FOR.A®
INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

OPERATION MANUAL

HVS-2000GUI

Graphical User Interface Software

Version 1.00.0-01-41 or Higher

FOR-A COMPANY LIMITED

Version Revision History

Ver.	Rev.	Date	Description	Section/Page
1.00.0-00-88	-	2016/09/26	1st release	
1.00.0-01-09	-	2017/03/01	Supported Windows 10. Changed MU IP address settings. Changed MACRO menu page. Added EXT TALLY control. Revised TSL UMD protocol. Supported HVS-AUX16A/16B/32A/64A. Added ROUTER menu. Added folder name limitation for sequential image files. Added data loading.	1-1 4-1-2 18 22-2-6 22-3 22-4 22-8 23-3-4 23-3-5
1.00.0-01-19	-	2017/04/28	Adding ASPECT SET button for CROP function.	13-3
1.00.0-01-27	-	2017/06/23	RGB FULL RANGE / RGB LIMITED RANGE supported on HDMI outputs. 14-way display supported on MV outputs.	7-3 16-2
1.00.0-01-37	-	2017/09/07	Added TEMPERATURE ALARM pop-up dialog box. Added MV Tallies. Revised the time adjustment using SNTP server. Supported PNG image files for read and write.	5-2-1 16-4-7 16-5-1 23
1.00.0-01-41	-	2017/11/09	Added Mask feature. Added still operations using V-RAM. Added OU Event feature Added EAL/MAL file splitting procedure.	13-3 15-1-3 17-7 23-1-1

Software License Agreement

This Software License Agreement is a legally binding agreement between you (“User”) and FOR-A Company Limited (“Company”). The software, user manual and all other associated documentation (collectively, “Product”) are licensed, not sold, to the User. By installing and using the software, or by using a product of the Company in which the software is installed, User agrees to be bound by all terms and conditions of this agreement, as set forth below.

1. Grant of License
    a. The Company grants User a license to operate the Product in the manner specified in the user manual and other associated documentation. User may not use the Product in any manner other than that specified.
    b. The Company only grants User a license to personally use the Product, and does not allow User to transfer the license to a third person or to enable a third person to use the Product by any other method.
    c. In principle, the software may only be used on a single computer or device.
    d. While the software may include various programs, they may not be unbundled and used as standalone programs.
2. Restrictions on Distribution, Duplication, Leasing and/or Transfer of Product

    User may not, without the Company’s prior permission, distribute via communication lines, or lease or transfer electronic copies of the Product to another party, in whole or in part, nor attempt to do so.
3. Limitations of Guarantee

    The Company and its program licensors disclaim all legal warranties, express or implied, with respect to the Product. User must use the Product at his or her own risk. In no event shall the Company and its program licensors be liable for any damages or loss of data or contents resulting from User’s use of or inability to use the Product.
4. Provision of Upgrades and Updates

    Whenever a software version is upgraded or updated, User may use the new version of the software by paying the amount separately specified by the Company. After upgrading software, User may not use an earlier version without the Company’s prior permission.
5. Term of Validity of Agreement

    This agreement shall be effective for a period of one year from the day User begins using the software. The same conditions of the agreement shall be extended for further one-year terms unless User or the Company expresses, at least one month prior to expiration of the agreement, the intent not to renew the agreement.
6. Termination of Agreement
    a. The Company reserves the right to immediately terminate this agreement if User corresponds to any of the following circumstances.
        (1) User violates any terms of this agreement
        (2) User is unable or refuses to make any required payment.
    b. User may terminate this agreement by written notice to the Company under the following circumstances, but may not seek a refund of the amount that User has already paid to the Company.
        (1) User waives the license.
        (2) User destroys or loses the software package and prevents the Company from being able to confirm its existence.
    c. After termination of this agreement, User may not use the Product in any way, shape or form.
7. Ownership

    The Company and its program licensors retain all rights, including copyright and intellectual property rights, to the Product. User may not modify any program included in this software, nor disassemble, decompile, or reverse-engineer a program to analyze its source code.
8. Others

    This agreement will be governed by and construed in accordance with copyright laws and treaties in Japan and by laws and international treaties relating to intangible property rights. User must comply with all copyright laws as well as applicable laws and regulations when using the Product.
9. Jurisdiction

    Any dispute relating to the Agreement shall be subject to the exclusive jurisdiction of the Tokyo District Court of Japan.
10. Support

    If the Company discovers a flaw in the software or revises a program within one year after User receives the software, the Company will provide information regarding the flaw or revision or a revised program to User, free of cost.

Table of Contents

1. Setup

Installing the HVS-2000GUI (See Sec. 2.)
↓
PC Network Settings (See Secs. 3-2 and 3-3.)
↓
Connecting the PC to HVS-2000 system (See Sec. 3-1.)
↓
Starting HVS-2000GUI (See Sec. 3-2.)
↓
HVS-2000 switcher operation

1-1. PC System Environment

◆ **Required System**

OS	Windows 7(Home Premium Edition or later) Windows 10 (Pro or later)
CPU	Intel(R) Atom(TM) CPU N450 @ 1.66GHz or faster
Memory	1GB or more
Hard Disk Space	32GB or more
Display	Resolution of WXGA (1280 x 768 pixels) or better Must be capable of full color(24-bit) display
Graphic Card	256.0MB or more video memory
Network Port	1 port, 1000BASE-T (USB-LAN adapter can also be used.*)
USB Port	1 port for transferring files

* When using USB-LAN converters, disable the sleep and standby modes on your computer.

◆ **Recommended Monitor**

Multi-touch screen monitor

2. HVS-2000GUI Installation

2-1. Installing HVS-2000GUI

Before installing HVS-2000GUI, set the text size in Windows to **Smaller – 100%** using the following prodedure.

- Go to **Control Panel > Appearance and Personalization > Display.** Select **Smaller – 100%** and tap **Apply**.

◆ **Installation**

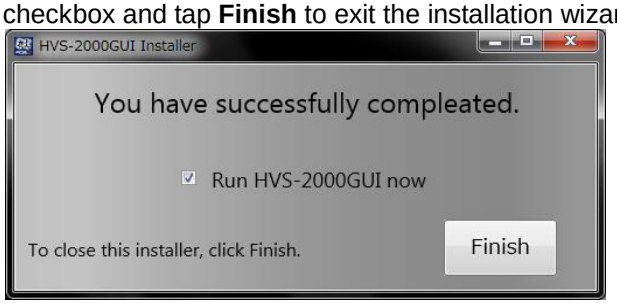
(1) Load the supplied installation CD-ROM into the PC.
Double-tap **"HVS-2000GUI_vXXXX_XXXX_XXXX.exe"** in the folder to start the installation wizard.

NOTE

If you are copying contents from the CD-ROM to a folder on the PC for installation, only one-byte alphanumeric characters can be used for the folder name. Otherwise, installation may not be completed properly.

(2) The HVS-2000GUI installation will automatically start.

(3) Once the installation is completed properly, the screen as below will appear. Check the checkbox and tap **Finish** to exit the installation wizard and start HVS-2000GUI.(2)



2-2. Starting / Closing the HVS-2000GUI

◆ **Starting the HVS-2000GUI**

(1) Go to **Start > All Programs > FOR-A > HANABI > HVS-2000GUI** to start **HVS-2000GUI**.

(2) The HOME screen will be displayed. Make sure that the status indicator (upper right) turns green.

◆ **Closing the HVS-2000GUI**

Tap the close button [X] at the upper-right corner of the window, then tap **YES** to exit the HVS-2000GUI.

2-3. Removing the HVS-2000GUI

To remove HVS-2000GUI from the PC, follow the steps below.

(1) Go to **Control Panel.** Tap **Uninstall a program beneath Programs.** Select **HVS-2000GUI** and tap **Uninstall**.

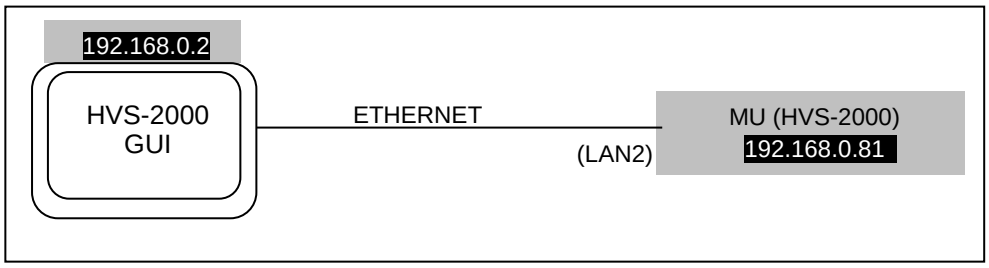
(2) Select **Remove** and tap **Next**.

(3) Tap **Finish**.

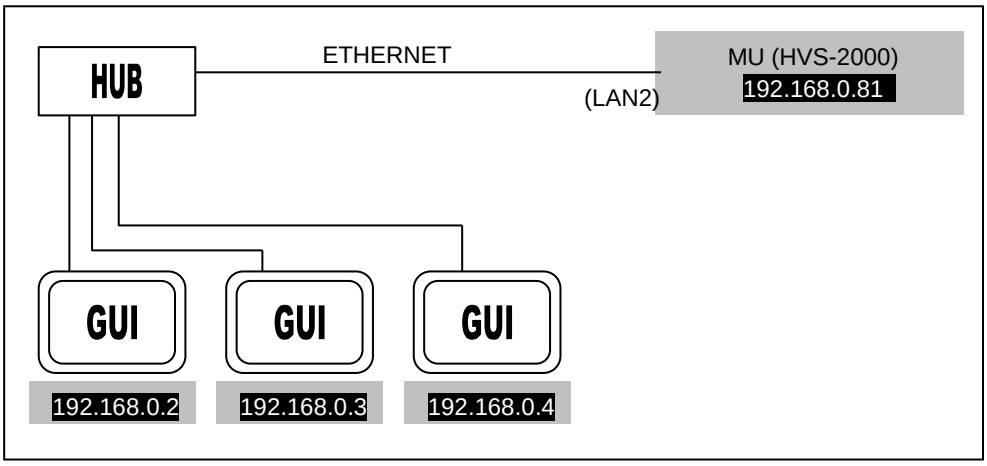
3. Connection Settings

3-1. How to Connect the HVS-2000 System to the PC

Configure your devices as shown below.



Up to three GUI (including a control panel Midas Touch) can control a single MU (HVS-2000) via an Ethernet hub.



3-2. PC Network Settings

HVS-2000 units and GUI are connected via Ethernet. The Ethernet port on the HVS-2000 supports 10/100/1000BASE-T. Use the supplied or prepared LAN cable to connect to the HVS-2000. Use Category 5e or 6 cables. Use a cross-over cable for directly connection and straight-through cables for connection via a network hub.

◆ **MU (HVS-2000) LAN1 Default Settings**

IP address	192.168.0.80
Subnet mask	255.255.255.0
Gateway	192.168.0.1

◆ **MU (HVS-2000) LAN2 Default Settings**

IP address	192.168.0.81
Subnet mask	255.255.255.0
Gateway	192.168.0.1

◆ **PC Network Settings (if MU LAN ports settings are factory default)**

Available IP address range	192.168.0.2 to 254 (Do NOT use an IP address already being used by device on the same network.)
Subnet mask	255.255.255.0
Gateway	192.168.0.1

(1) Go to **Start > Control Panel > Network and Internet > Network and Sharing Center**.
(2) Tap the **Local Area Connection** icon and choose **Properties**. If the administrator password or confirmation is requested, enter the password or enter the confirmation information.
(3) Tap the **Network** tab. Tap **Internet Protocol Version 4 (TCP/IPv4)** under **"This connection uses the following items:"** and tap **Properties.**
(4) Select the **Use the following IP address:** radio button and set the **IP address** and **Subnet mask** settings.

After completing all settings, tap **OK** and close all windows.

NOTE

The procedure for setting network settings on the PC varies depending on the PC, so refer to your computer's USER Manual for details.
Make a note of the network settings before changing them in case you need to return the settings to their original settings later.
When running HVS-2000GUI within a company LAN, consult your network administrator.

3-3. PC Network Device Settings

Before using your HVS-2000GUI, verify that the network device on the computer is set as shown below.

(1) Tap on the **Start** button, then select **Control Panel**.
(2) Change **Viewed by:** to **Large Icons** found in the drop down in the upper left of the screen.
(3) Tap on **Device Manager**.
(4) Double tap on the Ethernet adapter device listed under **Network Adapters**.
(Choose an appropriate device, because an Ethernet device may vary depending on computers.)
(5) Tap on the **Advanced** tab.
(6) Select **Large Send Offload v2(IPV4)** in the **Property** box, then set **Disable** in the **Value** box.
(7) Tap **OK**.

Note that depending on the Ethernet device, **Large Send Offload v2(IPV4)** may not listed or appear under a different name in the **Property** box.

4. Connection

4-1. Connecting the PC to HVS-2000 System

After completing the network settings on the PC (see Sec. 3-2. " PC Network Settings"), connect your PC to the LAN. Once the HVS-2000GUI has launched, the connection to the MU will be established automatically. (The "**LINK**" indication in the bottom right of the HVS-2000GUI window changes to "**CONNECTION**".)

If the connection between the MU and PC is not established or Windows Security Alert window does not appear:

(1) Go to **Start > Control Panel > Windows Firewall > Allow a program or feature through Windows Firewall**.
(2) Tap the **Change settings** button.
(3) Check the **HVS-2000GUI** checkbox and tap **OK**.

4-1-1. Manually Selecting an MU

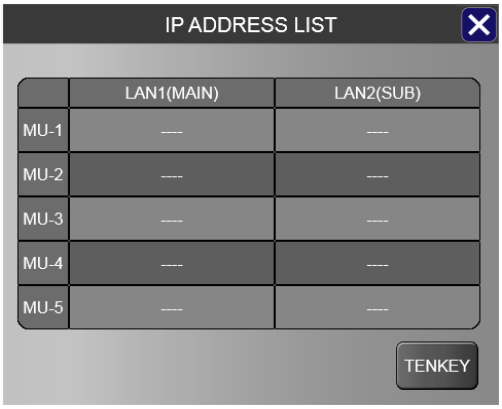
Normally the MU connection is automatically established, however, an MU can be manually connected by specifying the IP address (LAN2). To connect to another MU or the MU whose IP address has changed, proceed as follows:

◆ **Specifying an IP address**

(1) Display the [SETUP > HOME > GUI SETUP] menu.
(2) Tap **CONTROL MU** to display parameters.
(3) Tap **CONTROL MU IP ADDRESS** (left edge) and enter the MU IP address (LAN2).
(4) Tap **RE CONNECT** and **EXEC**. The specified MU IP address will pop-up. Tap **YES** to connect to the MU.

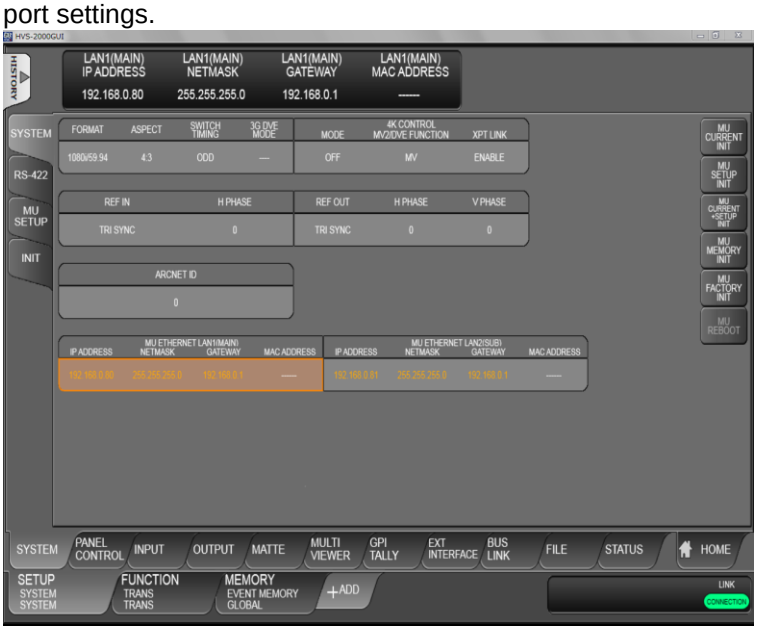
◆ **Selecting the MU IP address from the IP address list**

(1) Display the [SETUP > HOME > GUI SETUP] menu.
(2) Tap **CONTROL MU** to display parameters.
(3) Tap **CONTROL MU IP ADDRESS** (left edge) to display the numeric keypad.
(4) Tap **LIST** on the keypad.
(5) An IP address list as shown below will appear.
(6) Select the MU IP address to be connected.
(7) Tap **RE CONNECT** and **EXEC**. The specified MU IP address will pop-up. Tap **YES** to connect to the MU.



4-1-2. Changing the Connected MU IP Address

Open the [SETUP > SYSTEM > SYSTEM] menu and set the LAN1(MAIN) and LAN2(SUB) port settings.



Tap a parameter in the menu to display it in the Setting area. Tap the parameter value in the Setting area to change port settings using a pop-up keypad. After completing settings, click **Enter**.

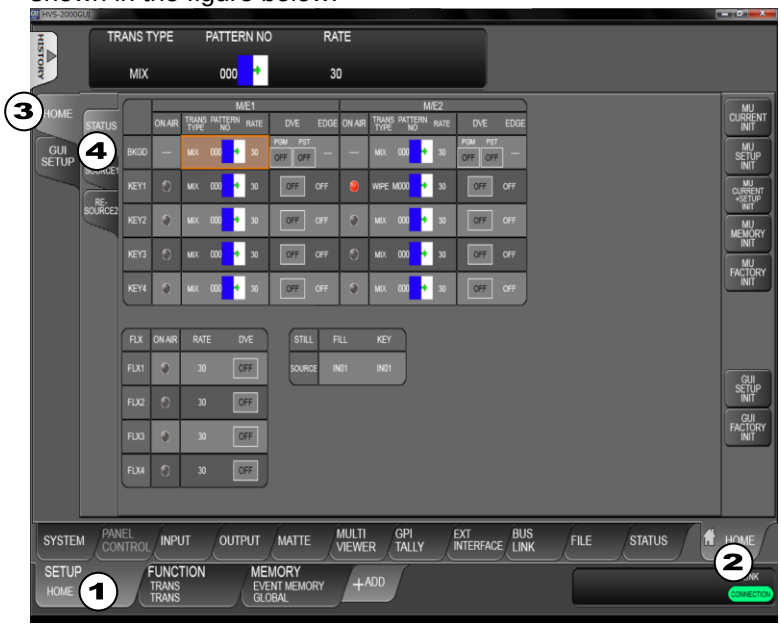
LAN port settings require an MU reboot, which can be performed after finishing all other necessary settings by pressing **MU REBOOT**.

4-2. Verifying Current Status

The HOME screen allows you to verify the M/E, FLEXaKEY and STILL status.

◆ **[SETUP > HOME > HOME > STATUS] menu**

If this tab screen does not appear on your display, tap tabs in the order (1), (2), (3) and (4) as shown in the figure below.

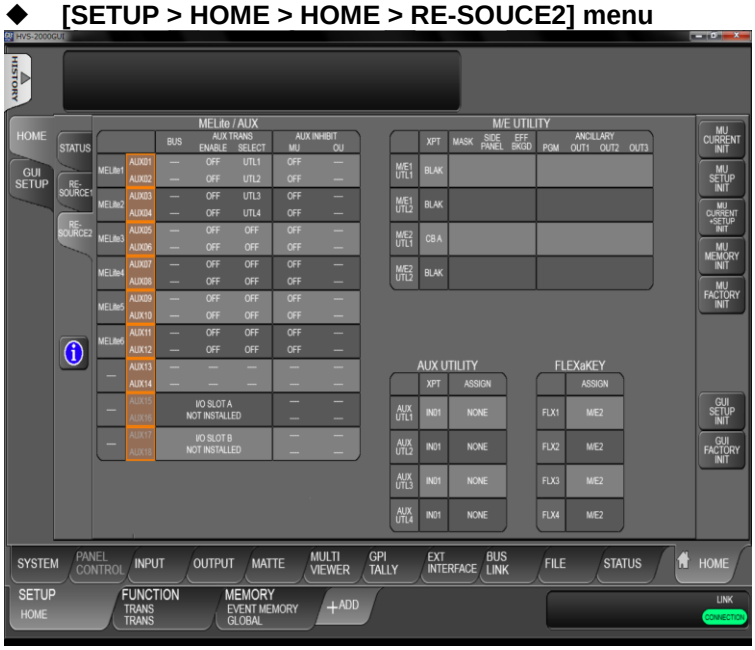


ON AIR	TRANS TYPE	PATTERN NO	RATE	DVE	EDGE	FILL	KEY
Lit red: On-air **Unlit**: Off-air	Displays current settings			Channel type when using DVE	Key edge type	Selected video sources	
See Sec. 10-4.	10-3, 10-7, 10-12-1			12	11-7	11-8	

◆ **[SETUP > HOME > HOME > RE-SOURCE1] menu**

Symbol	Meaning	Symbol	Meaning
✓	This is being used.	---	Unavailable
X	Unavailable in the current setting.		Available

◆ **[SETUP > HOME > HOME > RE-SOUCE2] menu**



MELite / AUX

M/E Lite / AUX	BUS	AUX TRANS		AUX INHIBIT	
		ENABLE	SELECT	MU	OU
Lit: Active output bus between them	M/E Lite video source	AUX transition ON/OFF	Transition support bus	AUX image change locked (ON) / unlocked (OFF)	AUX bus buttons locked (ON)/ unlocked (OFF)
See Sec. 9.	9-1	7-2-2, 10-11		7-2-2	7-2-1

M/E UTILITY

XPT	MASK	SIDE PANEL	EFF BKGD	ANCILLARY PGM	ANCILLARY OUT1-3
Selected video source	Displays the M/E UTILITY usage status.				
See Sec. 6-7-1.	11-6-2	6-7	10-12-5	7-8	7-8

AUX UTILITY

AUX UTILITY XPT	AUX UTILITY ASSIGN
Selected video source	Displays the AUX UTILITY usage status.
See Sec. 6-7-1.	10-11

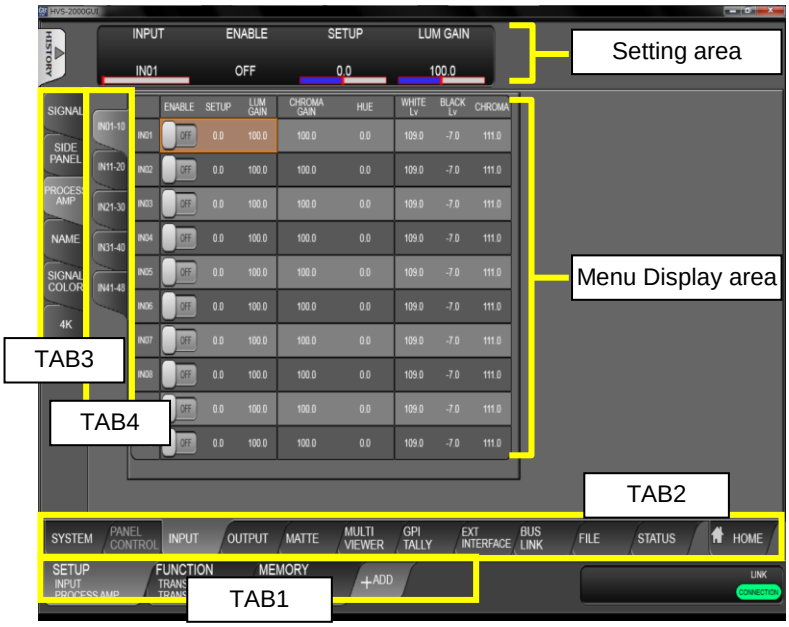
FLEXaKEY

ASSIGN
Displays the FLEXaKEY assignment status.
See Sec. 11-8-1.

5. Menu Operation

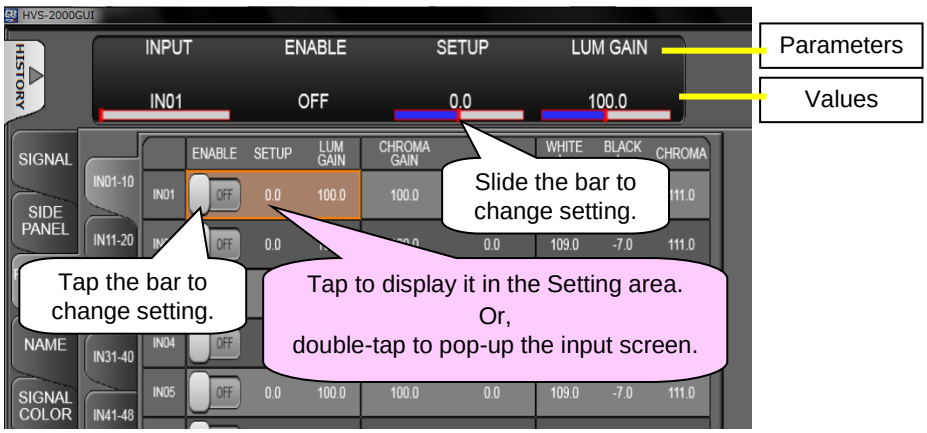
5-1. Opening Menu Pages

Tap tabs in the “TAB1 > TAB2 > TAB3 > TAB4” order as shown below to display the desired menu page.



5-2. Setting Menu Parameters

The figure below shows **IN01-10** in the [SETUP > INPUT > PROCESS AMP] menu page.
To change parameter settings, tap to select parameters in the **Menu Display** area to display them in the **Setting** area at the top of the screen.



(Ex.) To change **IN01 ENABLE** to ON:
Tap the bar to change from OFF to ON.

(Ex.) To change the **SETUP** value, use any of the following procedures.

- Tap the parameter value in the Menu Display area to display it in the Setting area. Slide the bar to change the SETUP value.
- Double-tap the parameter value in the Menu Display area to pop-up the input screen and directly enter the value.

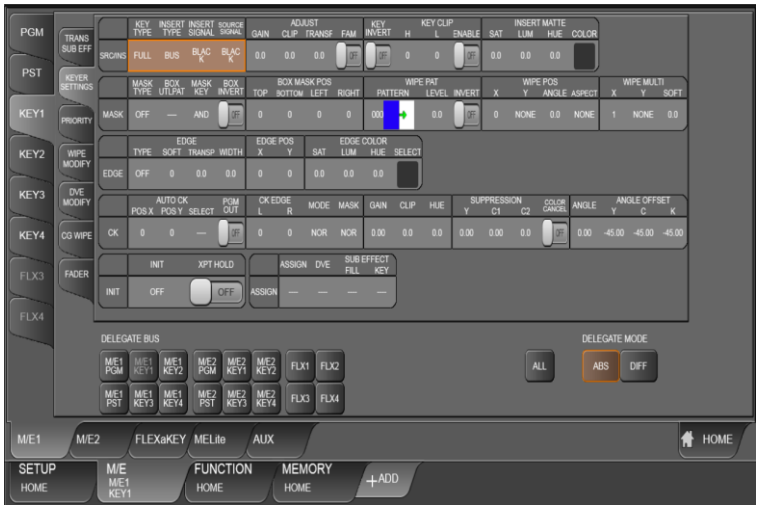
5-2-1. GUI SETUP

The [HOME > GUI SETUP] menu allows you to set GUI display settings.

Item	Description
MENU LINE DISPLAY	Displays borders between parameters.
MEMORY MENU CLEAR DISPLAY	Displays clear items for each or all pages.
SIGNAL NUMBER DISPLAY	Displays connector names to the top left of current video names.
MU TEMPERATURE ALARM POPUP	Enables/disables the MU TEMPERATURE ALARM pop-up dialog.

5-2-2. Displays a Settings List for Each Bus

A settings list for each bus can be displayed in the menu. The figure below shows the list of M/E1KEY1 settings ([M/E > M/E1 > KEY1 > KEYER SETTINGS] menu).



Settings list pages allow you not only to verify settings, but also change the following menu settings.

- FUNCTION > TRANS
- FUNCTION > KEYER
- FUNCTION > WIPE MODIFY
- FUNCTION > DVE MODIFY
- FUNCTION > SUB EFFECT

- SETUP > OUTPUT > MELite
- SETUP > OUTPUT > OUT XPT

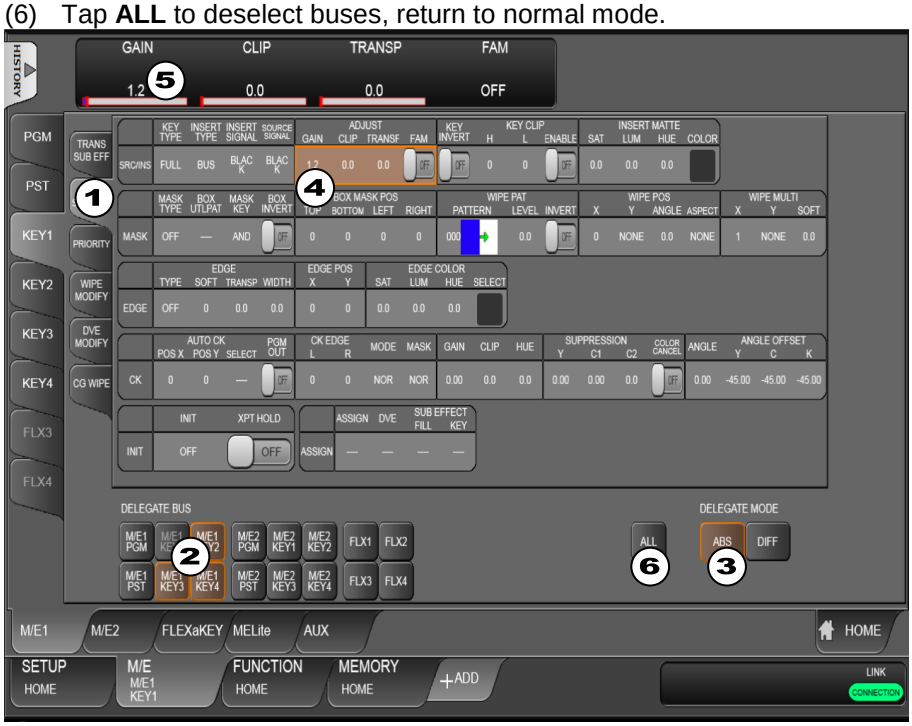
◆ Setting Same Parameters Simultaneously

If delegate operation is available, the following subsidiary buttons appear.

Button	Description
DELEGATE BUS	Allows you to select multiple buses to be set simultaneously.
ALL	Allows you to select all buses. Allows you to deselect buses if two or more buses are selected.
ABS	Allows you to set a parameter of the selected buses to the same value.
DIFF	Allows you to add a value to each parameter setting.

Operation Example 1: To Set GAIN to 1.2 for KEY1 to KEY4

(1) Open the [M/E > M/E1 > KEY1 > KEYER SETTINGS] menu.
(2) Tap **M/E1 KEY2**, **M/E1 KEY3**, and **M/E1 KEY4** in the DELEGATE BUS block.
(3) Tap **ABS**.
(4) Tap the **GAIN** value to display it in the setting area.
(5) Change **GAIN** to 1.2. M/E1 KEY1 to M/E1 KEY4 values are set to 1.2.
(6) Tap **ALL** to deselect buses, return to normal mode.



Ex. 2: To Increase CLIP by 4.5 for KEY1 and KEY2

(1) Open the [M/E > M/E1 > KEY1 > KEYER SETTINGS] menu.
(2) Tap **M/E1 KEY2** in the DELEGATE BUS block.
(3) Tap **DIFF**.
(4) Tap the **CLIP** value to display it in the setting area.
(5) Add **4.5** to the value. The CLIP value increases by 4.5 in both KEY1 and KEY2.
(6) Tap **ALL** to deselect buses, return to normal mode.

5-3. GUI Menus (Mini Menu / Midas Touch / HVS-2000GUI)

The HVS-2000 switcher provides three types of GUI menus.

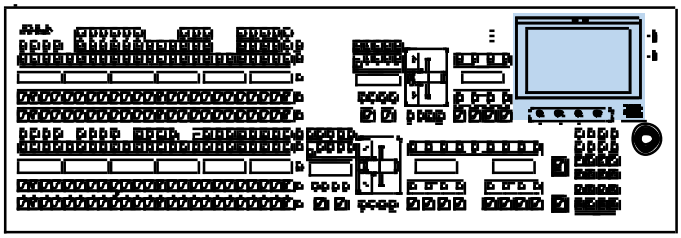
Mini Menu: Used to operate on a control panel display.
See the HVS-2000/OU Operation Manual for details on the operation.

Midas Touch: Used to operate on a touch panel or monitor directly connected to the control panel via HDMI or VGA. USB keyboard and mouse are also available.
Menu structure and operation are almost the same as those of the HVS-2000GUI.

HVS-2000GUI: Used to install on a computer or tablet PC and set menus remotely through the LAN. Connect to the HVS-2000 (MU) LAN2 port.
See this operation manual for connection and operation details.

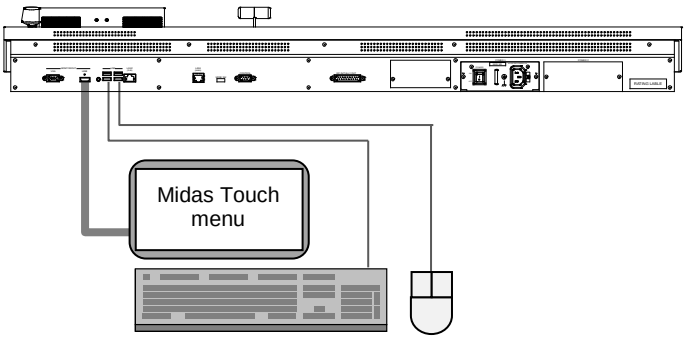
◆ **Mini Menu**

Mini Menu is displayed on the control panel.



◆ **Midas Touch**

Midas Touch menu pages are displayed on a touch panel or monitor directly connected to the control panel via HDMI (VGA).

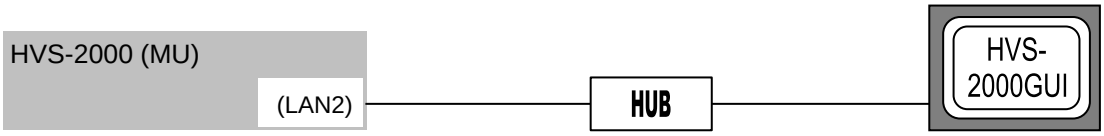


IMPORTANT

Power OFF your control panel before plug or unplug HDMI or VGA cables.
HDMI and VGA ports cannot be used simultaneously.
Note that the EWF (Enhanced Write Protection) function is enabled on the OS system volume on the HDD to protect it from writing. This will increase the memory consumption as the time elapses. A warning message is displayed when the remaining memory capacity is insufficient. In such cases, open the GUI SETUP menu and perform the GUI REBOOT.

◆ **HVS-2000GUI**

HVS-2000GUI menu pages are displayed on a computer remotely connected via LAN.

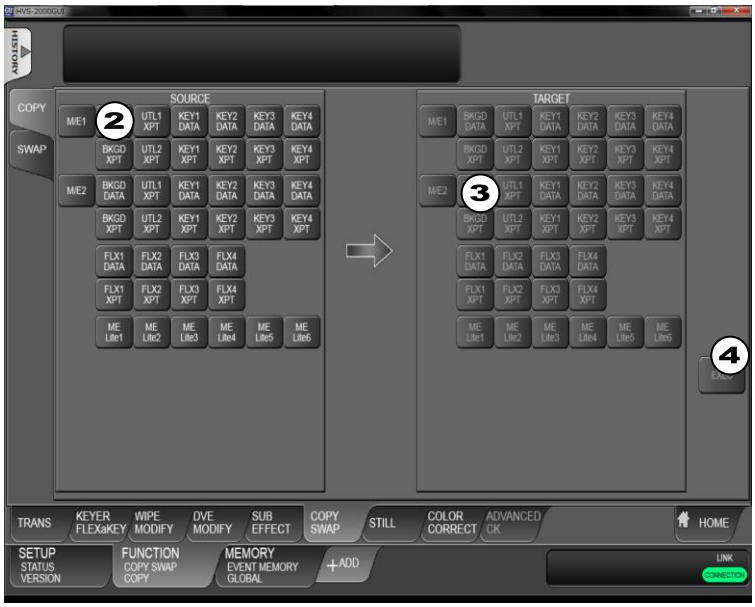


5-4. Copying / Swapping Settings

The [FUNCTION > COPY SWAP] menu allows you to copy or swap settings between MEs, MELites or, KEYs.

◆ **Ex. 1: Copying Settings from M/E1BKGD to M/E2BKGD**

(1) Open the [FUNCTION > COPY SWAP > COPY] menu.
(2) Tap **M/E1 BKGD DATA** in the SOURCE block.
(3) Tap **M/E2 BKGD DATA** in the TARGET block.
(4) Tap **EXEC** to copy settings.



◆ **Ex. 2: Swapping Settings between M/E1KEY3 and FLEXaKEY4**

(1) Open the [FUNCTION > COPY SWAP > COPY] menu.
(2) Tap **M/E1 KEY3 DATA** in the SOURCE block.
(3) Tap **FLX4 DATA** in the TARGET block.
(4) Tap **EXEC** to swap settings.

5-5. Returning Menu Settings to Default

5-5-1. Returning Parameters to Default

Press and hold each parameter value in the Setting area to return the setting to factory default

5-5-2. Returning Menus to Default

The menu pages in the table below have an INIT parameter, which can reset all relevant parameters to their default setting.

Menu with INIT included			Menu to be reset
SETUP	SYSTEM	INIT	See “System Initialization” on next page.
FUNCTION	WIPE MODIFY	INIT	WIPE MODIFY menu for each bus
FUNCTION	DVE MODIFY	INIT	DVE MODIFY menu for each bus
FUNCTION	KEYER FLEXaKEY	INIT	Keyer setup menu

5-6. Reboot and Initialization

◆ Rebooting the System

Tap **MU REBOOT** in the right side of the screen in the [SETUP > SYSTEM] menu.

◆ Resetting the Control Panel

The operation is unavailable. Do it on the control panel.

◆ MU Initialization

Tap any of INIT buttons at the right edge of the [SETUP > SYSTEM] menu screen.

INIT button	Description
MU CURRENT INIT	Resets the BKGD, KEY and MATTE data.
MU SETUP INIT	Resets the SETUP menu data
MU CURRENT +SETUP INIT	Resets the menu data in MU CURRENT and MU SETUP INIT.
MU MEMORY INIT	Reset the EVENT, SEQUENCE, MACRO, STILL and V-RAM data.
MU FACTORY INIT	Resets all menu data.

◆ OU Initialization

The operation is unavailable. Do it on the control panel.

◆ GUI Initialization

Tap any of INIT buttons at the right edge of the [SETUP > HOME > GUI SETUP] menu

INIT button	Description
GUI SETUP INIT	Resets the GUI excluding network settings.
GUI FACTORY INIT	Resets the GUI including network settings.

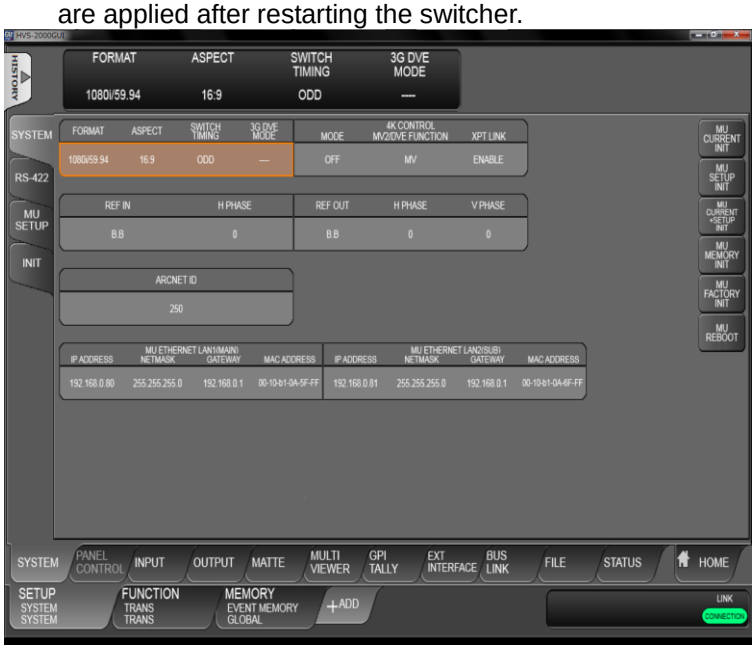
◆ Restarting the GUI (Midas Touch)

The operation is unavailable. Do it on the control panel.

