



OPERATION MANUAL

VRCAM Sensorless Virtual Studio System

Version 2.2.2.0 – Higher

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Upon Receipt

Unpacking

VRCAM Sensorless Virtual Studio System and its accessories are fully inspected and adjusted prior to shipment. Operation can be performed immediately upon completing all required connections and operational settings.

Check your received items against the packing lists below.

ITEM	QTY	REMARKS
Installation CD-ROM	1	
Dongle	1	
USB extension cable	1	
Operation Manual	1	

Check

Check to ensure no damage has occurred during shipment. If damage has occurred, or items are missing, inform your supplier immediately.

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1. Prior to Starting

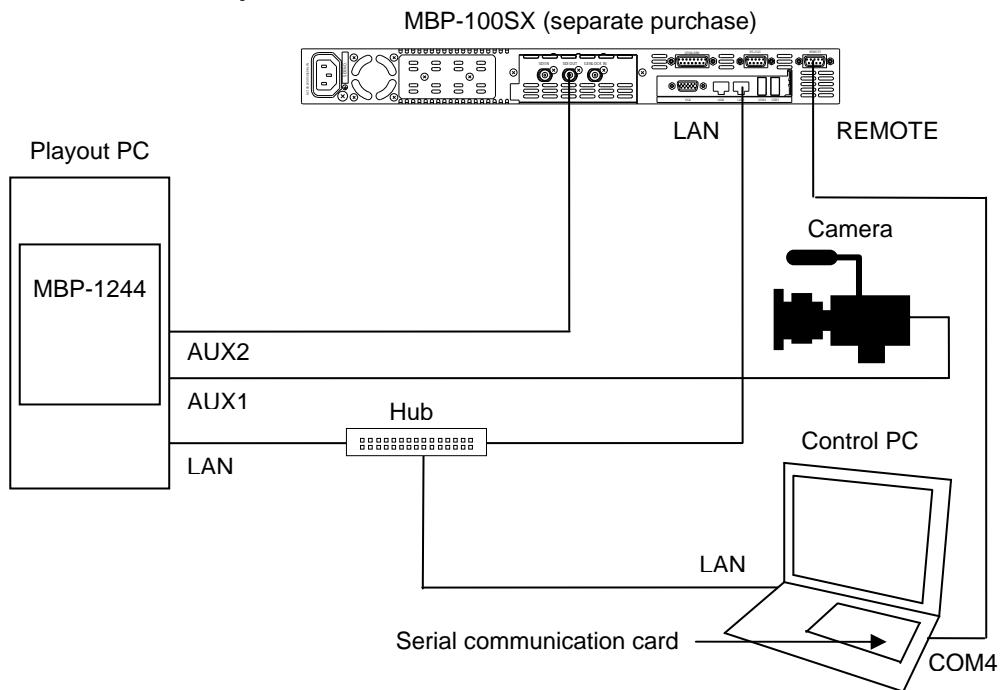
1-1. About VRCAM

VRCAM Sensorless Virtual Studio System is a software application that allows you to build a virtual studio using the Brainstorm virtual camera, without the use of a virtual reality tracking device (sensor camera).

1-2. Features

- Allows virtual camera positioning changes using Virtual Link of the HANABI series switcher
- Allows a system to be built using a camera sensor
- OA/PREV mode available
- Allows you to operate the system without noticing Brainstom
- Allows you to cue and play video files saved on the MBP-100SX, MBP-110SX, or MBP-100PD if connected (separate purchase).

◆ Connection Example



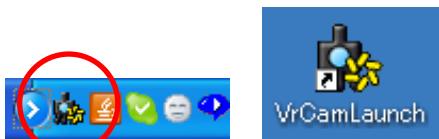
1-3. About This Manual

This manual is intended to help the user easily operate this product and make full use of its functions during operations. Before connecting or operating your unit, read this operation manual thoroughly to ensure you understand the product. After reading, it is important to keep this manual in a safe place and available for reference.

2. Starting and Exiting Application

2-1. Starting VRCAM Launch

VRCAM Launch automatically starts when the playout PC is started. If the icon of **VRCAM Launch** does not appear on the taskbar on the playout PC, double-click the shortcut to **VrCamLaunch** on the desktop.



2-2. Starting VRCAM Cont

Make sure that the icon of **VRCAM Launch** is displayed on the taskbar on the playout PC. On the desktop of the control PC, double-click the shortcut to **VrCamGUI** to start **VRCAM Cont**. If the same computer is used for playout and control, start **VRCAM Cont** on the same computer in which **VRCAM Launch** is installed.



2-3. Starting Brainstorm eStudio

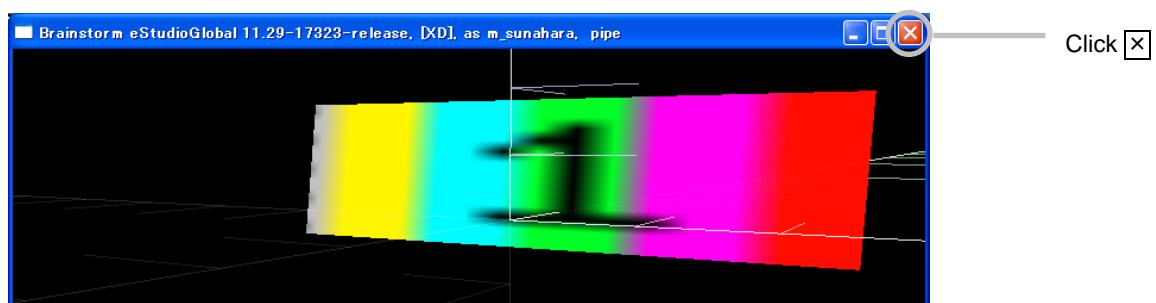
VRCAM automatically starts and closes **Brainstorm eStudio**. There is no need to start it manually.

2-4. Loading eLibrary

VRCAM automatically loads **eLibrary**. There is no need to load eLibrary manually.

2-5. Exiting Brainstorm eStudio

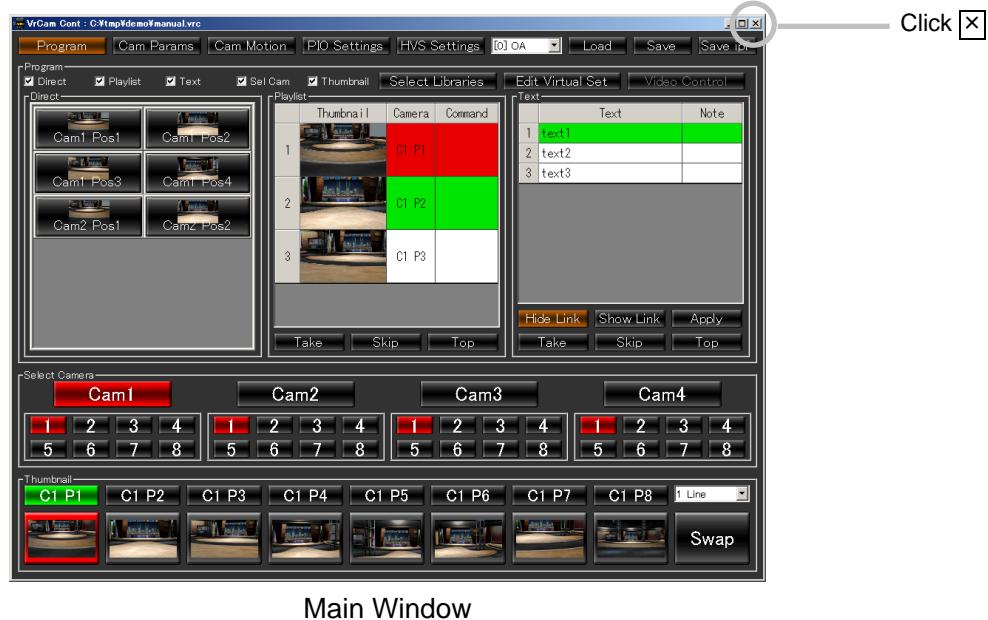
VRCAM automatically starts and closes **Brainstorm eStudio**. Normally, there is no need to close **Brainstorm eStudio** manually. To manually close **Brainstorm eStudio**, click the **X** button in the upper right corner of the **GFX** window.



GFX Window

2-6. Exiting VRCAM Cont

Click the  button in the upper right corner of the **VRCAM Cont** main window to exit **VRCAM Cont**.

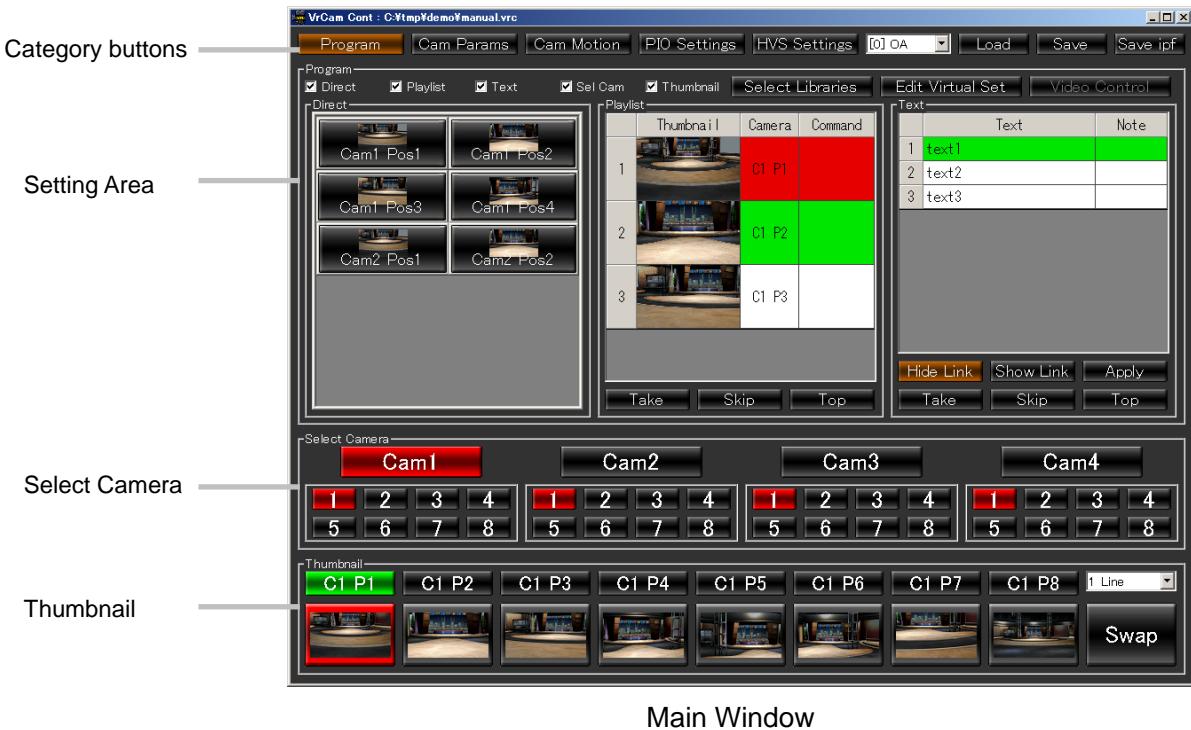


If **Brainstorm eStudio** is running on the playout PC, closing **VRCAM Cont** displays the following dialog box. To exit **Brainstorm eStudio**, click **Yes**.



