SONY

HD CAMERA CONTROL UNIT

HDCU-900

SD ANALOG INTERFACE UNIT
HKCU-901

HD ANALOG INTERFACE UNIT
HKCU-902

FRAME RATE CONVERTER UNIT
HKCU-903

LINE CONVERTER UNIT
HKCU-904

HDVS

INSTALLATION AND MAINTENANCE MANUAL
2nd Edition

⚠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ことがあります。
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 manual 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.

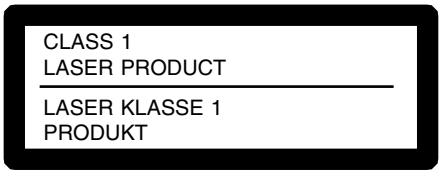
HDCU-900 (UC)	Serial No. 11001 and Higher
HDCU-900 (J)	Serial No. 31001 and Higher
HDCU-900 (CE)	Serial No. 41001 and Higher
HKCU-901 (UC)	Serial No. 10001 and Higher
HKCU-901 (J)	Serial No. 30001 and Higher
HKCU-901 (CE)	Serial No. 40001 and Higher
HKCU-902 (SY)	Serial No. 10001 and Higher
HKCU-903 (SY)	Serial No. 10001 and Higher
HKCU-904 (SY)	Serial No. 10001 and Higher

For HDCU-900

Laser Diode Properties

Material	: In GaAsP
Wave length	: 1310 ±40 nm
Emission duration	: Continuous
Laser output power	: –8 dBm

For HDCU-900



This camera control unit is classified as a CLASS 1 LASER PRODUCT.
The CLASS 1 LASER PRODUCT label is located on the rear panel.

For HDCU-900

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

For HDCU-900

Attention-when the product is installed in Rack:

1. **Prevention against overloading of branch circuit**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please make sure that the rack does not overload the supply circuit.

2. **Providing protective earth**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please confirm that the outlet is provided with a suitable protective earth connection.

3. **Internal air ambient temperature of the rack**
   When this product is installed in a rack, please make sure that the internal air ambient temperature of the rack is within the specified limit of this product.

4. **Prevention against achieving hazardous condition due to uneven mechanical loading**
   When this product is installed in a rack, please make sure that the rack does not achieve hazardous condition due to uneven mechanical loading.

5. **Install the equipment while taking the operating temperature of the equipment into consideration**
   For the operating temperature of the equipment, refer to the specifications of the Operation Manual.

Table of Contents

Manual Structure

1. Installation Overview

2. System Setup

3. Service Overview

Manual Structure

Purpose of this manual

This manual is the installation and maintenance manual of the following models :

HD Camera Control Unit	HDCU-900
SD Analog Interface Unit	HKCU-901
HD Analog Interface Unit	HKCU-902
Frame Rate Converter Unit	HKCU-903
Line Converter Unit	HKCU-904

This manual is intended for use by trained system and service engineers, and describes the information regarding the installation of the unit and the information that premises the service based on components replacement.

Related manuals

Beside this Installation and Maintenance Manual, the following manuals are available for the unit.

- **Operation Manual (Supplied with HDCU-900)**
  This manual describes how to operate the HDCU-900.

- **Maintenance Manual (Available on request)**
  This manual intended for use by trained system and service engineers describes (the circuit overview, self-diagnosis, the main part replacements, electrical alignment, etc.) required for parts-level service.
  For obtaining, contact your local Sony Sales Office/Service Center.
  Part number : 9-968-566-0X

- **“Camera System HDC-900 Series Maintenance Manual” CD-ROM (Available on request)**
  This “Camera System HDC-900 Series Maintenance Manual” CD-ROM allows you to search for the detailed information (parts list, semiconductor pin assignments, block diagrams, schematic diagrams and board layouts) of the HD color camera HDC-900/950, that of HD camera control unit HDCU-900 and that of option board HKCU-901/902/903/904 for HDCU-900 that premises the service on the component level.
  In addition to the above-described information, you can view the PDF files of the related manuals of the equipment models that are used in the HDC-900 series camera system. (Contents are subject to change without notice.) For obtaining, contact your local Sony Sales Office/Service Center.

- **“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 maintenance manual for the corresponding unit. The maintenance 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

The following is a summary of the sections of this manual.

Section 1 Installation Overview

Describes how to checking the ROM version, connectors and cables, setting of switches and controls on boards, installing in 19-inch rack, etc.

Section 2 System Setup

Describes how to set and adjust when connecting the unit to the camera system.

Section 3 Service Overview

Describes recommended replacement parts and how to cleaning connector/cables.

Trademarks

Trademarks and registered trademarks used in this manual are follows.

- Clear-Com is a registered trademark of Clear-Com Intercom Systems.
- Accuride is a registered trademark of Accuride International Corporation.

Section 1
Installation Overview

1-1. Checking the ROM Version

When connecting the following peripheral equipment to the unit, confirm that the versions of the ROMs which are installed in each model. If the version is lower than the following one, the ROM needs to be replaced.
In this case, contact your local Sony Sales Office/Service Center.

Peripheral equipment	Board	Ref. No.	ROM version
MSU-700A	CPU-293	IC5, IC6	Ver. 1.10 or higher
MSU-750	CPU-286	IC5, IC6	Ver. 1.10 or higher
CNU-700	AT-89 or AT-89A	IC4, IC5	Ver. 3.20 or higher
CNU-500	AT-100	IC4, IC5	Ver. 2.80 or higher
RCP-720/721	MPU-79	IC10	Ver. 2.80 or higher
RCP-730/731	MPU-79	IC10	Ver. 2.80 or higher
RCP-740/741	MPU-79	IC10	Ver. 2.80 or higher
RCP-700/701	MPU-92	IC6	Ver. 2.73 or higher

1-2. Connectors and Cables

1-2-1. Connector Input/Output Signal

BNC connector

HDCU-900

1125 digital signal

SERIAL RET INPUT (1-4) : BNC
1.485 Gbps/1.4835 Gbps
SMPTE 292M

SERIAL OUTPUT (1-3, MONI) : BNC
0.8 V p-p, 75 Ω, 1.485 Gbps/1.4835 Gbps
SMPTE 292M

REFERENCE IN : BNC
±0.3 V, ternary SYNC, 75 Ω
Or, Black burst
0.286 V p-p, 75 Ω (for UC)
0.3 V p-p, 75 Ω (for CE)

SD (525/625) digital signal

SERIAL RET INPUT (1-4) : BNC
Component serial signal : 270 Mbps
SMPTE 259M

SERIAL OUTPUT (1-4) : BNC
Component serial signal : 0.8 V p-p, 75 Ω , 270 Mbps
SMPTE 259M

Analog signal

PIX OUT : BNC
1.0 V p-p, 75 Ω

WF OUT : BNC
1.0 V p-p, 75 Ω

SYNC OUT : BNC
±0.3 V, ternary SYNC, 75 Ω
0.3 V p-p, SD SYNC, 75 Ω selectable

CHARACTER : BNC
525/625 black and white
Picture : 0.5 V, Sync : 0.3 V, 75 Ω

Others

DIGITAL AUDIO : BNC
AES/EBU format

PROMPTER IN : BNC
1.0 V p-p, 75 Ω

HKCU-901 (525/625 analog signal)

RET INPUT (1-4) : BNC
1.0 V p-p, 75 Ω

Y/G OUTPUT : BNC
Y : 1.0 V p-p (picture : 0.714 V, sync : 0.286 V), 75 Ω
G : 0.7 V, 75 Ω

B-Y/B OUTPUT : BNC
B-Y : 0.7 V p-p, 75 Ω
(for UC : during 75 % color bar input)
0.525 V p-p, 75 Ω
(for CE : during 75 % color bar input)
B : 0.7 V, 75 Ω

R-Y/R OUTPUT : BNC
R-Y : 0.7 V p-p, 75 Ω
(for UC : during 75 % color bar input)
0.525 V p-p, 75 Ω
(for CE : during 75 % color bar input)
R : 0.7 V, 75 Ω

VBS OUT (1-2) : BNC
1.0 V p-p, 75 Ω

PIX OUT : BNC
1.0 V p-p, 75 Ω

WF OUT : BNC
0.714 V p-p, 75 Ω
ENC : 1.0 V p-p

SYNC OUT : BNC
0.3 V p-p, SD SYNC, 75 Ω

HKCU-902 (1125 analog signal)

RET INPUT (1-4) : BNC
1.0 V p-p (picture : 0.7 V, sync : ±0.3 V), 75 Ω

Y/G OUTPUT (1-2) : BNC
1.0 V p-p (picture : 0.7 V, sync : ±0.3 V), 75 Ω

P_B/B OUTPUT (1-2) : BNC
B : 1.0 V p-p (picture : 0.7 V, sync : ±0.3 V), 75 Ω
P_B : Picture : ±0.35 V, Sync : ±0.3 V, 75 Ω

P_R/R OUTPUT (1-2) : BNC
R : 1.0 V p-p (picture : 0.7 V, sync : ±0.3 V), 75 Ω
P_R : Picture : ±0.35 V, Sync : ±0.3 V, 75 Ω

PIX OUT : BNC
1.0 V p-p (picture : 0.7 V, sync : ±0.3 V), 75 Ω

SYNC OUT : BNC
±0.3 V, ternary SYNC, 75 Ω

HKCU-903

1125 digital signal

SERIAL RET INPUT (1-4) : BNC
1.485 Gbps/1.4835 Gbps
SMPTE 292M

SERIAL OUTPUT (1-3, MONI) : BNC
0.8 V p-p, 75 Ω, 1.485 Gbps/1.4835 Gbps
SMPTE 292M

Analog signal

SYNC OUT : BNC
±0.3 V, ternary SYNC, 75 Ω

SYNC OUT : BNC
±0.3 V, ternary SYNC, 75 Ω

FRAME REFERENCE IN : BNC
±0.3 V, ternary SYNC, 75 Ω
Black burst
0.286 V p-p, 75 Ω (for UC)
0.3 V p-p, 75 Ω (for CE)

FRAME REFERENCE OUT : BNC
THROUGH OUT/0.3 V p-p, FRAME SYNC pulse, 75 Ω

HKCU-904 (720/60P signal)

SERIAL RET INPUT (1-4) : BNC
1.485 Gbps/1.4835 Gbps
SMPTE 292M

SERIAL OUTPUT (1-3) : BNC
0.8 V p-p, 75 Ω, 1.485 Gpbs/1.4835 Gbps
SMPTE 292M

SYNC OUT : BNC
±0.3 V, ternary SYNC, 75 Ω

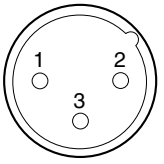
SYNC OUT : BNC
±0.3 V, ternary SYNC, 75 Ω
0.3 V p-p, SD SYNC, 75 Ω selectable

CAMERA connector (optical/electorical connector)

VIDEO	$Y/P_B/P_R$ 1.485 Gbps/1.4835 Gbps serial SMPTE 292M
RET VIDEO	$Y/P_B/P_R$ 1.485 Gbps/1.4835 Gbps serial SMPTE 292M
INCOM	2ch
MIC	2ch

DIGITAL AUDIO (AES/EBU)
CAMERA COMMAND
PROMPTER

AUDIO OUTPUT CH-1/CH-2 (XLR 3-pin, Male)

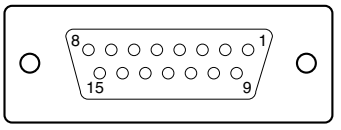


– EXT VIEW –

(0 dBu = 0.775 Vrms)

No.	Signal	Specifications
1	MIC OUT (G)	0 dBu/–20 dBu
2	MIC OUT (X)	(Selectable with S402,
3	MIC OUT (Y)	S403/AT board)

MIC REMOTE (D-sub 15-pin, Female)



– EXT VIEW –

No.	Signal		Specifications
1	+5.5 V OUT		Max. 250 mA
2	TALLY GND		GND for TALLY
3	G TALLY OUT		ON (GND) : Max. 30 mA IN
4	R TALLY OUT		ON (GND) : Max. 30 mA IN
5	CHU MIC	$\overline{\text{CONT2}}$	∗1 Refer to the right column.
6	AMP	$\overline{\text{CONT1}}$	
7	GAIN IN	CONT0	
8	MIC1 GAIN CONT $\overline{\text{ON}}$/OFF IN		∗2 Refer to the right column.
9	GND		GND for +5.5 V
10	TALLY OUT		R/G TALLY OUT ON (GND) : Max. 30 mA IN
11	NC		No connection
12	ASPECT REMOTE $\overline{\text{ON}}$/OFF		L : REMOTE
13	ASPECT	$\overline{\text{CONT1}}$	∗3 Refer to the right column.
14	CTL	CONT2	
15	MIC2 GAIN CONT $\overline{\text{ON}}$/OFF IN		∗2 Refer to the right column.

∗1 : CHU MIC 1/2 AMP GAIN

CONT0	CONT1	CONT2	CHU MIC AMP GAIN
H	H	H	60 dB
L	H	H	50 dB
H	L	H	40 dB
L	L	H	30 dB
H	H	L	20 dB

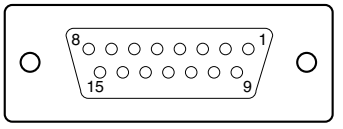
∗2 :

8pin	15pin	MIC GAIN CONT
L	L	MIC 1 and 2 ON
L	H	MIC 1 ON
H	L	MIC 2 ON
H	H	INTERNAL set

∗3 :

CONT1	CONT2	ASPECT
L	H	SQ (16 : 9)
H	H	EC (4 : 3)
L	L	INTERNAL set
H	L	LB (4 : 3)

WF REMOTE (D-sub 15-pin, Female)



– EXT VIEW –

Recall system*4

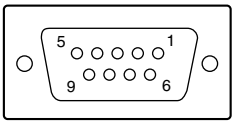
No.	Signal	Specifications
1	NC	No connection
2	NC	No connection
3	NC	No connection
4	NC	No connection
5	RECALL2 (G)	LOW ACTIVE
6	RECALL3 (B)	
7	RECALL1 (R)	
8	RECALL4 (SEQ)	
9	GND	
10	NC	No connection
11	NC	No connection
12	RECALL5 (ENC)	LOW ACTIVE
13	RECALL6 (R+B)	
14	RECALL7 (R+G)	
15	RECALL8 (G+B)	

1735HD/1730HD*4

No.	Signal	Specifications
1	LINE/FIELD	LINE : 5 V dc FIELD : 0 V dc
2	FOUR OUT	FOUR : 0 V dc
3	ONE/TWO OUT	ONE : 5 V dc TWO : 0 V dc
4	REMOTE 1 OUT	REMOTE : 5 V dc ENB : 0 V dc
5	RECALL 1 OUT	RECALL : 5 V dc
6	STORE OUT	STORE : 0 V dc
7	RECALL 0 OUT	RECALL : 5 V dc
8	THREE OUT	THREE : 0 V dc
9	GND	GND for signal
10	REMOTE SYNC OUT	REMOTE SYNC : 5 V dc
11	BOTH OUT	BOTH : 0 V dc
12	CH-1-ON OUT	CH-1 ON : 0 V dc
13	CH-2-ON OUT	CH-2
14	CH-3-ON OUT	CH-3
15	A/B OUT	A : 5 V dc B : 0 V dc

*4 : This is set using the S103-4 and -5 switches on the AT-141 board.
4 : ON : Recall system (5 : OFF 1125 SDI/ON 525/625 SDI)
4 : OFF : 1735HD/1730HD

TRUNK LINE (D-sub 9-pin, Female)

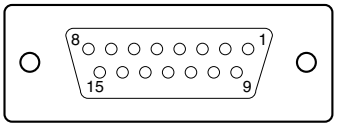


– EXT VIEW –

No.	Signal	Specifications
1	NC (DCD IN)*5	No connection
2	EXT-CMD0-IN (RXD IN)*5	
3	EXT-CHD0-OUT (TXD OUT)*5	
4	(DTR-OUT)*5	12 V, 15 kΩ
5	GND	
6	(DSR IN)*5	No connection
7	EXT-CMD1-OUT (RTS OUT)*5	
8	EXT-CHD1-IN (CTS IN)*5	
9	NC	No connection

*5 : This is set using the S1 switch on the AT-141 board.
AT : (AUX)
DPR : Set using TRUNK.

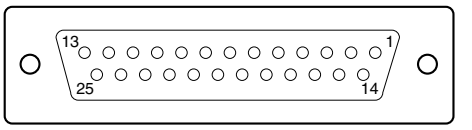
I/O PORT (D-sub 15-pin, Female)



– EXT VIEW –

No.	Signal	Specifications
1	IN1	GND/+5 V, OPEN (47 kΩ +5 V PULL UP)
2	IN2	GND/+5 V, OPEN (47 kΩ +5 V PULL UP)
3	IN3	GND/+5 V, OPEN (47 kΩ +5 V PULL UP)
4	IN4	GND/+5 V, OPEN (47 kΩ +5 V PULL UP)
5	IN5	GND/+5 V, OPEN (47 kΩ +5 V PULL UP)
6	IN6	GND/+5 V, OPEN (47 kΩ +5 V PULL UP)
7	IN7	GND/+5 V, OPEN (47 kΩ +5 V PULL UP)
8	IN8	GND/+5 V, OPEN (47 kΩ +5 V PULL UP)
9	GND	
10	OUT1	0/+5 V (1 kΩ)
11	OUT2	0/+5 V (1 kΩ)
12	OUT3	0/+5 V (1 kΩ)
13	OUT4	0/+5 V (1 kΩ)
14	OUT5	0/+5 V (1 kΩ)
15	OUT6	0/+5 V (1 kΩ)

INTERCOM/TALLY/PGM (D-sub 25-pin, Female)

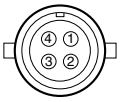


– EXT VIEW –

(0 dBu = 0.775 Vrms)

No.	Signal	Specifications
1	ENG (R) (X) OUT	ENG SYSTEM RECEIVE
2	ENG (R) (Y) OUT	0 dBu BALANCED
3	ENG (G)	GND for ENG
4	ENG (T) (X) IN	ENG SYSTEM TALK
5	ENG (T) (Y) IN	0 dBu BALANCED
6	PGM1 (X) IN	–20 dBu/0 dBu
7	PGM1 (Y) IN	(Selectable with
8	PGM1 (G) IN	S301/AT board)
9	GND	GND for AUX
10	AUX3	
11	R TALLY (X) IN	ON : 24 Vdc, TTL (H), SHORT
12	R TALLY (Y) IN	OFF : 0 Vdc, TTL (L), OPEN
13	GND	CHASSIS GND
14	PROD (R) (X) OUT	PROD SYSTEM
15	PROD (R) (Y) OUT	RECEIVE 0 dBu BALANCED
16	PROD (G)	GND for PROD
17	PROD (T) (X) IN	PROD SYSTEM TALK
18	PROD (T) (Y) IN	0 dBu BALANCED
19	PGM2 (X) IN	–20 dBu/0 dBu
20	PGM2 (Y) IN	(Selectable with
21	PGM2 (G) IN	S302/AT board)
22	AUX4	
23	AUX5	
24	G TALLY (X) IN	ON : 24 Vdc, TTL (H), SHORT
25	G TALLY (Y) IN	OFF : 0 Vdc, TTL (L), OPEN

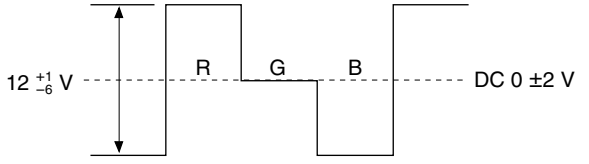
WF MODE (4-pin, Female)



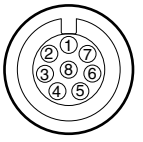
– EXT VIEW –

No.	Signal	Specifications
1	SEQ CONT OUT (G)	OPEN COLLECTOR
		+(PNP)/–(NPN)
2	SEQ CONT OUT (X)	(Selectable with COP1/VDA board)
3	STAIR CASE OUT (X)	∗6
4	STAIR CASE OUT (G)	GND for STAIR CASE

∗6 : Stair Case signal



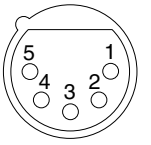
RCP/CNU (8-pin, Female)



– EXT VIEW –

No.	Signal	Specifications
1	TX (+)	CCU SERIAL DATA
2	TX (–)	
3	RX (+)	RCP/CNU/BVP/MSU/
4	RX (–)	VCS SERIAL DATA
5	TX GND	GND for TX
6	POWER (+) OUT	RCP POWER, +30 V
7	POWER (–) OUT	GND for POWER
8	SPARE	

INTERCOM (5-pin, Female)



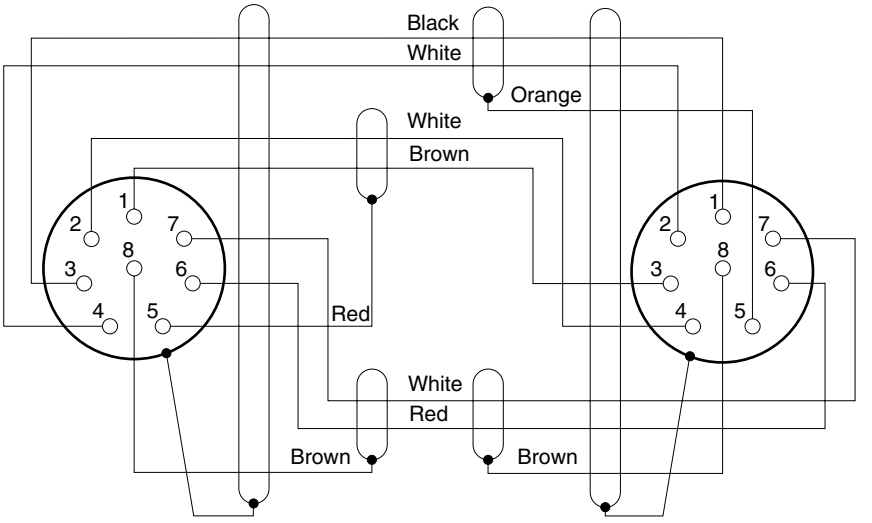
– EXT VIEW –

(0 dBu = 0.775 Vrms)

No.	Signal	Specifications
1	INCOM (T) IN (Y)	–20 dBu
		(CARBON MIC)
2	INCOM (T) IN (X)	–60 dBu
		(DYNAMIC MIC)
3	INCOM (T) IN (G)	GND for INCOM
4	INCOM (R) OUT (X)	Max. 12 dBu
5	NC	No connection

1-2-2. Cable Wiring Diagram

CCA-5 cable (for RCP/CNU connector)



1-2-3. Connection Connectors

When connecting cables to each connector of the connector panel during installation or service, connect the following connectors or equivalent to the tip.

Connector	Connector/cable
HDCU-900	
CAMERA	LEMO®
	PUW. 3K. 93C. TLCC96 ∗1
(HDC-900/910/950/930 side)	
CCU	LEMO®
	FUW. 3K. 93C. TLMC96 ∗1
HDCU-900	1-564-742-11 PLUG, BNC
REFERENCE IN	or B-B cable assembly
PIX OUT	(1.5 m, optional)
WF OUT	
SYNC OUT	
CHARACTER	
DIGITAL AUDIO	
PROMPTER IN	
HKCU-901	
RET INPUT (1-4)	
Y/G OUTPUT	
B-Y/B OUTPUT	
R-Y/R OUTPUT	
VBS OUT (1-2)	
PIX OUT	
WF OUT	
SYNC OUT	
HKCU-902	
RET INPUT (1-4)	
Y/G OUTPUT (1-2)	
P_B/B OUTPUT (1-2)	
P_R/R OUTPUT (1-2)	
PIX OUT	
SYNC OUT	
HKCU-903	
SYNC OUT	
FRAME REFERENCE IN	
FRAME REFERENCE OUT	
HKCU-904	
SYNC OUT	
(BNC)	
HDCU-900	1-569-370-12 PLUG, BNC or
SERIAL RET INPUT (1-4)	BELDEN8281 Cable or
SERIAL OUTPUT (1-3, MONI)	equivalent
SERIAL RET INPUT (1-4)	
SERIAL OUTPUT (1-4)	
HKCU-903	
SERIAL RET INPUT (1-4)	
SERIAL OUTPUT (1-3, MONI)	
HKCU-904	
SERIAL RET INPUT (1-4)	
SERIAL OUTPUT (1-3)	
(BNC)	
AUDIO OUTPUT CH-1/CH-2	1-508-083-00 XLP 3-pin female
(3-pin, Male)	or CANNON XLR-3-11C
	equivalent
WF REMOTE/MIC REMOTE	1-506-582-11 D-sub 15-pin, male
I/O PORT	or JAE DA-CI-J10 equivalent
(D-sub 15-pin, Female)	
INTERCOM/TALLY/PGM	D-sub 25-pin, male
(D-sub 25-pin, Female)	JAE DA-25PF-N equivalent
WF MODE	1-560-155-00 PLUG, 4-pin male
(4-pin, Female)	(supplied)
RCP/CNU	1-766-848-11 PLUG, 8-pin male
(8-pin, Female)	or CCA cable assembly (optional)
	CCA-5-10 (10 m), CCA-5-3 (3 m)
INTERCOM	1-508-370-11 XLR 5-pin, male
(5-pin, Female)	or CANNON XLR-5-12C
	equivalent
TRUNK LINE	1-560-651-00 D-sub 9-pin, male
(D-sub 9-pin, Female)	or JAE DE-9PF-N equivalent
	1-561-749-00 JUNCTION SHELL

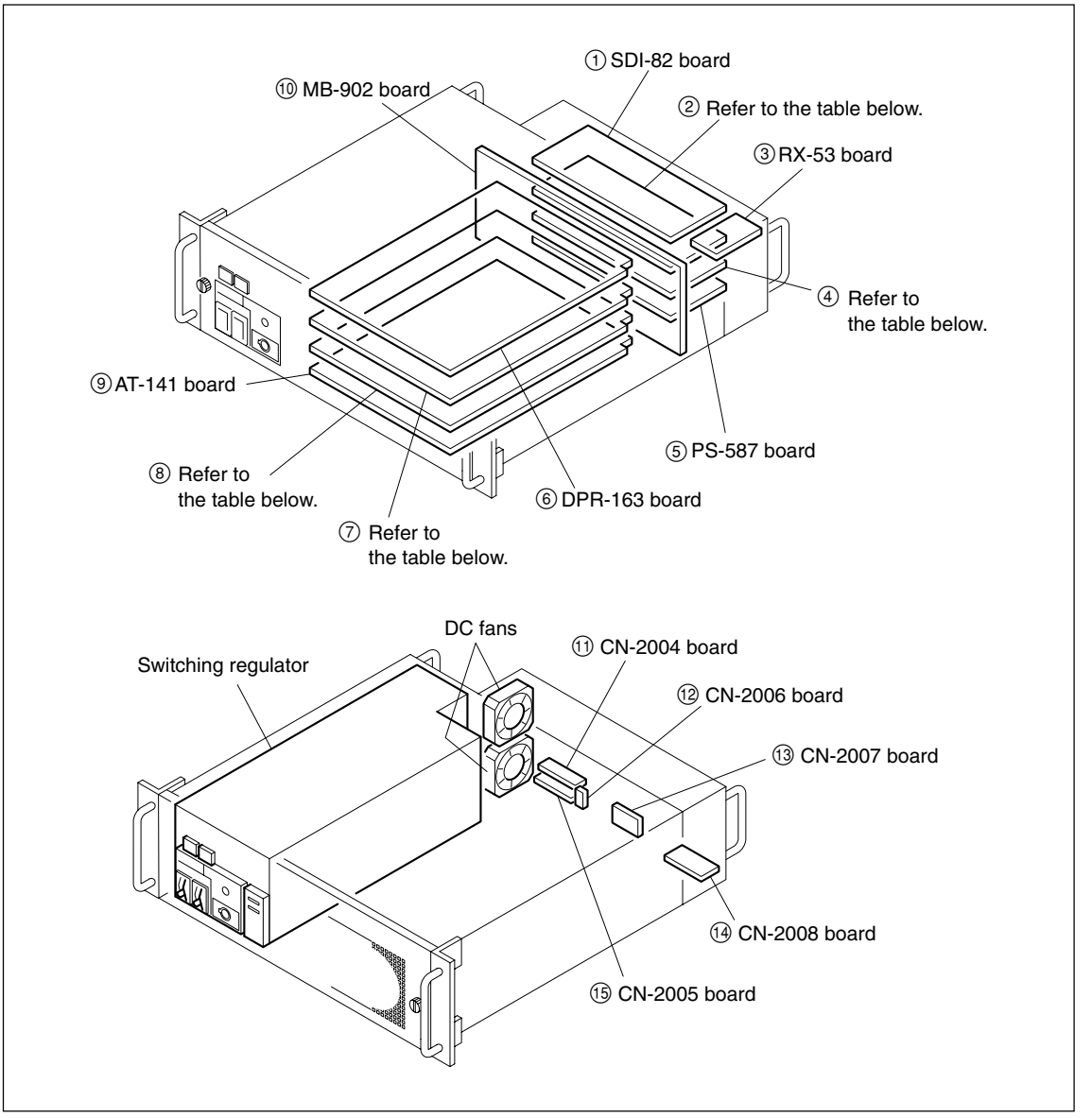
∗1 : Caution in making the optical/electric signal composite cable:
When making the optical/electric signal composite cable used for this camera system, the connection connectors specified in this manual must be used in order to comply with the limits for EMC regulations.

