OPERATION MANUAL

HVS-3800HS/S Virtual Link

2nd Edition

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1. Overview and Features

1-1. Overview

The Hanabi Virtual Link System software establishes a link between digiStorm Virtual System and FOR-A Hanabi series switchers. It allows the users to build a compact, virtual studio system comprised of a large number of cameras and small number of CG/combine processors. This software has been designed to allow operation that simulates regular switchers as much as possible even when linked to the digiStorm Virtual Studio.

1-2. Features

➢ A compact virtual studio system can be built using a small number of CG generators and video combine processors (called hereafter the "virtual processors") and DSC-100 / DSC-200 (camera sensor data control processor).

➢ Camera switching of virtual combine images can be made by XPT of the M/E bus in the same way as regular switchers.

➢ A Hanabi built-in chromakey is available in the Hanabi Virtual Link System.

➢ The Hanabi built-in chromakey can follow the camera switching (The switcher can preserve chromakey data for each camera and switch it according to the M/E XPT switchover.)

➢ If the virtual processor cannot generate a combine image due to the selection conditions for M/E buses, replacement signals are selected automatically.

➢ A tally logic function has been added. This enables combining of the video wall display tally and Video wall selection signal tally obtained from the digiStorm Virtual System for output of a suitable Video wall tally.

1-3. About This Manual

In this manual, the basic concepts and terminology are explained in Chapter 2, "Basics of Hanabi Virtual Link System." The specific setting menus are presented starting from Chapter 3. The basic concepts and terminology in Chapter 2 must be grasped to understand the information starting from Chapter 3. Therefore, be sure to read through Chapter 2 first.

2. Basics of Hanabi Virtual Link System

2-1. Ideal Virtual System

In the ideal virtual system, the camera and virtual video and CG processors are connected one-to-one as shown in the figure below. This configuration has the following advantages.

- The PGM output, NEXT output, monitor environments, and camera operator preview can all be obtained without conflicts.
- Switching can be made between any input signals using "Dissolve".
- Ease of operation and wiring concepts for switcher peripherals are basically identical to typical studio operation and are easy to understand.

However, this configuration entails high cost.

Ideal Virtual Studio System
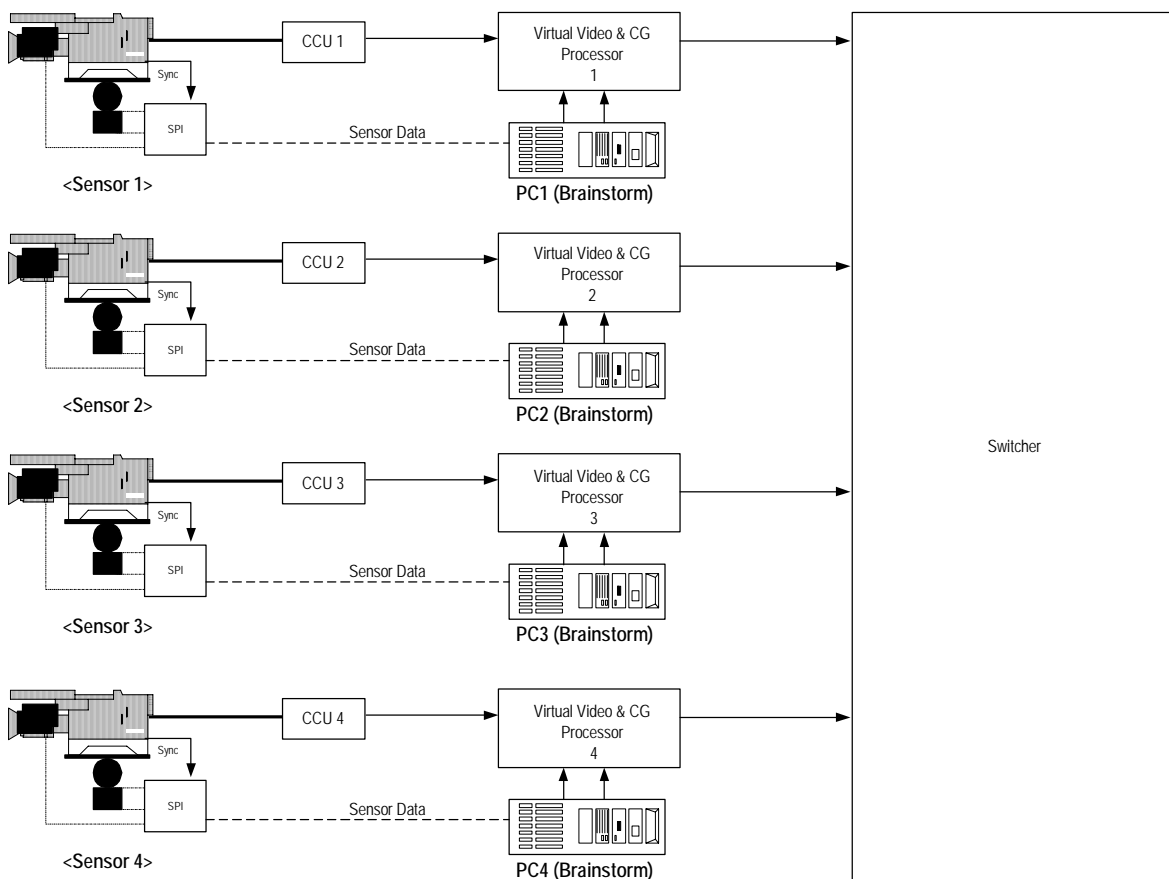
2-2. Hanabi Virtual Link System (Video)

Hanabi Virtual Link System enables configuration of a virtual studio at low cost using a small number of virtual video and CG processors (called hereafter the "virtual processors".).
An example of a virtual linkage system configuration using the Hanabi switcher and two virtual processors is shown below.
This system configuration has the following features.

● PGM and PVW virtual combine image systems are obtained, and switching can be made between two virtual cameras using "Dissolve".
● Camera operator previews must be fed from the PGM or NEXT output.

2-2-1. Using External Chromakey

The basic configuration operates in the following way.

1) The selected camera input signals are sent to AUX1 and AUX2 respectively.
2) The AUX1 and AUX2 outputs go to camera inputs of the virtual processors.
3) CG generation and CK/DSK combining are performed within the virtual processors and returned to the Hanabi switcher.

HANABI Virtual Link System (Video)
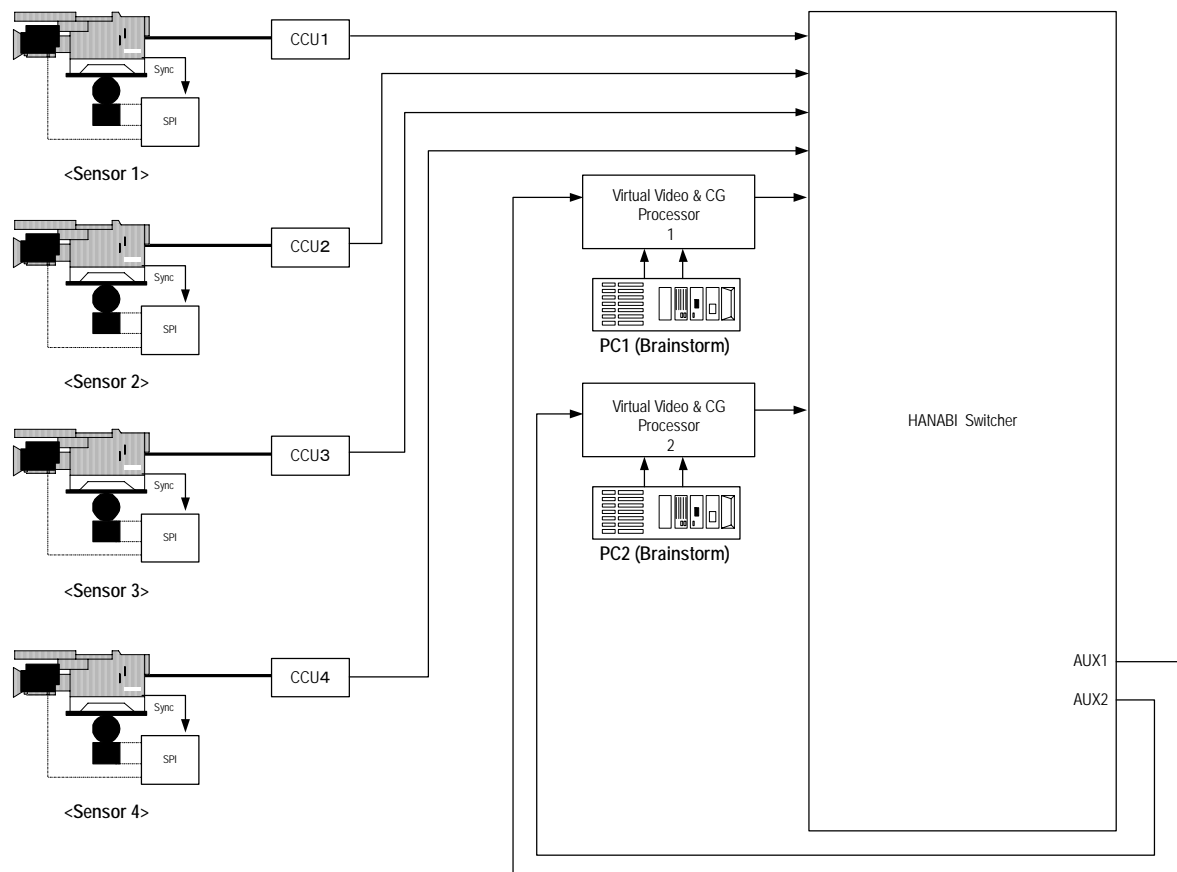
2-2-2. Using Internal Chromakey

The basic configuration operates in the following way.

