CameraPosition X

Documentation



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1. Overview

This small application makes it very easy to add and edit camera definitions for your aircraft.

You can:

- Load and edit CameraDefinition tags from your aircraft and simulator definition files
- Add end Edit new cameras by visually positioning them in the simulator world
- Add fixed point "world" cameras either globally or individually for your aircraft
- Remove unwanted camera definitions.
- Build a playlist out of camera definitions that cycles through the different positions automatically
- Works completely stand alone camera definitions are saved to your aircraft.cfg or cameras.cfg.
 It is not required to run this app alongside your simulator once you have set up your cameras.

2. Installation

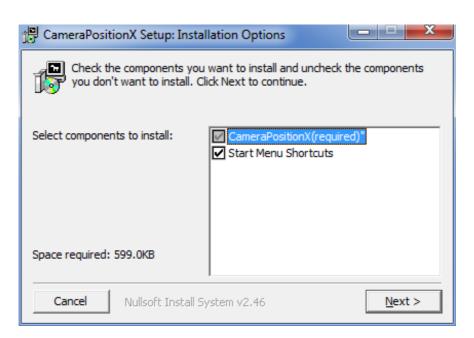
2.1 Distribution

CameraPosition X is distributed as self-extracting installer packages.

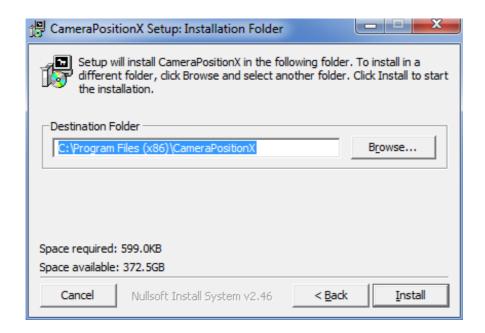
2.2 Installation

- Please use the installer intended for your sim:
 - FSX boxed or dual install with SE: CameraPositionX_Install.exe
 - FSX SE stand alone: CameraPositionX_SE_Install.exe
 - Prepar3D V2.5: CameraPositionX_P3D_Install.exe
 - Prepar3D V3: CameraPositionX_P3D_V3_Install.exe
 - Prepar3D V4: CameraPositionX_P3D_V4_Install.exe

Running the installer:



- "Start Menu Shortcuts": CameraPosition X will be added to your Start Menu (advised)



On the next page you choose the installation path for CameraPosition X.

THIS IS NOT THE PATH TO YOUR SIMULATOR DIRECTORY, IT IS USED EXCLUSIVELY FOR CameraPosition X!

- Selecting "Install" will begin the installation

2.3 Microsoft .Net 4.5.1

The CameraPosition X requires that the .Net ("dot Net") library version 4.5.1 is installed and current on your PC.

This library can be obtained here:

https://www.microsoft.com/en-us/download/details.aspx?id=40779

2.4 SimConnect

CameraPosition X relies on SimConnect being installed correctly on your computer. SimConnect is a part of FSX/P3D and it is set up automatically when you first install the simulator. To save you the trouble of installing the SDK, the necessary SimConnect DLL for each sim is shipped inside CameraPosition X and gets deployed in your Temp folder when CameraPosition X is run.

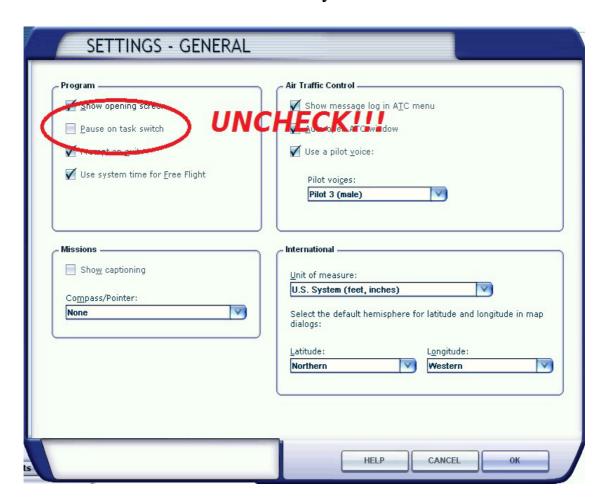
FSX only: In case SimConnect is not installed, and CameraPosition X does not start up, giving you an error message instead, you will have to install the SimConnect Client manually:

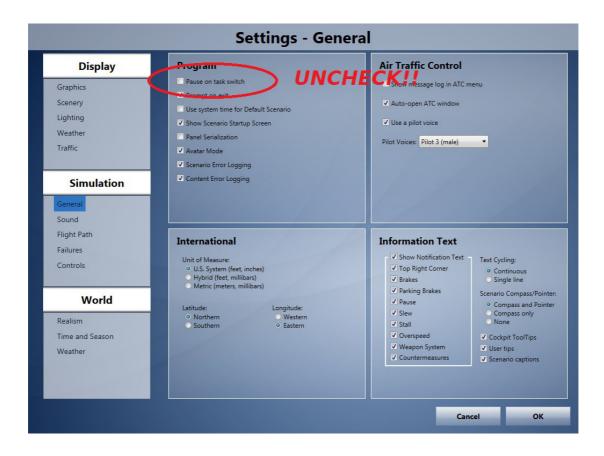
- FSX boxed users can find the "SimConnect.msi" installation file either online or in the FSX SDK folder "..\Microsoft Flight Simulator X SDK\SDK\Core Utilities Kit\SimConnect SDK\lib"
- FSX SE users find it here:
 - "..\Steam\steamapps\common\FSX\SDK\Core Utilities Kit\SimConnect SDK\LegacyInterfaces\FSX-SP1\SimConnect.msi "

2.5 Pause on Task Switch

CameraPosition X is a separate application, a task independent from your simulator.

It is therefore extremely important, that you switch the "Pause On Task Switch" option OFF in your simulator. If you leave it on, the CameraPosition X cannot work correctly!





2.6 Run as Administrator

CameraPosition X needs to change files inside your simulator's main directory. If that directory is inside the standard installation path ("Program Files" or "Program Files (x86)", then the standard UAC (user access control) mechanism of Windows 7 and above may interfere with this, causing errors when you try to save cameras. To avoid this, please run this application as Administrator.

2.7 EZDOK compatibility

Starting with version 1.14, CameraPosition X is largely compatible with EZDOK.

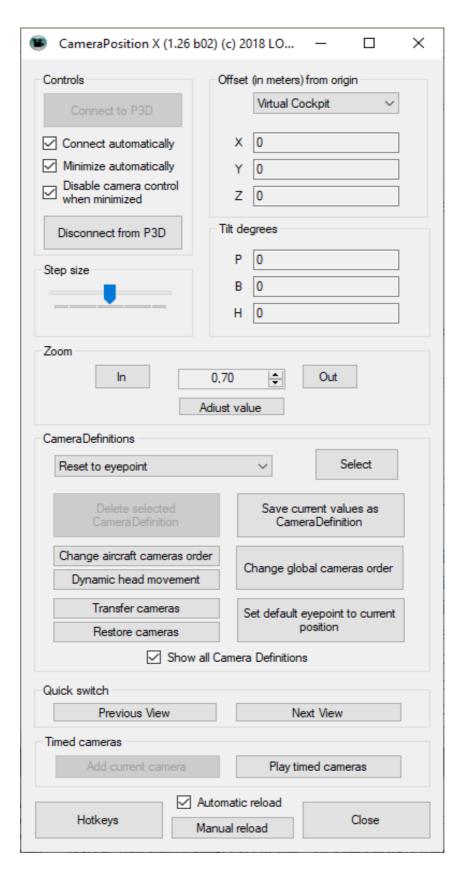
One thing needs to set up in advance: the global definition 203 "EZCA Aircraft cam" is hidden from the view cycle (parameter "CycleHidden=Yes". This prevents the app from calling up aircraft cameras. Please change this parameter to "No", either by using the CameraPosition X or by editing the "cameras.cfg" file with Notepad.

There will still be interference, but generally all features worked in our tests.

- To move the camera with CPX, EZDOK has to be disabled temporarily in the simulator Add-ons menu (Add-ons\EZdok camera addon\global disable).
- On occasion the camera switching mechanism will get out of sync. In that case, please restart the CameraPosition X, connect to the sim and then switch to the "EZCA VC cam" manually before proceeding.

3. Main Window

3.1 Description



The Elements explained:

- Button "Connect to FSX/P3D" initializes SimConnect and starts the polling mechanism
- Button "Disconnect from FSX/P3D" terminates SimConnect
- Checkbox "Connect automatically" will try to connect to the simulator automatically when CameraPosition X is started (for example if you choose to start it with your simulator)
- *Checkbox "Minimize automatically"* will minimize the CameraPosition X window when it loses focus.
- *Checkbox "Disable camera control when minimized"* will disable the CPX internal camera keyboard controls (see chapter 3.3) while the app is minimized.
- *Slider "Step Size"* controls the amount of movement when you shift the camera around
- DropDown "Offset (in meters) from origin" displays the camera definition origin – the X/Y/Z values below are always relative to this point
- X/Y/Z: the position of the camera as offset from the origin
- *P/B/H*: pitch, bank and heading of the camera
- Buttons Zoom "In" "Out": control the camera zoom in the sim
- *Button "Adjust value"*: the zoom function can get out of sync and display a different value than the simulator window is set. Press this button and nudge the value to the correct zoom setting.
- CameraDefinitions: This dropdown list contains all camera definitions from your aircraft.cfg and your cameras.cfg that can be edited with the tool
- Button "Select" loads the selected camera definition.
- Button "Deleted selected CameraDefinition" removes the selected definition from the .cfg file.
- Button "Save current values as CameraDefinition" opens the Save Camera dialog where you can either replace the selected camera or save a new one.
- Buttons "Change aircraft cameras order / Change global cameras order" opens a dialog where you can change the camera definition sequence.
- Button "Transfer cameras" Opens a dialog to transfer camera definitions and their hotkeys to another aircraft.cfg

- *Button "Restore cameras"* Opens a dialog to restore cameras from the automatic backup, for example, when an update of the aircraft.cfg file erased your custom definitions
- Button "Set default eyepoint to current position" will change the eyepoint setting of your aircraft to the current camera position. Use this with caution!
- Button "Dynamic head movement" opens a dialog to change the DHM parameters of the simulator in fsx.cfg/prepar3D.cfg
- Checkbox "Show all Camera Definitions": activate this if you want to see aircraft and global camera defintions in the selection drop down list
- Buttons "Previous View" and "Next View" cycle through the camera definitions in the drop down list.
- Button "Add current camera" adds the currently selected camera to the playlist
- Button "Play timed cameras" opens the Timed Cameras dialog
- Button "Hotkeys" opens the hotkey definition dialog
- *Checkbox "Automatic reload"* deselect this checkbox to temporarily disable the automatic reload process.

Note: if you do this, your new or changed cameras will be saved, but the positions are not available in the sim until you click the "Manual reload" button.

This feature is intended to make defining cameras faster when you are using aircraft (like PMDG's) that take a while to re-initialize after every reload

- Button "Reload Aircraft" will reload your current aircraft in the sim.
- Button "Close" ends the program

3.2 Connecting to the simulator

To connect the application to your simulator, there are two options:

- Fully automatic:

If the checkbox "Connect automatically" is activated, the app will try to connect to the simulator on its own. The attempt is stopped if the simulator doesn't react after 2 minutes.

This is useful if you decide to start the app with your simulator by adding it to the exe.xml, to make use of the hotkey feature.

- Manually:

- First start the sim and load your aircraft.
- Wait until the loading process is complete, then select the Virtual Cockpit view
- Now you can start the CameraPosition X and press "Connect to FSX/P3D".
- Now the X/Y/Z/P/B/H field should all show the value "0", as the camera is positioned at the default eyepoint of your aircraft.

IMPORTANT:

CameraPosition X assumes that your standard VC view is at the simulator default – looking forward and level, at the eyepoint position of the aircraft, with a zoom factor of 0.70.

Please make sure that your view matches this position before you proceed, or your camera definitions will be offset to what you are seeing.

The application switches to this position automatically, but depending on your simulator setup and other addons there might be interference.

3.3 Camera Control

The following keyboard commands move the camera either in the simulator or when the CameraPosition X window has the focus.

The movement is being accelerated as long as you keep on holding down the keys.

```
- Ctrl & NumPad 4
                        = pan left

    Ctrl & NumPad 6

                       = pan right
                       = pan down

    Ctrl & NumPad 8

                       = pan up
- Ctrl & NumPad 2
- Ctrl & NumPad 9
                       = tilt left
                       = tilt right
- Ctrl & NumPad 3
- Ctrl & "+"
                       = zoom in
- Ctrl & "-"
                       = zoom out
- Ctrl & Enter
                       = reset view
```