3. Windows and Dialog Boxes

3-1. Main Window



Main Window

Category Buttons

Program	Displays Program in the setting area. (See section 3-2, "Program.")
Cam Params	Displays Adjust Camera and View in the setting area. (See section 3-3, "Adjust Camera" and 3-7, "View.")
Cam Motion	Displays Motion Path and View in the setting area. (See section 3-4, "Motion Path" and 3-7, "View.")
PIO Settings	Displays PIO Settings and View in the setting area. (See section 3-5, "PIO Settings" and 3-7, "View.")
HVS Settings	Displays HVS Settings and View in the setting area. (See section 3-6, "HVS Settings" and 3-7, "View.")

Setting Area

Program	Displays the Program screen (See section 3-2, "Program.") at startup. Clicking category buttons allows you to move between the Program , Adjust Camera , Motion Path , PIO Settings , HVS Settings , and View screens.
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Select Camera

Camera buttons (Cam1-Cam4)	Allows you to switch between cameras. (See section 4-2, "Switching Between Cameras.")
Camera position buttons (1-8)	Allows you to switch between camera positions.

Thumbnail

PREV (upper buttons)	Allows you to save camera positions. To save a camera position, use the right mouse button to drag a camera position button from Select Camera and drop it to a PREV or OA button. The camera position name is displayed on the PREV button. To clear a camera position from the button, right-click the button and choose Clear from the right-click menu.
OA (lower buttons)	Displays thumbnails of camera positions. Right-clicking a PREV or OA button and choosing Set Thumbnail captures the current image from the GFX window and displays it on the OA button. To clear a thumbnail from a button, choose Clear Thumbnail from the right-click menu. *Noise may appear on the output image when the thumbnail is set. *If the thumbnail does not fit properly into the button, please try again.
Rows	Allows you to select how many rows of thumbnail buttons to be displayed in the page. You can select a number from 1 through 4. There are 8 thumbnail buttons on each row. 32 buttons can be displayed at most. If you use all 32 thumbnail buttons of 4 rows, you can assign all camera positions to the buttons.,
Swap	Allows you to switch between OA and PREV (if using OA/PREV mode). (See section 4-2-2, "Switching Using VR CAM Cont (OA/PREV).")

IMPORTANT

Assigning all camera positions of all cameras to the thumbnail buttons on all 4 rows allows you to use the thumbnail buttons to switch camera positions in place of **Camera position** buttons. In such case, you can hide the buttons of **Select Camera** to use the limited screen more effectively, if you uncheck the **Select Camera** check box in the **Setting Area** on the **Program** screen.



Others

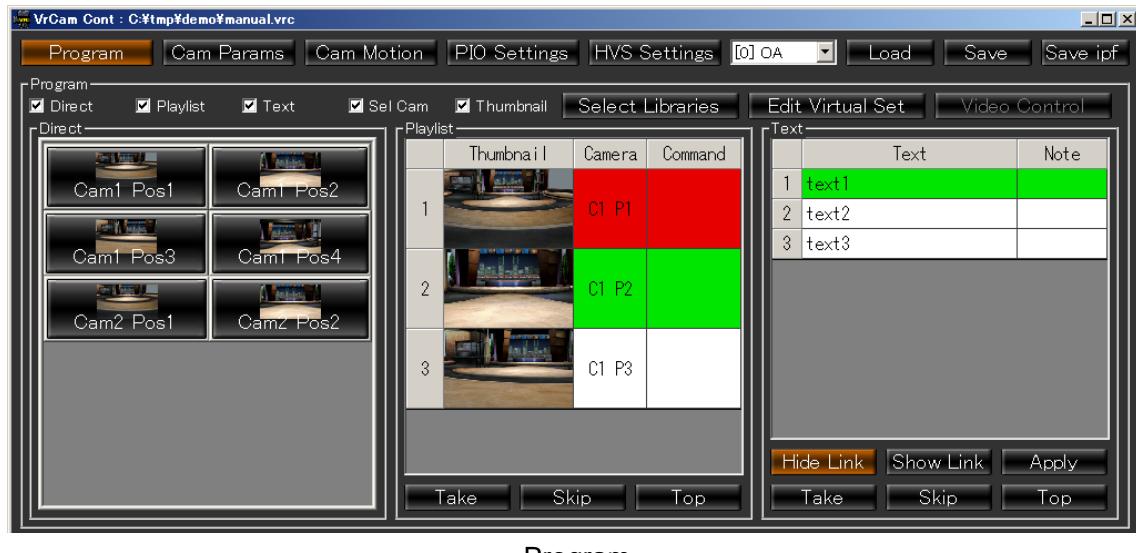
Playout PC	Allows you to select the playout PC. Select OA or OA+PREV for normal use.
Load	<p>Loads data from a .vrc file, .cam file, or .prg file. If the program differs from the current program when loading a .vrc file or .prg file, a message for confirming whether or not to change the library appears. Clicking Yes applies the data after changing the library. Clicking No applies the data without changing the library.</p> <p>.cam file: Information regarding cameras is included.</p> <p>.prg file: Information regarding a program is included.</p> <p>.vrc file: Information in .cam file and .prg file are both included.</p>
Save	<p>Saves data to a file. The file extensions available are .vrc, .cam, and .prg. The following status is not saved to the file.</p> <ul style="list-style-type: none"> - Which one of Program, Cam Params, Cam Motion, PIO Settings, and HVS Settings is selected - Which one of Mouse Cam, Real Cam, and VR Cam is selected - Which one of LOCK, POS, and ORT is selected - Which one of HPR and PTZ is selected - Which camera (Cam1-Cam4) is selected - Which camera position (1-8) is selected - Which thumbnail button is selected - OA/NEXT status in the playlist - Mouse camera settings adjusted in GFX
Save ipf	Issues a command for saving data to Brainstorm eStudio.

After loading or saving a file, the file path is displayed in the title bar of the window.

Lock Function

Camera settings	<p>To prevent accidental changes to the camera settings, you can disable the settings by choosing Disable Change Parameters in the right-click menu of the Cam Params, Cam Motion, PIO Settings, or HVS Settings button. To Enable the settings, choose Enable Change Parameters.</p>  <p>When the button is disabled;</p> <ul style="list-style-type: none"> - Adjust Camera in Cam Params is disabled. - Motion Path in Cam Motion is disabled. - PIO Settings is disabled. - HVS Settings is disabled. - VR Camera and GFX in View is disabled. - The camera selection mode is fixed to Recall mode.
Save ipf	<p>To prevent accidental changes, you can disable the Save ipf button by choosing Disable Save ipf in the right-click menu of the button. To Enable the button, choose Enable Save ipf.</p> 

3-2. Program



Program

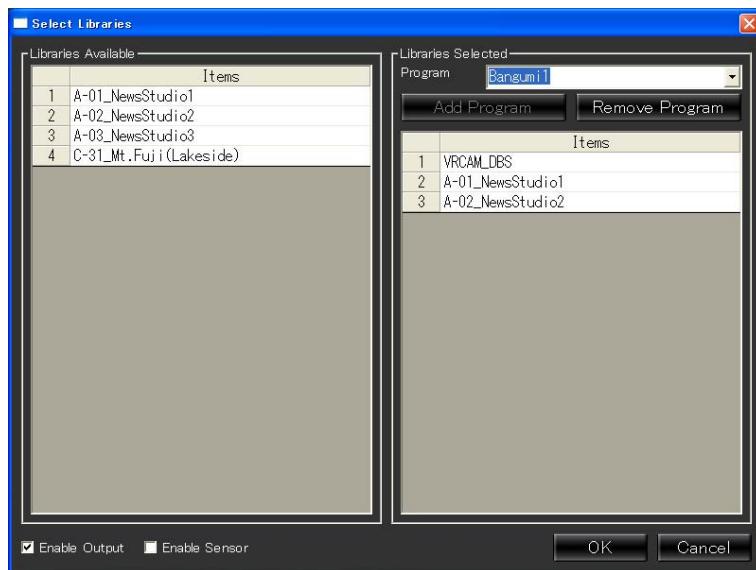
Show/Hide check boxes	Shows and hides Direct , Playlist , Text , Select Camera , and Thumbnail in the main window.
Select Libraries	Displays the Select Libraries dialog box. (See section 3-2-1, "Select Libraries.")
Edit Virtual Set	Displays the Edit Virtual Set dialog box. (See section 3-2-2, "Edit Virtual Set.")
Video Control	Displays the Video Control dialog box. (See section 3-2-3, "Video Control")
Direct	<p>Allows you to place command buttons that allows you to execute a command with a single click.</p> <p>To place a command button, drag and drop a button into Direct using the right mouse button. You can drop in camera position buttons from Select Camera or buttons from Control in the Edit Virtual Set dialog box.</p> <p>To remove a button from Direct, right-click a button and choose Remove from the right-click menu. Choosing Remove All removes all buttons.</p> <p>In the right-click menu you can also choose the following:</p> <ul style="list-style-type: none"> Edit opens Command Editor, which allows you to edit the command. Set Thumbnail captures the current image from the GFX window and displays it on the button. Clear Thumbnail clears the thumbnail from the button. <p>To move a button within Direct, left-click on and drag the button using your mouse while holding down the Ctrl key on the keyboard.</p> <p>*Overlapped buttons may not work properly.</p> <p>*Noise may appear on the output image when the thumbnail is set.</p> <p>*If the thumbnail does not fit properly into the button, please try again.</p>

