

English






















Hayabusa Renderer 2.0 for Rhinoceros Animation Tutorial

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Files to use

The downloaded data folder contains the following files

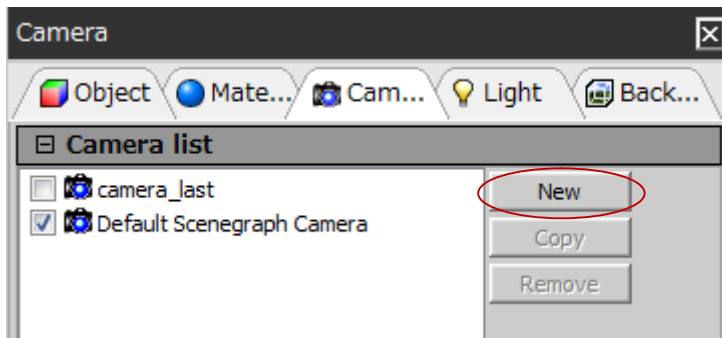
01camera	02object	03material
 anim_camera_01.hyp2  anim_camera_02.hyp2  anim_camera_03.hyp2  anim_camera_04.hyp2  anim_camera_05.hyp2  anim_camera_06.hyp2  Hayabusalogo_01.tga  anim_camera.wmv	 anim_objectmove_01.hyp2  anim_objectmove_02.hyp2  anim_objectmove_03.hyp2  anim_objectmove_04.hyp2  anim_objectmove_05.hyp2  Hayabusalogo_01.tga  anim_objectmove.wmv	 anim_material_01.hyp2  anim_material_02.hyp2  anim_material_03.hyp2  anim_material_04.hyp2  Hayabusalogo_01.tga  anim_materialchange.wmv

- .wmv file: Complete movie file
- .hyp2 file: Hayabusa 2.0 file to be used in the tutorial, including files in process of creation.
- Hayabusalogo_01.tga: Logo image file

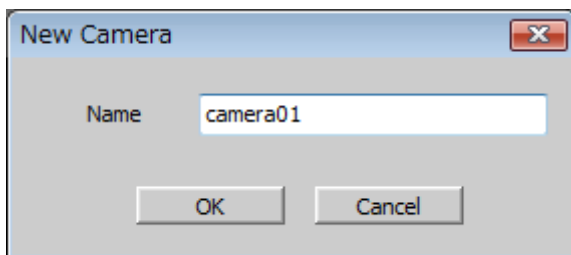
● Camera Animation

● Register camera

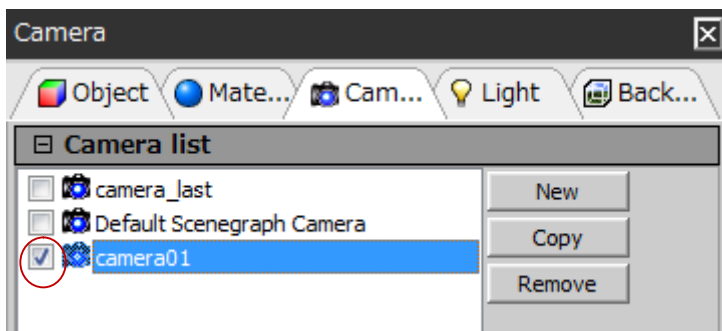
1. Select "anim_camera_01.hyp2" from the menu File to open.
2. First, create a camera to be a key. Switch to the Camera tab and click New from the Camera list pane.



3. Name the camera "camera01" and click OK.

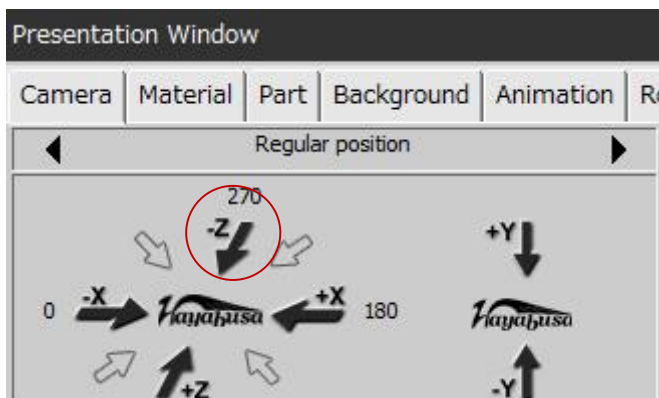


4. In the Camera list, select the newly created "camera01" to switch to.



* Make sure the name of the camera is selected while being highlighted in blue and checked. If it is not selected, you cannot save the camera in the next step.

5. In the presentation view (Ctrl+P), switch to the -Z camera.



6. Right click the view and select "Save current view" to save the camera angle. (The short cut F5 is handy.)

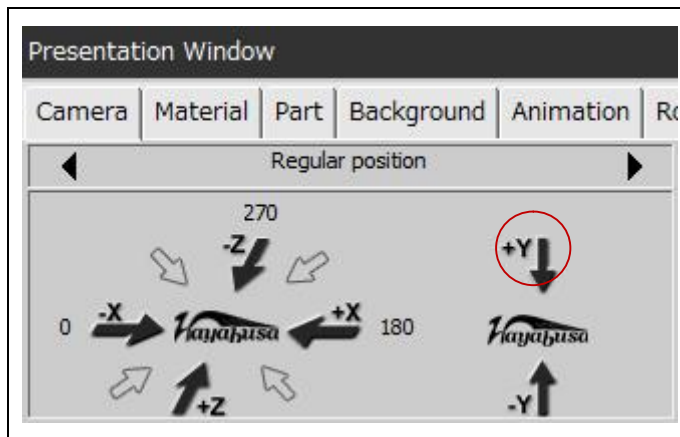


■Option

When you use the same procedure to change an existing camera angle, you can also update the camera by performing "Save current view".

- Repeat the same procedure to create three new cameras for camera02–04. It is helpful to use the short cut F5 for "Save current view".

<p>Camera02</p>	
<p>Camera03</p>	
<p>Camera04</p>	



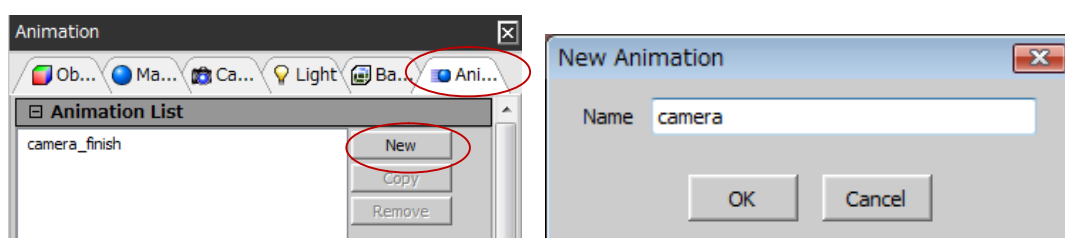
8. Make sure the Camera list looks like as below in the presentation view. If there are cameras which are not changed as you expected, repeat the above procedure.



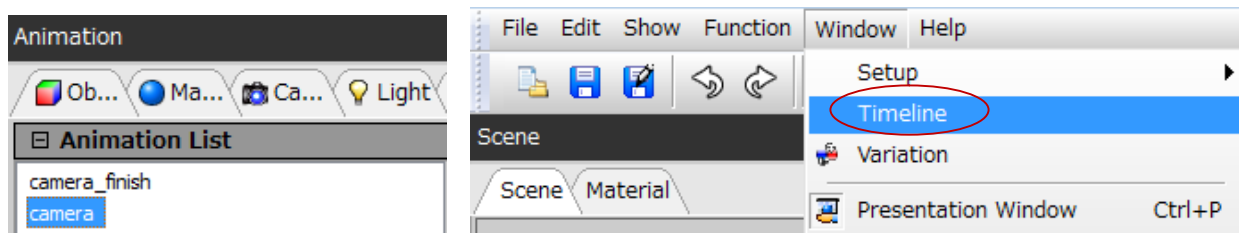
■ anim_camera_02. hyp2

● Prepare for animation

9. Switch to the Animation tab (If it's not being displayed, select the menu Window > Setup > Animation.), then select New. Type "camera" for the name of the new animation.

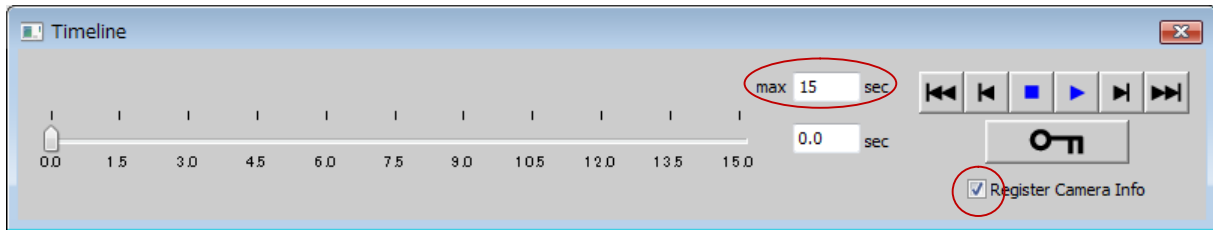


10. Click "camera" that was created in the Animation list and select Timeline in the menu Window.



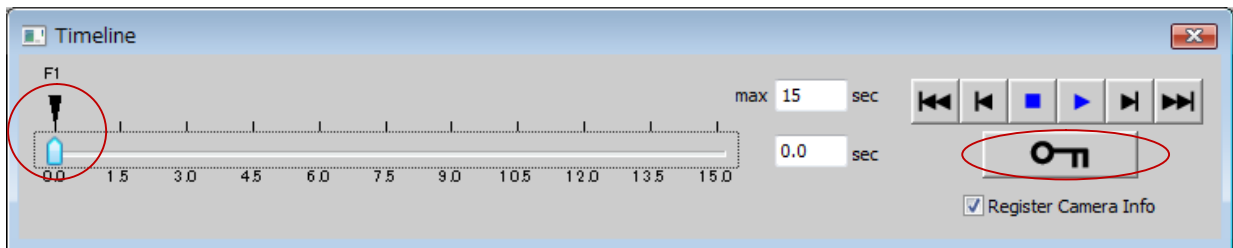
11. Set the entire length of the animation to 15 seconds for the max. Also, select the "Register Camera Info" check box.

This allows you to register the camera displayed in the current view as a key for the camera motion.

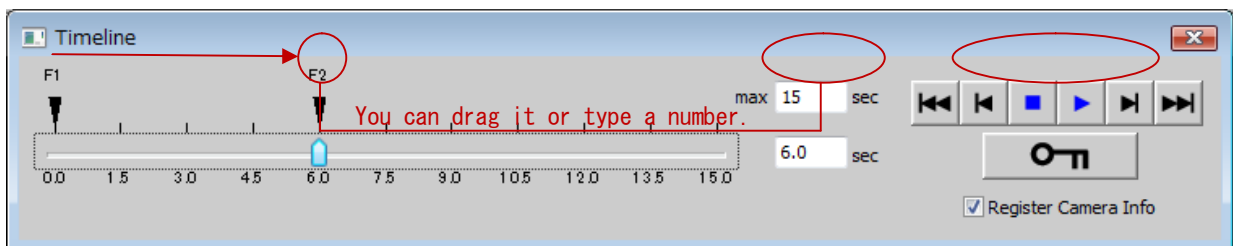


●Register camera motion key

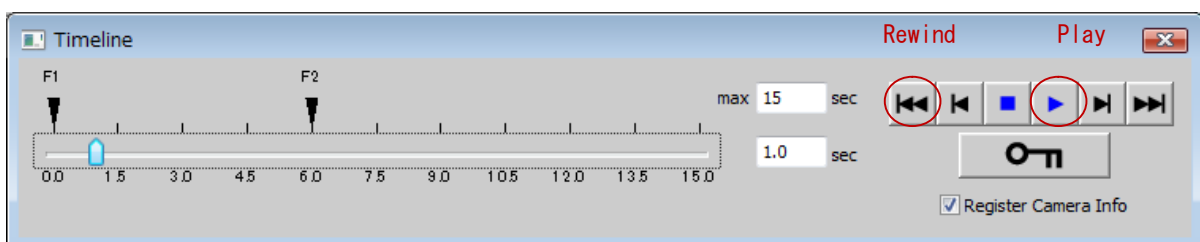
12. Select the "camera01" check box to switch the camera to and click the Create key frame/update button. A key is created at the 0 sec.



