

DME SWITCHER

DFS-700A

DFS-700AP

DFS-700

DFS-700P

DIGITAL/ANALOG INPUT BOARD

BKDF-701

ANALOG COMPOSITE INPUT BOARD

BKDF-702/702P

DIGITAL MULTI EFFECTS BOARD

BKDF-711

3D VIDEO MAPPING EFFECTS BOARD

BKDF-712

SERVICE MANUAL

Volume 1 1st Edition (Revised 2)

警告

このマニュアルは、サービス専用です。

お客様が、このマニュアルに記載された設置や保守、点検、修理などを行うと感電や火災、人身事故につながる可能性があります。

危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

WARNING

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

AVERTISSEMENT

Ce manuel est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

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Manual Structure

Purpose of this manual

This manual is the service manual Vol.1 of the DME Switcher DFS-700A/700AP/700/700P and their optional boards.

The service manuals (Vol.1 and Vol.2) are intended for use by trained system and service engineers, and describes the information on installing, maintenance, and detailed service.

This manual (Vol.1) describes the service overviews, diagnosis, and electrical alignment.

Related manuals

Besides this Service Manual Vol.1, the following manuals are available for the DFS-700A/700AP/700/700P.

- **Service Manual Vol.2**

Part No. 9-967-898-XX (for J, UC, CE)

Contains the spare parts, semiconductor pin assignments, block diagrams, schematic diagrams, and board layouts.

- **“Semiconductor Pin Assignments” CD-ROM (Available on request)**

This “Semiconductor Pin Assignments” CD-ROM allows you to search for semiconductors used in B&P Company equipment.

Semiconductors that cannot be searched for on this CD-ROM are listed in the service manual for the corresponding unit. The service manual contains a complete list of all semiconductors and their ID Nos., and thus should be used together with the CD-ROM.

Part number: 9-968-546-XX

Contents

This manual is organized by following sections.

Section 1 Operating Instructions

Please refer to the operating instructions supplied with this unit.

Section 2 Service Overview

This section explains the information that is required for installing (the operating conditions, power supply and power cords, installaion of the optional board, rack mounting, adaptive connectors), outline of the board circuit, replacement of the parts, switch setting on the board, error indication, and tools and adjustment equipment.

Section 3 Self-diagnosis

This section explains the activation (termination) of the check mode in this unit, the basic operation, and the check method.

Section 4 Electrical Alignment

This section explains the adjustment of the OPM-39/OPM-45, IPM-69, VIF-19, and VIF-20 boards.

Section 2

Service Overview

2-1. Installation

2-1-1. Operating Environment

Operating temperature	0 °C to 40 °C
Performance temperature	5 °C to 35 °C
Humidity	10 to 90 % (No condensation)

To prevent overheating of the DFS-700A/700AP/700/700P, ensure that there is good air circulation around the unit.

CAUTION

Install in a stable location.

Installation on unstable or tilting surface may cause the unit fall off, resulting in injury.

2-1-2. Power Supply Specifications

Power voltage	AC 100 V to 240 V
Power frequency	50/60 Hz
Power consumption	200 W (Boards installed)
Rush current	AC 230 V IN : 13 A AC 240 V IN : 24 A

Note

AC power supply is required a capacity which is commensurate with rush current.

If the capacity of the AC power supply is not enough, the breaker of AC power of a supply side may operate or this unit may not operate normally.

2-1-3. Power Supply Cord

For customers in the U.S.A. and Canada

- ① Power cord, 125 V 10 A (2.4 m): 1-557-377-11

For customers in Europe

- ② Power cord, 250 V 10 A (2.5 m): 1-590-910-11

WARNING

Use a supplied power cord only.

Be sure to use a recommended power cord to avoid fire and/or an electric shock.

CAUTION

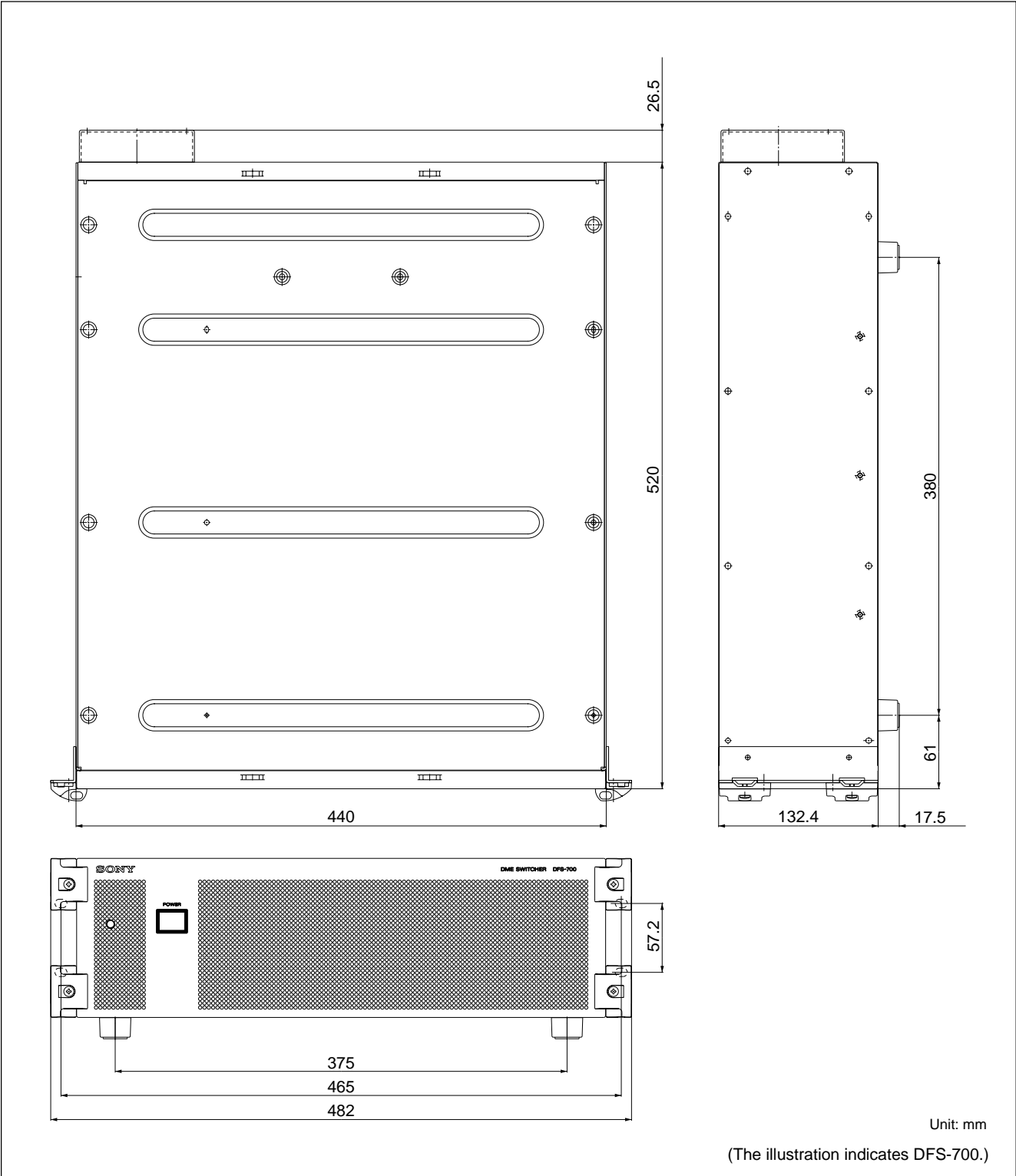
Ground the unit for your safety.

Be sure to attach a ground wire to avoid an electric shock.

2-1-4. Installation Space

Notes

- The rear side must be at least 400 mm away from the walls for ventilation and maintenance.
- Do not stop the fan or block the ventilator because this unit is air-cooled by the fan on the rear side.
If not, a failure or trouble may occur.



2-1-5. Matching Connector and Cable

When connecting cable to the connectors, match those connectors or equivalent with each other as listed below.

DFS-700A/700AP/700/700P side connector		Matching Connector and Cable		
Connector Function Name		Connector	Connector	Sony Parts No.
DIGITAL I/O				
PGM OUT	1, 2	BNC	BNC	1-569-370-12
SDI INPUTS	1 to 8	BNC	BNC	1-569-370-12
CLEAN OUT		BNC	BNC	1-569-370-12
ANALOG I/O				
PGM OUT	COMPOSITE 1, 2	3-BNC	3-BNC	1-569-370-12
	PVW			
	COMPONENT 1, 2	3-BNC	3-BNC	1-569-370-12
	(Y, R-Y, B-Y)			
VIDEO INPUTS	S VIDEO 1, 2	S VIDEO, Plug (F)	S VIDEO, Plug (M)	YC-30 V (3 m)
	COMPONENT 5/1 to 8/4	3-BNC	3-BNC	1-569-370-12
	(Y, R-Y, B-Y)			
	COMPONENT/COMPOSITE 5 to 8	3-BNC	3-BNC	1-569-370-12
	(Y/V, R-Y, B-Y)			
	REF. VIDEO(Loop-through)	BNC	BNC	1-569-370-12
	S VIDEO 5 to 8	S VIDEO, Plug (F)	S VIDEO, Plug (M)	YC-30 V (3 m)
DSK KEY IN	(Loop-through)	BNC	BNC	1-569-370-12
BLACK BURST OUT	1 to 3	BNC	BNC	1-569-370-12
GPI/T	1, 2	BNC	BNC	1-569-370-12
PANEL		D-sub, Plug 25P (F)	D-sub, Plug 25P (M)	(*)
TALLY		D-sub, Plug 25P (F)	D-sub, Plug 25P (M)	
EDITOR		D-sub, Plug 9P (F)	D-sub, Plug 9P (M)	1-560-651-00
TERMINAL		USB B-type (R) Receptacle	USB B-type (P) Plug	

(*) This Connector is attached to the cable of 10 m. (Sony parts No: 1-765-378-51)

2-1-6. Signal Input/Output

The input and output signals of the connectors on the rear panel are as described below.

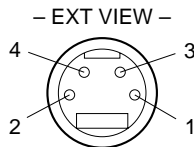
PGM OUT 1, 2

Connector: BNC
Output voltage: 800 mV p-p
Output impedance: 75 Ω

PGM OUT COMPOSITE 1, 2

Connector: BNC
Output voltage: 1.0 V p-p
Output impedance: 75 Ω

PGM OUT S VIDEO 1, 2 (S terminal 4-pin, Female)



Pin No.	Signal	Function
1	Y GND	Ground of luminance output
2	C GND	Ground of chrominance output
3	Y	Luminance output
4	C	Chrominance output

PGM OUT COMPONENT 1, 2

Connector: 3-BNC

Signal	Function
Y	Luminance output
R-Y	Chrominance R-Y output
B-Y	Chrominance B-Y output

PVW OUT

Connector: BNC
Output voltage: 1.0 V p-p
Output impedance: 75 Ω

CLEAN OUT

Connector: BNC
Output voltage: 800 mV p-p
Output impedance: 75 Ω

BLACK BURST OUT 1, 2, 3

Connector: BNC
Output voltage: Sync/Burst: 0.286 V p-p (NTSC)
Sync/Burst: 0.300 V p-p (PAL)
Output impedance: 75 Ω

DSK KEY IN (Loop-through)

Connector: BNC
Input voltage: 1.0 V p-p (Sync: approx 0.3 V p-p)
Input impedance: High impedance or 75 Ω (with termination 75 Ω ON/OFF switch)

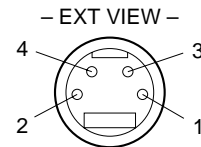
SDI INPUTS 1 to 8

Connector: BNC
Input voltage: 800 mV p-p
Input impedance: 75 Ω

*SDI 5 to SDI 8 require BKDF-701.

VIDEO INPUTS S VIDEO 5 to 8 (S terminal 4-pin, Female)

*BKDF-702/702P is required.



Pin No.	Signal	Function
1	Y GND	Ground of luminance input
2	C GND	Ground of chrominance input
3	Y	Luminance input
4	C	Chrominance input

VIDEO INPUTS COMPONENT 5/1 to 8/4

Connector: 3-BNC

① When the 8/4 input is set to YUV.

Connector	Function
Y	Y: Luminance input
R-Y	Color-difference signal R-Y: Chrominance input
B-Y	Color-difference signal B-Y: Chrominance input

② The 8/4 input when the 8/4 input is set to RGB. (Other inputs are the same as in step ①.)

Connector	Function
Y	Y: RGB signal G input (with Sync)
R-Y	R-Y: RGB signal R input
B-Y	B-Y: RGB signal B input

VIDEO INPUTS COMPONENT/COMPOSITE 5 to 8

Connector: BNC

① When BKDF-701 is installed

Connector	Function
Y/V	Y: Luminance input
R-Y	R-Y: Chrominance input
B-Y	B-Y: Chrominance input

② When BKDF-702/702P is installed

Connector	Function
Y/V	Composite input
R-Y	—
B-Y	—

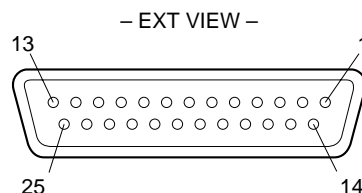
REF. VIDEO (Loop-through)

Connector: BNC

Input voltage: PAL 0.45 V p-p
(Sync/Burst: 0.300 V p-p)NTSC 0.43 V p-p
(Sync/Burst: 0.286 V p-p)Input impedance: High impedance or 75 Ω (with
termination 75 Ω ON/OFF switch)**GPI/T 1, 2**

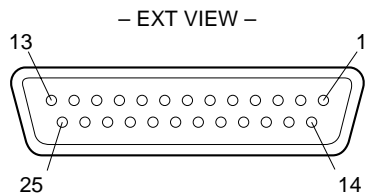
Connector: BNC

Input voltage: TTL level

PANEL (D-sub 25-pin, Female) (Processor)

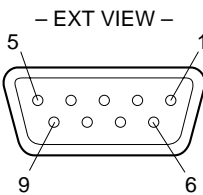
Pin No.	Signal	IN/OUT	Function
1	GND	—	Frame ground
2	DC CON	O	12 V output
3	KRD+	I	Receive data "B"
4	GND	—	Receive common
5	KTD+	O	Transmit data "B"
6	GND	—	Transmit common
7	RVD+	O	Transmit VD "B"
8	GND	—	Ground
9 to 10	—	—	—
11	GND	—	Ground
12	GND	—	Ground
13	GND	—	Ground
14	DC CON	O	12 V output
15	DC CON	O	12 V output
16	KRD—	I	Receive data "A"
17	GND	—	Receive common
18	KTD—	O	Transmit data "A"
19	GND	—	Transmit common
20	RVD—	O	Transmit VD "A"
21 to 24	GND	—	Ground
25	GND	—	Frame ground

PANEL (D-sub 25-pin, Female) (Control panel)



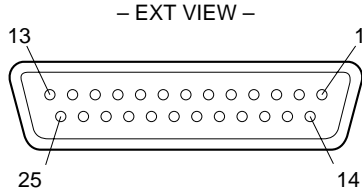
Pin No.	Signal	IN/OUT	Function
1	FG	—	Frame ground
2	+12 V	I	12 V input
3	MIT+	O	Transmit data “B”
4	GND	—	Transmit common
5	RCV+	I	Receive data “B”
6	GND	—	Receive common
7	RVD+	I	Receive VD “B”
8	GND	—	Ground
9	—	—	—
10	—	—	—
11	GND	—	Ground
12	GND	—	Ground
13	GND	—	Ground
14	+12 V	I	12 V input
15	+12 V	I	12 V input
16	MIT–	O	Transmit data “A”
17	GND	—	Transmit common
18	RCV–	I	Receive data “A”
19	GND	—	Receive common
20	RVD–	I	Receive VD “A”
21 to 24	GND	—	Ground
25	FG	—	Frame ground

EDITOR (D-sub 9-pin, Female)



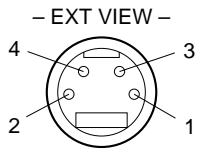
Pin No.	Signal	IN/OUT	Function
1	GND	—	Frame ground
2	TXA	O	Transmit “A”
3	RXB	I	Receive “B”
4	GND	—	Receive common
5	—	—	—
6	GND	—	Transmit common
7	TXB	O	Transmit “B”
8	RXA	I	Receive “A”
9	GND	—	Frame ground

TALLY (D-sub 25-pin, Female)



Pin No.	Signal	IN/OUT	Function
1	TL1A	O	Video input 1 Tally
2	TL1B	O	
3	TL2A	O	Video input 2 Tally
4	TL2B	O	
5	TL3A	O	Video input 3 Tally
6	TL3B	O	
7	TL4A	O	Video input 4 Tally
8	TL4B	O	
9	TL5A	O	Video input 5 Tally
10	TL5B	O	
11	TL6A	O	Video input 6 Tally
12	TL6B	O	
13	GND	—	Frame ground
14	—	—	—
15	TL7A	O	Video input 7 Tally
16	TL7B	O	
17	TL8A	O	Video input 8 Tally
18	TL8B	O	
19	—	—	—
20	—	—	—
21	—	—	—
22	—	—	—
23	—	—	—
24	—	—	—
25	GND	—	Frame ground

TERMINAL (USB B-type, Receptacle)



Pin No.	Signal	IN/OUT	Function
1	Vcc (not used)		
2	D–	I/O	Data–
3	D+	I/O	Data+
4	GND	—	Frame ground

2-1-7. Rack Mounting

The DFS-700A/700AP/700/700P can be mounted on a 19-inch standard rack for use.

Mount the DFS-700A/700AP/700/700P on the rack properly in the procedure below using a specified rack mounting kit.

Specified rack mounting kit: RMM-10

Note

The DFS-700A/700AP/700/700P may not be able to be mounted on a 19-inch standard rack using a rack mounting kit other than the specified one.

Components of RMM-10

- Rack brackets 2 pieces
- Rack mounting adaptor (right) 1 piece
[Including two screws (B 4×6: 7-682-560-09)]
- Rack mounting adaptor (left) 1 piece
[Including two screws (B 4×6: 7-682-560-09)]
- Rack bracket fixing screws (B 4×6: 7-682-560-09)
..... 6 pieces
- Adaptor fixing screws (B 4×10: 7-682-560-10)
..... 6 pieces

Other required parts

To mount in the rack, the rack mount kit RMM-10 and the following part are required.

- Screw for rack mounting (B5 × 12: 7-682-576-04)
..... 4 pieces

1. Notes on Rack Mounting

WARNING

- Fix the rack on the horizontal and firm floor with bolts to prevent it from turning over or moving.
If the rack overturn due to the weight of the unit, this may cause a death or serious injury.
- Use the specified rack mounting kit.
If not, the unit may fall because of insufficient strength. This causes an injury.
- After rack mounting, be sure to tighten the screws of the rack angle and fix this unit to the rack.
If not, this unit may slide and fall from the rack. This causes an injury.

CAUTION

Attention when this unit is installed in the rack:

- Mount the unit with two or more persons.
- Be careful not to put your hand or finger in the rack mount rail.
- Install in a stable posture.

Note

Install a ventilating fan in the rack to prevent the increase in the temperature inside a rack when multiple units are put in one rack.

2. Rack Mounting Procedure

Explains the procedure for rack mounting by Rack Mount Kit RMM-10.

Note

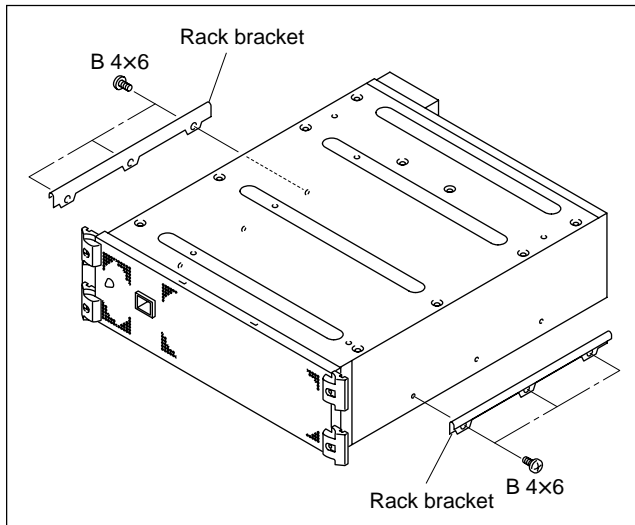
Fasten the screws at the tightening torque below.

Tightening torque: 1.2 N•m {12.2 kgf•cm}

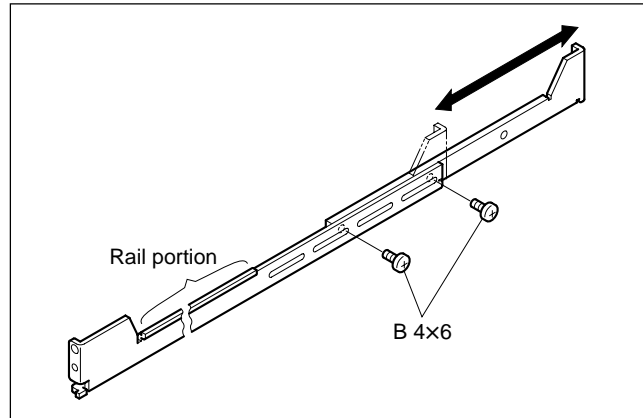
- (1) Attach the rack brackets at the side panels of the processor with the specified six screws.

Note

Be sure to use B4×6 as a screw.



- (2) Loosen the screws at the rear of the each adaptor and adjust each adaptor length to the rack depth.
(Following figure is case of left side.)

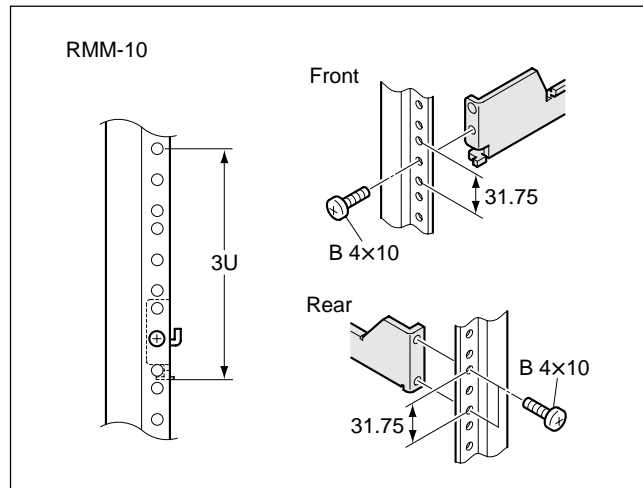
**Note**

The maximum depth of an adaptor is 750 mm.

The minimum depth of an adaptor is 595 mm.

- (3) Firmly lay the right and left adaptors in the rack with the specified six screws.

(Following figure is case of left side.)

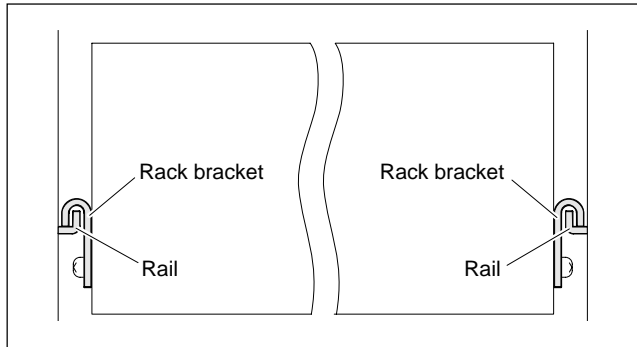


- (4) Fasten the length adjustment screws which are loosened in step (2).
- (5) Remove the front panel of the processor. (Refer to Section 2-2.)

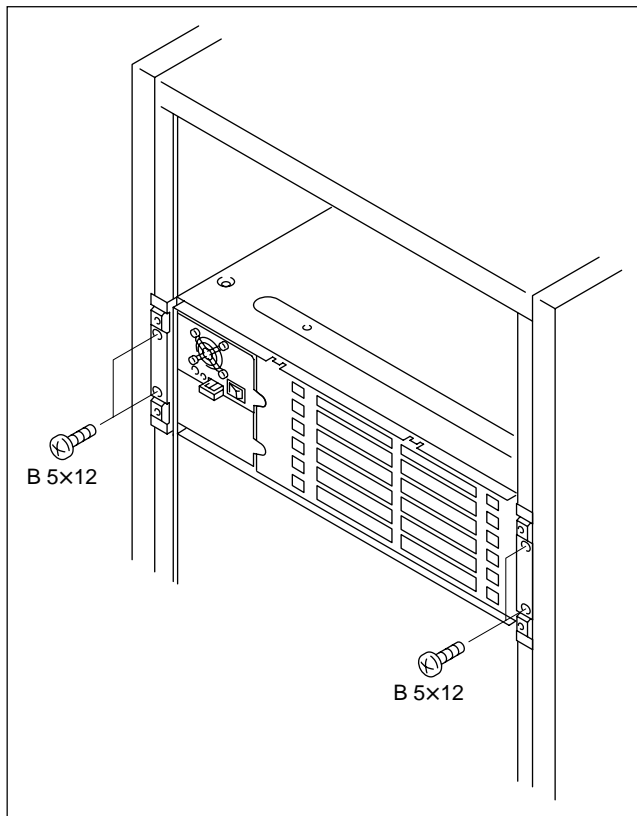
- (6) Align the crook of each rack bracket on the side panels of the processor with the rail, then slide the processor backward.

Note

Each rack bracket covers the rails as shown in the figure below.



- (7) Fix the unit to the rack with the specified screws and ornamental washers.



- (8) Install the front panel.(Refer to Section 2-2.)

2-1-8. Installing Optional Board

1. Inserting of Plug-in Boards (BKDF-701/702/702P)

CAUTION

To avoid shock hazards and/or damage to the mounted circuit boards, be sure to turn off the power switch before inserting or pulling out the plug-in boards.

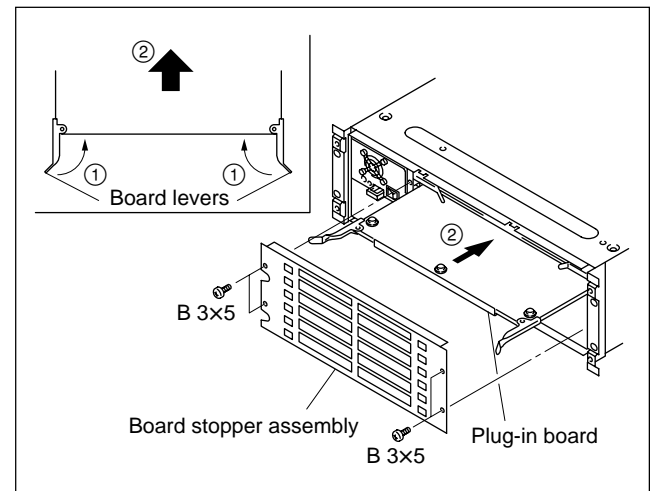
BKDF-701 and BKDF-702/702P are installed in slot No. 2 (the second slot from the top). BKDF-701 and BKDF-702/702P cannot be installed in the same processor unit.

- (1) Remove the front panel. (Refer to Section 2-2.)
- (2) Remove the four screws and then remove the board stopper assembly.
- (3) Insert the plug-in board into slot No. 2 with the board levers opened.

Note

Insert the board while applying an equal force to the both board levers.

- (4) Push the plug-in board in the direction of the arrow ②, then close the board levers in the direction of the arrow ①.



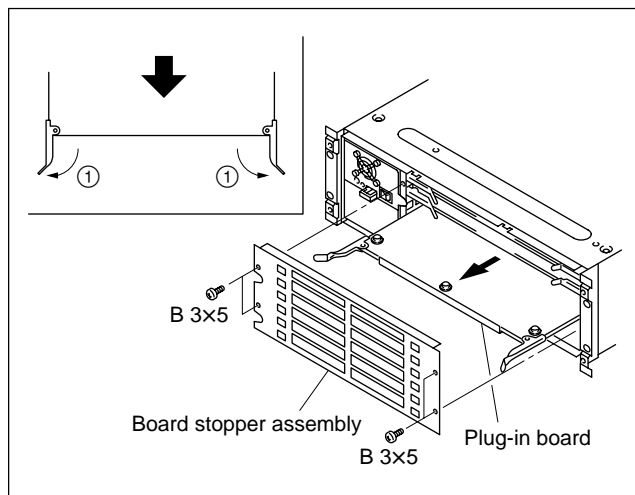
- (5) Install the board stopper assembly and front panel.

2. Installing the BKDF-711/712

CAUTION

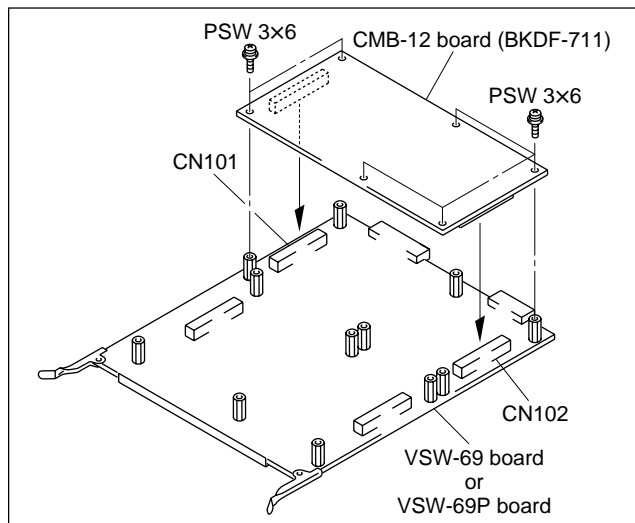
To avoid shock hazards and/or damage to the mounted circuit boards, be sure to turn off the power switch before inserting or pulling out the plug-in boards.

- (1) Remove the front panel. (Refer to Section 2-2.)
- (2) Remove the four screws and then remove the board stopper assembly.
- (3) Open the board levers in the direction of the arrow ① and remove the VSW-69/69P board from slot No. 4 (the fourth slot from the top).



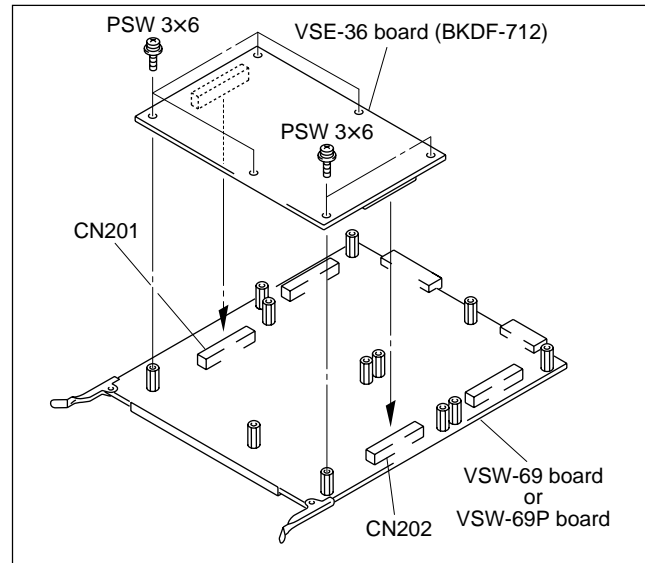
Installing the BKDF-711

- (4) Connect the connectors on the CMB-12 board firmly to the connectors (CN101 and CN102) on the VSW-69/69P board.
- (5) Fix the CMB-12 board to the VSW-69/69P board with the six screws supplied in BKDF-711.



Installing the BKDF-712

- (6) Connect the connectors on the VSE-36 board firmly to the connectors (CN201 and CN202) on the VSW-69/69P board.
- (7) Fix the connectors to the VSW-69/69P board with the six screws supplied for BKDF-712.



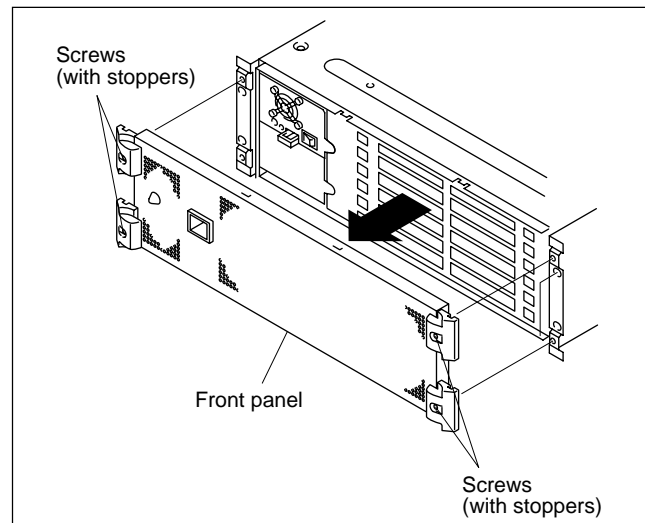
- (8) Install the VSW-69/69P board in slot No. 4.
- (9) Install the board stopper assembly and front panel.

Note

BKDF-711 and BKDF-712 can also be installed on the same VSW-69/69P board.

2-2. Removal of Cabinet

Remove the four screws (with stoppers) and then remove the front panel in the direction of the arrow.

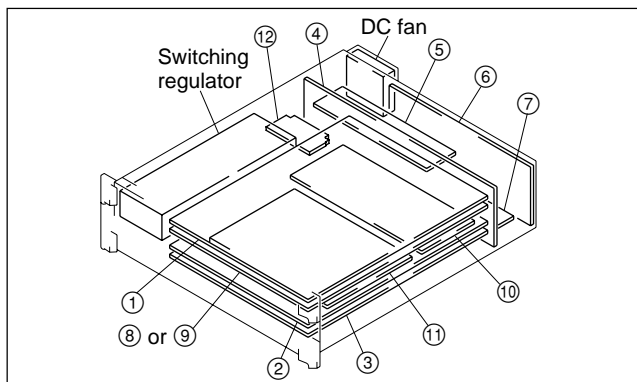


2-3. Location of Main Parts

Processor Unit

DFS-700A (UC): S/N 10331 and Higher

DFS-700AP (CE): S/N 40621 and Higher



DFS-700A (UC): S/N 10001-10330

DFS-700AP (CE): S/N 40001-40620

DFS-700 (UC): S/N 10001 and Higher

DFS-700P (CE): S/N 40001 and Higher

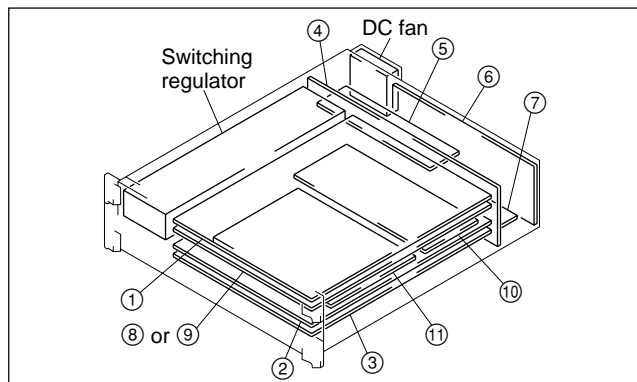


Fig No.	Board name	Function
①	IPM-96/96P	Input processor board
②	VSW-69/69P	Video processor board
③	OPM-39/39P OPM-45/45P	Output processor board
④	MB-874	Motherboard
⑤	DD-37	DC-DC conversion board
⑥	CN-1921	Connector board
⑦	CN-1942	Connector board
⑧	VIF-20/20P (BKDF-701)	Digital analog input board
⑨	VIF-19/19P (BKDF-702/702P)	Analog composite input board
⑩	CMB-12 (BKDF-711)	Digital multi effects board
⑪	VSE-36 (BKDF-712)	3D video mapping effects board
⑫	CN-2389	Connector board

Control Panel

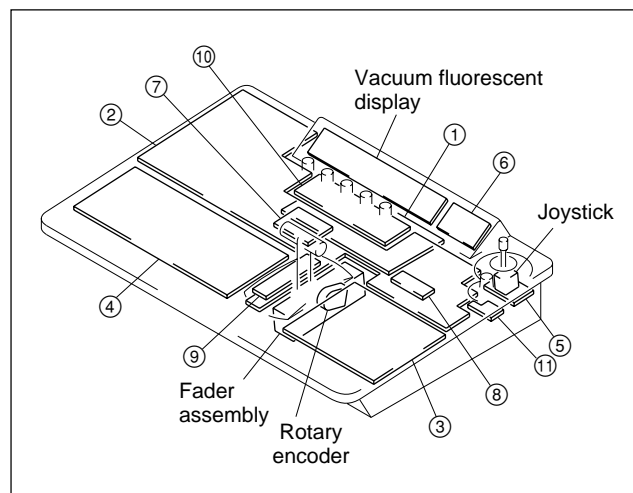


Fig No.	Board name	Function
①	CPU-305	CPU board
②	KY-466	Switch board
③	KY-467	Switch board
④	KY-468	Switch board
⑤	LC-40	Joystick board
⑥	LE-227	Display LED board
⑦	LE-233	7-segment LED board
⑧	LE-234	7-segment LED board
⑨	LE-235	LED board
⑩	VR-263	Volume board
⑪	VR-264	Volume board

2-4. Circuit Description

2-4-1. Processor

1. CMB-12 Board (2 Channel Digital Multi-effect Board)

V2 (FRGD) and K2 (TITLE) signals are processed on the CMB-12 board.

The V2 signal is used as an FRGD signal so as to perform the color collector processing, border addition, beveled edge addition, and two-dimensional low-pass filter processing.