Playlist	<p>To add an item to Playlist, right-click on a button to drag and drop it into Playlist using your mouse. You can add command buttons from Direct, camera position buttons from Select Camera, or buttons in Control in the Edit Virtual Set dialog box.</p> <p>To remove an item from Playlist, right-click an item and choose Remove from the right-click menu. Choosing Remove All removes all items.</p> <p>In the right-click menu you can also choose followings;</p> <ul style="list-style-type: none"> Edit from the right-click menu opens Command Editor which allows you to edit the command. Set Thumbnail captures the current image from the GFX window and displays it on the item in Thumbnail. Clear Thumbnail clears the thumbnail from the item. <p>The order of items in Playlist can be changed by left-clicking on and dragging an item using your mouse while holding down the Ctrl key on the keyboard.</p> <p>The text in each column heading (Camera and Command) can be changed by clicking on the text and pressing the F2 key.</p> <p>*Noise may appear on the output image when the thumbnail is set. *If the thumbnail does not fit properly into the button, please try again.</p>												
	Take	<p>Plays the selected item in Playlist and selects the next item. OA is highlighted in red and NEXT is highlighted in green.</p> <p>The Enter key functions the same as the Take. The PageUp key moves the green highlight of NEXT to the item above the item currently selected for NEXT. The PageDown key moves the green highlight of NEXT to the item under the item currently selected for NEXT.</p>											
	Skip	<p>Skips the item currently selected for NEXT in Playlist. The + key on the numeric keypad functions the same as the Skip.</p>											
	Top	<p>Selects the top item in Playlist for NEXT. The Home key functions the same as the Top.</p>											
	<p>Allows you to set texts. Select a text type object in Object in the Edit Virtual Set dialog box. The Text button in Control is enabled.</p> <p>To add an item to the list, right-click on the Text button to drag and drop it into Text using your mouse.</p> <p>To execute the event that is preset to the text that is added to the list, connect the event and the text in Text. To connect them, select the event in the Edit Virtual Set dialog box, and then right-click on the Event button under Control in the Edit Virtual Set dialog box to drag and drop it onto the text in Text.</p> <p>The order of items in the list can be changed by left-clicking on and dragging the item with your mouse while holding down the Ctrl key on the keyboard. The text in the column heading (Text) can be changed by clicking on the text and pressing the F2 key.</p>												
	Text	<table border="1"> <tr> <td>Hide Link</td><td>Displays Text and Note only.</td></tr> <tr> <td>Show Link</td><td>Displays Link in addition to Text and Note.</td></tr> <tr> <td>Apply</td><td>Allows you to apply the changes.</td></tr> <tr> <td>Take</td><td>Plays the selected item in Text and selects the next item. OA is highlighted in red and NEXT is highlighted in green.</td></tr> <tr> <td>Skip</td><td>Skips the item currently selected for NEXT in Text.</td></tr> <tr> <td>Top</td><td>Selects the top item in Text for NEXT.</td></tr> </table>	Hide Link	Displays Text and Note only.	Show Link	Displays Link in addition to Text and Note .	Apply	Allows you to apply the changes.	Take	Plays the selected item in Text and selects the next item. OA is highlighted in red and NEXT is highlighted in green.	Skip	Skips the item currently selected for NEXT in Text .	Top
Hide Link	Displays Text and Note only.												
Show Link	Displays Link in addition to Text and Note .												
Apply	Allows you to apply the changes.												
Take	Plays the selected item in Text and selects the next item. OA is highlighted in red and NEXT is highlighted in green.												
Skip	Skips the item currently selected for NEXT in Text .												
Top	Selects the top item in Text for NEXT.												

To use the numeric keypad to control the **Playlist**, NumLock must be off.

3-2-1. Select Libraries

Clicking the **Select Libraries** button in **Program** in the main window displays the **Select Libraries** dialog box. This dialog box allows you to select and copy the libraries (scenes) you wish to use. The selected libraries are managed by program name. To copy a library, select a program name in the **Program** drop down list in **Libraries Selected**, and right-click on a library to drag and drop it from **Libraries Available** into the list in **Libraries Selected**. Clicking **OK** creates a copy and starts and loads **Brainstorm eStudio**. Clicking **Cancel** closes the dialog box without saving the settings. To delete a library from **Libraries Selected**, right-click a library in the list and choose **Delete** from the right-click menu. **VRCAM_DBS** in **Libraries Selected** is automatically added when **OK** is clicked.



Select Libraries Dialog Box

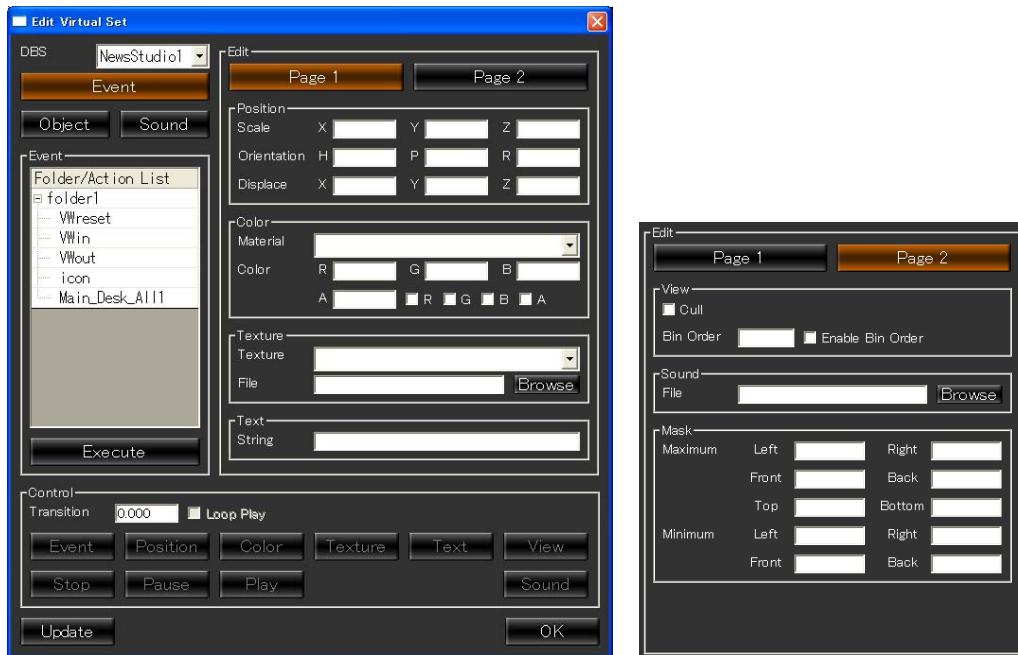
Program	Allows you to specify destination folders for managing libraries by program name.	
	Add Program	To add a new program name to the drop down list, enter the text and click Add Program .
	Remove Program	To remove a program name from the drop down list, select a program in the drop down list and click Remove Program .
Enable Output	Enables and disables the SDI output.	
Enable Sensor	Enables and disables receiving the sensor data.	
OK	Saves the changes and closes the dialog box.	
Cancel	Closes the dialog box without saving the changes.	

The command prompt starts up along with Brainstorm eStudio. If the command prompt is closed, Brainstorm eStudio is also closed. Minimize the command prompt if you do not use it.

Alphanumeric characters and some symbols can be used for program names.

3-2-2. Edit Virtual Set

Clicking the **Edit Virtual Set** button in **Program** in the main window displays the **Edit Virtual Set** dialog box. This dialog box allows you to change the position, color, texture, text, show/hide, sound, and mask area settings for the objects.



Edit Virtual Set Dialog Box

DBS	Allows you to select a database.
Event	Displays the events in the selected database.
Execute	Allows you to execute events.
Object	Displays the objects in the selected database. Right-click the object and choose Set Mark to change the object name to blue. This can be used as a marker while you are working with objects. Choose Clear Mark to return the object name to black.
Highlight	Highlights the objects in the GFX window.
Sound	Displays the sounds in the selected database.

Position	Allows you to set the scale, orientation, and position of objects.
Color	Allows you to set materials and colors.
Texture	Allows you to specify texture files.
Text	Allows you to set text.
View	Cull Allows you to show or hide the object.
	Bin Order Allows you to set the rendering order. To set the order, select the Enable Bin Order checkbox. Objects are layered in ascending order.
	Enable Bin Order To set the rendering order, select this checkbox.
Sound	Allows you to specify audio files.
Mask	Allows you to set the area of the mask objects.

Control	Command buttons	The command buttons in Control can be added to Direct or Playlist . To add a command button, right-click on a command button to drag and drop it into Direct or Playlist . *Clicking a command button in Control has no effect.	
		Event	Executes a given event.
		Position	Changes the position to the given value.
		Color	Changes the color to the given value.
		Texture	Changes the texture to the given value.
		Text	Changes the text to the given value.
		View	Toggles between show and hide.
		Sound	Changes the sound to the given value.
	Transition	Allows you to set the time spent for executing commands (value change).	
	Loop Play	Allows you to play the movie repeatedly.	
	Stop	Stops the sound.	
	Pause	Pauses the sound.	
	Play	Plays the sound.	

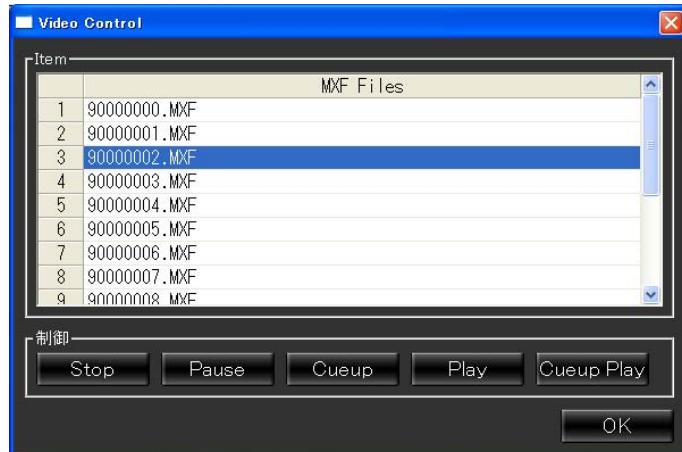
Update	Updates the list.
OK	Saves the settings and closes the dialog box.

If the layer of objects in the virtual set does not appear as you expect, change the rendering order after selecting the **Enable Bin Order** checkbox to correct the problem. You can also change the rendering order to correct the appearance of translucent parts of objects.

The **Bin Order** for the video wall is set at 100 as the default. If the video image on the video wall and other objects are not layered as you expect, select the **Enable Bin Order** checkbox and then set **Bin Order** for the object to a number larger than 101.