1) The selected camera input signal is sent to AUX1.
2) The AUX1 output is looped back to the Hanabi switcher to use as a chromakey source video.
3) The CG input from the virtual processor and the CK are combined within the virtual processors

HANABI Virtual Link System (Video)
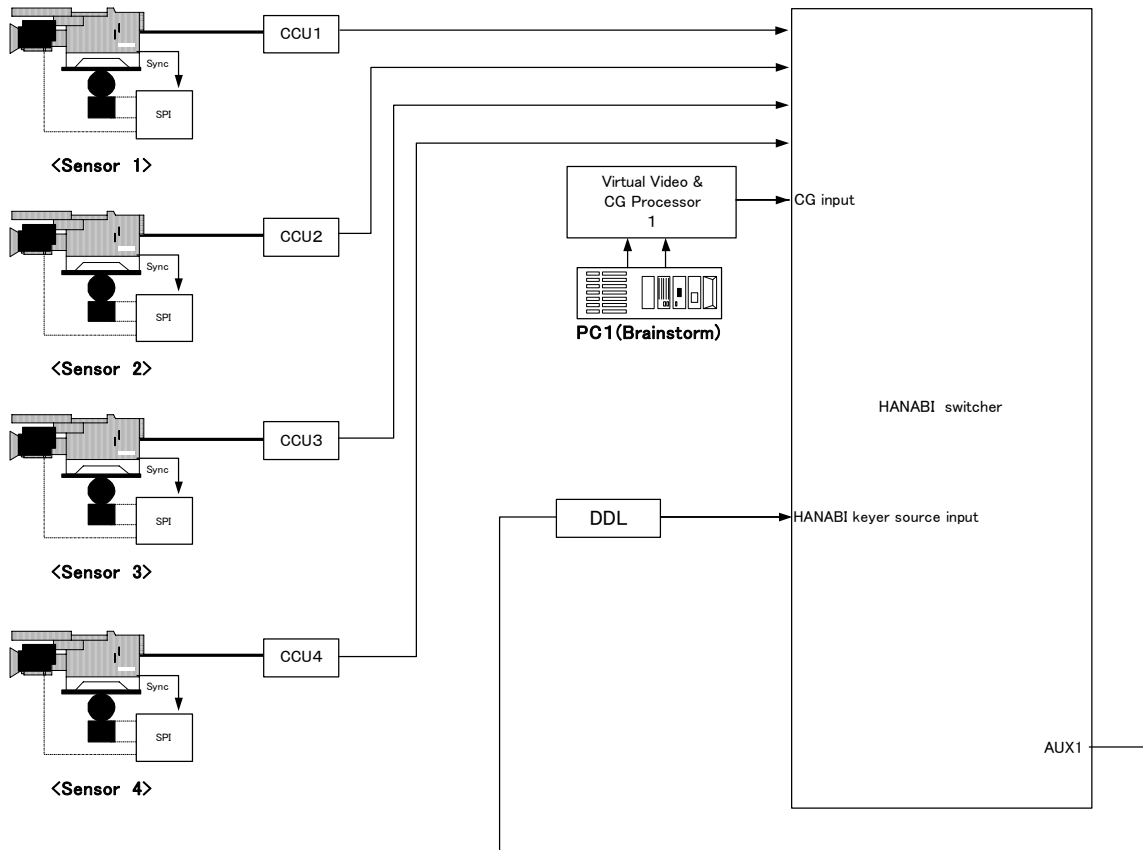
＊Only one Hanabi chromakeyer is available in this system

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2-3. Hanabi Virtual Link System (Sensor)

In the virtual studio, CG is constantly linked to the camera. As a result, CG must be switched in synchronization with camera switching by the Hanabi switcher. Therefore, the following functions are necessary.

- The Hanabi switcher must output the tally data.
- In the virtual system the camera data should be switched when the tally data is received.

Switching of the camera data is performed by DSC-100/200. The DSC-100/200 and Hanabi switcher communicate over an RS422 connection for realizing the functions above.

HANABI Virtual Link System (Video + Sensor)

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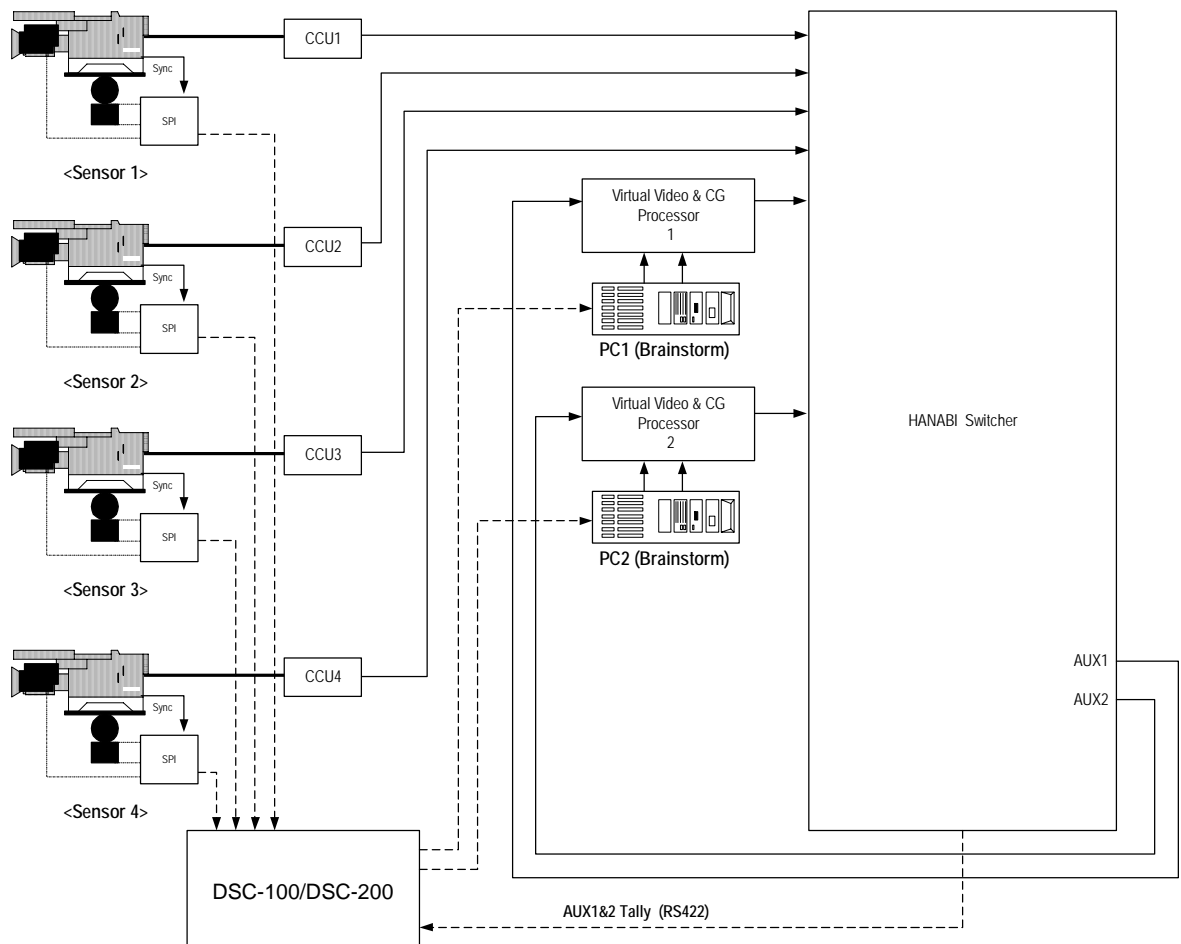
2-4. Usage and Ease of Operation Resembling Regular Systems

2-4-1. Virtual Line

In Chapter 2-2, "Hanabi Virtual Link System (Video)," the basic configuration of the virtual system was presented as shown below.

1) The virtual processor is selected using the M/E Xpts.
2) AUX1 and AUX2 select camera signals.
3) When using internal chromakey, Chromakey ON/OFF setting is controlled by the virtual system.

The switcher must also handle elements besides the virtual elements, and so the load is larger. Also, the tally requires a logic circuit between AUX1/2 and M/E bus, and this gives the system added complexity.

In the Hanabi switcher, the concept of the **Virtual Line** was introduced to provide easier operation. The Hanabi switcher already has available signal sources within it: IN01 to IN28, STILL1 to STILL4, and MATT. The Virtual Link software allows the user to add more 16 sources called Virtual Line: VR01 to VR016. (See the framed section in the figure below). When **VR01 to VR16** is selected, the following operations are performed automatically.

1) The AUX buses select camera signals.
2) The M/E buses select virtual sources.
3) The keyer is set to ON or OFF and the chromakey data is switched corresponding to the selected camera when the Hanabi built-in chromakey is used.
4) The related tally output is generated.

The concept of the **Virtual Line** enables virtual linkage by simply selecting a crosspoint of the M/E using regular operation.

External CK is used in the HANABI Virtual Link System (VIRTUAL LINE / COMPONENTS)
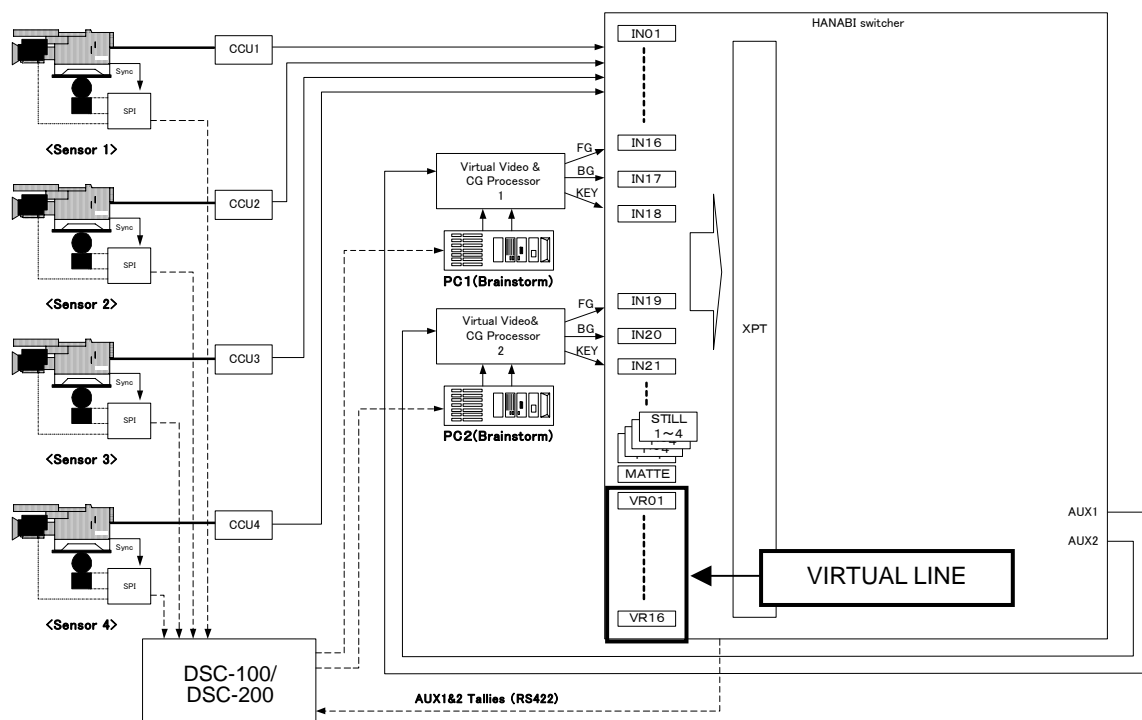
2-4-2. Virtual Component / Dummy XPT

To realize the Virtual Line concept, the function module which generates the virtual video is managed under the name **Virtual Component** in the Hanabi switcher. The **Virtual Component** requires the following settings.

