

SONY®

MULTI PURPOSE CAMERA

HDC-P43

SUPER MOTION

SERVICE MANUAL

1st 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可能性があります。

危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

WARNING

This manual is intended for qualified service personnel only.

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

WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

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

AVERTISSEMENT

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

Model Name	Serial No.
HDC-P43 (SY)	10001 and Higher
HDC-P43 (J)	30001 and Higher
HDC-P43 (CN)	50001 and Higher

安全のために、周辺機器を接続する際は、過大電圧を持つ可能性があるコネクタを以下のポートに接続しないでください。

: NETWORK TRUNK

上記のポートについては本書の指示に従ってください。

For safety, do not connect the connector for peripheral device wiring that might have excessive voltage to the following port(s).

: NETWORK TRUNK

Follow the instructions for the above port(s).

CAUTION

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

CLASS 1 LASER PRODUCT
LASER KLASSE 1 PRODUKT
LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

This Multi Purpose Camera is classified as a CLASS 1 LASER PRODUCT.

注意

指定以外の電池に交換すると、破裂する危険があります。
必ず指定の電池に交換してください。
使用済みの電池は、国または地域の法令に従って処理してください。

FÖRSIKTIGHET!

Fara för explosion vid felaktigt placerat batteri.
Byt endast mot samma eller likvärdig typ av batteri, enligt tillverkarens rekommendationer.
När du kasserar batteriet ska du följa rådande lagar för regionen eller landet.

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
When you dispose of the battery, you must obey the law in the relative area or country.

PAS PÅ

Fare for explosion, hvis batteriet ikke udskiftes korrekt.
Udskift kun med et batteri af samme eller tilsvarende type, som er anbefalet af fabrikanten.
Når du bortskaffer batteriet, skal du følge lovgivningen i det pågældende område eller land.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Lorsque vous mettez la batterie au rebut, vous devez respecter la législation en vigueur dans le pays ou la région où vous vous trouvez.

HUOMIO

Räjähdyksvaara, jos akku vaihdetaan virheellisesti. Vaihda vain samanlaiseen tai vastaavantyyppiseen, valmistajan suosittelemaan akkuun.
Noudata akun hävittämisessä oman maasi tai alueesi lakeja.

VORSICHT

Explosionsgefahr bei Verwendung falscher Batterien. Batterien nur durch den vom Hersteller empfohlenen oder einen gleichwertigen Typ ersetzen.
Wenn Sie die Batterie entsorgen, müssen Sie die Gesetze der jeweiligen Region und des jeweiligen Landes befolgen.

FORSIKTIG

Eksplosjonsfare hvis feil type batteri settes i. Bytt ut kun med samme type eller tilsvarende anbefalt av produsenten.
Kasser batteriet i henhold til gjeldende avfallsregler.

注意

如果更换的电池不正确，就会有爆炸的危险。
只更换同一类型或制造商推荐的电池型号。
处理电池时，必须遵守相关地区或国家的法律。

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Revision History

Manual Structure

Purpose of this manual

This manual is intended for the use of the system engineers and the service engineers, and provides the limited information for block service and the information related to maintenance of the unit, service overview, periodic maintenance and inspection, diagnosis, replacement of main parts, electrical alignment, software upgrade, file system, setup menu, circuit description, etc.

Related manuals

The following manuals are available for this model.

If any of these manuals is required, please contact your local Sony Sales Office/Service Center.

- Operating Instructions CD-ROM (supplied with the unit)
This manual contains information required to operate and use the unit.
- Factory Service Manual (available on request)
This manual provides the limited information for component service and the information related to maintenance of the unit.

Trademarks

Trademarks and registered trademarks described in this manual are as follows.

- FRAM is a registered trademark of Ramtron International Corporation.

Other system names and product names written in this manual are usually registered trademarks or trademarks of respective development manufacturers.

Non-disclosed boards

Following boards cannot be replaced on the board-level service or part-level service.

If parts become defective, replace the entire OHB assembly or FD assembly.

- BI-291 board (included in OHB assembly)
- SE-1093 board (included in FD assembly)

Section 1

Service Overview

1-1. Checking before Installation

1-1-1. Checking the ROM and Software Version

When connecting the peripheral equipment in the list below to this unit, be sure to check that the ROM and software version on each peripheral device is corresponding to the camera to be connected.

If the ROM and software version is lower than the specified below, be sure to perform ROM replacement and updating the software.

If ROM replacement and updating the software are required, contact your local Sony Sales Office/Service Center.

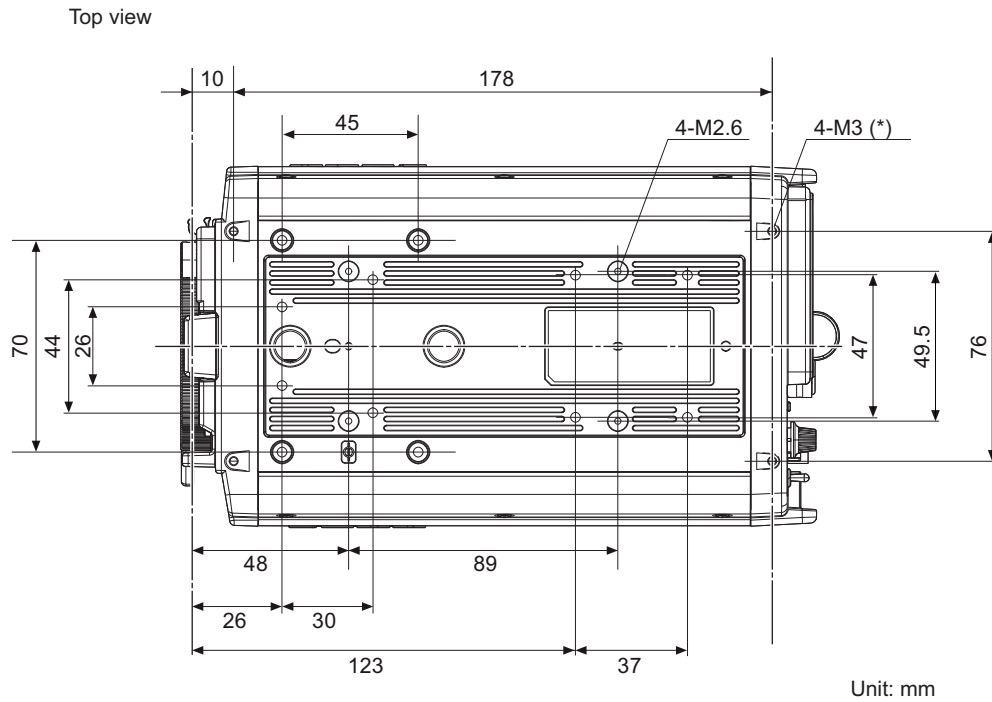
ROM

Peripheral Equipment	Board Name	Ref. No.	ROM Version
CNU-700	AT-89 board or AT-89A board	IC4, IC5	Ver. 1.30 and higher

Software

Peripheral Equipment	Board Name	Software Version
RCP-1500/1501/1530	MPU-153 board	Ver. 2.91 and higher
HDCU2000/2500	AT-167A board	Ver. 2.52 and higher
MSU-1000	MPU-150 board	Ver. 2.91 and higher
MSU-1500	MPU-151 board	Ver. 2.91 and higher
BPU4000	AT-189 board	Ver. 3.31 and higher
BPU4500	AT-189H board	Ver. 1.32 and higher
HDCU4300	AT-189K board	Ver. 1.21 and higher

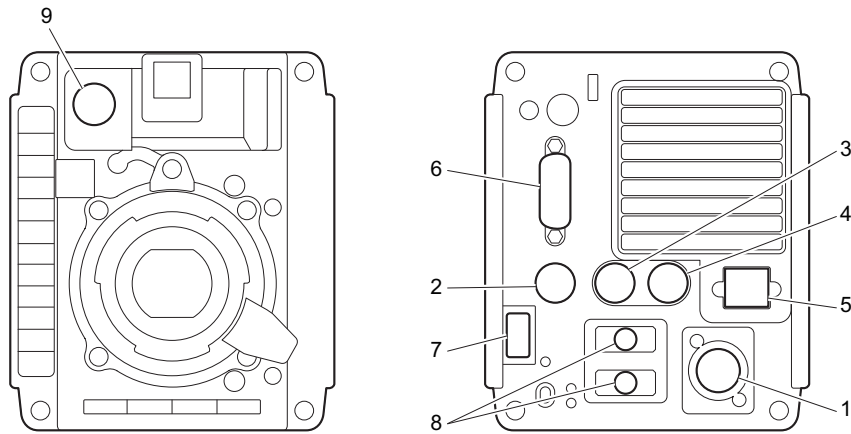
1-2. Screw Positions for Mounting and Hanging



- There are screw positions of 4-M3 (*) only on upper panel, other screw positions are the same dimensions with the top panel and the bottom panel.
- Other than M2.6 and M3 screws are using M4 screws.
- Use the screws (M2.6, M3, M4) of the length 5 mm for body. (thread depth: 5 mm)

1-3. Connectors and Cables

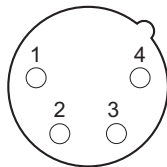
1-3-1. Input and Output Signals of the Connectors



Input Connectors

1. DC IN

XLR 4-pin, Male



- External View -

No.	Signal	I/O	Specifications
1	EXT DC (C)	—	GND for DC (+)
2	NC	—	No connection
3	NC	—	No connection
4	EXT DC (H)	IN	+10.5 to +17.0 V DC

Output Connectors

2. PROMPTER OUT

BNC type, 75 Ω, 1.0 V p-p, unbalanced

3. SDI 1

BNC type

HD SDI signal

SMPTE 292M/372M, BTA-S004 compliant

0.8 Vp-p 75 Ω, 1.485 Gbps/1.4835 Gbps serial

Input and Output Connectors

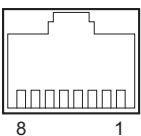
4. SDI 2

BNC type

- Output:
3G SDI signal
SMPTE 424M/425M-B compliant
0.8 Vp-p 75 Ω, 2.97 Gbps/2.9679 Gbps serial
or HD SDI signal
SMPTE 292M/372M, BTA-S004 compliant
0.8 Vp-p 75 Ω, 1.485 Gbps/1.4835 Gbps serial
- Input:
HD SDI signal
SMPTE 292M, BTA-S004 compliant
0.8 Vp-p 75 Ω, 1.485 Gbps/1.4835 Gbps serial

5. NETWORK TRUNK

8-pin, RJ-45, 10Base-T/100Base-TX/1000Base-TX



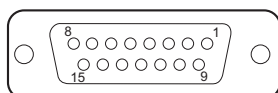
- External View -

No.	Signal	I/O	Specifications
1	TRD + (0)	IN/ OUT	Transmitted/Received Data + (0)
2	TRD – (0)	IN/ OUT	Transmitted/Received Data – (0)
3	TRD + (1)	IN/ OUT	Transmitted/Received Data + (1)
4	TRD + (2)	IN/ OUT	Transmitted/Received Data + (2)
5	TRD – (2)	IN/ OUT	Transmitted/Received Data – (2)

Continued

No.	Signal	I/O	Specifications
6	TRD – (1)	IN/ OUT	Transmitted/Received Data – (1)
7	TRD + (3)	IN/ OUT	Transmitted/Received Data + (3)
8	TRD – (3)	IN/ OUT	Transmitted/Received Data – (3)

6. EXT I/O

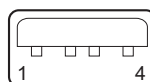


- External View -

No.	Signal	I/O	Specifications
1	UNREG	OUT	10.5 V to 17 V, 1.5 A (max)
2	UNREG GND	—	GND for UNREG
3	G-TALLY	OUT	Open Corrector: 10 mA (max)
4	RX0 (–): for RS-422A RX0: for RS-232C	IN	TRUNK Data In
5	RX0 (+): for RS-422A RX1: for RS-232C	IN	TRUNK Data In
6	ASSIGN1	IN/OUT	Digital IO OUT: Open Collector (max. 10 mA) IN: GND
7	GND	—	—
8	MIC (X)	IN	–60 to –20 dBu/Balanced
9	R-TALLY	OUT	Open Corrector: 10 mA (max)
10	GND	—	—
11	TX0 (–): for RS-422A TX0: for RS-232C	OUT	TRUNK Data Out
12	TX0 (+): for RS-422A TX1: for RS-232C	OUT	TRUNK Data Out
13	ASSIGN2	IN/OUT	Digital IO OUT: Open Collector (max. 10 mA) IN: GND
14	MIC GND	—	GND for MIC IN
15	MIC (Y)	IN	–60 to –20 dBu/Balanced

7. USB

USB 2.0 (Type A)



- External View -

No.	Signal	I/O	Specifications
1	VBUS	OUT	USB Vcc (+5 V)
2	D+	IN/ OUT	USB+
3	D–	IN/ OUT	USB–
4	GND	—	GND

8. IN/OUT

ST connector for single-mode fiber cables

10.692 Gbps/10.681 Gbps

Transmission signal: IN (BPU/CCU → CAMERA)

- Return Video
- Prompter Video
- Audio (PGM)
- NETWORK TRUNK
- RS422A/RS232C

Transmission signal: OUT (CAMERA → BPU/CCU)

- Camera Video
- Audio (MIC)
- HD-TRUNK
- NETWORK TRUNK
- RS422A/RS232C

9. LENS

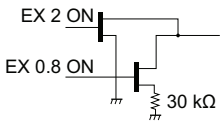
12-pin, Female



- External View -

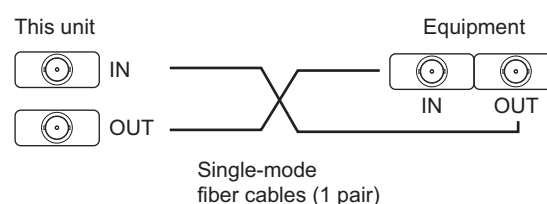
No.	Signal	I/O	Specifications
1	RET VIDEO ENABLE	IN	ENABLE: 0 V DISABLE: +5 V or OPEN
2	VTR CTL	IN	ENABLE: 0 V DISABLE: +5 V or OPEN
3	GND	—	GND for UNREG
4	SERVO MA/AT	OUT	AUTO: +5 V MANU: 0 V or OPEN

Continued

No.	Signal	I/O	Specifications
5	IRIS POSITION	OUT	+3.4 V (F16) to +6.2 V (F2.8)
6	UNREG	OUT	+10.5 to +17.0 V
7	IRIS POSITION	IN	+3.4 V (F16) to +6.2 V (F2.8)
8	IRIS AT/MA	OUT	AUTO IRIS: 0 V MANU IRIS: +5 V
9	EXTENDER ON/OFF	IN	EX 2 ON: GND EX 0.8 ON: 30 kΩ to GND OFF: OPEN 
10	ZOOM POSITION	IN	WIDE: 2 V TELE: 7V
11	FOCUS POSI (LENS RX)	IN	∞: 7 V Min: 2V
12	FOCUS POSI (LENS TX)	OUT	—

1-3-3. Note in Connecting Single-mode Optical Fiber Cable

- When connecting the cables, turn off the power of the unit and each equipment. Do not connect and disconnect the cables while equipments are turned on.
- If there is dust or other contamination on the connection face for the ST connector, transmission errors will occur. Be sure to protect the connector with the cover when not in use.
- Connect the single-mode fiber cables as shown below so that connecting destinations cross (IN to OUT, OUT to IN) between this unit and the equipment.



- It is recommendable to clean the optical contact portions of all equipments before connecting this unit to equipments with single-mode fiber cables.

For details on a cleaning method, refer to “[2-4. Cleaning of Connector/Cable](#)”.

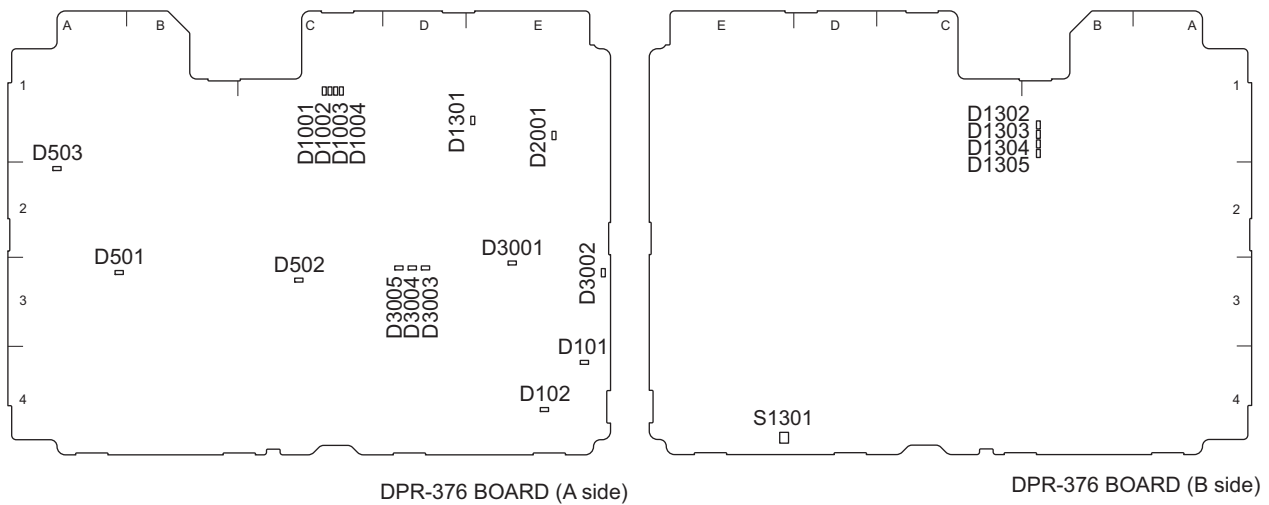
1-3-2. Connectors and Cables

Connection made with the connectors during installation or service, should be made with the connectors/complete cable assemblies specified in the following list, or equivalent parts.

Connector Name	Connectors and Cables
IN/OUT	ST connector or ST connector single-mode fiber cable
PROMPTER OUT (BNC)	Plug, BNC (Part No.: 1-794-166-41) or B-B Cable assembly (1.5 m optional)
SDI 1/2 (BNC)	Plug, BNC (Part No.: 1-794-166-51) or 5C-FB coaxial cable/ Recommendation manufactured by Fujikura
DC IN (XLR 4-pin, Male)	XLR 4-pin, Female (Part No.: 1-508-362-00) or ITT Cannon XLR-4-11C equivalent or DC cable CCDD-X2 (2 m)
LENS (12-pin, Female)	Connector 12-pin, Male (Part No.: 1-691-190-13) or HIROSE HR10A-10P-12P equivalent
EXT I/O (D-sub 15-pin, Female)	D-sub 15-pin, Male (Part No.: 1-506-582-11) or JAE DE-15PF-N equivalent (Available shell: JAE DE-C1-J10-R equivalent)

1-4. Functions of Onboard Switches and LED Indicators

1-4-1. DPR-376 Board



Ref. No.	Address	Name	Color	Description	Normal State
D101	E4 (side A)	POWER	Yellow-green	Lights when the power supply regulators (+3.2 V, +5 V) on the board are normal.	Lit
D102	E4 (side A)	Low-Volt	Yellow-green	Lights when the power supply regulators (+0.85 V, +1.5 V, +2.5 V, +3.3 V) on the board are normal.	Lit
D501	A3 (side A)	—	Yellow-green	Factory use	Inconstant
D502	C3 (side A)	—	Yellow-green	Factory use	Inconstant
D503	A2 (side A)	—	Yellow-green	Factory use	Inconstant
D1001	C1 (side A)	TDIS	Red	Factory use	Off
D1002	C1 (side A)	TFAULT	Red	Factory use	Off
D1003	C1 (side A)	MOD ABS	Red	Factory use	Off
D1004	C1 (side A)	RX LOS	Red	Factory use	Off
D1301	E1 (side A)	Conf-Done	Red	Off when FPGA (IC1001) normally completed configuration.	Off
D1302	B1 (side B)	—	Yellow-green	Factory use	Inconstant
D1303	B1 (side B)	—	Yellow-green	Factory use	Inconstant
D1304	B1 (side B)	—	Yellow-green	Factory use	Inconstant
D1305	B1 (side B)	—	Yellow-green	Factory use	Inconstant
D2001	E1 (side A)	—	Yellow-green	Factory use	Off
D3001	E3 (side A)	EXT	Yellow-green	Factory use	Off
D3002	E3 (side A)	PLL-NG	Red	Lights when the PLL is abnormal.	Off
D3003	D3 (side A)	LOCK2	Red	Lights when the clock synthesizer (IC3021) is not locked.	Off

Continued

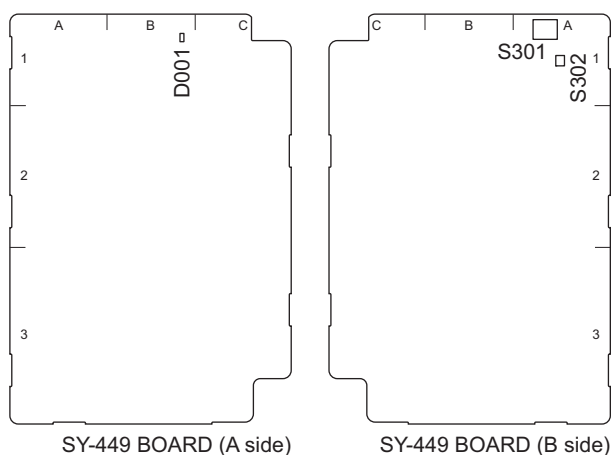
Ref. No.	Address	Name	Color	Description	Normal State
D3004	D3 (side A)	REF2	Red	Lights when the reference clock is not input to the clock synthesizer (IC3021).	Off
D3005	D3 (side A)	VCXO2	Red	Lights when the VCXO clock is not input to the clock synthesizer (IC3021).	Off

Note

Do not touch the unused switches.