3-2-3. Video Control

Clicking **Video Control** in **Program** in the main window displays the **Video Control** dialog box. If the MBP-100SX, MBP-110SX, or MBP-100PD is connected (separate purchase), this dialog box allows you to cue and play video files saved on the device.



Video Control Dialog Box

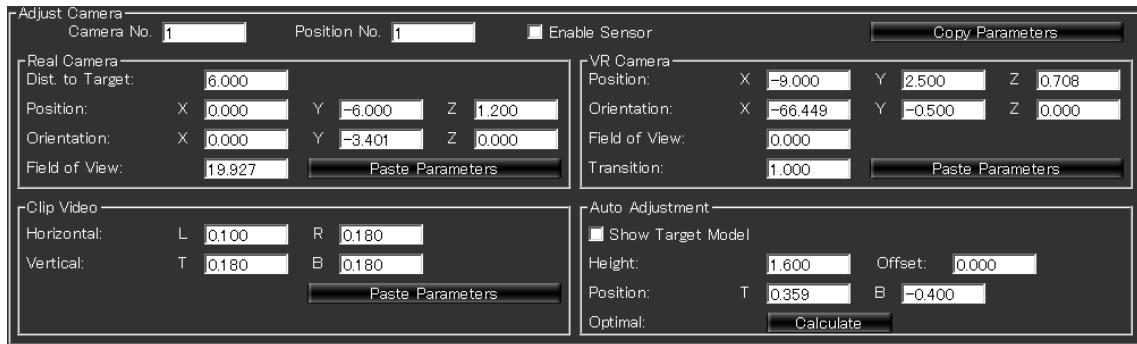
Item	Displays the video files saved on the device.
Control	The command buttons in Control can be added to Direct or Playlist . To add a command button, right-click on a command button to drag and drop it into Direct or Playlist .
Stop	Stops the video.
Pause	Pauses the video.
Cueup	Cues the video.
Play	Plays the video.
Cueup Play	Cues and plays the video.
OK	Closes the dialog box.

To enable the **Video Control** button in the main window, the value of **MBP_VDCP_ENABLE** under the **[SETTING]** section in the **VrCamGUI.ini** file, located in the same directory as **VrCamGUI.exe**, must be set to 1. The default value is 0.

The files are received via LAN and control is performed via the serial interface. If the files are not displayed or control is not performed, check that all devices are properly connected.

3-3. Adjust Camera

Clicking **Cam Params** in the main window displays **Adjust Camera**. **Adjust Camera** allows you to enter the camera position and video settings. See section 4-1, "Setup" for more details.



Adjust Camera

Camera No.	Displays the camera number selected in Select Camera .
Position No.	Displays the camera position number selected in Select Camera .
Enable Sensor	Select this checkbox when using a sensor camera. See ifCalibSTD Manual for details on camera calibration and using a sensor camera.
Copy Parameters	Copies parameters displayed in Real Camera , VR Camera , and Clip Video .

Real Camera

Dist. to Target	Enter the distance between the real camera and a person.
Position	Enter the position of the real camera (X: left-right, Y: depth, Z: up-down) in the coordinate system having its origin at the origin of the studio (Normally, the target position is defined as the origin of the studio.).
Orientation	Enter the orientation of the real camera (X: pan, Y: tilt, Z: roll) in the coordinate system having its origin at the origin of the studio.
Field of View	Enter the field of view of the real camera.
Paste Parameters	Pastes the copied Real Camera parameters.

VR Camera

Position	Enter the values of the virtual camera position in the relative value of the real camera position.
Orientation	Enter the values of the virtual camera orientation in the relative value of the real camera orientation.
Field of View	Enter the values of the field of view of the virtual camera in the relative value of the field of view of the real camera.
Transition	Sets the motion duration of the virtual camera in seconds.
Paste Parameters	Pastes the copied VR Camera parameters.

Clip Video

Horizontal	Allows you to remove the left and right areas of the video image.
Vertical	Allows you to remove the top and bottom areas of the video image.
Paste Parameters	Pastes the copied Clip Video parameters.

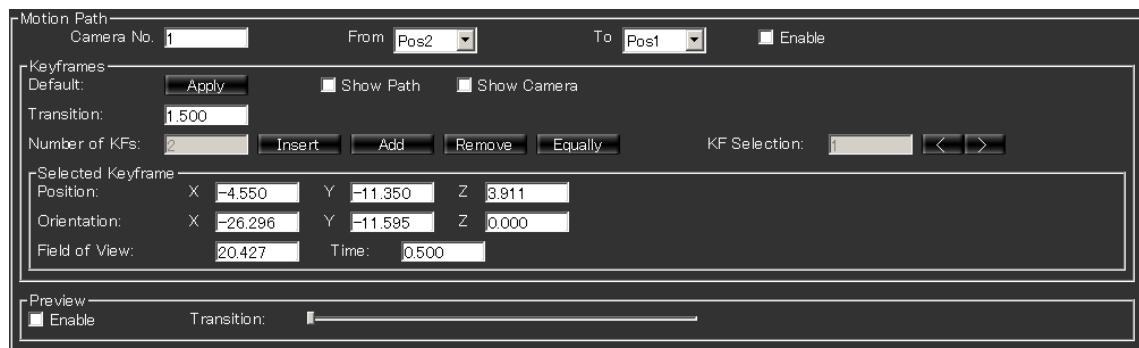
Auto Adjustment

Show Target Model	Select this checkbox to display a model.
Height	Enter the height of the person.
Offset	If the real camera is focused on a person's upper body, enter the height that is out of camera view (from foot to upper body). If it is a full body shot, set to 0 .
Position	Enter the values to align the yellow markers of the target model to the top and bottom of the person.
Optimal	Calculates the optimal values for Orientation Y and Field of View of the real camera using the Height and Position values under Auto Adjustment .

To display objects over the video image sent from a camera, the rendering order must be changed at **Bin Order**. See 3-2-2. "Edit Virtual Set" for details on **Bin Order**.

3-4. Motion Path

Clicking **Cam Motion** in the main window displays **Motion Path**. The motion path of the virtual camera is normally a straight line joining the two positions. By providing additional information, the path can be curved. See section 4-1, “Setup” for more details.



Motion Path

Camera No.	Displays the camera number selected in Select Camera .
From	Allows you to select the original position of the virtual camera.
To	Allows you to select the final position of the virtual camera.
Enable	Select this checkbox to enable Motion Path. Disabling Motion Path makes the path straight.

Keyframes

Default	Clicking the Apply button returns the values in Position , Orientation , and Field of View to their default values and returns the path to a straight line.								
Show Path	Displays the motion path on the output image.								
Show Camera	Displays the modeled virtual camera on the output image.								
Transition	Allows you to set the motion duration of the virtual camera in seconds.								
Number of KFs	<p>Displays the number of keyframes (64 keyframes maximum).</p> <table border="1"> <tr> <td>Insert</td> <td>Inserts a keyframe before the currently selected keyframe.</td> </tr> <tr> <td>Add</td> <td>Adds a keyframe at the end and increases the value in Transition. The value after removing the Time value of the last keyframe from the original transition value is the amount increased in Transition.</td> </tr> <tr> <td>Remove</td> <td>Deletes the currently selected keyframe.</td> </tr> <tr> <td>Equally</td> <td>Places keyframes evenly on a straight path.</td> </tr> </table>	Insert	Inserts a keyframe before the currently selected keyframe.	Add	Adds a keyframe at the end and increases the value in Transition . The value after removing the Time value of the last keyframe from the original transition value is the amount increased in Transition .	Remove	Deletes the currently selected keyframe.	Equally	Places keyframes evenly on a straight path.
Insert	Inserts a keyframe before the currently selected keyframe.								
Add	Adds a keyframe at the end and increases the value in Transition . The value after removing the Time value of the last keyframe from the original transition value is the amount increased in Transition .								
Remove	Deletes the currently selected keyframe.								
Equally	Places keyframes evenly on a straight path.								
KF Selection	Displays the keyframe number of the currently selected keyframe. (If the first keyframe is selected, 1 is displayed in the field.) The position, orientation, and field of view of the selected keyframe are displayed in Selected Keyframe . Click the < and > button to select a desired keyframe and set Position , Orientation , and Field of View .								

Selected Keyframe

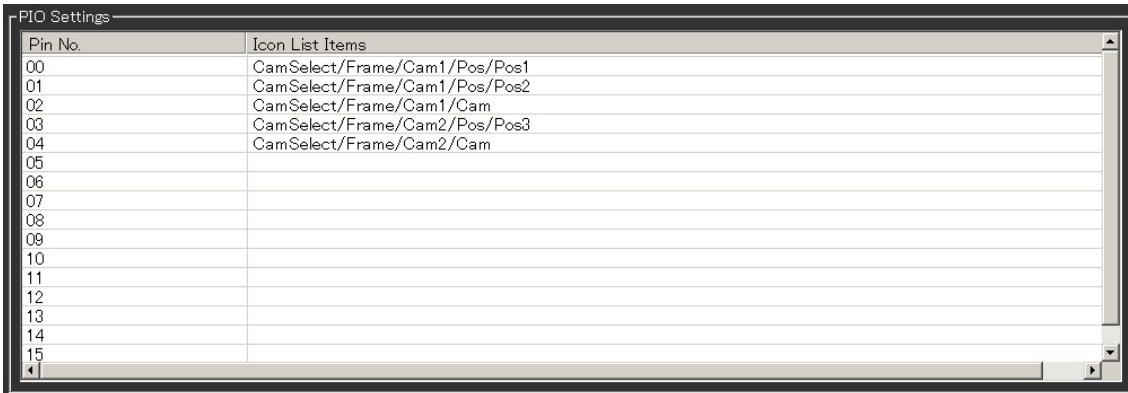
Position	Enter the coordinates of the currently selected keyframe (the keyframe with the number shown in KF Selection).
Orientation	Enter the orientation of the currently selected keyframe.
Field of View	Enter the field of view of the currently selected keyframe.
Time	Displays the time when the currently selected keyframe exists in seconds.

Preview

Enable	Select this checkbox for previewing the motion of the virtual camera.
Transition	The appearance of the camera changes according to the slider position.

3-5. PIO Settings

Clicking **PIO Settings** in the main window displays **PIO Settings**. **PIO Settings** allows you to assign functions to the buttons on the remote controller. See section 4-2-3, “Switching Using Remote Controller” for more details.