In the title mode, the K2 signal is used as a key signal. After key processing, the key signal is used as a wipe key by a wipe generator so as to transform the two-dimensional low-pass filter processing. After the processing, the FRGD and key signals are written in DME memory. For the read address of DME memory data, the generator circuit varies depending on the two types of effects below.

(1) 2D, 3D nonlinear effect

(2) 3D mapping effect (when the VSE-36 board is installed)

The read data is interpolated for lighting. The data is then combined using the key signal from the VSW-69/69P board and the key signal processed on the CMB-12 board. The resultant FRGD and key signals are sent to the VSW-69/69P board.

2. DD-37 Board (DC-DC Converter)

In the DD-37 board, a power supply of +12 V is converted into the voltage used in each circuit.

The 12 V power supply output from an AC-DC power unit is converted into the voltages (+5 V, +3.3 V, +7 V, and -7 V) required in each circuit.

IC3, IC4, and IC5 are dual switching regulator control ICs. One IC can control two power outputs. IC3 controls +5 V-1 and +5 V-2 outputs, and IC4 controls +5 V-3 and +3.3 V-2 outputs. IC5 controls +7 V and -7 V outputs. For the maximum load current of each output voltage, +5 V and +3.3 V are 10 A, and +7 V and -7 V are 3 A.

3. IPM-96/96P Board (Input Processor Board)

The IPM-96/96P board is used to input the SDI, component (Y, R-Y, B-Y), and component (RGB) signals for DFS-700A/700AP/700/700P. The IPM-96/96P board mounts a four-channel SDI circuit and four-channel component circuit. A video signal is sent to the BG and FG buses by the switching of a crosspoint.

The IPM-96/96P board accepts three input signals; SDI signals (270 Mbps), component (Y, R-Y, B-Y) signals, and component (RGB) signals. Four-channel SDI signals, four-channel component (Y, R-Y, B-Y) signals, and RGB signals can be assigned to channels 1 through 8 of a crosspoint. For the one-channel analog signal input to the 8/4 component input connector, a component (Y, R-Y, B-Y) signal or component (RGB) signal is selected according to the format.

(1) Signal input block

An SDI input signal is directly converted into 4:2:2 parallel signal of an eight-bit by an SDI input IC and sent to the next stage.

For a component signal input, an RGB-to-Y, R-Y, B-Y conversion circuit is added to only the 8/4 input connector. The analog component signal can be input based on an RGB or Y, R-Y, B-Y signal system by the selection of a format. As a result, all analog input signals become Y, R-Y, B-Y signals.

In each channel, these signals are analog-to-digital converted by the same circuit processing system and sent to the next stage as 4:2:2 parallel signal of an eight-bit.

(2) Analog input block

The analog input block on the IPM-96/96P board can accept four-channel component input signal. Basically, the analog input block receives Y, R-Y, and B-Y signals. Only the fourth channel is provided with an RGB-to-Y, R-Y, B-Y conversion circuit and selection circuit so that it can also receive an RGB component signal. Therefore, the circuit stage after the selection circuit in the fourth channel is the same in each channel. Only the first channel is described below as an example. A Y signal is passed through a 5.5 MHz low-pass filter, converted into the proper value in a signal level, and fed to the A/D converter by AC coupling. Color difference signals R-Y and B-Y are passed through a Y/C delay adjustment circuit and 2.5 MHz low-pass filter, converted into the proper value in level, and sent to the A/D converter by AC coupling. A/D converter IC107 is an eight-bit Y, R-Y, B-Y simultaneous conversion output circuit incorporating a clamp function. In the case of reference voltage for A/D conversion, a top voltage of 3.5 V and a bottom voltage of 1.5 V are supplied using a reference voltage generator circuit and operational amplifier. For the phase relation at the input end of the A/D converter, a Y signal is supplied in the state where it is advanced 222 ns (corresponding to three clocks of a 13.5 Mbps digital clock) with respect to a R-Y, B-Y signal. When the Y signal is converted into a digital signal, only the Y signal is delayed by three clocks (222 ns) for phase adjustment. Since the Y signal has a high frequency band, the delay in an analog circuit is disadvantageous in frequency characteristics and is processed by a digital circuit. Moreover, the digital output Y signal of the A/D converter is converted in a digital level by a ROM table so as to select the level difference in NTSC-J, NTSC-UC, and PAL. The level is converted (expanded) for NTSC-UC only.

(3) Input conversion clock generation block

Each input circuit requires a 4:2:2 digital clock (13.5 MHz) synchronized with an input analog signal. Therefore, each channel has a clock generator circuit in the input block. The signal just before entering the A/D converter is taken out from the Y signal system of an input signal and composite sync information is extracted using a sync separator circuit. One of the extracted information generates a clamp pulse for clamping an input signal. The other is passed through a half H killer circuit and then connected to a clock generation PLL circuit of 27 MHz via the video phase adjustment circuit during digital conversion. As a result, clocks of 27 MHz and 13.5 MHz and H start pulses are generated.

(4) Digital level conversion block

On the IPM-96/96P board, the input level is multiplied by 1.08 (expanded in level proportionally to the setup elimination) in the NTSC-UC mode using a ROM table after A/D conversion. This is the level conversion by digital processing. Using this system, the setup elimination can also be simultaneously processed without changing the clamp operation and function required until the A/D converter is used. This system is thus very efficient. The DFS-700A/700AP/700/700P is designed so that data completely returns to the former state between the input and output (expansion to reduction) and coincides with each other. Therefore, this ensures the satisfactory characteristics of waveforms.

(5) TBC block

After an SDI input signal is converted from serial to parallel, it is input to the line memory. After a component input signal is converted from analog to digital, it is input to the line memory. In this line memory, the TBC block having a lead-in range of -0.3 to $+1.3$ H from a REF signal as reference is constituted. On the write side, the line memory is written in the phase of an input signal. On the read side, it is read in the lead-in timing described above. As a result, on the read side, all input channels are adjusted to the same phase. Similarly, after a component input signal is converted from analog to digital, all channels become in phase with an SDI input by the output of line memory. The write and read control signals of the line memory are generated based on internal HD and VD pulses using memory control circuits (IC1320 to IC1323, IC1330, and IC1331).

(6) Crosspoint block

The input signal of a crosspoint on the IPM-96/96P board is a four-channel SDI input signal and four-channel component input signal. When the VIF-20/20P board is installed, the four-channel SDI input signal or four-channel component signal of the VIF-20/20P board is used as the input signal of a crosspoint. When the VIF-19/19P board is installed, the four-channel composite input signal or four-channel S video input signal of the VIF-19/19P board, and a memory bus and internal video signal are used as the input signal of a crosspoint. The output signal of a crosspoint is V1, K1, V2, K2, V3, and BG buses passed to the VSW-69/69P board, a DSKF bus passed to the OPM board (OPM-39/39P or OPM-45/45P), and a memory bus used as the input signal of the frame memory on the IPM-96/96P board.

(7) Frame memory block

The frame memory block freezes an input signal. The frozen video signal is used as one of the input signals in a crosspoint. When the input signal selected at the crosspoint is input from the memory bus to the frame memory circuit, it is separated into luminance and color-difference signals and written in the frame memory. The frame memory consists of four field memories and memorizes the luminance and color-difference signals separately in units of fields. After the luminance and color-difference signals are read, they are multiplexed and then output. For frame freezing, the luminance and color-difference signals are alternately read from memory in units of fields. For field freezing, odd and even field freezes are available. One field is read at all times. In the other field, two lines are added for interpolation. A two-line addition line buffer (IC1209) and adder (IC1208) are used as this circuit. The control signal of the frame memory is generated based on internal FD and VD pulses using memory control circuits (IC1322, IC1324, IC1326, and IC1333).

(8) CPU interface block

The IPM-96/96P board sets the mode selection or initial value by communicating with CPU (IC901) on the VSW-69/69P board. After IC1327 receives the data, address, and control signal from CPU and decodes them, it sends a chip select and set value to the SIF control circuit.

4. OPM-39/39P or OPM-45/45P Board (Output Processor Board)

The OPM-39/39P or OPM-45/45P board (abbreviated as OPM board hereafter) outputs the DME, PVW, and KEY signals input from the VSW-69/69P board as an SDI or analog (component, S video, or composite) format signal. The OPM board mounts a DSK circuit that mixes a DSK video signal with the DME signal. This board also has an external reference sync circuit and black burst output circuit as well as an internal sync generator.

The OPM board consists of the following blocks.

(1) Gen-lock/system clock

This block generates the reference signals required for DFS-700A/700AP/700/700P, such as internal signals (FD, VD, HD, BLK, CKF (27 MHz), and CKM (13.5 MHz) or an external output black burst signal.

Each output signal operates with the sync signal of a sync generator (IC103) as the source. In the operation mode, there are an EXTERNAL GEN-LOCK mode that is gen-locked to the sync signal (VBS or BS) supplied from an external signal oscillator and an INTERNAL mode that internally generates a sync signal. When a sync signal is sent to the REF. VIDEO input connector on the rear panel, the unit automatically enters the EXTERNAL GEN-LOCK mode.

(2) DSK (Down Stream Keyer)

This block generates the key signal required for mixing a DME signal and DSK video signal. In addition to the component key signal input from the DSK KEY input connector on the rear panel, the self-key obtained when only a Y signal is extracted from a DSK fill signal can also be selected for a DSK source signal. The DSK source signal is adjusted in gain and clip, and masked, using a key processor (IC303). A fill key (FLK) signal that mixes the DSK fill signal with a border mat signal and a downstream key (DK) signal that is required for mixing with the DME signal are generated in the next-stage border processor (IC310) using a five-line key signal. The OPM-45/45P board adjusts the position of keying characters, etc. (DSK) by changing the delay amount using IC301, IC410 and IC411.

(3) DSK M/E, FTB

The mixing operation of a DME signal and DSK video signal, and the FTB (feed-to-black) operation are performed in this block.

A DSK fill (or DSK mat) signal and border mat signal are first mixed with the fill key signal used as a coefficient. The PGM signal obtained when a DSK video signal with border is inserted into the DME signal is produced by this processing. The PGM signal is mixed for performing the FTB operation to a color mat signal and sent to the SDI and analog output circuit blocks. The signals (CLEAN, PVW, and KEY) output to the CLEAN connector are also selected by this block.

(4) OUTPUT

This block outputs PGM, CLEAN, PVW, and KEY signals as an SDI or analog format signal. In an SDI output system, there are a PGM signal and a signal output to the CLEAN connector. After V BLANKING addition and WHITE/DARK clipping are performed via this path using output processors (IC408 and IC504), these signals are converted from parallel to serial and then output. There are PGM and PVW signals in an analog output system. In the PGM path, a (eight-bit, 27 MHz) digital signal is separated into Y, V, and U signals and converted into an analog signal using a D/A converter. On the basis of the converted signal, component, S video, and composite signals are produced for output. Unlike the PGM path, in the PVW path, a digital signal is converted into a composite signal by one LSI (IC808).

The following signals can be output from the output connector on the rear panel according to the signal formats below.

PGM output signal	SDI signal	2 channels
	Component signal	2 channels
	Composite signal	2 channels
	S video signal	2 channels
PVW output signal	Composite signal	1 channel
CLEAN output signal	SDI signal	1 channel
(CLEAN, PVW, or KEY signal)		
Black burst output signal		3 channels
Tally output signal		8 outputs

(5) CPU interface

This block interfaces with the IC and local CPU on the OPM board. This block decodes the control signal generated by CPU using FPGA (IC805) and generates a control signal according to the way to control the IC. It also passes the information on the NTSC/PAL distinction and NTSC J/NTSC UC model to CPU via FPGA.

5. VIF-19/19P Board (Analog Composite and S Video Input Board)

The VIF-19/19P board is used for inputting the analog composite and S video signals of DFS-700A/700AP/700/700P. The VIF-19/19P board decodes the input composite signal and converts it into a D1 digital signal. This board also has a frame synchronizer function and uses an input signal as the signal synchronized with a reference signal. The output signal is sent to the IPM-96/96P board.

The VIF-19/19P board mounts a four-channel analog composite or S video input circuit. In each channel, an analog composite input signal or S video input signal can be independently selected in the setup menu. One channel is described below.

The circuit consists of a sync separator circuit, 13.5-MHz clock generation block, subcarrier clock generation block, Y/C separation and decode block, D1 encoder block, and frame synchronizer block.

The analog composite and S video input signals have an individual input connector on the rear panel. These signals can be simultaneously input to the VIF-19/19P board. On the VIF-19/19P board, two input signals are selected by controlling the setup menu.

The selected signal branches into two paths. One is input to the sync separation circuit so as to detect horizontal and vertical sync signals. After that, in the 13.5-MHz clock generation block, the signal generates a 13.5-MHz clock for the D1 signal synchronized with a horizontal sync signal.

The other is input to the Y/C separation and decode circuit. In the subcarrier clock generation block, the signal generates the clock of the subcarrier frequency, multiplied by four, that was synchronized with a burst signal. After that, a composite signal is converted from analog to digital, Y/C-separated, and decoded by this clock. The resultant signal is converted from digital to analog again to produce an analog component signal. The Y/C separation is based on an adaptive two-dimensional system in which three lines are used. For the S video signal, only a chroma signal is converted from analog to digital and decoded digitally by this clock. The resultant signal is converted from digital to analog again to produce analog B-Y and R-Y signals. For a Y signal, the input analog signal is used directly.

The analog component signal is adjusted in phase and gain and converted from analog to digital using the 13.5-MHz clock described above to produce a D1 digital signal.

A frame synchronizer is constituted for each signal Y and C. The frame synchronizer consists of two FIFOs of $384\text{ K} \times 8$ bits, respectively. The signals are written in FIFO using the clock synchronized with an input signal and read using the clock synchronized with a reference signal. The input signal synchronized with a reference signal is delayed by about 1 to 3 H in this portion, but absorbed by other boards. Therefore, in the system, the delay will not increase by passing through the frame synchronizer.

6. VIF-20/20P Board (SDI and Analog Component Input Board)

The VIF-20/20P board is an optional expansion board for inputting the SDI and analog component signals of DFS-700A/700AP/700/700P. The VIF-20/20P board mounts a four-channel SDI input circuit or four-channel analog component input circuit. The SDI or analog component input signal is sent to the IPM-96/96P board as a four-channel 4:2:2 component parallel digital signal. In each channel, the SDI input signal or analog component input signal can be independently selected according to the format.

(1) Signal input block

There are four channels in an SDI input circuit. An SDI input signal is directly converted into an eight-bit, 4:2:2 parallel signal. There are also four channels in a component input circuit. Finally, the signals in each channel are converted into eight-bit, 4:2:2 parallel signals by the same circuit system. The signals in four channels are selected together with the signal from the SDI input circuit and sent to the next-stage TBC circuit. The analog component input circuit generates a clock of 27 MHz synchronized with an input signal, regulates the level and delay value, and converts the signal from analog to digital.

(2) Analog input block

The analog input block on the VIF-20/20P board is basically almost the same in configuration as for the IPM-96/96P board. The circuit configuration is almost the same as that obtained when a component (RGB) signal input converter added to only the fourth channel is removed from the circuit configuration of the IPM-96/96P board and when a level selection circuit for each signal format is inserted into each four-channel color-difference (R-Y and B-Y) signal system. Therefore, the relevant circuit configuration is explained below. For other configuration, refer to “(2) Analog Input Block” of the IPM-96/96P board.

A video selection circuit of 3×1 is inserted in each four-channel color-difference signal system. On the input side, a chroma signal is precisely divided by a high-precision resistor so as to select the level using a selection signal and sent to the next stage. In the case of the chroma signal, the input level for making the same in level as 75% color bars of an SDI signal is 756 mV for NTSC J, 700 mV for NTSC UC, and 525 mV for PAL. As a result, the system operates so that the output level of a selector circuit is constant in any input level. This shows that the setting of a chroma signal level does not vary depending on the format used.

(3) Input conversion clock generation block

Each input circuit requires a 4:2:2 digital clock (13.5 MHz) synchronized with an input analog signal. Therefore, each channel has a clock generator circuit in the input block. The signal just before entering the A/D converter is taken out from the Y signal system of an input signal and composite sync information is extracted using a sync separator circuit. One of the extracted information generates a clamp pulse for clamping an input signal. The other is passed through a half H killer circuit and then connected to a clock generation PLL circuit of 27 MHz via the video phase adjustment circuit during digital conversion. As a result, clocks of 27 MHz and 13.5 MHz and H start pulses are generated.

(4) Digital level conversion block

On the VIF-20/20P board, the input level is multiplied by 1.08 (expanded in level proportionally to the setup elimination) in the NTSC-UC mode using a ROM table after A/D conversion. This is the level conversion by digital processing. Using this system, the setup elimination can also be simultaneously processed without changing the clamp operation and function required until the A/D converter is used. This system is thus very efficient. The DFS-700A/700AP/700/700P is designed so that data completely returns to the former state between the input and output (expansion to reduction) and coincides with each other. Therefore, this ensures the satisfactory characteristics of waveforms.

(5) TBC block

After an SDI input signal is converted from serial to parallel, the video signal selected according to the format is input to the line memory. After a component input signal is converted to analog to digital, the video signal selected according to the format is input to the line memory. In this line memory, the TBC block having a lead-in range of -0.3 to $+1.3$ H from a REF signal as reference is constituted. On the write side, the line memory is written in the phase of an input signal. On the read side, it is read in the lead-in timing described above. As a result, on the read side, all input channels are adjusted to the same phase. Similarly, after a component input signal is converted from analog to digital, all channels are adjusted to the same phase by the output of line memory. The write and read control signals of the line memory are generated based on internal HD and VD pulses using memory control circuits (IC1309, IC1320, IC1321, and IC1323). The output video signal of the TBC block is sent to the IPM-96/96P board and input to the crosspoint.

(6) CPU interface block

The VIF-20/20P board sets the mode selection or initial value by communicating with CPU (IC901) on the VSW-69/69P board. After IC1327 receives the data, address, and control signal from CPU and decodes them, it sends a chip select and set to the SIF control circuit.

7. VSE-36 Board (3D Mapping Effects Board)

The VSE-36 board is used to realize a three-dimensional mapping effect. This board consists of an address generation block and texture memory block.

The address generation block can be divided into a CPU block and rendering block. The CPU block consists of CPU (IC501), program flash memories (IC601 to IC605), SDRAMs (IC612, IC613, IC615, IC616), and dual port RAM (IC510). The rendering block consists of DDA (IC401), address memories (IC413 to IC420) and address memory controllers (IC105, IC106, and IC109).

The CPU block receives the information (e.g., system set information, effect pattern number, fader position, etc.) required for effect generation from the main CPU on the VSW-69/69P board via dual port RAM and transforms the three-dimensional object creation, geometry processing, and lighting calculation for each vertex.

The rendering block expands the vertex data from a CPU (IC901) block to the information based on units of pixels by DDA and draws it on the address memory. The address memory controller reads the drawn address information and sends it to the texture memory block on the VSE-36 board, or the VSW-69/69P and CMB-12 boards. The address memory has a double-buffer configuration. Therefore, drawing and reading are alternately switched for each field.

The texture memory block consists of a demultiplexer (IC105), color collector (IC251), border mixer (IC253), low-pass filters (IC201 and IC208), texture memory controllers (IC301 and IC306), and texture memories (IC302 to IC305, and IC307 to IC310).

In the texture memory block, color collector processing, border addition, and two-dimensional low-pass filter processing are performed for the V3 signal (8-bit, 27 MHz) sent from the VSW-69/69P board as a texture video source. After that, the signal is written in texture memory. The texture memory controller reads the written data using the address generated by an address generation block, interpolates the data, and send it to the VSW-69/69P board. The texture memory has a double-buffer configuration. Therefore, writing and reading are alternately switched for each field.

8. VSW-69/69P Board (Processor Board)

The VSW-69/69P board consists of a signal processing block and CPU block. This board transforms the DME processing according to the control panel operation.

V1, K1, BG, V2, K2, and V3 signals (8-bit, 27 MHz) are input from the IPM-96/96P board to the VSW-69/69P board.

The signal processing block processes the V1, K1, and BG signals and outputs PGM, KEY, and PVW signals to the OPM board (OPM-39/39P or OPM-45/45P).

The V1 signal is used as an FRGD signal so as to transform the color collector processing, border addition, beveled edge addition, and two-dimensional low-pass filter processing.

In the title mode, the K1 signal is used as a key signal. After key processing, the K1 signal is used as a wipe key by a wipe generator so as to perform the two-dimensional low-pass filter processing.

The FRGD and key signals in which the two-dimensional low-pass filter processing was carried out are written in DME memory. For the read address of DME memory data, the generator circuit varies depending on the three types of effects below.

- (1) 2D, 3D, and nonlinear effects
- (2) Sparkle effect
- (3) 3D-mapping effect (when the VSE-36 board is mounted)

The read data is interpolated for lighting.

The signal immediately after lighting for luminance and chroma signals and the signal immediately after interpolation for a key signal are sent to the VSW-69/69P board's later stage and the CMB-12 board in parallel.

The resultant signal is passed through a selection circuit and trailing block for the signal from the optional CMB-12 board. In a specific effect, the signal is then given later-stage wiping and later-stage border processing and mixed with a BKGD signal.

The signal that gave color collector processing to a BG signal and of which phase was adjusted to an FRGD signal via field memory is used as the BKGD signal.

The CPU block consists of CPU (IC901), a program, data flash memories (IC920 to IC924, IC941, IC942), SDRAMs (IC909 and IC910), dual port memory (IC912), SRAM (IC911), and a USB controller (IC932). The SRAM is backed up by a capacitor, storing the crosspoint state, effect parameters, or snapshot data.

The CPU block calculates the register set value of hardware from each effect parameter and writes it in the specified position inside the dual port memory. Moreover, the CPU block sets hardware with respect to the IPM-96/96P, OPM-39/39P or OPM-45/45P, VIF-19/19P, and VIF-20/20P boards.

The CPU block also communicates with the external equipment such as a control panel, edit controller, and personal computer using a 2-channel serial port and USB interface.

2-4-2. Control Panel

1. CPU-305 Board

The CPU-305 board is the system control board on the control panel of DFS-700A/700AP/700/700P. The CPU-305 board communicates with a processor unit via RS-422, scans switches, and displays indication elements such as LED/VFD (vacuum fluorescent display). The CPU-305 board mainly consists of the following circuit blocks.

- CPU and CPU's peripheral circuit
- DC-DC converter block
- External communication interface block
- Switch scan/LED lighting interface block
- Parallel interface block

(1) CPU and CPU's peripheral circuit

CPU uses a 16-bit microprocessor (IC21) in a clock of 16 MHz. CPU consists of 4 M-bit flash memory (IC51) in which a boot loader is stored, 4 M-bit flash memory (IC54) in which system control software is stored, two 512 k-bit work SRAMs (IC52 and IC53), and an address decoder (IC26) that generates memories, parallel interface chip select signals, or read/write control signals.

(2) DC-DC converter block

Powers of +5 V and +7 V are produced from +12 V, that is input from a processor unit, using the DC-DC converter (IC29). The +7 V power is passed through the KY-466 board and used to drive the green and red LEDs inside large switches on the KY-467 and KY-468 boards.

(3) External interface block

The external interface block communicates with a processor unit from the serial port (TXD0/RXD0) inside CPU via an RS-422 transceiver (IC24).

(4) Switch scan/LED lighting interface block

This block controls the data scanning of switches, volume controls, joysticks, and faders on the KY, VR, and LC boards and the lighting of LEDs on the LED board.

This block consists of 2 k-bit dual port memory (IC64), a dual port memory controller (IC70), parallel-to-serial converters (IC65 and IC66), a serial-to-parallel converter (IC68), and a buffer (IC67). The lighting on/off data of LEDs as well as the scan data of switches is memory-mapped on the dual port memory from CPU.

CPU writes the lighting on/off data of LEDs in the corresponding address of the dual port memory.

The contents of the data are converted from parallel to serial (using IC65 and IC66) and sent to the KY-466 board together with a clock and other control signals.

The scan data by which various switches were multiplexed is loaded from the KY-466 board in serial and converted from serial to parallel (using IC68). The converted data is loaded to the dual port memory and read by CPU.

(5) Parallel interface block

Using a parallel interface circuit (IC72), this block drives the buzzer and operating indication LEDs, reads the DIP switch information, and controls the dual port memory controller. Moreover, it controls and displays the vacuum fluorescent display through IC62 and IC63.

2. KY-466 Board

The KY-466 board scans the data of switches, volume controls, faders, and joysticks and turns on the LED indicators and indication elements.

The LEDs decode the serial data and timing signal sent from the CPU-305 board and turn on them dynamically with a matrix of 8×8 as reference. The switches scan data by a matrix of 8×8 . The pulse data of the volume controls (on the VR-263 and VR-264 boards) and faders is read using counter circuits (IC208 to IC210, and IC211 to IC214). The analog data of the joysticks (on the LC-40 board) is read using an A/D converter (IC215). After that, the read data is converted from parallel to serial together with switch scan data, and the multiplexed serial data is sent to the CPU-305 board.

3. Other Main Boards

The KY-467 board is used for numeric keys. The KY-468 board mounts crosspoint select switches, and CUT, AUTO, and TRANSITION switches. The main control circuit of these switches and LEDs on the board is located on the KY-466 board.

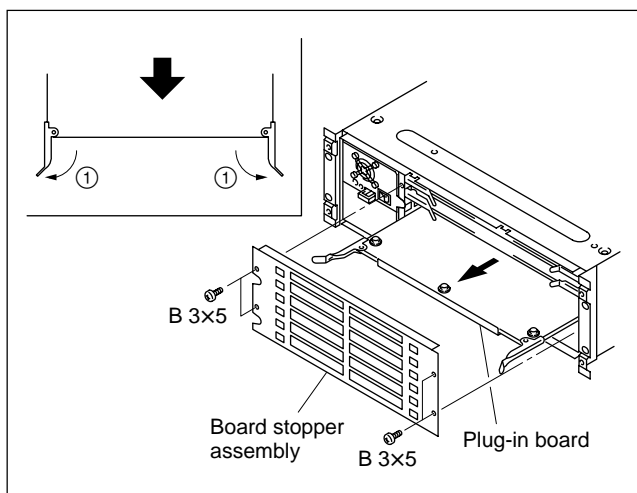
2-5. Replacement of Board

CAUTION

To avoid shock hazards and/or damage to the mounted circuit boards, be sure to turn off the power switch before inserting or pulling out the plug-in boards.

2-5-1. Replacement of Plug-in Board

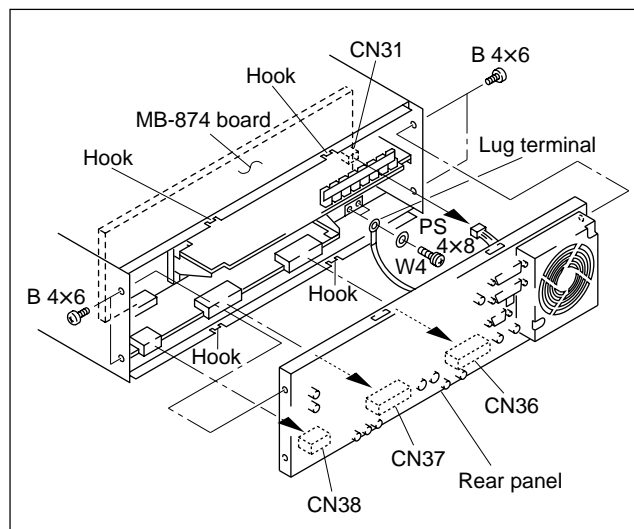
1. Remove the front panel. (Refer to Section 2-2.)
2. Remove the four screws and then remove the board stopper assembly.
3. Open the board levers in the direction of arrow ① and remove the plug-in board.



4. Install a new plug-in board in the reverse order of steps 1 to 3.

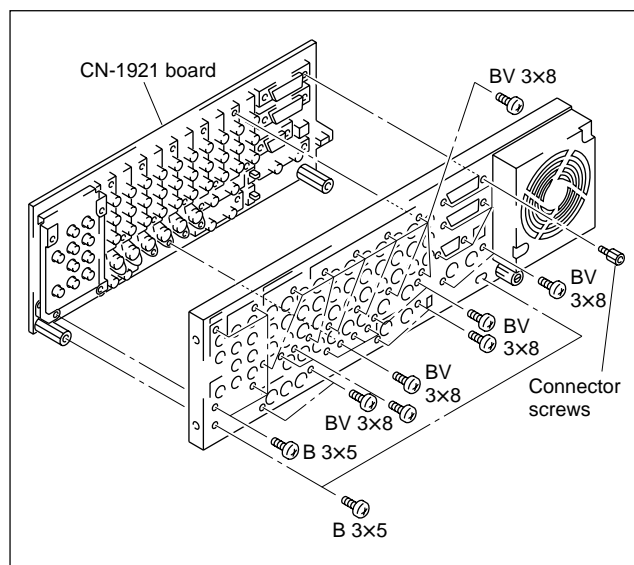
2-5-2. Replacement of Board

1. Remove the four screws (B4 × 6).
2. Disconnect the connectors (CN36, CN37, and CN38) on the CN-1921 board while removing the four hooks.
3. Remove the screw (PS4 × 8), washer (W4), and lug terminal and disconnect the connector (CN31) on the MB-874 board. Remove the rear panel.



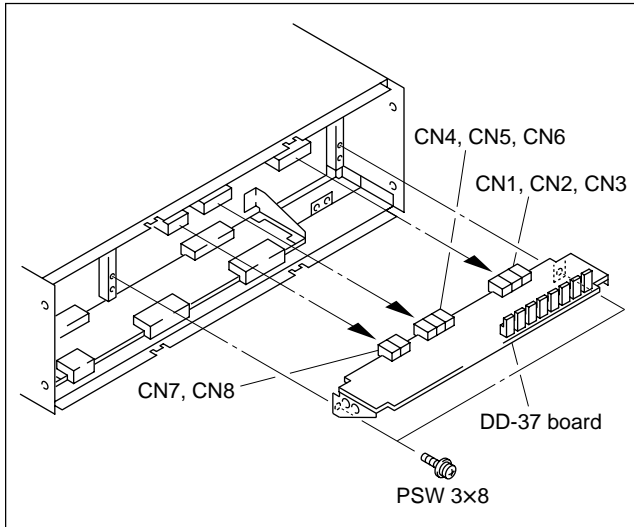
Replacing the CN-1921 board

1. Remove the 6 screws (B3 × 5) and 25 screws (BV3 × 8).
2. Remove the 6 connector screws and then remove the CN-1921 board.
3. Install a new CN-1921 board in the reverse order of steps 1 and 2.



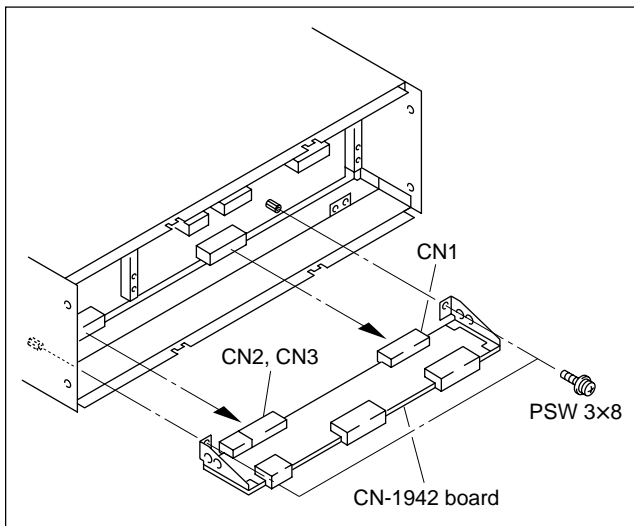
Replacement of DD-37 board

1. Remove the two screws.
2. Disconnect connectors (CN1 to CN8) on the DD-37 board and remove the DD-37 board.
3. Install a new DD-37 board in the reverse order of steps 1 and 2.



Replacement of CN-1942 board

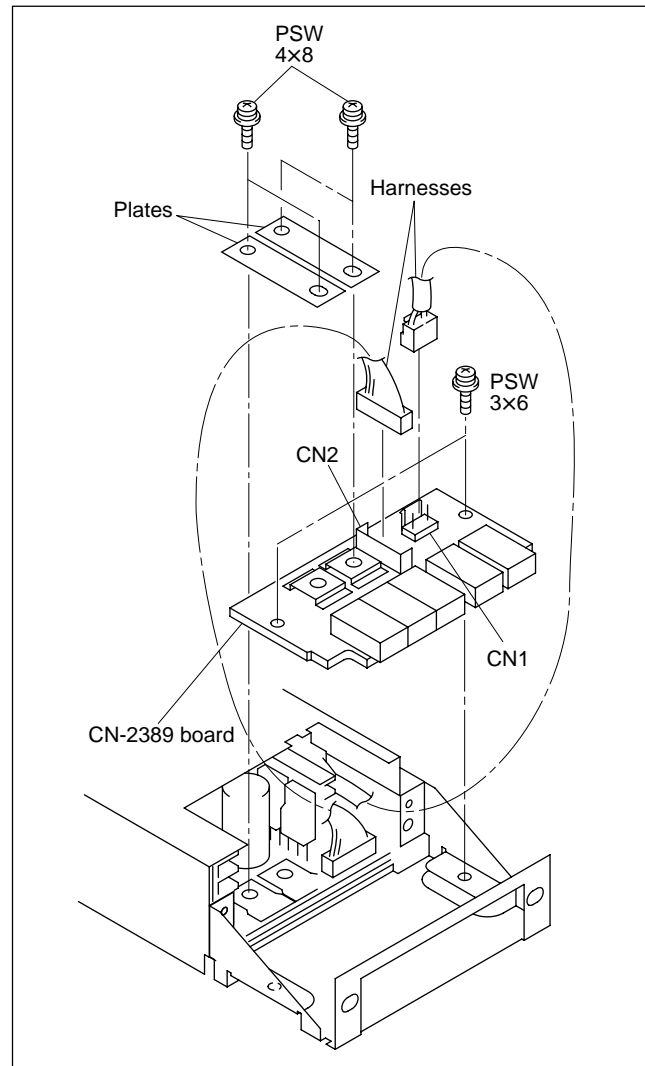
1. Remove the two screws.
2. Disconnect the connectors (CN1 to CN3) on the CN-1942 board and remove the CN-1942 board.
3. Install a new CN-1942 board in the reverse order of steps 1 and 2.



Replacement of CN-2389 board

(DFS-700A (UC): S/N 10331 and Higher)
(DFS-700AP (CE): S/N 40621 and Higher)

1. Remove the front panel. (Refer to Section 2-2.)
2. Remove the four screws (PSW 4x8), then remove the two plates.
3. Remove the two harnesses from the connectors (CN1, CN2) on the CN-2389 board.
4. Remove the two screws (PSW 3x6), then remove the CN-2389 board.
5. Install a new CN-2389 board in the reverse order of steps 1 to 4.



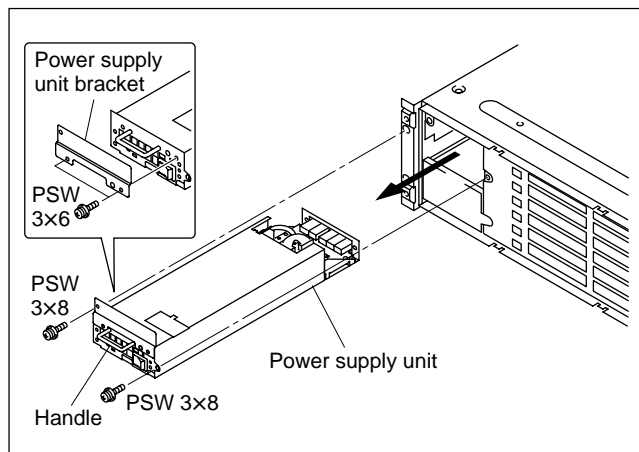
2-6. Replacement of Switching Regulator

WARNING

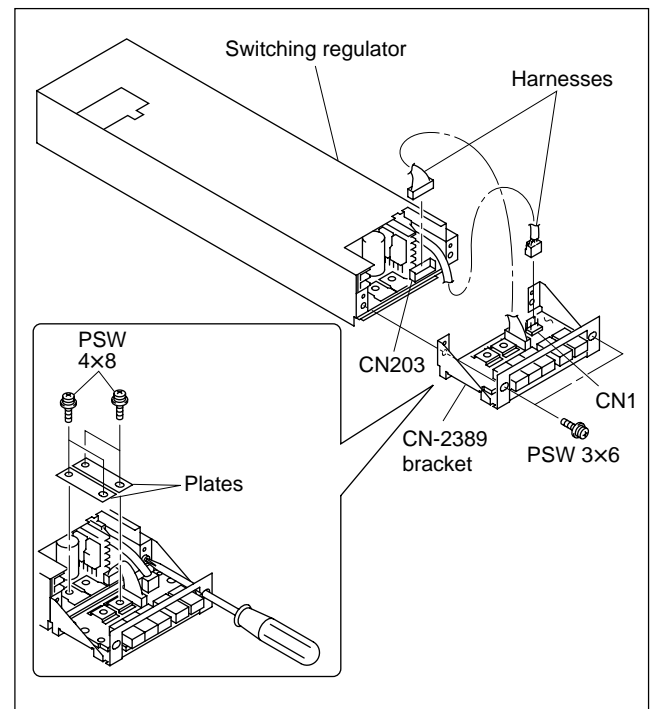
To avoid shock hazards and/or damage to the switching regulator, be sure to turn off the power switch before starting the replacement.