1-2-4. Note when Connecting CAMERA Connector

Before connecting the unit to the camera adapter, clean the following optical contact blocks.
For the cleaning procedure, refer to Section 3-1, “Cleaning of Connector/Cable”.

- CAMERA connector of the unit
- CCU connector of the camera adapter side
- Optical/electric signal composite cable

1-3. Circuit Boards and Main Parts Layouts



No.	Board Name
②	DIF-102 board (HDCU-900)
	ADA-59 board (HKCU-902)
	SDI-54B board (HKCU-903)
	SDI-54C board (HKCU-904)
④	DIF-102 board (HDCU-900)
	VDA-57 board (HKCU-901)
	ADA-59 board (HKCU-902)
	SDI-54C board (HKCU-904)
⑦	RC-86 board (HDCU-900)
	FC-83 board (HKCU-903)
	LC-41 board (HKCU-904)

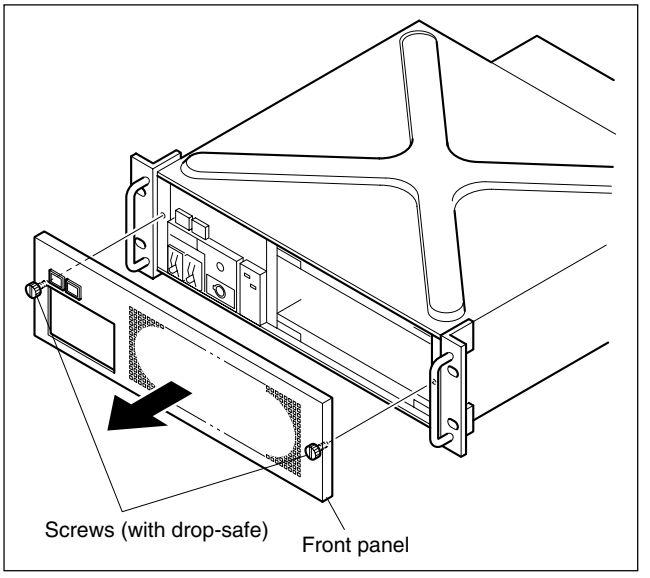
No.	Board Name
⑧	RC-86 board (HDCU-900)
	IF-789A/789P board (HKCU-901)
	LC-41 board (HKCU-904)

Note

Slots to be used in each board are different depending on the used system. For the details, refer to Section 2-1, “Setting the System Format.”

1-4. Removing/Installing the Front Panel

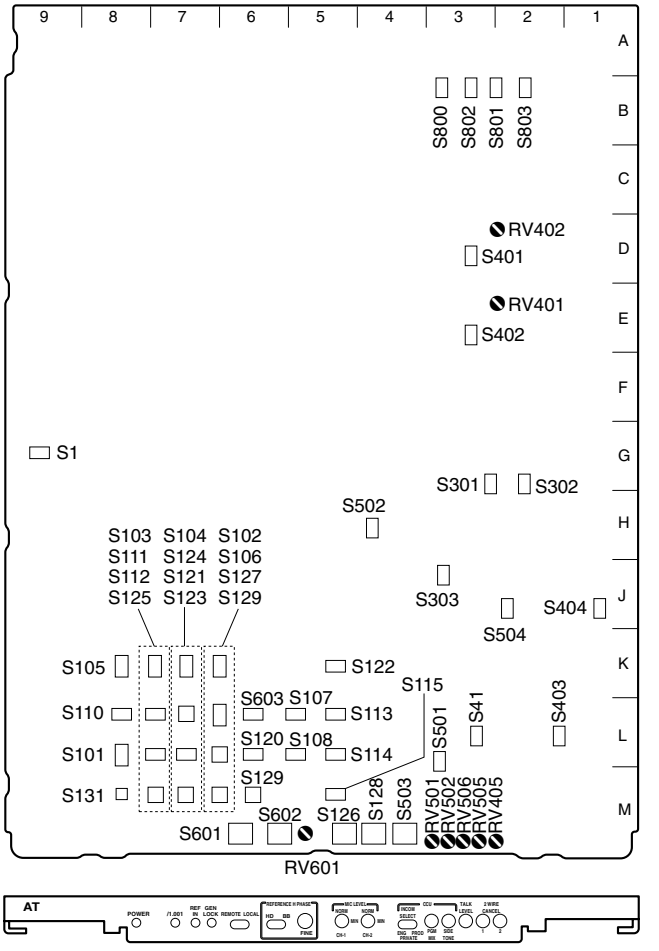
1. Fully loosen the two screws (with drop-safe) and remove the front panel in the direction of the arrow.



2. Reattach the front panel in reverse order of step 1.

1-5. Settings of Switches and Controls on Boards

1-5-1. AT-141 Board



AT-141 board (A side/panel side)

Switches

Note

Do not change the settings of the switches describes "Factory use only".

- S1 (232C SEL)
  Set the signal mode of the TRUNK LINE connector on the rear panel.
  AT : AUX mode
  DPR : TRUNK mode
  Factory setting : DPR

- S41 (PROD RTS/CLEAR)
- S504 (INCOM PROD SELECT)
  Set the intercom system of the producer line.
  Factory setting : 4W (S504)
  RTS (S41)

	S504	S41
4-wire system	4W	–
RTS system	RTS	RTS
Clear-Com system	RTS	CLEAR

- S101 (RET-SET)
  Select the BNC connector that the RET VIDEO signal is to be connected to when S110 on the AT-141 board is set to LOC. The switches can be set for each RET channel.

		Top slot	Second slot from the top	Third slot from the top
RET1	S101-1	OFF	ON	OFF
	S101-2	OFF	OFF	ON
RET2	S101-3	OFF	ON	OFF
	S101-4	OFF	OFF	ON
RET3	S101-5	OFF	ON	OFF
	S101-6	OFF	OFF	ON
RET4	S101-7	OFF	ON	OFF
	S101-8	OFF	OFF	ON

Factory setting : All OFF

Note

The RET signal formats are already fixed.

- S102-1 to 7
  Not used.

- S102-8 (NTSC/PAL)
  When the RC-86 board is not mounted, set NTSC/PAL of the REF input and character output. When the RC-86 board is mounted, perform the setting according to the setting of S802 on the RC-86 board.
  ON : PAL (for CE)
  OFF : NTSC (for J/UC)
  Factory setting : OFF

- S103-1 (HD-ANA-OUT-1 RGB/YCD)
  This switch is valid only when the ADA-59 board (HKCU-902) is mounted. Select the signal output from the OUTPUT1 connector on the ADA-59 board of the rear panel.
  ON : $Y/P_B/P_R$
  OFF : RGB
  Factory setting : OFF

- S103-2 (HD-ANA-OUT-2 RGB/YCD)
  This switch is valid only when the ADA-59 board (HKCU-902) is mounted. Select the signal output from the OUTPUT2 connector on the ADA-59 board of the rear panel.
  ON : $Y/P_B/P_R$
  OFF : RGB
  Factory setting : OFF

- S103-3
  Not used.

- S103-4 (RECALL TYPE CTL MODE SEL)
  Set the type of the waveform monitor when S103-5 on the AT-141 board is ON.
  ON : 525/625/1125 SDI (Recall system)
  OFF : Others SDI (Recall system) (Reserved)
  Factory setting : OFF

- S103-5 (WFM CTL SIGNAL SEL)
  Select the waveform monitor control signal output from the WF REMOTE connector of the rear panel.
  ON : Recall system control signal
  (Depends on the setting of S103-5 on the AT-141 board.)
  OFF : Control signal dedicated to 1735HD/1730HD
  Factory setting : OFF

- S103-6 (HD-ANA-OUT-2 LOCAL/REMOTE)
  Set whether the signal that is output when the OUTPUT2 connector on the ADA-59 board (HKCU-902) is used for the waveform monitor, is switched by pressing the ENC button (MONITOR SELECT block) on the control panel of RCP.
  ON : Selectable
  ENC button lights off : RGB
  ENC button lights : $Y/P_B/P_R$
  OFF : Not selectable (Depends on the setting of S103-2 on the AT-141 board.)
  Factory setting : OFF

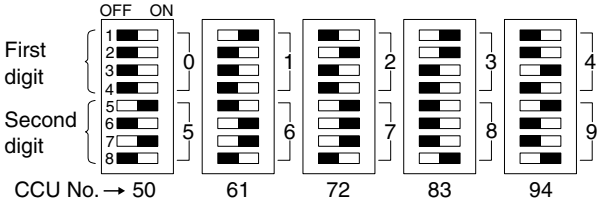
- S103-7
  Not used.

- S103-8 (MONI CTL MODE SEL)
  Select the method to switch the output of the PIX OUT and WF OUT connectors on the DIF-102 board (HDCU-900), the PIX OUT connector on the ADA-59 board (HKCU-902), and the PIX OUT and WF OUT connectors on the VDA-57 board (HKCU-901).
  ON : Selectable using RCP only : DIF-102 board/ADA-59 board
  Selectable using MSU only : VDA-57 board
  OFF : Selectable using both RCP and MSU (The last press has priority.)
  Factory setting : OFF

• S104-1 to 8
Factory use only
Factory setting : OFF

• S105-1 to 8
Factory use only
Factory setting : S105-5 only is ON
All others are OFF

• S106 (1-8 CCU No.)
This switch is mainly used to set the CCU numbers while RCP is connected to the HDCU-900.
Use switches 1 to 8 to set the CCU numbers from 1 to 96 in BCD notation.
Use switches 1 to 4 to set the first digit and use switches 5 to 8 to set the second digit. (“a” to “f” are invalid.)
Factory setting : OFF



• S107 to S109
Not used.

• S110 (RETURN REMOTE/LOCAL)
Set which of HDCU-900 or MSU is used to set the signal format to be connected to the RET VIDEO connector on the rear panel.
REM : Set using MSU.
LOC : Set using the switch on the AT-141 board.
Factory setting : REM

• S111 (MARKER REMOTE/LOCAL)
Select the HDCU-900 or MSU to control the aspect marker and skin gate signal that will be output from the monitor.
REM : Set using MSU.
LOC : Set using the switch on the AT-141 board.
Factory setting : REM

• S112 (MAKER MIX SIGNAL SEL)
When S111 on the AT-141 board is set to LOC, set whether the ASPECT MAKER signal is inserted into the HD-SDI MONITOR output signal.
ON : Inserted
OFF : Not inserted
Factory setting : OFF

• S113 to S115
Not used.

• S120 (CONVERSION DELAY)
Select delay amount between the HD-SDI signal that is output from the first stage and the signal after formatting the HD-SDI signal.
90H : Minimum delay mode for 90H lines of the HD signal
1Frm : Same phase mode that delayed at one frame
Factory setting : 90H

• S121 (MODULAT)
Select whether the aspect modulation signal is inserted into the HD-SDI MONITOR output signal when S111 on the AT-141 board is set to LOC.
ON : Inserted
OFF : Not inserted
Factory setting : OFF

• S122 (10F-BB)
Set this switch when the multi frame lock is desired using the BB signal (SMPTE318M) supporting 10-field sequence as a reference signal.
ON : Set the 10F-BB signal as master reference.
OFF : When the 10F-BB signal is not input to REFERENCE.
Factory setting : OFF

• S123 (MOD-LEVEL)
When the S111 on the AT-141 board is set to LOC, adjust the aspect modulation level.
Factory setting : 8

• S124 (ZEBRA LEVEL)
When S111 on the AT-141 board is set to LOC, adjust the zebra level of the skin gate of the monitor output.
Factory setting : 8

• S125 (MARKER SET)
Set the type of the aspect marker.

Switch setting	Aspect marker
0	4 : 3
1	13 : 9
2	14 : 9
3	15 : 9
4	None
5	16 : 8.649
6	16 : 6.75
7	None
8 through F	Interlocking down-converter

Factory setting: 8

- S126 (MIC CH-1 LEVEL)
- S128 (MIC CH-2 LEVEL)
  Use these switches to switch AMP GAIN of MIC CH-1/CH-2 of the camera head using this unit. Set GAIN to 60 dBu (NORMAL), 50 dBu, 40 dBu, 30 dBu or 20 dBu (MIN) according to MIC sensitivity and audio conditions during shooting.
  Factory setting : "NORM" (60 dBu)
  (0 dBu = 0.775 Vrms)

- S127 (H-PHASE COARSE)
  Perform the coarse adjustment of the H phase with regard to the reference signal when S601 on the AT-141 board is set to LOCAL. Perform the fine adjustment using RV601 on the AT-141 board.
  Factory setting : 8

- S129 (V-PHASE)
  Adjust the vertical phase with regard to the reference signal in unit of line.
  Factory setting : 8

- S130 (CONVERSION DELAY PHASE)
  Perform the fine adjustment of the delay amount of the signal that is set by S120 on the AT-141 board, after format conversion.
  Factory setting : 0

- S131 (CHARACTER PAGE)
  Factory use only

- S301 (PGM1 SEL)
  Set the input signal level of the PGM (program audio) CH-1 to 0 dBu or −20 dBu.
  Factory setting : 0 dBu

- S302 (PGM2 SEL)
  Set the input signal level of the PGM (program audio) CH-2 to 0 dBu or −20 dBu.
  Factory setting : 0 dBu

- S303 (STBY INCOM)
  Set the target of connection to which the intercom signal is connected in the standby mode.
  SYS : SYSTEM (1ch mode : PROD, 2ch mode : ENG)
  PRIV : Intercom between CHU-HDCU-900 only.
  Factory setting : SYS

- S401 (MIC 2 OUT LEVEL)
  Set the AUDIO signal level of the AUDIO OUTPUT CH-2 connector on the rear panel to 0 dBu or −20 dBu.
  Factory setting : 0 dBu

- S402 (MIC 1 OUT LEVEL)
  Set the AUDIO signal level of the AUDIO OUTPUT CH-1 connector on the rear panel to 0 dBu or −20 dBu.
  Factory setting : 0 dBu

- S403 (ENG RTS/CLEAR)
- S404 (INCOM ENG SELECT)
  Select the intercom system of the engineer line.
  Factory setting : 4W (S404)
  RTS (S403)

	S404	S403
4-wire system	4W	–
RTS system	RTS	RTS
Clear-Com system	RTS	CLEAR

- S501 (INCOM MIX)
  Select the line to which the intercom of the front panel is connected.
  ON : Connected to both of the procedure line and the engineer line.
  OFF : Depends on the setting of S503 on the AF-141 board.
  Factory setting : OFF

- S502 (INPUT SELECT)
  Set this switch to 1 ch (PROD), 2ch (PROD, ENG) according to the intercom system. When 1ch is set, PROD is fixed regardless of the setting of the ENG/PROD select switches of the camera and the CCU.
  Factory setting : 2ch

- S503 (INCOM SELECT)
  Select the line to which the intercom of the front panel is connected.
  PROD : Producer line
  PRIVATE : Private (When the unit is disconnected to the producer line or engineer line, only the intercom between the unit and the camera is possible.)
  ENG : Engineer line
  Factory setting : PROD

- S601 (REFERENCE REMOTE/LOCAL SEL)
  Select the selection and phase control methods of the external sync signal.
  REMOTE : Control is performed by RCP/MSU, etc. connected outward
  LOCAL : Depends on the setting of S602 on the AT-141 board
  Factory setting : REMOTE

- S602 (REFERENCE SIGNAL SEL)
  When S601 on the AT-141 board is set to LOCAL, select the type of the external sync signal.
  HD : HD ternary SYNC
  BB : 525/625 composite SYNC, BB (black burst) or 10F-BB
  Factory setting : HD

- S603 (HD FRAME FREQ. SELECT)
  Select coefficient between $\times \frac{1}{1.000}$ and $\times \frac{1}{1.001}$ depending upon the HD signal fame frequency.
  /1001 : $\frac{1}{1.001}$ times
  REMOTE : Remote
  /1000 : 1 time
  Factory setting : REMOTE

  Note

  The frame frequency coefficient of the SD signal is not interlocked.

- S800 (R TALLY POWER/CONTACT)
- S802 (R TALLY POWER/TTL)
  Set these switches according to the signal standard of the R TALLY signal to be input in the INTERCOM/TALLY/PGM connector of the rear panel. Refer to the following table for the relation between signals and switch setups.
  Factory setting : CONTACT (S800)
  POWER (S802)

- S801 (G TALLY POWER/CONTACT)
- S803 (G TALLY POWER/TTL)
  Set these switches according to the signal standard of the G TALLY signal to be input in the INTERCOM/TALLY/PGM connector of the rear panel. Refer to the following table for the relation between signals and switch setups.
  Factory setting : CONTACT (S801)
  POWER (S803)

Setting tally system

	Red tally		Green tally	
Switch	S800	S802	S801	S803
Signal standard	POWER/CONTACT	POWER/TTL	POWER/CONTACT	POWER/TTL
Contact supply	CONTACT	–	CONTACT	–
24 V voltage supply	POWER	POWER	POWER	POWER
5 V voltage supply	POWER	TTL	POWER	TTL

Controls

- RV401 (MIC 1 OUT LEVEL)
  Set the output level of MIC OUTPUT 1.

- RV402 (MIC 2 OUT LEVEL)
  Set the output level of MIC OUTPUT 2.

- RV405 (2WIRE CANCEL2)
  When S404 on the AT-141 board is set to RTS, set the SIDE TONE level of the headset microphone to the minimum level. (Rotate fully RV502 to the left.)

- RV501 (PGM MIX)
  Set the mix amount of the PGM audio signal of the headset connected to the INTERCOM connector on the front.

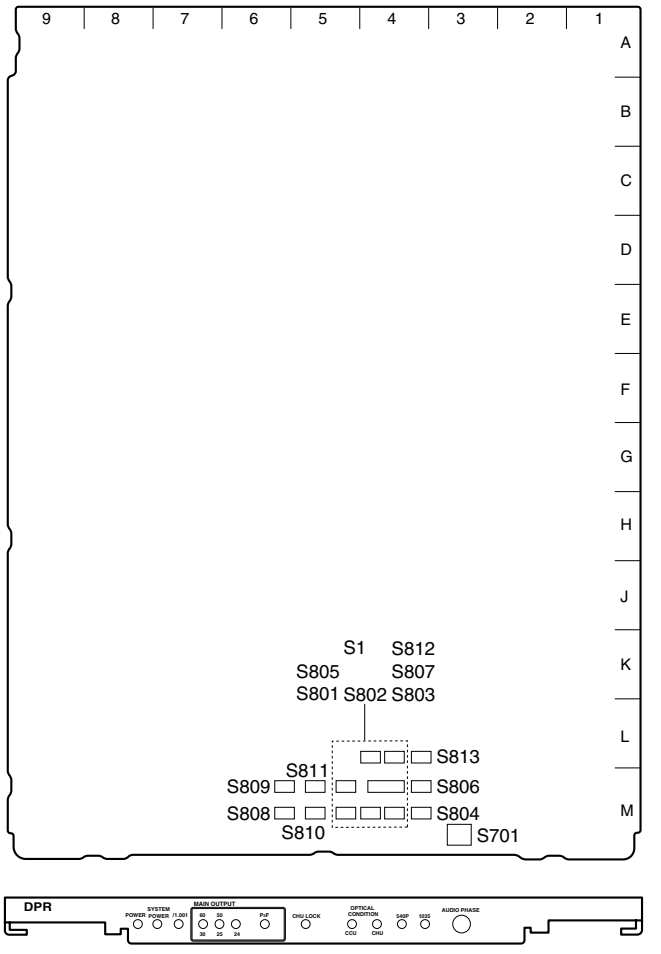
- RV502 (SIDE TONE)
  Set the SIDE TONE level of the headset microphone.

- RV505 (2WIRE CANCEL1)
  When S504 on the AT-141 board is set to RTS, set the SIDE TONE level of the headset microphone to the minimum level. (Rotate fully RV502 to the left.)

- RV506 (TALK LEVEL)
  Set the TALK LEVEL of the headset.

- RV601 (H PHASE FINE)
  Perform the fine adjustment of the H phase when S601 on the AT-141 board is set to LOCAL. Perform the coarse adjustment using S127 on the AT-141 board.

1-5-2. DPR-163 Board



DPR-163 board : Board suffix-23 and higher (A side/panel side)

Note

Do not change the settings of the switches describes "Factory use only".

• S1 (CB SPECIAL) : Board suffix-23 and higher
S810 (CB SEL)
Select the color bar signal to be output from the HD signal output.

Switch setting S1	S810	Color bar
OFF	0	16 : 9-100 %-CB (non-split)
	1	16 : 9-75 %-CB (non-split)
	2, 3	16 : 9 Pseudo SMPTE-CB
	4	4 : 3-100 %-CB
	5	4 : 3-75 %-CB
	6, 7	4 : 3 pseudo SMPTE-CB
	8	MF ARIB-CB (75 %)
	9	MF ARIB-CB (100 %)
	A	MF ARIB-CB (+I)
	B	MF SMPTE-CB (–I, Q)
	C	MF SMPTE-CB (75 %, Q)
	D	MF SMPTE-CB (100 %, Q)
	E	MF SMPTE-CB (+I, Q)
	F	4 : 3 pseudo SMPTE (non-I, Q-50 %)

Factory setting : 16 : 9-100%-CB (non-split)

Note

The settings of S810-8 through -F are valid when ROM version of IC105 and IC106/AT-141 is 1.30 and higher.

• S701 (AUDIO PHASE)
This switch is used to match the amount of delay of MIC and AES/EBU format audio signal with the video signal. About 5 msec. is delayed per one step.
Example 7 : 1 FRAME DELAY (30 FRAME/SEC)
8 : 1 FRAME DELAY (25 FRAME/SEC)
Factory setting : 0

• S801 (EXT COM SEL)
Select the command trunk line mode.
1ch : Bi-directional communication line containing one communication line capacity with doubled band width of 2ch, having double spectrum
2ch : Bi-directional communication line containing two communication line capacity (Can receive signal equivalent to RS-232C (19.2 kbps).)
Factory setting : 2ch

• S802
Not used.

- S803 (COLOR BARS OUTPUT MODE SEL)
  When you turn off the power of the camera or the communication with the camera is cut, select the signal to be output from the CCU.
  ON : Color bar signal
  OFF : Gray signal
  Factory setting : OFF

- S804 (FORMAT SEL)
  Select which of the HDCU-900 or MSU is used to set the shooting operation format of the camera.
  REMOTE : Set using MSU.
  LOCAL : Set using the switch on the DPR-163 board.
  Factory setting : REMOTE

- S805 (540P/NOT SEL)
  When S804 on the DPR-163 board is set to LOCAL, set the operation mode of the camera.
  540P : 540P
  NOT : Normal camera shooting operation
  Factory setting : NOT

- S806 (PsF/INTERLACE SEL)
  When S804 on the DPR-163 board is set to LOCAL set the PsF/Interlace of the camera.
  PsF : PsF system
  Intr : Interlace system
  Factory setting : Intr

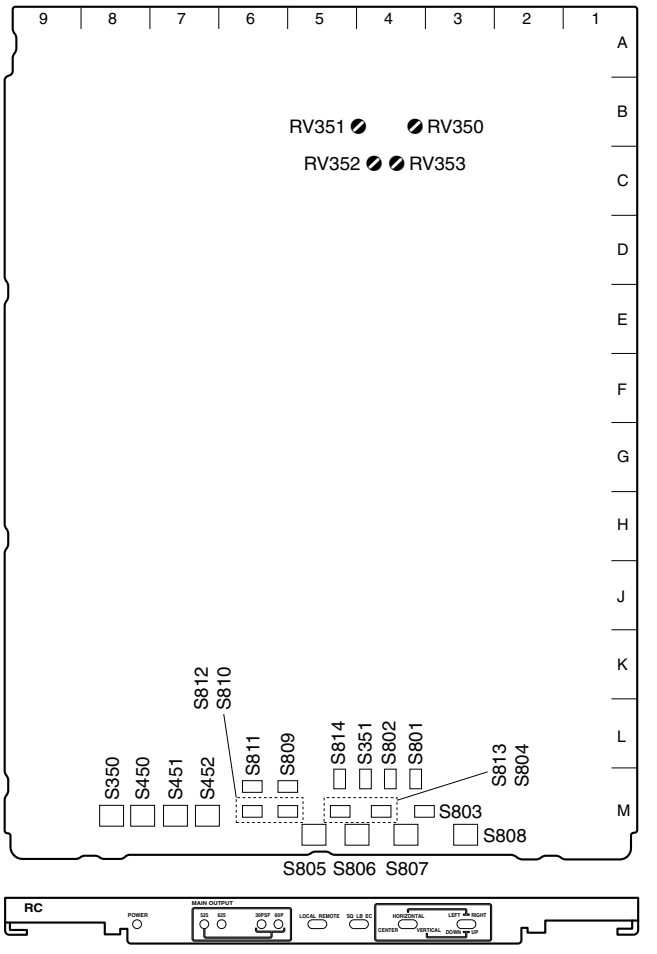
- S807 (FIELD FREQ. SEL)
  When S804 on the DPR-163 board is set to LOCAL, set the operation field frequency of the camera.
  48 : 48 Hz field
  50 : 50 Hz field
  60 : 60 Hz field
  Factory setting : 60

- S808-1 to 8
  Factory use only
  Factory setting : All OFF

- S809-1 to 8
  Factory use only
  Factory setting : All OFF

- S811 to S813
  Not used.

