

TERA

**HD Scan Converter
SC-2045**

Instruction Manual

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ASTRODESIGN, INC.



CONTENTS

Introduction.....	1
Safety Precautions.....	1
1 Concerning the SC-2045.....	3
1.1 Introduction.....	3
1.2 Features.....	3
1.3 Restrictions imposed by the scan converter's specifications.....	3
[1] Restrictions on the input video timing data.....	3
[2] Restrictions on the output video timing data.....	4
[3] HD-SDI output signals.....	5
[4] Analog output signals (for monitoring purposes).....	5
[5] External reference/Window input and external sync locking.....	5
1.4 Main functions.....	6
1.5 Parts and their functions.....	9
1.6 What is shown on the display.....	12
1.7 Setting menu.....	13
1.7.1 Menu configuration.....	13
1.7.2 Menu operation methods.....	14
2 Installation and connections.....	16
2.1 Connecting the Window input image.....	16
2.2 Connecting the display unit.....	16
[1] Analog output signals.....	16
[2] HD-SDI output signals.....	16
3 Adjustment procedures.....	17
3.1 Adjustment sequence.....	17
3.2 Performing the output settings.....	18
[1] Selecting the output timing data.....	18
[2] Setting the output sync and other signals.....	19
3.3 Adjusting the display unit.....	20
3.4 Adjusting the input timing data.....	22
3.4.1 IN mode setting types.....	22
3.4.2 When the input timing data has already been registered.....	23
3.4.3 When the input timing data has not yet been registered.....	23
3.4.4 Adjusting the picture outline (Auto Disp function).....	24
3.4.5 Finer adjustments.....	25
[1] Adjustment method when the input resolution is known.....	25
[2] Adjustment method when the input resolution is not known.....	26
[3] When adjusting the display period.....	27
[4] When adjusting the sampling phase.....	28
[5] When adjusting the back porch more finely.....	29
[6] Setting the input color space.....	29
[7] Setting the input signal search mode.....	30
3.5 Adjusting the image quality.....	31
[1] Adjusting the input picture quality.....	31
[2] Adjusting the output picture quality.....	32

3.6	Saving the adjustment data	32
4	Function settings	33
4.1	Setting the display position and size	34
	[1] Setting the Window display to ON or OFF	34
	[2] Displaying the Window frame.....	34
	[3] Setting the Window image capture position	35
	[4] Setting the Window image output position	35
	[5] Setting the Window image display position.....	36
	[6] Setting the Window image display rate.....	37
	[7] Changing the Base color	37
	[8] Setting the Base display position	38
	[9] Copying the mask table data	38
	[10] Initializing the preset data	38
4.2	Simplified method of setting the image outline	38
	[1] Image zooming and setting the image outline.....	39
	[2] Adjusting the input Window position	41
	[3] Adjusting the output Window position	42
4.3	Setting the input environment	43
	[1] Selecting the preset number	43
	[2] Changing the input signal search mode	43
	[3] Freezing the image	43
	[4] Changing the setting when the sync is lost	44
	[5] Input gamma correction	44
4.4	Setting the output environment	45
	[1] Selecting the output mask No.	45
	[2] Changing the output timing data	45
	[3] Setting the output sync.....	45
	[4] Outputting the test patterns	45
	[5] Adjusting the output image quality	45
	[6] Changing the output color space	45
	[7] Output gamma correction.....	46
	[8] Setting the external lock function	46
4.5	Editing the input timing tables	47
	[1] Editing the input timing data.....	47
	[2] Copying the input timing data.....	48
	[3] Swapping the input timing data	48
	[4] Initializing the input timing data.....	48
	[5] Setting the automatic search retrieval target table	49
4.6	Editing the preset tables	49
	[1] Editing the preset data.....	50
	[2] Copying the preset data.....	50
	[3] Initializing the preset data	51
4.7	Other settings	51
	[1] Setting the communication environment	51
	[2] Setting the multi-screen configuration	53
4.8	Saving the data	53
	[1] Saving all the data	53
	[2] Initializing the data to the factory setting data.....	54
	[3] Loading the saved data.....	54

5	Troubleshooting	55
6	Reference	56
6.1	List of setting menus	56
[1]	IN mode	56
[2]	OUT mode.....	58
[3]	VIDEO mode	58
[4]	MENU mode	59
6.2	List of settings.....	65
[1]	Input timing data table setting items	65
[2]	Preset table setting items	65
[3]	Input environment table setting items	66
[4]	Output environment table setting items	66
[5]	Mask table setting items.....	67
[6]	Configuration items	67
6.3	Data table configuration diagram.....	68
6.4	Rear panel DIP switches	69
7	Main specifications	70
	Revision history.....	73

Introduction

Thank you very much for purchasing this model SC-2045 HD scan converter.

This manual contains details on the functions and operation procedures used when the SC-2045 is operated as well as the checkpoints and precautions to be observed.

Since improper handling may result in malfunctioning, before using the SC-2045, please read through these instructions to ensure that you will operate the scan converter correctly.

After reading through the manual, keep it in a safe place for future reference.

Safety Precautions



CONCERNING THE POWER CORD

- Always take hold of the molded part of the plug when disconnecting the power cord.
- Do not use force to bend the power cord or bundle it with other cords for use. This may cause a fire.
- Do not place heavy objects on top of the power cord. This may damage the cord, causing a fire or electrical shock.

CONCERNING FOREIGN MATTER

- Do not spill liquids inside the scan converter or drop inflammable objects or metal parts into it. Operating the scan converter under these conditions may cause a fire, electric shocks and/or malfunctioning.

CONCERNING DISASSEMBLY OF THE PRODUCT

- Do not attempt to disassemble the scan converter. Users run the risk of electric shocks or injury and of causing malfunctioning if they open the panels and plug or unplug the internal circuit boards themselves.

CAUTION

CONCERNING THE POWER SUPPLY AND GROUNDING

Use a supply voltage within the range of AC 100V-120V or AC 200V-240V for this converter. The scan converter is grounded through a 3-wire type of power cable with a grounding line. To ensure safe operation, be absolutely sure to connect the power cable to a power outlet that is equipped with a grounding terminal for protection.

CONCERNING INSTALLATION AND OPERATION

No special precautions need be taken if this converter is to be operated in a normal indoor environment. However, installation and operation in the following locations should be avoided. Failure to do so may cause malfunctioning and accidents.

- Locations where the ambient temperature is outside the range of 5 to 40°C.
- Locations where the ambient humidity is outside the range of 30 to 80% RH.
- Locations which are near air conditioners or susceptible to sudden changes in temperature or the formation of condensation
- Locations with high concentrations of corrosive gases or dust
- Locations which are exposed to direct sunlight
- Locations where the scan converter may be splashed with water, oil, chemicals, etc.
- Locations where vibrations from the floor may be transmitted
- Unstable locations
- The ventilation holes in the side panels prevent internal temperature rises. On no account should they be blocked since doing so can cause malfunctioning.

CONCERNING IMPACT

- This is a precision instrument and, as such, subjecting it to impact may cause malfunctioning. Take special care when moving the scan converter.

WHEN TROUBLE OR MALFUNCTIONING OCCURS

- In the unlikely event that trouble or malfunctioning should occur in the scan converter, disconnect its power cord, and contact your dealer or an Astrodesign sales representative.

1 CONCERNING THE SC-2045

1.1 Introduction

The model SC-2045 is an HD scan converter which converts HDTV source input signals and PC/WS signals into HDTV signals. It incorporates a scan conversion chip (NYD001) to yield a high image quality and high resolution at a low cost.

In addition to the HD-SDI output signals, analog signals can also be output simultaneously for monitoring purposes as HDTV output signals.

1.2 Features

The features of the SC-2024 are described below.

- The high-resolution input of the signals of UXGA, HDTV, 1080p60 and other systems is supported.
- Equalizing and sampling adjustments can be performed using a navigation program.
- The accuracy of the automatic search and automatic image outline setting operations has been improved.
- HD-SDI output facilities are provided as a standard feature.
- Operating ease has been enhanced by a wired remote control unit (optional accessory).
- The scan converter comes in a compact size (1U) with a low price tag.

* Definition of terms

The term "Window" in the text denotes the analog input channel targeted for resolution conversion, and "Base" denotes the background color of the "Window" image.

1.3 Restrictions imposed by the scan converter's specifications

The timing data values which can be input to and output from the SC-2045 are subject to specific restrictions. The input of timing data outside these restrictions may cause the images to be disrupted on the output screen.

In addition, since some functions are subject to the restrictions imposed by the scan converter's characteristics, care must be taken when it comes to using them.

[1] RESTRICTIONS ON THE INPUT VIDEO TIMING DATA

Video timing data which satisfies all the conditions from (1) to (8) can be input.

- (1) Dot clock (WCLK): Max. 162×10^6 [Hz]
- (2) Horizontal frequency: 15 to 124 [kHz]
(This must be within the range of the horizontal blanking period in (3).)
- (3) Horizontal blanking period (WBLNK): The following equation must be satisfied.
 $WBLNK$ [sec] - $(20/WCLK$ [Hz]) [sec] $> 1.0 \times 10^{-6}$ [sec]
- (4) Vertical frequency: 24 to 100 [Hz]
(Vertical frequency must be 30 [Hz] or above for G-on inputs.)
- (5) Horizontal sync width: 0.25 [μ sec] or more

- (6) Horizontal front porch width: 0.15 [μsec] or more
- (7) Horizontal back porch width: 0.5 [μsec] or more
- (8) Vertical front porch: When this is 0, it may not be possible to measure the display size accurately.

[2] RESTRICTIONS ON THE OUTPUT VIDEO TIMING DATA

Video timing data which satisfies the conditions below can be output.

(1) Restrictions on the vertical frequency

The resolution at which the processing is undertaken inside the SC-2045 is determined by the resolution of the input and output video timing data. The maximum vertical frequency which can be output is restricted by this processing resolution.

The method used to calculate the maximum vertical frequency which can be output is as follows.

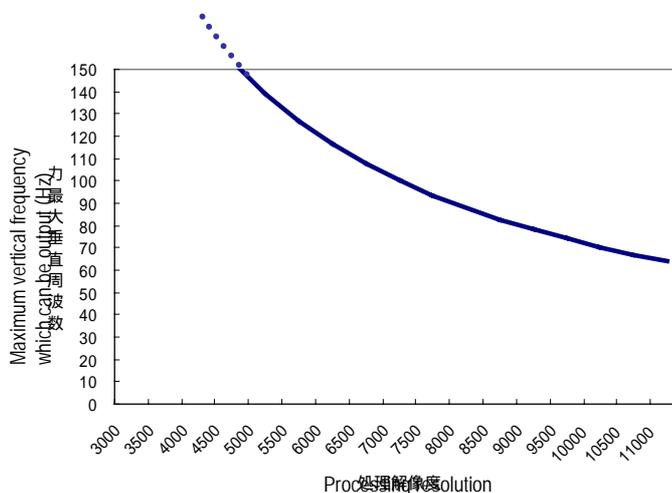
HD = Input horizontal display period (Hdisp) or output horizontal display period (Hdisp), whichever is higher [dots]

VD = Input vertical display period (Vdisp) or output vertical display period (Vdisp), whichever is higher [lines]

HDB = (D + 14 [dots])/256 (decimal places rounded up)

Processing resolution = HDB x (VD + 25 [lines])

Using the graph on the below, the maximum vertical frequency which can be output can be obtained from the "processing resolution" calculated above.



Example: Maximum vertical frequencies when the maximum resolution has been calculated using the method given above

HD	VD	Maximum vertical frequency
2000	1320	57.9 Hz
1920	1280	67.1 Hz
1920	1200	71.4 Hz
1920	1080	79.0 Hz
1600	1200	81.4 Hz
1280	1024	100.0 Hz

[3] HD-SDI OUTPUT SIGNALS

(1) Band restrictions

Since the SC-2045 is not equipped with a digital filter (for output purposes), return noise may be generated in the output images on some monitors.

(2) 4:4:4 → 4:2:2 conversion

The processing inside the SC-2045 is performed using the 4:4:4 (YPbPr) system. However, conversion to 4:2:2 (YC) when HD-SDI signals are output involves processing using simple PbPr attrition, with the result that color shifting may occur with some video patterns.

[4] ANALOG OUTPUT SIGNALS (FOR MONITORING PURPOSES)

(1) Band restrictions

The output of analog video signals is not subject to the band restrictions imposed by analog filters.

(2) Phase difference of sync signals

There is an error of several nanoseconds for the CS output phase in respect of the sync ON (Y-ON) phase.

[5] EXTERNAL REFERENCE/WINDOW INPUT AND EXTERNAL SYNC LOCKING

(1) Serration pulses

When composite signals (CS) are input as the external reference input or Window input to perform sync locking operations, the locking will not be performed correctly unless serration pulses are provided. (In actual fact, locking will not be possible even when the sync signals are correctly recognized and the lock enable indication appears on the front display.)

In addition, locking may not be implemented correctly even when poor quality signals from a VTR or other device have been input.

(2) Locking range

Frame lock operations (line lock operations if the timing data is the same) can be undertaken provided that the input frame frequency is 2.5, 2, 1, 1/2 or 1/2.5 times the output frame frequency.

Whether the timing data enables locking or not is indicated on the front display. (For further details of the display, refer to "What is shown on the display" in section 1.6.)

The reference lock range is ± 50 ppm of the sampling frequency of 74.25 MHz or 74.25/1.001 MHz. If signals exceeding this range of ± 50 ppm have been input, locking may not be implemented correctly even when the lock enable indication appears on the front display.

1.4 Main functions

INPUT SYSTEM FUNCTIONS

- **Sampling phase adjustments**

The phase of input sampling clock pulses can be adjusted across a range of 1/32 to 64/32 of the clock pulses, enabling more exact adjustments to be performed and more appropriate adjustment amounts to be set.

- **Input levels**

The input video levels can be adjusted in 1% increments separately for the R, G and B signals in a range of $0.7V \pm 10\%$. Highly individualized adjustments tailored to the video sources can be undertaken.

- **Input sync-loss operations**

Selection can be made from <8 colors + Window display OFF> for what is to be displayed when the sync signal among the input signals cannot be detected.

- **Automatic search and automatic measurements**

Highly accurate automatic retrieval is performed and the video signals are converted by automatic search if video timing data which has been registered is used as the input signals are switched.

Even for input video timing data which has not been registered, predictions are made on the basis of the timing data which has been automatically measured, and the signals are converted under the optimum conditions and displayed.

- **Automatic measurement of input display periods**

The input signals can be captured automatically from the appropriate positions by measuring the horizontal effective display periods and vertical effective display periods of the inputs and by estimating the number of periods from the aspect ratio and resolution.

- **TBC mode**

The images are displayed without disturbances even with VTR and other signals with unstable synchronization.

- **Multi-color format, multi-scan inputs**

A wide range of video sources is supported by automatically differentiating between the progressive and interlace systems and by setting color difference signals or RGB signals as the input signals.

- **Input color and level settings**

Brightness (black level), contrast (luminance), color and hue adjustments can be performed.

- **Input gamma correction**

Gamma correction can be performed for the input signals (luminance signals only).

OUTPUT SYSTEM FUNCTIONS

- **External sync lock function**

The sync signals can be output after adjusting the position of the horizontal sync signal

in 1-dot increments and the position of the vertical sync signal in 1-line increments (or 2-line increments for interlace systems) in response to the external sync signals which have been input from the external reference input connector or to the Window input signals.

- **Output color and level settings**

Brightness (black level), contrast (output level) and color adjustments can be performed.

- **Output gamma correction**

Gamma correction can be performed (for luminance signals only).

- **Window frame output**

The Window frame (in a color selected from 8 colors) can be displayed on the output screen.

- **Test pattern output**

Test patterns can be output to assist in the adjustment of display devices.

SCAN CONVERSION FUNCTIONS

- **Frame rate interpolation function**

This performs frame rate interpolation automatically to offset the difference between the input and output frame rates.

- **Flicker suppression function**

This enables the flickering that appears with interlace outputs to be suppressed.

- **Enhance function**

This enables a 9-step enhancing effect (edge emphasis) to be applied horizontally and vertically at the same time.

- **Freeze function**

This enables images to be frozen.

- **Horizontal and vertical zooming**

By selecting the zoom mode from a total of 4 modes including the pixel zoom mode and three interpolation zoom modes, the interpolation method optimally suited to the zoom ratio is selected automatically. The zoom ratio can be set from 3.2% to 2000%. Two different zoom modes can be selected for the horizontal and vertical zoom.

- **Window image input**

The start and end positions for capturing the Window image input can be set as a percentage (in 0.001% increments) or as a number of dots (1-dot increments). (The dot setting applies only when commands are used.)

- **Window image output**

The start and end positions for outputting and displaying the Window image output can be set as a percentage (in 0.001% increments) or as a number of dots (2-dot increments). (The dot setting applies only when commands are used.)

CONTROL SYSTEM FUNCTIONS

- **RS-232C or RS-422 port**

This port supports baud rates of 9600, 19200 and 38400 bps.

- **Serial bus**

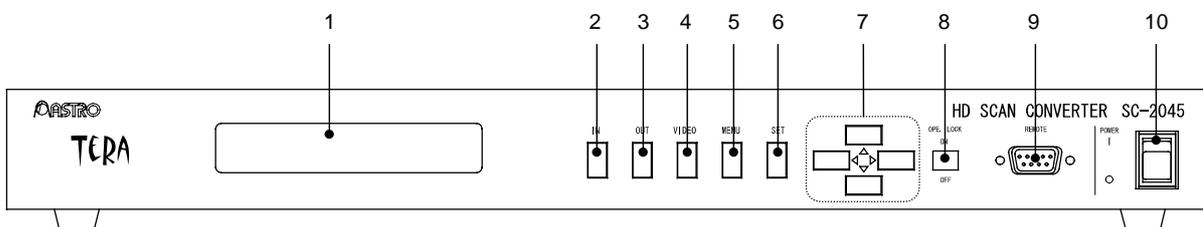
Cascade connection enables a multiple number of devices to be controlled at the same time.

- **Wired remote control unit (optional accessory)**

The same operations as the ones which can be performed using the front panel keys can be undertaken from a distance using the optional wired remote control unit.

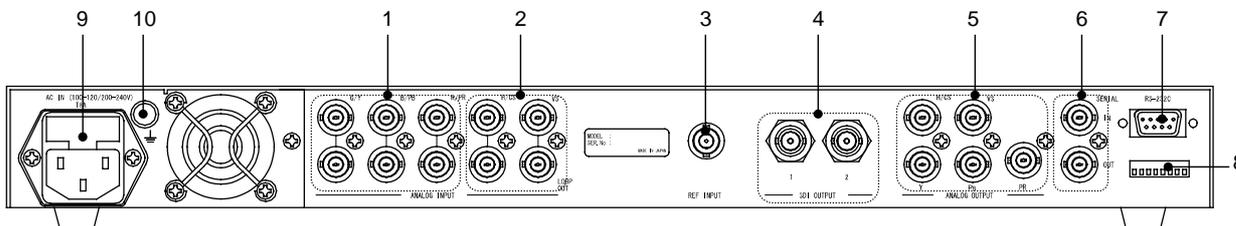
1.5 Parts and their functions

Front panel



No.	Name of part	Description
1	Display	<ul style="list-style-type: none"> ● During normal operation, the input timing data, preset table number, output timing data and mask table number appear here. → Refer to "What is shown on the display" in section 1.6. ● When any of the settings are to be changed, the setting menu is displayed here by operating the IN, OUT, VIDEO or MENU mode setting keys. → Refer to "Setting menu" in section 1.7. ● When OPE.LOCK is set to ON, the display is darkened. * If the power is set from OFF to ON with the OPE.LOCK key at ON, the display will return to its normal brightness. To darken the display, set KEY LOCK to OFF and then to ON again.
2	IN	This switches the display to the IN mode menu.
3	OUT	This switches the display to the OUT mode menu.
4	VIDEO	This switches the display to the VIDEO mode menu.
5	MENU	This switches the display to the MENU mode menu.
6	SET	This is used to move to different hierarchical levels of the menus and set the values.
7	UP/DOWN	These keys are used to select the menu items. (Hereafter, they will be indicated as the ▲ and ▼ keys.)
	LEFT/RIGHT	These keys are used to select the settings. (Hereafter, they will be indicated as the ◀ and ▶ keys.)
8	OPE. LOCK	This locks all the keys except the POWER switch. The LED lights when the OPE.LOCK key is at ON.
9	REMOTE	When the scan converter is to be operated using the optional wired remote control unit, the unit is connected here.
10	POWER	This is the power switch. Wait at less 5 seconds before turning the power ON after turning it OFF and vice versa.