DFS-700A (UC): S/N 10331 and Higher
DFS-700AP (CE): S/N 40621 and Higher

1. Remove the front panel. (Refer to Section 2-2.)
2. Remove the two screws (PSW 3×8) and pull out the power supply unit while holding the handle.
3. Remove the two screws (PSW 3×6), then remove the power supply unit bracket.



4. Remove the four screws (PSW 4×8), then remove the two plates.
5. Remove the one harness from the connector (CN1) on the CN-2389 board.
6. Remove the one harness from the connector (CN203) of the switching regulator.
7. Remove the two screws (PSW 3×6), then remove the switching regulator.



8. Install a new switching regulator in the reverse order of steps 1 to 7.

CAUTION

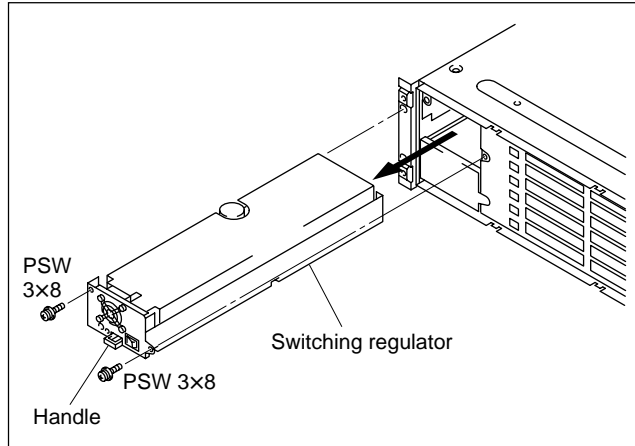
Installing the power unit incompletely may cause an increase in the contact resistance of a connector and the part damage or smoking. Firmly tighten the screws fixing the power unit. Do not turn on the power until the power unit is fixed securely.

Note

Before attaching the switching regulator to the CN-2389 bracket, be sure to temporarily secure the two plates.

DFS-700A (UC): S/N 10001-10330
DFS-700AP (CE): S/N 40001-40620
DFS-700 (UC): S/N 10001 and Higher
DFS-700P (CE): S/N 40001 and Higher

1. Remove the front panel. (Refer to Section 2-2.)
2. Remove the two screws and pull out the switching regulator while holding the handle.



3. Install a new switching regulator in the reverse order of steps 1 and 2.

CAUTION

Installing the power unit incompletely may cause an increase in the contact resistance of a connector and the part damage or smoking. Firmly tighten the screws fixing the power unit. Do not turn on the power until the power unit is fixed securely.

Note

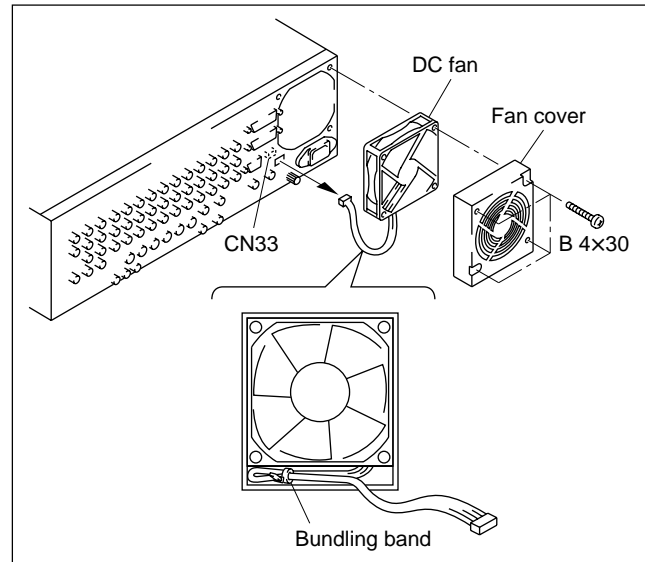
For the adjustment after the switching regulator replacement, refer to “4-8. Adjusting the Power Supply Voltage”.

2-7. Replacement of DC Fan

WARNING

To avoid shock hazards and/or damage to the DC fan, be sure to turn off the power switch before inserting or pulling out the plug-in boards.

1. Remove the four screws and then remove the fan cover.
2. Disconnect the connector (CN33) on the CN-1921 board and remove the DC fan.



3. Install a new DC fan in the reverse order of steps 1 and 2.

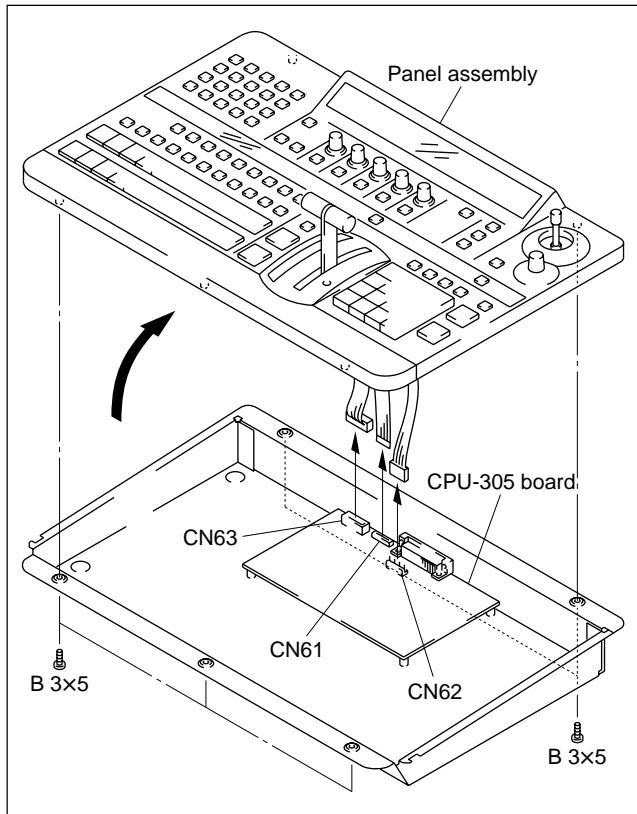
Notes

- As shown in the figure, fix the harness of the DC fan using a bundling band (available commercially).
- When installing the fan cover, take care not to interpose the harness at the bottom of the fan.

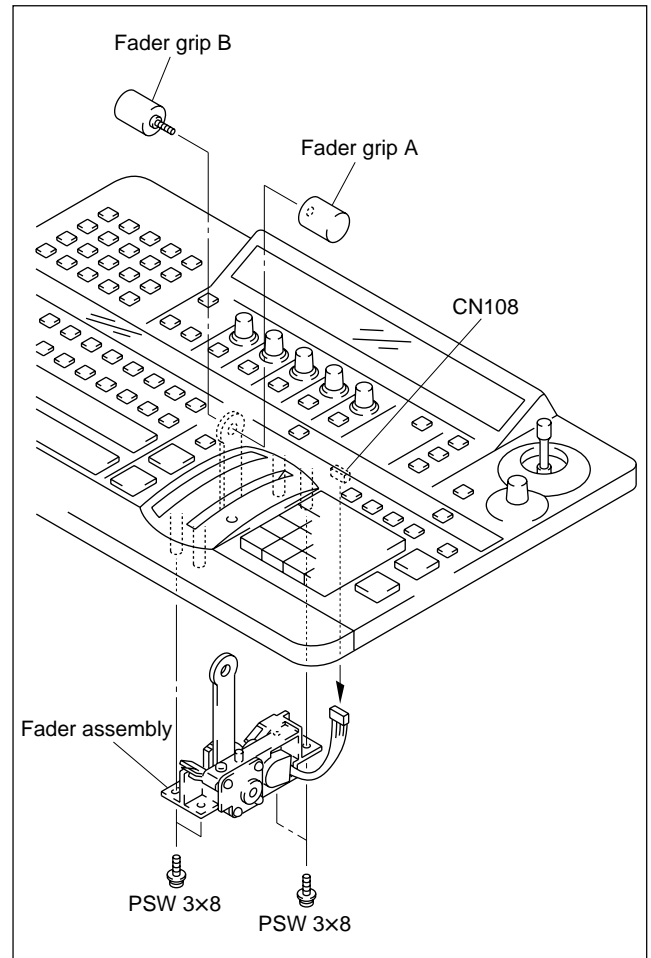
2-8. Replacement of Main Parts on Control Panel

2-8-1. Replacement of Fader Assembly

1. Remove the five screws and raise the panel assembly.
2. Disconnect the connectors (CN61 to CN63) on the CPU-305 board and remove the panel assembly.



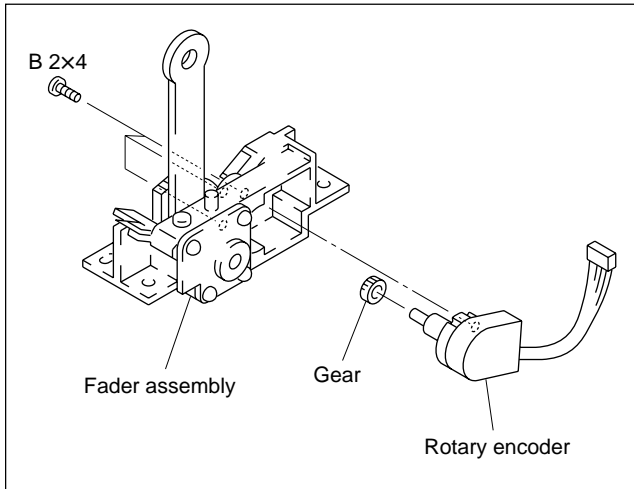
3. Remove the fader grips A and B.
4. Disconnect the connector (CN108) on the KY-466 board.
5. Remove the four screws and then remove the fader assembly.



6. Install a new fader assembly in the reverse order of steps 1 to 5.

2-8-2. Replacement of Rotary Encoder

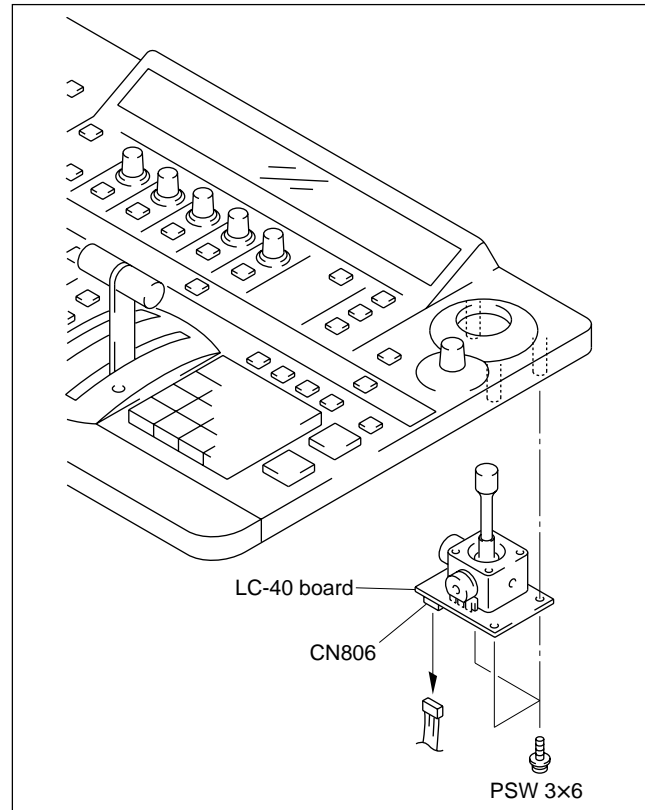
1. Remove the fader assembly. (Refer to Section 2-8-1.)
2. Remove the three screws, pull out the gear, and remove the rotary encoder.



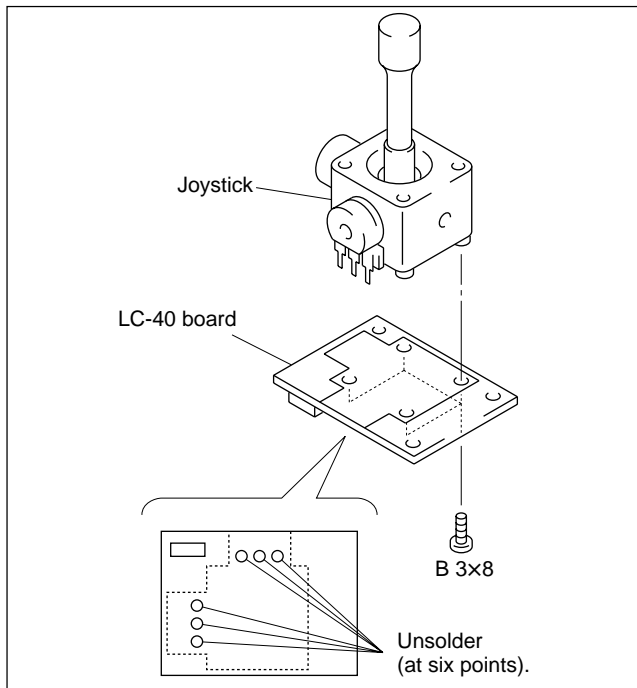
3. Install a new rotary encoder in the reverse order of steps 1 to 2.

2-8-3. Replacement of Joystick

1. Remove the panel assembly. (Refer to Section 2-8-1.)
2. Disconnect the connector (CN806) on the LC-40 board.
3. Remove the three screws and then remove the LC-40 board.



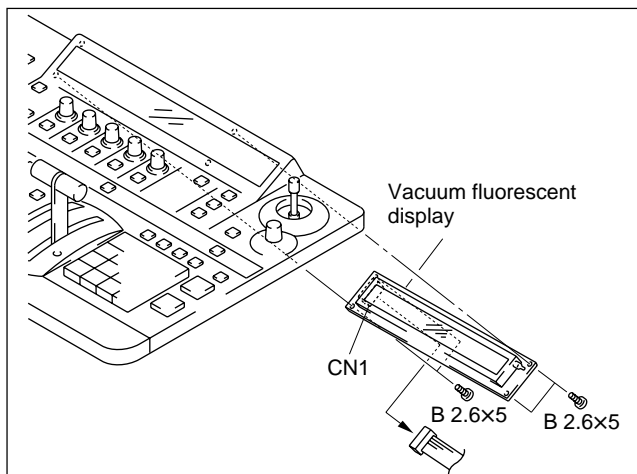
4. Remove the four screws on the LC-40 board.
5. Unsolder (at six points) on side B of the LC-40 board and remove the joystick.



6. Install a new joystick in the reverse order of steps 1 to 5.

2-8-4. Replacement of Vacuum Fluorescent Display

1. Remove the panel assembly. (Refer to Section 2-8-1.)
2. Disconnect the connector (CN1) of the vacuum fluorescent display.
3. Remove the four screws and then remove the vacuum fluorescent display.



4. Install a new vacuum fluorescent display in the reverse order steps 1 to 3.

2-9. Fuse/IC Link Replacement

WARNING

A fuse and an IC link are an important component to safe operation.

Replace an old fuse and IC link with Sony parts described in this manual. If not, this may cause a fire or electric shock. Be sure to use the specified parts.

The boards for DFS-700A/700AP/700/700P have fuses and IC links for circuit protection.

A fuse and an IC link blow when abnormality occurs in the equipment and an overcurrent flows or overheating occurs. Use the specified parts below. Eliminate the cause of fuse/IC link melting before replacing the parts.

DFS-700A/700AP/700/700P

Board	Ref. No.	Parts name	Parts No.
DD-37	F1 (F-2)	Fuse, chip 10A/125V	△1-533-843-21
	F2 (E-2)	Fuse, chip 10A/125V	△1-533-843-21
	F3 (D-2)	Fuse, chip 10A/125V	△1-533-843-21
	F4 (D-2)	Fuse, chip 8 A/125V	△1-533-477-11
	F5 (A-2)	Fuse, chip 4 A/125V	△1-533-272-11
	F6 (A-2)	Fuse, chip 4 A/125V	△1-533-272-11
IPM-96/ IPM-96P	F1401 (M-2)	Fuse, chip 10 A/125 V	△1-576-329-11
	F1402 (M-5)	Fuse, chip 10 A/125 V	△1-576-329-11
	PS1403 (M-7)	Circuit Protector IC link 2 A	△1-533-282-21
	PS1404 (M-7)	Circuit Protector IC link 2 A	△1-533-282-21
OPM-39/ OPM-39P/ OPM-45/ OPM-45P	F901 (M-1)	Fuse, chip 10 A/125 V	△1-576-329-11
	F902 (M-1)	Fuse, chip 10 A/125 V	△1-576-329-11
	F906 (M-2)	Fuse, chip 5 A/125 V	△1-533-627-21
	PS903 (M-2)	Circuit Protector IC link 2 A	△1-533-282-21
	PS904 (K-1)	Circuit Protector IC link 2 A	△1-533-282-21
	PS905 (K-2)	Circuit Protector IC link 2 A	△1-533-282-21
VSW-69/ VSW-69P	F1 (B-1)	Fuse, chip 10 A/125 V	△1-576-329-11
	F2 (F-1)	Fuse, chip 10 A/125 V	△1-576-329-11

The fuse/IC link location on the board is shown in parentheses.

BKDF-701

Board	Ref. No.	Parts name	Parts No.
VIF-20/ VIF-20P	F1401 (M-2)	Fuse, chip 10 A/125 V	△1-576-329-11
	F1402 (M-5)	Fuse, chip 10 A/125 V	△1-576-329-11
	PS1403 (M-7)	Circuit Protector IC link 2 A	△1-533-282-21
	PS1404 (M-7)	Circuit Protector IC link 2 A	△1-533-282-21

The fuse/IC link location on the board is shown in parentheses.

BKDF-702/702P

Board	Ref. No.	Parts name	Parts No.
VIF-19/ VIF-19P (Suffix-11 to -13)	F1701 (K-1)	IC link 10 A (CHIP)	△1-576-329-11
	PS1703 (K-9)	Circuit Protector IC link 2 A	△1-533-282-21
	PS1704 (K-8)	IC link 2.5 A	△1-576-398-21
	PS1705 (K-9)	IC link 2.5 A	△1-576-398-21
VIF-19/ VIF-19P (Suffix-14 and higher, Suffix-21 and higher)	F1701 (K-1)	IC link 10 A (CHIP)	△1-576-329-11
	F1704 (K-9)	Fuse (SMD) 3 A/125 V	△1-576-460-21
	F1705 (K-9)	Fuse (SMD) 3 A/125 V	△1-576-460-21
	PS1703 (K-9)	Circuit Protector IC link 2 A	△1-533-282-21

The fuse/IC link location on the board is shown in parentheses.

BKDF-711

Board	Ref. No.	Parts name	Parts No.
CMB-12	F1 (A-2)	Fuse, chip 10 A/125 V	△1-576-329-11
	PS2 (A-1)	Circuit Protector IC link 0.8 A	△1-576-123-21

The fuse/IC link location on the board is shown in parentheses.

BKDF-712

Board	Ref. No.	Parts name	Parts No.
VSE-36	PS1 (B-2)	Circuit Protector IC link 2 A	△1-533-282-21
	PS2 (B-2)	Circuit Protector IC link 2 A	△1-533-282-21

The fuse/IC link location on the board is shown in parentheses.

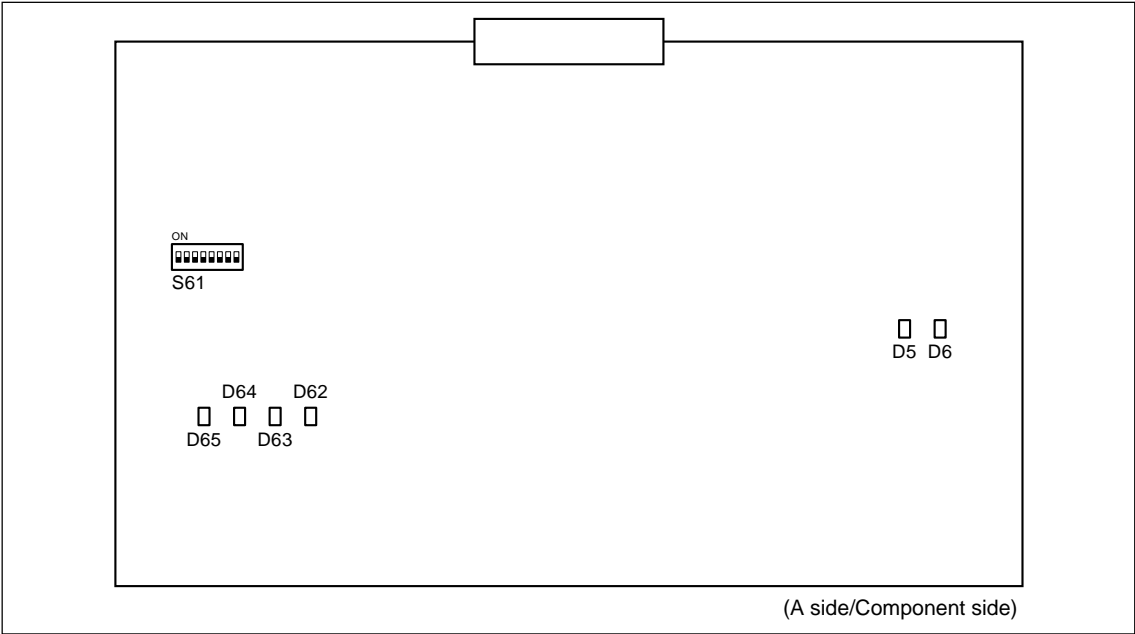
2-10. Switch, Indicators, and Volume Controls on Board

Note

The parts location on the board is shown in parentheses.

2-10-1. Control Panel

CPU-305 Board



Switch

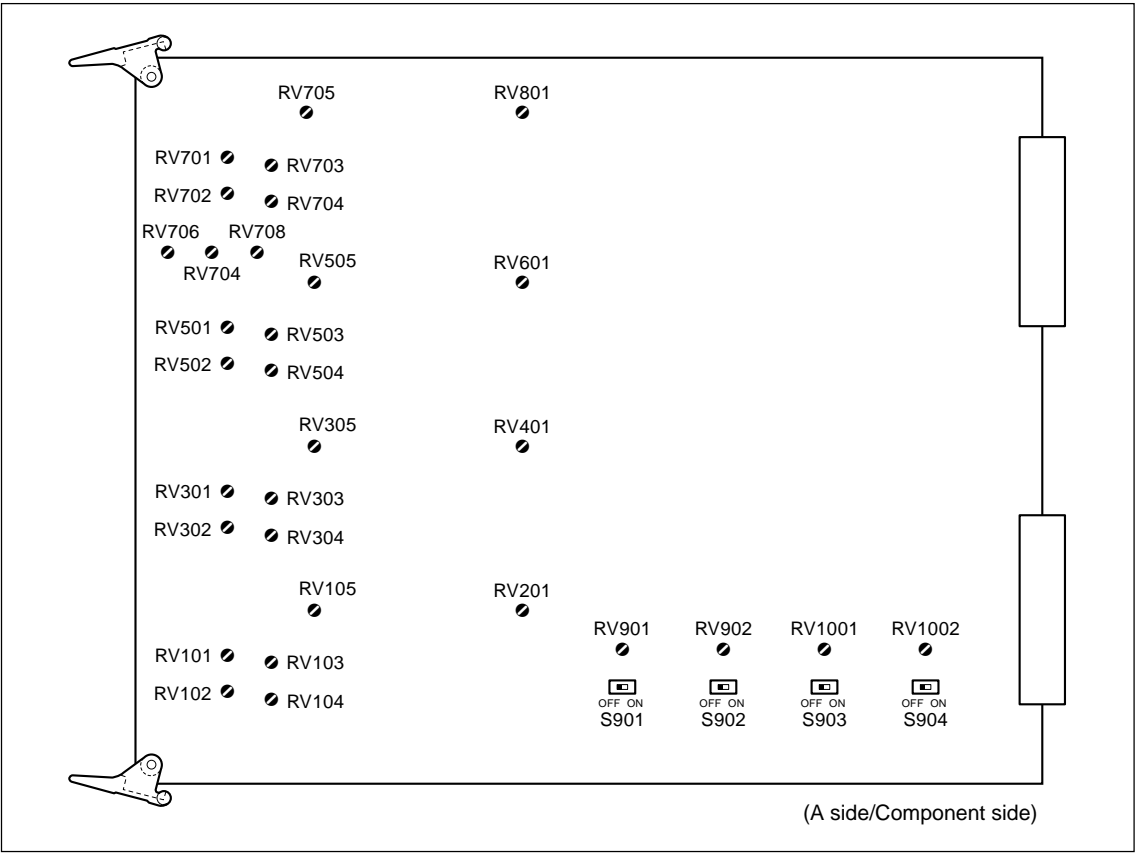
Ref.No.	Name	Description
S61 (C-1)	Setting switches for operation	The factory setting is set to the all OFF positions. Other settings are used for design or manufacturing.

Indicators

Ref.No.	Name	Description
D5 (B-6)	+5 V	Green: When a voltage of +5 V is output from IC29. (DC-DC Converter) Off: When a voltage of +5 V is not output from IC29. (DC-DC Converter)
D6 (B-7)	+7 V	Green: When a voltage of +7 V is output from IC29. (DC-DC Converter) Off: When a voltage of +7 V is not output from IC29. (DC-DC Converter)
D62 (B-2)	—	Unused.
D63 (B-2)		Blinks slowly at intervals of about one second: The CPU and software operate normally. Lights or off: The CPU, its peripheral circuit, or software is defective.
D64 (B-1)		Blinks: The internal V period timer of CPU and software is normal. Lights or off: The CPU, its peripheral circuit, or software is defective. Note The V period timer operates even if a sync signal is not input from the processor unit.
D65 (B-1)		Blinks: An external V sync signal is input. Lights or off: No signal is input or a proper signal is not input.

2-10-2. Processor

1. IPM-96/96P Board



Switches (Factory default settings are indicated by ■ mark.)

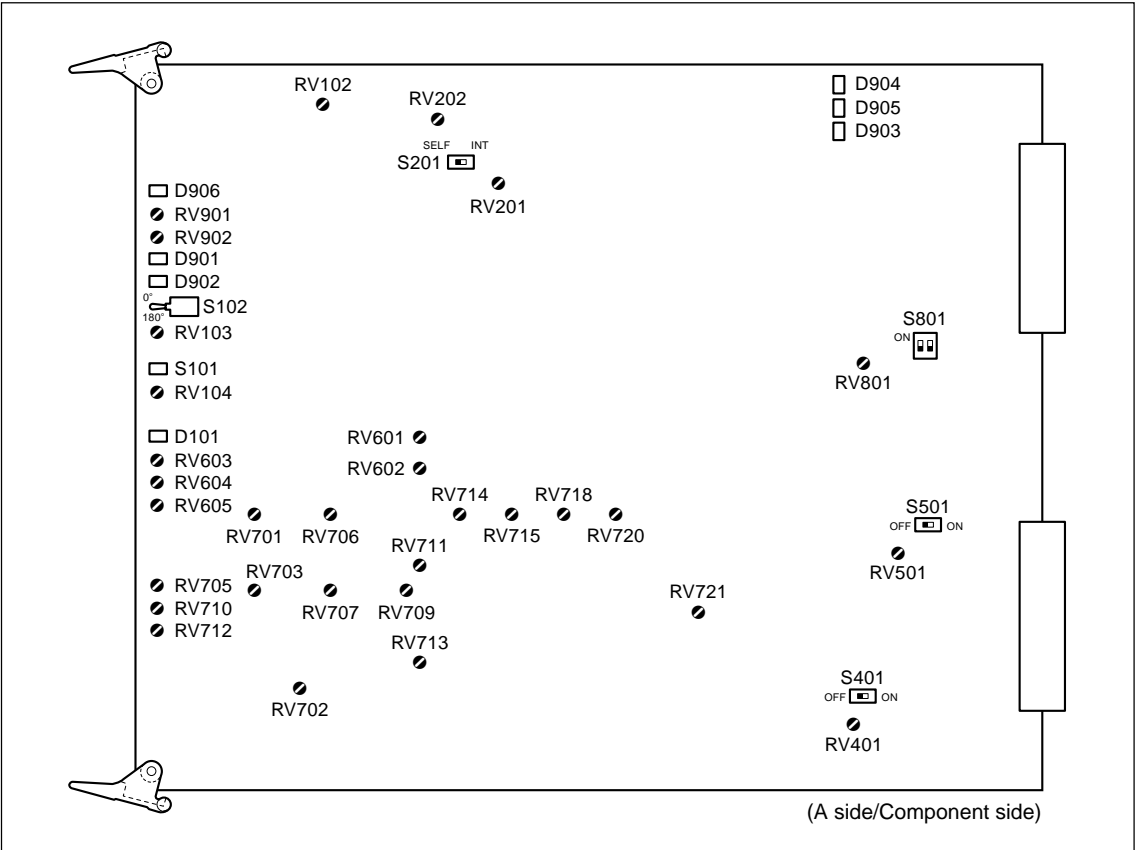
Ref.No.	Name	Function
S901 (G-9)	SDI IN 1 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S904 (J-9)	SDI IN 2 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S1001(K-9)	SDI IN 3 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S1002(L-9)	SDI IN 4 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation

Volume controls


Ref.No	Function
RV101 (B-9)	Used for 5/1CH input Y/R-Y delay adjustment
RV102 (B-9)	Used for 5/1CH input Y/B-Y delay adjustment
RV103 (B-9)	Used for 5/1CH input component R-Y chroma level adjustment
RV104 (B-9)	Used for 5/1CH input component B-Y chroma level adjustment
RV105 (C-8)	Used for 5/1CH input component Y level adjustment
RV201 (F-8)	Used for 5/1CH input video phase adjustment
RV301 (B-7)	Used for 6/2CH Y/R-Y delay adjustment

Ref.No	Function
RV302 (B-7)	Used for 6/2CH Y/B-Y delay adjustment
RV303 (B-7)	Used for 6/2CH input component R-Y chroma level adjustment
RV304 (B-7)	Used for 6/2CH input component B-Y chroma level adjustment
RV305 (C-6)	Used for 6/2CH input component Y level adjustment
RV401 (F-6)	Used for 6/2CH input video phase adjustment
RV501 (B-4)	Used for 7/3CH Y/R-Y delay adjustment
RV502 (B-5)	Used for 7/3CH Y/B-Y delay adjustment
RV503 (B-4)	Used for 7/3CH input component R-Y chroma level adjustment
RV504 (B-5)	Used for 7/3CH input component B-Y chroma level adjustment
RV505 (C-4)	Used for 7/3CH input component Y level adjustment
RV601 (F-4)	Used for 7/3CH input video phase adjustment
RV701 (B-2)	Used for 8/4CH Y/R-Y delay adjustment
RV702 (B-2)	Used for 8/4CH Y/B-Y delay adjustment
RV703 (B-2)	Used for 8/4CH input component R-Y chroma level adjustment
RV704 (B-2)	Used for 8/4CH input component B-Y chroma level adjustment
RV705 (C-1)	Used for 8/4CH input component Y level adjustment
RV706 (A-3)	RGB input Y level adjustment
RV707 (A-3)	RGB input R-Y chroma level adjustment
RV708 (B-3)	RGB input B-Y chroma level adjustment
RV801 (F-1)	Used for 8/4CH input video phase adjustment
RV901 (G-9)	Used for SDI input 1 VCO free-running adjustment
RV902 (J-9)	Used for SDI input 2 VCO free-running adjustment
RV1001 (K-9)	Used for SDI input 3 VCO free-running adjustment
RV1002 (L-9)	Used for SDI input 4 VCO free-running adjustment

2. OPM-39/39P or OPM-45/45P Board



Switches (Factory default settings are indicated by ■ mark.)

Ref.No.	Name	Function
S101 (A-5)	GEN.LOCK H PHASE COARSE	Adjusts the GEN.LOCK H phase during external synchronization. ■ Factory default settings: 8
<div></div> <div>(Factory default setting)</div>		
S102 (B-4)	GEN.LOCK SC PHASE COARSE	Inverts the GEN.LOCK SC phase (by 180 degrees) during external synchronization. ■ 0°: Under normal operation 180°: When inverting the GEN.LOCK SC phase by 180 degrees during external synchronization
S201 (E-2)	EXT DSK KEY CLAMP SEL	Selects the pulse that clamps an EXT DSK input signal. ■ SELF: Uses the clamp pulse generated from the sync signal of an input signal. INT: Uses the clamp pulse generated from a sync generator. <div>Note</div> Usually, do not change the setting.
S401 (K-9)	PGM OUT (SDI) VCO FREE RUN	ON: PGM OUT (SDI) turns to the VCO free-running state. ■ OFF: Under normal operation

Ref.No.	Name	Function
S501 (L-7)	CLEAN OUT (SDI) VCO FREE RUN	ON: CLEAN OUT (SDI) turns to the VCO free-running state. ■ OFF: Under normal operation
S801 (L-4)	SET UP	Switches NTSC J and NTSC UC according to the destination. Note Do not change the setting because it has been fixed according to the destination.

Indicators

Ref.No.	Name	Function
D101 (A-6)	GEN LOCK	Displays an external input sync signal turns to the REF. VIDEO input terminal on the rear panel. Amber: An external sync signal is input. The system is synchronized with the external sync signal automatically. Off: No external sync signal is input. The system is synchronized with an internal sync signal automatically.
D901 (A-3)	+5 V DC	Displays the input state of a +5 V power supply. Green: A power supply of +5 V is supplied. (Fuse F901 does not burn out.) Off: A power supply of +5 V is not supplied.
D902 (A-4)	+3.3 V DC	Displays the input state of a +3.3 V power supply. Green: A power supply of +3.3 V is supplied. (Fuse F902 does not burn out.) Off: A power supply of +3.3 V is not supplied.
D903 (K-2)	+5 V (A) DC	Displays the input state of a +7 V power from which a power line of +5 V(A) is supplied. Green: A power supply of +7 V is supplied. (IC link PS903 does not burn out.) Off: A power supply of +7 V is not supplied.
D904 (K-1)	−5 V DC	Displays the input state of a −7 V power from which a power line of −5 V(A) is supplied. Green: A power supply of −7 V is supplied. (IC link PS904 does not burn out.) Off: A power supply of −7 V is not supplied.
D905 (K-1)	+9 V DC	Displays the input state of a +12 V power from which a power line of +9 V is supplied. Green: A power supply of +12 V is supplied. (IC link PS905 does not burn out.) Off: A power supply of +12 V is not supplied.
D906 (A-2)	PANEL +12 V DC	Displays the input state a +12 V power that is input to the control panel. Green: A power supply of +12 V is supplied. (Fuse F906 does not burn out.) Off: A power supply of +12 V is not supplied.