Ref. No.	Address	Name	Bit	Description	Factory Setting
S1301	E4 (side B)	—	1	Not used	OFF

1-4-2. SY-449 Board



Ref. No.	Address	Name	Color	Description	Normal State
D001	B1 (side A)	Conf Done	Red	Off when FPGA (IC701) normally completed configuration.	Off

Note

Do not touch the unused switches.

Ref. No.	Address	Name	Bit	Description	Factory Setting
S301	A1 (side B)	—	1	Not used	OFF
			2	Not used	OFF
			3	Not used	OFF
			4	Not used	OFF
S302	A1 (side B)	JTAG EN	1	Not used	OFF

1-5. Flexible Flat Cable and Coaxial Cable

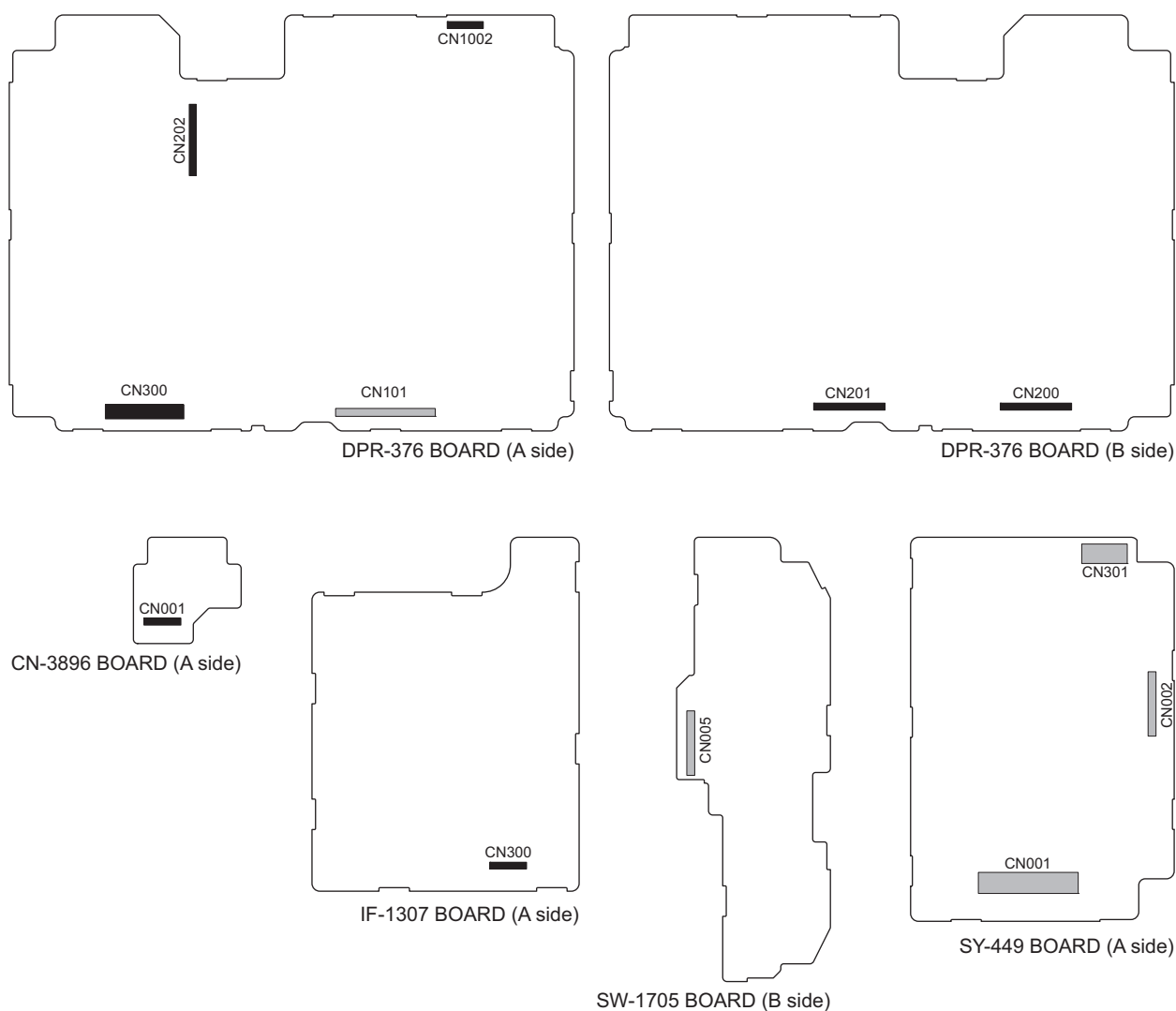
1-5-1. Connector for Flexible Flat Cable and Fine-Wire Coaxial Cable

Refer to the installing location and type of connector for connecting the flexible flat cable and fine-wire coaxial cable.

Note

Be careful when disconnecting and connecting the connector as its handling differs depending on the shape of connector.

Location of Connectors



Type of Connectors

Board	Ref. No.	Connector for Flexible Flat Cable	Connector for Fine-Wire Coaxial Cable
CN-3896	CN001	—	Type A
DPR-376	CN101	Type A	—
	CN200	—	Type B

Continued

Board	Ref. No.	Connector for Flexible Flat Cable	Connector for Fine-Wire Coaxial Cable
	CN201	—	Type B
	CN202	—	Type B
	CN300	—	Type C
	CN1002	—	Type B
IF-1307	CN300	—	Type A
SW-1705	CN005	Type A	—
SY-449	CN001	Type B	—
	CN002	Type A	—
	CN301	Type C	—

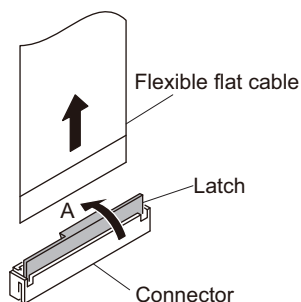
1-5-2. Disconnecting and Connecting Flexible Flat Cable

Note

- Be very careful not to fold flexible flat cables. Life of flexible flat cable will be significantly shortened if it is folded.
- Each flexible flat cable has conductive side and insulated side. If the flexible flat cable is connected in the wrong orientation of the conductive side and the insulated side, the circuit will not function.
- Insert the flexible flat cable straight.
- Check that the conductive side of the flexible flat cable is not contaminated.

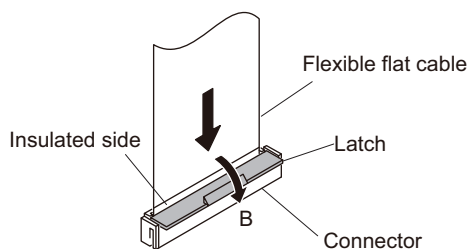
Type A

Disconnecting



1. Open the latch of the connector in the direction of arrow A to unlock.
2. Disconnect the flexible flat cable.

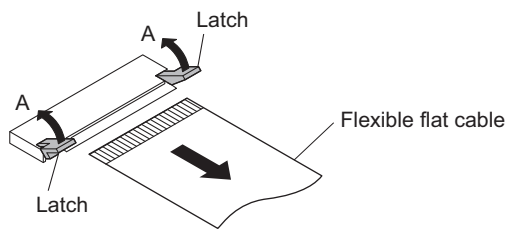
Connecting



1. Insert the flexible flat cable firmly as far as it will go with the insulating surface facing front.
2. Close the latch of the connector in the direction of arrow B to lock the flexible flat cable.

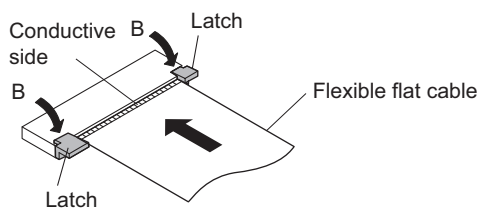
Type B

Disconnecting



1. Open the latch of the connector in the direction of arrow A to unlock.
2. Disconnect the flexible flat cable.

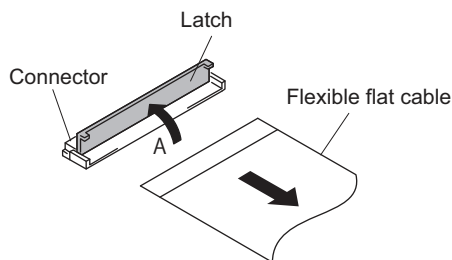
Connecting



1. Insert the flexible flat cable firmly as far as it will go with the conductive side up.
2. Close the latch of the connector in the direction of arrow B to lock the flexible flat cable.

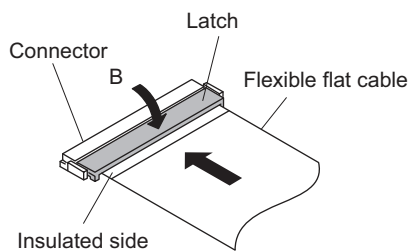
Type C

Disconnecting



1. Open the latch of the connector in the direction of arrow A to unlock.
2. Disconnect the flexible flat cable.

Connecting



1. Insert the flexible flat cable firmly as far as it will go with the insulated side up.
2. Close the latch of the connector in the direction of arrow B to lock the flexible flat cable.

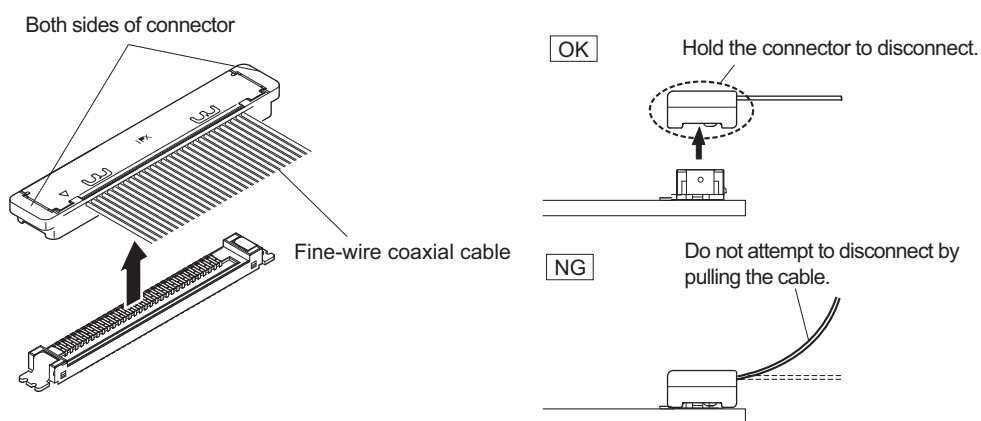
1-5-3. Disconnecting/Connecting Fine-Wire Coaxial Cable

Note

- Be very careful when handling the fine-wire coaxial cable so that fine wires are not disconnected.
- When disconnecting the fine-wire coaxial cable, be sure to hold the connector. Do not attempt to pull the cable.
- Check that the contact surface of the fine-wire coaxial cable connector is not contaminated.

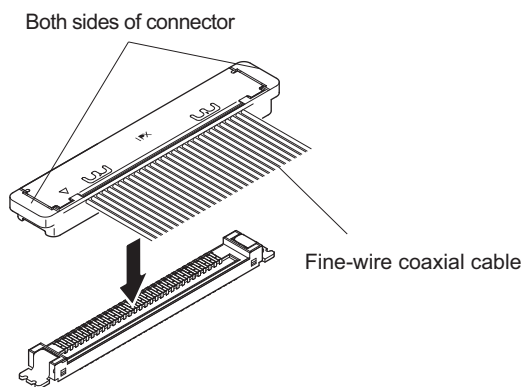
Type A

Disconnecting



1. Hold both sides of the fine-wire coaxial cable connector, and pull the connector in the arrow direction to disconnect it.

Connecting



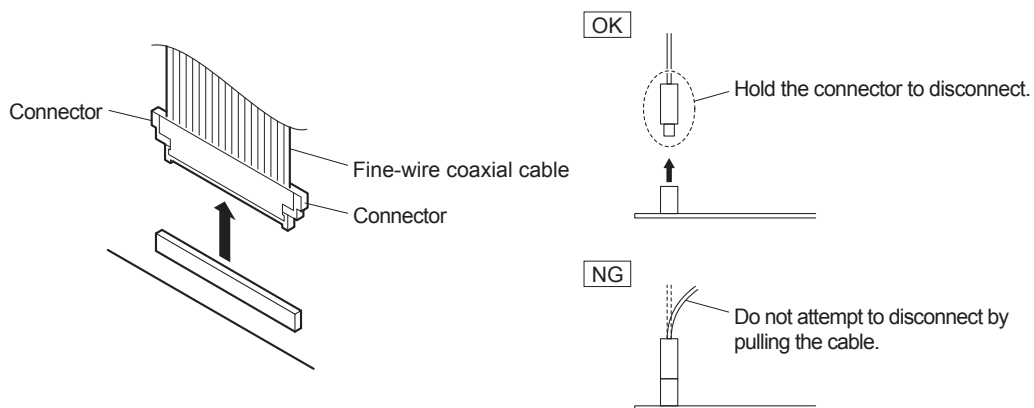
1. Insert the connector of fine-wire coaxial cable in the arrow direction to connect it.

Note

Insert firmly the connector of fine-wire coaxial cable in the interior.

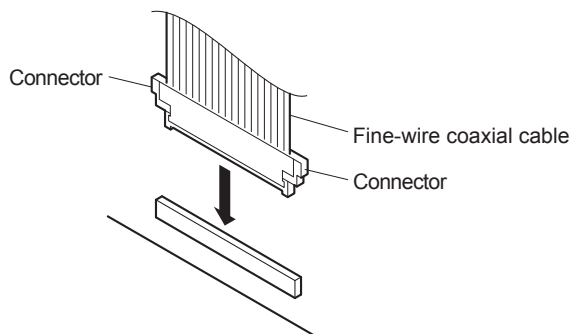
Type B

Disconnecting



1. Hold both sides of the fine-wire coaxial cable connector, and pull the connector straight to disconnect it.

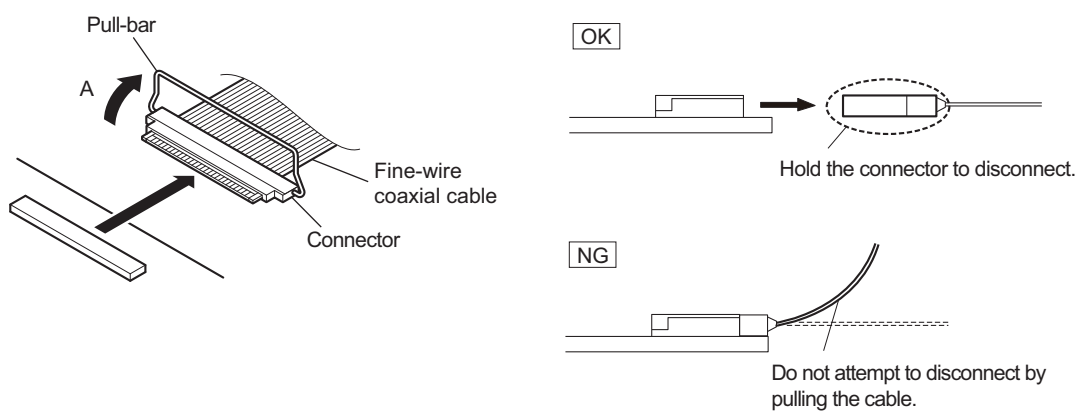
Connecting



1. Insert the connector straight.

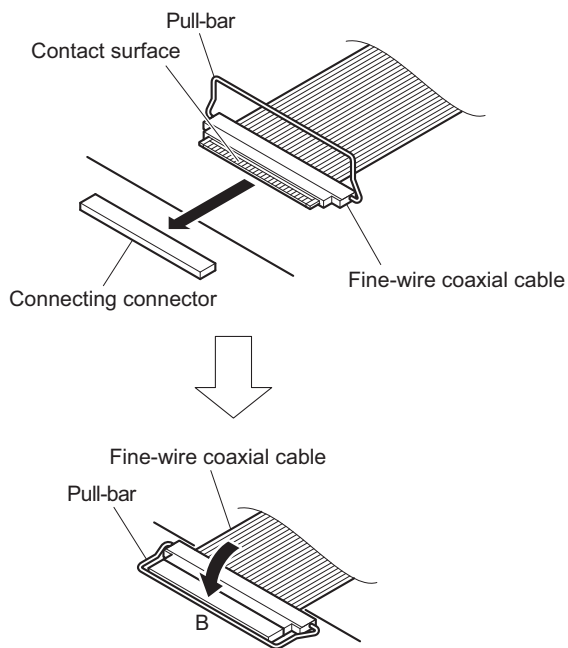
Type C

Disconnecting

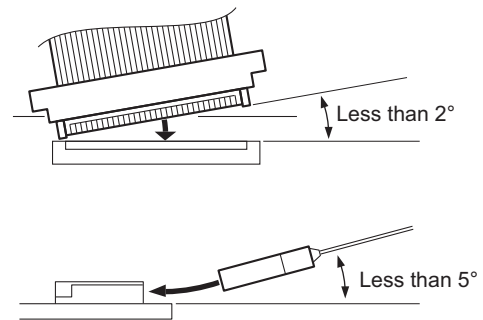


1. Raise the pull-bar in the direction of arrow A to unlock it.
2. Hold both sides of the fine-wire coaxial cable connector, and pull the connector straight to disconnect it.

Connecting



Angle regulation



Note

Insert the connector carefully so that the connector guides are not caught by the edge of the mating connector.

1. Hold both sides of the fine-wire coaxial cable connector with the contact surface facing up.
2. Insert the connector straight to meet the angle specified.
3. Turn the pull-bar in the direction of arrow B and lock it.

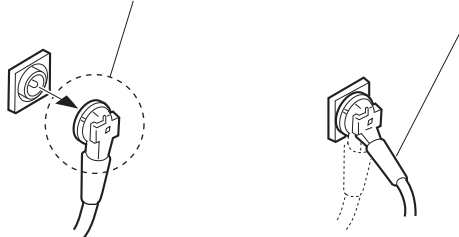
1-5-4. Disconnecting/Connecting Coaxial Cable

Note

Be sure to hold the plug when disconnecting the coaxial cable. Do not pull the cable.

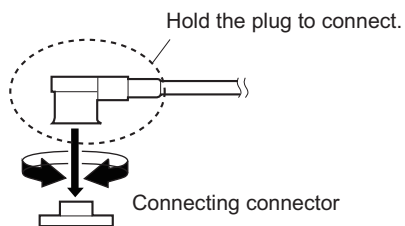
Disconnecting

OK Hold the plug to remove. **NG** Do not pull the cable.



