Flyway-BMS

Falcon 4 – BMS 4.32

Cougar Install & Assignments

"For the most part I've tried to keep this profile true to the F-16C Block50 HOTAS as described beginning on page 7 of OF's Dash-34 manual.
Beyond, I just tend to throw in additional functionality wherever possible."

Credits to Michael "Speedo" Crawford who inspired me on this Cougar Profile

Version 3.0

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Package content:

Package content is as follows;

- **Flyway-BMS. KEY**
  This file assigns keystrokes/ DirectX to in-game functions (callbacks).
- **Flyway-BMS.TMC**
  This file defines all Cougar axis in CCP.
- **Flyway-BMS-DX.TMJ**
  This file assignes Foxy internal variables to Cougar switches/ buttons.
  <u>This is the standard cougar configuration of my profile</u>.
- **Flyway-BMS-RealisticDX.TMJ**
  It's the realistic (as much as we could) version of this profile
  All cougar buttons have only one function (no extra functions) and as much as possible the "Real Life" ones.
- **Flyway-BMS-KEYS.TMJ**
  It's the KEYstrokes version of this profile. Maintained this version of Foxy file for historical reasons, even if not very usefull as of yet. Thou it can be usefull for some one for some reason or circumstances.
- **Flyway-BMS.TMM**
  This is the Foxy interpreter file for the internal variables assigned by TMJ file.
  It grabs commands from TMJ file and converts them into keystrokes/ DirectX inputs to be sent from cougar to the game.
  This file configures Cougar the way this manual describes bellow.
- **Flyway-BMS.RTF**
  This is the Foxy Manual assigned to this Cougar Profile.
- **Flyway-BMS-Cougar-Manual.PDF**
  It's the manual you are reading.
- **Flyway-BMS.PNG**
  Picture containing all Cougar functionalities for an easier way of getting used to them, refer to other pictures in the package to check full explanations of primary (realistic) functions.
- **Flyway-BMS-RealisticSSC.PNG and Flyway-BMS-RealisticTQS.PNG**
  Pictures with realistic Cougar functionalities for an easier way of getting better knowledge of these button functions for the Stick (SSC) and Throttle (TQS).
- **Flyway-BMS.XLSX**
  Excel format file containing all my callbacks crossed with their associated assignments, be it DirectX or keystrokes. It also shows what callbacks are different regarding assignements to BMS.KEY and Keystrokes:KEY original BMS files.

Version Log:

This version of my profile was meant to be adapted to BMS 4.32 Falcon simulator, using all the new features regarding usage of DirectX assignments capabilities that can be checked in the Cockpit Articules section of BMS forum;

http://www.benchmarksims.org/forum/content.php?153-DirectX-Shifting-Facility

This version focus is now oriented to BMS only, no more support to other simulators as it was in previous versions.

There was some changes in the buttons assignements, but still a realistic core was kept regarding Cougar's primary fuctions, also some of the extra (shifted) functions were slightly changed.

There's also a KEYstrokes version of this profile maintained for any reason, in case of need or historical reasons or even as an open door to other Falcon's flavour.

Before using this profile in virtual skies, recommend a good reading of below chapter devoted to the joystick's Layout and also printing all pictures included in this package;

- "**flyway-BMS.PNG**" is the Stick and Throttle, the pictures showing all buttons functions in a quick way of checking their functions.
- "**flyway-BMS-RealisticSSC.PNG**" and "**flyway-BMS-RealisticTQS.PNG**" are the pictures where you can see well described the usage of all the "Realistic" – primary functions of your cougar, regarding SSC (Stick – Side Stick Controller) and TQS (Throttle – Throttle Quadrant System).
- Finaly, "**flyway-BMS-Realistic-NewFeatures.PNG**" is the picture where can be seen all the new implementations of this simulator, relatively to the older sim – Open Falcon.

Making this profile version was possible thanks to Dunc and Red Dog. Using their profiles and help documents was of major importance to me on reviewing my old profile a being able to adapt it to this wonderful game – Falcon 4.0 – BMS.

Thank you gentlmen.