Volume controls

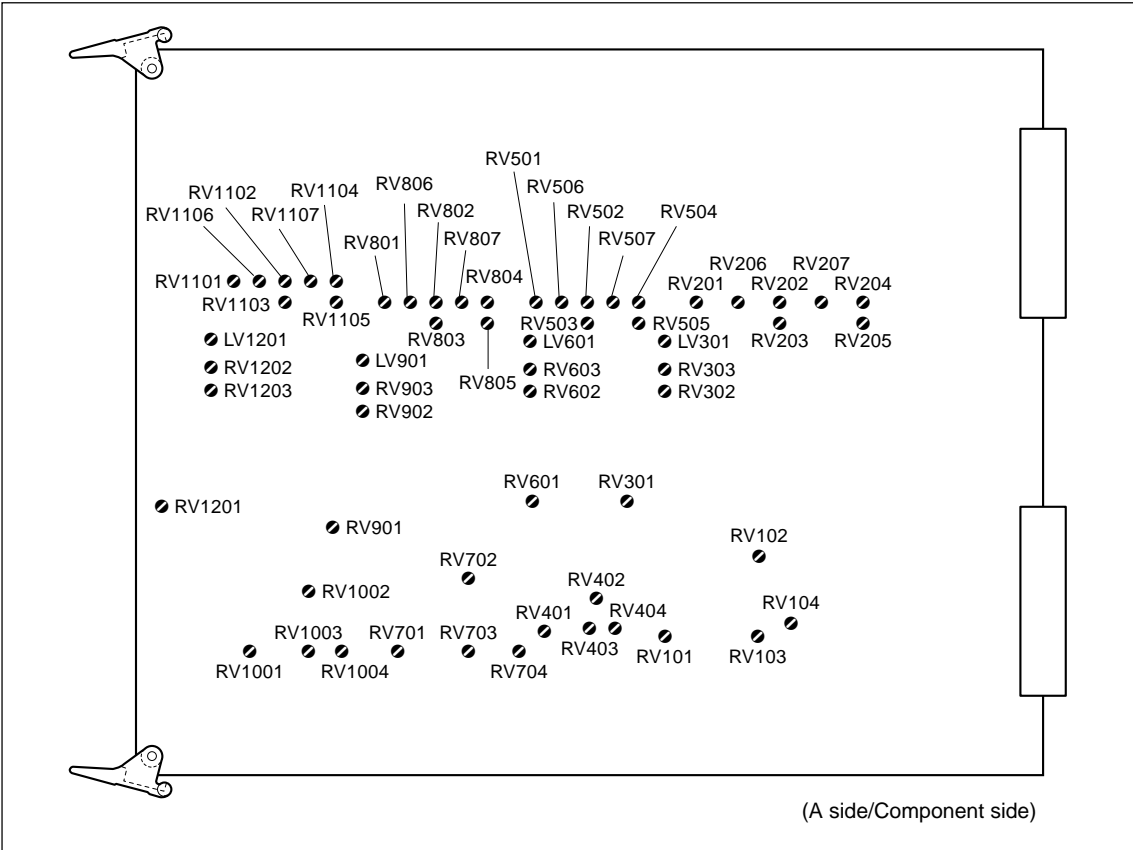
Ref.No	Function
RV101 (D-4)	Used for the SC frequency adjustment during internal oscillation
RV102 (C-1)	Used for the SCH phase adjustment during internal oscillation
RV103 (A-4)	Used for the GEN.LOCK SC phase adjustment during external synchronization
RV104 (A-5)	Used for the GEN.LOCK H phase adjustment during external synchronization

(Continued)

(Continued)

Ref.No	Function
RV105 (B-4)	Used for the SCH phase adjustment of a black burst output signal during internal oscillation
RV106 (B-3)	Used for the SCH phase adjustment during PGM OUT (Y/C and composite) pre-reading (PAL only)
RV107 (C-1)	Used for the burst flag position adjustment during PGM OUT (Y/C and composite) pre-reading (PAL only)
RV201 (E-2)	Used for EXT.DSK KEY gain adjustment
RV202 (E-2)	Used for EXT.DSK KEY clamp level adjustment
RV401 (K-9)	Used for PGM OUT (SDI) VCO free-running frequency adjustment Set switch S401 (K-9) to ON during adjustment and set it to OFF after adjustment
RV501 (L-7)	Used for CLEAN OUT (SDI) free-running frequency adjustment Set switch S501 (L-7) to ON during adjustment and set it to OFF after adjustment
RV601 (D-6)	Used for PGM OUT (COMPONENT) Y signal and R-Y signal delay adjustment
RV602 (D-6)	Used for PGM OUT (COMPONENT) Y signal and B-Y signal delay adjustment
RV603 (A-6)	Used for PGM OUT (COMPONENT) Y signal gain adjustment
RV604 (A-6)	Used for PGM OUT (COMPONENT) R-Y signal gain adjustment
RV605 (A-7)	Used for PGM OUT (COMPONENT) B-Y signal gain adjustment
RV701 (B-7)	Used for PGM OUT (COMPONENT, Y/C, COMPOSITE) SYNC level adjustment
RV702 (C-9)	Used for PGM OUT (COMPOSITE) C signal level adjustment
RV703 (B-8)	Used for PGM OUT (COMPOSITE) SC leak (R-Y signal) balance adjustment
RV704 (C-9)	Used for PGM OUT (COMPOSITE) burst AXIS adjustment (PAL only)
RV705 (A-8)	Used for PGM OUT (COMPOSITE) gain adjustment
RV706 (C-7)	Used for the PGM OUT (COMPOSITE and C of Y/C) burst level adjustment
RV707 (C-8)	Used for the gain adjustment of a PGM OUT (COMPOSITE) C signal V axis
RV709 (D-8)	Used for PGM OUT (COMPOSITE) SC leak (B-Y signal) balance adjustment
RV710 (A-8)	Used for PGM OUT (Y/C) Y signal gain adjustment
RV711 (D-8)	Used for the angle adjustment of a PGM OUT (COMPOSITE and Y/C) chroma-orthogonal modulation axis
RV712 (A-8)	Used for PGM OUT (Y/C) C signal gain adjustment
RV713 (D-9)	Used for PGM OUT (COMPOSITE) Y/C delay adjustment
RV714 (E-7)	Used for BLACK BURST OUT sync level adjustment
RV715 (E-7)	Used for BLACK BURST OUT burst level adjustment
RV717 (F-7)	Used for BLACK BURST OUT AXIS adjustment (PAL only)
RV718 (F-7)	Used for BLACK BURST OUT SC leak (V) balance adjustment
RV720 (G-7)	Used for BLACK BURST OUT SC leak (U) balance adjustment
RV721 (H-8)	Used for the SC phase adjustment to the PGM output signal of a black burst output signal
RV801 (K-4)	Used for PVW OUT (COMPOSITE) gain adjustment
RV901 (A-3)	Used for the voltage adjustment of +5 V DC Connect a tester to TP901 (+5 V) and TP903 (GND) and check the voltage
RV902 (A-3)	Used for the voltage adjustment of +3.3 V DC Connect a tester to TP902 (+3.3 V) and TP903 (GND) and check the voltage

3. VIF-19/19P Board



Volume controls

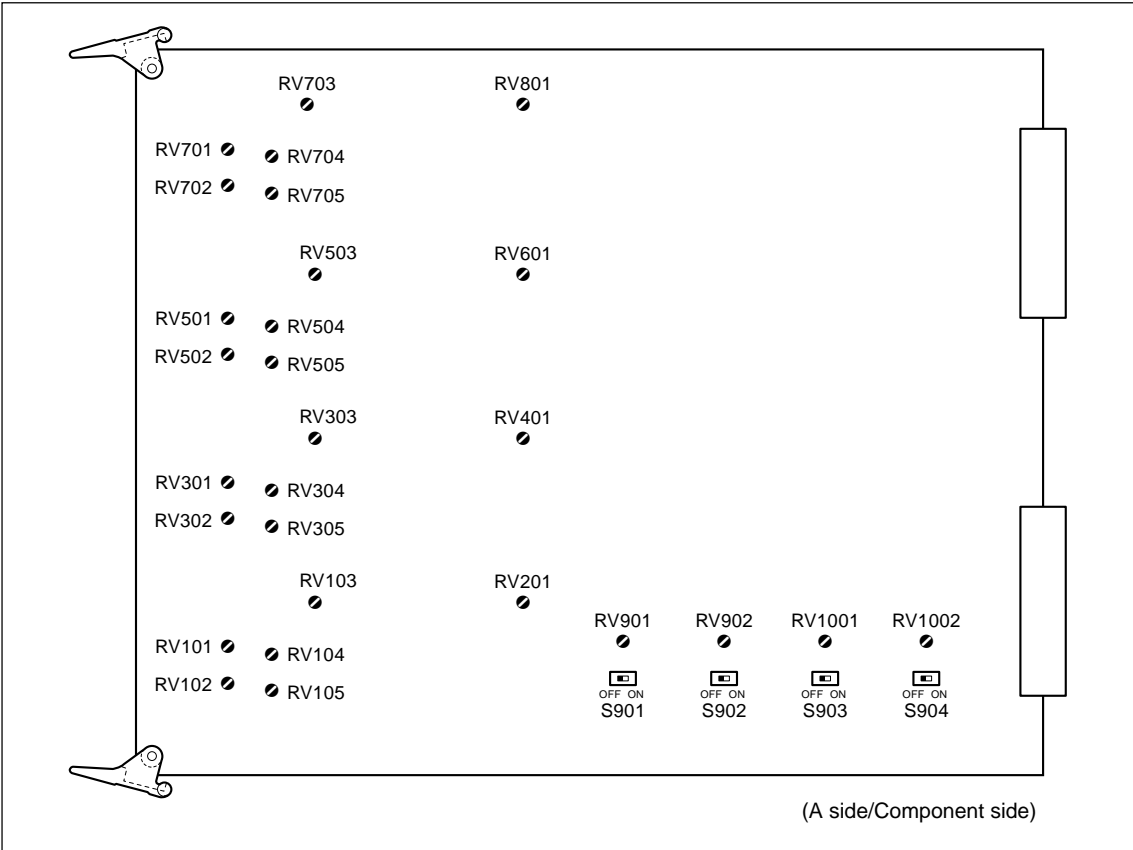
Ref.No	Function
LV301 (H-4)	Used for CH5 VFO BIAS adjustment
LV601 (F-4)	Used for CH6 VFO BIAS adjustment
LV901 (D-4)	Used for CH7 VFO BIAS adjustment
LV1201 (A-4)	Used for CH8 VFO BIAS adjustment
RV101 (H-9)	Used for CH5 burst delay adjustment
RV102 (J-8)	Used for CH5 composite Y level adjustment
RV103 (J-9)	Used for CH5 Y gain adjustment (during S video input)
RV104 (J-9)	Used for CH5 clamp DC adjustment
RV201 (H-4)	Used for CH5 Y gain adjustment (during composite input)
RV202 (J-4)	Used for CH5 Y/B-Y DL adjustment (during S video input)
RV203 (J-4)	Used for CH5 Y/B-Y DL adjustment (during composite input)
RV204 (J-4)	Used for CH5 Y/R-Y DL adjustment (during S video input)
RV205 (J-4)	Used for CH5 Y/R-Y DL adjustment (during composite input)
RV206 (H-4)	Used for CH5 B-Y level adjustment
RV207 (J-4)	Used for CH5 R-Y level adjustment
RV301 (G-7)	Used for CH5 sync separate adjustment
RV302 (H-5)	Used for CH5 SAWTOOTH slope adjustment
RV303 (H-5)	Used for CH5 sampling pulse phase adjustment and input video phase adjustment

(Continued)

(Continued)

Ref.No	Function
RV401 (F-9)	Used for CH6 burst delay adjustment
RV402 (G-8)	Used for CH6 composite Y level adjustment
RV403 (G-9)	Used for CH6 Y gain adjustment (during S video input)
RV404 (G-9)	Used for CH6 clamp DC adjustment
RV501 (F-4)	Used for CH6 Y gain adjustment (during composite input)
RV502 (G-4)	Used for CH6 Y/B-Y DL adjustment (during S video input)
RV503 (G-4)	Used for CH6 Y/B-Y DL adjustment (during composite input)
RV504 (G-4)	Used for CH6 Y/R-Y DL adjustment (during S video input)
RV505 (G-4)	Used for CH6 Y/R-Y DL adjustment (during composite input)
RV506 (F-4)	Used for CH6 B-Y level adjustment
RV507 (G-4)	Used for CH6 R-Y level adjustment
RV601 (E-7)	Used for CH6 sync separate adjustment
RV602 (F-5)	Used for CH6 SAWTOOTH slope adjustment
RV603 (F-5)	Used for CH6 sampling pulse phase adjustment and input video phase adjustment
RV701 (D-9)	Used for CH7 burst delay adjustment
RV702 (E-8)	Used for CH7 composite Y level adjustment
RV703 (E-9)	Used for CH7 Y gain adjustment (during S video input)
RV704 (E-9)	Used for CH7 clamp DC adjustment
RV801 (D-4)	Used for CH7 Y gain adjustment (during composite input)
RV802 (D-4)	Used for CH7 Y/B-Y DL adjustment (during S video input)
RV803 (D-4)	Used for CH7 Y/B-Y DL adjustment (during composite input)
RV804 (E-4)	Used for CH7 Y/R-Y DL adjustment (during S video input)
RV805 (E-4)	Used for CH7 Y/R-Y DL adjustment (during composite input)
RV806 (D-4)	Used for CH7 B-Y level adjustment
RV807 (E-4)	Used for CH7 R-Y level adjustment
RV901 (C-7)	Used for CH7 sync separate adjustment
RV902 (D-5)	Used for CH7 SAWTOOTH slope adjustment
RV903 (D-5)	Used for CH7 sampling pulse phase adjustment and input video phase adjustment
RV1001 (B-9)	Used for CH8 burst delay adjustment
RV1002 (B-8)	Used for CH8 composite Y level adjustment
RV1003 (C-9)	Used for CH8 Y gain adjustment (during S video input)
RV1004 (C-9)	Used for CH8 clamp DC adjustment
RV1101 (B-4)	Used for CH8 Y gain adjustment (during composite input)
RV1102 (B-4)	Used for CH8 Y/B-Y DL adjustment (during S video input)
RV1103 (B-4)	Used for CH8 Y/B-Y DL adjustment (during composite input)
RV1104 (C-4)	Used for CH8 Y/R-Y DL adjustment (during S video input)
RV1105 (C-4)	Used for CH8 Y/R-Y DL adjustment (during composite input)
RV1106 (B-4)	Used for CH8 B-Y level adjustment
RV1107 (C-4)	Used for CH8 R-Y level adjustment
RV1201 (A-7)	Used for CH8 sync separate adjustment
RV1202 (B-5)	Used for CH8 SAWTOOTH slope adjustment
RV1203 (A-5)	Used for CH8 sampling pulse phase adjustment and input video phase adjustment

4. VIF-20/20P Board



Switches (Factory default settings are indicated by ■ mark.)

Ref.No.	Name	Function
S901 (G-9)	SDI IN 5 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S904 (J-9)	SDI IN 6 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S1001 (K-9)	SDI IN 7 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation
S1002 (L-9)	SDI IN 8 VCO FREERUN	ON: Puts VCO into the free-running state. ■ OFF: Under normal operation

Volume controls

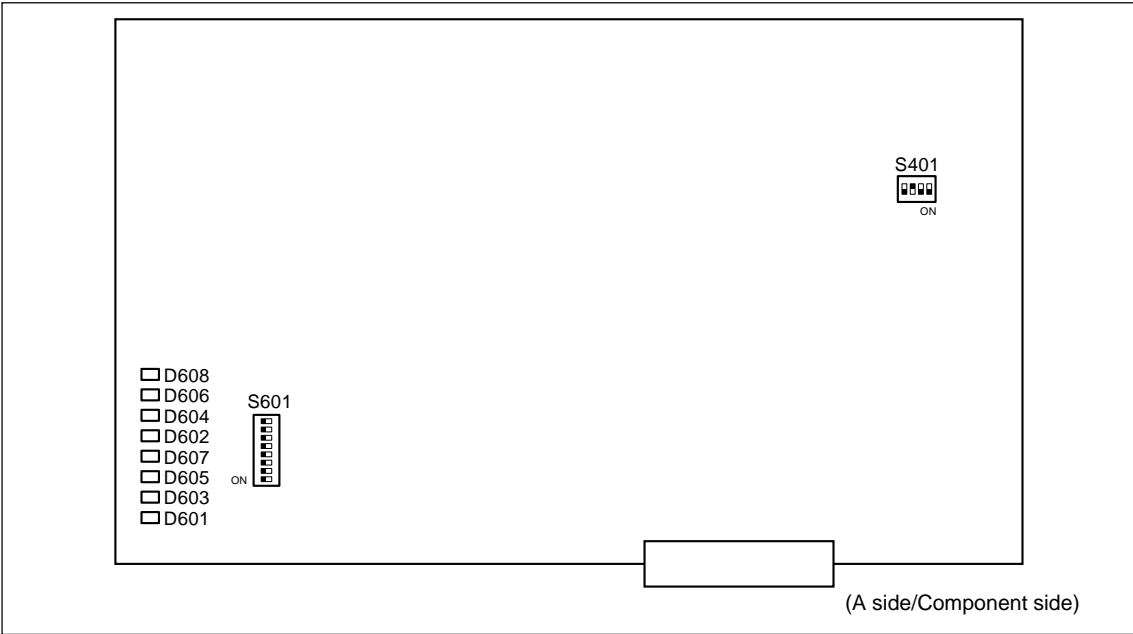
Ref.No	Function
RV101 (B-9)	Used for 5CH Y/R-Y delay adjustment
RV102 (B-9)	Used for 5CH Y/B-Y delay adjustment
RV103 (C-8)	Used for 5CH input component Y level adjustment
RV104 (B-9)	Used for 5CH input component R-Y chroma level adjustment
RV105 (B-10)	Used for 5CH input component B-Y chroma level adjustment
RV201 (F-8)	Used for 5CH input video phase adjustment
RV301 (B-7)	Used for 6CH Y/R-Y delay adjustment
RV302 (B-7)	Used for 6CH Y/B-Y delay adjustment

(Continued)

(Continued)

Ref.No	Function
RV303 (C-6)	Used for 6CH input component Y level adjustment
RV304 (B-7)	Used for 6CH component R-Y chroma level adjustment
RV305 (B-7)	Used for 6CH input component B-Y chroma level adjustment
RV401 (F-6)	Used for 6CH input video phase adjustment
RV501 (B-4)	Used for 7CH Y/R-Y delay adjustment
RV502 (B-5)	Used for 7CH Y/B-Y delay adjustment
RV503 (C-4)	Used for 7CH input component Y level adjustment
RV504 (B-4)	Used for 7CH component R-Y chroma level adjustment
RV505 (B-5)	Used for 7CH input component B-Y chroma level adjustment
RV601 (F-4)	Used for 7CH input video phase adjustment
RV701 (B-2)	Used for 8CH Y/R-Y delay adjustment
RV702 (B-3)	Used for 8CH Y/B-Y delay adjustment
RV703 (C-1)	Used for 8CH input component Y level adjustment
RV704 (B-2)	Used for 8CH component R-Y chroma level adjustment
RV705 (B-3)	Used for 8CH input component B-Y chroma level adjustment
RV801 (F-1)	Used for 8CH input video phase adjustment
RV901 (G-9)	Used for SDI input 5 VCO free-running adjustment
RV902 (J-9)	Used for SDI input 6 VCO free-running adjustment
RV1001 (K-9)	Used for SDI input 7 VCO free-running adjustment
RV1002(L-9)	Used for SDI input 8 VCO free-running adjustment

5. VSE-36 Board



Switches (Factory default settings are indicated by ■ mark.

Ref.No.	Name	Function
S401 (K-4)	Timing control switch	Sets the operation timing of address memory.
ON		Note Do not change the setting of switch S401 because it has been set to the optimum value at the factory.
S601 (B-7)	Main CPU control switch	Controls the address CPU operation.
		Note Set switch S601 to all ON during normal operation. Never set S601-1 and S601-3 to OFF. This may cause a system malfunction.
bit-1		Switches the main program to be activated. ■ ON: Activated from IC602. The system is not activated when this bit is set to OFF.
bit-2		Switches the serial port. ■ ON: Uses debugging terminal connection port (CN12). OFF: Uses no debugging terminal connection port (CN12).
bit-3		Specifies the source from which a copy command (debugging terminal) is copied. ■ ON: IC617 (Flash memory socket) The system is not activated when this bit is set to OFF.
bit-4		Executes the main program during boot up. ■ ON: Executes the main program. OFF: Executes no main program. (Executes only a start-up program.)
bit-5		Sets the communication rate of a debugging terminal. ■ ON: 38.4 Kbps OFF: 115.2 Kbps

(Continued)

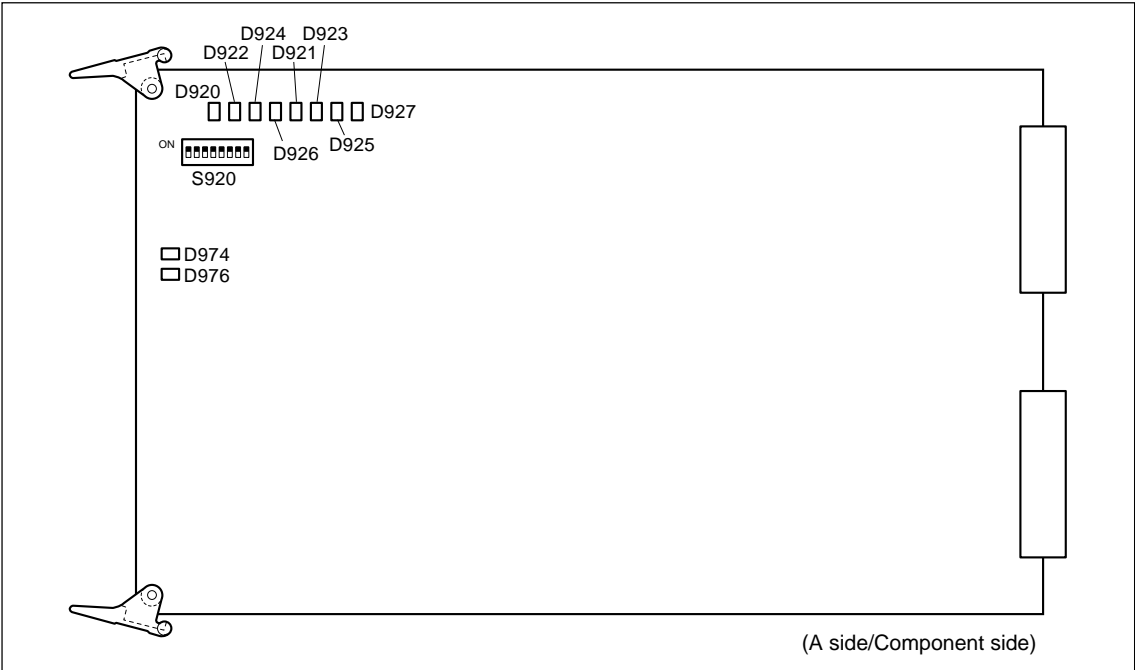
(Continued)

Ref.No.	Name	Function
bit-6		Confirms the checksum of a main program during boot up. <div> <div>■ ON:</div> <div>Confirms the checksum.</div> </div> <div> <div>OFF:</div> <div>Confirms no checksum.</div> </div>
bit-7		Not used
bit-8		Not used

Indicators

Ref.No.	Function
D601 (A-7)	Blinks during address CPU operation.
D602 (A-6)	Blinks during address CPU operation. (Does not exist on the board of LOT No. 0C1 or later.)
D603 (A-7)	Blinks during address CPU operation.
D604 (A-6)	Blinks during address CPU operation. (Does not exist on the board of LOT No. 0C1 or later.)
D605 (A-7)	Blinks during address CPU operation.
D606 (A-6)	Blinks during address CPU operation. (Does not exist on the board of LOT No. 0C1 or later.)
D607 (A-6)	Blinks during address CPU operation.
D608 (A-6)	Blinks during address CPU operation.
D705 (F-7)	<div>Lights: A power supply of +3 V is normal</div> <div>Off: A power supply of +3 V is abnormal</div>
D707 (E-7)	<div>Lights: A power supply of +5 V is normal</div> <div>Off: A power supply of +5 V is abnormal</div>

6. VSW-69/69P Board



Switches (Factory default settings are indicated by ■ mark.)

Ref.No.	Name	Function
S920 (B-14)	Main CPU control switch	Controls the main CPU operation. Note Set switch S920 to all ON during normal operation. Never set S920-1 and S920-3 to OFF. This may cause a system malfunction.
bit-1		Switches the main program to be activated. ■ ON: Activated from IC920. The system is not activated when this bit is set to OFF.
bit-2		Switches the serial port. ■ ON: Used as an editor interface. OFF: Used as a debugging terminal connection port (CN12).
bit-3		Specifies the source from which a copy command (debugging terminal) is copied. ■ ON: IC958 (Flash memory socket) The system is not activated when this bit is set to OFF.
bit-4		Executes the main program during boot up. ■ ON: Executes the main program. OFF: Executes no main program. (Executes only a start-up program.)
bit-5		Sets the communication rate of a debugging terminal. ■ ON: 38.4 Kbps OFF: 115.2 Kbps
bit-6		Confirms the checksum of the main program during boot up. ■ ON: Confirms the checksum. OFF: Confirms no checksum.
bit-7		Not used
bit-8		Returns the set value to the factory setting during boot up. ■ ON: Under normal operation OFF: Returns to the factory setting.

Indicators

Ref.No.	Function
D920 (A-14)	Blinks during main CPU operation.
D921 (A-13)	Blinks during main CPU operation. (Does not exist on the board of LOT No. 0C1 or later.)
D924 (A-13)	Blinks during main CPU operation.
D924 (A-13)	Blinks during main CPU operation. (Does not exist on the board of LOT No. 0C1 or later.)
D925 (A-12)	Blinks during main CPU operation. (Does not exist on the board of LOT No. 0C1 or later.)
D926 (A-13)	Blinks during main CPU operation.
D927 (A-12)	Lights: PAL (VSW-69P is installed) Off: NTSC (VSW-69 is installed)
D974 (E-15)	Lights: A power supply of +3 V is normal Off: A power supply of +3 V is abnormal
D975 (E-15)	Lights: A power supply of +5 V is normal Off: A power supply of +5 V is abnormal

2-11. Error Indication

Error indication blinks on the menu display if some failure occurs during power-on sequence or normal operation.

To clear the error indication, press the F5 (OK) button.

If multiple errors exist, an error with higher priority is displayed first.

After the error indication with higher priority is cleared using the F5 (OK) button, an error with lower priority is displayed.

The remedy when an error occurred are described below.

No.	Error indication		Contents of error	Remedy
011	"011 FAN STOP!! " ->Turn OFF Power	OK "	The processor detects that the power fan stopped.	Turn off the power and confirm that the power harness of a DC fan is not disconnected and connected properly. If no failure is found, replace the DC fan.
012	"012 Power Unit Error " ->Turn OFF Power	OK "	The power supply has a trouble.	Turn off the power and check the block around the power supply.
021	"021 Reference Signal Error " ->	OK "	A V sync signal is not properly sent from the processor to the control panel.	Confirm the cable connection.
022	"022 Self Diagnostic Error. (XXXX/XXXX) " ->Check on Maintenance menu An error status is displayed in the (XXXX/XXXX) section. The status of the VSW-69/69P board is displayed before "/", and that of the VSE-36 board after "/". 0000: Normal 0001: Memory error	OK "	Failure is detected during self-diagnosis.	Replace the VSW-69/69P or VSE-36 board.
023	"023 Software Version Mismatch " ->Load the latest S/W	OK "	The software versions of the processor and control panel are different.	Install the software.
031	"031 Data Backup Error. (XX) " -> An error status is displayed in the (XX) section. 01: User program 02: Snapshot 04: Direct pattern 08: Resume 10: Setup If multiple errors occurred, the value obtained when they were added is displayed.	(XX) OK "	The information on a user program and setup is not properly written in backup memory.	Replace the VSW-69/69P board.

2-12. Periodic Inspection

2-12-1. Periodic Replacement Parts

To keep the performance of this unit, inspect the parts below periodically and clean or replace them.

Parts	Cleaning period	Replacement period	Parts No.
Filter	Two months	Five years	3-625-956-01
Fan	One month	Three years	1-698-080-11

For more details of cleaning, refer to Section 2-12-2.
For the fan replacement, refer to Section 2-7.

2-12-2. Filter Cleaning

WARNING

Before starting the cleaning, be sure to turn off the power switch and pull out the power plug.

CAUTION

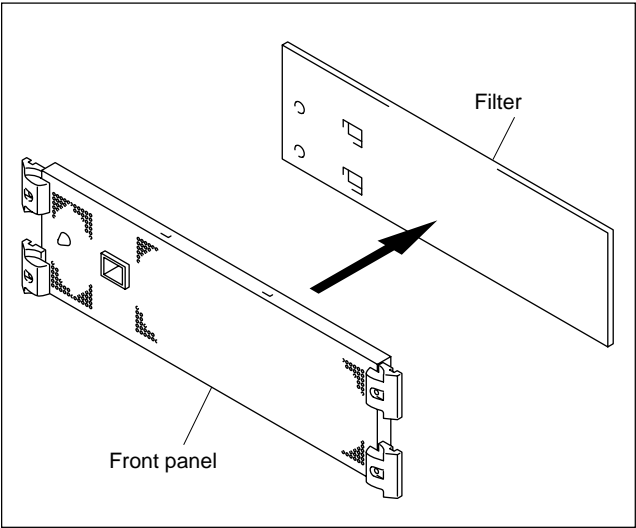
Do not block the ventilating hole with the dust on a filter. This causes an increase in temperature inside this unit. In this case, do not touch the inside of this unit. This may cause a burn.

Clean the Filter Periodically (every two months).

- 1. Remove the front panel. (Refer to Section 2-2.)
- 2. Absorb the dust on the filter using a vacuum cleaner.

Note

It is recommended to wash it when dust excessively adheres to the filter. However, dry it fully after washing the filter.

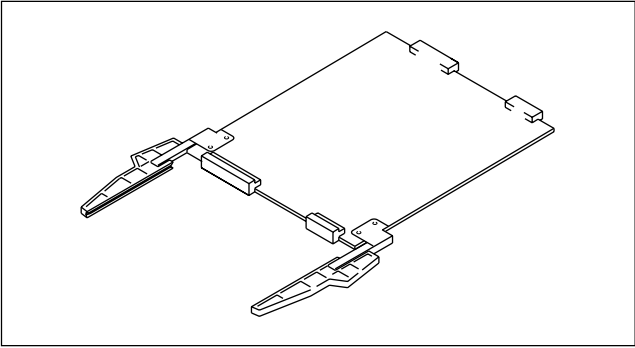


2-13. Fixtures/Measuring Instruments

2-13-1. Fixtures

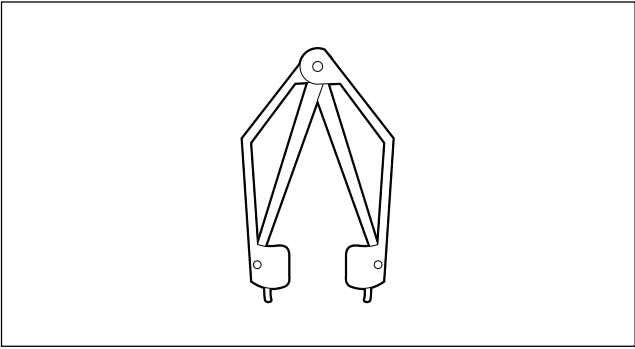
Extension Board EX-732

Sony Part No. A-8324-779-A
Extension board EX-732 is used for IPM-96/96P, VSW-69/69P, OPM-39/39P/45/45P boards and optional boards (CMB-12, VIF-19/19P, VIF-20, VSE-36) to inspect and adjust.



PLCC IC Extraction Tool

Sony Part No. J-6035-070-A
This tool is used for extraction of the PLCC ICs.



25-pin Control Cable (5 m)

Sony Part No. 1-575-065-11

This 25-pin Control Cable is used for inspection and adjustment.

Connector Cable (5 m)

Multi Connector Cable (DO BNC)

Sony Part No. J-6031-830-A

Multi Connector Cable (DI BNC)

Sony Part No. J-6031-820-A

Video Cable (S-BNC)

Sony Parts No. J-6381-380-A

Standard Product

Spot Heater HS-600 (100 V)

HS-600 (117 V)

HS-600 (220 V)

HS-600 (240 V)

Nozzle HS-616 (for HS-600)

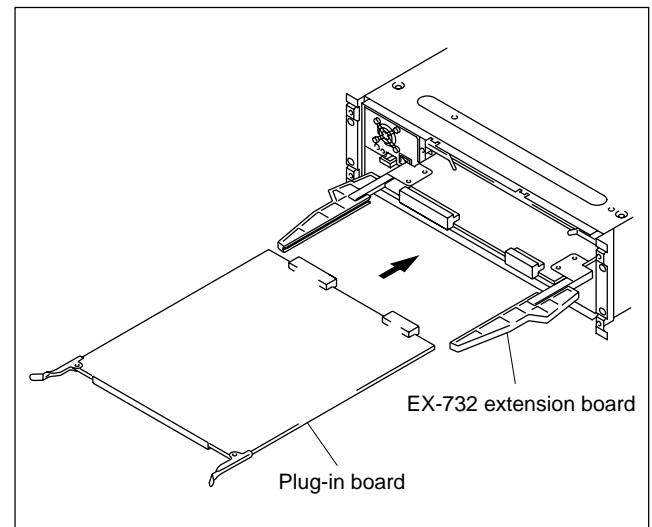
HS-619 (for HS-600)

Connect the Nozzle to the Spot Heater.

These Spot Heater and Nozzle are used for extraction the ICs by warm wind.

2-13-2. How to Use Extension Board

1. Turn off the power of the processor unit.
2. Remove the front panel. (Refer to Section 2-2.)
3. Remove the board stopper assembly. (Refer to Section 2-5-1.)
4. Open the board levers and remove the board.
5. Insert the extension board into the slot from which the board was removed in step 4.
6. As shown in the figure, insert the plug-in board into the extension board.

**2-13-3. Measuring Instruments**

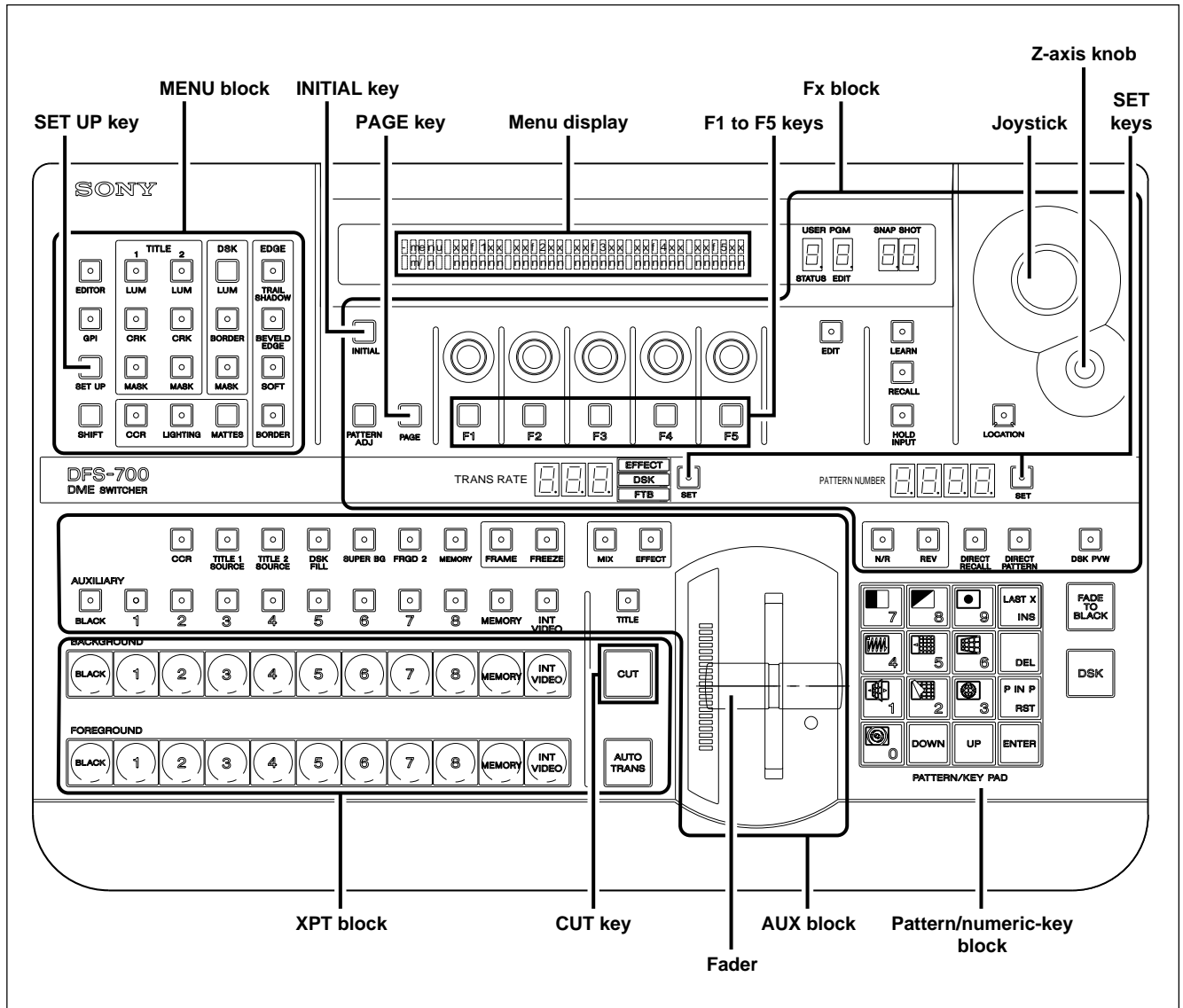
1. Analog Component/Composite Signal Generator
Equivalent: Tektronix TSG130A (for NTSC)
Tektronix TSG131A (for PAL)
2. Digital Component Signal Generator
Equivalent: Tektronix TSG422
3. Waveform/Vectorscope
Equivalent: Tektronix 1780R (for NTSC)
Tektronix 1781R (for PAL)
4. Video Monitor
Equivalent: Sony BVM-14M4DJ
5. Oscilloscope
Equivalent: Tektronix 2465B
6. Digital Voltmeter
Equivalent: Hewlett Packard 3435A
7. Frequency Counter
Equivalent: Hewlett Packard 5313

Section 3

Self-diagnosis

A version and check menu appear on the menu display when some failure occurs during the power-on sequence or normal operation.

The names and positions of buttons and blocks are shown in the figure below.



3-1. Confirmation of Version

For the boards (VSW-69, VSE-36, and CPU-305 boards) below, the version of each item can be confirmed.

The version is confirmed on the menu display of the control panel.

Processor

Board	Check item	Checkpoint on menu display
VSW-69	Main programs (IC920 and IC921)	DFS700A or DFS700
	Effect data (IC923 and IC924)	DATA
VSE-36 (BKDF-712: Option)	Main programs (IC602 to IC605)	BKDF712

Control Panel

Board	Check item	Checkpoint on menu display
CPU-305	System control software (IC54)	Panel

3-1-1. Execution

1. Press the **SET UP** key on the MENU block so that page 1/8 of the SET UP menu appears on the menu display.

< Display example >

SYS	SCREEN	PPE_RD	PORTS	TALLY
1/8	4:3	OFF	PVE500	OFF

2. Press the **PAGE** key on the Fx block to switch the display so that page 2/8 appears on the menu display.

< Display example >

SYS	INFO	INFO	PW ON	INSTL
2/8	CONF IG↓	VER↓	FACTRY	↓

3. Press the **F2** key to select VER INFORMATION.
The version is displayed at the X.XX portion.

< Display example >

INFO	DFS700A	BKDF712	DATA	Panel	EXIT
1/1	X.XX	X.XX	X.XX	X.XX	↓

3-1-2. Viewing the Version

- DFS700A: Displays the versions of the main programs (IC920 and IC921) of the VSW-69 board (DFS700) installed in a processor as a standard feature.
- BKDF712: Displays the versions of the main programs (IC602 to IC605) of the VSE-36 board (BKDF-712: option) installed in a processor. "0.00" is displayed when BKDF-712 is not installed.
- DATA: Displays the versions of the effect data (IC923 and IC924) of the VSW-69 board installed in a processor as a standard feature.
- Panel: Displays the version of the system control software (IC54) mounted on the CPU-305 board of the control panel.