1. Hold the plug of the coaxial cable.
2. Pull the plug straight in the arrow direction to disconnect the coaxial cable.

Connecting



1. Hold the plug of the coaxial cable.
2. Push the plug perpendicularly to the connector while slightly turning the plug clockwise and counterclockwise.

1-6. Circuit Protection Parts

1-6-1. Circuit Protection Element

This unit is equipped with positive-characteristic thermistors (power thermistors) as circuit protection elements.

The positive-characteristic thermistor limits the electric current flowing through the circuit as the internal resistance increases when an excessive current flows or when the ambient temperature increases.

If the positive-characteristic thermistor works, turn off the main power of the unit and inspect the internal circuit of the unit. After the cause of the fault is eliminated and the positive-characteristic thermistor is cooled down, turn on the main power again. The unit works normally. It takes about one minute to cool down the positive-characteristic thermistor after the main power is turned off.

Board	Ref. No.	Address	Part No.	Holding Current
LE-411	TH001	B1 (side A)	 1-802-063-21	1.10 A/20 °C
	TH002	B1 (side A)	 1-802-063-21	1.10 A/20 °C
SW-1705	TH002	A2 (side A)	 1-802-108-11	1.50 A/20 °C

1-7. Fixtures/Measuring Equipments List

1-7-1. Service Tools

Part No.	Name	Usage/Note
J-6029-140-B	Pattern box PTB-500	Camera adjustment
J-6252-540-B	Bit set for torque screwdriver (size 2, 2.5, 3 nut driver, +2 mm, +2.6 mm, +3 mm bit)	Screw tightening
J-6325-400-A	Torque screwdriver (3 kg•cm) (0.3•N m)	Screw tightening
J-6252-510-A	Torque screwdriver (6 kg•cm) (0.6•N m)	Screw tightening
J-6252-520-A	Torque screwdriver (12 kg•cm) (1.2 N•m)	Screw tightening
J-6394-080-A	Grayscale chart	Transparent type (16:9), Camera adjustment
Commercially available	Grayscale chart	Reflective type (16:9), Camera adjustment
Commercially available	Nut driver (size: 4mm, 5mm)	hexagonal support tightening
Commercially available	Hexagon box bit (size: 11mm)	Nut tightening
Commercially available	USB drive	Upgrading software, writing and rewriting the PLD internal data

1-7-2. Measuring Equipment

Use the calibrated equipment or equivalent as listed below for the adjustments.

Equipment	Model name
4K waveform monitor	Leader Electronics LV5490 (multi waveform monitor) or equivalent
4K color monitor	Sony BVM-X300 or equivalent
Luminance meter	Konica Minolta LS-110 or equivalent

1-8. Explanation of Adhering Number

The CMOS imager adhering is managed by following mount assembly number.

Prism optical: A-2075-369-A

Mount assembly number (8-digit): A0000001 and higher

1-9. Lead-free Solder

All boards mounted in this unit use lead-free solder. Be sure to use lead-free solder when repairing the boards of this unit. A lead free mark (LF) indicating that the solder contains no lead is printed on each board. (Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)



: LEAD FREE MARK

Note

- The lead-free solder melts at a temperature about 40 °C higher than the ordinary solder, therefore, it is recommended to use the soldering iron having a temperature regulator.
- The ordinary soldering iron can be used but the iron tip has to be applied to the solder joint for a slightly longer time. The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful.

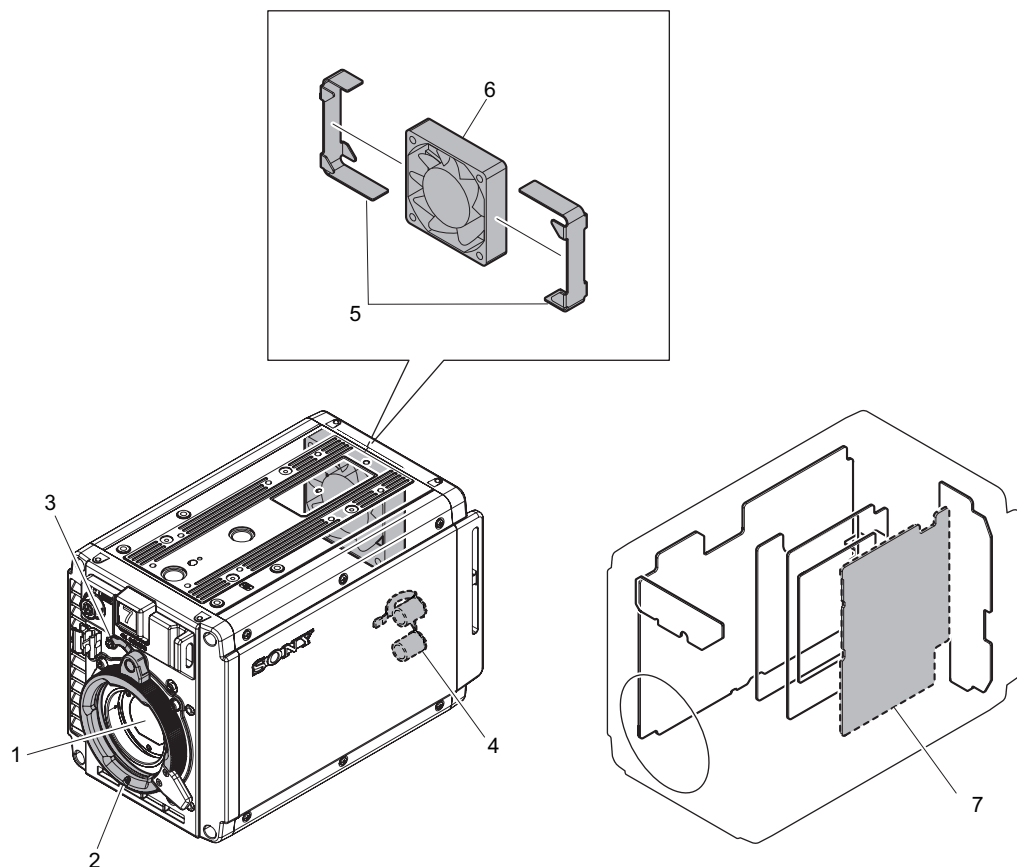
Section 2

Periodic Maintenance and Inspection

2-1. Recommended Replacement Parts

This section describes the recommended replacement parts and recommended replacement time.

The replacement period of each part is changed according to the environment and condition. The parts made of rubber used for this unit may become cracked and split with the lapse of time, therefore also replace it if necessary.



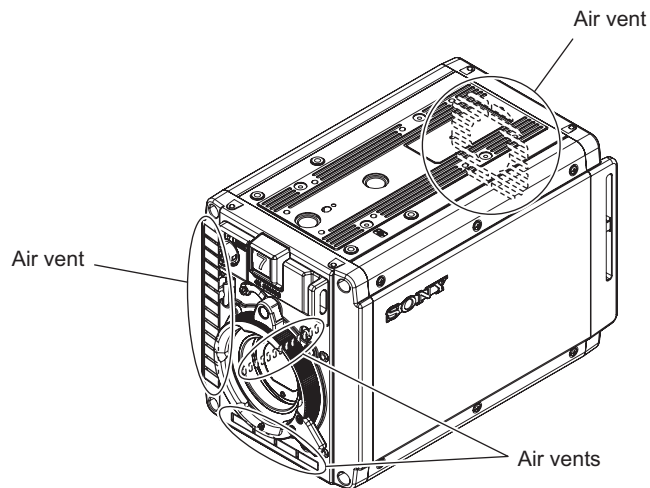
No.	Part name	Part No.	Recommended replacement timing
1	Optical filter unit	1-856-701-11	It can become nebulous (in transparent and whitened) with elapse of time. Replace it as necessary.
2	Bayonet ring	4-263-184-04	Replace every 5 years.
3	Lens mount holder	3-796-982-03	Check for deformation and deterioration (abraded or damaged or lost) from time to time. Replace it as necessary.
4	ST connector cap	4-579-333-01	
5	Fan cushion	4-689-064-01	
6	DC fan (60 square)	△ 1-855-154-11	Check every five years and replace it if necessary. (When used for eight hours a day.)
7	PS-921 board	A-2178-389-A	It is recommended that replace it when energizing time has elapsed about 25,000 hours.

2-2. Cleaning the Air Vents

Clogging of dust or foreign matters may cause a temperature increase inside the camera, which may result in a failure. Clean the air vents every two or three months.

Procedure

1. Remove dust on the four air vent areas with a vacuum cleaner.



2-3. Replacing Lithium Battery

2-3-1. Note on Replacement of Lithium Battery

A lithium battery is mounted on the SY-449 board to back up the real time clock (RTC).

If this unit is not energized, the backup period is about two years. When the RTC is reset without using this unit for long time, charge the lithium battery by energizing this unit all day long.

When the backup period is shortened even if the lithium battery is charged, the lithium battery must be replaced.

- Replacement part: Lithium secondary battery (ML621 (U))
- Part number: △ 1-756-134-16

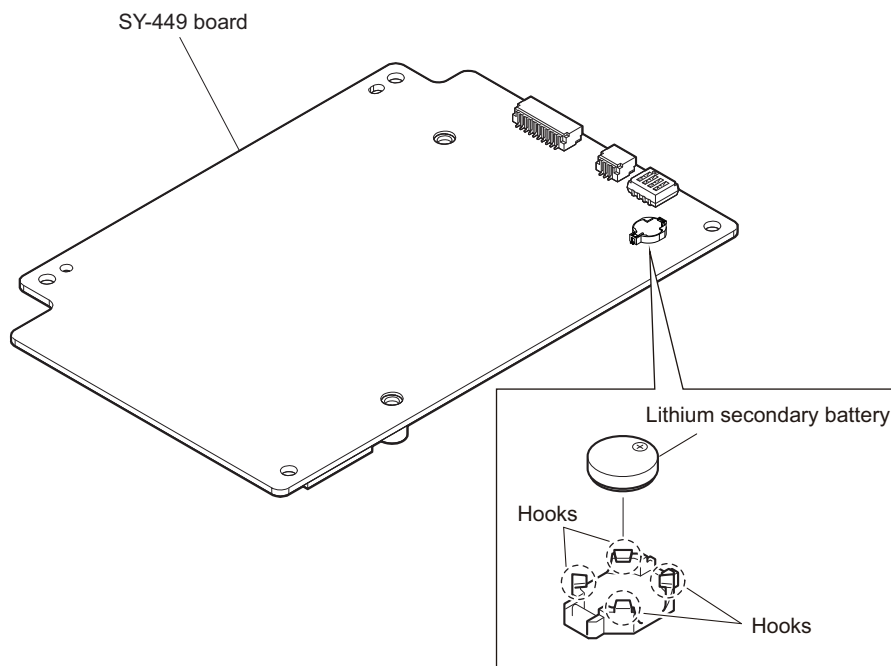
Note on Replacement of Lithium Battery

CAUTION

When replacing the lithium battery, ensure that the battery is installed with “+” and “-” poles connected to the correct terminals. Improper connection may cause an explosion or leakage of fluid, resulting in injury or damage to surrounding properties.

2-3-2. Replacing Lithium Battery

1. Remove the SY-449 board. (Refer to “4-15. SY-449 Board”.)
2. Remove the Lithium secondary battery (ML621 (U)) from the four hooks of the battery holder, and replace it.



Note

Be sure to use an insulating stick to remove the Lithium secondary battery (ML621 (U)).

3. Install the removed parts by reversing the steps of removal.
4. The date and time in the internal clock to be set. (For setting method, refer to Operation Manual.)

2-4. Cleaning of Connector/Cable

The photo receptive condition of the optical connector can be checked by Camera Control Unit (CCU), Baseband Processor (BPU) and camera that is connected to this unit.

- When two green indicators lit: Reception is very good
- When one green indicator lit: Reception is good
- When the yellow indicator lit: Reception is poor
- When the red indicator lit: Reception is very poor.

When lit in red, be sure to clean the optical contact portions.

When lit in yellow, cleaning is recommended.

The attenuation of the photo-receptive level may cause transmission error. Clean optical contact portions proceeding as follows.

Note

The optical contact portion exists in the optical connector on the camera or camera control unit, and in the optical/ electrical cables. Clean the connected optical contact portion all equipment.

The cleaning method of the unit is describes on the following. For other equipment, refer to the service manual of the equipment to be connected.

2-4-1. When the Optical Connector Cleaner (Commercially Available) is Available

Tool and Fixtures

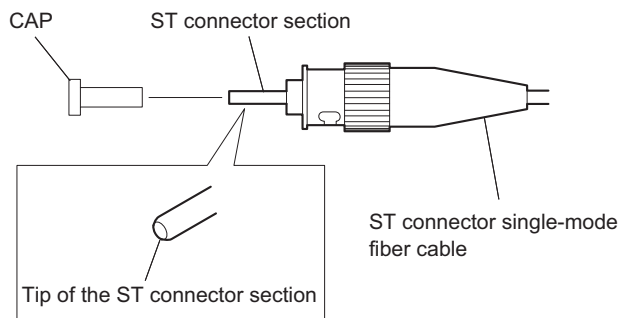
- Optical connector cleaner (commercially available)
 - Product name: CLETOP[®]
 - 14100402 or 14100403 (stick type) or equivalent
 - 14100402: 2.0 mm
 - 14100403: 2.0/2.5 mm double ended

Tip

- Alcohol is not necessary during cleaning.
- Number of possible wipes is one cleaning per a piece. Do not reuse it.

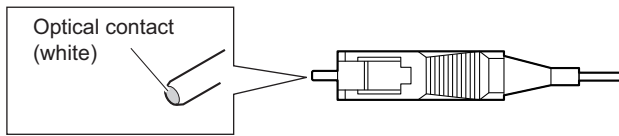
Cleaning of ST Connectors Single-mode Fiber Cable

Clean the tip of the white optical contacts using the optical connector cleaner.



Cleaning of Connector

Clean the tip of the white optical contacts using the optical connector cleaner.



2-4-2. When the Optical Connector Cleaner (Commercially Available) is not Available (Connector)

Fixtures

- Alcohol (commercially available)
- Cotton swabs (commercially available)

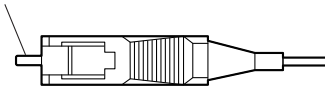
Note

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.

Connector

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

Optical contact (white)



Section 3

Diagnostics

3-1. Device Check

This unit is provided with a self-diagnosis function for checking the communication function of each device. Diagnosis result can be monitored on the BOARD STATUS page of the DIAGNOSIS menu.

3-1-1. BOARD STATUS (DIAGNOSIS menu)

When “NG” is displayed on this page, there may be a problem with the relevant device or its connection.

<BOARD STATUS>		D02 TOP
OHB	:	OK
DPR	:	OK
SY	:	OK
PS	:	OK
HOURS METER		: x x x x H

Item	Setting:	Function
OHB	Display only	Indicates the status of the LSI (IC005) on the BI-291 board.
DPR	Display only	Indicates the status of the LSI (IC1001) on the DPR-376 board.
SY	Display only	Indicates the status of LSI (IC701) on the SY-449 board.
PS	Display only	Indicates the status of power supply on the PS-921 board.
HOURS METER	Display only	Displays the total working time.

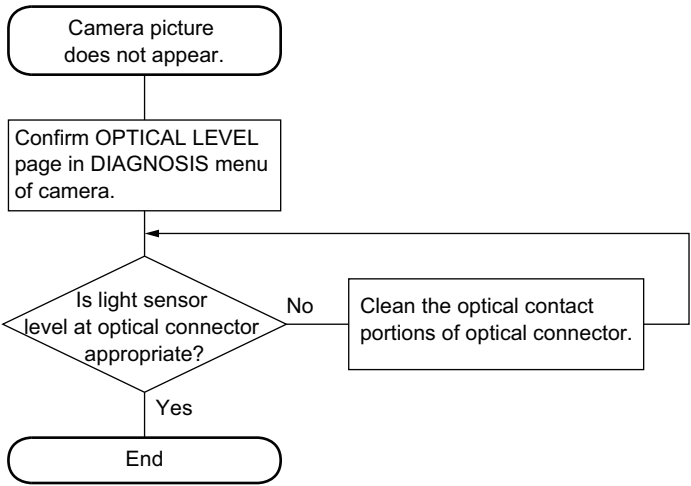
3-1-2. Displaying

1. Turn the DISPLAY/MENU switch to the MENU side while pressing the MENU SEL knob/ENTER button.
[TOP] appears at the upper right of the screen of the monitor connected to SDI 1 connector.
2. Set the cursor at [TOP] and press the MENU SEL knob/ENTER button.
The TOP MENU screen showing the entire configuration of menu items appears.
3. Set the cursor to [DIAGNOSIS] and press the MENU SEL knob/ENTER button.
4. Set the cursor to [BOARD STATUS] and press the MENU SEL knob/ENTER button.

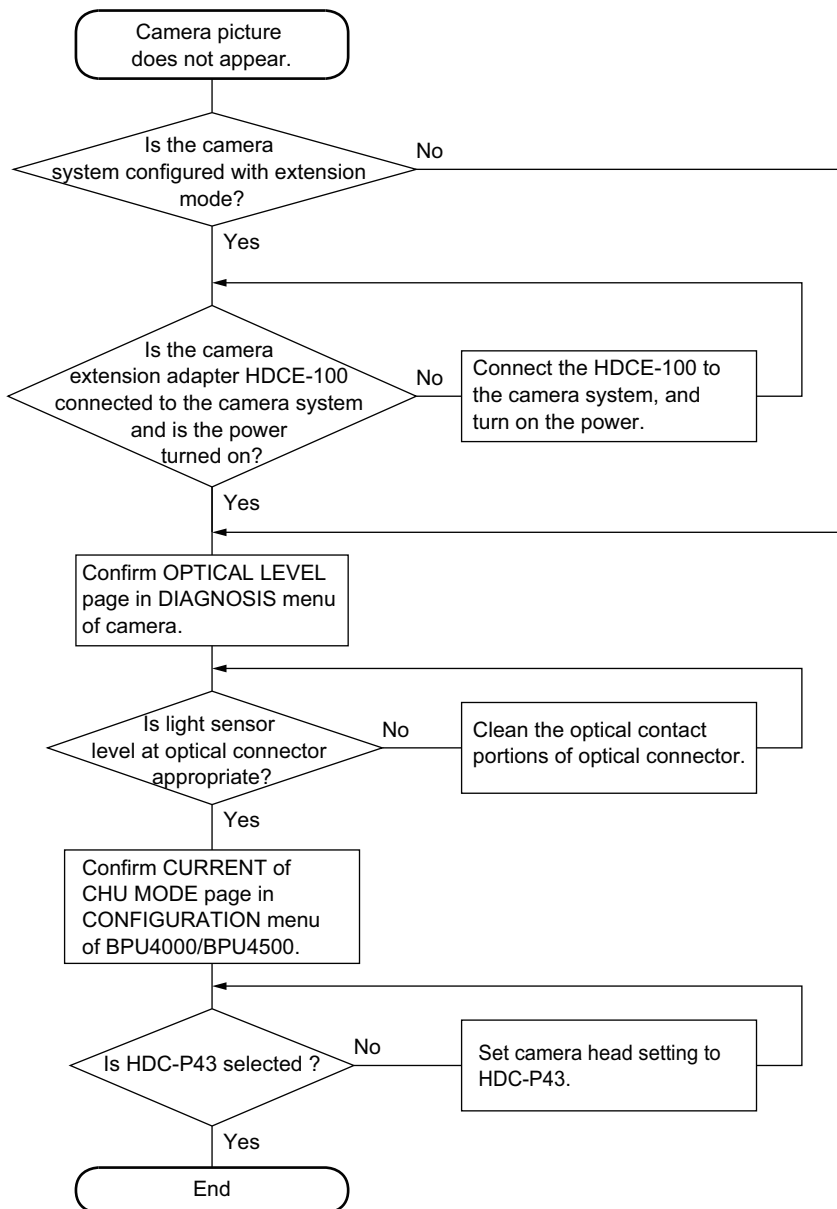
3-2. Troubleshooting

3-2-1. Camera picture does not appear

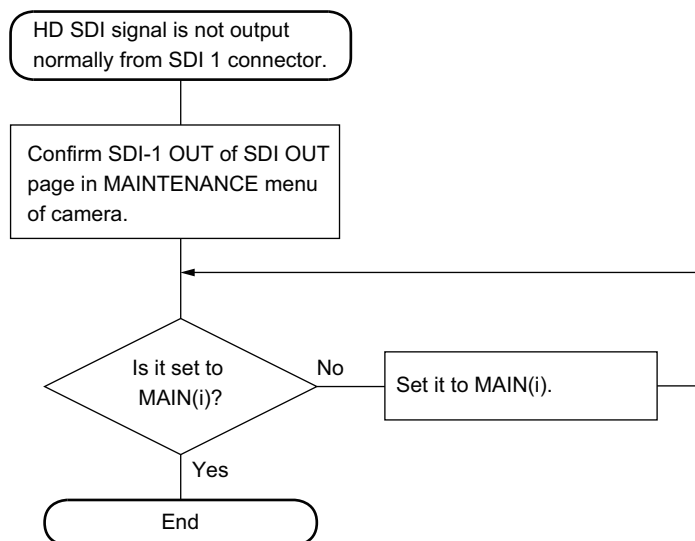
When using the camera control unit HDCU4300