Rear panel



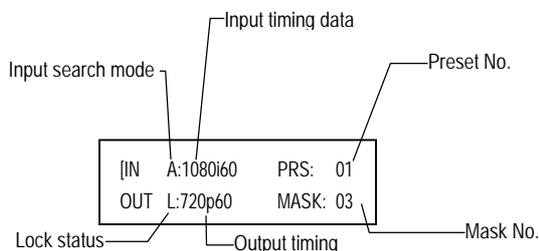
No.	Name of part		Description
1	Video input connectors	G/Y	IN This BNC connector is used for the G/Y video input signal. In the case of OnSYNC, this channel serves as the reference. It is terminated by a 75-ohm resistance while the loop-out facility is not being used.
			OUT This BNC connector is used to output the G/Y video input signal straight through (loop-out). When a signal is connected here, the G/Y video input becomes a high-impedance input.
		B/Pb	IN This BNC connector is used for the B/Pb video input signal. It is terminated by a 75-ohm resistance while the loop-out facility is not being used.
			OUT This BNC connector is used to output the B/Pb video input signal straight through (loop-out). When a signal is connected here, the B/Pb video input becomes a high-impedance input.
		R/Pr	IN This BNC connector is used for the R/Pr video input signal. It is terminated by a 75-ohm resistance while the loop-out facility is not being used.
			OUT This BNC connector is used to output the R/Pr video input signal straight through (loop-out). When a signal is connected here, the R/Pr video input becomes a high-impedance input.
2	Sync input connectors	H/CS	IN This BNC connector is used for the H/CS sync input signal. The CS signal or the H signal in the case of H/V separate signals is input here. The connector is terminated by a 75-ohm resistance while the loop-out facility is not being used.
			OUT This BNC connector is used to output the H/CS sync input signal straight through (loop-out). When a signal is connected here, the H/CS sync input becomes a high-impedance input.
		V	IN This BNC connector is used for the V sync input signal. The V signal in the case of H/V separate signals is input here. The connector is terminated by a 75-ohm resistance while the loop-out facility is not being used.
			OUT This BNC connector is used to output the V sync input signal straight through (loop-out). When a signal is connected here, the V sync input becomes a high-impedance input.

No.	Name of part	Description	
3	Reference input connector	This BNC connector is used for the external reference signal. The HDTV binary or tri-level CS signal is supplied here. Terminated by a 75-ohm resistance.	
4	HD-SDI output connectors	These are used to output the HD-SDI signals.	
5	Analog output connectors	Y	This is used to output the G/Y video signal.
		Pb	This is used to output the B/Pb video signal.
		Pr	This is used to output the R/Pr video signal.
		H/CS	This is used to output the H/CS sync signal.
		VS	This is used to output the VS sync signal.
6	Serial bus input and output connectors	IN	This is connected with the OUT connector on a device made by Astrodesign that supports a serial bus.
		OUT	This is connected with the IN connector on an Astrodesign device that supports a serial bus.
			The high-impedance state is established when cables are connected to both the IN and OUT connectors, and when a cable is connected to one connector only, the other connector is terminated by a 75-ohm resistance.
7	RS-232C (RS-422) port	This port is used for serial control. It enables all the devices connected to the serial bus through this port to be controlled.	
8	DIP switches	These are used to turn the demonstration displays of the setting menu ON or OFF.	
9	AC power inlet	The accessory power cord is connected here.	
10	FG terminal	This is the frame ground.	

Note: The through output connectors are used to check the signals when the equipment is installed: avoid using them for signal distribution purposes. Bear in mind that if their use for these purpose is absolutely unavoidable, the generation of noise due to the reflection of the video signals, reductions in signal levels and other trouble may occur.

1.6 What is shown on the display

During normal operation, the setting statuses and other information are indicated on the front display of the scan converter as shown below. (Default screen)



IN	The input timing data is displayed here. "A" stands for the automatic search mode; "F" stands for the fixed-to-input mode.
	When the automatic search mode (A:) is established If the input uses the timing data which has been registered, the name of the timing data is displayed. If the input timing data has not been registered, "NEW" appears.
	When the fixed-to-input mode (F:) is established The name of the timing data set as the fixed timing data is displayed.
	When no sync signals are supplied "No Sync" appears.
	When an input signal error occurs "SyncErr" appears.
PRS	The number of the preset table used for the current display is displayed here. It can be changed using the ▲ and ▼ keys. When the preset number is changed, the image display is changed on the basis of the preset information (image quality adjustment values, zoom mode, sampling phase adjustment values, input video level adjustment values, etc.) which is registered in the preset table. and
OUT	The current output timing data is displayed here. The "L" or "F" display indicates whether the timing data can be externally locked or not. "L" denotes line lock whereas "F" denotes frame lock. If "L" or "F" lights, it indicates the lock enabled status; if it flashes, it indicates the lock disabled status.
MASK	The number of the currently selected mask table is displayed here. It can be changed using the ◀ and ▶ keys. When the mask number is changed, the image display is changed on the basis of the mask information (Window image display position, Window frame) which is registered in the mask table.

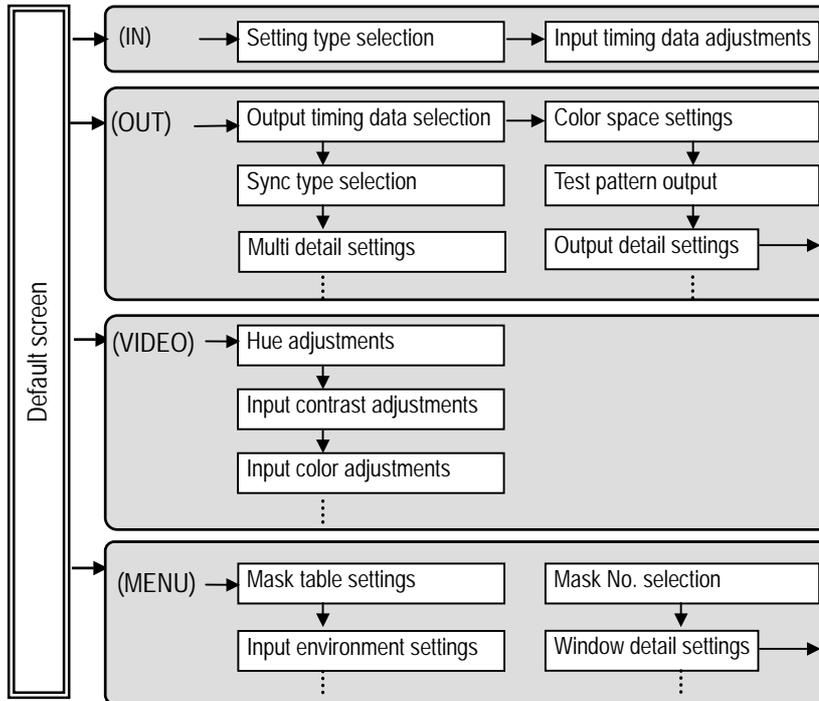
- To change the input signal search mode:
→ Turn to page 43.
- To change the output timing data:
→ Turn to page 18.
- The lock may not actually be engaged even when "L" or "F" has lighted.
→ Turn to page 5.

1.7 Setting menu

The setting menu shown on the front display is used to perform the adjustments and settings.

1.7.1 MENU CONFIGURATION

The setting menu is divided into four setting modes, each of which is structured hierarchically.



- For figures showing the transitions of all the screens using actual screen images → Turn to page 56 and up.

Setting modes

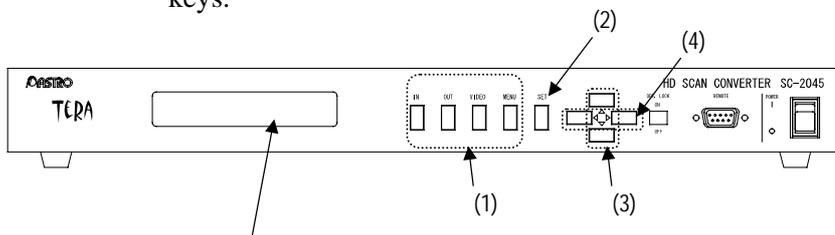
A menu configuration is provided for the IN, OUT and VIDEO modes in order to enable the basic adjustments to be easily performed for the current input and output.

The detailed settings of the SC-2045's functions can be performed in the MENU mode.

- IN mode: Window input adjustments
- OUT mode: Output timing selection, test pattern output, output image quality adjustments, output gamma correction and other output-related settings
- VIDEO mode: Input image quality adjustments, zoom mode, video level adjustments, etc.
- MENU mode: Settings for image display position and size, input environment and output environment, etc.
Editing of registered input/output timing data and preset data, settings for communication environment, storage of setting data, etc.

1.7.2 MENU OPERATION METHODS

The following keys are used for the menu operations:
 (1) mode selector keys (IN, OUT, VIDEO and MENU keys), (2) SET key, (3) ▲ and ▼ keys, and (4) ◀ and ▶ keys.



Operation method

(1) Establishing the setting mode

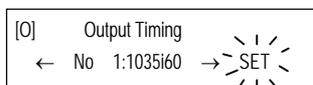
When one of the mode selector keys in (1) is pressed, the corresponding mode will be established.

IN: The IN mode is established.

OUT: The OUT mode is established.

VIDEO: The VIDEO mode is established.

MENU: The MENU mode is established.

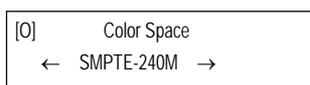


Example: Screen which appears when **OUT** is pressed (OUT mode)

The mode selector keys are also used to return to the default screen. (The OUT key is pressed from the OUT mode.)

(2) Moving from one hierarchical level to another

The **SET** key is used to move between the hierarchical levels. One of the mode selector keys is used to return from a lower to a higher hierarchical level. (Example: **OUT** key in the OUT mode)

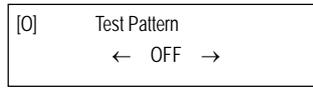


Example: Screen which appears when **SET** is pressed (OUT mode)

- When there is a lower hierarchical level, the letters "SET" flash or <<Press SET Key>> appears.

(3) Selecting the setting items

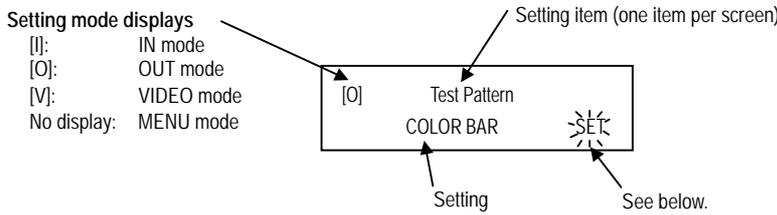
The setting items are selected using the ▲ and ▼ keys.



Example: Screen which appears when ▼ is pressed (OUT mode)

(4) Setting the values

After the screen with the desired setting items has appeared, the ◀ and ▶ keys are used to set the values.



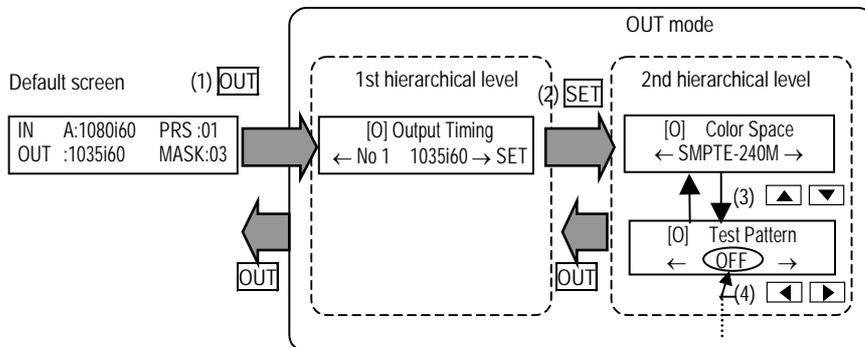
Example: Test pattern setting screen (OUT mode)

When "SET" is flashing

When the letters "SET" are flashing at the bottom right of the screen, it means either that there is a lower hierarchical level or that a changed value must be entered using the SET key.

If the letters flash when a setting is changed, it means that it is only after the SET key has been pressed that the value is entered and reflected in the image display or data table.

With an item for which "SET" does not flash even if its value has been changed, the setting change is displayed in real time or reflected in the data table. (There is no need to press the SET key.)



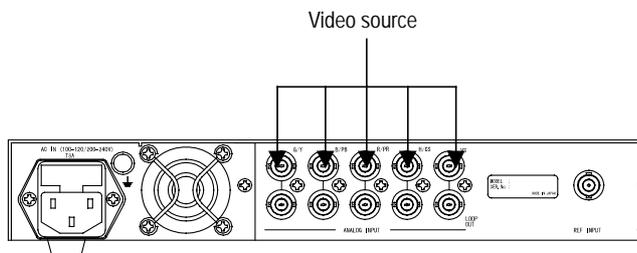
Example of menu screen transition

2 INSTALLATION AND CONNECTIONS

This section describes the basic installation and connection procedures.

2.1 Connecting the Window input image

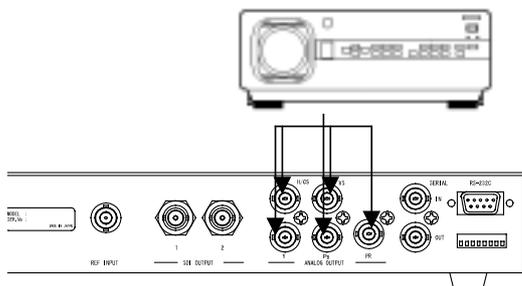
Use BNC cables to connect the resolution conversion video source to the Window input connectors on the SC-2045.



2.2 Connecting the display unit

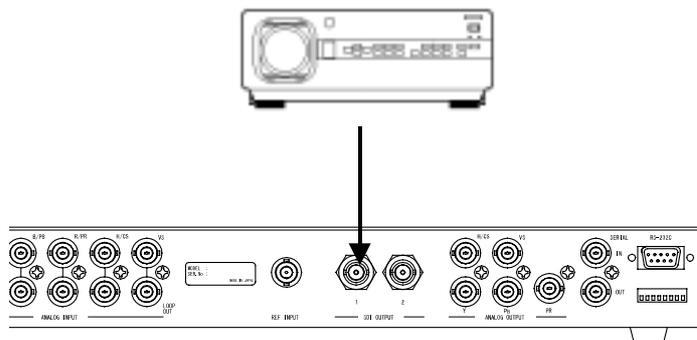
[1] ANALOG OUTPUT SIGNALS

Use BNC cables to connect the input connectors on the display unit to the BNC output connectors on the SC-2045.



[2] HD-SDI OUTPUT SIGNALS

Use a BNC cable to connect the input connector on the display unit to the SDI output connector on the SC-2045.



3 ADJUSTMENT PROCEDURES

Upon completion of the connections with the input and output devices, turn on the power of the devices, and proceed with the adjustments of the SC-2045 and of the devices connected to the SC-2045.

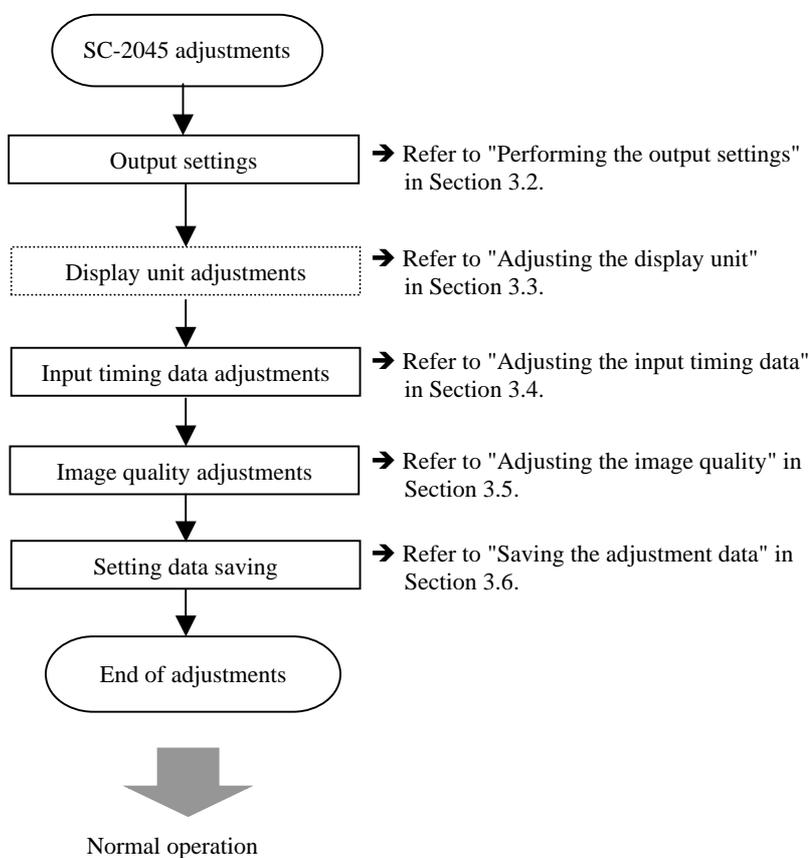
Note

Since any unsaved adjustment data will be lost when the power of the SC-2045 is turned off, be absolutely sure to save it before turning off the power.

- How to save the data
→ Turn to page 32.

3.1 Adjustment sequence

The adjustments are performed in the following sequence.



3.2 Performing the output settings

[1] SELECTING THE OUTPUT TIMING DATA

First, set the output timing data which is optimally suited to the display unit. Select the settings from the output data (in the table below) registered in the SC-2045.