KEY file changing Log:

This KEY file was also kept as much closer to the original and in-game keystrokes defaults as possible. It was also completed and corrected using Red Dog's documents containing all the new callbacks implemented. All their functionality listed, can be found under Red Dog's Cougar profile downloadable here;

http://www.candyparty.com/ST/Download/Checklists/BMS/Document/F4_BMS4_RD.zip

Tried to keep this file as much complete as possible, just like it was before, it has now, an amount of 1085 different callbacks. Again, in this version, all callbacks were unconflicted regarding assignments, corrected for assigning duplications, miss-formed lines, etc…

Due to various reasons, have also changed some keystroke assignments relatively to BMS and Keystrokes KEY files that comes with original install BMS simulator. These reasons are mostly intended to eliminate incorrections found in those KEY files, regarding line construction and fields miss assigned, but most were changed in order to fulfil some issues with my profile which includes my small scale cockpit buttons plate, and also some other assignments were using keystrokes that cannot replicate in some of my used applications like Autokey, because of my Portuguese language keyboard. Finally, refer to the included Flyway-BMS.RTF file where you can see all the assignments available in my excel format file, cross-checked with BMS original files; Flyway-BMS.XLSX which is also included in this package.

- Important Note:

  Be very carefull when making changes to this file. It can jeopardize your BMS installation.
  Also, don't save this file in BMS setup screen, it will eliminate all remarks in the file.
  ALWAYS make a back copy of this file before making changes to it or saving it in BMS.

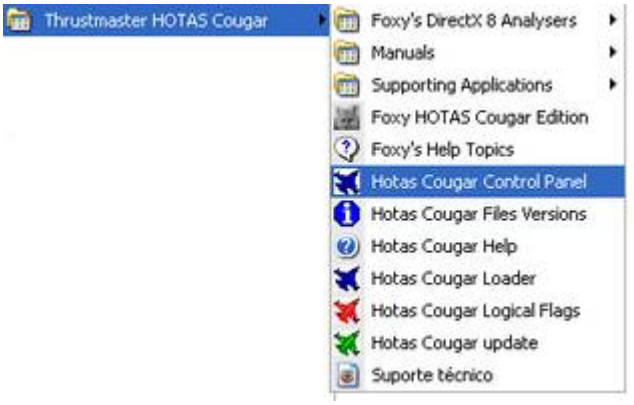
Instalation Help:

This Cougar Profiles make use of DirectX inputs and some keystrokes to perform all necessary BMS cockpit and Hotas functions.

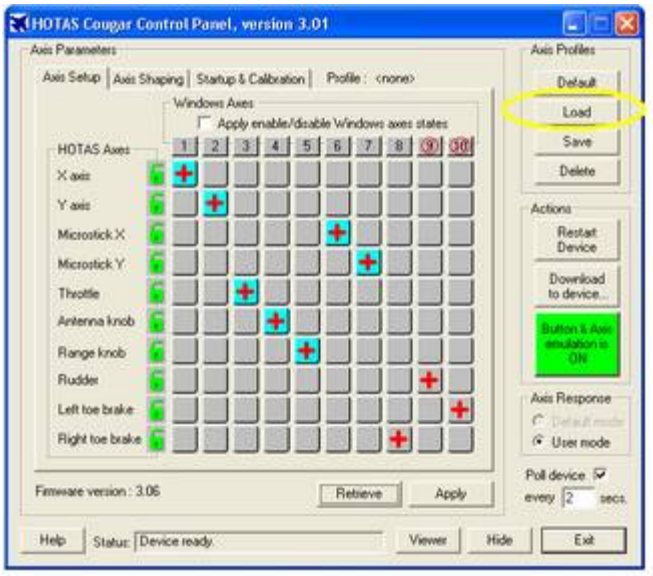
In order to correctly use these profiles, there's a few steps to follow:

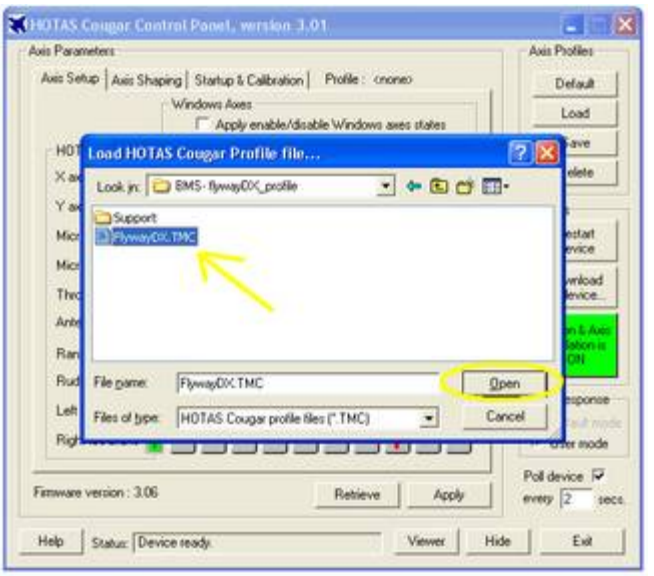
- Place all the files in their correct folders
  - Uncompress ZIP file and place all files in an own (created) folder.
  - From that folder, copy KEY file to your BMS instalation folder "Drive:\Falcon BMS 4.32\User\Config". This file must reside there in order to BMS setup to be able to browse it.
  - Then follow bellow guide to get all stuff ready to go…

- Set up your Cougar Control Panel (CCP)
  - Open up your CCP.

