astro Snap **Line Doublers**

# SC-2054-A, SC-2054-S, SC-2054-T, SC-2054-D Instruction Manual

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Ver.1.00

**ASTRODESIGN, INC.**

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# CONTENTS

# INTRODUCTION

Thank you very much for purchasing this model SC-2054-A, S, T or D line doubler.

This manual contains descriptions of the functions provided by the SC-2054-A, S, T or D as well as the operation procedures, checkpoints and precautions to be observed.

Since improper handling may result in malfunctioning, before using the SC-2054A, S, T or D, please read through these instructions to ensure that you will operate the line doubler correctly.

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

# SAFETY PRECAUTIONS

## ⚠ WARNING

### 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 line doubler or drop inflammable objects or metal parts into it. Operating the line doubler under these conditions may cause a fire, electric shocks and/or malfunctioning.

### Concerning disassembly of the product

- Do not attempt to disassemble the line doubler. 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-240V for this line doubler. The line doubler 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 line doubler is to be operated in a normal indoor environment. 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 degrees Celsius.
- Locations where the ambient humidity is outside the range of 30 to 80% RH.
- Near air conditioners or locations which are 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 line doubler may be splashed with water, oil, chemicals, etc.
- Locations where vibrations may be transmitted from the floor to the line doubler
- Unstable locations
- The ventilation holes are provided in the side panels to prevent the internal temperature from rising. 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 line doubler.

### If trouble or malfunctioning should occur

- In the unlikely event that trouble or malfunctioning has occurred in the line doubler, disconnect its power cord, and contact your dealer or an Astrodesign sales representative.

## Concerning use

### Precautions concerning copyrights

- The copying or duplication of copyright materials for purposes other than personal use without the permission of the holders of the copyrights and holders or other rights is prohibited by copyright laws and the stipulations of related international agreements. ASTRODESIGN will in no way be liable in the event that the line doubler is used in a manner which infringes these laws and stipulations.

# 1. Concerning the SC-2054-A/S/T/D

## 1.1 Introduction

Using Astro's original high-accuracy I/P conversion technology called "astrosnap" (which is short for Astro SuperNatural motion Picture), this line doubler makes it possible to convert NTSC or PAL system standard composite video signals, Y/C video signals, YCbCr component signals (SC-2054-A/T) and SD-SDI serial signals (SC-2504-S/D) into double-speed progressive RGB signals and DVI digital signals (SC-2504-T/D). It comes with a 2-3/2-2 pull-down processing function to display film images and computer graphics images with no ensuing deterioration in their resolution.

## 1.2 Features

### 1.2.1 "astrosnap" I/P conversion function

By using the newly developed algorithms provided by "astrosnap" for the processing which converts interlaced signals into progressive signals, high-quality progressive images free from image quality deterioration can be enjoyed.

### 1.2.2 2-3/2-2 pull-down function

By automatically identifying the 24- or 30-frame video data of film images, computer graphics images, etc. and by using the optimum I/P conversion processing, high-quality progressive images free from image quality deterioration can be enjoyed.

### 1.2.3 3-dimensional Y/C separation function

When composite NTSC video signals are supplied, frame-to-frame Y/C separation is achieved using a 3-dimensional Y/C separation circuit for still images while highly accurate Y/C separation is achieved using a comb filter for moving images. (SC-2054-A/T only)

### 1.2.4 10-bit processing

The color space conversion of YCbCr signals into RGB signals and the I/P conversion of interlaced signals into progressive signals are performed with a 10-bit accuracy.

### 1.2.5 Oversampling output (54 MHz)

Deterioration in the image quality induced by noise is minimized by oversampling processing and digital post-filtering. (SC-2054-A/S only)

### 1.2.6 External reference sync function, frame synchronizing function

Output signals synchronized with the reference signal can be obtained by using the external reference sync function. Further, stable outputs can be provided for laser disc signals, home VTR signals and other video signals with high jitter levels by using a crystal oscillator and buffer memory.

### 1.2.7 Image quality adjustment functions

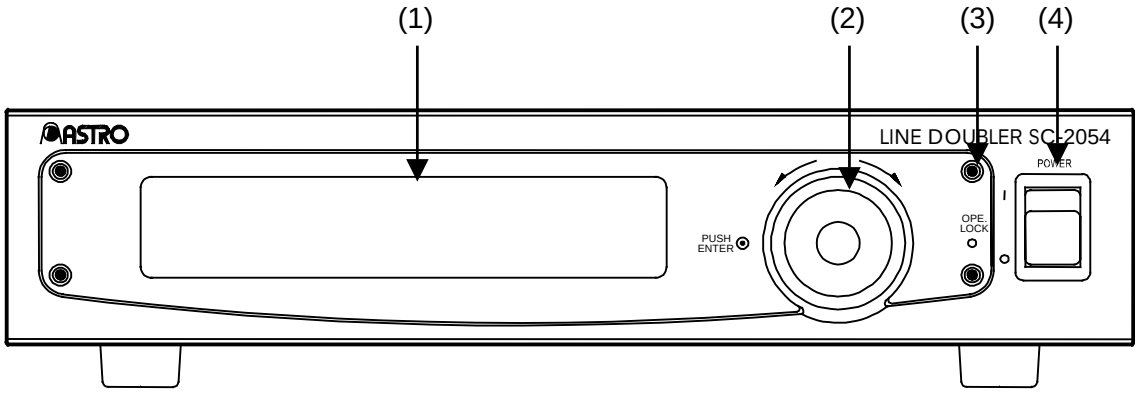
Utilization of the following image quality adjustment functions enables the image quality to be adjusted to suit the video source and display used.

- Black level adjustment function
- White level adjustment function
- White balance adjustment function
- Enhance adjustment function
- Hue adjustment function
- Color adjustment function
- Noise reduction adjustment function

## 1.3 Parts and their functions

Main unit/front panel

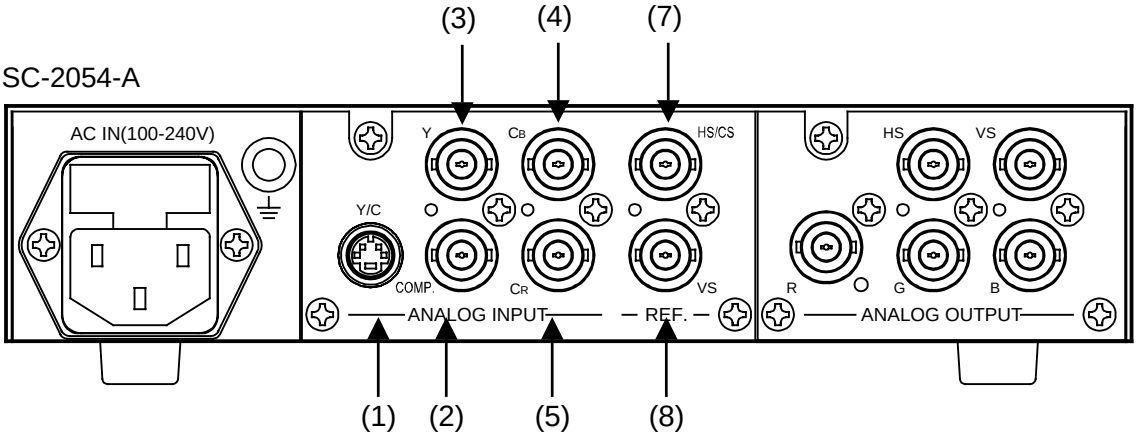
Same for all models (SC-2054-A/S/T/D)



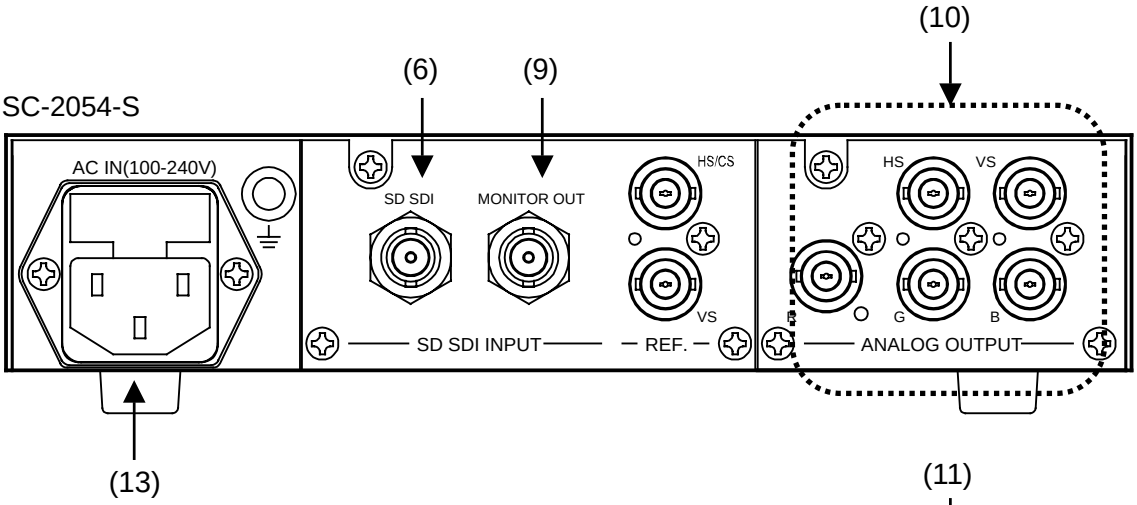

| No. | Part | Description |
|---|---|---|
| (1) | Display | The default display appears when the main unit is started up. The input signals, input channels, external lock status and pull-down status are displayed. Refer to "3.1 What appears on the display."<br>Both menu items and setting screens appear on the display.<br>If a menu screen is displayed and the shuttle button is not operated for a minute or so, the menu screen is replaced with the default screen. If AUTO has been selected as the dimmer setting, the display brightness is turned down if shuttle button is not operated for 3 minutes or so. |
| (2) | Shuttle button | Use this to change the menu items and settings. Refer to "3.2 Menu operation methods." |
| (3) | OPE LOCK LED | This lights when ON has been selected as the operation lock setting. "Refer to "3.3.10 Operation lock setting." |
| (4) | POWER | This is the power switch. After turning off the power, wait at least 5 seconds before turning it back on. |