13. In the Timeline, set the time forward to 6 sec, switch the camera to "camera02" and click the Create key frame/update button.

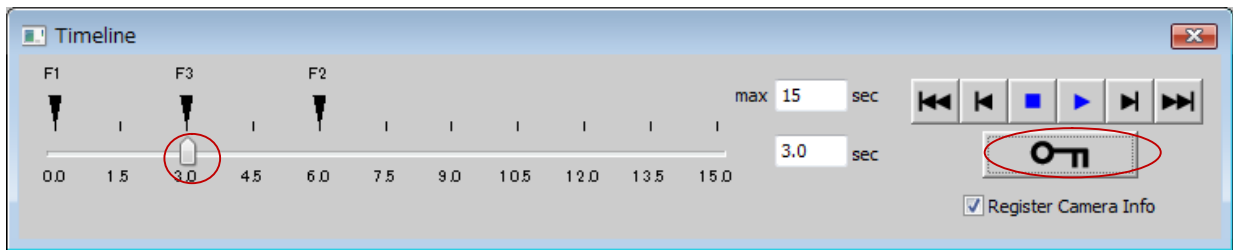


14. When you rewind the time to the first frame and click the Play button, an animation where camera01 is zoomed up and switched to camera02, will be created. An animation that registers frames to be keys and interpolates the motions between them automatically is called "Key frame animation".



●Add camera

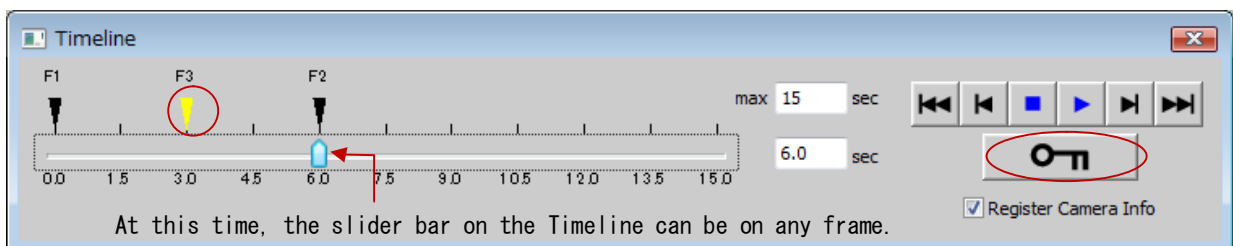
15. Add camera04 between camera01 and camera02. Set the time back to the 3 sec, switch the camera to "camera04" and click the Create key frame/update button.



camera04

●Modify camera

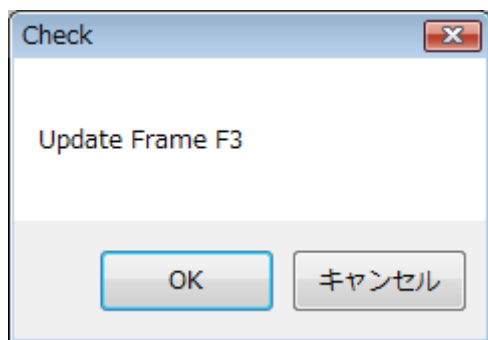
16. When you play the animation, you will see the object disappeared once at the 3 sec point. This is because "camera04" is shot from directly above and the interpolation between "camera01" and "camera02" cannot tell which axis should be the criteria.
17. To modify "camera04", click and select the key of "F3" to highlight it in yellow. Switch the camera to Camera04, drag it by right clicking in the viewport to make it tilted a bit forward and click the Create key frame/update button.



→

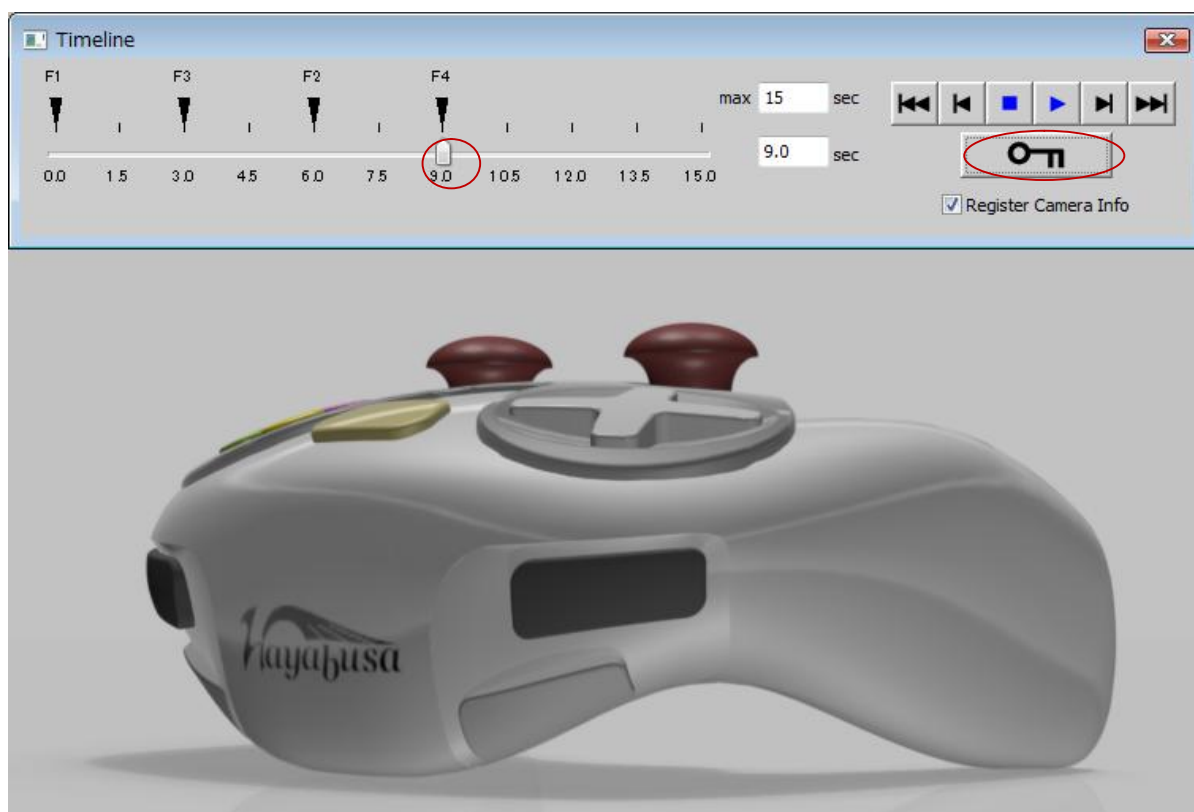


18. The confirm window asks you if it's OK to update the current F3 frame or not open. Click OK. When you play the animation, you will notice the animation goes smoothly this time because the axis was specified.

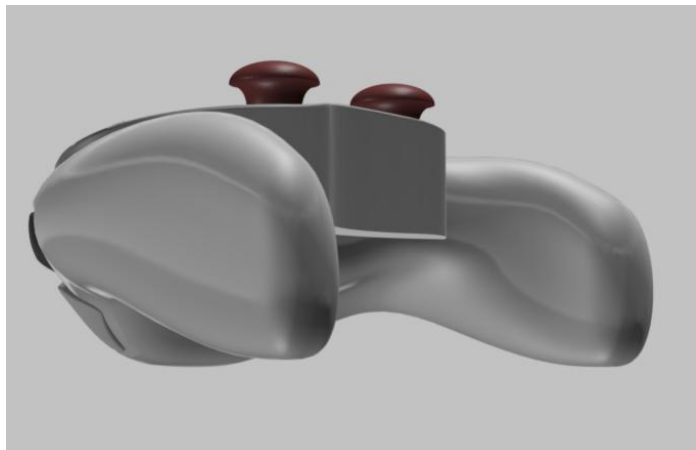


■anim_camera_04.hyp2

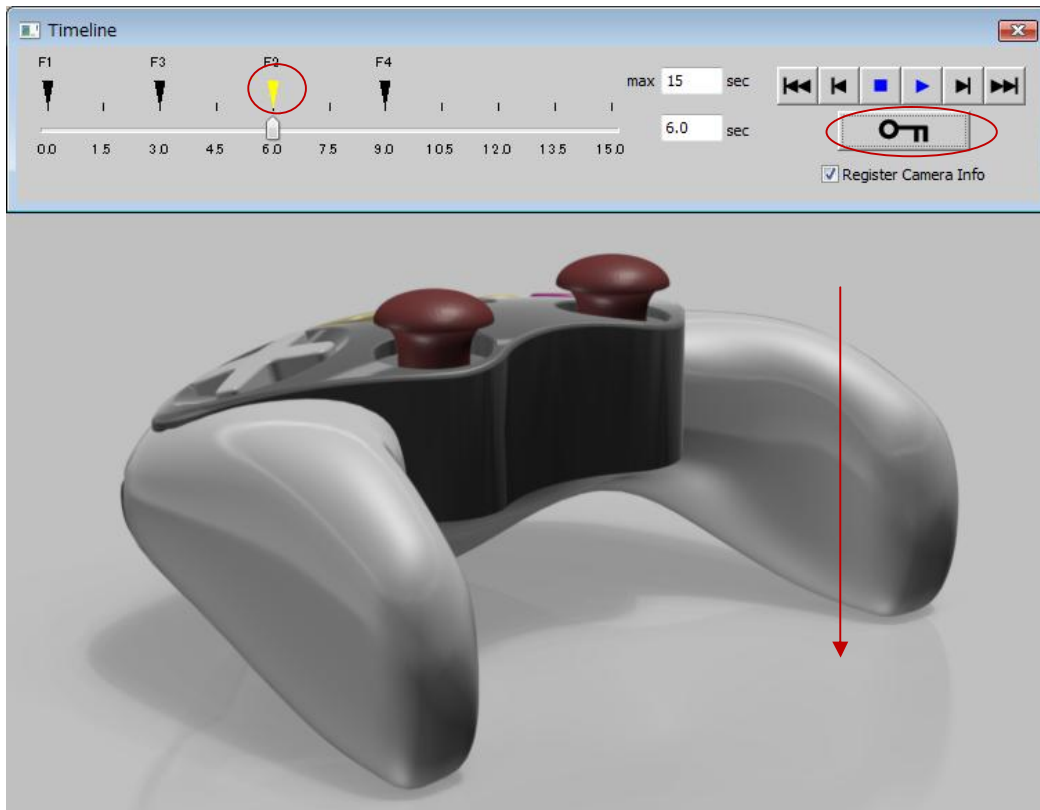
19. Click in the blank space of the Timeline window to deselect the F3 key.
20. Set the time forward to 9 sec and switch the camera to camera03. Then, click the Create key frame/update button.