6. Setting up Video Sources

6-1. Selecting a System Mode (Signal Format)

(1) Open the [SETUP > SYSTEM > SYSTEM] menu.
(2) Select a signal format under **FORMAT**.
(3) Select an aspect ration under **ASPECT**.
(4) Select **SWITCH TIMING** from ODD, EVEN or ANY.
(5) Tap **MU REBOOT**. Tap **YES** in the confirmation dialog. The selected format and aspect ratio are applied after restarting the switcher.



◆ **Crosspoint Switch Timing**

Setting	Description
ODD	Switches crosspoints in odd fields.
EVEN	Switches crosspoints in even fields.
Setting	Switches crosspoints at any time whenever commands are issued.

6-2. Reference Signal Settings

The HVS-2000 switcher provides reference input, loop-through and output connectors in the GENLOCK section on the rear panel.

◆ **Reference Input**

(1) Open the [SETUP > SYSTEM > SYSTEM] menu.
(2) Select a reference input signal under **REF IN**.
(3) **H PHASE** allows you to adjust horizontal timing.

◆ **Reference Output**

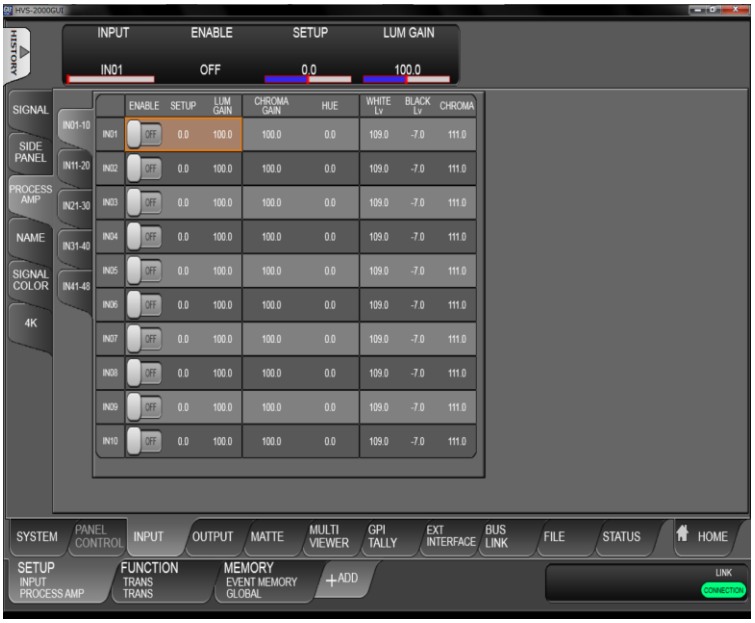
(1) Open the [SETUP > SYSTEM > SYSTEM] menu.
(2) Select a reference output signal under **REF OUT**.
(3) **H PHASE** and **V PHASE** allow you to adjust horizontal and vertical timings.

6-3. Adjusting Input Signal Levels

6-3-1. Proc Amp

The HVS-2000 switcher provides the following Proc Amp features.

(1) Open the [SETUP > INPUT > PROCESS AMP] menu.
(2) Turn **ENABLE** to ON to activate the PROCESS AMP feature.
(3) Adjust the black level under **SETUP**.
(4) Adjust the luminance level under **LUM GAIN**.
(5) Adjust the chrominance level under **CHROMA GAIN**.
(6) Adjust the color under **HUE**.



6-3-2. Video Level Clip

To maintain desired signal levels after adjusting video levels with the Proc Amp, use the Video Level Clip function to adjust the upper and lower YPbPr color space limits. Note that Video Level Clip can be applied only when the Proc Amp is enabled.

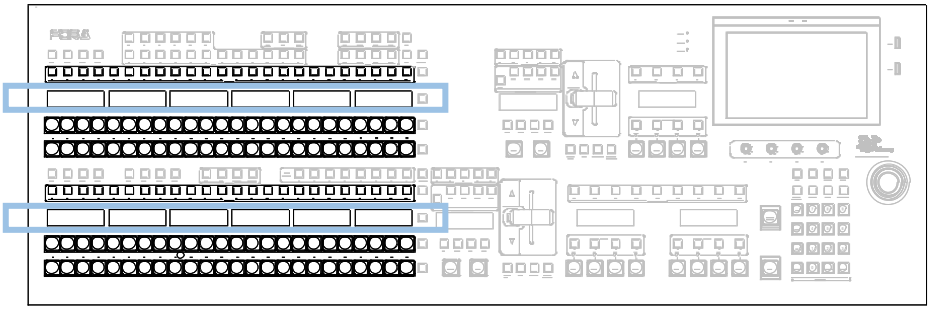
(1) Open the [SETUP > INPUT > PROCESS AMP] menu.
(2) Signal level limits can be set respectively under **WHITE Lv, BLACK Lv** and **CHROMA**.

6-4. Mapping Video Sources to Bus Buttons

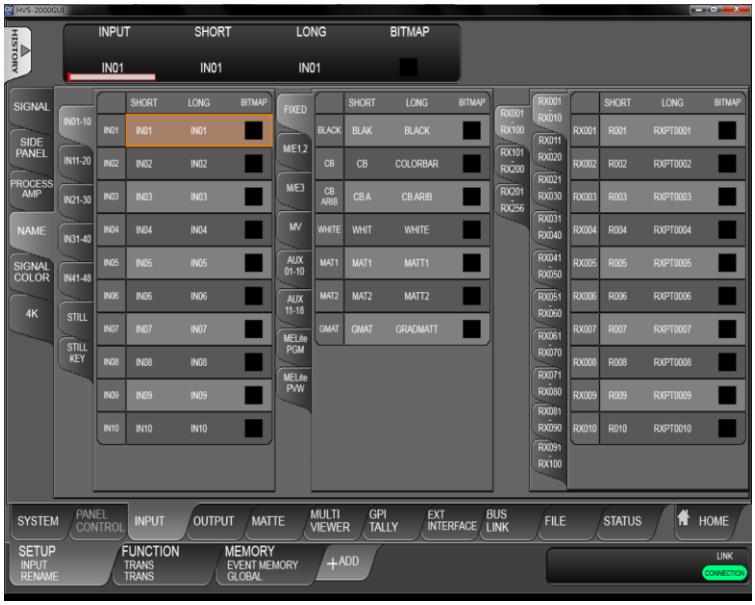
The operation is unavailable. Do it on the control panel.

6-5. Changing Video Source Names

Input or internally generated video sources have default names (such as IN01-IN24, MATTE1, BLACK, COLOR BAR, etc.), which can be freely changed by the user. These source names are displayed on the video name displays and as titles in multiview images.
To change video source names, proceed as follows.



(1) Open the [SETUP > INPUT > NAME] menu.
(2) Select a video source.
(3) To change the short name, tap **SHORT**, type a new name (max. 4 characters) and tap **Enter**.
(4) To change the long name, tap **LONG**, type a new name (max. 8 characters) and tap **Enter**.



6-5-1. Setting Video Source Name Display Mode

The operation is unavailable. Do it on the control panel.

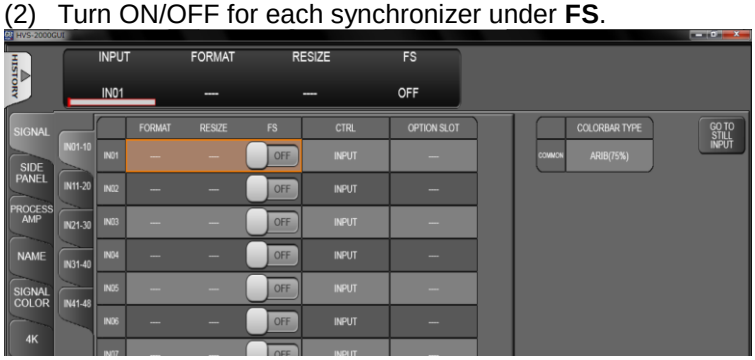
6-5-2. Displaying M/E Bus Names

The operation is unavailable. Do it on the control panel.

6-6. Frame Synchronizer

A video frame synchronizer is provided for each input (including optional inputs) and is used to synchronize asynchronous signals. Users can select whether to apply frame synchronization to input signals (for each signal) as shown in the procedure below.

(1) Open the [SETUP > INPUT > SIGNAL] menu.
(2) Turn ON/OFF for each synchronizer under **FS**.

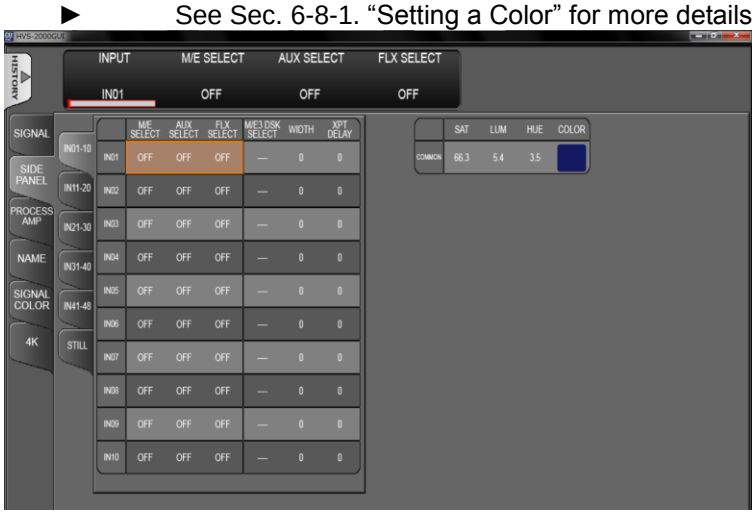


Ancillary data in input video cannot be passed through if **FS** (input frame synchronizer) is set to ON or **RESIZE** is enabled. To pass ancillary data, input the video synchronized with the genlock signal and set **FS** to OFF. Note that ancillary data in SD inputs cannot be used when the switcher operates in HD mode.

6-7. Changing the Side Panel Image

The side panel image of 4:3 video can be changed as shown in the procedure below.

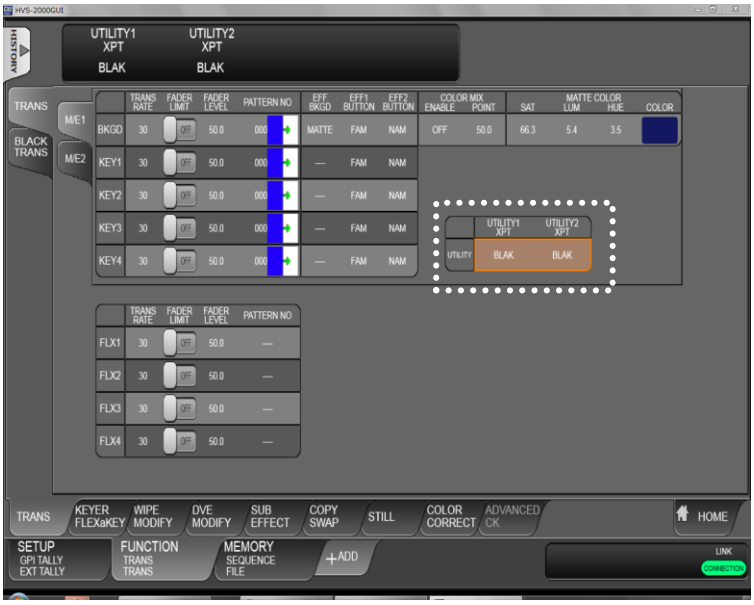
(1) Open the [SETUP > INPUT > SIDE PANEL] menu.
(2) Select a video signal to be used for the side panel.
Select to select a side panel source to be used for M/E1-2 outputs under **M/E SELECT**.
Select to select a side panel source to be used for AUX outputs under **AUX SELECT**.
Select to select a side panel source to be used for M/E3 outputs under **M/E3 DSK SELECT**. (if an HVS-2000ME is installed).
(3) Adjust the side panel position in pixels under **WIDTH**.
(4) If SIDE MATTE is set for the side panel source, select a color under **COMMON**.
► See Sec. 6-8-1. “Setting a Color” for more details on color settings.



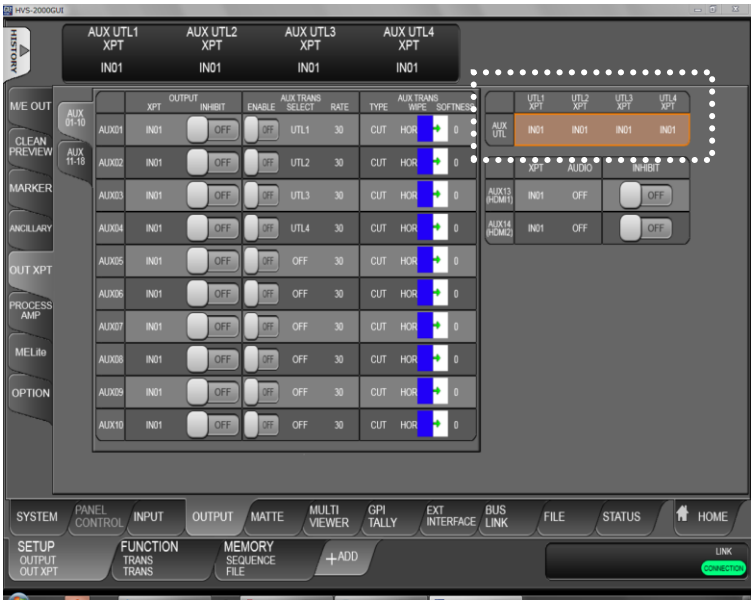
6-7-1. UTILITY 1-2 and AUX UTILITY 1-4

UTL (UTILITY) 1-2 are internal buses that can be used for M/E1-2 side panels and applied to

key masks. To select a video source for these buses, open the [FUNCTION > TRANS > TRANS] menu.



AUX UTL (UTILITY) 1-4 are also internal buses that can be used for AUX and MELite side panels and for which video sources can be selected in the [SETUP > OUTPUT > OUT XPT] menu.



6-8. Matte Color Images

Two matte color and one gradient matte signals (MAT1, MAT2 and GMAT) can be used as video sources and assigned to all bus buttons.

6-8-1. Setting Matte Colors

(1) Open the [SETUP > MATTE > MATTE] menu.
(2) Set a color using **SAT**, **LUM** and **HUE** parameters or select a color by tapping on **COLOR**.

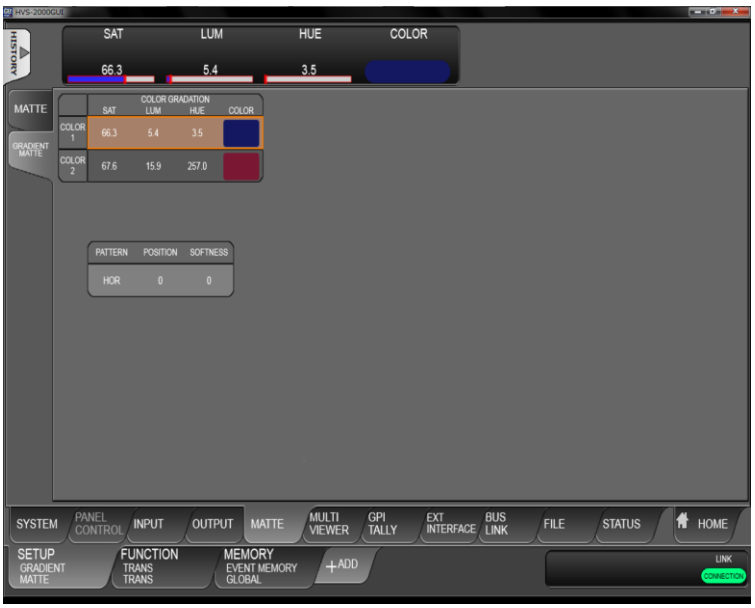
◆ **MATTE SPIN Effect**

The MATTE SPIN effect automatically changes matte color values (SAT, LUM and HUE) using set speeds. Adjust the speed under **COLOR SPIN** and turn **ENABLE** to ON to see how the color changes.

6-8-2. Creating a Gradient Color Image

(1) Open the [SETUP > MATTE > GRADIENT MATTE] menu.
(2) Set a color under **COLOR1** and set the other color under **COLOR2**.
(3) Adjust the gradient color image using **PATTERN**, **POSITION** and/or **SOFTNESS**.

Parameter	Description
PATTERN	**HOR**: Displays a horizontal gradient from COLOR1 to COLOR2. **VER**: Displays a vertical gradient from COLOR1 to COLOR2. **H/V**: Displays a diagonal gradient from COLOR1 to COLOR2.
POSITION	Adjusts position.
SOFTNESS	Adjusts the softness gradient



6-9. Setting up Additional Inputs

Up to 6 additional input/output cards can be installed into 6 slots: IN A, IN-B, IN-C, IN-D, I/O A and I/O B.

Option Slot	Input signal name		Available card	Signal (connector)	Input number per card
IN A	IN33-36		HVS-100DI-A	HD/SD SDI (BNC)	4 inputs
IN B	IN37-40				
IN C	IN41-44		HVS-100AI	HD/SD analog component or analog composite (BNC)	2 inputs
IN D	IN45-48				
I/O A	IN25-28		HVS-100PCI	Digital RGB (HDMI) Analog RGB (VGA)	2 inputs
I/O B	IN29-32				

* When installing a 2-input card such as HVS-100AI or HVS-100PCI, the first two input numbers are assigned to inputs. (For example, IN37 and 38 are assigned when installing an HVS-100AI card onto the IN B slot.)

◆ **Signal Name**

Each card provides four or two channels of input and each channel can be independently set. Input signal names are initially fixed for each slot as shown in the above table (although they can be changed). Use these names to set up additional input signals.

▶ See Sec. 6-5. "Changing Video Source Names" for details on signal name changes.
▶ See Sec. 6-4. "Mapping Video Sources to Bus Buttons" for signal source assignments.

◆ **Proc Amp, Frame Synchronizer, Input Still and Side Panel**

Almost the same functions as those for standard inputs can be applied to additional inputs, such as Frame Synchronizer and Input Still.

▶ See Sec. 6-3. "Mapping Video Sources to Bus Buttons" for signal level adjustments.
▶ See Sec. 6-6. "Frame Synchronizer."
▶ See Sec. 15-3. "Still Image Display using FS Buffer (INPUT STILL)."
▶ See Sec. 6-7. "Changing the Side Panel Image," if resize option is available.

◆ **4K Mode**

Only SDI input cards support 4K mode. HVS-100AI and HVS-100PCI cards accept no inputs in 4K mode.

6-9-1. HVS-100DI-A

HVS-100DI-A cards accept SDI signals. Normally, no menu settings are required for the cards.

6-9-2. HVS-100AI

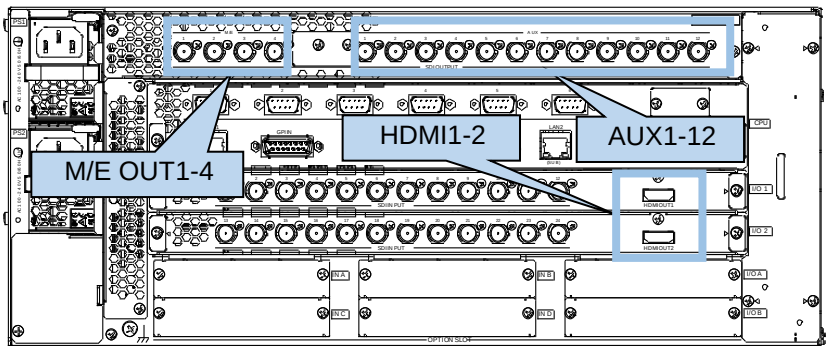
HVS-100AI cards accept analog signals. Specify the analog signal format for each input in the menu. Select the signal format in the [SETUP > INPUT > SIGNAL] menu.
See the HVS-2000/OU Operation Manual for more details.

6-9-3. HVS-100PCI

HVS-100PCI cards accept HDMI and VGA signals. Select a signal for **Ch2** in the [SETUP > INPUT > SIGNAL] menu.
See the HVS-2000/OU Operation Manual for more details.

7. Video Outputs

Three output types are provided: **M/E OUT1-4** ports are for combined M/E images and both **AUX1-12** and **HDMI1-2** ports can output input video sources as well as combined M/E and multiview images.



7-1. Selecting Video for M/E OUT 1-4

M/E OUT1-4 ports on the MU rear panel are dedicated to output combined M/E video images. Select M/E images for OUT1-4 in the menu as shown below.

(1) Open the [SETUP > OUTPUT > M/E OUT] menu.
(2) Select an composite video under .**DIRECT M/E OUT**. Options are M/E1PGM, M/E1 OUT1 to 3, M/E2PGM, and M/E2 OUT1 to 3.

◆ **M/E1 OUT 1-3 and M/E2 OUT1-3 buses**

M/E1 OUT 1-3 and M/E2 OUT1-3 are internal buses that can output from **M/E OUT1-4** ports as shown above. All combined images for M/E1 and M/E2 can be assigned to these buses.

NOTE

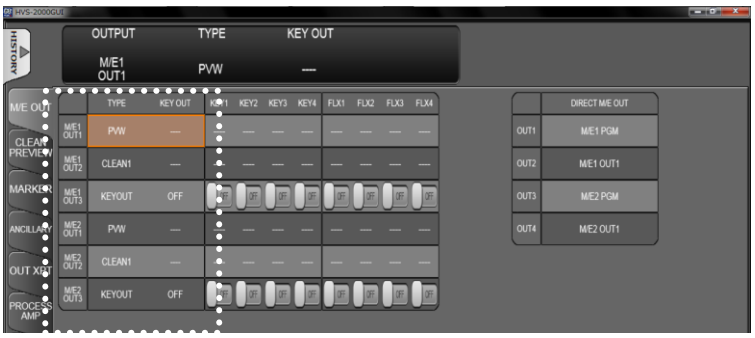
M/E3 PGM and M/E1 OUT 1-3 selections are available in the higher HVS-2000 editions as shown below.
S/N:15880001 to 15880220: Unavailable (Select them under AUX OUT.)
S/N:15880221 and higher: Available with an HVS-2000ME option

7-1-1. Selecting OUT 1-3 Images on M/E 1-3

Combined M/E1 and M/E2 images (PGM, PVW, CLEAN1, CLEAN2 and KEY OUT) can be easily assigned to AUX or KEY buses by using M/E1OUT1-3 and M/E2OUT1-3 internal buses.

(1) Open the [SETUP > OUTPUT > M/E OUT] menu.

(2) If **M/E1 OUT1 TYPE** is set to PGM, M/E1OUT1 becomes the M/E1 program image.
If **M/E2 OUT2 TYPE** is set to PVW, M/E2OUT2 becomes the M/E2 preview image.
If turning **KEY OUT** to ON, the output image becomes the keyed signal of combined image, which is helpful when adjusting a chromakey.



7-1-2. PREVIEW (PVW), CLEAN1 and CLEAN2 Images

◆ **PVW (Preview) images**

The switcher does not provide dedicated preview outputs. To preview the next combined M/E image, assign PVW to one of the M/E internal buses (M/E1OUT1-3 and M/E2OUT1-3) using the menu, then select the bus for an AUX output or M/E OUT1-4.

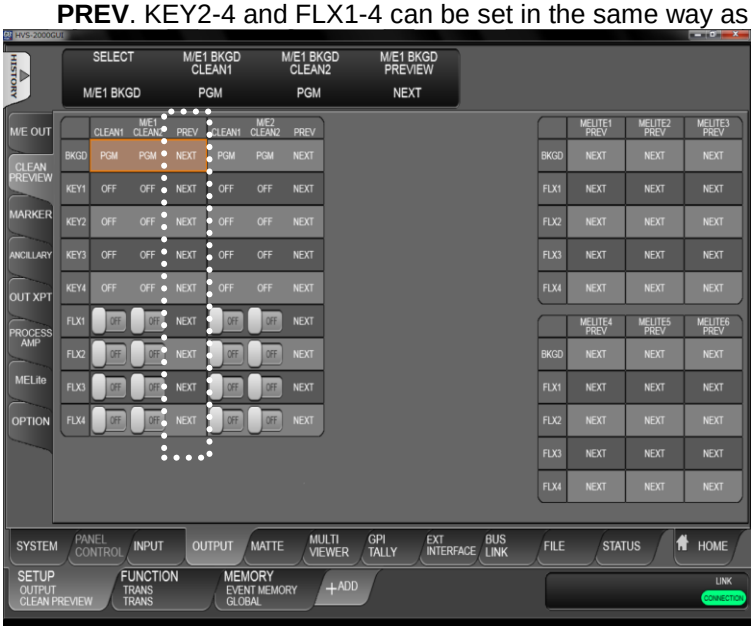
◆ **CLEAN images**

Clean images are essentially the same as program images, but they can also include key images. They also have no dedicated outputs. To display clean images, assign CLEAN1 or CLEAN2 to one of the M/E internal buses (M/E1OUT1-3 and M/E2OUT1-3) using the menu, then select the bus for an AUX output or M/E OUT1-4.

◆ **Setting up PVW and CLEAN images**

On-air or standby key images can be added to CLEAN or PREVIEW images. This can be done as explained below:

(1) Open the [SETUP > OUTPUT > CLEAN PREVIEW] menu.
(2) For example, to add M/E1KEY1 to the PREVIEW image, turn ON **KEY1** under **M/E1 PREV**. KEY2-4 and FLX1-4 can be set in the same way as M/E1KEY1.



7-2. Changing AUX Output Images (AUX Transitions)

AUX output images can be selected from all video sources, program, preview, clean and key out signals. To select a combined M/E signal, use an internal bus from among M/E1 OUT1-3 and M/E2 OUT1-3. In addition, simple video effects can be applied to AUX video switching.
See Sec. 9-2 "XPT Re-entry" for details on re-entry video layers.

7-2-1. Selecting a Video Using Bus Buttons (HVS-2240OU)

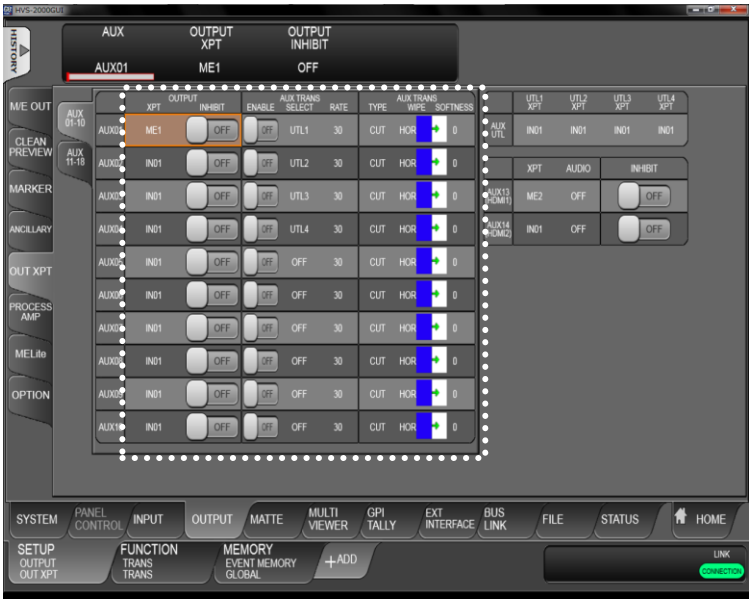
Select it on the control panel.

7-2-2. Selecting a Video Using the Menu

(1) Open the [SETUP > OUTPUT > OUT XPT] menu.
(2) Turn **AUX TRANS ENABLE** to ON.
(3) Select a transition type under **AUX TRANS TYPE** and a direction under **WIPE**, if the type is set to WIPE.
(4) Select a video under **OUTPUT XPT** to change the AUX video image.

◆ **Other Menu Settings**

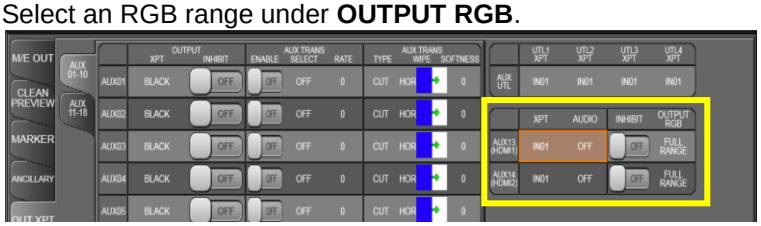
Parameter	Description
OUTPUT INHIBIT	If set to ON, the AUX video image is fixed and cannot be changed.
AUX TRANS RATE	Allows you to set the duration time needed for MIX or WIPE transitions.
AUX TRANS SOFTNESS	Allows you to set transition softness.



7-3. HDMI Output

Note that the **HDMI 1** and **HDMI 2** output ports are respectively assigned to **AUX13** and **AUX14**.

(1) Open the [SETUP > OUTPUT > OUT XPT] menu.
(2) Select a video image under **XPT**.
(3) The HDMI ports can output dual-channels of audio. Select a channel pair under **AUDIO**.
(4) if **INHIBIT** is set to ON, the video images cannot be selected for the HDMI port on the control panel.
(5) Select an RGB range under **OUTPUT RGB**.



◆ **HD Multiviewer Video Output in SD Mode**

The HDMI ports can display multiviewer video (MV1 or MV2) in HD resolution when the switcher is running in SD mode. To do so, open the [SETUP > SYSTEM > MV SETUP] menu and turn **MV HIGH QUALITY MODE** to ON.

7-4. Setting up Additional Outputs

Up to two cards of additional outputs can be installed into slots **I/O A** and **I/O B**.

Option slot	Output name		Available card	Available Video Signal (Connector)	Number of outputs per card.
I/O A	AUX15 AUX16		HVS-100DO	HD/SD SDI (BNC)	2 outputs (*1)
			HVS-100AO	HD/SD Analog Component or Analog Composite (BNC)	2 outputs
			HVS-100PCO	Digital RGB (HDMI)	2 outputs
I/O B	AUX17 AUX18			Digital RGB (HDMI) / Analog RGB or Y/Pb/Pr (VGA)	
				Digital RGB (HDMI)	
				Digital RGB (HDMI) / Analog RGB or Y/Pb/Pr (VGA)	

(*1) Each channel in the HVS-100DO card has a simultaneous SD output feature. When operating in HD mode, the simultaneous output outputs the down-converted SD signal.

◆ **Output name**

A card provides two output channels, which can be independently set in the menu.
Output bus numbers are fixed to AUX15-18, as shown in the above table. Use these numbers to set up additional output signals.

◆ **Proc Amp, Safety Area Marker and Color Correction**

Almost the same functions as those for standard outputs can be applied to additional outputs, such as Proc Amp, Safety Area Marker, and Color Correction.

▶ See Sec. 7-5. "Adjusting Output Signal Levels" to 7-9. "BUS LINK Function" for details.

◆ **4K Mode**

Only SDI output cards support 4K mode. No video outputs from HVS-100AO and HVS-100PCO cards in 4K mode.

7-4-1. HVS-100DO

HVS-100DO cards output SDI signals.
Open the [SETUP > OUTPUT > OUT XPT] menu and select video signals for **AUX15** and **AUX16** (if the card is installed in **Slot A**), or **AUX17** and **AUX18** (Ii the card in Slot B).

7-4-2. HVS-100AO

The 100AO card outputs analog signals.
Use the supplied conversion cable for AUX16 and AUX18. Specify the signal format in the [SETUP > OUTPUT > OPTION] menu.
See the HVS-2000/OU Operation Manual for more details.

7-4-3. HVS-100PCO

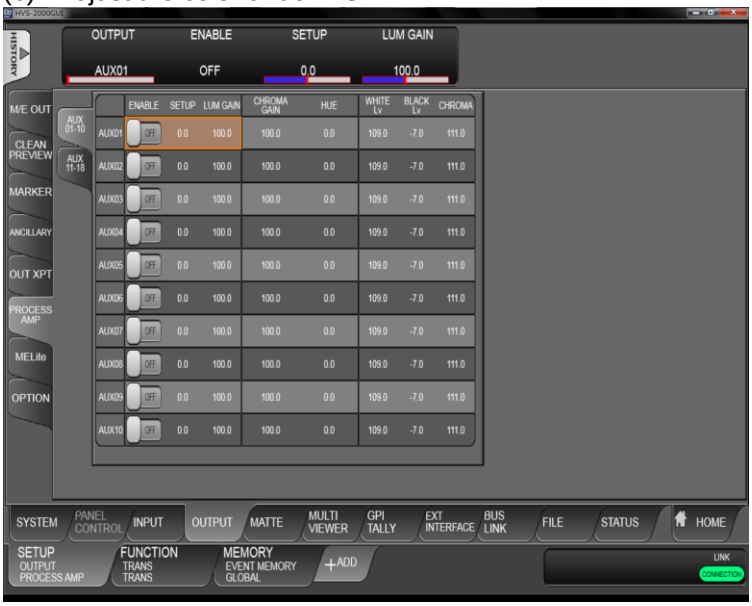
HVS-100PCO cards output HDMI signals.
Select the **RESOLUTION** and **ASPECT RATIO** in the [SETUP > OUTPUT > OPTION] menu.
See the HVS-2000/OU Operation Manual for more details.

7-5. Adjusting Output Signal Levels

7-5-1. Proc Amp

The switcher provides the following Proc Amp features, allowing you to adjust output signal levels.

(1) Open the [SETUP > OUTPUT > PROCESS AMP] menu.
(2) Turn **ENABLE** to ON to enable the Proc Amp feature.
(3) Adjust the Black Level under **SETUP**.
(4) Adjust the luminance level under **LUM GAIN**.
(5) Adjust the chrominance level under **CHROMA GAIN**.
(6) Adjust the color under **HUE**.



7-5-2. Video Level Clip

To maintain the desired signal level after adjusting video levels with the Proc Amp, use the Video Level Clip function to adjust the upper and lower limits of YPbPr color space. Note that Video Level Clip can be applied only when the Proc Amp is enabled.

(1) Open the [SETUP > OUTPUT > PROCESS AMP] menu.
(2) Signal level limits can be set respectively under **WHITE-Lv**, **BLACK-Lv** and **CHROMA**.

7-6. Color Correction

The switcher has two color correction filters for each M/E that can be assigned to inputs, M/E outputs and keys. In addition, Clip adjustment allows users to set signal level limits for all color correction outputs. The following features are available:

- Max. 4 color correction filters (2 for each M/E)
- Separate or group adjustment for RGB White/Black/Gamma levels.
- Three Color Correction modes available: BAL (balanced), DIF (differential) and SEPIA.
- Two Clip modes available: YBR and RGB (GBR)

Installing an HVS-2000EX option card allows you to add 8 more color corrector channels to the switcher. See Sec. 7-6-5 "Input Color Correction (HVS-2000EX)."

7-6-1. Assigning a Color Correction Channel

(1) Open the [FUNCTION > COLOR CORRECT > BUS CC] menu.
(2) Select a color correction channel. Channel 1 of M/E1 (M/E1 CH1) is selected in the below menu example.
(3) Select a video (bus) to be adjusted under **SIGNAL**.
(4) Set **ENABLE** to ON to enable the channel.

7-6-2. Adjusting Colors

Now the selected video signal can be processed using Color Correction. Check and adjust the signal using a waveform monitor and vector scope. Also use an SDI monitor to compare pre- and post-processed images.

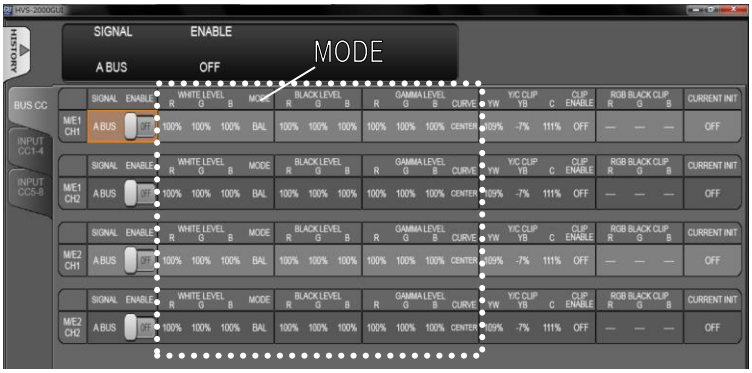
◆ Selecting a Correction Mode

(1) Open the [FUNCTION > COLOR CORRECT > BUS CC] menu.
(2) Select BALANCE, DIFFERENTIAL or SEPIA under **MODE**.

<If BALANCE or DIFFERENTIAL selected>

Set signal levels for **WHITE LEVEL**, **BLACK LEVEL** and **GAMMA LEVEL**. Set levels for **R**, **G** and **B** components respectively. Select a gamma curve under **CURVE**.

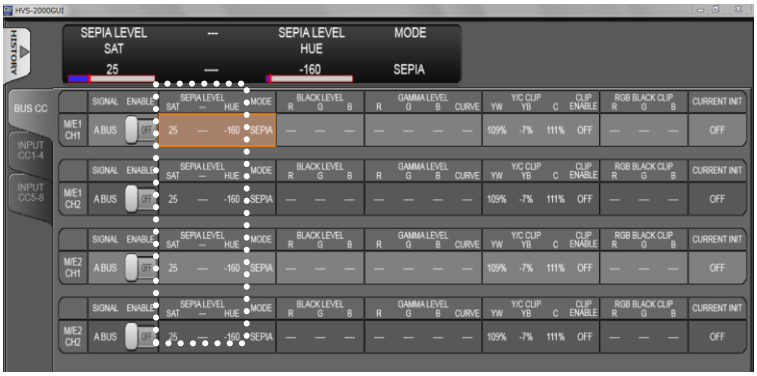
	Parameter	Description	Default	Setting range
WHITE LEVEL	R / G / B	Adjusts R, G and B.	100%	0% to 200%
BLACK LEVEL	R / G / B	Adjusts R, G and B.	100%	0% to 200%
GAMMA LEVEL	CURVE	Select a gamma curve.	CENTER	CENTER, BLACK, WHITE
	R / G / B	Adjusts R, G and B.	100%	0% to 200%



<If Sepia is selected>

Adjust **SAT** and **HUE** under SEPIA LEVEL.

	Parameter	Description	Default	Setting range
SEPIA LEVEL	SAT	Adjusts the SATURATION level.	25	0 to 100
	HUE	Adjusts the HUE.	-160	-179 to 180

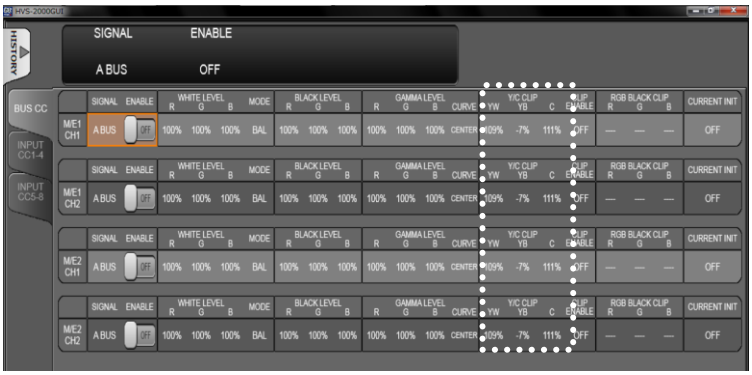


7-6-3. Clip Adjustment

Signal level thresholds for all color correction outputs (Clip adjustment) can be adjusted in YBR or RGB mode. If Clip adjustment is disabled (ENABLE to OFF), default values are applied to output signals.

<To Set Clip in Y/C Mode>

(1) Open the [FUNCTION > COLOR CORRECT > BUS CC] menu.
(2) Select Y/C under **CLIP ENABLE**.
(3) Set each parameter limit respectively under Y/C CLIP.

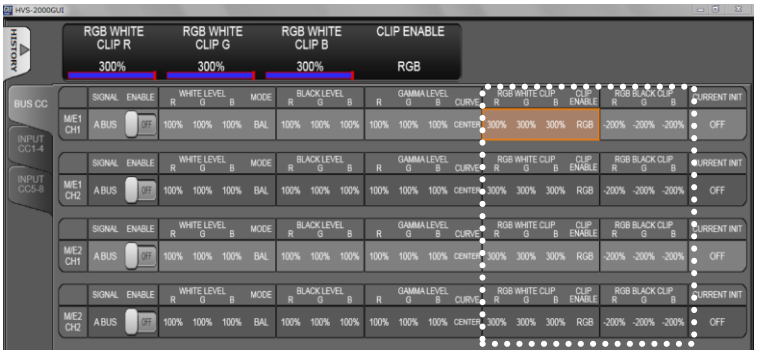


Parameter	Description	Default	Setting range
YW	Sets the WHITE limit in Y signal.	109%	50% to 109%
YB	Sets the BLACK limit in Y signal.	-7%	-7% to 50%
C	Sets the WHITE limit in C signal.	111%	50% to 111%

<To Set Clip in RGB Mode>

(1) Open the [FUNCTION > COLOR CORRECT > BUS CC] menu.
(2) Select RGB under **CLIP ENABLE**.
(3) Set **R**, **G** and **B** limits respectively under RGB WHITE CLIP and RGB BLACK CLIP.