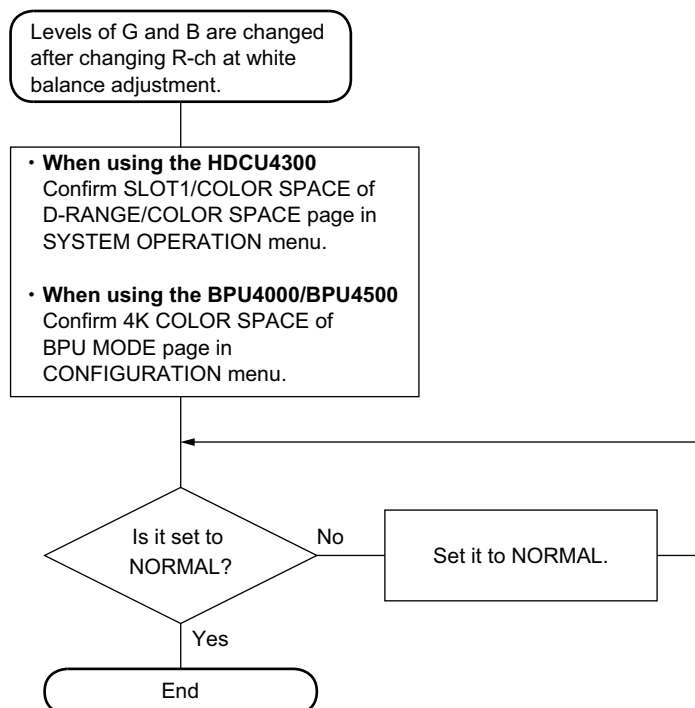
When using the baseband processor unit BPU4000/BPU4500



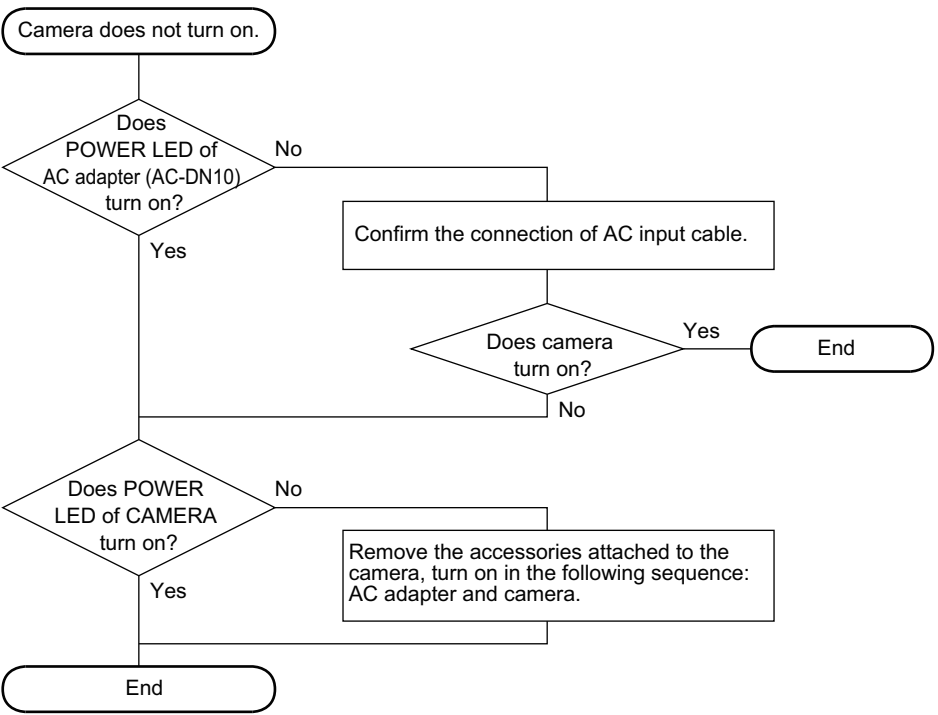
3-2-2. HD SDI signal is not output normally from SDI 1 connector



3-2-3. The levels of G and B are changed after changing R-ch at white balance adjustment



3-2-4. Camera does not turn on



Section 4

Replacement of Main Parts

4-1. Precautions before Work

4-1-1. Tightening Torque

When tightening screws used in this unit, be sure to use a torque driver and tighten screws to the specified tightening torque.

If the specified tightening torque is described in the figure in this section, tighten screws to the specified tightening torque in the figure.

Tightening torque

M2 : $0.30 \pm 0.03 \text{ N}\cdot\text{m}$

M2.6 : $0.53 \pm 0.07 \text{ N}\cdot\text{m}$

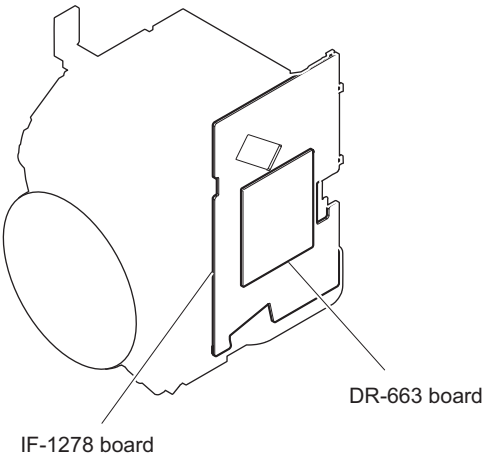
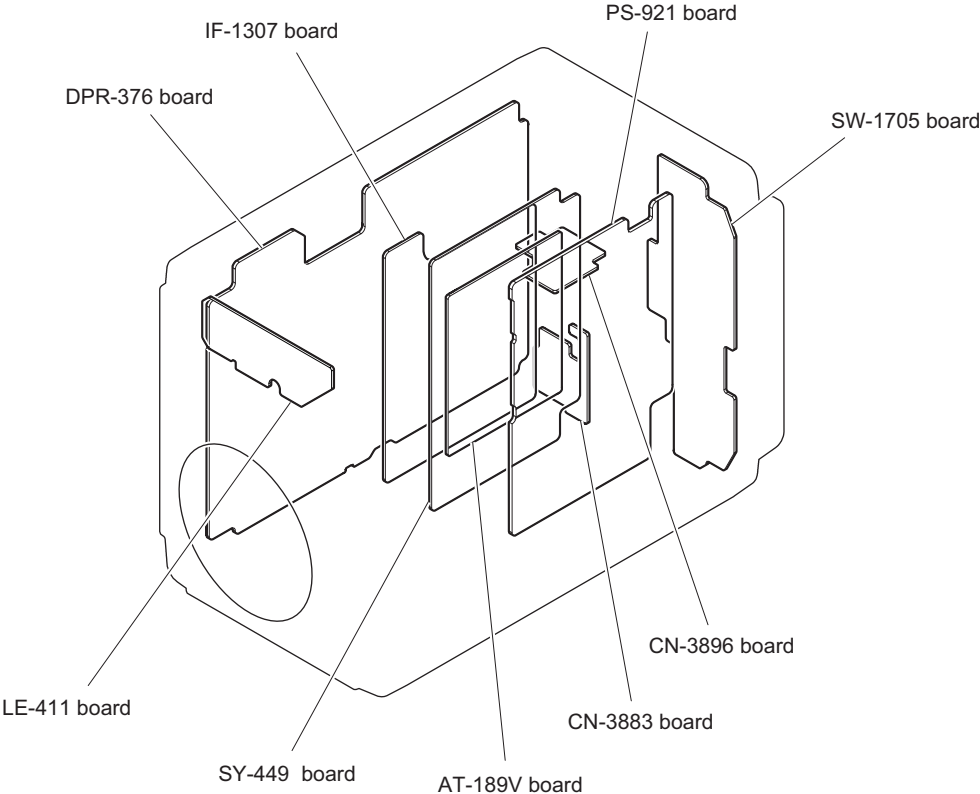
M3 : $0.80 \pm 0.12 \text{ N}\cdot\text{m}$

Tip

When using the torque driver with the notation of $\text{cN}\cdot\text{m}$, interpret it as follows.

Example: $0.8 \text{ N}\cdot\text{m} = 80 \text{ cN}\cdot\text{m}$

4-2. Location of Printed Wiring Boards



4-3. Actions to be Taken during Board Replacement and after Board Replacement or after Board Repair

4-3-1. Stored Data of ICs

The table below lists data retained in the IC on the following boards.

When any of the following boards or ICs is replaced, deal with action to be taken in replacing parts.

Note

The part number listed in “Spare Parts” is for IC which is not programmed. If replacement is needed, contact your local Sony Sales Office/Service Center.

Board	Ref. No. (Type)	Stored Data	Replacement and Actions
AT-189V	IC401 (eMMC)	Software program	Replacement of the board (not replacing IC) Necessary (refer to “6-1. Upgrading Software Programs” .)
DPR-376	IC109 (EEPROM)	Model information data	Replacement of the board Remove the IC attached to the former board and replace it to the new board.
	IC1303 (Flash)	PLD data	Replacement of the board (not replacing IC) Necessary (refer to “6-2. PLD” .)
IF-1278	IC204 (Flash)	CMOS adjustment data, RPN compensation data	Replacement of the board (not replacing IC) Necessary (refer to “4-3-2. Alignment and Setting Required when Replacing IF-1278 Board” .)
SY-449	IC403, IC404 (FRAM)	Paint data, etc.	Replacement of the board (not replacing IC) Necessary (refer to “4-3-3. Alignment and Setting Required when Replacing SY-449 Board” .)
	IC804 (Flash)	PLD data	Replacement of the board (not replacing IC) Necessary (refer to “4-3-3. Alignment and Setting Required when Replacing SY-449 Board” .)

4-3-2. Alignment and Setting Required when Replacing IF-1278 Board

1. Replace the IF-1278 board.
(Refer to [“4-9. IF-1278 Assembly”](#).)
2. Compensate the RPN.
(Refer to [“5-6. RPN Compensation”](#).)
3. Make electrical adjustment as needed.
(Refer to [“5. Electrical Alignment”](#).)

4-3-3. Alignment and Setting Required when Replacing SY-449 Board

Camera setting status and files are stored in the SY-449 board. When the SY-449 board is replaced, contents of the reference file, scene file, lens file, and operator file are lost. Store these files in a USB drive and then replace the SY-449 board.

The content of the OHB file stored in the OHB assembly is not lost.

Procedure

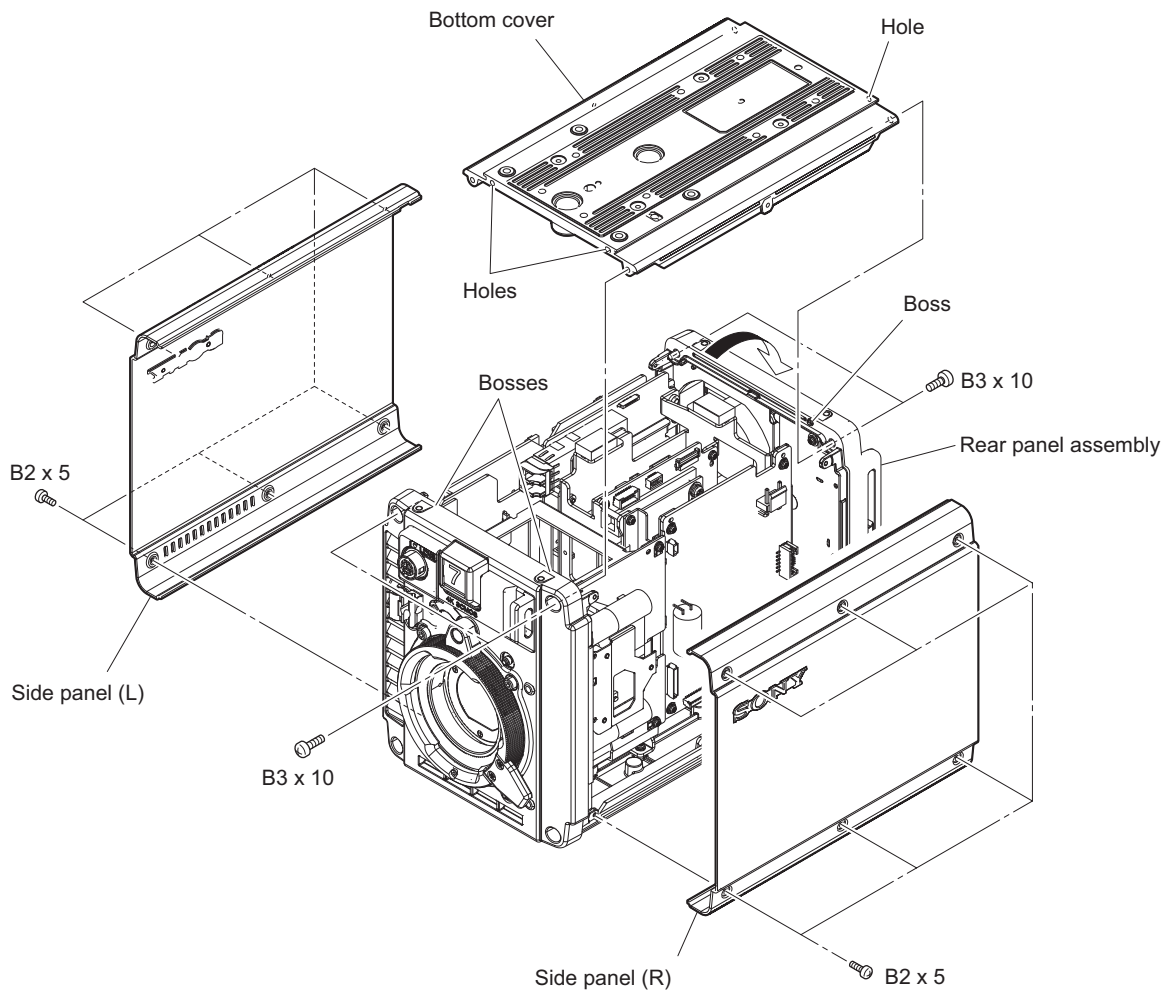
1. Store the operator file, scene file, and reference file in a USB drive.
 - Operator file (Refer to [“7-2. Operator File”](#).)
 - Scene file (Refer to [“7-4. Scene File”](#).)
 - Reference file (Refer to [“7-5. Reference File”](#).)

2. Replace the SY-449 board.
(Refer to [“4-15. SY-449 Board”](#).)
3. Upgrade the PLD data.
(Refer to [“6-2. PLD”](#).)
4. Execute ALL PRESET on the REFERENCE page of the FILE menu.
(Refer to [“7-5. Reference File”](#).)
5. Execute STORE FILE on the REFERENCE page of the FILE menu.
(Refer to [“7-5. Reference File”](#).)
6. Execute the automatic adjustment.
(Refer to [“5-2. Automatic Adjustment”](#).)
7. Load the operator file, scene file, and reference file stored in the USB drive in step 1.
 - Operator file (Refer to [“7-2. Operator File”](#).)
 - Scene file (Refer to [“7-4. Scene File”](#).)
 - Reference file (Refer to [“7-5. Reference File”](#).)
8. Readjust the lens and OHB.
(Refer to [“7-6. Lens File”](#), [“7-7. OHB File”](#).)

4-4. Side Panel, Bottom Cover

Procedure

1. Remove the side panel (L), side panel (R) and bottom cover.
 - (1) Remove the six screws (B2 x 5) and remove the side panel (L).
 - (2) Remove the six screws (B2 x 5) and remove the side panel (R).
 - (3) Remove the four screws (B3 x 10), tilt the rear panel assembly in the direction of the arrow, and release the hole of the bottom cover from the boss of the rear panel assembly.
 - (4) Release the two holes of the bottom cover from the two bosses of the front panel assembly, and then remove the bottom cover.



2. Install the removed parts by reversing the steps of removal.

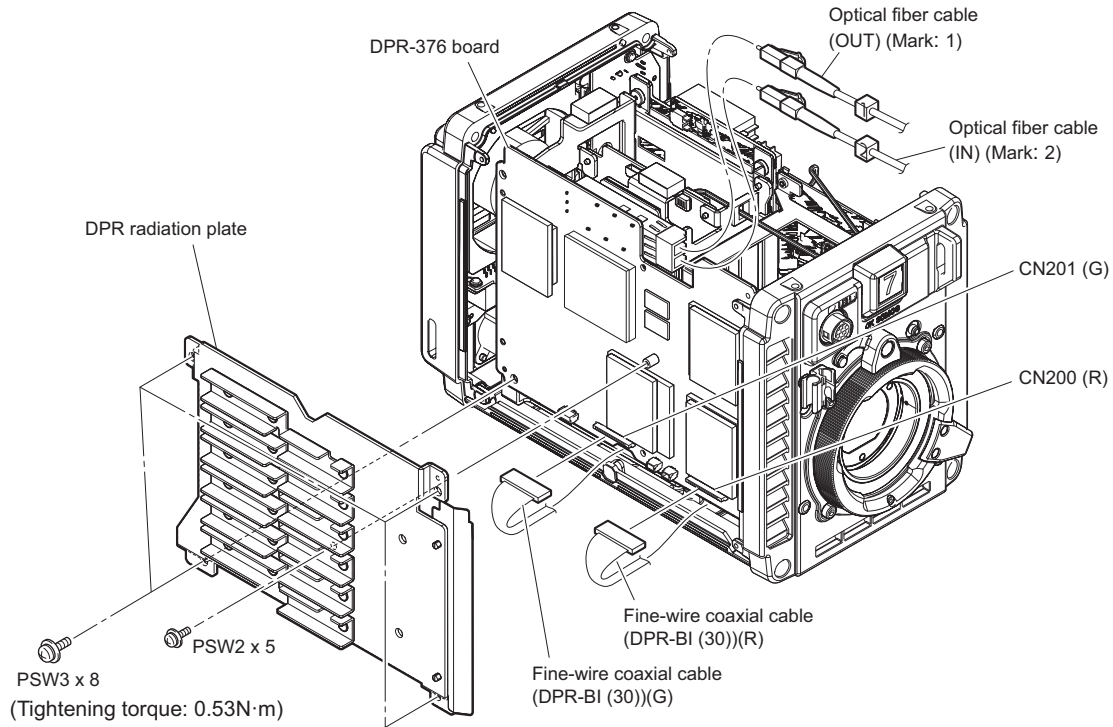
4-5. DPR-376 Board

Preparation

1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to [“4-4. Side Panel, Bottom Cover”](#))

Procedure

1. Remove the DPR radiation plate, and disconnect the cables.
 - (1) Remove the four screws (PSW3 x 8) and the screw (PSW2 x 5), and then remove the DPR radiation plate.
 - (2) Disconnect the two optical fiber cables from the two connectors of the optical module on the DPR-376 board.
 - (3) Disconnect the two fine-wire coaxial cables from the two connectors (CN201(G), CN200(R)) on the DPR-376 board.