21. When you play the animation, you will see the floor disappeared between 6 sec and 9 sec.

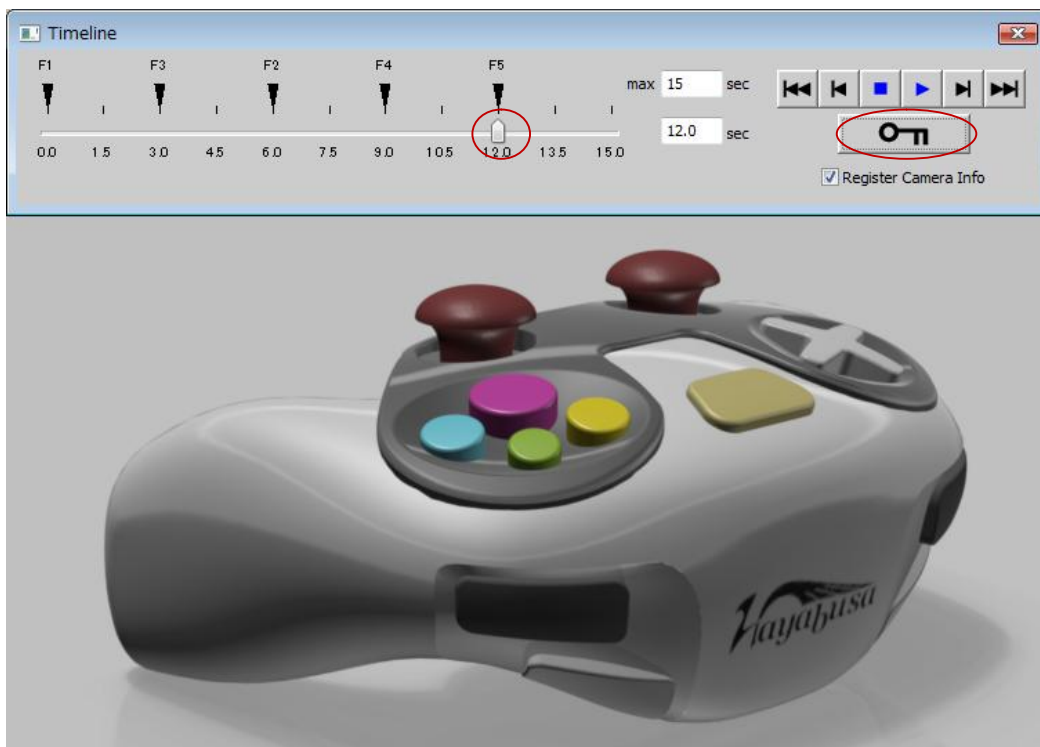


22. Select F2 key to highlight it in yellow, switch the camera to camera02, change the view angle from the image above to look like the image below in the viewport. Click the Create key frame/update button to update the F2 frame same as before. When you play the animation, the floor appears.



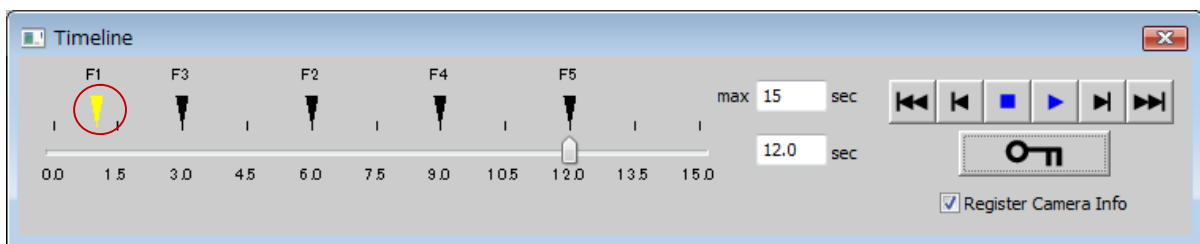
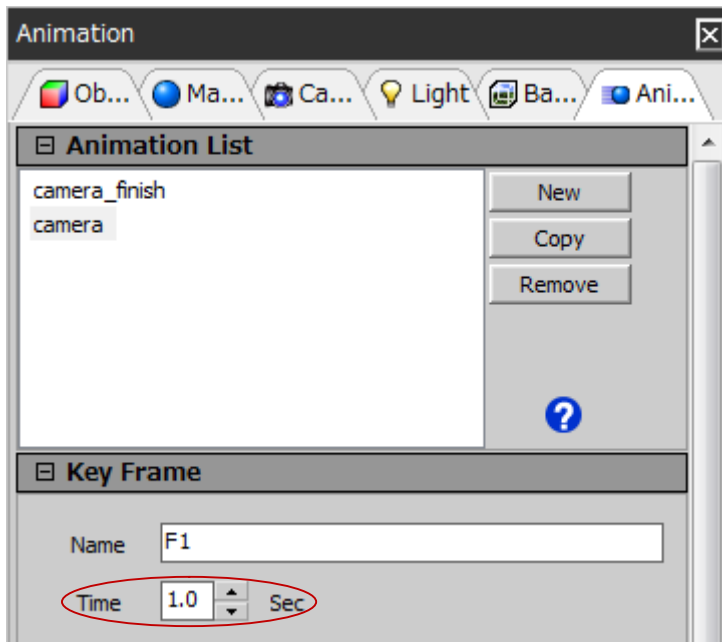
■ anim_camera_05. hyp2

23. Click in the blank space of the Timeline to deselect the F2 frame.
24. Set the time forward to 12 sec and switch the camera to "camera_last". Click the Create key frame/update button to create F5 key.



●Modify key frame

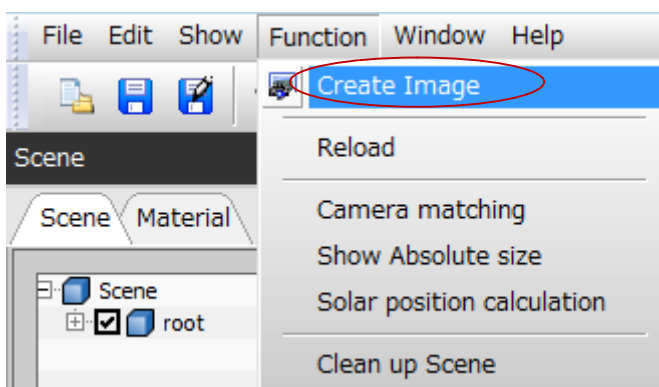
25. When you play the entire animation, the beginning appears to have a sudden start. Select the ▼ mark of the F1 key frame in the Timeline and set the time to 1.0 sec in the Key frame in the Animation tab.



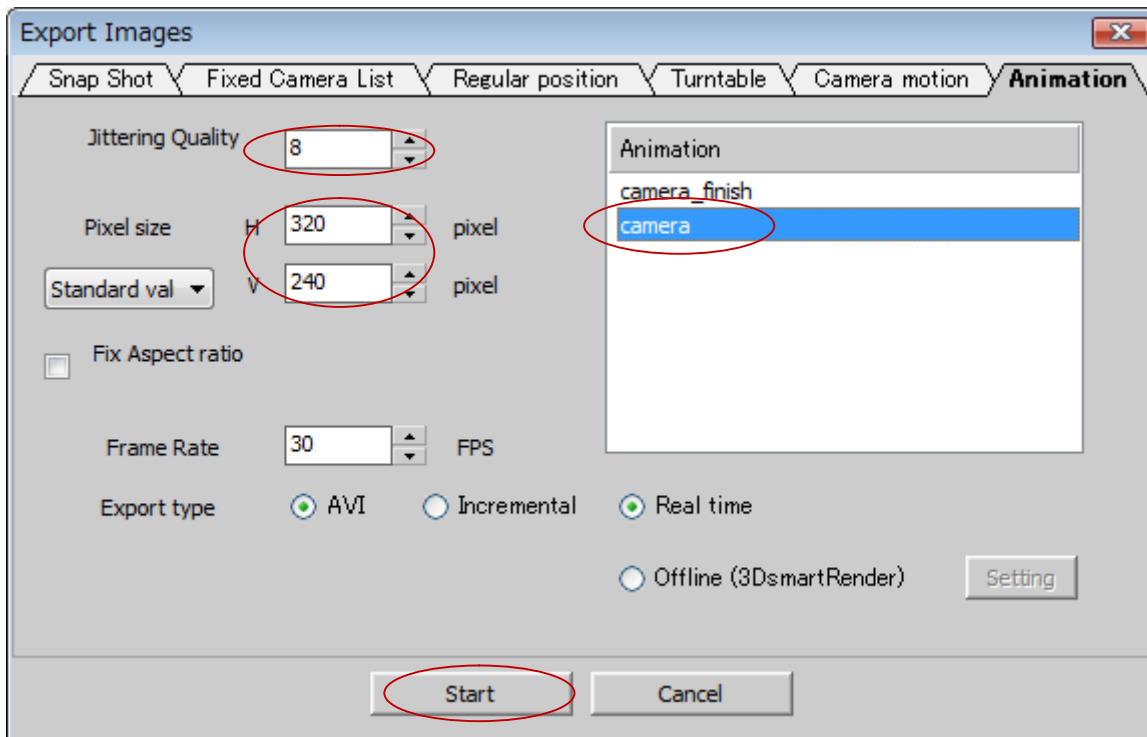
■anim_camera_06. hyp2

●Export images

26. Export the created animation to avi file. Select Create Image from the Function menu.



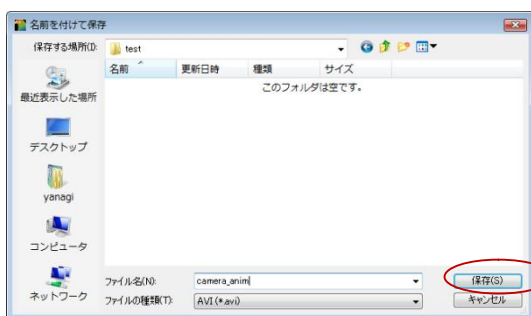
27. Switch to the Animation tab, and change the Jittering Quality to 8 and the Pixel size to 320 pixel x 240 pixel. Select "camera" from the Animation list on the right and click Start.



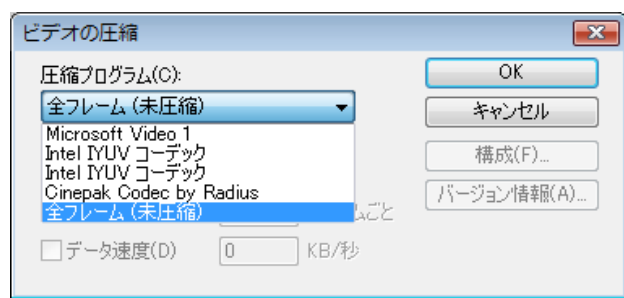
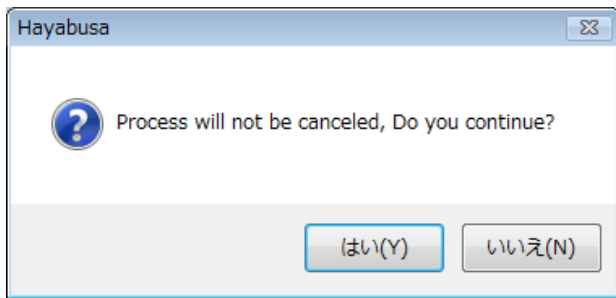
*What's jittering?

Hayabusa performs anti-aliasing (a process to smooth outlines) when the camera is not moving. Displacing (jittering) a viewpoint position little by little randomly when there is no camera and no motion makes the animation less jaggy. Jittering quality is this displacement number. The higher the displacement number, the better the quality, but the longer the process time.

28. A message is displayed that asks you name the file and its save location. Type "camera_anim(.avi)" and click Save.



29. When the Option window opens and you click Yes, the Select codec (compression program) window opens. Here, select All frames (uncompressed), and click OK.



■ Option

Compared with exporting still images, animations need more file size and rendering time to export. The following options describe how to decrease file size or rendering time as much as possible.

● Compress file size

If you do not compress the file size, the quality will not be deteriorated, but the amount will be enormous.

*What's Codec?

A method that is mainly used for compressing/expanding big video files.

In Hayabusa you can choose from the compression methods that come with Windows XP or Vista.

Which method should be chosen depends on your priority of rendering time, file size or quality..

Reference: codec types and feature comparison

When rendering this tutorial's data in pixel size 320 x 240 at Jittering 8

Machines used for the validation: Hp xw4600 core2duo 3.0GHz/4GBRAM/Quadro FX1700

	Uncompressed	Intel IYUV	Cinepak	Microsoft VIDEO1
Rendering time	102 Sec	108 Sec	115 Sec	107 Sec
File size	99.1MB	49.5MB	5.9MB	6.7MB
Quality	Very good	good	bad	Very bad (Default)

*These codec are relatively old. Also, as Hayabusa exports files to AVI while compressing, the waiting time to export and the load for PC increase. For best results, we recommend to use the third party's compression program or the following encode tools.

■ Windows Media Encoder 9

<http://www.microsoft.com/windows/windowsmedia/forpros/encoder/default.mspx>

Using this tool to convert an .avi file created in Hayabusa to .wmv file, you can make the file size small without image quality loss.