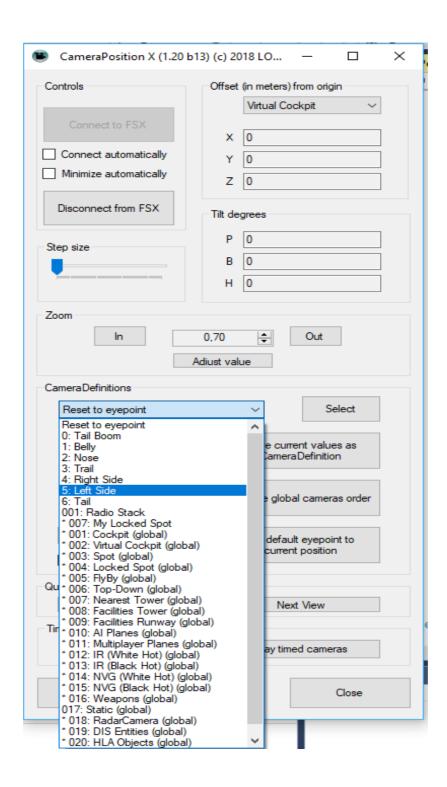
```
Shift & Ctrl & NumPad 4 = move left
Shift & Ctrl & NumPad 6 = move right
Shift & Ctrl & NumPad 8 = move forward
Shift & Ctrl & NumPad 2 = move back
Shift & Ctrl & NumPad 9 = move up
Shift & Ctrl & NumPad 3 = move down
```

The CameraPosition X will only track these exact viewing system events, any other way of moving the camera or the viewpoint will not be processed!

When using these keys in the simulator, the CameraPosition X will override all native simulator events that are associated with the above keys.

3.4 Selecting existing cameras

Existing cameras are read on startup from your aircraft.cfg and cameras.cfg. The cameras that you can select are limited to those that can be edited with the application.



Select a camera from the dropdown list and press "Select" - the camera values will be loaded and the simulator view is shifted to the camera position.

"Reset to eyepoint": Reset the camera display to the default eyepoint.

Notes:

As the simulator viewing system does not allow the reading of values, the shifting of the camera is asynchronous and it can fail. In that case please use the controls in the simulator to load the intended camera position.

Zoom is especially critical and it will happen rather often, that the zoom setting in the sim will not correspond to the zoom setting in the app. In that case, please use the "Adjust value" button of the zoom section to adjust the value to the actual zoom in the simulator.

Sometimes it helps to use the "Reset to eyepoint" value, then switch back to the camera.

Some camera types may require you to switch to another view mode first (outside view, tower view).

3.4 Selecting cameras in the simulator

Once a camera definition has been saved, the application resets the viewpoint to the VC default. You can immideately select the new camera with the view system in the sim, either by using the main menu or the view context menu that you get when right-clicking on you simulator view.



3.5 Camera switching getting out of sync

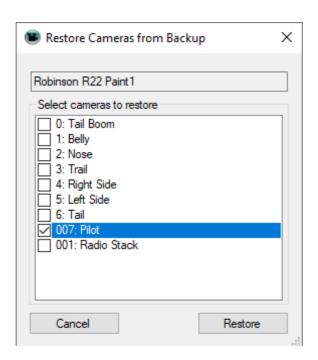
Sometimes the simulator will decide that it doesn't want to switch to the camera that you are selecting, and that it will show you a different one instead. This can be resolved by reloading your aircraft with the "Reload Aircraft" button on the main CameraPosition X window.

Note that this reloads your aircraft in the simulator, which may take a little while depending on the model.

3.6 Restoring Cameras

Every time you add a custom camera, the application will automatically create a backup of it. If at some point your camera configurations get deleted from the aircraft.cfg, for example through an update or reinstall, you can restore your custom cameras using the button "Restore cameras".

If there is a backup associated with the current aircraft, this button will open a new dialog:



Select the cameras that you want to restore by activating the checkboxes, then press "Restore" to add them back into your aircraft.cfg

4. Save Camera Window

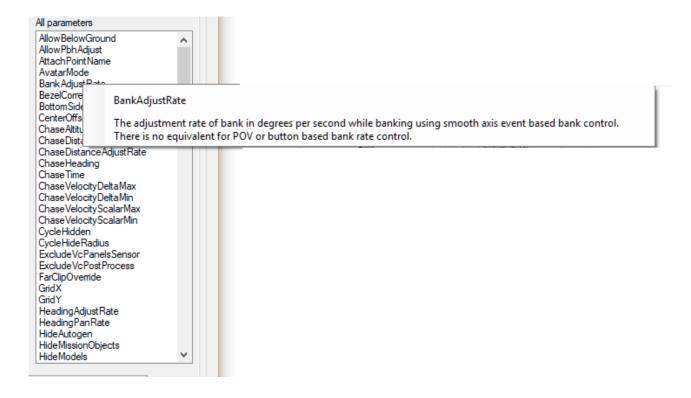
With this dialog, all parameters that can be edited in cfg files can be altered.

Note that you can create any type of camera defintion that you want, but the CameraPosition X app can only read, work with and display Virtual Cockpit, Aircraft and Fixed position cameras.