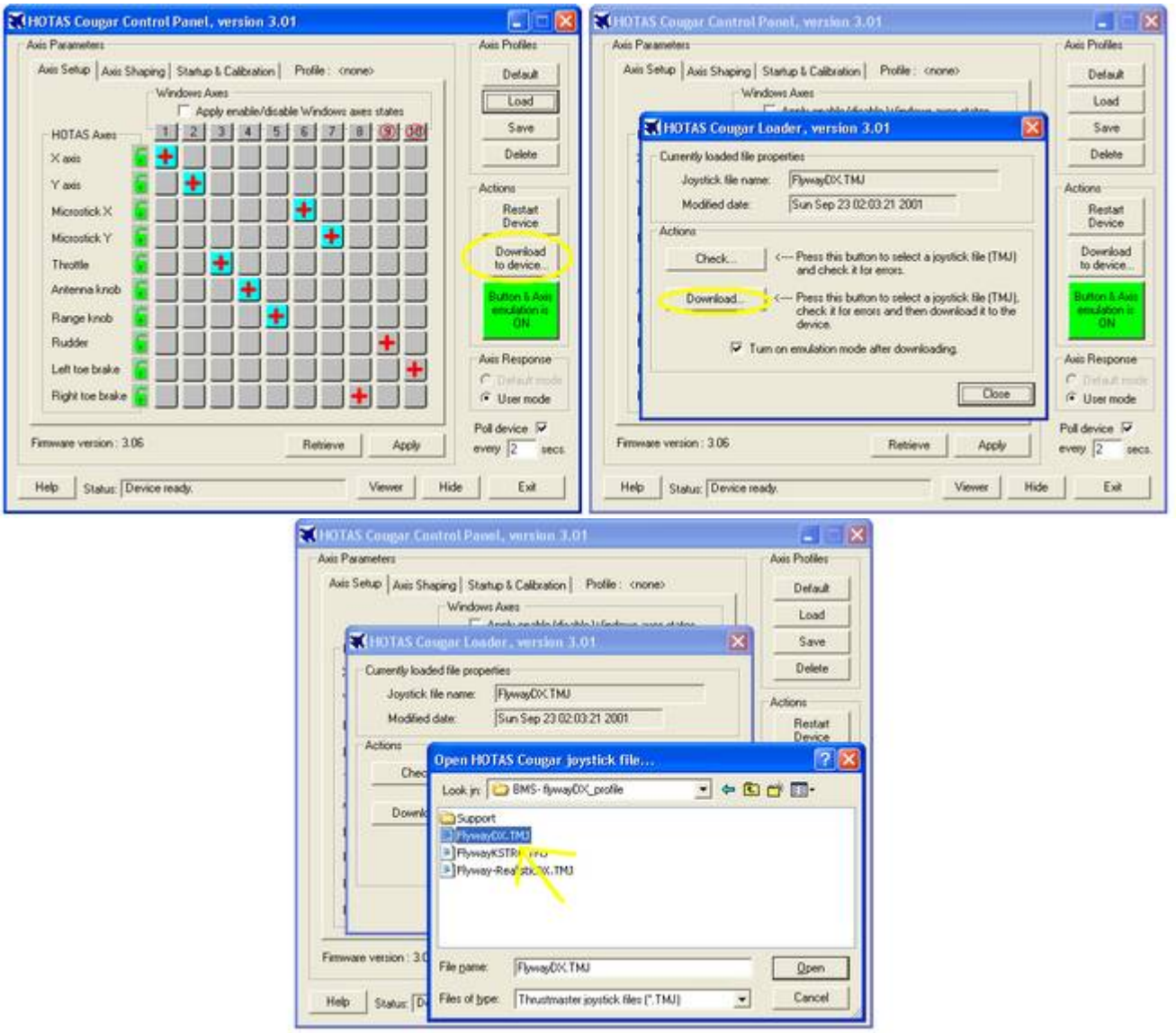


  - Set it up for the Axis, Dead-Zones, Offsets/ Curves and other Configurations, using the file Flyway-BMS.TMC.
  - Press "Load", browse to your Profile folder and select the referred file.