Setup) New session/Convert file > Delivery contents/Save to file> Encode options/Best quality videoVBR100

this tutorial data uncompressed avi file 99MB > after converting .wmv 942KB

● Save rendering time

If you want to compromise the image quality to shorten the time to export, the following adjustments are effective.

- Adjust jittering quality

Although the outline gets jaggy, you can shorten the rendering time significantly.

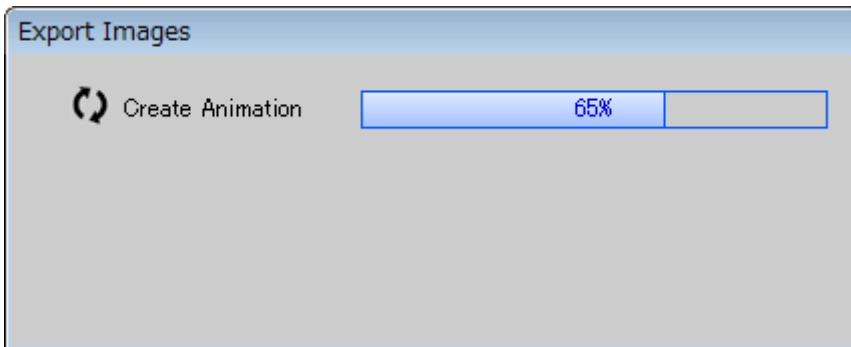
Jittering quality 8→1 min 42 sec 64→10 min 8 sec

- Adjust frame rate

The frame rate is a number of how many still images are created per a second. The default is 30 frames. If you reduce it, you can shorten the process time and make the file size smaller in exchange for the motion smoothness.

Frame rate 30 fps: 102 sec 15 fps: 53 sec (The file size will be also half.)

30. Rendering (exporting image) starts. When it reaches 100%, the rendering is completed.



31. In the hierarchy level where the file was saved, check the created AVI file.

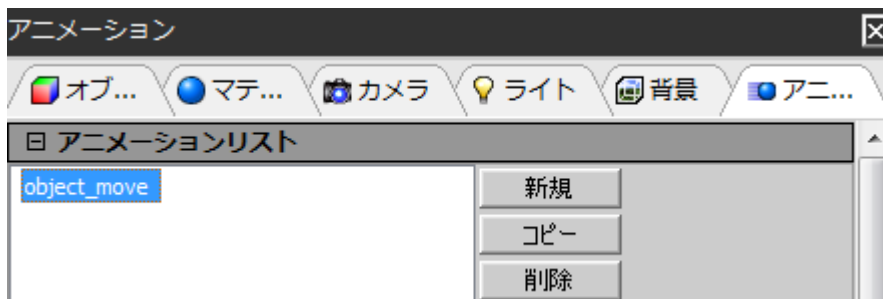


-END-

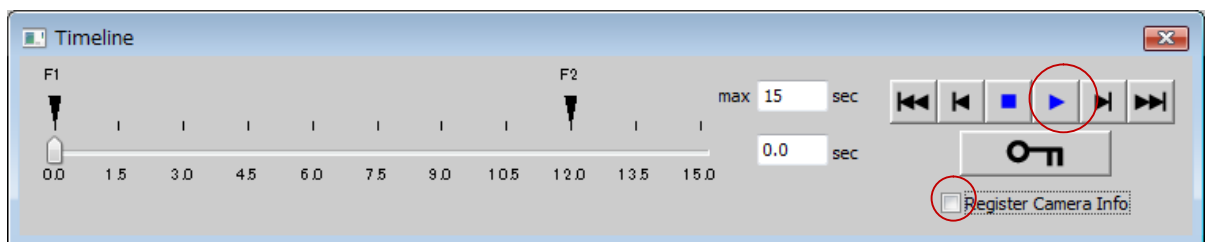
● Object Animation

● Confirm camera animation

1. Open "anim_objectmove_01.hyp2" from the menu File.
2. Open the Animation tab and select "object_move" in the Animation list.



3. Select Timeline from the Window menu to show it and play the animation. You can see the animation where the camera switches from camera01 to camera02. Addition to this motion, let's create an animation where each part moves. Here, you must clear the check box of Register Camera Info.

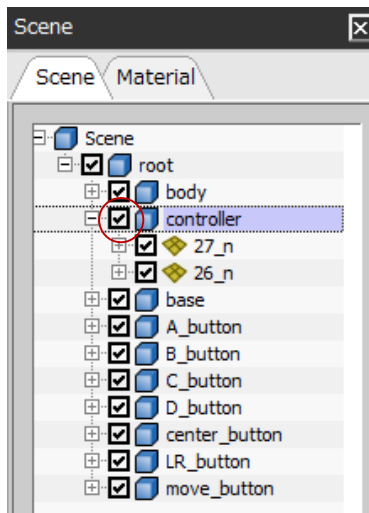


■ Option

When you want to perform an object animation after creating a camera animation, make sure the Register Camera Info check box is cleared. If the check box is selected, a camera animation will be automatically changed using the key of the object animation and it may make the camera motion weird.

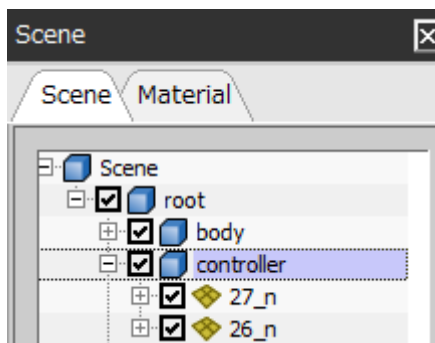
● Create object animation [controller]

4. Click "controller" in the Scene graph on the left to select it. (Objects on the same layer can be selected together as a group.)

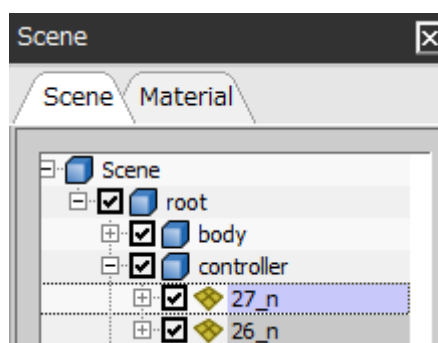


Option

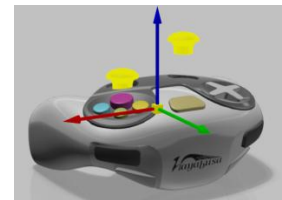
When selecting in the Scene graph, you can select two levers in a group in the upper level "controller". However, when selecting directly in the view (by holding the Shift key and double clicking), the selection happens in the one level below. With this state, you cannot combine the moving animation into two parts. Also, if you want to move the several parts in the different layers together, you should group them first. (*see below)



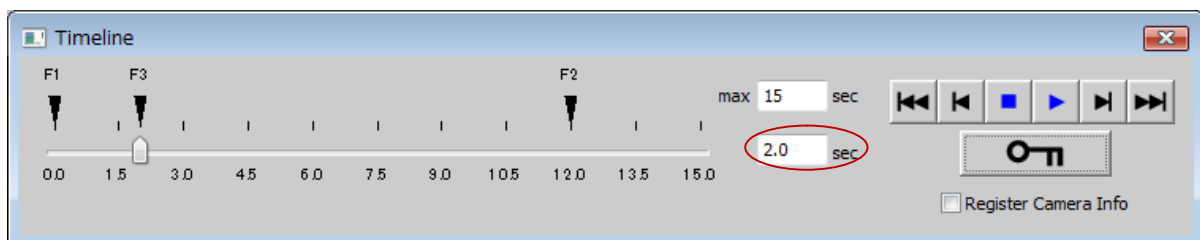
[When selecting in the Scene graph]



[When selecting in the view by clicking] --> they move separately

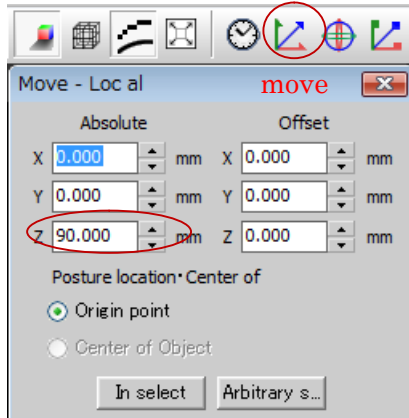
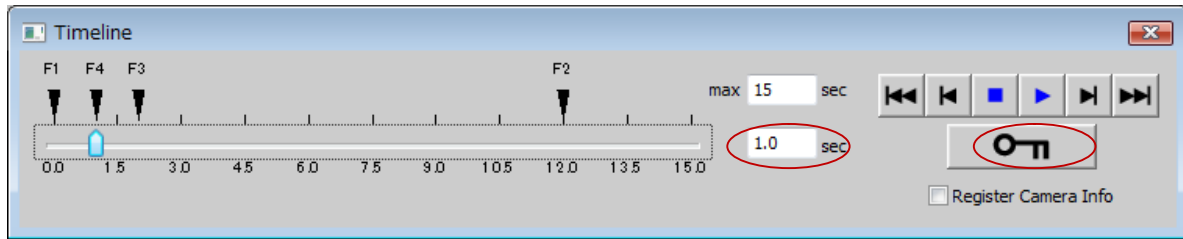


5. If the Timeline is not open, select Timeline from the Window menu and select "object_move" in the Animation list. Set the time forward to 2.0 sec and click the Create key frame/update button.



6. Then, also in the Timeline, set the time back to 1.0 sec and click the Move button. In the open Conversion window, set the value of Z to 90 and click the Create key frame/update button. (It is OK to move the position out of the scene by dragging.)

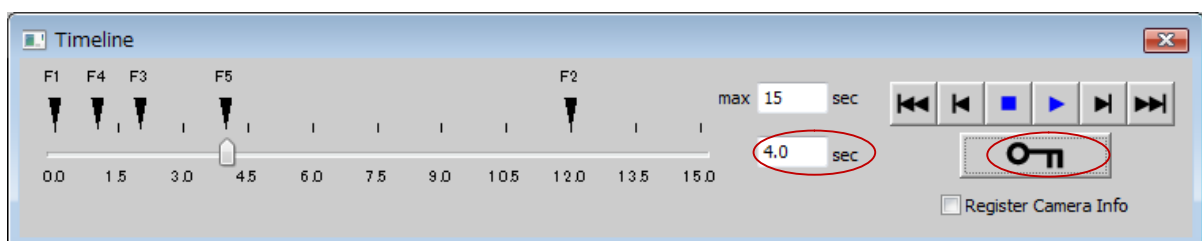
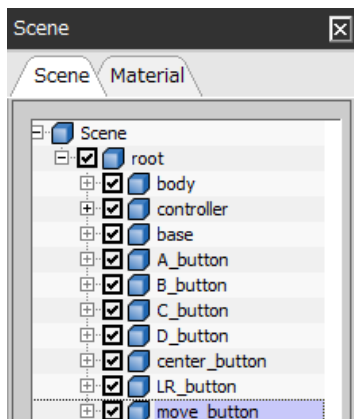
When you play the animation, you will see the controller object coming down from above.



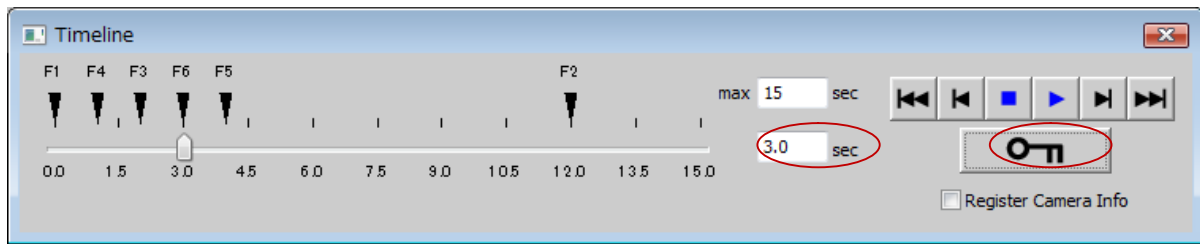
■ anim_objectmove_02.hyp2

● Create object animation [move_button]

7. Select "move_button" from the Scene graph. In the Timeline, set the time forward to 4.0 sec and click the Create key frame/update button.