1-5-3. RC-86 Board



RC-86 board (A side/panel side)

Switches

Note

Do not change the settings of the switches describes "Factory use only".

- S350
  Not used.

- S351 (SEQ)
  Set this switch according to the used waveform monitor.
  Letters (SEQ side) : NPN open collector output
  Opposite side : PNP open collector output
  Factory setting : Letters (SEQ side)

- S450 to S452
  Not used.

- S801
  Not used.

• S802 (625/525 SEL)
When S804 on the DPR-163 board is set to LOCAL, select the number of lines per one frame of the MAIN OUTPUT signal (SD).
625 : 625 lines
525 : 525 lines
Factory setting : 525

• S803
Not used.

• S804 (DOWN CONVERTER MODE SEL)
Select the sample rate when downconverting the HD signal to the SD-SDI signal.
422YC : 4 : 2 : 2 (Y/R-Y/B-Y)
444YC : 4 : 4 : 4 (Y/R-Y/B-Y)
444RGB : 4 : 4 : 4 (R/G/B)
4 : 2 : 2 signal of four systems are output from the SERIAL OUTPUT 1, 2, 3 and 4 connectors on the DIF-102 during 4 : 2 : 2 output.
They are divided into two systems and is output; The 4 : 2 : 2 signal is output from the SERIAL OUTPUT 1 and 2 connectors on the DIF-102 board and the 0 : 2 : 2 signal is output from the SERIAL OUTPUT 3 and 4 connectors on the DIF-102 board.
Factory setting : 422YC

• S805 (ASPECT REMOTE/LOCAL)
Set whether the aspect ratio of the SD signal is selected using MSU.
REMOTE : Set using MSU
LOCAL : Set using the switch on the RC-86 board.
Factory setting : REMOTE

• S806 (ASPECT SEL)
This switch is valid when S805 on the RC-86 board is set to LOCAL. Select the aspect ratio to downconvert from HD signal to SD signal. (Also used for the analog output of the HKCU-901.)
SQ (squeeze) : The signal is output to the SD OUT in the 16 : 9 as it is.
LB (letter box) : The picture (13 : 9, 14 : 9, 16 : 9) having the aspect ratio selected by S813 on the RC-86 board is inserted into the picture of 4 : 3 as it is, and the signal is output to the SD OUT. (Top and bottom are blanked and the right and left most ends are cut when the screen is 13 : 9, 14 : 9.)
EC (edge-crop) : The right and left most ends are cut and the picture of 4 : 3 aspect ratio is output to the SD OUT.
Factory setting : SQ

• S807 (EC POSITION SEL)
This switch is valid when S805 on the RC-86 board is set to LOCAL.
When S806 on the RC-86 board is set to EC, select the cutting position.
CENTER : Isolates the center.
HORIZONTAL : Changes the horizontal cutting position with S808 on the RC-86 board.
Factory setting : CENTER

• S808 (EC POSITION ADJ)
This switch is valid when S805 on the RC-86 board is set to LOCAL.
When S807 on the RC-86 board is set to HORIZONTAL, adjust the cutting position.

	S807	S808
The cutting position moves left.	HORIZONTAL	LEFT
The cutting position moves right.	HORIZONTAL	RIGHT

• S809 (RET ASPECT SEL)
When S814 on the RC-86 board is set to LOC, select the aspect ratio of the RETURN VIDEO signal. (This switch is also used to set RET1 to 4 of the HKCU-901.)
S809-1, -2 : RET1
S809-3, -4 : RET2
S809-5, -6 : RET3
S809-7, -8 : RET4

S809-1, -3, -5, -7	S809-2, -4, -6, -8	Aspect ratio
ON	ON	Letter box*1
ON	OFF	Squeeze*1
OFF	ON	–
OFF	OFF	Edge-crop*1

*1 Letter box : The HD video signal of 16 : 9 is inserted into the picture frame of 4 : 3 as it is and converted to the SD signal. (The black level is inserted into the top and bottom of the picture.)
Squeeze : The HD video signal of 16 : 9 is converted to the SD signal as it is.
Edge-crop : Video signal as large as 4 : 3 is cut from the HD video signal and is converted to the SD signal.

Factory setting : Squeeze

• S810 (RET LB ASPECT SEL)
This switch is valid when S814 on the RC-86 board is set to LOC.
When S809 on the RC-86 board is set to letter box, select the aspect ratio of the letter box.
S810-1, -2 : RET1
S810-3, -4 : RET2
S810-5, -6 : RET3
S810-7, -8 : RET4

S810-1, -3, -5, -7	S810-2, -4, -6, -8	Aspect ratio
ON	ON	13 : 9
ON	OFF	16 : 9
OFF	ON	14 : 9
OFF	OFF	–

Factory setting : 16 : 9

• S811-1, 2 (CB SEL)
Select the color bar signal to be output from the SD signal output.

S811-1	S811-2	Color bar
OFF	OFF	100 %-CB (non-split)
ON	OFF	100 % & 75 %-CB (non-split)
OFF	ON	75 %-CB (non-split)
ON	ON	Pseudo SMPTE-CB

Factory setting : 100 % & 75 %-CB (non-split)

• S811-3 (CB SEL)
When S811-1, -2 on the RC-86 board are set to OFF, select the same color bar as HD to be output from the SD signal output.
ON : Selected
OFF : Not selected
Factory setting : OFF

• S811-4 to 8
Factory use only
Factory setting : All OFF

• S812-1 (SYNC SEL)
Select the SYNC signal to be output to the SYNC OUTPUT connector on the DIF-102 board.
ON : SD SYNC
OFF : HD SYNC
Factory setting : OFF

• S812-2 (SETUP SEL)
Select whether SETUP is added to the VBS signal of PIX/WFM OUT.
ON : Added
OFF : Not added
Factory setting : OFF

• S812-3 to 8
Factory use only
Factory setting : All OFF

• S813 (LB ASPECT SEL)
This switch is valid when S805 on the RC-86 board is set to LOCAL.
When S806 on the RC-86 board is set to letter box, select the aspect ratio of the letter box.
13 : 9 → 13 : 9
14 : 9 → 14 : 9
16 : 9 → 16 : 9
Factory setting : 16 : 9

• S814 (RET VIDEO ASPECT REMOTE/LOCAL)
Set whether the aspect ratio of the RETURN VIDEO signal is selected using MSU.
REM : Set using MSU.
LOC : Depends on the settings of S809 and S810 on the RC-86 board.
Factory setting : REM

Controls

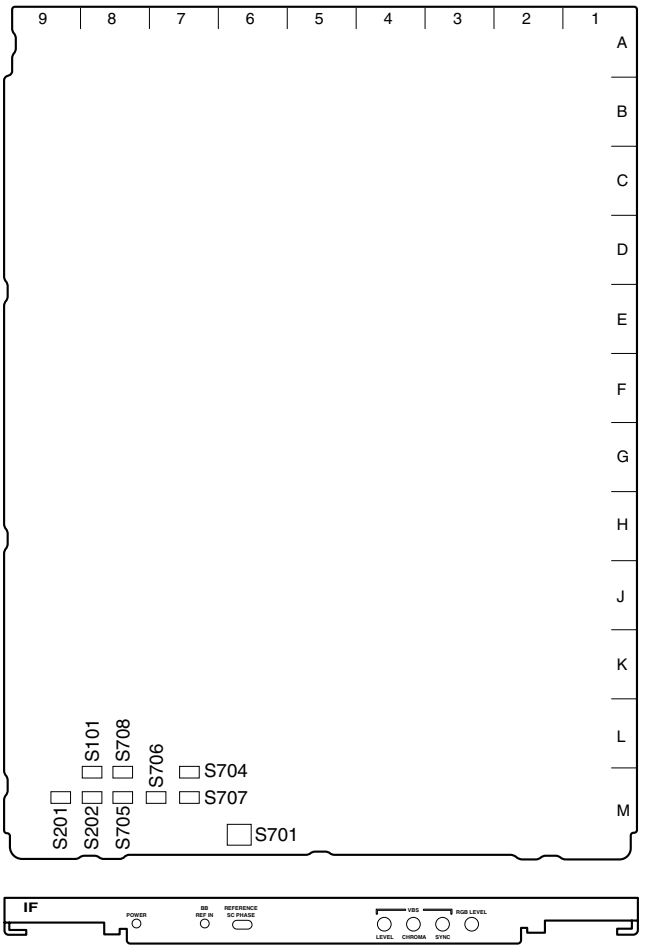
• RV350 (WFM GAIN)
Adjust the level of the signal for the waveform monitor.

• RV351 (PIX GAIN)
Adjust the level of the signal for the picture waveform monitor.

• RV352 (STAIR STEP POSITION)
Set the position to display the STAIR CASE signal.

• RV353 (STAIR STEP LEVEL)
Set the interval of the STAIR CASE signal.

1-5-4. IF-789A/789P Board (HKCU-901)



IF-789A/789P board (A side/panel side)

- S101-1 (CB CONT)
  Set whether the color bar ON/OFF mounted in the encoder is controlled from MSU.
  ON : Controlled
  OFF : Not controlled
  Factory setting : ON

- S101-2 (CB SEL)
  Select the type of the color bar mounted in the encoder.
  SMPTE : SMPTE color bar (NTSC MODE)
  EIAJ : EIAJ color bar (NTSC MODE)
  EBU color bar (PAL MODE)
  Factory setting : SMPTE (NTSC MODE)
  EBU (PAL MODE)

- S201 (SETUP SEL)
  Select whether SETUP is added to the VBS signal of SD.
  ON : Added
  OFF : Not added
  Factory setting : ON (for UC)
  OFF (for CE)

- S202 (G/Y SYNC SEL)
  Select whether SYNC is added to the G/Y signal of SD.
  ON : Added
  OFF : Not added
  Factory setting : ON

- S701 (SC PHASE)
  When S602 on the AT-141 board is set to BB, adjust the sub carrier phase of the sync signal.

- S704
  Not used.

- S705 (SD-ANA OUT RGB/YCD)
  Select the signal to be output from the OUTPUT connector on the VDA-57 board.
  YCD : Y/B-Y/R-Y
  RGB : RGB
  Factory setting : RGB

- S706 (WFM WAVE 3/4)
  Switch the sequential output of the WF OUT connector on the VDA-57 board.
  3WAVE : Three waveforms
  4WAVE : Four waveforms
  Factory setting : 3WAVE

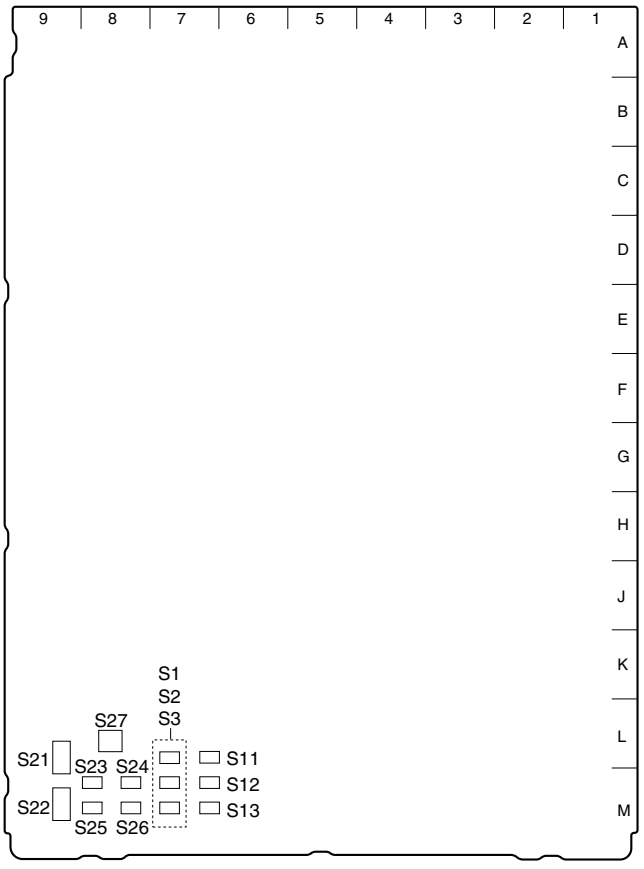
- S707 (Q FILTER SEL)
  Select the bandwidth of the Q signal.
  NQ : Narrow band
  WQ : Wide band
  Factory setting : NQ

- S708-1 (DATA CENTER)
  This switch is used to return the control value coming from the CPU to its center value during LEVEL, SYNC and CHROMA adjustment of the VBS signal.
  ON : The control value is set to its center.
  OFF : The control value is not set to its center.
  Factory setting : OFF

- S708-2 (VBS ASPECT FLAG ON/OFF)
  This switch is used to add the ASPECT identification flag to the NTSC signal.
  ON : Added
  OFF : Not added
  Factory setting : OFF

- S708-3, 4
  Not used.

1-5-5. FC-83 Board (HKCU-903)



FC-83 board (A side)

- S1
  Not used.

- S2 (24/25/30 SEL)
  When S804 on the DPR-163 board is set to LOCAL, set the conversion format of the VFS-MAIN OUTPUT signal.
  24 : 24 Hz frame (Reserved)
  25 : 25 Hz frame (Reserved)
  30 : 30 Hz frame
  Factory setting : 30

- S3 (i/PsF/P SEL)
  When S804 on the DPR-163 board is set to LOCAL, set the conversion format of the VFS-MAIN OUTPUT signal.
  i : Interlace system
  PsF : PsF system (Reserved)
  P: Progressive system (Reserved)
  Factory setting : i

- S11 (RETURN AUTO/MANUAL)
  Set the format of the RETURN VIDEO signal to be input in the FC-83 board.
  AUTO : Auto setting
  MANU : Depends on the settings of S12 and S13 on the FC-83 board.
  Factory setting : AUTO

- S12 (24/25/30 SEL)
  When S11 on the FC-83 board is set to MANU, set the format of the RETURN VIDEO signal to be input in the FC-83 board.
  24 : 24 Hz frame (Reserved)
  25 : 25 Hz frame (Reserved)
  30 : 30 Hz frame
  Factory setting : 30

- S13 (i/PsF/P SEL)
  When S11 on the FC-83 board is set to MANU, set the format of the RETURN VIDEO signal to be input in the FC-83 board.
  i : Interlace system
  PsF : PsF system (Reserved)
  P : Progressive system (Reserved)
  Factory setting : i

- S21, S22
  Not used.

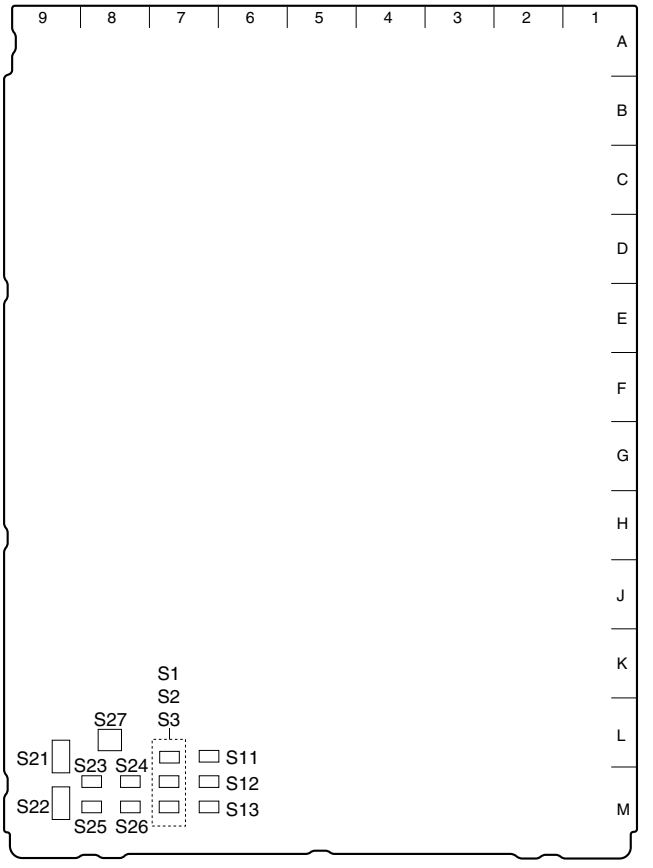
- S23 (FRAME REF)
  When inputting the FRAME REFERENCE signal, set ON.
  Factory setting : OFF

- S24 (S.SYNC MODE)
  Select whether the S.SYNC signal is automatically detected or it forcibly is output.
  AUTO : Auto detection
  ACTIVE : Forced output
  Factory setting : AUTO

- S25, S26
  Not used.

- S27 (FRAME REF SEL)
  Select the FRAME REFERENCE signal to be input.
  0 : FRAME REF HD
  1 : FRAME REF SD
  2 : FRAME REF S.SYNC
  Factory setting : 0

1-5-6. LC-41 Board (HKCU-904)



LC-41 board (A side)

- S1
  Not used.

- S2 (1080/1035/720P SEL)
  When S804 on the DPR-163 board is set to LOCAL, set the conversion format of the VSP-MAIN OUTPUT signal.
  1080 : Not used.
  1035 : Not used.
  720P : 720/60P
  Factory setting : 720P

- S3
  Not used.

- S11 to S13
  Not used.

- S21, S22
  Not used.

- S23 (DELAY FRAME/MIN)
  Selects the delay amount of the signal that is converted of its format by HKCU-904.
  FRAME : Unity phase mode with 1 frame delay
  MIN : Minimum delay mode equivalent to 90H lines of HD signal.
  Factory setting : FRAME

- S24
  Not used.

- S25 (SYNC LC/UPPER)
  Selects the SYNC signal that is output to the SYNC OUTPUT connector/SDI-54C board.
  LC : HD SYNC that is converted of its format by the LC-41 board
  UPPER : SYNC signal that is output from the slot on the front, that is one slot higher than the slot in which the LC-41 board is installed.
  Factory setting : LC

- S26, S27
  Not used.

1-6. Installing the Optional Boards

The following optional boards can be available for this unit. Use different slots for each board and set the switches respectively.
For the details, refer to Section 2-1, “Setting the System Format”.

Model	Board (slot in the front)	Board (slot in the rear)	Slot into which boards are installed
SD Analog Interface Unit HKCU-901	IF-789A*1/789P*2	VDA-57	Third slot from the top slot
HD Analog Interface Unit HKCU-902	–	ADA-59	Second or third slot from the top slot
Frame Rate Converter Unit HKCU-903	FC-83	SDI-54B	Second slot from the top slot
Line Converter Unit HKCU-904	LC-41	SDI-54C	Second or third slot from the top slot

*1 : for UC
*2 : for CE

Notes

When installing the optional boards, make sure of the following items.

- When installing the optional boards, be sure to start installation from the second slot from the top on both the front side and rear side. Never install an optional board in the third slot from the top leaving the slots blank without installing the board.
- Be sure to install the HKCU-901 of the same destination as the HDCU-900.
- Be sure to install the HKCU-901/903/904 into the same slot on the front and rear sides.
- Do not install two or more of the same circuit boards at the same time.

Installation Procedure

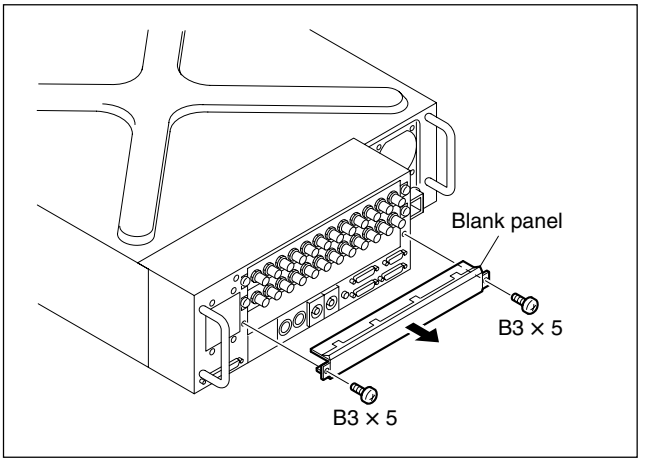
1. Turn off the power and disconnect the plug from the outlet.

Rear side

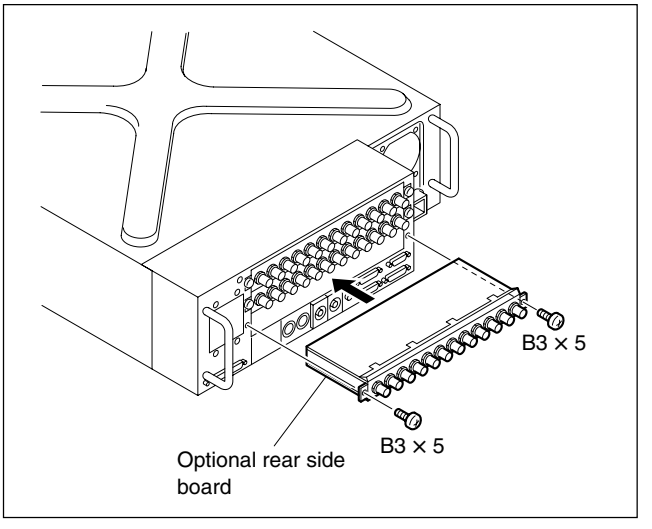
2. Remove the two screws from the slots and remove the blank panel or the board that is already installed.

   Note

   The top slot at the rear side is used for the SDI-82 board only. So that any of the option boards cannot be installed in the top slot.



3. Insert the optional rear side board into the slot of the removed blank panel and fix it with the screws removed in step 2.



Notes

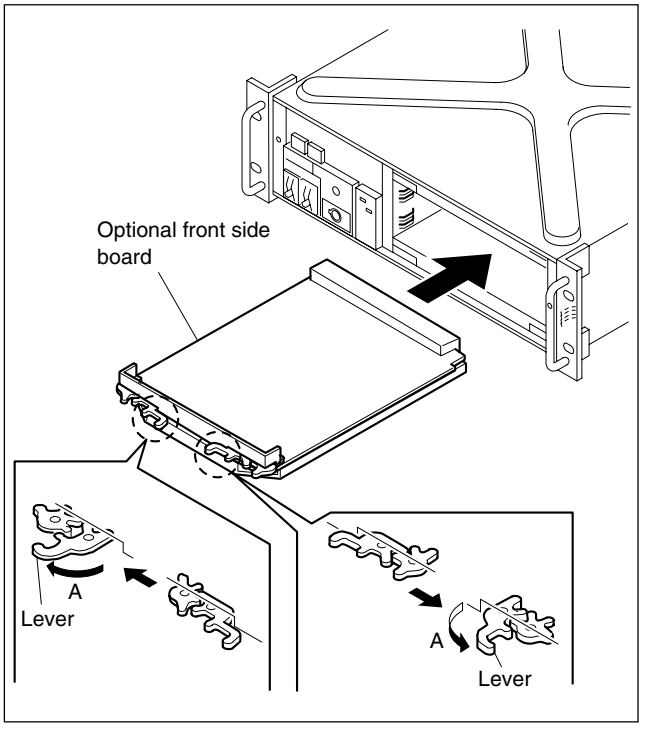
- Regarding the rear side, install the boards starting from the top slot, one after another. When removing the boards, start removal from the bottom slot.
- Be sure to attach the supplied blank panel to the slot that is not used at the rear.

Front side

4. Remove the front panel. (Refer to Section 1-4.)
5. If any circuit board is already installed in the desired slot, remove it before hand.
6. Insert the optional front side boards into the slots, and open the levers in the direction of arrow A to lock them.

   Note

   The top slot on the front is dedicated to the DPR-163 board, and the bottom slot is dedicated to the AT-141 board. So that any of the option boards cannot be installed in the top and bottom slots of the front.



1-7. Installing in 19-inch Rack

The unit can be mounted in a 19-inch EIA standard rack (height three unit).

WARNING

- Fix the rack on the floor.
  If the rack falls due to the weight of the equipment, it may cause death or injury.
  To prevent the rack from falling or moving, be sure to fix the rack to the floor.
- Do not install at a height of 1 m or higher from the floor.
  If the rack falls, death or serious injury may result.
  When attaching the unit, be sure to fix the rack on the floor and be careful not to attach at a height of 1 m or higher from the floor.

Required Parts

CAUTION

Use the specified rack mount rail.
If not, injury could occur by drop of the unit because strength of rail is not enough.