3-2. Check Mode

In the check mode, the following items can be confirmed.

- Operation of LEDs, switches, joystick, volumes, and fader
- Menu display
- V sync signal input
- Checksum confirmation of system control software on the CPU-305 board

Two types of modes below are available.

ALL mode: Used when executing all check items continuously.

However, each check item cannot be selected.

PART mode: Used during normal operation.

3-2-1. Activation and Termination

To enter the check mode, switch off the power of the processor.

Next, switch on the power of the processor while pressing and holding the following three keys simultaneously on the control panel; the **0** key at the pattern/numeric-key block, the **SET** key at the TRANS RATE block (Fx block), and the **CUT** key at the XPT block. When the check mode is activated, the top menu appears on the menu display.

< Top menu >

<p><<< DFS PANEL HARDWARE DIAGNOSES >>></p> <p>ALL PART</p>
--

To terminate the check mode, switch off the power of the processor.

3-2-2. Basic Operation

The basic operation is as described below.

- [F1] to [F5] keys: Proceeds to the hierarchical level lower by one. (Selection of check items)
- [INITIAL] key: Returns to the hierarchical level higher by one.

Note

If you cannot understand in which hierarchical level you exist, press the INITIAL key a few times to return to the top menu.

The relation between the menu hierarchy in the check mode, and the boards and parts that can be checked is shown below. The characters in brackets ([]) indicate the title that appears on the menu display.

Menu hierarchy	Board that can be checked	Parts that can be checked
TOP MENU		
— [ALL] ALL TEST		
— [PART] PART TEST		Buzzer
— [KY] KY TEST	KY-466 (LE-233, 234, 235) KY-467, 468, LE-227	
— [LED] LED TEST		LEDs, digit indicators, and switch LEDs
— [SWITCH] SWITCH TEST		Switches
— [VOL_Fx] VOLUME TEST	VR-263	Volumes at function key block
— [POS/FD] TEST		
— [POS] POS/Z TEST	LC-40, VR-264	Joystick and Z-axis volume
— [FADER] FADER TEST		Fader assembly, Fader lever
— [VFD] VFD DISPLAY TEST		Vacuum fluorescent display (Menu display)
— [CPU] CPU TEST	CPU-305	
— [VD] VD TEST		V sync signal input
— [CHKSUM] FLASH CHECKSUM TEST		Checksum of system control software

3-2-3. Checking

Note

For the remedy against the malfunction detected in the checks, refer to “3-3. Troubleshooting”.

1. LED Check

LEDs are checked in units of blocks (MENU, Fx, AUX, XPT, and pattern/numeric-key blocks).

- (1) At the top menu, press the **F2** key. ([PART] selection)
- (2) Press the **F1** key. ([KY] selection)
- (3) Press the **F1** key. ([LED] selection)

< LED check menu >

PART	NOW TESTING
KYLED	

XPT and pattern/numeric-key blocks check

- (4) Press any key in a block.
- (5) Every time you press a key, confirm that the lighting state of all switch LEDs in the block changes in the following order; amber → red → green → going-off → amber ...

MENU, Fx, and AUX blocks check

- (6) Press any transparent and small key.
- (7) Every time you press a key, confirm that the lighting state of all switch LEDs and seven-segment LEDs in the block changes between on and off.

Notes

- The three switches below do not light.
SET UP, **DSK LUM**, and **MATTES** (in the MENU block)
- The six switches below light in green.
LEARN, **RECALL**, **DIRECT RECALL**, **DIRECT PATTERN** (in the Fx block), and two **SET** (in the TRANS RATE and PATTERN NUMBER sections)
- Other switches light in amber.

2. Switch Check

- (1) At the top menu, press the **F2** key. ([PART] selection)
- (2) Press the **F1** key. ([KY] selection)
- (3) Press the **F2** key. ([SWITCH] selection)

< Switch check menu >

PART	NOW TESTING
KYSW	

- (4) Press any switch and confirm that the buzzer sounds.

3. Volume Check

- (1) At the top menu, press the **F2** key. ([PART] selection)
- (2) Press the **F2** key. ([VOL_Fx] selection)

< Display example of volume check >

PART	F1 : a b	F2 : 0	F3 : f f	F4 : c	F5 : d 4
VOL	##	#			

- (3) Rotate a knob clockwise by two turns and confirm that two marks “#” are displayed on the corresponding display section. (One mark “#” is displayed every time you rotate the knob by one turn.)
- (4) Confirm that the two-digit value on the right of “Fx:” (x: 1 to 5) changes.

4. Joystick and Z-axis Volume Checks

- (1) At the top menu, press the **F2** key. ([PART] selection)
- (2) Press the **F3** key. ([POS/FD] selection)
- (3) Press the **F1** key. ([POS] selection)

< Display example of joystick check >

PART	X : 7 8 f	Y : 1 c	Z : e a
POS	##		##

Joystick check

- (4) Move the joystick to the right and left or in the vertical direction and confirm that three marks “#” are displayed below “X:” and “Y:” on the menu display. (One mark “#” is displayed every time you reciprocate the joystick once.)
- (5) Confirm that the three-digit values on the right of “X:” and “Y:” on the menu display change.

Z-axis volume check

- (6) Rotate the Z-axis knob to the right (clockwise) and confirm that two marks “#” are displayed below “Z:” on the menu display. (One mark “#” is displayed every time you rotate the Z-axis knob once.)
- (7) Confirm that the two-digit value on the right of “Z:” on the menu display changes.

5. Fader Check

- (1) At the top menu, press the **F2** key. ([PART] selection)
- (2) Press the **F3** key. ([POS/FD] selection)
- (3) Press the **F2** key. ([FADER] selection)

< Display example of fader check >

PART	DATA	Δ	
FADER	fff	452	##

- (4) Move the fader from end to end and confirm that four marks “#” are displayed on the corresponding display section. (One mark “#” is displayed every time you reciprocate the fader once.)
- (5) Confirm that the three-digit value below “DATA:” on the menu display changes.

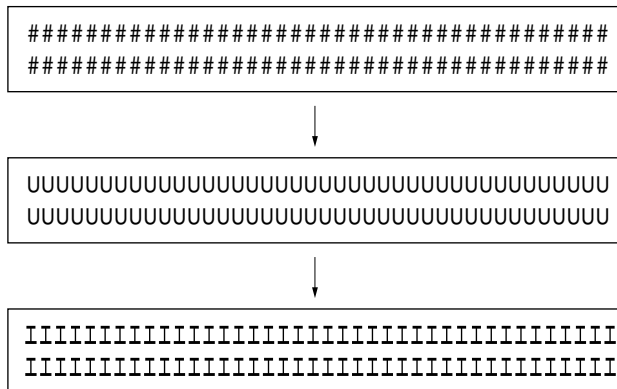
6. Menu Display (VFD: Vacuum Fluorescent Display) Check

- (1) At the top menu, press the **F2** key. ([PART] selection)
- (2) Press the **F4** key. ([VFD] selection)
- (3) Confirm that all-dot “#” lighting, character “U” display, or character “ \pm ” display is switched every time you press the **F2** key.
- (4) During all-dots lighting, confirm that no dots are missing.

Note

If dots are missing, VFD is judged to be defective.

< Display example of menu display check >



7. V Sync Signal Input Check

- (1) At the top menu, press the **F2** key. ([PART] selection)
- (2) Press the **F5** key. ([CPU] selection)
- (3) Press the **F1** key. ([VD] selection)

< Display example of V sync signal input check >

PART	
CPUVD	**

- (4) During check, confirm that “OK” is displayed on the menu display section “**”.

8. Check of Program Flash Memory (IC54) Checksum

- (1) At the top menu, press the **F2** key. ([PART] selection)
- (2) Press the **F5** key. ([CPU] selection)
- (3) Press the **F2** key. ([CHKSUM] selection)
- (4) After the buzzer for calculation completion sounds, confirm that “OK” is displayed on the menu display.

Note

It takes a few seconds to calculate the checksum.

< Display example of checksum check >

In the case of OK:

PART	
CPUCS	OK

In the case of NG:

PART	
CPUCS	NG

3-3. Troubleshooting

The table below shows the possible cause and remedy for the operating situation (malfunction) that occurs in “3-2. Check Mode”.

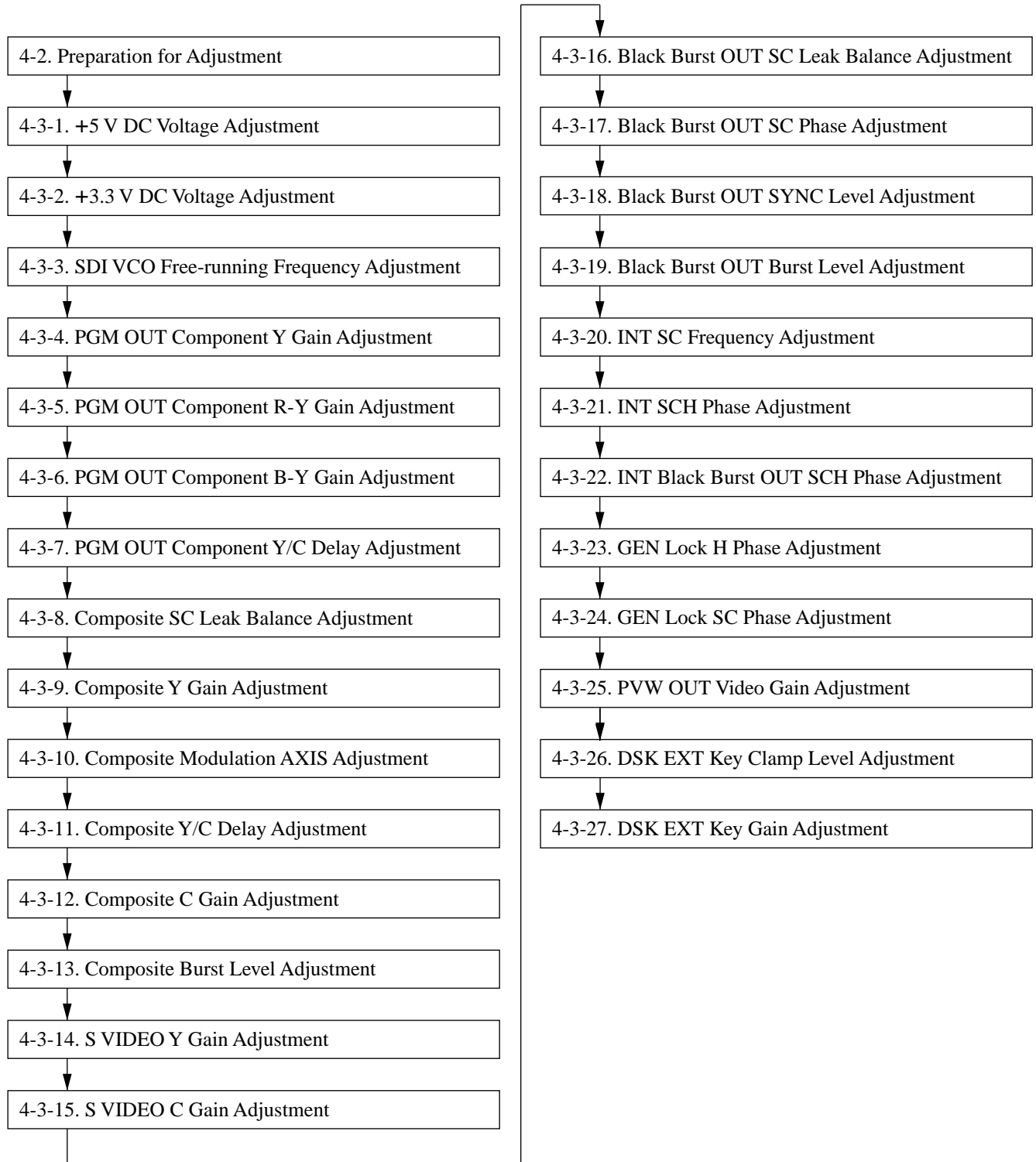
Checkpoint	Situation	Cause	Remedy
LED	Only one LED does not light.	LED failure	Replace the LED.
	Multiple LEDs do not light.	LED failure	Replace the LEDs.
		IC or the timing signal input to IC is abnormal.	Confirm the connection or replace IC.
	All switches (large switches) on the XPT and pattern/numeric-key blocks do not light.	Defective IC29 on the CPU-305 board.	Replace the IC.
Switch	The buzzer of only one switch does not sound.	Switch failure	Replace the switch.
	The buzzer of multiple switches does not sound.	Switch failure	Replace the switches.
		IC or the timing signal input to IC is abnormal.	Confirm the connection or replace IC.
Volume	Only one knob does not operate.	Knob failure	Replace the knob.
		The flexible flat cable between the VR-263 and KY-466 boards is not connected properly.	Connect the cable.
		Counters (IC208 to IC210, and IC211 to IC214: UPG4702G) on the KY-466 board are defective.	Replace the counters.
	Multiple knobs do not operate.	The flexible flat cable between the VR-263 and KY-466 boards is not connected properly.	Confirm the cable connection or replace the cable.
LED/switch /volume	All LEDs, switches, and knobs (not including the vacuum fluorescent display) do not operate.	The flat cable between the CPU-305 and KY-466 boards is disconnected.	Confirm the cable connection.
		The dual port SRAM (IC64) or dual port memory controller are defective.	Replace the IC.
Joystick	Operation failure	Joystick trouble	Replace the joystick.
		The harness between the LC-40 and KY-466 boards is disconnected.	Confirm the harness connection or replace the harness.
		The A/D converter (IC215: μ PD7004) on the KY-466 board is defective.	Replace the A/D converter.
Fader	Operation failure	An encoder supplied for the fader is defective.	Replace the encoder.
		The harness connected with the KY-466 board is disconnected.	Confirm the harness connection or replace the harness.
		The counter (IC211: μ PD4701) on the KY-466 board is defective.	Replace the counter.
V sync signal input	"NG" is displayed on the menu display.	RS-422 transceiver (IC24) failure	Replace the RS-422 transceiver (IC24).
		The cable connected to pin 7 or 20 of CN21 on the CPU-305 board is disconnected.	Confirm the connection or replace the connector.
Vacuum fluorescent display (VFD)	"#" is missing during all-dot lighting.	The vacuum fluorescent display is defective.	Replace the vacuum fluorescent display.
	No display	The vacuum fluorescent display, IC62, or IC63 is defective, or the harness connected with the CPU board is removed or disconnected.	Confirm the harness connection or replace the harness, vacuum fluorescent display, IC62, or IC63.

Section 4

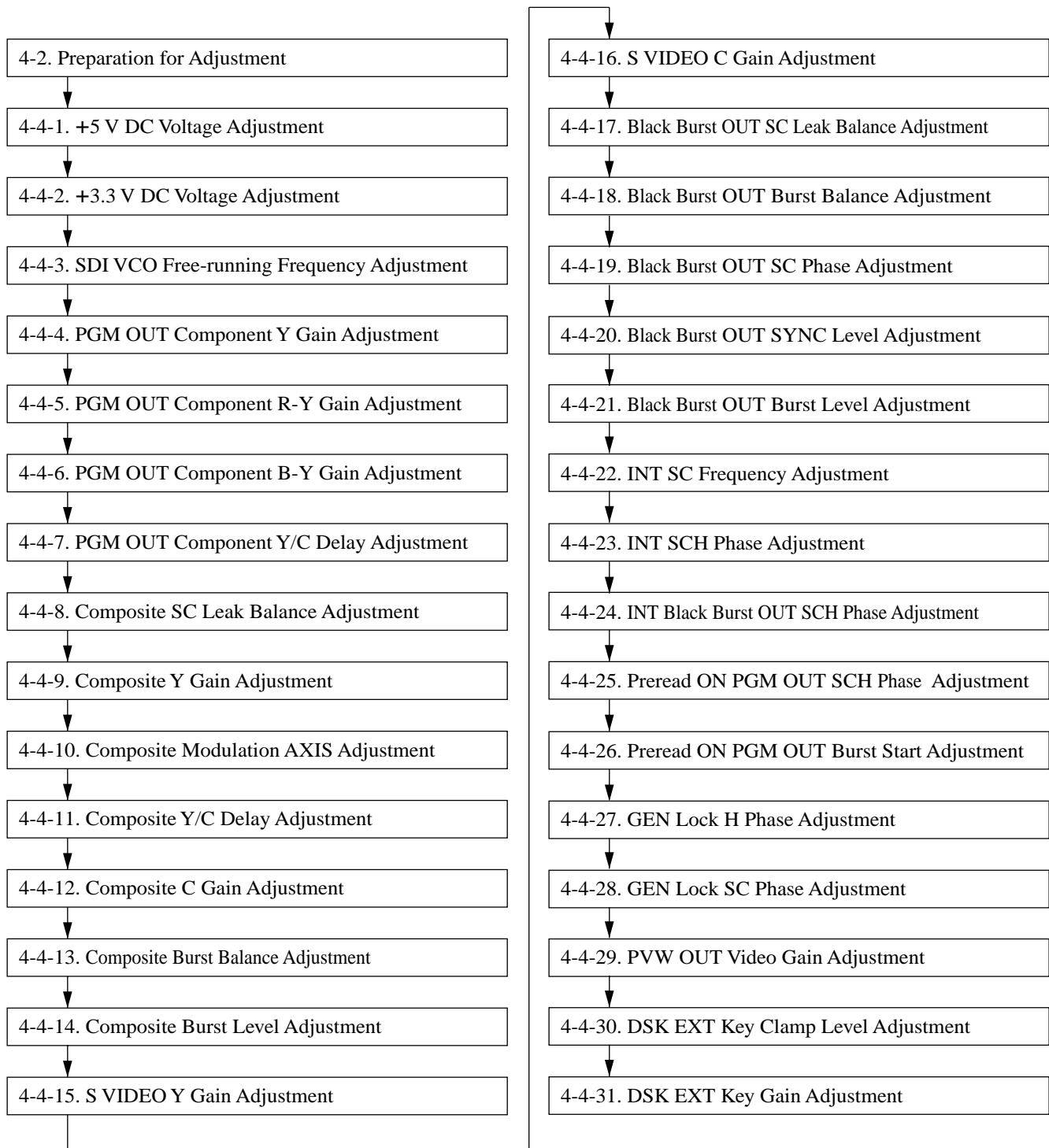
Electrical Alignment

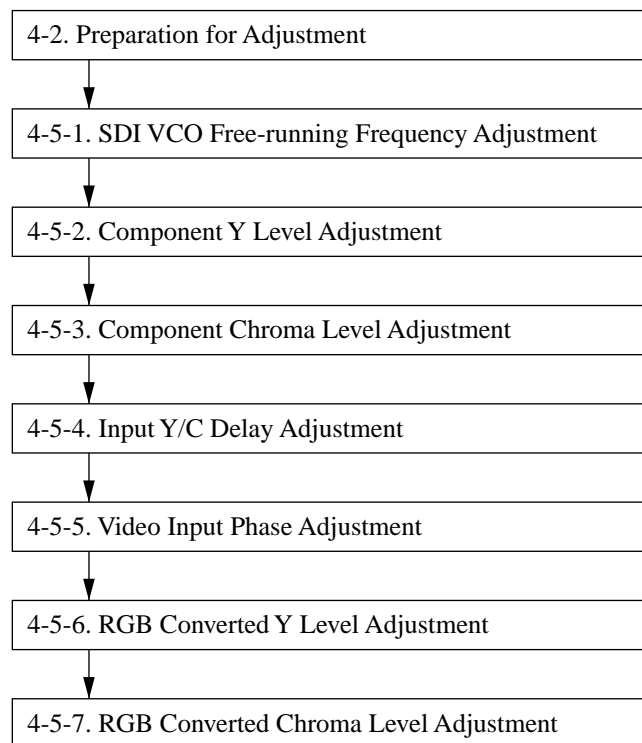
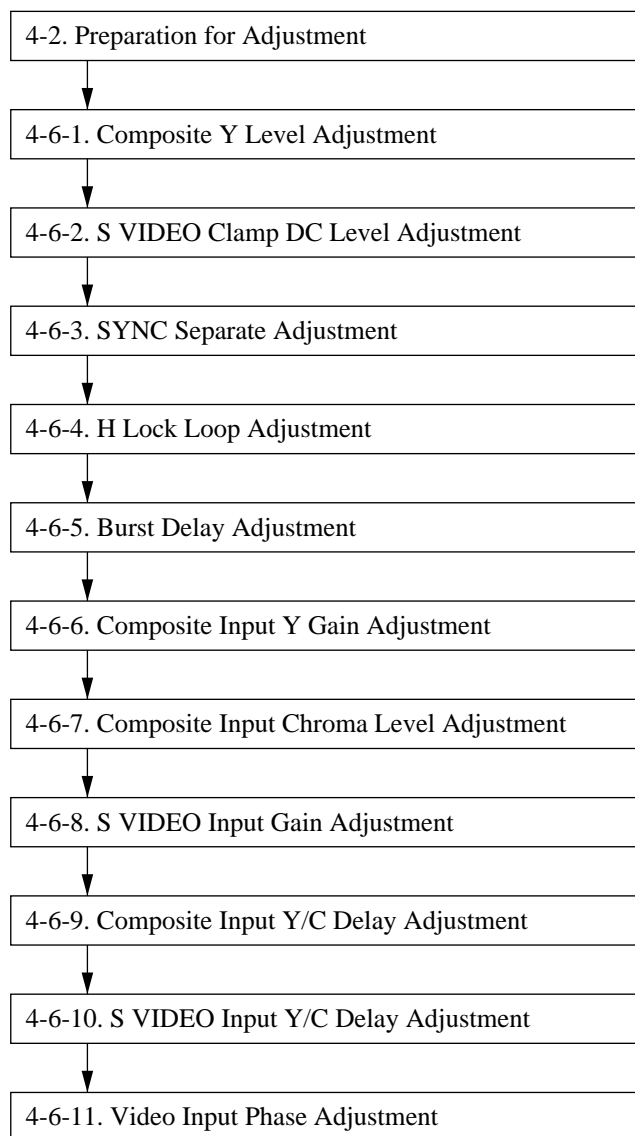
4-1. Adjustment Sequence

OPM-39/OPM-45 Board Adjustment (For NTSC)

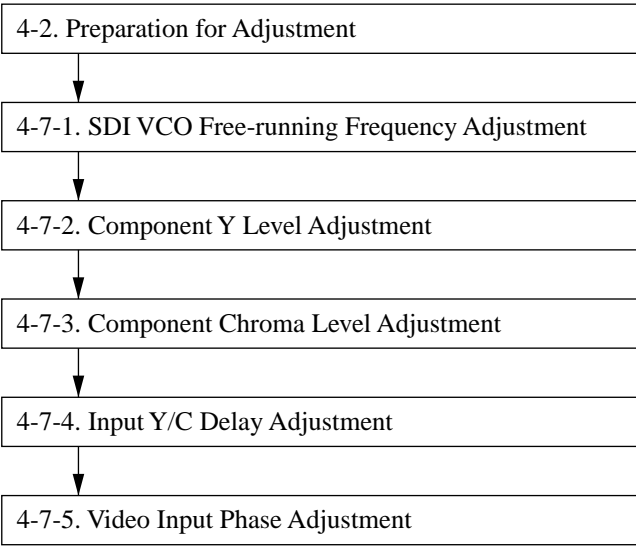


OPM-39P/OPM-45P Board Adjustment (For PAL)



IPM-96/96P Board Adjustment**VIF-19/19P Board Adjustment**

VIF-20/20P Board Adjustment

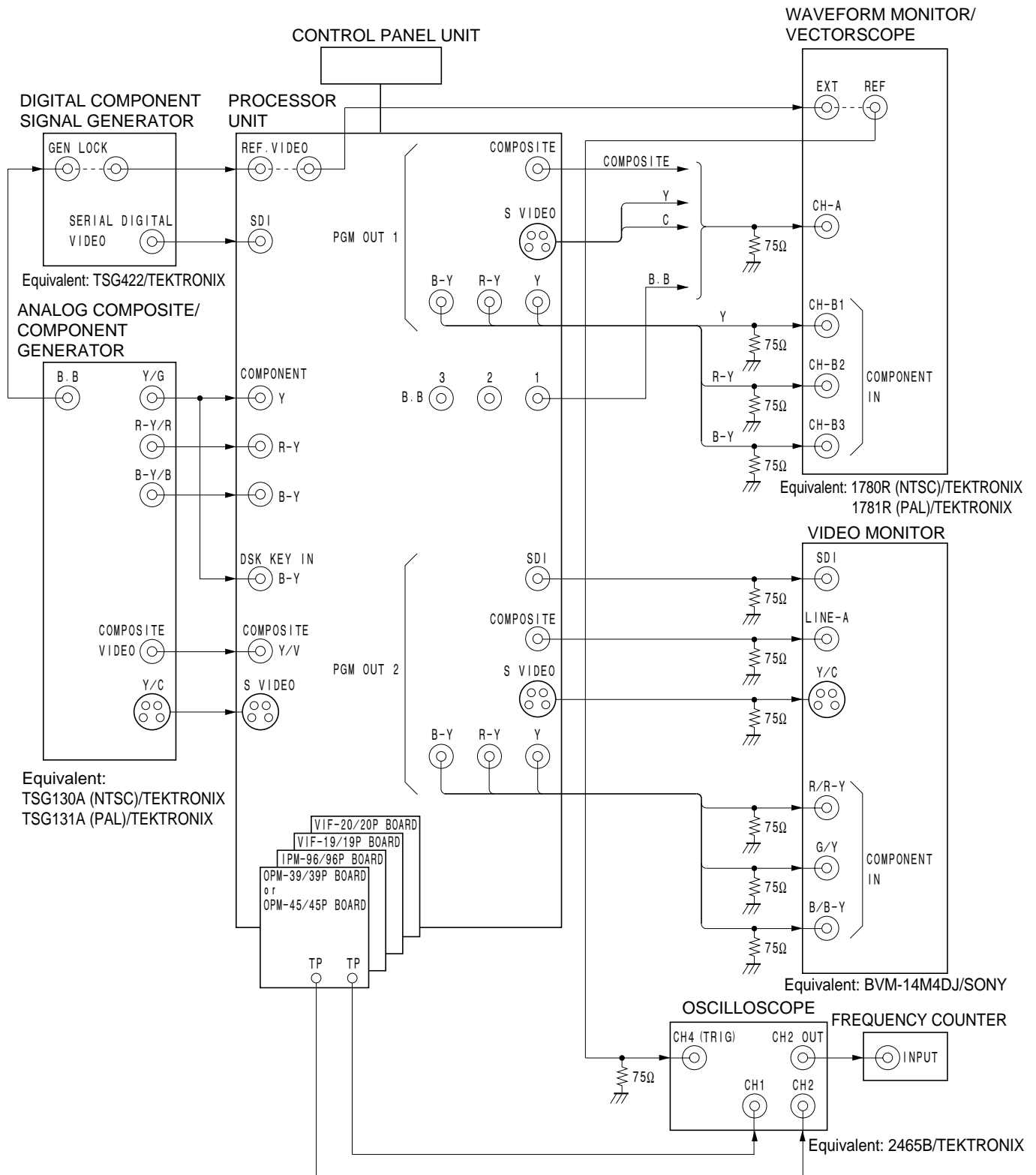


4-2. Preparation for Adjustment

Connection

Note

For the tools and measurement equipment used for each adjustment, refer to “2-13. Fixtures/Measuring Instruments”.



4-3. OPM-39/OPM-45 Board Adjustment (For NTSC)

4-3-1. +5 V DC Voltage Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2.		
STEP-2 • Digital Voltmeter	TP901/OPM-39 or OPM-45 (A-3) TP903/OPM-39 or OPM-45 (A-4) GND • Specification: 5.00 ± 0.05 V dc	+5 V DC voltage adjustment OPM-39 or OPM-45 ● RV901 (A-3)

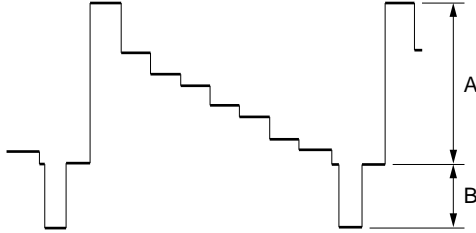
4-3-2. +3.3 V DC Voltage Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP1 • Connection: Refer to Section 4-2.		
STEP2 • Digital Voltmeter	TP902/OPM-39 or OPM-45 (A-3) TP903/OPM-39 or OPM-45 (A-4) GND • Specification: 3.30 ± 0.03 V dc	+3.3 V DC voltage adjustment OPM-39 or OPM-45 ● RV902 (A-3)

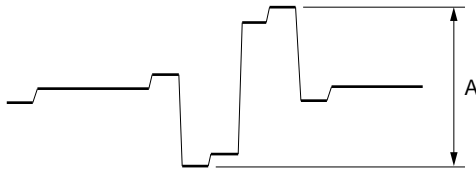
4-3-3. SDI VCO Free-running Frequency Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732. • Switch setting: S401/OPM-39 or OPM-45 (K-9): ON S501/OPM-39 or OPM-45 (L-7): ON		
STEP-2 • Frequency counter	• Specification: 27.00 ± 0.27 MHz	Free-running frequency adjustment OPM-39 or OPM-45 ● RV401 (K-9): TP401 (L-8) ● RV501 (L-7): TP501 (M-8)
STEP-3 • After completing the adjustment, set the switches S401 (K-9) and S501 (L-7) on the OPM-39 or OPM-45 board to OFF.		

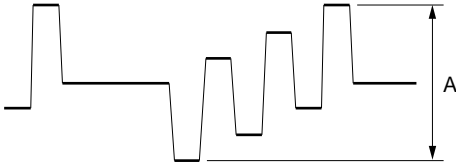
4-3-4. PGM OUT Component Y Gain Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μ s/DIV TRIG: B.B (CH4)	COMPONENT Y OUT  $A = 714 \pm 5 \text{ mV p-p}$ $B = 286 \pm 4 \text{ mV p-p}$	A: Y gain adjustment OPM-39 or OPM-45 ●RV603 (A-6) B: SYNC level (Y) OPM-39 or OPM-45 ●RV701 (B-7)

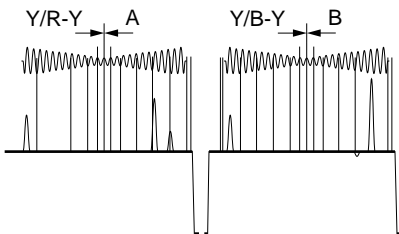
4-3-5. PGM OUT Component R-Y Gain Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μ s/DIV TRIG: B.B (CH4)	COMPONENT R-Y OUT  $A = 700 \pm 5 \text{ mV p-p}$	R-Y gain adjustment OPM-39 or OPM-45 ●RV604 (A-6)

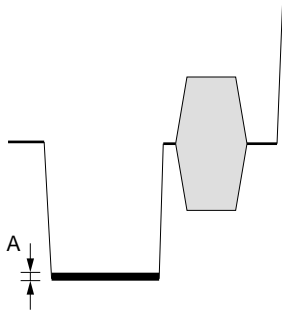
4-3-6. PGM OUT Component B-Y Gain Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μ s/DIV TRIG: B.B (CH4)	COMPONENT B-Y OUT  $A = 700 \pm 5 \text{ mV p-p}$	B-Y gain adjustment OPM-39 or OPM-45 ●RV605 (A-7)

4-3-7. PGM OUT Component Y/C Delay Adjustment

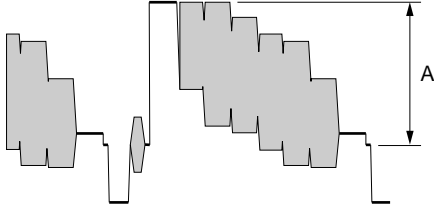
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732. • Test signal: SDI 500 kHz BOWTIE		
STEP-2 • Waveform monitor MEASURE: BOWTIE INPUT: CH-B1 (COMPONENT Y) CH-B2 (COMPONENT R-Y) CH-B3 (COMPONENT B-Y) MODE: WAVEFORM REF: EXT	CH-B1: PGM OUT (COMPONENT Y) CH-B2: PGM OUT (COMPONENT R-Y) CH-B3: PGM OUT (COMPONENT B-Y)  $A = 0 \pm 20 \text{ ns}$ $B = 0 \pm 20 \text{ ns}$ • Set the each BOWTIE DIP point A and B on the center marker.	Y/R-Y delay adjustment OPM-39 or OPM-45 ●RV601 (D-6) Y/B-Y delay adjustment OPM-39 or OPM-45 ●RV602 (D-6)

4-3-8. Composite SC Leak Balance Adjustment

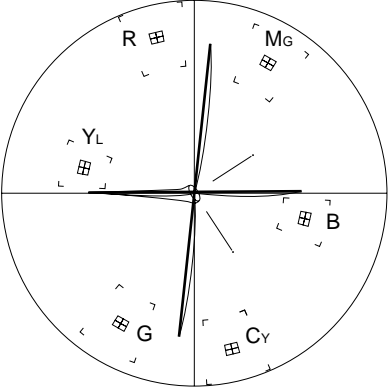
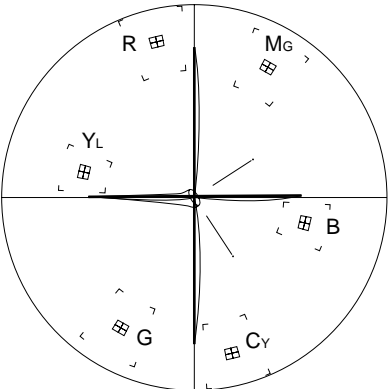
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 μ s/DIV TRIG: B.B (CH4)	COMPOSITE OUT  <p>A = 20 mV p-p or less (Adjust to minimum.)</p>	SC leak (R-Y) adjustment OPM-39 or OPM-45 ●RV703 (B-8) SC leak (B-Y) adjustment OPM-39 or OPM-45 ●RV709 (D-8)

4-3-9. Composite Y Gain Adjustment**Note**

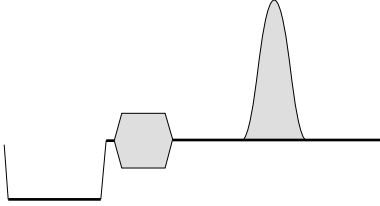
Perform “4-3-4. PGM OUT Component Y Gain Adjustment” in advance.

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μ s/DIV TRIG: B.B (CH4)	COMPOSITE OUT  <p>A = 714 \pm 5 mV p-p</p>	Composite gain adjustment OPM-39 or OPM-45 ●RV705 (A-8)

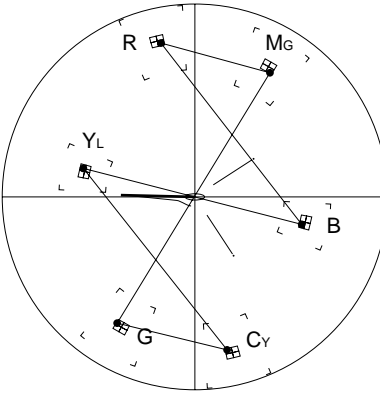

4-3-10. Composite Modulation AXIS Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732.• Test signal: Analog component quad phase		
STEP-2 <ul style="list-style-type: none">• Vectorscope75 %, SetupL. DISP: VECTINPUT: CH-AFILTER: FLATREF: EXT	<p>PGM OUT (COMPOSITE)</p>  <ul style="list-style-type: none">• Adjust the phase shift control so that the B-Y signal on the vectorscope coincides with the U axis.	
STEP-3 <ul style="list-style-type: none">• Vectorscope75 %, SetupL. DISP: VECTINPUT: CH-AFILTER: FLATREF: EXT	<p>PGM OUT (COMPOSITE)</p>  <ul style="list-style-type: none">• Adjust ⦿RV711 so that the R-Y signal on the vectorscope coincides with the V axis.	<p>Modulation AXIS adjustment OPM-39 or OPM-45 ⦿RV711 (D-8)</p>

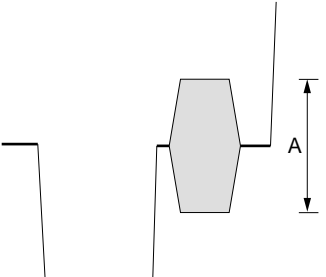
4-3-11. Composite Y/C Delay Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732. • Test signal: SDI MOD pulse & bar (MOD 12.5T)		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A (COMPONENT Y) MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 2 μ s/DIV TRIG: B.B (CH4)	CH-B1: PGM OUT (COMPOSITE)  • Adjust so that the Y/C phase is the same in phase (the base line of a 12.5T modulation pulse is symmetrical with the pulse time base in the center).	Y/C delay adjustment OPM-39 or OPM-45 ●RV713 (D-9)

4-3-12. Composite C Gain Adjustment

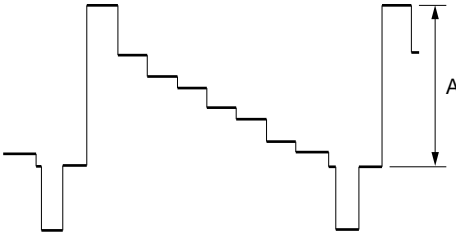
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • Vectorscope 75 %, Setup L.DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	COMPOSITE OUT  • Adjust ●RV702 and ●RV701 so that the luminance points for MG, B, CY, G, YL, and R on the vectorscope are located in each  mark.	C level adjustment OPM-39 or OPM-45 ●RV702 (C-9) B-Y AXIS level adjustment OPM-39 or OPM-45 ●RV701 (B-7)

4-3-13. Composite Burst Level Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 μ s/DIV TRIG: B.B (CH4)	COMPOSITE OUT  $A = 286 \pm 4 \text{ mV p-p}$	Burst level (PGM) adjustment OPM-39 or OPM-45 ● RV706 (C-7)

4-3-14. S VIDEO Y Gain Adjustment**Note**

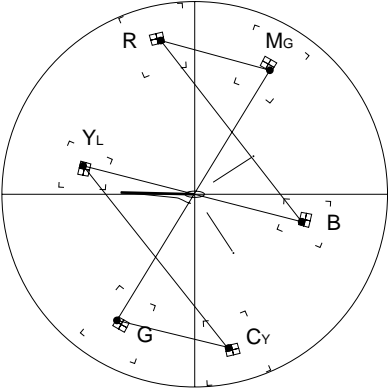
Perform “4-3-4. PGM OUT Component Y Gain Adjustment” in advance.

