

# TM HOTAS Cougar DirectX Setup

## **Introduction & Index:**

DirectX is implemented into the key file for the shifted and an unshifted layer of TM HOTAS Cougar

It uses the work of Dunc (Version 1.0, 2011-08-17) and is fully incorporated into my key file. He gave me his kind permission to use his DirectX part. All credits should go to him.

You can find the DirectX code lines at the end of my key files.

On the following sites you can find all info about setting up your Cougar and how to change functions. Most of the work has been done by Dunc. I combined all his doc's in this document and added how to change DX assignments.

It is assumed that you've read the BMS-Keyfile Manual and the [DirectX Shifting Facility Article](#) in the forum.

Kolbe-49th

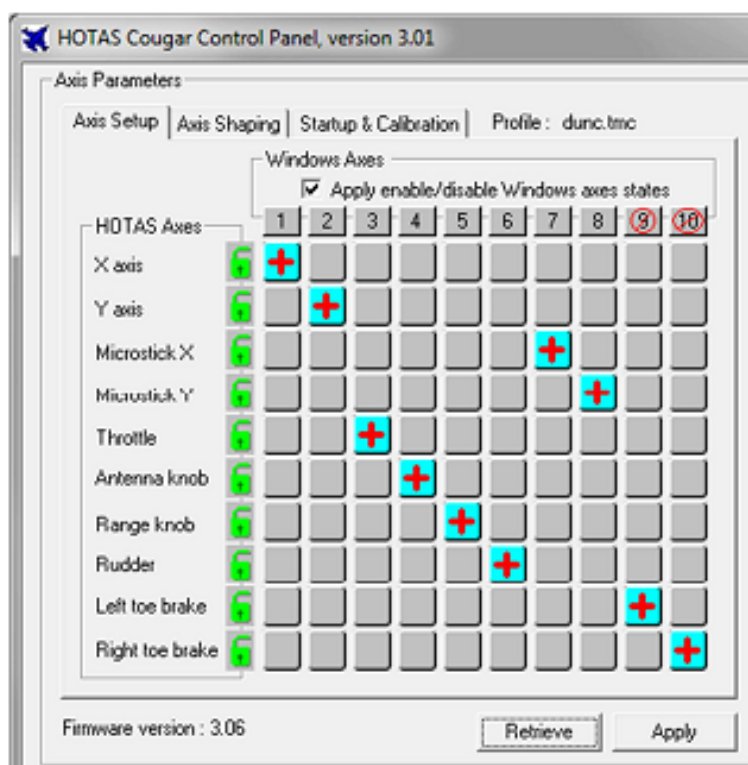
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## How to get started:

This description assumes that you already know how to setup your TM Hotas Cougar in general (i.e. performing manual/automatic calibration, load and compile Foxy profiles and how to load keyfiles in Falcon BMS). It only covers necessary steps to get the provided files up and running.

- 1) This profile uses the new BMS DirectX shifting feature to avoid any emulated keyboard input whenever possible. In order for this profile to work, make sure that the axis mapping configuration within your TM Hotas Cougar CCP is setup like this (to ensure that we can use the microstick as analogue axis):



- 2) Copy the Dunc\_DX.tmm and Dunc\_DX.tmj files to your Foxy files folder, open foxy, load the files, compile and download to the Cougar. Please note that you will NOT see anything happen in the Foxy keytester if you press Cougar buttons, as this profile uses DirectX buttons nearly exclusively.
- 3) Open the Falcon BMS.cfg file which is located in your BMS User\Config folder with a text editor. Find the setting: set g\_bHotasDgftSelfCancel. It's set to 0 by default, please set it to 1. Additionally, verify that the setting set g\_nHotasPinkyShiftMagnitude is set to 256 (default).

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- Copy one of the BMS\_keystroke.key files to your BMS User\Config folder. Start Falcon BMS, go to the Setup Controllers screen, and make sure that Thrustmaster HOTAS Cougar is selected as main controller. Next, load the key file, then go to the Advanced – Avionics Control section. Make sure that the axis are mapped as follows:



- This concludes the mandatory part of the Dunc\_DX profile setup. Please note that the BMS Setup Controllers screen is unable to display the DirectX shifted functionality, you will only be able to test/see the unshifted DirectX buttons. To test out the shifted DirectX buttons, you have to enter the sim and fly.
- Check out the included PDFs for keyboard mappings.