	Parameter	Description	Default	Setting range
RGB WHITE CLIP	R / G / B	Sets the WHITE limit.	300%	50% to 300%
RGB BLACK CLIP	R / G / B	Sets the BLACK limit.	-200%	-200% to 50 %



7-6-4. Resetting a Color Corrector Channel

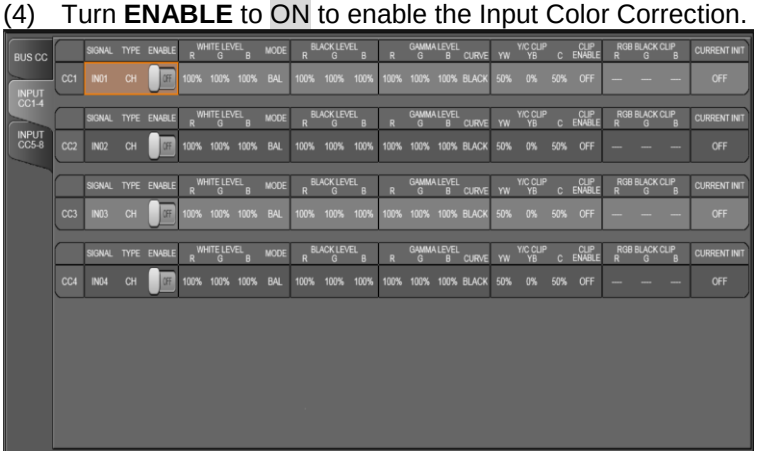
(1) Open the [FUNCTION > COLOR CORRECT > BUS CC] menu.
(2) Select EXEC under **CURRENT INIT**.
(3) Tap **YES** in the confirmation dialog. Color Corrector Channel Settings are reset excluding SIGNAL and ENABLE items.

7-6-5. Input Color Correction (HVS-2000EX)

An optional HVS-2000EX allows you to add 8 color corrector channels in HD/SD mode (4 channels in 1080p mode), and assign corrected video signals to bus buttons as input sources. The following procedure explains how to assign INPUT01 to the CC1 channel and then to AUX01.

◆ **Assigning INPUT01 to CC1**

(1) Open the [SETUP > COLOR CORRECT > INPUT CC1-4] menu.
(2) Select IN01 under **CC1 SIGNAL**.
(3) Select CH or INPUT under **TYPE**.
If set to CH, menu settings are stored per channel.
If set to INPUT, menu settings are stored per input.
If the same input video is assigned to different channels and the input video is color-corrected on a channel, the input video on the other channel is not color-corrected. The last settings are stored as the color correction values for the input.
(4) Turn **ENABLE** to ON to enable the Input Color Correction.



◆ **Correcting Colors**

See Sec. 7-6-2. "Adjusting Colors" for details on color correction.
To clip signal levels, see Sec. 7-6-3. "Clip Adjustment."
To reset color corrections, see Sec. 7-6-4. "Resetting a Color Corrector Channel.

◆ **Assigning the corrected signal to the AUX01 output**

(1) Open the [SETUP > OUTPUT > OUT XPT] menu.
(2) Select **CC1** under **AUX01 OUTPUT XPT**.

7-7. Safety Area Markers

Various markers for the safety area and screen center can be displayed on the desired output.

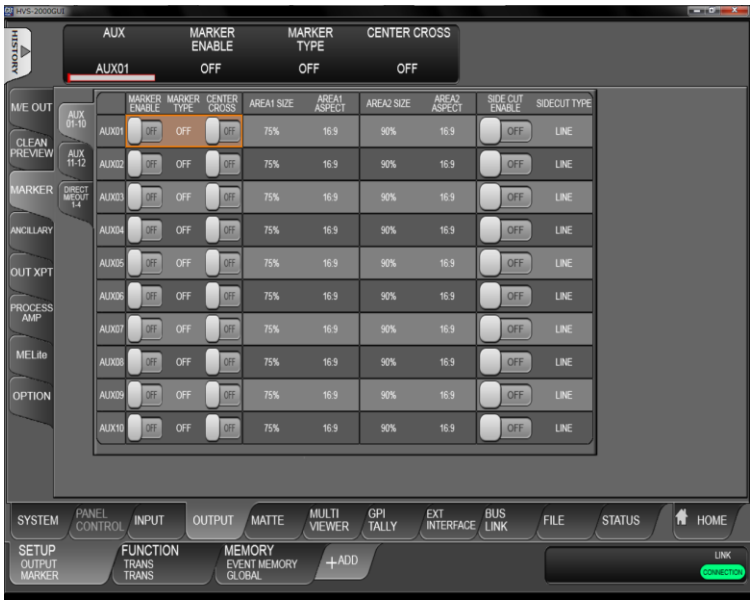
(1) Open the [SETUP > OUTPUT > MARKER] menu.
(2) Turn **MARKER ENABLE** to ON to enable the marker display function.
(3) Select a safety area mark type (see table on next page).

OFF	No safety markers are displayed. Set to OFF if SIDE CUT ENABLE is set to ON.
BOX	Displays a safety area in a box-shaped frame. Set the size and aspect ratio respectively under **AREA1 SIZE** and **AREA1 ASPECT**.
HOOK	Displays a safety area with four corner marks. Set the size and aspect ratio respectively under **AREA1 SIZE** and **AREA1 ASPECT**.
B+H	Displays two safety areas: box and hook. Set the size and aspect ratio respectively under **AREA1 SIZE** and **AREA1 ASPECT**, **AREA2 SIZE** and **AREA2 ASPECT**.
B+B	Displays two box type safety areas. Set the size and aspect ratio respectively under **AREA1 SIZE** and **AREA1 ASPECT**, **AREA2 SIZE** and **AREA2 ASPECT**.

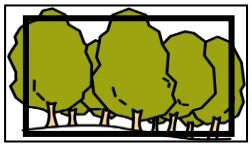
(4) The center point will be added if CENTER CROSS is set to ON.

◆ Side Cut Display (HD mode only)

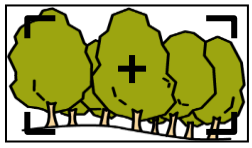
To check the Side Cut image converting the aspect ratio from 16:9 to 4:3, go to PAGE 4 and select the SIDE CUT TYPE from LINE, BLACK or HALF. Then turn SIDE CUT ENABLE to ON.



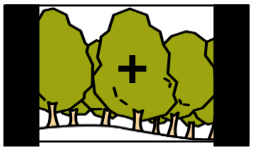
◆ Marker Display Examples



MARKER TYPE: BOX
AREA1 SIZE: 85%
AREA1 ASPECT: 16:9



MARKER TYPE: HOOK
AREA1 SIZE: 85%
AREA1 ASPECT: 16:9
CENTER CROSS: ON



MARKER TYPE: OFF
SIDE CUT TYPE: BLACK
CENTER CROSS: ON

7-8. Ancillary Data

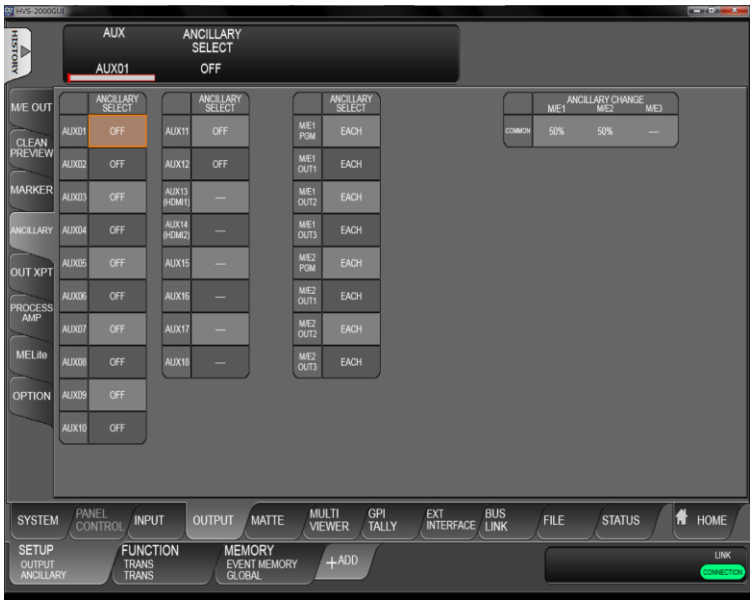
Ancillary data embedded in SDI input signals can be erased or passed through to outputs. As factory default, ancillary data, including audio, is set to pass through all combined M/E outputs, but **not** to pass through all AUX outputs.

Ancillary data in input video cannot be passed through if input frame synchronizers are set to ON for SDI input. To pass ancillary data to video output, input the video that is synchronized with the genlock signal and set **FS** to OFF in the [SETUP > INPUT > SIGNAL] menu.

Note that ancillary data in SD inputs cannot be used when the switcher operates in HD mode.

(1) Open the [SETUP > OUTPUT > ANCILLARY] menu.
(2) If a **combined M/E output** is selected:
Select OFF (blank), EACH (pass-through), or a UTILITY signal (UTL1 or UTL2) under **ANCILLARY SELECT**. If a UTILITY signal is selected, ancillary data in combined M/E signals are replaced with ancillary data in the UTILITY signal. (See Sec. 6-7-1. “UTILITY1-2 and AUX UTILITY1-4.”)

If an **AUX output** is selected:
Select OFF (blank), EACH (pass-through), or UTL1 to UTL4 (replace) under **ANCILLARY SELECT**.
(3) Select the data switching point during video transitions under **ANCILLARY CHANGE**.



7-9. BUS LINK Function

The BUS LINK function allows you to link video switches between any two buses among M/E PGM, PST and AUX outputs. Two types of bus links are available: **BUS (video) LINK** and **TRANS (transition) LINK**.

7-9-1. BUS LINK

The BUS LINK function allows images to be switched synchronously. For example, when you change the AUX1 image, the AUX2 image will automatically change accordingly, or when you change the M/E1PGM image, the M/E2PGM image will automatically change accordingly. In the above examples, AUX1 and M/E1PGM are called **Master Bus** and AUX2 and M/E2PGM **Slave Bus**. Let's set up bus link examples that meet the following conditions.

◆ **Required Link Conditions**

When M/E1PGM selects IN01, M/E1PST automatically selects IN05.
When M/E1PGM selects IN02, M/E1PST automatically selects IN06.
When AUX1 selects IN01, AUX2 automatically selects IN05.
When AUX1 selects IN02, AUX2 automatically selects IN06.

(1) Open the [SETUP > BUS LINK > BUS LINK] menu.
(2) Select LINK1 under **LINK No**.
(3) Set **MASTER BUS** to M/E1PGM and **SLAVE BUS** to M/E1PST.
(4) Set **LINK MODE** to NORMAL.

NORMAL	When the video image is changed in a Master Bus, the paired image is automatically applied to its Slave Bus.
SYNC	When the video image is changed in a Master Bus, the same image is automatically applied to its Slave Bus.

(5) Select pair images for LINK1.
  (a) Assign IN01 to MASTER XPT and IN05 to **SLAVE XPT** under PAIR No.01.
  (b) Assign IN02 to MASTER XPT and IN06 to **SLAVE XPT** under PAIR No.02.
(6) Change **LINK No** to LINK2 and set **MASTER BUS** to AUX1, **SLAVE BUS** to AUX2, and **LINK MODE** to NORMAL.
(7) Then turn ALL ENABLE ON to enable all bus (video) links.

◆ **Copying BUS LINK Setting**

(1) Open the [SETUP > BUS LINK > BUS LINK] menu. Select a destination link under **LINK No** (LINK3, for example).

(2) Select a source link (LINK1, for example) under **XPT COPY SOURCE**. Select **YES** in the confirmation dialog.
LINK1 setting is copied to LINK3.

◆ **Resetting Bus Links**

(1) Open the [SETUP > BUS LINK > BUS LINK] menu.

(2) Select CURRENT LINK or ALL INIT under **LINK INIT**.

7-9-2. TRANS LINK

The TRANS LINK function allows you to perform synchronous transitions. When a transition is performed on a master bus, the same transition is automatically performed on its slave bus. The following transition settings are shared.

-CUT or AUTO transition
-Transition Type, Pattern number and Transition Rate
-Fader Level, Fader Limit and Limit Enable

(1) Open the [SETUP > BUS LINK > TRANS LINK] menu.

(2) Select a master bus under **MASTER BUS** and a slave bus under **SLAVE BUS**.

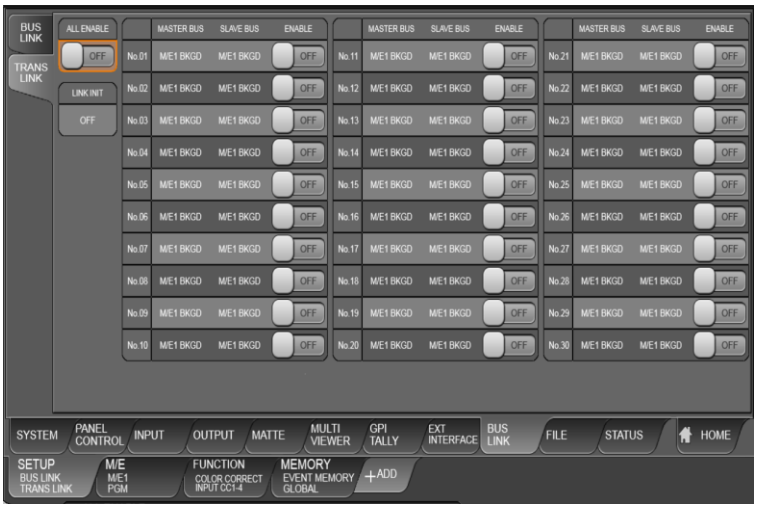
(3) Turn **ENABLE** to ON to enable the trans link.

◆ **Enabling/Disabling All Trans Links**

Open the [SETUP > BUS LINK > TRANS LINK] menu and turn ON/OFF **ALL ENABLE**.

◆ **Resetting Trans Links**

Open the [SETUP > BUS LINK > TRANS LINK] menu and change **LINK INIT** to EXEC.



8. Bus Operation

8-1. Control Panel

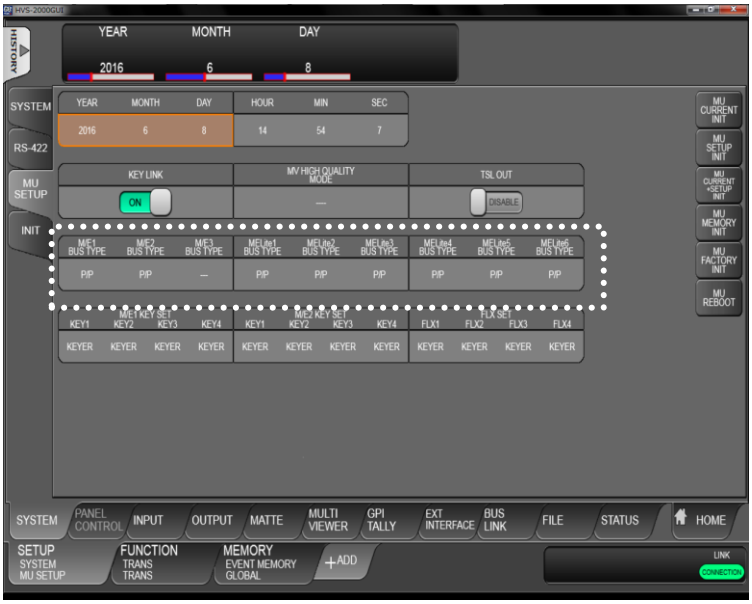
See the HVS-2000/OU Operation Manual for control panel details.

8-2. Selecting Video Sources

8-2-1. M/E Bus Type

The M/E bus type can be selected under **BUS TYPE** in the [SETUP > SYSTEM > MU SETUP] menu from the following three options.

P/P (PGM/PST) (Default)	Source selections in the PGM and PST buses are switched when transitions occur and users can always select the next background signal (PST image) in the bottom row.
A/B	Source selections in the PGM and PST buses do not switch when transitions occur and the next signal must be selected in the accompanying bus after each transition.
P/P Reverse	PST/PGM mode. PGM and PST buses are placed in the reverse order of **P/P(PGM/PST)** and users can always select the on-air background signal (PGM image) in the bottom row.



8-3. XPT DELAY

The XPT DELAY (crosspoint delay) feature allows you to add a time delay until a signal is changed after pressing a bus button. To enable the feature, proceed as follows:

(1) Open [SETUP > INPUT > SIDE PANEL] menu.
(2) Select a video input source.
(3) Set a delay value in frames.

8-4. Selecting a Function to BUS FUNC Buttons

The operation is unavailable. Do it on the control panel.

8-5. Bus Button Colors

Bus buttons on the control panel can be changed to any desired color with the COLOR PALETTE menu. Before changing button colors, create and save colors to the color palette or to signals.

8-5-1. Creating and Saving Colors

◆ **Registering Signal Colors**

Signal colors can be applied to bus buttons. To create signal colors proceed as follows.

(1) Open the [SETUP > INPUT > SIGNAL COLOR] menu.

(2) Select a signal and create and assign a color under **PALETTE COLOR**.

8-6. Adjusting Control Panel Brightness

The operation is unavailable. Do it on the control panel.

9. MELite1-6 Operations

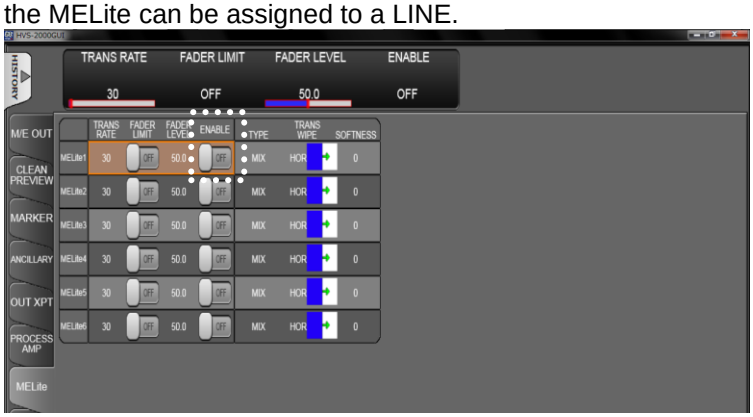
MELites, simplified M/Es, can be assigned to a LINE. Once an MELite (MELite1-6) is enabled, PGM/PST buses are automatically assigned to two AUX buses: AUX1/2 for MELite1, AUX3/4 for MELite2…and AUX11/12 for MELite6.
FLEXaKEY1-4 can be displayed on MELite mixed images. Therefore the switcher can provide up to 6 M/E with a key for each. See the table below for MELite configuration details.

M/E	PGM output	PST output	Available keys
MELite1	AUX1	AUX2	FLEXaKEY1-4
MELite2	AUX3	AUX4	
MELite3	AUX5	AUX6	
MELite4	AUX7	AUX8	
MELite5	AUX9	AUX10	
MELite6	AUX11	AUX12	

Note that once an MELite is assigned to a LINE, AUX transitions (signal selection) are disabled on the AUX buses used for associated MELite PGM and PST buses.

9-1. Setting up an MELite

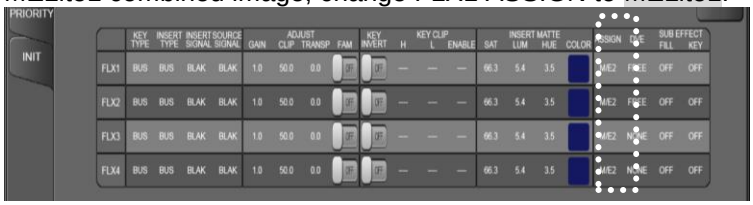
Open the [SETUP > OUTPUT > MELite] menu and turn ON ENABLE for an MELite. Once enabled, the MELite can be assigned to a LINE.



MELite output (AUX) images can be used as video sources for other buses.
► See Sec. 7-2. “Changing AUX Output Images (AUX Transitions).”

◆ **Displaying Key Images**

MELites can display up to 4 key images (FLEXaKEY1-4) in total.
Open the [FUNCTION > KEYER FLEXaKEY > SRC INS] menu. To display FLEXaKEY1 on the MELite1 combined image, change FLX1 ASSIGN to MELite1.



9-2. XPT Re-entry

See the HVS-2000/OU Operation Manual for crosspoint re-entry details.

10. Transitions

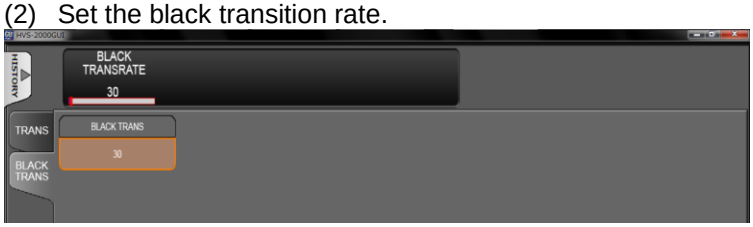
Transitions cannot be performed on the HVS-2000GUI. See the HVS-2000/OU Operation Manual for transition details.

10-1. Black Transitions

◆ **Setting Black Transition Rate**

(1) Open the [FUNCTION > TRANS > BLACKTRANS] menu.

(2) Set the black transition rate.



10-2. Transition Block

See the HVS-2000/OU Operation Manual for transition block details.

10-3. Background Transitions

The operation is unavailable. Do it on the control panel.

10-4. KEY Transitions

The operation is unavailable. Do it on the control panel.

10-5. Simultaneous BKGD and Key Transitions

The operation is unavailable. Do it on the control panel.

10-6. Simultaneous Transition of M/Es (ONStage)

The operation is unavailable. Do it on the control panel.

10-7. Pattern (WIPE/DVE) Transitions

The operation is unavailable. Do it on the control panel.

10-8. Direct Pattern Function

10-8-1. Registering Direct Patterns

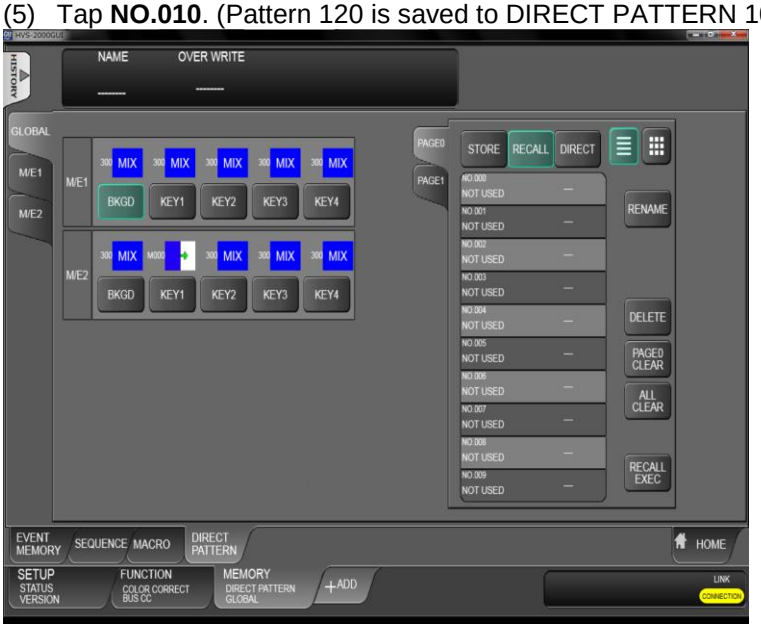
DIRECT PATTERN data is copied from BKGD or KEY pattern buffers, so that modification information stored in buffers can be copied to DIRECT Patterns. The following example saves **Pattern 120** for **M/E2 BKGD** to **DIRECT PATTERN 10** in **GLOBAL** memory.

◆ **Selecting Pattern 120 for M/E2 BKGD**

(1) Open the [FUNCTION > TRANS > TRANS] menu.
(2) Select Pattern 120 under M/E2 BKGD **PATTERN NO**.
(3) Modify the pattern, if necessary. (See Sec. 10-9. “Modifying Patterns.”)

◆ **Saving Pattern 120 to DIRECT PATTERN 10**

(1) Open the [MEMORY > DIRECT PATTERN > GLOBAL] menu.
(2) Select the **PAGE1** tab in the right side of the screen. (PAGE0 contains DIRECT PATTERN 0-9 and PAGE1 DIRECT PATTERN 10-19.)
(3) Tap **M/E2 BKGD**.
(4) Tap **STORE**.
(5) Tap **NO.010**. (Pattern 120 is saved to DIRECT PATTERN 10 in GLOBAL memory.)



If a number button (lit red) cannot be overwritten, cancel the operation, change OVERWRITE from DISABLE to ENABLE in the [DIRECT RECALL] menu, then overwrite the pattern setting.

10-8-2. Loading a Direct Pattern

Let’s load **DIRECT PATTERN10**, which is saved in the previous chapter, to **M/E2 KEY1**.

(1) Open the [MEMORY > DIRECT PATTERN > GLOBAL] menu.
(2) Select **PAGE1**.
(3) Select **NO.010**.
(4) Tap on **M/E2 KEY1** button to specify the target.
(5) Tap **RECALL**. The M/E2 KEY1 pattern is changed to PATTERN 120 and the transition type to WIPE.

If DIRECT in the [DIRECT PATTERN] menu is set to ON, direct patterns can be recalled by pressing number buttons without pressing RECALL.

10-8-3. Clearing Direct Patterns

◆ **Clearing a Direct Pattern Individually**

(1) Open the [MEMORY > DIRECT PATTERN > GLOBAL] menu.
(2) Tap the number button to be deleted.
(3) Tap **DELETE**.

◆ **Clearing a Direct Pattern Page**

(1) Open the [MEMORY > DIRECT PATTERN > GLOBAL] menu.
(2) Select **PAGE0** or **PAGE1** and tap **PAGE CLEAR**.

◆ **Clearing all Direct Patterns**

(1) Open the [MEMORY > DIRECT PATTERN > GLOBAL] menu.
(2) Tap **ALL CLEAR**.

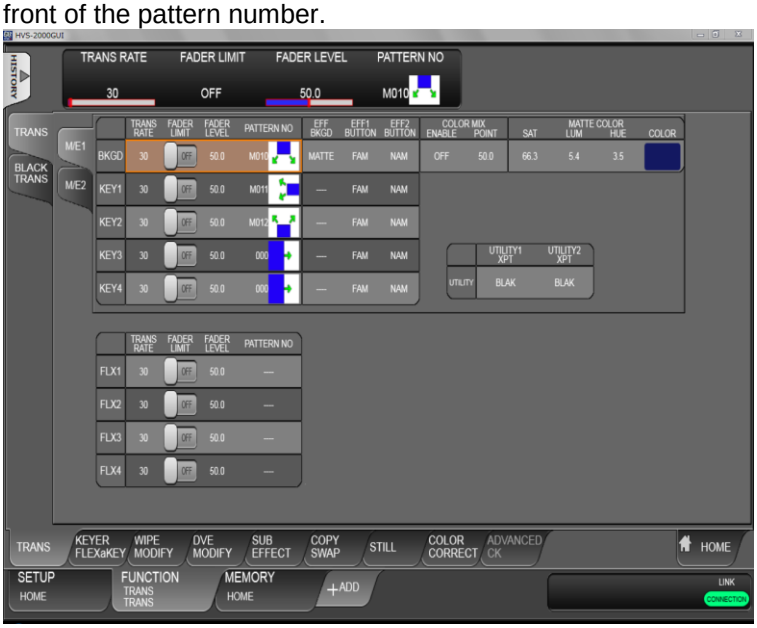
Before clearing a direct pattern registration, set **DIRECT** to OFF. Otherwise, the selected pattern is loaded immediately when pressing the number button.

10-9. Modifying Patterns

Preset patterns for pattern transitions can be changed or modified from their original patterns. There are two types of preset patterns, WIPE and DVE, which undergo different image processing methods and algorithms and provide different MODIFY menus: WIPE MODIFY and DVE MODIFY.

10-9-1. Modified Pattern Data

When opening the [FUNCTION > TRANS > TRANS] menu, selected pattern numbers and icons are displayed under **PATTERN NO**. If a pattern is modified, the letter "M' is added in front of the pattern number.



A pattern can be differently modified for the background and KEY1-4 buses, because each bus has two temporary buffers to store WIPE and DVE pattern data. Note that, however, modified data will be lost if another pattern is selected for a bus.

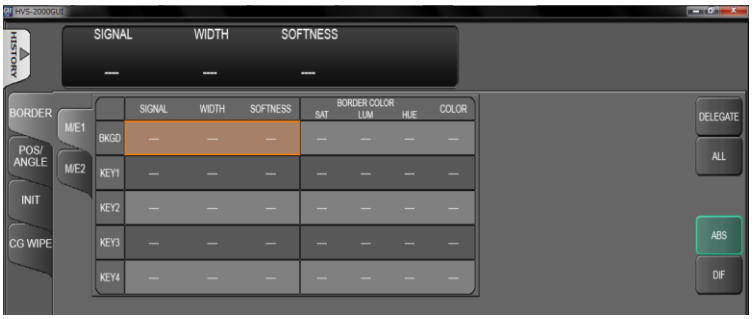
The DIRECT patterns allow you to store “pattern and modified information” and to load the data as needed. (See Sec. 10-8. “Direct Pattern Function.")

10-9-2. WIPE Modify Example

This modification example adds a border effect to the M/E1 background transitions using Pattern 20.

(1) Select a desired video on the M/E1 PST bus.
(2) Open the [FUNCTION > TRANS > TRANS] (or [SETUP > HOME > HOME > STATUS]) menu.
(3) Select Pattern 20 under M/E1 BKGD **PATTERN NO**.
(4) Change M/E1 BKGD **TRANS TYPE** to WIPE.

(5) Open the [FUNCTION > WIPE MODIFY > BORDER] menu.
(6) Select a video signal used for borders under **SIGNAL** in M/E1 BKGD. Select MATTE in this example. Set the border width under **WIDTH** and border softness under **SOFTNESS**.
(7) Specify a MATTE color under **BORDER COLOR**.

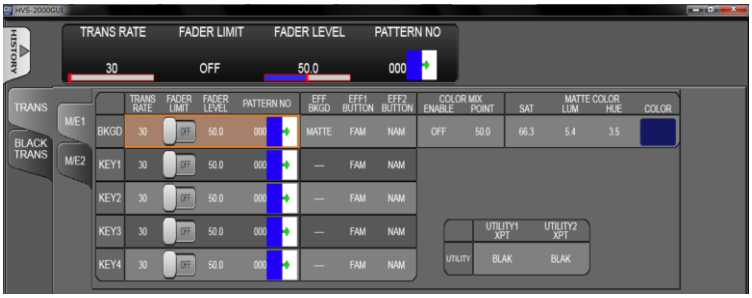


10-9-3. DVE Modify Example

The following modification example is applied to M/E1KEY1 transitions using Pattern 117.

A DVE channel is applied to a bus when the bus selects a DVE type pattern, regardless of pattern modification.
See Sec. 12. “Assigning DVE Channels. “

(1) Refer to Sec. 11. “KEY and FLEXaKEY” to set up M/E1 KEY1.
(2) Open the [FUNCTION > TRANS > TRANS] menu.
(3) Select Pattern 117 under **PATTERN NO** of M/E1 KEY1.



(4) Select WIPE on the control panel (or in the [SETUP > HOME > HOME > STATUS] menu) to change the M/E1 BKGD transition type to WIPE.
(5) Use the fader to perform the KEY1 pattern transition on the control panel.
Let's modify the pattern while monitoring the screen.
(6) Open the [FUNCTION > DVE MODIFY > POS/SIZE] menu. Refer to Sec. 13. "DVE Effects" to modify the pattern.

◆ **Saving the Modify Pattern to a DIRECT Pattern**

The modified pattern can be saved to a DIRECT Pattern. Then let's save Pattern 117 that was modified for M/E1KEY1 to **DIRECT PATTERN 07**.

(1) Open the [MEMORY > DIRECT PATTERN > GLOBAL] menu.
(2) Select **PAGE0**.
(3) Tap **M/E2 KEY1**.
(4) Tap **STORE**.
(5) Tap **NO.007**.

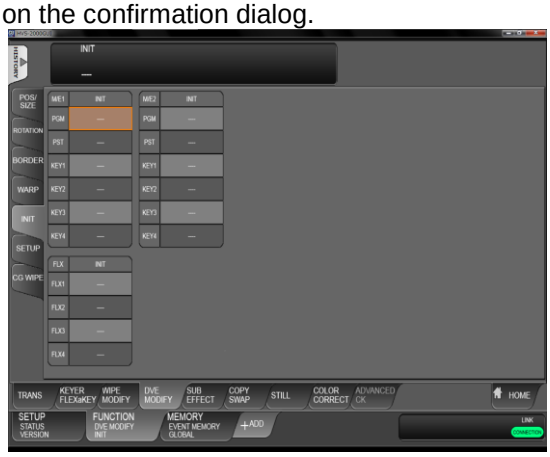
See Sec. 10-8. "Direct Pattern Function" for Direct Pattern function details.

10-9-4. Resetting Modified Pattern

The INIT parameters in the menu allow you to reset all or subset of modified data.

◆ **Resetting a subset of modified settings**

(1) Open the [FUNCTION > WIPE MODIFY > INIT] or [FUNCTION > DVE MODIFY > INIT] menu.
(2) Tap a bus.
(3) Select a subset to be reset, then tap **YES** on the confirmation dialog.



◆ **Resetting all modified settings**

(1) Select ALL in the [FUNCTION > WIPE MODIFY > INIT] or [FUNCTION > DVE MODIFY > INIT] menu.
(2) Tap **YES** on the confirmation dialog.

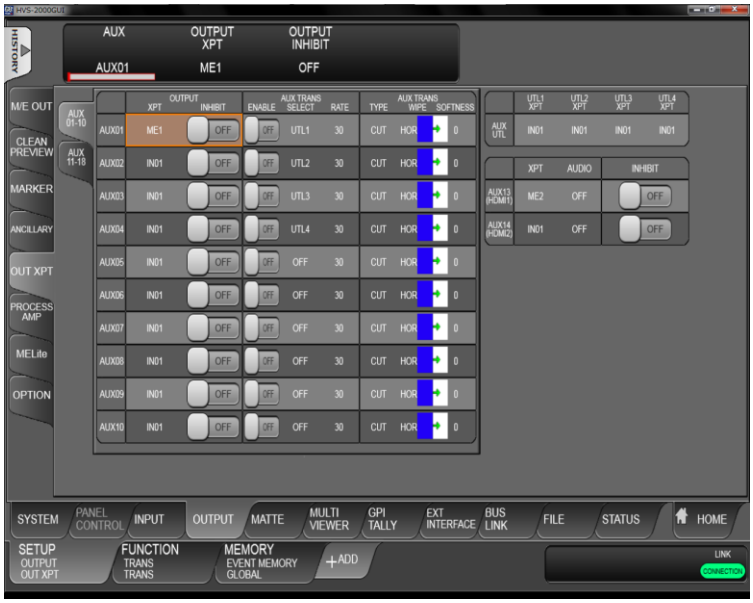
10-10. KEY IN/OUT Using Cut or Fade

The operation is unavailable. Do it on the control panel.

10-11. AUX Image Transitions

AUX bus images can be switched using simple effects, such as fade and horizontal, vertical and both directional slides. The following example shows how to fade in/out AUX 1 images in 30 frames.

(1) Open the [SETUP > OUTPUT > OUT XPT] menu.
(2) Turn ON **AUX TRANS ENABLE** for AUX01. Set **RATE** to 30 (frames).
(3) Change **TYPE** to MIX.
(4) Select a next video under **OUTPUT XPT**. The AUX1 image is switched to the next one with fade-in/fade-out effect.



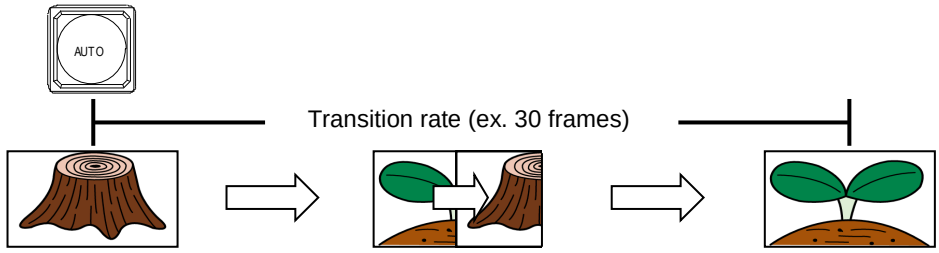
FLEXaKEY or AUX UTILITY buses are used for AUX transitions.
AUX01-04 transitions need AUX UTILITY bus support.
AUX05-12 transitions need FLEXaKEY1-4 support. (FLEXaKEY1-4 must be assigned to AUX outputs.)
Therefore, when AUX UTILITY and FLEXaKEY are used for AUX transitions, they cannot perform their original functions.

Note that once an MELite is turned to ON, AUX transitions are disabled on its PGM/PST outputs. (e.g. AUX1 and 2 if MELite 1 is ON.)

10-12. Advanced Transition Settings

10-12-1. Transition Rate

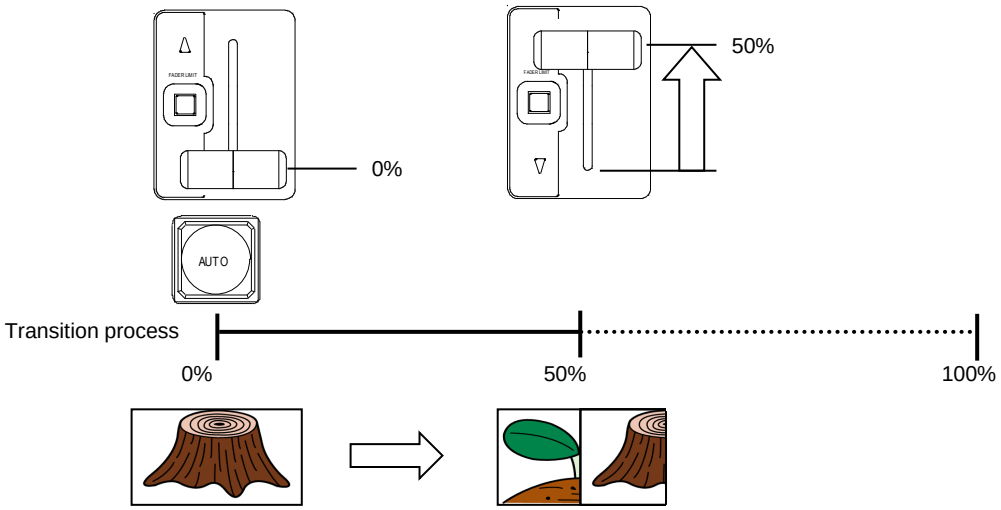
The transition rate setting determines how long transitions take in frames to complete and is effective only for AUTO transitions.



(1) Open the [FUNCTION > TRANS > TRANS] menu.
(2) Set the transition rate under **TRANS RATE**.

10-12-2. Using Fader Limit

Fader Limit allows you to set how far transitions can proceed. You will need to set the **FADER LEVEL** setting, turn **FADER LIMIT** to **ON** and perform transitions using the AUTO button or fader lever. The figure below shows the case in which **FADER LEVEL** is set to 50%.



(1) Open the [FUNCTION > TRANS > TRANS] menu.
(2) Set the fader limit value under **FADER LEVEL**. Default is 50.0. With this setting, transitions are completed midway in the switching process. (See the figure above.)
(3) Set **FADER LIMIT** ON/OFF to enable/disable the **FADER LEVEL** setting.

10-12-3. Adjusting Fader Offset

The operation is unavailable. Do it on the control panel.

10-12-4. Disabling Faders (Fader Inhibit)

The operation is unavailable. Do it on the control panel.

10-12-5. EFF1 and EFF2 Buttons

Transition type effects can be assigned to EFF1 and EFF2 buttons on the control panel. Open the [FUNCTION > TRANS > TRANS] menu and select an effect under **EFF1 BUTTON** or **EFF2 BUTTON** from MIX, WIPE, NAM, FAM or PRESET BLACK (BKGD only).