Main unit/rear panel

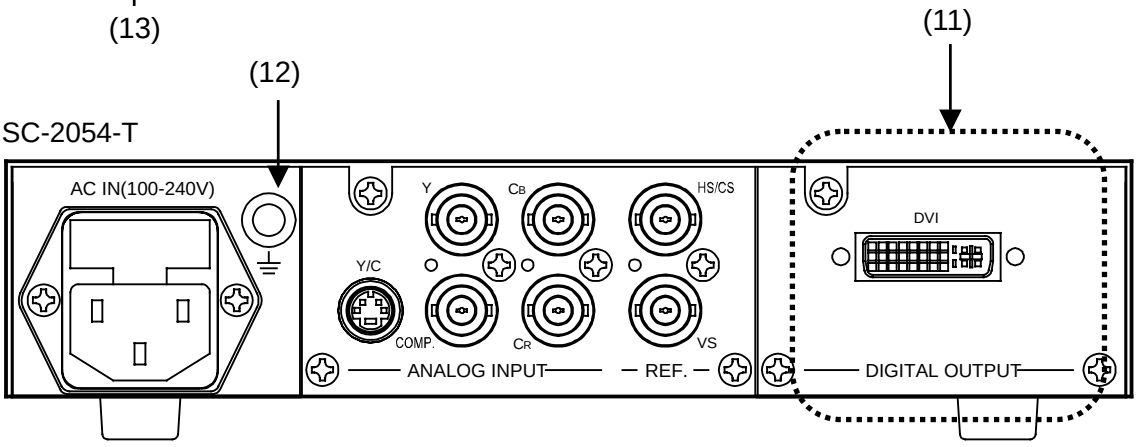
SC-2054-A



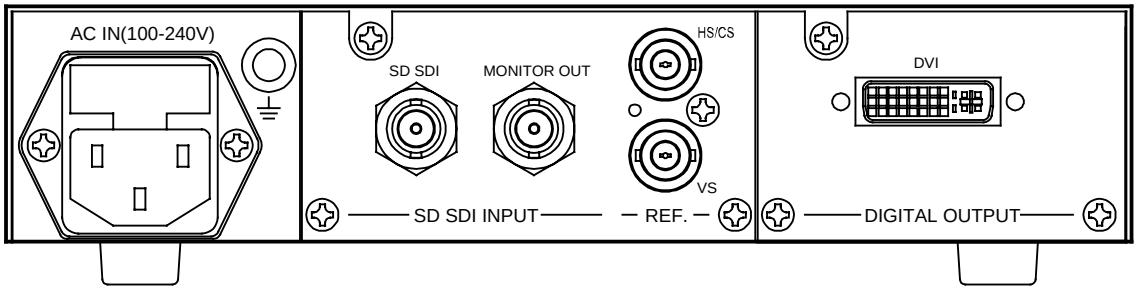

SC-2054-S




SC-2054-T




SC-2054-D



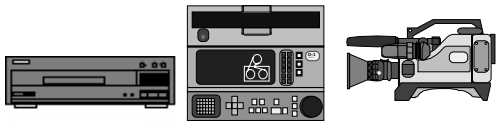
| No. | Part | Description |
|---|---|---|
| (1) | Y/C input connector | Input connector for the Y/C video signals (S-VIDEO). (S connector) (SC-2054-A/T only) |
| (2) | COMP. input connector | Input connector for the composite video signals (VIDEO). (BNC connector) (SC-2054-A/T only) |
| (3) | Y input connector | Y video input connector for the component video signals. (BNC connector) (SC-2054-A/T only) |
| (4) | Cb input connector | Cb video input connector for the component video signals. (BNC connector) (SC-2054-A/T only) |
| (5) | Cr input connector | Cr video input connector for the component video signals. (BNC connector) (SC-2054-A/T only) |
| (6) | SDI input connector | Input connector for the SD SDI (D1) signals. (BNC connector) (SC-2054-S/D only) |
| (7) | REF HS/CS input connector | Input connector for the external reference HS sync signal or CS sync signal. (BNC connector) |
| (8) | REF VS input connector | Input connector for the external reference VS sync signal. (BNC connector) |
| (9) | SDI monitor output connector | Output connector for the SD SDI (D1) signals. (BNC connector) (SC-2054-S/D only) |
| (10) | R video output connector | R video output connector. (BNC connector) (SC-2054-A/S only) |
| | G video output connector | G video output connector. (BNC connector) (SC-2054-A/S only) |
| | B video output connector | B video output connector. (BNC connector) (SC-2054-A/S only) |
| | HS output connector | HS sync signal output connector. (BNC connector) (SC-2054-A/S only) |
| | VS output connector | VS sync signal output connector. (BNC connector) (SC-2054-A/S only) |
| (11) | Digital output connector | TMDS video signal output connector. (DVI-I connector, 29 pins) (SC-2054-T/D only) |
| (12) | FG terminal | The frame ground is connected here. |
| (13) | AC power socket | The accessory power cable is connected here. |

# 2. Connections with peripherals units

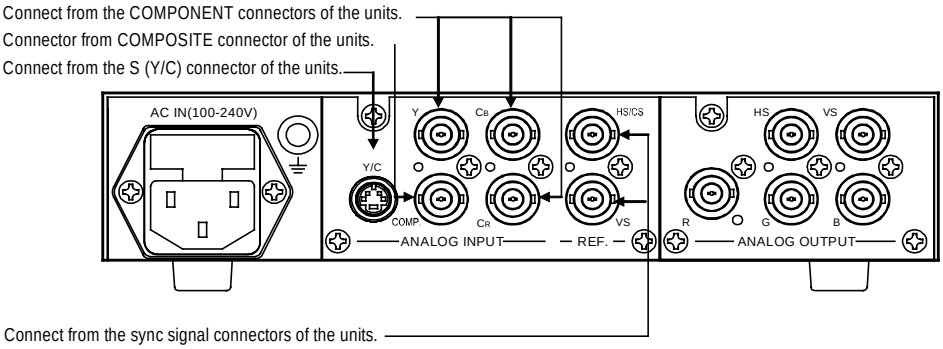
## 2.1 Connecting the input signals

As shown in the figures below, connect the output signals (YCbCr, Y/C, composite, SD SDI) of the VTR, DVD player or other unit to the SC-2054's input connectors.

SC-2054-A/T

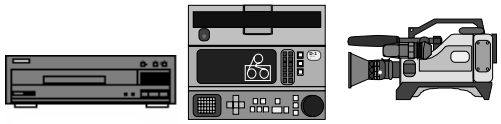


DVD or LD player　　VTR　　Camera

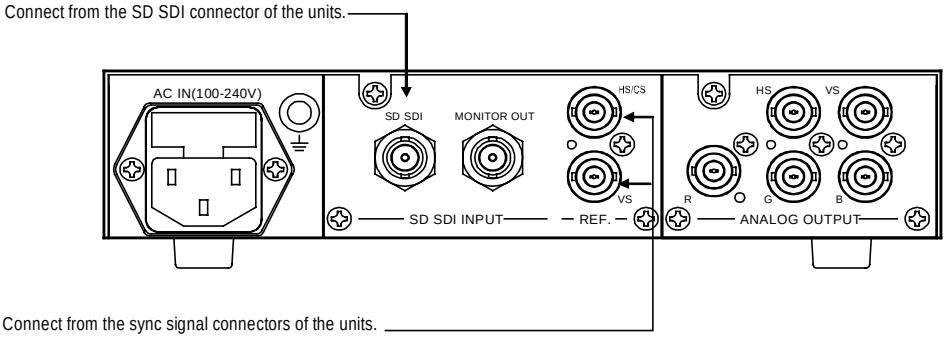



* Connect these connectors only when using an external reference.

SC-2054-S/D



DVD or LD player　　VTR　　Camera




* Connect these connectors only when using an external reference.

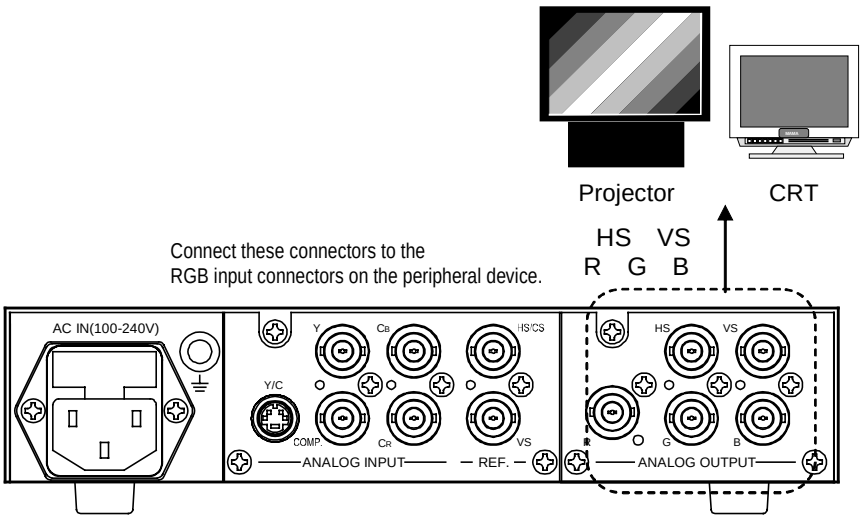
## 2.2 Connecting the output signals

### 2.2.1 Connecting the line doubler to a display unit

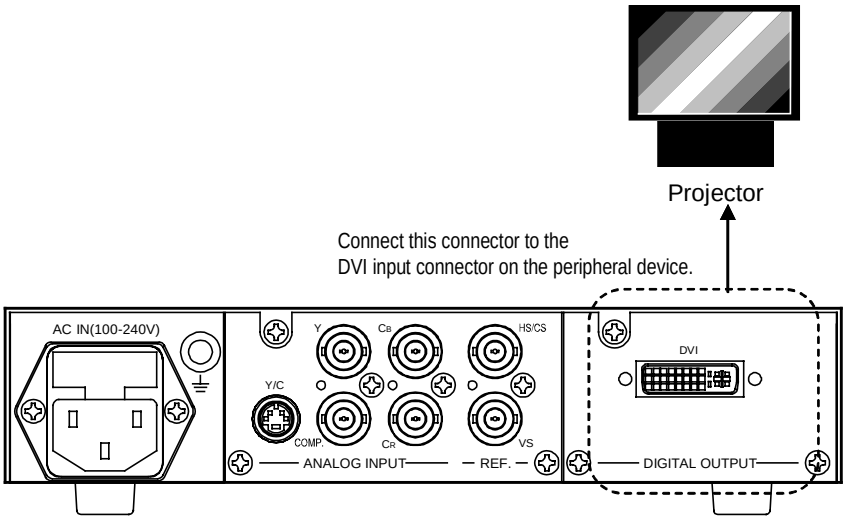
As shown in the figures below, connect the SC-2054's output signals from the output connectors (RGB/HS/VS, DVI) in a manner which meets the input conditions of the peripheral connectors.