- What type is this module?
  (Whether the Hanabi built-in chromakey is used or not.)
- What is the delay when passing through this module?
- How is this module assigned and managed in the Hanabi switcher?

Fewer **VIRTUAL COMPONENTS** in the system results in more operating restrictions. For example, what happens when the following selections are made in a system with two virtual processors?

- VR01 is selected in the M/E2-A bus
- VR02 is selected in the M/E2-B bus
- VR03 is selected in the M/E1-A bus
- VR04 is selected in the M/E1-B bus

Four different virtual sources are selected, but these selections are not possible since there are only two virtual processors in this virtual system. In this case, the **Priority** for each bus should be determined. If the priority for M/E2 is set higher, for example, some other signal (in most cases, raw camera video) must be output from M/E1 so that the virtual video is output from M/E2. This "some other signal assignment" is called **Dummy XPT (Crosspoint)**.

HANABI Virtual Link System (VIRTUAL Components & DUMMY XPTs)
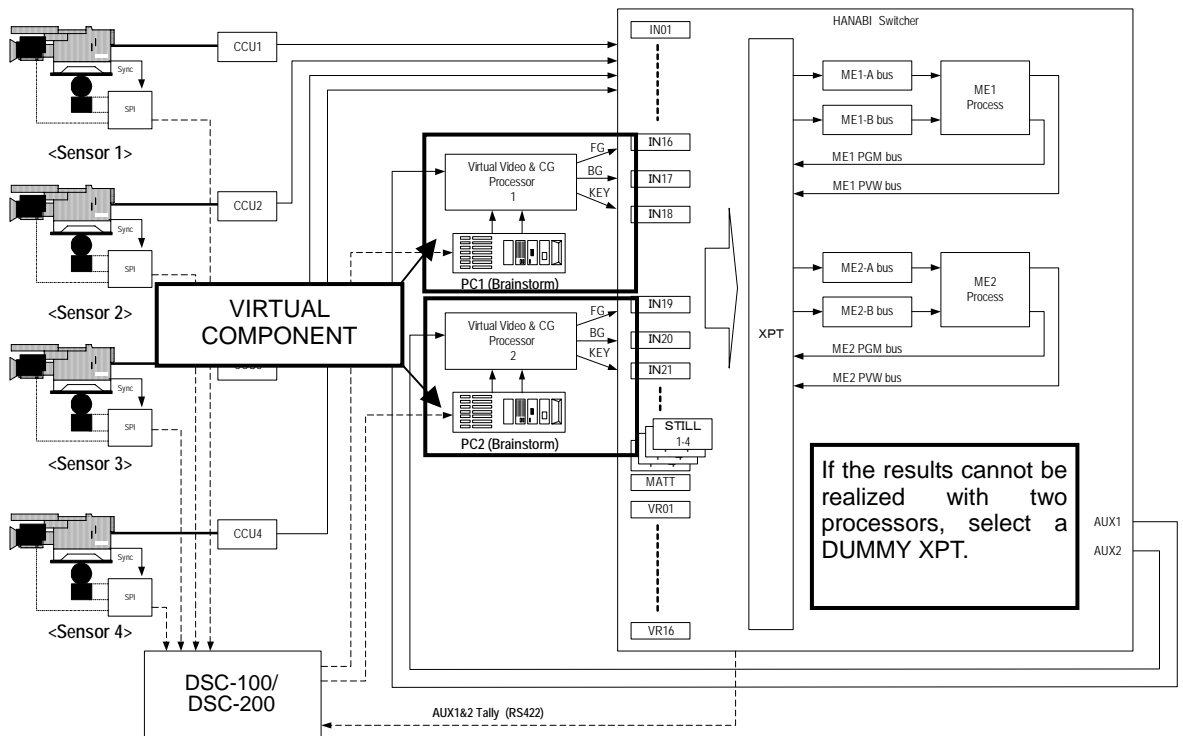
2-4-3. Camera Number and Tally Data (Serial Tally)

During studio operation, numbers are normally assigned to each camera. These camera numbers and their usage may change from program to program.
In the Virtual System, both the camera video and sensor wiring must be taken into account. It is more convenient if these changes can be made by the software rather than by the actual wiring. To realize this, Hanabi Virtual Link System prepares the virtual system setup menu in the Hanabi switcher where **Virtual Camera Numbers** can be set.

● The camera " X " actually uses sensor " Y " through the IN " Z " signal.

These types of setting changes can only be made using the software.

In this case, the **Tally Data (serial tally)** determines which sensor is used. The tally data that is set here is sent to DSC-100/200, and the sensor data is switched in synchronization with the video.

2-4-4. Virtual Crosspoint

Finally, the actual wiring, camera numbers mentioned before, and the virtual concept known as the Component need to be linked together. The **Virtual XPT (Crosspoint)** is used to make these settings. It makes the following settings.

● Is the IN " X " signal for camera? Is it a Virtual Component? Is it a signal unrelated to the virtual system?
● Is AUX " Y " assigned to the Virtual Component?
● Which serial tally is related to which Virtual Component?

Thus, the Virtual XPT can be considered to define the wiring on the hardware system.

3. Select a Virtual System Preset

The Hanabi Virtual Link System prepares six system setup presets of the Virtual System (up to four cameras) for configuring the virtual system quickly and easily. Select and use a preset according to your system needs.
This chapter explains the details of each preset, how to select a virtual preset and how to complete the system setup with the preset. After applying the preset, you can manually customize the preset setup suitable for your system by using other VIRTUAL menus. (See 4. "Virtual System Manual Setup".)

3-1. Select a Preset in the Virtual Menu

1) Press the FUNC button in the Menu Select section. The FUNCTION SETUP menu opens.

2) Turn F1 to select VIRTUAL and then press F1. The VIRTUAL top menu as shown below opens.

```
FUNCTION  --------      VIRTUAL    -- -- -- -- -- --
  1.SYSTEM          6.STANDARD
  2.LINE
  3.CAMERA
  4.COMPONENT
  5.CROSS POINT
  SELECT
     6
```

3) Turn F1 to select STANDARD and then press F1. The VIRTUAL - STANDARD menu as shown below opens.

```
FUNCTION VIRTUAL  ----  STANDARD  -------------
  1. VCG CAM x 4 COMP x 1 BUS=M/E1   CK=INT
  2. VCG CAM x 4 COMP x 1 BUS=M/E1/2 CK=INT
  3. VCG CAM x 4 COMP x 1 BUS=M/E1   CK=EXT
  4. VCG CAM x 4 COMP x 1 BUS=M/E1/2 CK=EXT
  5. RCG CAM x 4 COMP x 1 BUS=M/E1   CK=INT
  PATT
     1
```

4) Six virtual presets are available. (See section 3-2 "Details of Virtual Preset1-6" for details about each preset.) Turn F1 to select a preset and then press F1. A beep sound will be heard and the settings will be loaded to the swithcer.

5) Reboot your Hanabi swithcer MU.

6) See Virtual Preset1-6 in section 3-2."Details of Virtual Preset1-6" for how to configure the system and finish the setup. See section 3-2-8."List of Virtual Preset Setting Values" for the preset values of each preset.

3-2. Details of Virtual Preset1-6

3-2-1. Virtual Preset 1

VCG CAM×4 COMP×1 BUS=M/E1 CK=INT

Preset1 is used to create a full virtual video, such as a person appeared in the computer graphics background by using a chromakey as shown below. The chromakey feature (KEY2) on the Hanabi switcher is used for combining video images.

Input the BKGD image (CG) to INPUT5.

Use KEY2 to display the chromakey image (camera1-4) on the CG. Switch the camera (chromakey) image with the M/E bus buttons 1-4.

Virtual composite image
(Switcher PGM out of M/E1 bus)

- The virtual composite video is assigned only to the M/E1 bus. If you want to use the virtual composite video in the M/E2 bus, use the M/E re-entry feature.
- The Virtual Line 1 to 4 are assigned to (Camera 1 to 4) the bus button 1 to 4 respectively

System Setup Procedure

1) Make input and output signal connections of the system as shown in the table below.

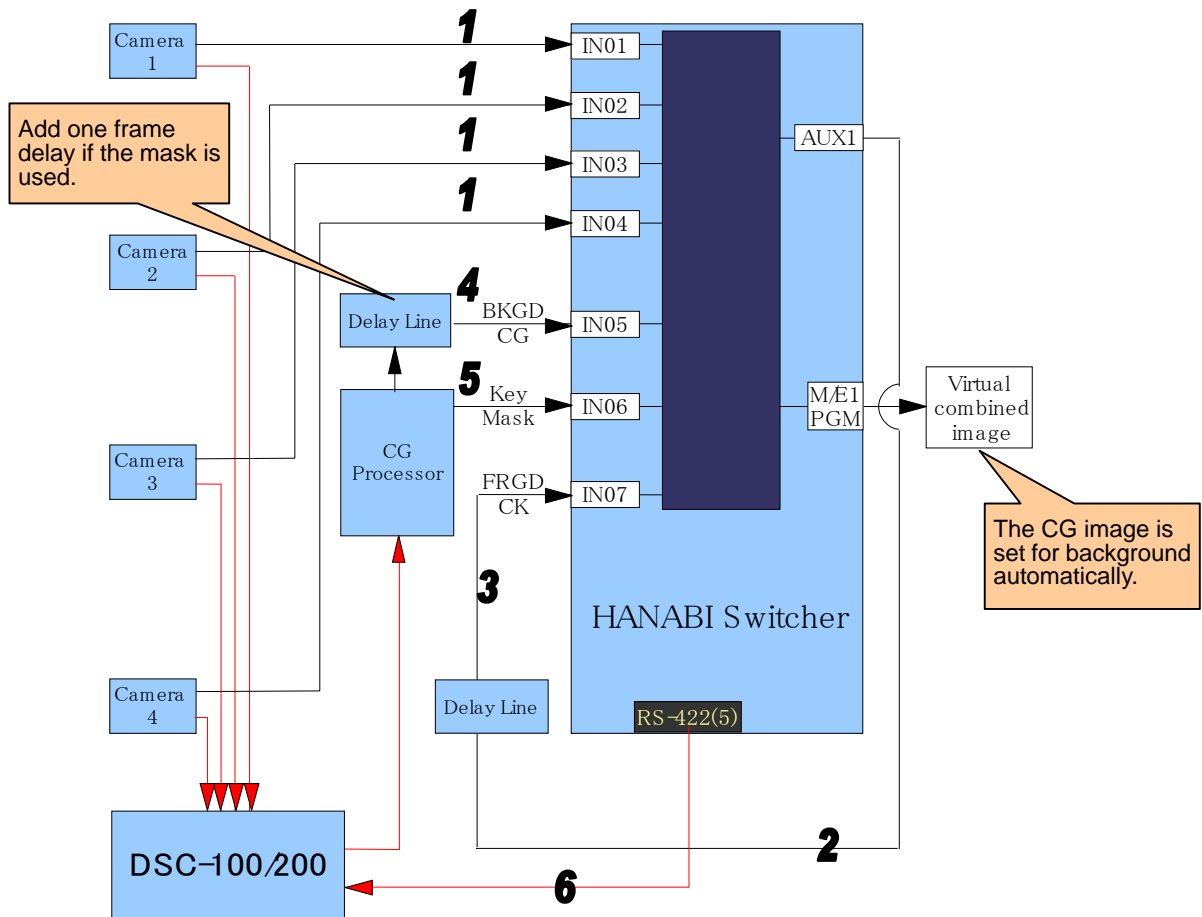| No.	Signal	Description	Switcher connection		Bus Assignment	
			Switcher side (Connector)	Destination	Signal name	Bus button
1	CAM1 to 4	Live camera signals used as virtual lines.	INPUT1 INPUT2 INPUT3 INPUT4	Camera 1 Camera 2 Camera 3 Camera 4	VR01 VR02 VR03 VR04	1 2 3 4
2	Camera image sent to Delay Line	Selected camera image used for virtual composition. A delay time will be added to it for compensating CG rendering time.	AUX1	Delay Line In	-	-
3	CK source video	Delayed camera image. This image becomes the foreground of virtual composite image by chromakeying.	INPUT7	Delay Line Out	IN07	-
4	CG Fill for composite video	Computer graphics image (key fill video) generated in the CG processor. This image becomes the background of virtual composite image.	INPUT5	CG Processor Out (Fill)	IN05	-
5	CG Key for composite video (*See below)	Computer graphics image (key cut video) generated in the CG processor. This image is used for the garbage mask key of virtual composite image.	INPUT6	CG Processor Out (Key)	IN06	-
6	VTALY	Camera tally signal to be sent to the CG processor via RS-422.	RS422 Port 5	HVS-TALLY port of DSC-100/ 200	-	-