8. Then, set the time back to 3.0 sec and click the Move button. As before, in the open Conversion window, set the value of Z to 90 and click the Create key frame/update button. When you play the animation, you will see "move_button" move down after the controller.



Option

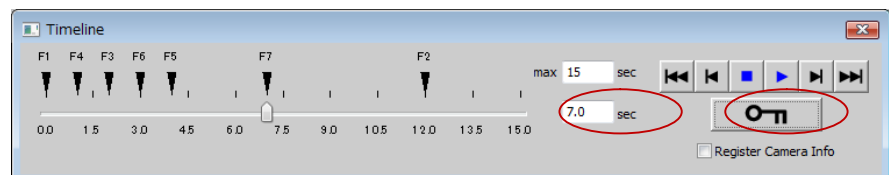
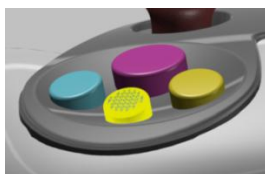
"move_button" has only one object in the layer. When selecting "move_button" in the view (22_n) and when selecting it in the Scene graph, the selected objects will be same but they are in different levels. So, when you create keys, it would be better to use only one selection method. (Same as above)



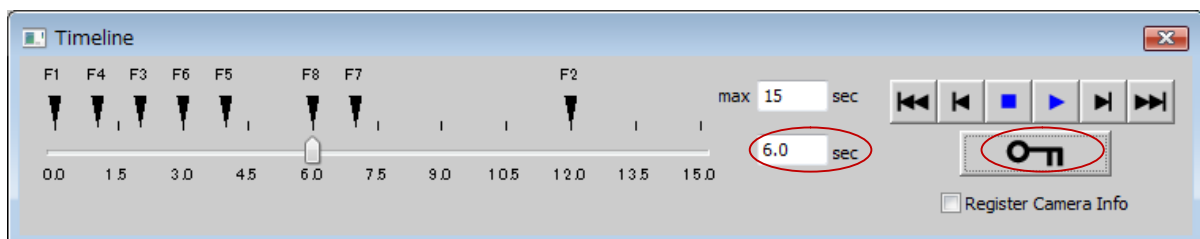
■ anim_objectmove_03.hyp2

● Create object animation [ABCD_button]

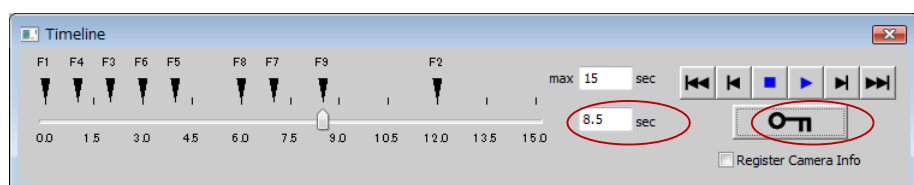
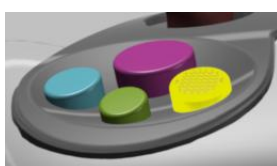
9. Animate A-D_button. First, double click the green "C_button" in the view to select it. In the Timeline, set the time forward to 7 sec and click the Create key frame/update button.



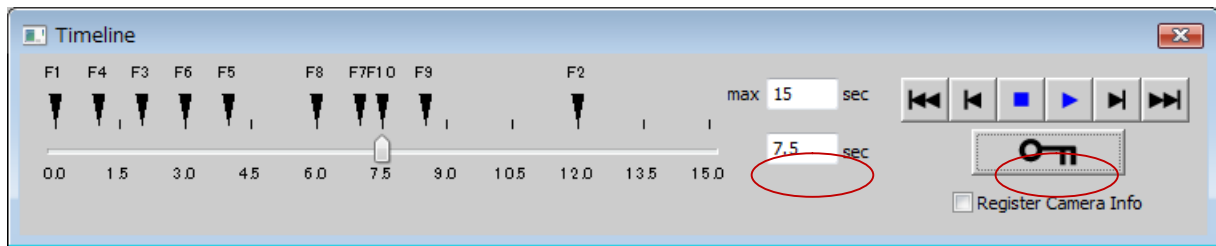
10. In the Timeline, set the time to 6 sec and click the Move button. As before, in the open Conversion window, set the value of Z to 90 and click the Create key frame/update button.



11. Then, double click the yellow "B_button" in the view to select it. In the Timeline, set the time forward to 8.5 sec and click the Create key frame/update button.

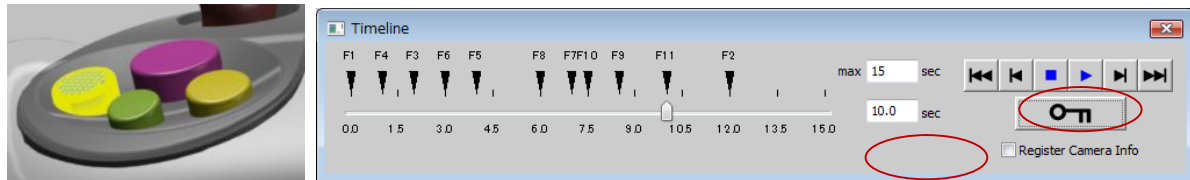


12. In the Timeline, set the time to 7.5 sec and click the Move button. As previously, in the Conversion window, set the value of Z to 90 and click the Create key frame/update button.

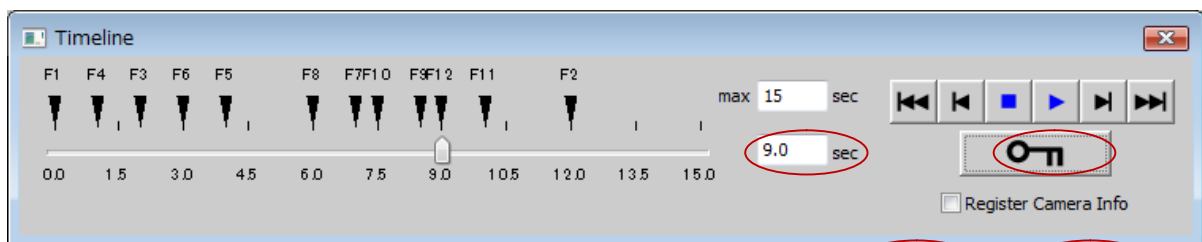


13. Then, double click the light blue "D_button" in the view to select it.

In the Timeline, set the time forward to 10 sec and click the Create key frame/update button.

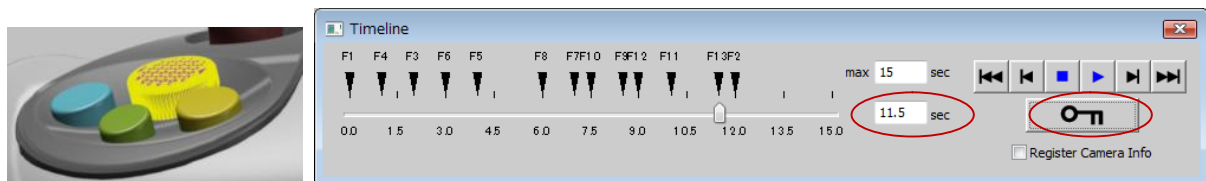


14. In the Timeline, set the time to 9 sec and click the Move button. As previously, in the Conversion window, set the value of Z to 90 and click the Create key frame/update button.

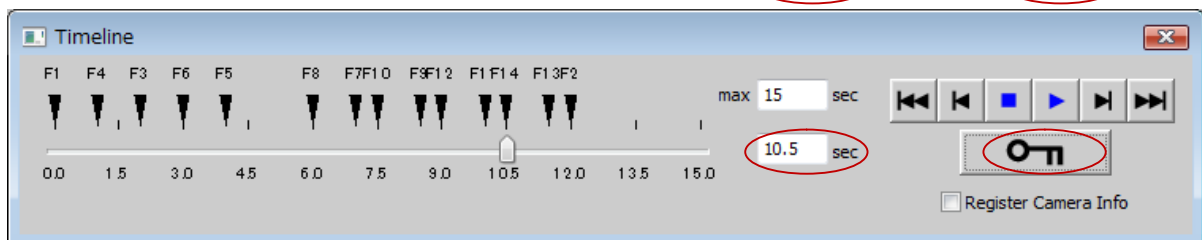


15. Finally, double click the pink "A_button" in the view to select it.

In the Timeline, set the time forward to 11.5 sec and click the Create key frame/update button.



16. In the Timeline, set the time to 10.5 sec and click the Move button. Same as the last time, in the Conversion window, set the value of Z to 90 and click the Create key frame/update button.



17. When you play the animation, you will see the buttons move down from above in turns.



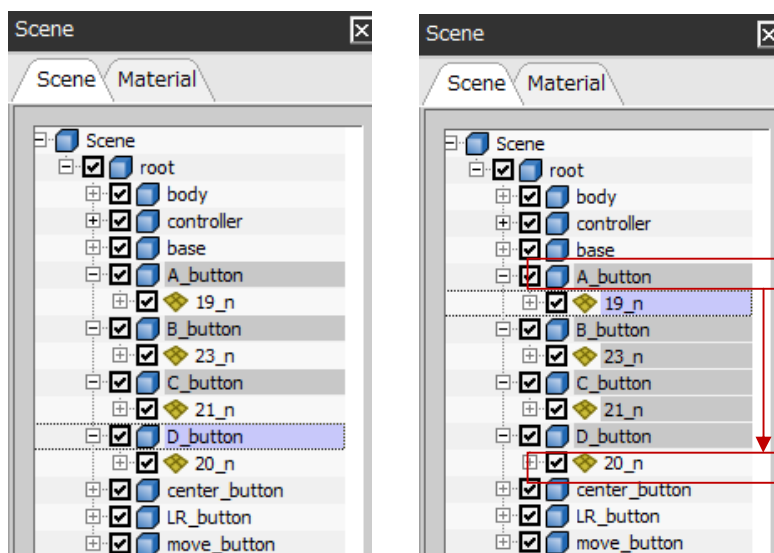
■ anim_objectmove_04. hyp2

■ Option -About grouping objects

This was the animation where the four buttons were moving separately, but if you want them to move together, these four buttons need to be grouped.

[How to group objects]

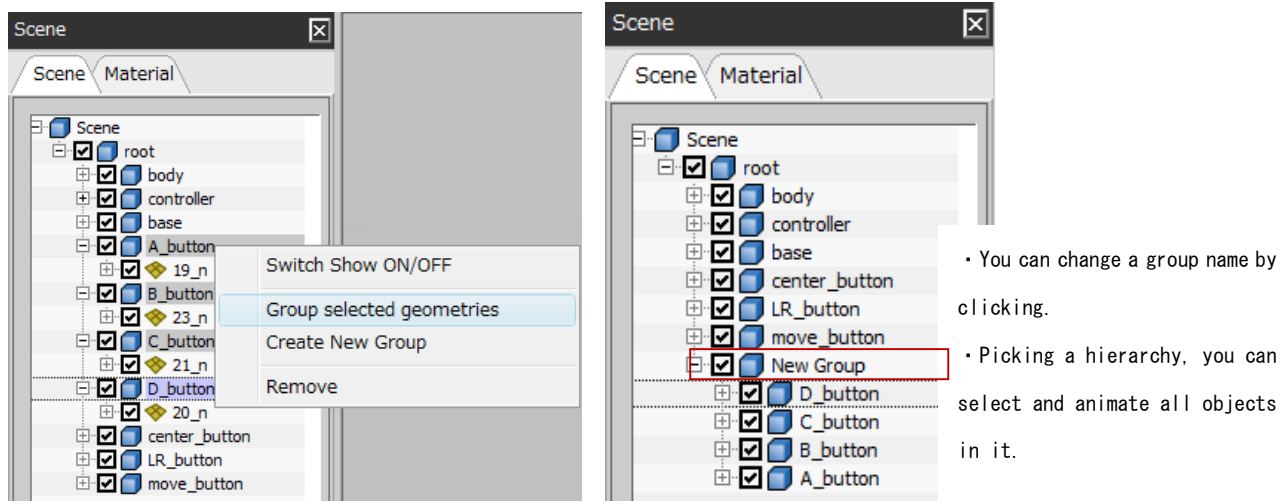
1. In the Scene graph, select objects that you want to move together as a multiple selection by Ctrl+left click. You can select objects that are in the different layers (blue squares). (With Shift+ left click, you cannot select all within the specified extent.)