- Set your CCP for the Profile; in the example have chosen “Flyway-BMS-DX.TMJ”, but there’s also available “Flyway-BMS-KEYS.TMJ” and “Flyway-BMS-RealisticDX.TMJ”. Refer to Package Content chapter to see what are these…
- Press “Download to device…”, on pop-up window press “Download”, then browse to your Profile folder and select the preferred file.

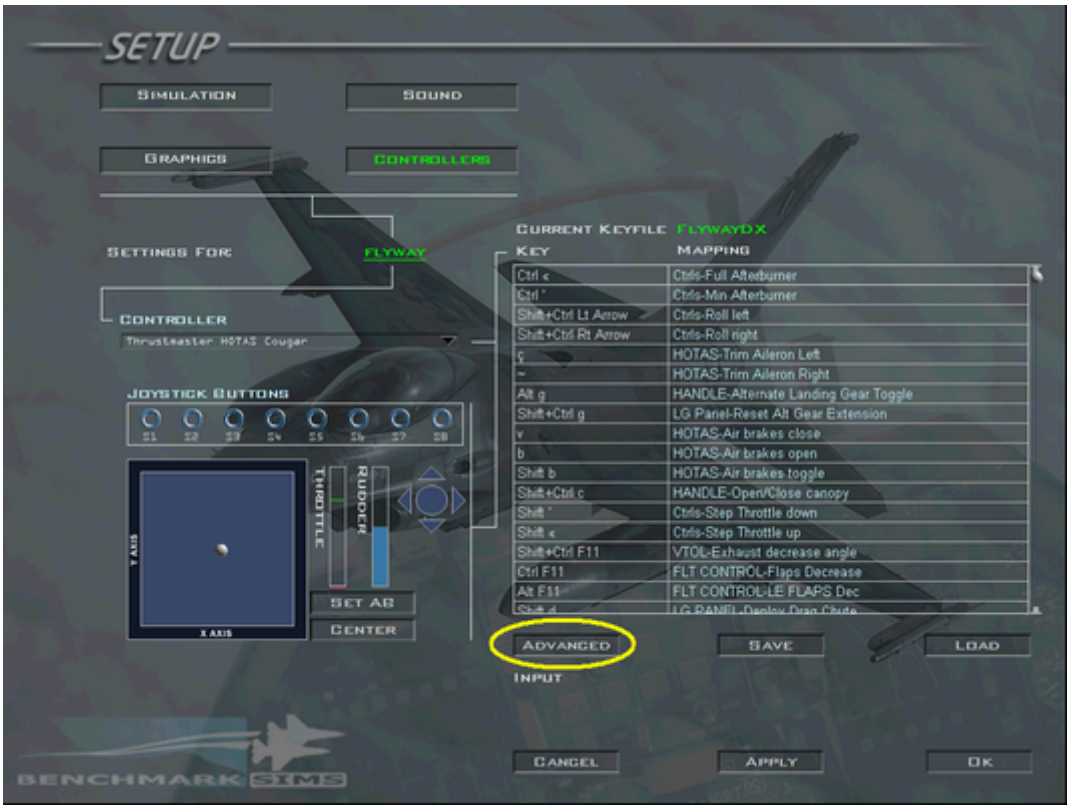


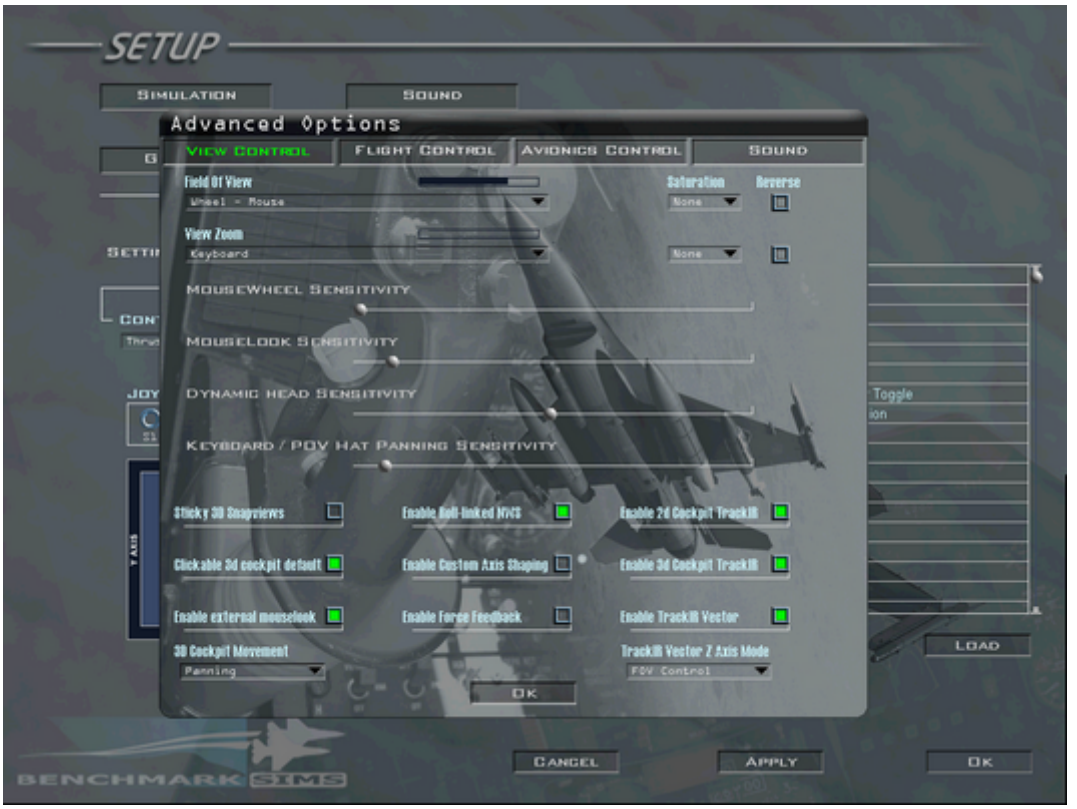
- Set up your Cougar in BMS Setup
  - Ensure this setting in your BMS Configuration file “falcon bms.cfg”. This file can be found in your BMS installation folder “Drive:\Falcon BMS 4.32\User\Config”
    - **set g_nHotasShiftQuickPressTimeLimit 200**
      The maximum pinky tapping time in milliseconds that is used to determine whether the pinky button should execute EXPAND or act as shift button can be configured within the falconbms.cfg file.
      The parameter value defaults to 200. If the pinky button is tapped and released within *n* milliseconds, EXPAND is executed. If it is not released within *n* milliseconds, shift is executed instead.
    - **set g_bHotasDgftSelfCancel 1**
      Some sticks like the TM Hotas Cougar have a specific behavior for the Dogfight switch that needs to be addressed. While there is a dedicated DX button state for both the “Dogfight” and the “Missile Override” modes, there is no explicit state for the normal centerposition.
      In order to get out of DGFT or MSL OVRD mode, BMS can be configured to cancel these modes automatically once the corresponding DX button is released. Like this, there is no need for an extra “center position” or “cancel” button anymore. This behavior can be configured by adding the following statement to the falconbms.cfg file.
      This parameter value defaults to 0 (off) and can actually be modified from within the Falcon BMS Config tool as well
    - **set g_nHotasPinkyShiftMagnitude 256**