*   When using garbage mask, **CG Key** (garbage mask signal) must be **advanced by one frame** from CG Fill by adding a delay to the CG fill signal.

Camera 1 → IN01
Camera 2 → IN02
→ IN03
→ IN04

Add one frame delay if the mask is used.

Delay Line → BKGD CG → IN05
CG Processor → Key Mask → IN06
→ FRGD CK → IN07

AUX1

M/E1 PGM → Virtual combined image

The CG image is set for background automatically.

HANABI Switcher

RS-422(5)

Delay Line

DSC-100/200

2) Select `VCG CAM×4 COMP×1 BUS=M/E1 CK=INT` in the VIRTUAL - STANDARD menu. Press `F1` to apply Virtual Preset 1 to the switcher.

3) Reboot the switcher (MU).

4) Once the preset is applied to the switcher, four cameras are assigned as virtual lines. If you use three or less cameras, the fourth camera or more should be unassigned. (Refer to section 3-2-7. "Additional Setting".)

5) The delay time for matching virtual link timing varies by the CG processor rendering time. Check your system and set the suitable delay time at the `DELAY` item in the VIRTUAL - COMPONENTmenu. (See section 4-6. Virtual Component Setting".)

6) If you want to use garbage mask, make the setup for KEY2 and KEY3 as shown below.
   KEY2 MASK TYPE: KEY3_A
   KEY2 MASK INVERT: ON
   KEY3 SOURCE SIGNAL: IN06

7) Press the bus button `1` on the M/E1 bus to send the virtual line video to the PGM out, display KEY2 on it and adjust the chromakey. Repeat the same procedure for the remaining virtual line video by pressing `2` to `4` respectively on the M/E1 bus.

8) If you want to change settings manually in addition to this setup, refer to section 4. "Virtual System Manual Setup."

3-2-2. Virtual Preset 2

VCG CAM×4 COMP×1 BUS=M/E1/2 CK=INT

The setup setting of **Preset 2** is **almost the same as** that of **Preset 1**. However the virtual processing can be also performed on the M/E2 bus directly. (Note that only one virtual composite image can be processed at the same time in both M/E1 and M/E2 because there is only one CG processor in the system.)

● Adjust the chromakey by pressing the bus button 1 on the M/E1 bus to send the virtual line video to the PGM out and displaying KEY2 on it. Repeat the same procedure for the remaining virtual line video (bus button 2 to 4). Repeat the same procedure in the M/E2 bus.
● Other system setup procedure is **same as** that of **Preset 1**.

3-2-3. Virtual Preset 3

VCG CAM×4 COMP×1 BUS=M/E1 CK=EXT

Preset3 is used to create a full virtual video by using a chromakey same as Preset1. However, the chromakey feature on a virtual processor such as the VRP series processor is used for combining video images.

● The virtual composite video is assigned only to the M/E1 bus. If you want to use the virtual composite video in the M/E2 bus, use the M/E re-entry feature.
● The Virtual Line 1 to 4 are assigned to (Camera 1 to 4) the bus button 1 to 4 respectively
● The chromakey is adjusted in the virtual processor.
● The same chromakey adjustment is used for all camera images (1 to 4) in this system.
● The virtual composition is performed in the virtual processor.

System Setup Procedure
1) Make input and output signal connections of the system as shown in the table below.

No.	Signal	Description	Switcher connection		Bus Assignment	
			Switcher side (Connector)	Destination	Signal name	Bus button
1	CAM1 to 4	Live camera signals used as virtual lines.	INPUT1 INPUT2 INPUT3 INPUT4	Camera 1 Camera 2 Camera 3 Camera 4	VR01 VR02 VR03 VR04	1 2 3 4
2	Camera image for virtual composition	Selected camera image used for virtual composition.	AUX1	Camera IN of the virtual processor such as VRP.	-	-
3	Virtual composite image	Virtual composite image sent from the virtual processor such as VRP.	INPUT5	Mixed image OUT of the virtual processor such as VRP.	IN05	-
4	VTALY	Camera tally signal to be sent to the CG processor via RS-422.	RS422 Port 5	HVS-TALLY port of DSC-100/200	-	-

2) Select VCG CAM×4 COMP×1 BUS=M/E1 CK=EXT in the VIRTUAL - STANDARD menu. Press F1 to apply Virtual Preset 3 to the switcher.

3) Reboot the switcher (MU).

4) Once the preset is applied to the switcher, four cameras are assigned as virtual lines. If you use three or less cameras, the fourth camera or more should be unassigned. (Refer to section 3-2-7. "Additional Setting".)

5) The delay time for matching virtual link timing varies by the CG processor rendering time. Check your system and set the suitable delay time at the DELAY item in the VIRTUAL - COMPONENT menu. (See section 4-6. Virtual Component Setting".)

6) If you want to change settings manually in addition to this setup, refer to section 4. "Virtual System Manual Setup."
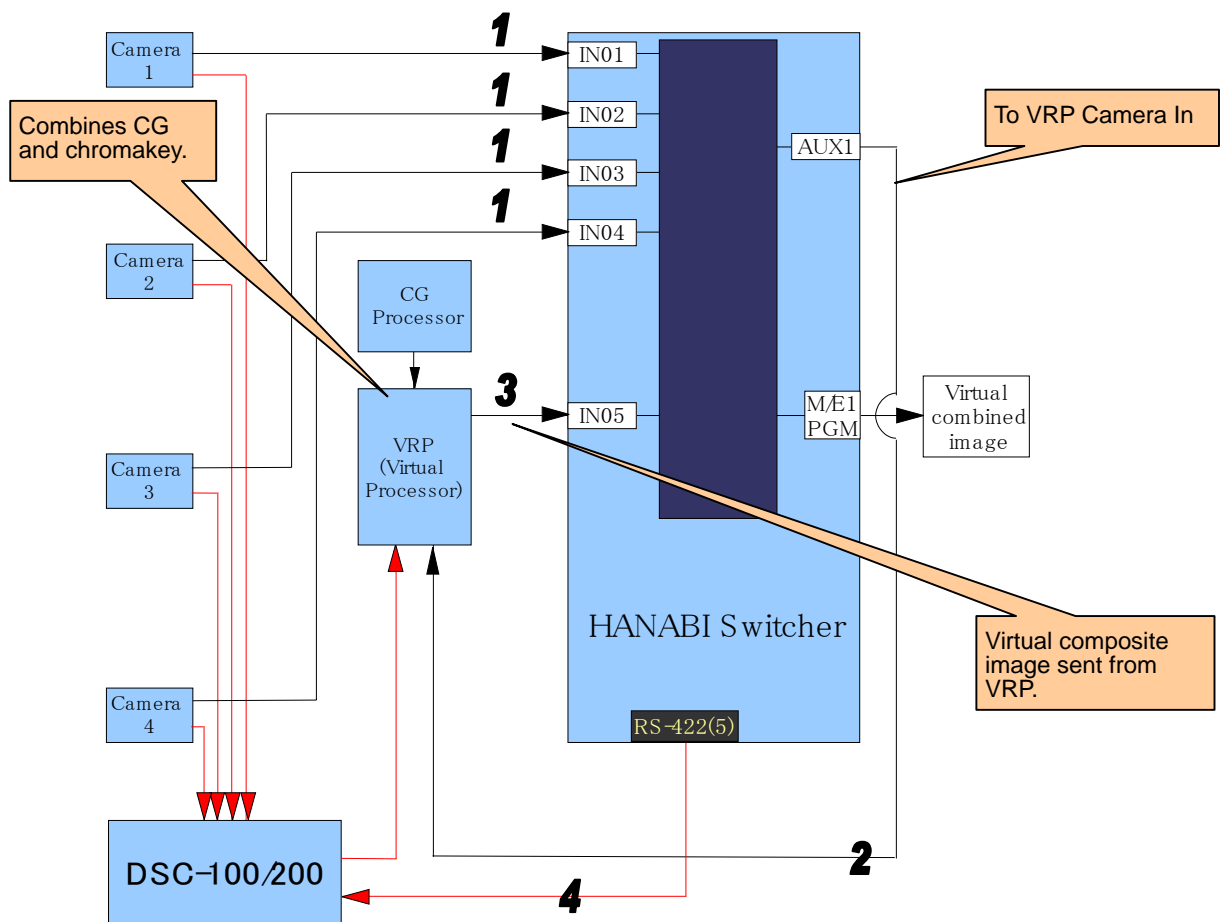
3-2-4. Virtual Preset 4

CG CAM×4 COMP×1 BUS=M/E1/2 CK=EXT

The setup setting of **Preset 4** is **almost the same as** that of **Preset 3**. However the virtual processing can be also performed on the M/E2 bus directly. (Note that only one virtual composite image can be processed at the same time in both M/E1 and M/E2, because there is only one CG processor in the system.)

