selection button located on the HOTAS throttle.

It is used to:

- Move a radar target cursor within MFD radar displays then select targets
- Move a ground target lock position within the HUD display
- Adjust an IR Maverick seeker view angle and lock onto a target
- Adjust the target pod view and click to lock on a position

TDC Assignment

The TDC is 'assigned' to various functions as a result of Sensor Select switch or MFD inputs.

- HUD/INS Assignment
In A/G Master Mode the TDC can adjust (or sweeten) the INS Lock position. After setting an INS Lock position by pressing Sensor Select FWD, the TDC is assigned to the HUD. The HUD velocity vector displays a dot to show TDC is assigned.
- Radar MFD Display
- AGM-65 IRMAV
- Litening Pod

To lock on to a point ahead of the aircraft press Sensor Select Forward. The terrain point in the centre of the HUD is used as a lock. A target diamond symbol is drawn at the lock location. If the lock moves out of the HUD view it will flash at the HUD edge. Also, a direction to lock arrow is drawn at HUD centre.

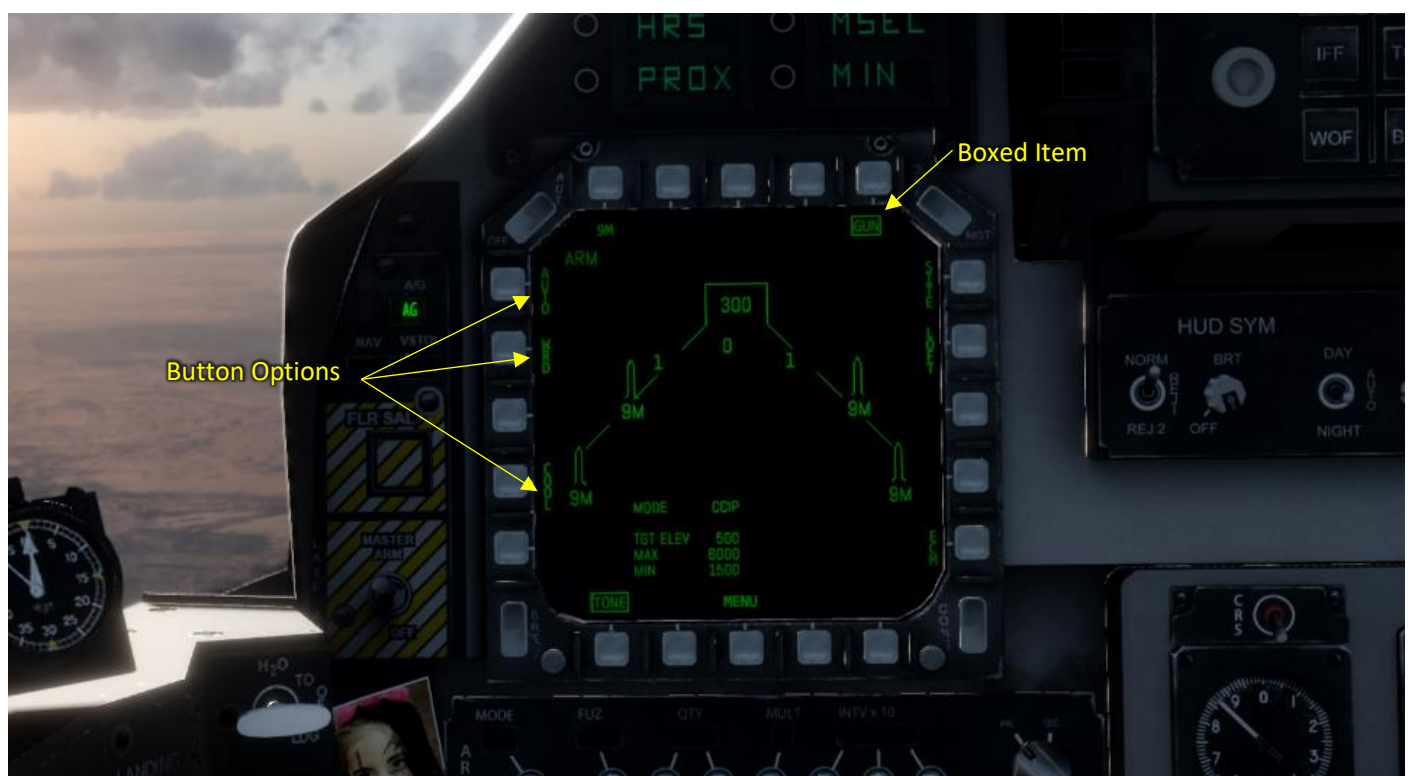
AV-8B II Avionics Guide

MFD Display Panels

The MFDs have 5 buttons on each edge for a total of 20 per display.

Buttons are assigned functions within each MFD page. Their function is shown by onscreen horizontal text for the top and bottom row and vertical text for the left and right columns.

Functions which are toggled on and off will 'box' the text to show their state as on.



Standby Instruments

There are 5 Standby Instruments:

- Altimeter
Shows ASL (Above Sea Level) altitude
- Speed
Shows speed in kts x 100
- Altimeter
- Speed
- Vertical speed
Shows climb or descent rate in ft/s x 1000
- Vertical speed
- Artificial Horizon
Shows aircraft attitude
- Angle of Attack
Shows the wing airflow angle
- Angle of Attack



HUD Control Panel

These toggle switches and rotary knobs adjust the HUD display

HUD Symbology

- **Reject**
3 State toggle to reject HUD elements to declutter the display
- **Brightness**
Knob to adjust brightness

HUD Video Controls

- **Day/Night Mode**
3 State toggle to select between HUD day and night mode. Select night mode to overlay a FLIR (Forward Looking Infra-Red night vision) view over the HUD
- **HUD Video Brightness & Contrast**
Rotate these knobs to adjust HUD FLIR view brightness and contrast
- **Altitude Source - Baro/RDR**
2 State toggle to switch between barometric (air pressure) altitude readings and radar altimeter readings



HUD



The HUD (Head Up Display) displays critical information to the pilot while allowing him to look out of the cockpit.

See sections discussing HUD modes and weapon procedures & HUD displays for detailed descriptions of HUD symbology.

UFC – Up Front Control

The UFC is used to select frequently used controls from an 'up front' easily accessible position.

Controls include:

- UFC & ODU display brightness knob
- Left & right radio channel selector knobs
- Left & right radio volume knobs

Buttons include

- TMR - Timer
Selects UFC & ODU timer options for features such as 'Time On Target', stopwatch displays
* Not active in current CAP2 build *
- TOO - 'Target Of Opportunity'
If the pilot overflies a target of opportunity, pressing this button selects AG master mode and an AG lock at the current position to allow the pilot to return with target location symbology pre-set
- IFF – Identification Friend or Foe
Toggles the IFF system
- TCN – TACAN
- AWL – All Weather Landing system
- WPN – Weapon Parameters
- WOF – Waypoint Over Fly
- BCN – Beacon
Displays radar beacon emission status on scratchpad
Press on/off to toggle
- ALT – Radar Altimeter Altitude Warning
Selects radar altitude warning display on scratchpad consisting of on/off and altitude
Select on/off to toggle
Enter numbers to set a new warning altitude in ft then select 'ENT'
- EMCON – Emissions Control
Select EMCON then click ON/OFF to toggle. When enabled radar emissions, beacon and radar altimeter are inhibited



ODU – Option Display Unit



The ODU displays 5 push button options numbered 1 to 5 as shown in the image below.

When a function is assigned, a 4-character label is displayed to the right of the button. The brightness of the ODU is adjusted with the UFC brightness knob.

Which options displayed are based on a mode or selection made within other avionics controls, typically by the UFC keypad.

The 'Early Access' build of CAP2 does not currently allow ODU inputs.