* Depending on the specifications of the display unit, some output signals may not be displayed. Check these specifications before proceeding with the connections.

SC-2054-A/S




SC-2054-T/D

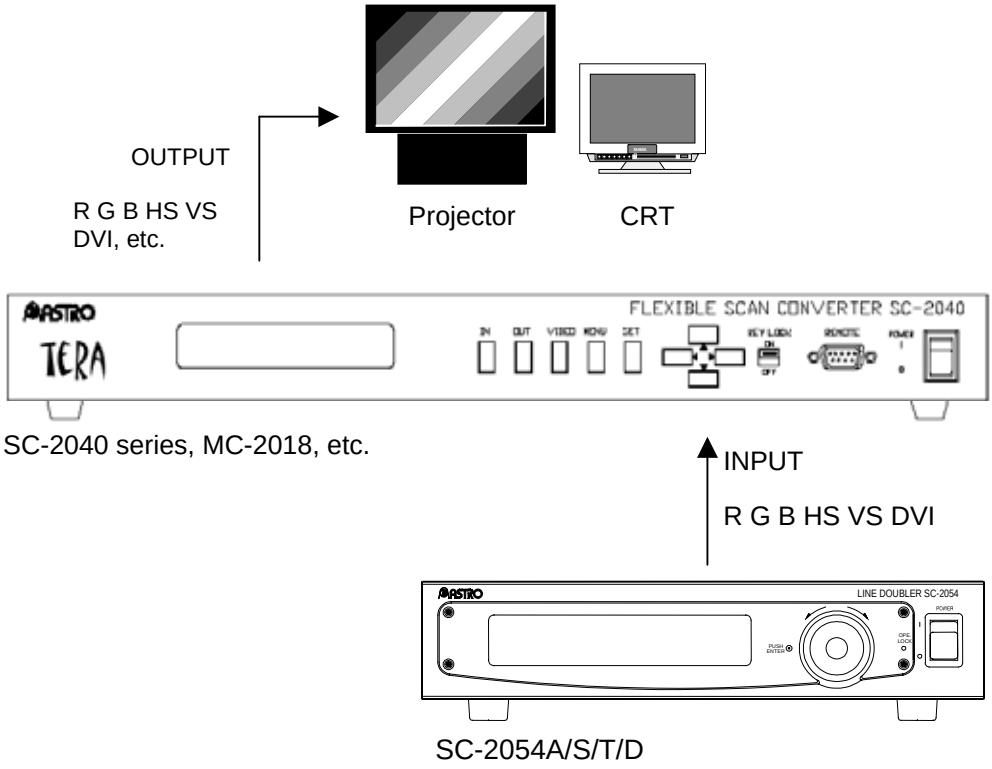



* The maximum allowable length of the DVI cable is 5 meters.

### 2.2.2 Connecting the line doubler to a scan converter

An Astro scan converter (such as SC-2040 series and MC-2018) can be connected to the SC-2054's output signals, as shown in the figure below. The SC-2054-A/S/T/D models provide the output video timing values listed in the tables below. By setting these values to the input video timing values of the scan converter, high-quality images can be enjoyed.

The same high-quality images can be enjoyed also when the input video timing values listed in the tables below can be set in the display unit.




SC-2054-A/S output video timing designations

| SC-2054 | | Clock | Hperiod | Hdisp (*2) | Hsync | Hbp (*2) | Vtotal | Vdisp (*2) | Vsync | Vbp (*2) | Scan |
|---|---|---|---|---|---|---|---|---|---|---|---|
| INPUT | OUTPUT | | | | | | | | | | |
| NTSC-M<br>480/60I | 480/60P | 54.00MHz | 1716 | 1440 | 126 | 118 | 525 | 487 | 6 | 26 | Progressive |
| PAL-BDGHI<br>576/50I | 576/50P | 54.00MHz | 1728 | 1440 | 126 | 138 | 625 | 576 | 5 | 39 | Progressive |

SC-2054-T/D (SC-2054-A/S) output video timing designations (*1)

| SC-2054 | | Clock | Hperiod | Hdisp (*2) | Hsync | Hbp (*2) | Vtotal | Vdisp (*2) | Vsync | Vbp (*2) | Scan |
|---|---|---|---|---|---|---|---|---|---|---|---|
| INPUT | OUTPUT | | | | | | | | | | |
| NTSC-M<br>480/60I | 480/60P | 27.00MHz | 858 | 720 | 63(62) | 59(60) | 525 | 487 | 6 | 26 | Progressive |
| PAL-BDGHI<br>576/50I | 576/50P | 27.00MHz | 864 | 720 | 63(62) | 69(70) | 625 | 576 | 5 | 39 | Progressive |

Values in parentheses are used by models with settings in 2-dot increments.

*1: These timing designations can also be used by the SD-2054-A/S. Use them for a model in which the SC-2054-A/S output video timing value designations listed above cannot be set.

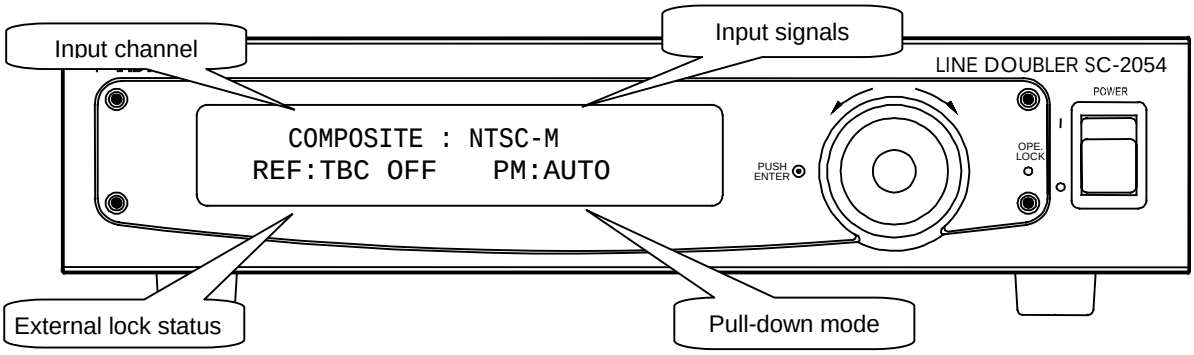
*2: The above output video timing designations apply to the effective video display area of the SC-2054-A/S/T/D. If unnecessary video signals are superimposed at the top and bottom or left and right of the screen, adjust the Hdisp/Hbp and Vdisp/Vbp values to mask them.

* For details on the parameters, refer to "6.1.8 Timing table."

# 3. Operation methods

## 3.1 What appears on the display

When the unit is started up, the following settings and other statuses appear on the front display. (Default screen)

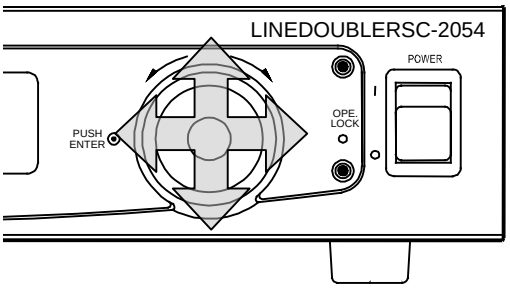



| | | |
|---|---|---|
| Input signals | The current input signals are displayed here. | |
| | NTSC-M | NTSC video signals |
| | PAL-M *1 | PAL-M video signals |
| | PAL-BDGHI | PAL-B, PAL-D, PAL-G, PAL-H, PAL-I video signals |
| | PAL-N | PAL-N video signals |
| | SECAM *1 | SECAM video signals |
| | 480/60I | Component 60 Hz video signals |
| | 576/50I | Component 50 Hz video signals |
| | Not Std | Non-standard video signals or other signals |
| | No Signal (No Sync) | No input video signals detected |
| | *1: The display is shown, but it may not be possible to obtain the proper images. | |
| Input channel | The currently set input channel is displayed here. | |
| | COMPOSITE | COMP. input connector selected |
| | Y/C | Y/C input connector selected |
| | YcbCr | YCbCr input connector selected |
| External lock status | The current external lock status is displayed here. | |
| | TBC OFF | Synchronized with input video signals |
| | TBC ON | Synchronized with internal crystal oscillator |
| | Timing designation | Synchronized with external reference sync signal ⇨ Refer to "3.3.6 Setting the external reference input." |
| | Not Std *2 | Synchronized with internal crystal oscillator |
| | UnLock!! *3 | No synchronization with external reference sync signal possible ⇨ Refer to "3.3.6 Setting the external reference input." |
| | Measure | Now measuring external reference sync signal |
| | No Signal (No Sync) *3 | External reference sync signal not yet detected |
| | Warning! ! *3 | Outside external reference sync signal frequency specification |
| | Set Err!! *3 | |
| | Error!! *3 | |
| | Hs Err!! *3 | Error in external reference horizontal sync signal frequency |
| | Vs Err!! *3 | Error in external reference vertical sync signal frequency |
| | Unknown *3 | External reference sync signal not yet detected |
| | *2: TBC ON status is established. | *3: Normal video signals are not output. |
| Pull-down mode | The currently set pull-down mode is displayed here. | |
| | AUTO | When "AUTO" has been set as the pull-down mode |
| | 2-3PULL | When the pull-down mode has been set |
| | 2-2PULL | |

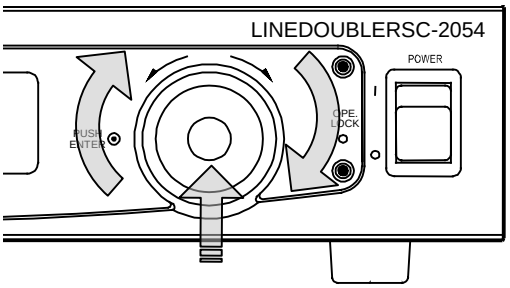
VIDEO

## 3.2 Menu operation methods

The shuttle button is tilted in the up, down, left and right directions, rotated or pushed to perform menu operations.