● System setup procedure is **same as** that of **Preset 3**.

3-2-5. Virtual Preset 5

CG CAM×4 COMP×1 BUS=M/E1   CK=INT

Preset5 is used to create a virtual video in real-time computer graphics (RCG) mode, such as a computer-generated plane graphic (line, circle or arrow, for example) overlaid on a live camera feed. The keyer (KEY2) on the Hanabi switcher is used for downstream keying.

Background video is the delayed camera image.

Use KEY2 (CG image) to display the circle.

Virtual composite image
(Switcher PGM out of M/E1 bus)

● The virtual composite video is assigned only to the M/E1 bus. If you want to use the virtual composite video in the M/E2 bus, use the M/E re-entry feature.
● The Virtual Line 1 to 4 are assigned to (Camera 1 to 4) the bus button 1 to 4 respectively

System Setup Procedure

1) Make input and output signal connections of the system as shown in the table below.

No.	Signal	Description	Switcher connection		Bus Assignment	
			Switcher side (Connector)	Destination	Signal name	Bus button
1	CAM1 to 4	Live camera signals used as virtual lines.	INPUT1 INPUT2 INPUT3 INPUT4	Camera 1 Camera 2 Camera 3 Camera 4	VR01 VR02 VR03 VR04	1 2 3 4
2	Camera image sent to Delay Line	Selected camera image used for virtual composition. A delay time will be added to it for compensating CG rendering time.	AUX1	Delay Line In	-	-
3	CG Fill for composite video	Computer graphics image (key fill video) generated in the CG processor. This image becomes the foreground (KEY2 Insert) of virtual composite image.	INPUT5	CG Processor Out (Fill)	IN05	-
4	Camera image for composite video	Delayed camera image. This image becomes the background of virtual composite image.	INPUT7	Delay Line Out	IN07	-
5	CG Key for composite video	Computer graphics image (key cut video) generated in the CG processor. This image becomes the foreground (KEY2 Source) of virtual composite image.	INPUT6	CG Processor Out (Key)	IN06	-
6	VTALY	Camera tally signal to be sent to the CG processor via RS-422.	RS422 Port 5	HVS-TALLY port of DSC-100/ 200	-	-

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2) Select CG CAM×4 COMP×1 BUS=M/E1 CK=INT in the VIRTUAL - STANDARD menu. Press F1 to apply Virtual Preset 5 to the switcher.

3) Reboot the switcher (MU).

4) Once the preset is applied to the switcher, four cameras are assigned as virtual lines. If you use three or less cameras, the fourth camera or more should be unassigned. (Refer to section 3-2-7. "Additional Setting".)

5) Press the desired button (1 to 4) on the M/E1 bus to send the virtual line video to the PGM out and display KEY2 on it respectively.

6) The delay time for matching virtual link timing varies by the CG processor rendering time. Check your system and set the suitable delay time at the DELAY item in the VIRTUAL - COMPONENTmenu. (See section 4-6. Virtual Component Setting".)

7) If you want to change settings manually in addition to this setup, refer to section 4. "Virtual System Manual Setup."
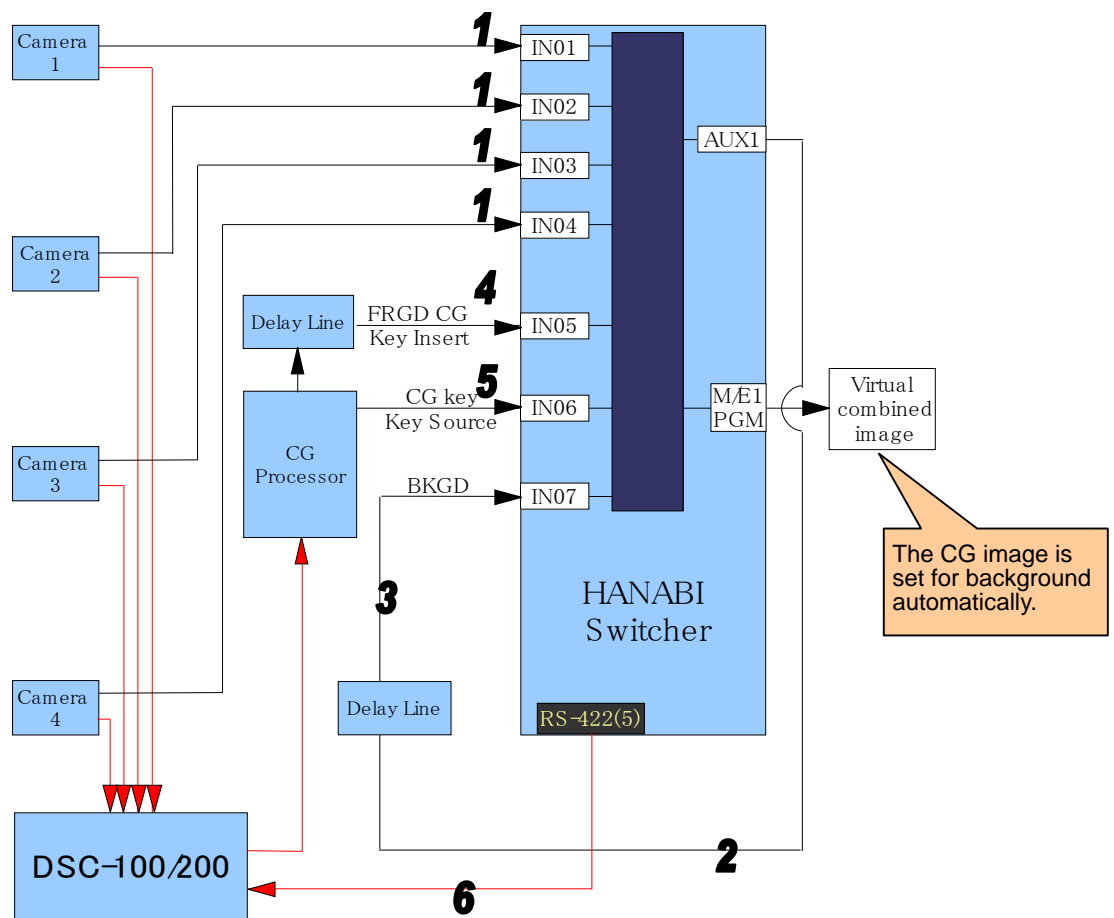
3-2-6. Virtual Preset 6

CG CAM×4 COMP×1 BUS=M/E1/2 CK=INT

The setup setting of **Preset 6** is **almost the same as** that of **Preset 5**. However the virtual processing can be also performed on the M/E2 bus directly. (Note that only one virtual composite image can be processed at the same time in both M/E1 and M/E2, because there is only one CG processor in the system.)

● System setup procedure is **same as** that of **Preset 5**.

3-2-7. Additional Setting

If you have selected a desired preset from **Virtual Preset1 to 6**, the preset setting has applied to your system following the procedure in the previous sections and your system has four cameras, your virtual standard setup is now finished.
If your system has three or less cameras, make the additional settings as shown below.

■ VIRTUAL - LINE Menu Setting

Once **Virtual Preset** is applied to the switcher, the ENABLE item for LINE NO VR01 to VR04 (corresponding to Camera 1 to 4) in the VIRTUAL - LINE menu are all changed to ON. Leave the ENABLE item to ON for the cameras used in the system and set to OFF for the cameras not used in the system. (See section 4-4-2. "Virtual Line Advanced Setting" and section 3-2-8."List of Virtual Preset Setting Values".)
For example, if you have two cameras, leave ENABLE to ON for VR01 and VR02 and change to OFF for VR03 and VR04. (See section 4-4-2. "Virtual Line Advanced Setting" and section 3-2-8. "List of Virtual Preset Setting Values".)

Ex.) If your system has two cameras:

■ OU SETUP - BUS ASSIGN Menu Setting

Once **Virtual Preset** is applied to the switcher, VR01 to VR04 are assigned to the bus buttons 1 to 4 respectively. Change the virtual line bus assignment for the camera inputs not used in the system.
For example, if you have two cameras, change the bus assignment of Button 3 and Button 4 to other signals such as IN03 and IN04.
(See section 4-9."Assignment of Virtual Line to M/E Bus Button.")

Ex.) If your system has two cameras:

3-2-8. List of Virtual Preset Setting Values

■ VIRTUAL - SYSTEM menu

Preset1 - Preset6		
ENABLE	DELAY	DUMMY XPT
ON	0	BLAK

PRIORITY	
NO	BUS
1	M2PGM
2	M2PST
3	M1PGM
4	M1PST

■ VIRTUAL - LINE menu

Preset1 / Preset2							
NO	ENABLE	DUMMY XPT	CAMERA	EXT COMPO		INT COMPO	
				TYPE	SELECT	TYPE	SELECT
VR01	ON	IN01	1	DL--CG	BG	--CK--	FG
VR02	ON (*1)	IN02	2	DL--CG	BG	--CK--	FG
VR03	ON (*1)	IN03	3	DL--CG	BG	--CK--	FG
VR04	ON (*1)	IN04	4	DL--CG	BG	--CK--	FG
VR05-16	OFF	BLAK	1	DLCKCG	BG	OFF	OFF

Preset3 / Preset4							
NO	ENABLE	DUMMY XPT	CAMERA	EXT COMPO		INT COMPO	
				TYPE	SELECT	TYPE	SELECT
VR01	ON	IN01	1	DLCKCG	BG	OFF	OFF
VR02	ON (*1)	IN02	2	DLCKCG	BG	OFF	OFF
VR03	ON (*1)	IN03	3	DLCKCG	BG	OFF	OFF
VR04	ON (*1)	IN04	4	DLCKCG	BG	OFF	OFF
VR05-16	OFF	BLAK	1	DLCKCG	BG	OFF	OFF

Preset5 / Preset6							
NO	ENABLE	DUMMY XPT	CAMERA	EXT COMPO		INT COMPO	
				TYPE	SELECT	TYPE	SELECT
VR01	ON	IN01	1	DL--CG	FG	--CK--	BG
VR02	ON (*1)	IN02	2	DL--CG	FG	--CK--	BG
VR03	ON (*1)	IN03	3	DL--CG	FG	--CK--	BG
VR04	ON (*1)	IN04	4	DL--CG	FG	--CK--	BG
VR05-16	OFF	BLAK	1	DLCKCG	BG	OFF	OFF

(*1) Set to OFF for the unused lines if your system has three or less cameras.