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## TM HOTAS Cougar DX button mapping:

### Unshifted layer (without holding Pinky/S3):

#### TG1 (Win DX1 = BMS DX0):

SimTriggerFirstDetent 0 -1 -2 0 0x0 0

#### Pickle/S2 (Win DX2 = BMS DX1):

SimPickle 1 -1 -2 0 0x0 0

#### Pinky/S3 (Win DX3 = BMS DX2):

SimHotasPinkyShift 2 -1 -2 0 0x0 0

#### Paddle/S4 (...and so on...):

SimAPOVERRIDE 3 -1 -2 0 0x0 0

#### MslStep/S1:

SimMissileStep 4 -1 -2 0 0x0 0

#### TG2:

SimTriggerSecondDetent 5 -1 -2 0 0x0 0

#### TMS/H2:

SimTMSUp 6 -1 -2 0 0x0 0

SimTMSRight 7 -1 -2 0 0x0 0

SimTMSDown 8 -1 -2 0 0x0 0

SimTMSLeft 9 -1 -2 0 0x0 0

#### DMS/H3:

SimDMSUp 10 -1 -2 0 0x0 0

SimDMSRight 11 -1 -2 0 0x0 0

SimDMSDown 12 -1 -2 0 0x0 0

SimDMSLeft 13 -1 -2 0 0x0 0

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## CMS/H4:

SimCMSUp 14 -1 -2 0 0x0 0

SimCMSRight 15 -1 -2 0 0x0 0

SimCMSDown 16 -1 -2 0 0x0 0

SimCMSLeft 17 -1 -2 0 0x0 0

## Cursor Enable/T1:

SimCursorEnable 18 -1 -2 0 0x0 0

## Radio Switch/T2-T5:

SimTransmitCom2 19 -1 -2 0 0x0 0

SimTransmitCom1 20 -1 -2 0 0x0 0

SimCommsSwitchRight 21 -1 -2 0 0x0 0

SimCommsSwitchLeft 22 -1 -2 0 0x0 0

## Uncage/T6:

SimToggleMissileCage 23 -1 -2 0 0x0 0

## Dogfight/T7-8:

SimSelectSRMOverride 24 -1 -2 0 0x0 0

SimSelectMRMOverride 25 -1 -2 0 0x0 0

## Speedbrakes/T9-10:

AFBrakesOut 26 -1 -2 0 0x0 0

AFBrakesIn 27 -1 -2 0 0x0 0

## TRIM hat/H1:

The TRIM hat/H1 will NOT be mapped here, hence it will default to POV changes. We will use the SHIFTED layer on the POV for TRIM later. If you don't need POV (e.g. TrackIR available), see notes on how to change POV assignments later in this document.

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## Shifted layer (with holding Pinky/S3):

TG1 (Win DX1 = BMS DX0+256 = BMS DX256):

SimDoNothing 256 -1 -2 0 0x0 0

Pickle/S2 (Win DX2 = BMS DX1+256 = BMS DX257):

AFResetTrim 257 -1 -2 0 0x0 0

Pinky/S3 (Win DX3 = BMS DX2+256 = BMS DX258):

SimHotasPinkyShift 258 -1 -2 0 0x0 0

Paddle/S4 (...and so on...):

SimEject 259 -1 -2 0 0x0 0

MslStep/S1:

SimFuelDoorToggle 260 -1 -2 0 0x0 0

TG2:

SimDoNothing 261 -1 -2 0 0x0 0

TMS/H2:

FOVToggle 262 -1 -2 0 0x0 0

SimHSIModeInc 263 -1 -2 0 0x0 0

SimAVTRToggle 264 -1 -2 0 0x0 0

SimHSIModeDec 265 -1 -2 0 0x0 0

DMS/H3:

OTWSelect3DCockpitMode 266 -1 -2 0 0x0 0

OTWSelectOrbitMode 267 -1 -2 0 0x0 0

OTWSelect2DCockpitMode 268 -1 -2 0 0x0 0

OTWSelectHUDMode 269 -1 -2 0 0x0 0

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## CMS/H4:

SimHmsSymWheelUp 270 -1 -2 0 0x0 0

SimExtIPower 271 -1 -2 0 0x0 0

SimHmsSymWheelDn 272 -1 -2 0 0x0 0

SimECMOn 273 -1 -2 0 0x0 0

## Cursor Enable/T1:

SimEmergencyJettison 274 -1 -2 0 0x0 0

## Radio Switch/T2-5:

AWACSDeclare 275 -1 -2 0 0x0 0

AWACSRequestPicture 276 -1 -2 0 0x0 0

SimDoNothing 277 -1 -2 0 0x0 0

SimDoNothing 278 -1 -2 0 0x0 0

## Uncage/T6:

SimThrottleIdleDetent 279 -1 -2 0 0x0 0

## Dogfight/T7-8:

(Unmapped, they should ALWAYS use unshifted functionality, just listed here for reference.)

SimDoNothing 280 -1 -2 0 0x0 0

SimDoNothing 281 -1 -2 0 0x0 0

## Speedbrakes/T9-10:

(Unmapped, they should ALWAYS use unshifted functionality, just listed here for reference.)

SimDoNothing 282 -1 -2 0 0x0 0

SimDoNothing 283 -1 -2 0 0x0 0

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## TRIM hat/H1:

(Has its own syntax. Please just believe me that this section is ok, a full explanation is available in the "DX Shifting" docu).

We map TRIM for the SHIFTED layer here. There is no need to map the UNSHIFTED stuff (POV change), because BMS will automatically use POV for ALL unmapped/unused layers by default.

AFElevatorTrimUp 2 -1 -3 0 0x0 0

SimDoNothing 2 -1 -3 1 0x0 0

AFAileronTrimRight 2 -1 -3 2 0x0 0

SimDoNothing 2 -1 -3 3 0x0 0

AFElevatorTrimDown 2 -1 -3 4 0x0 0

SimDoNothing 2 -1 -3 5 0x0 0

AFAileronTrimLeft 2 -1 -3 6 0x0 0

SimDoNothing 2 -1 -3 7 0x0 0

## The Cougar files:

### Dunc DX.tmj:

To be used together with Dunc\_DX.tmm and keystroke files by Kolbe-49th!

Make sure to use the correct TMM file:

USE MDEF Dunc\_DX.tmm

Disable any mouse functionality on the Cougar (e.g. microstick):

USE ZERO\_MOUSE

DISABLE MOUSE

Map ALL Cougar buttons and hats to their default DirectX buttons:

USE ALL\_DIRECTX\_BUTTONS

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By using ALL\_DIRECTX\_BUTTONS, the following DX values will get assigned. This is purely Foxy functionality and has nothing to do with BMS:

TG1 = DX1 (Trigger 1st Detent)

S2 = DX2 (Pickle)

S3 = DX3 (Pinky)

S4 = DX4 (Paddle)

S1 = DX5 (MSL Step)

TG2 = DX6 (Trigger 2nd Detent)

H1U = POV Up

H1R = POV Right

H1D = POV Down

H1L = POV Left

H2U = DX7 (TMS Up)

H2R = DX8 (TMS Right)

H2D = DX9 (TMS Down)

H2L = DX10 (TMS Left)

H3U = DX11 (DMS Up)

H3R = DX12 (DMS Right)

H3D = DX13 (DMS Down)

H3L = DX14 (DMS Left)

H4U = DX15 (CMS Up)

H4R = DX16 (CMS Right)

H4D = DX17 (CMS Down)

H4L = DX18 (CMS Left)

T1 = DX19 (Cursor Enable)

T3 = DX20 (VHF)

T2 = DX21 (UHF)

T4 = DX22 (IFF In)

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T5 = DX23 (IFF Out)

T6 = DX24 (Uncage)

T7 = DX25 (DGF Override)

T8 = DX26 (MSL Override)

T9 = DX27 (Speedbrakes Open)

T10 = DX28 (Speedbrakes Close)

Now, BMS can handle exactly ONE function for each button/hat position for the UNSHIFTED position (without Pinky/S3), and exactly ONE function for each button/hat position for the SHIFTED position (with Pinky/S3).