Tilting the button in the up, down, left and right directions




Turning and pushing the button

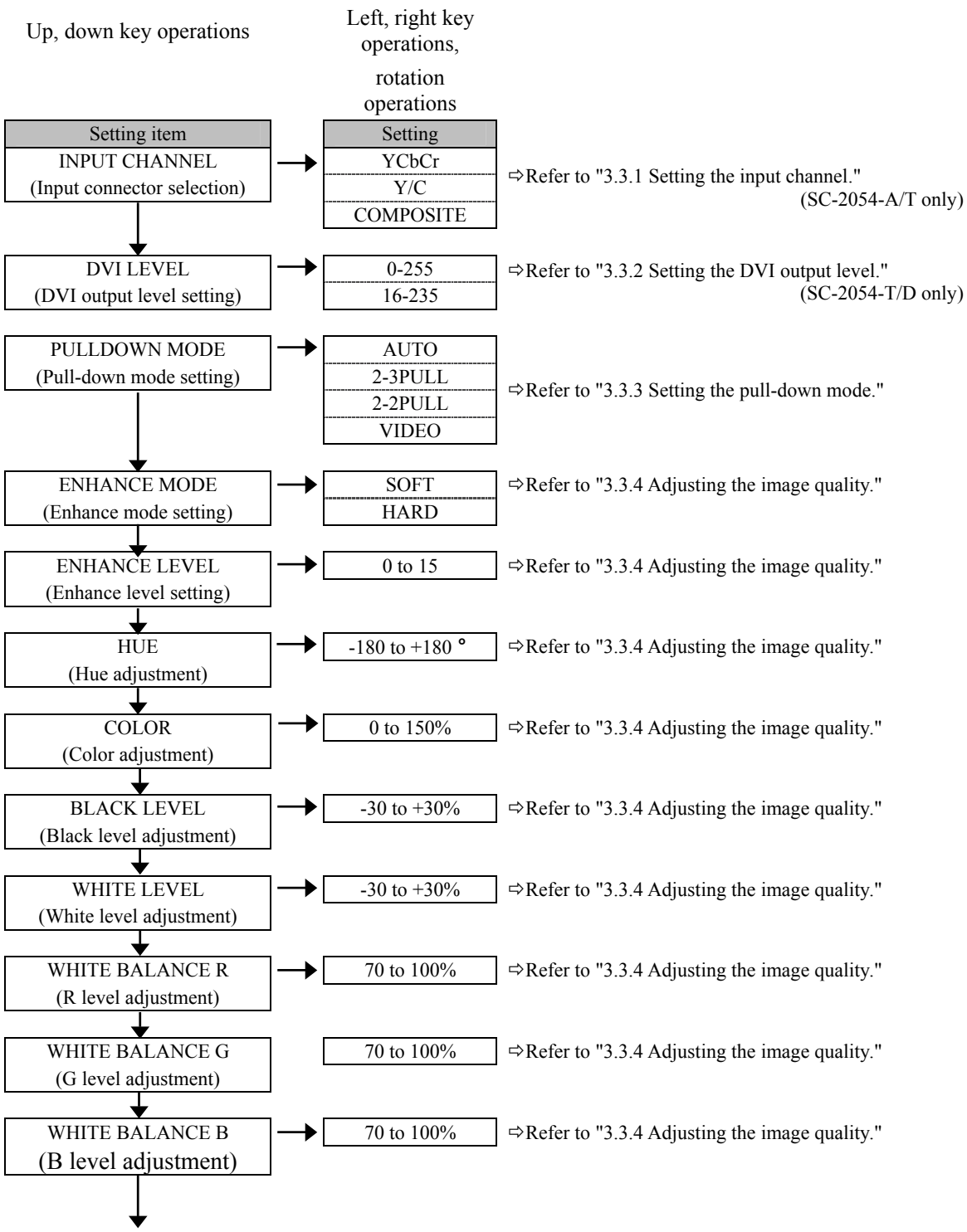
(1) How to select the setting items
Tilt the shuttle button up or down to select the setting items.

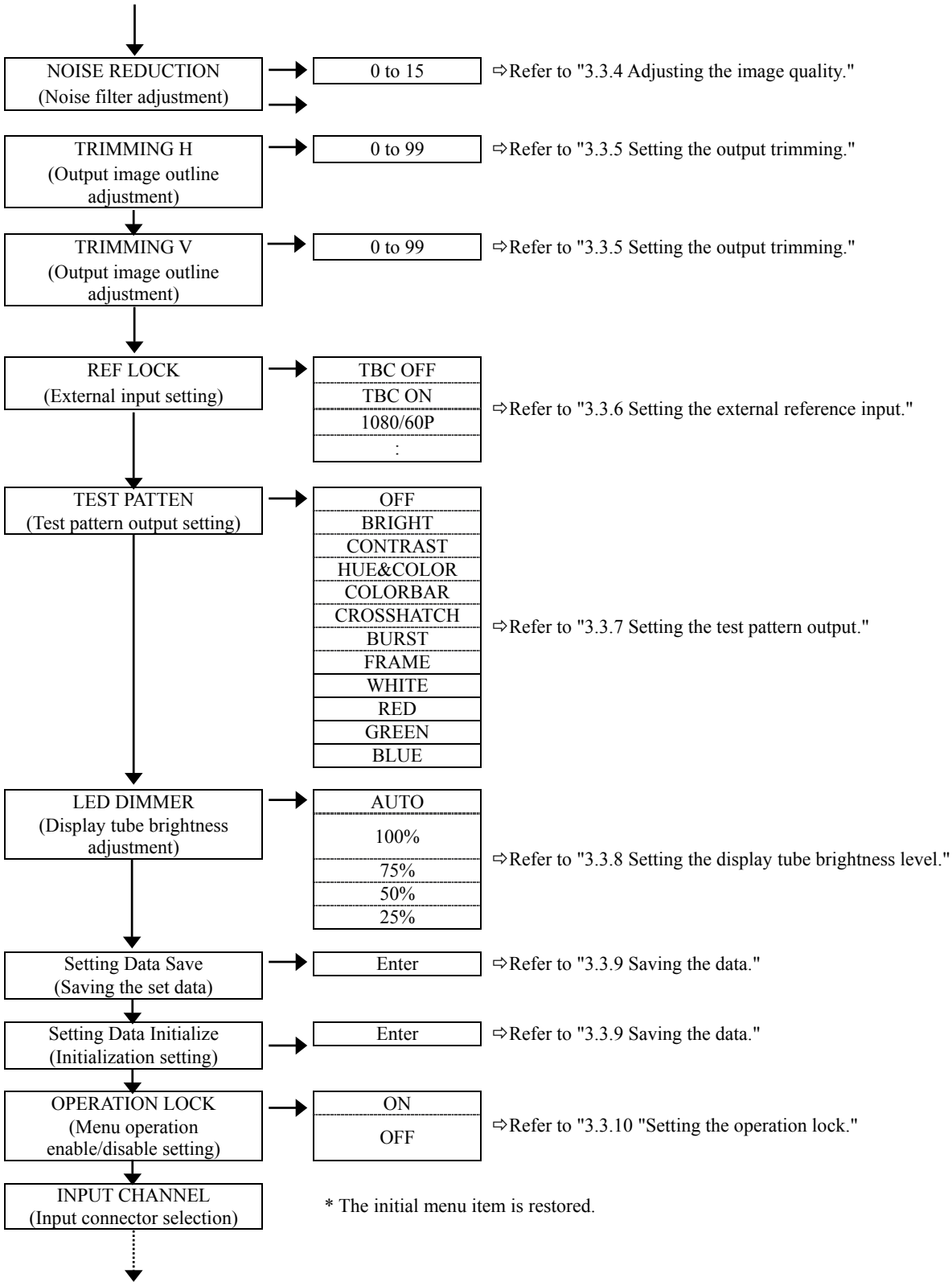
(2) Selecting the settings
Rotate the shuttle button or tilt it to the left or right to select the settings.

(3) Items with [ENTER] on menu displays
Pushing the shuttle button initiates the [ENTER] operation.

## 3.3 Menu configuration

The menu configuration shown below is entered from the default screen by tilting the shuttle button in the up, down, left or right direction.






* If no key operations are performed for the menu items during the space of one minute, the default display (input signals, external lock status and pull-down mode) is restored.

* When a series of menu operations are performed, the menu item corresponding to the last operation appears on the display. When the unit's power is turned off, the default screen display is restored.

### 3.3.1 Setting the input channel

The video input channels listed in the table below can be selected on the SC-2054.

| Setting item | Setting | Remarks |
|---|---|---|
| INPUT CHANNEL (SC-2054-A/T only) | YCbCr | Component video signal input connector (BNC connector) |
| | Y/C | Y/C video signal (S-VIDEO) input connector (S connector) |
| | COMPOSITE | Composite video signal (VIDEO) input connector (BNC connector) |

* Check whether the video signals have been connected to the selected input channel.

### 3.3.2 Setting the DVI output level

The dynamic range of the DVI digital output can be changed.

| Setting item | Setting | Remarks |
|---|---|---|
| DVI LEVEL (SC-2054-T/D only) | 0 to 255 | When reproducing the digital video data using an 8-bit gray scale, the black level is set to 0 and white level to 255. |
| | 16 to 235 | When reproducing the digital video data using an 8-bit gray scale, the black level is set to 16 and white level to 235. |

### 3.3.3 Setting the pull-down mode

The SC-2054 can automatically identify the 24- or 30-frame video data of film images, computer graphics images, etc. (if AUTO is set) and reproduce the optimum progressive images.