■ VIRTUAL - CAMERA menu

Preset1 - Preset6	
NO	TALLY DATA
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

■ VIRTUAL - COMPONENT menu

Preset1

EXT/INT	NO	TYPE	DELAY	ASSIGN	
				TYPE	SHARE
EXT	1	DL--CG	6	FR1ALL	NON
EXT	2-16	OFF	0	FR ALL	ALL
INT	1	--CK--	2	FR1ALL	NON
INT	2	OFF	2	FR2ALL	NON

Preset2

EXT/INT	NO	TYPE	DELAY	ASSIGN	
				TYPE	SHARE
EXT	1	DL--CG	6	FR ALL	BUS
EXT	2-16	OFF	0	FR ALL	ALL
INT	1	--CK--	2	FR1ALL	NON
INT	2	--CK--	2	FR2ALL	NON

Preset3

EXT/INT	NO	TYPE	DELAY	ASSIGN	
				TYPE	SHARE
EXT	1	DLCKCG	6	FR1ALL	NON
EXT	2-16	OFF	0	FR ALL	ALL
INT	1	OFF	2	FR1ALL	NON
INT	2	OFF	2	FR2ALL	NON

Preset4

EXT/INT	NO	TYPE	DELAY	ASSIGN	
				TYPE	SHARE
EXT	1	DLCKCG	6	FR ALL	ALL
EXT	2-16	OFF	0	FR ALL	ALL
INT	1	OFF	2	FR1ALL	NON
INT	2	OFF	2	FR2ALL	NON

Preset5

EXT/INT	NO	TYPE	DELAY	ASSIGN	
				TYPE	SHARE
EXT	1	DL--CG	4	FR1ALL	NON
EXT	2-16	OFF	0	FR ALL	ALL
INT	1	--CK--	2	FR1ALL	NON
INT	2	OFF	2	FR2ALL	NON

Preset6

EXT/INT	NO	TYPE	DELAY	ASSIGN	
				TYPE	SHARE
EXT	1	DL--CG	4	FR ALL	BUS
EXT	2-16	OFF	0	FR ALL	ALL
INT	1	--CK--	2	FR1ALL	NON
INT	2	--CK--	2	FR2ALL	NON

■ VIRTUAL - CROSSPOINT menu

Preset1 / Preset2 / Preset5 / Preset6

INPUT				AUX			SERIAL TALLY	
NAME	TYPE	NAME		NAME	DESTINATION		NAME	COMP
IN01	CAM	1		AUX01	COMPO	COMPO1	VR1-1	1
IN02	CAM	2		AUX02-10	OFF	----	VR1-2	1
IN03	CAM	3					VR2-1	OFF
IN04	CAM	4					VR2-2	OFF
IN05	BG	1						
IN06	KEY	1						
IN07	FG	1						
IN08-16	OFF	----						

Preset3 / Preset4

INPUT				AUX			SERIAL TALLY	
NAME	TYPE	NAME		NAME	DESTINATION		NAME	COMP
IN01	CAM	1		AUX01	COMPO	COMPO1	VR1-1	1
IN02	CAM	2		AUX02-10	OFF	----	VR1-2	1
IN03	CAM	3					VR2-1	OFF
IN04	CAM	4					VR2-2	OFF
IN05	OFF	----						
IN06	OFF	----						
IN07	BG	1						
IN08-16	OFF	----						

4. Virtual System Manual Setup

The Hanabi Virtual Link System has great flexibility to allow users to make virtual setup in any systems by using VIRTUAL 1 to 5 menus in the Hanabi switcher.

4-1. Access to Virtual Setting Menu

The menu for making the switcher virtual system settings can be accessed by the following procedure.

1) Press the FUNC button in the menu select section. The FUNCTION SETUP menu opens.

2) Turn F1 to select VIRTUAL and then press F1. The VIRTUAL top menu as shown below opens. Use VIRTUAL 1 to 5 menus for manual setup.

```
FUNCTION _ _ _ _ _ _ _ _    VIRTUAL   _ _ _ _ _ _ _ _ _ _ _ _ _
 1.SYSTEM             6.STANDARD
 2.LINE
 3.CAMERA
 4.COMPONENT
 5.CROSS POINT
  SELECT
     1
```
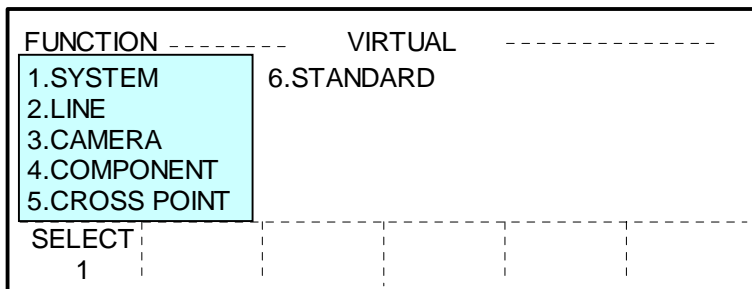
4-2. Menu Overview

The concepts described in Chapter 2, "Basics of Hanabi Virtual Link System," are provided in the following menu format.

◆ Virtual System Setup Menu
1) SYSTEM menu
   ● Enables/Disables Virtual Link.
   ● Sets bus priority.

2) LINE menu
   ● Select a camera to be used.
   ● Sets a signal for Dummy XPT.
   ● Selects virtual component type and signal.

3) CAMERA menu
   ● Select a camera tally data.

4) COMPONENT
   ● Select a virtual component and sets its type.
   ● Sets the virtual component delay.
   ● Selects virtual components to the Hanabi M/E bus and sets their signal sharing method.

5) CROSSPOINT
   ● Sets input signal type by selecting from camera raw video, virtual component or other no virtual related signal.
   ● Selects AUX buses used for virtual component signal output
   ● Sets which virtual component uses which tally data.

4-3. Virtual System Menu

In this menu, the basic settings are made for the Virtual System.

```
FUNCTION VIRTUAL  --  SYSTEM  ------------------
 ENABLE  DELAY  DAMMY
                 XPT
   ON      0    BLACK

  PRIORITY
 NO    BUS
  1   M1ABUS
```

Parameter		Setting Range	Description
ENABLE		ON/OFF	Enables/Disables Virtual Link.
DELAY		0 to 10	Sets an overall delay needed for virtual link.
			A DELAY setting is also provided in the VIRTUAL COMPONENT menu (to be described later). If the delay of the VIRTUAL SYSTEM menu is set to "0", the delay setting in the VIRTUAL COMPONENT menu is used. Otherwise, the delay setting of the VIRTUAL SYSTEM menu is used. Normally, make delay setting at the VIRTUAL COMPONENT menu, leaving the delay at the VIRTUAL SYSTEM menu to "0."
DUMMY XPT		Signal names set in the INPUT menu of MU SETUP	Sets an overall Dummy XPT signal.
			A DUMMY XPT setting is also provided in the VIRTUAL LINE menu (to be described later). If a signal is not defined in the VIRTUAL LINE menu, the DUMMY XPT setting of this menu is used.
			* When the Virtual Link is enabled in the Hanabi switcher, alternative signal is required instead of the real virtual signal because of the limited system configuration. Dummy XPT is used for this alternative signal assignment.
PRIORITY	NO	1 to 4	When each bus vies for limited Virtual Components during virtual operation, this sets which bus has priority when displayed.
	BUS	M1ABUS M1BBUS M1PGM M1PST M2ABUS M2BBUS M2PGM M2PST	Selects two each from the M/E1 bus and the M/E2 bus, used for virtual component assignments under the "BUS" item and sets their priority under the "NO" item. The number 1 is given the highest priority. The following buses are available.
			Generally, the following settings are used. PRIORITY NO 1 = M2 PGM PRIORITY NO 2 = M2 PST PRIORITY NO 3 = M1 PGM PRIORITY NO 4 = M1 PST

4-4. Virtual Line Menu

The virtual signal stream for realizing virtual link in the Hanabi switcher is called the "**Virtual Line**" as described in the Chapter 2-4-1.

4-4-1. Virtual Line Name Setting

The Virtual Line can be handled as an input signal resource in the same way as the regular BLACK, IN01 to IN28, STILL1 to STILL4, and MATT signals, and names can be also assigned in the same way as other signals.
Signals are available from VR01 to VR16.

The name setting operation for Virtual Line is the same as the regular switcher operation.

1) Press the MU SETUP button to select the INPUT menu.
2) Use SIGNAL to make a selection from VR01 to VR16.
3) Press F2 to start changing the name of signal. The signal names must be one or two words of up to 4 characters. Change the name on a character-by-character basis. First, select a position to be changed by turning F2 at RENAME. And then select a character by turning F4 at CHARA. The names should be in alphabet, numbers and symbols (ASCII characters) only. To switch among alphabet, number and symbol inputs, press F3 under the CHANGE item.
4) After the input is finished, press F2 to confirm the changed name.

The name "VR1V" is given to the Virtual Line VR01 in the menu example below.

```
MUSETUP  --------    INPUT   -----------------
STL2    ┆ STL2          ┆ MATT1 ┆ MAT1
STL3    ┆ STL3          ┆ MATT2 ┆ MAT2
STL4    ┆ STL4          ┆ ME    ┆ ME
CB      ┆ CB            ┆ VR01  ┆ VR1V
WHITE   ┆ WHITE         ┆ VR02  ┆ VR2  LINE

 SIGNAL ┆RENAME┆CHANGE┆ CHARA ┆
  VR01  ┆  4   ┆ BIG  ┆  'V'  ┆
```

The Virtual Line can be selected as a signal in the MU SETUP - INPUT menu.
A total of 16 signals from VR01 to VR16 are available.

The names set here are used in all subsequent settings.

4-4-2. Virtual Line Advanced Setting

In this menu, the Virtual Line advanced settings are made.

```
FUNCTION VIRTUAL    LINE  -------------------
   LINE   ENABLE  DUMMY  CAMERA
   NO              XPT
   VR01    OFF     BLAK     1

   EXT COMPO          INT COMPO
  TYPE   SELECT     TYPE   SELECT
  DLCKCG   BG        OFF     OFF
```

Parameter		Setting Range	Description
NO		(Signal name)	Selects a virtual line by its signal name set in the INPUT menu.
ENABLE		ON/OFF	Enables/Disables the selected virtual line.
DUMMY XPT		(Signal name)	Sets a Dummy XPT signal used for the selected virtual line.
CAMERA		(Camera number)	Select a camera used in the selected virtual line by its number.
EXT COMPO	TYPE	DLCKCG DL--CG OFF	Designates the virtual external component type used for the selected virtual line. DLCKCG: Indicates the external chromakeyer is used. DL--CG: Indicates the internal chromakeyer is used.
	* SELECT	FG BG KEY OFF	Selects a signal assigned to the selected virtual line.
INT COMPO	TYPE	--CK-- OFF	Designates the virtual internal component (Hanabi built-in chromakeyer) type used for the selected virtual line. --CK-- Indicates the internal chromakeyer is used. OFF Indicates the external chromakeyer is used.
	* SELECT	FG BG KEY OFF	Selects a signal assigned to the selected virtual line.