      To enable the shifting facility, the following parameter has to be added to the falconbms.cfg file.
      The parameter value defaults to 0. Setting *n* to a higher value enables shifting and specifies the button offset number. Although arbitrary offset numbers are supported, it is highly recommended to use a multiple of 32 for the offset. Like this, a shifted DX button range always maps to the complete button range of another (virtual) DX device.
      Note: Users with more than one physical DX device should specify a shift offset which is outside the DX button range of their physical devices. So if you use three DX input devices, the button ranges 0-31, 32-63 and 64-95 are already in use, hence the minimum shift offset should be 96 to avoid physical and shifted (virtual) button overlap.

  - Important Note:
    Be very carefull when making changes to this file. It can jeopardize your BMS installation. ALWAYS make a back copy of this file before making changes to it.
    Also, be carefull when applying Updates to your BMS, because all these configurations get back to their default values. They should be set to above values after any install or new BMS version installed.

- Launch BMS and at Controller drop-down menu, select “Trustmaster HOTAS Cougar” and at lower right corner hit “LOAD”, then select “Flyway-BMS.KEY” file.

- Set up your Axes in BMS Setup
  - Hit “Advanced” and select your BMS axes the way you see in below pictures.





It’s done.
Go to your game key settings under setup and test/ check all your Cougar buttons.
Please report any anomaly you find.

General Usage Tips:

If you've never used a profile set up like this before, I suggest playing around in Foxy's key tester some to get a feel for how fast you have to release buttons for the normal function, as well as how long they need to be held to activate the held function.