Engine Panel

The engine panel contains the following displays:

- Nozzle angle indicator
When horizontal, the nozzles are fully back for forward flight
- RPM – Tachometer
Displays engine speed in percent RPM
- JPT – Jet Pipe Temperature
Display JPT in C
- Stab – Stabilator Position Indicator
Displays stabilator nose up or down in degrees
- FF - Fuel Flow
Displays fuel flow rate (lbs per minute)
- H2O - Water Quantity Indicator
Displays remaining water (lbs)
- Duct – Duct Pressure Indicator
Displays reaction control system duct pressure in lbs/in²



Fuel Panel



The fuel panel contains the following controls:

- Fuel quantity display selector
5 position rotary knob to select:
 - BIT
 - Feed
 - Total
 - Internal
 - Wing
 - Inboard
 - Outboard

- Bingo fuel level

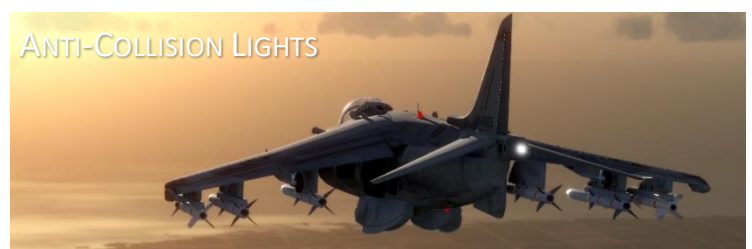
Rotary knob. This sets the 'BINGO' fuel level after which the aircraft must return to base. Warning lights and sounds are enunciated when total fuel decreases to this level



Exterior Light Controls

Exterior Lights

- **Formation Lights**
These external low intensity strip lights are primarily used for low light level formation flying
- **Position Lights**
These lights show aircraft position and orientation in low light situations. The port wing light is red, the starboard wing light is green. This allows observers to know whether our aircraft is heading towards or away.
The 3-state switch corresponds to Off, Low level and High level
- **Anti-Collision Lights**
These red lights flash every few seconds. They are located on the top and bottom of the rear fuselage

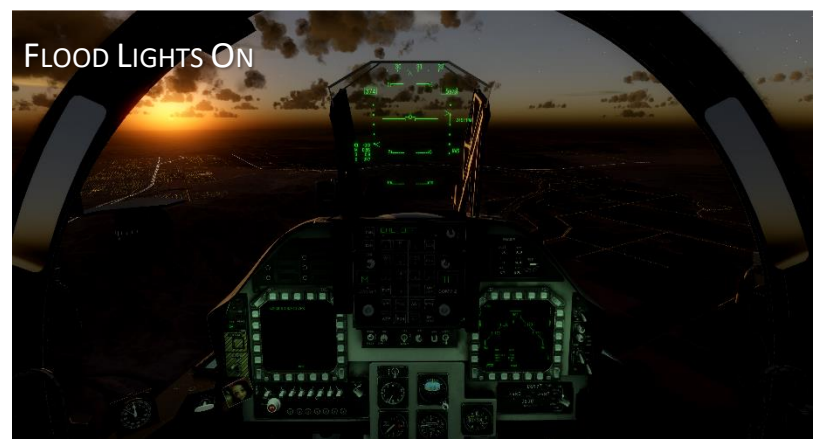


Cockpit Lighting Controls

There are two types of cockpit lighting:

- Console Lights
These instrument back lights are adjusted by rotating Console Light knob
- Flood Lights
These green lights are located in the canopy, pointing down to the cockpit controls

Both controls are located in the lower right panel.



Autopilot

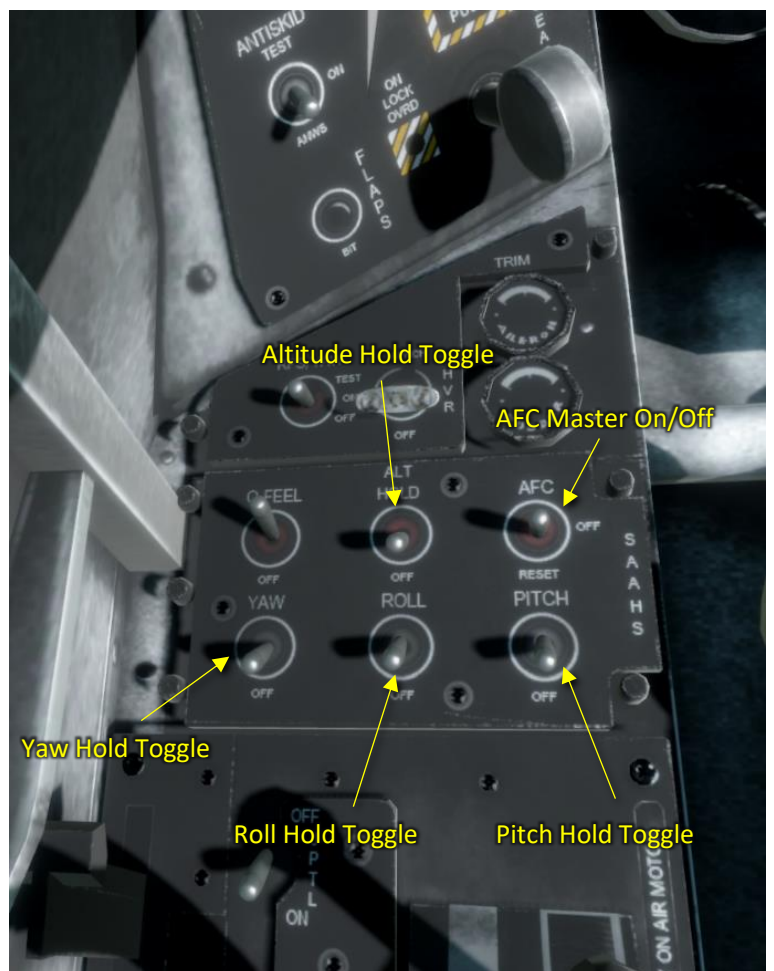
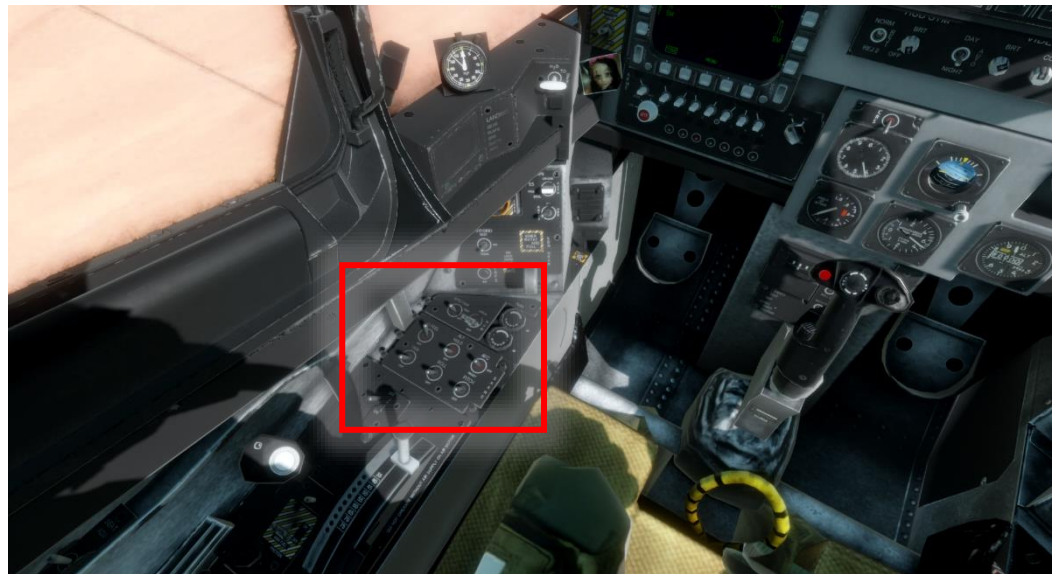
The autopilot or AFC (Automatic Flight Control) can be commanded to selectively control heading, pitch, roll and altitude.

The control 'Auto Pilot Mode Cycle' will switch between 'Pitch and Roll' and 'Pitch, Roll and Altitude' and autopilot disengaged. When engaging autopilot the current pitch, roll and altitude values are captured for reference.

Pitch and roll values less than 5deg are treated as 0deg.

Individual AP functions can be selected by clicking on the following cockpit switches:

- AFC/Off/Reset
Master on/off for AFC
- ALT Hold/Off
Toggle altitude hold at current altitude
- PITCH/off
Toggle pitch hold
- ROLL/off
Toggle roll hold



Air to Air Refuelling



To deploy the refuelling probe, click the switch shown here

'Refuelling Help' modes are available to reduce the workload required for A/A refuelling. Select the Options->Realism menu then choose a 'Refuel Help' setting.