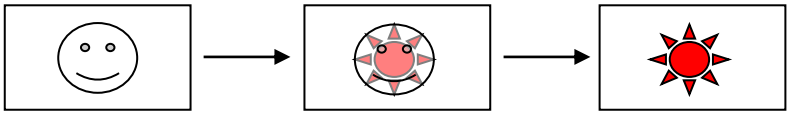
10-12-6. COLOR MIX

This effect allows you to mix a color or image to the transition image during background transitions. COLOR MIX is effective only for background MIX transitions.

Refer to the table below and set up the color mix effect in the [FUNCTION > TRANS > TRANS] menu.

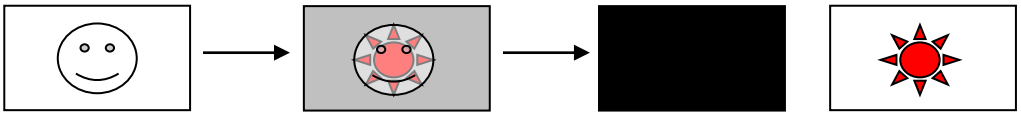
Parameter	Default	Setting range	Description
COLOR MIX ENABLE	OFF	OFF, ON ONCE	If set to **ON**, color mix effects are enabled. If set to **ONCE**, color mix effects are one-time enabled.
COLOR MIX POINT	50.0	0.1 to 99.9	Specifies the signal insertion point.
EFF BKGD	MATTE	See Sec. 10-12-7.	Specifies a color or image to be mixed.

Background MIX transition (COLOR MIX ENABLE: **OFF**)



PGM image — The video is switched while overlapping. — PGM image

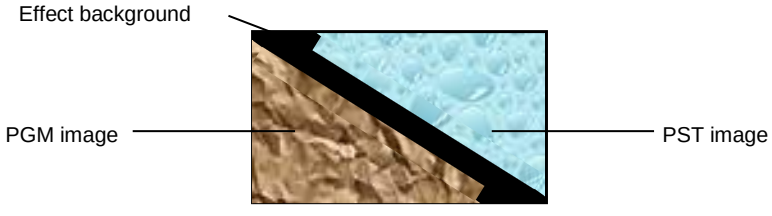
Background MIX transition (COLOR MIX ENABLE: **ON** or **ONCE**)



Black is mixed from the middle of the transition (if POINT is set to 50.0 and EFF BKGD is Black).

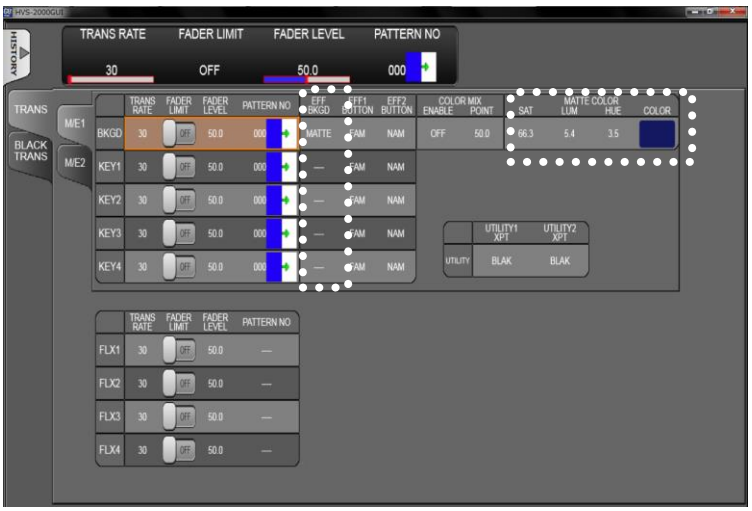
10-12-7. Background Layer of DVE Images (Effect Background)

The bottom effect background layer, below the DVE effects, is used to fill gaps between PGM and PST DVE images, which occasionally arise when two DVE channels are used for backgrounds.



(1) Open the [FUNCTION > TRANS > TRANS] menu.

(2) Select MATTE, UTILITY1 or UTILITY2 under **EFF BKGD**.
Images used for internal buses UTILITY1 and 2 should be selected in the menu. (See Sec. 6-7-1. “UTILITY1-2 and AUX UTILITY1-2.")
If MATTE is selected, set the color under **MATTE COLOR**.



10-12-8. AUTO Button Setting

The operation is unavailable. Do it on the control panel.

11. KEY and FLEXaKEY

The key feature enables you to superimpose titles and images onto background signals. **Four key channels** are provided for **each M/E** and **four key types** are available in all keyers: Luminance Key, Full Key, Bus Key and Chroma Key. Key Invert, Mask and DVE effects can also be added to keys. Furthermore, **FLEXaKEY 1-4**, whose background buses can be freely selected, are equipped as downstream keyers.

KEY/FLEXaKEY features

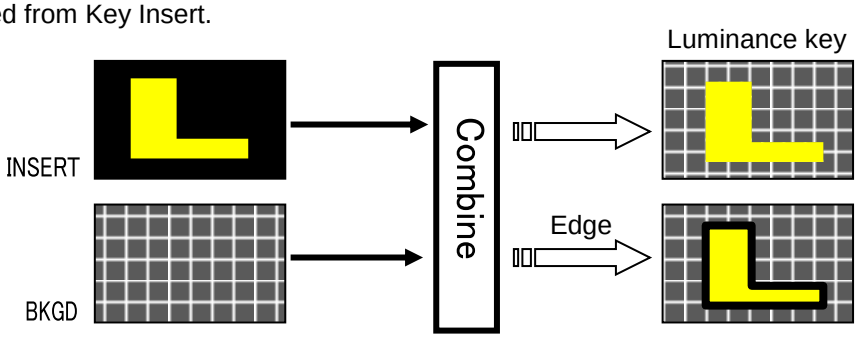
Feature	KEY1-4	FLEXaKEY1-4	DSK1-4 (M/E3) (*2)	Refer to
Luminance key	Available	Available	Available	11-1
Full key	Available	Available	Available	11-1
Bus key	Available	Available	Available	11-2
Chroma key	Available	-	Available	11-4
Key invert	Available	Available	Available	11-6-1
Box mask	Available	Available	Available	
Pattern mask	Available	-	Available	11-6-2
Utility mask	Available	-	-	
Edge effect	Available	-	Available	11-7
Pattern transition	Available	-	Available	10-7
M/E1, M/E2, M/E3 and AUX image selection (re-entry)	Available (*1)	Available (*3)	Available (*1)	9-2
M/E1 output	Available	FLEXaKEY3-4	-	11-8
M/E2 output	Available	Available	-	11-8
M/E3 output (*2)	Available	-	Available	11-8
MELite1-6 output	-	Available	-	9
AUX output	-	Available	-	11-8

(*1) Except when destination backgrounds are the same.
(*2) M/E3 is an option and HVS-2000M/E card is required.
(*3) Note that FLEXaKEY video images are delayed by one line.

This chapter describes the key setup and adjustment using M/E1 KEY1 as an example.

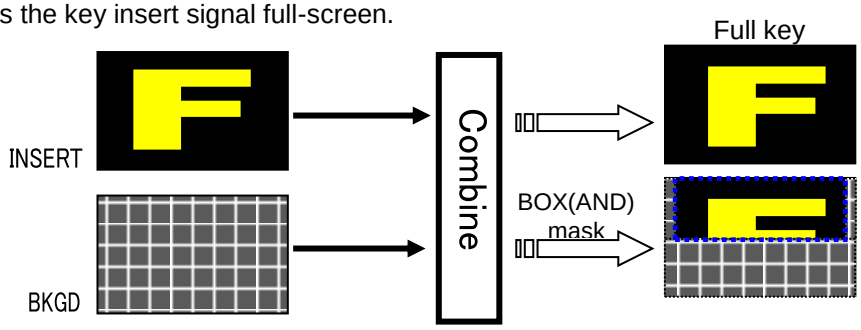
◆ **Luminance Key**

Luminance Key, also called Self Key, uses the same image for Key Source and Key Insert. This image is selected from Key Insert.



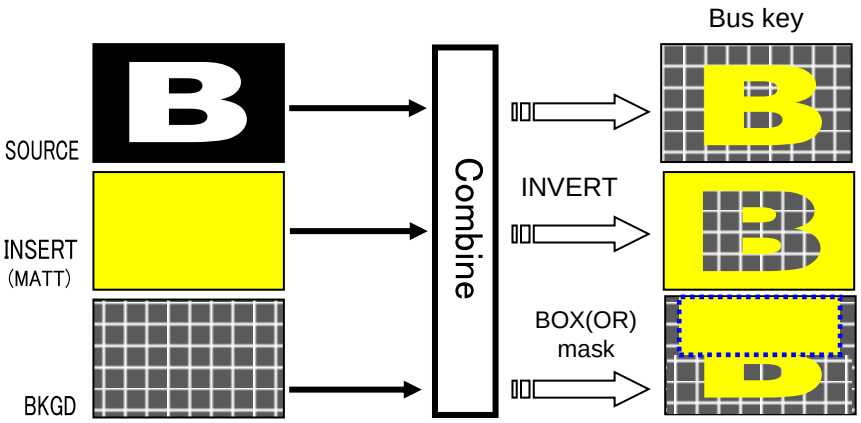
◆ **Full Key**

Full Key displays the key insert signal full-screen.



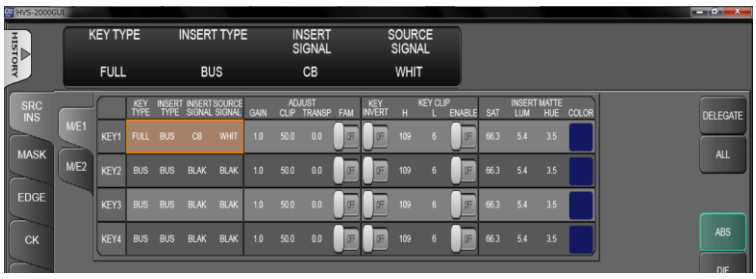
◆ **Bus Key**

Bus Key, also called External Key, uses different images for Key Source and Key Insert. The background signal is cut out using Key Source and Key Insert fills in the cut out part of the signal.



11-1. Creating a Luminance Key and Full Key

(1) Open the [FUNCTION > KEYER FLEXaKEY > SRC INS > M/E1] menu.
(2) Select a signal under KEY1 **INSERT SIGNAL**.
(3) Select LUM or FULL under **KEY TYPE**.



► See Sec. 11-3. "Adjusting Key Signal" for details on making fine adjustments.
► Key edge, invert, mask and DVE effects can be applied to these keys. See the following sections.

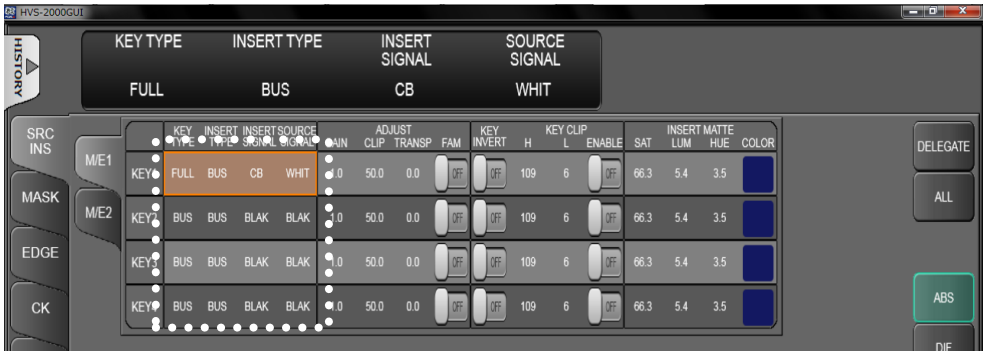
11-2. Creating Bus Keys

Bus Keys use different signals for the INSERT SIGNAL and SOURCE SIGNAL. To create a Bus Key, select key insert and key source signals in the menus. Since selecting both signals in the menu takes time, the switcher KEY LINK function allows you to select an insert and source signal pair by selecting only an insert signal. See Sec. 11-2-1. "Key Link" for details.

(1) Open the [FUNCTION > KEYER FLEXaKEY > SRC INS > M/E1] menu.
(2) Select BUS under KEY1 **KEYTYPE**.
(3) Select a video signal under **INSERT SIGNAL**.
(4) Select a video signal under **SOURCE SIGNAL**.

Using a MATTE for KEY INSERT

The internally generate matte signal can be used as key fill (KEY INSERT). To do so, **INSERT** TYPE to MATTE and select the color under **INSERT MATTE**.



► See Sec. 11-3. "Adjusting Key Signal" for details on making fine adjustments.
► Key edge, invert, mask and DVE effects can be applied to these keys. See the following sections.

11-2-1. Key Link

If KEY LINK is on, a paired Key Source video is automatically selected when a Key Insert video is selected.

◆ **Using Key Links**

First, turn **KEY LINK** to ON (default) in the [SETUP > SYSTEM > MU SETUP] menu. Then, successively select key insert and source pair signals as necessary for a BUS key in the menu to save key link pairs.

The INSERT/SOURCE signal pairs for Bus keys are automatically set once they are selected for a key. To reassign a signal assignment, select the INSERT/SOURCE signal pair again for the key or another key. The same assignments are shared among all keys.

11-2-2. Key Quick Recall (KEY SET: INPUT)

If KEY SET is changed from KEYER to INPUT, key setups can be quickly recalled by selecting corresponding KEY INSERT signals. Open the [SETUP> SYSTEM > MU SETUP] menu to change the KEY SET setting for each key, as needed.

◆ **KEY SET Setting**

INPUT	KEY TYPE, Key CLIP, GAIN, FAM ON/OFF and Chromakey adjustment settings are stored in each **input** set for KEY INSERT and are **not saved** to events and sequences.
KEYER	KEY TYPE, Key CLIP, GAIN, FAM ON/OFF and Chromakey adjustment settings are stored in each **key** and are **saved** to events and sequences.

◆ **Operation Example**

To quickly recall key settings, which are set up in M/E1KEY1 and M/E1KEY2, to M/E2KEY2, proceed as follows.

(1) Open the [SETUP > SYSTEM > MU SETUP] menu. Change **KEY SET** to INPUT under M/E1KEY1, M/E1KEY2 and M/E2KEY2.
(2) Create a logo key for M/E1KEY1 using IN01 (KEY INSERT).
(3) Create a chromakey for M/E1KEY2 using IN02 (KEY INSERT).
(4) Select IN01 (KEY INSERT) for M/E2KEY2. The logo key set for M/E1KEY1 is recalled. Then, select IN02 to recall the chromakey set for M/E1KEY2.

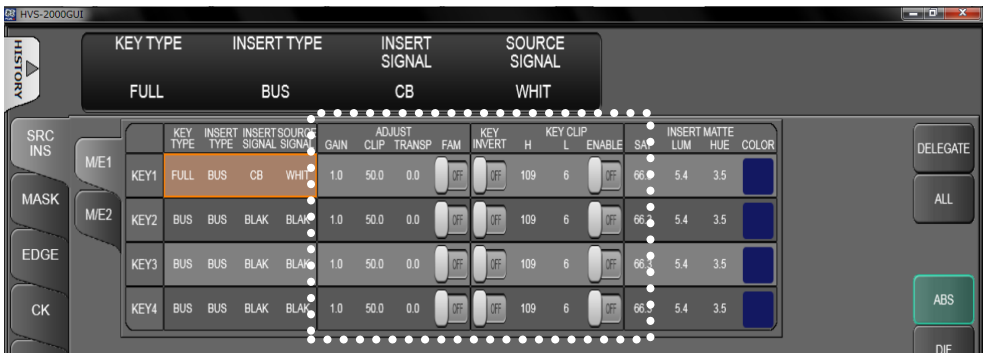
This function (KEY SET: INPUT) is very useful for live broadcast, streaming, or recording purposes, however , note that these settings are not saved to events.

11-3. Adjusting Key Signal

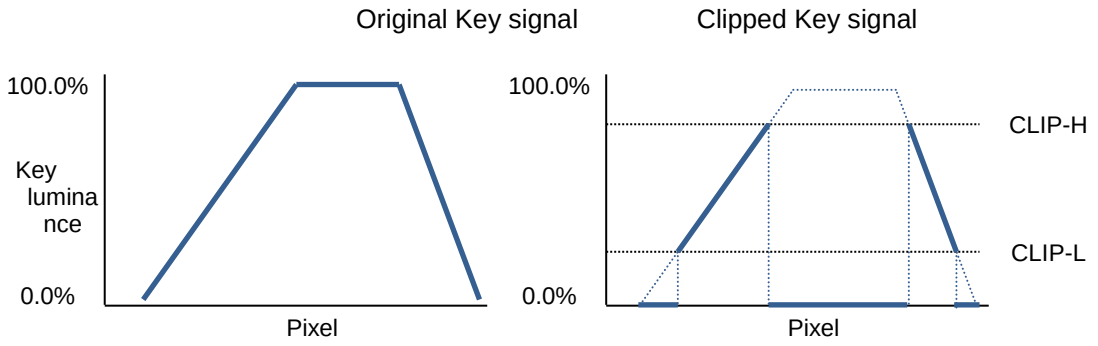
Clip and Gain allows users to adjust the key signal and its composition over the background. Key transparency can also be adjusted. Adjust these parameters while monitoring keys on the screen by displaying keys on the Program, Preview or Clean video.

(1) Open [FUNCTION > KEYER FLEXaKEY > SRC INS > M/E1] menu.
(2) Adjust the key gain under ADJUST **GAIN**.
(3) Adjust the key clip level under **CLIP**.
(4) If increasing the **TRANSP** value, the key appears more transparent.
(5) If set FAM to ON, the key will created using Full Additive Mix.

For Bus type keys, key luminance thresholds can be adjusted. Set the upper and lower luminance levels for clipping, and turn ON **CLIP ENABLE**.

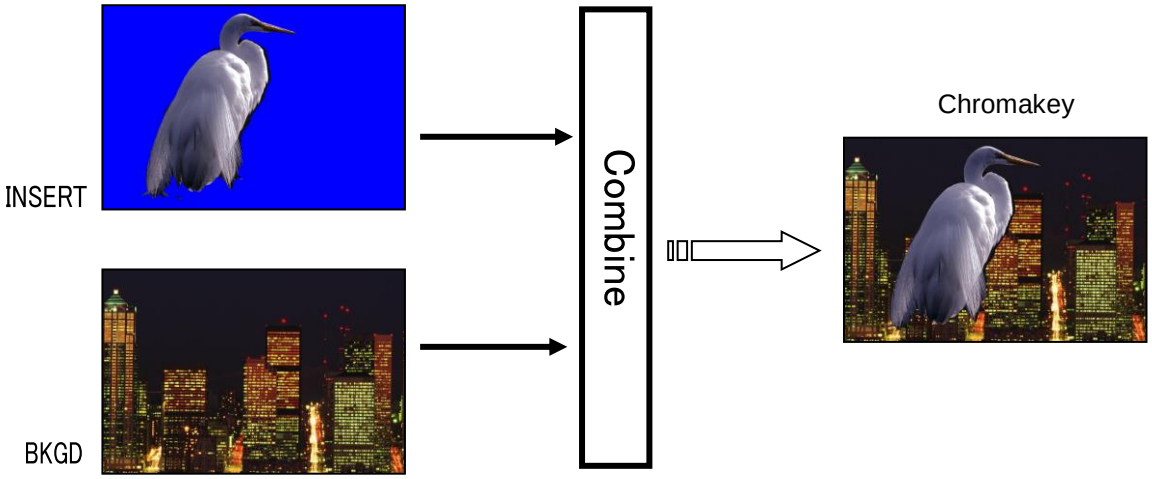


◆ Clip Example



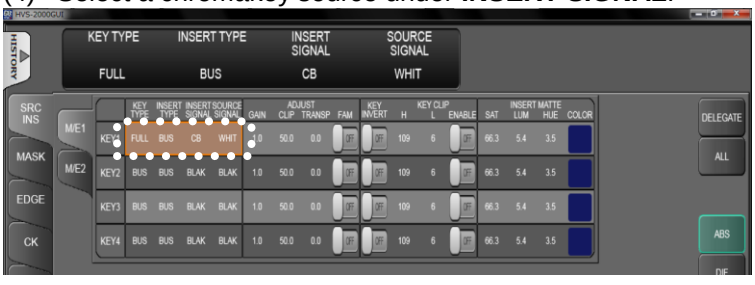
11-4. Chroma Key Setup

Chroma keying allows key signal creation using a chroma component instead of a luminance component. This feature is mostly used to composite moving subjects such a person in a virtual background. For example, to place a person onto a background graphic, first film the person standing in front of a blue screen background. The blue colored area of the filmed image is detected and will be used to create the key signal.



11-4-1. Creating a Chroma Key

(1) Select a background video for M/E1 PGM on the control panel.
(2) Open the [FUNCTION > KEYER FLEXaKEY > SRC INS > M/E1] menu.
(3) Select CHRM under **KEY TYPE**.
(4) Select a chromakey source under **INSERT SIGNAL**.



(5) Press KEY1 ON AIR in the M/E1 transition block of the control panel to display KEY1 on the M/E1 PGM video.

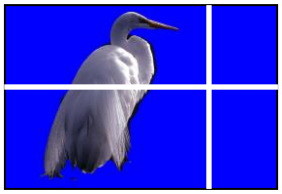
(6) [FUNCTION > KEYER FLEXaKEY > CK > M/E1] menu.
(7) Turn ON **SELECT** to activate the Auto Chroma-keyer.

KEY1 is displayed on the topmost layer of the M/E1 preview image and a cross hair cursor appears. The current position of the cursor is displayed under **POS X** and **POS Y**.

To make a crosshair cursor also appear on the M/E1 PGM screen, turn **PGM OUT** to ON in the menu.

(8) Move the joystick up, down, left, or right on the control panel to move the crosshair cursor onto the desired color.

(9) Twist the joystick counter-clockwise to generate the Chroma key. This can also be done by turning **SELECT** to OFF in the [FUNCTION > KEYER FLEXaKEY > CK > M/E1] menu.



Preview image

Move the crosshair with the joystick along the X-Y axes and twist the joystick CCW to create a Chroma key.

11-4-2. Chroma Key adjustments

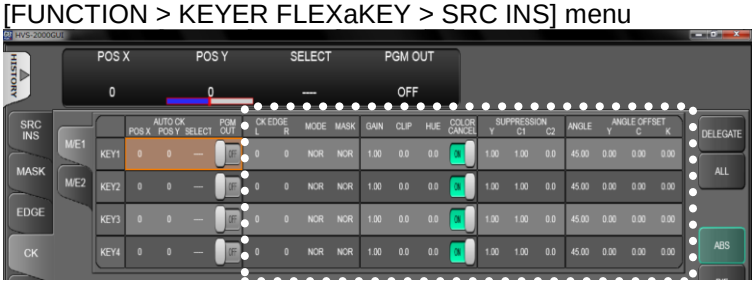
If the desired result is not achieved using the automatic chroma key generation procedure, fine adjustments can be made as follows:

Adjust HUE, ANGLE and ANGLE OFFSET to make the background clear.

Use CK EDGE to smooth chroma key edges.

Use COLOR CANCEL and SUPPRESSION to eliminate or reduce color noise on the bird.

[FUNCTION > KEYER FLEXaKEY > SRC INS] menu



◆ **Adjusting Edges**

Used to adjust the edge of the Keyed area when it appears unnatural.
Open the [FUNCTION > KEYER FLEXaKEY > SRC INS] menu and adjust the left edge under **CK EDGE L** and the right edge under **CK EDGE R**.

◆ **GAIN and Clip**

These parameters are used to adjust the key signal and its composition over the background image.

◆ **Chroma Key Mix Mode**

Adjust the Chroma Key Mix Mode using **MODE** and **MASK** parameters.

Parameter		Description
MODE	NOR	Used for ordinary background images.
	BLK	Used for lower luminance background images. Reduces the luminance level of chroma key edges to appear smoother.
MASK	NOR	Used for the standard chroma key composite. (Used to mask areas characterized by both luminance and chrominance components with the key cut signal.)
	CHROMA	Used to mask areas characterized by the chrominance component with the key cut signal. (See the next chapter.)

◆ **Adjusting Chroma key Colors**

Fine-tune specific chroma key colors under **HUE**.

◆ **Chroma Angle**

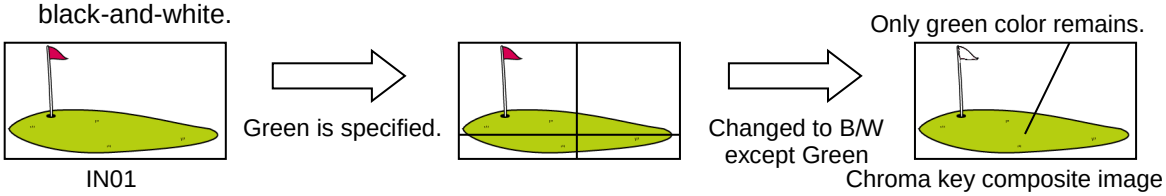
The ANGLE parameter determines the width of the color hue. If the reference color (blue back panel or other background) is not uniform and has some variation, widen the **ANGLE** to make the **HUE** range wider. You can fine-tune the range using the **Y**, **C** and **K** parameters of ANGLE OFFSET.

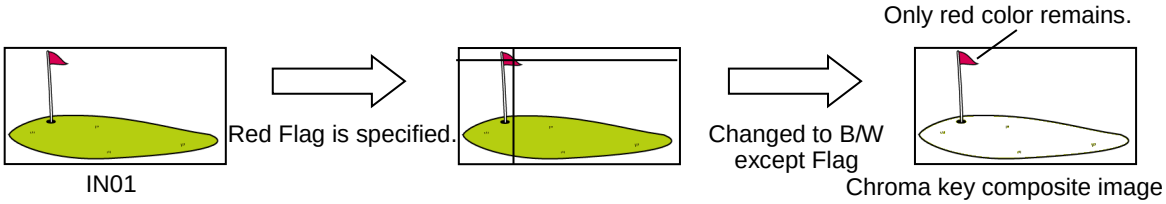
◆ **Color Cancellation and Suppression**

Turning ON **Color Cancel** (default) reduces the reflection in the foreground and background images. If you still notice some tint or spill of color (blue) on the foreground subject, use the **Y**, **C1**, and **C2** parameters in SUPPRESSION respectively to eliminate or reduce the color noise.

11-4-3. Example (Images with a Specified Color Left)

KEY INVERT to ON in the [FUNCTION > KEYER FLEXaKEY > SRC INS] menu.
Change **MASK** to CHROM in the [FUNCTION > KEYER FLEXaKEY > CK] menu.
Then the specified color areas remain with the original color and other areas changed to black-and-white.





11-5. Advanced Chromakey (HVS-2000EX)

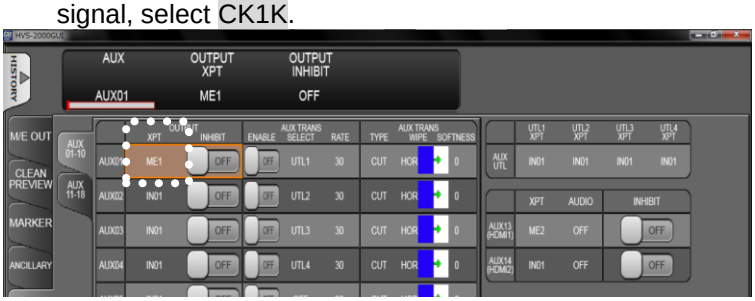
An optional HVS-2000EX card allows you to add 4 channels of advanced chromakeys.
In advanced chromakeys, chromakey fill and key signals can be adjusted and output independently.

> Note that the advanced chromakey feature is unavailable when the system format is set to SD or 1080p/23.98, 24, 25, 29.97, 30.

11-5-1. Independently Outputting FILL and KEY Signals

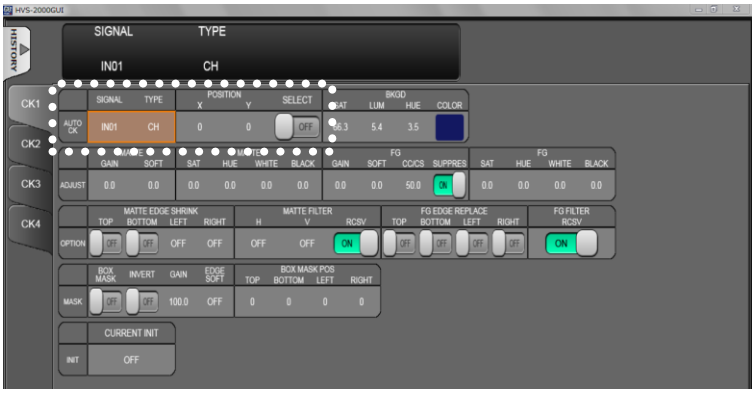
Before creating a chromakey, assign chromakey signals to output buses in order to let them to display. For example, to output the CK1 (Advanced Chromakey 1) fill or key signal from AUX1, proceed as follows.

(1) Open the [SETUP > OUTPUT > OUT XPT] menu.
(2) Select AUX01 under **AUX**.
(3) To output the CK1 fill signal, select CK1F under **AUX01 XPT**. To output the CK1 key signal, select CK1K.



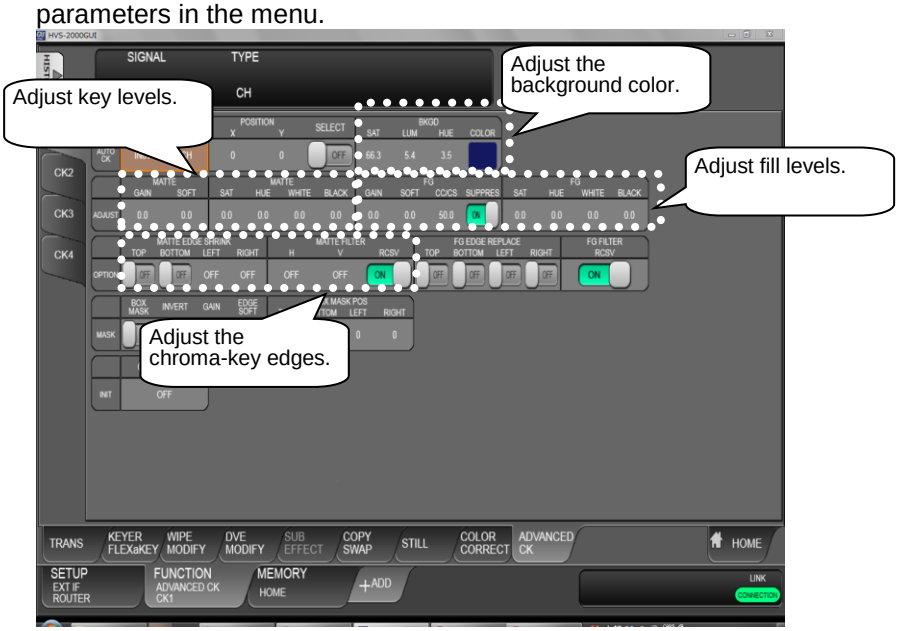
11-5-2. Creating Advanced Chromakeys

(1) Open the [FUNCTION > ADVANCED CK > CK1] menu.
(2) Select an input signal under **AUTO CK SIGNAL**.
(3) Select CH or INPUT under **TYPE**.
If set to CH, menu settings are stored per channel.
If set to INPUT, menu settings are stored per input.
(4) Turn **SELECT** to ON to display the cross hair cursor on the FILL video screen.
(5) Change **POSITION X** and **Y** to move the cursor on the target color.
(7) Turn OFF **SELECT** to create a chroma-key.



11-5-3. Adjusting Advanced Chromakeys

If auto chromakeying gives an unsatisfied result, adjust the chromakey using the following parameters in the menu.



◆ **Adjusting the Background Color**

Finely adjust the keyed color under **AUTO CK BKGD**.

◆ **Adjusting KEY Levels**

◆ **Adjusting FILL Levels**

After adjusting the keyed color, a new key (MATTE) signal is created. **MATTE** in ADJUST allows you to adjust the MATTE signal.

Increasing values widens / sharpens the key-cut region, and decreasing values narrows / softens the key-cut region. MATTE component levels can be adjusted independently and as a whole.

FG in ADJUST allows you to adjust the fill (FOREGROUND) signal. FG component levels can be adjusted independently and as a whole.

Parameters for adjusting key (MATTE) levels.	Parameters for adjusting fill (FG) signal levels.
MATTE GAIN	FG GAIN
MATTE SOFT	FG SOFT
MATTE SAT	FG SAT
MATTE HUE	FG HUE
MATTE WHITE	FG WHITE
MATTE BLACK	FG BLACK

The following parameters allow to remove key color spills from the FG image.

Parameter	Description
FG SUPPRESSION	Turns FG CC/CS to ON/OFF.
FG CC/CS	If set to 0: Color cancellation is active and the adjusted keyed color is reduced from each pixel on the FOREGROUND. If set to 100: Color suppression is active and color levels are decreased. If color spills on the image are not removed, decrease the value. If color spills are removed and hue values, however, are shifted, increase the value.

◆ **Adjusting Chroma-key Edges**

＜MATTE side＞

Parameter	Description
MATTE EDGE SHRINK TOP	Cuts off both up and down edges of MATTE by one line each.
MATTE EDGE SHRINK BOTTOM	
MATTE EDGE SHRINK LEFT	Cuts off both left and right edges of MATTE by a half pixel each. * No selection (unlit) means OFF.
MATTE EDGE SHRINK RIGHT	
MATTE FILTER H	Enables horizontal/vertical filter on MATTE. Select the filtering strength from LOW, HIGH and MID.
MATTE FILTER V	
MATTE FILTER RCSV	If set to ON, a recursive filter is activated on MATTE to reduce noise.

＜FOREGROUND side＞

Parameter	Description
FG EDGE REPLACE TOP	If set to ON, replace the edge color with the inside color.
FG EDGE REPLACE BOTTOM	
FG EDGE REPLACE LEFT	
FG EDGE REPLACE RIGHT	
FG FILTER RCSV	If set to ON, a recursive filter is activated on FOREGROUND to reduce noise.

11-5-4. Adding a Box Mask

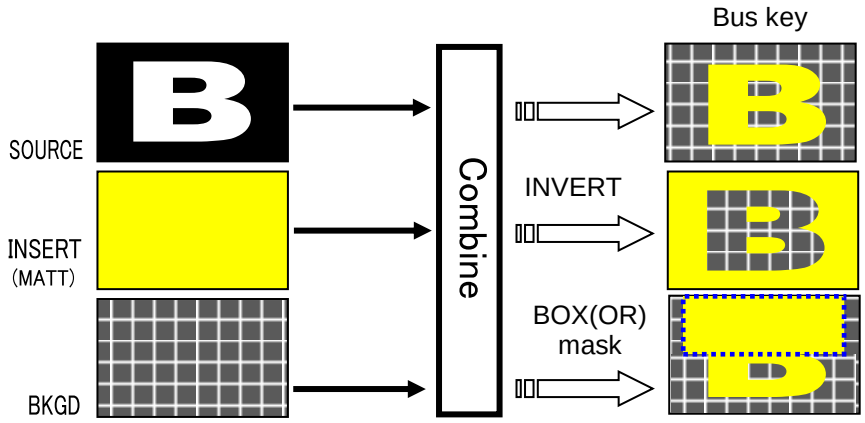
A box mask can be applied to chromakeys. To do this, go to the [SETUP > ADVANCED CK > CK1] menu. See Sec. 11-6-2 "Key Masks" for details on mask settings.

11-5-5. Resetting an Advanced Chromakey

(1) Open the [FUNCTION > ADVANCED CK > CK1] menu.
(2) Change **CURRENT INIT** to EXEC.
(3) Tap **YES** on the confirmation dialog. The selected channel will be reset except SIGNAL and TYPE settings.

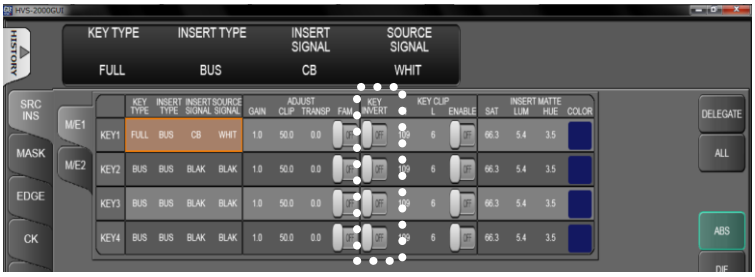
11-6. Mask and Invert

Mask and Invert can be used for all keys. Preset masks are available only for KEY1-4.



11-6-1. Inverting Key and Background (INVERT)

Setting **KEY INVERT** to ON inverts the key and the background images.
Display the [FUNCTION > M/E FLEXaKEY1 > SRC/INS] menu. Set **KEY INVERT** to ON.



11-6-2. Key Masks

◆ **BOX Mask**

Box-shaped masks can be applied to all keys and can also be inverted so that the keyed area inside the box becomes invisible.

(1) Create a KEY1.
(2) Open the [FUNCTION > KEYER FLEXaKEY > MASK] menu.

(3) Select BOX under **MASK TYPE**.

If **MASK & KEY** is set to AND, the area where Key Source and Box Mask overlap is used as the key signal. If set to OR, both Key Source and Box Mask are used as the key signal. To invert the box mask, turn **BOX INVERT** to ON.

(4) Set the mask size under **BOX MASK POS**.

◆ **UTILTITY MASK**

Video inputs can be used for mask signals instead of Box. Inputs used for masks must be assigned to UTILITY 1 or UTILITY 2. Combined video signals such as program or multi-view cannot be used.

(1) Create KEY1.
(2) Open the [FUNCTION > KEYER FLEXaKEY > MASK] menu.
(3) Select UTILITY1 or UTILITY2 under **MASK TYPE**.

The UTILITY 1 and 2 images should be selected in the [M/E FLEXaKEY1 > M/E1(2) > BKGD PGM > TRANS SUB EFF> UTILITY] menu. (See Sec. 6-7-1. “UTILITY1-2 and AUX UTILITY1-2.")

◆ **PATTERN MASK**

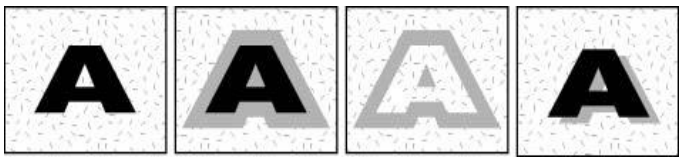
WIPE patterns can be used for mask signals for keys.

(1) Create KEY1.
(2) Open the [FUNCTION > KEYER FLEXaKEY > MASK] menu.
(3) Select PATTERN under **MASK TYPE**.
(4) Select a pattern and set the level.
(5) Modify the pattern using **WIPE POS** and **WIPE MULTI**, if necessary.

Mixed mask signals using BOX, UTILITY and PATTERN are also available. Select BOX + UTL1, for example, under BOX TYPE.

11-7. KEY EDGE

The EDGE function allows users to add border type edges on KEY1-4. Three types of edges are available: Normal, Outline and Drop Shadow. The width, transparency, and color can be set for the edges. Shadow effects can also be added by changing the position of the edges. This chapter shows how to add a key edge using M/E1 KEY1 as an example.

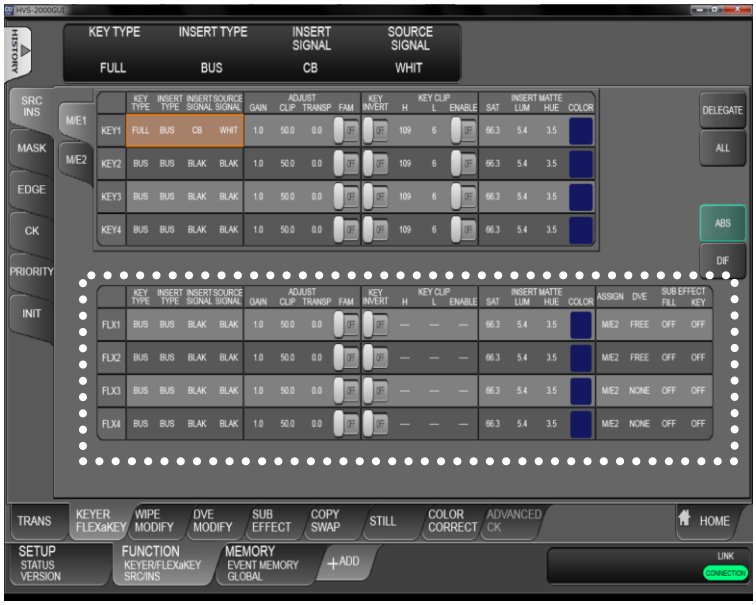


(No edge) Normal edge Outline edge Drop shadow

(1) Open the [FUNCTION > KEYER FLEXaKEY > EDGE] menu.
(2) Select NORMAL, OUT LINE or DROP SHADOW under **TYPE**.
Selecting NORMAL allows users to add edges. O_LINE allows users to display outlines without key fill images.
(3) The **SOFT** (SOFTNESS) parameter is used to set softness, **TRANSP** (TRANSPARENCY) is to set transparency, and WIDTH to set edge width.
(4) Change the **X** and **Y** values to set the edge position under **EDGE POS**.
(5) Set the edge color under **EDGE COLOR**.