Here's the color code used below:

- ***black Italic letters*** – Realistic assignments.
- Any other color means non realistic cougar functions.
- **In this color** – BMS new features
- **In this color** – Are the ones non realistic functions assigned to cougar buttons without any of the following conditions, when associated to "primary" functions.
- **FOV (S3) In** – Extra functions assigned. You must press "HOTAS pinky switch (S3) + the intended cougar button, to use this "Shifted function". BUT this button MUST be released quickly (before 200ms) in order to perform this function.
- **Held (0.5s)** – Extra function assigned. You must press the intended button for more than 1 second and only then release the button to use this "Held function".

Some game functions have a in-game "Held" imposed functions to match the "Real Life" Viper features. Those will be shown bellow as; "**(In game HELD)**"

Some additional implementations have been integrated, regarding the use of S3 pressed while moving some axis, "**FOV (S3) In**";

- **Both (X&Y) SSC** axis will react slower, this helps aircraft controlling in various situations like, Flying Formations, Air Refuelling, Landing Approach, etc.
- **ManRange** rotary will emulate basic Rudder function, useful if no Rudder Pedals are present and no other cougar axis assigned to this function.
- **Throttle** will engage Full Afterburner when past 90% of its travel, specially useful, if normal throttle full travel is to be used for mil power. Any throttle movement without S3 in, will desingage afterburner immediately.

All the following information (Stick/ Throttle Layout) regarding Cougar's primary functions is based on In Real Life information as much as could. There's always some unknown/ confidential information that once not published, hardly will be implemented in our simulator and in joysticks profiles as obvious. All the below informationcan be checked in BMS manual, on pages 28 – 33. It can also be checked in BMS Dash 1, Red Dog's manual for this sim on pages; 24 – 27 and 50 – 52, thou I'd recommend reading all this manual chapter. The manual can be downloaded here;

http://www.candyparty.com/ST/Download/Checklists/BMS/Document/BMS432_dash1.pdf

Hotas Mapping:

SSC Side Stick Controller Layout:

Trigger (TG1 and TG2):

1st Detent:

AA Mode

Activate ACMI if set to AUTO

AG Mode

Activate ACMI if set to AUTO

Manual Laser

2 nd Detent:

AA or AG Modes

Fire gun

FOV(S3)In

Laser Switch Toggle (Arm/ Off)

NOTE: Use this functions very carefully.

You may end up firing gun when not wanted.

Always use this function briefly and ensured that S3 is depressed.

MSL Step (S1):

On the Ground

Nose Wheel Steering (NWS) Toggle

AA Mode

(Held < 0,5s – in game timming);

= *Current missile type Phylon Toggle*

(Held >= 0,5s – in game timming);

= *Missile Type Toggle*

AG Mode

CCIP, CCRP and DTOS Toggle

AGM Pylon Toggle

All Modes

A/R Disconnect (Disconnects Refuel Boom)

FOV(S3)In

CAT Switch Toggle (CAT I/ CAT III)

Pickle Button (S2):

AA Mode

Weapon Release

Note: AMRAAMs; the Pickle must be held for 1s before a missile will fire as data is transferred to the missile (in game timming).

AG Mode

Activate ACMI if set to AUTO

Weapon Release

Designates target in "Pre-Designate DTOS"

Release Weapon in "Post-Designate DTOS"

Jettisons Wpns & Tanks in SelJett (MFDs)

All Modes

Jettisons Wpns & Tanks in SelJett (MFDs)

FOV(S3)In – (In game HELD)

Emergency Jettison

FOV (Field Of View, aka Pinky Switch, S3):

AA Mode

TWS -Norm/ EXP

RWS - Norm/ EXP

AG Mode

GM - Norm/ EXP/ DBS1/ DBS2

GMT & SEA - Norm/ EXP

WPN - Wide/ Narrow

TGP - Wide/ Narrow/ Exp

HAD (SOI - POS) – Toggles flight profile

HAD (SOI - HAS) – Toggles HAD FOV

All Modes

HSD - Norm/EXP1/ EXP2

With this button held down while pressing any other button, it will be activated the **"FOV (S3) In"** functions.

AP Disc (S4):

All Modes

Autopilot Override

Wheel Brakes – **[Non Realistic]**

Note: These two functions are held at the same time, but won't interfere with each other as you aren't going to be using the autopilot while on the ground.

FOV (S3) In

Autopilot Right Switch Toggle - (Up/ Middle/ Down - Pitch; ALTHOLD/ OFF/ PITCH)

POV (Point Of View, H1):

All Modes

Up = Trim Nose Down
Right = Trim Roll Right
Down = Trim Nose Up
Left = Trim Roll Left

NOTE: Use Trims by long press till getting the desired/ needed trimming.
Use short presses for more precise trimming.