* When using the Hanabi built-in chromakeyer, the SELECT settings for EXT COMPO and INT COMPO should be different. The signals set for FG, BG and KEY corresponds to the settings set for FG, BG and KEY at the INPUT item in the VIRTUAL CROSSPOINT menu.

4-5. Virtual Camera Setting

In this menu, the Virtual Camera settings are made.

```
FUNCTION VIRTUAL --- CAMERA ----------------
    NO    TALLY
          DATA
    1       0
    ----------------------------------------
```

Parameter	Setting Range	Description
NO	1 to 8 (Camera No.)	Selects a virtual camera by its number.
TALLY DATA	0 to 15	Selects the tally data corresponding to the selected camera. This tally data is sent to the camera sensor data control processor (DSC-100/200) where the sensor data is switched in synchronized with the tally.

4-6. Virtual Component Setting

In this menu, the Virtual Component settings are made.

```
FUNCTION  VIRTUAL -- COMPONENT --------------
    EXT     NO.    TYPE   DELAY      ASSIGN
    /INT                           TYPE   SHARE
    EXT      1    DLCKCG    0       FR A    BUS
    ----------------------------------------
```

Parameter		Setting Range	Description
EXT/INT		EXT, INT	Selects INT(internal component) or EXT(external component).
NO	EXT/INT = EXT	1-16	Selects the VIRTUAL COMPONENT number.
	EXT/INT = INT	1-2 (M/E ea.)	Selects the VIRTUAL COMPONENT number.
TYPE	EXT/INT = EXT	DLCKCG	Indicates the external chromakeyer is used.
		DL--CG	Indicates the internal chromakeyer is used.
	EXT/INT = INT	--CK--	Indicates the internal chromakeyer is used.
		OFF	Indicates the external chromakeyer is used.
DELAY	EXT/INT = EXT	0-10	Sets the video delay when passing through the selected Virtual Component in terms of the number of fields. Normally set to the delay for CG.
	EXT/INT = INT	0-10	Sets the video delay when passing through the selected Virtual Component in terms of the number of fields. Normally set to 2 fields, the delay for built-in chromakeyer.

Parameter		Setting Range	Description
ASSIGN		Sets how to assign Virtual Components to the buses. TYPE sets the buses where the components are used. The SHARE item sets the behavior when the same Virtual Line is selected in both M/E1 and M/E2.	
	TYPE	FR ALL FX1A FX1B FX1PGM FX1PST FX2A FX2B FX2PGM FX2PST FR A FR B FR PGM FR PST FR ME1 FR ME2	Used in all buses. Used in A bus of M/E1 only. Used in B bus of M/E1 only. Used in PGM bus of M/E1 only. Used in PST bus of M/E1 only. Used in A bus of M/E2 only. Used in B bus of M/E2 only. Used in PGM bus of M/E2 only. Used in PST bus of M/E2 only. Used in A bus only. Used in B bus only. Used in PGM bus only. Used in PST bus only. Used in both A and B buses of M/E1. Used in both A and B buses of M/E2.
	SHARE	BUS	Same virtual composite image can be shared only in each M/E. When M/E2 has higher priority and same signal is selected both in M/E1-A and M/E2-B, the virtual image same as M/E2-A is output from M/E2-B, while Dummy XPT signal is output from M/E1-A.
		NON	The virtual image is output from the bus with higher priority only. The Dummy XPT signal is always output from the bus with lower priority.
		ALL	Same virtual composite image can be shared for all buses. When M/E2 has higher priority and same signal is selected both in M/E1-A and M/E2-B, the virtual image same as M/E2-A is output from both from ME1-A and M/E2-B.

4-7. Virtual Crosspoint Setting

In this menu, settings are made for the signals that are actually connected to the Hanabi switcher.

```
FUNCTION VIRTUAL --- CROSS POINT --------------
         INPUT                      AUX
  NAME        TYPE        NAME    DESTINATION
  IN01    OFF       1     AUX01  COMPO COMP01

  ---------------------------
   SERIAL TALLY
  NAME     COMP
  VR1-1      1
```

Parameter			Setting Range	Description
INPUT	NAME		(Signal name)	Selects the signal name that is actually connected to the Hanabi switcher.
	TYPE		OFF	Indicates no virtual related signal.
			CAM	Indicates virtual camera incoming signal.
			FG BG KEY	Indicates virtual component signal. Select from FG, BG and KEY. This parameter corresponds to the SELECT item of the EXT/INT COMPO in the VIRTUAL LINE menu.
	(Number)	TYPE =CAM	1 to 8 (Camera number)	Selects a virtual camera by its number. The numbers are assigned to cameras in the CAMERA item in the VIRTUAL LINE menu.
		TYPE =FG, BG, or KEY	1 to 16 (Virtual Component number)	Selects a virtual component signal by its number. The numbers are assigned to the virtual components in the VIRTUAL COMPONENT menu.
AUX	NAME		Selects an AUX bus.	
	DESTINATION		OFF	Indicates no virtual related bus.
			COMPO	Indicates that the selected AUX bus is connected to the Virtual Component. In this case, select a component number to be assigned to the selected Virtual Component.
			MONI	Sends the Virtual Component video to the AUX bus.
SERIAL TALLY	NAME		Selects a tally signal from VR1-1, VR1-2, VR2-1, and VR2-2. Up to 4 tally signals (two types of two virtual lines) can flow to a single SERIAL TALLY.	
	COMPO		0 (OFF) 1 to 16	Designates which Virtual Component uses the selected tally.

4-8. RS422 Setting

In this menu, the serial tally settings sent to the virtual system are made.
The serial tally from the Hanabi switcher is sent to DSC-100/200, where it is analyzed, and then the camera sensor switches in synchronization with video switching.

HANABI Virtual Link System (Video + Sensor)
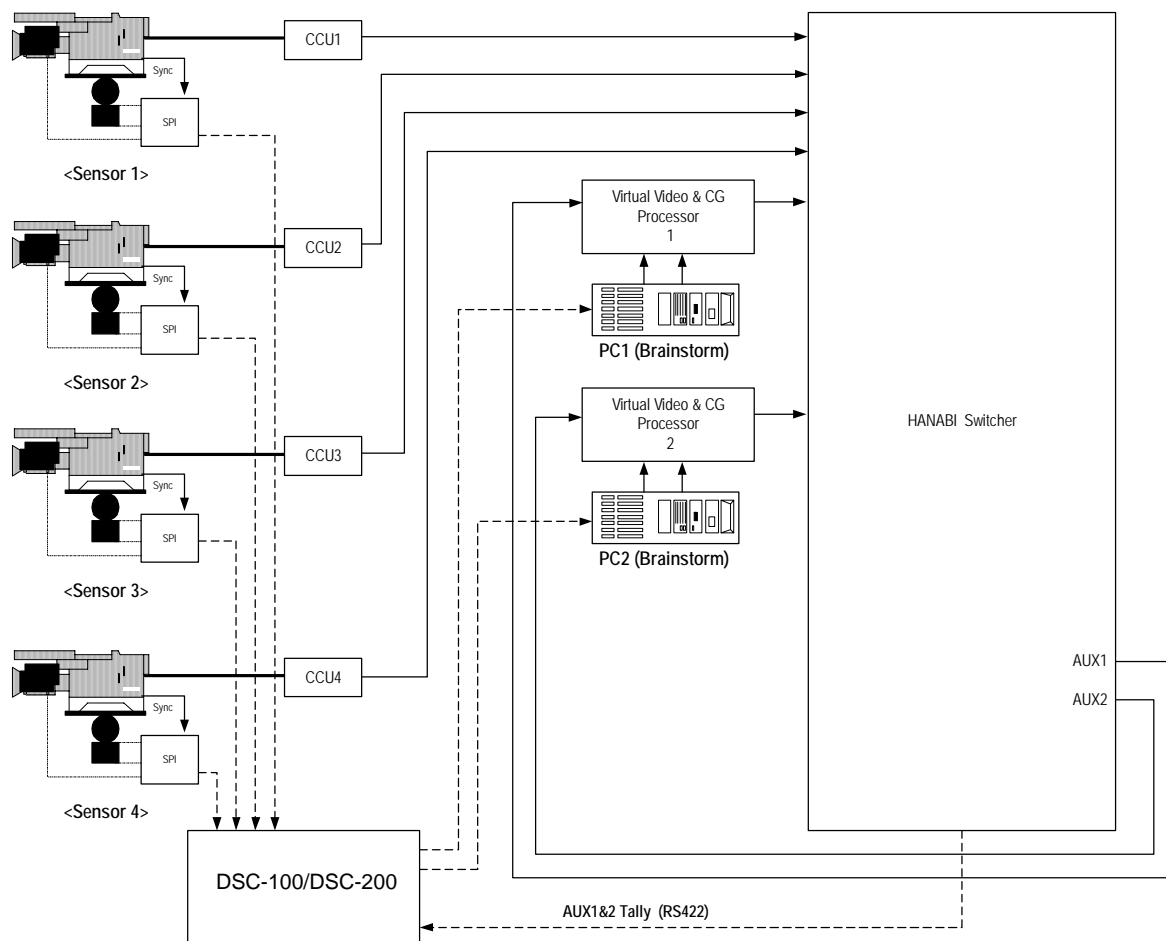
◆ RS422 port settings

1) Press MU SETUP button to open the MU SETUP menu. Select RS-422 in the MU SETUP menu shown below and then press F1 or DOWN button to go to RS422 menu.

```
MU SETUP ------------------------ Ver.1.00.0
1.SYSTEM         6.RS-422
2.INPUT          7.NETWORK
3.OUTPUT         8.DATE
4.MODE
5.MATT CLIP
SELECT                         X-BUFF  REBOOT
   6                             OFF     OFF
```
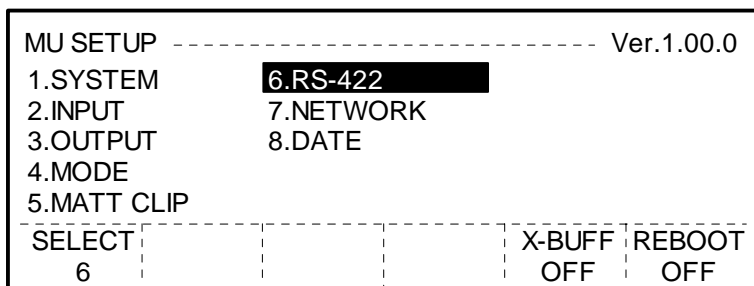
2) The RS422 menu is displayed. In this example, the serial port connected to DSC-100/200 is set as "VTALLY1". As shown below, the number 4 port is connected to DSC-100/200.

```
MU SETUP  --------      RS-422      --------------
NO.1    EDITOR   ODD    38400
NO.2    ROUTER   NONE   38400
NO.3    TALLY    EVEN   38400
NO.4    VTALLY1  ODD    38400
NO.5    VTALLY2  ODD    38400
SELECT  FUNC   PARITY   BAUD
  NO.1   EDITOR   ODD    38400
```

3) Next, the RS422 communication format is made in the RS422 menu. Make the following settings for connection with DSC-100/200:

    PARITY=ODD
    BAUD＝38400

4-9. Assignment of Virtual Line to M/E Bus Button

After making settings at the MU side, assign the virtual line to the M/E bus button in the Operation Unit (OU).