- Slide rail : 1 set
  Accuride No.305A-18 (457 mm)
- Front brackets : 2 pcs
  Sony P/N 2-142-214-01
- Rear brackets : 2 pcs
  Sony P/N 2-142-215-01
- Screws (B4 × 8) : 14 pcs
- Screws (B5 × 8) : 8 pcs
- Plate nut : 1 pc
  Sony P/N 3-651-812-00
- Screws for rack mounting (RK5 × 14) : 4 pcs
- Washers for rack mounting : 4 pcs
  Sony P/N 2-297-913-01

Manufacturer :

UNITED STATES

- **Accuride**
  12311 Shoemaker Avenue
  Santa Fe Springs, CA 90670
  TEL 213-903-0200
  FAX 213-903-0208
- **Accuride**
  Quality Drive
  Charlotte, NC 28217
  TEL 704-588-5880
  FAX 704-588-6316
- **Accuride**
  1930 Parco Avenue
  Ontario, CA 91761
  TEL 714-923-9922
  FAX 714-947-8586

WEST GERMANY

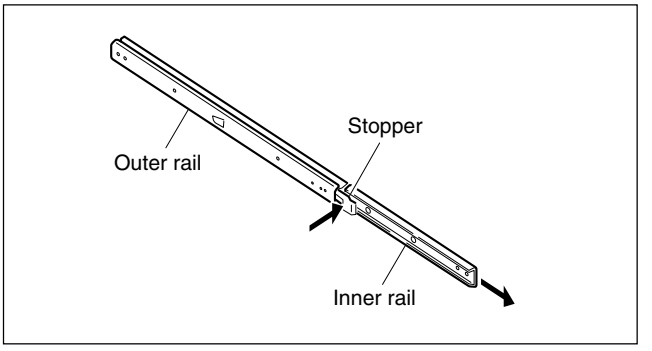
- **Standard-Praezision GmbH**
  Postfach 1464
  Werner-von-Siemens-Strasse 16-18
  6252 Diez/Lahn West Germany
  TEL 6432-6080
  FAX 6432-60820

UNITED KINGDOM

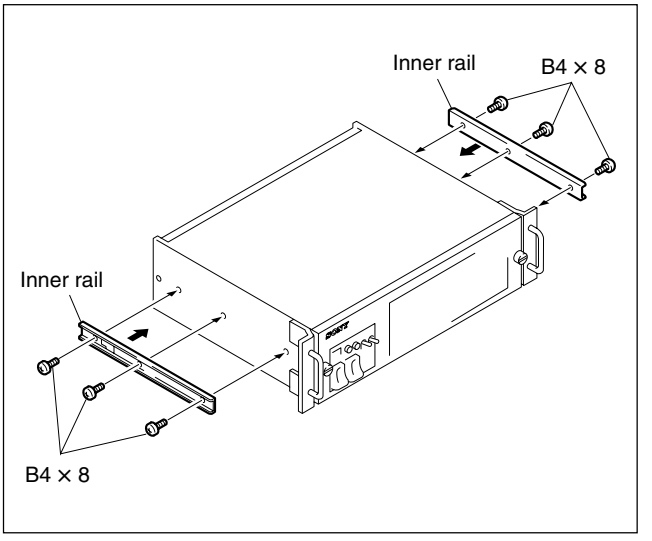
- **Accuride Limited**
  Lilliput Road
  Brackmills Industrial Estate
  Northampton, NN4 OAR
  United Kingdom
  TEL 604-761111
  FAX 604-767190

Rack Mount Procedure

1. Pull out the inner rail while pressing the stopper of the rail.



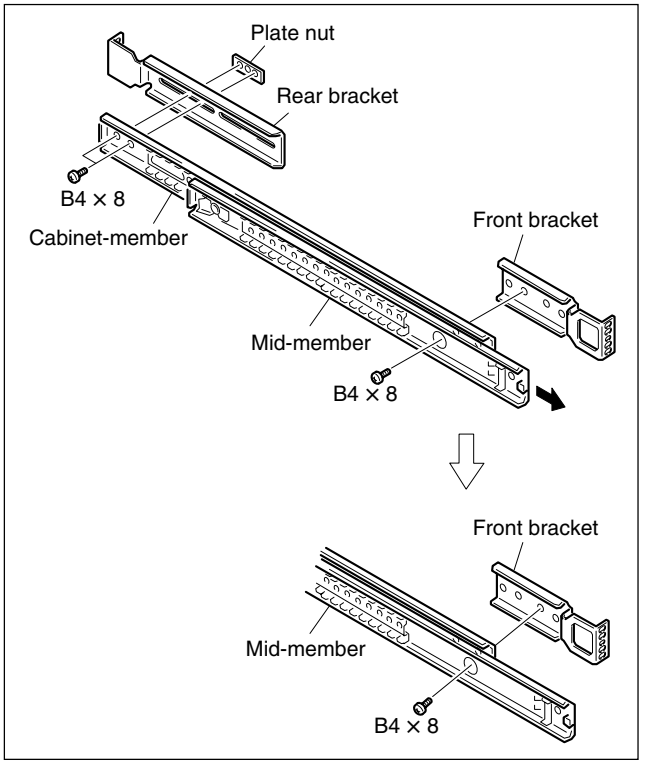
2. Attach the inner rails to the unit using the six screws (B4 × 8).



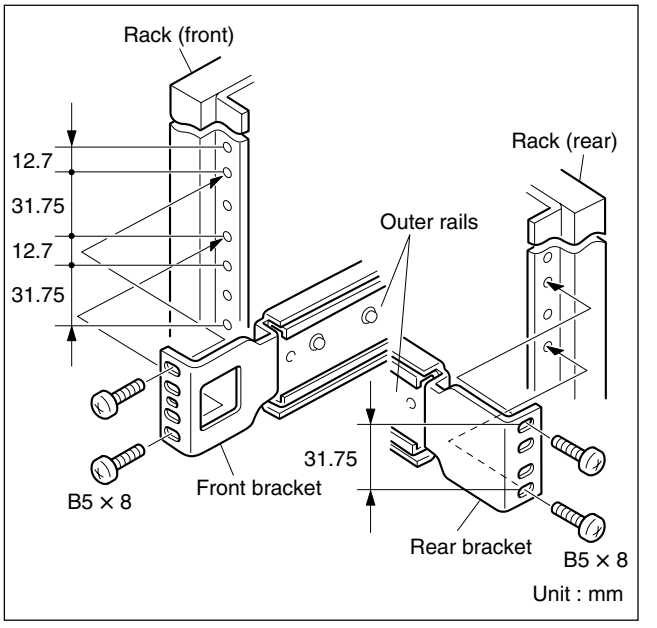
3. Attach the front and rear brackets to the outer rails using the eight screws (B4 × 8).

Notes

- When attaching the front bracket, slide the mid-member until the screw holes in the cabinet-member are visible through the hole in the mid-member as shown below.
- When attaching the rear bracket, adjust the position of the bracket with the rack depth.



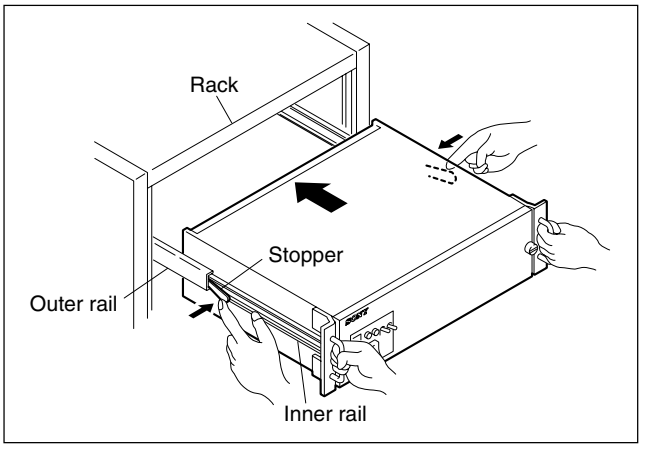
4. Attach the front and rear brackets to the outside of the rack temporarily using the eight screws (B5 × 8).



CAUTION

- Mount the unit with more than two persons.
  A one-man job may cause injury.
- If you forget to fasten the screws of the rack angle, the unit may slip and fall, causing injury.
  After rack mounting, be sure to fasten the screws.
- Install in a posture of stability.
  Injury could occur by drop of the unit in unbalance condition of installation or removal. Install in a posture of stability and carefully.
- Be careful not to catch your finger or hand in rack mount rail.

5. While pressing the stoppers of the inner rails, slide the inner rails fully into the outer rails, and push the unit into the rack slowly.

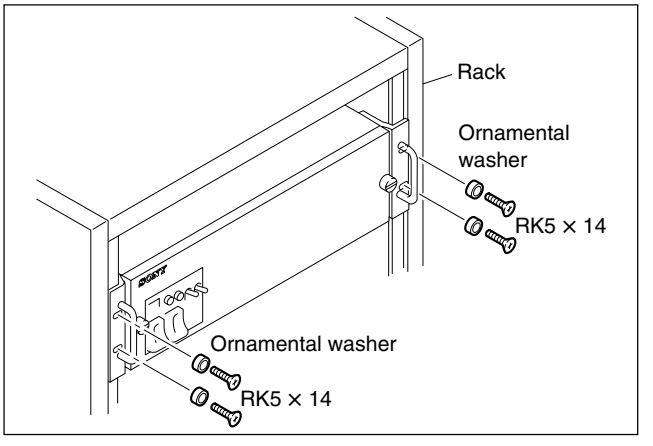


6. After confirming that the unit can be moved smoothly, tighten the screws (B5 × 8) secured temporarily in the step 4.

   Note

   When securing the front brackets to the rack by screws, pull the unit out of the rack about 20 cm (8 inches), and fasten the screws of the front brackets to the rack.

7. After installing the unit in the rack, fix the unit to the rack using the four screws (RK5 × 14) and four ornamental washers.



Section 2
System Setup

2-1. Setting the System Format

This unit can support input and output of multiple formats. It can also support various types of user's format by installing the optional circuit boards.
The slots to which the circuit boards are inserted and the internal switches of the unit differ depending upon the system used. They need to be set according to the system used.

HDCU-900 and list of optional boards

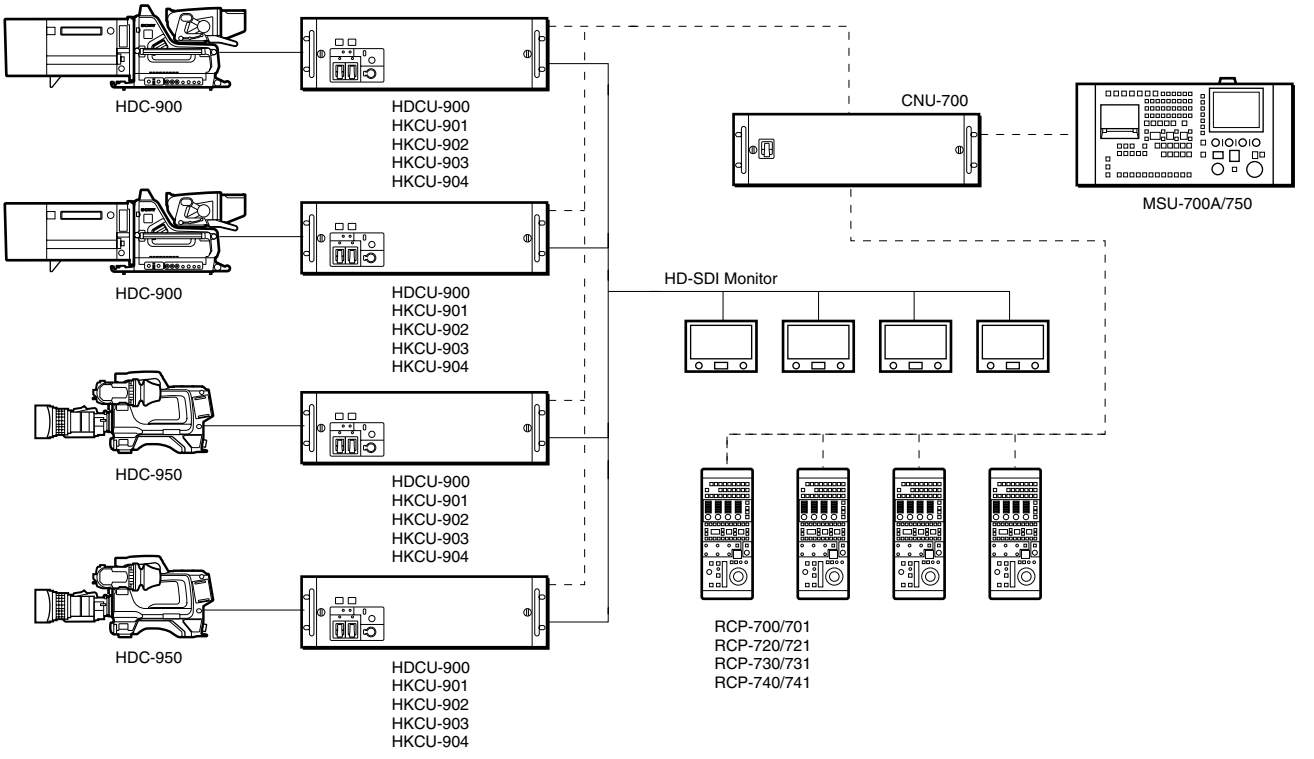
Model name	Board name (Slots on the front)	Board name (Slots on the rear)	Slot to be installed
HDCU-900	DPR-163	SDI-82	Fixed to the top most slot
	RC-86	DIF-102	Second or third slot from the top
	AT-141	–	Fixed to the bottom most slot
SD Analog Interface Unit HKCU-901	IF-789A*1/789P*2	VDA-57	Third slot from the top
HD Analgo Interface Unit HKCU-902	–	ADA-59	Second or third slot from the top
Frame Rate Converter Unit HKCU-903	FC-83	SDI-54B	Second slot from the top
Line Converter Unit HKCU-904	LC-41	SDI-54C	Second or third slot from the top

*1 : for UC
*2 : for CE

Notes

- Be sure to install the HKCU-901 of the same destination as the HDCU-900.
- When the HKCU-901 is going to be installed, confirm beforehand that the RC-86 board is installed in the second slot from the top on the front side, the DIF-102 board or the HKCU-902 is installed in the second slot from the top on the front side.
- When installing the optional boards, be sure to start installation from the second slot from the top on both the front side and rear side. Never install an optional board in the third slot from the top leaving the slots blank without installing the board.
- Be sure to install the HKCU-901/903/904 into the same slot on the front and rear sides.
- Do not install two or more of the same circuit boards at the same time.

2-1-1. HD System



Combination of boards

System format	Combination of boards (Slots on the front)		Signal input/output slot
	Second slot from the top	Third slot from the top	
1080/59.94I SDI	RC/FC/LC/–	RC/LC/IF*1/–	Top most slot
1080/59.94I SDI Film Like	FC	RC/LC/–	Second slot from the top
1080/59.94I Analog	RC*2	IF/–	Second slot from the top
	RC/FC/LC	–*3	Third slot from the top
1080/50I SDI	RC/FC/LC/–	RC/LC/IF*1/–	Top most slot

∗1 : When installing the IF-789A/789P board (HKCU-901), confirm that the RC-86 board is installed in the second slot from the top.
∗2 : The second slot from the top on the rear side must have the ADA-59 board (HKCU-902) installed.
∗3 : The third slot from the top on the rear side must have the ADA-59 board (HKCU-902) installed.

Setting switches

System format	Setting swtich					
	DPR-163 board (S804 : LOCAL)			AT-141 board	FC-83 board	
	S805	S807	S806	S603	S2	S3
1080/59.94I SDI	NOT	60	Intr	/1001	∗	∗
1080/59.94I SDI Film Like	NOT	48	PsF	/1001	30	i
1080/59.94I Analog	NOT	60	Intr	/1001	∗	∗
1080/50I SDI	NOT	50	Intr	/1000	∗	∗

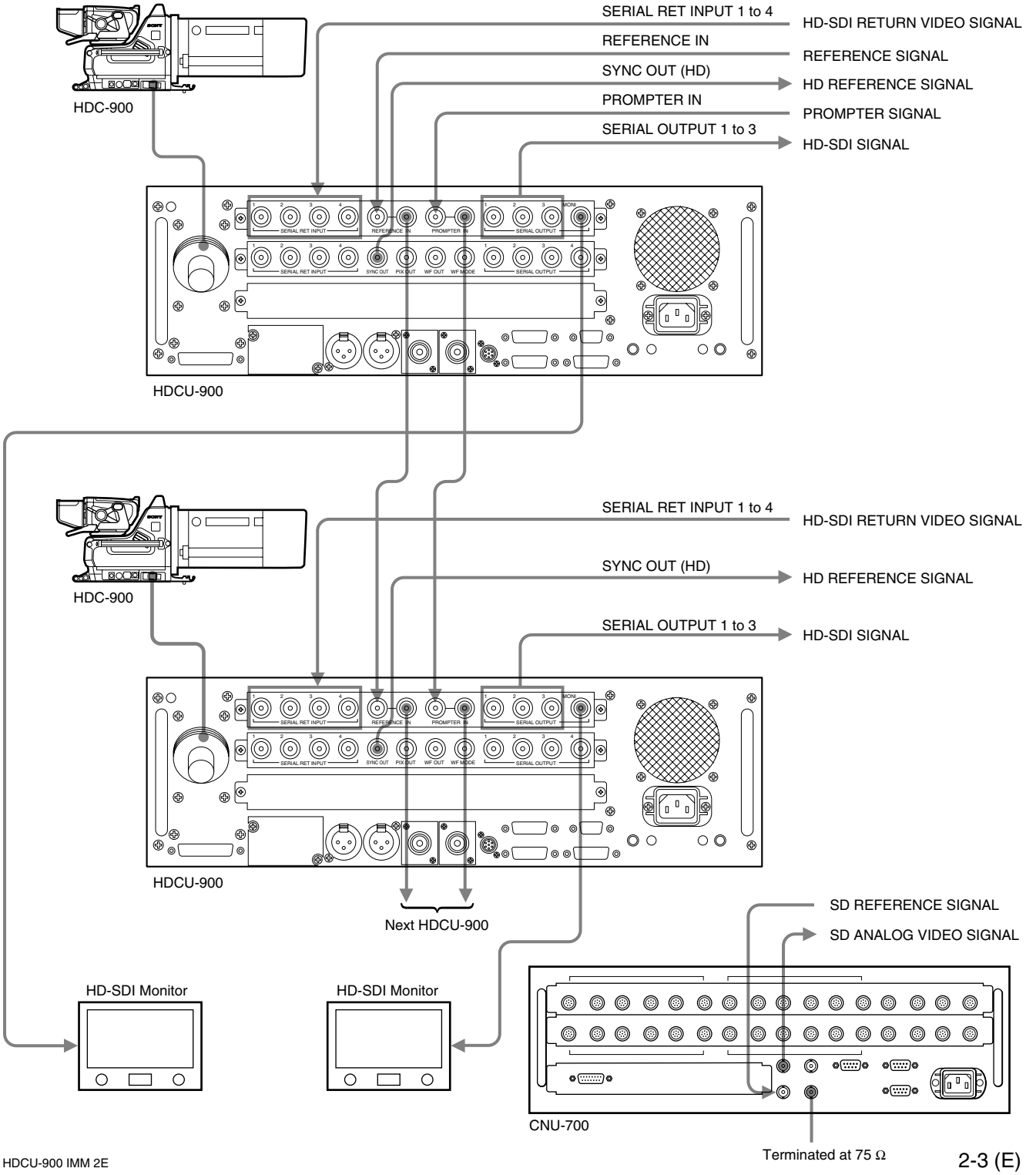
∗ : Don't care

Example of connection

System format : 1080/59.94I SDI

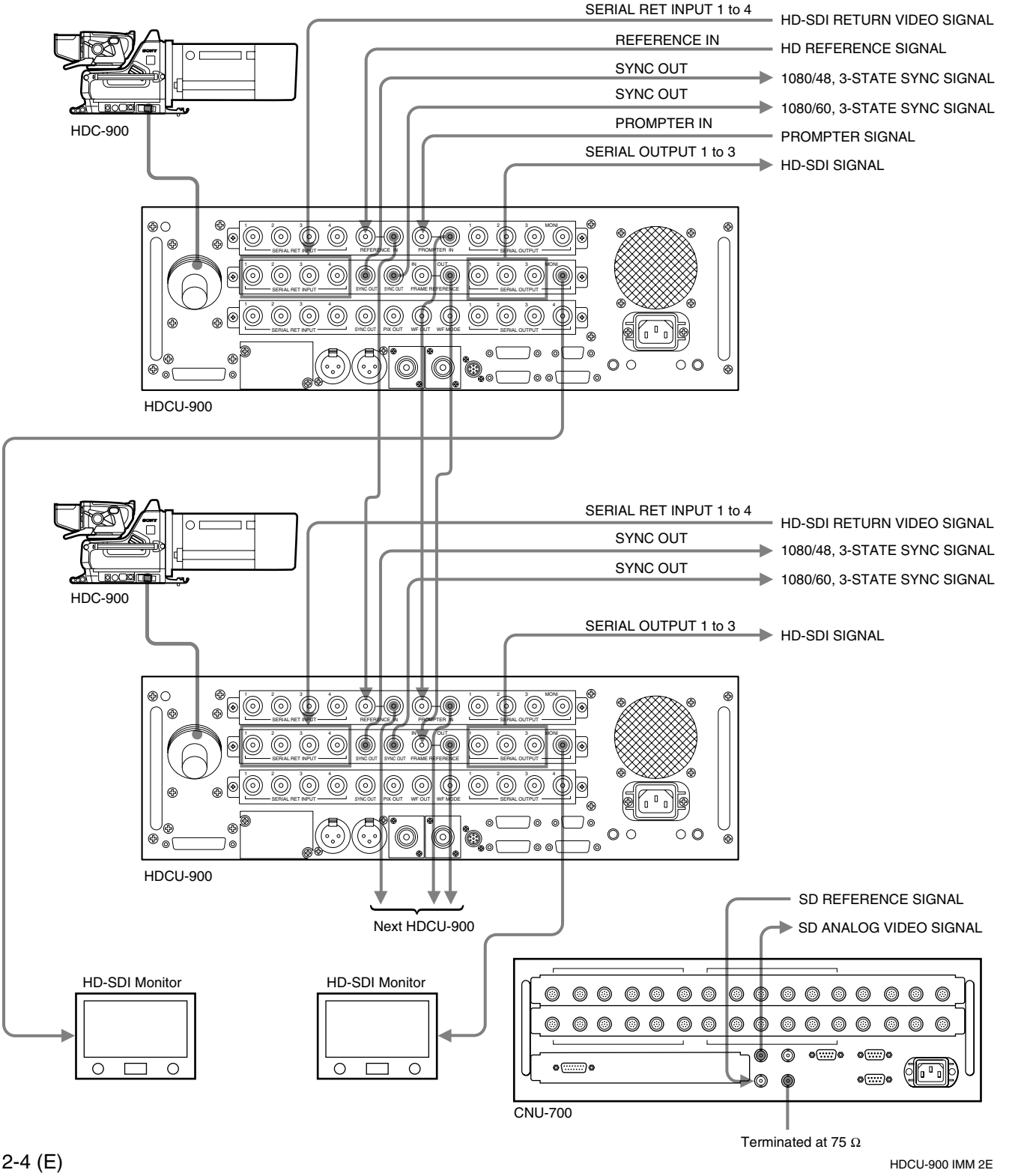
Required boards

Slot to be installed	Board name (Slots on the front)	Board name (Slots on the rear)	Remarks
Top most slot	DPR-163	SDI-82	HDCU-900
Second slot from the top	RC-86	DIF-102	HDCU-900
Third slot from the top	Blank	Blank	



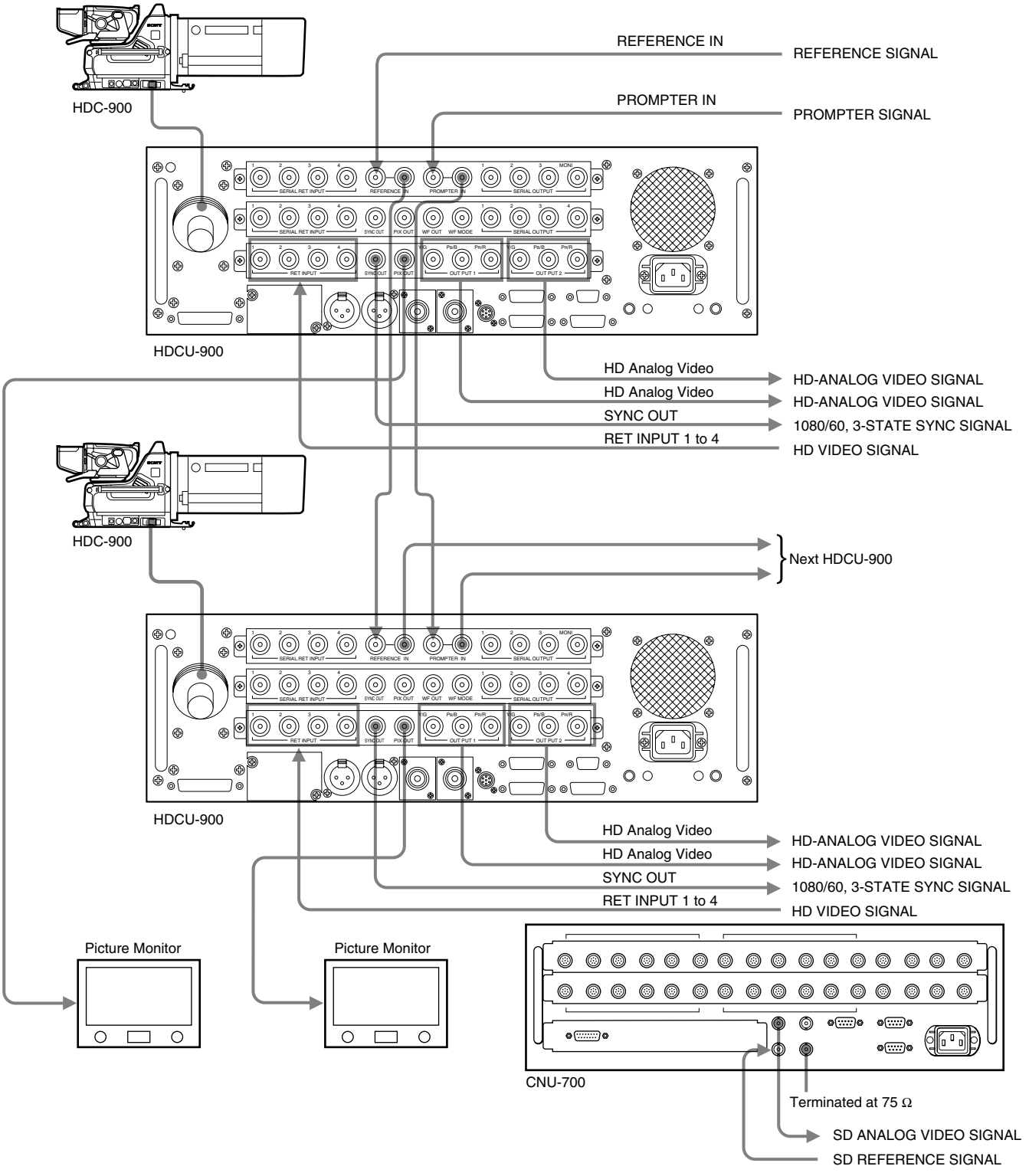
System format : 1080/59.94I SDI Film Like
Required boards

Slot to be installed	Board name (Slots on the front)	Board name (Slots on the rear)	Remarks
Top most slot	DPR-163	SDI-82	HDCU-900
Second slot from the top	FC-83	SDI-54B	HKCU-903
Third slot from the top	RC-86	DIF-102	HDCU-900