Note

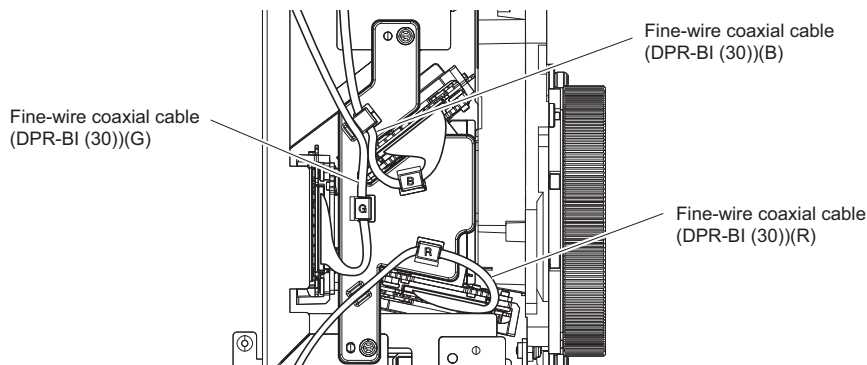
When connecting the optical fiber cable, pay attention as follows.

- Connect after cleaning the tip of optical connector.
- Confirm the marks (1, 2) of connectors, and connect correct connectors.

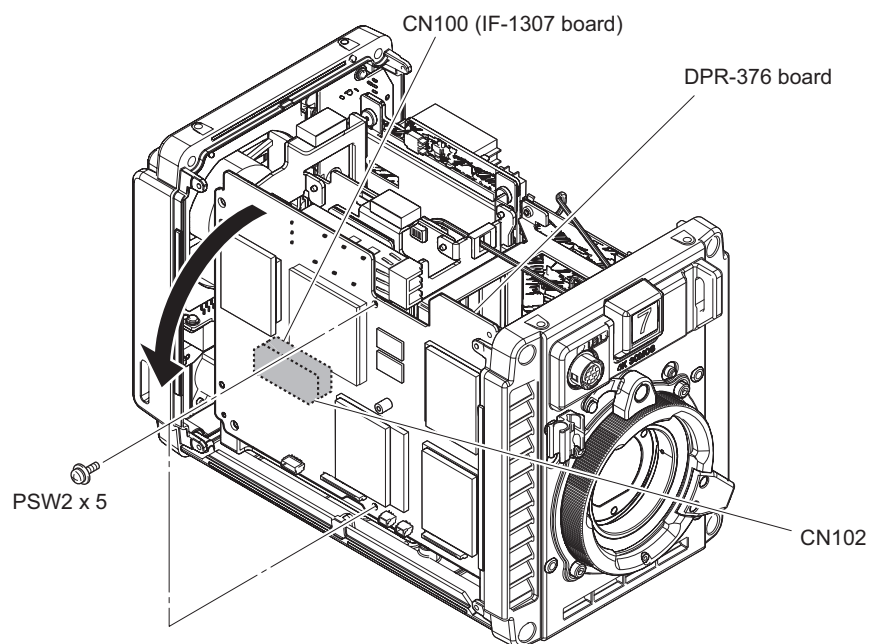
Note

When connecting the fine-wire coaxial cable, pay attention as follows.

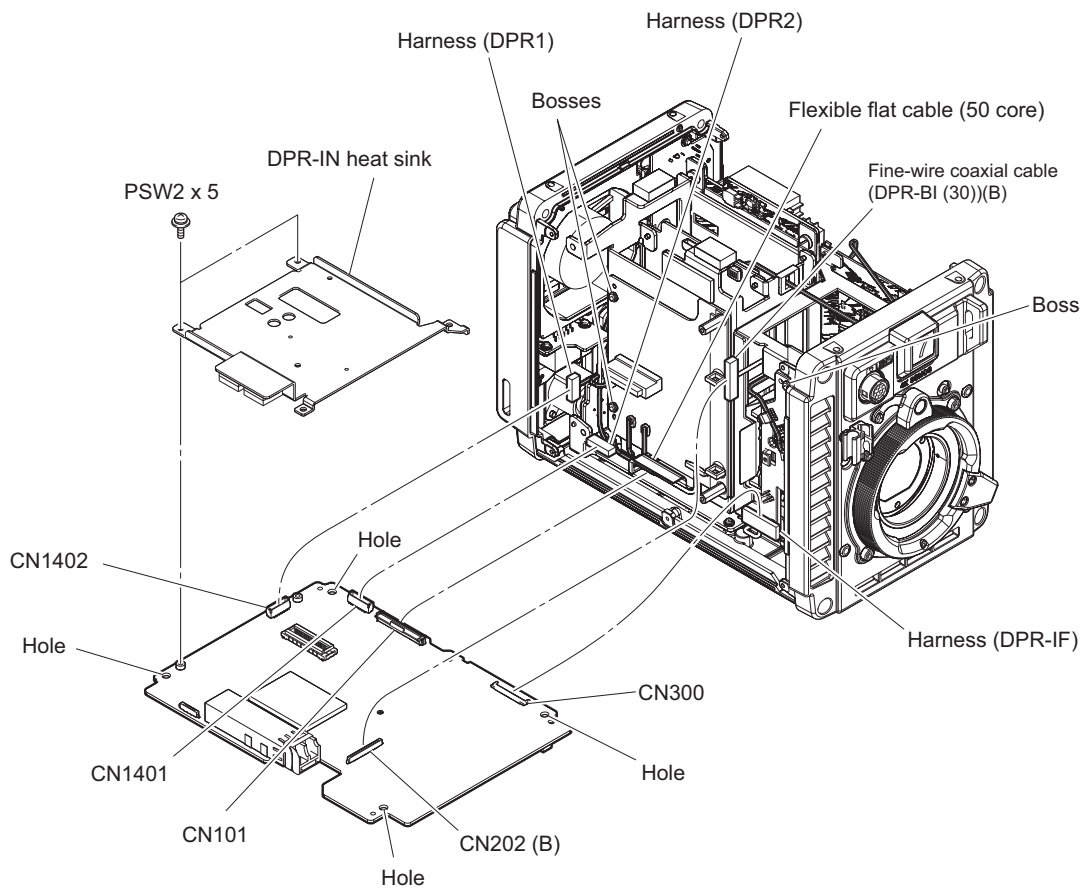
- Connect correct connectors.
- Carefully handle these fine-wire coaxial cables so that they are not disconnected.



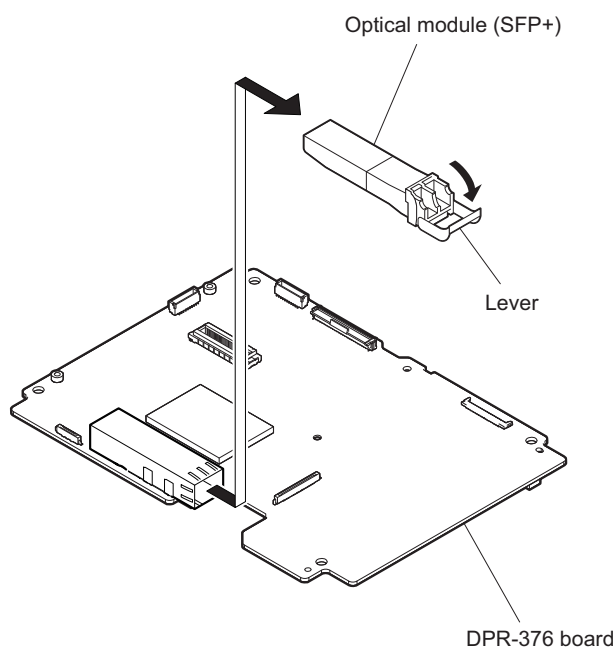
2. Remove the DPR-376 board.
 - (1) Remove the two screws (PSW2 x 5).
 - (2) Disconnect the connector (CN102) on the DPR-376 board from the connector (CN100) on the IF-1307 board and open the DPR-376 board in the direction of the arrow.



3. Remove the parts on the DPR-376 board.
 - (1) Disconnect the fine-wire coaxial cable from the connector (CN202 (B)) on the DPR-376 board.
 - (2) Disconnect the flexible flat cable (50 core) from the connector (CN101) on the DPR-376 board.
 - (3) Disconnect the two harnesses from the two connectors (CN1401, CN1402) on the DPR-376 board.
 - (4) Disconnect the harness from the connector (CN300) on the DPR-376 board.
 - (5) Remove the two screws (PSW2 x 5), and then remove the DPR-IN heat sink.



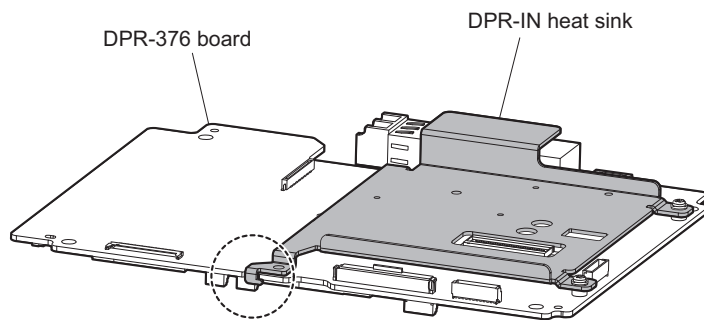
4. Turn the lever and remove the optical module (SFP+).



5. Install the removed parts by reversing the steps of removal.

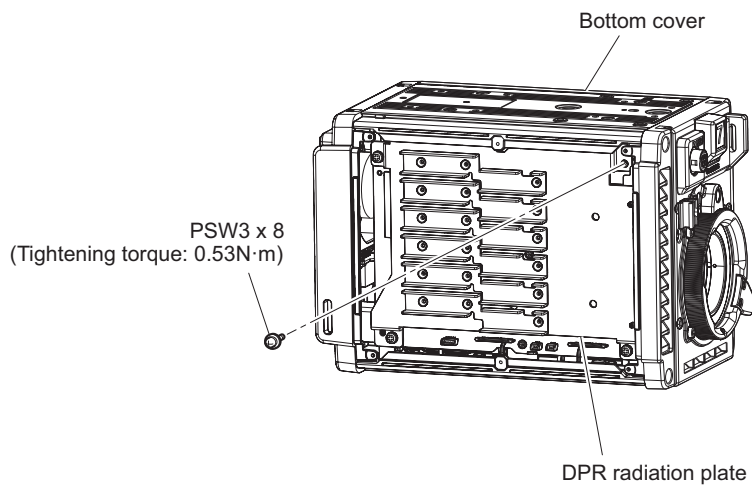
Note

When attaching the DPR-IN heat sink, hook the hook of the DPR-IN heat sink to the notch of the DPR-376 board.



Note

When attaching the DPR radiation plate, install the screw (PSW3 x 8) at the position shown below with the bottom cover attached.



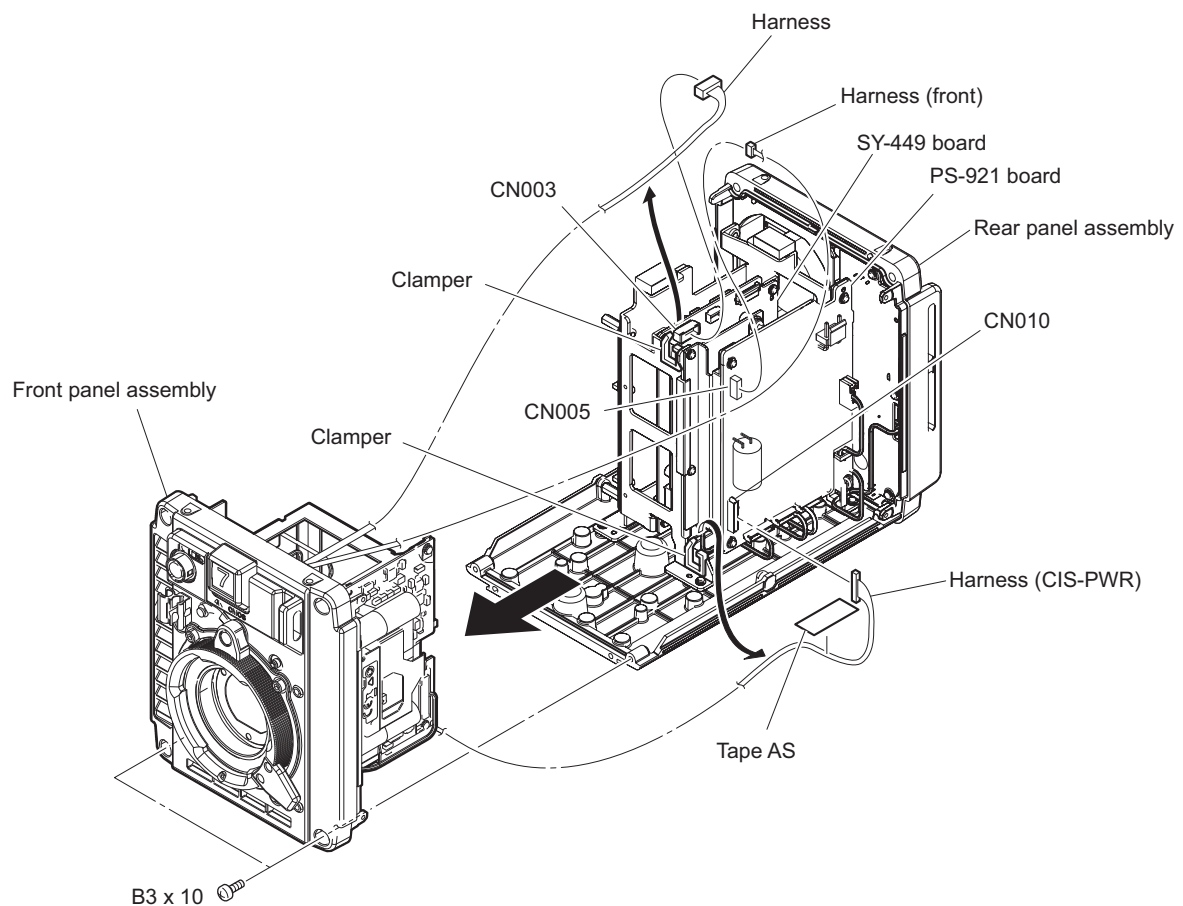
4-6. Front Panel Assembly

Preparation

1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to “4-4. Side Panel, Bottom Cover”)
2. Remove the DPR-376 board. (Refer to “4-5. DPR-376 Board”)

Procedure

1. Remove the front assembly.
 - (1) Disconnect the harness from the connector (CN003) on the SY-449 board, and release the harness from the clamper.
 - (2) Disconnect the harness from the connector (CN005) on the PS-921 board.
 - (3) Remove the two screws (B3 x 10), and then draw the front panel assembly in the direction of the arrow.
 - (4) Disconnect the harness from the connector (CN010) on the PS-921 board, and release the harness (CIS-PWR) from the clamper, and then remove the peel off the tape AS.
 - (5) Remove the front panel assembly.



2. Install the removed parts by reversing the steps of removal.

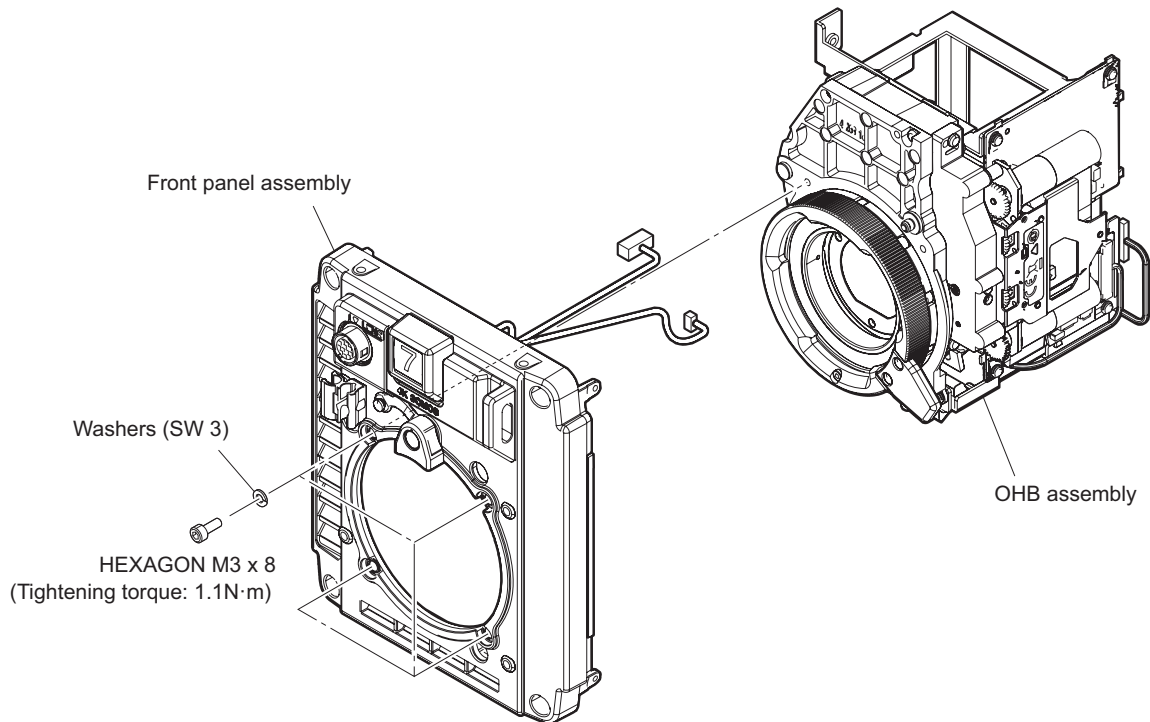
4-7. OHB Assembly

Preparation

1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to “4-4. Side Panel, Bottom Cover”)
2. Remove the DPR-376 board. (Refer to “4-5. DPR-376 Board”)
3. Remove the front assembly. (Refer to “4-6. Front Panel Assembly”)

Procedure

1. Remove the four HEXAGON screws and the four spring washers (SW3), and then remove the OHB assembly.



2. Install the removed parts by reversing the steps of removal.

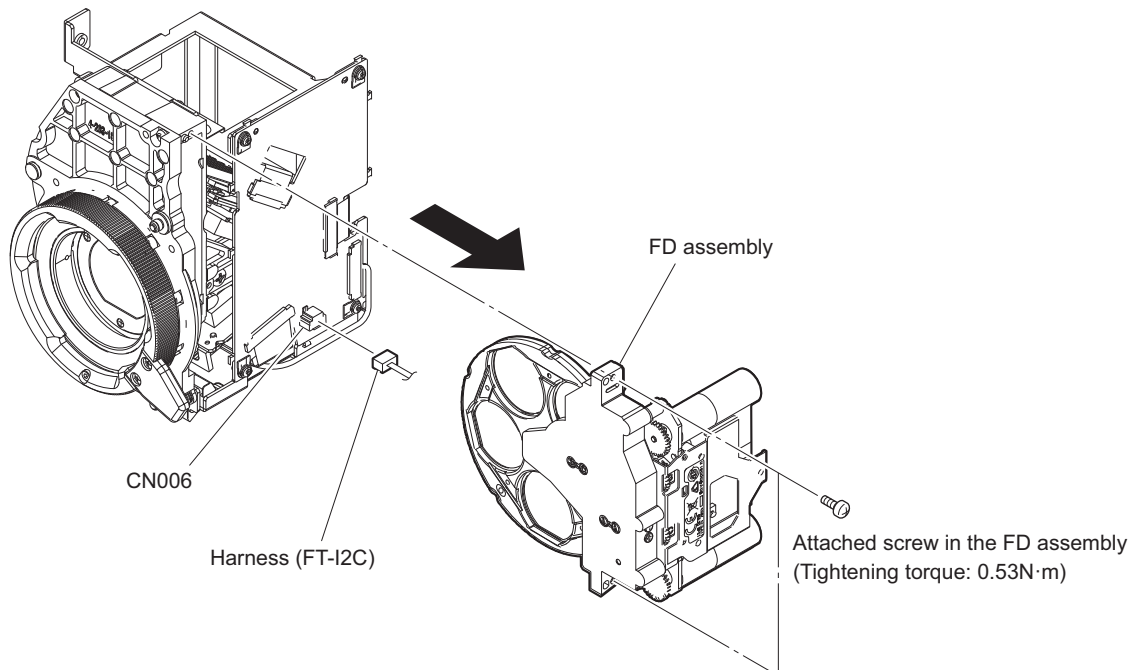
4-8. FD Assembly

Preparation

1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to “4-4. Side Panel, Bottom Cover”)
2. Remove the DPR-376 board. (Refer to “4-5. DPR-376 Board”)
3. Remove the front assembly. (Refer to “4-6. Front Panel Assembly”)
4. Remove the OHB assembly. (Refer to “4-7. OHB Assembly”)

Procedure

1. Remove the FD assembly.
 - (1) Remove the two screws, and then draw the FD assembly in the direction of the arrow.
 - (2) Disconnect the harness from the connector (CN006) on the IF-1278 board.
 - (3) Remove the FD assembly.