FOV (S3) In

4 Directions = POV hat (view)

NOTE: Use this functions carefully because of the Held + S3 functions (see below).
Don't hold pressed POV functions – use short presses.
You may end up activating one of the Held + S3 functions

Held (0.5s) + S3

Up = Trim Reset
Right = NVG Toggle
Down = POV Reset
Left = Smoke Toggle

TMS (Target Management Switch, H2):

AA Mode

Up

RWS = Designate Target > SAM > STT
TWS = Designate Target > STT
ACM = Boresight Scan (rejects current target)
ACM HELD (HMCS) = Commands NO Radar
ACM RELEASED (HMCS) = Locks Target
HSD = Designates current Steerpoint,
= Designates PPT as current STP
= Displays PPT's Range Ring
TGP = Ground stabilize

(Held > 0,5s – in game timming)

RWS & TWS = Spotlight Scan: Radar tries to acquire a target when button released

Down

RWS = STT > SAM > Search
TWS = STT > Estrapolated tracks reapear and target will be bugged > target dropped > all tracks dumped and tracks rebuild begins > RWS
ACM = 30x20 Scan (rejects current target – Radar to standby) > 10x60 Scan (Radar to on)
HSD = Drops PPT as current STP
= Turns off PPT's Range Ring

Right

(Held <= 0,5s – in game timming)

TWS = Step Bug (step closest track)
= (No Bugs) Command Auto Bugging
ACM = 30x20 Scan (rejects current target)

(Held > 0,5s – in game timming)

RWS = Command TWS
TWS = Command TWS

ACM (slewing cursors) *= Command Slewable Mode (rejects current target)*

AG Mode

Up

FCR = Designate Target
= Designate FCR Mark
= (SnowPlow) Ground Stabilizes Cursors
HUD = Designate Target in DTOS & E-O Vis
= Overfly Point in VIP & VRP
= Designate HUD Mark
WPN & TGP = Command Track (Upon Release)

Right

FCR = Cycles through Mark Points
WPN (SOI – HARM) = Selects first valid threat > Steps to next threat
TGP = Commands AREA mode

Down

FCR & WPN
& TGP = Reject Target and Returns all sensors to Slave
HUD = Reject DTOS & E-OVis Target
= Returns TDbox to FPM
WPN (SOI – HARM) = Deselect current threat
HSD = Declutters threat rings

Left

WPN = Tracking COH / HOC Toggle
WPN (SOI – HARM) = Toggles threat Tables
TGP (short twice) = Toggle between FLIR and TV mode
TGP (FLIR mode) = Toggle FLIR polarity

FOV (S3) In

Up = Master Arm - Arm
Right = Call WINGMAN – Attack My Target
Down = Master Arm - Safe
Left = Call ELEMENT – Attack My Target

DMS (Display Management Switch, H3):

All Modes

Up = Select HUD as SOI
Right = Cycles Right MFD formats
Down = Moves SOI from HUD to highest priority MFD
= Cycles SOI between left & right MFD
Down (HMCS) = Toggles HMCS ON/OFF
Left = Cycles Left MFD formats

FOV (S3) In

Up = Pause TrackIr/ FreeTrack (using ALT+ Bspace)
Right = 3D Cockpit Costume View***
Down = Center TrackIr/ FreeTrack (using CTL+ Bspace)
Left = Paddlock Next A-A

(* Check below chapter dedicated to this subject)**

CMS (Counter-Measures Switch, H4):

Note: The actual functions of the CMS on USAF F16C's are classified.

All Modes – [in _Realistic profile]

Up = *Run selected (1 to 4) EWS Program*
Right = *ECM in Standby; Semi/ Auto Toggle*
Down = *ECM On, Semi or Auto; Consent Toggle*
Left = *Run Program 6*

All Modes - [Not in _Realistic profile]

Up = *Run selected (1 to 4) EWS Program*
Right = Radar Standby Toggle
Down = *ECM Standby Toggle*
Left = External Lights Power Toggle

FOV (S3) In

Up = EWS Program Select 1
Right = EWS Program Select 2
Down = EWS Program Select 3
Left = EWS Program Select 4

TQS Throttle Quadrant System Layout:

Throttle (Throttle Axis):

FOV (S3) In

Ensure Full AB (Bring lever back then move full FWD with S3 in)

NOTE: Doesn't seem to work in BMS.

It'll need some more testing and investigation, that haven't the time right now.