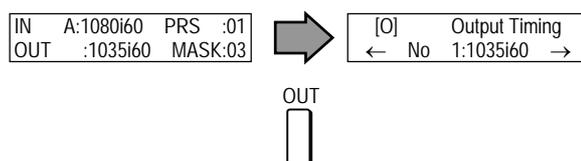
Output timing data

	Data	DotCLK (MHz)	Scan	Hperiod (dot)	Hdisp (dot)	Vtotal (line)	Vdisp (line)
1	1035i60	74.25	Interlace	2200	1920	1125	1034
2	1035i59	74.25 /1.001	Interlace	2200	1920	1125	1034
3	1080i60	74.25	Interlace	2200	1920	1125	1080
4	1080i59	74.25 /1.001	Interlace	2200	1920	1125	1080
5	1080i50	74.25	Interlace	2640	1920	1125	1080
6	1080p30	74.25	Progressive	2200	1920	1125	1080
7	1080p29	74.25 /1.001	Progressive	2200	1920	1125	1080
8	1080p25	74.25	Progressive	2640	1920	1125	1080
9	1080p24	74.25	Progressive	2750	1920	1125	1080
10	1080p23	74.25 /1.001	Progressive	2750	1920	1125	1080
11	1080sF24	74.25	Progressive (sF)	2750	1920	1125	1080
12	1080sF23	74.25 /1.001	Progressive (sF)	2750	1920	1125	1080
13	720p60	74.25	Progressive	1650	1280	750	720
14	720p59	74.25 /1.001	Progressive	1650	1280	750	720
15	720p50	74.25	Progressive	1980	1280	750	720
16	720p30	74.25	Progressive	3300	1280	750	720
17	720p29	74.25 /1.001	Progressive	3300	1280	750	720
18	720p25	74.25	Progressive	3960	1280	750	720
19	720p24	74.25	Progressive	4125	1280	750	720
20	720p23	74.25 /1.001	Progressive	4125	1280	750	720

Operation method

The output timing data is set in the OUT mode.

- (1) Press the **OUT** key. (The Output Timing screen now appears.)



- (2) On the Output Timing screen, use the **◀** and **▶** keys to select the output timing data.

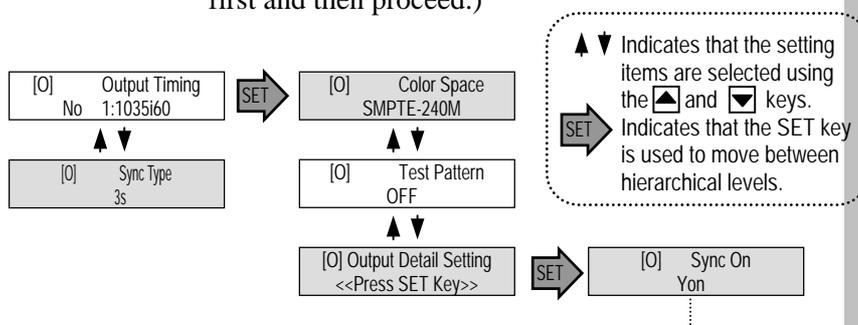
[2] SETTING THE OUTPUT SYNC AND OTHER SIGNALS

Now proceed with the output sync type, output color space and output sync on video settings. The output sync type and output sync on video settings take effect for analog outputs only.

Operation method

As with selecting the output timing data, these three items can be set in the OUT mode.

- (1) With the Output Timing screen displayed, display each of the setting screens while referring to the screen transition diagram below. (If the Output Timing screen is not displayed, press the **OUT** key first and then proceed.)



Screen transition (OUT mode)

- (2) On each setting screen, use the **◀** and **▶** keys to set the values. The settings are as follows.

Setting item	Description of setting	Setting
Sync Type	Output sync type	H/V, 3s
Color Space	Output color space	SMPTE-240M, SMPTE-274M, SMPTE-296M
Sync On	Output sync on video	OFF.Y-on

3.3 Adjusting the display unit

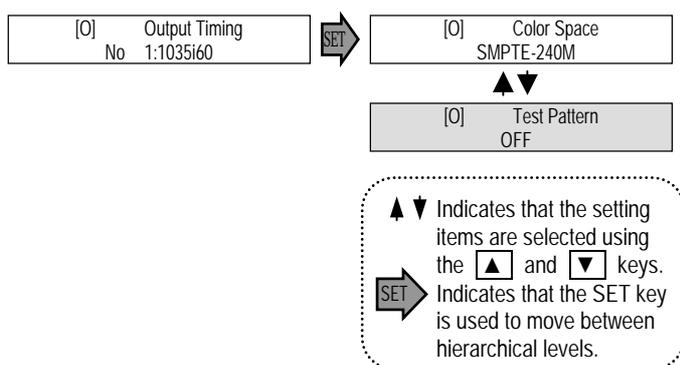
After completing the output settings and before adjusting the SC-2045, output test patterns from the SC-2045, and use them to adjust the display unit. (Perform the adjustments while referring to the operating instructions which accompany the display unit that is to be used.)

A total of 8 test patterns can be output from the SC-2045.

Operation method

The test pattern output can also be set in the OUT mode.

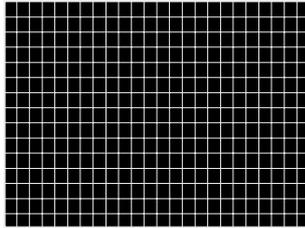
- (1) While referring to the screen transition diagram below, display the test pattern output screen (Test Pattern). (If the Output Timing screen is not displayed, press the **OUT** key first and then proceed.)



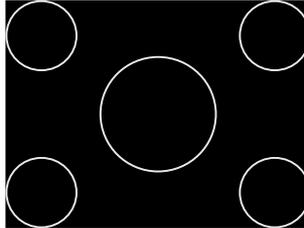
Screen transition (OUT mode)

- (2) On the Test Pattern screen, use the **◀** and **▶** keys to select a test pattern. Any of the following patterns can be set.

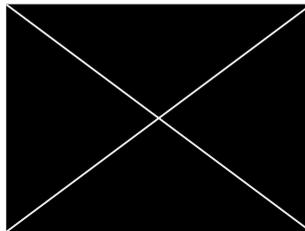
Pattern	Description
CROSS HATCH	This grid pattern consists of dots and lines.
BURST	This pattern repeats one white dot and one black dot horizontally.
COLOR BAR	This displays 100% color bar signals.
CIRCLE	This displays a circle in the center and smaller circles in the four corners of the image display period.
CROSS	This pattern consists of one line extending from the top right to bottom left of the image display period and another line extending from the top left to bottom right.
RUMP	This displays the video level from 0 to 255.
FRAME	This displays a frame which fills the image display period.
COMP	This displays the CROSS, CIRCLE and FRAME patterns.



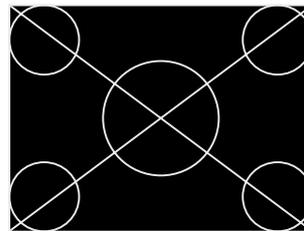
CROSS HATCH



CIRCLE



CROSS



COMP

- (3) Press the **SET** key.

The test pattern now appears. Proceed with the adjustments of the display unit.

- (4) Upon completion of the display unit adjustments, turn off the test pattern display on the Test Pattern screen, and press the **SET** key.

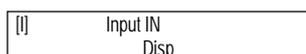
Return to the previous hierarchical level using the **OUT** key, and then return to the default screen.

3.4 Adjusting the input timing data

Next, adjust the Window input timing data. The input data is adjusted in the IN mode.

3.4.1 IN MODE SETTING TYPES

The following menu screen appears first when the **IN** key is pressed. This screen is called the setting type selection screen.



The setting types can be selected on this screen using the **◀** and **▶** keys. By selecting the setting type suited to the prevailing situation, it becomes possible to select the required adjustments and perform them more easily. The table below lists the setting types which can be selected.

For the actual adjustment procedures, refer to "When the input timing data has already been registered" in Section 3.4.2 and following.

- A different display appears when video signals with unregistered timing data have been input. After the timing data has been registered, the setting type selection screen appears.
→Turn to page 23.

Setting types and setting items

Setting type	Description	Setting item
Disp	When the image display period is to be adjusted	H Disp , H BackPorch, V Disp , V BackPorch
VGA	When the VGA screen resolution applies to the image outline	H Period, H Sync, H BackPorch, V BackPorch, Sampling Phase
SVGA	When the SVGA screen resolution applies to the image outline	
XGA	When the XGA screen resolution applies to the image outline	
SXGA	When the SXGA screen resolution applies to the image outline	
UXGA	When the UXGA screen resolution applies to the image outline	
NON	When none of the above image outlines is applicable and all the timing data is to be set	H Period, H Disp, H Sync, H BackPorch, V Disp, V BackPorch, Sampling Phase
S.Phase	When the sampling phase and back porch delay are to be adjusted	Sampling Phase Bakcp Delay
ColorSP	When the color space is to be set	Color Space
SrhMode	When the input signal search mode is to be set	Search Mode
AT Disp	When Auto Disp (automatic Disp measurement) is to be executed	None

Setting items and settable range

Item	Description	Setting range
H Period	Horizontal period	200 to 3000 dots (in 2-dot increments)
H Disp	Horizontal display period	128 to 2000 dots (in 2-dot increments)
H Sync	Horizontal sync	6 to 500 dots (in 2-dot increments) ^{*1 *2}
H Back Porch	Horizontal back porch	0 to 1/2H period dots (in 2-dot increments) ^{*2}
V Disp	Vertical display period	128 to 1320 lines (in 1-line increments) ^{*3}
V Back Porch	Vertical back porch	0 to 1/2V total lines (in 1-line increments) ^{*3, *4}
Sampling Phase	Sampling phase	0 to 63 steps
Backp Delay	Back porch delay	±4 dots (set as a percentage)
Color Space	Color space	RGB, SMTPE-125M, SMTPE-240M SMTPE-274M, SMTPE-296M
Search Mode	Input signal search mode	Auto, Fix

*1 H Sync ≤ 1/2 H Period

*2 H Sync + H Back Porch ≥ 96

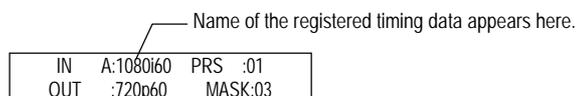
*3 In 2-line increments for interlaced scanning

*4 V Sync + V Back Porch ≥ 12

3.4.2 WHEN THE INPUT TIMING DATA HAS ALREADY BEEN REGISTERED

In a case where the Window input timing data is already registered, the name of the timing data appears on the default screen. Basically, no input adjustments need to be performed in this case.

Observe the image status and, if necessary, perform the display period and sampling phase adjustments.

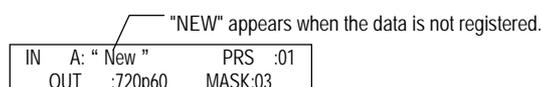


**Default screen
(when registered timing data has been input)**

3.4.3 WHEN THE INPUT TIMING DATA HAS NOT YET BEEN REGISTERED

If unregistered timing data has been input, an image is displayed after the video signal measurements have been executed to predict the timing data.

In this case, "NEW" appears on the default screen.



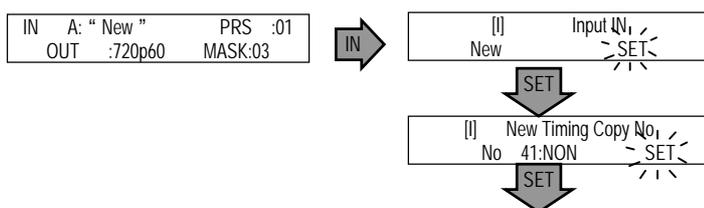
**Default screen
(when unregistered timing data has been input)**

Since the image is displayed with the optimum image outline on the basis of the measurement results, the image can basically be used as is. However, it may be necessary to adjust the display position and other aspects depending on the video source signals which have been input and other conditions. Adjust as required.

Since the image is displayed on the basis of the measurement results when "NEW" is displayed, the setting information will be lost if the video signals are interrupted or the power is turned off. The first step which must be taken before proceeding with the adjustments is, therefore, to register the data in the timing table. Follow the steps on the next page to register the data.

Operation method

- (1) Press the **IN** key.
 "NEW" appears, and the letters "SET" start flashing.
- (2) Press the **SET** key.
 The copy menu for the input timing data is displayed.
- (3) Press the **SET** key.
 The data is copied and registered in the timing data.
 The setting type selection screen is displayed on the menu.



- The copy menu will not appear if there is no more room on the input timing data table. The input data can be adjusted, but it cannot be saved without taking the further step of deleting the timing data which is no longer required so that space is made on the table.
 →Turn to page 47.

3.4.4 ADJUSTING THE PICTURE OUTLINE (AUTO DISP FUNCTION)

When certain video source signals are input (such as when the image is dark), the measurements may not be undertaken correctly, resulting in the image being enlarged or with its edges cut off. The "Auto Disp" function is available as an adjustment function for cases like this.

The Auto Disp function re-measures the valid display period so that the deviations in the image outlines can be easily adjusted.

First, input video signals which brighten up the whole screen, and then follow the steps below.

Operation method

- (1) Press the **IN** key and display the setting type selection screen.
- (2) Select "AT Disp" using the **◀** and **▶** keys.
- (3) Press the **SET** key.

The Auto Disp function is executed, and the deviations

in the image outlines are adjusted.

3.4.5 FINER ADJUSTMENTS

The adjustment procedure is basically completed once the adjustments described in the foregoing have been performed. However, in order to achieve an image with an even higher quality, some finer adjustments can be additionally undertaken.

[1] ADJUSTMENT METHOD WHEN THE INPUT RESOLUTION IS KNOWN

If the input resolution is known to be VGA or XGA, for instance, the adjustments can be performed more easily.

The adjustments are also facilitated by using the pattern which repeats one white dot and one black dot horizontally for the input image.

Operation method

- (1) Press the **IN** key and display the setting type selection screen.
- (2) Select the input resolution using the **◀** and **▶** keys. (VGA, SVGA, XGA, SXGA or UXGA can be selected.)



- (3) Press the **SET** key.

A more accurate value is now set on the basis of the resolution information which has been set.

To facilitate the adjustment process, the image is displayed temporarily with a horizontal zoom ratio of 100% (ratio of the number of input dots to the number of output dots = 1 to 1).

- In the case where none of the five resolutions applies to the input signals, select NON for the setting type, and proceed with the adjustment.
→ Turn to page 28.

- (4) Select the adjustment items using the and keys and, while checking the image status, set the adjustment values using the and keys. The adjustment items are listed below.

Item	Description	Adjustment method
H Period	Horizontal period	If light and dark vertical stripes appear on the screen, adjust this item in such a way that the overall brightness is made uniform. ^{*1}
H Sync	Horizontal sync	Adjust this item when the display of the image is skewed horizontally. ^{*2}
H Back Porch	Horizontal back porch	Adjust this item when the display of the image is skewed horizontally. ^{*2}
V Back Porch	Vertical back porch	Adjust this item when the display of the image is skewed vertically.
Sampling Phase	Sampling phase	Adjust this item when the image is flickering or shaking. ^{*3}

*1 If H Period has shifted when the white/black horizontal repeat pattern is input, vertical lines will be displayed clearly, making the adjustment easier to perform.

*2 Adjust the image position using H Sync and H BackPorch.

*3 If Sampling Phase has shifted when the white/black horizontal repeat pattern is input, lines will appear to run horizontally. Adjust the value in such a way that these lines are made as inconspicuous as possible.

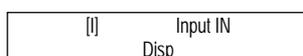
- (5) The "back porch delay" function is available if the back porch needs to be adjusted even more finely. For details, refer to "When adjusting the back porch more finely" in [5].

[2] ADJUSTMENT METHOD WHEN THE INPUT RESOLUTION IS NOT KNOWN

If the input resolution is not known or none of the five resolutions provided by the SC-2045 is applicable, all the timing data must be set and adjusted.

Operation method

- (1) Press the key and display the setting type selection screen.



- (2) Select NON using the and keys.



- (3) Press the key.

- Setting ranges of the items:
→ Turn to page 23.

- Back porch delay
→ Turn to page 29.

- (4) Select the adjustment items using the  and  keys and, while checking the image status, set the adjustment values using the  and  keys. The adjustment items are listed below.

Item	Description	Adjustment method
H Period	Horizontal period	If light and dark vertical stripes appear on the screen, adjust this item in such a way that the overall brightness is made uniform.
H Disp	Horizontal display period	Use this item to adjust the horizontal display period (size).
H Sync	Horizontal sync	Adjust this item when the display of the image is skewed horizontally.
H Back Porch	Horizontal back porch	Adjust this item when the display of the image is skewed horizontally.
V Disp	Vertical display period	Use this item to adjust the vertical display period (size).
V Back Porch	Vertical back porch	Adjust this item when the display of the image is skewed vertically.
Sampling Phase	Sampling phase	Adjust this item when the image is flickering or shaking.

- Setting ranges of the items:
→ Turn to page 23.

[3] WHEN ADJUSTING THE DISPLAY PERIOD

The display position may deviate slightly depending on the input video device (such as a VTR). In cases like this, only the display period and back porch adjustments can be performed by selecting Disp as the setting type.

Operation method

- (1) Press the  key and display the setting type selection screen.



- (2) Check that Disp is displayed as the setting type, and press the  key.



- (3) Select the adjustment items using the ▲ and ▼ keys and, while checking the image status, set the adjustment values using the ◀ and ▶ keys. The adjustment items are listed below.

Item	Description	Adjustment method
H Disp	Horizontal display period	Use this item to adjust the horizontal display period (size).
H Back Porch	Horizontal back porch	Adjust this item when the display of the image is skewed horizontally.
V Disp	Vertical display period	Use this item to adjust the vertical display period (size).
V Back Porch	Vertical back porch	Adjust this item when the display of the image is skewed vertically.

- Setting ranges of the items:
→Turn to page 23.

[4] WHEN ADJUSTING THE SAMPLING PHASE

Select S.Phase as the setting type when only the sampling phase adjustment is to be performed.

Operation method

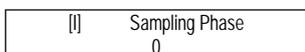
- (1) Display the setting type selection screen in the IN mode.



- (2) Select S.Phase as the setting type using the ◀ and ▶ keys.



- (3) Press the **SET** key.
- (4) On the Sampling Phase screen, perform the adjustment using the ◀ and ▶ keys while checking the image status.



[5] WHEN ADJUSTING THE BACK PORCH MORE FINELY

Although the regular back porch can only be adjusted in 2-dot increments, the "Back porch delay" function is provided to adjust the back porch more finely. In a range of ± 4 dots, the back porch can be adjusted finely by setting a percentage (in 0.001% increments).

Operation method

- (1) Refer to the previous page and display the Sampling Phase screen.
- (2) Display the Backp Delay screen using the  and  keys, and adjust the value using the  and  keys.

[]	Backp Delay 0.000%
-----	-----------------------

[6] SETTING THE INPUT COLOR SPACE

Select Color SP as the setting type to set the input color space.

Operation method

- (1) Display the setting type selection screen in the IN mode.

[]	Input IN Disp
-----	------------------

- (2) Select Color SP using the  and  keys.

[]	Input IN Color SP
-----	----------------------

- (3) Press the **SET** key.
- (4) Select the setting on the Color Space screen using the  and  keys.

Select RGB, SMPTE125M, SMPTE240M, SMPTE274M or SMPTE296M.

[]	Color Space RGB
-----	--------------------

3.5 Adjusting the image quality

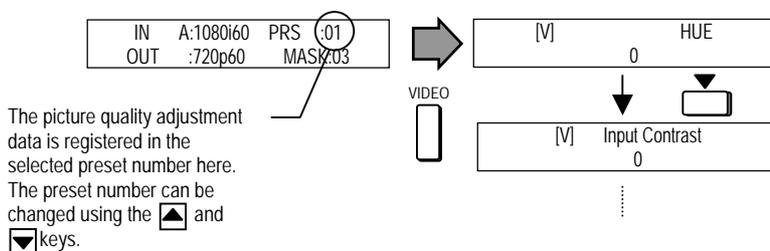
The image quality adjustments can be set separately for the input side and output side. Perform the adjustments in such a way as to yield the desired picture quality.

[1] ADJUSTING THE INPUT PICTURE QUALITY

The contrast, brightness, color, hue, gamma and enhancement effect of the Window input images can be adjusted. The picture quality adjustments for the Window input images are performed in the VIDEO mode.