Available settings are:

None, Low, High



AV-8B II 'Master Mode'

The AV-8B II has four avionics 'Master Modes' which are selected according to the mission phase

The four modes are:

- NAV
Used in non-combat flight situations
- VSTOL
Used during take-off and landing
- AA
Used during Air to Air combat
- AG
Used during Air to Ground combat

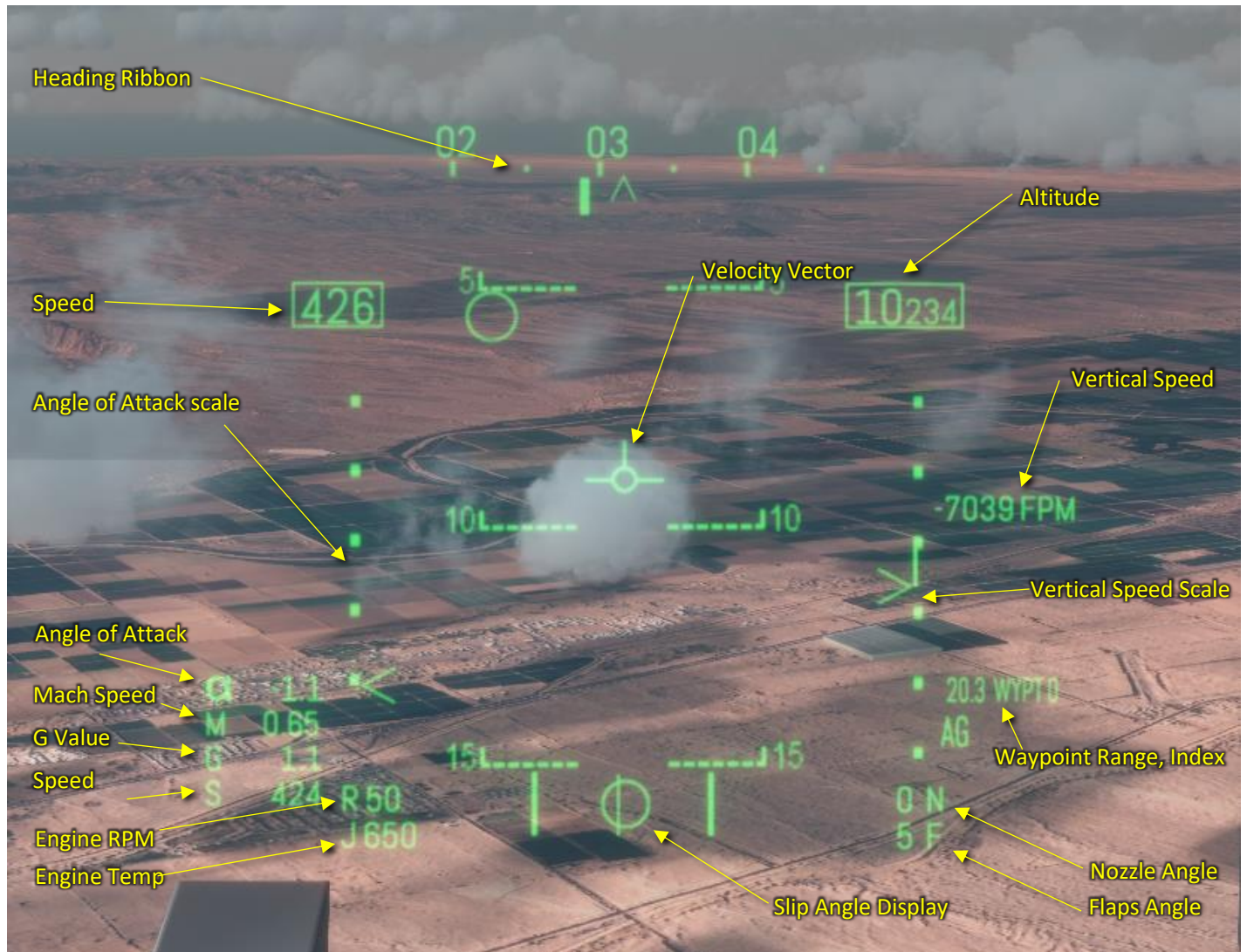


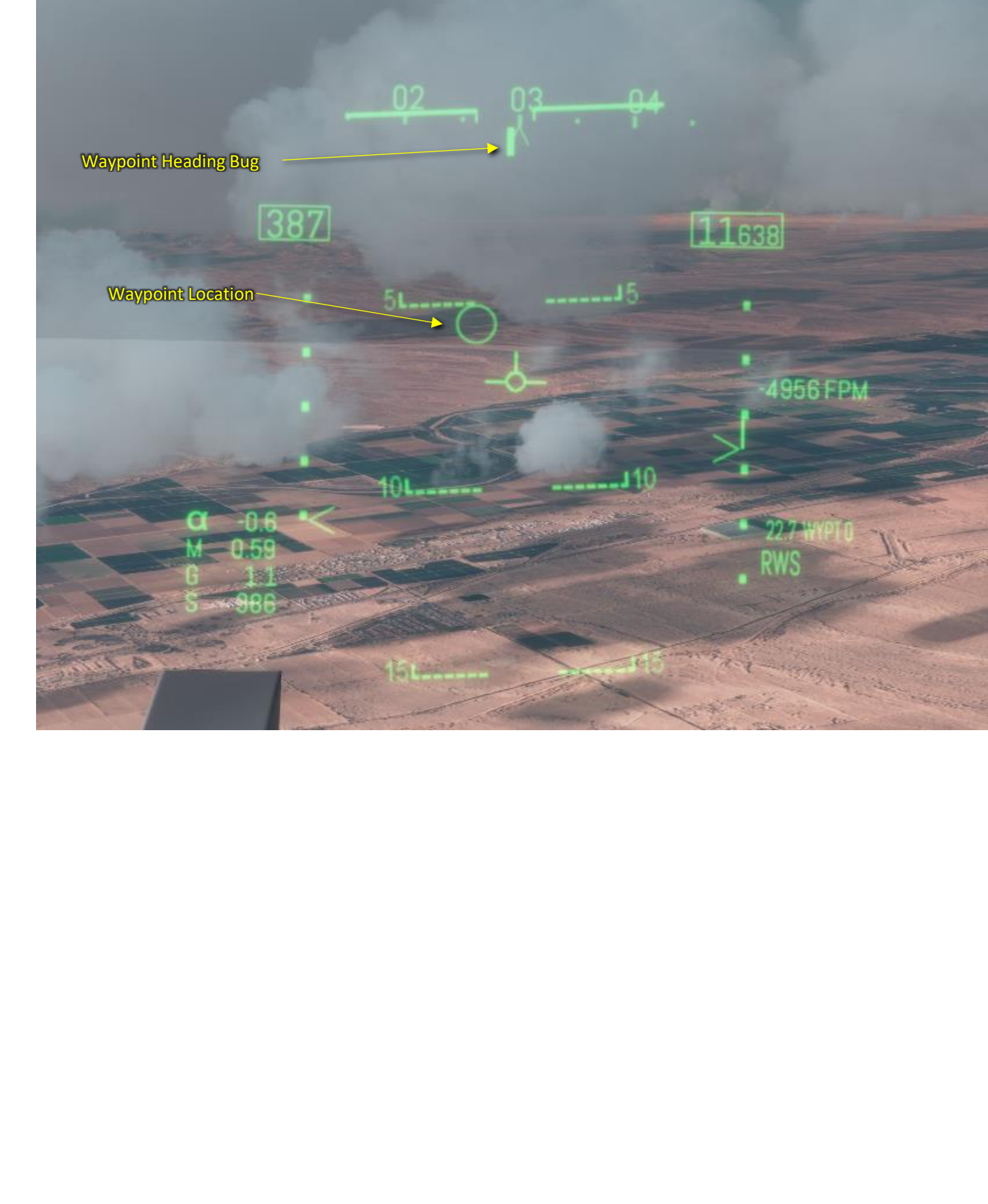
Master Mode selectors are positioned to the left of the left MFD. There are 3 illuminated selectors for NAV, VSTOL & AG. When neither light is illuminated, the Master Mode is AA.