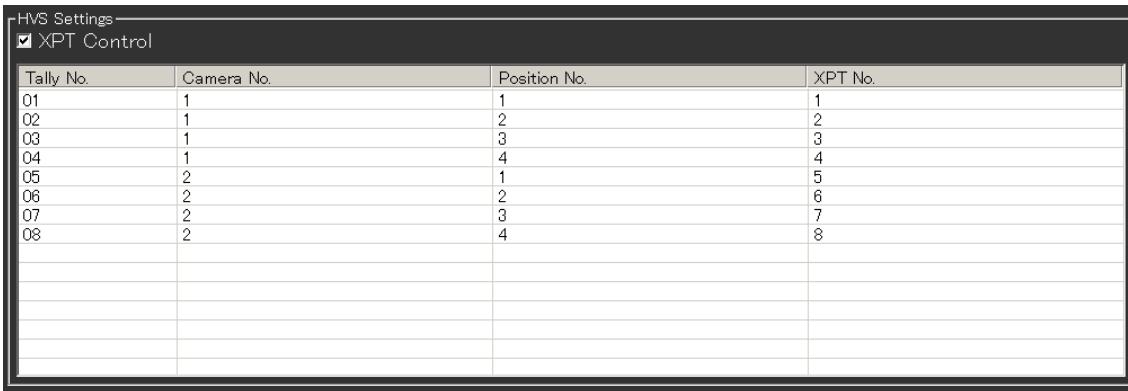


PIO Settings

Pin No.	PIO input pin numbers.
Icon List Items	Enter the names of the Icon List items. You can also drag a camera position button from Select Camera and drop it into PIO Settings using the right mouse button to enter the name of the Icon List item.

3-6. HVS Settings

Clicking **HVS Settings** in the main window displays **HVS Settings**. **HVS Settings** allows you to assign camera switching and camera position switching settings to the VR tallies of the HANABI series switcher. See section 4-2-5, “Switching Using HANABI Virtual Link” for more details.



HVS Settings

XPT Control	Select the check box to enable the HVS-300HS/350HS crosspoint control via VRCAM GUI .
Tally No.	VR tally numbers.
Camera No.	Enter the camera numbers. You can also drag a camera position button from Select Camera and drop it into HVS Settings using the right mouse button to enter the camera number.
Position No.	Enter the position numbers. You can also drag a camera position button from Select Camera and drop it into HVS Settings using the right mouse button to enter the position number.
XPT No.	If VR-XPT is selected for XPT No. Mode (3-12. HVS Settings ③), set the VIRTUAL XPT number (for example, VR01=1 and VR02=2) to which VR tally is set. If Button is selected for XPT No. Mode , enter the bus button number to which VIRTUAL XPT is assigned.

IMPORTANT

VR-XPT may not work with the certain versions of HVS-300HS units. In such case, the editor interface (optional) must be used to control VRCAM via the HVS-300HS buttons. (For more details, contact our sales office.)

For the settings to control VRCAM via the HVS-300HS/350HS buttons, see sections 3-6-1, "HVS-300HS/350HS Settings for XPT Control" and 3-12, "HVS Settings".

To assign a bus button number, select a number from 1 through 12.

3-6-1. HVS-300HS/350HS Settings for XPT Control

The Ethernet and VR-Link settings of the HVS-300HS/350HS must be changed to use the XPT Control function. Please check the following settings if the XPT Control does not function.

[Ethernet Settings]

Go to the [SETUP - SYSTEM - ETHERNET] menu and check if the IP address and net mask are correct. See "Network Settings" in the HVS-300HS/350HS Operation Manual for details.

SYSTEM : IP ADDRESS :	1 / 4
ETHERNET: =192. 168. 000. 010 :	:
SYSTEM : NET MASK :	2 / 4
ETHERNET: =255. 255. 255. 000 :	:

[Editor Interface (Optional)]

If the HANABI editor interface is enabled, the editor setting is required.

- HVS-300HS: [SETUP-EXT I/F-EDITOR]
- HVS-350HS: [SETUP-FUNCTION-EDITOR]

①	②	③	
	: TYPE :	ENABLE : SELECT	: WIPE : 1 / 2
EDITOR	: =	: =ON	: =NORML:
④			
	: XPT CTL:	WI P CTL: KEY CTL:	: 2 / 2
EDITOR	: =	: =ON	: =ON

- ① For the HVS-300HS, select **BVS3K** for **TYPE**. For the HVS-350HS, select **DVS**.
- ② Set **ENABLE** to **ON**.

Normally, the default settings are used for the following settings. For the certain versions of HVS-300HS units, the following settings are required when **XPT No Mode** is set to **Button**.

- ③ Set **SELECT** to other than **PREV**.
- ④ If **XPT No Mode** (see section 3-12, HVS Settings) is set to **Button**, set **XPT CTL** to **BUTTON**.

For details on the EDITOR menu, see "Editor Control" in the HVS-300HS/350HS Operation Manual.

[Virtual Processor Input Settings]

The [SETUP-VIRTUAL-ADVANCED-CG COMP] menu allows you to select a virtual processor input assignment. See "CG COMPONENT Menu" in the HVS-30VR/35VR Operation manual for details. When changing the TYPE setting, change the bus selection setting on the VRCAM along with the TYPE setting. See [Control Bus] in section 3-12, "HVS Settings" for details.

VIRTUAL : COMPO :	TYPE	: SHARED : 2/3
CG COMP : =1	=FIX ME PGM	: =NON :

To use VRCAM with the HANABI series switcher, select a type from the following four types.

Setting	Description
FIX ME PGM	Outputs composited video with a virtual set when VR XPT is selected on the M/E PGM bus.
FIX ME PST	Outputs composited video with a virtual set when VR XPT is selected on the M/E PST bus.
FIX PP PGM	Outputs composited video with a virtual set when VR XPT is selected on the P/P PGM bus.
FIX PP PST	Outputs composited video with a virtual set when VR XPT is selected on the P/P PST bus.

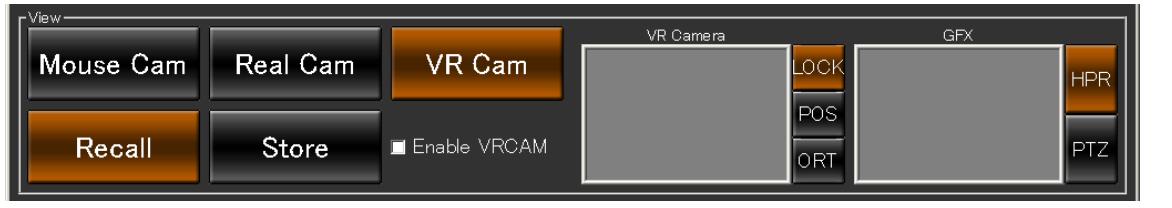
For the HVS-300HS, select either **FIX PGM** or **FIX PST** for **TYPE**.

IMPORTANT

Do not select the setting other than the above four settings. Otherwise, the system may not operate properly or synchronization between the virtual set and video may be lost.

On the HANABI series switcher, use P/P bus mode instead of A/B bus mode.

3-7. View



View

Mouse Cam	Displays the mouse camera view in the GFX window.
Real Cam	Displays the real camera view in the GFX window.
VR Cam	Displays the virtual camera view in the GFX window.
Recall	Sets the camera selection mode to Recall . In Recall mode, clicking a camera button in Select Camera recalls and displays the stored parameters in Real Camera , VR Camera or Clip Video . If the value of Real Camera , VR Camera or Clip Video is changed in Recall mode, the change is applied to the camera that is currently selected in Select Camera .
Store	Sets the camera selection mode to Store . In Store mode, clicking a camera button in Select Camera stores the parameters displayed in Real Camera , VR Camera or Clip Video to the clicked button. If another camera button is clicked in Store mode, the parameters for the camera are also changed to the stored parameters. If another Camera Position button is clicked in Select Camera in Store mode, the parameter of VR Camera is changed to the stored parameter. To exit Store mode, click the Recall button.
Enable VRCAM	Select this checkbox to enable VRCAM.
VR Camera	Drag the mouse to adjust the virtual camera position and orientation.
GFX	Drag the mouse to adjust the mouse camera view in the GFX window.

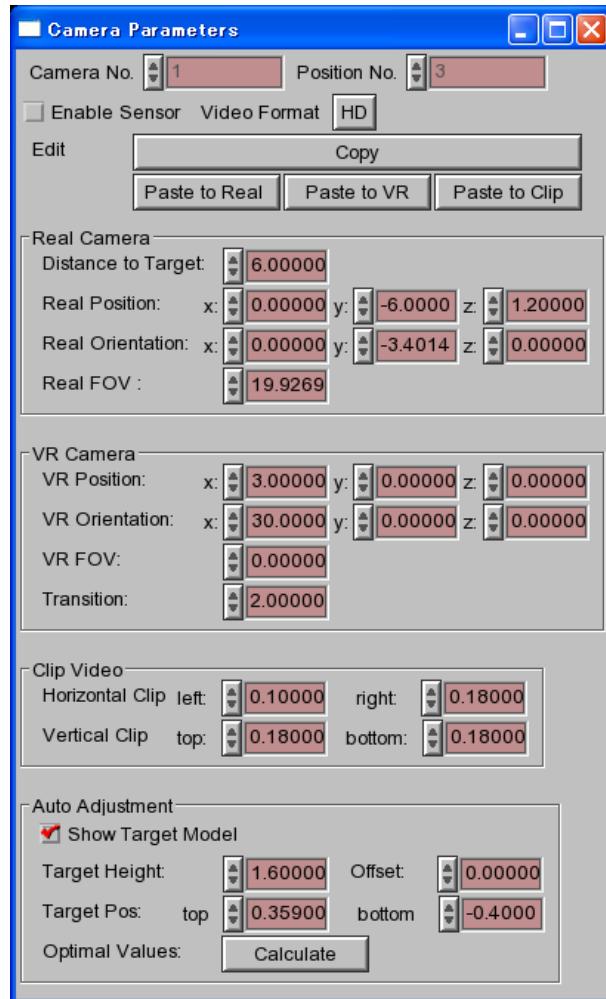
3-8. Camera Control

After **Brainstorm eStudio** is started, the **Camera Control** dialog box is displayed. The behavior of buttons in the **Camera Control** dialog box is the same as the buttons under **View** and **Select Camera** in the **VRCAM Cont** main window. See section 3-1, “Main Window” and section 4-2-1, “Switching Using VRCAM Cont (OA Only)” for details.



3-9. Camera Parameters

Clicking the **Camera Parameters** button in the **Camera Control** dialog box displays the **Camera Parameters** dialog box. The parameters displayed in the **Camera Parameters** dialog box are the same as the parameters under **Adjust Camera** in the **VRCAM Cont** main window. (See section 3-9-1, “Displaying Camera Parameters” for details.) The camera parameters can be copied in **Edit**. (See section 3-9-2, “Copying and Pasting Camera Parameters” for details.)