Up to 10 patterns for each input timing data can be preset and registered as the adjustment data. The preset number used for the display is indicated at PRS on the default screen, and it can be changed using the and keys.

The adjustments performed in the VIDEO mode are registered in the currently selected preset data.



Adjustment item	Description	Setting
HUE	Hue adjustment	-180 to+180 °
Input Contrast	Contrast adjustment	±30%
Input Color	Color adjustment	±30%
Input Brightness	Brightness adjustment	±30 steps
Enhance level	Enhancement effect in horizontal, vertical directions	OFF,Lv±1 to 4
TBC Mode	This item is set for input signals (VTR, etc.) with unstable sync.	OFF, MODE1, MODE2, BOTH
Zoom Mode (H)	This item selects the zoom algorithm. It can be set separately for H and V.	Auto1 to Auto3, Pixel
Zoom Mode (V)		Auto1 to Auto3, Pixel
In Video level(R)	Input video level adjustment	±10% (0.7±10% V)
In Video level(G)		±10% (0.7±10% V)
In Video level(B)		±10% (0.7±10% V)
Flicker Control	Flicker suppression	OFF, Lv1 to 3
Motion Disposal	Moving image processing mode	OFF, 2-2 pull

[2] ADJUSTING THE OUTPUT PICTURE QUALITY

The picture quality adjustments for the output images are performed in the OUT mode.

Adjustment item	Description	Setting
Output Contrast	Contrast adjustment	±30%
Output Color	Color adjustment	±30%
Output Brightness	Brightness adjustment	±30 steps
Out Gamma Mode	Output gamma setting mode	OFF, Gamma, 1/Gamma, User1
Out Gamma Data (Y)	Output gamma correction value (Y)	1.0 to 3.0

3.6 Saving the adjustment data

The basic input and output adjustments are now completed.

The changing of the image display position, display size, etc. and the various other functions can now be set. For details, refer to "Function settings" in 4.

Since any unsaved adjustment data will be lost when the power of the SC-2045 is turned off, be absolutely sure to save it by following the steps below.

Operation method

- Press the **MENU** key. (The Mask Create screen appears.)

Mask Create
 <<Press SET Key>>

- Display Memory Operation using the **▲** and **▼** keys.

Memory Operation
 <<Press SET Key>>

- Press the **SET** key. (The Temporary Data Save screen appears.)

Temporary Data Save
 <<Press SET KEY>>

- Press the **SET** key. (The Are You Sure screen appears.)

Are You Sure
 No

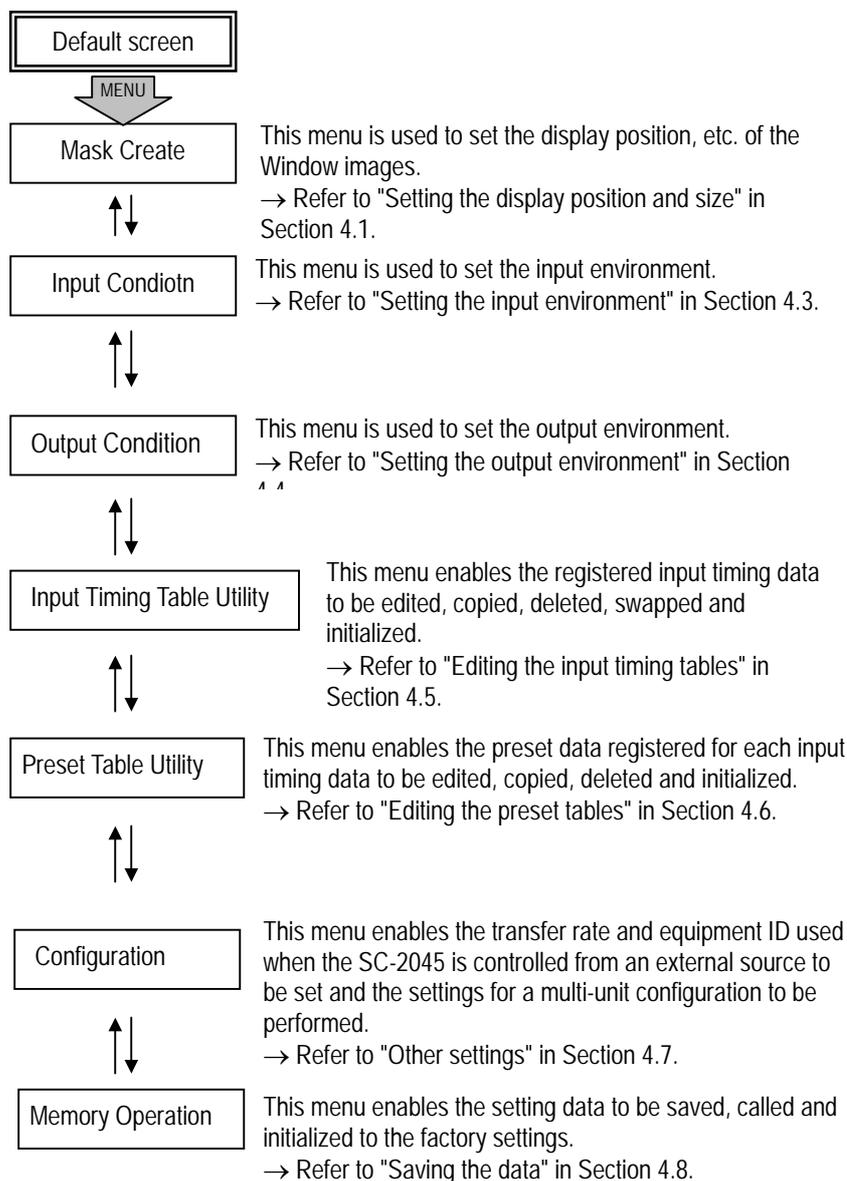
- Select Yes using the **◀** or **▶** key, and press the **SET** key. The adjustment data is now saved.

Are You Sure
 Yes

- For details on the MENU mode, refer to the following pages.

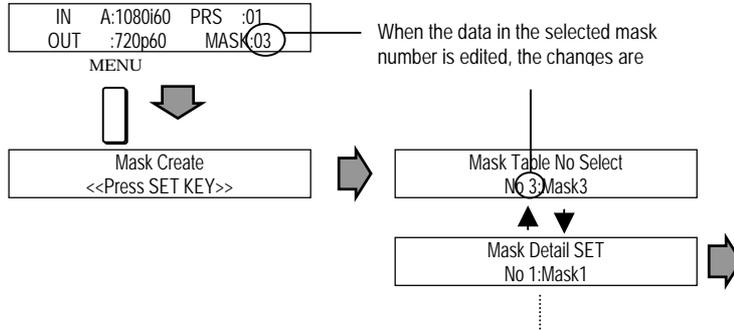
4 FUNCTION SETTINGS

In the MENU mode, detailed settings for the functions can be performed. When the **MENU** key is pressed on the default screen, the Mask Create (mask table edit) menu appears first. When the menu display is switched using the **▲** and **▼** keys, the following 7 function menus are displayed.



4.1 Setting the display position and size

Using the Mask Create menu items in the MENU mode, the settings related to the Window images, Window frame, etc. can be performed. The setting data is registered in the mask stable.



- Mask Create ⇒ Mask table No. selection
- Mask table detailed setting ⇒ Window display ON setting
- Display rate setting
- Frame color setting
- Base color setting
- Base display position setting
- Mask table copying
- Mask table initializing
- Frame display ON setting
- Input capture position setting
- Output position setting
- Display position setting

- A simplified setting of the display position of the Window image can be performed using the SET + IN keys. Refer to the following page. →Turn to page 38.

- Menu transition diagram →Turn to page 59.

[1] SETTING THE WINDOW DISPLAY TO ON OR OFF

Setting item	Adjustment/setting
Display	This item is used to set whether Window is to be displayed or not. [ON] [OFF]

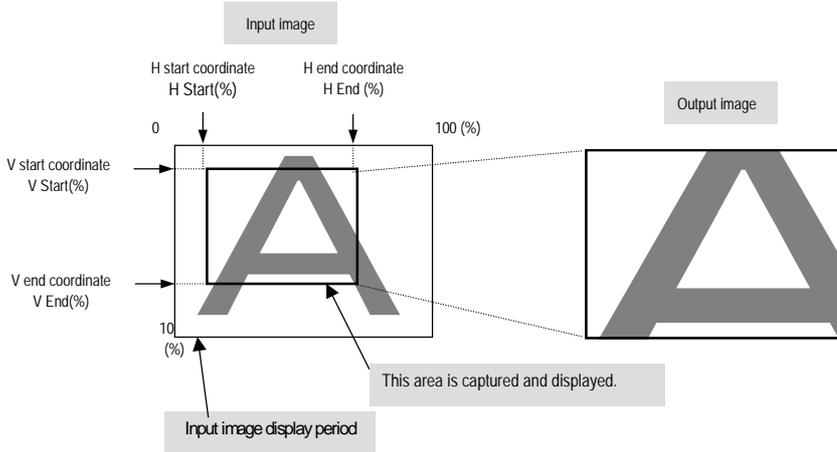
[2] DISPLAYING THE WINDOW FRAME

Setting item	Adjustment/setting
Frame	This item is used to set whether the Window frame is to be displayed or not. [ON][OFF]
Frame Color	This item is used to select the frame color when a frame is to be displayed on Window. One of the following 8 colors can be selected. [Black] [Red] [Green] [Yellow] [Blue] [Magenta] [Cyan] [White]

[3] SETTING THE WINDOW IMAGE CAPTURE POSITION

Setting item	Adjustment/setting
Window Input H Start	These items are used to set the capture coordinates of the Window input image. They are set as percentages of the input display period.
Window Input H End	
Window Input V Start	
Window Input V End	

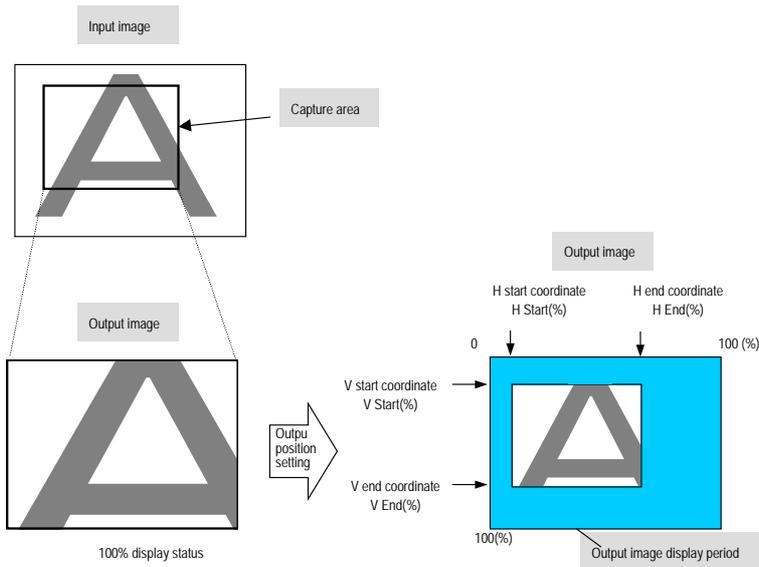
- A simplified setting of the display position of the Window image can be performed using the SET + IN keys. Refer to the following page.
→ Turn to page 38.



[4] SETTING THE WINDOW IMAGE OUTPUT POSITION

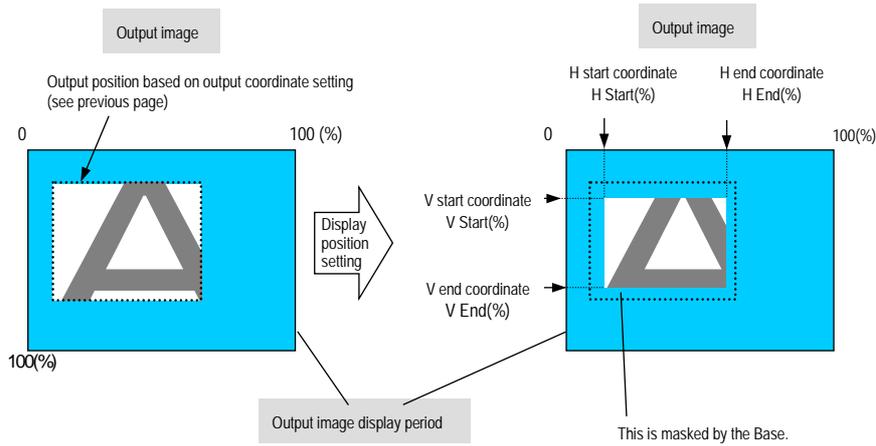
Setting item	Adjustment/setting
Window Output H Start	These items are used to set the output coordinates of the Window output image. They are set as percentages of the input display period.
Window Output H End	
Window Output V Start	
Window Output V End	

- A simplified setting of the display position of the Window image can be performed using the SET + IN keys. Refer to the following page.
→ Turn to page 38.



[5] SETTING THE WINDOW IMAGE DISPLAY POSITION

Setting item	Adjustment/setting
Window Mask H Start	These items are used to set the display coordinates of the Window output image. They are set as percentages of the input display period.
Window Mask H End	
Window Mask V Start	
Window Mask V End	



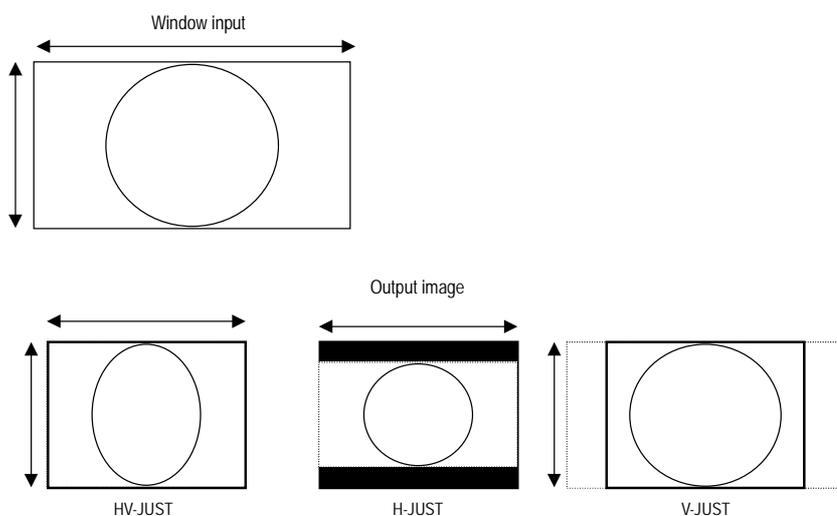
- Output coordinate and display coordinate setting conditions

The display coordinates can be set within the range of the coordinates which were set by the output coordinates.

Output H Start ≤ Mask H Start, Output H End ≥ Mask H End
 Output V Start ≤ Mask V Start, Output V End ≥ Mask V End

[6] SETTING THE WINDOW IMAGE DISPLAY RATE

Setting item	Adjustment/setting
Display Rate	[HV Just] The entire Window input image is displayed filling the whole output screen.
	[H Just] The Window input image is displayed with its horizontal direction filling the whole horizontal direction of the output while the input aspect ratio is left unchanged.
	[V Just] The Window input image is displayed with its vertical direction filling the whole vertical direction of the output while the input aspect ratio is left unchanged.

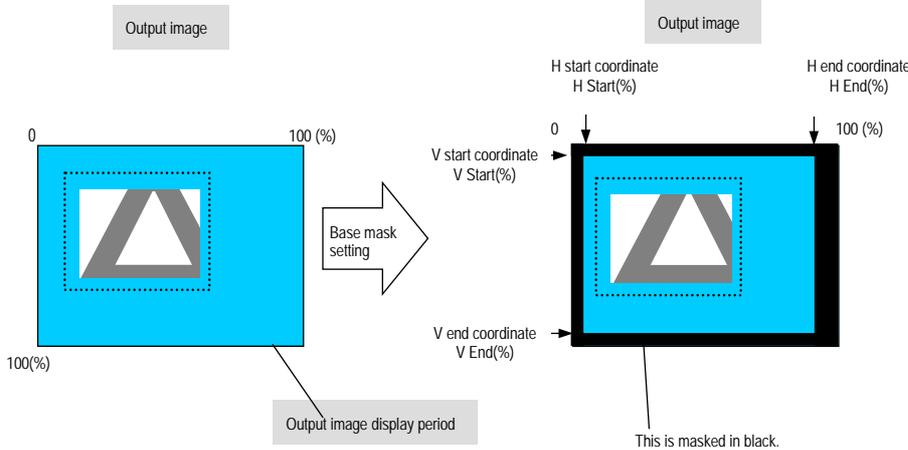


[7] CHANGING THE BASE COLOR

Setting item	Adjustment/setting
Base Color	This item is used to set the Base color. One of the following 8 colors can be selected. [Black] [Red] [Green] [Yellow] [Blue] [Magenta] [Cyan] [White]

[8] SETTING THE BASE DISPLAY POSITION

Setting item	Adjustment/setting
Base Mask H Start	These items are used to set the effective display position of Base. They are set as percentages of the output display period. [0.000 to 100.000%]
Base Mask H End	
Base Mask V Start	
Base Mask V End	



[9] COPYING THE MASK TABLE DATA

Setting item	Description
Copy Mask No Select	This item is used to set the mask table No. of the copy source.
New Mask No Select	This item is used to set the mask table No. of the copy destination.

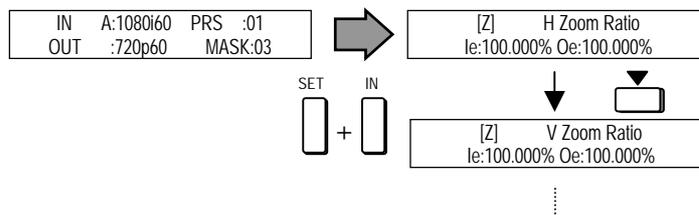
[10] INITIALIZING THE PRESET DATA

Setting item	Description
Init Mask No Select	This item is used to set the number of the mask table whose data is to be initialized.

4.2 Simplified method of setting the image outline

Using the Mask Create menu items in the MENU mode, the H start, H end, V start and V end coordinates of the Window image input capture position and Window image output position can be set separately to adjust the image display position and size. The adjustment of image outline is facilitated simply by using the simplified image outline setting function.

When the **[IN]** key is pressed while the **[SET]** key is held down on the default screen, the simplified image outline adjustment menus shown below are displayed.