So whenever we want to have only ONE function for each position, we don't need to do anything in the Foxy profile anymore, we will cover that completely in the BMS key file.

All that we still need to cover HERE are special cases where we want to have e.g.:

- a) more than one function at the same time,
- b) toggle/alternate between different functions,
- c) create functions that are not meant for BMS, but for other programs (e.g. TrackIR)

NOTE: Whenever we override one of the default ALL\_DIRECTX\_BUTTONS assignments, we need to make sure that we manually add the DX mapping again for the positions that we NOT want to override (because they are lost otherwise).

For example, if we only want to override e.g. a SHIFTED position, we need to manually map the UNSHIFTED position back to whatever DX mapping was there by default. See the TG1 below for an complete example.

Trigger 1st Detent SHIFTED (/I) should be used to toggle between padlock and 3D view. As BMS cannot toggle, we need to create the toggle here as usual, using /I to indicate that this should be for the SHIFTED layer, and then add the two toggle positions with /T.

However, as we now did override TG1 for /I, TG1 for /O will be reset to "nothing" automatically by Foxy. But we want to keep the default DX assignment, hence we need to add it back manually using /O /H and the DX mapping from the list above.

Additionally, we will keep the state of TG1 UNSHIFTED in a logical flag for TG2 (see below).

```
BTN TG1 /I /T Padlock_AA /T 3D_Cockpit
      /O /H {DX1 X1}
```

Trigger 2nd Detent SHIFTED (/I) should do nothing to avoid firing the guns accidentally while toggling between padlock and 3D\_cockpit view. Usually, we can map this in the BMS key file

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directly. However, as soon as we release the pinky switch, BMS will immediately detect that TG2 is pressed and start firing. So what we do here is make sure that BMS only sees TG2 when it has been reached by passing only over TG1 (and not Pinky+TG1) before.

```
BTN TG2 ^
```

```
DEF X2 TG2 AND X1
```

```
BTN X2 /H DX6
```

The Paddle should do two things at the same time:

a) the normal AP override (which is done by BMS DX assignment, hence we just use the default DX mapping from the list),

b) wheelbrakes

To make sure that both commands are done at the same time, we use the curly brackets to tie them together.

Because we did not override /I or /O, we don't need to do anything else here, the rest will be in the BMS key file.

```
BTN S4 /H {DX4 Wheelbrakes}
```

Because we mapped the microstick (radar cursor) to use analog axis in the HOTAS CCP, the toe brake axis can only be used with digital statements now. Hence we will simply issue and hold a "Wheelbrake" keystroke whenever either of the toe brakes is pushed down more than 10%.

```
LBRK 5 2 (0 10 100) ^ (/H Wheelbrakes)
```

```
RBRK 5 2 (0 10 100) ^ (/H Wheelbrakes)
```

## Dunc DX.tmm:

To be used together with Dunc\_DX.tmm and keystroke files by Kolbe-49th!

To avoid side effects, it is good practice to use SINGLE keystrokes for macros only.

So whenever possible, avoid doing things like "Shift + Key" and use only "Key" instead.

This macro file will ONLY contain keyboard mappings. Everything that will be mapped by pure DirectX in the BMS key file will NOT show up here.

```
Padlock_AA = SHF 4
```

```
3D_Cockpit = 3
```

```
Wheelbrakes = k
```

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## How to change functions:

### DX Button Assignments:

Changing the button assignments is quite simple. Here is an example:

#### Pickle/S2 (unshifted layer):

**SimPickle** 1 -1 -2 0 0x0 0

In unshifted layer we use the S2 button to fire weapons. The callback for this is SimPickle. If you would like to use a different function just replace the callback (bolded part) with a callback of your choice.

Important note:

To avoid side effects not used buttons in unshifted layer have to be set to the callback **SimDoNothing**. This prevents the Cougar from using its default functions.

### DX POV hat:

As explained in the DX Shifting Facility Article in the forum the POV Hat has its own syntax. If you don't change anything the Cougar uses Hat1 as POV in unshifted layer by default. The TRIM functions are set to the shifted layer by manually editing the POV code lines.