1) Open the OU SETUP menu and select BUS CTRL.

```
OU SETUP  ---------------------------  Ver.1.00.0
1.BUS CONTROL
 2.USER BUTTON
 3.MODE
 4.FADER
 5.NETWORK
 SELECT
     1
```

2) In the BUS CTRL menu, select a bus button under BUTTON. And then select a signal to be assigned to the selected bus button under NAME.

```
OUSETUP    ----    BUS CONTROL(1/2) -----------
   1     VR01    VR1V          OFF
   2     VR02    VR2V          OFF
   3     VR03    VR3V          OFF
   4     VR04    VR4V          OFF
   5     VR05    VR5V          OFF
BUTTON  SIGNAL   NAME          INHBIT   ENABLE
   1     VR01    VR1V           OFF      OFF
```

The setting range of SIGNAL for Virtual LINE is from VR01 to VR16. The signal name that was set to NAME in MU SETUP is displayed.

5. GPI/O and TALLY Setup Menu

When the Hanabi switcher is used in the virtual system, a tally logic circuit is required in many cases. For example, to output a tally for the video wall used in the Virtual System, a logic circuit must be built from the video wall display tally that is output from the Virtual System and the signal tally selected by the AUX bus. In the Hanabi Virtual Link software, the COLOR LOGIC menu is added in the GPI/O&TALLY menu to enable incorporation of the logic circuit in THE Hanabi switcher.

The descriptions below cover only the new COLOR LOGIC menu that was added. For information about other menus, refer to the Hanabi switcher Standard Manual.

5-1. Access to Color Logic Setting Menu

1) In the FUNCTION SETUP menu below select **2 GPI/O & TALLY** and then press F1 or DOWN button to open the GPI/O & TALLY menu.

2) In the GPI/TALLY menu below select **9 COLOR LOGIC** and then press F1 or DOWN button to open the COLOR LOGIC menu.

```
FUNCTION --------      GPI/TALLY --------------
1.TALLY COLOR    6.TALLY3
2.GPI IN         7.TALLY4
3.GPI OUT        8.TALLY5
4.TALLY1         9.COLOR LOGIC
5.TALLY2
---------
SELECT
    9
```

3) The COLOR LOGIC menu as shown below is opened.

```
FUNCTION GPI/TALLY ---COLOR LOGIC -----------
  1.    RED  = POSI  GPI-01    OR      COL09
  2.    RED  = POSI  GPI-02    OR      COL10
  3.    OFF  = POSI
  4.    OFF  = POSI
  5.    OFF  = POSI
 ----------
  NO.    SEL1    SEL2    SEL3    SEL4    SEL5
   1     RED     POSI    GPO-1    OR     COL09
```

5-2. COLOR LOGIC Setting Menu

In the COLOR LOGIC menu, logic circuits can be incorporated in the following way.

    Conditions:
        GPO signals (1 to 16) are POSI or NEGA.
    Logical formula:
        TARGET_COLOR=TARGET_COLOR <Operator> SRC_COLOR

                                    ↓

                            OR/AND/XOR
    Available colors:
        RED/GREEN/COLOR1 to COLOR10

    In terms of program language, this is written in the following way:
        if(Condition＝GPO "XX" is POSI or NEGA.)
        then   TARGET_COLOR=TARGET_COLOR and/or/xor SRC_COLOR

In THE Hanabi switcher, the statement above is expressed using the menu shown below.

```
FUNCTION GPI/TALLY --- COLOR LOGIC -----------
   1.      RED    =  POSI    GPI-01     OR        COL09
   2.      RED    =  POSI    GPI-02     OR        COL10
   3.      OFF    =  POSI
   4.      OFF    =  POSI
   5.      OFF    =  POSI
- - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   NO.  ¦  SEL1  ¦  SEL2  ¦  SEL3  ¦  SEL4  ¦  SEL5
    1   ¦  RED   ¦  POSI  ¦ GPO-1  ¦  OR    ¦ COL09
```

       TARGET_COLOR   Conditions   Logical   SRC_COLOR
                                       operator

NO.   Select from 1 to 30.
SEL1   TARGET COLOR is selected from OFF, RED, GREEN and COL01 to COL10.
SEL2   The condition (signal polarity) is selected between POSI and NEGA.
SEL3   The condition (signal) is selected from GPO-01 to GPO-16.
SEL4   The logical operator when the conditions are met is selected from OR/AND/XOR.
SEL5   SRC COLOR is selected from NON, RED, GREEN, COL01 to COL10.

5-3. Color Logic Configuration Example

As an example, this section presents simple logic of the virtual video wall tally.
As shown in the figure below, this configuration assumes that the following connections were made.

- AUX3 and 4 of the Hanabi switcher are connected to video wall1 and 2 of the virtual processor.
- The display-tallies for video wall1 and 2 are connected to GPI1 and GPI2 of the Hanabi switcher.

Video walls sent from two virtual processors always appear at the same timing in regular virtual operation. Therefore, this has been simplified so that only the tallies for virtual processor 1 are visible.
It is assumed that the tally basic settings are already completed, the suitable red tallies are set for signals other than video wall signals, and that COLOR9, COLOR10, GPO15, and GPO16 are unused.

HANABI Virtual Link System (VideoWall & Tally)
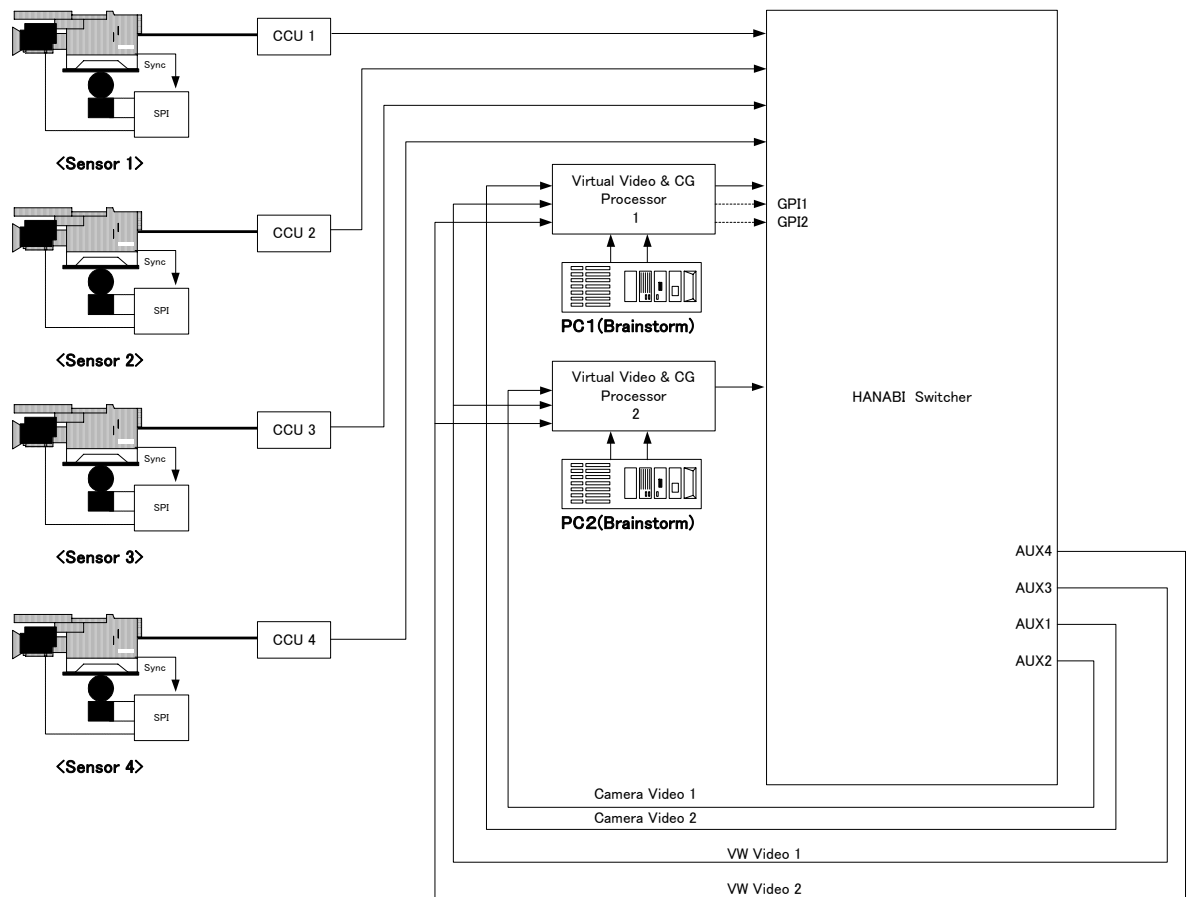
In the conditions above, to configure the video wall tally system the following settings may be required:

In the TALLY COLOR menu

1) Assign AUX3 tally to COLOR9
2) Assign AUX4 tally to COLOR10

In the GPI IN menu

3) Assign GPI1 to GPO15
4) Assign GPI2 to GPO16

In the COLOR LOGIC menu

5) RED = POSI GPO15 OR COL09
6) RED = POSI GPO16 OR COL10

```
FUNCTION GPI/TALLY ---COLOR LOGIC -----------
  1.     RED   = POSI   GPI-15     OR      COL09
  2.     RED   = POSI   GPI-16     OR      COL10
  3.     OFF   = POSI
  4.     OFF   = POSI
  5.     OFF   = POSI
 -------------------------------------------------
  NO.  ¦  SEL1  ¦  SEL2  ¦  SEL3  ¦  SEL4  ¦  SEL5
   1   ¦  RED   ¦  POSI  ¦ GPO-15 ¦  OR    ¦ COL09
```

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*The contents of this manual are subject to change without notice.