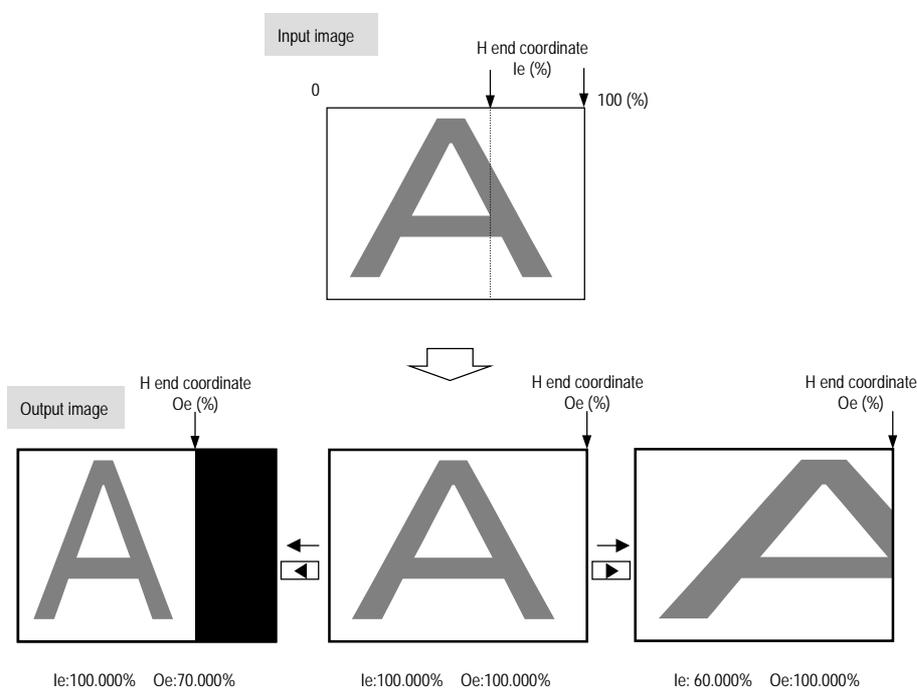
- Menu transition diagram → Turn to page 64.

[1] IMAGE ZOOMING AND SETTING THE IMAGE OUTLINE

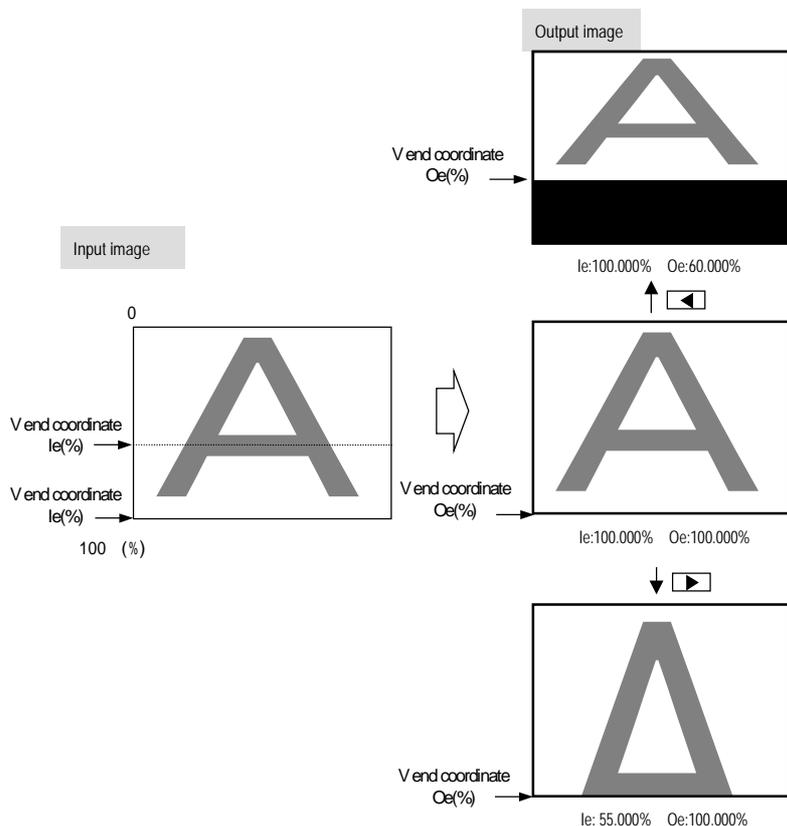
The Window image input capture coordinates and output coordinates are set automatically simply by setting the desired image outline while zooming in on the actual image displayed.

Zooming is done separately in the horizontal and vertical directions.

Setting item	Adjustment/setting
H Zoom Ratio	The image is reduced horizontally using the ◀ key or enlarged horizontally using the ▶ key, and the input capture H end coordinate (Ie) and output H end coordinate (Oe) are set automatically. [0.001 to 100.000%]



Setting item	Adjustment/setting
V Zoom Ratio	The image is reduced vertically using the ◀ key or enlarged vertically using the ▶ key, and the input capture V end coordinate (Ie) and output V end coordinate (Oe) are set automatically. [0.001 to 100.000%]

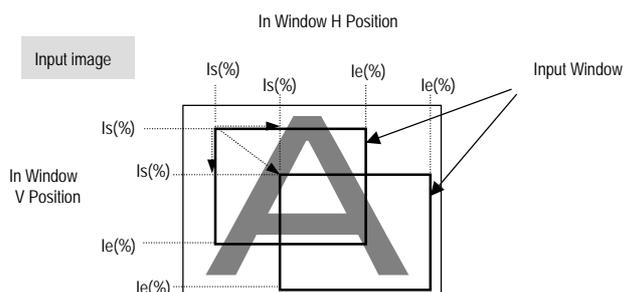


[2] ADJUSTING THE INPUT WINDOW POSITION

The position of the capture image area (input Window) determined by the input capture H start, H end, V start and V end coordinates can be easily adjusted while checking the status of the image which is actually displayed.

The position is adjusted using the Window image while the correlation between the coordinate positions is left unchanged.

Setting item	Adjustment/setting
In Window H Position	The input Window is moved in the negative horizontal direction using the ◀ key or in the positive horizontal direction using the ▶ key. The input H start coordinate (Is) and input H end coordinate (Ie) are set automatically. [0.000 to 100.000%]
In Window V Position	The input Window is moved in the negative vertical direction using the ▲ key or in the positive vertical direction using the ▼ key. The input V start coordinate (Is) and input V end coordinate (Ie) are set automatically. [0.000 to 100.000%]

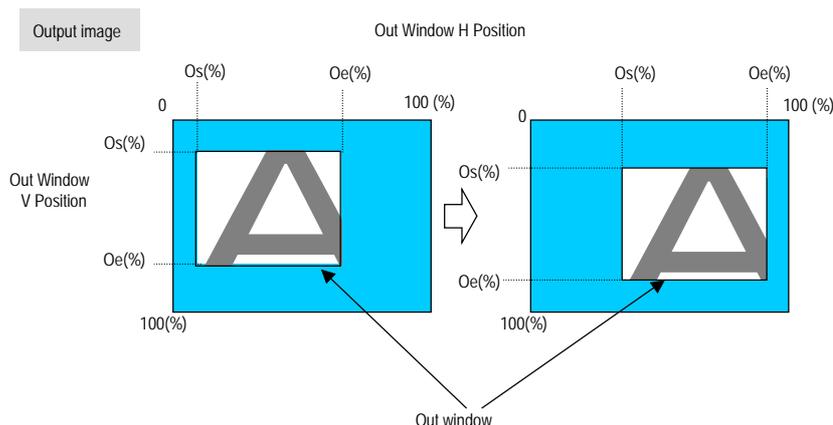


[3] ADJUSTING THE OUTPUT WINDOW POSITION

The position of the output image area (output Window) determined by the H start, H end, V start and V end coordinates of the output can be easily adjusted while checking the status of the image which is actually displayed.

The position is adjusted using the Window image while the correlation between the coordinate positions is left unchanged.

Setting item	Adjustment/setting
Out Window H Position	The output Window is moved in the negative horizontal direction using the ◀ key or in the positive horizontal direction using the ▶ key. The output H start coordinate (Os) and output H end coordinate (Oe) are set automatically. [0.000 to 100.000%]
Out Window V Position	The output Window is moved in the negative vertical direction using the ▲ key or in the positive vertical direction using the ▼ key. The output V start coordinate (Os) and output V end coordinate (Oe) are set automatically. [0.000 to 100.000%]



4.3 Setting the input environment

The input environment is set using the Input Condition menu setting items.

Menu configuration

Input Condition	⇒	Preset number selection Search mode setting Fixed timing data setting Image freeze Sync loss setting Input gamma correction
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- Menu transition diagram
→ Turn to page 61.

[1] SELECTING THE PRESET NUMBER

Setting item	Description/setting
Preset No Select Set	This item is used to select the preset number used for the current display. The procedure is the same as for changing the preset number by pressing the  and  keys on the default screen.

- Switching the preset numbers on the default screen
→ Turn to page 12.

[2] CHANGING THE INPUT SIGNAL SEARCH MODE

If the Window input is unstable and automatic search does not work properly, the input timing data can be set to fixed ahead of time.

Setting item	Description/setting
Input Search Mode	This item is used to set whether to perform automatic search as the input sync signal is switched or fix the input timing data. [Auto] [Fix]
Input Fix Timing	This item is used to set the fixed timing data number in the input fixed (Fix) mode.

When synchronization is lost in the input fixed (Fix) mode, an image disrupted for an instant may be displayed.

[3] FREEZING THE IMAGE

Setting item	Description/setting
Freeze	This item is used to display frozen images. [OFF] [ON] [EX-ON]

The EX-ON freeze setting is for providing a clear display when the input signal is switched. At the normal ON setting, the sync-loss color is displayed when the sync is lost, but the frozen image remains displayed at the EX-ON setting.

[4] CHANGING THE SETTING WHEN THE SYNC IS LOST

Setting item	Description/setting
Sync Loss Mode	This item is used to set what operation is to be performed when the input sync signal is lost. [Black] [Red] [Green] [Yellow] [Blue] [Magenta] [Cyan] [White] [Win OFF] (Window display OFF)

[5] INPUT GAMMA CORRECTION

Setting item	Description/setting
Input Gamma Mode	This item is used to set the input gamma setting mode. [OFF] [Gamma] [1/Gamma] [User1 to 4]
In Gamma Data(Y)	This item is used to set the input gamma correction value (Y).[1.0 to 3.0]

4.4 Setting the output environment

The output environment is set using the Output Condition menu setting items.

Menu configuration

Output Condition ⇒ Output mask No. selection
 Output timing data selection
 Output sync setting (analog outputs only)
 Test pattern output
 Output image quality adjustment
 Output color space setting
 Output gamma correction
 External sync setting

- Menu transition diagram
 → Turn to page 61.

[1] SELECTING THE OUTPUT MASK NO.

Setting item	Description/setting
Mask Table Select Set	This item is used to select the mask No. used for the current display. The procedure is the same as for changing the mask by pressing the ◀ and ▶ keys on the default screen.

- Switching the masks on the default screen
 → Turn to page 12.

[2] CHANGING THE OUTPUT TIMING DATA

Setting item	Description/setting
Output Timing	This item is used to switch the output timing data. The data can also be changed in the OUT mode.

[3] SETTING THE OUTPUT SYNC

Setting item	Description/setting
Output Sync Type	This item is used to set the output sync type.
Output Sync On	This item is used to set the output sync on video.

[4] OUTPUTTING THE TEST PATTERNS

Setting item	Description/setting
Test Pattern	This item is used to output the test patterns. The test patterns can also be set in the OUT mode.

[5] ADJUSTING THE OUTPUT IMAGE QUALITY

Setting item	Description/setting
Output Contrast	This item is used to adjust the contrast.
Output Color	This item is used to adjust the color.
Output Brightness	This item is used to adjust the brightness.

[6] CHANGING THE OUTPUT COLOR SPACE

Setting item	Description/setting
Output Color Space	This item is used to set the output color space.

[7] OUTPUT GAMMA CORRECTION

Setting item	Description/setting
Out Gamma Mode	This item is used to set the output gamma setting mode. [OFF] [Gamma] [1/Gamma] [User1]
Out Gamma Data(Y)	This item is used to set the output gamma correction value. [1.0 to 3.0]

[8] SETTING THE EXTERNAL LOCK FUNCTION

Setting item	Description/setting
Lock Mode	[OFF] External sync not used [AUTO] Automatic discrimination [EXT-ON] External input [IN-ON] Window input
Lock H Phase Set	This item is used to adjust the lock output phase (H). [±999 dot]
Lock V Phase Set	This item is used to adjust the lock output phase (V). [±2048 line]

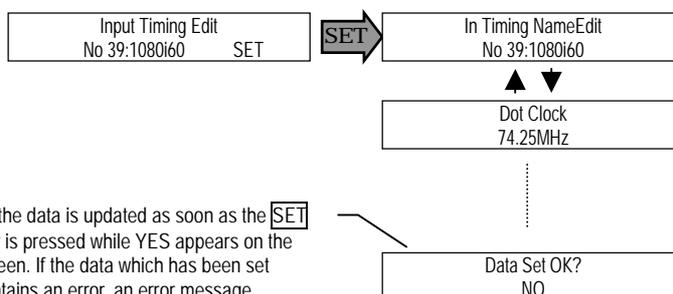
4.5 Editing the input timing tables

Using the Input Timing Utility, all the data registered in the input timing tables can be edited, copied, swapped, initialized or deleted.

Setting item	Description/setting
Input Timing Edit	This item enables all the registered input timing data to be edited.
Input Timing Delete	This item is used to delete the input timing data. However, the currently input timing data and the timing data which has been set as fixed timing data cannot be deleted.
Input Timing Copy	This item is used to copy the input timing data into an empty table. It cannot be used to copy data by overwriting existing data.
Input Timing Swap	This item is used to swap the input timing data. However, the currently input timing data and the timing data which has been set as fixed timing data cannot be swapped.
Input Timing Init	This item is used to initialize the input timing data to the factory setting data.
Input Timing Search	This item is used to set whether the data to serve as the retrieval target during an automatic search is to be set.

- When the currently input timing data is edited, the changes are reflected in the image display.

[1] EDITING THE INPUT TIMING DATA



All the data is updated as soon as the **SET** key is pressed while YES appears on the screen. If the data which has been set contains an error, an error message appears, and it is not possible to register the data.

- Menu transition diagram → Turn to page 62.

Setting item	Description	
Name	Name of timing data	Any name consisting of not more than 8 ASCII characters
Dot Clock	Dot clock	17.00 to 162.00 (in 0.01 MHz increments) ^{*1}
H Period	Horizontal period	200 to 3000 dots (in 2-dot increments)
H Disp	Horizontal display period	128 to 2000 dots (in 2-dot increments)
H Sync	Horizontal sync	6 to 500 dots (in 2-dot increments) ^{*2 *3}
H Back Porch	Horizontal back porch	0 to 1/2H period dots (in 2-dot increments) ^{*3}
V Total	Number of vertical lines	200 to 2000 lines (in 1-line increments)
V Disp	Vertical display period	128 to 1320 lines (in 1-line increments) ^{*4}
V Sync	Vertical sync	2 to 60 lines (in 1-line increments) ^{*4 *5}
V Back Porch	Vertical back porch	0 to 1/2V total lines (in 1-line increments) ^{*4 *5}
Scan	Scanning system	Interlace or progressive

^{*1} 17.00 to 81.00 MHz for interlaced scanning

^{*2} H Sync ≤ 1/2 H Period

^{*3} H Sync + H Back Porch ≥ 96

^{*4} In 2-line increments for interlaced scanning

^{*5} V Sync + V Back Porch ≥ 12

[2] COPYING THE INPUT TIMING DATA

Setting item	Description
Copy Timing No Select	This item is used to set the copy source table No.
New Timing No Select	This item is used to set the copy destination empty table No.

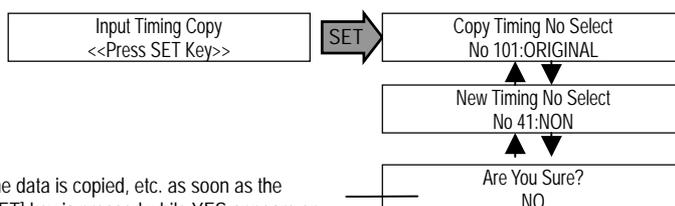
[3] SWAPPING THE INPUT TIMING DATA

Setting item	Description
Swap Timing No Select1	This item is used to set the Swap table No.1.
New Timing No Select2	This item is used to set the Swap table No.2.

[4] INITIALIZING THE INPUT TIMING DATA

Setting item	Description
ROM Timing No Select	This item is used to set the factory setting data table No.
RAM Timing No Select	This item is used to set the application data table No.

Common to (2), (3) and (4)



The data is copied, etc. as soon as the [SET] key is pressed while YES appears on the screen.

[5] SETTING THE AUTOMATIC SEARCH RETRIEVAL TARGET TABLE

Setting item	Description
Input Timing No Select	[Table No.] At this setting, the selected table is set to serve as the retrieval target. [ALL] At this setting, all the tables are set to serve as the retrieval target.
Window Search	[ON] The input timing data serves as the retrieval target for the automatic search. [OFF] The input timing data no longer serves as the retrieval target.

4.6 Editing the preset tables

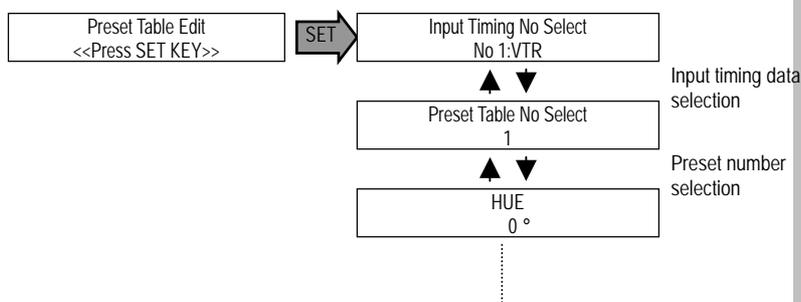
Using the Preset Table Utility, all the data registered in the preset tables can be edited, copied or initialized.

Setting item	Description
Preset Table Edit	This item enables all the registered preset data to be edited.
Preset Table Copy	This item is used to copy the preset data into an empty table. It cannot be used to copy data by overwriting existing data.
Preset Table Init	This item is used to initialize the preset data to the factory setting data.

- When the currently selected preset data is edited, the changes are reflected in the image display.

There is preset data for each input timing data. Therefore, first select the input timing data, and then select the number of the preset data to be edited.

- Menu transition diagram → Turn to page 63.



[1] EDITING THE PRESET DATA

The preset data used for the current display is adjusted in the VIDEO mode. (The sampling phase and back porch delay items are edited in the IN mode.)

Setting item	Description	
HUE	This item is used to adjust the hue.	-180 to +180 °
Input Contrast	This item is used to adjust the contrast.	±30%
Input Color	This item is used to adjust the color.	±30%
Input Brightness	This item is used to adjust the brightness.	±30 steps
Enhance level	This item is used to set the enhancement effect in the horizontal and vertical directions.	OFF, Lv±1 to 4
TBC Mode	This item is set for input signals (VTR, etc.) with unstable sync.	OFF, MODE1, MODE2, BOTH
Zoom Mode (H)	This item is used to select the zoom algorithm. It can be set separately for H and V.	Auto1 to Auto3, Pixel
Zoom Mode (V)		Auto1 to Auto3, Pixel
Sampling Phase	This item is used to set the sampling phase.	0 to 63 steps
Backp Delay	This item is used to set the back porch delay.	±4 dots (set as a percentage)
Input Color Space	This item is used to set the input color space.	RGB, SMPTE-125M SMPTE-240M SMPTE-274M SMPTE-296M
In Video level(R)	This item is used to adjust the input video level.	±10% (0.7±10% V)
In Video level(G)		±10% (0.7±10% V)
In Video level(B)		±10% (0.7±10% V)
Flicker Control	This item is used to suppress the flicker.	OFF, Lv1 to 3
Motion Disposal	This item is used to set the moving image processing mode.	OFF, 2-2 pull

[2] COPYING THE PRESET DATA

Setting item	Description
Copy Preset No Select	This item is used to set the copy source table No.
New Preset No Select	This item is used to set the copy destination empty table No.

[3] INITIALIZING THE PRESET DATA

Setting item	Description
Init Preset No Select	This item is used to set the number of preset table to be initialized.