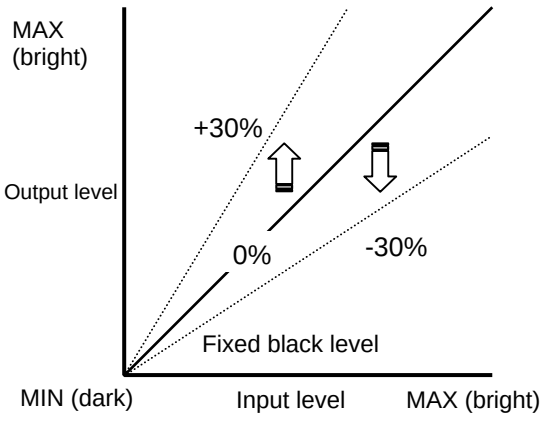
| Setting item | Setting | Remarks |
|---|---|---|
| PULLDOWN MODE | AUTO | The pull-down system matching the video sources is automatically identified as 2-3 PULL DOWN, 2-2 PULL DOWN or VIDEO MODE. |
| | 2-3PULL | For video sources whose film images (24 frames per second) are converted (= telecine) to video images (60 images per second), the 2-3, 2-3, 2-3 interpolation pattern is automatically identified from the flow of images, and displayed.<br>* Select this setting if it is known ahead of time that the images are from a film source. |
| | 2-2PULL | For still image video sources whose single frame images in even- or odd-numbered fields are reproduced, the 2-2, 2-2 interpolation pattern is automatically identified from the flow of images, and displayed.<br>* Select this setting if it is known ahead of time that the images are CG images or some other 2-2 pull-down pattern. |
| | VIDEO | In this mode, regular interlaced moving images are converted into progressive images.<br>* Select this setting if it is known that neither of the above pull-down modes applies. |

* When 2-3 PULL or 2-2 PULL mode is used, the video signals may be disrupted if they do not match the interpolation pattern of the input video source.

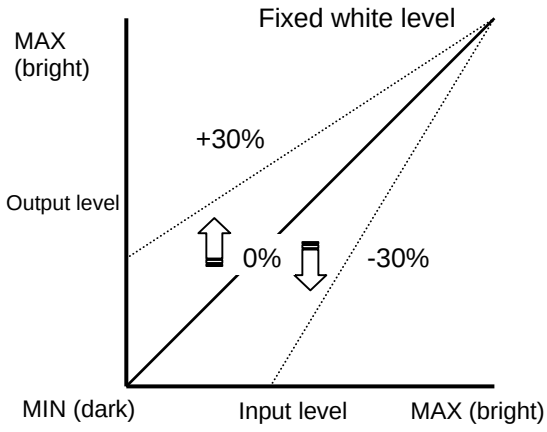
### 3.3.4 Adjusting the image quality

The following image quality adjustments can be conducted on the SC-2054. Perform them in such a way that the optimum image quality is achieved for the images displayed.

| Adjustment item | Type of adjustment | Setting | Remarks |
|---|---|---|---|
| ENHANCE MODE | Enhance effect | SOFT / HARD | The outlines look more accentuated by controlling frequency response of the images. |
| ENHANCE LEVEL | Enhance effect | 0 to 15LEVEL | |
| HUE | Hue adjustment | -180° to +180° | The hue is adjusted. |
| COLOR | Color adjustment | 0% to 150% | The intensity of the colors is adjusted. |
| BLACK LEVEL | Black level adjustment | -30% to +30% | The reference level (black level) for the brightness of the entire screen is adjusted. |
| WHITE LEVEL | White level adjustment | -30% to +30% | The white areas (white level) on the entire screen are adjusted. |
| WHITE BALANCE R | R level adjustment | 70% to 100% | The white areas (white level) on the entire screen are adjusted. |
| WHITE BALANCE G | G level adjustment | 70% to 100% | |
| WHITE BALANCE B | B level adjustment | 70% to 100% | |
| NOISE REDUCTION | Noise level reduction | 0 to 15LEVEL | The noise mixed in with the video signals is reduced. |




White level adjustment



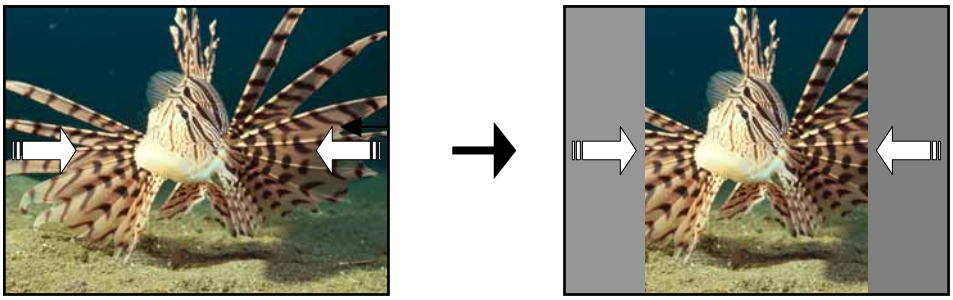

Black level adjustment

### 3.3.5 Setting the output trimming

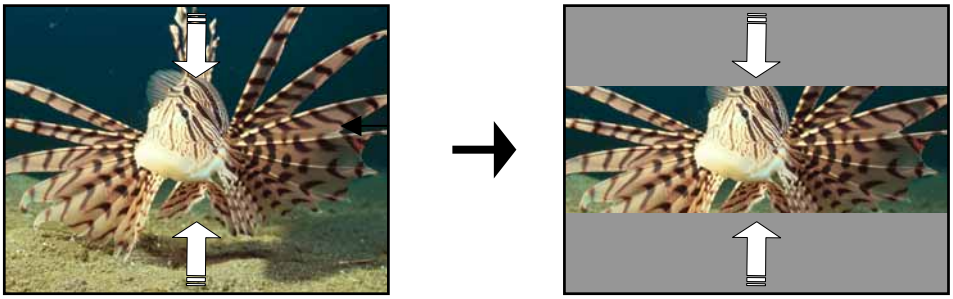
The output image display period can be adjusted on the SC-2054.

| Setting item | Setting | Remarks |
|---|---|---|
| TRIMMING H | 0 to 99 | Both the left and right ends of the images are masked on the display. |
| TRIMMING V | 0 to 99 | The top and bottom of the images are masked on the display. |

TRIMMING H setting



TRIMMING V setting



### 3.3.6 Setting the external reference input

Using the sync signal supplied to the external reference connector as the reference, the SC-2054 enables output video signals matching the vertical frequency of the input signal to be obtained.

When the external reference connector is used, the sync signal corresponding to the input signal must be selected from the table below.

| Setting item | Setting | Remarks | H period | V period |
|---|---|---|---|---|
| REF LOCK | TBC OFF | TBC function OFF; synchronized with input signal. | — | — |
| | TBC ON | TBC function ON; synchronized with internal reference signal. | — | — |
| | 1080/60p | Equivalent to 1920 × 1080/60P, 1920 × 1080/59.94P | 67.43K | 59.94 |
| | 1080/50p | Equivalent to 1920 × 1080/50P | 56.25K | 50.00 |
| | 1080/60i | Equivalent to 1920 × 1080/60I, 1920 × 1080/59.94I | 33.71K | 59.94 |
| | 1080/50i | Equivalent to 1920 × 1080/50I | 28.13K | 50.00 |
| | 720/60p | Equivalent to 1280 × 720/60P, 1280 × 720/59.94P | 44.95K | 59.94 |
| | 720/50p | Equivalent to 1280 × 720/50P | 37.50k | 50.00 |
| | 480/60p | Equivalent to 720 × 480/60P, 720 × 480/59.94P | 31.47K | 59.94 |
| | 576/50p | Equivalent to 720 × 576/50P | 31.25K | 50.00 |
| | 480/60i | Equivalent to 720 × 480/60I, 720 × 480/59.94I | 15.73K | 59.94 |
| | 576/50i | Equivalent to 720✕576/50I | 15.63K | 50.00 |
| | UXGA@60Hz | VESA standard 1600 × 1200/60 Hz * Only HS, VS supported | 75.00K | 60.00 |
| | SXGA@60Hz | VESA standard 1280 × 1024/60Hz * Only HS, VS supported | 63.98K | 60.02 |
| | XGA@60Hz | VESA standard 1024 × 768/60Hz * Only HS, VS supported | 48.36K | 60.00 |
| | SVGA@60Hz | VESA standard 800 × 600/60Hz * Only HS, VS supported | 37.88K | 60.32 |
| | VGA@60Hz | VESA standard 640 × 480/60Hz * Only HS, VS supported | 31.45K | 59.94 |

* If the unit is used with the TBC function OFF, jitter may occur in the output video signals depending on the input video signals. If this is the case, set the TBC function to ON for use.
* When using the external reference sync signal, input a signal with no deterioration such as one from a reference signal source as the sync input signal.
* When using the external reference sync signal, the images may be disrupted if there is no sync input signal or if a timing value at variance from the setting is input.
* When using the external reference sync signal, the vertical frequency of the output sync signal may match but the vertical phase may not match.

* When the REF LOCK item is selected, the horizontal frequency and vertical frequency of the signal supplied to the external reference input connector as well as the timing designations (recommended timing designations) which can be set are displayed by pressing the ENTER key.


Search Timing: Currently input timing designation

H:, V: Horizontal frequency and vertical frequency of currently input signal

* An error of ±5% or so may occur.

### 3.3.7 Setting the test pattern output

Seven different test patterns can be output by the SC-2054.

Use these patterns to adjust the display unit.

| Setting item | Setting | Remarks |
|---|---|---|
| TEST PATTEN | OFF | Normal screen display |
| | BRIGHT | ⇨ Refer to "6.1.7 (1) Brightness." |
| | CONTRAST | ⇨ Refer to "6.1.7 (2) Contrast." |
| | HUE&COLOR | ⇨ Refer to "6.1.7 (3) Hue & color." |
| | COLORBAR | ⇨ Refer to "6.1.7 (5) Crosshatch." |
| | CROSSHATCH | ⇨ Refer to "6.1.7 (6) Burst." |
| | BURST | ⇨ Refer to "6.1.7 (4) Color bar." |
| | FRAME | ⇨ Refer to "6.1.7 (7) Frame." |
| | WHITE | ⇨ Refer to "6.1.7 (8) White/red/green/blue." |
| | RED | |
| | GREEN | |
| | BLUE | |

* When these patterns are used in a REF LOCK setting, they will not be output unless the external sync signal is supplied.

### 3.3.8 Setting the display tube brightness level

The brightness level of the display tube can be set by the SC-2054.