2. Install the removed parts by reversing the steps of removal.

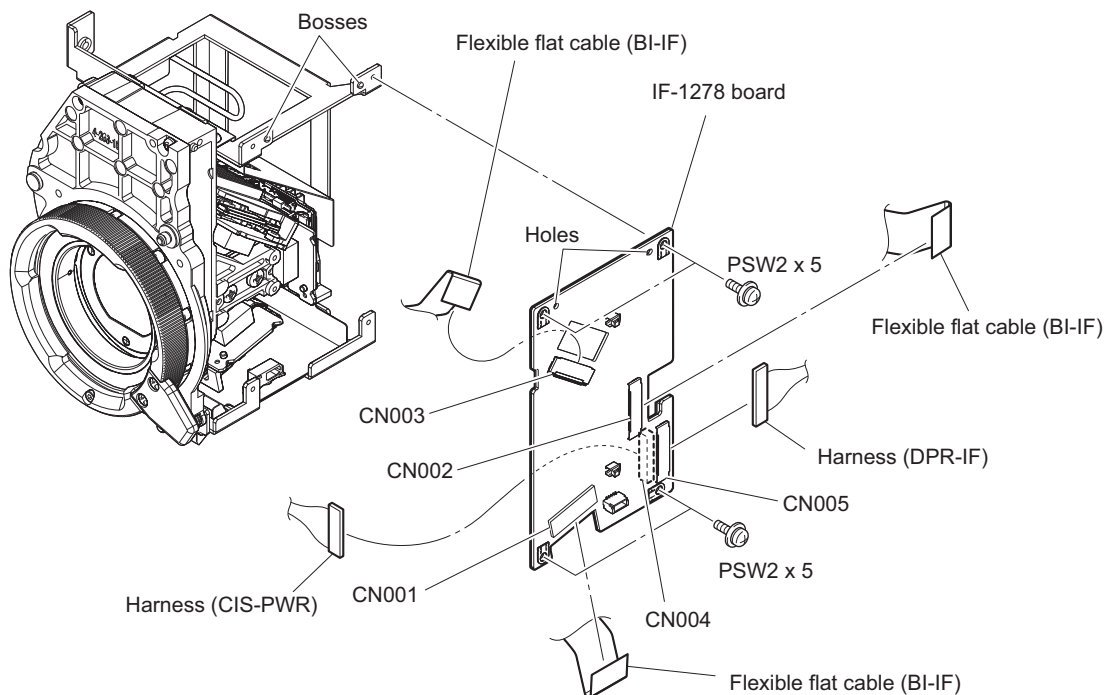
4-9. IF-1278 Assembly

Preparation

1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to “4-4. Side Panel, Bottom Cover”)
2. Remove the DPR-376 board. (Refer to “4-5. DPR-376 Board”)
3. Remove the front assembly. (Refer to “4-6. Front Panel Assembly”)
4. Remove the OHB assembly. (Refer to “4-7. OHB Assembly”)
5. Remove the FD assembly. (Refer to “4-7. OHB Assembly”)

Procedure

1. Remove the IF-1278 board.
 - (1) Disconnect the three flexible flat cables from the three connectors (CN001, CN002, CN003) on the IF-1278 board.
 - (2) Disconnect the two harnesses from the two connectors (CN004, CN005) on the IF-1278 board.
 - (3) Remove the four screws (PSW2 x 5), and then remove the IF-1278 board.



2. Install the removed parts by reversing the steps of removal.

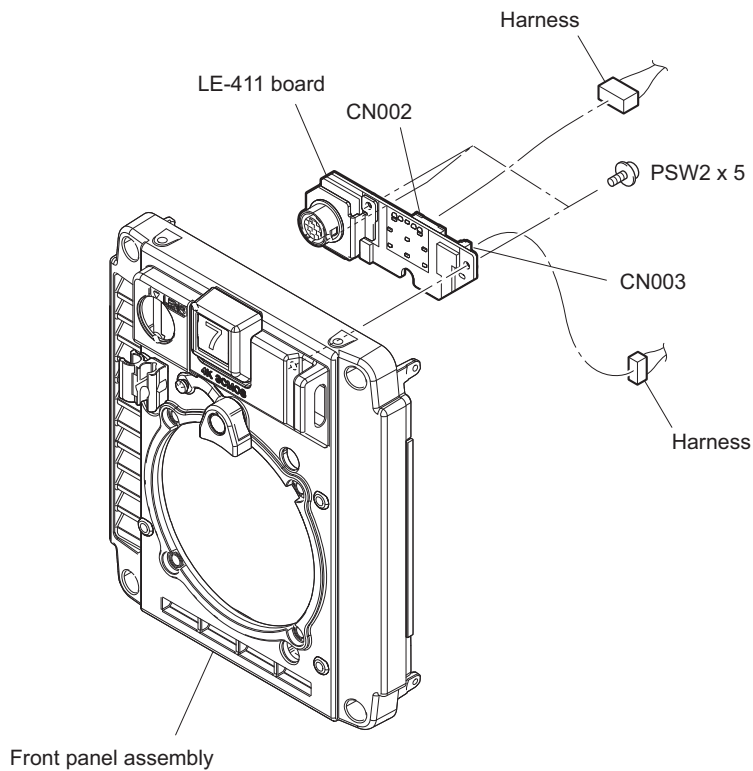
4-10. LE-411 Assembly

Preparation

1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to “4-4. Side Panel, Bottom Cover”)
2. Remove the DPR-376 board. (Refer to “4-5. DPR-376 Board”)
3. Remove the front assembly. (Refer to “4-6. Front Panel Assembly”)
4. Remove the OHB assembly. (Refer to “4-7. OHB Assembly”)

Procedure

1. Remove the LE-411 board.
 - (1) Disconnect the two harnesses from the two connectors (CN002, CN003) on the LE-411 board.
 - (2) Remove the three screws (PSW2 x 5), and then remove the LE-411 board.



2. Install the removed parts by reversing the steps of removal.

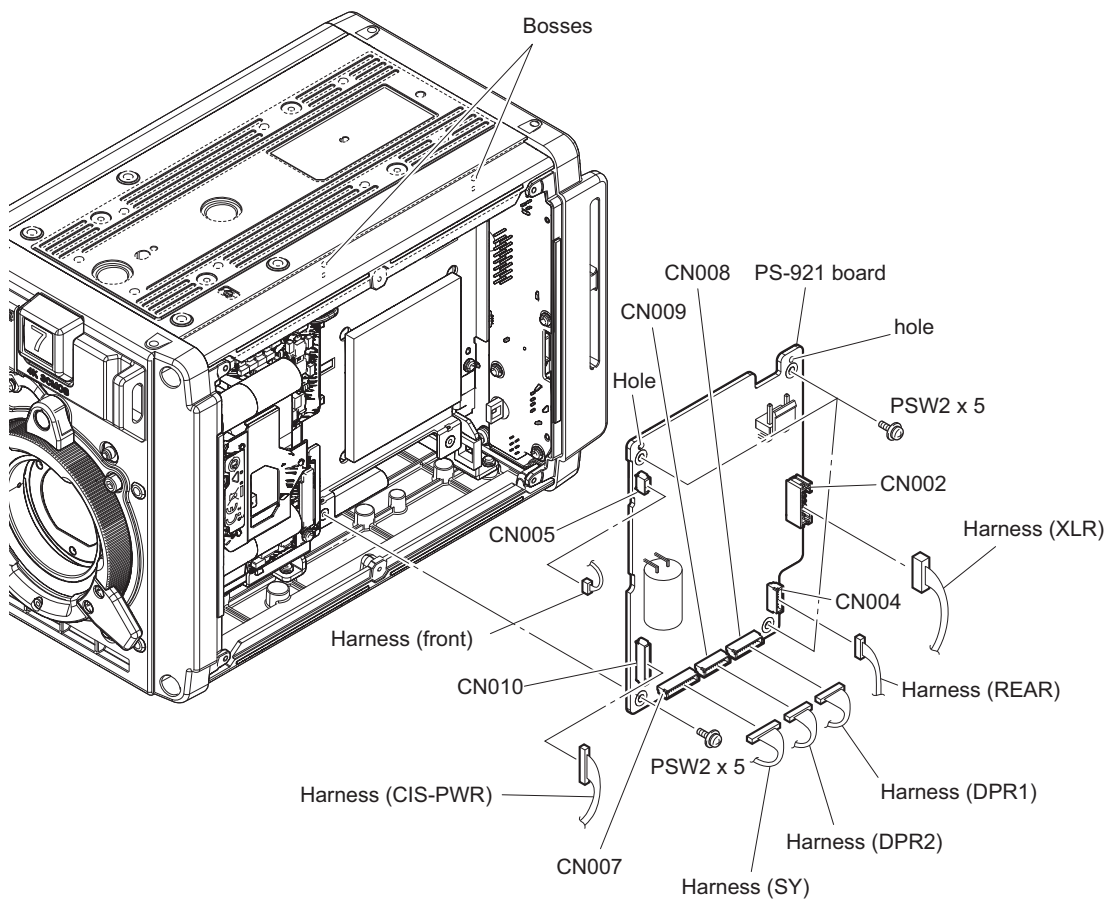
4-11. PS-921 Board

Preparation

1. Remove the side panel (R). (Refer to “4-4. Side Panel, Bottom Cover”)

Procedure

1. Remove the PS-921 board.
 - (1) Disconnect the seven harnesses from the seven connectors (CN002, CN004, CN005, CN007, CN008, CN009, CN010) on the PS-921 board.
 - (2) Remove the four screws (PSW2 x 5), and then remove the PS-921 board.



2. Install the removed parts by reversing the steps of removal.

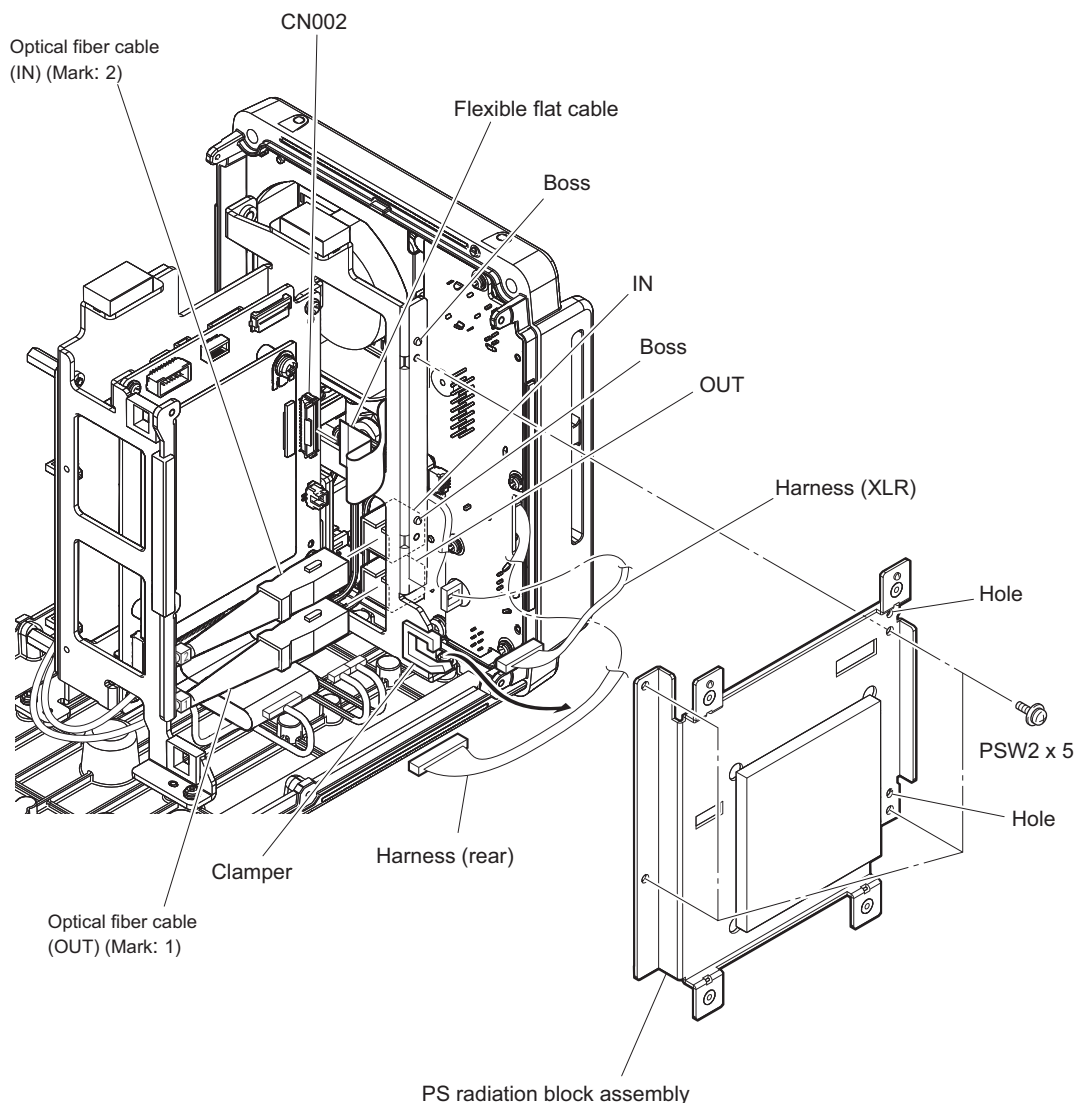
4-12. Rear Panel Assembly

Preparation

1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to “4-4. Side Panel, Bottom Cover”)
2. Remove the DPR-376 board. (Refer to “4-5. DPR-376 Board”)
3. Remove the front assembly. (Refer to “4-6. Front Panel Assembly”)
4. Remove the PS-921 board. (Refer to “4-11. PS-921 Board”)

Procedure

1. Disconnect the cables.
 - (1) Remove the four screws (PSW2 x 5), and then remove the PS radiation block assembly.
 - (2) Disconnect the flexible flat cable from the connector (CN002) on the SY-449 board.
 - (3) Disconnect the two optical fiber cables from the SC-ST optical fiber adaptor.
 - (4) Release the harness (rear) from the clamper.



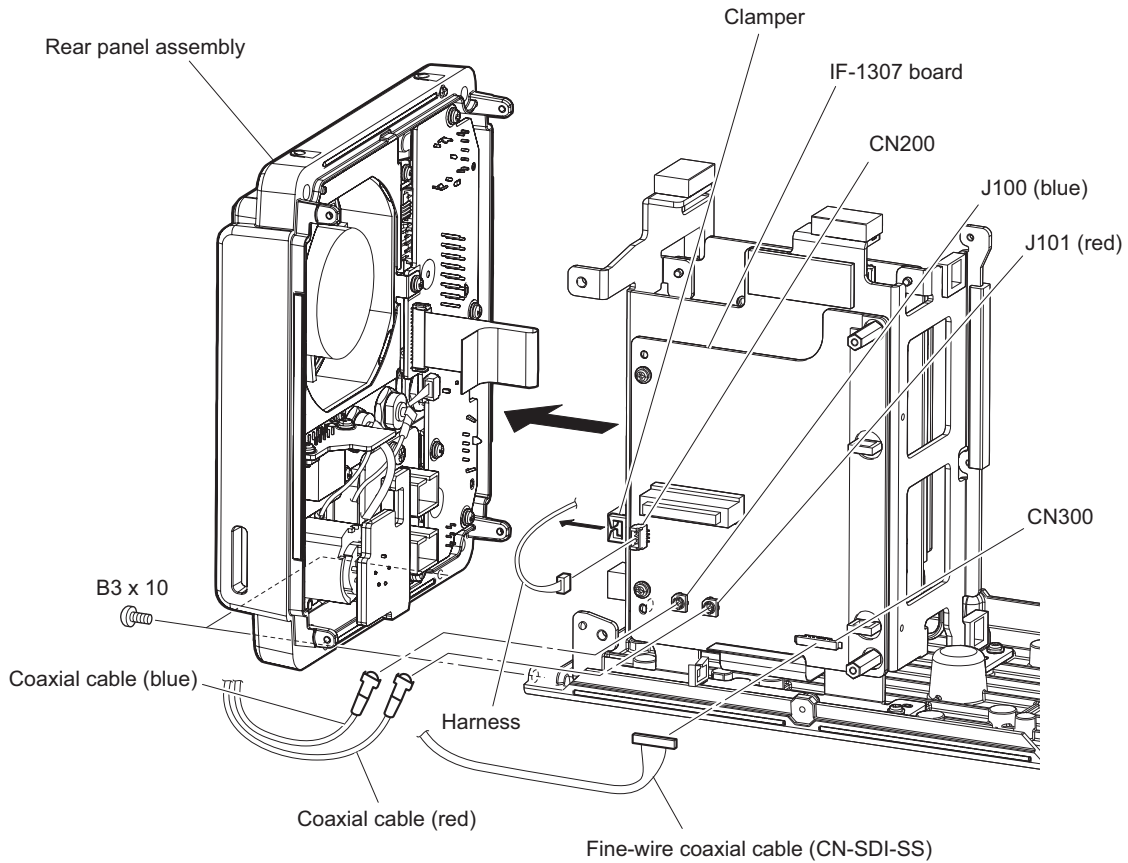
Note

When connecting the optical fiber cable, pay attention as follows.

- Connect after cleaning the tip of optical connector.
- Confirm the marks (1, 2) of connectors, and connect correct connectors.

2. Remove the rear panel assembly.

- (1) Disconnect the coaxial cable (blue) from the connector (J100) on the IF-1307 board.
- (2) Disconnect the coaxial cable (red) from the connector (J101) on the IF-1307 board.
- (3) Disconnect the fine-wire coaxial cable (CN-SDI-SS) from the connector (CN300) on the IF-1307 board.
- (4) Remove the two screws (B3 x 10), and then draw the rear panel assembly in the direction of the arrow.
- (5) Disconnect the harness from the connector (CN200), and then release the harness from the clamper.



Note

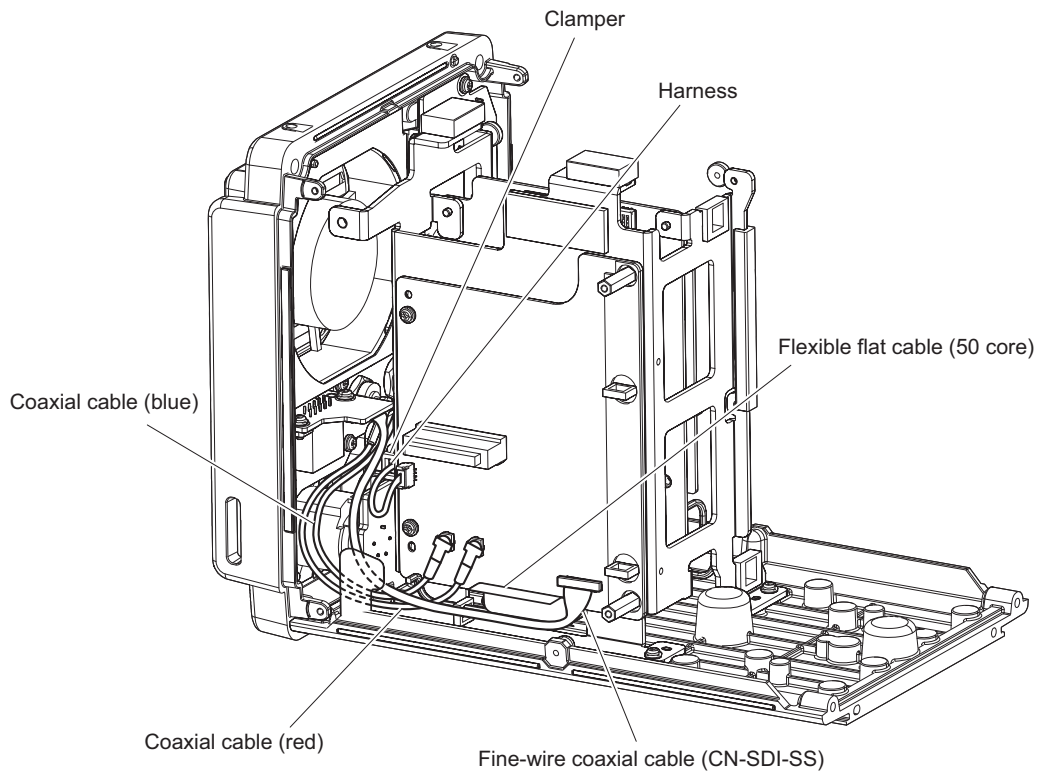
When installing the rear panel assembly, pay attention as follows.