Ctrl+left click

Shift+left click

2. Right click on the selected object name (in gray) and select Group selected geometries to make a new group. If you create a key for the hierarchy of the group, you can make an animation of several objects.

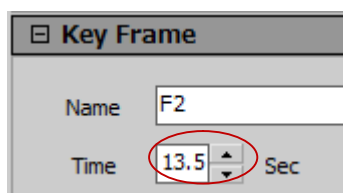
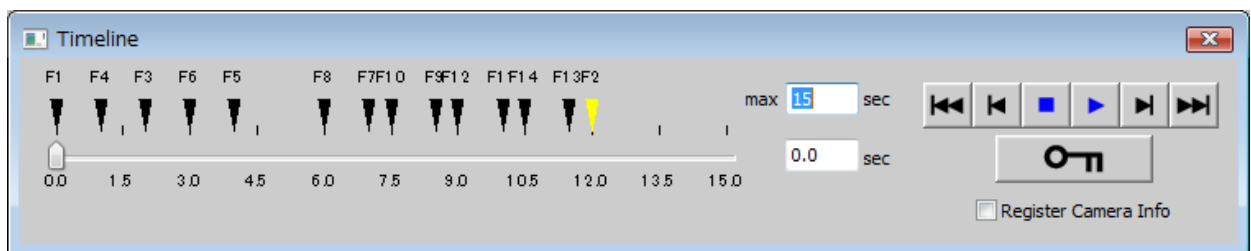


* You can also make an empty group by using Create New Group, then insert objects to it by dragging and dropping them.

* You can also make a hierarchy (parent & child relationship) by dragging and dropping in the Scene graph.

●Tweak animation

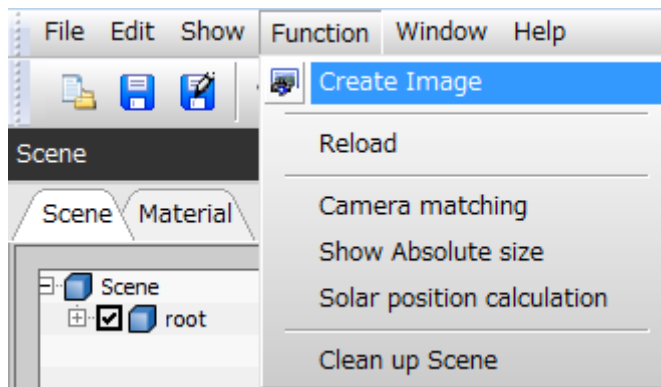
18. Tweak the camera animation. In the Timeline, select the key F2 and change the time from 12 to 13.5 sec in the Key frame in the Animation tab. Also, change the time to adjust some motions as required.



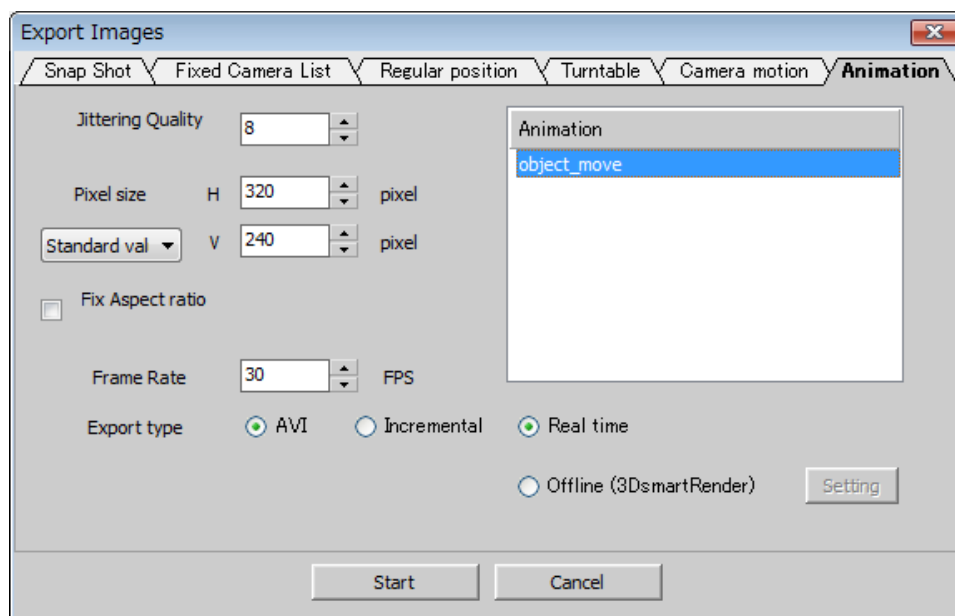
■anim_objectmove_05.hyp2

●Export animation

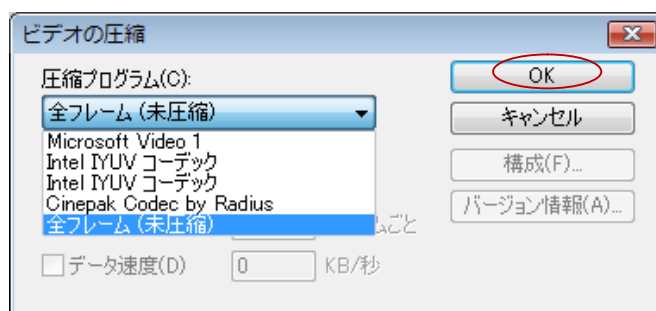
19. Export the created animation to AVI file. Select Create Image from the menu Function.



20. [Switch to the Animation tab and change the Jittering Quality to 8 and the Pixel size to 320 x 240. Select "object_move" from the Animation list and click the Start button.



21. When you are prompted, enter a name for the animation file and where to save it, type "materialchange_anim (.avi)" and click the Save button.
22. The codec (compression program) selection window opens. Select All frames (uncompressed), and click OK.



23. Play the finished movie to confirm.

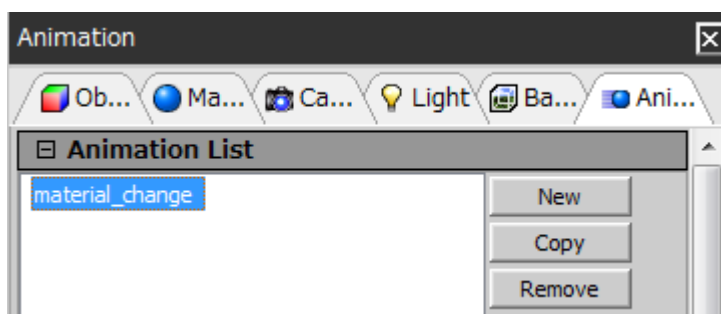


-END-

● Material Animation

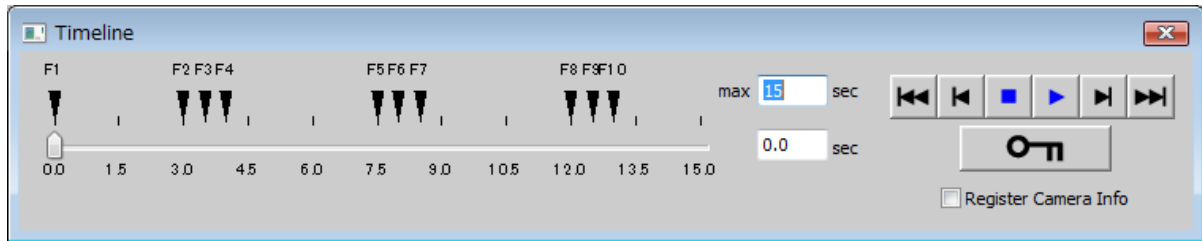
● Confirm camera animation

1. Open "anim_material_01.hyp2" from the menu File.
2. Open the Animation tab and select "material_change" from the Animation list.



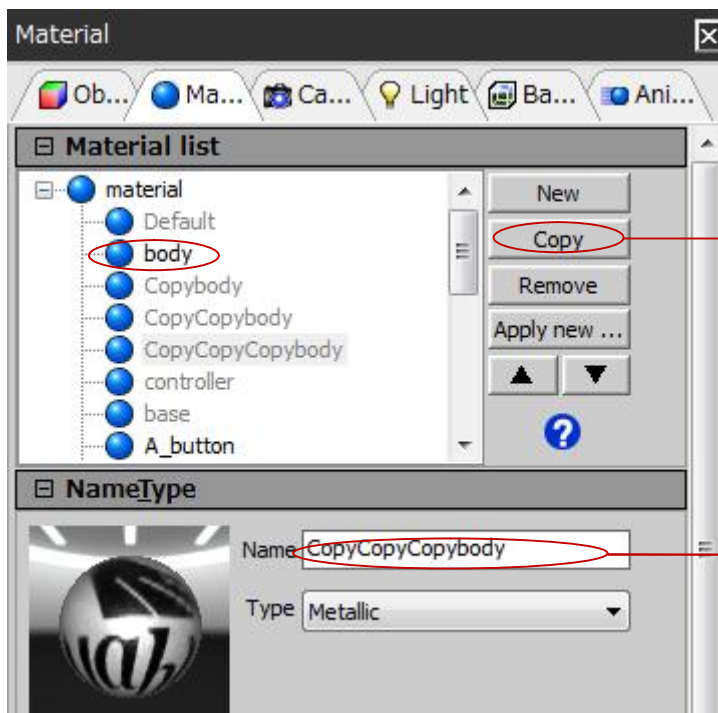
3. Select Timeline from the Window menu to open and play the animation. The object rotates three times in the

animation. Let's make an animation where the material changes when the object rotates.



● Create/Change material

4. Select "body" material in the Material list in the Material tab. Click the Copy button three times to make three copies of the body material. Change the name to body2, body3 and body4 respectively.

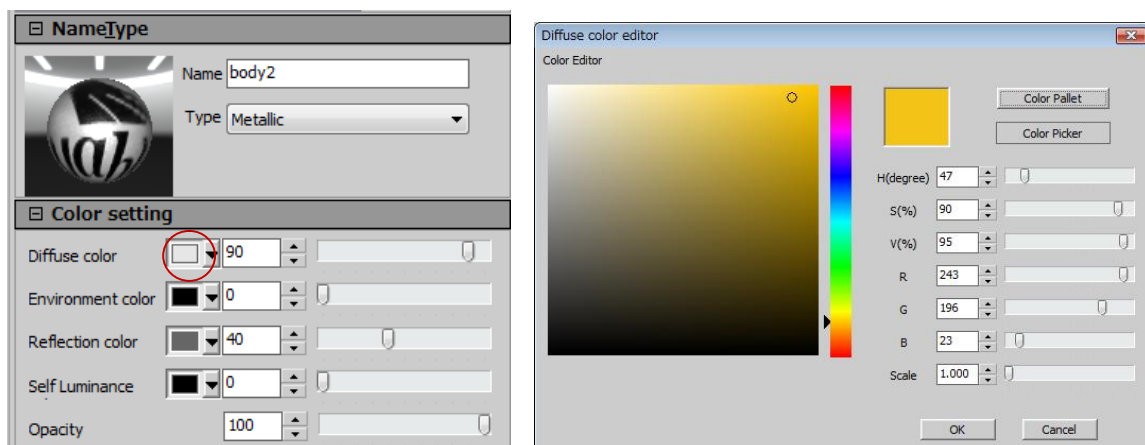


Click three times to make four body materials.