Radar Cursor/Enable (T1):

Microstick:

(*Controls cursor in the current SOI*)

AA Mode

FCR	= Moving the cursor off of the left or right side of the FCR page will toggle 30 <> 60 degree.
FCR - 10 degrees	> 30 degrees.
ACM - moving cursors	= Commands SLEWABLE mode, and slews Antenna pointing symbol.

AG Mode

HUD = Slews optimized symbol and LOS

WPN & TGP = Slew LOS (After TMSup)

Slews Radar Video in Expanded Fovs

NOTE: In both FCR-AA and FCR-AG modes, moving them off of the top of the screen, will increase range while moving them off of the bottom decreases it.

Enable:

AA Mode

AIM9/ AIM120 = Selects SLAVE / BORE Toggle

NOTE: Must be held to use BORE. In BORE Mode, Seeker is slaved to 3º below HUD BoreCross for AIM-9 and 6º below HUD BoreCross for AIM-120

AG Mode

WPN = submodes PRE/VIS/BORE Toggle

WPN (SOI – HARM) = Toggles between POS and HAS modes

FOV(S3)In – (In game HELD)

Eject

Antenna (Antenna Axis):

AA Mode

Controls radar antenna elevation

Note: No effect in ACM and STT.

AG Mode

Controls radar antenna elevation

NOTE: No effect in AGR.

Manual Range/Uncage (T6):

Man Range (Man. Range Axis):

AA Mode

No Function

AG Mode

GM = Adjusts Radar gain

GMT = Controls Target Gain

WPN = Controls Zoom

NOTE: Adds/ Subtracts 20% value set by MFD Gain rocker Switch.

FOV (S3) In

Rudder (Using keypress for left and right rudder control)

NOTE: Don't recommend to use this in BMS.

Behavior seems very different from OF, when used it a lot, by that time without pedals. It seems to be very hard to find (return) to central position. So A/C keeps turning as no center position anymore exists.

Uncage (T6):

AA Mode

AIM9 seeker – Cage/ Uncage Toggle

AG Mode

Removes AGM65 seeker cover

GEAR down

Declutters HUD

FOV (S3) In

Landing Gear Toggle (Open/ Close)

DogFight Switch (T7 and T8):

All Modes

Left (Back) = Dogfight Override mode

Right (Forward) = MRM Override mode

Center Position = Cancels selected override mode

Speed Brake Switch (T9 and T10):

All Modes

Left (Back) = *Opens speedbrakes until released or fully open*

Right (Forward) = *Closes speedbrakes while pressed*

Center position = *Stops speedbrakes at their current setting*

FOV (S3) In

Left (Back) = Take Screen Picture

Comms Switch (T2, T3, T4 and T5):

All Modes

*Up **(T2)*** = *Transmit Com1 - UHF*

*Down **(T3)*** = *Transmit Com2 – VHF*

(picture has T2/ T3 reversed)

*Right **(T4)***

FCR = *Initiates A-G DataLink cursor position.*

HSD = *Initiates A-G DataLink selected GroundPoint, SteerPoint or MarkPoint.*

*Left **(T5)***

(Held > 500ms – in game timming);

= *Clears FCR A-A DataLink symbols.*

(Held <= 500ms – in game timming);

= *Initiates A-A DataLink cursor position.*

FOV (S3) In

T2 = Call AWACS – Request Picture

T3 = Call AWACS – Declare

T4 = Call ELEMENT – Rejoin

T5 = Call WINGMAN – Rejoin

3D Cockpit Costume View Instalation:

This is a very useful functionality of this simulator. It's been around from the time of older versions, like Open Falcon. It permits the pilot to freeze a determined point of view according to some definitions.

First thing to do is to open up this BMS installation's folder;

"C:\MicroProse\Falcon4\art\ckptart\", here you'll find a lot of airplanes's folders and inside each one you'll find this file; "3dckpit.dat". Choose what type of aircratfts you fly most, and possibly want to use this game function and open that file and add to it's end the following code:

```
//customview x y z yaw pitch roll fov comment clickable
customview 0 0 0 0 -39 0 38 "Front" 1;
```

The 1st line of this code it's only an help line , describing all the fields. The 2nd line is what game will use. My advice here is you to adjust these values to your confort using one cockpit (airplane) in flight and when satisfied copy these lines to all other cockpits you may be flying also in your missions.

This cougar button works like toggle, press one time and your TrackIr/ FreeTrack/ etc.. will stop working and your view is shifted to the condition above described. If you press same cougar button again it will re-start your viewing software and your game's view will follow it as usual.

I believe that you can make as many Costume 3D cockpit Views as you want, but since I only use this functions to check central console gauges, am using only one Costumed View.

Enjoy.