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μ s/DIV TRIG: B.B (CH4)	S VIDEO Y OUT  $A = 714 \pm 5 \text{ mV p-p}$	S-Y gain adjustment OPM-39 or OPM-45 ● RV710 (A-8) (Front)

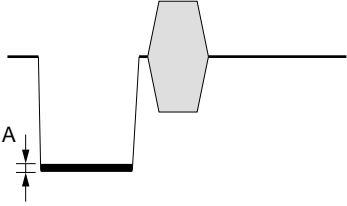
4-3-15. S VIDEO C Gain Adjustment

Note

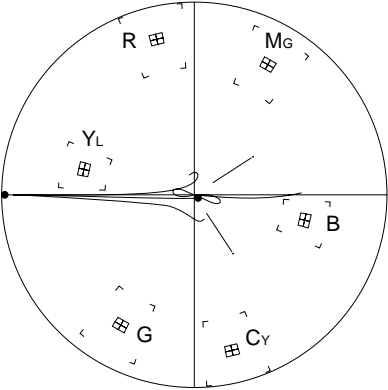
Perform “4-3-12. Composite C Gain Adjustment” in advance.

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • Vectorscope 75 %, Setup L.DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	S VIDEO C OUT  • Adjust RV712 so that the luminance points for MG, B, CY, G, YL, and R on the vectorscope are located in each square mark.	S-C gain adjustment OPM-39 or OPM-45 RV712 (A-8) (Front)

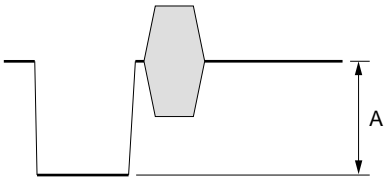
4-3-16. Black Burst OUT SC Leak Balance Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732.		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 μ s/DIV TRIG: B.B (CH4)	B.B OUT  A = 20 mV p-p or less (Adjust to minimum.)	SC leak (V) adjustment OPM-39 or OPM-45 RV718 (F-7) SC leak (U) adjustment OPM-39 or OPM-45 RV720 (G-7)

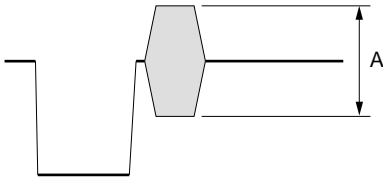
4-3-17. Black Burst OUT SC Phase Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732.• Test signal: SDI 75 % color bars		
STEP-2 <ul style="list-style-type: none">• Vectorscope75 %, SetupL.DISPLAY: VECTINPUT: CH-A/CH-BFILTER: FLATREF: EXT	<p>CH-A: PGM OUT (COMPOSITE) CH-B: B.B OUT</p>  <ul style="list-style-type: none">• Switch CH-A and CH-B on the vectorscope alternately for measurement.• Adjust the phase of a B.B OUT BURST signal to that of a PGM OUT BURST signal.• Specification: $0 \pm 1^\circ$	<p>B.B OUT SC phase adjustment OPM-39 or OPM-45 ●RV721 (H-8)</p>

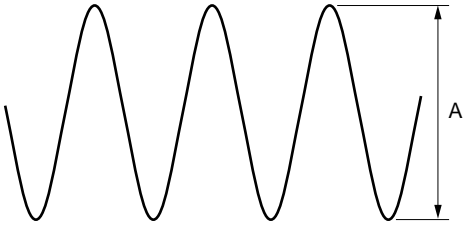
4-3-18. Black Burst OUT SYNC Level Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732.		
STEP-2 <ul style="list-style-type: none">• (1) or (2) is used.(1) Waveform Monitor<ul style="list-style-type: none">INPUT: CH-AMODE: WAVEFORMREF: EXT(2) Oscilloscope<ul style="list-style-type: none">CH1: 100 mV/DIV2 μs/DIVTRIG: B.B (CH4)	<p>B.B OUT</p>  <p>$A = 286 \pm 4 \text{ mV p-p}$</p>	<p>SYNC level adjustment OPM-39 or OPM-45 ●RV714 (E-7)</p>

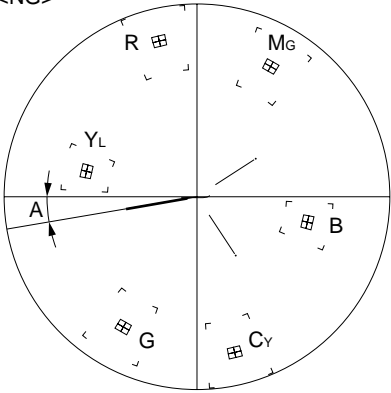
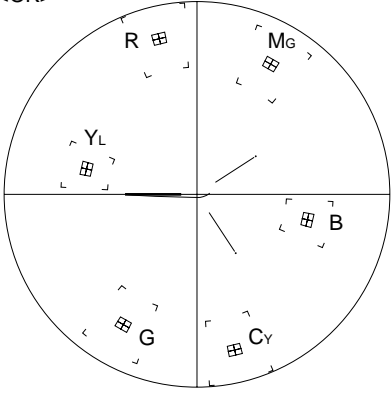
4-3-19. Black Burst OUT Burst Level Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732.		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 μ s/DIV TRIG: B.B (CH4)	B.B OUT  $A = 286 \pm 4 \text{ mV p-p}$	Burst level adjustment OPM-39 or OPM-45 ●RV715 (E-7)

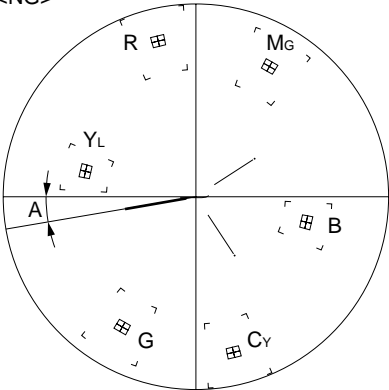
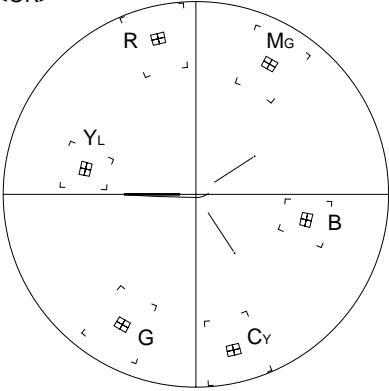
4-3-20. INT SC Frequency Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732.		
STEP-2 • Oscilloscope CH2: 200 mV/DIV (AC) 100 ns/DIV TRIG: CH2	CH2: TP106/OPM-39 or OPM-45 (D-1)  $A = 0.9 \pm 0.2 \text{ V p-p}$ • Check that the specification above is satisfied.	(Check)
STEP-3 • Set the oscilloscope as follows. CH2: 200 mV/DIV (AC) • Connect a frequency counter to CH2 OUT of the oscilloscope.	• Specification: 3,579,545 \pm 5 Hz • Check that D101/OPM-39 or OPM-45 (A-6) is off.	SC frequency adjustment OPM-39 or OPM-45 ●RV101 (D-4)

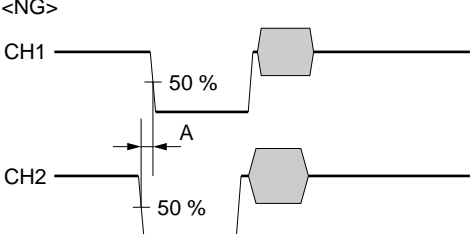
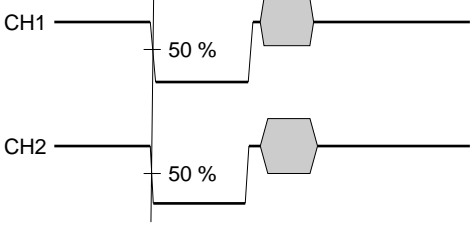
4-3-21. INT SCH Phase Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732.		
STEP-2 <ul style="list-style-type: none">• Vectorscope75 %, SetupL.DISP: SCHINPUT: CH-AFILTER: FLATGAIN: VARREF: INT	<p>PGM OUT (COMPOSITE)</p> <p><NG></p>  <p><OK></p>  <p>$A = 0 \pm 0.5^\circ$</p>	INT SC phase adjustment OPM-39 or OPM-45 ●RV102 (C-1)

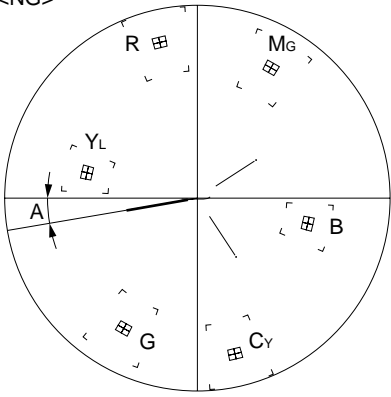
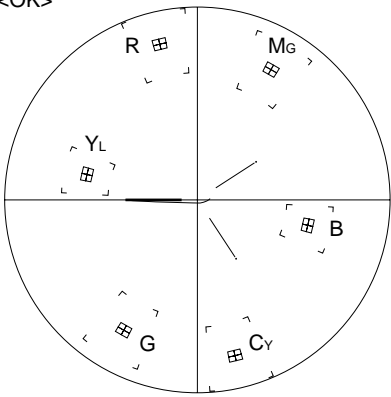
4-3-22. INT Black Burst OUT SCH Phase Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732. 		
STEP-2 <ul style="list-style-type: none"> • Vectorscope 75 %, Setup L.DISP: SCH INPUT: CH-A FILTER: FLAT GAIN: VAR REF: INT 	<p>B.B OUT</p> <p><NG></p>  <p><OK></p>  <p>$A = 0 \pm 0.5^\circ$</p>	<p>INT B.B OUT SCH</p> <p>phase adjustment</p> <p>OPM-39 or OPM-45</p> <p>● RV105 (B-4)</p>

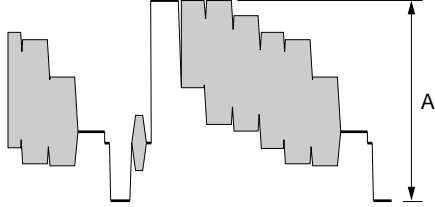
4-3-23. GEN Lock H Phase Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Connect the REF. VIDEO connector to CH1 of the oscilloscope.• Connect the PGM COMPOSITE connector to CH2 of the oscilloscope and select the BLACK input button.		
STEP-2 <ul style="list-style-type: none">• Oscilloscope<ul style="list-style-type: none">CH1: 200 mV/DIV2 μs/DIVCH2: 200 mV/DIV2 μS/DIVTRIG: B.B (CH4)	<p>CH1: REF. VIDEO CH2: PGM COMPOSITE (BLACK)</p> <p><NG></p>  <p><OK></p>  <p>A = 0 ±50 ns</p> <ul style="list-style-type: none">• Check that D101/OPM-39 or OPM-45 (A-6) lights up.• Adjust ⚙RV104 (A-5) and S101 (A-5) so that the specification above is satisfied.	<p>H phase fine adjustment OPM-39 or OPM-45 ⚙RV104 (A-5) (Front)</p> <p>H phase coarse OPM-39 or OPM-45 S101 (A-5) (Front)</p>

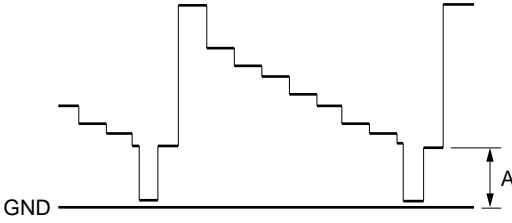
4-3-24. GEN Lock SC Phase Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Connect the PGM COMPOSITE connector to CH-A on the waveform monitor/vectorscope and select the BLACK input button. • Connect the REF. VIDEO connector to CH-B on the waveform monitor/vectorscope. 		
STEP-2 <ul style="list-style-type: none"> • Vectorscope 75 %, Setup L.DISP: VECT INPUT: CH-A FILTER: FLAT GAIN: VAR REF: EXT 	<p>CH-A: PGM COMPOSITE</p> <p><NG></p>  <p><OK></p>  <p>$A = 0 \pm 0.5^\circ$</p> <ul style="list-style-type: none"> • Adjust the burst phase of a REF. VIDEO vectorscope waveform to 0° (counterclockwise) in CH-B. • Switch to the PGM COMPOSITE vectorscope waveform in CH-A and adjust S102 and RV103 so that the burst phase is 0°. 	<p>SC phase fine adjustment OPM-39 or OPM-45 RV103 (A-4) (Front)</p> <p>SC phase coarse OPM-39 or OPM-45 S102 (B-4) (Front)</p>

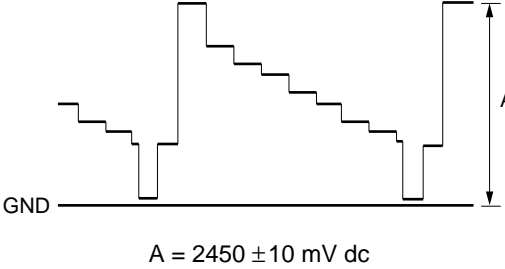
4-3-25. PVW OUT Video Gain Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 2 μ s/DIV TRIG: B.B (CH4)	PVW OUT  $A = 1000 \pm 10 \text{ mV p-p}$	PVW OUT gain adjustment OPM-39 or OPM-45 ● RV801 (K-4)

4-3-26. DSK EXT Key Clamp Level Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732. • DSK KEY IN signal setting: 75 % color bars = 700 mV p-p (Y only) • Switch settings: S201/OPM-39 or OPM-45 (E-2): SELF		
STEP-2 • Oscilloscope CH1: 500 mV/DIV TIME: 10 μ s/DIV	 $A = 730 \pm 10 \text{ mV dc}$	DSK EXT key clamp level adjustment OPM-39 or OPM-45 ● RV202 (E-2): TP201 (E-2)

4-3-27. DSK EXT Key Gain Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39/OPM-45 board with an extension board EX-732.• DSK KEY IN signal setting: 75 % color bars = 700 mV p-p (Y only)• Switch settings: S201/OPM-39 or OPM-45 (E-2): SELF		
STEP-2 <ul style="list-style-type: none">• Oscilloscope CH1: 500 mV/DIV TIME: 10 μs/DIV	 <p>A = 2450 \pm 10 mV dc</p>	DSK EXT key gain adjustment OPM-39 or OPM-45 ●RV201 (E-2): TP201 (E-2)

4-4. OPM-39P/OPM-45P Board Adjustment (For PAL)

4-4-1. +5 V DC Voltage Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2.		
STEP-2 • Digital Voltmeter	TP901/OPM-39P or OPM-45P (A-3) TP903/OPM-39P or OPM-45P (A-4) GND • Specification: 5.00 ± 0.05 V dc	+5 V DC voltage adjustment OPM-39P or OPM-45P ⚙ RV901 (A-3)

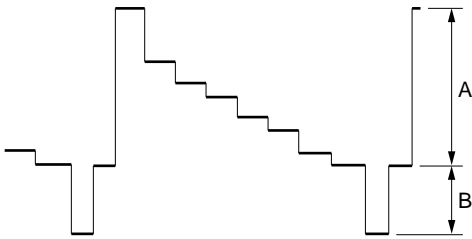
4-4-2. +3.3 V DC Voltage Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP1 • Connection: Refer to Section 4-2.		
STEP2 • Digital Voltmeter	TP902/OPM-39P or OPM-45P (A-3) TP903/OPM-39P or OPM-45P (A-4) GND • Specification: 3.30 ± 0.03 V dc	+3.3 V DC voltage adjustment OPM-39P or OPM-45P ⚙ RV902 (A-3)

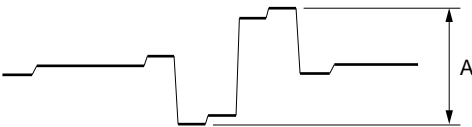
4-4-3. SDI VCO Free-running Frequency Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732. • Switch setting: S401/OPM-39P or OPM-45P (K-9): ON S501/OPM-39P or OPM-45P (L-7): ON		
STEP-2 • Frequency counter	• Specification: 27.00 ± 0.27 MHz	Free-running frequency adjustment OPM-39P or OPM-45P ⚙ RV401 (K-9): TP401 (L-8) ⚙ RV501 (L-7): TP501 (M-8)
STEP-3 • After completing the adjustment, set the switches S401 (K-9) and S501 (L-7) on the OPM-39P/OPM-45P board to OFF.		

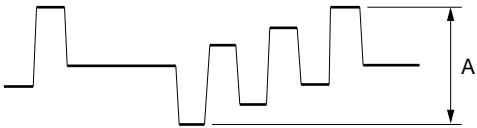
4-4-4. PGM OUT Component Y Gain Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μ s/DIV TRIG: B.B (CH4)	COMPONENT Y OUT  $A = 700 \pm 5 \text{ mV p-p}$ $B = 300 \pm 4 \text{ mV p-p}$	A: Y gain adjustment OPM-39P or OPM-45P ●RV603 (A-6) B: SYNC level (Y) OPM-39P or OPM-45P ●RV701 (B-7)

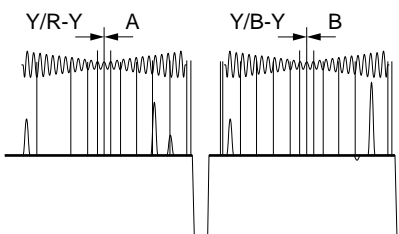
4-4-5. PGM OUT Component R-Y Gain Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μ s/DIV TRIG: B.B (CH4)	COMPONENT R-Y OUT  $A = 525 \pm 7 \text{ mV p-p}$	R-Y gain adjustment OPM-39P or OPM-45P ●RV604 (A-6)

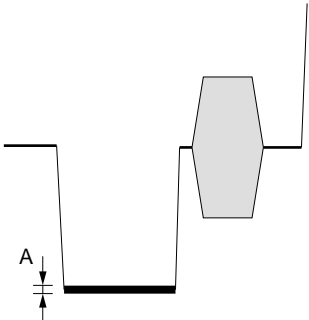
4-4-6. PGM OUT Component B-Y Gain Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μ s/DIV TRIG: B.B (CH4)	COMPONENT B-Y OUT  $A = 525 \pm 7 \text{ mV p-p}$	B-Y gain adjustment OPM-39P or OPM-45P ● RV605 (A-7)

4-4-7. PGM OUT Component Y/C Delay Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732. • Test signal: SDI 500 kHz BOWTIE		
STEP-2 • Waveform monitor MEASURE: BOWTIE INPUT: CH-B1 (COMPONENT Y) CH-B2 (COMPONENT R-Y) CH-B3 (COMPONENT B-Y) MODE: WAVEFORM REF: EXT	CH-B1: PGM OUT (COMPONENT Y) CH-B2: PGM OUT (COMPONENT R-Y) CH-B3: PGM OUT (COMPONENT B-Y)  $A = 0 \pm 20 \text{ ns}$ $B = 0 \pm 20 \text{ ns}$ • Set the each BOWTIE DIP point A and B on the center marker.	Y/R-Y delay adjustment OPM-39P or OPM-45P ● RV601 (D-6) Y/B-Y delay adjustment OPM-39P or OPM-45P ● RV602 (D-6)

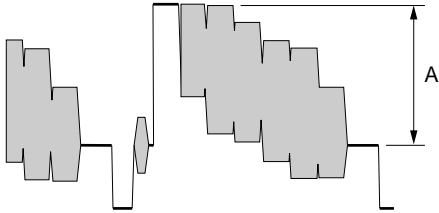
4-4-8. Composite SC Leak Balance Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732. • Test signal: SDI 75 % color bars 		
STEP-2 <ul style="list-style-type: none"> • (1) or (2) is used. (1) Waveform Monitor <ul style="list-style-type: none"> INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope <ul style="list-style-type: none"> CH1: 100 mV/DIV 2 μs/DIV TRIG: B.B (CH4) 	COMPOSITE OUT  <p>A = 20 mV p-p or less (Adjust to minimum.)</p>	SC leak adjustment OPM-39P or OPM-45P ● RV703 (B-8) SC leak (B-Y) adjustment OPM-39P or OPM-45P ● RV709 (D-8)

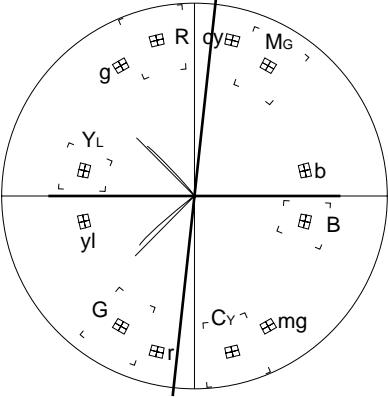
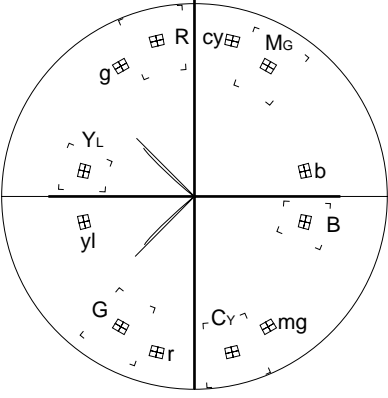
4-4-9. Composite Y Gain Adjustment

Note

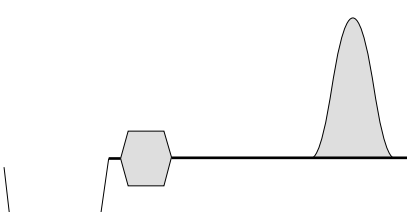
Perform “4-4-4. PGM OUT Component Y Gain Adjustment” in advance.

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars 		
STEP-2 <ul style="list-style-type: none"> • (1) or (2) is used. (1) Waveform Monitor <ul style="list-style-type: none"> INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope <ul style="list-style-type: none"> CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	COMPOSITE OUT  <p>A = 700 \pm 5 mV p-p</p>	Composite gain adjustment OPM-39P or OPM-45P ● RV705 (A-8)

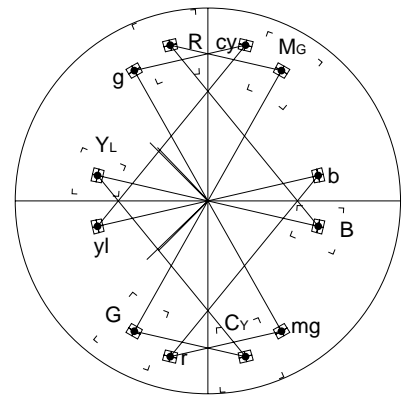
4-4-10. Composite Modulation AXIS Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.• Test signal: Analog component quad phase		
STEP-2 <ul style="list-style-type: none">• Vectorscope75 %L. DISP: VECTINPUT: CH-AFILTER: FLATREF: EXT	<p>PGM OUT (COMPOSITE)</p>  <ul style="list-style-type: none">• Adjust the phase shift control so that the B-Y signal on the vectorscope coincides with the U axis.	
STEP-3 <ul style="list-style-type: none">• Vectorscope75 %L. DISP: VECTINPUT: CH-AFILTER: FLATREF: EXT	<p>PGM OUT (COMPOSITE)</p>  <ul style="list-style-type: none">• Adjust ⦿RV711 so that the R-Y signal on the vectorscope coincides with the V axis.	<p>Modulation AXIS adjustment OPM-39P or OPM-45P ⦿RV711 (D-8)</p>

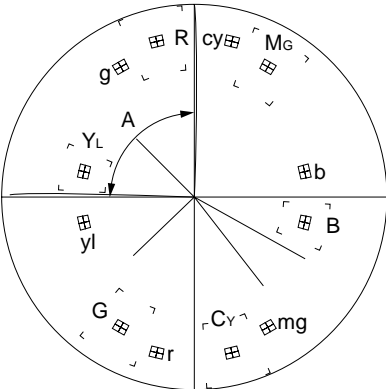
4-4-11. Composite Y/C Delay Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732. • Test signal: SDI MOD pulse & bar (MOD 12.5T)		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A (COMPONENT Y) MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 2 μ s/DIV TRIG: B.B (CH4)	CH-B1: PGM OUT (COMPOSITE)  • Adjust so that the Y/C phase is the same in phase (the base line of a 12.5T modulation pulse is symmetrical with the pulse time base in the center).	Y/C delay adjustment OPM-39P or OPM-45P ●RV713 (D-9)

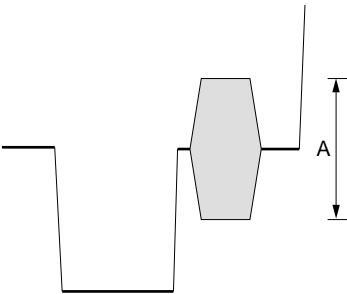
4-4-12. Composite C Gain Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732. • Test signal: SDI 75 % color bars		
STEP-2 • Vectorscope 75 % L.DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	COMPOSITE OUT  • Adjust ●RV702 and ●RV701 so that the luminance points for MG, mg, B, b, CY, cy, G, g, YL, yl, R, and r on the vectorscope are located in each \boxplus mark.	C level adjustment OPM-39P or OPM-45P ●RV702 (C-9) B-Y AXIS level adjustment OPM-39P or OPM-45P ●RV701 (B-7)

4-4-13. Composite Burst Balance Adjustment

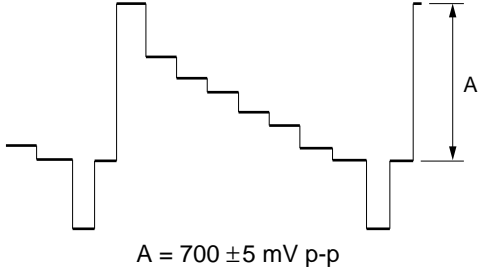
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.		
STEP-2 <ul style="list-style-type: none">• Vectorscope75 %L.DISP: VECTINPUT: CH-AFILTER: FLATREF: EXT	COMPOSITE OUT <div></div> <ul style="list-style-type: none">• Set the spot of BURST on the position of circumference by GAIN control on the vectorscope.Then adjust RV704 so that A is the specification. <p>$A = 90 \pm 0.5^\circ$</p>	Burst balance adjustment OPM-39P or OPM-45P RV704 (C-9)

4-4-14. Composite Burst Level Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.• Test signal: SDI 75 % color bars		
STEP-2 <ul style="list-style-type: none">• (1) or (2) is used.(1) Waveform Monitor<ul style="list-style-type: none">INPUT: CH-AMODE: WAVEFORMREF: EXT(2) Oscilloscope<ul style="list-style-type: none">CH1: 100 mV/DIV2 μs/DIVTRIG: B.B (CH4)	COMPOSITE OUT <div></div> <p>$A = 300 \pm 4 \text{ mV p-p}$</p>	Burst level (PGM) adjustment OPM-39P or OPM-45P RV706 (C-7)

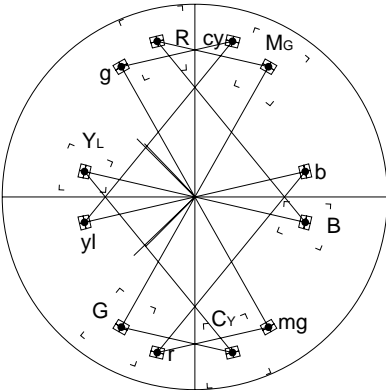
4-4-15. S VIDEO Y Gain Adjustment**Note**

Perform “4-4-4. PGM OUT Component Y Gain Adjustment” in advance.

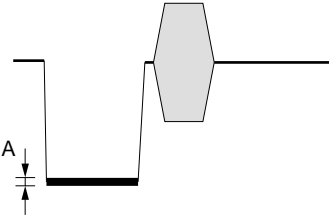
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μ s/DIV TRIG: B.B (CH4)	S VIDEO Y OUT  <p>A = 700 \pm 5 mV p-p</p>	S-Y gain adjustment OPM-39P or OPM-45P ● RV710 (A-8) (Front)

4-4-16. S VIDEO C Gain Adjustment**Note**

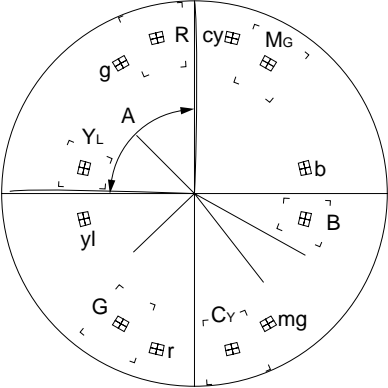
Perform “4-4-12. Composite C Gain Adjustment” in advance.

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • Vectorscope 75 % L.DISP: VECT INPUT: CH-A FILTER: FLAT REF: EXT	S VIDEO C OUT  <p>• Adjust ●RV712 so that the luminance points for MG, B, CY, G, YL, and R on the vectorscope are located in each 田 mark.</p>	S-C gain adjustment OPM-39P or OPM-45P ● RV712 (A-8) (Front)

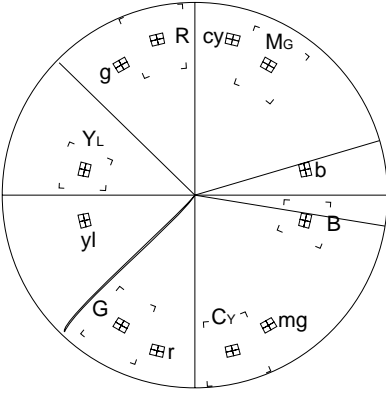
4-4-17. Black Burst OUT SC Leak Balance Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.		
STEP-2 <ul style="list-style-type: none">• (1) or (2) is used.(1) Waveform Monitor<ul style="list-style-type: none">INPUT: CH-AMODE: WAVEFORMREF: EXT(2) Oscilloscope<ul style="list-style-type: none">CH1: 100 mV/DIV2 μs/DIVTRIG: B.B (CH4)	B.B OUT  <p>A = 20 mV p-p or less (Adjust to minimum.)</p>	SC leak (V) adjustment OPM-39P or OPM-45P ●RV718 (F-7) SC leak (U) adjustment OPM-39P or OPM-45P ●RV720 (G-7)

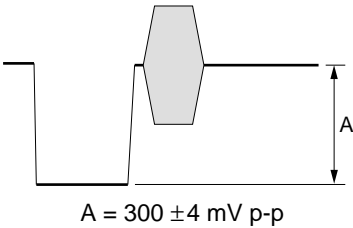
4-4-18. Black Burst OUT Burst Balance Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.		
STEP-2 <ul style="list-style-type: none">• Vectorscope75 %L.DISP: VECTINPUT: CH-AFILTER: FLATREF: EXT	B.B OUT  <ul style="list-style-type: none">• Set the spot of BURST on the position of circumference by GAIN control on the vectorscope.Then adjust ●RV717 so that A is the specification. <p>A = 90 \pm 0.5°</p>	Burst balance adjustment OPM-39P or OPM-45P ●RV717 (F-7)

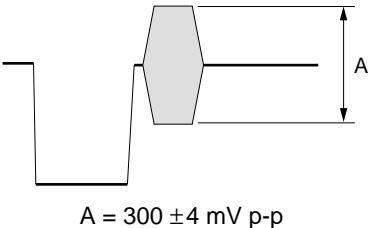
4-4-19. Black Burst OUT SC Phase Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.		
STEP-2 • Vectorscope 75 % L.DISP: VECT INPUT: CH-A/CH-B FILTER: FLAT REF: EXT	CH-A: PGM OUT (COMPOSITE) CH-B: B.B OUT  • Switch CH-A and CH-B on the vectorscope alternately for measurement. • Adjust the phase of a B.B OUT BURST signal to that of a PGM OUT BURST signal. • Specification: $0 \pm 1^\circ$	B.B OUT SC phase adjustment OPM-39P or OPM-45P ●RV721 (H-8)

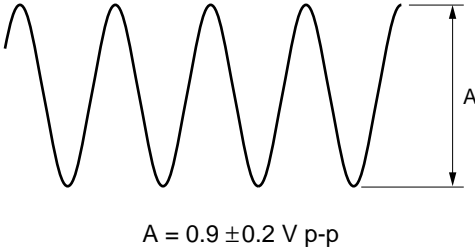
4-4-20. Black Burst OUT SYNC Level Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 μ s/DIV TRIG: B.B (CH4)	B.B OUT  $A = 300 \pm 4 \text{ mV p-p}$	SYNC level adjustment OPM-39P or OPM-45P ●RV714 (E-7)

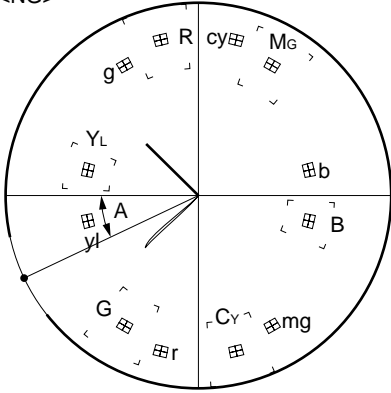
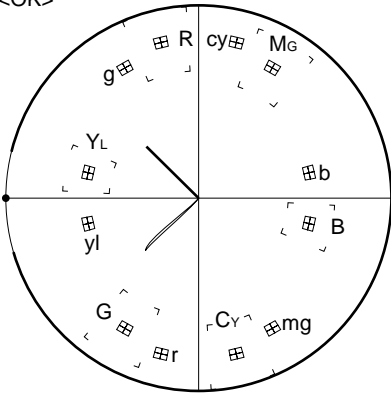
4-4-21. Black Burst OUT Burst Level Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100 mV/DIV 2 μ s/DIV TRIG: B.B (CH4)	B.B OUT  $A = 300 \pm 4 \text{ mV p-p}$	Burst level adjustment OPM-39P or OPM-45P ● RV715 (E-7)

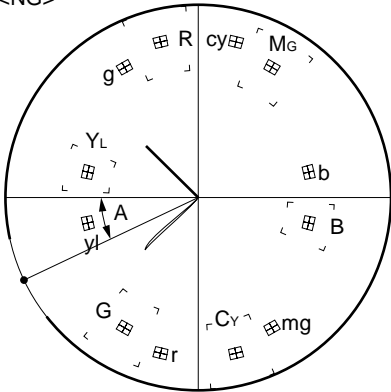
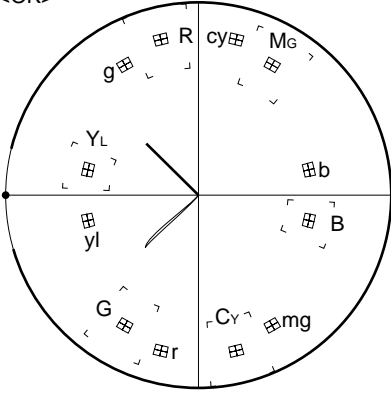
4-4-22. INT SC Frequency Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.		
STEP-2 • Oscilloscope CH2: 200 mV/DIV (AC) 100 ns/DIV TRIG: CH2	CH2: TP106/OPM-39P or OPM-45P (D-1)  $A = 0.9 \pm 0.2 \text{ V p-p}$ • Check that the specification above is satisfied.	(Check)
STEP-3 • Set the oscilloscope as follows. CH2: 200 mV/DIV (AC) • Connect a frequency counter to CH2 OUT of the oscilloscope.	• Specification: $4,433,619 \pm 5 \text{ Hz}$ • Check that D101/OPM-39P or OPM-45P (A-6) is off.	SC frequency adjustment OPM-39P or OPM-45P ● RV101 (D-4)

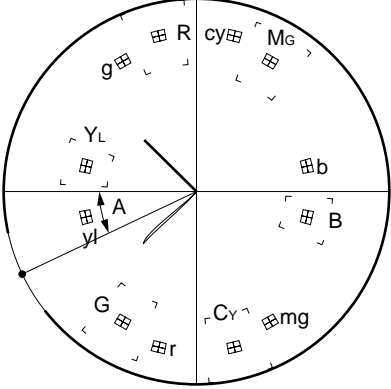
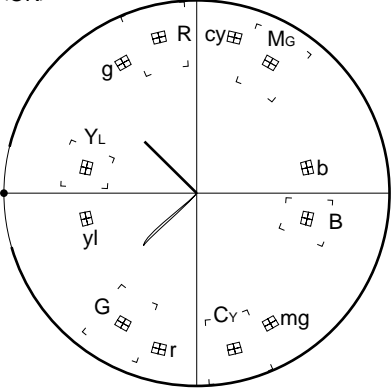
4-4-23. INT SCH Phase Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.		
STEP-2 <ul style="list-style-type: none">• Vectorscope 75 % L.DISP: SCH INPUT: CH-A FILTER: FLAT GAIN: VAR REF: INT	<p>PGM OUT (COMPOSITE)</p> <p><NG></p>  <p><OK></p>  <p>$A = 0 \pm 0.5^\circ$</p>	INT SC phase adjustment OPM-39P or OPM-45P ●RV102 (C-1)