11-8. FLEXaKEY1-4

To create FLEXaKEY1-4, use the [FUNCTION > KEYER FLEXaKEY > SRC/INS] menu.
Note that FLEXaKEY1-4 do not support Chromakey, Edge or UTILITY / PATTERN masks.



11-8-1. Where FLEXaKEY1-4 Appear

FLEXaKEY1-4 images appear on combined M/E2 images as factory default. Users can change the destination of FLEXaKEY1-4 to another bus under **ASSIGN** in the [FUNCTION > KEYER FLEXaKEY > SRC INS] menu.

Note that only FLEXaKEY3 and 4 can select M//E1 and FLEXaKEY1-4 cannot be used on M/E3.

11-9. Changing Key Layer Order

Layer order from KEY1 to KEY4 can be changed.

(1) Open the [FUNCTION > KEYER FLEXaKEY > PRIORITY] menu.
(2) Change the key layer order. If set to PRI1, the key will appear in front of others.

12. Assigning DVE Channels

The HVS-2000 has 8 DVE modules as standard: 4 modules each for M/E1 (LINE1) and M/E2 (LINE2). These modules are applied to the BKGD or Key buses as a DVE channel or DVE pattern to allow various advanced effects. FLEXaKEYs can use DVE effects by assigning available DVE channels in each M/E.

12-1. Pattern Transitions with DVE Types

A DVE channel is required for transitions with a DVE pattern (PATTERN 100 and later) regardless of whether the pattern is modified or not. Two DVE channels are used if BKGD and KEY1 transitions are performed using DVE type patterns, for example.
See Sec. 10-7. ”Pattern (WIPE/DVE) Transitions” for details on pattern transitions.

◆ **To Release a DVE Channel from a Bus**

Change the pattern for the bus from DVE to WIPE type (or transition type from WIPE to MIX or CUT). Or, turn LINE DVE to OFF for the bus.

12-2. Assigning DVE Channels to Buses (LINE DVE)

LINE DVE is a function that applies DVE effects to individual buses, not patterns, and applies reduction, enlargement, movement, rotation, lighting, and other effects using the DVE MODIFY menu. It can be used for the PGM, PST, KEY and FLEXaKEY buses.

For example, LINE DVE allows you to create PinP images as shown below, by turning on LINE DVE on the PGM bus, reducing the PGM video size and moving it to the lower-right corner.

M/E output image

See Sec. 13. ”DVE Effects” for details on DVE effects.

12-2-1. LINE DVE ON/OFF Button

The operation is unavailable. Do it on the control panel.

12-2-2. Enabling LINE DVE on a BUS

◆ **To Enable LINE DVE**

Open the [FUNCTION > DVE MODIFY > POS/SIZE] menu and turn ON **LINE DVE**.

◆ **To Enable LINE DVE for FLEXaKEY1-4**

(1) Open the [FUNCTION > KEYER FLEXaKEY > SRC INS] menu.
(2) Select a DVE channel to be assigned to FLX1 to 4 under **ASSIGN**.
Select FREE if the key is assigned to (displayed on) **M/E1** (FLX3, 4) or **M/E2** (FLX1, 2).
Select another option if the key is assigned to an **AUX** or **MELite** bus.
FLEXaKEY1-2 are allowed to select M/E2CH1-4 and FLEXaKEY3-4 are allowed to select M/E1CH1-4.
(3) Open the [FUNCTION > DVE MODIFY > POS/SIZE] menu and turn ON **LINE DVE**.

12-3. DVE Channel Status Indication

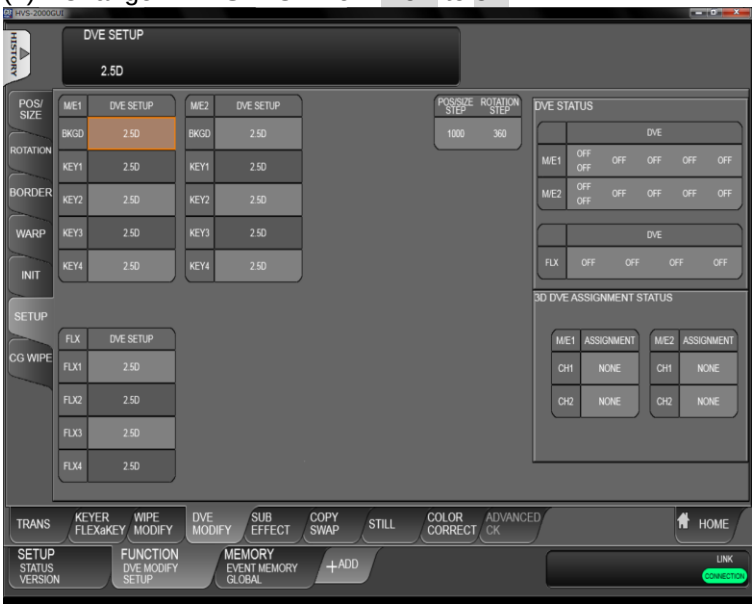
The operation is unavailable. Do it on the control panel.

12-4. Assigning 3D DVE (HVS-2000DVE)

An HVS-2000DVE card is required for 3D DVE effects.

An HVS-2000DVE card adds 4 channels of 3D DVE and allows you to use 3D preset patterns such as Page Turn and Page Roll and apply Warp or Highlight effects to images.
Before using 3D DVE patterns or effects in a bus, a 3D DVE channel must be assigned to the bus by changing **DVE SETUP** to 3D. For example, to assign 3D DVE channel to M/E2KEY1, proceed as follows.

(1) Open the [FUNCTION > DVE MODIFY > SETUP] menu.
(2) Change **DVE SETUP** from 2.5D to 3D.



◆ **3D DVE Channels**

The number of available 3D DVE channels changes depending on the implementation of HVS-2000DVE-EX and HVS-2000ME cards.

Option cards			Maximum channels	
2000DVE	2000DVE-EX	2000ME	Total	Each M/E
✓	-	-	4	2
✓	✓	-	4	2
✓	-	✓	4	2
✓	✓	✓	6	2

13. DVE Effects

This chapter shows how to apply DVE effects to M/E2KEY1 as an example. Assume that LINE DVE is set to ON for M/E2KEY1. (See Sec. 12-2-2. “Enabling LINE DVE on a BUS.") In this example, the **KEY1 image**, to which DVE effects is applied, is called “**DVE image**.”

13-1. Changing Position and Size

Let’s change the position and size of a DVE image using the menu or joystick.

(1) Open the [FUNCTION > DVE MODIFY > POS/SIZE] menu.
(2) Change the DVE image position using **POSITION X** and **Y**.
(3) Change the DVE image size under **SIZE**.

The base POSITION of the DVE image is originally the center of the output screen. You can set the position of the image by specifying X and Y coordinates, with the origin of the axes located at screen-center.
Setting the size allows users to change the size of key images while retaining aspect ratios. If the value is 1,000, the key images will be full-screen size.

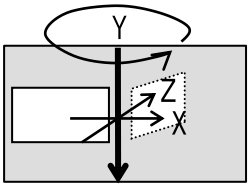
The **POS/SIZE STEP** parameter in [M/E1,2 FLEXaKEY > M/E1 > BKGD PGM > MODIFY >DVE INIT/SETUP] menu PAGE20 allows you to enlarge the maximum size from 1000 to 4096 to enable finer settings.

13-2. Rotation

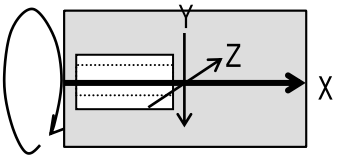
In addition to position and size changes, users can add rotational effects to DVE images.
Open the [FUNCTION > DVE MODIFY > ROTATION] menu.
Remember that DVE images are located at their POSITION X and Y coordinates, with the origin of the axes located at the center of the screen.

◆ **GLOBAL ROTATION**

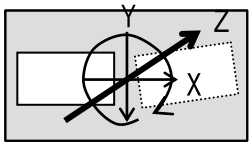
Rotates DVE images **around the center of the screen** up to approximately eight times in the positive or negative direction.



X rotation



Y rotation



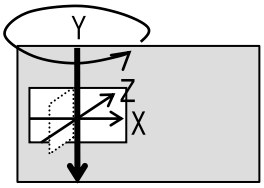
Z rotation

◆ **GLOBAL POSITION**

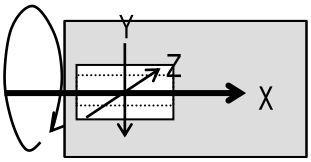
Sets the GLOBAL axis position for DVE images.

◆ **LOCAL ROTATION**

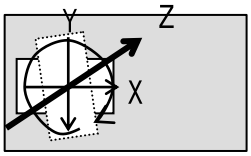
Rotates DVE images **around the center of the DVE image** (GLOBAL POSITION values) up to approximately eight times in the positive or negative direction.



X rotation



Y rotation



Z rotation

◆ **LOCAL POSITION**

Sets the LOCAL axis position for DVE images.

◆ **PERSPECTIVE**

Allows you to add the perspective effect to a pattern or DVE image.
This effect requires an **HVS-2000DVE option card**.

13-3. CROP/MASK

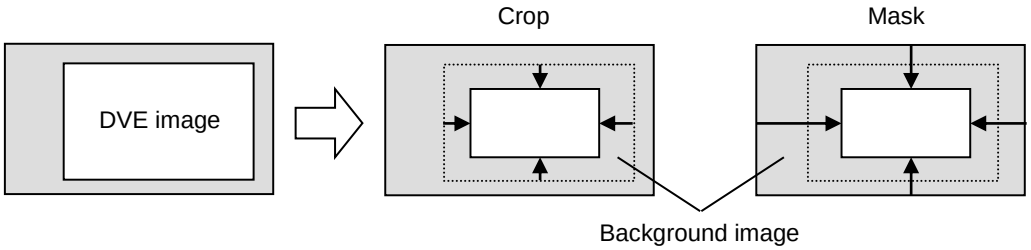
CROP or MASK can be selected for DVE image trimming.
Open the [FUNCTION > DVE MODIFY > POS/SIZE] menu.
Select CROP or MASK under **CROP/MASK**.
Set the trimming region under **TOP**, **BOTTOM**, **LEFT** and **RIGHT**. The background image will appear in the trimming region.

◆ **Differences between Crop and Mask**

The Crop effect is useful when moving sub-images having borders in PIP pictures.

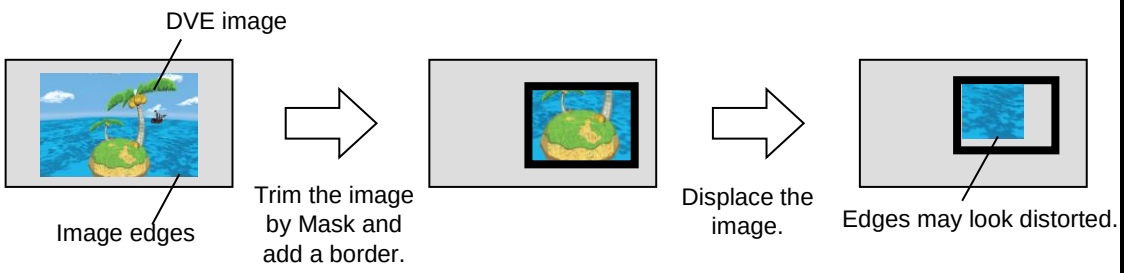
The Mask effect is useful when modifying sub-images in PIP pictures without changing position and size.

Their trimming settings are different as shown below.



NOTE

If you need to displace masked DVE images, cover and do not expose their edges. Otherwise, the edges may look distorted.



NOTE

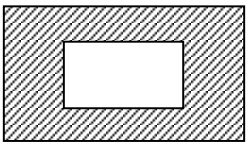
Note that Mask and 3D DVE Warp effects cannot be used together. (See Sec. 13-7. “Warp effects.”) An effect that is used first is enabled, but the other effect is disabled.

13-4. SIZE(X, Y) and FADE

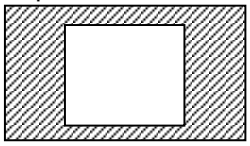
◆ **SIZE (X, Y)**

The **SIZE X** and **Y** in the [FUNCTION > DVE MODIFY > POS/SIZE] menu allow you to change the aspect ratio of DVE images.

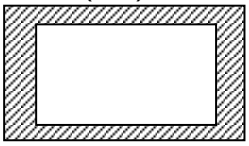
The figures below show examples when POSITION is set to (0, 0) and SIZE 1,000.



(500,500)



(500, 750)



(750, 750)

◆ **FADE Effect**

FADE in the same menu page allows you to add an effect to make backgrounds transparent. The higher the value, the clearer the background becomes.

13-5. ROUND RATE and WARP EDGE

ROUND RATE and WARP EDGE effects require an HVS-2000DVE option card.
Before using these effects, change **DVE SETUP** to 3D or 3D(x2) for the bus. (See Sec. 12-4. "Assigning 3D DVE (HVS-2000DVE).")

◆ **ROUND RATE**

ROUND RATE allows you to round DVE image edges.

◆ **WARP EDGE**

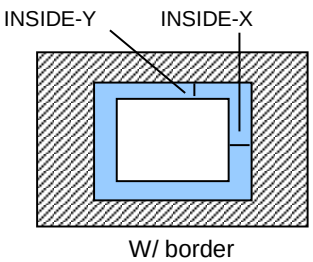
If WARP EDGE is set to ON, WARP and HILIGHT effects are applied only on DVE image edges.

13-6. BORDER

Borders can be added to a DVE image. Inside border and outside borders can be adjusted independently.

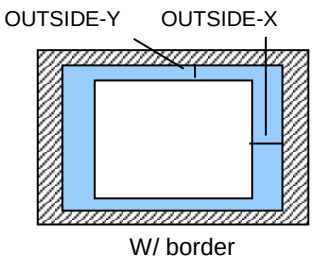
(1) Open the [FUNCTION > DVE MODIFY > BORDER] menu.
(2) To use the inside border, set the width under **INSIDE X** and **Y**.
To use the outside border, set the width under **OUTSIDE X** and **Y**.
(3) Adjust the edge softness under **SOFTNESS** parameters.
(4) Set the border color under **BORDER COLOR**.

Inside Borders



W/ border

Outside borders



W/ border

13-7. Warp Effects

Warp effects require an HVS-2000DVE option card.
Before setting Warp menu pages, change **DVE SETUP** to 3D or 3D(x2) for the bus. (See Sec. 12-4. "Assigning 3D DVE (HVS-2000DVE).")

WARP effects allow you to create complex and advanced effects such as Page Turn, Page Roll, Wave, Ripple and Screw. Open the [FUNCTION > DVE MODIFY > WARP] menu to create your own warp effects. These effects are also applied to images when **WARP EDGE** is turned on.

Available parameters vary depending on WARP TYPE. Once a type is selected, available parameters are displayed in the menu.

Parameter	Setting	Description
TYPE	OFF	Disables warp effects.
	PGTURN HZTURN VZTURN QDTURN	Adds a page turn effect.
	PGROLL HZROLL VZROLL QDROLL	Adds a page roll effect.
	WAVE ACCORD	Adds a waving effect.
	SPLIT	Adds a split effect.
	STREAM	Adds an effect that stretches an image from one side.
	SW WIN	Adds an effect that divides images horizontally and vertically.
	RIPPLE	Adds a rippling water effect.
	LENS	Adds a zoom lens effect.
	SPHERE	Adds an effect to an image so that it looks like it is wrapped on a sphere.
	SCREW1 to 4	Adds an effect to an image so that it looks like it is spirally wound.
	STRM1 to 12	Adds a stormy effect.
	HDOOR VDOOR	Adds an open door effect.
LEVEL	(See the table below.)	Sets the warp effect level.
DIR	(See the table below.)	Sets the warp effect direction.
RAD	(See the table below.)	Sets the warp effect radian.
ROLL	-7999 to 7999	Sets the warp effect rotation.

Available parameters for each type

TYPE	LEVEL	DIR	RAD	ROLL
*PGTURN	0 to 2999	-7999 to 7999	0 to 7999	-
*HZTURN	0 to 2999	250 to 750		-
*VZTURN	0 to 2999	0 to 500		-
*QDTURN	0 to 2999	-125 to 125		-
*PGROLL	0 to 1500	-7999 to 7999		-
*HZROLL	0 to 1500	250 to 750		-
*VZROLL	0 to 1500	0 to 500		-
*QDROLL	0 to 1500	-125 to 125		-
WAVE	-1000 to 1130	-7999 to 7999	0 to 1900	-7999 to 7999
ACCORD	-1000 to 1130	-7999 to 7999	0 to 1900	-7999 to 7999
SPLIT	-1000 to 1130	-7999 to 7999	0 to 1900	-7999 to 7999

STREAM	0 to 1000	-7999 to 7999	-	-
*SW WIN	-500 to 7999	-500 to 7999	-	-
RIPPLE	0 to 1000	-	-	-
LENS	-1000 to 1000	-	-	-
*SPHERE	0 to 1000	-	-	-
SCREW1 to 4	-1000 to 1000	-	-	-
STRM1-12	0 to 1000	-	-	-
H DOOR	-3000 to 3000	-	-	-
V DOOR	-3000 to 3000	-	-	-

* Cannot be used with **OUTSIDE SOFTNESS X, Y** in the [DVE BORDER] menu.

13-8. Lighting Effects

Lighting effects require an HVS-2000DVE option card.
Before setting Hilite menu pages, change **DVE SETUP** to 3D or 3D(x2) for the bus. (See Sec. 12-4. "Assigning 3D DVE (HVS-2000DVE).")

HILIGHT effects allow you to add lighting effects to images. Light type, source and position can be selected. Available parameters vary depending on HILIGHT TYPE. Once a type is selected, available parameters are displayed in the menu.
These effects are also applied to images when WARP EDGE is turned on.

Parameter	Setting	Description
TYPE	OFF	Disables lighting effects.
	FLAT	Adds flat light.
	BAR	Adds a bar light.
	SPOT	Adds a spot light.

Available parameters for each type

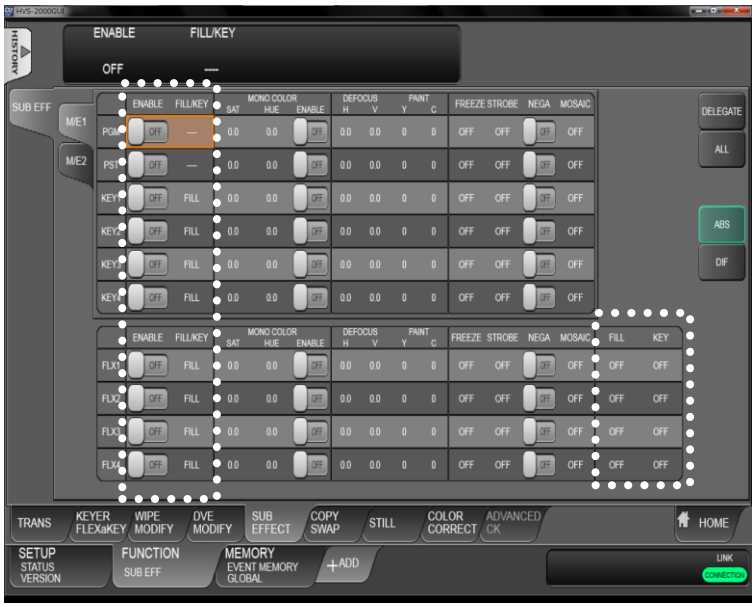
TYPE	BAR ROT	SPOT RAD	POS	WIDTH	POS-X	POS-Y
FLAT	-	-	-100.0 to 100.0	0.0 to 100.0	-	-
BAR	-7999 to 7999	-	-100.0 to 100.0	0.0 to 100.0	-	-
SPOT	-	0 to 1000			-100.0 to 100.0	-0.0 to 100.0
(Description)	Bar rotation	Spotlight radius	Lighting position	Lighting width	Spotlight center	

14. SUB EFFECT

Sub effects such as Mono Color, Defocus, Paint and Mosaic can be added to video images. To do so, assign a SUB EFFECT channel to a bus (PGM, PST, KEY1-4 and FLEXaKEY1-4). Up to 4 channels are available for each M/E (LINE).

14-1. Assigning a SUB EFFECT Channel to a Bus

(1) Open the [FUNCTION > SUB EFFECT > SUB EFF] menu.
(2) Turn **ENABLE** to ON.
(3) FILL or FILL/KEY can be selected for a key bus.
If FILL/KEY is selected, two channels are automatically assigned.
For FLEXaKEYs, SUB EFFECT channel(s) must be manually assigned to keys.



* Note that when SUB EFFECT is used on FLEXaKEY, an abnormal image mixing process is applied.
* If **KEY TYPE** is set to FULL (KEYER and FLEXaKEY), set **FILL/KEY** to FILL.
If **KEY TYPE** is set to LUM, BUS or CHR, set **FILL/KEY** to FILL/KEY.

14-2. Applying Sub Effects

◆ **MONO COLOR**

Monochrome effects can be configured via the following menu page.
Turn **ENABLE** to ON and set a color using **SAT** and **HUE**.

◆ **DEFOCUS**

Defocus allows you to add an effect that will blur the image.
Set the horizontal defocus level under **DEFOCUS H**.
Set the vertical defocus level under **DEFOCUS V**.

◆ **PAINT**

The Paint Color effect allows you to add an effect, which makes the image look like a painting. Increasing the value decreases the degree of gradation, so the image resembles a painting.
Set the luminance level under **PAINT Y** and chrominance level under **PAINT C**.

◆ FREEZE, STROBE, NEGA and MOSAIC

Freeze, Strobe, Nega and Mosaic effects are also available by turning each parameter ON under the setting.

Parameter	Description
FREEZE	Allows users to enable the freeze effect function. Users can select either frame freeze or field freeze.
STROBE	Allows users to enable strobe effects. Increasing the value increases the light flashing interval. If set to FILM A or FILM B, a different film effect is applied
NEGA	Setting to ON makes an image negative by reversing all luminance levels.
MOSAIC	Allows users to use a mosaic effect. Increasing the value enlarges the size of mosaic cells.

15. Still and Clip Store

The switcher can capture and memorize still images from the switcher input and output video, and record and play back the output video as video clips. In addition, input video can display frozen images by capturing an input video and saving it to the Frame Synchronizer buffer. (INPUT STILL function) (See Sec. 23. "File Operations.")

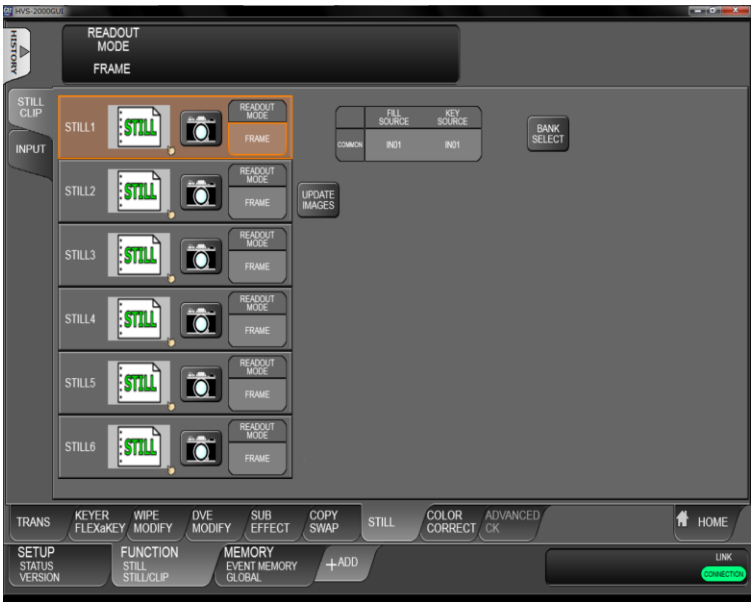
STILL5 and STILL6 are added by installing an optional HVS-2000MV card.

15-1. Still Images (STILL)

15-1-1. Capturing Still Images

Up to four Video and Key still pictures can be stored.
Let's capture M/E1 program images using STILL1 as follows:

(1) Open the [FUNCTION > STILL > STILL CLIP] menu.
(2) Select M/E1 for both FILL SOURCE and KEY SOURCE.
(3) Tap on the **STILL1 camera i**con to capture a still image. The image is saved to STILL1.



Still images 1-6 are respectively stored to four still memory buffers. These still images are automatically backed up and loaded at start-up.
They can be backed up to USB flash drives and loaded to still memory buffers from USB flash drives. (See Sec. 23. “File Operations.”)

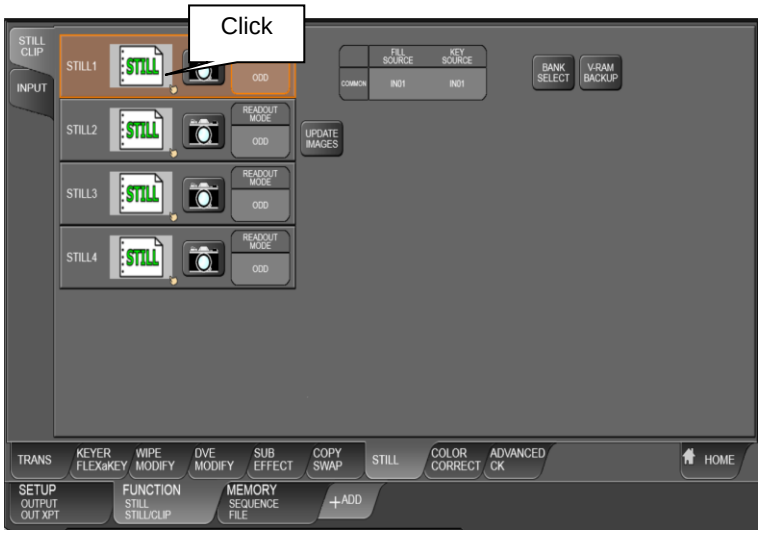
15-1-2. Displaying Still Images

To display the STILL1 image stored above on a screen, select STILL1 for the M/E, AUX or a key insert video in the menu. Or, assign STILL1 on a bus button and press the button to select it. The read out mode of still images can be changed. Select it from FRAME, ODD or EVEN. For example, to load the STILL1 image in odd mode, select ODD under **READOUT MODE**.

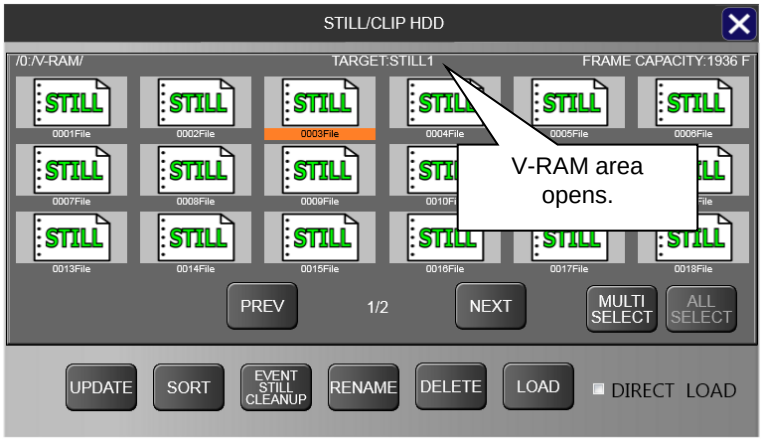
15-1-3. Handling V-RAM Still Images

Still images backed up from STILL buffers (STILL1-6) or loaded using the FILE LOAD menu are stored in V-RAM (built-in video memory), and can be sorted, renamed and deleted. The images can also be uploaded to STILL1-6 or INPUT STILL1-48. (See Sec. 15-4. “Saving Multiple Still / Clip Sets” for details on saving image data.)

(1) Click a still image thumbnail in the [FUNCTION > STILL > STILL CLIP] menu.



(2) A pop-up screen as shown below will appear. Operations listed in the following table are available.



Operation	Description
UPDATE	Refreshes image thumbnails.
SORT	Sorts images by name and date.
EVENT STILL CLEANUP	Deletes still images that were stored by saving events if linked events do not exist.
RENAME	Renames the selected image.
DELETE	Deletes the selected image.
LOAD	Uploads the selected image to the still buffer. If **DIRECT LOAD** is checked, images are immediately uploaded by selecting them. (In the example above, the selected image is uploaded to STILL 1.)
MULTI SELECT/ ALL SELECT	Allows you to select multiple images at the same time. Multiple image selection is ineffective for **RENAME** and **LOAD** (DIRECT LOAD).

15-1-4. Loading 4K Still Images

Still images of 3840 x 2160 pixels can be used on the switcher.

◆ **Loading 4K Images**

(1) Insert the USB drive in which a 4K still image file is stored, into the USB port.
(2) Open the [SETUP > FILE > LOAD] menu. Select STILL.
(3) Select the USB drive letter. (The USB drive should be displayed under “E: \\”.)
(4) Select the still image in the right side of the screen.
(5) Select an image to load it to the still memory (STILL1-4).

To store 4K images to the still or input still memory, any channel from 1 to 4 can be specified under TARGET. 4K images will be divided and stored, preserving their original division method.

◆ **Loading 4K Images by Specifying the Division Method (SQD / 2SI)**

To load 4K images by specifying SQD or 2SI, divide a 4K image into four HD images on the GUI.

(1) Insert a USB flash drive in which a 4K image file (file name with less than 8 characters) is stored into a USB port on the control panel.
(2) Open the [SETUP >FILE > DATA BACKUP] menu. Select STILL.
(3) Select the 4K still image in the left side of the screen.
(4) Select **4K SPLIT**.
(5) Select the division method between SQD and 2SI.
(6) Four HD images are created with the following file names.
[Original file name]_1.xxx to **[original file name]_4.xxx**

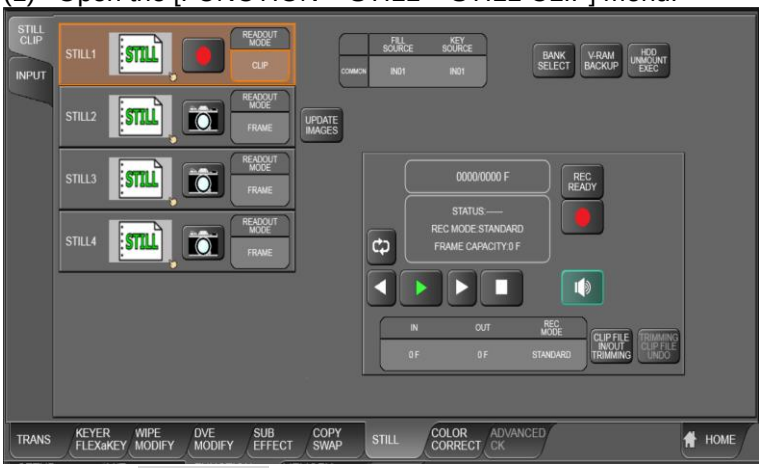
15-2. Video Clips (CLIP)

Output images can be recorded as Video and Key clips (up to 1,024 clips). STILL1-6 buses are used for recording and playing video clips, however, they are stored in different internal memory buffer (V-RAM).

15-2-1. Recording Video Clips

Let's record M/E1 program images using STILL1 as follows:

(1) Open the [FUNCTION > STILL > STILL CLIP] menu.



(2) Select M/E1 PGM for both **FILL SOURCE** and **KEY SOURCE**.
(3) Select CLIP for STILL1 **READOUT MODE**.
(4) Tap on **REC READY** to be on recording standby. (If the number of recording frames are predetermined, set the number of frames under **OUT**.)

(5) Tap on **RECORD** (red circle) to start recording.
(6) Tap on **STOP** (square) to stop recording. (If the number is set under **OUT**, the recording will automatically stop.)

Vido clips are automatically backed up and loaded on start-up.
Clip data can be backed up to USB flash drives and loaded to the switcher memory from USB flash drives. (See Sec. 23. “File Operations.”)

◆ **Recording Mode (REC MODE)**

The recording mode can be changed. To start recording with no standby (without tapping REC READY), change **REC MODE** from STANDARD to DIRECT.

◆ **CLIP FILE TRIMMING**

To trim a video clip, select a clip, set IN and OUT points and press **CLIP FILE IN/OUT TRIMMING**. Pressing **TRIMMING CLIP FILE UNDO** allows you to restore the trimmed data to its original clip. Note that, however, rebooting or next clip trimming disables **TRIMMING CLIP FILE UNDO**.

15-2-2. Playing Video Clips

This example shows how to play the M/E1PGM clip recorded above on the M/E2 background through STILL1. Assume that STILL 1 is assigned to the bus button 10 on the control panel.

(1) Open the [FUNCTION > STILL > STILL CLIP] menu.
(2) Select CLIP for STILL1 **READOUT MODE**.
(3) Select the STILL icon of STILL1 in the [STILL/CLIP HDD] menu.
(4) Select the recorded clip for playback.
(5) On the control panel, press 10 in the M/E2 PGM bus. (The start frame will be displayed on the M/E2 program screen.)
(6) Tap **PLAY** (green arrow) to start playback. (The screen returns to a stopped state when playback is complete.)

◆ **Simultaneous Playback of Video and Audio Clips**

If a video clip is set up with an audio file, video and audio are simultaneously played back.

15-2-3. CG WIPE

CG Wipes are video effects that allow you to play movie files according to background transitions. CG Wipes can be created using a modified pattern. CG WIPE videos are composed using an M/E key.
The procedure example below shows how to play a CG WIPE on the M/E1 background under the conditions listed in the table. The CG clip should be stored in the switcher by capturing video or uploading from a USB flash drive.

Item	Setting example
Channel	STILL1
Pattern	No. 51
Key used for CG	M/E1KEY1
Play time	60 frames
BKGD transition type	WIPE
BKGD transition pattern (preset or modified)	WIPE No. 51

◆ **CG Settings**

(1) Open the [FUNCTION > WIPE MODIFY > CG WIPE] menu or [FUNCTION > DVE MODIFY > CG WIPE] menu.
(2) Turn **ENABLE** to ON to enable CG WIPE mode.
(3) Specify the CG clip under **SOURCE**.
(4) Set **DURATION** (CG playback time) to 60 frames.

◆ **KEY and Background Settings**

(1) Select KEY1 under **KEYER SELECT**.
(2) Set the delay time from the start of the CG WIPE to setting the key ON under **KEYER DELAY(f)**.
(3) Set **TRANS END** to KEY_OFF to clear KEY1 from the screen after CG playback is finished. (In CG WIPE operations, a key is cut into and cut out from the screen after the specified time elapses.)
(4) Set the BKGD transition type to WIPE under **TRAMS TYPE**.
(Note that NOR/REV, the WIPE direction button, on the control panel must be OFF. In other cases, CG wipes may be improperly performed.)
(5) Set the delay time from the start of the CG WIPE to the start of the background transition under **TRANS DELAY(f)**.
(6) Set the BKGD transition rate under **TRANS RATE**.

◆ **Executing the CG WIPE**

(1) On the control panel transition block, verify that the transition type is set to WIPE and Pattern 51 is selected for the BKGD in the menu.
(2) Press AUTO on the control panel to perform the CG WIPE effect.

◆ **Fader Operation Setting**

The FADER setting allows you to isolate CG WIPE and Fader operations.

(1) Open [FUNCTION > WIPE MODIFY > CG WIPE] or [FUNCTION > DVE MODIFY > CG WIPE] menu.

(2) Select the fader operation from CG, MIX and WIPE.

FADER Setting	Description
CG	Moring fader performs CG Wipes in the same way as AUTO transitions.
MIX	Moving fader performs MIX transitions. CG Wipes are not performed.
WIPE	Moving fader performs WIPE transitions. CG Wipes are not performed.

15-3. Still Image Display Using FS Buffer (INPUT STILL)

The switcher standard inputs can display still images by capturing input video or uploading still images to frame synchronizer buffers (INPUT STILL) from USB flash drives. (See Sec. 23. “File Operations.”)
The following example shows how to capture and display a still image on IN05.

15-3-1. Capturing Still Images

(1) Open the [FUNCTION > STILL > INPUT] menu.
(2) Select IN05 for both **FILL SOURCE** and **KEY SOURCE**.
(3) Tap on the IN05 **Camera** icon to capture the current video frame. The captured image is saved in the FS memory buffer.
(4) To change read out mode, select it from ODD, EVEN and FRAME.

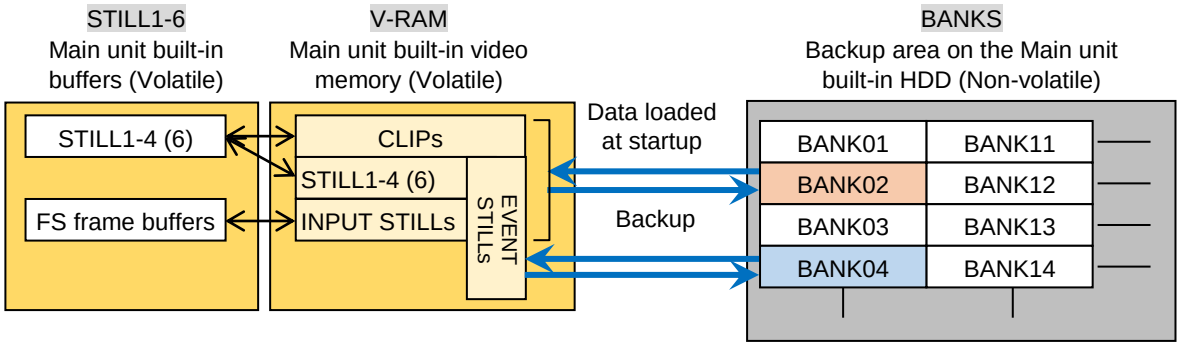
Input Stills use the frame synchronizer buffer memory. Therefore, the frame synchronizer is inoperable while an INPUT STILL is displayed or enabled. (See Sec. 6-6. “Frame Synchronizer.”)

15-3-2. Returning to Input Video Display

To return IN05 to input video, open [SETUP > INPUT > SIGNAL] menu, and change **CTRL** from STILL to INPUT.

15-4. Saving Multiple Still / Clip Sets

Although HVS-2000 units automatically back up 4 captured still images and clips (one data set) in the built-in HDD and load them on start-up, the BANK SELECT menu allows you to store multiple data sets of images by manually changing the destination location.
Furthermore, this menu can also specify the still data destination for events.
The diagram below shows the case where BANK02 is set as the backup memory.



◆ **To Enable Image Backup**

(1) Open the [FUNCTION > STILL > STILL CLIP] menu.
Turn ON **V-RAM BACKUP** to enable image backup. STILL and INPUT STILL images are automatically backed up to V-RAM and images are stored to the V-RAM whenever an image is captured.

◆ **To Change the Destination Location (BANK number)**

(1) Open the [FUNCTION > STILL > STILL CLIP] menu.
(2) Tap **BANK SELECT** to display the BANK SELECT pop-up window.

Item	Description
NAME	Data location (bank) name. Tap **RENAME** to enter the bank name.
FORMAT	Displays the video signal format of the switcher when the data was stored.
FRAME	Displays the remaining number of frames available in the bank.
CLIP	Displays the stored number of clips and stills in the bank.
ATTRIBUTE	Displays the data type stored in the bank. **RESUME**: Still and clip backup data **EVENT STILL**: Still data for events **RESUME/EVENT STILL**: Still data both for RESUME and EVENT STILL. Clip data is stored in the remaining area, allowing events (EVENT STILL) to load faster. **NOT USED**: No data is stored.

(3) Select a BANK number, then tap the **RESUME** button (tap EVENT STILL if changing the still data destination for events.)

Note that 1080/50i and 1080/25PsF sources are stored in the same bank, so these still sources are swappable, however, these movie sources must be played back in their proper format.
In the same manner, 1080/59.94i, 1080/30PsF and 1080/29.97PsF materials are stored in the same bank.