- When connect the coaxial cables, connect correct connectors.
- When connect the fine-wire coaxial cables, carefully handle these fine-wire coaxial cables so that they are not disconnected.

3. Install the removed parts by reversing the steps of removal.

Tip

Arrange the coaxial cables (blue) and (red), fine-wire coaxial cable (CN-SDI-SS), harness, flexible flat cable (50 core) as shown in the figure.



4-13. DC Fan

When replacing the DC fan, also replace the two fan cushions.

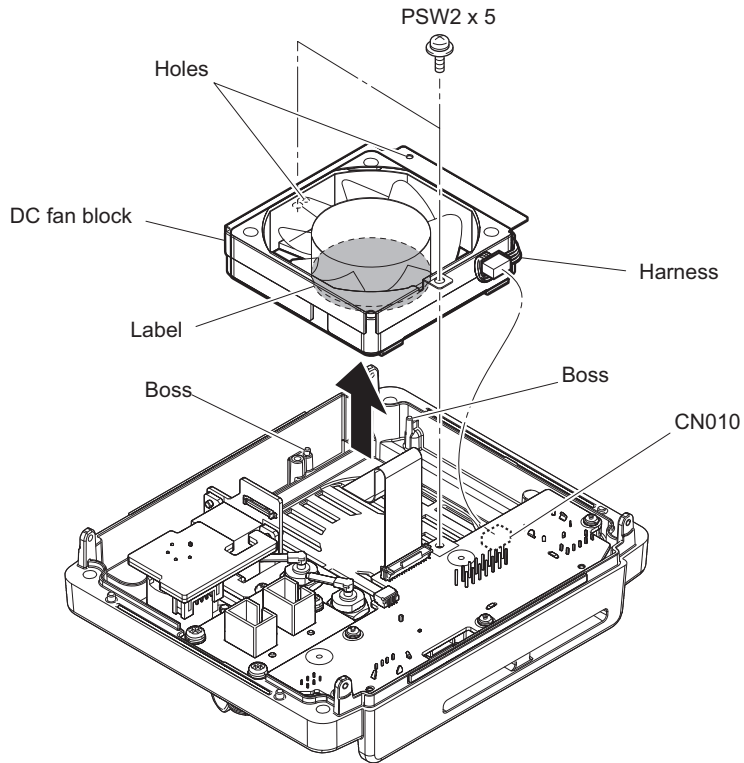
- Fan cushion : 2 pcs

Preparation

1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to [“4-4. Side Panel, Bottom Cover”](#))
2. Remove the DPR-376 board. (Refer to [“4-5. DPR-376 Board”](#))
3. Remove the front assembly. (Refer to [“4-6. Front Panel Assembly”](#))
4. Remove the PS-921 board. (Refer to [“4-11. PS-921 Board”](#))
5. Remove the rear panel assembly. (Refer to [“4-12. Rear Panel Assembly”](#))

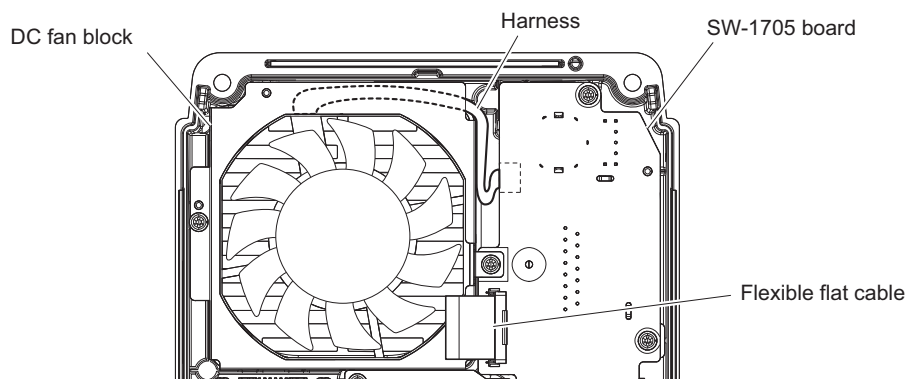
Procedure

1. Remove the DC fan block.
 - (1) Remove the two screws (PSW2 x 5), and then lift the DC fan block.
 - (2) Disconnect the harness from the connector (CN010) on the SW-1705 board.
 - (3) Remove the DC fan block.

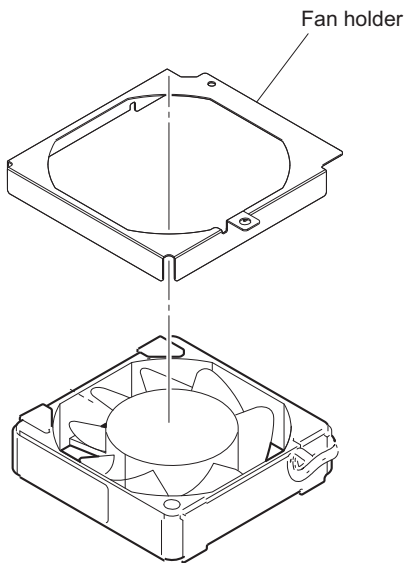


Note

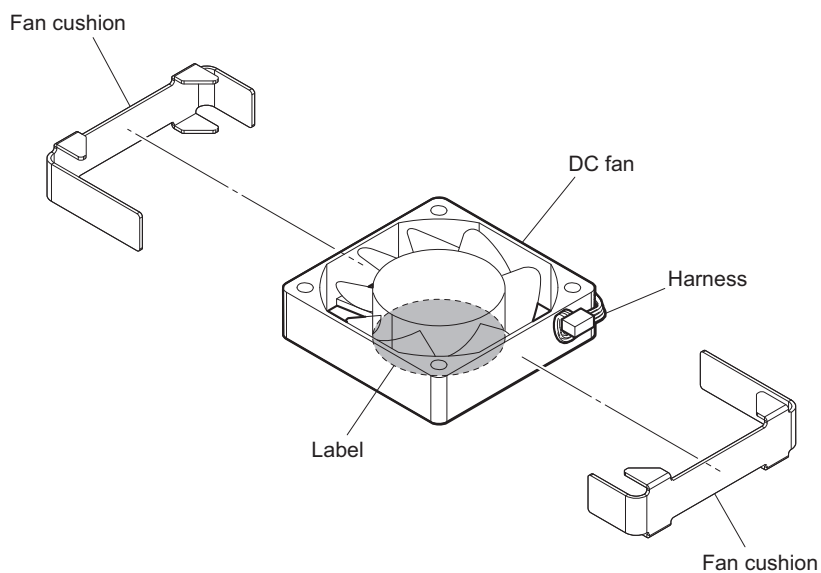
When attaching the DC fan block, arrange the harness.



2. Remove the fan holder.



3. Attach two new fan cushions to a new DC fan.



Note

Install the fan cushion carefully paying attention to the label side and the harness position.

4. Reassemble the unit.

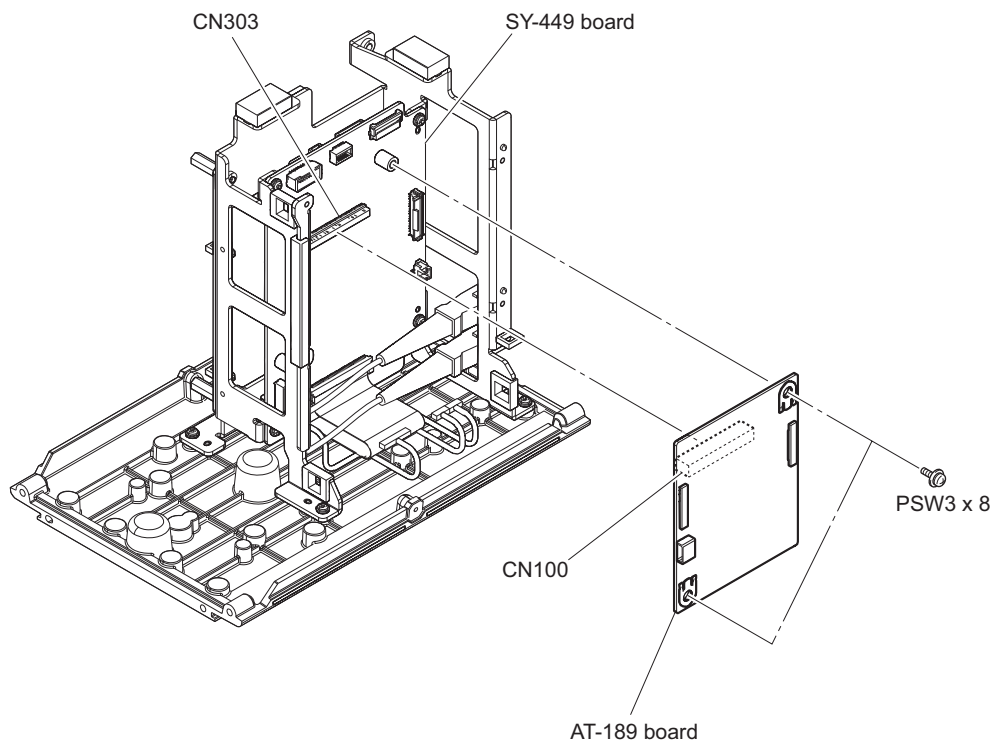
4-14. AT-189 Board

Preparation

1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to “4-4. Side Panel, Bottom Cover”)
2. Remove the DPR-376 board. (Refer to “4-5. DPR-376 Board”)
3. Remove the front assembly. (Refer to “4-6. Front Panel Assembly”)
4. Remove the PS-921 board. (Refer to “4-11. PS-921 Board”)
5. Remove the rear panel assembly. (Refer to “4-12. Rear Panel Assembly”)

Procedure

1. Remove the AT-189 board.
 - (1) Remove the two screws (PSW3 x 8).
 - (2) Disconnect the connector (CN100) on the AT-189 board from the connector (CN303) on the SY-449 board, and then remove the AT-189 board.



2. Install the removed parts by reversing the steps of removal.

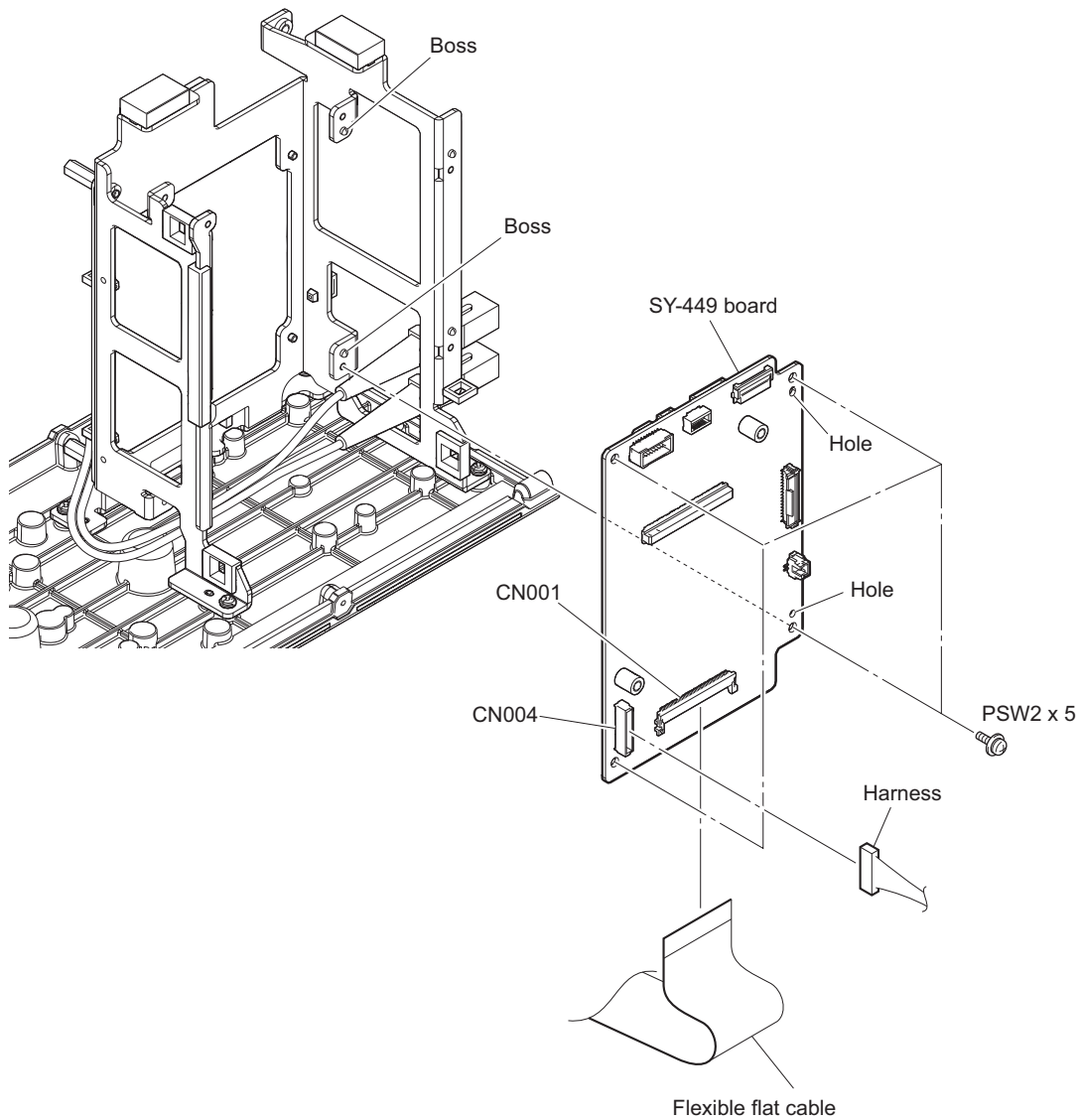
4-15. SY-449 Board

Preparation

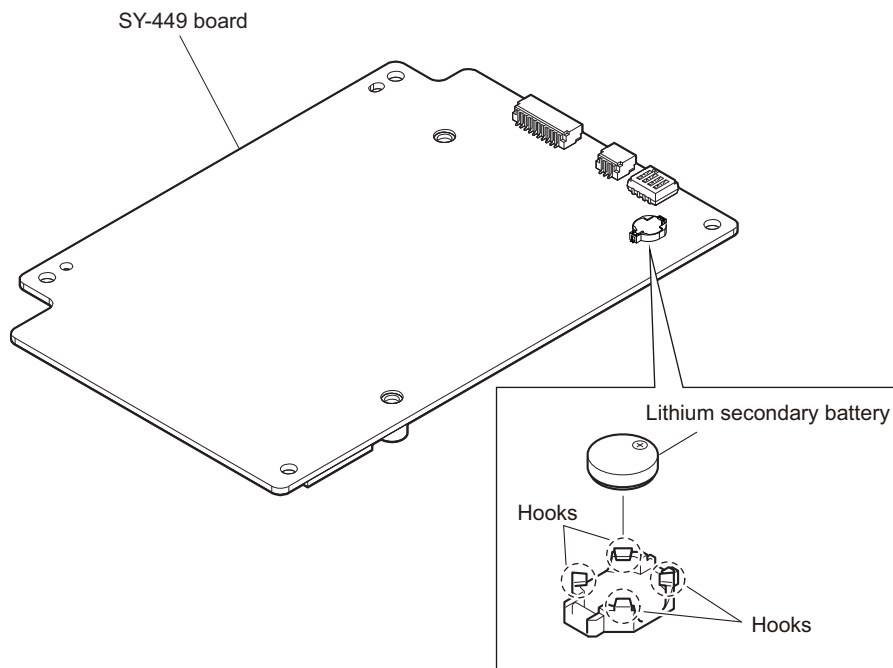
1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to “4-4. Side Panel, Bottom Cover”)
2. Remove the DPR-376 board. (Refer to “4-5. DPR-376 Board”)
3. Remove the front assembly. (Refer to “4-6. Front Panel Assembly”)
4. Remove the PS-921 board. (Refer to “4-11. PS-921 Board”)
5. Remove the rear panel assembly. (Refer to “4-12. Rear Panel Assembly”)
6. Remove the AT-189 board. (Refer to “4-14. AT-189 Board”)

Procedure

1. Remove the SY-449 board.
 - (1) Disconnect the flexible flat cable from the connector (CN001) on the SY-449 board.
 - (2) Disconnect the harness from the connector (CN004) on the SY-449 board.
 - (3) Remove the four screws (PSW2 x 5), and then remove the SY-449 board.



2. Remove the lithium secondary battery.



3. Install the removed parts by reversing the steps of removal.

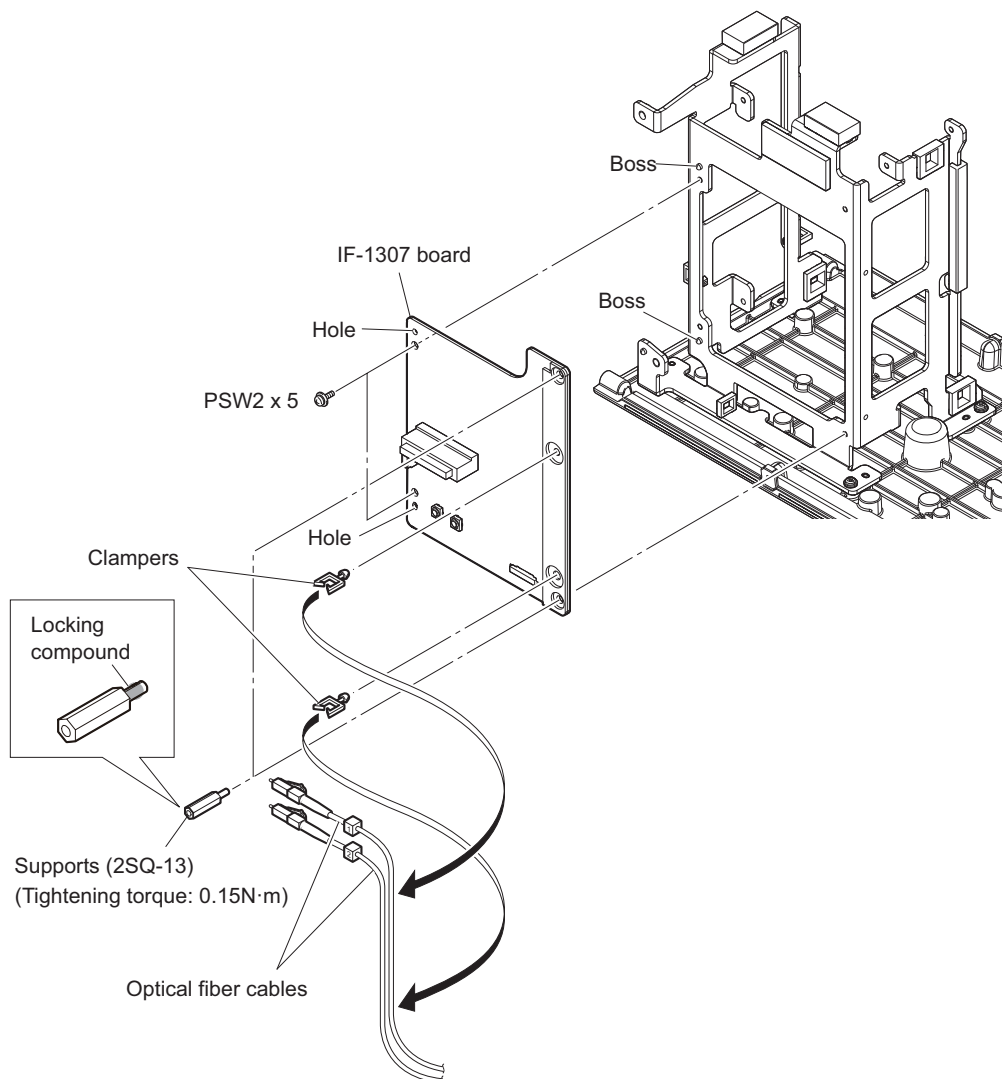
4-16. IF-1307 Board

Preparation

1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to “4-4. Side Panel, Bottom Cover”)
2. Remove the DPR-376 board. (Refer to “4-5. DPR-376 Board”)
3. Remove the front assembly. (Refer to “4-6. Front Panel Assembly”)
4. Remove the PS-921 board. (Refer to “4-11. PS-921 Board”)
5. Remove the rear panel assembly. (Refer to “4-12. Rear Panel Assembly”)
6. Remove the AT-189 board. (Refer to “4-14. AT-189 Board”)
7. Remove the SY-449 board. (Refer to “4-15. SY-449 Board”)

Procedure

1. Remove the IF-1307 board.
 - (1) Release the two optical fiber cables from the two clampers.
 - (2) Remove the two clampers from the IF -1307 board.
 - (3) Remove the two screws (PSW2 x 5) and the two supports (2SQ-13), and then remove the IF-1307 board.