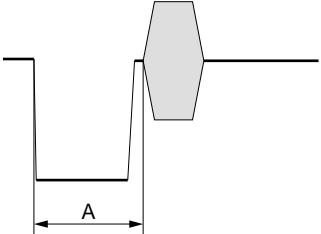
4-4-24. INT Black Burst OUT SCH Phase Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.		
STEP-2 <ul style="list-style-type: none">• Vectorscope75 %L.DISP: SCHINPUT: CH-AFILTER: FLATGAIN: VARREF: INT	<p>B.B OUT</p> <p><NG></p>  <p><OK></p>  <p>$A = 0 \pm 0.5^\circ$</p>	<p>INT B.B OUT SCH phase adjustment OPM-39P or OPM-45P ● RV105 (B-4)</p>

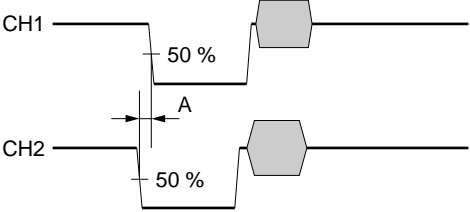
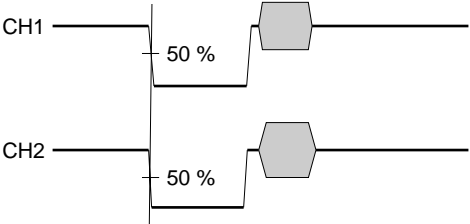
4-4-25. Preread ON PGM OUT SCH Phase Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.• Test signal: SDI 75 % color bars		
STEP-2 <ul style="list-style-type: none">• Vectorscope 75 % L.DISP: SCH INPUT: CH-A FILTER: FLAT GAIN: VAR REF: INT	<p>PGM OUT (COMPOSITE)</p> <p><NG></p>  <p><OK></p>  <p>$A = 0 \pm 0.5^\circ$</p>	<p>PREREAD ON PGM OUT SCH phase adjustment</p> <p>OPM-39P or OPM-45P</p> <p>●RV106 (B-3)</p>

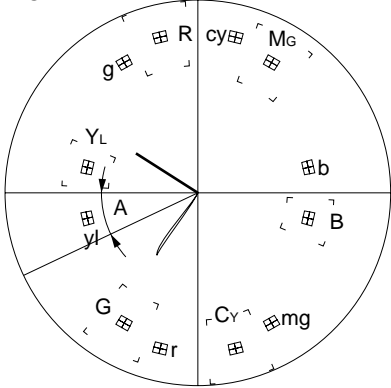
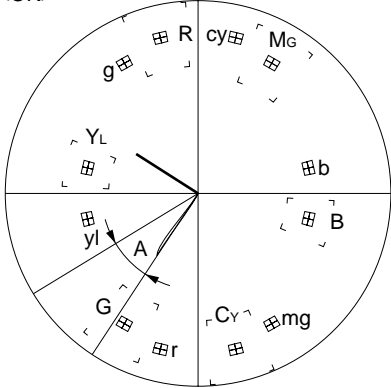
4-4-26. Preread ON PGM OUT Burst Start Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.• Test signal: SDI 75 % color bars		
STEP-2 <ul style="list-style-type: none">• (1) or (2) is used.(1) Waveform Monitor<ul style="list-style-type: none">INPUT: CH-AMODE: WAVEFORMREF: INT(2) Oscilloscope<ul style="list-style-type: none">CH1: 100 mV/DIV2 μs/DIVTRIG: B.B (CH4)	<p>COMPOSITE OUT</p>  <ul style="list-style-type: none">• Adjust ⌚RV107 so that burst start A of a Pre Read ON PGM OUT signal is the same as burst start B of a Preread OFF PGM OUT (Normal PGM OUT) signal.	<p>PREREAD ON PGM OUT burst start (PGM) adjustment</p> <p>OPM-39P or OPM-45P</p> <p>⌚RV107 (C-1)</p>

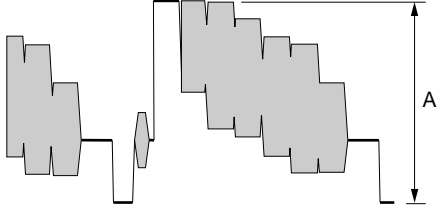
4-4-27. GEN Lock H Phase Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Connect the REF. VIDEO connector to CH1 of the oscilloscope.• Connect the PGM COMPOSITE connector to CH2 of the oscilloscope and select the BLACK input button.		
STEP-2 <ul style="list-style-type: none">• Oscilloscope<ul style="list-style-type: none">CH1: 200 mV/DIV2 μs/DIVCH2: 200 mV/DIV2 μs/DIVTRIG: B.B (CH4)	<p>CH1: REF. VIDEO CH2: PGM COMPOSITE (BLACK)</p> <p><NG></p>  <p><OK></p>  <p>$A = 0 \pm 50 \text{ ns}$</p> <ul style="list-style-type: none">• Check that D101/OPM-39P or OPM-45P (A-6) lights up.• Adjust ⦿RV104 (A-5) and S101 (A-5) so that the specification above is satisfied.	<p>H phase fine adjustment OPM-39P or OPM-45P ⦿RV104 (A-5) (Front)</p> <p>H phase coarse OPM-39P or OPM-45P S101 (A-5) (Front)</p>

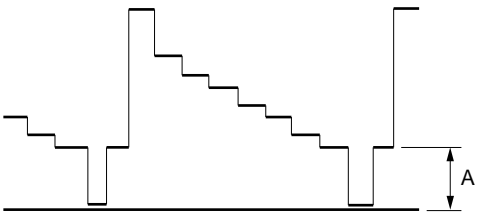
4-4-28. GEN Lock SC Phase Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Connect the PGM COMPOSITE connector to CH-A on the waveform monitor/vectorscope and select the BLACK input button.• Connect the REF. VIDEO connector to CH-B on the waveform monitor/vectorscope.		
STEP-2 <ul style="list-style-type: none">• Vectorscope75 %L.DISP: VECTINPUT: CH-AFILTER: FLATGAIN: VARREF: EXT	<p>CH-A: PGM COMPOSITE</p> <p><NG></p>  <p><OK></p>  <p>$A = 0 \pm 0.5^\circ$</p> <ul style="list-style-type: none">• Adjust the burst phase of a REF. VIDEO vectorscope waveform to 0° (counterclockwise) in CH-B.• Switch to the PGM COMPOSITE vectorscope waveform in CH-A and adjust S102 and \odotRV103 so that the burst phase is 0°.	<p>SC phase fine adjustment OPM-39P or OPM-45P \odotRV103 (A-4) (Front)</p> <p>SC phase coarse OPM-39P or OPM-45P S102 (B-4) (Front)</p>

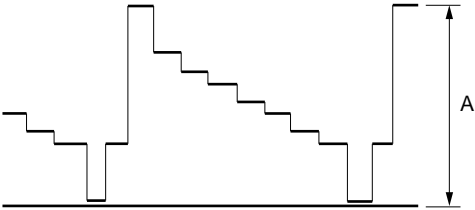
4-4-29. PVW OUT Video Gain Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Test signal: SDI 75 % color bars		
STEP-2 • (1) or (2) is used. (1) Waveform Monitor INPUT: CH-A MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 100mV/DIV 2 μ s/DIV TRIG: B.B (CH4)	PVW OUT  $A = 1000 \pm 10 \text{ mV p-p}$	PVW OUT gain adjustment OPM-39P or OPM-45P ● RV801 (K-4)

4-4-30. DSK EXT Key Clamp Level Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732. • DSK KEY IN signal setting: 75 % color bars = 700 mV p-p (Y only) • Switch settings: S201/OPM-39P or OPM-45P (E-2): SELF		
STEP-2 • Oscilloscope CH1: 500 mV/DIV TIME: 10 μ s/DIV	 $A = 730 \pm 10 \text{ mV dc}$	DSK EXT key clamp level adjustment OPM-39P or OPM-45P ● RV202 (E-2): TP201 (E-2)

4-4-31. DSK EXT Key Gain Adjustment

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the OPM-39P/OPM-45P board with an extension board EX-732.• DSK KEY IN signal setting: 75 % color bars = 700 mV p-p (Y only)• Switch settings: S201/OPM-39P or OPM-45P (E-2): SELF		
STEP-2 <ul style="list-style-type: none">• Oscilloscope CH1: 500 mV/DIV TIME: 10 μs/DIV	 <p>A = 2450 ± 10 mV dc</p>	DSK EXT key gain adjustment OPM-39P or OPM-45P ● RV201 (E-2): TP201 (E-2)

4-5. IPM-96/96P Board Adjustment

4-5-1. SDI VCO Free-running Frequency Adjustment

For NTSC/PAL

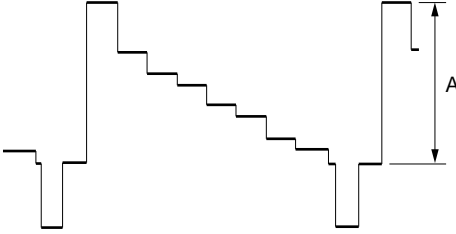
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96/96P board with an extension board EX-732. • Switch setting: S901/IPM-96/96P (G-9): ON S904/IPM-96/96P (J-9): ON S1001/IPM-96/96P (K-9): ON S1002/IPM-96/96P (L-9): ON		
STEP-2 • Frequency counter	• Specification: 27.00 ±0.27 MHz	Free-running frequency adjustment (NTSC) ● RV901/IPM-96 (G-9): TP901/IPM-96 (F-8) ● RV902/IPM-96 (J-9): TP902/IPM-96 (G-8) ● RV1001/IPM-96 (K-9): TP1001/IPM-96 (J-8) ● RV1002/IPM-96 (L-9): TP1002/IPM-96 (K-8)
STEP-3 • After completing the adjustment, set the switches S901 (G-9), S904(J-9), S1001 (K-9), and S1002 (L-9) on the IPM-96/96P board to OFF.		(PAL) ● RV901/IPM-96P(G-9): TP901/IPM-96P (F-8) ● RV902/IPM-96P (J-9): TP902/IPM-96P (G-8) ● RV1001/IPM-96P (K-9): TP1001/IPM-96P (J-8) ● RV1002/IPM-96P (L-9): TP1002/IPM-96P (K-8)

4-5-2. Component Y Level Adjustment

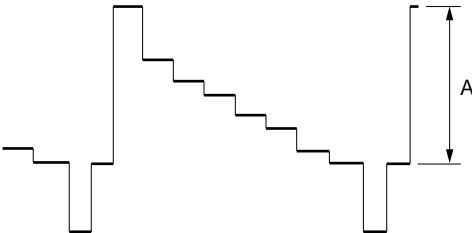
Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96 board with an extension board EX-732. • Test signal: 75 %, color bars • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.) 		
STEP-2 <ul style="list-style-type: none"> • Waveform monitor INPUT: CH-B1 MODE: WAVEFORM REF: EXT 	PGM OUT (COMPONENT Y)  $A = 714 \pm 5 \text{ mV p-p}$	Component Y level adjustment ● RV105/IPM-96 (C-8): INPUT 5/1 ● RV305/IPM-96 (C-6): INPUT 6/2 ● RV505/IPM-96 (C-4): INPUT 7/3 ● RV705/IPM-96 (C-1): INPUT 8/4

For PAL

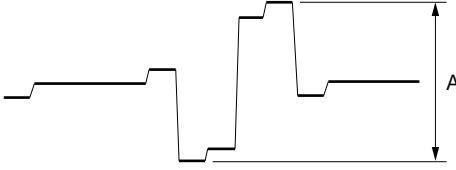
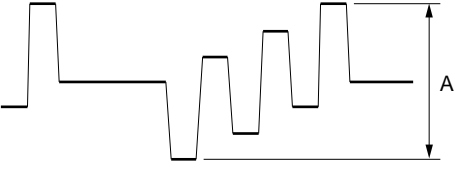
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96P board with an extension board EX-732. • Test signal: 75 %, color bars • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.) 		
STEP-2 <ul style="list-style-type: none"> • Waveform monitor INPUT: CH-B1 MODE: WAVEFORM REF: EXT 	PGM OUT (COMPONENT Y)  $A = 700 \pm 5 \text{ mV p-p}$	Component Y level adjustment ● RV105/IPM-96P (C-8): INPUT 5/1 ● RV305/IPM-96P (C-6): INPUT 6/2 ● RV505/IPM-96P (C-4): INPUT 7/3 ● RV705/IPM-96P (C-1): INPUT 8/4

4-5-3. Component Chroma Level Adjustment

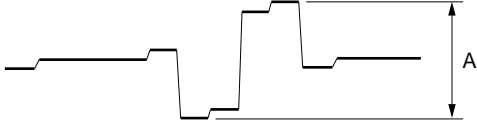
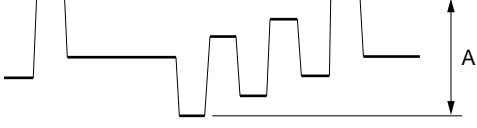
Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96 board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.) 		
STEP-2 <ul style="list-style-type: none"> • Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT 	PGM OUT (COMPONENT R-Y)  $A = 700 \pm 5 \text{ mV p-p}$	Component Chroma R-Y level adjustment ● RV103/IPM-96 (B-9): INPUT 5/1 ● RV303/IPM-96 (B-7): IINPUT 6/2 ● RV503/IPM-96 (B-4): INPUT 7/3 ● RV703/IPM-96 (B-2): INPUT 8/4
STEP-3 <ul style="list-style-type: none"> • Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT 	PGM OUT (COMPONENT B-Y)  $A = 700 \pm 5 \text{ mV p-p}$	Component Chroma B-Y level adjustment ● RV104/IPM-96 (B-9): INPUT 5/1 ● RV304/IPM-96 (B-7): IINPUT 6/2 ● RV504/IPM-96 (B-4): INPUT 7/3 ● RV704/IPM-96 (B-2): INPUT 8/4

For PAL

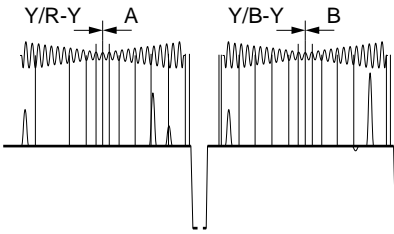
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96P board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.)		
STEP-2 • Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT R-Y)  $A = 525 \pm 5 \text{ mV p-p}$	Component chroma level adjustment ● RV103/IPM-96P (B-9): INPUT 5/1 ● RV303/IPM-96P (B-7): INPUT 6/2 ● RV503/IPM-96P (B-4): INPUT 7/3 ● RV703/IPM-96P (B-2): INPUT 8/4
STEP-2 • Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT B-Y)  $A = 525 \pm 5 \text{ mV p-p}$	Component chroma B-Y level adjustment ● RV104/IPM-96P (B-9): INPUT 5/1 ● RV304/IPM-96P (B-7): INPUT 6/2 ● RV504/IPM-96P (B-4): INPUT 7/3 ● RV704/IPM-96P (B-2): INPUT 8/4

4-5-4. Input Y/C Delay Adjustment

Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC/PAL

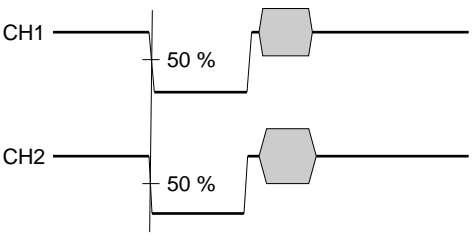
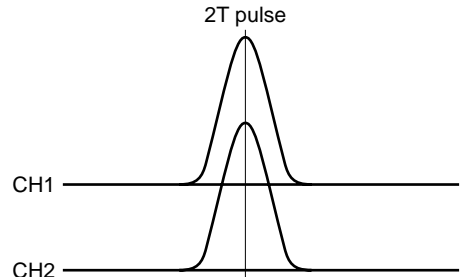
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96/96P board with an extension board EX-732. • Test signal: BOWTIE • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.) 		
STEP-2 <ul style="list-style-type: none"> • Waveform monitor MEASURE: BOWTIE INPUT: CH-B1 (CH-Component Y) CH-B2 (CH-Component R-Y) CH-B3 (CH-Component B-Y) MODE: WAVEFORM REF: EXT	CH-B1: PGM OUT (COMPONENT Y) CH-B2: PGM OUT (COMPONENT R-Y) CH-B3: PGM OUT (COMPONENT B-Y) <div style="text-align: center;">  <p>A = 0 ± 20 ns B = 0 ± 20 ns</p> </div> <ul style="list-style-type: none"> • Set the each BOWTIE DIP point A and B on the center marker. 	Y/R-Y delay adjustment (NTSC) ● RV101/IPM-96 (B-9): INPUT 5/1 ● RV301/IPM-96 (B-7): INPUT 6/2 ● RV501/IPM-96 (B-5): INPUT 7/3 ● RV701/IPM-96 (B-2): INPUT 8/4 (PAL) ● RV101/IPM-96P (B-9): INPUT 5/1 ● RV301/IPM-96P (B-7): INPUT 6/2 ● RV501/IPM-96P (B-5): INPUT 7/3 ● RV701/IPM-96P (B-2): INPUT 8/4 Y/B-Y delay adjustment (NTSC) ● RV102/IPM-96 (B-9): INPUT 5/1 ● RV302/IPM-96 (B-7): INPUT 6/2 ● RV502/IPM-96 (B-5): INPUT 7/3 ● RV702/IPM-96 (B-2): INPUT 8/4 (PAL) ● RV102/IPM-96P (B-9): INPUT 5/1 ● RV302/IPM-96P (B-7): INPUT 6/2 ● RV502/IPM-96P (B-5): INPUT 7/3 ● RV702/IPM-96P (B-2): INPUT 8/4

4-5-5. Video Input Phase Adjustment

Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC/PAL

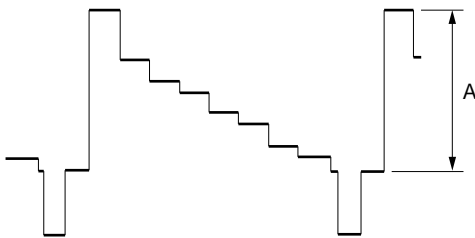
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96/96P board with an extension board EX-732. • Test signal: Pulse and bar (2T pulse) • Control panel setting: BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5/1, 6/2, 7/3, or 8/4.) 		
STEP-2 <ul style="list-style-type: none"> • Oscilloscope CH1: 200 mV/DIV 2 μs/DIV CH2: 200 mV/DIV 2 μs/DIV TRIG: B.B (CH4) 	CH1: COMPONENT Y IN 5/1, 6/2, 7/3, 8/4 CH2: PGM OUT (COMPONENT Y)  <ul style="list-style-type: none"> • Check that D101/OPM board (A-6) lights up. • Check that INPUT COMPONENT Y SYNC and RGM OUT (COMPONENT Y) SYNC have the same phase. 	(Check)
STEP-3 <ul style="list-style-type: none"> • Oscilloscope CH1: 200 mV/DIV 2 ns/DIV CH2: 200 mV/DIV 2 ns/DIV TRIG: B.B (CH4) 	CH1: COMPONENT Y IN 5/1, 6/2, 7/3, 8/4 CH2: PGM OUT (COMPONENT Y)  <ul style="list-style-type: none"> • Check that D101/OPM board (A-6) lights up. • Adjust so that INPUT COMPONENT Y 2T pulse and RGM OUT (COMPONENT Y) 2T pulse have the same phase. 	Input video phase adjustment (NTSC) <ul style="list-style-type: none"> ● RV201/IPM-96 (F-8): INPUT 5/1 ● RV401/IPM-96 (F-6): INPUT 6/2 ● RV601/IPM-96 (F-4): INPUT 7/3 ● RV801/IPM-96 (F-1): INPUT 8/4 (PAL) <ul style="list-style-type: none"> ● RV201/IPM-96P (F-8): INPUT 5/1 ● RV401/IPM-96P (F-6): INPUT 6/2 ● RV601/IPM-96P (F-4): INPUT 7/3 ● RV801/IPM-96P (F-1): INPUT 8/4

4-5-6. RGB Converted Y Level Adjustment

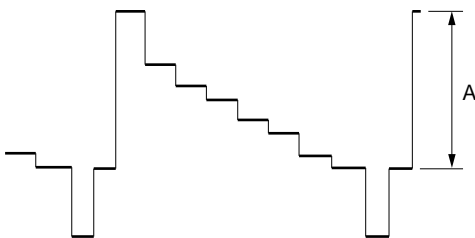
Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P) and “4-5-2. Component Y Level Adjustment”.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96 board with an extension board EX-732. • Test signal: 75 % color bars (GBR format) • Control panel setting: 1. BACKGROUND bus: Select input 8. (Used for input 8/4.) 2. Setup: Select input 8. (RGB) 		
STEP-2 <ul style="list-style-type: none"> • Waveform monitor INPUT: CH-B1 MODE: WAVEFORM REF: EXT 	PGM OUT (COMPONENT Y)  <p>$A = 714 \pm 5 \text{ mV p-p}$</p>	RGB converted level adjustment ● RV706/IPM-96 (A-3)

For PAL

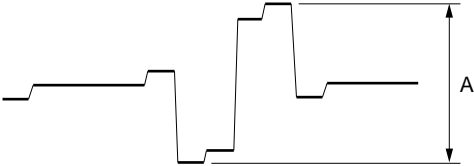
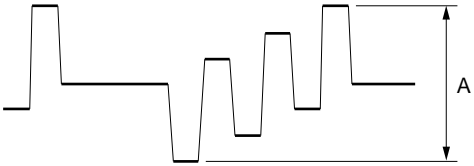
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the IPM-96P board with an extension board EX-732. • Test signal: 75 % color bars (GBR format) • Control panel setting: 1. BACKGROUND bus: Select input 8. (Used for input 8/4.) 2. Setup: Select input 8. (RGB) 		
STEP-2 <ul style="list-style-type: none"> • Waveform monitor INPUT: CH-B1 MODE: WAVEFORM REF: EXT 	PGM OUT (COMPONENT Y)  <p>$A = 700 \pm 5 \text{ mV p-p}$</p>	RGB converted level adjustment ● RV706/IPM-96P (A-3)

4-5-7. RGB Converted Chroma Level Adjustment

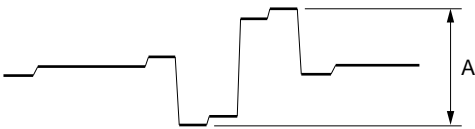
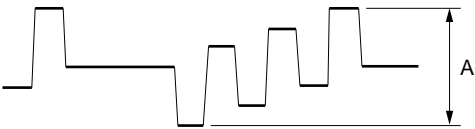
Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P) and “4-5-3. Component Chroma Level Adjustment”.

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2• Extension board: Extend the IPM-96 board with an extension board EX-732.• Test signal: 75 % color bars (GBR format)• Control panel setting: 1. BACKGROUND bus: Select input 8. (Used for input 8/4.) 2. Setup: Select input 8. (RGB)		
STEP-2 <ul style="list-style-type: none">• Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT R-Y)  $A = 700 \pm 5 \text{ mV p-p}$	RGB converted chroma R-Y level adjustment ● RV707/IPM-96 (A-3)
STEP-3 <ul style="list-style-type: none">• Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT	PGM OUT (COMPONENT B-Y)  $A = 700 \pm 5 \text{ mV p-p}$	RGB converted chroma level adjustment ● RV708/IPM-96 (B-3)

For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2 • Extension board: Extend the IPM-96P board with an extension board EX-732. • Test signal: 75 % color bars (GBR format) • Control panel setting: 1. BACKGROUND bus: Select input 8. (Used for input 8/4.) 2. Setup: Select input 8. (RGB) 		
STEP-2 <ul style="list-style-type: none"> • Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT 	PGM OUT (COMPONENT R-Y)  $A = 525 \pm 5 \text{ mV}$	RGB converted chroma R-Y level adjustment ● RV707/IPM-96P (A-3)
STEP-3 <ul style="list-style-type: none"> • Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT 	PGM OUT (COMPONENT B-Y)  $A = 525 \pm 5 \text{ mV}$	RGB converted chroma B-Y level adjustment ● RV708/IPM-96P (B-3)

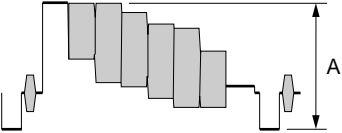
4-6. VIF-19/19P Board Adjustment

4-6-1. Composite Y Level Adjustment

Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the VIF-19 board with an extension board EX-732.• Test signal: 75 % color bars• Switch setting: S801-1/OPM-39 or OPM-45 (L-4): ON (UC)• Control panel setting:<ul style="list-style-type: none">1. Pattern number: 1 (Reverse: OFF)2. Fader lever: Move it fully to the top and bottom a few times and set it at the top.3. Setup: Select inputs 5 to 8 (CPS)4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 <ul style="list-style-type: none">• Oscilloscope<ul style="list-style-type: none">CH1: 500 mV/DIV10 μs/DIVTRIG: B.B (CH4)	<div>CH1: TP201/VIF-19 (H-8)</div> <div>CH1: TP501/VIF-19 (F-8)</div> <div>CH1: TP801/VIF-19 (D-8)</div> <div>CH1: TP1101/VIF-19 (B-8)</div> <div></div> <div>A=1.55 V p-p</div>	Component Y level adjustment <ul style="list-style-type: none">● RV102/VIF-19 (J-8):● RV402/VIF-19 (G-8):● RV702/VIF-19 (E-8):● RV1002/VIF-19 (B-8):

For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39P or OPM-45P (L-4): OFF • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V) 		
STEP-2 <ul style="list-style-type: none"> • Oscilloscope <ul style="list-style-type: none"> CH1: 500 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	CH1: TP201/VIF-19P (H-8) CH1: TP501/VIF-19P (F-8) CH1: TP801/VIF-19P (D-8) CH1: TP1101/VIF-19P (B-8) <div data-bbox="706 789 1166 932"> </div>	Component Y level adjustment <ul style="list-style-type: none"> ● RV102/VIF-19P (J-8): ● RV402/VIF-19P (G-8): ● RV702/VIF-19P (E-8): ● RV1002/VIF-19P (B-8):

4-6-2. S VIDEO Clamp DC Level Adjustment

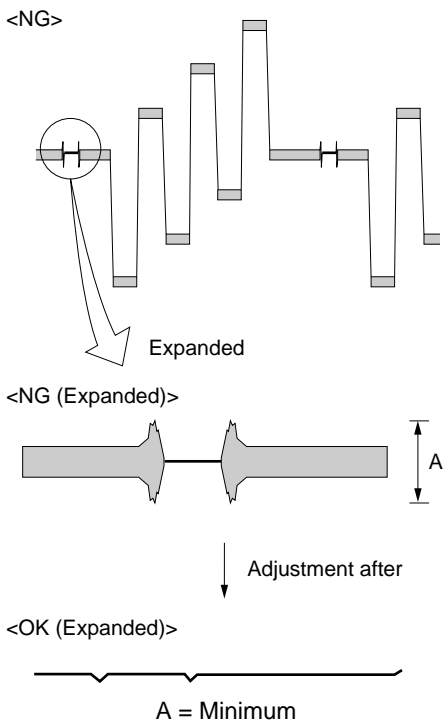
Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the VIF-19 board with an extension board EX-732.• Test signal: 75 % color bars• Switch setting: S801-1/OPM-39 or OPM-45 (L-4): ON (NTSC <UC>)• Control panel setting:<ul style="list-style-type: none">1. Pattern number: 1 (Reverse: OFF)2. Fader lever: Move it fully to the top and bottom a few times and set it at the top.3. Setup: Select inputs 5 to 8 (YC)4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO)		
STEP-2 <ul style="list-style-type: none">• Oscilloscope<ul style="list-style-type: none">CH1: 200 mV/DIV10 μs/DIVTRIG: B.B (CH4)• Oscilloscope (Expanded)<ul style="list-style-type: none">CH1: 50 mV/DIV2 μs/DIVTRIG: B.B (CH4)		Clamp DC adjustment <ul style="list-style-type: none">●RV104/VIF-19 (J-9): TP203/VIF-19 (H-4)●RV404/VIF-19 (G-9): TP503/VIF-19 (F-4)●RV704/VIF-19 (E-9): TP803/VIF-19 (D-4)●RV1004/VIF-19 (C-9): TP1103/VIF-19 (B-4)

For PAL

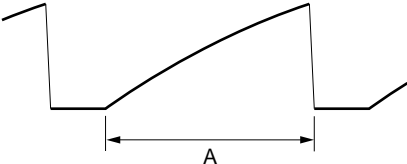
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39P or OPM-45P (L-4): OFF (PAL) • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom several times and set it at the top. 3. Setup: Select inputs 5 to 8 (YC) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO) 		
STEP-2 <ul style="list-style-type: none"> • Oscilloscope <ul style="list-style-type: none"> CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) <ul style="list-style-type: none"> CH1: 50 mV/DIV 2 μs/DIV TRIG: B.B (CH4) 		Clamp DC adjustment ●RV104/VIF-19P (J-9): TP203/VIF-19P (H-4) ●RV404/VIF-19P (G-9): TP503/VIF-19P (F-4) ●RV704/VIF-19P (E-9): TP803/VIF-19P (D-4) ●RV1004/VIF-19P (C-9): TP1103/VIF-19P (B-4)

4-6-3. SYNC Separate Adjustment

Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC/PAL

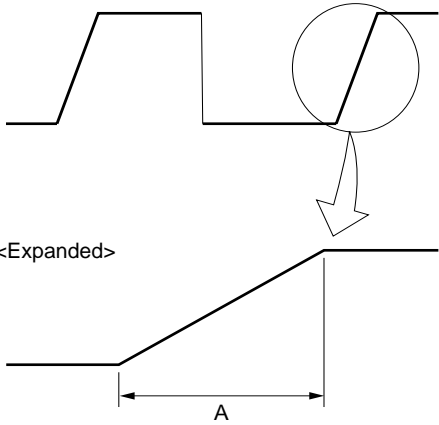
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the VIF-19/19P board with an extension board EX-732.• Test signal: 75 % color bars• Switch setting: S801-1/OPM-39 or OPM-45 (L-4): ON (NTSC <UC>) S801-1/OPM-39P or OPM-45P (L-4): OFF (PAL)• Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 <ul style="list-style-type: none">• Oscilloscope CH1: 1 V/DIV 10 μs/DIV TRIG: B.B (CH4)	CH1: TP301/VIF-19,19P (G-8) CH1: TP601/VIF-19,19P (E-8) CH1: TP901/VIF-19,19P (C-8) CH1: TP1201/VIF-19,19P (A-8)  A = 50 μ s	SYNC separate adjustment (NTSC) <ul style="list-style-type: none">●RV301/VIF-19 (G-7)●RV601/VIF-19 (E-7)●RV901/VIF-19 (C-7)●RV1201/VIF-19 (A-7) (PAL) <ul style="list-style-type: none">●RV301/VIF-19P (G-7)●RV601/VIF-19P (E-7)●RV901/VIF-19P (C-7)●RV1201/VIF-19P (A-7)

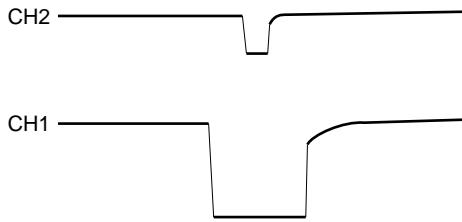
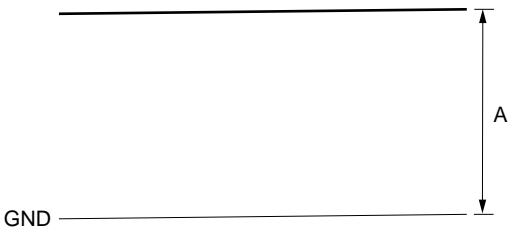
4-6-4. H Lock Loop Adjustment

Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC/PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19/19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 or OPM-45 (L-4): ON (NTSC <UC>) S801-1/OPM-39P or OPM-45P (L-4): OFF (PAL) • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V) 		
STEP-2 <ul style="list-style-type: none"> • Oscilloscope <ul style="list-style-type: none"> CH1: 2 V/DIV 2 μs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) <ul style="list-style-type: none"> CH1: 2 V/DIV 2 μs/DIV TRIG: B.B (CH4) <p>(Continued to STEP-3 on the next page.)</p>	TP302/VIF-19, 19P (H-6) TP602/VIF-19, 19P (F-6) TP902/VIF-19, 19P (D-6) TP1202/VIF-19, 19P (B-6)  <p style="text-align: center;">$A = 9.4 \mu\text{s}$</p>	Sawtooth slope adjustment (NTSC) ●RV302/VIF-19 (H-5) ●RV602/VIF-19 (F-5) ●RV902/VIF-19 (D-5) ●RV1202/VIF-19 (B-5) (PAL) ●RV302/VIF-19P (H-5) ●RV602/VIF-19P (F-5) ●RV902/VIF-19P (D-5) ●RV1202/VIF-19P (B-5)

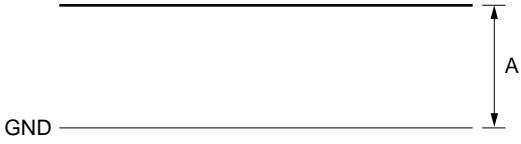
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-3 • Oscilloscope CH1: 5 V/DIV 500 ns/DIV CH2: 2 V/DIV 500 ns/DIV TRIG: B.B (CH4)	CH1: TP306/VIF-19,19P (H-7) TP606/VIF-19,19P (F-7) TP906/VIF-19,19P (D-7) TP1206/VIF-19,19P (B-7) CH2: TP303/VIF-19,19P (G-6) TP603/VIF-19,19P (E-6) TP903/VIF-19,19P (C-6) TP1203/VIF-19,19P (A-6)  • Adjust so that the waveform in CH2 is almost in the center of CH1.	Sample pulse phase adjustment (NTSC) ⚙RV303/VIF-19 (H-5) ⚙RV603/VIF-19 (F-5) ⚙RV903/VIF-19 (D-5) ⚙RV1203/VIF-19 (A-5) (PAL) ⚙RV303/VIF-19P (H-5) ⚙RV603/VIF-19P (F-5) ⚙RV903/VIF-19P (D-5) ⚙RV1203/VIF-19P (A-5)
STEP-4 • Digital voltmeter	TP305/VIF-19/19P (G-6) TP605/VIF-19/19P (E-6) TP905/VIF-19/19P (C-6) TP1205/VIF-19/19P (A-6)  GND $A = 2.5 \text{ V dc}$	VFO BIAS adjustment (NTSC) ⚙LV301/VIF-19 (H-4) ⚙LV601/VIF-19 (F-4) ⚙LV901/VIF-19 (D-4) ⚙LV1201/VIF-19 (A-4) (PAL) ⚙LV301/VIF-19P (H-4) ⚙LV601/VIF-19P (F-4) ⚙LV901/VIF-19P (D-4) ⚙LV1201/VIF-19P (A-4)

4-6-5. Burst Delay Adjustment

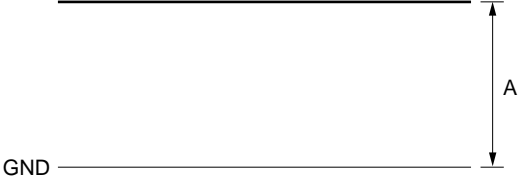
Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 or OPM-45 (L-4): ON (UC) • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V) 		
STEP-2 <ul style="list-style-type: none"> • Digital voltmeter 	TP103/VIF-19 (H-9) TP403/VIF-19 (F-9) TP703/VIF-19 (C-9) TP1003/VIF-19 (A-9)  GND $A = 1.5 \text{ V dc}$	Burst delay adjustment ⚙RV101/VIF-19 (H-9) ⚙RV401/VIF-19 (F-9) ⚙RV701/VIF-19 (D-9) ⚙RV1001/VIF-19 (B-9)

For PAL

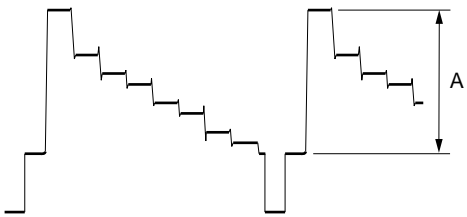
Machine Conditions for Adjustment	Specifications	Adjustment Point
<div>STEP-1<ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the VIF-19P board with an extension board EX-732.• Test signal: 75 % color bars• Switch setting: S801-1/OPM-39P or OPM-45P (L-4): OFF• Control panel setting:<ul style="list-style-type: none">1. Pattern number: 1 (Reverse: OFF)2. Fader lever: Move it fully to the top and bottom a few times and set it at the top.3. Setup: Select inputs 5 to 8 (CPS)4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)</div>		
<div>STEP-2<ul style="list-style-type: none">• Digital voltmeter</div>	<div><div>TP103/VIF-19P (H-9) TP403/VIF-19P (F-9) TP703/VIF-19P (C-9) TP1003/VIF-19P (A-9)</div><div><p>GND</p><p>A = 2.0 V dc</p></div></div>	<div>Burst delay adjustment<ul style="list-style-type: none">●RV101/VIF-19P (H-9)●RV401/VIF-19P (F-9)●RV701/VIF-19P (D-9)●RV1001/VIF-19P (B-9)</div>