Preset table initial settings

Setting item	Initial setting
HUE	0 °
Input Contrast	0%
Input Color	0%
Input Brightness	0
Enhance level	OFF
TBC Mode	OFF
Zoom Mode (H)	Auto1
Zoom Mode (V)	Auto1
Sampling Phase	0
Backp Delay	0.000%
Input Color Space	RGB
In Video level (R)	0%
In Video level (G)	0%
In Video level (B)	0%
Flicker Control	OFF
Motion Disposal	OFF

4.7 Other settings

Using the Configuration menu, the communication environment for externally controlling the SC-2045 from a PC, the screen configuration when constructing multi-screens, etc. can be set.

[1] SETTING THE COMMUNICATION ENVIRONMENT

When a PC is connected to the RS-232C (or RS-422) port on the SC-2045, the SC-2045 can be controlled by commands from the PC.

For details on the communication commands, refer to the SC-2045 Command Manual.

Setting item	Description
Baud-Rate	This item is used to set the transfer rate. [9600] [19200] [38400] (bps)
Equipment ID	This item is used to set the equipment ID. [00] Master [01 to 99] Slave
Set Command Response	This item is used to set whether a response is to be given when the setting commands are sent. [ON] ACK response given. [OFF] ACK response not given.

- **Concerning the equipment ID setting**
(when using the serial bus)

If a multiple number of devices are to be controlled when, for instance, using a multi-screen configuration,

- Menu transition diagram
→ Turn to page 63.

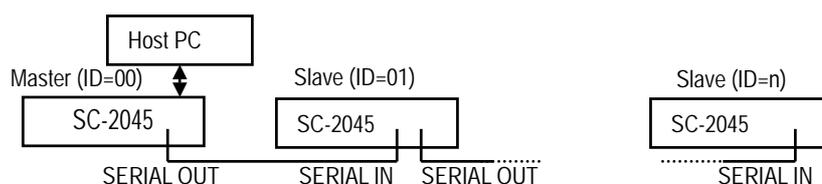
all the devices can be controlled together by connecting the control PC to the master device and connecting the slave devices using BNC cables.

When a serial bus is used, IDs (none of which must be used more than once) must be set inside the bus for all the devices to be connected. The device at the other end of the communication specifies these IDs and sends and receives the commands.

The device which is connected to the host through its RS-232C port is called the master, and it is given #0 as its ID number. The other devices are called slaves and given ID numbers #1 to #99, none of which must be used more than once. (The equipment ID numbers do not need to be consecutive so that they will correspond to the connection sequence.)

Serial bus connections and equipment IDs

Connect the SERIAL IN connector and SERIAL OUT connector on each of the devices to be controlled simultaneously using BNC cables.



Precautions when using the serial bus

The serial bus must feature a daisy chain connection, and both its start point (the "master" in the figure above) and end point ("slave n" in the figure above) must be terminated.

An automatic termination circuit is incorporated inside the serial bus connectors, and when the cable is connected to both the IN and OUT connectors, the terminating resistance is cut off, resulting in the high-impedance state.

When the SC-2045 scan converter is used as the "master" and start point of the bus

Connect the cable only to the serial bus OUT connector of the master, and leave its IN connector unconnected.

When the SC-2045 scan converter is used as the "slave n" and end point of the bus

Connect the cable only to the serial bus IN connector of the slave n, and leave its OUT connector unconnected.

In order to ensure normal communication, it is absolutely necessary for the power of the two devices at the start and end points of the bus to be left at ON.

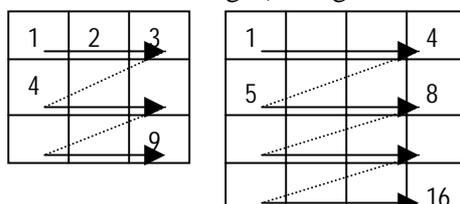
[2] SETTING THE MULTI-SCREEN CONFIGURATION

These settings are required when a multiple number of SC-2045 scan converters are to be connected and a multi-screen configuration is to be configured.

Setting item	Description
Multi Compose (H)	This item is used to set the number of screens in the horizontal direction [1 to 20].
Multi Compose (V)	This item is used to set the number of screens in the vertical direction [1 to 20].
Multi Address	This item is used to perform the multi address settings [1 to 100].

Any number of multi screens can be set within the range of $H \times V \leq 100$.

Multi address settings (see figure below)



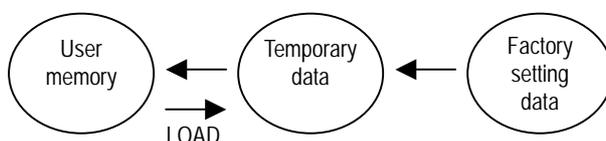
4.8 Saving the data

Since the data yielded by the adjustments made to the SC-2045 will be lost when the power of the SC-2045 is turned off, take steps to save it before turning off the power by following the steps below.

When the power is next turned on, the data saved in the user memory will be loaded and started.

Using Memory Operation, all the data can be saved in the user memory, the data saved in the memory can be loaded, and the data can be initialized to the factory setting data.

Configuration of SC-2045 memory



[1] SAVING ALL THE DATA

Setting item	Description
Temporary Data Save	This item is used to save all the temporary data in the user memory by overwriting the existing data in the memory.

- Menu transition diagram → Turn to page 63.

[2] INITIALIZING THE DATA TO THE FACTORY SETTING DATA

Setting item	Description
Temporary Data Init	This item is used to overwrite the temporary data with the factory setting data.

[3] LOADING THE SAVED DATA

Setting item	Description
Temporary Data Load	This item is used to overwrite the temporary data with the saved user data.

Common to (1), (2) and (3)



The data is saved, etc. as soon as the **SET** key is pressed while YES appears on the screen.

5 TROUBLESHOOTING

Check out the following points.

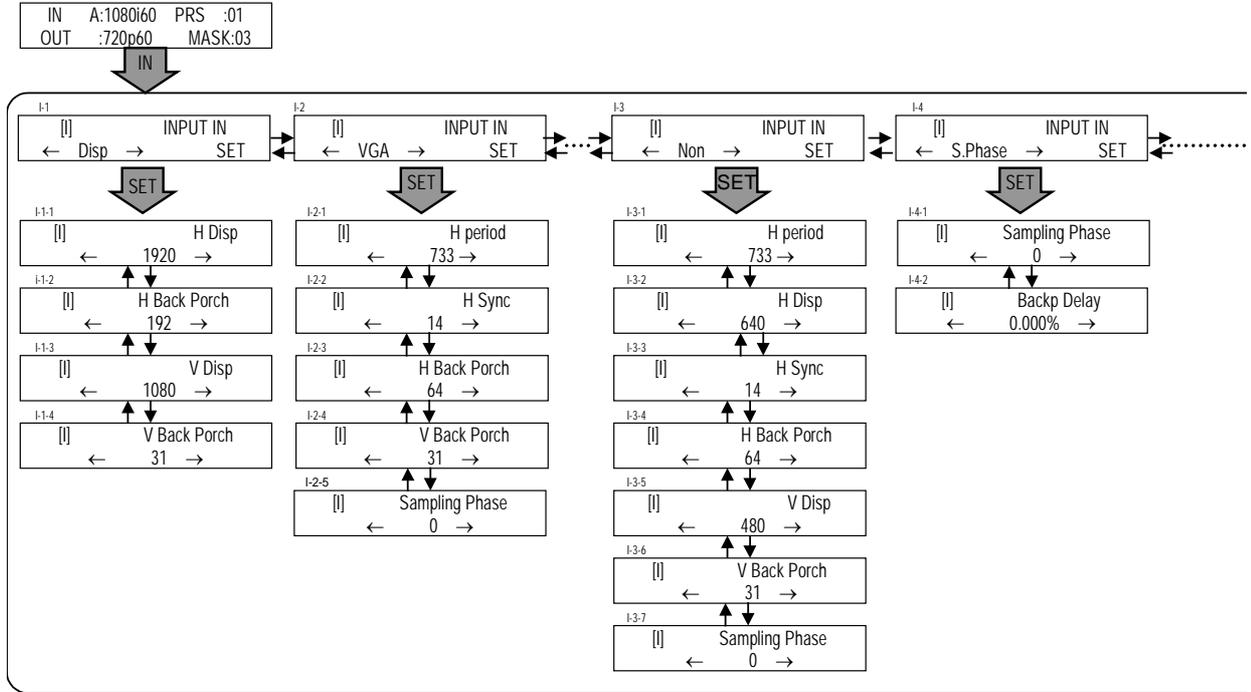
Symptom	Check and remedial action	Reference page
"SyncErr" is displayed even though video signals are input.	(1) Check whether the restriction level for the input timing data has been exceeded.	2
The normal display and sync-loss color are displayed alternately.	(1) Set the TBC mode to any setting except OFF. Note: Perform this setting with the input signals disconnected.	32
	(2) Set the input signal search mode to FIX. Note: Automatic search is not performed.	42
The images are disrupted.	(1) Check whether the restriction level for the input timing data has been exceeded.	2
	(2) In the case of copy-guarded input images, the video image may not be displayed properly with some copy guard types.	-
	(3) Depending on the quality of the input video signals (as with those from a VTR, for instance), the video image may not be displayed properly.	-
The images shake.	(1) Adjust the sampling phase of the Window input.	22
The images appear to be doubled.	If interlaced scanning applies to both the input and output timing data, the images may appear to be doubled. Try performing the following settings.	
	(1) Set frame lock for the input and output timing data. (2) Set the moving picture processing mode to "2-2 pull."	45 32/48
The images appear to resemble frame advance. (Moving pictures)	(1) If the difference between the input and output frame rates is too great, the images may appear to resemble frame advance. Narrow the gap between the two frame rates.	-
The adjustments are not reflected in the display.	(1) Check whether the number of the table used matches the number of the table with the adjusted data.	35, 48
	(2) If the adjusted data is not saved, it will be lost when the power is turned off. Upon completion of the adjustments, save the data.	52
The commands cannot be communicated.	(1) Check whether the transfer rate is set correctly.	50
	(2) When using a serial bus, check whether it has been connected correctly.	50
	(3) When using a serial bus, check that the same equipment ID has not been used more than once.	50
The front panel keys cannot be operated.	(1) Check that the OPE.LOCK key is not at the ON position.	8

6 REFERENCE

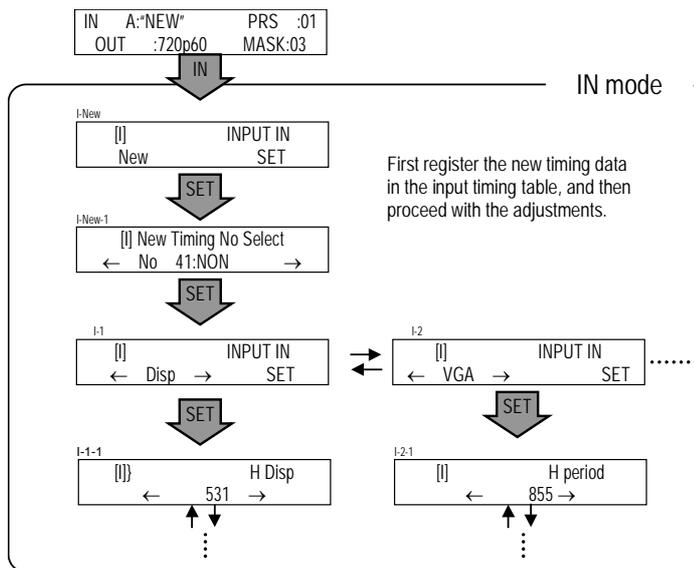
6.1 List of setting menus

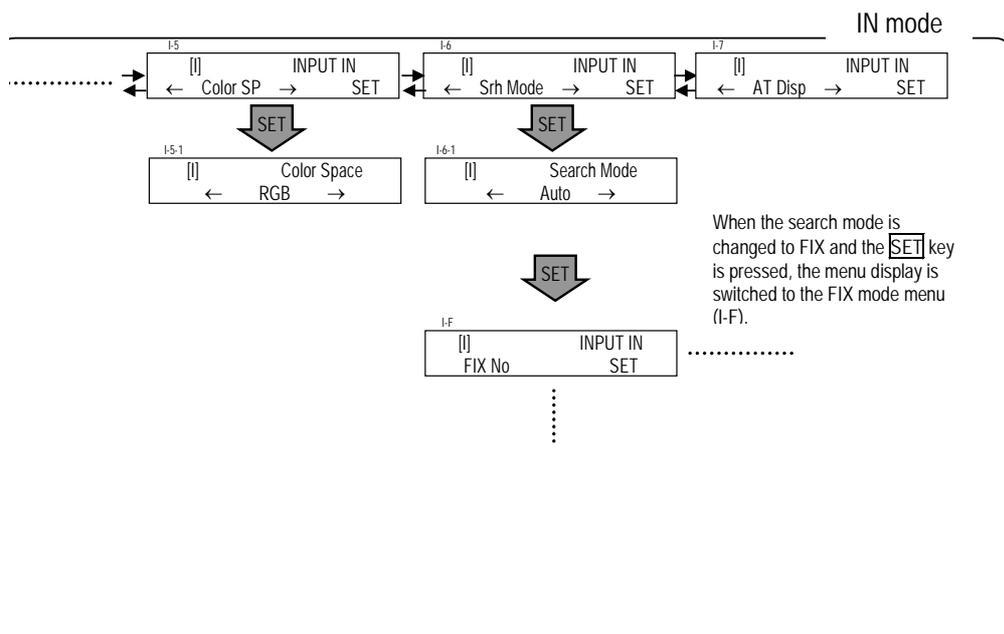
[1] IN MODE

- When the input search mode is set to AUTO and the input timing data has been registered:

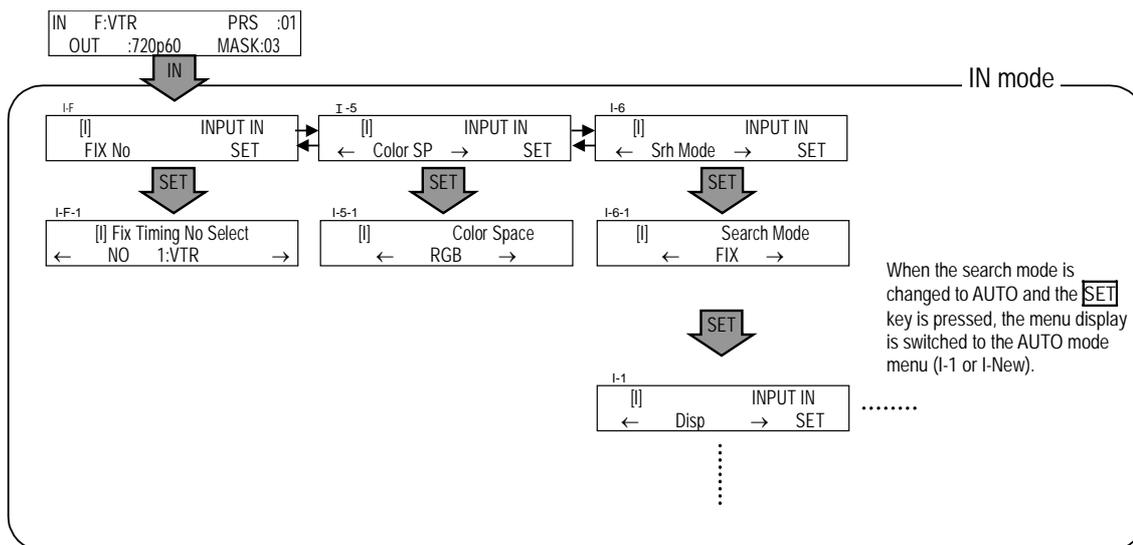


- When the input search mode is set to AUTO and there is NEW timing data:

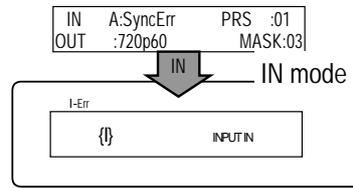
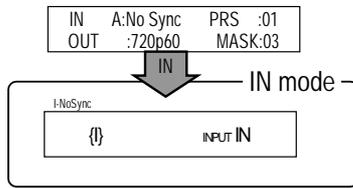




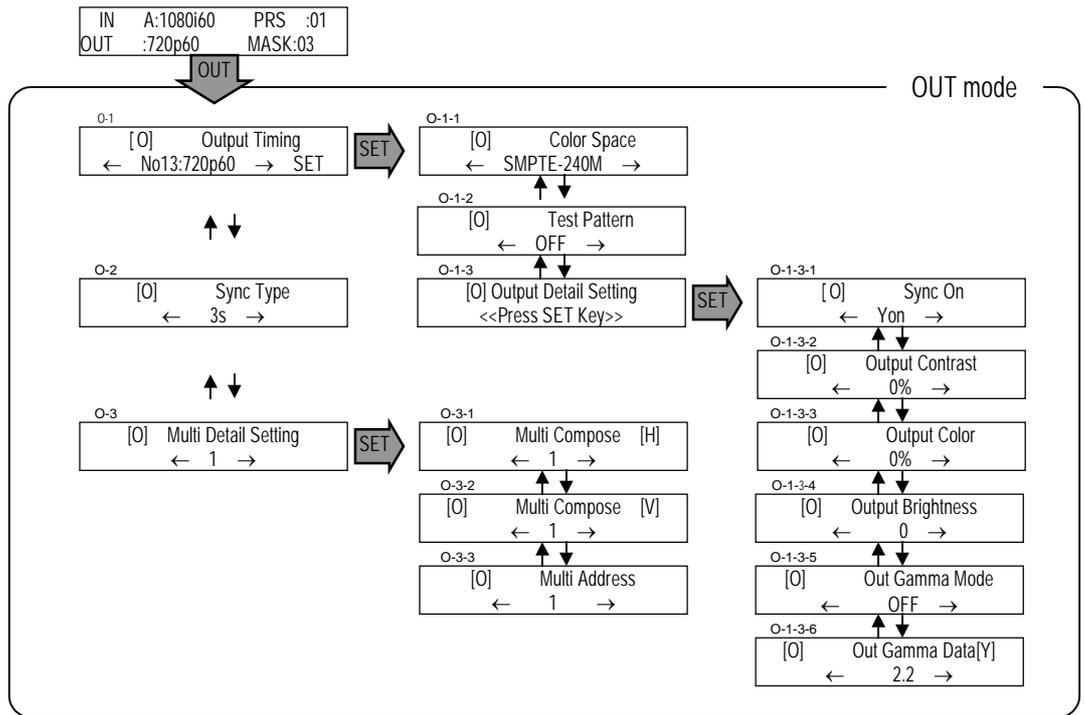
- When the input search mode is set to FIX:



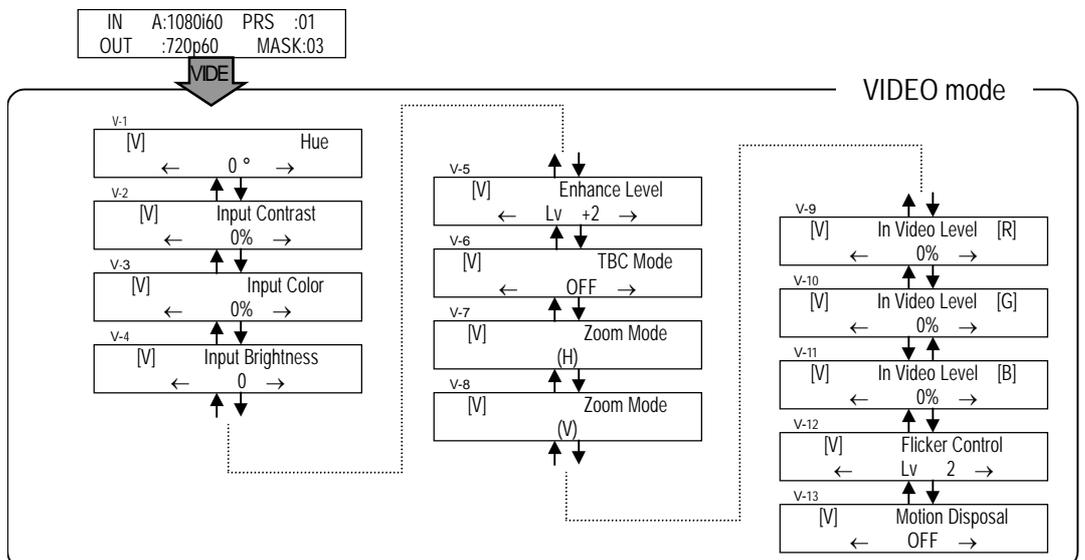
- When there are no input sync signals:
- When an input error has occurred



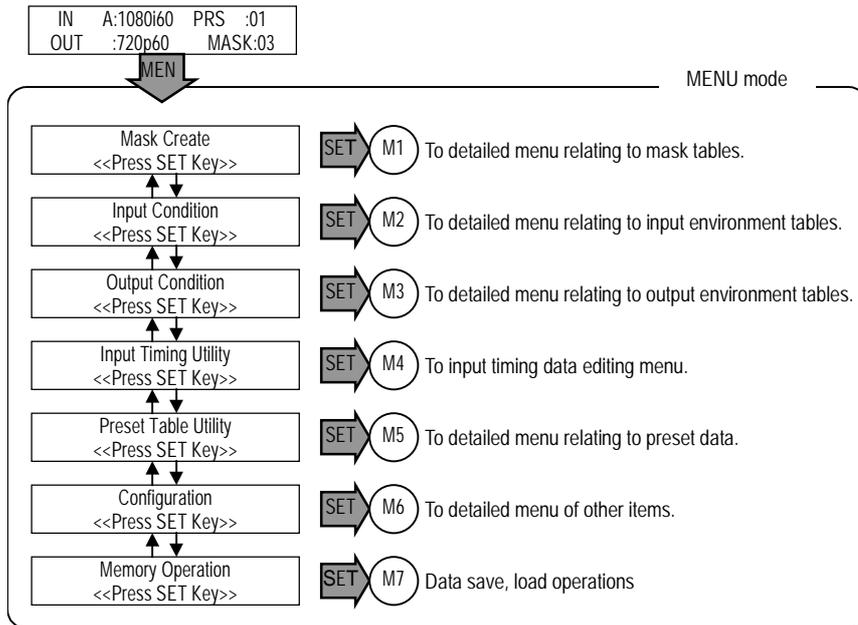
[2] OUT MODE

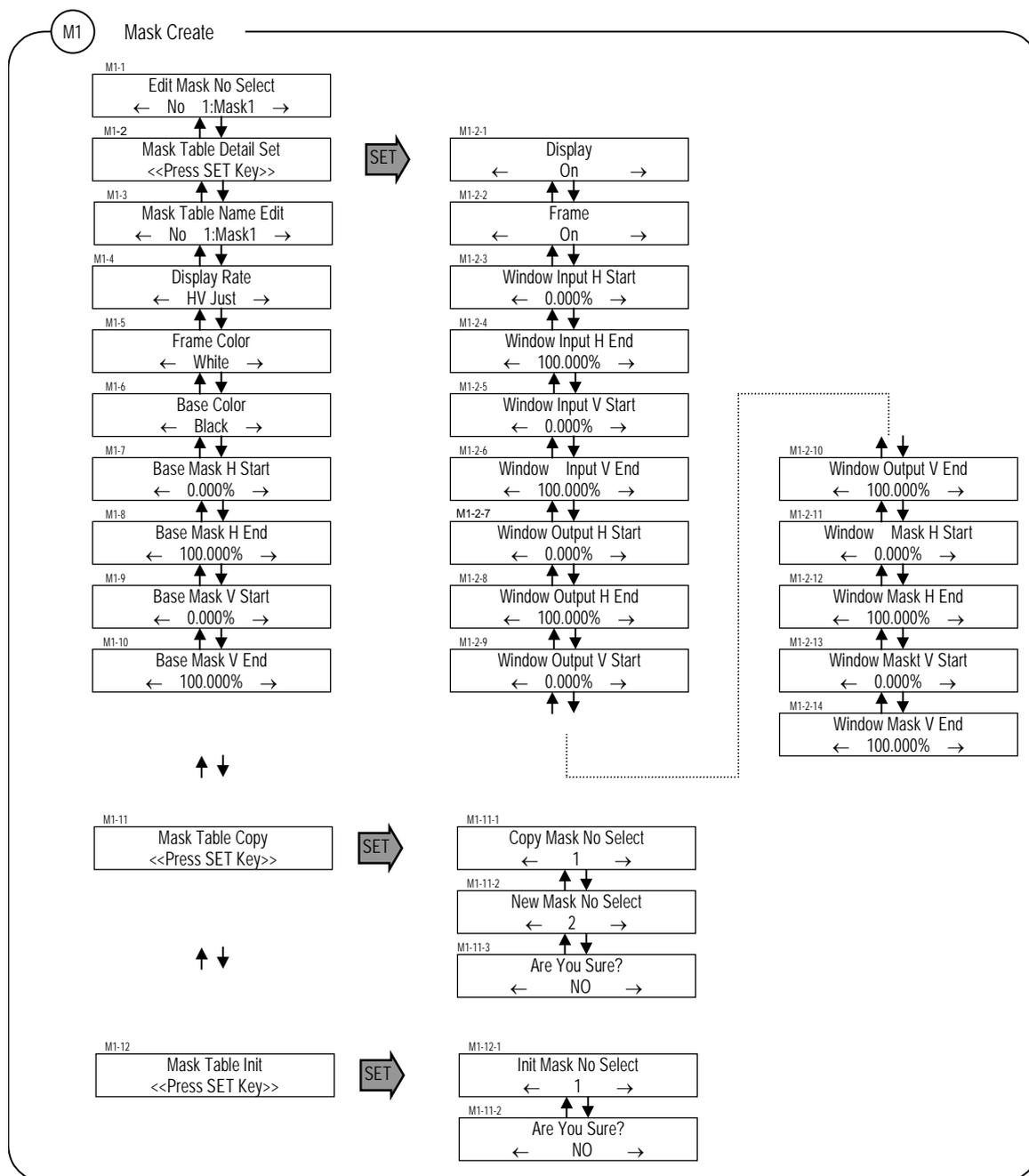


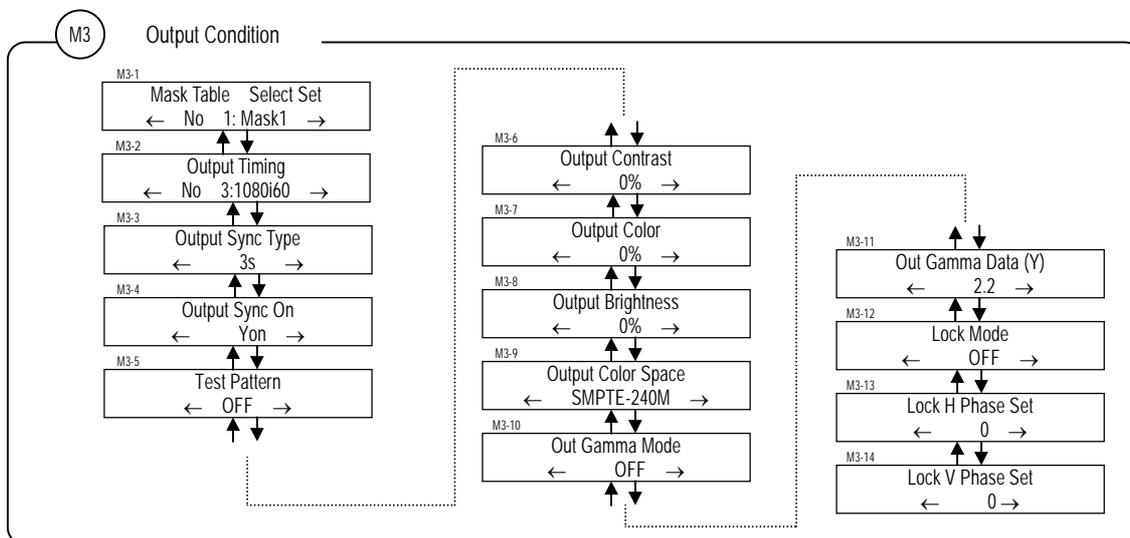
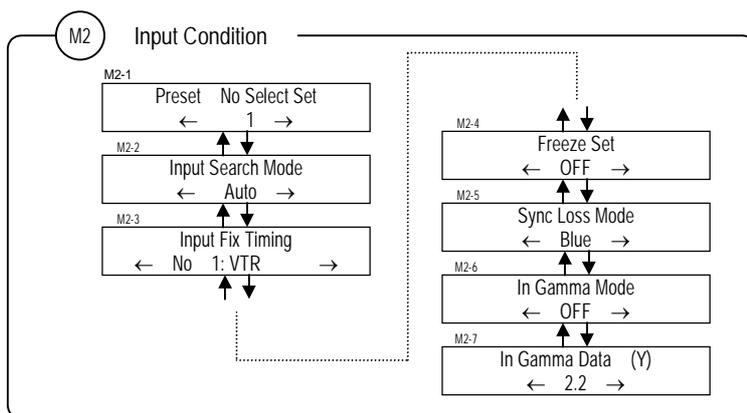
[3] VIDEO MODE

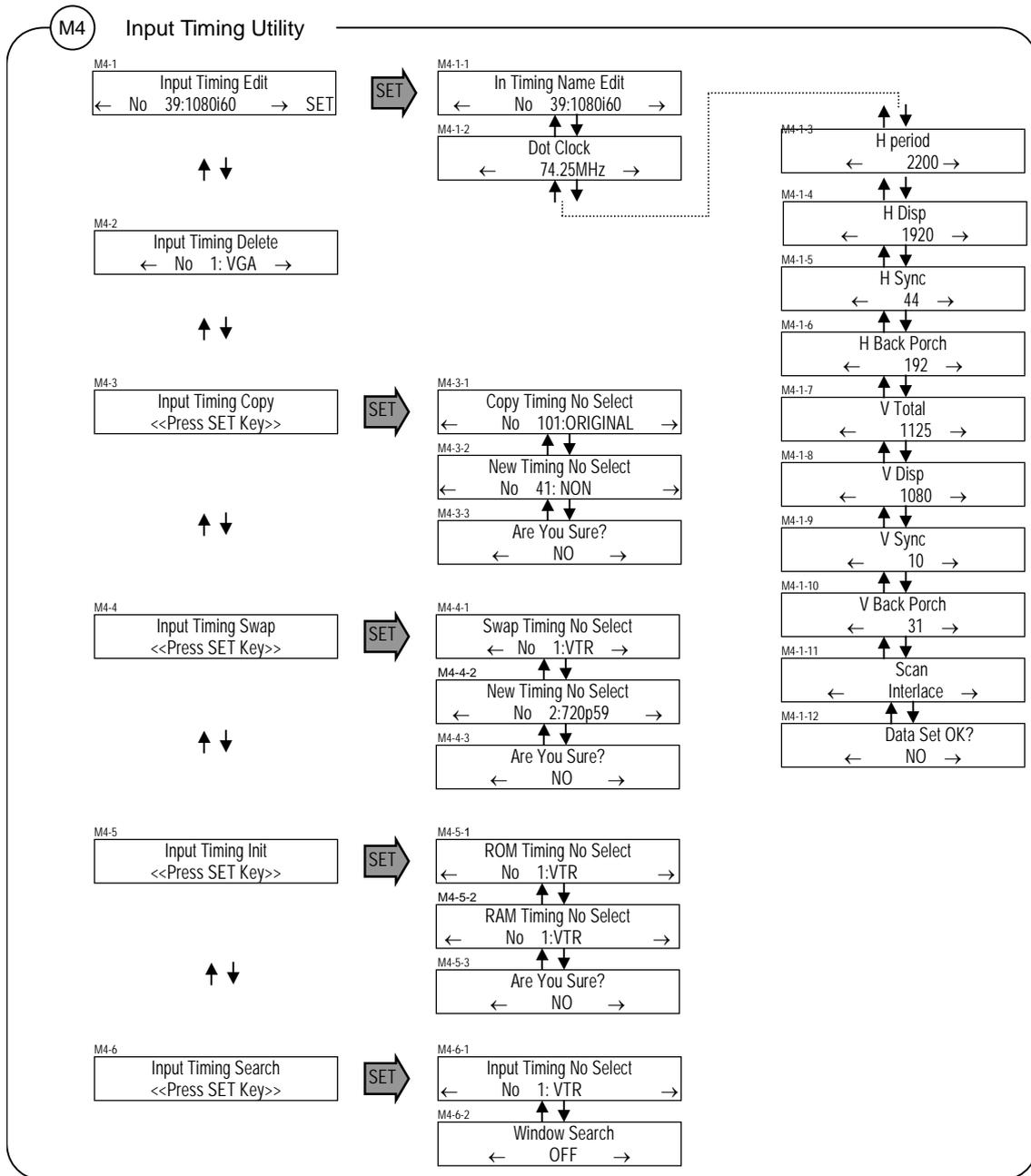


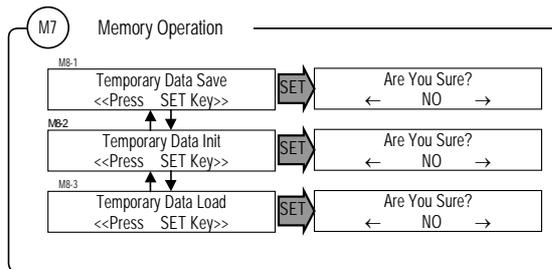
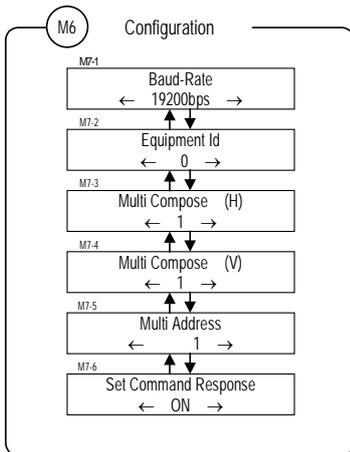
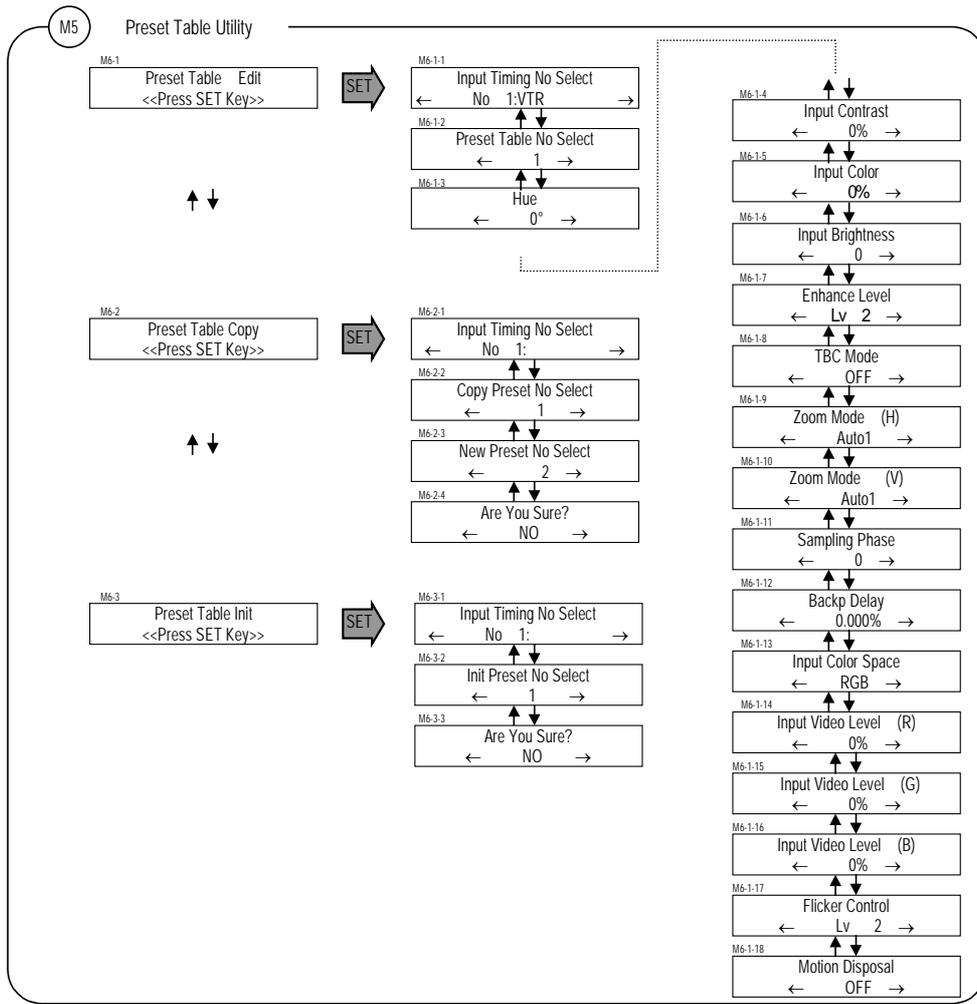
[4] MENU MODE









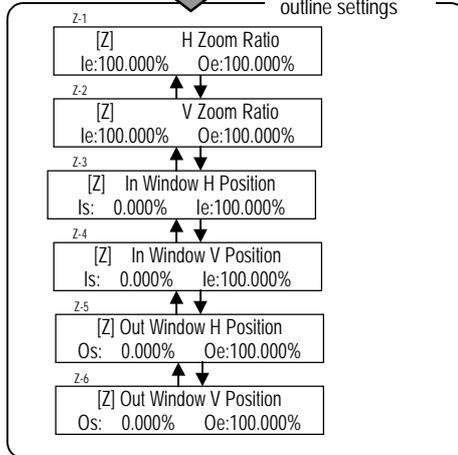


[5] Simplified image outline settings

IN A:1080i60 PRS :01
 OUT :720p60 MASK:03

SET+IN

Simplified image
 outline settings



6.2 List of settings

[1] INPUT TIMING DATA TABLE SETTING ITEMS

Item	Description	Setting	Menu No.
Name	Timing name	Not more than 8 ASCII characters	M4-1-1
Search	Search target	ON or OFF	M4-6-2
DotClock	Dot clock	17.00 to 162.00 (in 0.01 MHz increments) ^{*1}	M4-1-2
H Period	Horizontal period	200 to 3000 dots (in 2-dot increments)	M4-1-3 I-2-1 I-3-1
H Disp	Horizontal display period	128 to 2000 dots (in 2-dot increments)	M4-1-4 I-1-1 I-3-2
H Sync	Horizontal sync	6 to 500 dots (in 2-dot increments) ^{*2 *3}	M4-1-5 I-2-2 I-3-3
H Back Porch	Horizontal back porch	0 to 1/2H period dots (in 2-dot increments) ^{*3}	M4-1-6 I-1-2 I-2-3 I-3-4
V Total	Number of vertical lines	200 to 2000 lines (in 1-line increments)	M4-1-7
V Disp	Vertical display period	128 to 1320 lines (in 1-line increments) ^{*4}	M4-1-8 I-1-3 I-3-5
V Sync	Vertical sync	2 to 60 lines (in 1-line increments) ^{*4 *5}	M4-1-9
V Back Porch	Vertical back porch	0 to 1/2V total lines (in 1-line increments) ^{*4 *5}	M4-1-0 I-1-4 I-2-4 I-3-6
Scan	Scanning system	Interlace or progressive	M4-1-1