AV-8B II HUD Modes

There are four HUD modes, one for each 'Master Mode'

HUD VTOL Mode



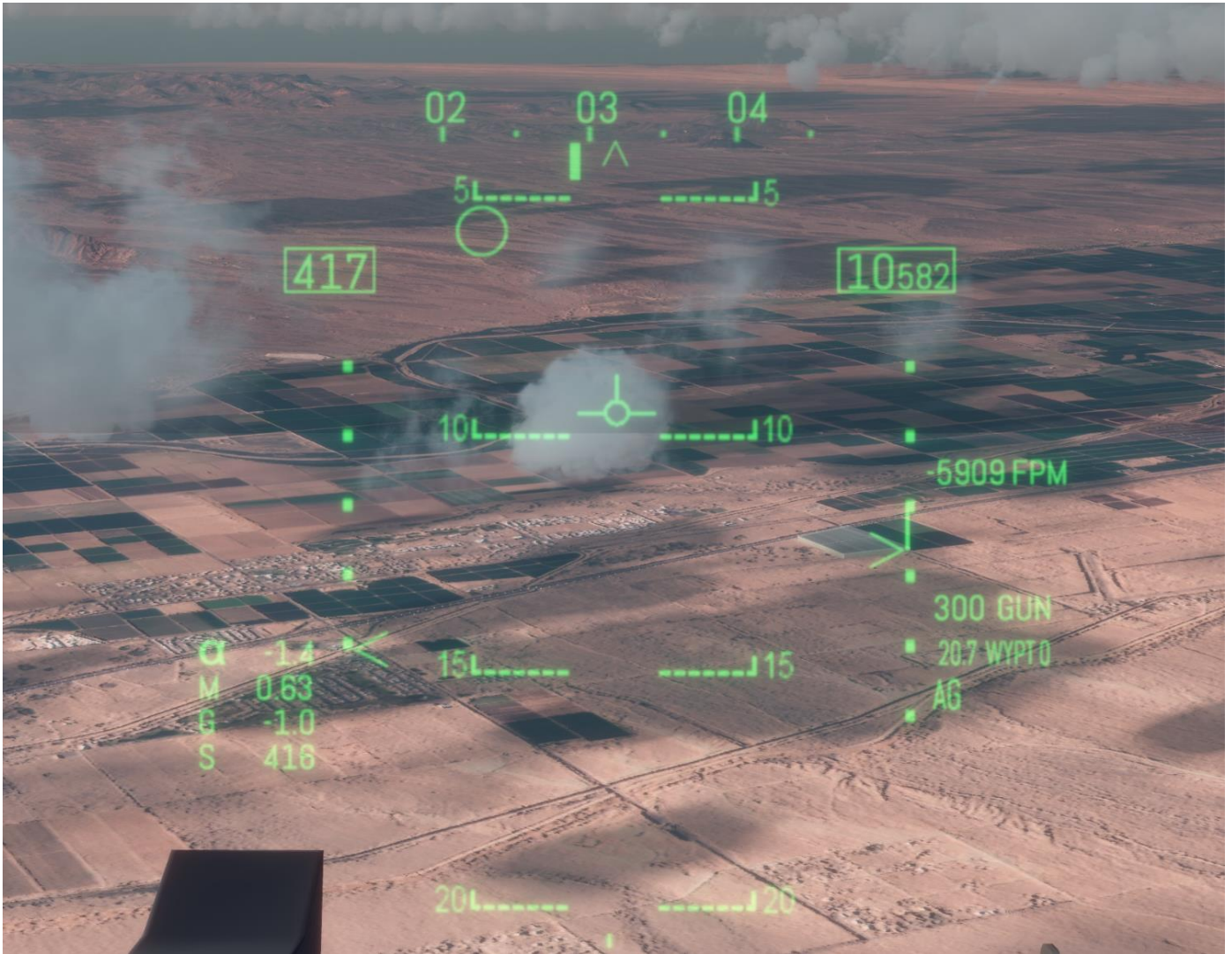


HUD A/A Mode



Show AA target Box

HUD A/G Mode



Show AG target

HUD FLIR View



Selecting Night Mode on the HUD Control Panel enables HUD FLIR View. This mode shows Infra-red night vision video projected onto the HUD. Adjust video brightness and contrast with adjacent knobs.



AV-8B II MFD (Multi-Function Display) Pages

MFD

An MFD is a 'Multi-Function Display' capable of displaying a wide range of information such as:

- Aircraft status
- Navigation
- Radar Displays
- Weapon Selection
- Weapon Displays
- Target Pod Displays

There are two MFD's in the front panel of the Harrier.

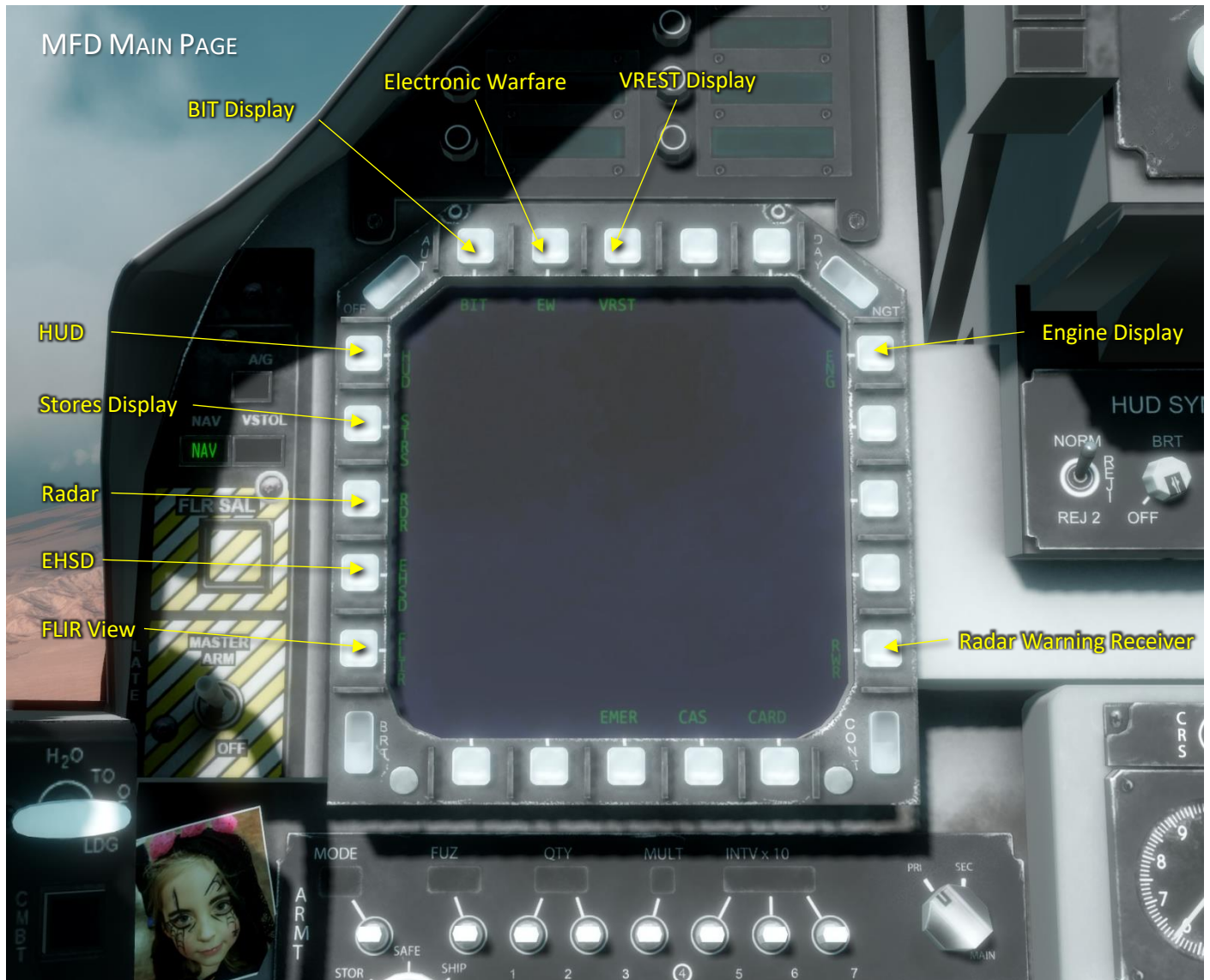
Each MFD is surrounded by an array of buttons which activate on-display options which change with each MFD page.

If you have a 'Thrustmaster MFD Cougar' input device it will automatically control the corresponding MFD buttons.