3-9-1. Displaying Camera Parameters

◆ Displaying parameters in Real Camera

Parameters of the selected real camera are displayed in **Real Camera**. To move between real cameras, follow the steps below.

1. Click a real camera button (**Cam1-Cam4**) to select a real camera in the **Camera Control** dialog box.

◆ Displaying parameters in VR Camera

The parameters of the selected virtual camera are displayed in **VR Camera**. To move between virtual cameras, follow the steps below.

1. Click a real camera button (**Cam1-Cam4**) to select a real camera in the **Camera Control** dialog box.
2. Click a camera position button (1-8) to select a camera position in the **Camera Control** dialog box.

◆ Displaying parameters in Clip Video

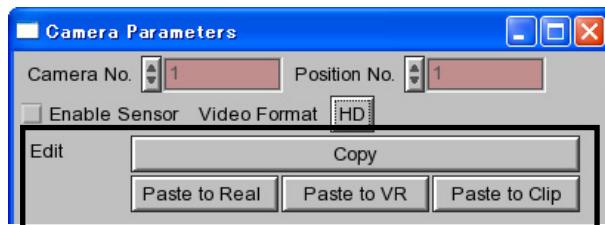
The video clipping parameters of the selected real camera are displayed in **Clip Video**. To move between cameras, follow the step below.

1. Click a real camera button (**Cam1-Cam4**) to select a real camera in the **Camera Control** dialog box.



3-9-2. Copying and Pasting Camera Parameters

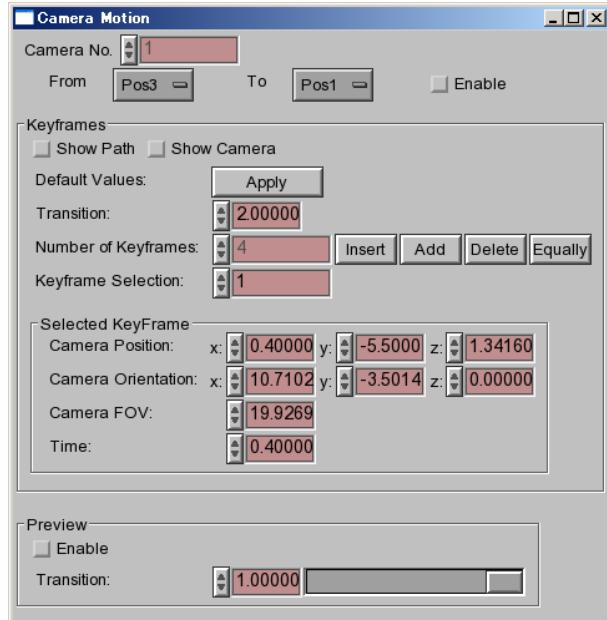
The example in this section describes how to copy parameters from **Cam1 Position1** to **Cam2 Position1**.



1. Select **Cam1** in the **Camera Control** dialog box and then select **1** below **Cam1**. The **Camera Parameters** dialog box appears.
2. Click the **Copy** button. The parameters of **Cam1 Position1** are copied to the buffer.
3. In the **Camera Control** dialog box, select **Cam2** and then select **1** below **Cam2**.
4. In the **Camera Parameters** dialog box, click **Paste to VR**. The parameters of the **Cam1 Position1** are copied to **Cam2 Position1**.
5. Click **Paste to Real**. The parameters of **Cam1** are copied to **Cam2**.

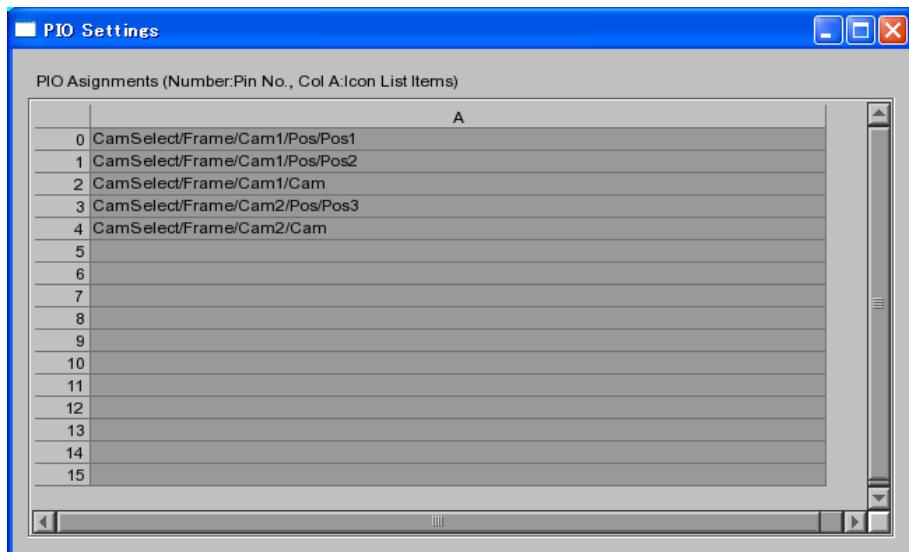
3-10. Camera Motion

Clicking the **Camera Motion** button in the **Camera Control** dialog box displays the **Camera Motion** dialog box. The behavior in the **Camera Motion** dialog box is the same as **Motion Path** in the **VRCAM Cont** main window. See section 3-4, “Motion Path” for details.



3-11. PIO Settings

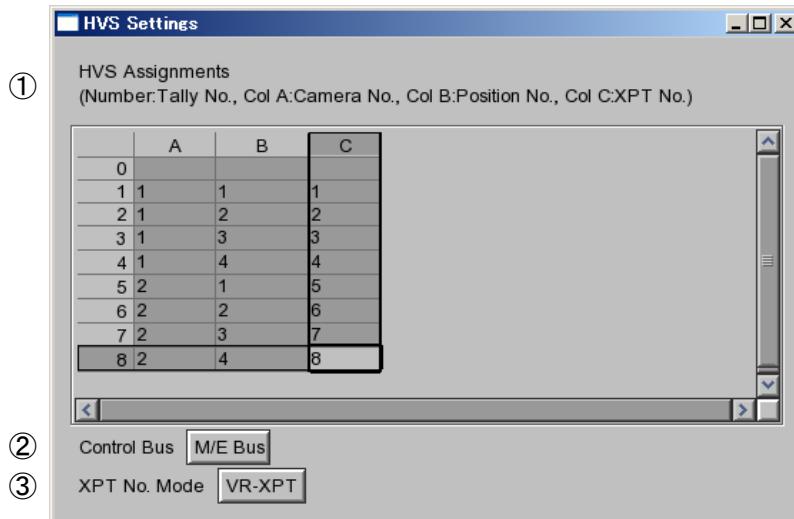
Clicking the **PIO Settings** button in the **Camera Control** dialog box displays the **PIO Settings** dialog box. The behavior in the **PIO Settings** dialog box is the same as **PIO Settings** in the **VRCAM Cont** main window. See section 3-5, “PIO Settings” for details.



Left-clicking and dragging and dropping a camera button or camera position button from the **Camera Control** dialog box into the **PIO Settings** dialog box brings the item to the topmost empty line, instead of the selected line.

3-12. HVS Settings

Clicking the **HVS Settings** button in the **Camera Control** dialog box displays the **HVS Settings** dialog box.



HVS Settings

- ① The behavior in **HVS Assignments** is the same as those for **HVS Settings** in the **VRCAM Cont** main window. See section 3-6, "HVS Settings" for details. However, the values cannot be entered by dragging and dropping them into this **HVS Settings** dialog box.

- ② **HVS-300HS**
Select **M/E Bus**.

HVS-350HS

If an M/E setting is selected under Virtual Processor Input Settings (see section 3-6-1, "HVS-300HS/350HS Settings for XPT Control"), select the **M/E Bus**. If a P/P setting is selected, select the **P/P Bus**.

- ③ Normally select **VR-XPT**. On the certain versions of HVS-300HS units, VR-XPT may not work. In such case, select **Button** and change the editor setting on the HANABI series switcher (an optional editor interface required). For details on the editor settings, see section 3-6-1, "HVS-300HS/350HS Settings for XPT Control".

If the optional editor interface is enabled, the editor setting is required.

4. Using VRCAM

4-1. Setup

This section describes necessary preparations before using VRCAM.

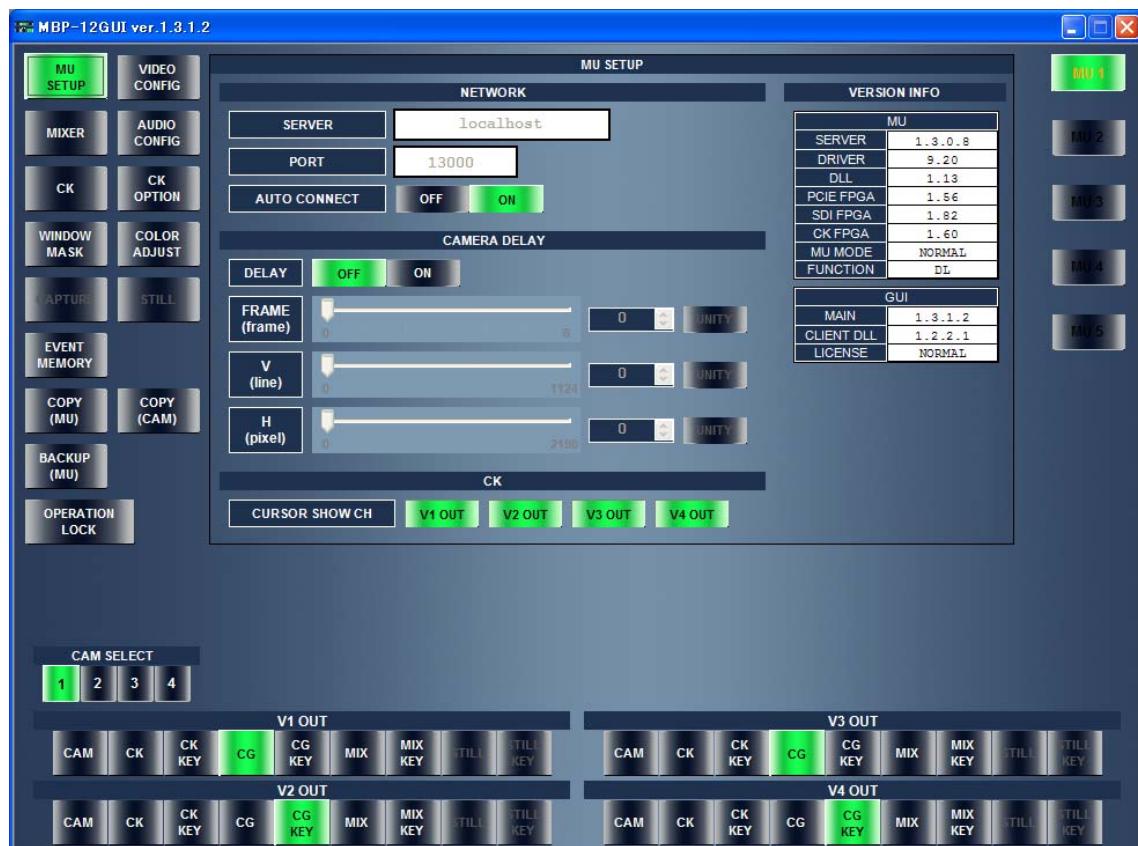
4-1-1. Studio Preparation

Follow the steps below for studio setup.