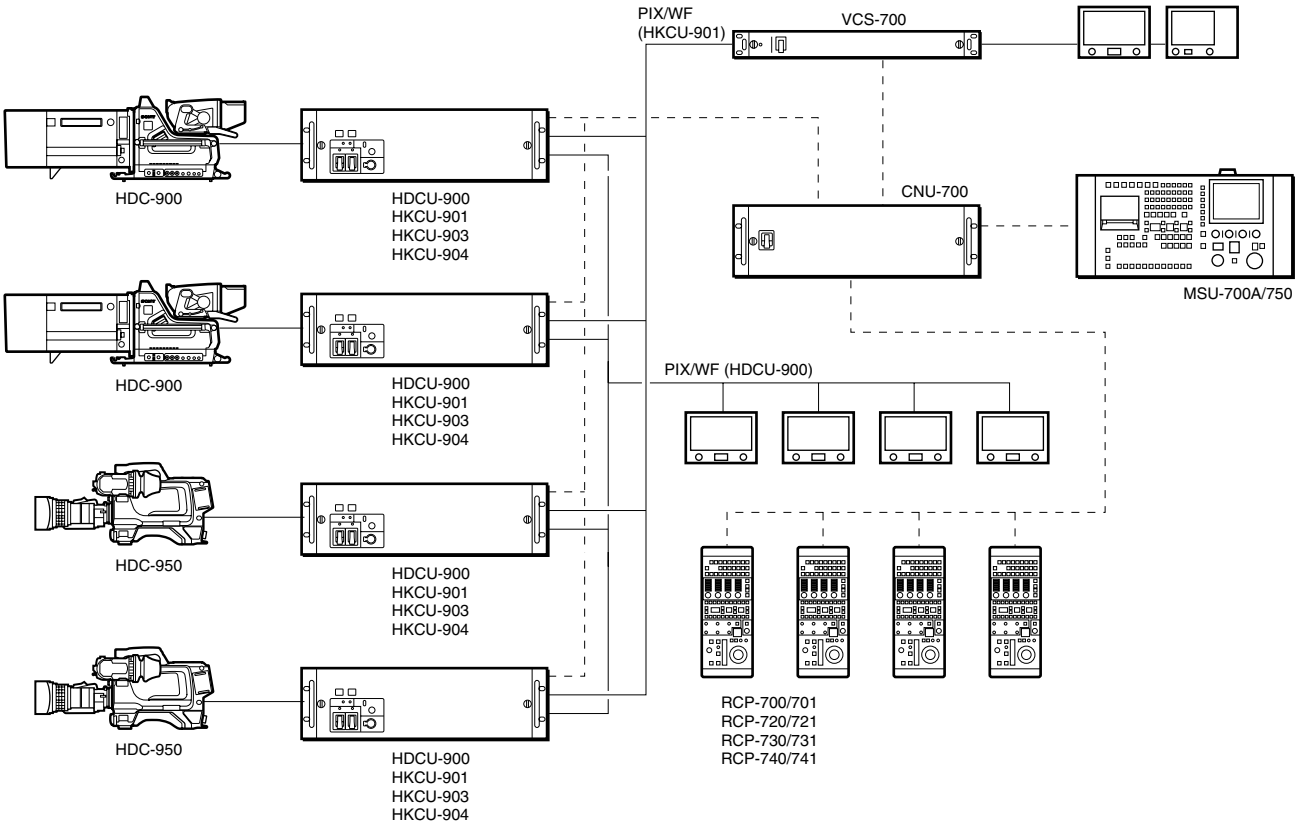


System format : 1080/59.94I Analog
Required boards

Slot to be installed	Board name (Slots on the front)	Board name (Slots on the rear)	Remarks
Top most slot	DPR-163	SDI-82	HDCU-900
Second slot from the top	RC-86	DIF-102	HDCU-900
Third slot from the top	Blank	ADA-59	HKCU-902



2-1-2. SD System



Combination of boards

System format	Combination of boards (Slots on the front)		Signal input/output slot
	Second slot from the top	Third slot from the top	
525/59.94I SDI	RC	LC/IF/–	Second slot from the top
525/29.97 PSF SDI Film Like	FC	RC	Third slot from the top
NTSC	RC	IF	Third slot from the top
625/50I SDI	RC	LC/IF/–	Second slot from the top
PAL	RC	IF	Third slot from the top

Setting switches

System format	Switch setting						
	DPR-163 board (S804 : LOCAL)			AT-141 board	FC-83 board		RC-86 board
	S805	S807	S806	S603	S2	S3	S802
525/59.94I SDI	NOT	60	Intr	/1001	*	*	525
525/29.97 PSF SDI Film Like	NOT	48	PsF	/1001	*	*	525
NTSC	NOT	60	Intr	/1001	*	*	525
625/50I SDI	NOT	50	Intr	/1000	*	*	625
PAL	NOT	50	Intr	/1000	*	*	625

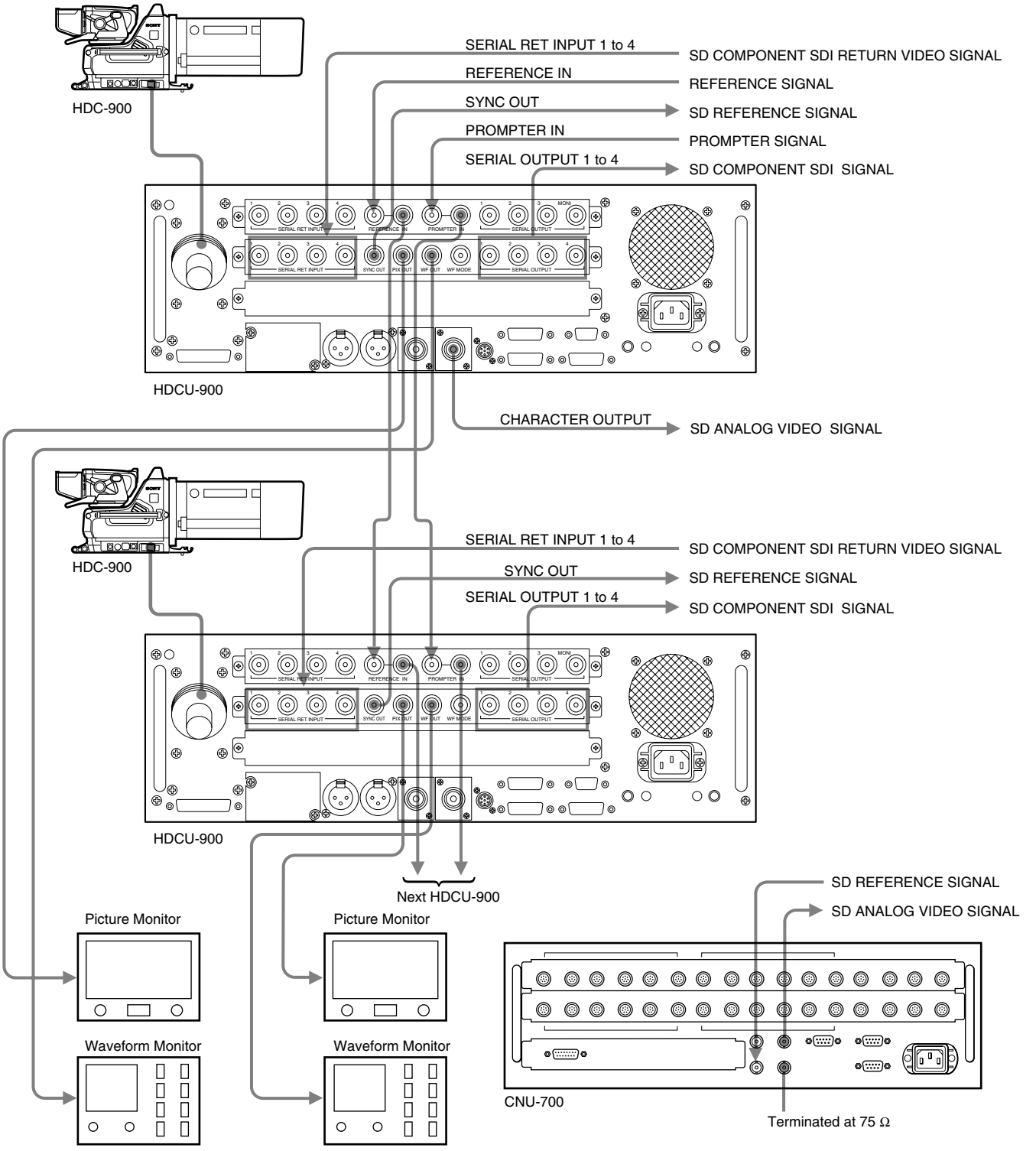
* : Don't care

Example of connection

System format : 525/59.94I SDI

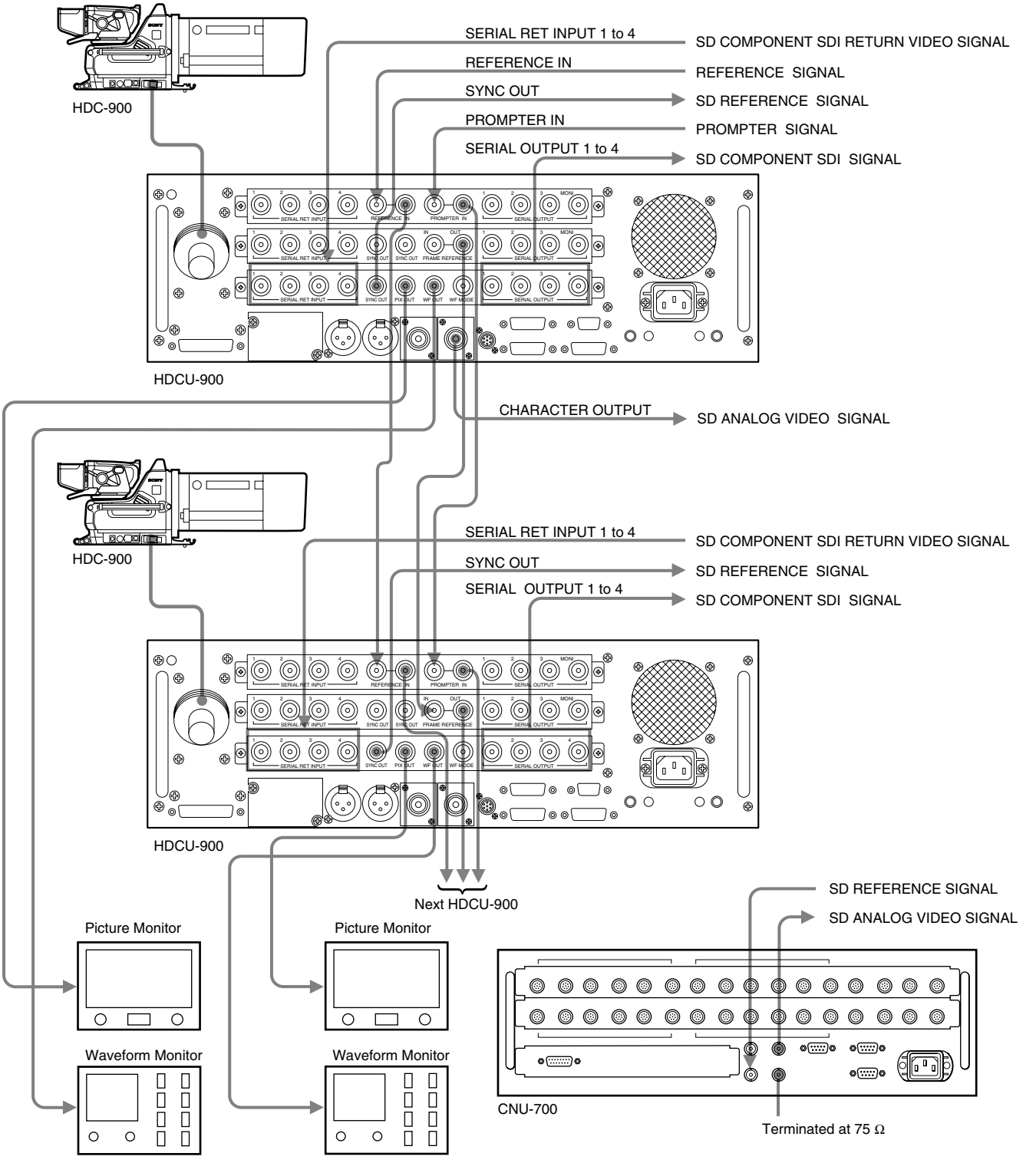
Required boards

Slot to be installed	Board name (Slots on the front)	Board name (Slots on the rear)	Remarks
Top most slot	DPR-163	SDI-82	HDCU-900
Second slot from the top	RC-86	DIF-102	HDCU-900
Third slot from the top	Blank	Blank	



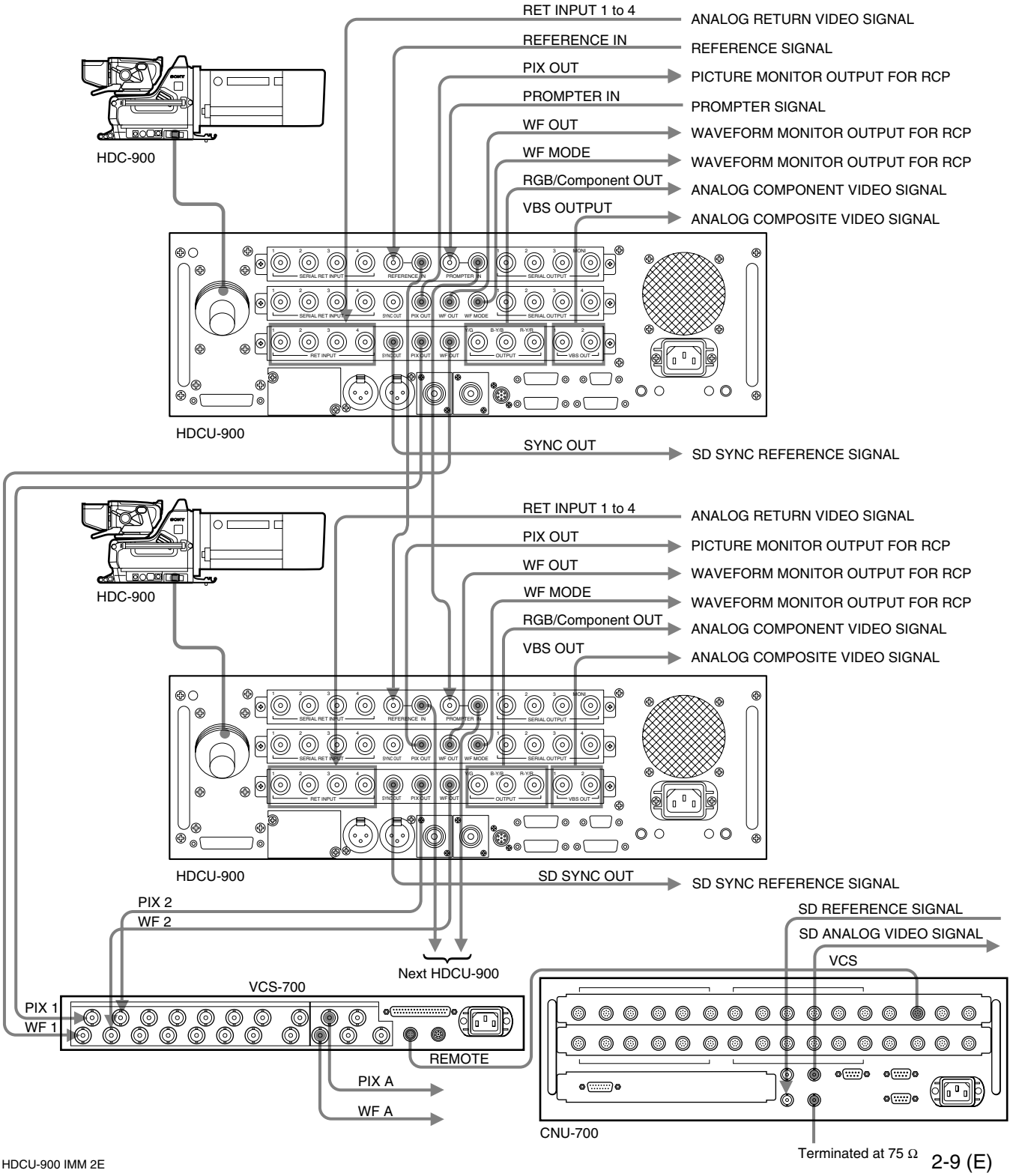
System format : 525/29.97 PsF SDI Film Like
Required boards

Slot to be installed	Board name (Slots on the front)	Board name (Slots on the rear)	Remarks
Top most slot	DPR-163	SDI-82	HDCU-900
Second slot from the top	FC-83	SDI-54B	HKCU-903
Third slot from the top	RC-86	DIF-102	HDCU-900

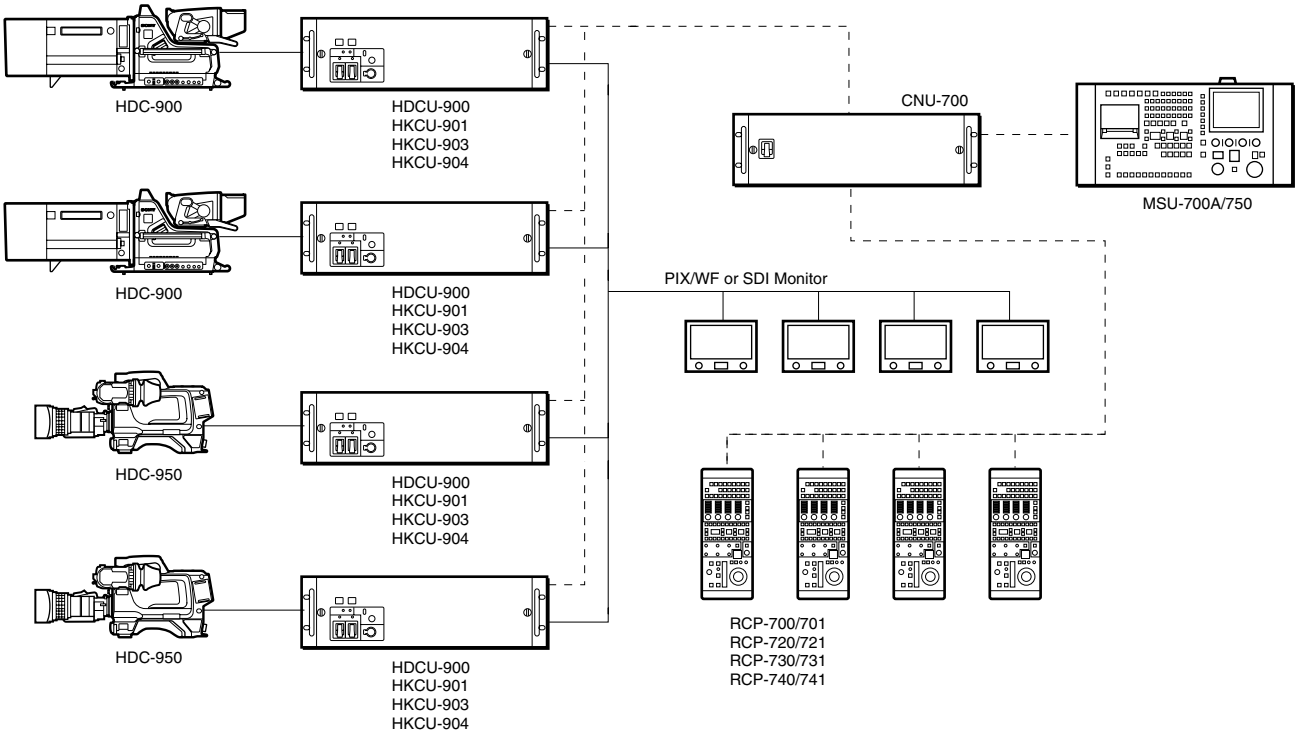


System format : NTSC
Required boards

Slot to be installed	Board name (Slots on the front)	Board name (Slots on the rear)	Remarks
Top most slot	DPR-163	SDI-82	HDCU-900
Second slot from the top	RC-86	DIF-102	HDCU-900
Third slot from the top	IF-789A/789P	VDA-57	HKCU-901



2-1-3. Progressive and Cinema Production System



Combination of boards

System format	Combination of boards (Slots on the front)		Signal input/output slot
	Second slot from the top	Third slot from the top	
720/59.94P SDI	RC/FC	LC	Third slot from the top
720/59.94P SDI Film Like	FC	LC	Third slot from the top
1080/23.98PsF SDI	RC/FC/LC/–	RC/LC/–	Top most slot
1080/24PsF SDI	RC/FC/LC/–	RC/LC/–	Top most slot
1080/25PsF SDI	RC/FC/LC/–	RC/LC/IF*4/–	Top most slot
1080/29.97PsF SDI	RC/FC/LC/–	RC/LC/IF*4/–	Top most slot
1080/30PsF SDI	RC/FC/LC/–	RC/LC/–	Top most slot
525/29.97PsF SDI	RC	LC/IF/–	Second slot from the top

*4 : When the IF-789A/789P board (HKCU-901) is going to be installed, confirm beforehand that the RC-86 board is installed in the second slot from the top.

Setting switches

System format	Switch setting							
	DPR-163 board (S804 : LOCAL)			AT-141 board	FC-83 board		LC-41 board	RC-86 board
	S805	S807	S806	S603	S2	S3	S2	S802
720/59.94P SDI	540P	∗	∗	/1001	∗	∗	720P	∗
	NOT	60	Intr					
720/59.94P SDI Film Like	NOT	48	PsF	/1001	∗	∗	720P	∗
1080/23.98PsF SDI	NOT	48	PsF	/1001	∗	∗	∗	∗
1080/24PsF SDI	NOT	48	PsF	/1000	∗	∗	∗	∗
1080/25PsF SDI	NOT	50	PsF	/1000	∗	∗	∗	∗
1080/29.97PsF SDI	NOT	60	PsF	/1001	∗	∗	∗	∗
1080/30PsF SDI	NOT	60	PsF	/1000	∗	∗	∗	∗
525/29.97PsF SDI	NOT	60	PsF	/1001	∗	∗	∗	525

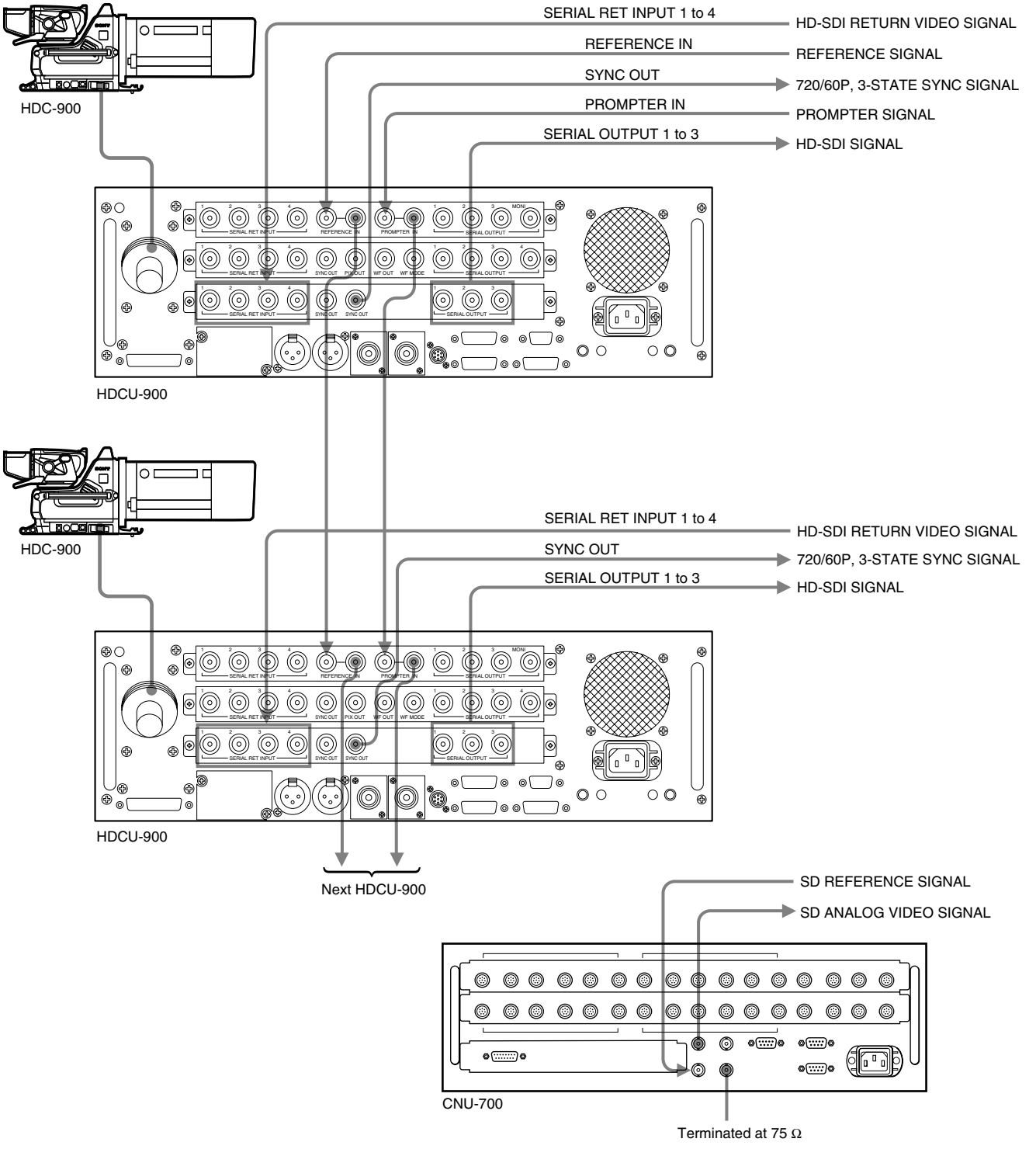
∗ : Don’t care

Example of connection

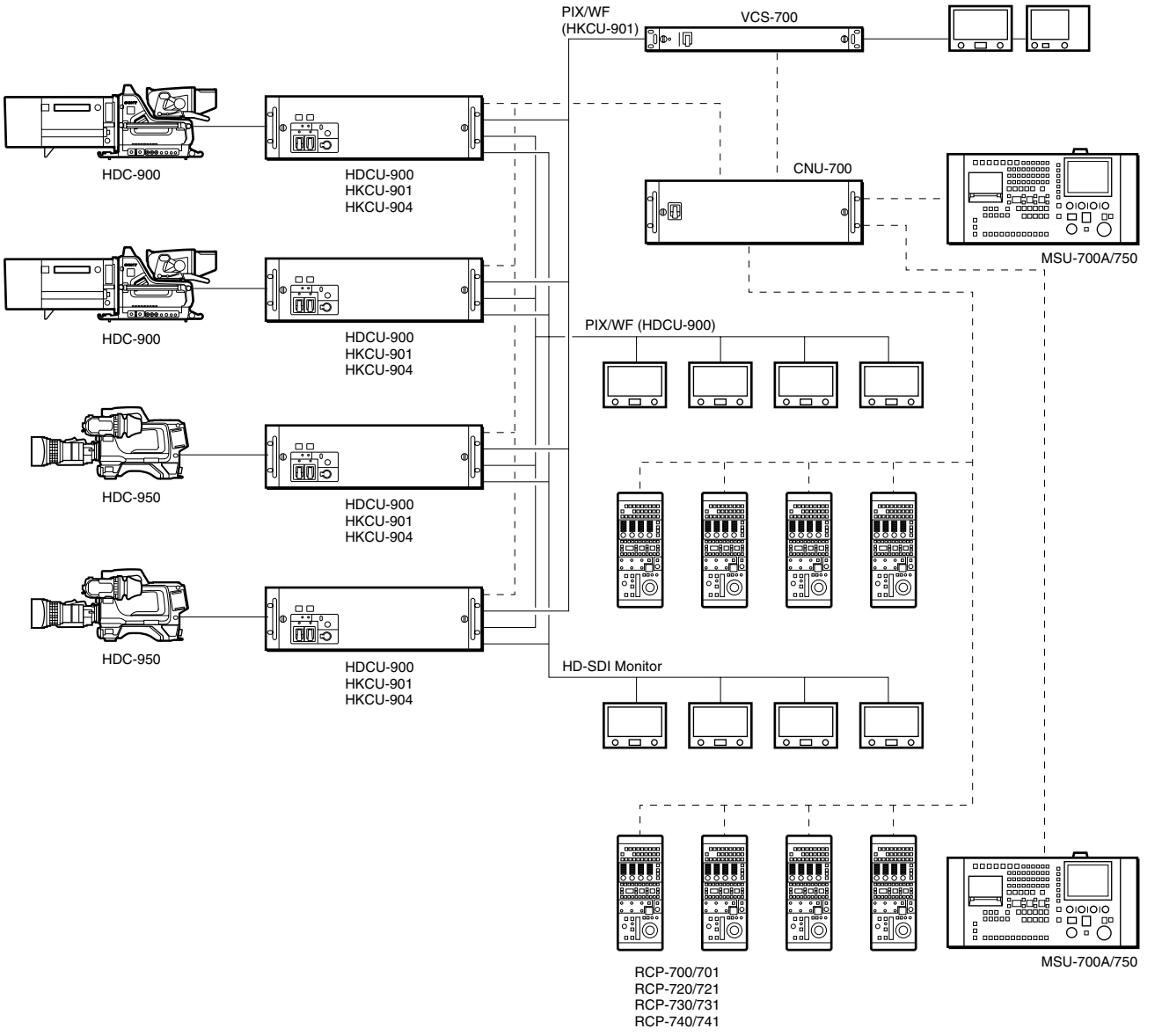
System format : 720/59.94P SDI

Required boards

Slot to be installed	Board name (Slots on the front)	Board name (Slots on the rear)	Remarks
Top most slot	DPR-163	SDI-82	HDCU-900
Second slot from the top	RC-86	DIF-102	HDCU-900
Third slot from the top	LC-41	SDI-54C	HKCU-904