- MENU
- EHSD
- ENG
- STRS
- HUD
- FLIR
- VRST

MFD MENU - Main Page

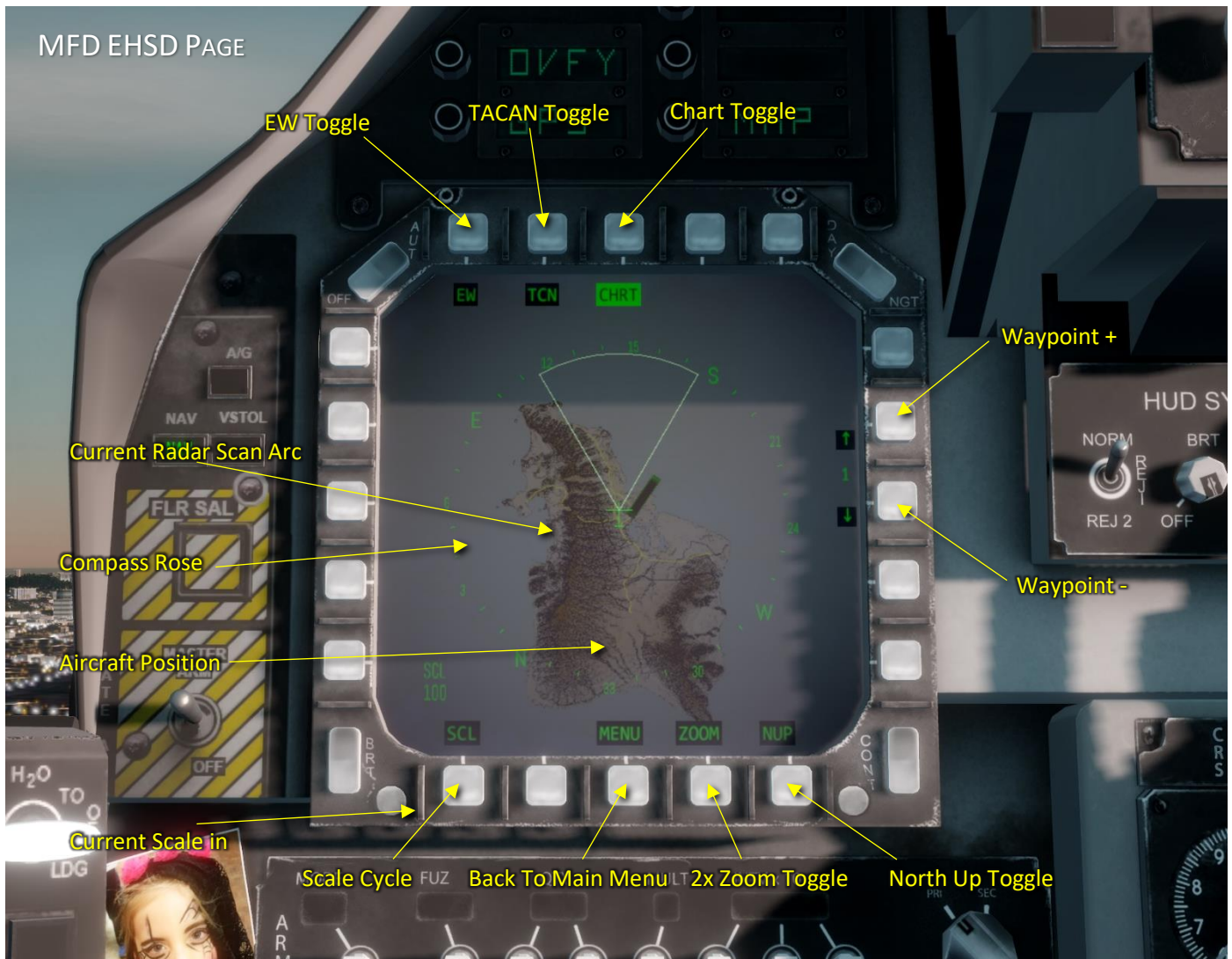
This is the central page of the MFD system where you can access all sub-pages such as weapons, Navigation, Radar etc



MFD EHSD - Enhanced Horizontal Situation Display

Select this display by clicking 'EHSD' on the main page.

The EHSD (Enhanced Horizontal Situation Display) shows a 2D top down view of the area surrounding your aircraft to aid situational awareness.



Active button options include:

- EW - Toggles overlay of Electronic Warfare symbology showing detected threats
- TCN - Display Tacan navigation symbology
- CHRT - Toggles display of a background chart of surrounding terrain
- SCL - Cycles through display range scales
- ZOOM - Toggles a 2x display zoom factor
- NUP - Toggles the display rotation between 'North Up' and aircraft heading
- Arrow Up/Down - Select the next or previous waypoint and display waypoint index

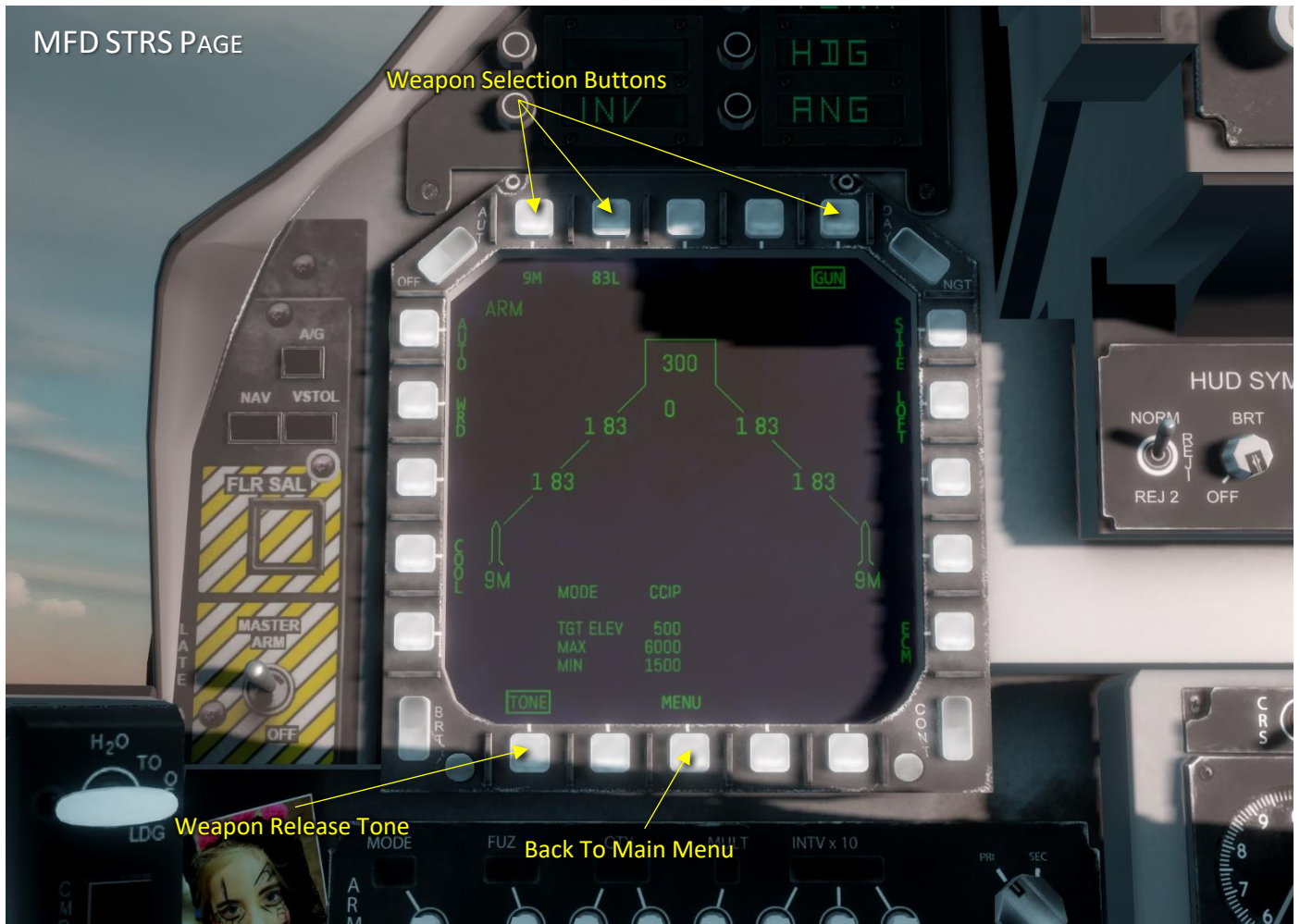
MFD ENG – Engine Display

Select this display by clicking 'FLIR' on the main page.