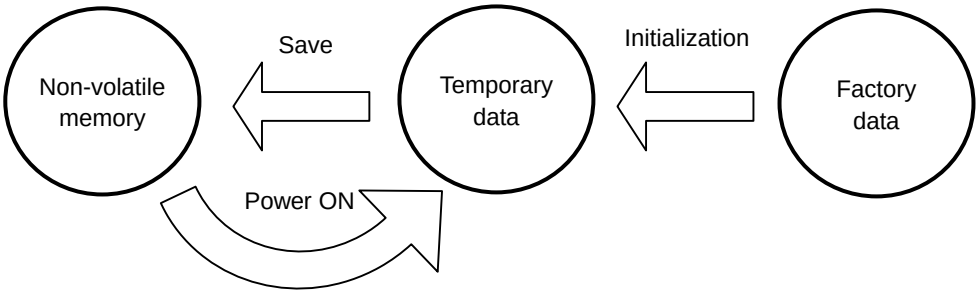
| Setting item | Setting | Remarks |
|---|---|---|
| LED DIMMER | AUTO | The brightness level of the display is reduced to 25% if no key operations have been performed for 3 minutes. It is restored to 100% when the shuttle button is operated. |
| | 100% | The brightness level is set to 100%. |
| | 75% | The brightness level is set to 75%. |
| | 50% | The brightness level is set to 50%. |
| | 25% | The brightness level is set to 50%. |

### 3.3.9 Saving the data

Data can be saved in the SC-2054's non-volatile memory or the factory data can be restored (= initialization).

Since the data adjusted for the SC-2054 will be deleted when the unit's power is turned off, get into the habit of saving the data before turning off the power. When the power is then turned back on, the saved data will take effect after the unit starts up.

Memory configuration of SC-2054




#### (1) Saving all the data

| Setting item | Description |
|---|---|
| Setting Data Save | All the temporary data is saved in the non-volatile memory, overwriting the data already stored there. |

#### (2) Restoring the factory data (initializing)

| Setting item | Description |
|---|---|
| Setting Data Initialize | The temporary data is overwritten by the factory data, and the display is also initialized. |

Displays common to (1), (2)


When the ENTER key is pressed at YES, the data is saved or initialized.

The tables below list the factory data.

| Setting item | Setting |
|---|---|
| INPUT CHANNEL (*1) | COMPOSITE |
| DVI LEVEL (*2) | 0 to 255 |
| PULLDOWN MODE | AUTO |
| ENHANCE MODE | SOFT |
| ENHANCE LEVEL | 1 |
| HUE | +0° |
| COLOR | 100% |
| BLACK LEVEL | +0% |
| WHITE LEVEL | +0% |
| WHITE BALANCE R | 100% |

| Setting item | Setting |
|---|---|
| WHITE BALANCE G | 100% |
| WHITE BALANCE B | 100% |
| NOISE REDUCTION | 0 |
| TRIMMING H | 0 |
| TRIMMING V | 4 |
| REF LOCK | TBC OFF |
| TEST PATTEN | OFF |
| LED DIMMER | AUTO |
| OPERATION LOCK | OFF |

*1: SC-2054-A/T only

*2: SC-2054-T/D only

### 3.3.10 Setting the operation lock

The SC-2054 allows menu operations to be enabled (unlocked) or disabled (locked). Set the operation lock to ON to ensure that no unintentional changes will be made to the settings.

| Item | Setting | Remarks |
|---|---|---|
| OPERATION LOCK | ON | The menu operations are disabled (locked). |
| | OFF | The menu operations are enabled (unlocked). |

**OPERATION LOCK ON (operation lock setting)**

When ON is selected for the OPERATION LOCK item, no further menu operations can be performed.

**OPERATION LOCK OFF (operation unlock setting)**

When OFF is selected for the OPERATION LOCK item, menu operations can be performed by pressing the keys as usual.

* The default display appears when the ENTER key is pressed at the operation lock item.

# 4. Main specifications

**[General specifications of SC-2054 series models]**

The table below shows how the specifications are configured for each model (A/S/T/D) in the SC-2054 series. For further details, refer to the respective items.

| Item | SC-2054-A | SC-2054-S | SC-2054-T | SC-2054-D |
|---|---|---|---|---|
| Composite input ⇨"4.1(1) Composite input signals" | ○ | — | ○ | — |
| Y/C input ⇨ "4.1(2) Y/C input signals" | ○ | — | ○ | — |
| Component input ⇨ "4.1(3) Component input signals" | ○ | — | ○ | — |
| SD SDI (D1) input ⇨ "4.1(4) SD SDI (D1) input signals" | — | ○ | — | ○ |
| External reference input ⇨ "4.2 External reference input signal" | ○ | ○ | ○ | ○ |
| Analog output ⇨ "4.3(1) Analog output signals" | ○ | ○ | — | — |
| DVI output ⇨ "4.3(2) DVI output signals" | — | — | ○ | ○ |
| General specifications ⇨ "4.4 General specifications" | ○ | ○ | ○ | ○ |
| Accessories ⇨ "4.5 Accessories" | ○ | ○ | ○ | ○ |

○: Standard specifications -: Not supported

## 4.1 Input video signals

### (1) Composite input signals

| Item | Specification |
|---|---|
| Scanning system | NTSC-M/PAL-B/PAL-D/PAL-G/PAL-H/PAL-I (automatically switched) |
| Signal system | Composite signals 1.0Vp-p/75Ω |
| Connector | BNC connector, 1 system |
| Y/C separation | 3-dimensional Y/C separation (NTSC), 2-dimensional Y/C separation (PAL) |
| A/D conversion frequency | 4fsc |
| Resolution | 10bit |

### (2) Y/C input signals

| Item | Specification |
|---|---|
| Scanning system | NTSC-M/PAL-B/PAL-D/PAL-G/PAL-H/PAL-I (automatically switched) |
| Signal system | Y/C signals Y signal: 1.0 Vp-p/75 Ω<br>C signal: 0.286Vp-p/75Ω |
| Connector | S connector, 1 system |
| A/D conversion frequency | 4fsc |
| Resolution | 10bit |

### (3) Component input signals

| Item | Specification | |
|---|---|---|
| Scanning system | 720 × 480/59.94i/720 × 576/50i (automatically switched) | |
| Signal system | Component signals | Y signal: 0.7Vp-p/75Ω<br>CBCR signal: 0.7Vp-p/75Ω |
| Sync signal | YonSYNC | 0.3Vp-p/75Ω |
| Connector | BNC connectors × 3, 1 system | |
| A/D conversion frequency | 4fsc | |
| Resolution | 10bit | |

### (4) SD SDI (D1) input signals

| Item | Specification |
|---|---|
| Scanning system | 720 × 480/59.94/720 × 576/50i (automatically switched) |
| Signal system | SMPTE 259M standard complied with |
| Connector | BNC connector, 1 system |
| Resolution | 10bit |

## 4.2 External reference input signal

| Item | Specification | |
|---|---|---|
| Scanning system | SMPTE274M standard complied with<br>SMPTE296M standard complied with<br>VESA standard complied with | |
| Horizontal frequency<br>Vertical frequency | SMPTE274M standard (60、59.94、50Hz) complied with<br>SMPTE296M standard (60、59.94、50Hz) complied with<br>VESA standard (60 Hz) complied with | |
| Sync signal | CS | 0.3/TTL 75Ω |
| | HS | TTL/75Ω |
| | VS | TTL/75Ω |
| Connectors | BNC connectors × 2, 1 system; connectors serve as both CS and HS connectors | |

## 4.3 Output signals

### (1) Analog output signals

| Item | Specification |
|---|---|
| Scanning system | 720 × 480/59.94P/720 × 576/50P (automatically switched) |
| Horizontal frequency | 31.47KHz/31.25KHz (*1) |
| Vertical frequency | 59.94Hz/50.00Hz (*1) |
| D/A conversion frequency | 54.0MHz |
| Resolution | 10bit |
| Video signals, RGB | 0.7Vp-p/75Ω |
| Sync signal | HS TTL (negative polarity) |
| | VS TTL (negative polarity) |
| Connector | BNC connectors × 5 |

*1: When the internal crystal oscillator is used

### (2) DVI output signals

| Item | Specification |
|---|---|
| Scanning system | 720 × 480/59.94P/720 × 576/50P (automatically switched) |
| Horizontal frequency | 31.47KHz/31.25KHz (*1) |
| Vertical frequency | 59.94Hz/50.00Hz (*1) |
| Pixel clock frequency | 27.0MHz |
| Resolution | 8bit |
| Data format | TMDS |
| Sync signal | HS/VS |
| DDC | Not supported |
| Hot Pulg Detect | Not supported |
| Connector | DVI-I connector (digital output only) |

*1: When the internal crystal oscillator is used

## 4.4 General specifications

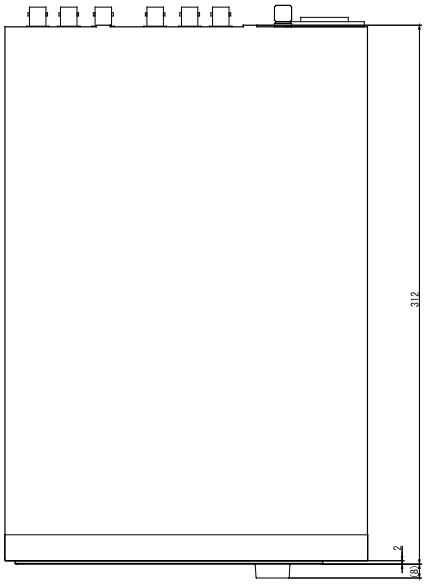
| Item | Specification |
|---|---|
| Power | Effective power 16W MAX |
| | Apparent power 17VA MAX |
| | Power factor 0.91 TYP |
| Power requirements | AC100-120, 200-240V (50/60Hz) |
| Operating temperature range | 5 to 40°C (no condensation) |
| Operating humidity range | 30 to 80%RH (no condensation) |
| Dimensions | Half rack size |
| | 210 (W) × 44 (H) × 312 (D) mm (excluding protrusions) |
| Weight | Approx. 1.7 kg |