2-1-4. HD/SD Simul-Cast System



Combination of boards

System format		Combination of boards (Slots on the front)		Signal input/output slot
HD	**SD**	**Second slot from the top**	**Third slot from the top**	
1080/59.94I SDI	525/59.94I SDI	RC	LC/IF/–	Top most slot or second slot from the top
1080/59.94I SDI	NTSC	RC	IF	Top most slot or third slot from the top
1080/50I SDI	625/50I SDI	RC	LC/IF/–	Top most slot or second slot from the top
1080/50I SDI	PAL	RC	IF	Top most slot or third slot from the top
720/59.94I SDI	525/59.94I SDI	RC	LC	Second slot from the top or third slot from the top

Setting switches

System format		Switch setting					
		DPR-163 board (S804 : LOCAL)			AT-141 board	LC-41 board	RC-86 board
HD	**SD**	**S805**	**S807**	**S806**	**S603**	**S2**	**S802**
1080/59.94I SDI	525/59.94I SDI	NOT	60	Intr	/1001	*	525
1080/59.94I SDI	NTSC	NOT	60	Intr	/1001	*	525
1080/50I SDI	625/50I SDI	NOT	50	Intr	/1000	*	625
1080/50I SDI	PAL	NOT	50	Intr	/1000	*	625
720/59.94I SDI	525/59.94I SDI	540P	*	*	/1001	720P	525
		NOT	60	Intr			

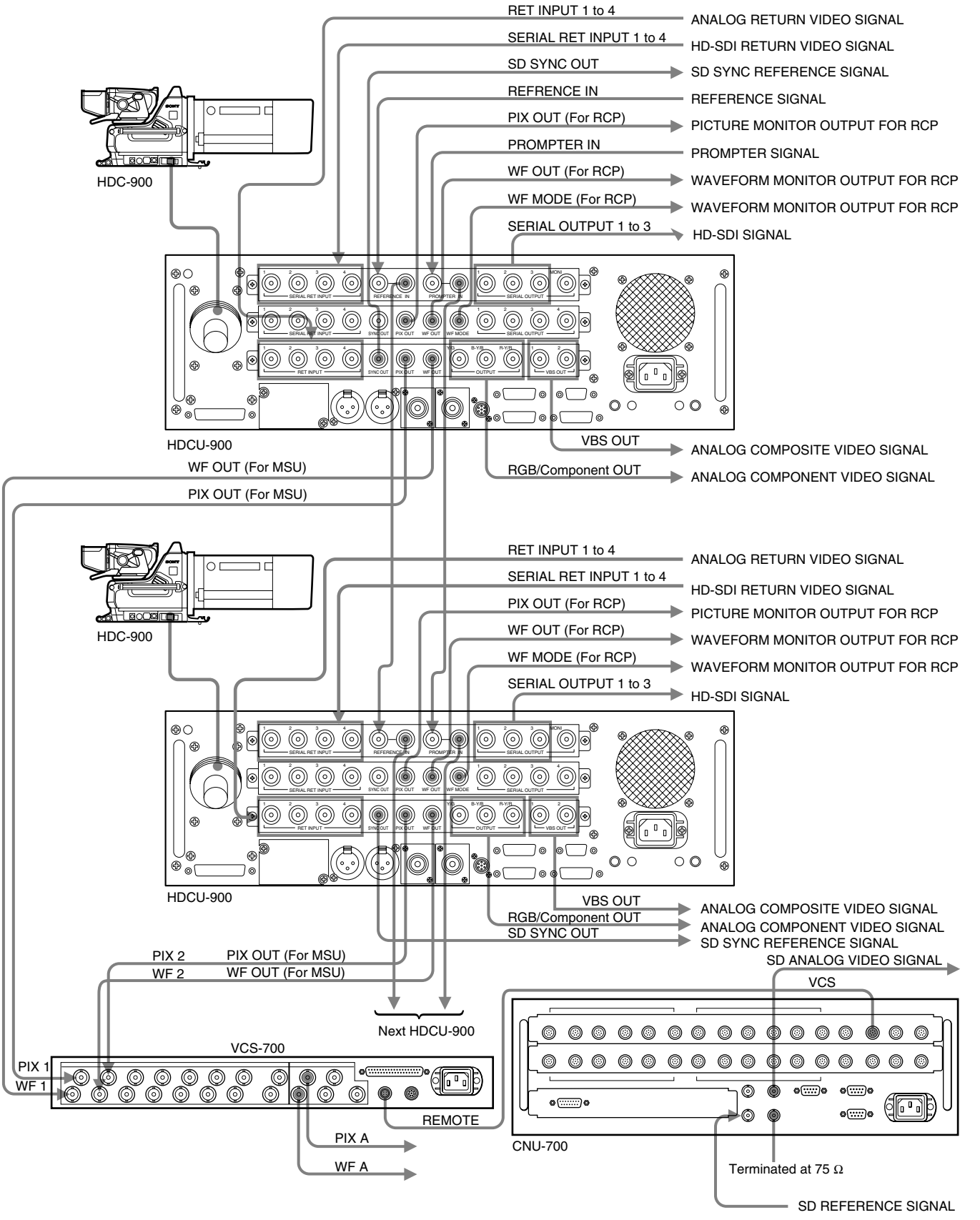
* : Don't care

Example of connection

System format : HD : 1080/59.94I SDI, SD : NTSC

Required boards

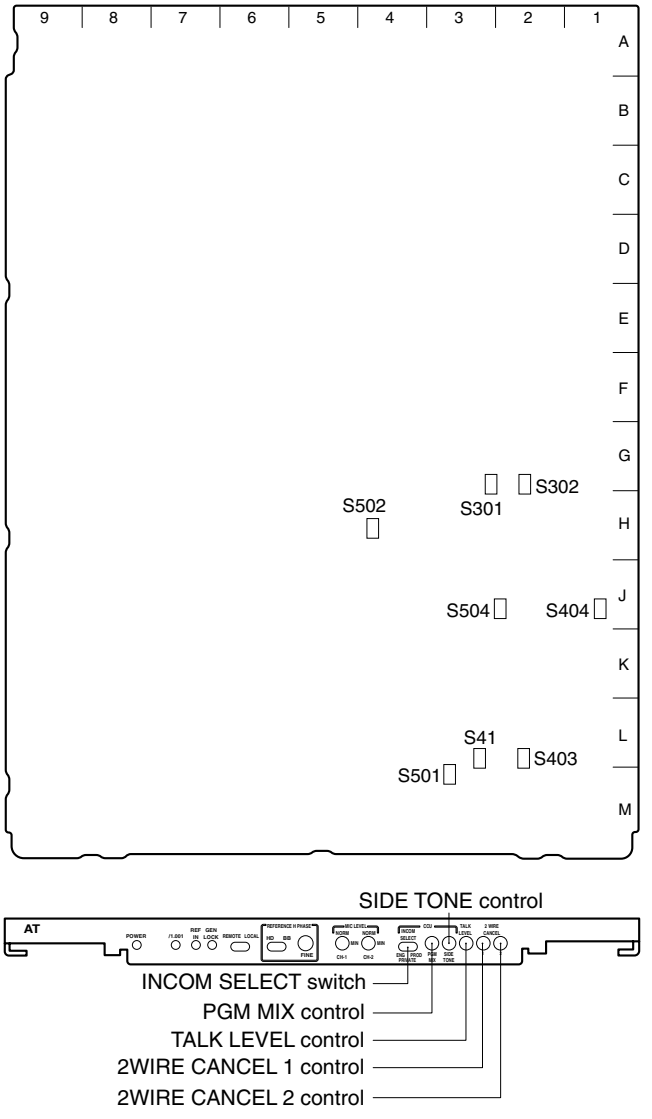
Slot to be installed	Board name (Slots on the front)	Board name (Slots on the rear)	Remarks
Top most slot	DPR-163	SDI-82	HDCU-900
Second slot from the top	RC-86	DIF-102	HDCU-900
Third slot from the top	IF-789A/789P	VDA-57	HKCU-901


RET INPUT 1 to 4
ANALOG RETURN VIDEO SIGNAL
SERIAL RET INPUT 1 to 4
HD-SDI RETURN VIDEO SIGNAL
SD SYNC OUT
SD SYNC REFERENCE SIGNAL
REFRENCE IN
REFERENCE SIGNAL
PIX OUT (For RCP)
PICTURE MONITOR OUTPUT FOR RCP
PROMPTER IN
PROMPTER SIGNAL
WF OUT (For RCP)
WAVEFORM MONITOR OUTPUT FOR RCP
WF MODE (For RCP)
WAVEFORM MONITOR OUTPUT FOR RCP
SERIAL OUTPUT 1 to 3
HD-SDI SIGNAL
HDC-900
HDCU-900
VBS OUT
ANALOG COMPOSITE VIDEO SIGNAL
RGB/Component OUT
ANALOG COMPONENT VIDEO SIGNAL
WF OUT (For MSU)
PIX OUT (For MSU)
HDC-900
HDCU-900
VBS OUT
ANALOG COMPOSITE VIDEO SIGNAL
RGB/Component OUT
ANALOG COMPONENT VIDEO SIGNAL
SD SYNC OUT
SD SYNC REFERENCE SIGNAL
PIX 2
PIX OUT (For MSU)
WF 2
WF OUT (For MSU)
SD ANALOG VIDEO SIGNAL
VCS
Next HDCU-900
VCS-700
PIX 1
WF 1
REMOTE
PIX A
WF A
CNU-700
Terminated at 75 Ω
SD REFERENCE SIGNAL

2-2. Audio System

2-2-1. Setting the Intercom System

This unit can be connected to the intercom lines (producer line and engineer line) of the two independent systems and can be switch them.
The intercom systems conforming to this unit are 4W, RTS and Clear-Com. The internal switches of the unit need to be set according to the system used.



AT-141 board (A side/panel side)

1. Selecting the intercom system

Select a system (4W, RTS or Clear-Com) respectively for the engineer line and the producer line according to the system used. Then, select the number of intercom line systems (1ch or 2ch).

- **Selecting the producer line** :
  Set switches S41/504 (PROD SELECT) on the AT-141 board according to the system used.
  Factory setting : 4W (S504)
  RTS (S41)
- **Selecting the engineer line** :
  Set switches S403/404 (ENG SELECT) on the AT-141 board according to the system used.
  Factory setting : 4W (S404)
  RTS (S403)
- **When the intercom line is 1 channel** :
  Set switch S502 (INPUT SELECT) on the AT-141 board to 1 ch. Then, connect the intercom line to the producer line of this unit.
  When the switch is set in this position, connection of the intercom line of this unit is fixed to the producer line regardless of the setting of the INTERCOM PROD/ENG switch of the HDC-900/950 and the INCOM SELECT switch of this unit.
- **When the intercom line is 2 channels** :
  Set switch S502 (INPUT SELECT) on the AT-141 board to 2ch.
  Factory setting : 2ch

Adjusting the RTS cancel

When the RTS intercom system is used, the following adjustment also needs to be made.

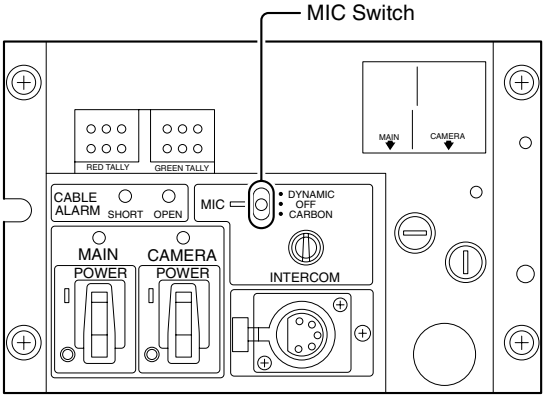
(1) Connect a headset to the INTERCOM connector on the front and perform the procedure described in the following paragraph “2. Setting the headset microphone”.
(2) Fully rotate the SIDE TONE control of the AT-141 board panel counter-clockwise to minimize the side tone.
(3) Set the INCOM SELECT switch of the AT-141 board panel to PROD.
(4) Speak into the microphone of the headset and adjust the 2WIRE CANCEL1 control of the AT-141 board panel to minimize the side tone.
(5) Set the INCOM SELECT switch on the AT-141 board panel to ENG.
(6) Speak into the microphone of the headset and adjust the 2WIRE CANCEL2 control of the AT-141 board panel to minimize the side tone.
(7) Return the SIDE TONE control on the AT-141 board panel to its original position or to the desired position of user.

Note

When setting S504 and S404 to RTS, be sure to connect them to the RTS system. Otherwise, they oscillate and have adverse effects on the peripheral circuits.

2. Setting the headset microphone

Set the MIC switch on the front panel according to the type of headset microphone to be connected to the INTERCOM connector on the front.
When using a carbon microphone : CARBON
When using a dynamic microphone : DYNAMIC
When no microphone is connected : OFF (factory setting)



- **Adjusting amount of the side tone**
  Use the SIDE TONE control on the AT-141 board panel and adjust amount of the side tone to be connected to the INTERCOM connector on the front fit your needs.
- **Adjusting the TALK level**
  Use the TALK LEVEL control on the AT-141 board panel and adjust the TALK level of headset to fit your needs.

3. Setting the input level of the PGM audio signal

Set switches S301 (PGM1 SEL) and S302 (PGM2 SEL) on the AT-141 board to 0 dBu or −20 dBu according to each level of audio 1 and 2 of the system.
Factory setting : 0 dBu

- **Adjusting the mix amount of the PGM audio signal**
  Use the PGM MIX control on the AT-141 board panel and adjust mix amount of the PGM audio signal of the headset connected to the INTERCOM connector on the front fit your needs.

4. Selecting an intercom line to be connected to the INTERCOM connector

Use the switch on the AT-141 board panel to select the intercom line to be connected to the INTERCOM connector on the front as follows.

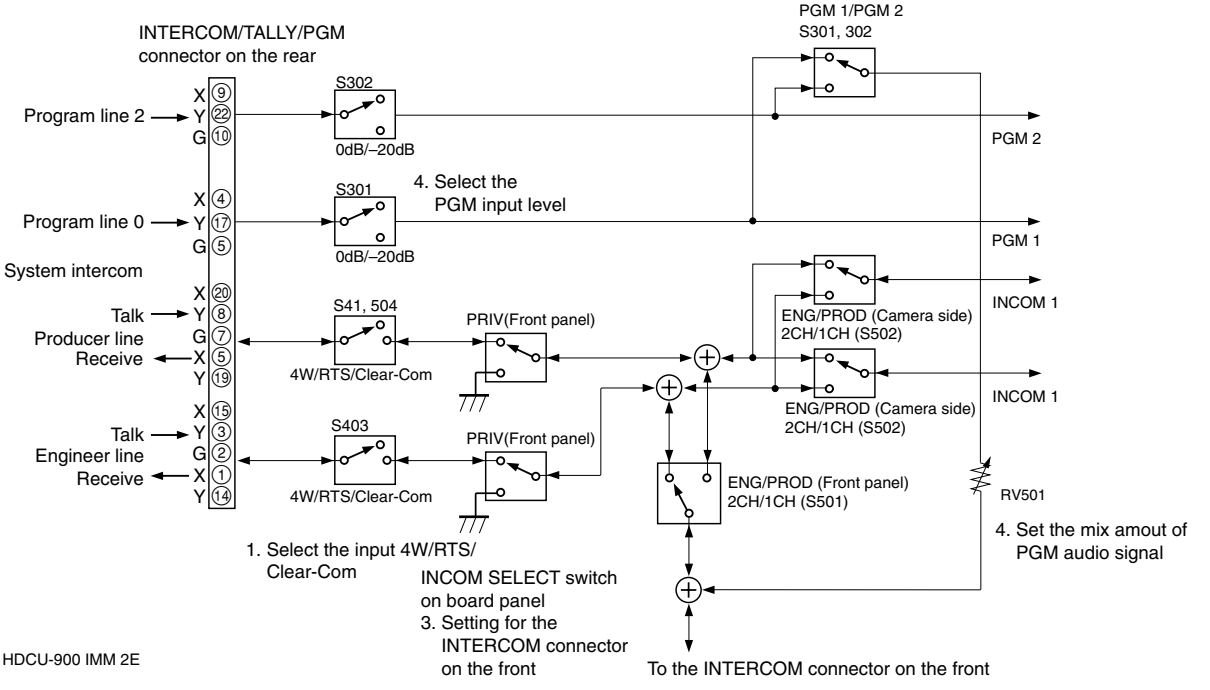
- **When connecting to the producer line** :
  Set the INCOM SELECT switch to PROD.
- **When connecting to the engineer line** :
  Set the INCOM SELECT switch to ENG.
- **When connecting only a camera** :
  Set the INCOM SELECT switch to PRIV. When this position is set, the intercom from outside is cut and the system consists of the intercom and camera.
- **When connecting to both the engineer line and producer line** :
  Set switch S501 (INCOM MIX) on the AT-141 board to ON. When this position is set, the intercom is fixed to PRIV line regardless of the setting.
  Factory setting : OFF

Note

When switch S502 (INPUT SELECT) on the AT-141 board is set to 1 ch, the INCOM SELECT switch on the AT-141 board panel of the unit and the camera are fixed to the producer line regardless of the setting.

5. Setting the AT-141 board switch

The flow of the switch setting on the AT-141 board and the intercom signals is as follows.



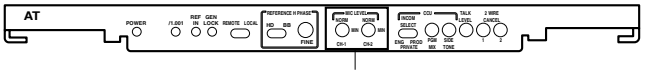
2-2-2. Setting the Microphone

This unit can output the two independent microphone lines (MIC 1, MIC 2) of video camera HDC-900/950 as it receives these MIC signals.

Controlling the Microphone Input Level Using the Remote Control

This unit can adjust the input level of the MIC connector of camera HDC-900/950 using the remote control in the range of −60 dBu to −20 dBu in 10 dBu steps using either of the following methods.

1. Adjusting the microphone input level using the MIC LEVEL switch



AT-141 board (panel side)

When the MIC REMOTE connector on the rear is connected to nothing or the levels of pin-8 (MIC 1) and pin-15 (MIC 2) of the MIC REMOTE connector are High, use the MIC LEVEL switch on the AT-141 board panel of the unit to set the microphone input level.
Factory setting : NORM (60 dBu)

2. Adjusting the input level of the microphone using the MIC REMOTE connector

Set the microphone input level control to ON or OFF via pin-8 and pin-15 of the MIC REMOTE connector on the rear as shown below. The input level can be controlled via pin-5, pin-6 and pin-7 as shown in the table on the top-right.

Setting the microphone input control of the video camera

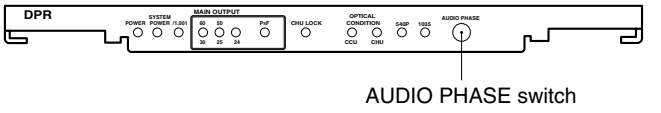
Pin No.		Microphone connector	
8	**15**	**MIC IN CH-1**	**MIC IN CH-2**
L	L	ON	ON
L	H	ON	OFF
H	L	OFF	ON
H	H	Internal setup (MIC LEVEL switch on the AT-141 board panel)	

Setting the microphone input control of the video camera

Pin No.	7	6	5
−60 dBu	H	H	H
−50 dBu	L	H	H
−40 dBu	H	L	H
−30 dBu	L	L	H
−20 dBu	H	H	L

H : +5 V or OPEN
L : GND
Input resistance : Pulled-up 47 kΩ +5 V

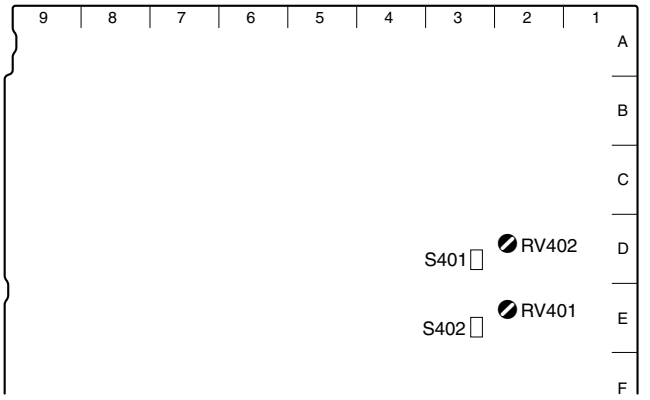
3. Adjusting the MIC signal phase



DPR-163 board (panel side)

When the PGM microphone signal phase is in advance with respect to the video signal phase in use, adjust the audio phase using the AUDIO PHASE switch on the DPR-163 board panel to adjust amount of audio delay. Each step of the switch corresponds to about 5 ms delay.
Example 7 : 1 FRAME DELAY (30 FRAME/SEC)
8 : 1 FRAME DELAY (25 FRAME/SEC)
Factory setting : 0

Setting the Microphone Output Level



AT-141 board (A side)

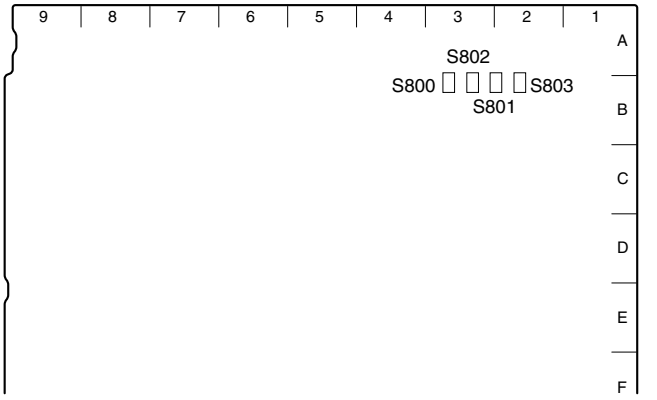
Select the microphone output signal level (0 dB, −20 dBu) from the AUDIO OUTPUT connector on the rear using the switches on the AT-141 board.
Setting the output level of MIC OUTPUT 1 :
Switch S402 (MIC 1 OUT LEVEL)
Setting the output level of MIC OUTPUT 2 :
Switch S401 (MIC 2 OUT LEVEL)
Factory setting : 0 dBu (both S401 and S402)

The microphone output signal level from the AUDIO OUTPUT connector on the rear can be adjusted using the volume on the AT-141 board.
Setting the output level of MIC OUTPUT 1 :
⊘RV401 (MIC 1 OUT LEVEL)
Setting the output level of MIC OUTPUT 2 :
⊘RV402 (MIC 2 OUT LEVEL)

2-3. Systems

2-3-1. Setting the Tally System

This unit supports the red tally and the green tally. It also supports the MAKING CONTACT and supplying power (24 V/TTL). Set the switches on the AT-141 board according to the system used as follows :



AT-141 board (A side)

Set the tally system as shown in the following table.

Setting the tally system

	Red tally		Green tally	
Switch	**S800**	**S802**	**S801**	**S803**
MAKING CONTACT	CONTACT	–	CONTACT	–
Supplying 24 V power	POWER	POWER	POWER	POWER
Supplying 5 V power	POWER	TTL	POWER	TTL

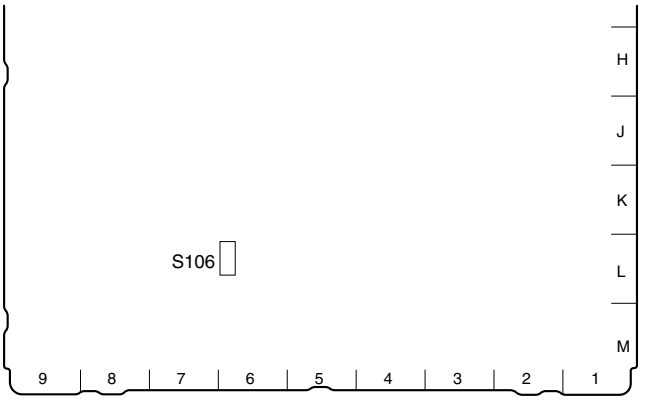
Switches S800 and S801 are set to CONTACT when the unit is shipped from the factory.

2-3-2. Setting the Camera Number

System that does not use CNU-700/500

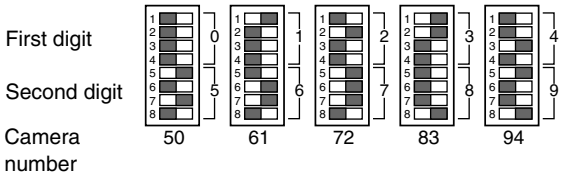
Use switch S106 on the AT-141 board to set the camera number.