(4) A pop-up dialog will appear. Set the resume bank and tap **EXEC**.

16. Multiview Output

The multiviewer allows you to monitor multiple images such as video sources input to the switcher and internally generated or combined images on the same screen. The switcher provides **two multiviewer channels (MV1** and **MV2)**, with each output having various types of split displays: **2, 4, 5, 7, 9, 10, 11, 13, 14 and 16 way**.
Each MV channel provides dual outputs: **Out-A** and **Out-B**. **Out-A** displays a multiview image while **Out-B** displays a key signal (alpha-channel) output of window layout. Only in quad-screen mode, **Out-B** can display a quad screen image different from **Out-A**.
Different video images can be displayed in different patterns. An **HVS-2000MV** option card allows you to add **2 channels (MV3** and **MV4**). Video titles and on-air tally information can also be displayed. This chapter use MV1 as an example, but MV1 and MV2 operations are the same.
Note that the multiviewer outputs are **delayed by one frame** relative to the program output.

Note that adding an HVS-2000ME card disables all the standard and optional multiview channels.

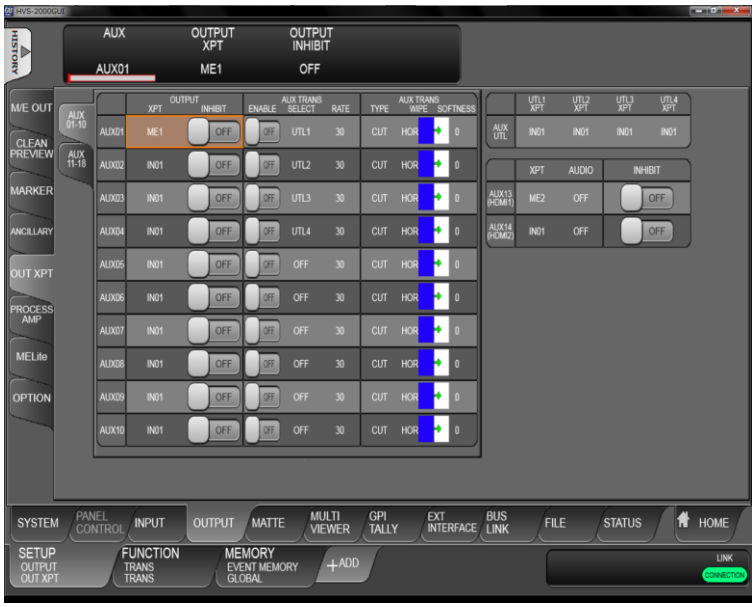
The setup procedure for the multiviewer is as follows:

1. **Assign a multiviewer video to an AUX output bus.**
2. **Select a split-screen type.**
3. **Select video for each split area. (Clock display available instead of video)**
4. **Add titles, audio level meters, safety area markers, on-air tallies and frame borders.**

16-1. Assigning a Multiview Image to an AUX Bus

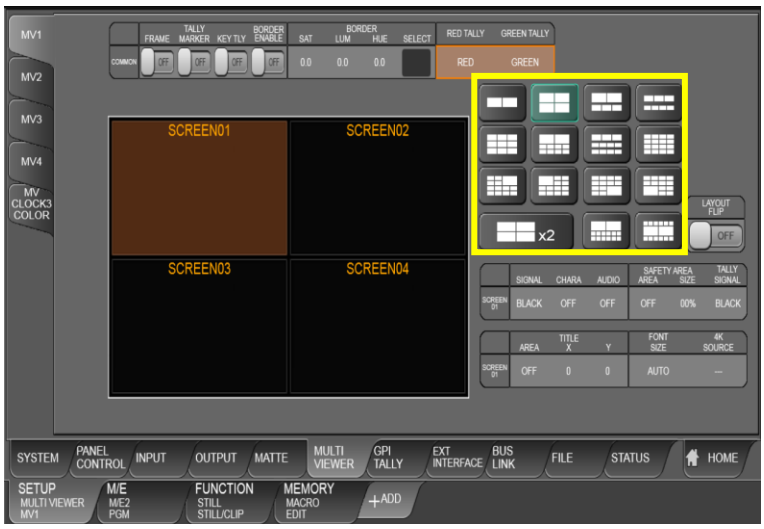
The multiviewer channels can be assigned to any AUX bus. There are two ways to select an AUX bus: using the buttons in BUS SELECT or using the menu. In the following example AUX2 is selected to be the MV1 output. If AUX13 or AUX14 is selected, the multiview image will appear on the HDMI1 or HDMI2 screen.

(1) Open the [SETUP > OUTPUT > OUT XPT] menu.
(2) Select MV1 for AUX02 **OUTPUT XPT**.



16-2. Selecting the Screen Layout

(1) Open the [SETUP > MULTI VIEWER > MV1] menu.
(2) Select the screen layout.



- When using a 5,7,10 11 or 14-way display, setting **LAYOUT FLIP** to ON interchanges the top and bottom subscreens.
- In quad mode, Out-A and Out-B can display different quad-screen images.

16-3. Assigning Video to Sub-screens

(1) Open the [SETUP > MULTI VIEWER > MV1] menu.
(2) Select the sub-screen number under **SCREEN**.
(3) Tap **SIGNAL** and select a video to be displayed on the sub-screen.

Available images for MV1 to MV4	IN01-IN40 BLAK(BLACK), STL1- STL4, ST1K - ST4K, MATTE1, MATTE2, CB(Color bar), CB A, WHIT (WHITE) CK1K-CK4K, M/E1 PGM, M/E1 OUT1-3, M/E2 PGM, M/E2 OUT1-3, AUX1-AUX14, CLOCK, CLOCK2, CLOCK3
Available images for MV3 and MV4	In addition to all images listed above following images are available. STL5, STL6, ST5K, ST6K, IN41-48, CK1F-CK4F, CC1-CC8

(4) Repeat steps (2) and (3) to assign images to the multiviewer sub-screens.
A clock is also selectable, to adjust time for the clock, See Sec. 16-5. “Setting Date and Time.”

16-4. Setting up Each Sub-screen

16-4-1. Titles (Signal Names)

(1) Open the [SETUP > MULTI VIEWER > MV1] menu.
(2) Select a sub-screen.
(3) Changing CHARA from OFF to SHORT (up to 4 characters), LONG (up to 8 characters) or LONG2 (included signal sources for AUX buses) displays the signal name on the sub-screen.
Signal names displayed on sub-screens can be changed in the [SETUP > INPUT > NAME] menu. (See Sec. 6-5. “Changing Video Source Names.")

(4) Set the title background and position under **TITLE**.

TITLE AREA setting	Description
WIDE	Spreads the title background to the width of the screen.
NORMAL	Adjusts the width of the title background to fit the title.
OFF	Title Backgrounds are not displayed.

Parameter		Description
TITLE	X	Selects the horizontal title position from -100 (left), 0 (middle) or 100 (right).
	Y	Selects the vertical title position from 100 (high), 0 (middle) or -100 (low).

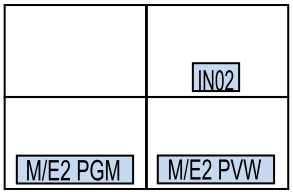
(5) Set the title font size under **FONT SIZE**.

FONT SIZE setting	Description
AUTO	Automatically changes the font size according to the sub-screen size.
MINIMUM	Minimum font size to fit to a 1/36 size sub-screen.
SMALL	Small font size to fit to a 1/16 size sub-screen.
MIDDLE	Middle font size to fit to a 1/9 size sub-screen.
LARGE	Large font size to fit to a 1/4 size sub-screen.

◆ **Setting Example**

In the following setting example, the multiview image is displayed as shown at right.
(Names are default settings.)

SCREEN	SIGNAL	CHARA	TITLE AREA
1	IN01	OFF	NORMAL
2	IN02	SHORT	
3	ME2PVW	LONG	
4	ME2PGM	LONG	



16-4-2. Audio Level Meter

A Level Meter for embedded audio can be displayed on each screen in multiviewer video. Select 2- or 4-channel for audio type to be displayed, which can be set for each screen.

(1) Open the [SETUP > MULTI VIEWER > MV1] menu.
(2) Select a sub-screen.
(3) Select audio channels to be displayed under **AUDIO**.

AUDIO setting	Description
OFF	Displays no level meters.
Ch1/2, Ch3/4, Ch5/6, Ch7/8	Displays level meters for two channels.
Ch1-4, Ch5-8	Displays level meters for four channels.

16-4-3. Safety Area

(1) Open the [SETUP > MULTI VIEWER > MV1] menu.
(2) Select a sub-screen.
(3) Select HOOK or BOX under **AREA** of SAFETY AREA (for each sub-screen).
(4) Select the safety area size under **SIZE** of SAFETY AREA.

16-4-4. On-air Tally Indications

The tally indicates which video is currently On-air (output from the program) and which is set to be the next output. The multiviewer can display two types of tally indicators: Frame and Marker. You can use either or both at the same time.

(1) Open the [SETUP > MULTI VIEWER > MV1] menu.
(2) If **FRAME** is set to ON, the tally is indicated on the sub-screen frame.
(3) If **MARKER** is set to ON, the tally is indicated on a small square mark.
(4) If **KEY TLY** is set to ON, the key tally is also indicated.
(5) Turning **BORDER ENABLE** to OFF hides the frame borders.

To display the tally indication of another video, set the video signal under **TALLY SIGNAL**.

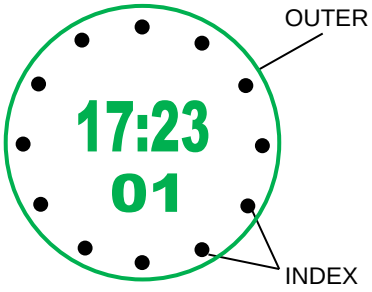
16-4-5. Frame Border Color

Frame Border that divide sub-screens can be added.
(1) Open the [SETUP > MULTI VIEWER > MV1] menu.
(2) Turn ON **BORDER ENABLE**.
(3) Select the border color under BORDER **SAT**, **LUM** and **HUE**, or using **SELECT**.

16-4-6. Clock3 Color

The following procedure allows you to set the CLOCK3 color according to red and green tally information of a bus

(1) Open the [SETUP > MULTI VIEWER > MV CLOCK3 COLOR] menu.
(2) Sets clock colors under **OUTER**, **INDEX** and **NUMBER** for NORMAL, RED and GREEN states.
(3) **TALLY BUS SELECT** allows you to select a bus to monitor tallies. According to the bus tally information, clock colors in NORMAL, RED or GREEN states are applied.



16-4-7. MV TALLY

MV tally color allocation can be changed from RED and GREEN to RED, GREEN and COLOR1-24 as shown below.
(1) Open the [SETUP > MULTI VIEWER > MV1] menu.
(2) Select **RED TALLY** or **GREEN TALLY**.
(3) Select a color to be allocated from RED, GREEN and COLOR1-24.

16-5. Setting Date and Time

The date and time are used for the multiviewer clock and recording data backup time. Note that if the switcher is turned OFF within 100 hours (or less if it is not fully charged), date and time data will be cleared. In such case, open the [SETUP> SYSTEM > MU SETUP] menu and reset the date and time.

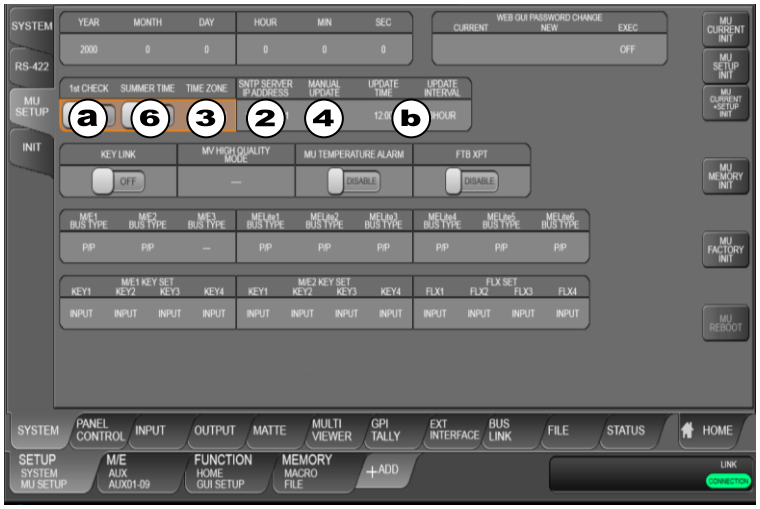
16-5-1. Time Adjustment using an SNTP Server

The switcher time can be synchronized to a SNTP server time as shown below.

(1) Open the [SETUP > SYSTEM > MU SETUP] menu.
(2) Enter the server IP address under **SNTP SERVER IP ADDRESS**.

Network delay or other factors may decrease the SNTP server time accuracy. To increase the time accuracy, place the server on the local network.

(3) The SNTP uses UTC (Coordinated Universal Time). Select the time zone under **TIME ZONE** to convert UTC to your local time.
(4) Select EXEC under **MANUAL UPDATE**. A beep sound is heard and the switcher time is updated.
(5) To set auto time adjustment:
  (a) To adjust time at startup, turn **1st CHECK** to ON.
  (b) To adjust time at a set time, specify the time under **UPDATE TIME**. **UPDATE INTERVAL** allows you to repeat time adjustment at the set intervals starting from the **UPDATE TIME**.
(6) Setting **SUMMER TIME** to ON advances the time by one hour at time adjustment.



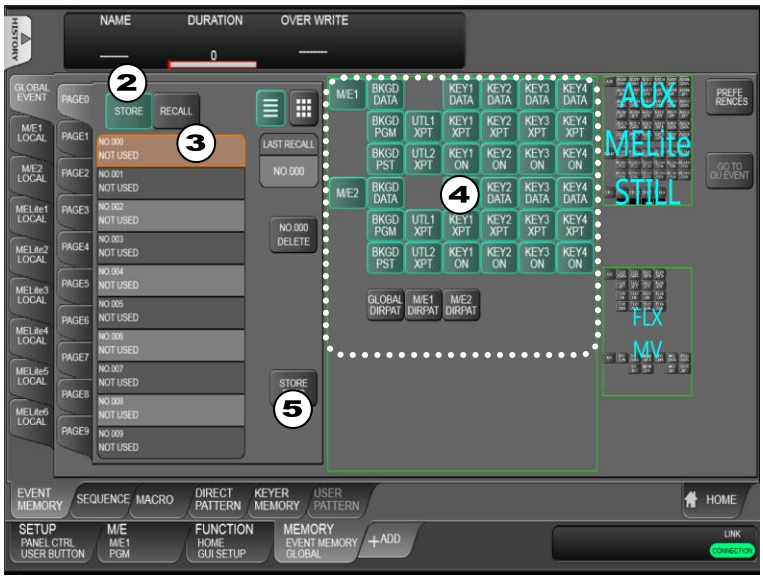
17. Event Memory

The switcher can save settings as a data set. This function is called Event Memory. Event Memory allows you to quickly recall saved panel settings at any time when needed. The MEMORY block is used to save and recall events. In addition, data to be stored to or loaded from events can be selected in the menu. Selecting STILL allows you to store still images saved in the STILL memory to events.
Event memory data can be backed up to USB flash drives using MEMORY menu. (See Sec. 23. “File Operations”)
In addition, the RATE item in the EVENT menu allows users to perform transitions by loading events. (See Sec. 17-2-3. "Transitions Using Event Recall.")

17-1. Storing Events

Event memory can store control panel settings. Up to 100 events (10 memory pages, with 10 events per page) can be stored in memory.

(1) Open the [MEMORY > EVENT MEMORY > GLOBAL EVENT] menu.
(2) Select **STORE**.
(3) Select an event number.
(4) Select data to be stored in the right side of the menu screen.
(5) Tap **STORE EXEC** to save the data to the event.

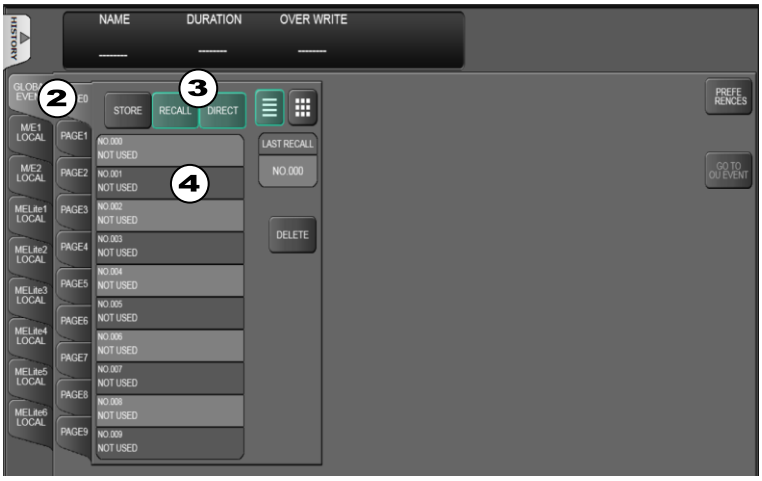


17-2. Recalling Events

17-2-1. DIRECT Mode

Events can most quickly be recalled in Direct Operation mode. However, loaded data cannot be selected while recalling events.

(1) Open the [MEMORY > EVENT MEMORY > GLOBAL EVENT] menu.
(2) Select a page.
(3) Tap **RECALL** and **DIRECT**.
(4) Select an event memory button to load the event data to the switcher.



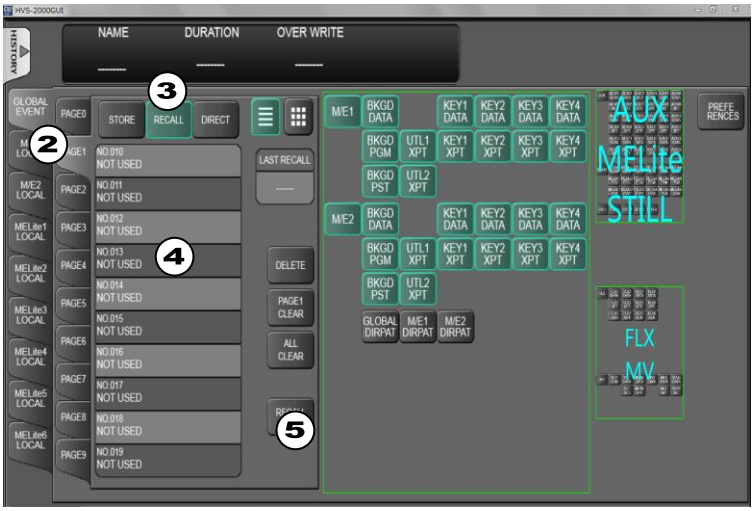
17-2-2. Using the RECALL Button

◆ **To Recall Events (DIRECT OFF):**

(1) Open the [MEMORY > EVENT MEMORY > GLOBAL EVENT] menu.
(2) Select a page.
(3) Tap **RECALL**.
(4) Select an event memory button.
(5) Tap **RECALL EXEC** to load the event.

Ex) To Recall EVENT 013

Tap buttons in the following order: **PAGE1** > **RECALL** > **NO.013** > **RECALL EXEC**.

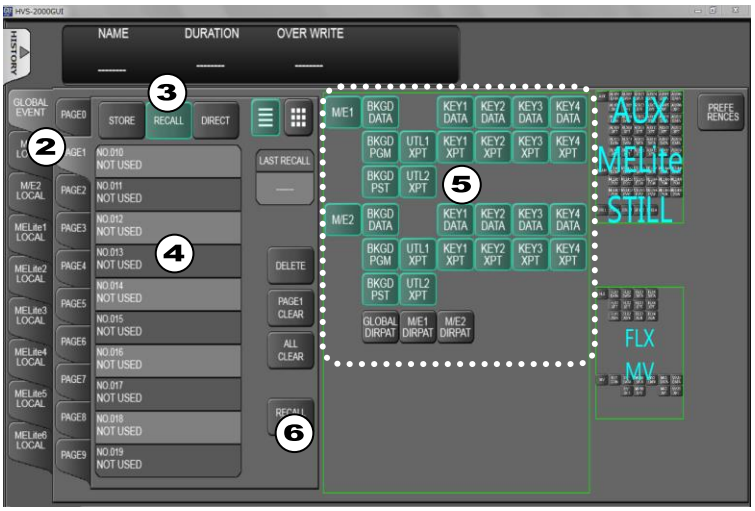


◆ **To Recall Events while Selecting Loaded Data (DIRECT OFF):**

(1) Open the [MEMORY > EVENT MEMORY > GLOBAL EVENT] menu.
(2) Select a page.
(3) Tap **RECALL**.
(4) Select an event memory button.
(5) At this time users can select to recall all saved data or specific data within the event by selecting on the menu screen (for example, loading data excluding M/E2 settings)
(6) Tap **RECALL EXEC**.

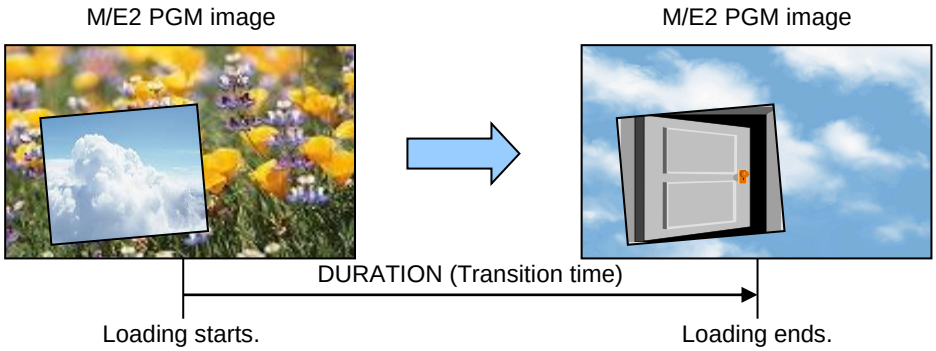
Ex) To Load EVENT 13

Tap buttons in the following order:
PAGE1 > **RECALL** > **NO.013** > (Data Selection) > **RECALL EXEC**



17-2-3. Transitions Using Event Recall

The DURATION parameter in the EVENT menu allows users to set the time duration (transition rate) it takes to load events. With this time duration, transition sequences of two steps (statuses before and after recalling events) can be performed. The two images (keyframes) before and after recalling events that appear on program screens are automatically interpolated to create a smooth transition in the same way as the Sequence feature. The DURATION time can be set for each event. It can also be set and changed when events are recalled.

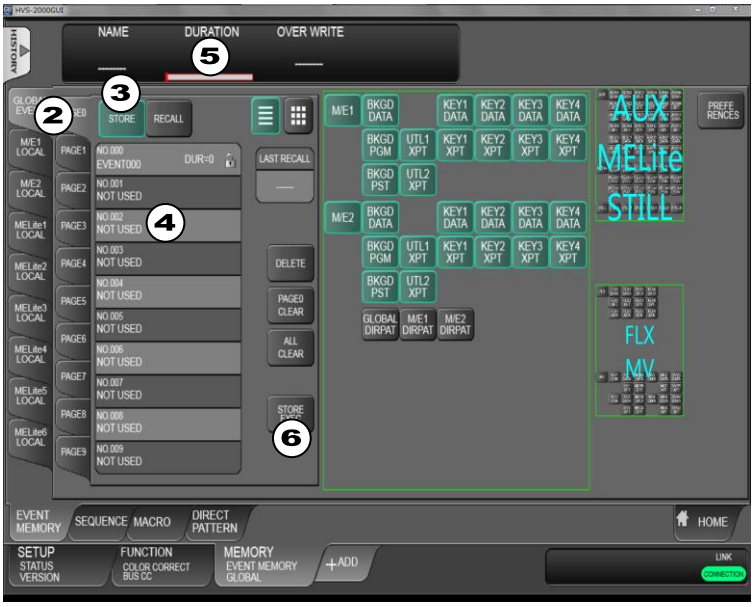


◆ **Operation Example**

The following operation example shows an event that is saved to EVENT No. 2 with 150 frames for DURATION and it is recalled while changing DURATION to 30 frames.

To Save EVENT 2

(1) Open the [MEMORY > EVENT MEMORY > GLOBAL EVENT] menu.
(2) Select **PAGE 0** (Event 0-9).
(3) Tap **STORE**.
(4) Tap **NO. 002** to select Event 2.
(5) Enter 150 for **DURATION** and press **Enter**.
(6) Tap **STORE EXEC** to save the current control panel settings to Event 2.



To Load Event 2

(1) Open the [MEMORY > EVENT MEMORY > GLOBAL EVENT] menu.
(2) Select **PAGE 0**.
(3) Tap **RECALL**.
(4) Tap **NO. 002** to select Event 2.
(5) Change **DURATION** from 150 to 30.
(6) Tap **RECALL EXEC**. EVENT 2 data is loaded in 30 frames.

17-3. Overwrite Protection

(1) Open the [MEMORY > EVENT MEMORY > GLOBAL EVENT] menu.
(2) Select an event memory number.
(3) Change **OVERWRITE** to DISABLE.

17-4. Deleting Event Data

◆ **To Delete Data for an Event**

(1) Open the [MEMORY > EVENT MEMORY > GLOBAL EVENT] menu.
(2) Select an event memory number.
(3) Tap **DELETE** to clear the event memory.

◆ **To Delete Data for an Event Page**

(1) Open the [MEMORY > EVENT MEMORY > GLOBAL EVENT] menu.
(2) Select an event memory page such as PAGE0.
(3) Tap **PAGE0 CLEAR**.

◆ **To Delete All Event Data**

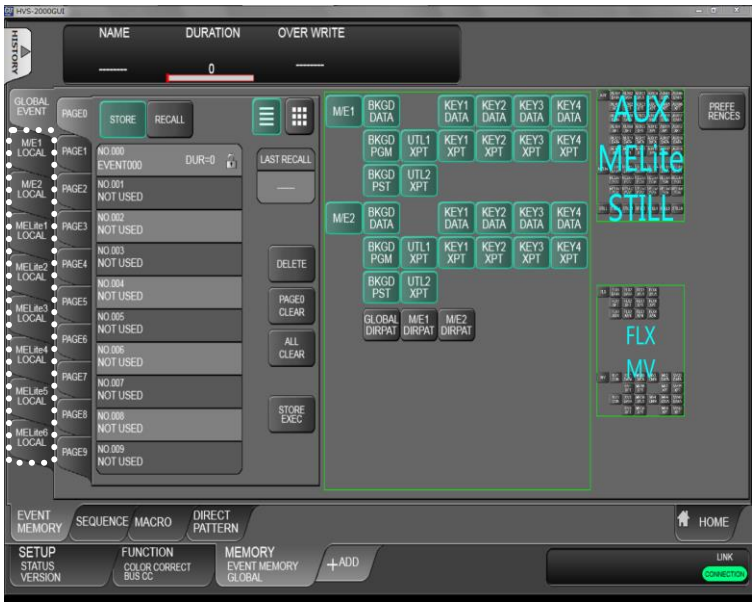
Tap **ALL CLEAR** in the [MEMORY > EVENT MEMORY > GLOBAL EVENT] menu.

17-5. User Default Setting

The event store data can be changed from the factory default settings (M/E1 and M/E2). To do so, open the [MEMORY > EVENT MEMORY > GLOBAL EVENT] menu and select the default store data, then press **PREFERENCES** to save settings.

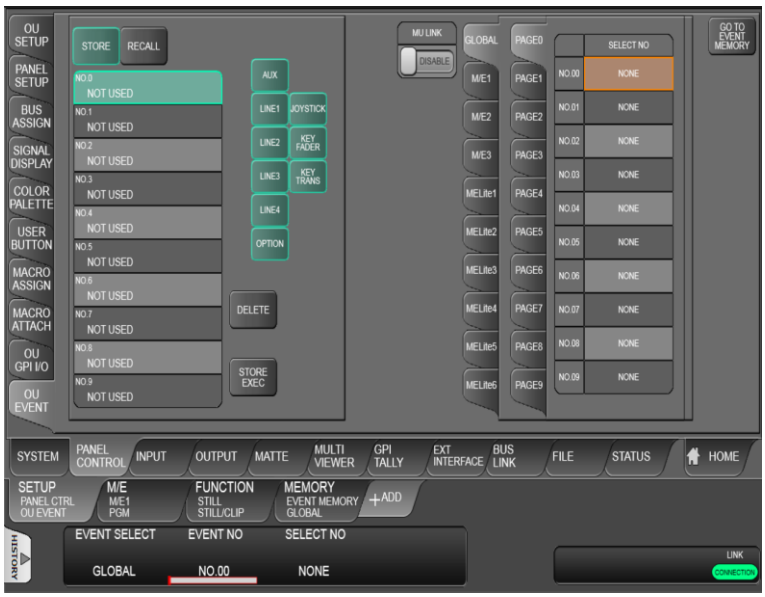
17-6. Local Event Memory

ME LOCAL tabs shown at the right edge of the following screen open each LOCAL EVENT MEMORY menu, in which event recall, event transition, overwrite protection and event clear can be performed in the same manner as those for global events. In addition, note that the DIRECT mode setting is applied to both global and local event operations.



17-7. OU Event Function

The OU Event function allows you to save / load individual control panel settings, including GLOBAL / LOCAL events.



◆ **STORE**

(1) Open the [SETUP > PANEL CONTROL > OU EVENT] menu.
(2) Press **STORE** and select an event number.
(3) Select setting items to be stored.
(4) Press **STORE EXEC**. The control panel settings are stored to the selected event number.

◆ **RECALL**

(1) Open the [SETUP > PANEL CONTROL > OU EVENT] menu.
(2) Press **RECALL** and select an event number.
(3) Press **RECALL EXEC**. The stored settings are loaded to the control panel.

NOTE

When loading events, loaded items cannot be selected.

◆ **MU LINK ASSIGN**

Global/Local and OU events can be loaded together by linking them.

(1) Open the [SETUP > PANEL CONTROL > OU EVENT] menu
(2) Set MU LINK to **ENABLE**.
(3) Select a select a GLOBAL or LOCAL event number.
(4) Select an OU event number under SELECT NO.

The OU event is loaded after the GLOBAL/LOCAL event is loaded.

18. Macro Operations

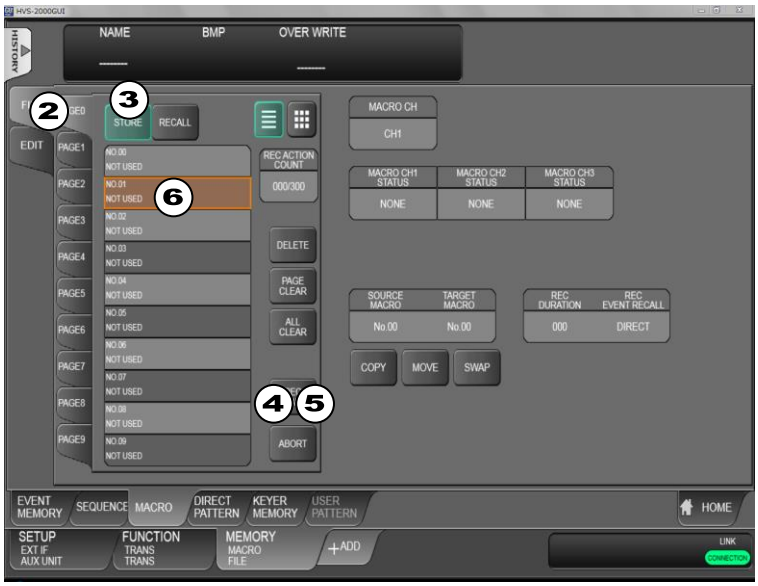
The Macro function allows users to perform a sequence of recorded operations with the single push of a button. The keypad is used to record and execute macros. Macro memory data can be backed up and restored from USB flash drives. (See Sec. 23 "File Operations.")

18-1. Recording Macros

Max of 100 macros (10 pages with 10 macros per page) can be stored in memory.
No. **0-89** macros can hold up to **30** actions for each and No. **90-99** up to **300**. Use No. 90-99 when using the fader or joystick, because these operations involve many actions.

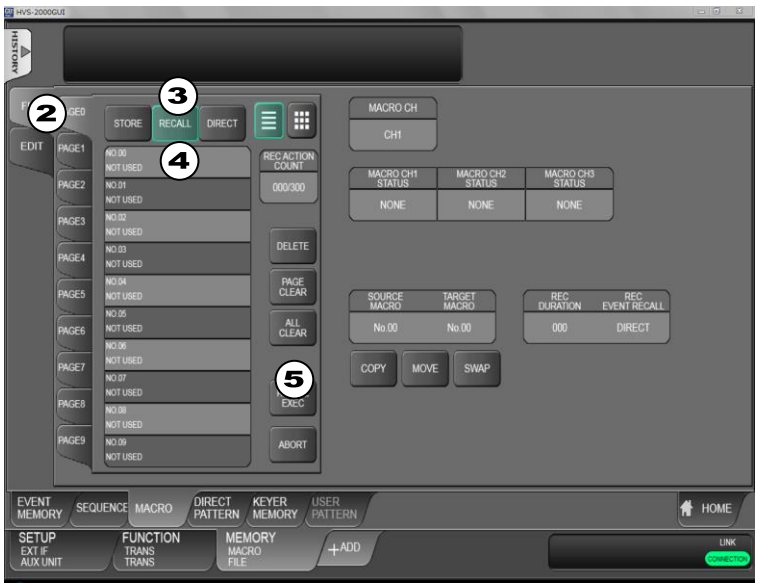
◆ **Recording Macros**

(1) Open the [MEMORY > MACRO > FILE] menu.
(2) Select a page.
(3) Tap **STORE**.
(4) Tap **REC START**. When the button display is changed to **REC READY,** perform actions to be stored to the macro.
(5) Tap **REC END** to stop recording.
(6) Select a macro memory number to save the macro data.



18-2. Executing Macros

(1) Open the [MEMORY > MACRO > FILE] menu.
(2) Select a page.
(3) Tap **RECALL**.
(4) Select a macro number.
(5) Tap **RECALL EXEC** to run the macro.



18-3. Macro Memory Operation

18-3-1. Overwrite Protection

(1) Open the [MEMORY > MACRO > EDIT] menu.
(2) Select a macro number.
(3) Turn on the overwrite protection.

18-3-2. Naming Macros

Macros are named as **MACRO0000 to MACRO0099** by default. Names for registered macros can be changed following the steps shown below. Alphanumeric and symbol characters are available.

(1) Open the [MEMORY > MACRO > EDIT] menu.
(2) Select a macro number.
(3) Tap **NAME** to type a name, then tap **Enter** on the pop-up keyboard.

18-3-3. Deleting Macro Data

◆ **To Delete Macro Data**

(1) Open the [MEMORY > MACRO > FILE] menu.
(2) Select a macro number.
(3) Tap **DELETE**.

◆ **To Delete a Macro Page**

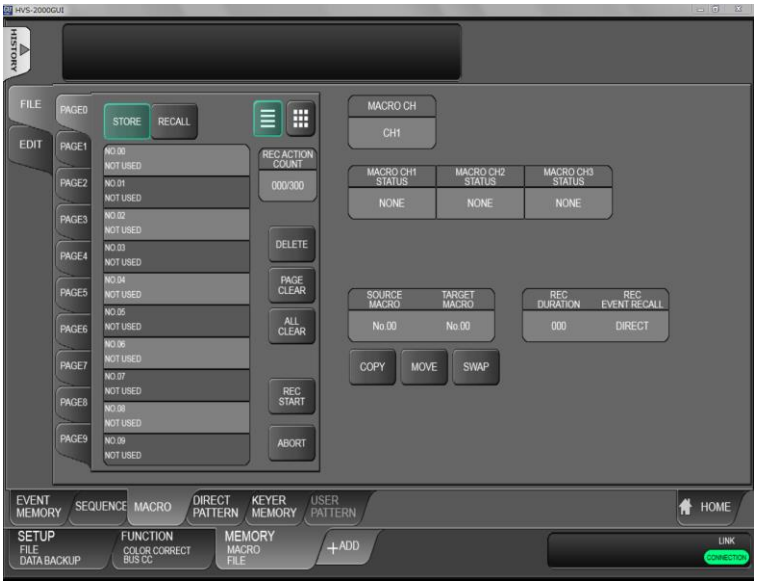
(1) Open the [MEMORY > MACRO > FILE] menu.
(2) Select a page and tap **PAGE CLEAR**.

◆ **To Delete All Macro Data**

Tap **ALL CLEAR**.

18-3-4. Copying, Moving and Exchanging Macro Data

(1) Open the [MEMORY > MACRO > FILE] menu.
(2) Select a macro number under **SOURCE MACRO**.
(3) Select a macro number under **TARGET MACRO**.
(4) Tap **COPY** to copy data.
Tap **MOVE** to move data.
Tap **SWAP** to swap data.



Copying, moving or exchanging macros between No.90-99 and No.00-89, only the first 30 actions are used.

18-3-5. Macro Play Channel

Three play channels are provided to macros and able to execute macros simultaneously on different controllers. For example, the HVS-2240OU plays a macro using CH1 and the HVS-2000GUI plays another macro using CH2. The macro execution channel can be changed in the menu.

(1) Open the [MEMORY > MACRO > FILE] menu.
(2) Select a macro channel under **MACRO CH**.

18-3-6. Macro Record Setting

REC DURATION allows you to specify a duration between actions before recording macros. REC EVENT RECALL allows you to record event recall actions to macros in Direct Recall mode.

18-4. Editing Macros

The MACRO EDIT menu allows users to adjust the time between macro actions, add actions to and delete actions from macros.
Open the [MEMORY > MACRO > EDIT] menu, tap **MACRO NO** to enter a macro number. Once the macro is selected, detailed information is displayed.

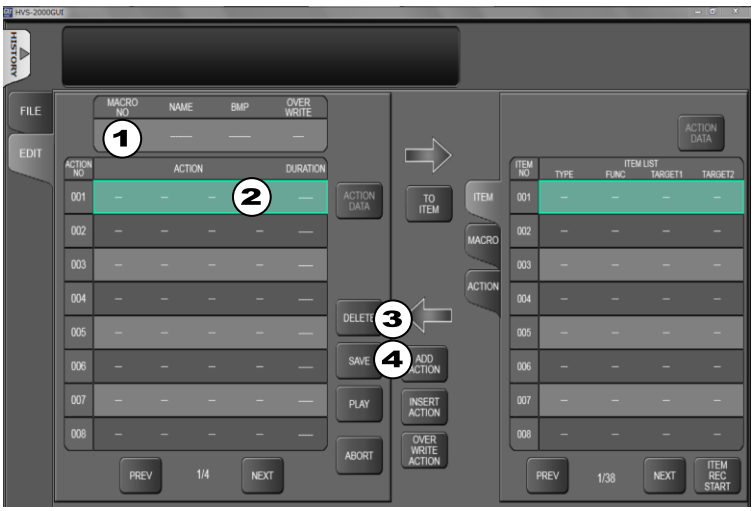
18-4-1. Adjusting Macro Duration

Time duration setting between macro actions can be adjusted.

(1) Select a macro number.
(2) Tap an action bar in the left side of the screen.
(3) Double-tap **DURATION** to enter the new value in fields (for interlaces video) or in frames (for progressive video).
(4) Tap **SAVE** to apply changes.
(5) To run the macro, tap **PLAY**.

18-4-2. Deleting Actions from Macros

(1) Select a macro number.
(2) Tap an action entry in the left side of the screen.
(3) Tap **DELETE** to delete the selected action from the macro.
(4) Tap **SAVE** to apply changes.



18-4-3. Adding Actions to Macros

To add actions to macros, first, add an action to a temporary list (ITEM LIST) in the left side, then add the action from the temporary to a macro. In addition to this, add actions by creating them in the ACTION LIST.
There are two methods to add actions to the ITEM LIST: Using ITEM REC or TO ITEM (copying actions from other macros).

* Note that the ITEM LIST is cleared when the MU is restarted.