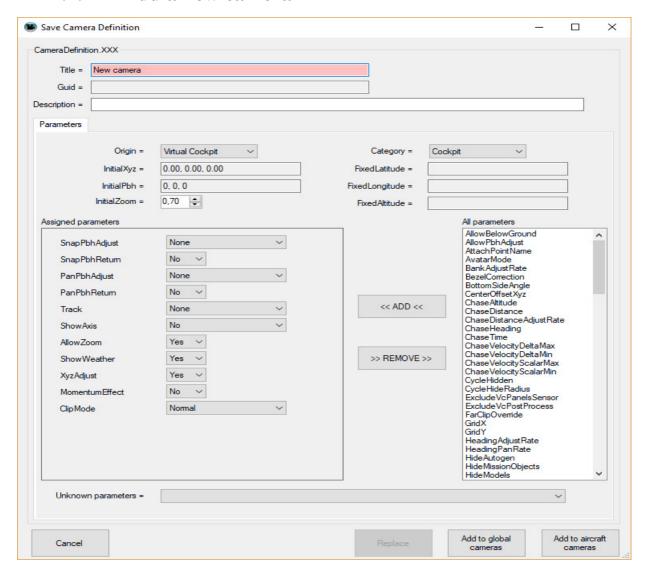
After the camera has been saved, the aircraft is reloaded in the simulator to make the camera available. Depending on the aircraft model, this may take a while.

Notes:

- Parameters can be added to the camera definition or removed from it with the "<<ADD<<" and ">>REMOVE>>" buttons
- Right-Clicking a parameter name in the "All parameters" list will bring up the description from the SDK (if available):

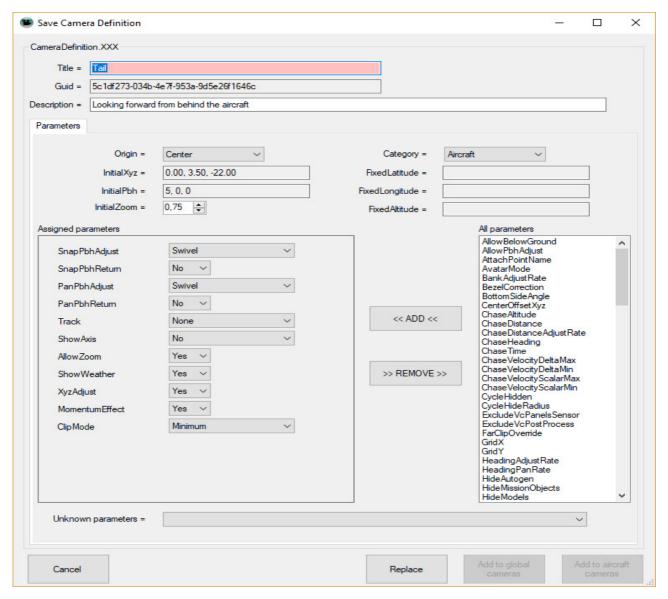


4.1. Add a new camera



- The "Add" buttons are inactive until you type in a unique "Title" string.
- The GUID is calculated when the camera is saved

4.2. Replace an existing camera



- By default, the "Replace" button is active the values will be saved to the existing camera.
- If you change the "Title", then the buttons "Add..." will become active, and you can save the camera as an additional new definition. A new GUID is calculated when you press the button.

4.3. Adding a fixed camera

Fixed cameras can be saved either globally (=to the cameras.cfg) or individually for the current aircraft (=to the aircraft.cfg).

To position a fixed camera:

- Switch to the standard Virtual Cockpit view ("Reset to eyepoint")
- Select "Fixed" from the origin drop down



- move your aircraft close to the desired location
- then fine tune the camera position and orientation with the control keys.
- Save the camera. On the save dialog, make sure that the Origin is "Fixed" and the Category is "Custom".
- Fixed cameras can be saved as "Global" cameras to your cameras.cfg file, making them available in every aircraft. When saving a fixed camera, the appropriate button "Add Global" will be visible on the save dialog.
- Your aircraft is only moved to the location of the fixed camera when you press the "Select" button in the section "Camera Definitions".

4.4. Editing a fixed camera

Unfortunately, fine tuning an existing fixed camera's lat/lon/alt position is next to impossible. The reason is, that the simulator overrides the camera control input with accelerated movements of its own, making the camera move wildly off it's intended track – and thus invalidating the lat/lon/alt readout on the main dialog (you never know if these values are correct or not).

Your only option is to delete the fixed camera and create a new one as described in the previous chapter.

P, B, H values on the other hand can be adjusted normally.