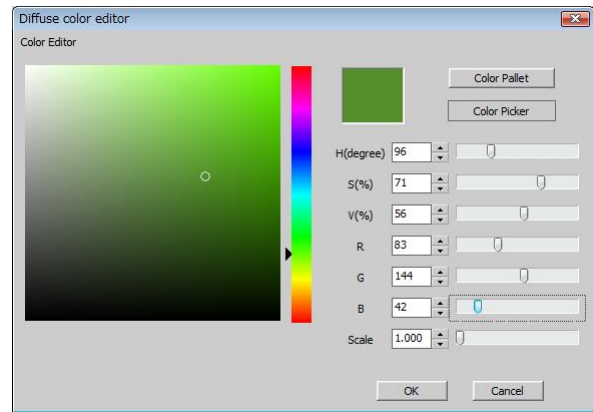
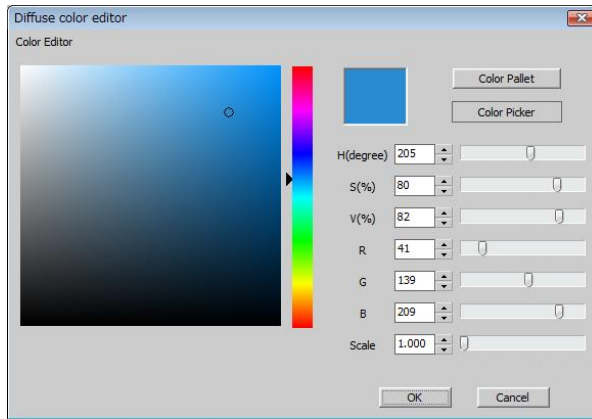
Change the names to body2, body3 and body4.

After typing press the Enter key

5. Select "body2" material from the Material list. Click the Diffuse color box to open the Diffuse color editor. Change to yellow like color.



6. Also, change the diffuse color of the body3 to blue like color, and of the body4 to green like color.

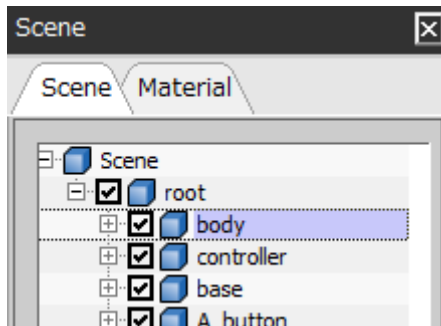


body3 body4

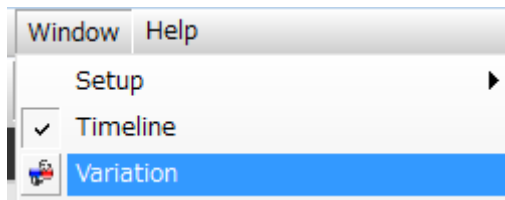
■anim_material_02.hyp2

●Register variation

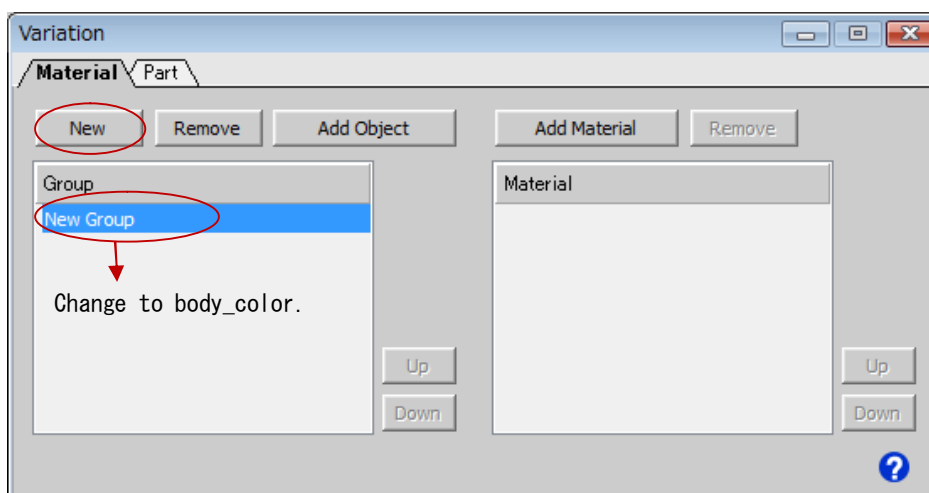
- Group the materials created to associate with the object. First, select the “body” object from the scene graph.



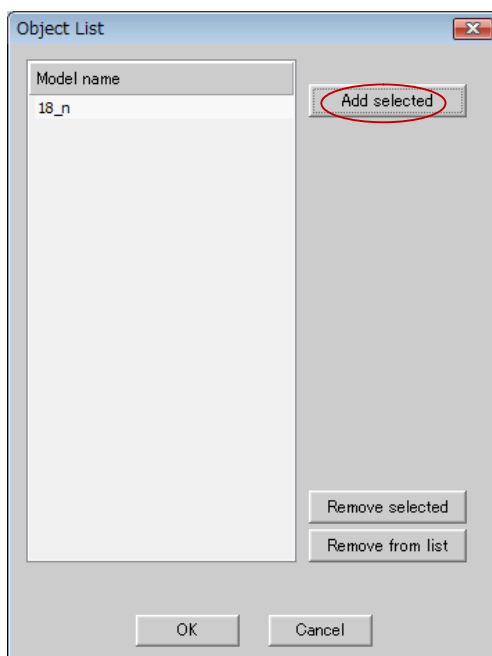
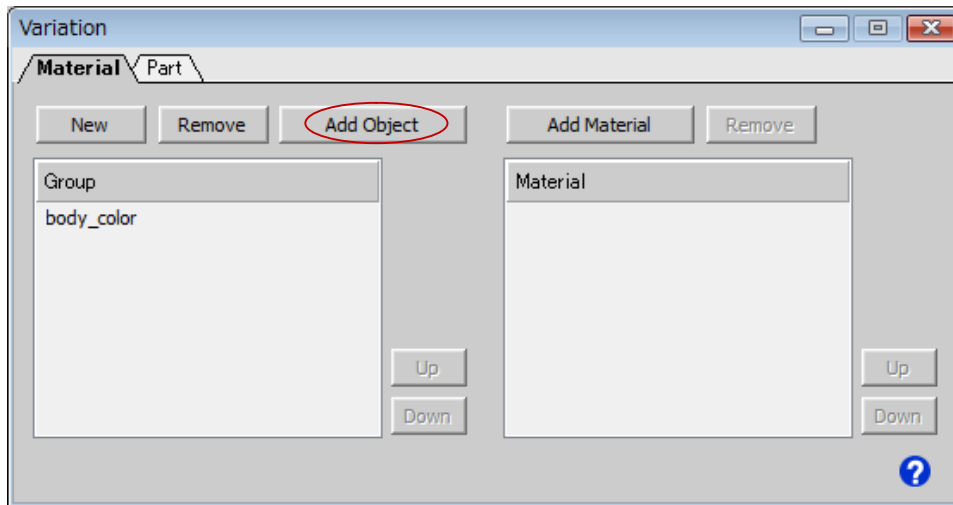
- Select Variation from the Window menu.



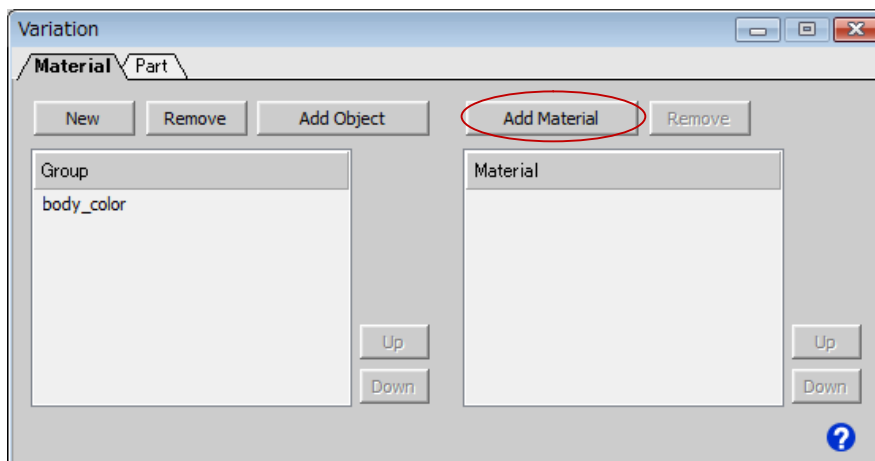
- Click the New button in the Material tab in the open Variation window. Click once on the new group to change the group name to “body_color”.

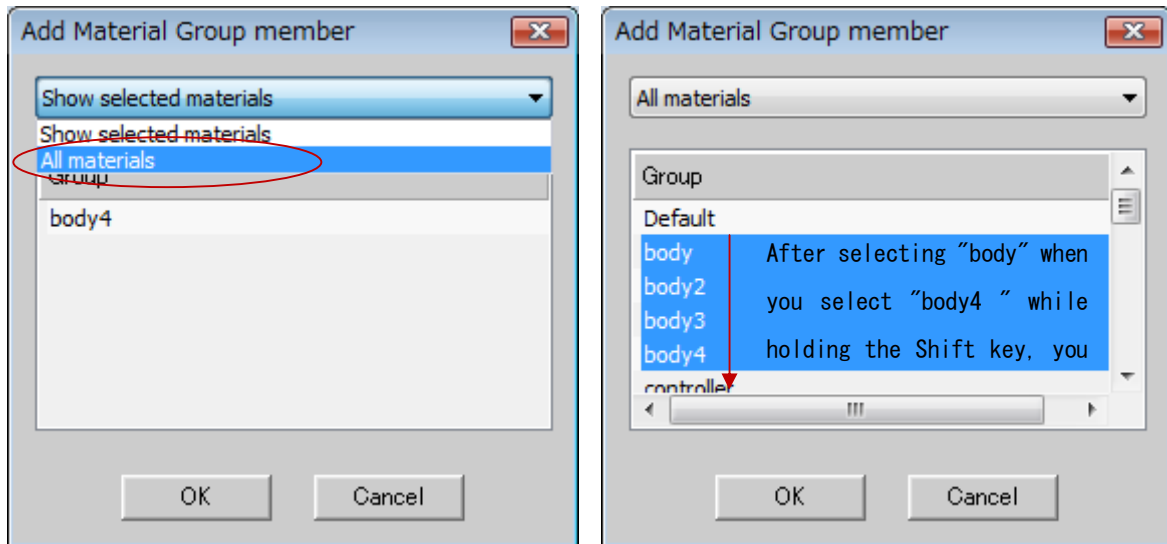


10. Next, click the Add Object button. When you click the Add selected button in the open window, the body object named "18_n" is added. Click OK to close the window.

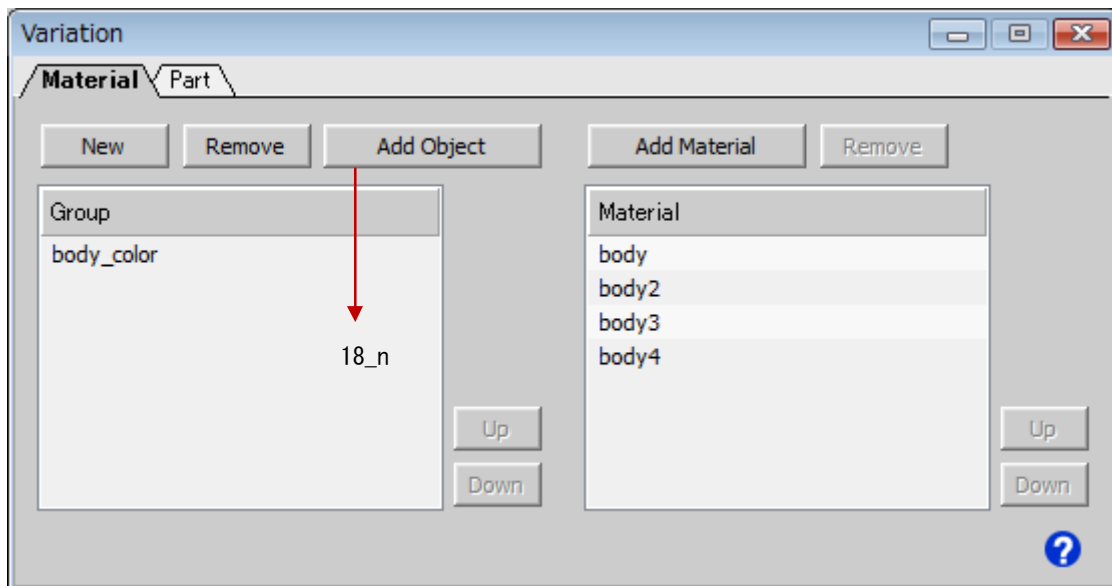


11. Click the Add Material button and switch to the All Materials in the Add Material Group member window. Select four materials such as body, body2, body3 and body4, and click OK.