MFD STRS - Stores (Weapon Pylons)

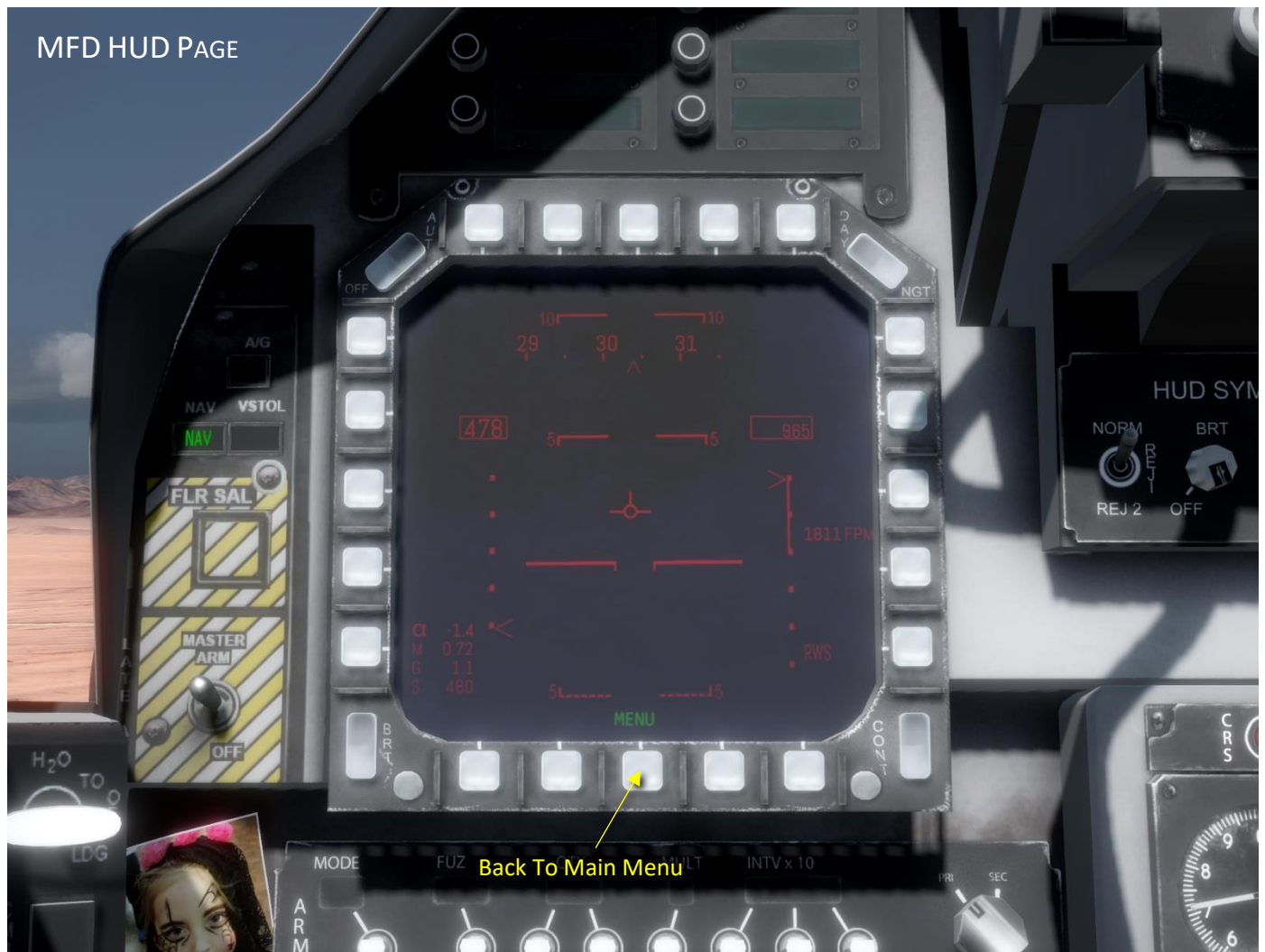
Select this display by clicking 'STRS' on the main page.



MFD HUD – HUD Display

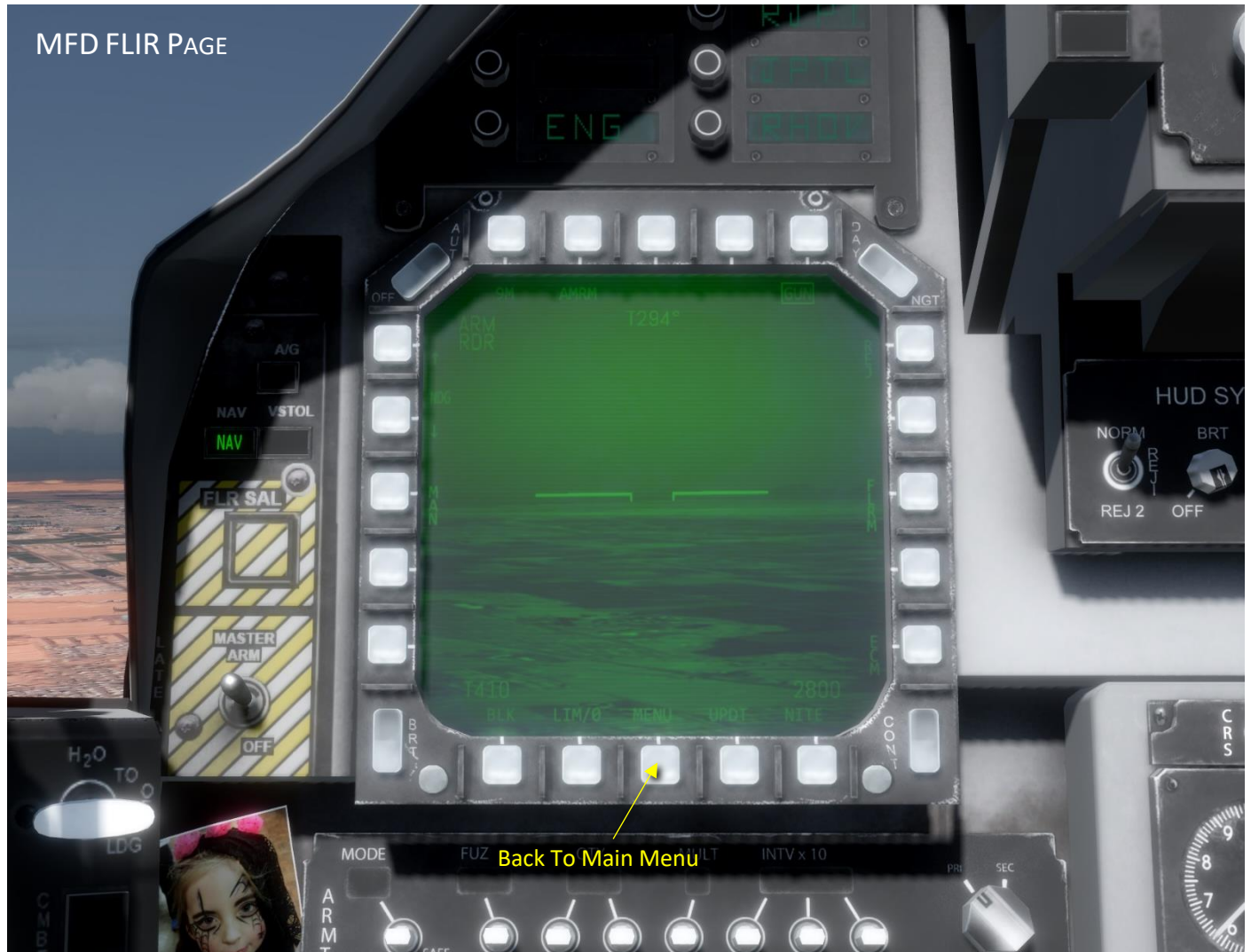
Select this display by clicking 'HUD' on the main page.

The MFD HUD page duplicates the HUD display, useful when there is a HUD malfunction.



MFD FLIR – Forward Looking Infra-Red

Select this display by clicking 'FLIR' on the main page.



MFD VRST

Select this display by clicking 'VRST' on the main page.



AV-8B II Radars

APG-65 RADAR

The APG-65 Radar is a mechanically scanned radar. It operates in two main modes; A/A and A/G with several sub-modes in each.

A/G mode is available in A/G, VTOL & NAV Master Modes while A/A mode is available in A/A Master Mode.

Selecting sub-modes is accomplished by pressing the MFD radar mode selection pushbutton.

The radar display is normally displayed on the right MFD.

A/A Radar Mode

A/A mode is entered by selecting an A/A weapon, press an A/A Weapon Select button or cycling Master Mode to A/A mode.

There are three 'Search Modes'

- RWS – Range While Search
- VS - Velocity Search
- TWS - Track While Scan

There are several 'Acquisition Modes'

- AACQ
- ACM Modes
 - WACQ
 - VACQ
 - BST
 - GACQ

There is one 'Track Mode'

- STT – Single Target Track

The A/A sub-modes are

- RWS - Range While Search
RWS is the primary search mode. It provides all aspect target detection for high and low closure rate attacks i.e. head-on and tail attacks. The RWS MFD display shows range on the vertical axis and azimuth (horizontal angle to target) on the horizontal axis
- VS – Velocity Search
VS is used for long range target detection. It has the limitation that the target must be nose aspect, i.e. closing on our aircraft. If the target is heading across or away from our view it will not be detected. The VSS MFD display shows closing velocity on the vertical axis and azimuth (horizontal angle to target) on the horizontal axis.
- TWS – Track While Scan
TWS mode provides a display which enhances the pilots view of the tactical situation. The TWS MFD display shows range on the vertical axis and azimuth (horizontal angle to target) on the

horizontal axis. TWS prioritises targets based on closing speed and distance. The first eight priority tracked targets are displayed as an inverted half box with a protruding target aspect angle pointer. The primary or L&S (Launch & Steering) target is selected by pressing 'Next Target' or using the TDC to highlight a target and pressing TDC-Select. The selected target displays its Mach speed and altitude either side of it.