4.5. File backups

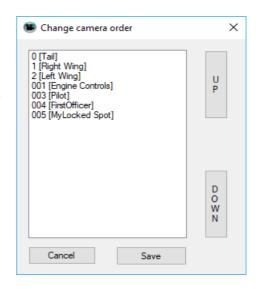
The CameraPosition X creates two types of backup files:

- When the application is first run and used to alter an existing aircraft.cfg or cameras.cfg, a backup file ending with "_orig" is created, containing the initial content of the file
- When the same config file is altered again at a later date, the last configuration is saved in a backup file ending with "_CPXBAK"

In case you want to revert to the original cfg or to the previous state, just delete the current cfg and rename the backup file to it's original name.

4.6. Change camera order

On this dialog you can change the order in which the cameras are loaded by the simulator. This also influences the order when using the "S" or "A" sequence keys in the simulator.

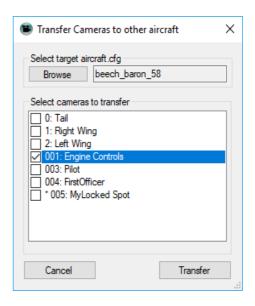


4.7. Transfer cameras

First browse to the aircraft.cfg or sim.cfg of the model that you want to transfer the cameras to with the "Browse" button.

Then select the desired cameras with the checkboxes and press "Transfer".

The selected cameras will be added to the target craft, including their hotkey definitions.



4.8. Camera parameters

The camera parameters are explained in detail in the documentation that comes with the simulator.

For each simulator you will either find a Windows help file or online documentation:

- FSX boxed: https://msdn.microsoft.com/en-us/library/cc526984.aspx
- FSX:SE: ..\Steam\steamapps\common\FSX\SDK\fsxsdk.chm
- Prepar3D: "Learning Center.chm" in your main simulator directory.

Notes:

- The values "True/False" are translated to "Yes/No" in CameraPosition X.
- Parameters that are not set in the dialog and/or keep their default values are not written to the config file (the simulator will use the default anyway).

5. Virtual Hotkeys

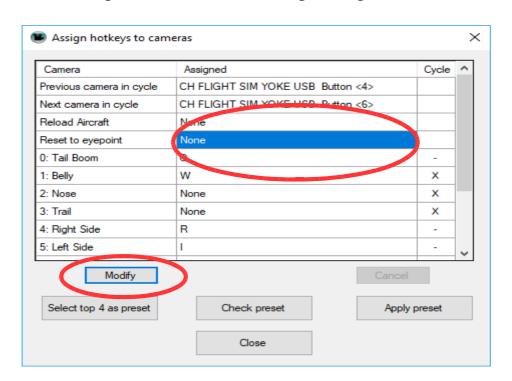
5.1. Functionality

With CameraPosition X it is possible to assign virtual hotkeys to cameras in addition the simulators own mechanism. The movement between the camera positions depends on how their "transition" parameters have been set up (see chapter 4). The camera view will "float" between two positions that have "transition=true", otherwise the switch is instantaneous.

Note: CPX virtual hotkeys will only work as long as the app is running alongside the sim.

5.2. Assigning hotkeys to cameras

Hotkeys can be assigned with the following dialog:



It will show a list of available cameras according to your selection on the main page ("Show all Camera Definitions" activated or not).

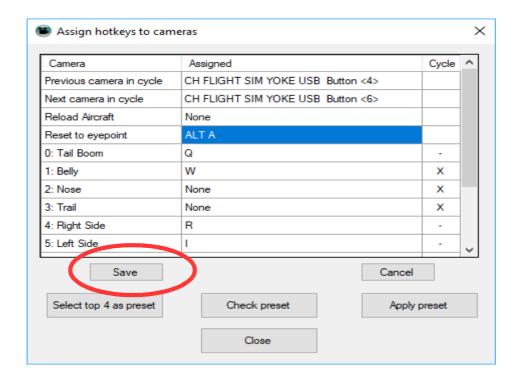
You can assign any Joystick button or the following keyboard combinations:

<Shift / No Shift> < Alt or Ctrl> < any key>

To assign a key to a camera either click on the "Modify" button or click directly into the appropriate cell (the blue one).

- Joystick buttons are assigned simply by pressing them
- Keyboard combos have to be entered one key after the other. Example: to assign "Shift&Ctrl&A" you would press "Shift", release it, then press "Ctrl", release it, then press "A"

When you have finished assigning hotkeys, press the "Save" button.

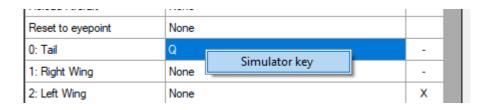


Pressing "Del" while assigning will delete the selected hotkey.