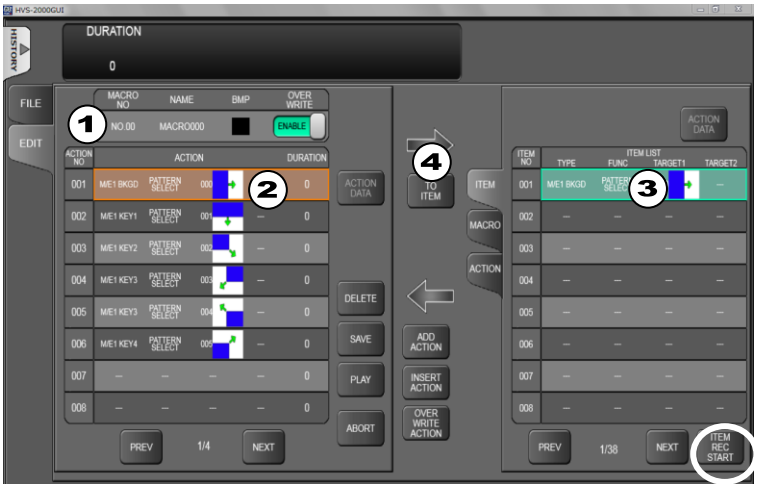
◆ Preparing Actions to be added

<Adding actions to ITEM LIST (using ITEM REC)>

(1) Tap **ITEM REC START** to change mode to REC.
(2) Perform operations on the control panel or GUI you need to record as an action in the same manner as macro recording. The **ITEM REC START** button will blink.
(3) Tap **ITEM REC START** again. (Do not tap **MACRO REC**.) A confirmation message will pop-up.
(4) Tap **YES** to add actions to the ITEM LIST and exit the REC mode.

<Adding actions to ITEM LIST (using TO ITEM) >

(1) Tap **MACRO NO** to select a macro. Actions in the macro are listed in the left side of the window.
(2) Tap an action to be added to the ITEM LIST.
(3) Tap a target entry in the ITEM LIST.
(4) Tap **TO ITEM** to add the action to the ITEM LIST.

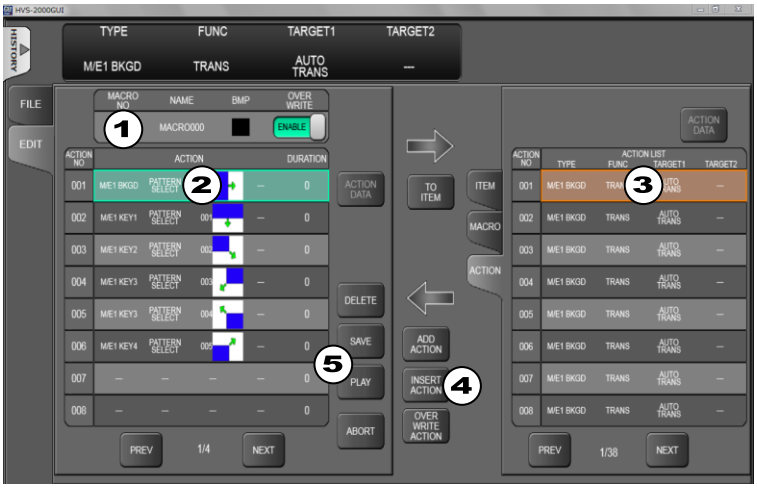


<Adding actions to ACTION LIST (creating actions) >

(1) Open the [MEMORY > MACRO > EDIT] menu.
(2) Tap the ACTION tab in the right list.
(3) Create actions by setting TYPE, FUNC, TARGET1 and TARGET2. Up to 300 actions can be temporarily stored.

◆ Adding actions to a macro

(1) Tap **MACRO NO** to select a macro (with data or without data).
(2) Select a target entry in the macro action list (left side).
(3) Select an action in the ITEM LIST (right side)
(4) Tap **ADD ACTION** to add the action to the macro.
INSERT ACTION allows you to insert the action above the target entry.
OVER WRITE ACTION allows you to overwrite the target entry.
(5) Tap **SAVE** to save changes. To run the macro, tap **PLAY**.

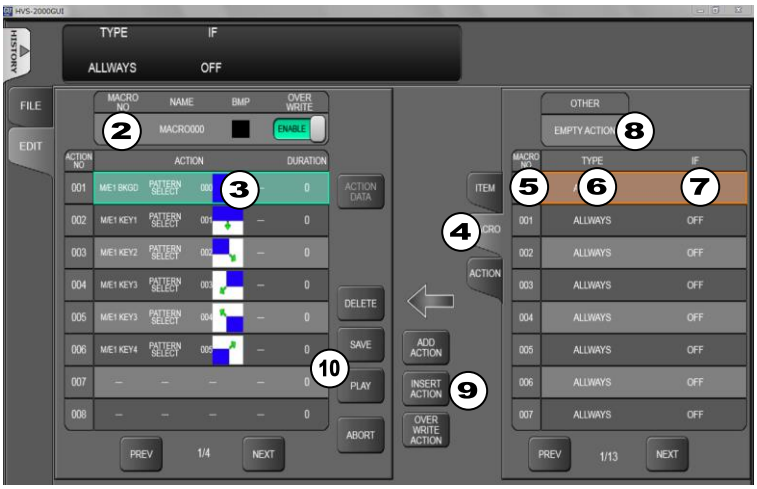


18-4-4. Adding Macro Recalls to Macros

A Macro recall can be added to macros as an action.

(1) Open the [MEMORY > MACRO > EDIT] menu.
(2) Select **MACRO NO** to select a macro (with data or without data).
(3) Select a target entry in the macro action list (left side).
(4) Tap the **MACRO** tab in the right side of the window.
(5) Specify a macro to be recalled under **RECALL MACRO NO**.
(6) Tap **TYPE** to select ALWAYS. If you need to set a condition to recall the macro, select a user flag number.
(7) If you select a user flag, define the condition under **IF**.
(8) Select **EMPTY ACTION** under OTHER to add a “No Action,” which allows you to adjust execution time.
(9) Tap **ADD ACTION**. The action is added beneath the target entry (selected at Step (3)) in the macro action list.
INSERT ACTION allows you to insert the action above the target entry.
OVER WRITE ACTION allows you to overwrite the target entry.
(10) Tap **SAVE** to save changes. To run the macro, tap **PLAY**.

* When executing macros with a macro recall, the original macro resumes after the recalled macro is complete.



18-4-5. Showing Event Recall Data

If an event recall action is included in macros, detailed event data can be displayed.
To do this, select an event recall action in a macro, then tap **EVENT DATA**.

18-5. Macro Execution Buttons

The operation is unavailable. Do it on the control panel.

19. USER Button

The operation is unavailable. Do it on the control panel.

20. 4K Mode

4K Mode settings are mainly performed in [SETUP > SYSTEM > SYSTEM] and [SETUP > INPUT > 4K] menu. See the HVS-2000/OU Operation Manual for more details.

21. Sequence Function

See the HVS-2000/OU Operation Manual for details on sequence function.

21-1. Basic Sequence Operations

The HVS-2000 allows you to create sequences based on which buses are to be used.
For example, to create sequences of the M/E1, create **a group** of **M/E1 BKGD** and **M/E1 KEY1 to 4,** then create and store sequences based on the group.

This chapter explains basic sequence operations: how to create, store, load and play sequences using only one bus, M/E1 BKGD. Then, the next chapter (Sec. 21-2) describes the details on sequence group management.

21-1-1. Creating New Sequences

This chapter shows how to create a sequence of M/E1 BKGD in three steps as an example.

◆ **Selecting M/E1 BKGD**

(1) Open the [MEMORY > SEQUENCE > EDIT] menu.
(2) Select **GROUP0** under **GROUP**. (See Sec. 21-2 for details on GROUP.)
(3) Tap **M1BG**.

◆ **Creating Steps**

(4) Tap **NEW** to clear the M/E1 BKGD block in the working memory.
(5) Create “Video A.” Tap **ADD** to save it to Step 1.
(6) Create “Video B.” Tap **ADD** to save it to Step 2.
(7) Create “Video C.” Tap **ADD** to save it to Step 3.

Now the sequence is created and saved in the working memory.

Note that DVE channel switching may cause video distortion. The switches will happen in cases when turning LINE-DVE On/Off, or changing the transition type or pattern.

21-1-2. Storing Sequences

The following procedure shows how to store the **M/E1 BKGD sequence** just created to **Sequence Memory 10**.

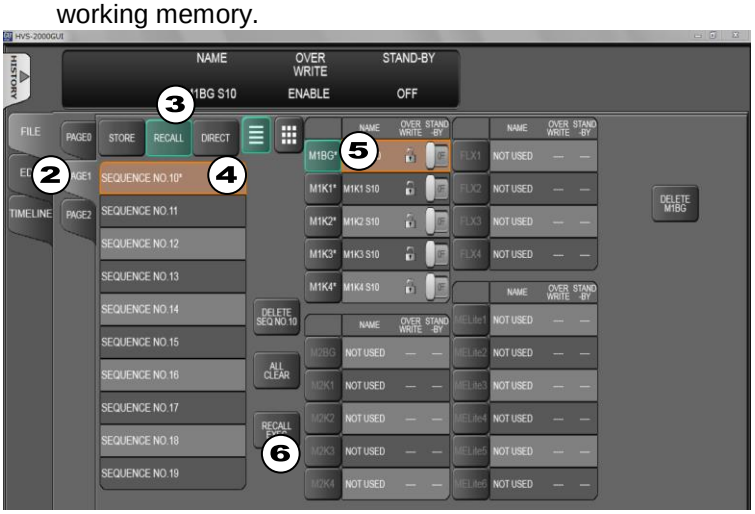
(1) Open the [MEMORY > SEQUENCE > FILE] menu.
(2) Tap **PAGE1**.
(3) Tap **STORE**.
(4) Tap **M1BG**.
(5) Tap **SEQUENCE NO.10**.
(6) Tap **STORE EXEC**.
The sequence data in the working memory is stored to **Sequence Memory 10**.

Although the sequence data saved in the working memory is cleared and lost when the switcher is powered off, it can be kept and recalled by storing it to sequence memory. Up to 30 sequences (10 x 3 pages) of 20 steps at most for each bus can be saved to sequence memory.

21-1-3. Playing Back Sequences

The following procedure shows how to load and play the sequence stored in **Sequence Memory 10**.

(1) Open the [MEMORY > SEQUENCE > FILE] menu.
(2) Tap **PAGE1**.
(3) Tap **RECALL**.
(4) Tap **SEQUENCE NO.10**.
(5) Tap **M1BG**.
(6) Tap **RECALL EXEC**.
The M1BG block data in **Sequence Memory 10** is loaded to the M1BG block in the working memory.



(7) Open the [MEMORY > SEQUENCE > EDIT] menu.
(8) Tap **PLAY/PAUSE**. To stop playback, press **STOP**.

The RUN button on the control panel also allows you to play/pause sequences.

◆ **Quick Recall (DIRECT mode)**

In DIRECT mode, sequences can be loaded just pressing a memory button without pressing **RECALL**.

To recall **Sequence Memory 0** in DIRECT mode:

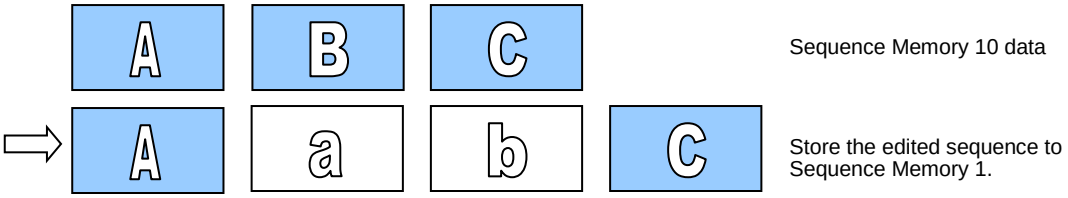
(1) Open the [MEMORY > SEQUENCE > FILE] menu.
(2) Tap **PAGE0**.
(3) Tap **RECALL**.
(4) Tap **DIRECT**.
(5) Tap **SEQUENCE NO.00**.

21-1-4. Playing Back Sequences Using Advanced Settings

Playback settings can be set in the [MEMORY > SEQUENCE > EDIT].
See the HVS-2000/OU Operation Manual for details on sequence play.

21-1-5. Editing Sequences (Adding or Inserting Steps)

This chapter explains how to copy, paste and delete steps. The operational example below shows how to load **Sequence Memory 10** (created in Sec. 21-1-1) and edit the sequence by adding and overwriting steps.

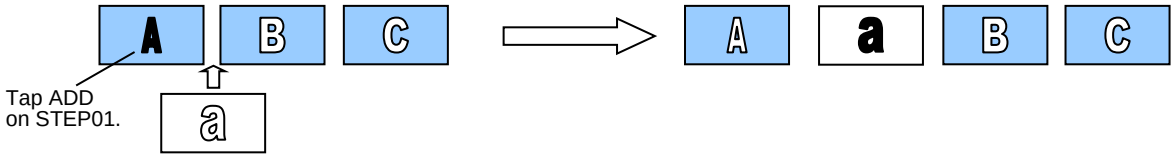


◆ **Loading the Sequence**

(1) Refer to Sec. 21-1-3. “Playing Back Sequences” to load **Sequence Memory 10**.

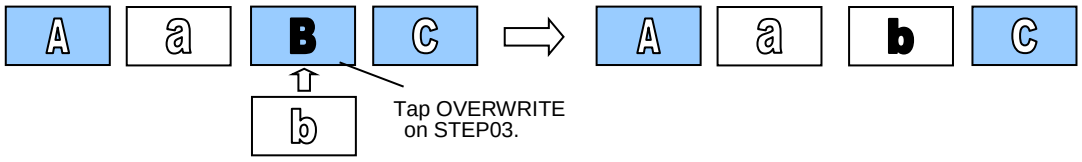
◆ **Adding a Step**

(2) Open [MEMORY > SEQUENCE > EDIT] menu.
(3) Verify that STEP01 is selected. (If not, go to STEP01.)
(4) Create **“Video a**”. Tap **ADD** to add “**Video a**” to the sequence.

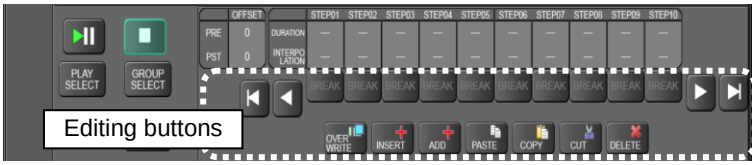


◆ **Replacing the Step**

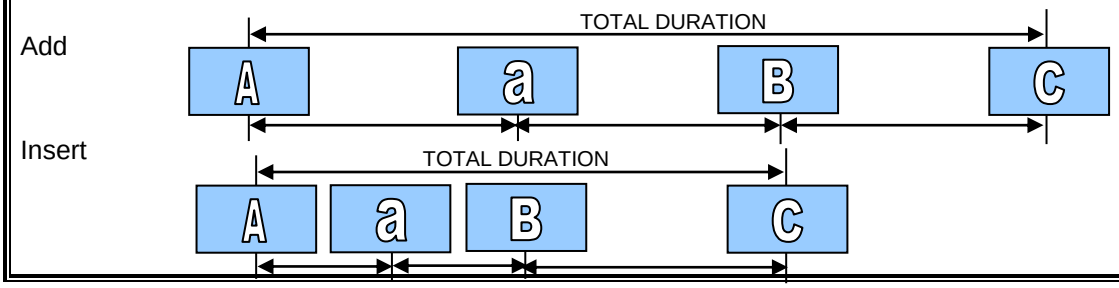
(5) Go to STEP03.
(6) Create **“Video b**”. Tap **OVERWRITE** to replace “**Video B**” with “**Video b**”.



(7) Tap **PLAY/PAUSE** to play the edited sequence.
(8) To store the sequence, refer to Sec. 21-1-2. “Storing Sequences.”



Tapping **ADD** adds a step behind the current step and the total duration is increased.
Tapping **INS** add a step behind the current step but the total duration is the same as before.

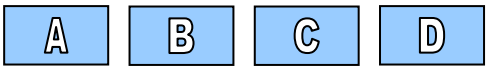


21-1-6. Editing Sequences (Step Copy and Step Delete)

The following procedure example creates a sequence having 4 steps, then shows how to copy & paste, cut & paste and delete steps.

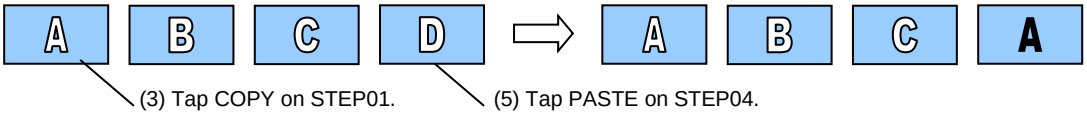
◆ **To create a New Sequence:**

Refer to Sec 21-1-1. “Creating New Sequences” to create a sequence with 4 steps.

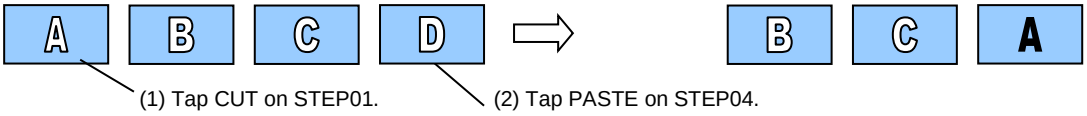


◆ **To copy STEP01 then paste it to STEP04:**

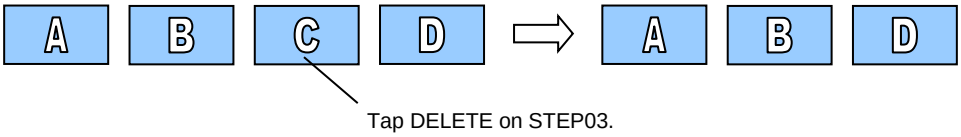
(1) Open [MEMORY > SEQUENCE > EDIT] menu.
(2) Turn F1 to go to STEP01.
(3) Tap **COPY** to copy the STEP01 data.
(4) Turn F1 to go to STEP04.
(5) Tap **PASTE** to replace STEP04 with the STEP01 data.



◆ **To cut STEP01 then paste it to STEP04:**

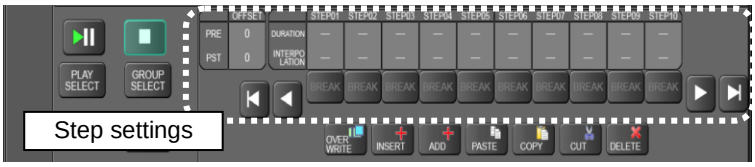


◆ **To delete STEP02:**



21-1-7. Editing Sequences (Step Settings)

In the [MEMORY > SEQUENCE > EDIT] menu, detailed step settings can be performed.



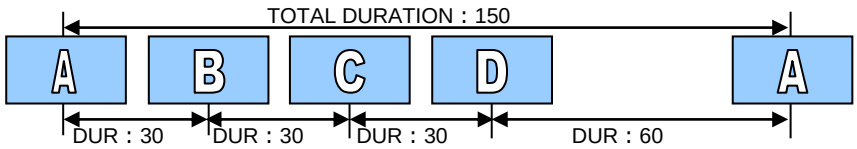
◆ **INTERPOLATION mode between Steps**

The INTERPOLATION mode allows you to add no interpolation (OFF), or to interpolate steps smoothly (SMOOTH) or linearly (LINE).

◆ **Changing Playback Time (DURATION)**

As factory default, durations between steps (keyframes) are defined as 30 frames (for video in 60 Hz format) or 25 frames (for video in 50 Hz format). Each duration, however, can be changed.

For example, if the STEP04 duration in the following sequence is changed to 60 (frames), the total duration is summed up to 150 (frames).



◆ **Break Points**

If **BREAK** is set to ON for a step, the sequence play will pause on the step. Retapping **PLAY/PAUSE** resumes the sequence play.

Note that BREAK settings are disabled in loop playback mode.

21-2. Sequence Group Operation

Sequence Group in the HVS-2000 is a strong tool for sequence bus operations and allows you to flexibly manage video buses in sequences. Once buses are grouped, sequence operations using multiple buses can be performed only by selecting a group.

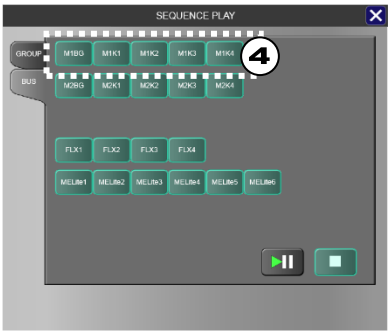
In the previous chapter, sequences are operated with only one bus, M/E1 BKGD). This chapter, however, shows how to operate sequences having multiple buses using the following operation examples:

- **M/E1 BKGD** and **M/E2KEY1 to M/E2KEY4** are grouped in **Group 0**. (See Sec. 21-2-1.)
- **M/E2 BKGD** and **M/E2KEY1 to M/E2KEY4** are grouped in **Group 1**. (See Sec. 21-2-1.)
- Create and store sequences based on **Group 0** or **Group 1**. (See Sec. 21-2-2.)
- Select to **narrow down the bus data** while storing or loading sequences. (See Sec. 21-2-3.)

21-2-1. Assigning Buses to a Group

◆ **Assigning five M/E1 buses to GROUP 0**

(1) Open the [MEMORY > SEQUENCE > EDIT] menu.
(2) Tap **GROUP** to select GROUP0.
(3) Tap **GROUP SELECT** to pop-up an input dialog box.
(4) Tap **M1BG**, **M1K1**, **M1K2**, **M1K3** and **M1K4** to select 5 buses.
This allows you to simultaneously use these M/E1 buses for sequences under GROUP 0.



◆ **Assigning five M/E2 buses to GROUP 1.**

(1) Tap **GROUP** to select GROUP0.
(2) Tap **GROUP SELECT**.
(3) Tap **M2BG**, **M2K1**, **M2K2**, **M2K3** and **M2K4** to select 5 buses.
This allows you to simultaneously use these M/E2 buses for sequences under GROUP 1.

Note that **PLAY SELECT** allows you to directly select buses for playback.

21-2-2. Creating, Editing and Playing Sequences

Once group settings are complete, select GROUP0 or GROUP1 in the [SEQUENCE > EDIT] menu, then create, edit and play sequences in the same manner as described in Sec 21-1.
If GROUP0 is selected, five M/E1 buses are simultaneously set for sequence operations.
If GROUP1 is selected, five M/E2 buses are simultaneously set for sequence operations.

Note that group bus assignments are not fixed and able to change accordingly. Be careful, however, that a video bus cannot belong to two or more groups, but to only one group simultaneously, although buses can be assigned to any group.

21-2-3. SEQUENCE Memory Operation

◆ **A sequence having multiple bus data to Sequence Memory 3**

(1) Open the [MEMORY > SEQUENCE > FILE] menu.
(2) Tap **PAGE0**.
(3) Tap **STORE**.
(4) Verify that all required buses are selected.
Note that only buses whose data is saved in the working memory are active in STORE mode.
(5) Tap **SEQUENCE NO.03** to store the sequence data.

◆ **Loading Data in Sequence Memory 3**

(1) Open the [MEMORY > SEQUENCE > FILE] menu.
(2) Tap **SEQUENCE NO.03**.
(3) Multiple bus data will be displayed in the menu. If there is an unneeded bus, deselect the bus.
(4) Tap **RECALL** to load the sequence.

21-3. Deleting Sequence Memory Data

Open the [MEMORY > SEQUENCE > FILE] menu.

◆ **Deleteing a bus data in Sequence Memory 10**

(1) Refer to Sec. 21-1-3 to load Sequence Memory 10.
(2) Select a bus.
(3) Tap **DELETE BUS** to delete the bus data from the Sequence Memory 10.

◆ **Deleteing all data in Sequence Memory 10**

(1) Select Sequence Memory 10.
(2) Tap **DELETE SEQ**.

◆ **Deleteing all Sequence Memory data**

Tap **ALL CLEAR**.

22. External Device Connections

See the HVS-2000/OU Operation Manual for details on external device connections.

22-1. GPI Control

The switcher can control external devices or can be controlled by external devices via the GPI interface. Tally output is also possible. GPI input and output functions and tallies are freely assignable to the GPI IN and GPI/TALLY OUT connectors on the HVS-2000.
Pin assignments are also available for the OU GPI IN/TALLY OUT connector on the control panel.

22-1-1. GPI IN

The GPI IN connector on the HVS-2000 provides GPI inputs. Assign GPI IN functions as shown below.

(1) Open the [SETUP > GPI TALLY > GPI IN] menu.
(2) Set the number under **RULE**. (This number becomes the pin and function registration number.)
(3) Select a pin number under **PIN**.
(4) Select POSITIVE or NEGATIVE logic under **TRIGGER**.
(5) Select the function type under **FUNCTION**.
(6) Select a function under **TARGET**. (See “HVS-2000/OU Operation Manual, Appendix “GPI/GPO/TALLY Functions for assignable options.)
(7) Turn ENABLE to ON to activate this GPI input.
(8) Repeat the above steps to assign and enable functions to other pins.

22-1-2. GPI OUT

The GPI/TALLY OUT connector on the HVS-2000 provides GPI outputs, to which functions can be assigned in the [SETUP > GPI TALLY > GPI OUT] menu.

(1) Open the [SETUP > GPI TALLY > GPI OUT] menu.
(2) Select the pin number or flag number under **PIN/FLAG**.
(3) Select a signal type under **ACTIVE** between LOW and HIGH.
(4) Select FUNC for **TYPE**.
(5) Select the function type under **FUNC/COL** and a function under **TARGET/XPT**. (See “HVS-2000/OU Operation Manual, Appendix “GPI/GPO/TALLY Functions for assignable options.)
(6) Repeat the above steps to assign functions to other pins.

22-1-3. GPI IN/TALLY OUT (Control Panel)

The HVS-2000 cannot perform function assignments fro the GPI IN/TALLY OUT connector pins on the control panel. Do it on the control panel.

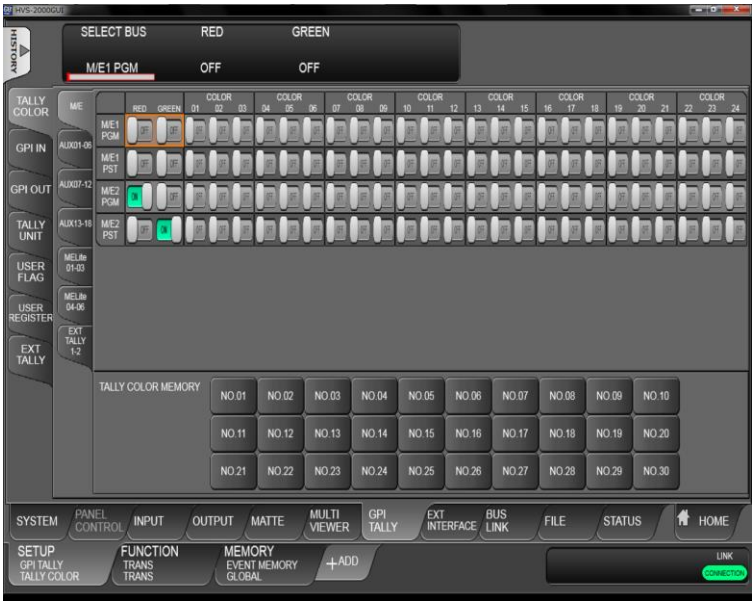
22-2. Tally Output

Tally information can be output from the GPI /TALLY OUT connectors. Tallies can be assigned to the GPI/TALLY OUT connector on the HVS-2000. (See Sec. 22-2-2. "Tally Output Settings (GPI /TALLY OUT).") for details on settings.)
Tally information can also be output via the Tally Unit, in which case the RS-422 connector is used for connection to tally units. (See Sec. 22-2-4. "Tally Output Settings (Tally Units).")

22-2-1. Tally Color Settings

(1) Open the [SETUP > GPI TALLY > TALLY COLOR] menu.
(2) Select a bus (M/E1 PGM, for example).
(3) Turn ON the color to be used for the bus: RED, GREEN or COLOR1-24.

Set colors for M/E1 PST, M/E2 PGM, M/E2 PST, AUX and MELite output buses and EXT TALLY in the same manner.



Tally Color settings made in this menu are shared with those for the GPI/TALLY OUT connectors and Tally Units.

◆ **Tally Color Memory**

Up to 30 sets of tally color settings can be saved to Tally Color Memory.

Saving Tally Color Settings

(1) Open the [SETUP > GPI TALLY > TALLY COLOR] menu.
(2) Select a memory number under **TALLY COLOR MEMORY**.
(3) A confirmation dialog will appear. Tap **STORE** to save the current tally color settings to the memory number. Once data is saved, an asterisk "*" is added after the number such as "No.01*"

Loading Tally Color Settings

(1) Open the [SETUP > GPI TALLY > TALLY COLOR] menu.
(2) Select a memory number under **TALLY COLOR MEMORY**.

(3) A confirmation dialog will appear. Tap **RECALL** to load the tally color settings to the switcher.

22-2-2. Tally Output Settings (GPI /TALLY OUT)

To change GPI/TALLY OUT connector pin assignments, proceed as follows.

(1) Set tally colors for output buses. (See above.)
(2) Open the [SETUP > GPI TALLY > GPI OUT] menu.
(3) Select the pin number.
(4) Select TALLY under **TYPE**.
(5) Select a tally color under **FUNC/COL** and a tally signal under **TARGET/XPT**.
See “HVS-2000/OU Operation Manual, Appendix “GPI/GPO/TALLY Functions for assignable options.

22-2-3. GPI IN/TALLY OUT (Control Panel)

The HVS-2000 cannot perform function assignments fro the GPI IN/TALLY OUT connector pins on the control panel. Do it on the control panel.

22-2-4. Tally Output Settings (Tally Units)

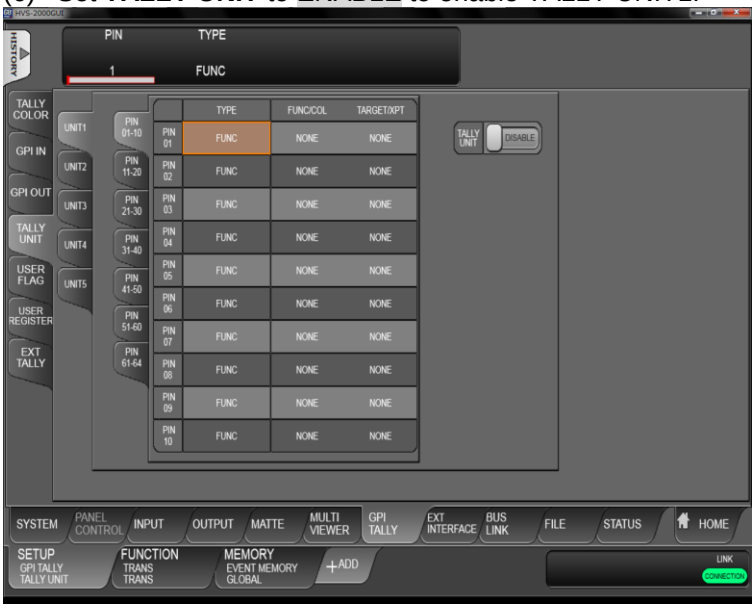
Up to 5 tally units can be connected. This section explains how to set up TALLY1 (the tally unit 1) as an example.

◆ **Selecting Tally Color for an Output Bus**

See Sec. 22-2-1 "Tally Color Settings." The Tally Color settings made in this menu are shared with those for the GPI/TALLY OUT connectors and Tally Units.

◆ **Setting Pin Assignments for TALLY1**

(1) Open the [SETUP > GPI TALLY > TALLY UNIT1] menu.
(2) Select the pin number.
(3) Select TALLY under **TYPE**.
(4) Select a tally color under **FUNC/COL** and signal under **TARGET/XPT**.
(5) Assign tallies to other pins in the same manner.
(6) Set **TALLY UNIT** to ENABLE to enable TALLY UNIT1.



Setup other tally units. See the HVS-TALOC/TALR 20/32 operation manual for details on tally connection and operation.

◆ **Connection Settings with Tally Units (RS-422 port setting)**

Tally units are connected in series to the switcher via RS-422 port (Port 1 in this example). The connection settings with Tally Units are set in the menu as shown below.

(1) Open the [SETUP > SYSTEM > RS-422] menu.
(2) Select TALLY under **FUNCTION** for PORT1.
(3) Set **BAUDRATE** to 38400 and **PARITY** to EVEN.
(4) Reboot the HVS-2000. (See Sec. 5-6. “Reboot and Initialization.”)

22-2-5. USER REGISTER

User registers can hold values between 0 and 255 and 16 registers are available. They are used by external systems such as GearLink, an integrated control software for FOR-A devices.

(1) Open the [SETUP > GPI TALLY > USER REGISTER] menu.
(2) Set a value in each register.

22-2-6. EXT TALLY

Two external tallies allow users to freely notify the system information to external devices. Their tally colors are also set in the [SETUP > GPI TALLY > TALLY COLOR] menu.

(1) Open the [SETUP > GPI TALLY > EXT TALLY] menu.
(2) Select the tally control method under **EXT TALLY CTRL.**
(3) Turn ON/OFF for signals by tapping the toggle buttons.

Item	Setting	Description
TALLY	EDITOR	Controls EXT TALLY via an editor.
	TSL RED	Controls EXT TALLY via TSL RED signals.
	TSL GREEN	Controls EXT TALLY via TSL GREEN signals.
	TSL AMBER	Controls EXT TALLY via TSL AMBER signals.

22-3. TSL UMD Protocol

The HVS-2000 supports the TSL UMD 5.0 protocol, through which tally export and signal name import/export over Ethernet are available.

FOR-A MV-1200 Series multiviewers can receive tally information sent from HVS-2000 units.
The HVS-2000 can receive signal names from FOR-A MFR Series routers.
Consult your FOR-A resellers for more details.

◆ Receiving Signal Names (TSL IN)

The HVS-2000 can receive source signal names using TSL UMD 5.0.

Item	Description	
ENABLE	Setting to ON starts receiving TSL commands.	
LAN2(SUB) IP ADDRESS	Displays MU LAN2 (SUB) IP address.	
LAN2(SUB) PORT	Displays MU LAN2(SUB) port number	
DLE OPTION	Turns Data Link Escape on/off.	
SCREEN NO	Sets the TSL screen number.	
DISPLAY ID OFFSET	Sets the Display ID start position. (See the table below.)	
NAME TYPE	NONE	Ignores received signal names.
	SHORT	Uses received signal names in Short (4-letter) format.
	LONG	Uses received signal names in Long (8-letter) format.
	BOTH	Uses received signal names in both Short and Long formats.

Display ID numbers are defined as shown below.
To change Display ID numbers, specify the start position under DISPLAY ID OFFSET.

Signal name	INPUT 01-48	AUX 01-18	M/E1 PGM	M/E1 OUT1	M/E1 OUT2	M/E1 OUT3	M/E2 PGM	M/E2 OUT1	M/E2 OUT2	M/E2 OUT3	M/E3 PGM	M/E3 OUT1	M/E3 OUT2	M/E3 OUT3
ID	0-47	50-67	70	71	72	73	80	81	82	83	90	91	92	93

◆ **Sending Tally Information and Signal Names (TSL OUT1-3)**

To send signal names and RED/GREEN tallies through TSL UMD 5.0, the LAN2 (SUB) port on the HVS-2000 is used. Three output targets can be specified.

Item	Description	
ENABLE	Setting to ON starts sending TSL commands, in which input source names, and AUX and M/E OUT output tally information are included for FOR-A switchers (input source names, and Mode 1 tally information for FOR-A multi-viewers)	
TARGET IP ADDRESS	Specify the target IP address.	
TARGET PORT	Specify the target port number.	
DLE OPTION	Turns Data Link Escape on/off.	
SCREEN NO	Sets the TSL screen number.	
DISPLAY ID OFFSET	Sets the Display ID start position. (See the table on previous page.)	
NAME TYPE	SHORT	Sends signal names in Short format (4 letters).
	LONG	Sends signal names in Long format (8 letters).
RED TALLY	Selects a tally color from RED, GREEN, COLOR1-24 to re-allocate the MV RED or GREEN tally.	
GREEN TALLY		

22-4. AUX Bus Control Box (HVS-AUX16A/16B/32A/64A)

HVS-AUX16A/16B/32A/64A units allow users to remotely change AUX output signals or recall events of the switcher. A single AUX Box can manage all AUX outputs. Up to 16 (32 with SHIFT) actions can be assigned to buttons on HVS-AUX16A/16B, 32 (64 with SHIFT) on HVS-AUX32A and 64 on HVS-AUX64A. Up to 10 AUX units can be connected to the switcher.

A LAN cable is required for the AUX box connection.

22-4-1. Connecting AUX Boxes

AUX boxes should be connected to the switcher using an Ethernet hub and LAN cables.

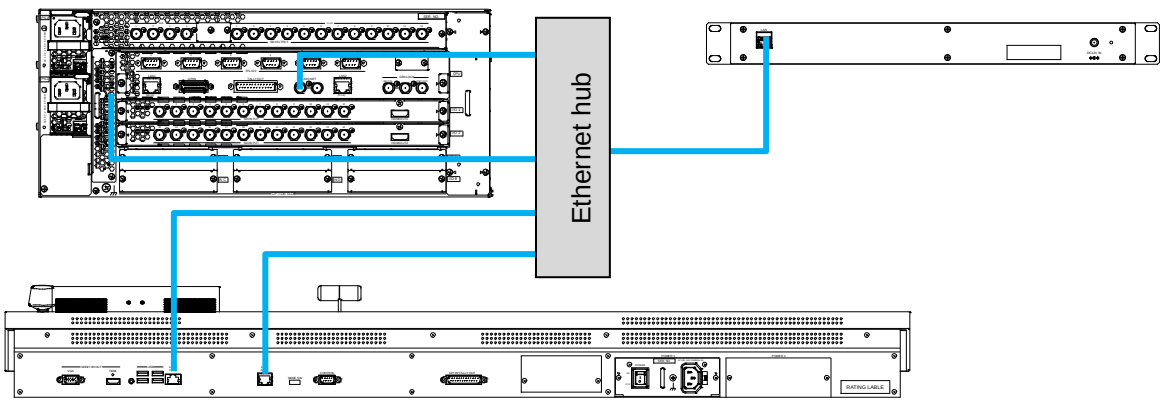
◆ **AUX ID Number**

AUX ID numbers from 1 to 255 are used to uniquely identify an AUX box.
To connect to HVS-2000 units, use **ID1 to ID12**. (Default setting: ID1)
The ID numbers should not be duplicated when connecting to a switcher.
In an AUX box, specify the IP address of the **LAN1 (MAIN)** port on the HVS-2000 as a switcher IP address. (Default: 192.168.0.80)

▶ See the "HVS-AUX16A/16B/32A/64A Operation Manual" for more details.

HVS-2000 rear panel

HVS-AUX16A rear panel



HVS-2240OU rear panel

◆ **Checking AUX Box Connection**

The following example shows how to check the connection between AUX Box and the switcher.

(1) Open the [SETUP > EXT INTERFACE > AUX UNIT] menu.
(2) Specify the Unit ID of the AUX unit (**AUX01** in this example) under **AUX SELECT**.

22-4-2. Assigning Actions to AUX Box Buttons

Actions can be assigned to AUX Box buttons. (Ex 1)
An AUX Box can change crosspoints on the router connected to the switcher. (Ex 2)

Ex 1) To assign the action "Output the M/E1PGM video from the AUX3 bus" to Button 1 on UNIT 01 (AUX01):

(1) Open the [SETUP > EXT INTERFACE > AUX UNIT > UNIT01] menu.
(2) Once AUX connection is established, the product name and MAC address is displayed respectively under **AUX SELECT** and **MAC ADDRESS**.
(3) Select **AUX03/MELite 2 PGM** under **TYPE**.
(4) Select **M/E1PGM** under **FUNCTION**.
(5) Select **01** in the **BUS BUTTON SELECT** block.
(6) Press Button 1 on the UNIT 1 AUX box. The AUX 3 output signal is changed to PGM.

Ex 2) To assign the action "Select SRC5 for DST3 on the connected router" to Button 2 on UNIT02 (AUX02):

(1) Open the [SETUP > EXT INTERFACE > AUX UNIT > UNIT02] menu.
(2) Once AUX connection is established, the product name and MAC address is displayed respectively under **AUX SELECT** and **MAC ADDRESS**.
(3) Select **DST3** under **ROUTER DST**.
(4) Select **ROUTER SRC** under **TYPE**.
(5) Select **SRC5** under **FUNCTION**.
(6) Select **02** ithe **BUS BUTTON SELECT** block.
(7) Press Button 2 on the UNIT 2 AUX box. The DST (Destination) 3 is switched to SRC (Source) on the connected router.

◆ TYPE and FUNC Settings

AUX Box buttons light as shown below to indicate the status.