- WACQ – Wide Acquisition
The radar scans a wide pattern (140° wide and 14° high)
Selected by Sensor Select LFT
- VACQ – Vertical Acquisition
The radar is commanded to scan a vertical pattern (+5° to +55° high and 5° wide), best used in turning dogfights
The HUD displays 2 vertical dashed lines to show scan extents
Selected by Sensor Select RGT
- BST – Boresight
The radar points dead ahead. A radar beam cue of 4° is depicted on the HUD by a dashed circle
Selected by Sensor Select FWD
- GACQ – Gun Acquisition
Selected after selecting GUN in A/A Master Mode
- STT – Single Target Track
STT provides a 'hard lock' on a target, providing the highest quality target data
Selected by either:
 - long press on 'Next Target'
 - press 'TDC Select' on a currently selected target
- To exit STT mode press 'Undesignate'

A/G Radar Mode

A/G mode is entered by selecting A/G Master Mode, selecting an A/G weapon, or cycling Master Mode to A/G mode.

The A/G sub-modes are

- MAP – Real Beam Ground Map
MAP is used to generate a map of the area ahead at medium resolution
- GMT – Ground Moving Target
This mode shows only moving ground targets detected by a doppler shift. Target speed must be greater than 4kts. Displayed radar returns vary in size. Trains and convoys will show a string of returns.
- SEA – Sea Surface Search
This mode is optimised to detect and display ships

Target Lock Types

A/A Mode

Lock Types

- A/A Radar
- AIM9 Heat

A/G Mode

Lock Types

- INS
- A/G Radar
- AGM65 IR
- Litening Pod

AV-8B II Sensor Pods

AN/AAQ-28(V) Litening Target Pod

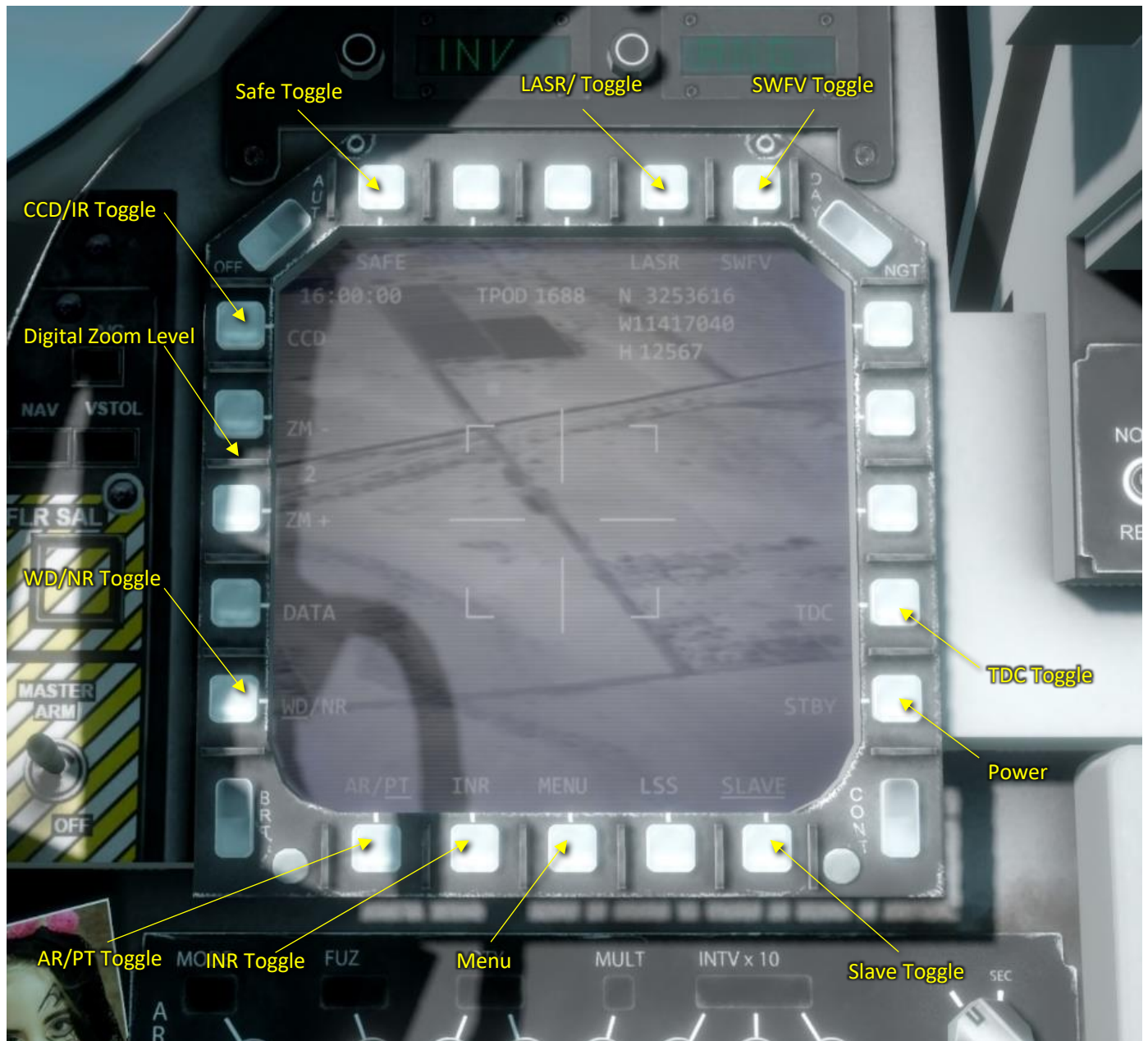
The Litening Pod is an advanced precision targeting pod system.

Its features include:

- A high-resolution, forward-looking infrared (FLIR) sensor that displays an infrared image of the target on the MFD
- A CCD camera for visible spectrum target imagery
- Wide & narrow field of view for search and targeting
- A laser designator for precise delivery of laser guided munitions.
- A laser rangefinder
- Automatic target tracking



Litening Pod MFD Controls



CCD/IR

ZM - Digital Zoom

WD/NR - Wide/Narrow view

AR/PT - Area/Point

INR

MENU

LSS

SLAVE

SAFE

LASR/

SWFV

WH/BH Toggle

When the pod display is in IR mode select this control to toggle between white hot and black hot IR view. This can aid target identification.

TDC

STBY



AV-8B II Air to Air Weapons

GAU-12 Equalizer Cannon

Description

The General Dynamics GAU-12/U Equalizer is a five-barrel 25 mm Gatling-type rotary cannon.

Usage

To use this weapon against air targets, select A/A Master Mode and GUN by either:

- Click A/A Weapon Select LFT
- Selecting A/A Master Mode by clicking 'Cycle Master Mode' to A/A mode then clicking 'Next Weapon' till Gun is selected

The target pipper shows the CCIP (Continuously Computed Impact Point) if the gun was fired now.

HUD Display

Without an A/A target lock A/A Gun Hud displays this:

When an A/A radar target is locked the HUD displays this:



AIM-9M Sidewinder

Description

The AIM-9 Sidewinder is a short-range, heat seeking, air-to-air missile.



Usage

To deploy the AIM-9 first select A/A Master Mode and AIM-9 by either:

- Click A/A Weapon Select FWD or AFT
- Select weapon 9M from MFD STRS page
- Selecting A/A Master Mode by clicking 'Cycle Master Mode' to A/A mode then clicking 'Next Weapon' till 9M is selected

The AIM-9 has a moving infrared seeker in the nose which is displayed on the HUD as a small solid or dashed circle. When the seeker is aligned with a heat source (i.e. an aircraft) the seeker is locked on and the circle is drawn solid. Also, a tone in the pilot's headset changes from low to high pitched as lock is attained.



The AIM-9 has three methods of attaining lock

- **Boresight**
The seeker is locked straight ahead. The pilot manoeuvres the aircraft to point directly at the target and launches when lock is heard
- **SEAM - Sidewinder Expanded Acquisition Mode**
SEAM mode displays a large dashed circle in which the seeker head erratically moves around looking for a target. Once a target lock is attained the seeker tracks the target within the dashed circle boundary
- **Radar contact slaved**
The seeker is slaved to a radar target lock. The radar can be in any of the A/A modes described in the radar section

AIM-9 HUD Display



AIM-120 AMRAAM

Description

The AIM-120 Advanced Medium-Range Air-to-Air Missile AMRAAM is a beyond-visual-range air-to-air missile (BVRAAM). Launch guidance is provided by the carrying aircraft with optional mid-course updates. Terminal guidance is provided by an active radar seeker giving the AIM-120 a 'Fire and Forget' capability.