- Set up the equipment, including cameras, lightings, and a chromakey blue screen (green screen).
- Define the origin of the studio. It is normally the position of the person (host). This defines the positional relation between the graphic image and video image.
- Have a person stand at the position or put an object there having the same height as that of the person.
- Use a tape measure to measure rough camera coordinates (X, Y, Z) with X as the left-right, Y as depth, and Z as up-down coordinates.
- Estimate the orientation of the camera (pan, tilt, roll). This step is not necessary if the camera orientation is along the Y axis (enter [0, 0, 0] in that case).
- Measure the distance between the camera and the person.

4-1-2. Hardware Settings

Start **MBP-12Server.exe** and **MBP-12GUI.exe** on the playout PC, and set the settings as shown in the figure below.



MBP-12GUI

- Select **MU SETUP**.
- Set both **MIXER 1** and **MIXER 2** to **VIRTUAL**.
- Set **DELAY** to **OFF**.
- Set **V1 OUT** to **CG**.
- Set **V2 OUT** to **CG KEY**.

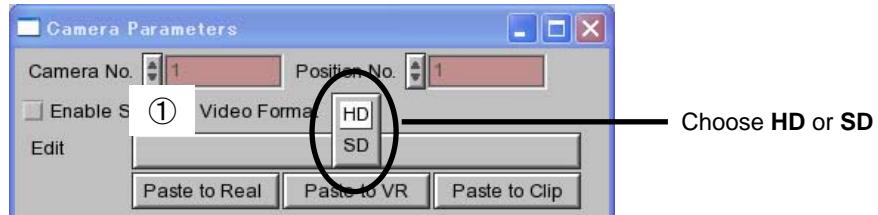
See the MBP-12Server Operation Manual and MBP-12GUI Operation Manual for details.

If you change **VIDEO CONFIG** settings in **MBP-12GUI** while **Brainstorm eStudio** is running, be sure to restart **Brainstorm eStudio**. Otherwise, noise may appear on the output image.

4-1-3. Video Format

On the control PC, start **VRCAM Cont. HD** or **SD** can be specified in the **Camera Parameters** dialog box in **Brainstorm estudio**.

1. Start **Brainstorm eStudio** and click the **Camera Parameters** button in the **Camera Control** dialog box. The **Camera Parameters** dialog box is displayed.
2. Choose **HD** or **SD** in **Video Format** (①)



4-1-4. Enable Sensor

For a system with a sensor, either **Cam1** or **Cam4** can be synchronized with the sensor.



1. Select a camera in **Select Camera**, and select the **Enable Sensor** checkbox (①).

Camera calibration is required for the use of a sensor camera. See the ifCalibSTD Operation Manual for details.

4-1-5. Real Camera

The example in this section describes how to set real camera settings. Before setting the **Real Camera** settings, select **Real Cam** in **View** and **Cam1** in **Select Camera**.

① Real Camera
Dist. to Target: 6.000
② Position: X 0.000 Y -6.000 Z 1.200
③ Orientation: X 0.000 Y -3.401 Z 0.000
④ Field of View: 19.927 Paste Parameters

Real Camera

1. Enter the distance between the real camera and the person in **Dist. to Target** (①).
2. Enter the coordinates of the real camera in **Position** (②).
3. Enter the orientation of the real camera in **Orientation** (③).
4. Enter the field of view of the real camera in a range of about 30 to 50 in **Field of View** (④).

⑤ Auto Adjustment
⑥ Show Target Model
⑦ Height: Offset:
⑧ Position: T B
⑨ Optimal: Calculate

Auto Adjustment

5. Select the **Show Target Model** checkbox (⑤).
6. Enter the height of the person in **Height** (⑥).
7. If the real camera is focused on a person's upper body, enter the height that is out of camera view (from foot to upper body) in **Offset** (⑦).
8. While viewing the output image, enter the values to align the yellow markers of the target model to the top and bottom of the person in a range of -0.5 to 0.5 in **Position** (⑧).
9. Click **Calculate** to the right of **Optimal** (⑨). The optimal values for **Orientation Y** and **Field of View** of the real camera are calculated.
10. If there are multiple cameras, select a camera in **Select Camera** and repeat steps 1 to 9.
11. Deselect the **Show Target Model** checkbox (⑤).

4-1-6. Clip Video

The example in this section describes how to remove the unnecessary blue screen area of a real camera image. Before setting the **Clip Video** settings, select **Real Cam** in **View** and **Cam1** in **Select Camera**.



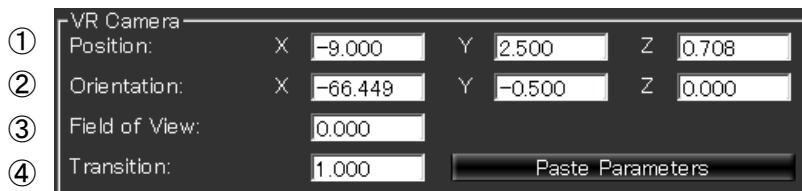
Clip Video

1. **Clip Video** allows you to remove the unnecessary blue screen (green screen) area of the camera image while viewing the output image. Entering **0.1** in ① removes 10 % of the image from the edge.
2. If there are multiple cameras, select a camera in **Select Camera** and repeat step 1.

The **Clip Video** settings are not necessary for the camera that **Enable Sensor** has checked in **Adjust Camera** is checked. In this case, the clip setting is not applied even if the value is changed.

4-1-7. VR Camera

The example in this section describes how to set the virtual camera settings. Before setting the **VR Camera** settings, select **VR Cam** in **View** and **Cam1** in **Select Camera**.

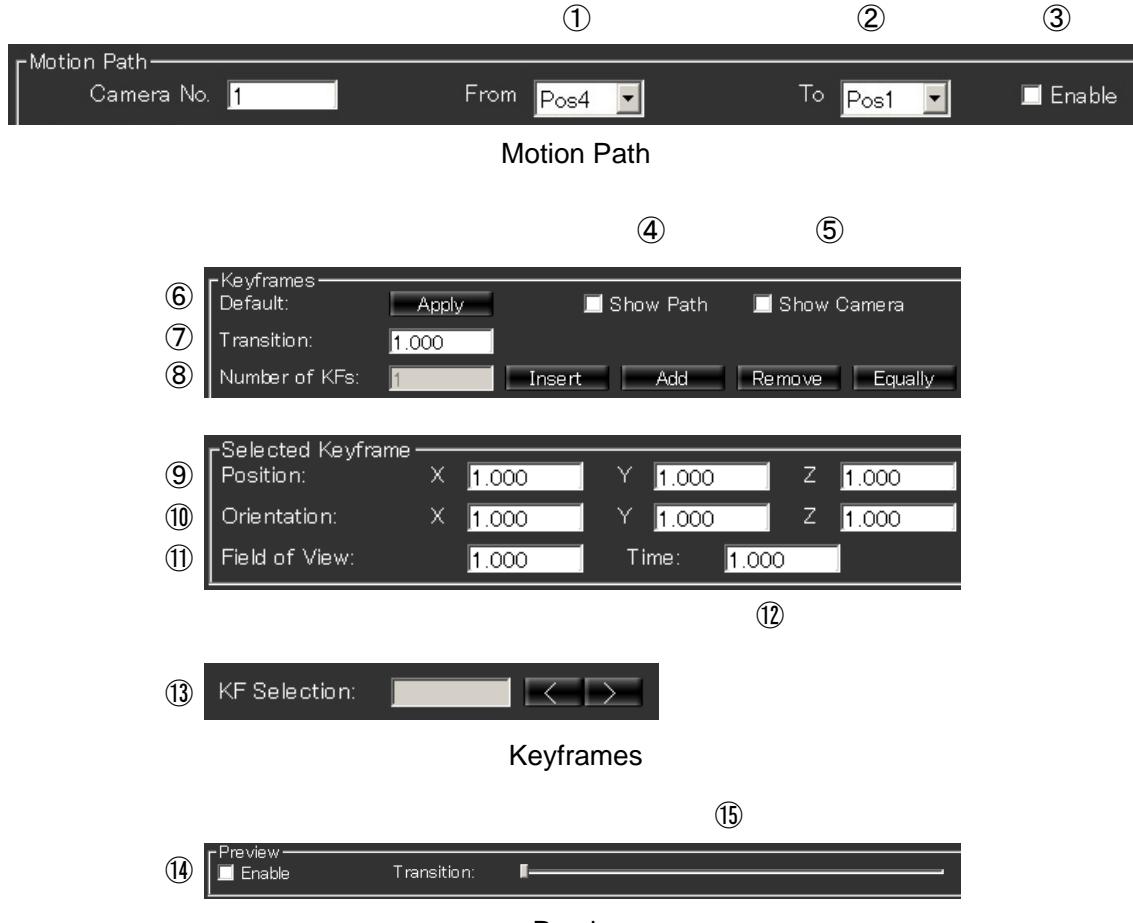


VR Camera

1. While viewing the output image, specify the position of the virtual camera in **Position** (①).
2. Specify the orientation of the virtual camera in **Orientation** (②).
3. Set the field of view of the virtual camera in **Field of View** (③).
4. Enter the transition duration in seconds to the right of **Transition** (④).
5. Select **Store** in **View**, and click a desired camera position button to store the virtual camera settings.
6. Repeat steps 1 to 5 for all necessary positions.
7. If there are multiple cameras, select a camera in **Select Camera** and repeat steps 1 to 6.
8. Select **Recall** in **View**, and click the camera position buttons in **Select Camera** to check the appearance of the image. If the legs of the person go under the floor, adjust **Orienteation Y** of the real camera.