When an action is assigned to a button: **Dim-lit**
When an action is being performed: **Lit green**

TYPE Setting	FUNC (action) Setting	Description
NONE	(NOT ASSIGN)	
AUX	AUX01-AUX12 AUX01/MELite1 PGM XPT SELECT AUX02/MELite1 PST XPT SELECT | | AUX11/MELite6 PGM XPT SELECT AUX12/MELite6 PST XPT SELECT AUX13 XPT SELECT | AUX18 XPT SELECT	Selects an AUX bus.
	M/E1 PGM M/E1 PST M/E1 ABUS M/E1 BBUS M/E1 KEY1-4 INSERT M/E1 KEY1-4 SOURCE M/E2 PGM M/E2 PST M/E2 ABUS M/E2 BBUS M/E2 KEY1-4 INSERT M/E2 KEY1-4 SOURCE FLX1-4 INSERT FLX1-4 SOURCE M/E3 PGM M/E3 PST M/E3 A BUS M/E3 B BUS M/E3 KEY1-4 INSERT M/E3 KEY1-4 SOURCE M/E3 DSK1-4 INSERT M/E3 DSK1-4 SOURCE	Selects mixed video for AUX outputs. Note that an AUX bus should be selected using buttons assigned to "**AUX01/MELite1 PGM XPT SELECT**" to "**AUX18 XPT SELECT**" above before pressing a signal selection button. If an AUX bus is not selected when pressing a signal selection button, the selected signal is applied to the AUX bus set under **AUX SELECT** in [SETUP > EXT I/F > AUX UNIT] menu PAGE 1 on the HVS-2000.
AUX XPT	BLACK IN01-48 STILL1-6 COLOR BAR COLOR BAR ARIB WHITE MATTE1-2 GMATTE MV1-2 M/E1-3 PGM M/E1-3 OUT1-3 AUX1-12	Selects input video for AUX outputs.
AUX01/MELite1 PGM AUX02/MELite1 PST | | AUX11/MELite6 PGM AUX12/MELite6 PST AUX13 | AUX18		
AUX TRANS	AUX1-12	Turns the AUX bus transition ON/OFF.
AUX CUT AUX MIX AUX WIPE	AUX1-12	Selects the AUX bus transition type.
EVENT RECALL	EVENT NO.0-99	Loads an event.
MACRO RECALL	MACRO NO.0-99	Recalls a macro.
M/E1-2 PGM M/E1-2 PST M/E1-2 A BUS M/E1-2 B BUS M/E1-2 KEY1-4 INSERT M/E1-2 KEY1-4 SOURCE * FLX1-4 INSERT FLX1-4 SOURCE * M/E3 PGM M/E3 PST M/E3 A BUS M/E3 B BUS M/E3 KEY1-4 INSERT M/E3 KEY1-4 SOURCE * M/E3 DSK1-4 INSERT M/E3 DSK1-4 SOURCE *	BLACK IN01-48 STILL1-6 (STILL1-6 KEY) * COLOR BAR COLOR BAR ARIB WHITE MATTE1-2 GMATTE MV1-2 M/E1-3 PGM M/E1-3 OUT1-3 AUX1-12 MELite1-6 MELite1-6 PVW	Selects the output signal.
AUTO TRANS CUT TRANS	M/E1 BKGD M/E1 KEY1-4 M/E2 BKGD M/E2 KEY1-4 FLX1-4 M/E3 BKGD M/E3 KEY1-4 M/E3 DSK1-4 MELite1-6	Performs a CUT or AUTO transition.
TRANS TYPE MIX TRANS TYPE WIPE		Selects the transition type.

USER FLG PUSH USER FLG TOGGLE	USER FLG 1-60	Turns a user flag ON/OFF.
ROUTER DST	DST 1-256	Selects a destination on the router.
ROUTER SRC	SRC 1-1024	Selects a source on the router.

Select a macro play channel under **MACRO CH**.

22-4-3. Adjusting Light Levels for AUX Box Buttons

(1) Adjust the normal light level under **BRIGHTNESS H**.
(2) Adjust the dim light level **BRIGHTNESS L**.

22-4-4. Assigning the SHIFT or TAKE Function

HVS-AUX16A/16B/32A units can use additional 16/32 buttons by using the SHIFT function. In addition, HVS-AUX16A/16B/32A/64A units can use the TAKE (confirmation) function.

Note that the SHIFT and TAKE functions cannot be used simultaneously. The TAKE function is always enabled by setting TAKE to ON in the menu regardless of SHIFT state.

◆ **Using the SHIFT function**

(1) Open [SETUP > EXT INTERFACE > AUX UNIT] menu.
(2) Select TOGGLE or NORMAL under **SHIFT**.
(3) Set **TAKE** to OFF.

With these settings, HVS-AUX16A/16B/32A units can use additional 16/32 buttons using the SHIFT/TAKE button. Refer to the table below for details on how to use this button.

Parameter	Default	Setting	Description
SHIFT	OFF	OFF	Additional buttons cannot be used.
		TOGGLE	Pressing the SHIFT/TAKE button enables SHIFT and pressing the button again disables SHIFT.
		PUSH	SHIFT is enabled while the SHIFT/TAKE button is pressed.

◆ **Using the TAKE (Confirmation) function**

(1) Open [SETUP > EXT INTERFACE > AUX UNIT] menu.
(2) Set TAKE to ON.

Parameter	Default	Setting	Description
TAKE	OFF	OFF	An action is immediately executed (by pressing the action button) without pressing TAKE.
		ON	An action is executed by pressing TAKE after pressing the action button. Press TAKE within 5 seconds after pressing an action button. Otherwise, the operation will be canceled.

22-4-5. Using an OU LINE as AUX Box

Unavailable on HVS-2000GUI

22-5. Editor Control

Use the [SETUP > EXT INTERFACE > EDITOR] menu for editor control.
See the HVS-2000/OU Operation Manual for the details.

22-6. VTR Control

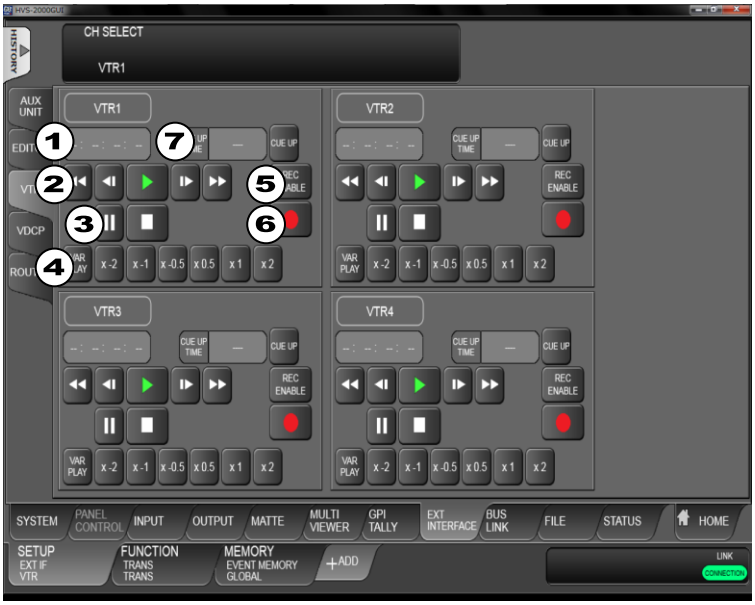
The switcher can control video tape or video disk recorders via RS-422 using the VTR (Sony 9-pin) protocol. Up to 4 channels are available. Connect a device to a desired RS-422 port, configure the port and select a channel for VTR following the procedures in this chapter.

22-6-1. Assigning VTR Channel to an RS-422 Port

(1) Open the [SETUP > SYSTEM > RS-422] menu.
(2) Select a VTR channel (VTR1 to VTR4) under **FUNCTION** for the desired RS-422 port.
(3) Select **BAUDRATE** and **PARITY** according to your VTR device.

22-6-2. VTR Control

(1) Open the [SETUP > EXT INTERFACE > VTR] menu.
(2) Control your VTR using the selected VTR channel.



NO	Item	Description
1	Timecode	Displays the current timecode on the VTR.
2	VTR control buttons (1st line)	**REW**, **JOG-REV**, **PLAY**, **JOG-FWD** and **FF**
3	VTR control buttons (2nd line)	**PAUSE** and **STOP**
4	VTR control buttons (3rd line)	Variable playback and direction/speed setting buttons Before performing variable playback, select the direction and speed. Note that some VTR devices may not accept double speed or reverse playback.
5	REC BUTTON (REC ENABLE / DISABLE)	Enables/disables recording.
6	RECORD button	Starts recording video on the VDCP device while recording is enabled.
7	CUE UP TIME	Tap to set the CUE UP time, then tap **CUE UP**.

22-7. VDCP Operation

The switcher can control a VCR or Video Disk Recorder through RS-422 or LAN using VDCP protocol. Up to 4 channels (device connections) are available. Follow the procedure below to perform VDCP communication and RS-422 port settings.

22-7-1. Changing to LAN Connection

Default VDCP connection is set to RS-422. To change connection to LAN, proceed as follows:

(1) Open the [SETUP > EXT INTERFACE > VDCP] menu.
(2) Select a VDCP channel (VDCP1 to VDCP4).
(3) Select LAN under CONNECTION.
(4) Enter the IP address of your VDCP device.
(5) Specify the TCP/UDP port number under **PORT**.

22-7-2. RS-422 Connection Settings

To use an RS-422 connection, assign a VDCP channel to an RS-422 port on the switcher, then set communication settings as shown below:

(1) Open the [SETUP > SYSTEM > RS-422] menu.
(2) Select a VDCP channel (VDCP1 to 4) under **FUNCTION**.
(3) Select **BAUDRATE** and **PARITY** according to your VDCP device.

22-7-3. VDCP Control

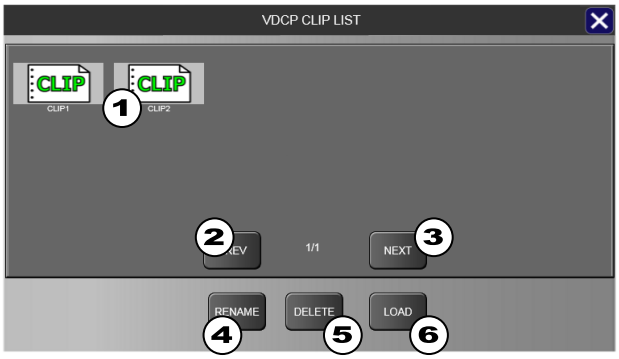
(1) Open the [SETUP > EXT INTERFACE > VDCP] menu.
(2) Control your VTR using the selected VTR channel.

NO	Item	Description
1	Current timecode	Displays the current timecode on the VDCP device.
2	VDCP control buttons (1st line)	22-7-4, **JOG-REV**, **PLAY**, **JOG-FWD**, **FF**
3	VDCP control buttons (2nd line)	**PAUSE**, **STOP**
4	REC BUTTON (REC ENABLE / DISABLE)	Enables/disables recording.
5	RECORD button	Starts recording video on the VDCP device while recording is enabled.
6	CUE UP TIME	Tap to set the CUE UP time, then **CUE UP**.
7	CLIP SEL	VSelects a clip in the VDCP device. See Sec. 22-7-4. "Selecting a Clip."
8	IN/OUT TIME	Sets IN and OUT points.

9	IN CUEUP	Cues up to the IN point.
10	OUT CUEUP	Cues up to the OUT point.

22-7-4. Selecting a Clip

Tap **CLIP SEL**. A pop-up window as shown below will appear.



NO	Item	Description
1	Clip list	Clips saved in the VDCP device are displayed.
2	PREV	Goes to next page.
3	NEXT	Goes to previous page.
4	RENAME	Changes clip names using up to 8 characters.
5	DELETE	Deletes a clip.
6	LOAD	Loads the selected clip.

22-8. ROUTER

The switcher can control a FOR-A MFR series routing switcher.
The following functions are available:

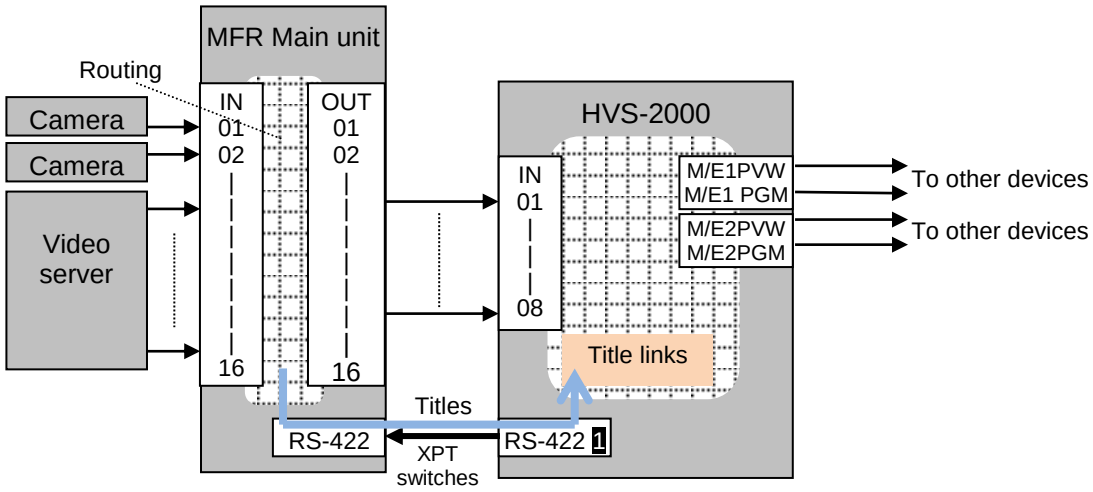
- Switches Router's crosspoints on the control panel. (See Sec.22-8-3 and 22-8-4.)
- Receives titles with video signals (MFR link). (See Sec.22-8-2.)
- Links a router crosspoint and switcher source and switches them simultaneously on the switcher. (See Sec. 22-8-5.)

Manageable number	
Level	16
Source	1,024
Destination	256

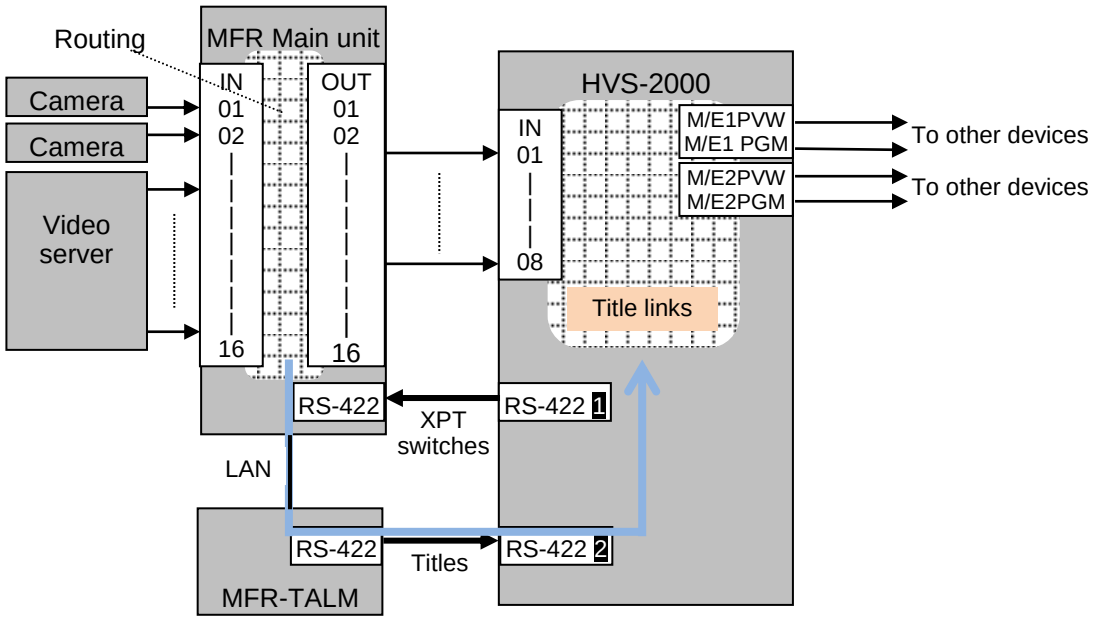
-

Connect an MFR main unit to the HVS-2000 using an RS-422 straight-through cable. Two types of connections are possible as shown below. Then, configure the RS-422 port(s) for the router control. (See Sec. 22-8-1.)
Refer to each MFR Main unit manual for details on router settings.

<Connection 1 (Connecting MFR Main unit to HVS-2000)>



<Connection 2 (Connecting MFR Main unit and MFR-TALR to HVS-2000)>



22-8-1. Assigning Router Channel to an RS-422 Port

◆ **If Connection 1 is configured:**

(1) Open the [SETUP > SYSTEM > RS-422] menu.
(2) Select an RS-422 port for the router main unit connection.
(3) Select ROUTER under **FUNCTION**.
(4) Set **BAUDRATE** and **PARITY** according to the router.

◆ **If Connection 2 is configured:**

(1) Open the [SETUP > SYSTEM > RS-422] menu.
(2) Select an RS-422 port for the router main unit connection.
(3) Select ROUTER XPT under **FUNCTION**.
(4) Select an RS-422 port tor the router tally unit connection.
(5) Select ROUTER NAME under **FUNCTION**.
(6) Set **BAUDRATE** and **PARITY** according to the router.

22-8-2. Setting MFR Link

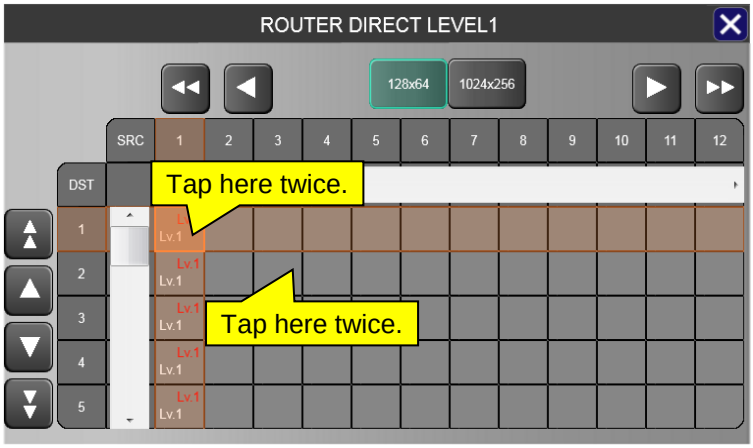
When the title link display is set to ON, the switcher accepts video titles with video signals from the router and displays them on the control panel in accordance with crosspoint switches on the router.

(1) Open the [SETUP > EXT I/F > ROUTER NAME LINK] menu.
(2) Tap the LINK setting and select MFR.
(3) Select a name link type from SHORT, LONG and BOTH (Both short and long names) to be used in the switcher.
(4) Set the title link display to ON or OFF for each video.

22-8-3. Crosspoint Switches using the Menu

(1) Open the [SETUP > EXT INTERFACE > ROUTER > XPT] menu.
(2) Select **NORMAL** and a level.
(3) Tap a crosspoint. Re-tap the crosspoint to execute switching.

Ex. 1) Change Destination 1 to Source 2.
Ex. 2) Change Destination 1 to Source 4.



22-8-4. Simultaneous Switching (TAKE function)

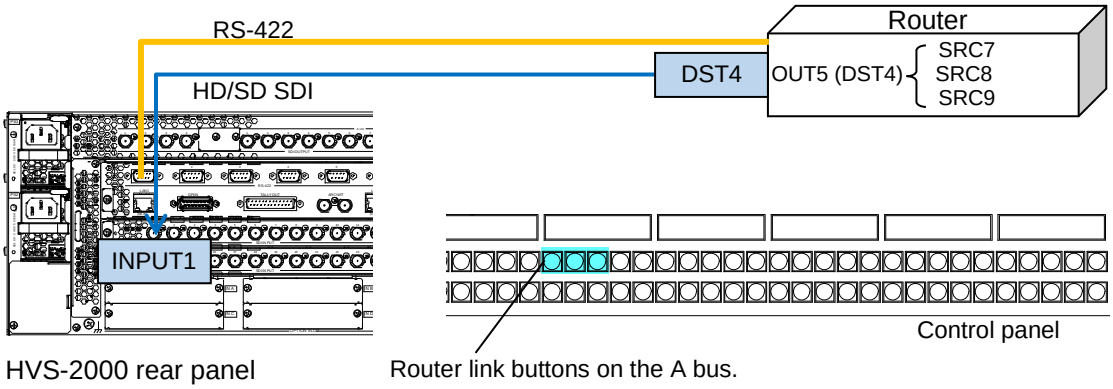
Multiple crosspoints (destination/source pairs) can be switched simultaneously in the menu using stored crosspoint data.

◆ **Simultaneous switching using the menu**

(1) Open the [SETUP > EXT INTERFACE > ROUTER > XPT] menu.
(2) Select **PRESET**.
(3) Select a level.
(4) Tap a crosspoint. Re-tap the crosspoint to confirm the selection.
(5) Repeat it three times, if necessary.
(6) Tap **TAKE**. Tap **YES** in the confirmation dialog to execute the take.
To cancel the process, tap **CANCEL**, then **YES** in the confirmation dialog.

22-8-5. ROUTER LINK

The Router Link function allows you to switch a crosspoint on a router by pressing a switcher bus button when inputting video from the router.
The following example will help to explain how to set up and use this function.
In the connection example below, the **DST4** video is input to the switcher **INPUT1**. The system will be set up so that if the switcher bus button **1**, **2** or **3** is pressed, **SRC7**, **SRC8** or **SRC9** video is respectively sent to the switcher.
If Router Link is enabled, pressing a linked bus button sends a signal switch command to a router and the switcher receives the specified video from a router even if a different video is assigned to the associated destination channel on the router.



HVS-2000 rear panel

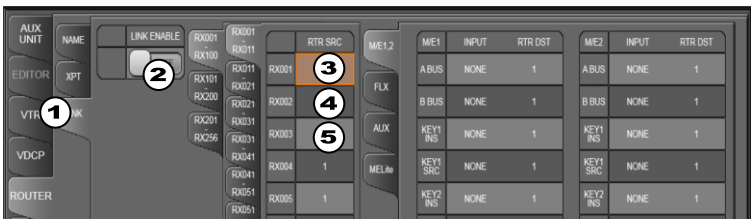
Router link buttons on the A bus.

Router Link function can be applied to the M/E A bus and B bus. (See Sec. 8-2-1. "M/E Bus Type."

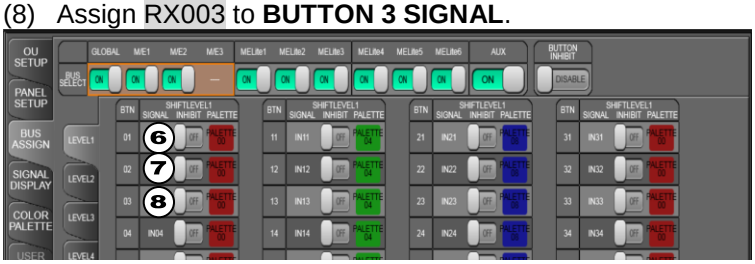
◆ **Router Link Settings**

The following procedure shows how to create a router crosspoint and source pair and assign it to a bus button. In the example below, three link pairs (RX001, RX002 and RX003) are respectively assigned to Buttons 1, 2 and 3.

(1) Open the [SETUP > EXT INTERFACE > ROUTER > LINK] menu.
(2) Turn **LINK ENABLE** to ON.
(3) Assign **RX001** in RTR XPT (router crosspoints) to 7 in RTR SRC (router sources).
(4) Assign **RX002** to 8.
(5) Assign **RX003** to 9.



(6) Open the [SETUP > PANEL CONTROL > BUS ASSIGN > LEVEL1] menu.
Assign the link pair RX001 to **BUTTON 1 SIGNAL**.
(7) Assign RX002 to **BUTTON 2 SIGNAL**.
(8) Assign RX003 to **BUTTON 3 SIGNAL**.



(9) Open the [SETUP > EXT INTERFACE > ROUTER > LINK] menu.
Tap the **M/E1,2** tab. When using M/E1 A BUS, select IN01 (input port on the swithcer) for M/E1 A BUS **INPUT** and 4 (router destination channel) for **RTR DST**.

Link settings are now completed.

◆ Router Link Operation

Pressing Bus Button 1 on the switcher A bus displays the SRC7 image on the M/E output.
Pressing Bus Button 2 on the switcher A bus displays the SRC8 image on the M/E output.
Pressing Bus Button 3 on the switcher A bus displays the SRC9 image on the M/E output.

<Available Bus for Router Link (Selectable bus under BUS SEL)>
A BUS, B BUS, AUX1-18,
K1-4INS, K1-4SRC, FLX1-4INS, FLX1-4SRC,
MELite1-6 A BUS, MELite1-6 B BUS

◆ Router Crosspoints

The maximum number of available router crosspoints: **256**
The maximum number of available source/destination pairs: **256**

23. File Operations

The switcher is capable of storing operational data, such as system and bus setting data, still images, WIPE and DVE modifications and event data, to USB flash drives and of recalling and downloading previously saved data for application to production operations.

23-1. Setting and Image Files

Supported Menu Setting Files and Image Files

File (folder) name (*1)	Extension	File Data Description
HVS-2000 folder	All data including the following shaded files.	
HVS2000	sys	System data
	msy	MU data (including pattern lists)
	osy	OU data
	gsy	GUI data
ME KEY FLX	kym	Each keyer memory data
	kms	Each key data in keyer memory
	kma	All keyer memory data
USER PATTERN	upt	Each user pattern data
	ual	All user pattern data
EVENT	eal	All event data
	evt	Each event data
	lema	All local event data (M/E)
	lem	Each local event data (M/E)
	lela	All local event data (MELite)
	lel	Each local event data (MELite)
MACRO	mal	All macro data
	mcr	Each macro data
SEQUENCE	pbkd	BKGD sequence data
	pkey	KEYER sequence data
	pflx	FLEXaKEY sequence data
	pmel	MELite sequence data
STILL1-6	jpg	Still images in JPEG format
	tga	Still images in TARGA format
	bmp	Still images in BITMAP format
	png	Still images in PNG format

Note that file names are limited to max. 8 characters in length (ASCII code).
(*1) Files are automatically named to their correct name as shown above when saving to USB flash drives.

23-1-1. Breaking Down EAL/MAL Files

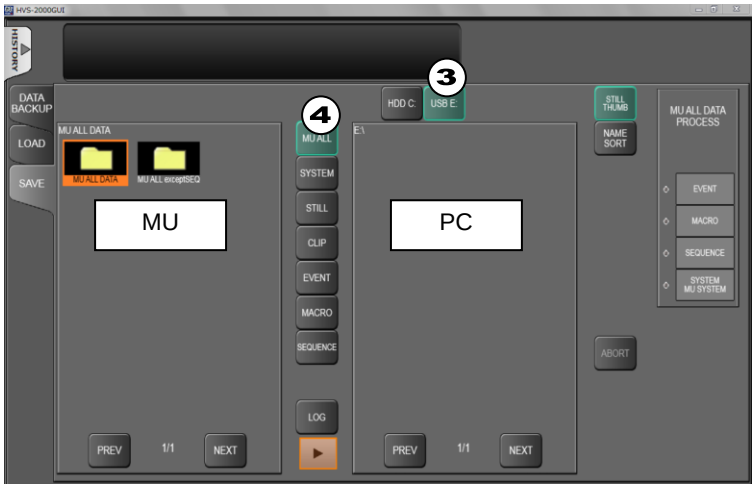
Total event or macro data files such as **ealm**, **lema**, **lela** and **mal** files can be divided into each event or macro data files (**evtm lem**, **lel** and **mcr** respectively). The procedure below shows how to break down "**Sample.eal**" file as an example.

(1) Open the [SETUP > FILE > DATA BACKUP] menu.
(2) Select **EVENT** in the center of the screen.
(3) Select **Sample.eal** on the left side of the screen.
(4) Select a location into which divided files are stored on the right side of the screen.
(5) Press **EAL SPLIT** on the right side of the screen to break down the file. All divided files are generated and stored in the **Sample** (same name as the eal source file) folder as **evt** files.

23-2. Saving Data (from Switcher to USB Drive)

This section explains how to save all switcher settings to USB flash drives as an example.

(1) Insert a USB flash drive into the USB port.
(2) Open the [SETUP > FILE > SAVE] menu.
(3) Tap **USB E:** (USB drive to which the data is going to be backed up).
(4) Tap MU ALL.
(5) Tap the **MU ALL DATA** icon in the right side of the screen.
(6) Tap on **YES** on the confirmation dialog to save the data to the USB drive.



ALL data files will be stored to the “HVS-2000” folder in the root directory.
A lot of sequence data will take a longer time, more than 30 minutes, to save ALL data. In such cases, change **MU ALL DATA** to **MU ALL except SEQ** to save ALL data excluding sequences.

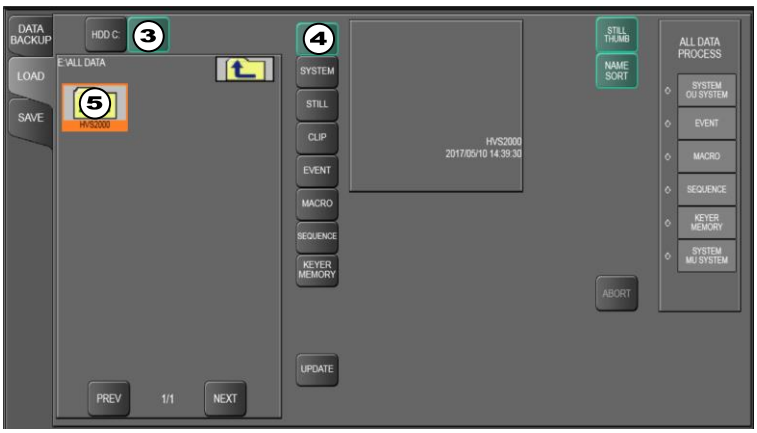
Do not remove the USB drive while the access lamp is flashing. The time at which data is saved to a USB drive is also recorded according to the switcher internal clock. Set the date and time if it is improperly set. (See Sec. 16-5. “Setting Date and Time.”)

23-3. Loading Data (from USB Drive to Switcher)

23-3-1. Loading ALL Data

The following example shows how to load panel settings from a USB drive to the switcher in which all data is saved as shown in the previous page.

(1) Insert the USB drive in which the all data is stored, into the USB port.
(2) Open the [SETUP > FILE > LOAD] menu.
(3) Tap **USB E:** (USB drive to which the file is stored).
(4) Tap **MU ALL**.
(5) Select the folder to which the data is to be stored (HVS-2000) to load all setting data.
(6) Reboot the system. (See Sec. 5-6. "Reboot and Initialization".)



Once the saved system data (files with "all" or "sys" extension) finishes loading, you will have to restart the switcher. (The unit should be powered off then powered ON.) The system data is applied only after the switcher is restarted.

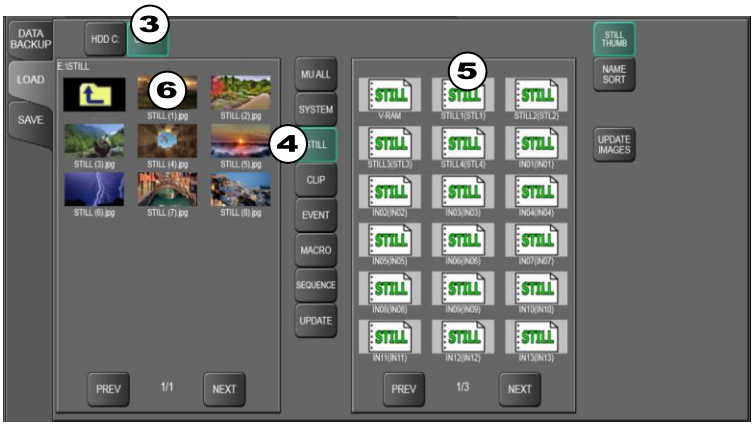
23-3-2. Loading Event, Macro or Sequence Files

(1) Insert the USB drive in which your file is stored, into the USB port.
(2) Open the [SETUP > FILE > LOAD] menu.
(3) Tap **USB E:** (USB drive to which the file is stored).
(4) Tap **EVENT**, **MACRO**, or **SEQUENCE**.
(5) Select the memory number to load all data in the memory number.

23-3-3. Loading Image Files

JPEG. TARGA, BITMAP or PNG image files can be loaded to STILL1-6 and INPUT STILL buffers using USB drives. The following procedure explains how to download a JPEG file to STILL1 as an example.

(1) Insert the USB drive in which the JPG file is stored, into the USB port.
(2) Open the [SETUP > FILE > LOAD] menu.
(3) Tap **USB E:** (USB drive to which the file is stored).
(4) Tap **STILL**.
(5) Tap **STILL1**.
(6) Select an image file to load it to STILL1



◆ **Image File Upload Targets**

Upload Target	Description
STILL1-STILL6	Loads to each still buffer. Once an image is uploaded, the previous image is replaced with this.
IN01-IN48 (INPUT STILL)	Loads to each input frame buffer. Once an image is uploaded, the input bus automatically displays the image instead of input video. To recover the input video display, change **CTRL** to INPUT in the [SETUP > INPUT > SIGNAL] menu. (See Sec. 15-3-2. “Returning to Input Video Display.”)
V-RAM	Loads to internal video memory.

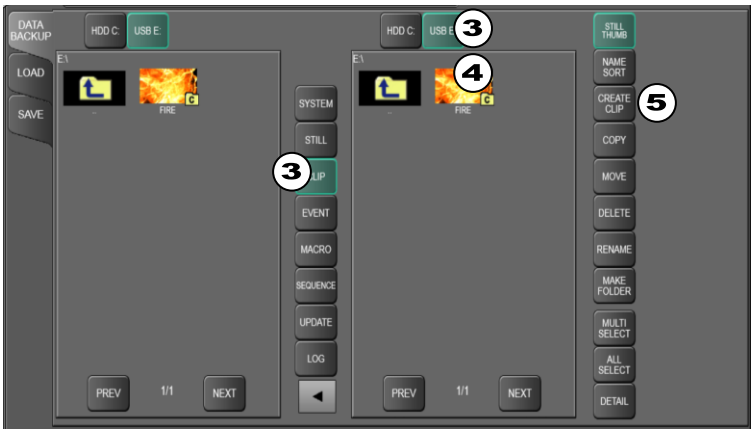
◆ **Image File Thumbnails**

The menu allows you to view thumbnails of images when loading still images or clip video. To do this, tap **STILL THUMB**.

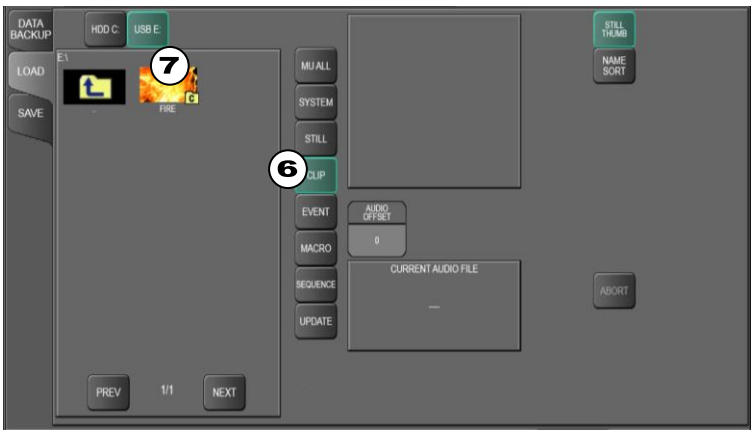
23-3-4. Loading Sequential Image Files

JPEG. TARGA, BITMAP or PNG sequential image files can be uploaded to the switcher and used as clips as shown below.

(1) Insert the USB drive in which sequential image files (with up to 8 file names) are stored, into the USB port.
(2) Open the [SETUP > FILE > DATA BACKUP] menu. Tap **CLIP**.
(3) Select **USB E:** (USB drive to which the data is stored).
(4) Tap on the menu screen to specify the folder that contains the image files.
(5) Tap **CREATE CLIP**.



(6) Open the [SETUP > FILE > LOAD] menu. Tap **CLIP**.
(7) Specify the folder (the same as specified in Step (4)) to load the files to the switcher as a clip.



◆ **Sequential Image File Names**

Folder name	XXXXXXXX
XXXXXXXX	Up to 8 alphanumeric characters (Folders whose name have 9 or more characters cannot be accessed.)

Prepare sequential file names in the following name format.

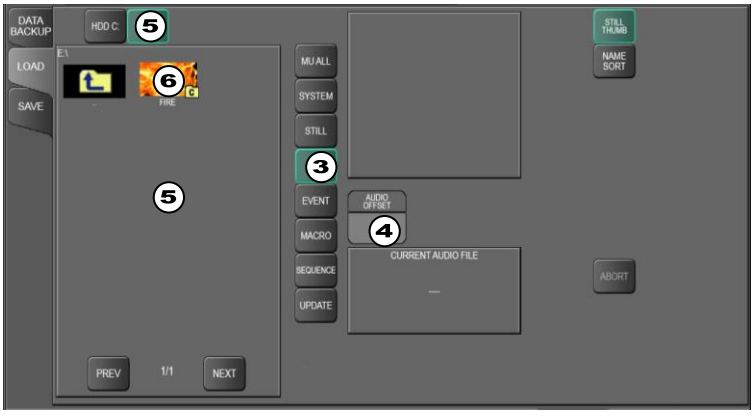
File name	[XXXXXXXX-yyyy.zzz]
XXXXXXXX	Up to 8 alphanumeric characters (File names must be within 8 characters and excess characters are truncated on the right.)
-	Hyphen
yyyy	Serial numbers starting from 0
zzz	File extension (bmp, jpg, tga or png)

23-3-5. Adding Audio to Sequential Image Files

Loading an audio with sequential image files allows you to add the audio data to the created clip. The following procedure shows how to upload an audio file and multiplex it to a clip. WAV files (Windows standard audio files) can be used as audio sources.

◆ **Loading an audio file**

(1) Insert the USB drive, in which sequential image files and an audio file are stored, into the USB port. Follow Step (1) to (5) in the previous chapter to create a clip from the sequential files.
(2) Open the [FILE > LOAD] menu.
(3) Select **CLIP**.
(4) Set the audio delay under **AUDIO OFFSET**. To add the audio from the beginning of the clip, leave the value at zero.
(5) Tap **USB E**, select and load a WAV file.
(6) Select and load a clip that should have been created as a clip.



IMPORTANT

Load an audio file first, then a create clip. Otherwise the audio is not inserted to the clip. Once the audio is multiplexed to the clip, the audio file is removed.

Audio-included clips can be loaded to STILL1-6 in the same manner as those for normal clips and played back with audio in down-stream devices.

◆ Audio Files

Format	WAV or WAVE（RIFF waveform Audio Format） Filenames are allowed only alphanumeric characters.
Sampling frequency	48kHz, 20/24-bit
Upload Target	V-RAM

- If the duration of audio is longer than that of video, the gap in between is filled with black video.
- Clips are backed up to the internal hard disk drive with audio and loaded whenever the switcher is restarted. The audio inserting position, however, is reset to zero (not stored).
- Clips cannot be stored with audio as files.

24. Status Information

The [SETUP > STATUS] menu pages allow you to view miscellaneous information such as the cooling fan / power alarm, hardware and option installation status and firmware and software versions.
See the HVS-2000/OU Operation Manual for details on status information.

25. Updating the System Software

Consult your FOR-A supplier in order to update or upgrade your switcher.
See the HVS-2000/OU Operation Manual for details on system update.

25-1. Update Procedure

Once the system is updated, the setting data will be lost and returns to factory default. Important setting data should be backed up by saving it to a USB drive.

You will needs to go through the following process to complete the update procedure:

Step	Description	Refer to
1	Save current setting data to a USB drive.	23-2
2	Update the software	25-1-1
3	Reboot the switcher.	5-6
4	Initialize the switcher.	5-6
5	Reload the setting data saved in Step 1.	23-3-1
6	Reboot the switcher.	5-6
7	Turn the control panel power Off then On.	

25-1-1. Updating the HVS-2000

(1) Insert the USB drive that contains update data into the USB port.
(2) Open the [SETUP > FILE > LOAD] menu.
(3) Select the drive in which the update file is stored.
(4) Tap **UPDATE**.
(5) Select the update file. (The data starts writing to the switcher. DO NOT turn the power of your units OFF or try to remove the USB drive from the port until the file downloads are complete.)
(6) A pop-up status window appears showing the file transfer progress.
(7) Another pop-up window appears showing data is being written to the flash ROM.
(8) When the writing is complete, “COMPLETE” is displayed.
(9) Repeat the above steps if you have other update files.
(10) Perform **Step 3 and later** in the table above to complete the update procedure.