^{*1} 17.00 to 81.00 MHz for interlaced scanning

^{*2} H Sync \leq 1/2 H Period

^{*3} H Sync + H Back Porch \geq 96

^{*4} In 2-line increments for interlaced scanning

^{*5} V Sync + V Back Porch \geq 12

[2] PRESET TABLE SETTING ITEMS

Item	Description	Setting	Menu No.
HUE	Hue	-180 to +180°	M5-1-3 V-1
Input Contrast	Contrast	\pm 30%	M5-1-4 V-2
Input Color	Color	\pm 30%	M5-1-5 V-3
Input Brightness	Brightness	\pm 30 steps	M5-1-6 V-4
Enhance level	Enhancement effect	OFF, Lv \pm 1 to 4	M5-1-7 V-5
TBC Mode	TBC mode	OFF, MODE1, MODE2, BOTH	M5-1-8 V-6
Zoom Mode (H)	Zoom mode (H)	Auto1 to Auto3, Pixel	M5-1-9 V-7
Zoom Mode (V)	Zoom mode (V)	Auto1 to Auto3, Pixel	M5-1-10 V-8
Sampling Phase	Sampling phase	0 to 63 steps	M5-1-11 I-2-5 I-3-7 I-4-1
Backp Delay	Back porch delay	\pm 4 dots (set as a percentage)	M5-1-12 I-4-2
Input Color Space	Input color space	RGB, SMPTE-125M, SMPTE-240M, SMPTE-274M SMPTE-296M	M5-1-13 I-5-1
In Video level(R)	Input video level (R)	\pm 10% (0.7 \pm 10% V)	M5-1-14 V-9
In Video level(G)	Input video level (G)	\pm 10% (0.7 \pm 10% V)	M5-1-15 V-10
In Video level(B)	Input video level (B)	\pm 10% (0.7 \pm 10% V)	M5-1-16 V-11
Flicker Control	Flicker suppression	OFF, Lv1 to 3	M5-1-17 V-12
Motion Disposal	Moving image processing mode	OFF, 2-2 pull	M5-1-18 V-13

[3] INPUT ENVIRONMENT TABLE SETTING ITEMS

Item	Description	Setting	Menu No.
Preset Table	Preset number	1 to 10	M2-1
Input Search Mode	Input signal search mode	Auto/Fix	M2-2 I-6-1
Input Fix Timing	Fixed input timing data selection	Registered input timing data No.	M2-3 I-F-1
Freeze	Image freeze	OFF, ON, EX-ON	M2-4
Sync Loss Mode	Operation with input sync loss	Black, Red, Green, Yellow, Blue, Magenta, Cyan, White, WinOFF	M2-5
In Gamma Mode	Input gamma setting	OFF, Gamma, 1/Gamma, User1 to 4	M2-6
In Gamma Data (γ)	Input gamma correction (γ)	1.0 to 3.0	M2-7

[4] OUTPUT ENVIRONMENT TABLE SETTING ITEMS

Item	Description	Setting	Menu No.
Mask Table	Mask table No.	1 to 50	M3-1
Output Timing	Output timing	Registered output timing data No.	M3-2 O-1
Out Sync Type	Output sync type	H/V, 3s	M3-3 O-2
Out Sync On	Output sync on	OFF, Y-on	M3-4 O-1-3-1
Test Pattern	Test pattern	OFF, CROSS HATCH, BURST COLOR BAR, CIRCLE, CROSS, RAMP, FRAME, COMP	M3-5 O-1-2
Output Contrast	Contrast	$\pm 30\%$	M3-6 O-1-3-2
Output Color ^{*1 *2}	Color	$\pm 30\%$	M3-7 O-1-3-3
Output Brightness	Brightness	± 30 steps	M3-8 O-1-3-4
Output Color Space ^{*1}	Output color space	SMPTE-240M, SMPTE-274M SMPTE-296M	M3-9 O-1-1
Out Gamma Mode	Output gamma setting	OFF, Gamma, 1/Gamma, User	M3-10 O-1-3-5
Out Gamma Data(γ)	Output gamma correction	1.0 to 3.0	M3-11 O-1-3-6
Lock Mode	Sync lock mode	OFF, Auto, EXT-ON, IN-ON	M3-12
Lock H Phase	Lock horizontal phase adjustment	± 999 dots	M3-13
Lock V Phase	Lock vertical phase adjustment	± 2048 lines	M3-14

[5] MASK TABLE SETTING ITEMS

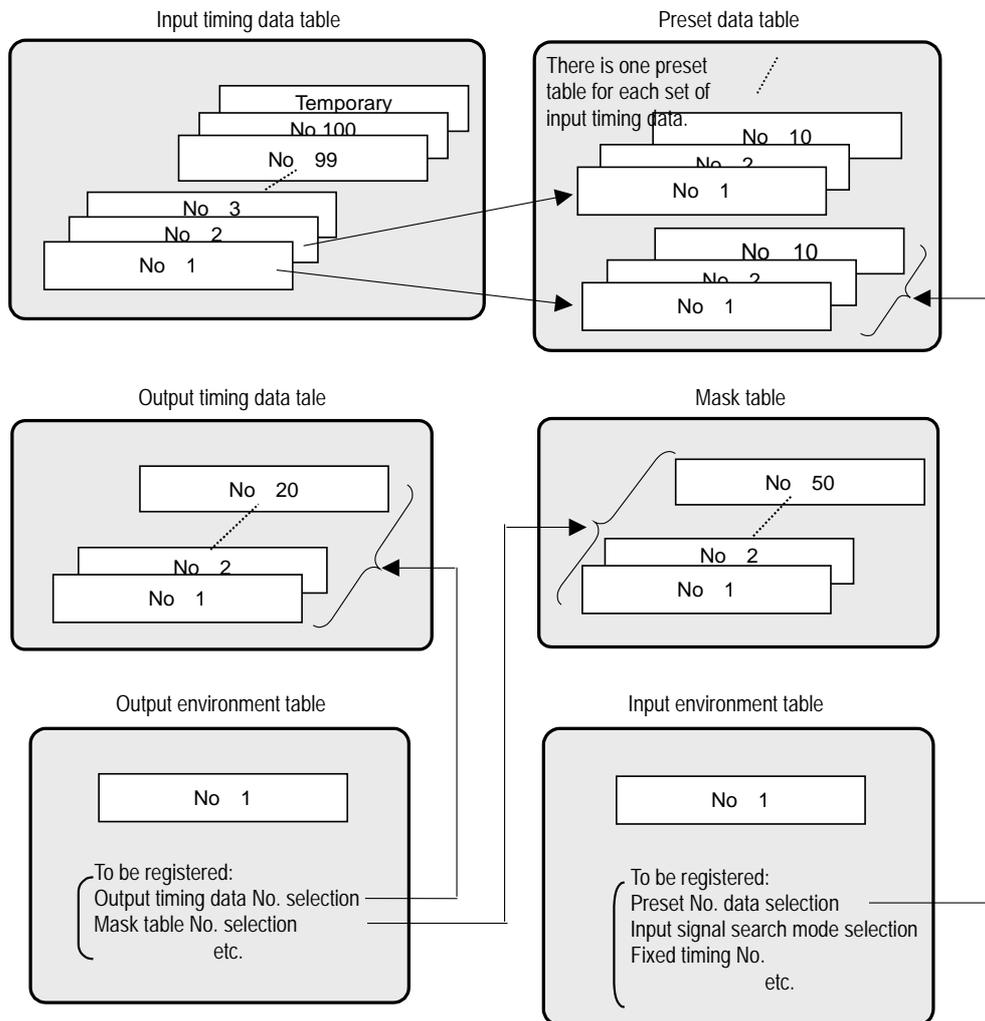
Item	Description	Setting	Menu No.
Mask Table Name Edit	Mask table name	Not more than 8 ASCII characters	M1-3
Display Rate	Just display setting	HVJust, HJust, VJust,	M1-4
Frame Color	Frame color	Black, Red, Green, Yellow, Blue, Magenta, Cyan, White	M1-5
Base Color	Base color	Black, Red, Green, Yellow, Blue, Magenta, Cyan, White	M1-6
Base Mask H Start	Base display H start coordinate	0.000 to 99.999%	M1-7
Base Mask H End	Base display H end coordinate	0.001 to 100.000%	M1-8
Base Mask V Start	Base display V start coordinate	0.000 to 99.999%	M1-9
Base Mask V End	Base display V end coordinate	0.001 to 100.000%	M1-10
<<Mask Detail>>			
Display	Window display ON/OFF	ON/OFF	M1-2-1
Frame	Frame display ON/OFF	ON/OFF	M1-2-2
Window Input H Start	Input H start coordinate	0.000 to 99.999%	M1-2-3
Window Input H End	Input H end coordinate	0.001 to 100.000%	M1-2-4
Window Input V Start	Input V start coordinate	0.000 to 99.999%	M1-2-5
Window Input V End	Input V end coordinate	0.001 to 100.000%	M1-2-6
Window Output H Start	Output H start coordinate	0.000 to 99.999%	M1-2-7
Window Output H End	Output H end coordinate	0.001 to 100.000%	M1-2-8
Window Output V Start	Output V start coordinate	0.000 to 99.999%	M1-2-9
Window Output V End	Output V end coordinate	0.001 to 100.000%	M1-2-10
Window Mask H Start	Display H start coordinate	0.000 to 99.999%	M1-2-11
Window Mask H End	Display H end coordinate	0.001 to 100.000%	M1-2-12
Window Mask V Start	Display V start coordinate	0.000 to 99.999%	M1-2-13
Window Mask V End	Display V end coordinate	0.001 to 100.000%	M1-2-14

[6] CONFIGURATION ITEMS

Item	Description	Setting	Menu No.
Baud-Rate	Transfer rate	9600, 19200, 38400 (bps)	M6-1
Equipment Id	Equipment ID	0 to 99	M6-2
Multi Compose(H)	Multi configuration (H)	1 to 20*	M6-3 O-3-1
Multi Compose(V)	Multi configuration (V)	1 to 20*	M6-4 O-3-2
Multi Address	Multi address	1 to 100	M6-5 O-3-3
Set Command Response	Setting command response	ON/OFF	M6-6

* The following equation applies to these items: Multi Compose (H) x Multi Compose (V) ≤ 100.

6.3 Data table configuration diagram



6.4 Rear panel DIP switches

The demonstration displays which appear during setting menu operations can be turned ON or OFF using the rear panel DIP switches. The 8-bit DIP switches are set as shown below. (The OFF setting is established at the bottom position.)

bit	Description	Setting	Details
8	Reserve	OFF	
7	Menu demonstration display setting	OFF	Menu demonstration display ON
		ON	Menu demonstration display OFF
6	Reserve	OFF	
5	Reserve	OFF	
4	Remote mode setting	OFF	Remote mode: Normal
		ON	Remote mode: Mask
3	Reserve	OFF	
2	Reserve	OFF	
1	Reserve	OFF	

7 MAIN SPECIFICATIONS

- Input system specifications

Item		Specification
Scanning system		Progressive, interlaced
A/D conversion frequency		17 to 162 MHz
Horizontal frequency		15 to 125 kHz
Vertical frequency		24 to 100 Hz (depends on input/output resolution) (30 to 100 Hz for G-ON)
Video signals	Color format	Analog RGB Analog YPbPr/YCbCr
	Video data resolution	8 bits
	Input level	0.7 Vp-p, 75-ohm termination (can be finely adjusted over a $\pm 10\%$ range in 1% increments)
	Number of display pixels	Max. 1920 x 1280
	Number of input channels	1 system (BNC)
	Connector through-out connection	Provided
	Termination switching	Automatic 75-ohm termination, high-impedance state with through-out connection
Sync signals	G-ON	0.3 Vp-p, 75-ohm termination HDTV tri-level synchronization
	CS	0.3 to 4.0 Vp-p, 75-ohm termination (positive/negative polarity) TTL level (positive/negative polarity) HDTV tri-level synchronization
	HS/VS	0.3 to 4.0 Vp-p, 75-ohm termination (positive/negative polarity) TTL level (positive/negative polarity)
	Number of input channels	1 system (BNC)
	Connector through-out connection	Provided
	Termination switching	Automatic 75-ohm termination, high-impedance state with through-out connection

- Input system (external reference) specifications

Item		Specification
Sync signals	CS	HDTV binary (0.3 Vp-p, 75-ohm termination) HDTV tri-level (± 0.3 Vp-p, 75-ohm termination)
	Number of input channels	1 system (BNC)
	Connector through-out connection	Not provided

- Output system (analog output) specifications

Item		Specification
Output timing		Equivalent to digital OUT (HD-SDI)
Video signals	Color format	Equivalent to digital OUT (HD-SDI)
	Video data resolution	10 bits (with gamma correction)
	Output level	0.7 Vp-p for Y, Pb, Pr; 75-ohm termination (excluding sync signals)
	Number of output channels	1 system
Sync signals	YPbPr-ON Y-ON	Tri-level synchronization
	CS	Tri-level synchronization
	HS/VS	TTL level (negative polarity)

- Output system (digital output) specifications

Item	Specification
Output timing	1920 x 1035 x 60/59.94i 1920 x 1080 x 60/59.94i 1920 x 1080 x 50i 1920 x 1080 x 30/29.97p 1920 x 1080 x 25p 1920 x 1080 x 24/23.98p 1920 x 1080 x 24/23.98sF 1280 x 720 x 60/59.94p 1280 x 720 x 50p 1280 x 720 x 30/29.97p 1280 x 720 x 25p 1280 x 720 x 24/23.98p
Connectors	BNC, 2 systems
Color format	YpbPr (SMPTE240M, SMPTE274M, SMPTE296M)
Video data resolution	10 bits (with gamma correction)
4:4:4 → 4:2:2 interpolation	Simple attrition

- Control system specifications

Item	Specification	
Remote control	Communication standard	RS-232C or RS-422 (option requested prior to shipment)
	Transfer rate	9600, 19200, 38400 bps
	Data format	1 start bit, 8-bit data length, 1 stop bit
	Connector	D-Sub 9-pin connector
Display unit	Fluorescent display tube	
Control operations	Front panel switches, communication of commands	
Wire remote control unit (option)	D-Sub 9-pin connector	

- General specifications

Item	Specification	
Power consumption	Effective power	80W MAX
	Apparent power	150VA MAX
	Power factor	0.53 TYP
Amount of heat generated	69Kcal MAX	
Power requirements	AC100 - 120, 200 - 240V (50/60Hz)	
Operating temperature	5 to 40°C. (no condensation)	
Operating humidity	30 to 80% RH (no condensation)	
Dimensions	430(W) x 44(H) x 510(D) mm (excluding protrusions)	
Weight	Approx. 7 kg	

- Accessories supplied

AC cable	1 pc
Power supply 3-pin/2-pin conversion adapter	1 pc
EIA rack-mounting brackets	1 set
Operating instructions (main unit, commands)	1 copy

* Remote control box (RB-1636) available as an optional accessory

- RS-232C port

The SC-2045 comes with an RS-232C port on its rear panel for the control interface with a PC.

[RS-232C specifications]

Transfer rate	9600, 19200 or 38400 bps
Communication system	Full duplex
Start bit	1 bit
Data length	8 bits
Stop bit	1 bit

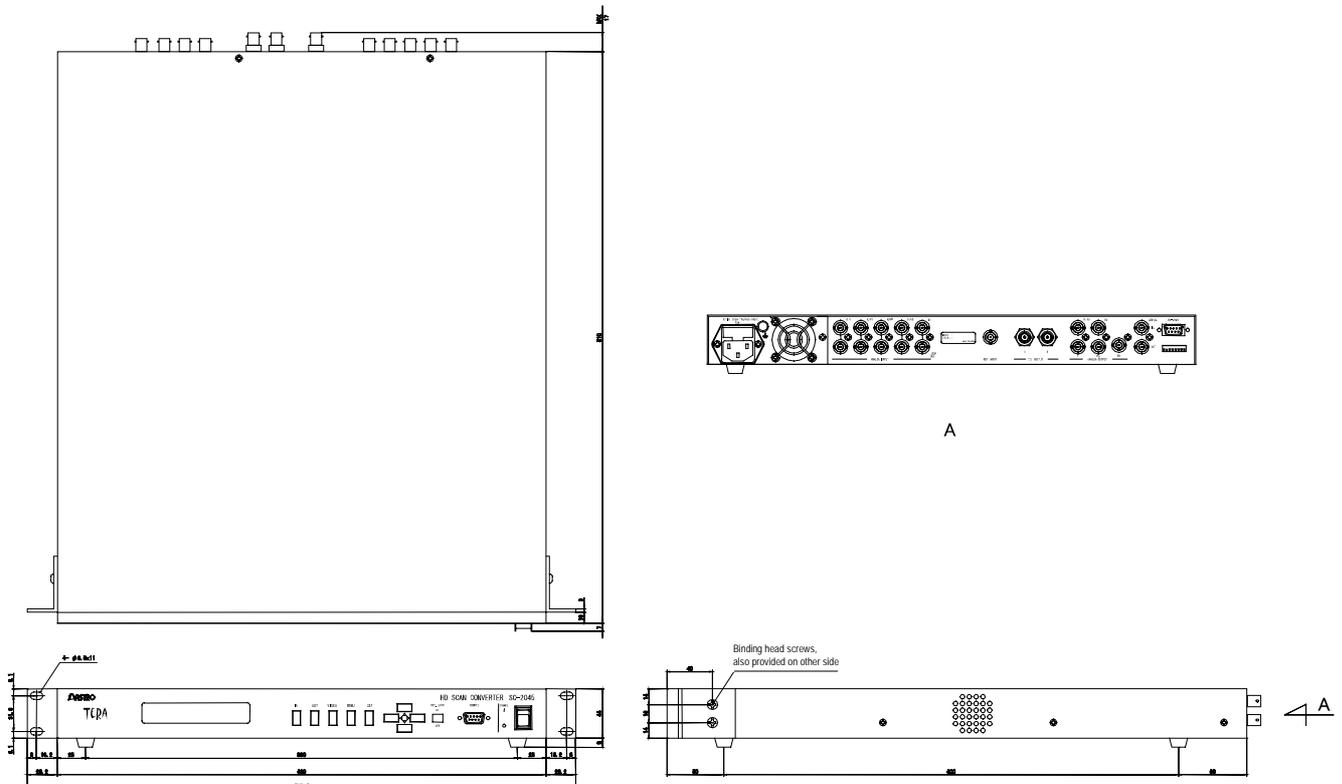
[RS-232C connector specifications]

Model: D-Sub 9-pin (male)

<p>SC-2045 pin layout</p>	Pin	SC-2045 signal		Computer signal	Pin
	2	SD	→	RD	2
	3	RD	←	SD	3
	5	FG	-	FG	5
	8	RS (note)	→	CS	8

* All pins not shown in the figure are not connected; pins 4 and 6 are shorted internally.
 (Note) Always marked
 * For details on the communication protocol, refer to the Command Manual.

- Outline drawings



REVISION HISTORY

Ver.	Date	Page	Section	Description of revision	Corresponding ROM Ver.
First edition	2003/03/20				

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