Use switches 1 to 4 to set the first digit and use switches 5 to 8 to set the second digit. “0” to “f” can be set as each digit, but “a” to “f” are invalid. Camera numbers 1 to 96 can be set.



AT-141 board (A side)

(Example of setting)



System that uses CNU-700/500

The CCU connector number on the rear of the CNU-700/500 is the camera number. For example, the camera number of the CCU video camera that is connected to the CCU 1 connector is 1.

2-3-3. Connecting the Control, Intercom and Tally Audio Signals

An example of connection is described on the next page.

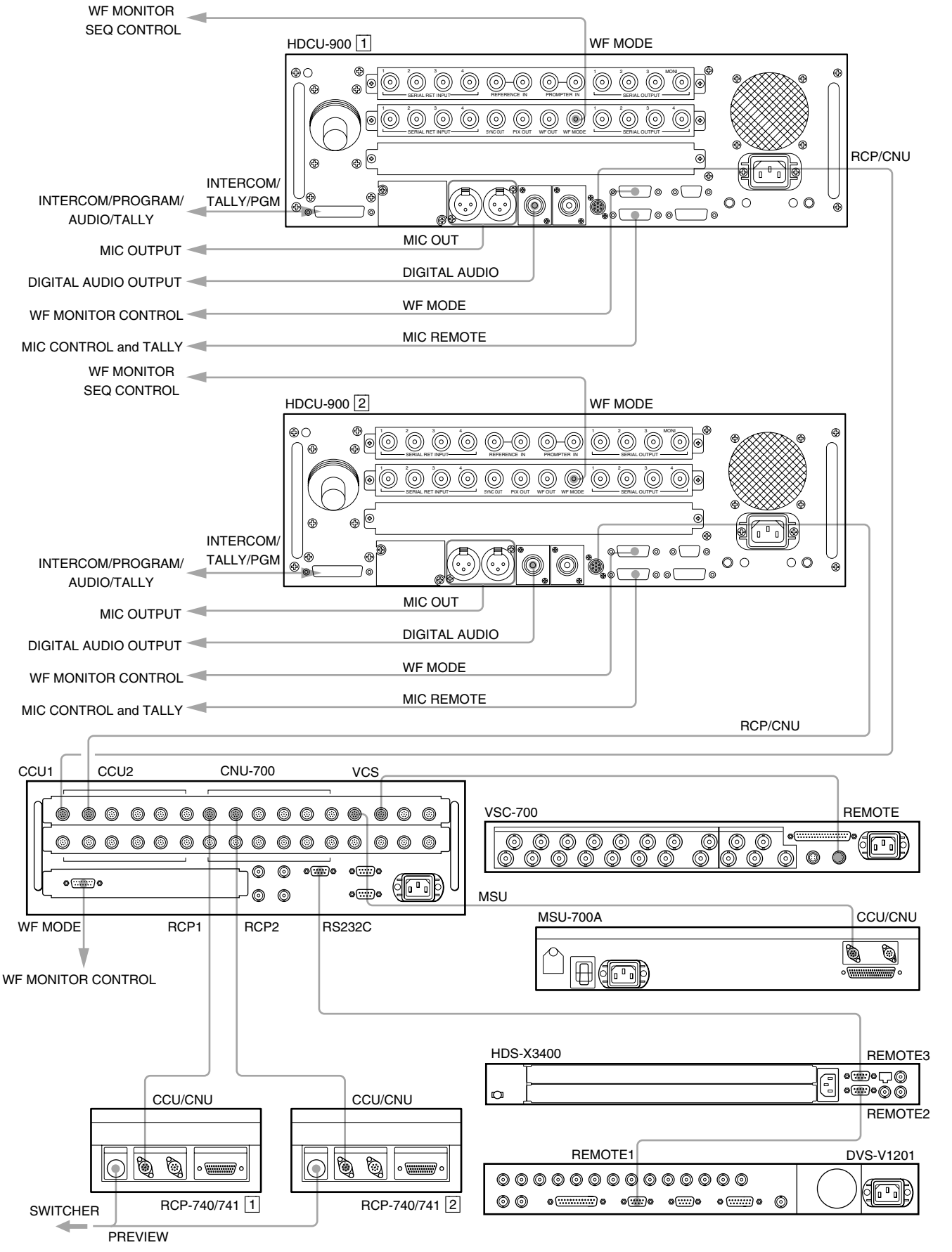
Selecting a waveform monitor

The recall type or the 1730HD/1735HD waveform monitor can be selected as a waveform monitor to be connected to the WF MODE connector of the HDCU-900 or CNU-700 camera command network unit. The recall type or 1730HD/1735HD waveform monitor is selected using switch S103-4 (WFM CTL SIGNAL SEL) and switch S103-5 (RECALL TYPE CTL MODE SEL) on the AT-141 board of the HDCU-900, and the switch inside the CNU-700. In the recall type waveform monitor, a display mode is set (preset) and selected (recall) externally.

For the details of the procedure for setting using the switch on the AT-141 board of the HDCU-900, refer to Section 1-5-1, “Settings of Switches and Controls on Boards−AT-141 Board”.

In case of cascaded connection of the DVS-V1201 SD digital video routing switcher :

Set unit address switch “5” of REMOTE2 of the DVS-V1201 SD digital video routing switcher to ON and set the other switches to OFF. For cascaded connection of the DVS-V1201 SD digital video routing switcher when at least 13 cameras are used, set unit address switch “6” of the second camera to ON and set the other switches to OFF.


WF MONITOR
SEQ CONTROL
HDCU-900 1
WF MODE
RCP/CNU
INTERCOM/
TALLY/PGM
INTERCOM/PROGRAM/
AUDIO/TALLY
MIC OUTPUT
MIC OUT
DIGITAL AUDIO OUTPUT
DIGITAL AUDIO
WF MONITOR CONTROL
WF MODE
MIC CONTROL and TALLY
MIC REMOTE
WF MONITOR
SEQ CONTROL
HDCU-900 2
WF MODE
INTERCOM/
TALLY/PGM
INTERCOM/PROGRAM/
AUDIO/TALLY
MIC OUTPUT
MIC OUT
DIGITAL AUDIO OUTPUT
DIGITAL AUDIO
WF MONITOR CONTROL
WF MODE
MIC CONTROL and TALLY
MIC REMOTE
RCP/CNU
CCU1
CCU2
CNU-700
VCS
VSC-700
REMOTE
MSU
MSU-700A
CCU/CNU
WF MODE
RCP1
RCP2
RS232C
WF MONITOR CONTROL
HDS-X3400
REMOTE3
REMOTE2
CCU/CNU
CCU/CNU
REMOTE1
DVS-V1201
SWITCHER
PREVIEW
RCP-740/741 1
RCP-740/741 2

2-4. Video Signal System

The equipment that is used for this unit and the HDC-900/950 series camera system were set to the specified level when shipped from the factory. Before operating, check the signal levels between each equipment and adjust them if required. Some adjustments can be performed using the maintenance menu of the MSU-700A/750 instead of using the control or switches on the board. Perform the basic adjustments on the board and perform the fine adjustments on the maintenance menu.

2-4-1. Selecting the Input/Output Signal

Select the input/output terminal signal of the rear panel according to the video system to be installed.

2-4-2. Adjusting the Signal Phase

Adjust the signal phase of the unit. Before adjustment, input the next sync signal to the unit and each of the equipment used.

HDCU-900

REFERENCE
HD ternary SYNC : 0.6 V p-p
Or
black burst signal : 40 IRE (0.3 V p-p)
(SMPTE318M (10F-BB) is also acceptable.)

Note

When the VBS signal of HKCU-901 is used when (SC phase lock is required), use the black burst signal.

HKCU-903

FRAME REFERENCE
HD ternary SYNC : 0.6 V p-p
Or
black burst signal : 40 IRE (0.3 V p-p)
sequence pulse : 40 IRE (0.3 V p-p)

CNU-700/500

Signal in which sync signal is included
Signal level : 40 IRE (0.3 V p-p)

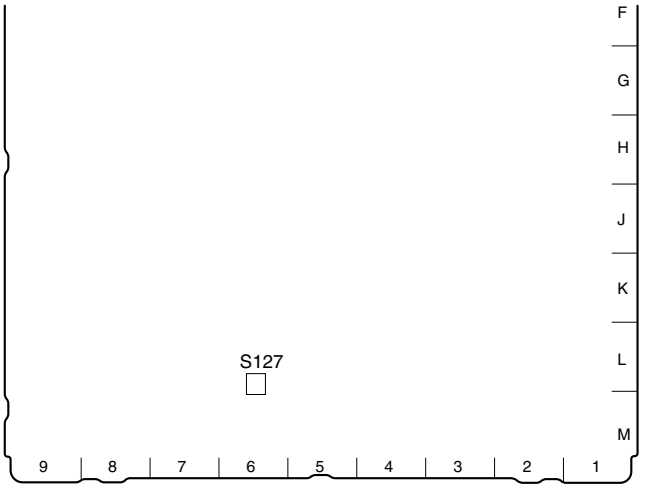
Waveform monitor

Sync signal specified by waveform monitor

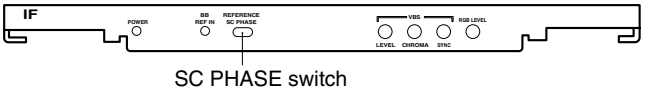
Adjusting the Phase of the Sync Signal

Adjust the phase of the output signal to match it with that of the reference signal. Perform the adjustment using the switch on the AT-141 board and the control switch on AT-141/IF-789A/789P board (HKCU-901) panel of the unit. The adjustment also can be performed on the maintenance menu of the MSU-700A/750. For more details, refer to the System Manual.

How to adjust on the AT-141/IF-789A/789P (HKCU-901) board of the unit



AT-141 board (A side/pane side)



IF-789A/789P board (panel side)

1. Set the REFERENCE REMOTE/LOCAL selector switch on the AT-141 board panel to LOCAL.
2. Select the type of external sync signal using the REFERENCE SIGNAL selector switch on the AT-141 board panel.
   HD : HD ternary SYNC
   BB : BB (black burst) signal
   Factory setting : HD
3. When setting HD in step 2:
   1) Coarse-adjust the H phase using switch S127 (H-PHASE COARSE) on the AT-141 board, then fine-adjust it using the H PHASE FINE control on the AT-141 board panel.

   When selecting BB in step 2 :
   1) Coarse-adjust the H phase using switch S127 (H-PHASE COARSE) on the AT-141 board, then fine-adjust using the H PHASE FINE control on the AT-141 board panel.
   2) Adjust the SC phase using switch SC PHASE on the IF-789A/789P board (HKCU-901) panel (when the BB signal is selected as a reference).

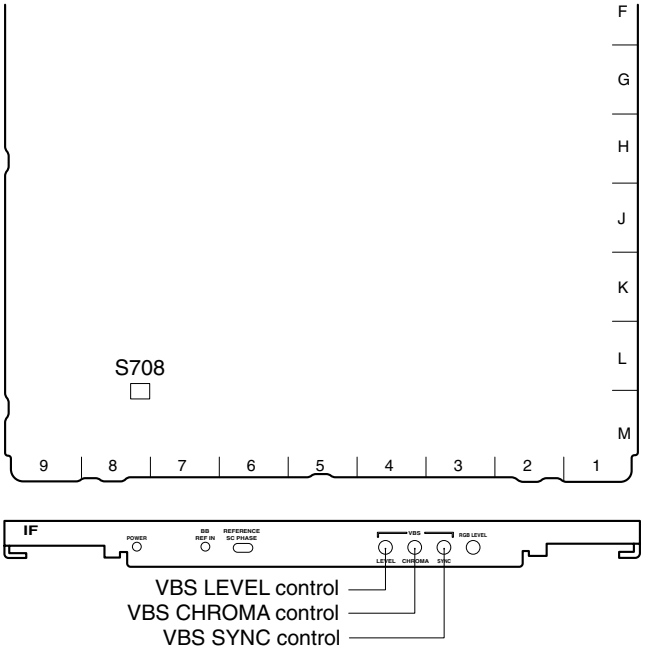
Note

When using 10F-BB (NTSC 10-field sequence BB) of SMPTE318M as BB, the frame sequences of the 30 Hz frame frequency and the 24 Hz frame frequency can be locked by setting switch S122 (10F-BB) on the AT-141 board to ON.

2-4-3. Level Adjustment of the VBS Signal (only when HKCU-901 is installed)

Adjust the level of the VBS signal output from the unit using the color bar signal.
Use the switch on the IF-789A/789P board (HKCU-901) and the control on the panel of the unit for adjustment. The adjustment also can be performed on the maintenance menu of the MSU-700A/750. For more details, refer to the System Manual.

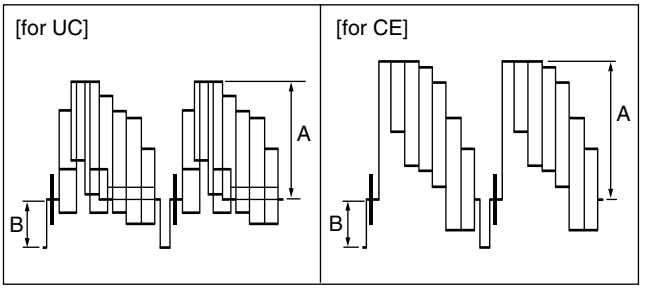
How to adjust using the IF-789A/789P board (HKCU-901) of the unit



IF-789A/789P board (A side/panel side)

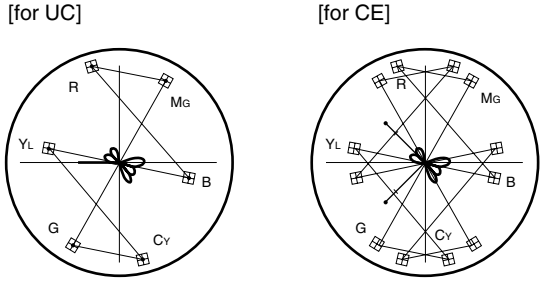
1. Set switch S708-1 on the IF-789A/789P board to ON.
   Factory setting : OFF
2. Press the BARS button of the MSU-700A/750, RCP-700 series, etc. to display the color bars on the waveform or vector monitor.

3. Adjust the color bar signal using the VBS LEVEL, VBS CHROMA and VBS SYNC controls on the IF-789A/789P board panel so that it is within the specified level.
   Measurement point : VBS OUT 1 connector on the HDCU rear panel
   Specifications : A = 100 ±1 IRE [for UC]
   A = 700 ±7 mV p-p [for CE]
   (VBS LEVEL control)
   B = 40.0 ±0.4 IRE [for UC]
   B = 300 ±3 mV p-p [for CE]



(VBS SYNC control)

Each luminescent spot on the vector monitor must be within the "⊞" range.



(VBS CHROMA control)

Setting after Adjustment

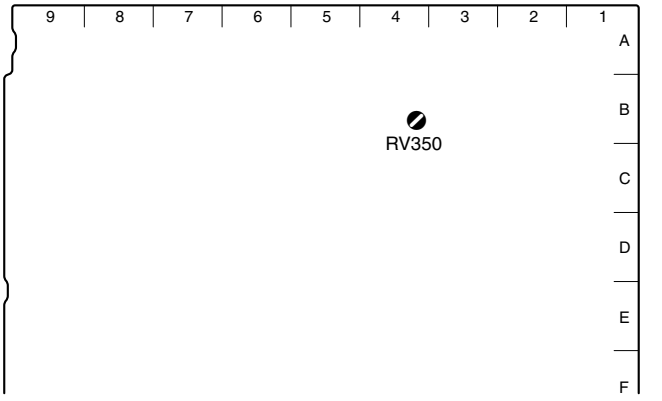
Reset switch S708-1 on the IF-789A/789P board to OFF.

2-4-4. Adjusting the Level of Signals for Waveform Monitor

The video output signal of the unit can be checked on the waveform monitor connected to the WF output connector. Adjust the WF output signal level using the color bar signal.
In the system with the MSU-700A/750, CNU-700/500 or VCS-700, the video output signal can be checked on the waveform monitor connected to the VCS-700.

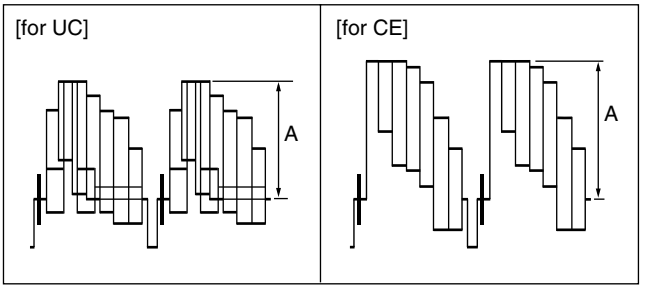
Adjusting the WF Output Signal Level

How to adjust on the RC-86 board of the unit



RC-86 board (A side)

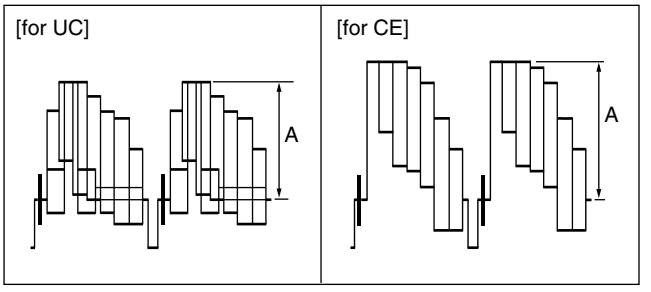
1. Press the BARS button of the MSU-700A/750, RCP-740/741, etc., or press the ENC button of the WAVEFORM MONITOR buttons (or MONITOR SELECT buttons) to display the color bars on the waveform monitor.
2. Adjust the color bar signal using control RV350 (WFM GAIN) on the RC-86 board so that it is within the specified level.
   Measurement point : WF OUT connector on the HDCU rear panel
   Specification : A = 100 ±1 IRE [for UC]
   A = 700 ±7 mVp-p [for CE]



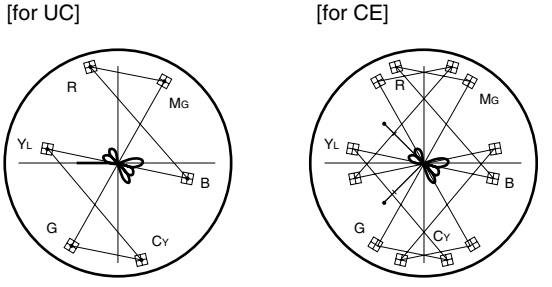
How to adjust using the VCS-700

In the system with the MSU-700A/750, CNU-700/500 or VCS-700, the video output signal of the unit can be checked on the waveform or vector monitor connected to the WF A OUTPUT connector and the WF B OUTPUT connector of the VCS-700.
Connect the WF OUT connector of the DIF-102 board or VDA-57 board (HKCU-901) to the WF 1 connector of the VCS-700 and connect the PIX OUT connector to the PIX 1 connector. Then adjust the signal level using the color bar signal.

1. Press the BARS button of the MSU-700A/750, RCP-740/741, etc., or press the ENC button of the WAVEFORM MONITOR buttons (or MONITOR SELECT buttons) to display the color bars on the waveform or vector monitor.
2. Set the CONTROL switch of the VCS-700 to RESET.
3. Adjust the color bars signal using the WFM 1 LEVEL and WFM 1 CHROMA controls of the VCS-700 so that it is within the specified level.
   Measurement point : PIX OUT connector on the VCS-700
   Specification : A = 100 ±1 IRE [for UC]
   A = 700 ±7 mV p-p [for CE]
   (WFM 1 LEVEL control)



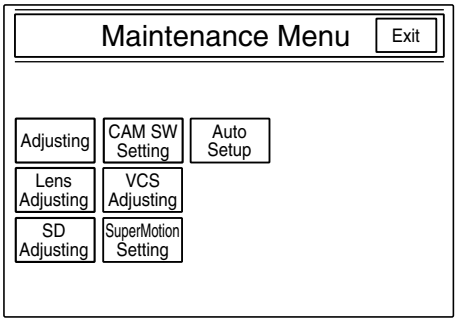
Each luminescent spot on the vector monitor must be within the "⊞" range.
(WFM 1 CHROMA control)



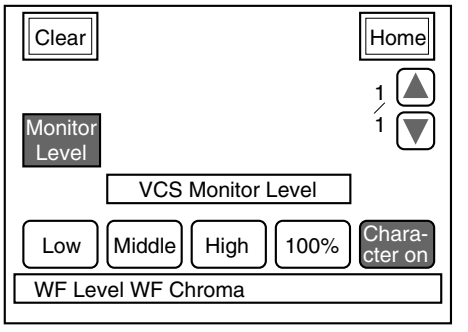
How to adjust using the MSU-700A/750

The signal level can be adjusted by using the MSU-700A/750 instead of using the controls of the VCS-700.

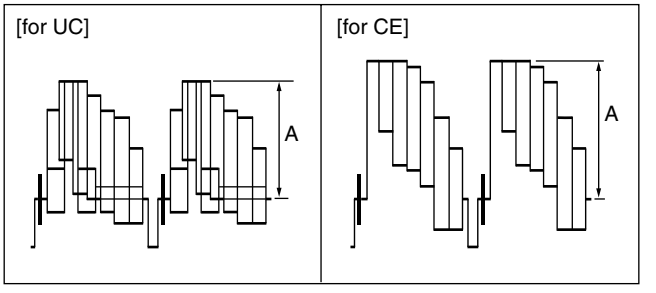
1. Press the MAINTENANCE button of the MODE block of the MSU-700A/750 so that the button lights. The maintenance menu is displayed.



2. Press VCS Adjusting.
   The VCS monitor level adjustment item menu is displayed.

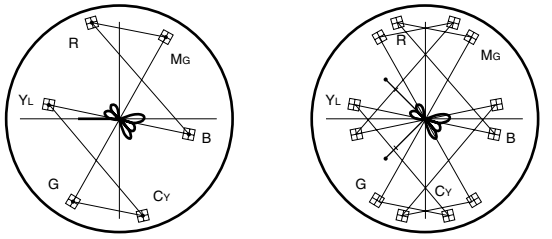


3. Adjust the color bars signal of the WF Level and WF Chroma so that it is within the specified level.
   Measurement point : PIX OUT connector on the VCS-700
   Specification : A = 100 ±1 IRE [for UC]
   A = 700 ±7 mV p-p [for CE]
   (WF level)



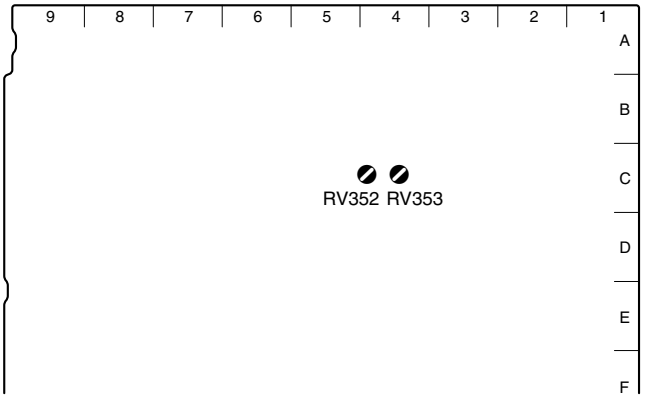
Each luminescent spot on the vector monitor must be within the "⊞" range.
(WF CHROMA)

[for UC] [for CE]



Adjusting the Staircase Signal

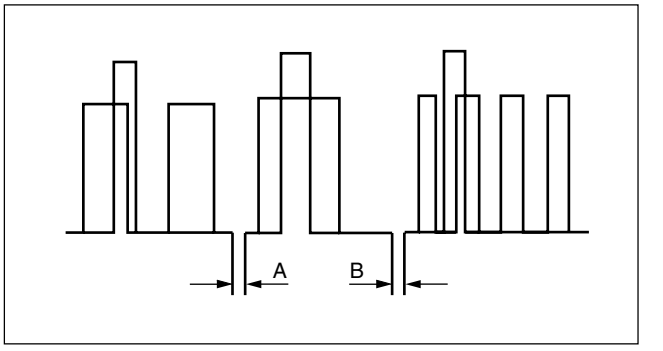
Adjust the staircase signal to display signals in the sequential mode on the waveform monitor. If the signal of the sequential mode is not normally displayed on the waveform monitor, perform this adjustment.
When the waveform monitor is connected to the unit, perform the adjustment using controls RV352 (STAIR STEP POSITION) and RV353 (STAIR STEP LEVEL) on the RC-86 board panel of the unit. When the VCS-700 is connected, refer to the VCS-700 Maintenance Manual.



RC-86 board (A side)

1. Press the SEQ button of the WAVEFORM MONITOR buttons (or MONITOR SELECT buttons) of the MSU-700A/750, RCP-740/741, etc.
2. Adjust the position of the signal to be displayed using control RV352 (STAIR STEP POSITION) on the RC-86 board.
3. Use control RV353 (STAIR STEP LEVEL) on the RC-86 board so that the intervals of signals A and B to be displayed are almost equal.

Press the SEQ button of the WAVEFORM MONITOR button (or the MONITOR SELECT button) of the MSU-700A/750, RCP-740/741, etc., to output the waveform monitor control signal of the unit, synchronizing with the output signal of the WF output connector.



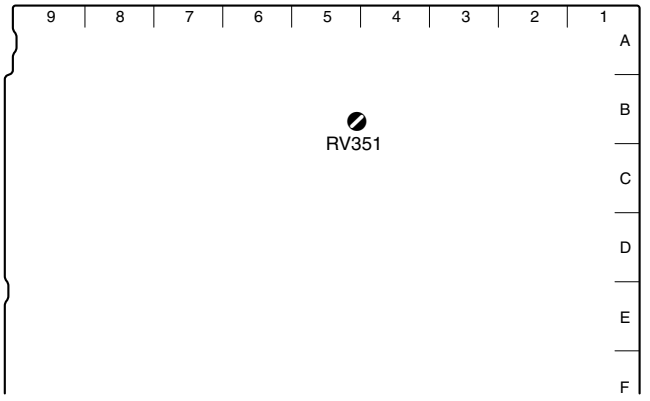
Note

The control method of the sequential mode depends on the waveform monitor used. If required, change the polarity of the control from the setting of switch S351 (SEQ) on the RC-86 board.
If adjustment is not possible even after the polarity is changed, perform the adjustment on the waveform monitor side.

2-4-5. Adjusting the Level of Signals for Picture Monitor

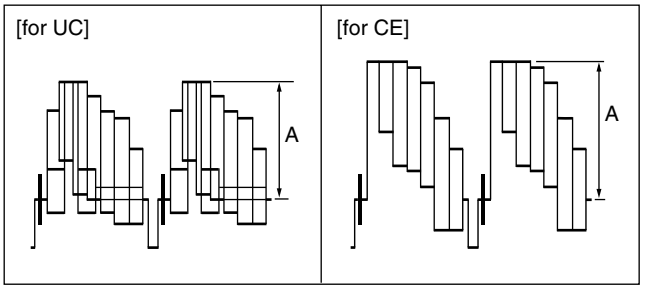
The video output signal can be checked on the waveform or vector monitor connected to the PIX output connector. Use the color bars to adjust the level of the PIX output signal.
In addition, in the system with the MSU-700A/750, CNU-700/500 or VCS-700, the video signal of the unit can be checked on the waveform or vector monitor connected to the VCS-700.