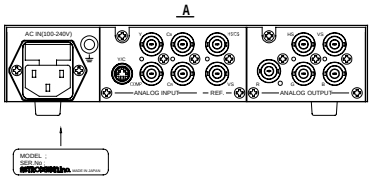
## 4.5 Accessories

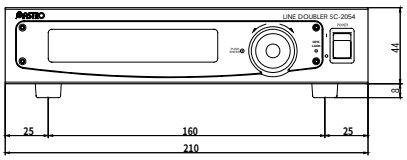
| Item | Specification |
|---|---|
| AC cable | 1 pc |
| Instruction manual | 1 copy |

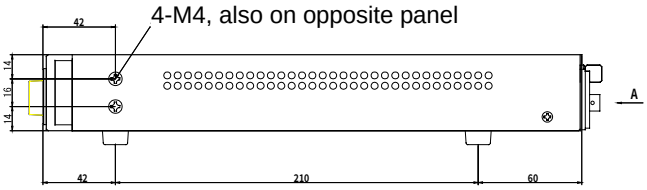
# 5. Outline drawings

SC-2054-A

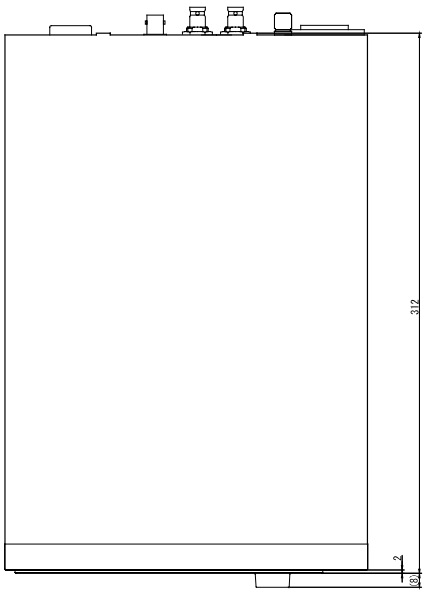


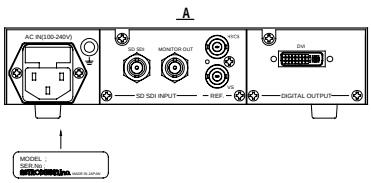



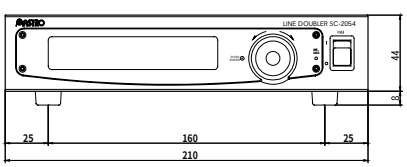



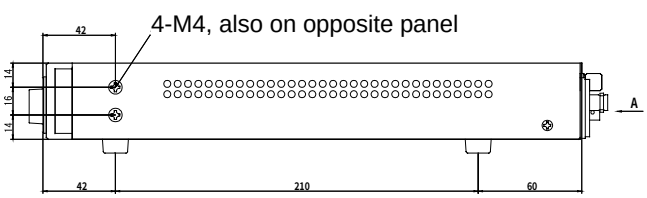




SC-2054-S

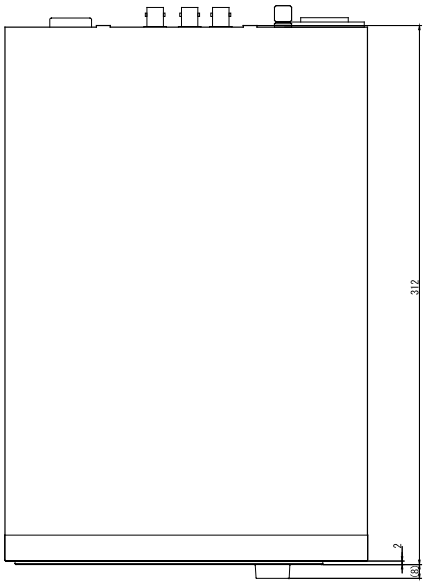


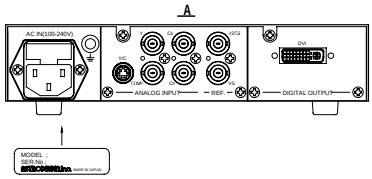



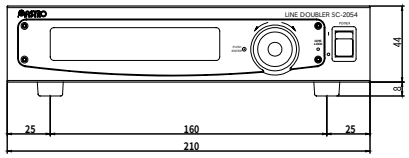



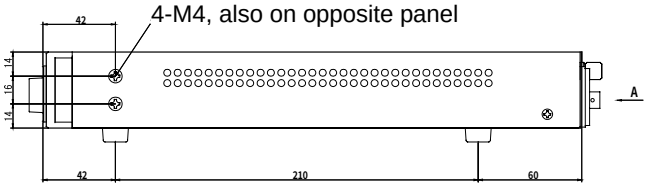



SC-2054-T

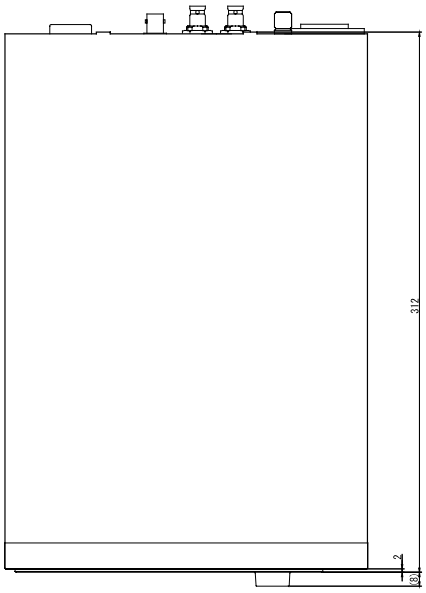


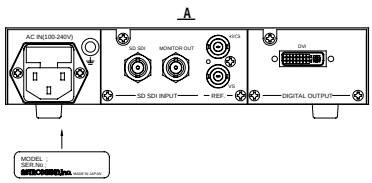



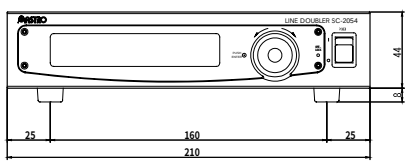



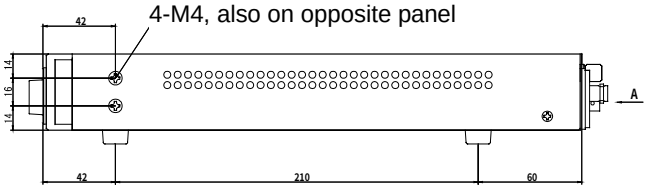




SC-2054-D



# 6. Appendix

## 6.1 Definitions of terms used

### 6.1.1 "astrosnap"

The term "astrosnap" (which stands for Astro SuperNatural motion Picture) is a high-accuracy I/P (interlaced/progressive) conversion technology developed by ASTRODESIGN.

With the interlaced signals of the NTSC, PAL, HDTV and other systems, the scanning lines that render a single image look like a venetian blind with every other line missing: this means that when I/P conversion is to be performed, the missing signals must be inferred and interpolated.

The I/P conversion technology used in the past caused a deterioration in the resolution referred to as "jaggies" when the signals were inferred and interpolated. In contrast, "astrosnap" is capable of significantly enhancing the contour parts of the images and reproducing the images at a high resolution whether the images are moving rapidly or slowly. It achieves this by using high-accuracy inference and interpolation algorithms.

### 6.1.2 DVI

DVI is short for digital video interface. Since it is capable of sending the images as digital signals, high-quality images free from signal deterioration can be enjoyed.

### 6.1.3 Component

This term refers to video signals whose luminance Y signal and color difference signals CbCr (PbPr) are output as separate components. Separating the video signals into these components and transmitting them in this format minimizes the interaction between the signals, and enables high-quality signal transmission.

### 6.1.4 Interlaced

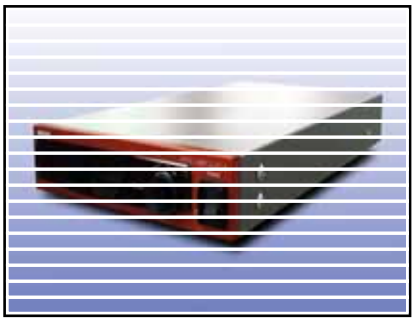
Interlaced images are rendered by two scans for every other line. The total number of 525 scanning lines, consisting of one screen with 262.5 odd-numbered lines and another screen with 262.5 even-numbered lines, are reproduced by updating the field at a rate of 60 frames per second. This means only the vertical resolution of 262.5 lines is achieved for the actual images, which in turn means that the images take on a pronounced roughness when displayed on large screens, and fast-moving images cannot be tracked.

Even-numbered field (1/60 sec.)

Odd-numbered field (1/60 sec.)

### 6.1.5 Progressive

With the progressive system, on the other hand, images are rendered by a single scan. Unlike interlaced images, progressive scanning can achieve a rate of 60 frames per second for 525 lines, and so it is able to maintain a high image quality even when images are displayed on a large screen.



Frame (1/60 sec.)

### 6.1.6 Time base corrector (TBC)

This function corrects time base errors. During VTR playback, the time-based fluctuations caused by irregularities in the rotational speed of the heads and unevenness in the tape transport speed, for example, are superimposed onto the video signals. The TBC function can correct these fluctuations and reproduce video signals with the correct time base.

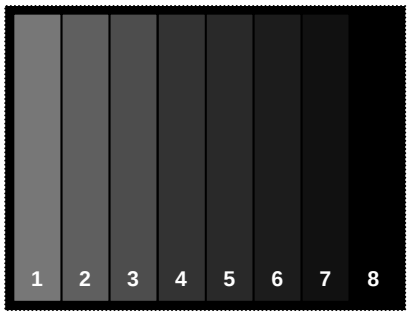
### 6.1.7 Test patterns

These patterns employ video signals to serve as a reference for adjusting the contours and quality of images shown on video display units.

#### (1) Brightness

Using black as the reference, this pattern consists of 8 successive steps to represent increasing levels of brightness.

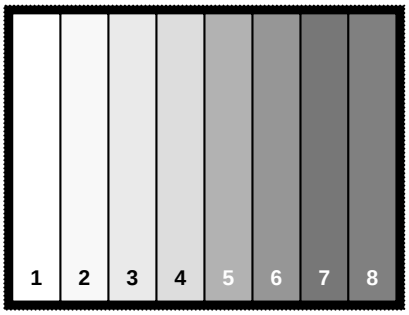
It is used to adjust the black level of display systems in such a way that the boundary between brightness levels 7 and 8 shown in the figure below is perceptible.