4-1-8. Motion Path

VRCAM can be used without setting the **Motion Path** settings. In such case, the motion path of the virtual camera is considered to be straight. To create a curved motion path, follow the steps below. Before creating a curved motion path, select **Mouse Cam** in **View** and **Cam1** in **Select Camera**.



1. Select the original position in **From** (①).
2. Select the final position in **To** (②).
3. Select the **Enable** checkbox (③). The camera motion settings between ① and ② are not enabled unless this checkbox is selected.
4. Select the **Show Path** and **Show Camera** checkboxes (④, ⑤).
5. Select the **Enable** checkbox (⑭) in **Preview**.
6. Click the **Apply** button to create a default path (⑥). A keyframe is created on the center of a straight path.
7. To add a new keyframe, click **Insert** or **Add** to the right of **Number of KFs** (⑧). Clicking **Insert** adds a keyframe between the keyframe selected in **KF Selection** and the previous keyframe. Clicking **Add** adds a keyframe at the end and increases the **Transition** value so that the rates of change of the position and orientation against the duration remain the same. Clicking **Equally** replaces all keyframes evenly on a straight line.
8. Set **KF Selection** (⑬) to 1. The **Position** (⑨), **Orientation** (⑩), **Field of View** (⑪) and **Time** (⑫) values of the keyframe specified in **KF Selection** (⑬) are displayed.
9. While viewing the path on the output image, enter the **Position** values (⑨). If the path is not well shown, drag in **GFX** in **View** to adjust the view. The motion path is drawn with blue cones, and the keyframes appear as red cones.
10. While viewing the camera on the output image, set **Orientation** (⑩). The appearance of the camera changes according to the position of the **Transition** slider (⑮).
11. Adjust the field of view in **FOV** (⑪).
12. To set the time of a keyframe, enter the time code in seconds in **Time** (⑫).

13. Select the next keyframe in **KF Selection** (13).
14. Repeat steps 9 to 12 for all necessary keyframes.
15. To change the duration, set **Transition** (7). (The duration between the last keyframe and the final position is changed.) The **Transition** value cannot be smaller than the **Time** value of the last keyframe.
16. Move the **Transition** slider (15) to check the camera motion.
17. While viewing the camera on the output image, fine adjust 9 to 15.
18. Select **VR Cam** in **View**, and move the **Transition** slider to check the camera motion on the output image.
19. Repeat steps 1 to 18 for all necessary keyframes.
20. If there are multiple cameras, select a camera in **Select Camera** and repeat the steps 1 to 19.

Checking **Enable** (14) in **Preview** enables the **Transition** slider (15). However, manually deselecting the checkbox does not disable the slider.

Clicking a button in **Select Camera** automatically deselects **Enable** (14) and it disables the **Transition** slider.

Enabling **Transition** may lower the rendering performance.

4-2. Switching Between Cameras

This section describes how to switch between cameras and camera positions.

4-2-1. Switching Using VRCAM Cont (OA Only)

Select Camera in **VRCAM Cont** allows you to switch between OA cameras and camera positions.



②

③ Select Camera

1. To switch to Camera 1, click **Cam1** (①). The output image is changed with a cut transition.
2. To change the position of Camera 1, click a desired camera position button (1-8) below **Cam1** (②). The transition of the output image is animated.
3. To change the position of Camera 2 while Camera 1 is selected, click a desired camera position button (1-8) below **Cam2** (③). In this case, the appearance of the output image does not change.
4. To change to Camera 2, click **Cam2** (④). The output image is changed with a cut transition.
5. The method for switching between Camera 3 and Camera 4 is the same.

4-2-2. Switching Using VRCAM Cont (OA/PREV)

Select Camera or **Thumbnail** in **VRCAM Cont** allows you to switch between OA and PREV cameras and camera positions.

◆ Using Select Camera

①

②



③

④ Select Camera



Thumbnail

⑤

1. In **Select Camera**, the camera buttons and camera position buttons selected for OA output are displayed in red, and those for PREV output are displayed in green. The buttons selected for both OA and PREV are also displayed in green.

2. To change to Camera 1, click **Cam1** (①). The output image on PREV is changed with a cut transition.
3. To change the image on OA to Camera 1, click **Swap** (⑤) in **Thumbnail**. The output image is changed with a cut transition.
4. To change the position of Camera 1, click the camera position button (1-8) below **Cam1** (③). The output image on PREV is changed with a cut transition.
5. To change OA positions to the above settings, click **Swap** (⑤) in **Thumbnail**. The transition of the output image is animated.
6. To change the position of Camera 2 while Camera 1 is selected, click a desired camera position button (1-8) below **Cam2** (④). In such case, the appearance of the output image will not change.
7. To change to Camera 2, click **Cam2** (②). The output image on PREV is changed with a cut transition.
8. To change the image on OA to Camera 2, click **Swap** (⑤) in **Thumbnail**. The output image is changed with a cut transition.
9. The method for switching between Camera 3 and Camera 4 is the same.

◆ Using Thumbnail



- 1 In **Thumbnail**, you can select a number of rows to display from 1 through 4 Lines (①). Eight thumbnails are displayed on each row. Thirty-two thumbnails are available.
- 2 In **Thumbnail**, the camera buttons and camera position buttons selected for OA output are displayed in red, and those for PREV output are displayed in green.
- 3 To change the image on PREV to Camera1 Position2, click **Cam1 Pos2** (②). The output image on PREV is changed with a cut transition.
- 4 In **Thumbnail**, the camera and camera position for OA output can be switched directly. To change the image on OA to Camera 1 Position 5, click (③). The transition of the output image is animated.
- 5 To swap PREV and OA, click **Swap** (④). The image on PREV is changed with a cut transition. If the cameras for PREV and OA are the same, the transition of the output image on OA is animated. If the cameras are different, the image on OA is changed with a cut transition.

IMPORTANT

Note that in OA/PREV mode **Camera Parameters** settings (See section 3-9, "Camera Parameters.") must be the same for both OA and PREV.

You can also add camera positions to **Direct** or **Playlist** to switch between cameras.

4-2-3. Switching Using Remote Controller

Using the remote controller allows you to switch between cameras and camera positions. Up to 16 functions can be assigned to the remote controller. Any function that has, its icon stored in the custom folder of Brainstorm eStudio, can be controlled via the remote controller.

PIO Settings	
Pin No.	Icon List Items
00	CamSelect/Frame/Cam1/Pos/Pos1
01	CamSelect/Frame/Cam1/Pos/Pos2
02	CamSelect/Frame/Cam1/Cam
03	CamSelect/Frame/Cam2/Pos/Pos3
04	CamSelect/Frame/Cam2/Cam
05	
06	

PIO Settings

1. Right-click on a desired camera button or camera position button from **Select Camera** to drag and drop it into **PIO Settings** to display the corresponding Icon List item on the line where the button is dropped.
2. Double-clicking a cell under the **Icon List Items** column allows you to enter the value directly.
3. Controlling a button on the remote controller connected to the input pin shown in **Pin No.** allows you to execute the item in the corresponding **Icon List**.

4-2-4. Controlling Playlist Using Numeric Keypad

You can also control **Playlist** from the numeric keypad. See section 3-2,"Program" for details on **Playlist**. To control from the numeric keypad, set **NumLock** off.

Enter	Take	Plays the selected item in Playlist and selects the next item.
+	Skip	Skips the item currently selected for NEXT in Playlist .
Home	Top	Selects the top item in Playlist for NEXT.
Page Up	-	Selects the item above the item currently selected for NEXT.
Page Down	-	Selects the item under the item currently selected for NEXT.

4-2-5. Switching Using HANABI Virtual Link

Using Virtual Link of a HANABI series switcher allows you to switch between cameras linked via the crosspoint switching. Up to eight camera position buttons can be assigned to the Virtual Link tallies. See the HANABI Series Switcher Virtual Link Operation Manual for details on Virtual Link.

HVS Settings		
<input checked="" type="checkbox"/> XPT Control		
Tally No.	Camera No.	Position No.
01	1	1
02	1	2
03	1	3
04	1	4
05	2	1
06	2	2
07	2	3
08	2	4

1. When a library (scene) is loaded, the connection between VRCAM and the HANABI series switcher is automatically established. There is no need to establish the connection manually.

2. Click **HVS-Setting** on the upper area of the window. Right-click on a desired camera position button from **Select Camera** to drag and drop it into **HVS Settings** to display the corresponding camera number and camera position number on the line where the button is dropped.
3. Double-clicking a cell under the **Camera No, Position No, or XPT No.** column allows you to enter the value directly.
4. Controlling a HANABI VR button, for which the tally shown in **Tally No.** is set, allows you to execute the corresponding camera position button. If **XPT Control** is enabled, the camera position can also be switched by the camera position buttons of **Select Camera** and by the thumbnail buttons.

IMPORTANT

- Please do not press any button on the switcher while the camera mode is set to **Store** (see section 3-7, “View”). If you press any button on the switcher, return the camera mode to **Recall** and switch the camera using the switcher.
- Assigning cameras and camera positions in **HVS Settings** allows a position change for the switcher. If the switcher is operated during the position change, however, the source may be changed during the position change and an improperly composite image may be present. To avoid this, make sure the camera is completely switched before operating the switcher, or use the switcher only for camera switching and use an external remote controller to change the camera position. Setting only **Camera No.** and leaving **Position No.** blank disables the position change from the switcher. For the system with a sensor, leave **Position No.** blank in **HVS Settings** to assign a camera switch to a sensor camera.
- If the focus is on a numeric field in **Cam Params** or **Cam Motion**, the screen cannot be refreshed by the external request (for example, HANABI). This is to prevent unexpected changes to the values applied by other users. To refresh the screen, click a button in the main window of VRCAM Cont and remove the focus from the field.
- Although **XPT Control** is enabled, if a **VIRTUAL XPT** signal is selected in the HANABI, i.e., a tally signal of tally numbers 1 through 8 is output, the camera positions cannot be changed from the position shown in the **HVS Setting** by the XPT control. Camera position can be changed by the XPT control if a signal that is not assigned to **VIRTUAL XPT** is selected in the HANABI, i.e., a tally signal of tally number 0 is output. However, once the camera position is set to the position shown in the **HVS Setting** by the XPT control, further change will be disabled.



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