A note about keyboard keys:

Many keyboard keys are already assigned to simulator events and cannot be used as hotkeys. If you want to override the simulator key because you need a specific assignment that is blocked by the sim, you can change an assigned key to attach to the simulator key event

- Right-click on a key assignment: a context menu appears

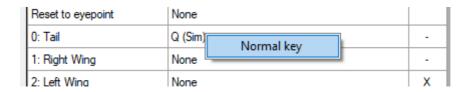


- Select "Simulator Key" to attach to the key event.



- Press "Save"
- From now on, CPX will use the simulator key in addition to the global hotkey.

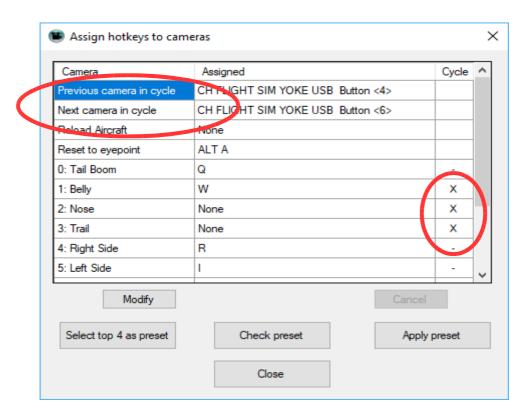
To revert a "(Sim)" key back to normal, right-click it again, and select "Normal key" from the context menu.



5.3. Cycling through cameras

Special hotkeys can be defined for cycling through a list of cameras that you have marked with "X" on the dialog. To add or remove a camera to/from the cycle, click on the appropriate cell last column:

"-" turns to "X": camera has been added to the cycle "X" turns to "-": camera has been removed from the cycle



5.4. Global hotkey preset

The top 4 "special" hotkey assignments can be selected as a global preset. This preset can be applied to any aircraft by clicking "Apply preset", so you can keep these global keys consistent for all your models.

You can overwrite those keys in a specific model any time, so they will take precedence over the global preset. This is useful if you have a different key layout for a specific aircraft.

6. Dynamic Head Movement

The simulator has a built-in dynamic head movement (DHM) feature, that moves the camera view in sync with the aircraft acceleration and movement vectors – if you have set the "Momentum Effect" parameter to "Yes" when saving a camera.

The parameters of this feature can only be changed globally (= for every aircraft) in the simulators cfg file (fsx.cfg, prepar3d.cfg).

With the button "Dynamic head movement" on the main Windows, you can open a helper dialog to tweak these parameters:

Adjust Dynamic Head Movement				
Adjust DHM parameters in simulator cfg file				
LonAccelOnHeadLon	-0,02			
LonAccelOnHeadPitch	-0,01			
RollAccelOnHeadLat	0,01			
YawAccelOnHeadLat	-0,10			
RollAccelOnHeadRoll	0,10			
MaxHeadAngle	5,00			
MaxHeadOffset	0,30			
HeadMoveTimeConstant	1,00			
Reset to default				
Cancel Save				

Please note that if you change these parameters, you will have to restart your simulator for them to take effect.

This is what the specification has to say about the DHM parameters:

The simulation uses these settings to compute how much camera acceleration (pitch, roll, side-to-side, and fore-to-aft) is generated in relation to aircraft accelerations. The table below describes each setting. Note that negative numbers move the camera in the opposite direction to the acceleration.

Property	Default	Description
LonAccelOnHeadLon	-0.02	Computes the camera's longitudinal (fore-to-back) change generated by longitudinal acceleration of the aircraft.
LonAccelOnHeadPitch	-0.01	Computes the camera's pitch change generated by longitudinal acceleration of the aircraft.
RollAccelOnHeadLat	0.01	Computes the camera's lateral (side-to-side) change generated by rolling acceleration of the aircraft.
YawAccelOnHeadLat	-0.1	Computes the camera's lateral (side-to-side) change generated by yawing acceleration of the aircraft.
RollAccelOnHeadRoll	0.1	Computes the camera's rolling motion generated by rolling acceleration of the aircraft.
MaxHeadAngle	5.0	Maximum allowed angular change in degrees.
MaxHeadOffset	0.3	Maximum allowed lateral change in feet.
HeadMoveTimeConstant	1.0	Acceleration multiplier (higher numbers increase responsiveness).

7. Timed Cameras

7.1. Overview

The "Timed Cameras" feature makes it possible to run an automated cycle of camera definitions indefinitely at pre-defined times. This can be useful for demo applications or YouTube videos.