How to adjust on the RC-86 board of the unit



RC-86 board (A side)

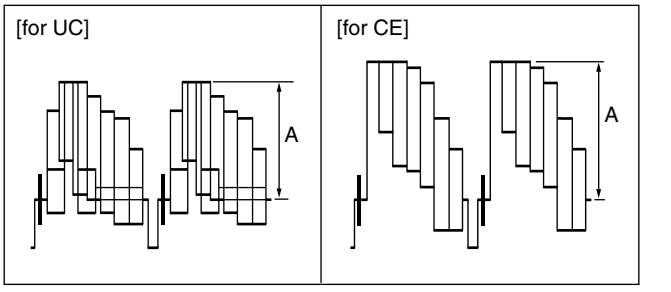
1. Press the BARS button of the MSU-700A/750, RCP-740/741, etc., and press the ENC button of the PICTURE MONITOR buttons (or MONITOR SELECT buttons) to display the color bars on the waveform monitor.
2. Adjust the color bar signal using control RV351 (PIX GAIN) on the RC-86 board so that it is within the specified level.
   Measurement point : PIX OUT connector on the HDCU rear panel
   Specification : A = 100 ±1 IRE [for UC]
   A = 700 ±7 mV p-p [for CE]



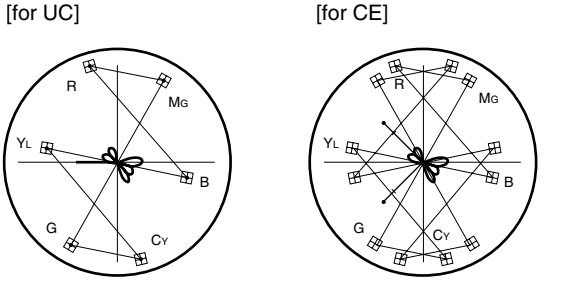
How to adjust using the VCS-700

In the system with the MSU-700A/750, CNU-700/500 or VCS-700, the video output signal of the unit can be checked on the waveform or vector monitor connected to the PIX A OUTPUT and PIX B OUTPUT connectors of the VCS-700.
Connect the PIX PUT connector of the RC-86 board or VDA-57 board (HKCU-901) to the PIX 1 connector of the VCS-700 using the color bars signal.

1. Press the BARS button of the MSU-700A/750, RCP-740/741, etc., or press the ENC button of the WAVEFORM MONITOR buttons (or MONITOR SELECT buttons) to display the color bars on the waveform or vector monitor.
2. Adjust the color bars signal using the PIX 1 LEVEL and PIX 1 CHROMA controls on the VCR-700 board so that it is within the specified level.
   Measurement point : PIX OUT connector on the VCS-700
   Specification : A = 100 ±1 IRE [for UC]
   A = 700 ±7 mV p-p [for CE]
   (PIX 1 LEVEL control)



Each luminescent spot on the vector monitor must be within the "⊞" range.
(PIX 1 CHROMA control)

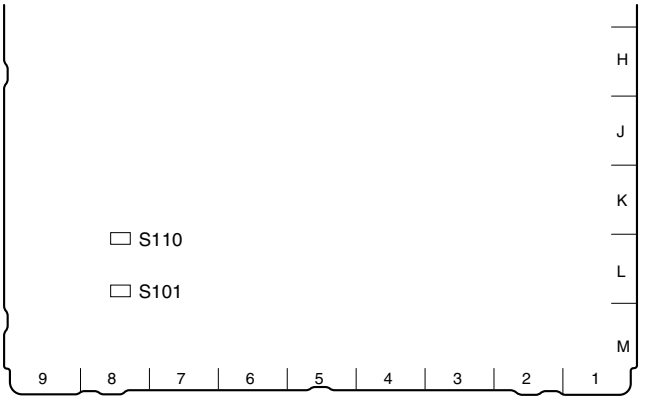


2-4-6. Setting RET Input

Set the slot to be input in the RET 1 to 4 connectors on the rear panel of the unit using switch S101 (RET-SET) on the AT-141 board.

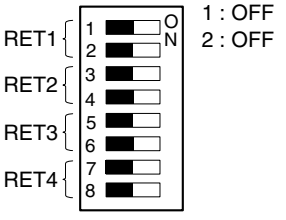
Note

Confirm that switch S110 (RETURN REMOTE/LOCAL) on the AT-141 board is set to LOC.
Factory setting : REM



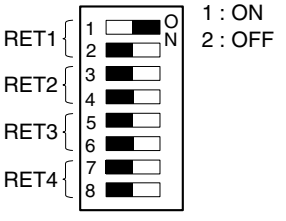
AT-141 board (A side)

When Inputting the RET1 Signal to the RET1 Connector the Top Slot



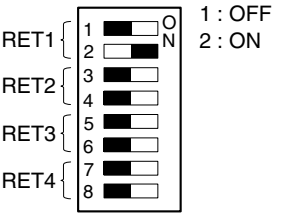
■ indicates the knob position.

When Inputting the RET1 Signal to the RET1 Connector of the Second Slot from the Top



■ indicates the knob position.

When Inputting the RET1 Signal to the RET1 Connector of the Third Slot from the Top



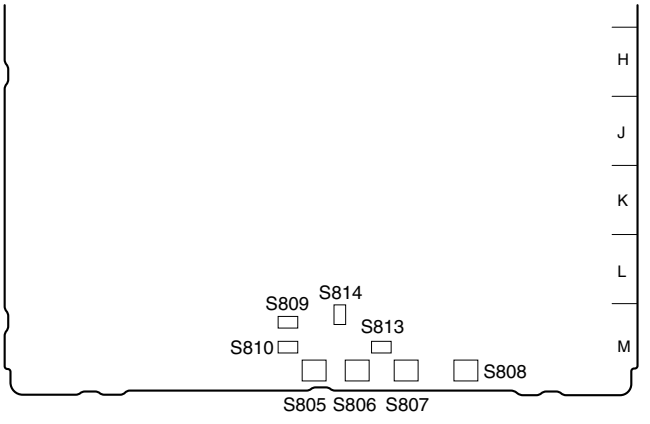
■ indicates the knob position.

Set RET2 to 4 in the same way.
For more details, refer to Section 1-5-1, “Settings of Switches and Controls on Boards−AT-141 Board”.

2-4-7. Setting Aspect Ratio Conversion

In the HDC-900/950 series camera system, the aspect ratio can be switched by using the HDCU-900 and MSU-700A/750 according to the system during HD-SD down-convert or RETURN VIDEO signal up-convert. Set the desired aspect ratio using the MIC REMOTE connector at the rear of the unit or the switch on the RC-86 board.
The aspect ratio also can be set on the maintenance menu of the MSU-700A/750. For more details, refer to the System Manual. The aspect ratio of the following four types can be switched in this system.

Squeeze :	The HD video signal of 16 : 9 is converted to the SD signal as it is. (16 : 9)
Edge-crop :	Video signal as large as 4 : 3 is cut from the HD video signal and is converted to the SD signal. (4 : 3)
Letter box :	The HD video signal of 16 : 9 is inserted into the picture frame of 4 : 3 as it is and converted to the SD signal. (4 : 3) (The black level is inserted into the top and bottom of the picture.)
Semi-letter box :	Video signal as large as 14 : 9 or 13 : 9 is cut from the HD video signal, is inserted into the picture frame of 4 : 3 and is converted to the SD signal. (4 : 3) (The black level is inserted into the top and bottom of the picture.)



RC-86 board (A side)

How to set using the MIC REMOTE connector at the rear of the unit

1. Set switch S805 (ASPECT REMOTE/LOCAL) on the RC-86 board to REMOTE.
2. Set pin-12 (ASPECT REMOTE ON/OFF) of the MIC REMOTE connector at the rear to L.
3. Set pin-13 (ASPECT CTL CONT1) and pin-14 (ASPECT CTL CONT2) of the MIC REMOTE connector at the rear according to the desired aspect ratio while referring to the following table.

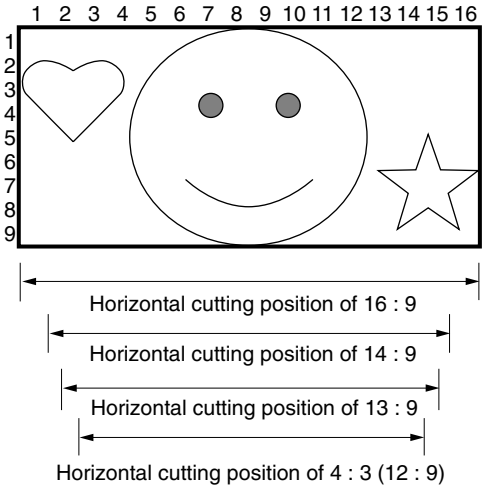
Pin-13 (ASPECT CTL CONT1)	Pin-14 (ASPECT CTL CONT2)	Aspect ratio
L	H	Squeeze (16 : 9)
H	H	Edge-crop (4 : 3)
L	L	Depends on the setting switches on the RC-86 board.
H	L	Letter box (4 : 3)

How to set on the RC-86 board of the unit (during HD-SD down-convert)

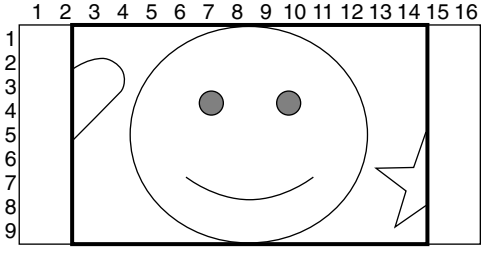
1. Set switch S805 (ASPECT REMOTE/LOCAL) on the RC-86 board to LOCAL.
2. Set switches S806, S807, S808 and S813 on the RC-86 board according to the desired aspect ratio.
   When setting S806 (ASPECT SEL) to EC (edge-crop), CROP POSITION (horizontal cutting position) can be changed by using S807 (EC POSITION SEL) or S808 (EC POSITION ADJ).
   For more details, refer to Section 1-5-3, “Settings of Switches and Controls on Boards—RC-86 Board”.

Examples of display

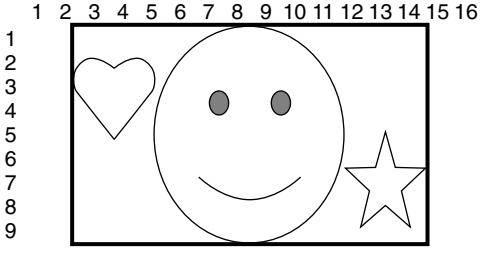
16 : 9 picture (picture from camera)



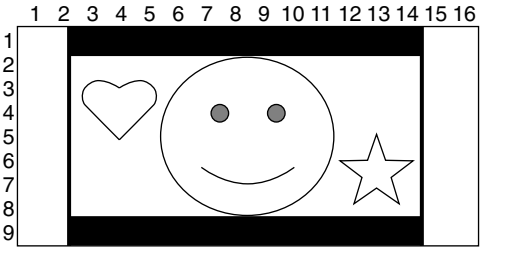
Picture whose aspect ratio is converted (SD SDI output)



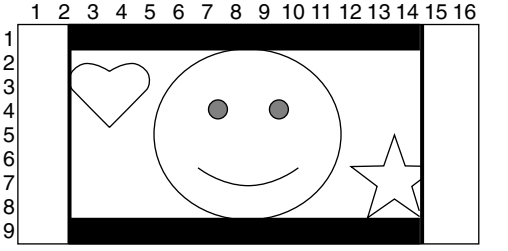
Edge-crop
S806/RC-86 → EC
The crop position can be changed by using S807 or S808 on the RC-86 board.



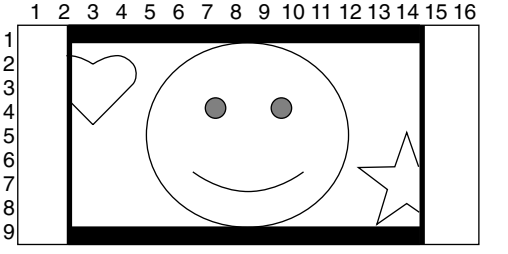
Squeeze
S806/RC-86 → SQ
The 16 : 9 ratio picture is output in the SD SDI format without changing the ratio.



Letter box (16 : 9)
S806/RC-86 → LB
S813/RC-86 → 16 : 9
The 16 : 9 ratio picture is inserted into the 4 : 3 ratio picture without changing the ratio and is output in the SD SDI format.



Semi-letter box (14 : 9)
S806/RC-86 → LB
S813/RC-86 → 14 : 9
The picture that is cut out with the aspect ratio of 14 : 9, is inserted into the 4 : 3 ratio picture and is output in the SD SDI format.

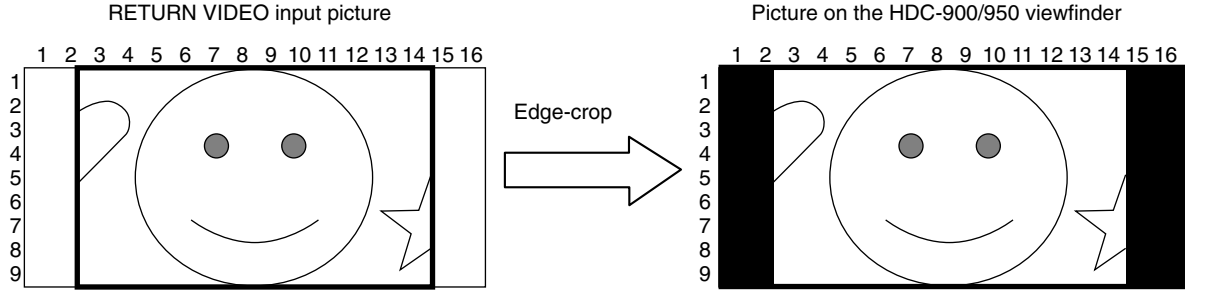


Semi-letter box (13 : 9)
S806/RC-86 → LB
S813/RC-86 → 13 : 9
The picture that is cut out with the aspect ratio of 13 : 9, is inserted into the 4 : 3 ratio picture and is output in the SD SDI format.

How to set on the RC-86 board of the unit (during RETURN VIDEO signal up-convert)

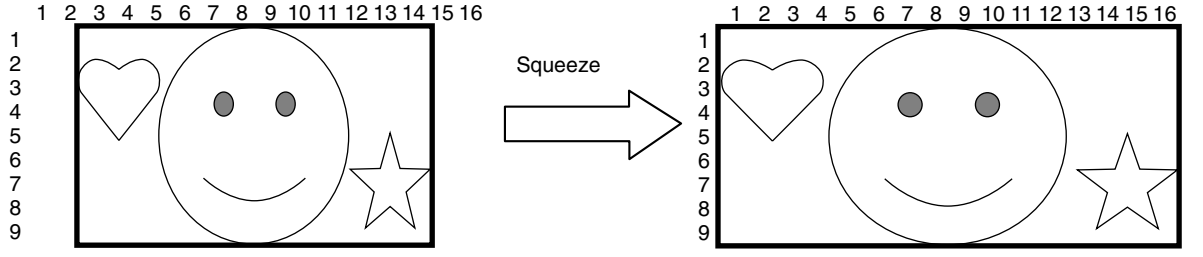
1. Set switch S814 (RETURN VIDEO ASPECT REMOTE/LOCAL) on the RC-86 board to LOC.
2. Set S809 (RET ASPECT SEL) and S810 (RET ASPECT LB SEL) on the RC-86 board according to the desired aspect ratio.
   For more details, refer to Section 1-5-3, “Settings of Switches and Controls on Boards−RC-86 Board”.

Examples of display



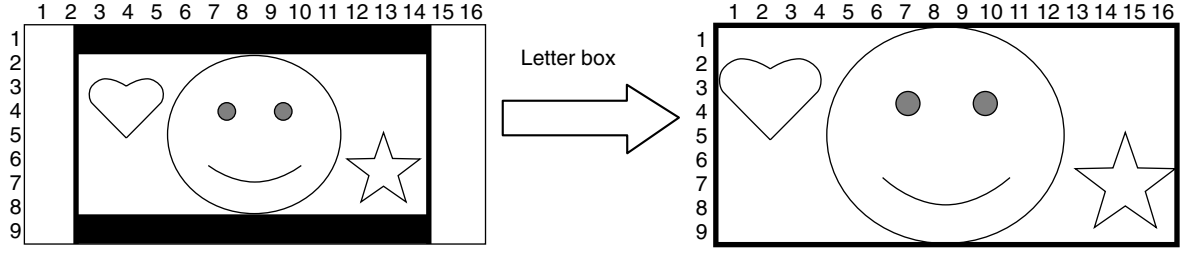
Edge-crop
S809-1 to -8/RC-86 → OFF

The rightmost end and the leftmost end are cut and replaced by black on the viewfinder.



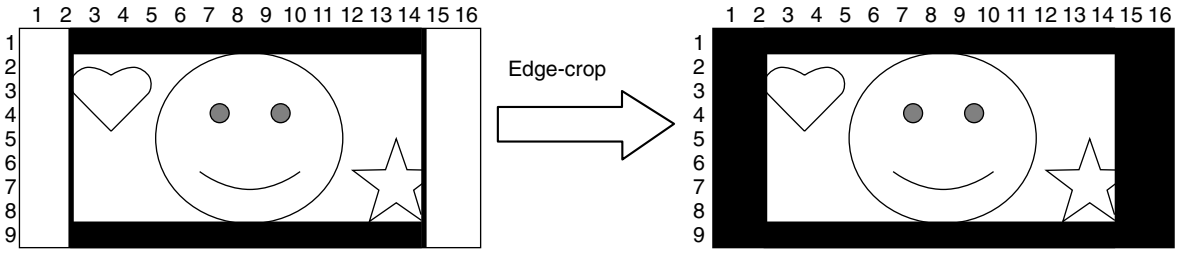
Squeeze
S809-1, -3, -5, -7/RC-86 → ON
S809-2, -4, -6, -8/RC-86 → OFF

The same picture as the camera output picture is shown.



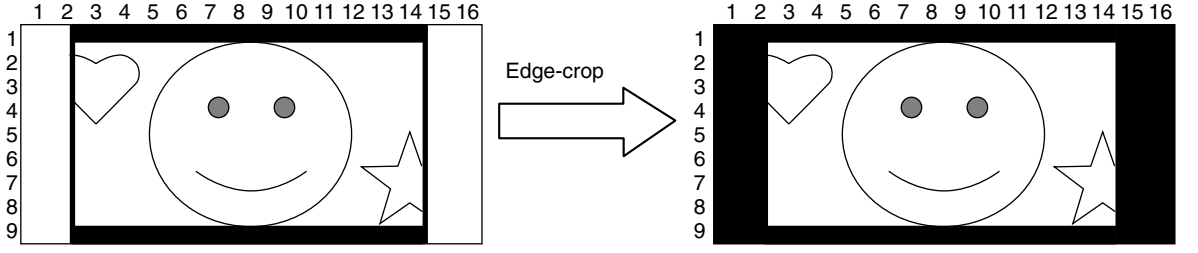
Letter box (16 : 9)
S809-1 to -8/RC-86 → ON
S810-1, -3, -5, -7/RC-86 → ON
S810-2, -4, -6, -8/RC-86 → OFF

The same picture as the camera output picture is shown.



Semi-letter box (14 : 9)
S809-1 to -8/RC-86 → ON
S810-1, -3, -5, -7/RC-86 → OFF
S810-2, -4, -6, -8/RC-86 → ON

When the signal was up-converted in the edge-crop mode



Semi-letter box (13 : 9)
S809-1 to -8/RC-86 → ON
S810-1 to -8/RC-86 → ON

When the signal was up-converted in the edge-crop mode

Section 3
Service Overview

3-1. Cleaning of Connector/Cable

Before connecting the unit to the camera, it is recommended to clean the following optical contact portions.
- CAMERA connector of the unit
- CCU connector of the camera side
- Optical/electrical cable

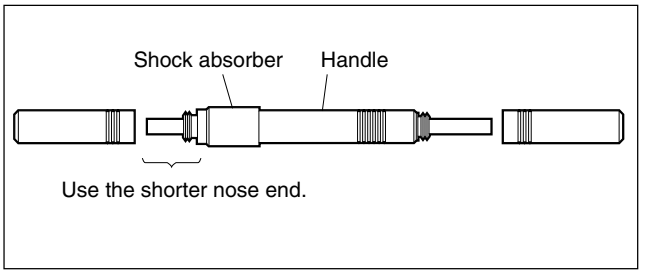
Follow the procedures below for cleaning.

Tools Required

- Alignment sleeve remover HC-001
  (for female connector)
  Sony P/N : J-6480-010-A

Note

Insert the shorter nose end when removing/installing the alignment sleeve.
Grasp not the shock absorber portion of the remover but the handle in use.



- Cotton swabs (commercially available)

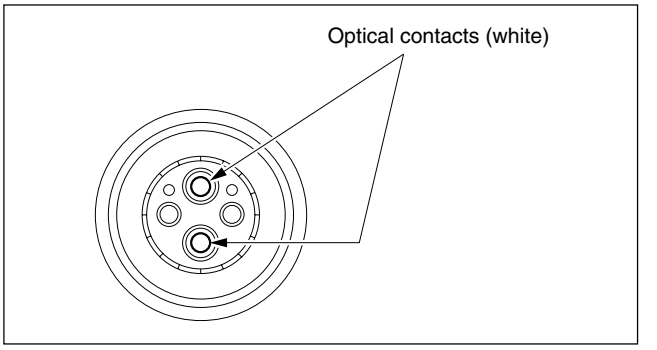
Note

Use a cotton swab whose diameter is about 4 mm.
If a cotton swab whose diameter exceeds 5 mm is used, the cotton swab cannot be inserted into the end of the connector and the tip of the optical contact cannot be cleaned.

Cleaning

Male connector

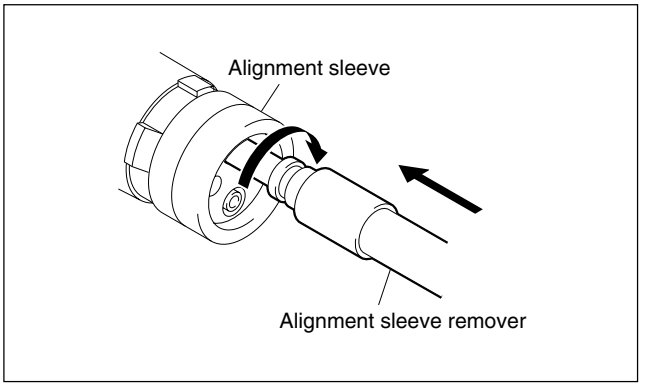
Clean the tip of the white optical contacts by a cotton swab moistened with alcohol.



Female connector

The optical contacts for female connector are in an unexposed state. In cleaning, it is necessary to be exposed by removing the alignment sleeve in advance. Proceed as follows.

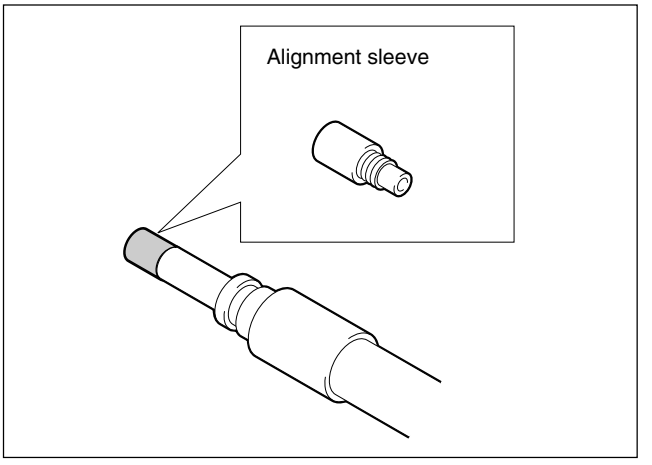
1. Insert the alignment sleeve remover into the alignment sleeve in the straight line and turn it clockwise.



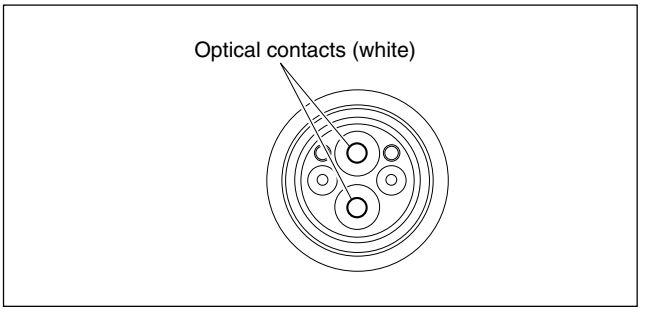
2. When the turn stops, pull out the remover in the straight line forcedly.

Note

The alignment sleeve can be removed/reinstalled with the sleeve itself attached to the tip of the remover. Great care should be taken so as not to lose or damage the alignment sleeve.
(Alignment sleeve: Sony P/N 9-980-074-01)



3. Clean the tip of the white optical contacts by a cotton swab moistened with alcohol.



4. Insert the remover with the alignment sleeve attached to its tip, and push it until it clicks.
5. Rotate the remover counterclockwise to install the alignment sleeve, and extract the remover.

3-2. Recommended Replacement Parts

3-2-1. DC Fans (Rear Panel)

The recommended replacement fans should be used in the rear panel assembly of this unit.
The lifespan of these fans is about 30,000 hours, which means that the fans can be used for about three and a half years if the power is on all the time, so the fans should be replaced according to service conditons.
For the replacement procedure, refer to the separately available maintenance manual volume 1.

Note

This unit is provided with the two DC fans in the rear panel assembly.

Replacement Part

Part : DC fan
Part No. : 1-698-059-11

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)

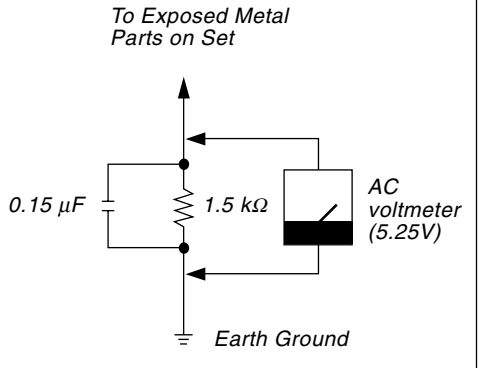


Fig A. Using an AC voltmeter to check AC leakage.

HDCU-900 (UC, J, CE)
HKCU-901 (UC, J, CE)
HKCU-902 (SY)
HKCU-903 (SY)
HKCU-904 (SY) J, E
3-204-285-11

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