Usage

To deploy the AIM-120 first select A/A Master Mode and AIM-120 by either:

- Selecting weapon 120 from MFD STRS page
- Selecting A/A Master Mode by clicking 'Cycle Master Mode' to A/A mode then clicking 'Next Weapon' till AIM-120 is selected



HUD Display



GAU-12 Equalizer Cannon

The General Dynamics GAU-12/U Equalizer is a five-barrel 25 mm Gatling-type rotary cannon.

To use this weapon against ground targets, select A/G Master Mode then press 'Select Next Weapon' or select GUN from the Stores (STRS) MFD page.

HUD Display



LAU-5003 Rocket Pod



Description

The LAU-5003 rocket pods contain 19 CRV7 2.75" ground attack rockets.

Usage

To use the LAU-5003 first select A/G Master Mode then press 'Select Next Weapon' or select RKT from the Stores (STRS) MFD page.

HUD Display

-



AGM-65 IR Maverick

Description

The AGM-65D IR Maverick is an air-to-ground missile (AGM) designed for close air support. It incorporates an Imaging Infrared guidance system for day and night use.

Usage

Select A/G Master Mode then press 'Select Next Weapon' or select IRMV from the Stores (STRS) MFD page.

Using MFD select STRS page

Select IRMV

Press HOTAS Cage/Uncage switch

IRMV video is displayed on MFD page

The TDC is used to slew the seeker to acquire a target.

Press Sensor Select Switch forward

Toggles between INS & IRMV sensor modes

HUD Display

-



MK81, MK82, MK83 Freefall Ballistic Bombs



Description

The Mark 80 Series are low drag, unguided, general purpose bombs.

There are three variants available for the AV-8B II:

MK81 – 250 lb

MK82 – 500 lb

MK83 – 1000 lb

Usage

-



MK81,82,83 HUD Display

The HUD displays a CCIP (Continuously Computed Impact Point) showing where bomb impact would occur if released now.

If the computed impact point is out of the HUD view the impact crosshair is drawn dashed and flashing. Also, a reflected cue marker (horizontal line) is drawn at a point along the cue to show offscreen distance.



GBU-12, GBU-16 Paveway II Laser Guided Bombs



Description

The GBU-12 & GBU-16 Paveway II laser-guided bombs are based on the Mk 82 & MK83 general-purpose bombs, but with the addition of a nose-mounted laser seeker and fins for guidance.

There are two variants available for the AV-8B II:

GBU-12 – 500 lb

GBU-16 – 1000 lb

Usage

-

HUD Display

-

AGM-84 HARPOON



Description

The AGM-84 Harpoon is an all-weather, over-the-horizon, anti-ship missile. The missile uses active radar homing and flies to the target just above the water to evade detection.

Usage

-

HUD Display

-

AGM-88 HARM



Description

The AGM-88 HARM (High-speed Anti-Radiation Missile) is an, air-to-surface anti-radiation missile. It is designed to home in on electronic transmissions coming from surface-to-air radar systems. If the target goes offline during flight the HARM will inertially guide to the last emission position.

Usage

-

HUD Display

-

Default Controls - Keyboard

At the simplest level you can fly using keyboard cursor keys for pitch and roll. Rudder is controlled by comma and period. Shift and cursor keys adjust trim.

The default control mappings for Keyboard are as follows

Control	Keyboard Mapping
Pitch	Cursor Up & Down
Roll	Cursor Right & Left
Yaw/Rudder	Comma & period
Throttle	PageUp & PageDown
Nozzle Angle	[&]
Gear Toggle	G
Flaps Mode Cycle	F
Canopy Open/Close	C
Brakes Toggle	B
Speed Brake Toggle	Ctrl-B
Eject	E
Autopilot Mode Cycle	A
Water Injection Mode Cycle	I
Waypoint Increment	N
View Change	V (hold for 1sec to go to pilot view)
View Cockpit	F1
View PadLock	F2

View FlyBy	F3
View Chase #1	F4
View Chase #2	F5
View Orbit	F7
Trigger	Space
Target Select	T
Weapon Select	W
Flares/Chaff Release	BackSpace
Master Mode Cycle	Tab
Objectives Toggle	O
Time Of Day +	P
Time Of Day -	Ctrl-P
Time Accelerate	U
Time Decelerate	Ctrl-U
Clouds Regenerate	Ctrl-C
Panel Lights +	J
Panel Lights -	Ctrl-J
Flood Lights +	K
Flood Lights -	Ctrl-K
HUD Intensity +	H
HUD Intensity -	Ctrl-H

Default Controls - GamePad

The default control mappings for an Xbox GamePad are based on Keyboard Defaults plus the following mappings

Control	GamePad Mapping
Pitch	Left Stick Up/Down
Roll	Left Stick Right/Left
Yaw/Rudder	Trigger Left & Right in combination
Throttle	DPad Up/Down
Nozzle Angle	DPad Left/Right
Cockpit Item Select +	Left Stick Button
View Angle	Right Stick
View Click	Right Stick Button
View Change	Y (hold for 1sec to go to pilot view)
Trigger	A
Target Select	B
Weapon Select	X
HUD Mode	Left Shoulder
Options	Right Shoulder

XBox gamepads use vibration to give feedback on game events such as firing weapons, gear state, AOA buffet etc.

Default Controls - FlightStick

The default control mappings for a DirectInput FlightStick are based on Keyboard Defaults plus the following mappings

Control	Flight Stick Mapping
Pitch	Stick 0 Axis 1
Roll	Stick 0 Axis 0
Yaw/Rudder	Stick 0 Axis 2
Trigger	Stick 0 Button 0

Controls Reference

Note 1: Some controls are duplicated for digital and analogue inputs e.g. digital throttle up, down and analogue throttle position. The digital inputs are assigned to keys or joystick buttons, the analogue controls to joystick/throttle slider controls. You assign/enable one or the other, not both. Avoid mapping both analogue and digital versions of related controls as the analogue control will override the digital inputs i.e. if you want to use digital throttle up/down ensure analogue throttle is unmapped. This applies to other duplicated controls such as nozzle angle.

Note 2: Some controls have a state cycle input and a group of explicit state inputs. At minimum the cycle function should be mapped with the explicit inputs provided for convenience.

Note 3. Many controls functions are implemented on the AV-8B 3D cockpit view or MFD buttons.

Flight Controls

Control	Default Mapping	Notes
Pitch	Cursor Up/Down	
Roll	Cursor Left/Right	
Yaw	Comma/Period	
Trim Adjust	Shift & Cursor	
Gear Toggle	G	
Cycle Flap Mode	F	
Canopy	C	
Wheel Brakes	B	
Air Brake	A	
Refuel Probe		
Vertical Flight Toggle	V	
Eject	E	Hold for 1 second

Avionics Controls

Caution Acknowledge		
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Warning Acknowledge		
Cycle HUD Mode	Tab	
HUD Brightness		Analogue
HUD Brightness Up	T	Digital
HUD Brightness Down	Space	Digital
Target Pod Slew L/R		
Target Pod Slew U/D		
Target Pod Lock Toggle		
Target Pod Zoom In		
Target Pod Zoom Out		

Engine/Nozzle Controls

Throttle		Analogue
Throttle Up]	Digital
Throttle Down	[Digital
Nozzle Angle		Analogue
Nozzle Angle + 5°		Digital option
Nozzle Angle - 5°		Digital option
Nozzle to Hover Stop	H	
Nozzle to Hover Brake	J	
Fuel Flow Toggle	F	
Ignition	I	
Water Inject Mode Cycle		

Weapon Controls

Next Weapon	W	
Next Target	T	
Fire Weapon	Space	

Chaff/Flare Dispense	C	
Target Pod Slew L/R		
Target Pod Slew U/D		

View Controls

Pilot	F1	
Tower	F2	
Fly-By	F3	
Exterior	F4	
Exterior2	F5	
Cockpit	F6	
Exterior Fixed	F7	
Weapon	F8	
Camera Left		Digital input for key, POV or button
Camera Right		Digital input for key, POV or button
Camera Up		Digital input for key, POV or button
Camera Down		Digital input for key, POV or button
Camera Left/Right		Analogue version
Camera Up/Down		Analogue version
Camera FOV +	PageDown	
Camera FOV -	PageUp	
Camera Distance +	NumPad +	
Camera Distance -	NumPad -	