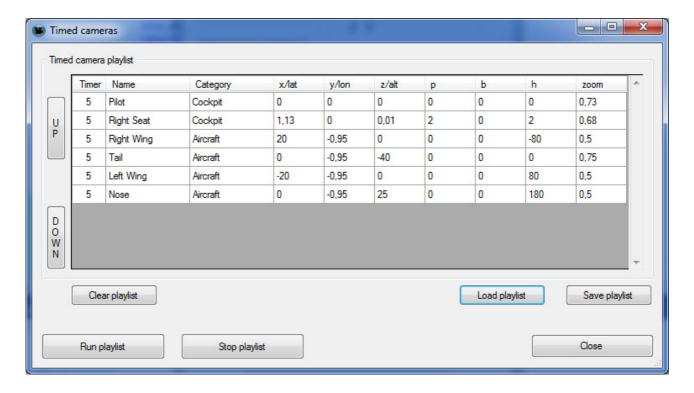
Note: the CameraDefinitionX application has to be running alongside your sim to used the timer feature.

7.2. Add a camera to the playlist

On the main window, after you have selected a camera and it is displayed in the sim, you can user the "Add current camera" in the "Timed cameras" section to add that camera to the playlist.

7.3. Show Playlist

On the main window, use the "Play timed cameras" button to open the playlist dialog:



This dialog displays a list of all cameras, that you have added to the play list.

7.4. Change timing

The column "Timer" contains the number of seconds that the app will wait before it displays the next camera.

The timer value can be changed like this:

- left click on the number reduces it by one second
- right click on the number adds one second

7.5. Change camera order

To change the order of the playlist, highlight the desired row with the mouse and use the "UP" / "DOWN" buttons to shift it's position in the list.

7.6. Remove camera from the playlist

To remove a camera from the list, right-click on any column other than the "Timer". A context menu with "Delete" appears – click on it, to remove the row from the list.

7.7. Run playlist / Stop playlist

The button "Run playlist" starts the camera sequence. It will be cycling through the camera positions in the playlist until either the playlist window is closed or until you press the button "Stop playlist".

7.8. Save playlist

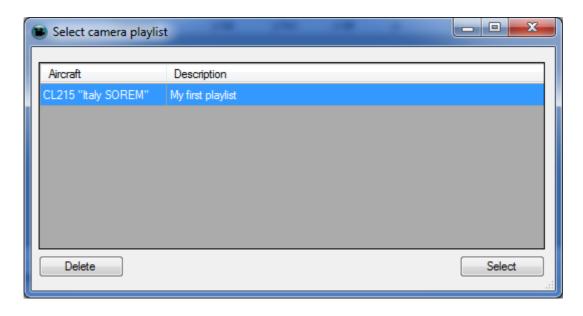
The button "Save playlist" opens the save dialog:



Add a description to identify the playlist, then the button "Save playlist" will save the current playlist.

7.9. Load playlist

The button "Load playlist" opens the selection dialog:



Highlight a row and choose "Select" to load the playlist.

Clicking on "Delete" removes the selected playlist from the database.

7.10. Clear playlist

Pressing the button "Clear playlist" will reset the currently displayed list and remove all camera definitions.

8. Starting CPX with the simulator

Setting up your simulator so that it starts CameraPosition X automatically is a little different for the various simulator versions.

For FSX, FSX:SE and Prepar3D 2,x, 3,x the app has to be added to the "exe.xml" file of the simulator.

This file is located in the local users appdata folder:

C:\Users\<yourname>\AppData\Roaming\Microsoft\FSX

C:\Users\<yourname>\AppData\Roaming\Lockheed Martin\Prepar3D V2

C:\Users\<yourname>\AppData\Roaming\Lockheed Martin\Prepar3D V3

Open the exe.xml with notepad and make the end of the file look like this:

The CPX path is different for every version of CameraPosition X: FSX:

C:\Program Files (x86)\CameraPositionX\CameraPositionX.exe

FSX:SE:

C:\Program Files (x86)\CameraPositionX_SE\CameraPositionX_SE.exe

P3D V2:

C:\Program Files (x86)\CameraPositionX_P3D\CameraPositionX_P3D.exe

P3D V3:

For Prepar3D V4.x, the procedure is much simpler:

- Go to the folder "\Documents\Prepar3D v4 Add-ons\Lorby-SI CameraPositionX_P3D_V4"
- Rename the file "add-on.xml.off" to "add-on.xml"

9. Disclaimer

CameraPosition X is licensed for private, non-commercial use only. It is not sold, any property rights remain with the author.

You may not distribute this package or parts of it.

Disassembling, refactoring or changes of any kind to code and models are prohibited.

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