If you want to change this (unshifted: TRIM / shifted: POV) you should do the following:

Delete the following lines in the key file (They set TRIM to shifted layer):

```
AFElevatorTrimUp 2 -1 -3 0 0x0 0
SimDoNothing 2 -1 -3 1 0x0 0
AFAileronTrimRight 2 -1 -3 2 0x0 0
SimDoNothing 2 -1 -3 3 0x0 0
AFElevatorTrimDown 2 -1 -3 4 0x0 0
SimDoNothing 2 -1 -3 5 0x0 0
AFAileronTrimLeft 2 -1 -3 6 0x0 0
SimDoNothing 2 -1 -3 7 0x0 0
```

Copy following lines into the key file (They set TRIM to unshifted and POV to shifted layer):

#### POV unshifted layer:

```
AFElevatorTrimUp 0 -1 -3 0 0x0 0
SimDoNothing 0 -1 -3 1 0x0 0
AFAileronTrimRight 0 -1 -3 2 0x0 0
SimDoNothing 0 -1 -3 3 0x0 0
AFElevatorTrimDown 0 -1 -3 4 0x0 0
SimDoNothing 0 -1 -3 5 0x0 0
AFAileronTrimLeft 0 -1 -3 6 0x0 0
SimDoNothing 0 -1 -3 7 0x0 0
```

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## POV shifted layer:

**OTWViewUp** 2 -1 -3 0 0x0 0  
SimDoNothing 2 -1 -3 1 0x0 0  
**OTWViewRight** 2 -1 -3 2 0x0 0  
SimDoNothing 2 -1 -3 3 0x0 0  
**OTWViewDown** 2 -1 -3 4 0x0 0  
SimDoNothing 2 -1 -3 5 0x0 0  
**OTWViewLeft** 2 -1 -3 6 0x0 0  
SimDoNothing 2 -1 -3 7 0x0 0

If you would like to add other functions just replace the bolded callbacks by callbacks of your choice.

In most cases, the up-right, down-right, down-left and up-left positions of the 8-way POV hat are not needed. The SimDoNothing callbacks are used to act the POV as a 4-way Coolie Hat AND to avoid unwanted actions, because the POV may have some default functions for the up-right...etc. positions. So it is always a good idea, to set ALL unused DX buttons (shifted and unshifted) to SimDoNothing!

## Using Foxy:

You can easily add functions by editing the tmm and tmj files. How to do that is not described here. But you can find some hints in the above Dunc\_DX. tmj / Dunc\_DX. tmm descriptions. But be advised:

If you program buttons manually you will lose their DX functionality. Keep that in mind when editing these files.

## Using BMS-Keyfile-Editor:

You can also use the excel file to change DX assignments. Just follow the instructions on the HOTAS Cougar related sheet.

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## Quick Reference:

(unshifted layer / shifted layer)

Stick:	Throttle:
TG1: Trigger 1 <sup>st</sup> Detent Toggles 3D Cockpit / Padlock AA View	Cursor/T1: Cursor Enable Emergency Jettison
TG2: Trigger 2 <sup>nd</sup> Detent (n/a)	Radio/T2-T5: up: UHF Transmit down: VHF Transmit left: IFF Out / Comms Left right: IFF In / Comms Right up: AWACS Picture down: AWACS Declare left: (n/a) right: (n/a)
S1: Msl Step / Nosewheel Steering Refuel Door Toggle	Uncage/T6: Missile Uncage Throttle Idle Detent
S2: Weapon Pickle Trim Reset	Dogfight/T7-T8: left: SRM Override center: Cancel Override right: MRM Override all positions: (n/a)
S3: Pinky Switch (n/a)	Speedbrakes/T9-T10: left: Open Speedbrakes right: Close Speedbrakes all positions: (n/a)
S4: AP Override, Wheelbrakes Eject	
H1: POV Trim	
H2: all directions: TMS up: Look Closer Toggle down: AVTR Toggle left: HSI Mode Decrease right: HSI Mode Increase	
H3: all directions: DMS up: 3D Cockpit View down: 2D Cockpit View left: HUD Only View right: Orbit View	
H4: all directions: CMS up: HMS Brightness Up down: HMS Brightness Down left: Jammer Toggle right: Master Lights Toggle	