4-6-6. Composite Input Y Gain Adjustment

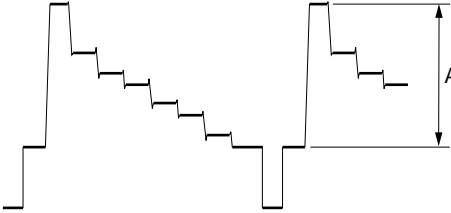
Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19/19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 or OPM-45 (L-4): ON (UC) • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V) 		
STEP-2 <ul style="list-style-type: none"> • Oscilloscope <ul style="list-style-type: none"> CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	PGM OUT (COMPONENT Y)  $A = 714 \pm 7 \text{ mV}$	Y gain adjustment <ul style="list-style-type: none"> ●RV201/VIF-19 (H-4) ●RV501/VIF-19 (F-4) ●RV801/VIF-19 (D-4) ●RV1101/VIF-19 (B-4)

For PAL

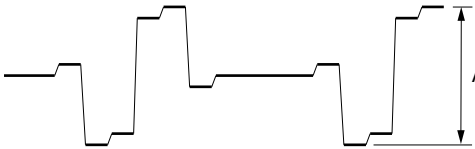
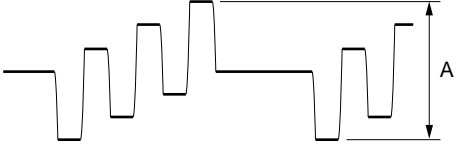
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the VIF-19P board with an extension board EX-732.• Test signal: 75 % color bars• Switch setting: S801-1/OPM-39P or OPM-45P (L-4): OFF• Control panel setting:<ol style="list-style-type: none">1. Pattern number: 1 (Reverse: OFF)2. Fader lever: Move it fully to the top and bottom a few times and set it at the top.3. Setup: Select inputs 5 to 8 (CPS)4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 <ul style="list-style-type: none">• Oscilloscope<ul style="list-style-type: none">CH1: 200 mV/DIV10 μs/DIVTRIG: B.B (CH4)	<p>PGM OUT (COMPONENT Y)</p>  <p>A = 700 ± 7 mV</p>	<p>Y gain adjustment</p> <ul style="list-style-type: none">●RV201/VIF-19P (H-4)●RV501/VIF-19P (F-4)●RV801/VIF-19P (D-4)●RV1101/VIF-19P (B-4)

4-6-7. Composite Input Chroma Level Adjustment

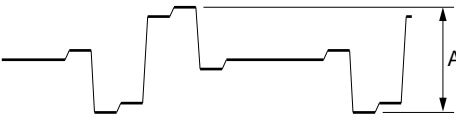
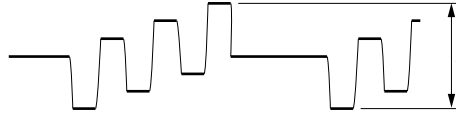
Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 or OPM-45 (L-4): ON (UC) • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V) 		
STEP-2 <ul style="list-style-type: none"> • Oscilloscope <ul style="list-style-type: none"> CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	PGM OUT (COMPONENT R-Y)  <p style="text-align: center;">$A = 700 \pm 7 \text{ mV}$</p>	R-Y level adjustment <ul style="list-style-type: none"> ●RV207/VIF-19 (J-4) ●RV507/VIF-19 (G-4) ●RV807/VIF-19 (E-4) ●RV1107/VIF-19 (C-4)
STEP-3 <ul style="list-style-type: none"> • Oscilloscope <ul style="list-style-type: none"> CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	PGM OUT (COMPONENT B-Y)  <p style="text-align: center;">$A = 700 \pm 7 \text{ mV}$</p>	B-Y level adjustment <ul style="list-style-type: none"> ●RV206/VIF-19 (H-4) ●RV506/VIF-19 (F-4) ●RV806/VIF-19 (D-4) ●RV1106/VIF-19 (B-4)

For PAL

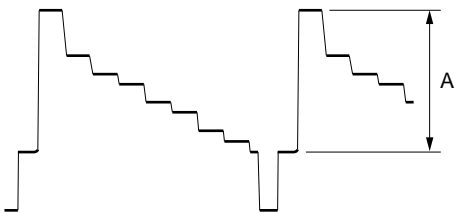
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars S801-1/OPM-39P or OPM-45P (L-4): OFF • Control panel setting: 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V)		
STEP-2 • Oscilloscope CH1: 200 mV/DIV 10 μ s/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT R-Y)  $A = 525 \pm 5 \text{ mV}$	R-Y level adjustment ●RV207/VIF-19P (J-4) ●RV507/VIF-19P (G-4) ●RV807/VIF-19P (E-4) ●RV1107/VIF-19P (C-4)
STEP-3 • Oscilloscope CH1: 200 mV/DIV 10 μ s/DIV TRIG: B.B (CH4)	PGM OUT (COMPONENT B-Y)  $A = 525 \pm 5 \text{ mV}$	B-Y level adjustment ●RV206/VIF-19P (H-4) ●RV506/VIF-19P (F-4) ●RV806/VIF-19P (D-4) ●RV1106/VIF-19P (B-4)

4-6-8. S VIDEO Input Gain Adjustment

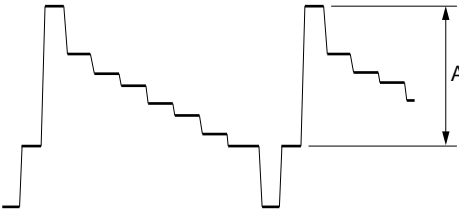
Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 or OPM-45 (L-4): ON (UC) • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (YC) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO) 		
STEP-2 <ul style="list-style-type: none"> • Oscilloscope <ul style="list-style-type: none"> CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	PGM OUT (COMPONENT Y)  $A = 714 \pm 7 \text{ mV}$	Y gain adjustment <ul style="list-style-type: none"> ●RV103/VIF-19 (J-9) ●RV403/VIF-19 (G-9) ●RV703/VIF-19 (E-9) ●RV1003/VIF-19 (C-9)

For PAL

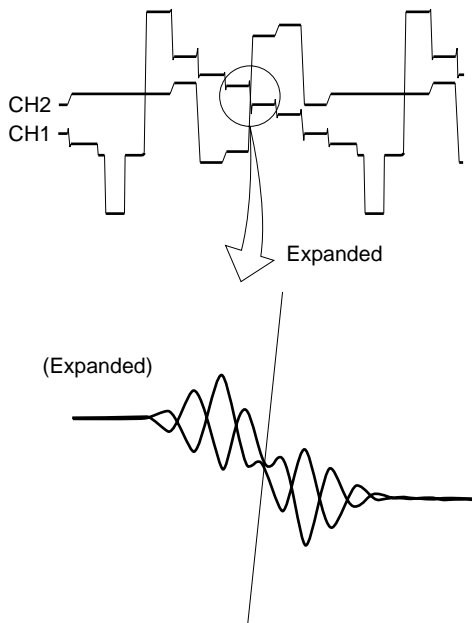
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none">• Connection: Refer to Section 4-2.• Extension board: Extend the VIF-19P board with an extension board EX-732.• Test signal: 75 % color bars S801-1/OPM-39P or OPM-45P (L-4): OFF• Control panel setting:<ol style="list-style-type: none">1. Pattern number: 1 (Reverse: OFF)2. Fader lever: Move it fully to the top and bottom a few times and set it at the top.3. Setup: Select inputs 5 to 8 (YC)4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO)		
STEP-2 <ul style="list-style-type: none">• Oscilloscope<ul style="list-style-type: none">CH1: 200 mV/DIV10 μs/DIVTRIG: B.B (CH4)	<p>PGM OUT (COMPONENT Y)</p>  <p>A = 700 ± 7 mV</p>	<p>Y gain adjustment</p> <ul style="list-style-type: none">●RV103/VIF-19P (J-9)●RV403/VIF-19P (G-9)●RV703/VIF-19P (E-9)●RV1003/VIF-19P (C-9)

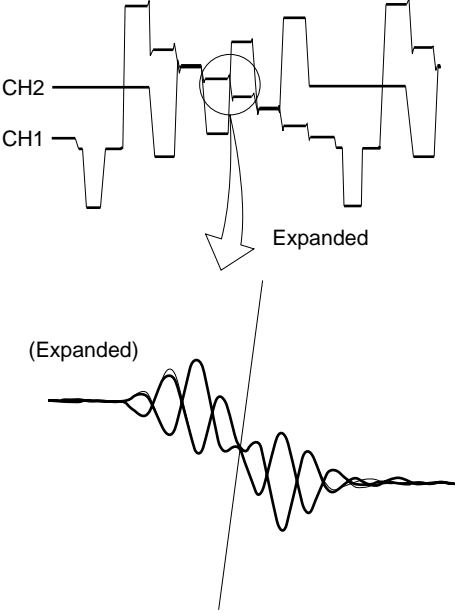
4-6-9. Composite Input Y/C Delay Adjustment

Note

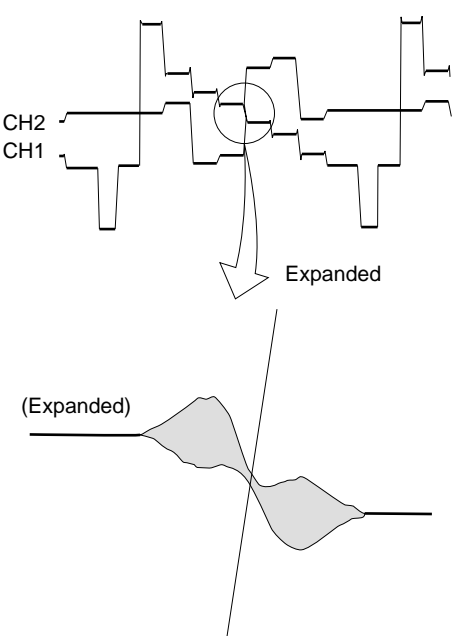
Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

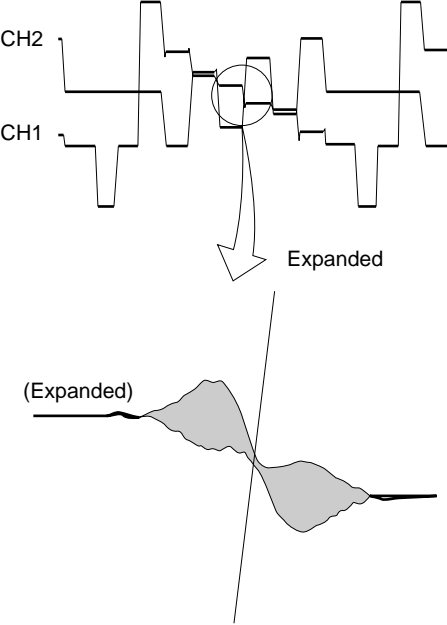
For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 or OPM-45 (L-4): ON (UC) • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 Y/V) 		
STEP-2 <ul style="list-style-type: none"> • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope <ul style="list-style-type: none"> CH1: 200 mV/DIV 10 μs/DIV CH2: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) <ul style="list-style-type: none"> CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4) <p>(Continued to STEP-3 on the next page.)</p>	CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT R-Y)  <p>(Expanded)</p> <ul style="list-style-type: none"> • Adjust so that the phases of the Y and R-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.) 	Y/R-Y DL adjustment ●RV205/VIF-19 (J-4) ●RV505/VIF-19 (G-4) ●RV805/VIF-19 (E-4) ●RV1105/VIF-19 (C-4)

Machine Conditions for Adjustment	Specifications	Adjustment Point
<p>STEP-3</p> <ul style="list-style-type: none">• Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis.• Oscilloscope <p>CH1: 200 mV/DIV 10 μs/DIV</p> <p>CH2: 200 mV/DIV 10 μs/DIV</p> <p>TRIG: B.B (CH4)</p> <ul style="list-style-type: none">• Oscilloscope (Expanded) <p>CH1: 50 mV/DIV 200 ns/DIV</p> <p>CH2: 20 mV/DIV 200 ns/DIV</p> <p>TRIG: B.B (CH4)</p>	<p>CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT B-Y)</p>  <p>Expanded</p> <p>(Expanded)</p> <ul style="list-style-type: none">• Adjust so that the phases of the Y and B-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	<p>Y/B-Y DL adjustment</p> <ul style="list-style-type: none">●RV203/VIF-19 (J-4)●RV503/VIF-19 (G-4)●RV803/VIF-19 (D-4)●RV1103/VIF-19 (B-4)

For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39P or OPM-45P (L-4): OFF • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO) 		
STEP-2 <ul style="list-style-type: none"> • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope <ul style="list-style-type: none"> CH1: 200 mV/DIV 10 μs/DIV CH2: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) <ul style="list-style-type: none"> CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4) <p>(Continued to STEP-3 on the next page.)</p>	<p>CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT R-Y)</p>  <p>• Adjust so that the phases of the Y and R-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)</p>	<p>Y/R-Y DL adjustment</p> <ul style="list-style-type: none"> ●RV205/VIF-19P (J-4) ●RV505/VIF-19P (G-4) ●RV805/VIF-19P (E-4) ●RV1105/VIF-19P (C-4)

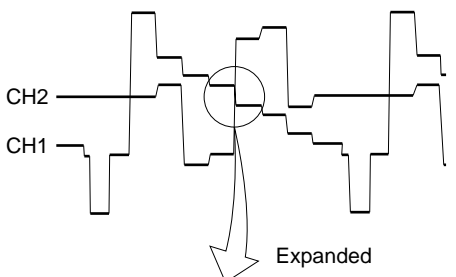
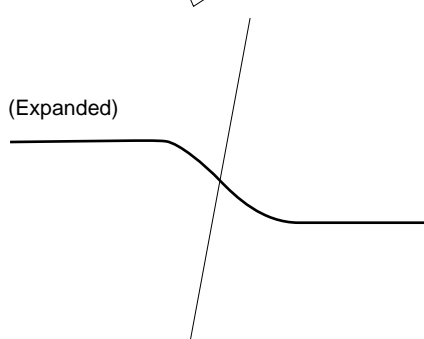
Machine Conditions for Adjustment	Specifications	Adjustment Point
<p>STEP-3</p> <ul style="list-style-type: none">Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis.Oscilloscope<ul style="list-style-type: none">CH1: 200 mV/DIV 10 μs/DIVCH2: 200 mV/DIV 10 μs/DIVTRIG: B.B (CH4) <p>Oscilloscope (Expanded)</p> <ul style="list-style-type: none">CH1: 50 mV/DIV 200 ns/DIVCH2: 20 mV/DIV 200 ns/DIVTRIG: B.B (CH4)	<p>CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT B-Y)</p>  <p>Expanded</p> <p>(Expanded)</p> <ul style="list-style-type: none">Adjust so that the phases of the Y and B-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	<p>Y/B-Y DL adjustment</p> <ul style="list-style-type: none">RV203/VIF-19P (J-4)RV503/VIF-19P (G-4)RV803/VIF-19P (D-4)RV1103/VIF-19P (B-4)

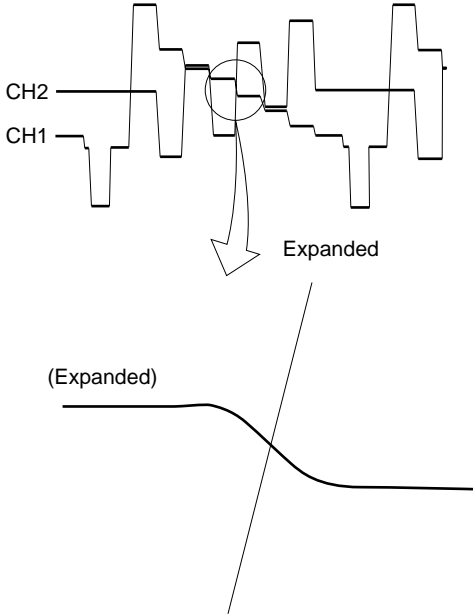
4-6-10. S VIDEO Input Y/C Delay Adjustment

Note

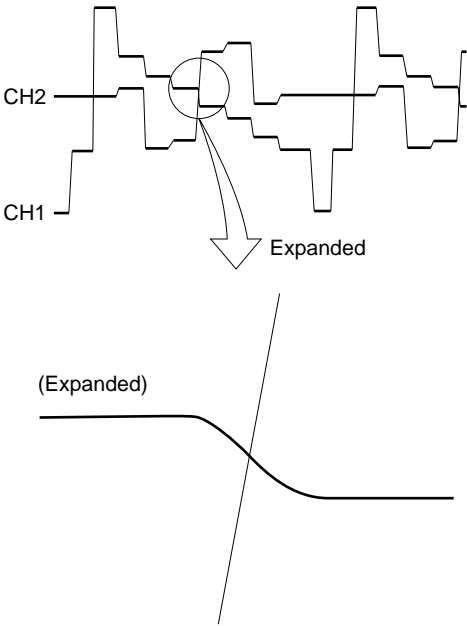
Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

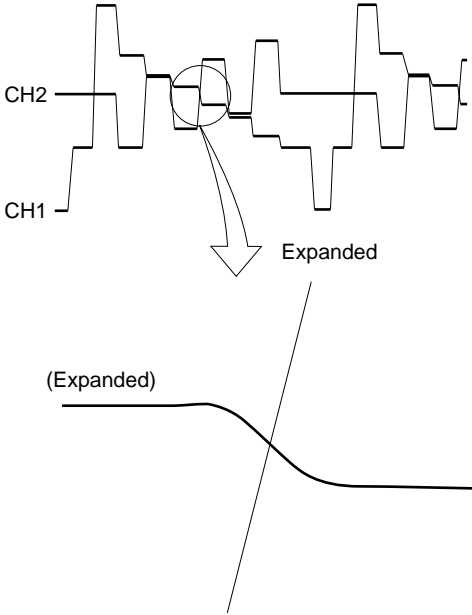
For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19 board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39 or OPM-45 (L-4): ON (UC) • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (YC) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO) 		
STEP-2 <ul style="list-style-type: none"> • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope <ul style="list-style-type: none"> CH1: 200 mV/DIV 10 μs/DIV CH2: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) <ul style="list-style-type: none"> CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4) <p>(Continued to STEP-3 on the next page.)</p>	CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT R-Y)  <p>Expanded</p>  <p>(Expanded)</p> <ul style="list-style-type: none"> • Adjust so that the phases of the Y and R-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.) 	Y/R-Y DL adjustment <ul style="list-style-type: none"> ●RV204/VIF-19 (J-4) ●RV504/VIF-19 (G-4) ●RV804/VIF-19 (E-4) ●RV1104/VIF-19 (C-4)

Machine Conditions for Adjustment	Specifications	Adjustment Point
<p>STEP-3</p> <ul style="list-style-type: none">Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis.Oscilloscope<ul style="list-style-type: none">CH1: 200 mV/DIV 10 μs/DIVCH2: 200 mV/DIV 10 μs/DIVTRIG: B.B (CH4)Oscilloscope (Expanded)<ul style="list-style-type: none">CH1: 50 mV/DIV 200 ns/DIVCH2: 20 mV/DIV 200 ns/DIVTRIG: B.B (CH4)	<p>CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT B-Y)</p>  <p>Expanded</p> <p>(Expanded)</p> <ul style="list-style-type: none">Adjust so that the phases of the Y and B-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	<p>Y/B-Y DL adjustment</p> <ul style="list-style-type: none">RV202/VIF-19 (J-4)RV502/VIF-19 (G-4)RV802/VIF-19 (D-4)RV1102/VIF-19 (B-4)

For PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19P board with an extension board EX-732. • Test signal: 75 % color bars • Switch setting: S801-1/OPM-39P or OPM-45P (L-4): OFF • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (YC) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO) 		
STEP-2 <ul style="list-style-type: none"> • Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis. • Oscilloscope <ul style="list-style-type: none"> CH1: 200 mV/DIV 10 μs/DIV CH2: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) • Oscilloscope (Expanded) <ul style="list-style-type: none"> CH1: 50 mV/DIV 200 ns/DIV CH2: 20 mV/DIV 200 ns/DIV TRIG: B.B (CH4) <p>(Continued to STEP-3 on the next page.)</p>	<p>CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT R-Y)</p>  <p>• Adjust so that the phases of the Y and R-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)</p>	<p>Y/R-Y DL adjustment</p> <ul style="list-style-type: none"> ●RV204/VIF-19P (J-4) ●RV504/VIF-19P (G-4) ●RV804/VIF-19P (E-4) ●RV1104/VIF-19P (C-4)

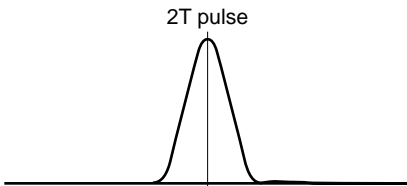
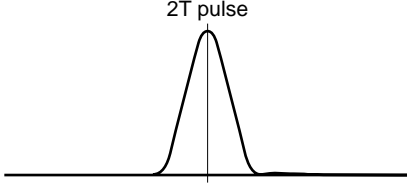
Machine Conditions for Adjustment	Specifications	Adjustment Point
<p>STEP-3</p> <ul style="list-style-type: none">Observe the forth gradation of the component color bars (line between green and magenta) by enlarging the time axis.Oscilloscope<ul style="list-style-type: none">CH1: 200 mV/DIV 10 μs/DIVCH2: 200 mV/DIV 10 μs/DIVTRIG: B.B (CH4)Oscilloscope (Expanded)<ul style="list-style-type: none">CH1: 50 mV/DIV 200 ns/DIVCH2: 20 mV/DIV 200 ns/DIVTRIG: B.B (CH4)	<p>CH1: PGM OUT (COMPONENT Y) CH2: PGM OUT (COMPONENT B-Y)</p>  <ul style="list-style-type: none">Adjust so that the phases of the Y and B-Y signals have the same phase. (Adjust so that the line between green and magenta become equal.)	<p>Y/B-Y DL adjustment</p> <ul style="list-style-type: none">RV202/VIF-19P (J-4)RV502/VIF-19P (G-4)RV802/VIF-19P (D-4)RV1102/VIF-19P (B-4)

4-6-11. Video Input Phase Adjustment

Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC/PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-19/19P board with an extension board EX-732. • Test signal: Pulse, bars • Switch setting: S801-1/OPM-39 or OPM-45 (L-4): ON (NTSC <UC>) S801-1/OPM-39P or OPM-45P (L-4): OFF (PAL) • Control panel setting: <ol style="list-style-type: none"> 1. Pattern number: 1 (Reverse: OFF) 2. Fader lever: Move it fully to the top and bottom a few times and set it at the top. 3. Setup: Select inputs 5 to 8 (CPS) 4. BACKGROUND bus: Select 5 to 8 (Input 5, 6, 7, 8 S VIDEO) 		
STEP-2 <ul style="list-style-type: none"> • Oscilloscope <ul style="list-style-type: none"> CH1: 200 mV/DIV 200 ns/DIV TRIG: CH1 	CH1: COMPOSITE IN 5, 6, 7, 8  CH1: PGM OUT (COMPONENT Y)  <ul style="list-style-type: none"> • Adjust so that INPUT COMPOSITE 2T pulse and PGM OUT (component Y) 2T pulse have the same phase. 	Input Video Phase adjustment (NTSC) ●RV303/VIF-19 (H-5) ●RV603/VIF-19 (F-5) ●RV903/VIF-19 (D-5) ●RV1203/VIF-19 (A-5) (PAL) ●RV303/VIF-19P (H-5) ●RV603/VIF-19P (F-5) ●RV903/VIF-19P (D-5) ●RV1203/VIF-19P (A-5)

4-7. VIF-20/20P Board Adjustment

4-7-1. SDI VCO Free-running Frequency Adjustment

For NTSC/PAL

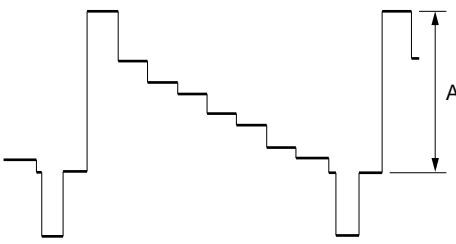
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20/20P board with an extension board EX-732. • Switch setting: S901/VIF-20, VIF-20P (G-9): ON S904/VIF-20, VIF-20P (J-9): ON S1001/VIF-20, VIF-20P (K-9): ON S1002/VIF-20, VIF-20P (L-9): ON		
STEP-2 • Frequency counter	• Specification: 27.00 ±0.27 MHz	Free-running frequency adjustment (NTSC) ● RV901/VIF-20 (G-9): TP901/VIF-20 (F-10) ● RV902/VIF-20 (J-9): TP902/VIF-20 (H-10) ● RV1001/VIF-20 (K-9): TP1001/VIF-20 (J-10) ● RV1002/VIF-20 (L-9): TP1002/VIF-20 (K-10)
STEP-3 • After completing the adjustment, set the switches S901 (G-9), S904 (J-9), S1001 (K-9) and S1002 (L-9) on the VIF-20/20P board to OFF.		(PAL) ● RV901/VIF-20P (G-9): TP901/VIF-20P (F-10) ● RV902/VIF-20P (J-9): TP902/VIF-20P (H-10) ● RV1001/VIF-20P (K-9): TP1001/VIF-20P (J-10) ● RV1002/VIF-20P (L-9): TP1002/VIF-20P (K-10)

4-7-2. Component Y Level Adjustment

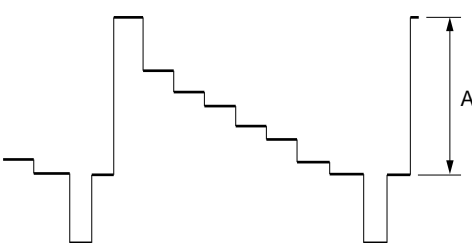
Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2 • Extension board: Extend the VIF-20 board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV) 		
STEP-2 <ul style="list-style-type: none"> • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B1 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	PGM OUT (COMPONENT Y)  $A = 714 \pm 5 \text{ mV p-p}$	Component Y level adjustment ● RV103/VIF-20 (C-8): INPUT 5 ● RV303/VIF-20 (C-6): INPUT 6 ● RV503/VIF-20 (C-4): INPUT 7 ● RV703/VIF-20 (C-1): INPUT 8

For PAL

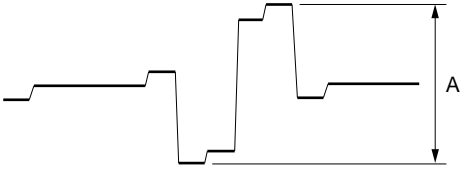
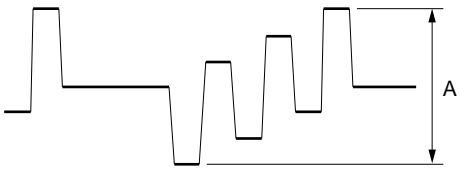
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20P board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV) 		
STEP-2 <ul style="list-style-type: none"> • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B1 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	PGM OUT (COMPONENT Y)  $A = 700 \pm 5 \text{ mV p-p}$	Component Y level adjustment ● RV103/VIF-20P (C-8): INPUT 5 ● RV303/VIF-20P (C-6): INPUT 6 ● RV503/VIF-20P (C-4): INPUT 7 ● RV703/VIF-20P (C-1): INPUT 8

4-7-3. Component Chroma Level Adjustment


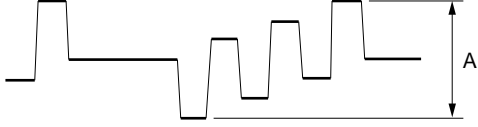
Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20 board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV) 		
STEP-2 <ul style="list-style-type: none"> • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	PGM OUT (COMPONENT R-Y)  $A = 700 \pm 5 \text{ mV p-p}$	Component chroma R-Y level adjustment ● RV104/VIF-20 (B-9): INPUT 5 ● RV304/VIF-20 (B-7): INPUT 6 ● RV504/VIF-20 (B-4): INPUT 7 ● RV704/VIF-20 (B-2): INPUT 8
STEP-3 <ul style="list-style-type: none"> • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	PGM OUT (COMPONENT B-Y)  $A = 700 \pm 5 \text{ mV p-p}$	Component chroma B-Y level adjustment ● RV105/VIF-20 (B-10): INPUT 5 ● RV305/VIF-20 (B-7): INPUT 6 ● RV505/VIF-20 (B-5): INPUT 7 ● RV705/VIF-20 (B-3): INPUT 8

For PAL

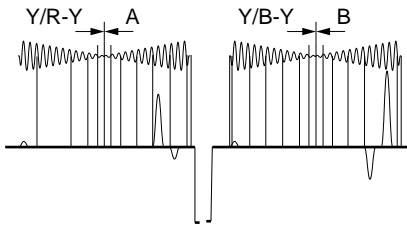
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20P board with an extension board EX-732. • Test signal: 75 % color bars • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV) 		
STEP-2 <ul style="list-style-type: none"> • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B2 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	PGM OUT (COMPONENT R-Y)  <p>$A = 525 \pm 5 \text{ mV p-p}$</p>	Component chroma R-Y level adjustment ●RV104/VIF-20P (B-9): INPUT 5 ●RV304/VIF-20P (B-7): INPUT 6 ●RV504/VIF-20P (B-4): INPUT 7 ●RV704/VIF-20P (B-2): INPUT 8
STEP-3 <ul style="list-style-type: none"> • (1) or (2) is used. (1) Waveform monitor INPUT: CH-B3 MODE: WAVEFORM REF: EXT (2) Oscilloscope CH1: 200 mV/DIV 10 μs/DIV TRIG: B.B (CH4) 	PGM OUT (COMPONENT B-Y)  <p>$A = 525 \pm 5 \text{ mV p-p}$</p>	Component chroma B-Y level adjustment ●RV105/VIF-20P (B-10): INPUT 5 ●RV305/VIF-20P (B-7): INPUT 6 ●RV505/VIF-20P (B-5): INPUT 7 ●RV705/VIF-20P (B-3): INPUT 8

4-7-4. Input Y/C Delay Adjustment

Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC/PAL

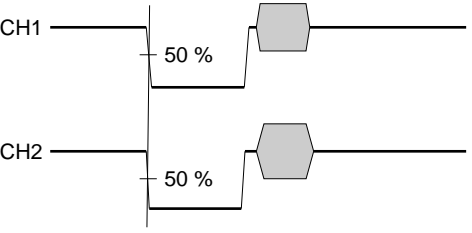
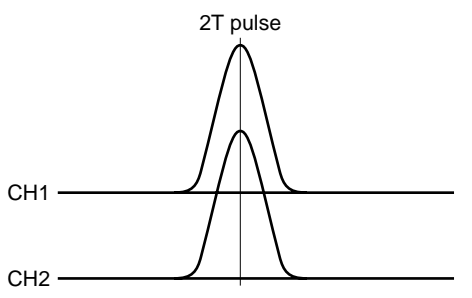
Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20/20P board with an extension board EX-732. • Test signal: BOWTIE • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV) 		
STEP-2 <ul style="list-style-type: none"> • Waveform monitor MEASURE: BOWTIE INPUT: CH-B1 (Component Y) CH-B2 (Component R-Y) CH-B3 (Component B-Y) MODE: WAVEFORM REF: EXT	CH-B1: PGM OUT (COMPONENT Y) CH-B2: PGM OUT (COMPONENT R-Y) CH-B3: PGM OUT (COMPONENT B-Y) <div style="text-align: center;">  <p>Y/R-Y A Y/B-Y B</p> <p>$A = 0 \pm 20 \text{ ns}$ $B = 0 \pm 20 \text{ ns}$</p> </div> <ul style="list-style-type: none"> • Set the BOWTIE DIP point A and B on the center marker. 	Y/R-Y delay adjustment (NTSC) ● RV101/VIF-20 (B-9): INPUT 5 ● RV302/VIF-20 (B-7): INPUT 6 ● RV502/VIF-20 (B-4): INPUT 7 ● RV702/VIF-20 (B-2): INPUT 8 (PAL) ● RV101/VIF-20P (B-9): INPUT 5 ● RV302/VIF-20P (B-7): INPUT 6 ● RV502/VIF-20P (B-4): INPUT 7 ● RV702/VIF-20P (B-2): INPUT 8 Y/B-Y delay adjustment (NTSC) ● RV102/VIF-20 (B-9): INPUT 5 ● RV302/VIF-20 (B-7): INPUT 6 ● RV502/VIF-20 (B-5): INPUT 7 ● RV702/VIF-20 (B-3): INPUT 8 (PAL) ● RV102/VIF-20P (B-9): INPUT 5 ● RV302/VIF-20P (B-7): INPUT 6 ● RV502/VIF-20P (B-5): INPUT 7 ● RV702/VIF-20P (B-3): INPUT 8

4-7-5. Video Input Phase Adjustment

Note

Perform this adjustment after completing all the adjustments for the OPM board (OPM-39/39P or OPM-45/45P).

For NTSC/PAL

Machine Conditions for Adjustment	Specifications	Adjustment Point
STEP-1 <ul style="list-style-type: none"> • Connection: Refer to Section 4-2. • Extension board: Extend the VIF-20/20P board with an extension board EX-732. • Test signal: pulse, bar (2T pulse) • Control panel setting: 1. BACKGROUND bus: Select inputs 5 to 8. (Used for inputs 5, 6, 7, or 8.) 2. Setup: Select inputs 5 to 8. (YUV) 		
STEP-2 H phase adjustment <ul style="list-style-type: none"> • Oscilloscope CH1: 200 mV/DIV 2 μ /DIV CH2: 200 mV/DIV 2 μ /DIV TRIG: B.B (CH4)	CH1: COMPONENT 5, 6, 7, 8 CH2: PGM OUT (COMPONENT Y)  <ul style="list-style-type: none"> • Check that D101/OPM board (A-6) lights up. • Check that INPUT COMPONENT Y SYNC and PGM OUT (COMPONENT Y) SYNC have the same phase. 	(Check)
STEP-3 Video phase adjustment <ul style="list-style-type: none"> • Oscilloscope CH1: 200 mV/DIV 2 μ /DIV CH2: 200 mV/DIV 2 μ /DIV TRIG: B.B (CH4)	CH1: COMPONENT 5, 6, 7, 8 CH2: PGM OUT (COMPONENT Y)  <ul style="list-style-type: none"> • Check that D101/OPM board (A-6) lights up. • Adjust so that INPUT COMPONENT Y 2T pulse and PGM OUT (COMPONENT Y) 2T pulse have the same phase. 	Video phase adjustment (NTSC) ●RV201/VIF-20 (F-8): INPUT 5 ●RV401/VIF-20 (F-6): INPUT 6 ●RV601/VIF-20 (F-4): INPUT 7 ●RV801/VIF-20 (F-1): INPUT 8 (PAL) ●RV201/VIF-20P (F-8): INPUT 5 ●RV401/VIF-20P (F-6): INPUT 6 ●RV601/VIF-20P (F-4): INPUT 7 ●RV801/VIF-20P (F-1): INPUT 8

4-8. Adjusting the Power Supply Voltage

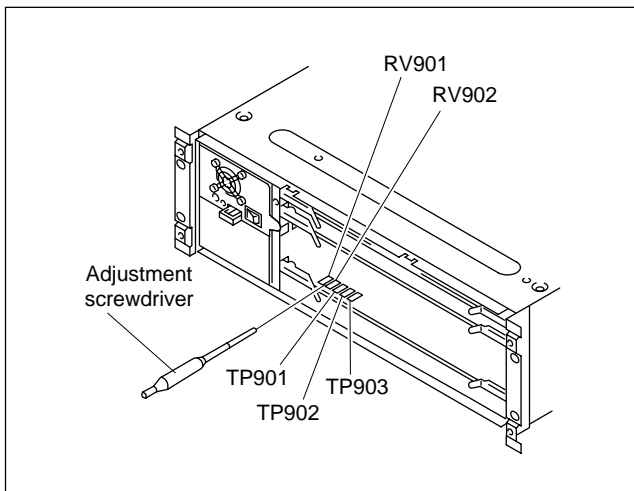
Note

When installing the unit, changing the board layout or replacing the power supply unit, be sure to adjust the power supply voltage.

Required equipment: Digital voltmeter

Adjustment

1. Remove the front panel. (Refer to Section 2-2.)
2. Remove the four screws and then remove the board stopper assembly. (Refer to Section 2-1-8.)
3. Connect the digital voltmeter to the GND terminal (TP903) and +5 V terminal (TP901) on the OPM board (OPM-39/39P or OPM-45/45P).
4. Adjust the +3.3 V adjustment volume (RV901) so that the voltage satisfies the specifications.
Specifications: $+5.0\text{ V} \pm 0.1\text{ V}$
5. Connect the digital voltmeter to the GND terminal (TP903) and +3.3 V terminal (TP902) on the OPM board (OPM-39/39P or OPM-45/45P).
6. Adjust the +3.3 V adjustment volume (RV902) so that the voltage satisfies the specifications.
Specifications: $+3.3\text{ V} \pm 0.1\text{ V}$



7. Remove the digital voltmeter.
8. Attach the board stopper assembly and front panel in reverse order of steps 1 through 2.

SAFETY CHECK-OUT

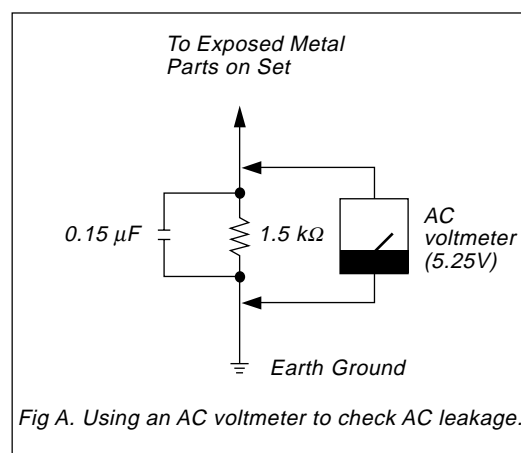
After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)



DFS-700A (UC)
DFS-700AP (CE)
DFS-700 (UC)
DFS-700P (CE) E
9-967-897-03

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