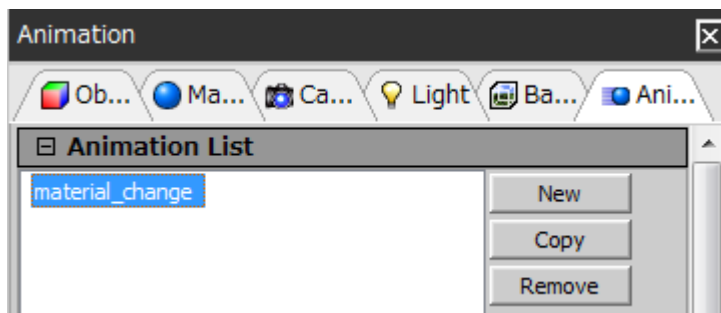
12. It's OK if it is set as below.



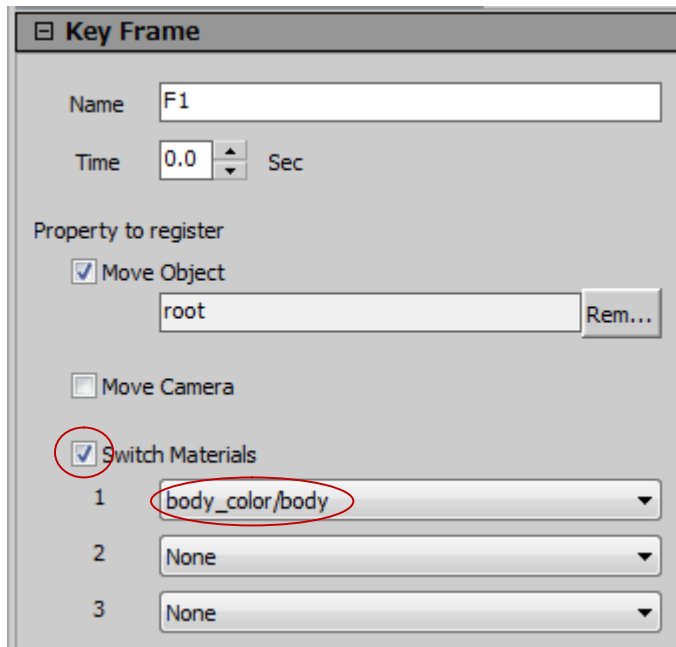
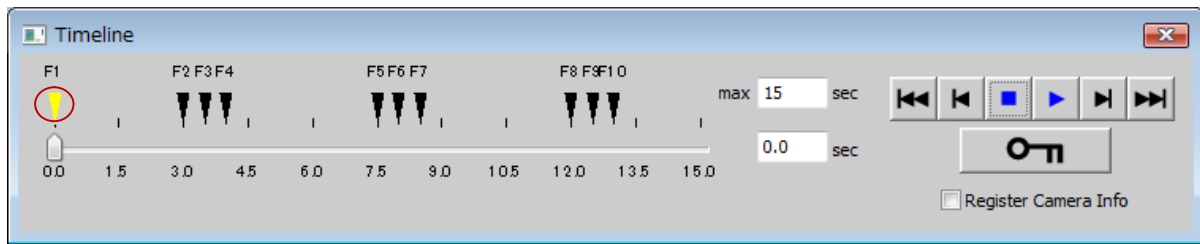
■anim_material_03.hyp2

●Create material animation

13. Select "material_change" from the Animation list and select Timeline from the Window menu to open it.



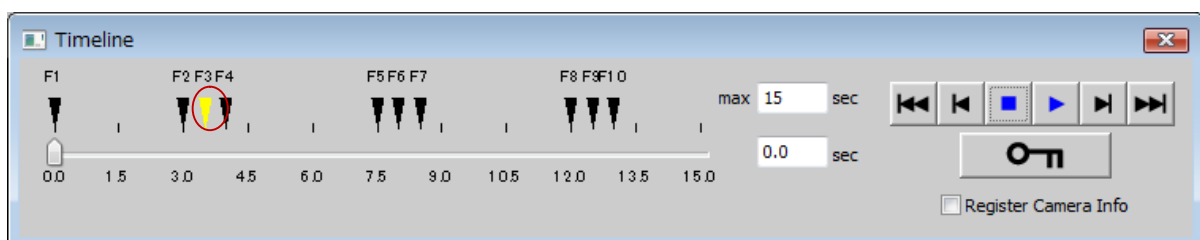
14. Select the F1 key and select the Switch Materials check box in the Key frame pane. Select "body_color/body (gray)" from the pull down list.

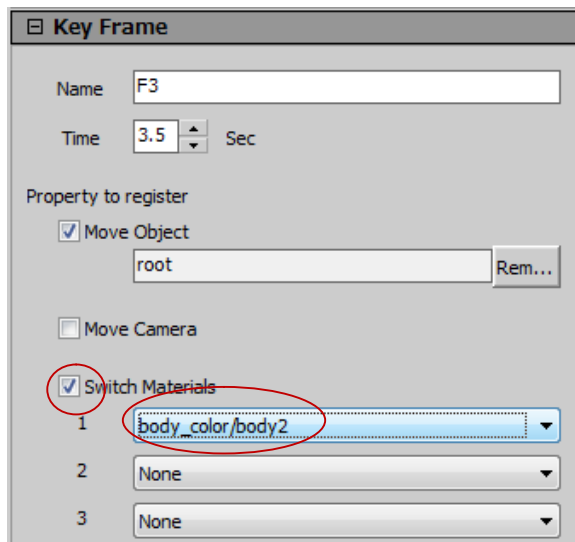


■ Option

When you switch a material, even if you were editing an existing key frame, you do not have to click the Create key frame/update button.

15. Then, select the F3 key and select the Switch Materials check box in the Key frame pane same as the last time. Select "body_color/body2 (Yellow)" from the pull-down list. When you play the animation, you will see the material change from "body (gray)" to "body2 (yellow)" at the point of the F3 key.





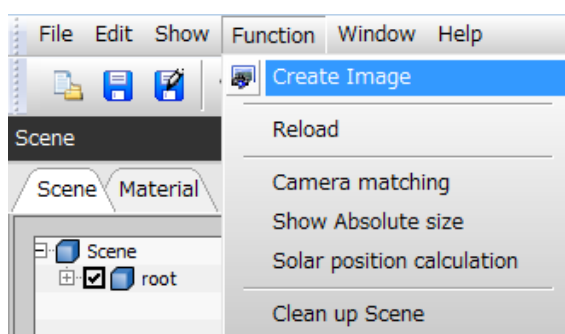
16. Also, select the F6 key, change the material to “body3 (blue)”, select the F9 key and change the material to “body4 (green)”.



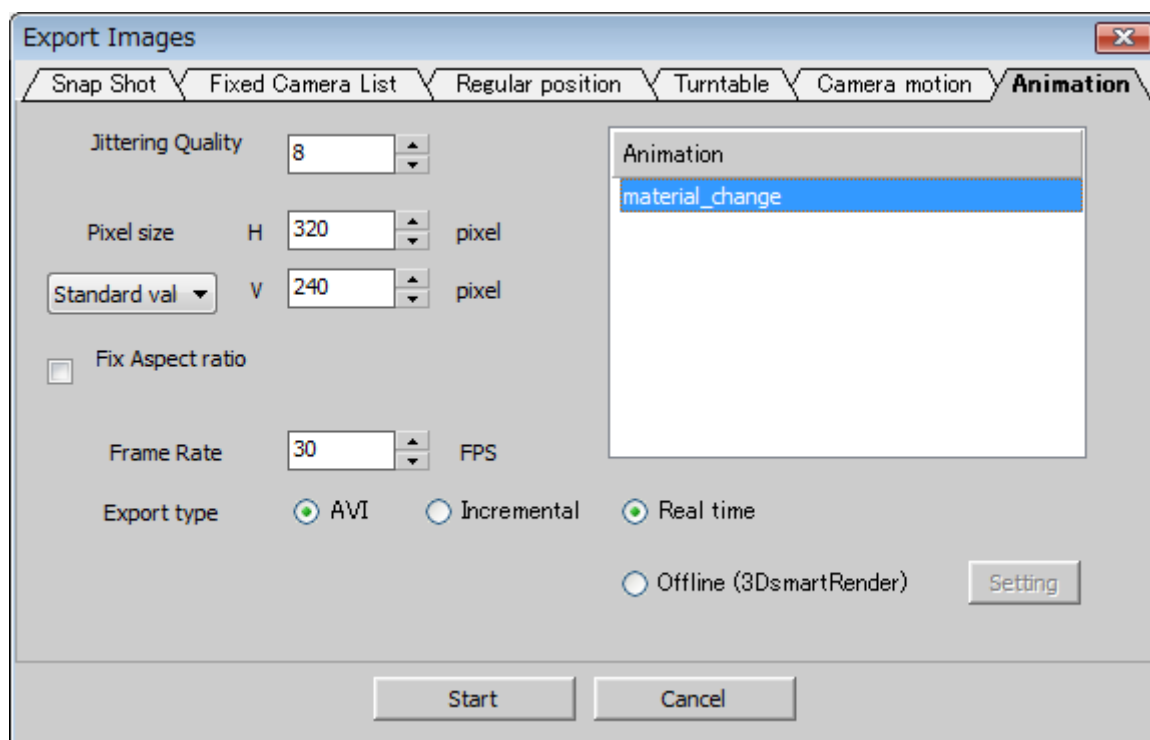
■anim_material_04.hyp2

●Export animation

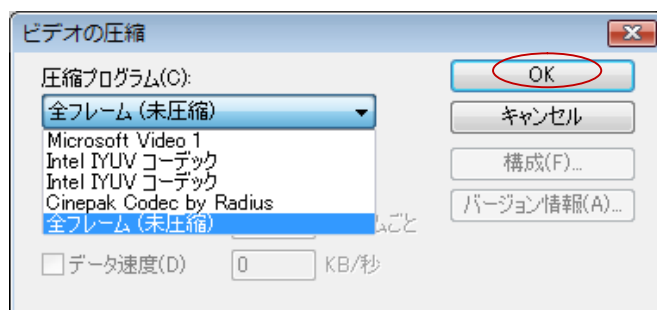
17. Export the created animation to AVI file. Select Create Image from the menu Function.



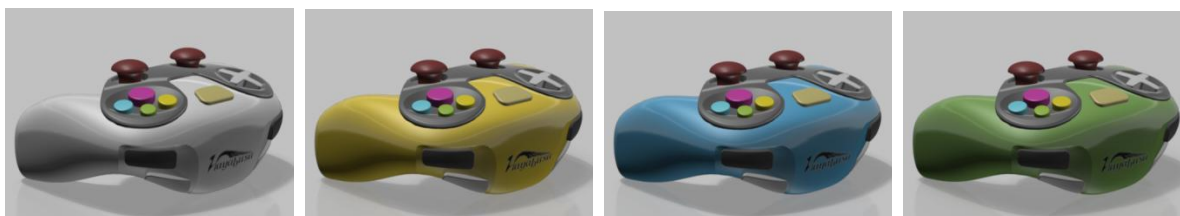
18. Switch to the Animation tab and change the Jittering Quality to 8 and the Pixel size to 320 x 240. Select “material_change” from the Animation list and click Start.



19. When you are prompted to enter a name for the animation file and where to save it, type "materialchange_anim (.avi)" and click the Save button.
20. The codec (compression program) selection window opens. Here, select All frames (uncompressed), and click OK.



21. Play the finished movie to confirm.



—END—