### (2) Contrast

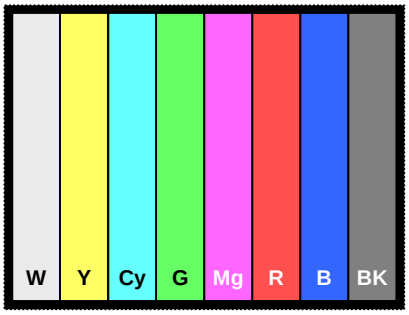
Using white as the reference, this pattern consists of 8 successive steps to represent decreasing levels of brightness.

It is used to adjust the white level of display systems in such a way that the boundary between brightness levels 1 and 2 shown in the figure below is perceptible.



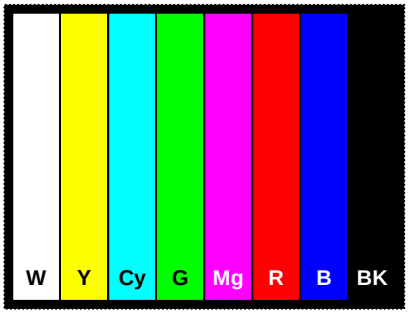

### (3) Hue & color

In this pattern, the white level and black level are attenuated to 75% and 25%, respectively, for each of the RGB signals in the color bar signals. It is used to adjust the hue and colors of display systems.




### (4) Color bar

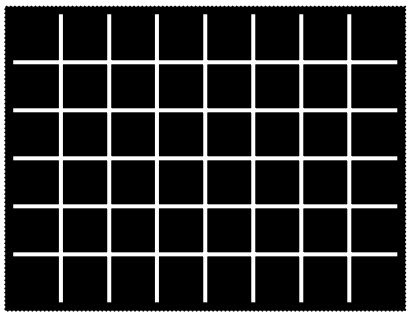
This signal pattern is used to check the color reproducibility. The colors are arranged in the following order of their brightness from the left: white, yellow, cyan, green, magenta, red, blue and black. The pattern is used to adjust the colors of display systems.



### (5) Crosshatch

This signal pattern is used to check for image distortion in display systems. Horizontal and vertical lines are drawn at equal intervals, and they show how the patterns appear. The trapezoidal distortion and other forms of distortion in display systems are adjusted in such a way that the shapes of the squares appear uniform.

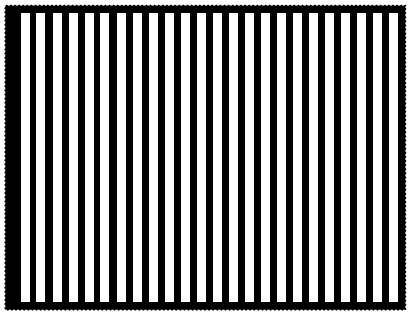
The pattern is also used to adjust the convergence in projectors with CRT tubes.



### (6) Burst

This pattern is formed by alternately repeating a line of one white dot and a line of one black dot horizontally across the screen. In display units such as an LCD or DLP projector with a tracking adjustment function (for adjusting the sampling number within one scanning period), a high image quality can be obtained by adjusting in such a way that the white and black lines of the pattern are clearly differentiated.

Some projectors do not come with a tracking adjustment function.



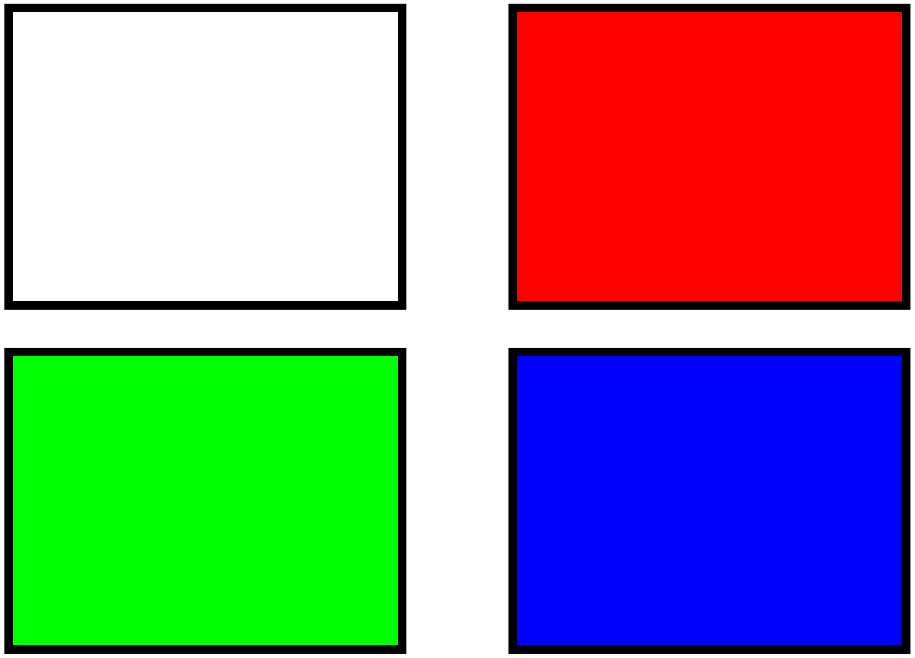
### (7) Frame

The outer frame of the effective display period of the SC-2054 is displayed with one pixel and one line in this pattern. It is used to adjust the display position in such a way that the entire frame appears on the screen.

* With some display units, the outer frame may not fit neatly within the confines of the screen.

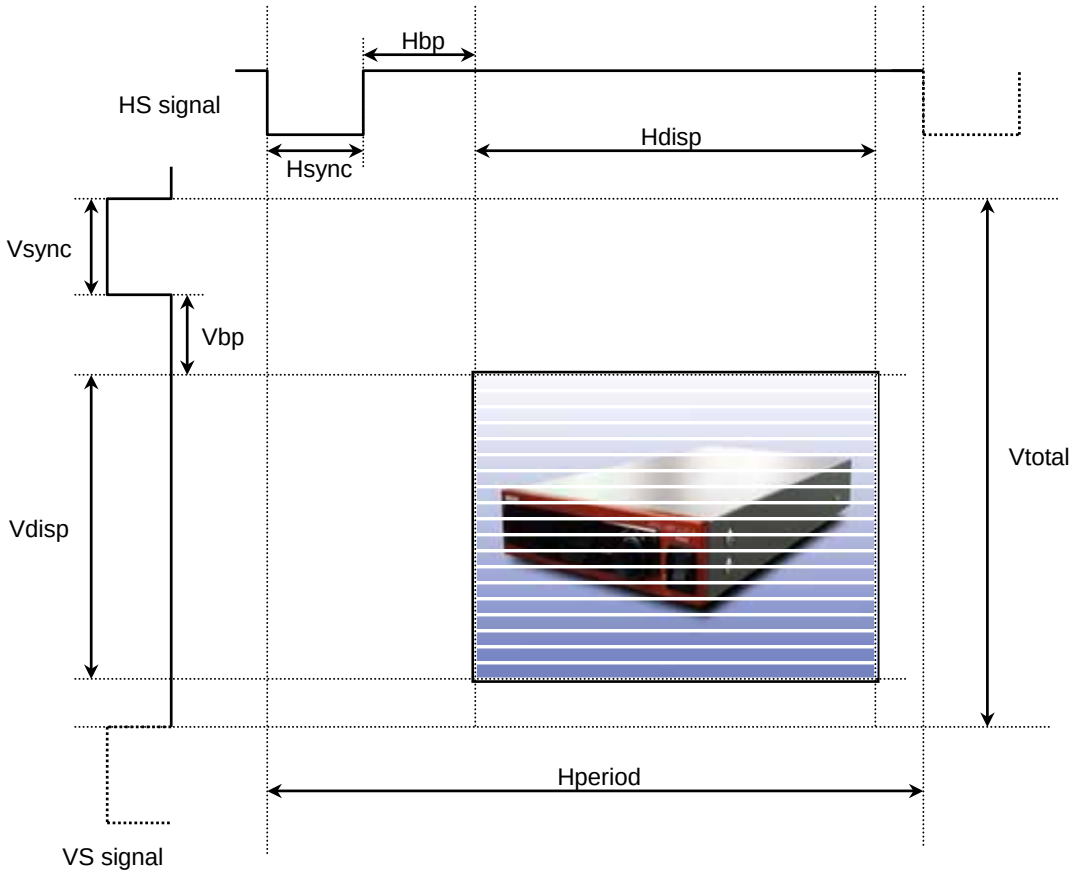
### (8) White/red/green/blue

This pattern turns the entire screen white, red, green and blue.



### 6.1.8 Timing table

In order for images to be rendered properly on a video display device, it is necessary to provide the horizontal sync (HS) signal for measuring the timing in the horizontal direction and the vertical sync (VS) signal for measuring the timing in the vertical direction. Parameters from these horizontal and vertical sync signals to the start (or end) of the video data are also required. These parameters are defined below and should be referred to along with the other parameters mentioned in this instruction manual.



| Signal/parameter (unit) | Description |
|---|---|
| HS signal | Horizontal sync signal (negative logic) |
| VS signal | Vertical sync signal (negative logic) |
| Clock (Hz) | Clock frequency for configuring the video signals |
| Hperiod (dot) | Horizontal sync period; indicated as a number of clock pulses *1 (in dots). |
| Hdisp (dot) | Horizontal effective video period; indicated as a number of clock pulses *1 (in dots). |
| Hsync (dot) | Horizontal sync signal period; indicated as a number of clock pulses *1 (in dots). |
| Hbp/Hbackporch (dot) | Indicated as a number of clock pulses *1 (in dots) from the horizontal sync signal period to the effective video period. |
| Vtotal | Vertical sync period; indicated as a number of lines *2 (in lines). |
| Vdisp (line) | Vertical effective video period; indicated as a number of lines *2 (in lines). |
| Vsync (line) | Vertical sync signal period; indicated as a number of lines *2 (in lines). |
| Vbp/Vbackporch (line) | Indicated as a number of lines *2 (in lines) from the vertical sync signal period to the vertical effective video period. |
| Scan | Progressive signals or interlaced signals. |

*1: Time Td(s) per clock pulse = 1/clock pulse

*2: Time Tl(s) per line = Hperiod/clock pulse

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