Note

When installing the supports (2SQ-13), apply locking compound to them.

2. Install the removed parts by reversing the steps of removal.

4-17. SW-1705 Board

Preparation

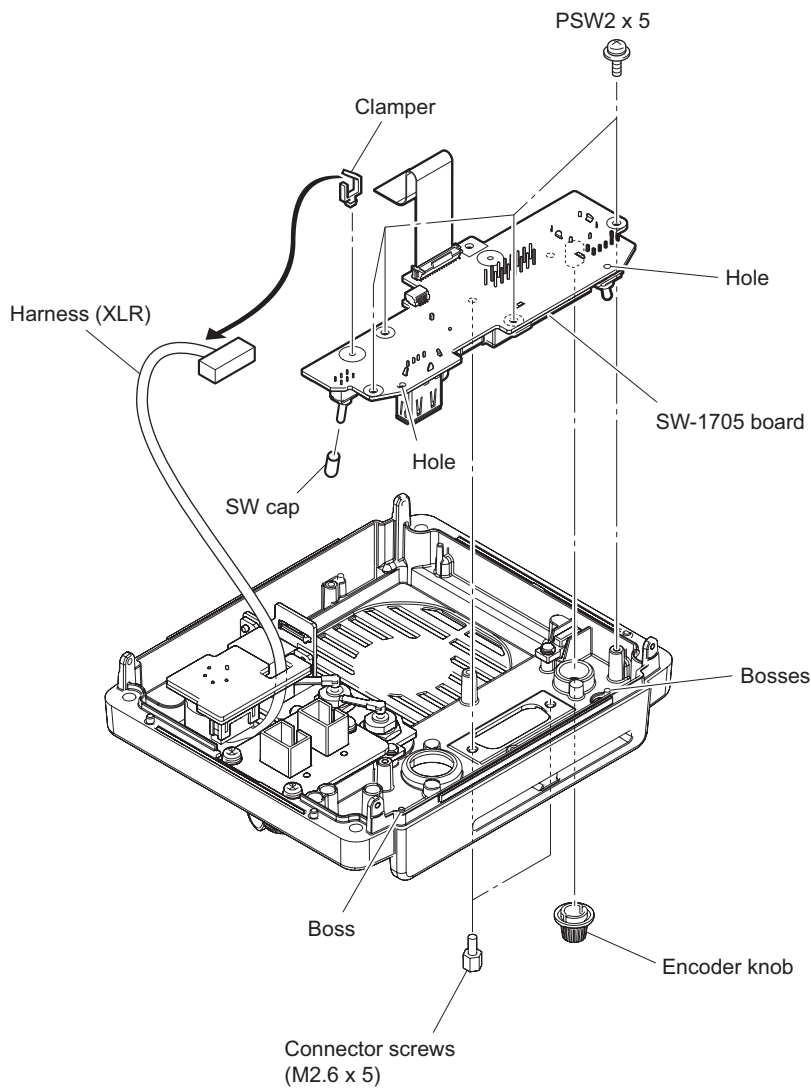
1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to “4-4. Side Panel, Bottom Cover”)
2. Remove the DPR-376 board. (Refer to “4-5. DPR-376 Board”)
3. Remove the front assembly. (Refer to “4-6. Front Panel Assembly”)
4. Remove the PS-921 board. (Refer to “4-11. PS-921 Board”)
5. Remove the rear panel assembly. (Refer to “4-12. Rear Panel Assembly”)
6. Remove the DC fan block assembly. (Refer to “4-13. DC Fan”)

Procedure

1. Remove the SW-1705 board.
 - (1) Release the harness from the clamber.
 - (2) Remove the two connector screws (M2.6 x 5) and the encoder knob.
 - (3) Remove the four screws (PSW2 x 5), and then remove the SW-1705 board.
 - (4) Remove the SW cap and the clamber.

Note

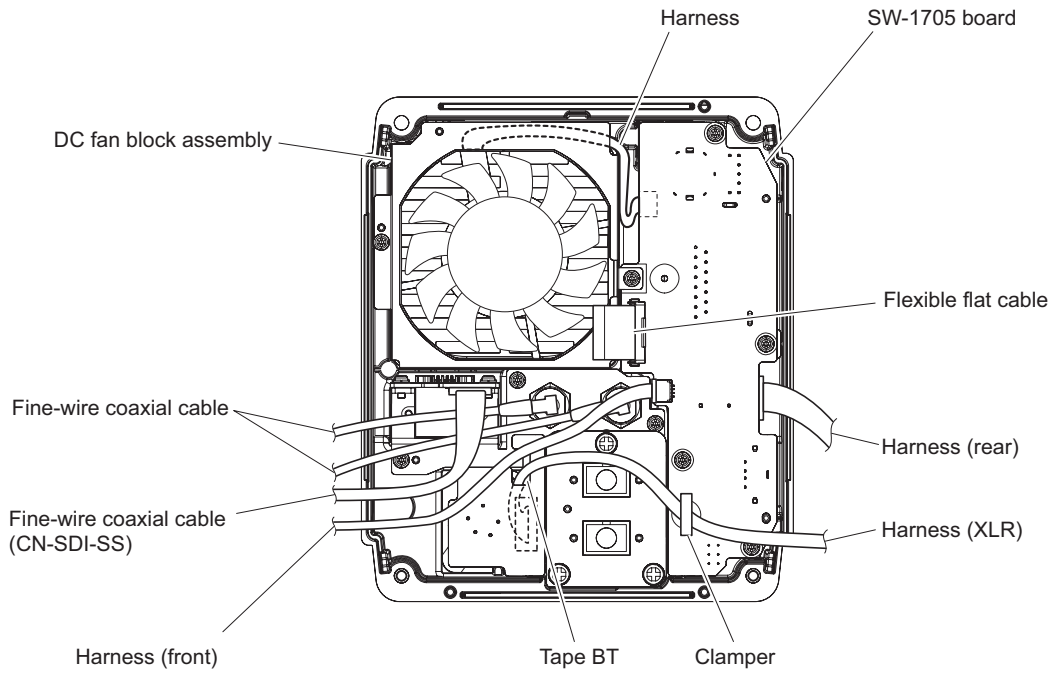
Be careful not to lose the SW cap.



2. Install the removed parts by reversing the steps of removal.

Note

When installing the SW-1705 board, arrange the harnesses and the fine-wire coaxial cables as shown in the figure.



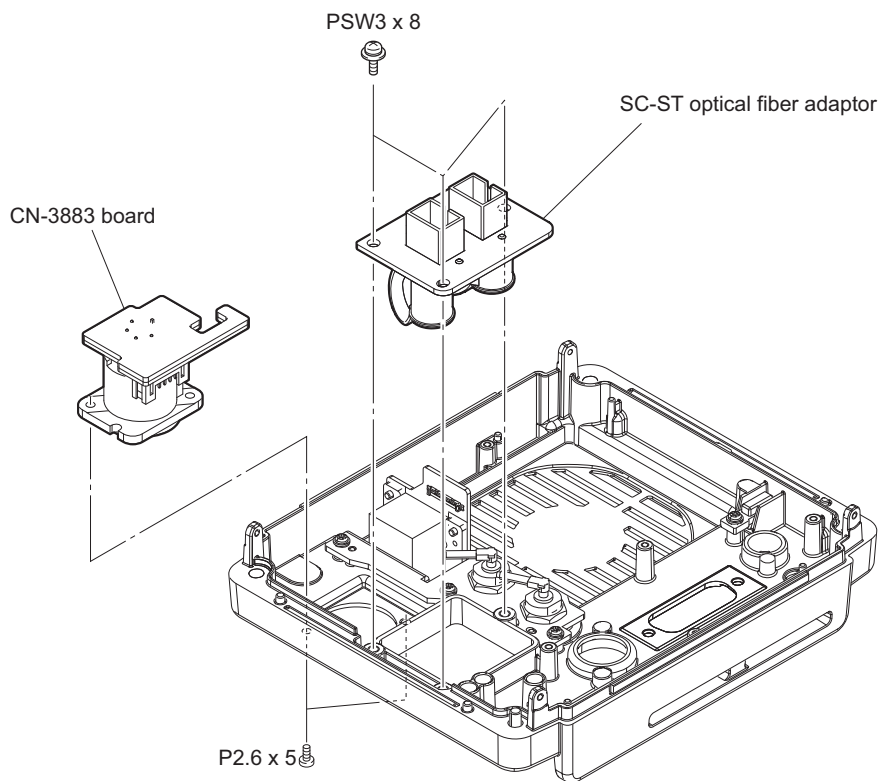
4-18. CN-3883 Board, CN-3896 Board

Preparation

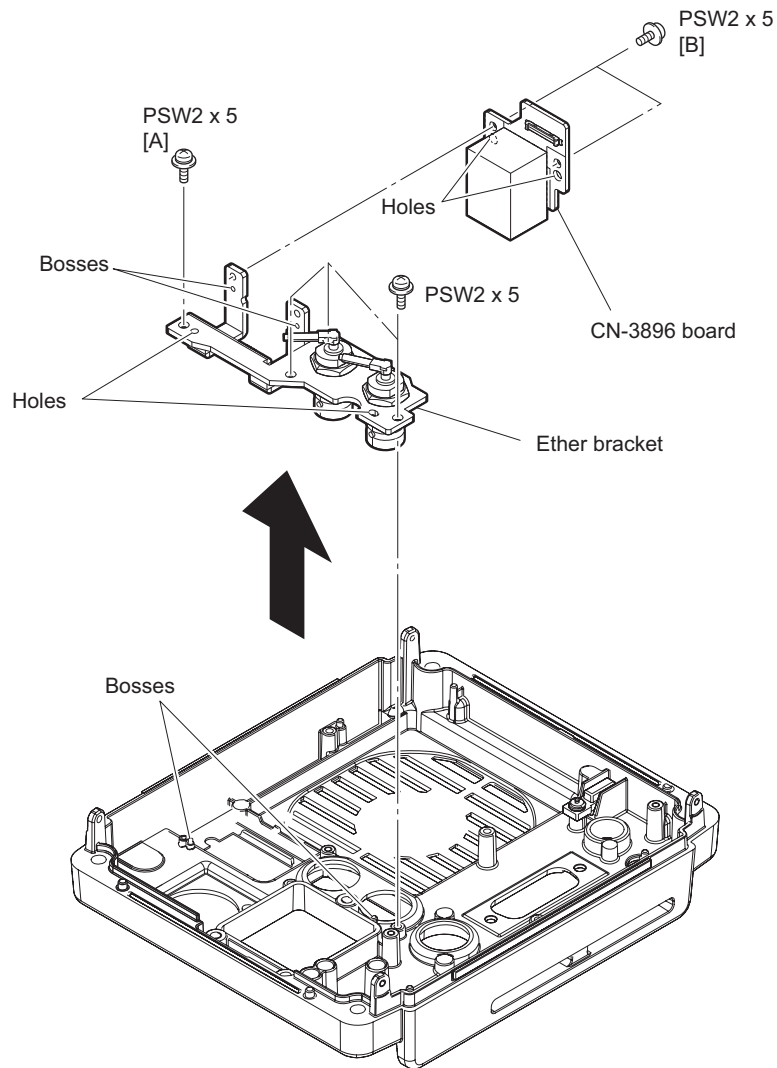
1. Remove the side panel (L), side panel (R) and bottom cover. (Refer to “4-4. Side Panel, Bottom Cover”)
2. Remove the DPR-376 board. (Refer to “4-5. DPR-376 Board”)
3. Remove the front assembly. (Refer to “4-6. Front Panel Assembly”)
4. Remove the PS-921 board. (Refer to “4-11. PS-921 Board”)
5. Remove the rear panel assembly. (Refer to “4-12. Rear Panel Assembly”)
6. Remove the DC fan block assembly. (Refer to “4-13. DC Fan”)
7. Remove the SW-1705 board. (Refer to “4-17. SW-1705 Board”)

Procedure

1. Remove the three screws (PSW3 x 8), and then remove the SC-ST optical fiber adaptor.
2. Remove the two screws (PSW2.6 x 5), and then remove the CN-3883 board.



3. Remove the CN-3896 board.
- (1) Remove the four screws (PSW2 x 5) [A], and then remove the Ether bracket and the CN-3896 board together.
 - (2) Remove the two screws (PSW2 x 5) [B], and then remove the CN-3896 board.



4. Install the removed parts by reversing the steps of removal.

Section 5

Electrical Alignment

When any board of this unit is repaired or replaced, adjust this unit for electrical alignment as this section.

Note

- Perform the “[5-4. Video System Level Adjustment](#)” according to the system that the customer uses.
- Master setup unit MSU-1000/1500 is used for electrical alignment of the unit.
Without using master setup unit (here after MSU), the electrical alignment also can be made using remote control unit (RCP-1000/1500) or setting menu of the camera.
Refer to “[5-1-7. Setup Menu Correspondence List](#)” for detail of setup menu.
- Camera control unit HDCU4300 is used for electrical alignment of the unit.
Without using camera control unit, the electrical alignment also can be made using base band processor unit (BPU4000/4500).

5-1. Preparations

Turn on the power switch before starting adjustments, and warm up the unit for about 10 minutes.

5-1-1. Required Equipment, Tool

Note

Use calibrated equipment and tools.

Equipment Required

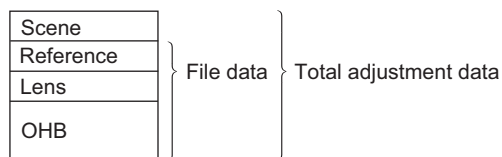
Name	Equipment
4K waveform monitor	Leader Electronics LV5490 (multi waveform monitor) or equivalent
4K color monitor	Sony BVM-X300 or equivalent
Master setup unit	Sony MSU-1000/1500
CCU extension adapter	Sony HKCU-SM100
Camera control unit	Sony HDCU4300
Baseband processor unit	Sony BPU4000/4500
Camera extension adapter	Sony HDCE-100 (Required when using the BPU4000/4500.)
Lens	Canon HJ18 or equivalent

Tool

Name	Sony Part No.	Remarks
Grayscale chart (16 : 9 reflective type)	—	Commercially available Since time degradation is appeared, replace for every two years. (The exchange time, change by the safekeeping situation.)
Grayscale chart (16 : 9 transparent type)	J-6394-080-A	Use when the grayscale chart (16 : 9 reflective type) is not available.
Pattern box PTB-500	J-6029-140-B	

5-1-2. File Data at Adjustment

The file structure of the adjustment data of this unit is as follows.



For detail of adjustment data, Refer to “7. File System”.

Reference File

- The reference file stores the custom paint data adjusted by the video engineer as standard paint data.
- The service engineer can store reference file in the camera and USB drive.
- The reference file stored in the USB drive(For back up) can be reset after adjustment.

Lens File

- Lens file is used for compensating the deviation generated by switching the lens extender from OFF to ON and for compensating the difference in the characteristics between lenses.
- The lens file is saved to a camera.
- When adjusting with lens file, mount the lens that customer uses actually.

OHB File

- OHB file is used for the prism block maintenance.
- OHB file is saved in the camera.

5-1-3. Handling the Grayscale Chart

It is preferable to use an 89.9%-reflective grayscale chart for electrical adjustments.

If a reflective chart is not available, use a calibrated pattern box and a transparent grayscale chart for adjustments.

Before beginning adjustment, set the illumination of the light source (or the luminous intensity on the chart surface) properly proceeding as follows and set the color temperature to 3200 K exactly by adjusting light.

Information on the Reflective Grayscale Chart (16:9)

Recommended chart

The reflective grayscale chart (16:9) is commercially available.

- Product name: Reflective grayscale chart
- Supplier: MURAKAMI COLOR RESEARCH LABORATORY

Handling precautions

- Do not touch the chart's surface with bare hands.
- Do not subject the surface to dirt or scratches.
- Do not prolonged exposure to sunlight.
- Protect the chart from excessive moisture or harmful gas.
- Avoid resting articles against the case.
- When the chart is not used for a long period and is stored, open the case and dry the chart for about an hour once or twice a month.

Setting Illumination

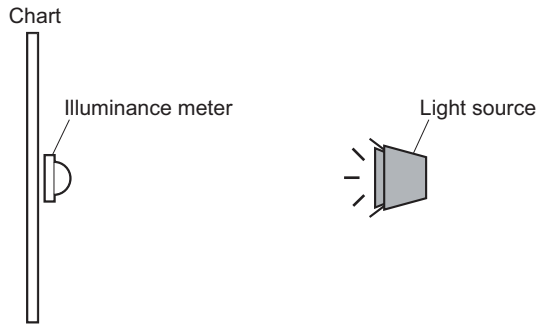
Measuring equipment : Illuminance meter (Calibrated)

Procedure

1. Turn on the light source.
2. Warm up the light source for about 30 minutes.
3. Place the illuminance meter on the chart surface.
4. Adjust the position and angle of the light source so that the whole surface of the chart is evenly 2000 lx.

Note

Light the chart from almost the same direction and height as the camera to shoot the chart.



Transparent grayscale chart (16:9)

Recommended chart

- Product name: Grayscale chart (16:9 transparent type)
- Sony Part No.: J-6394-080-A

Handling precautions

Use calibrated pattern box.

Setting Illumination

Measuring equipment : Illuminance meter

(KONICA MINOLTA LS-110 or equivalent , Calibrated)

Preparation

1. Place the pattern box where the chart is not exposed to light.
(Such as a darkroom, or cover the pattern box with a cover whose inside is painted in black.)
2. Light the pattern box.
3. Warm up the pattern box for about 30 minutes.

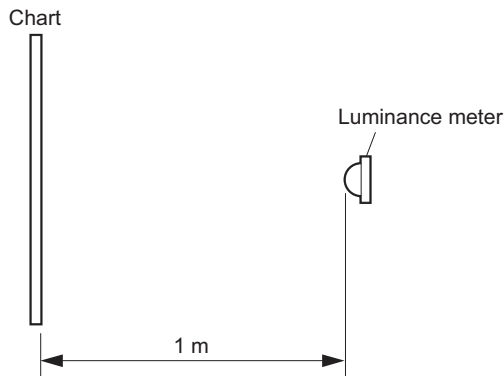
Procedure

1. Fix the luminance meter facing straight to the chart at a distance of 1 m from it.

2. Adjust the luminance control of the pattern box so that the white portion in the center of the chart is $573 \pm 6 \text{ cd/m}^2$.

Tip

This corresponds to the luminous intensity on the 89.9%-reflective chart at 2000 lx.



5-1-4. Setup Menu

Camera equips setup menu. Some of adjustments given in this section use the setup menu without MSU.

In setup menu, operate from TOP MENU screen on the camera.

Configuration of TOP MENU screen is as follows.

- USER menu
- USER MENU CUSTOMIZE menu
- ALL menu
- OPERATION menu
- PAINT Menu
- MAINTENANCE Menu
- FILE Menu
- DIAGNOSIS menu
- SERVICE Menu

Note

For how to display the SERVICE menu, refer to [“5-1-4-2. Displaying the SERVICE menu.”](#).

The setup menu operation is described as follows.

Example: When the AUTO SETUP page of MAINTENANCE menu is selected from the TOP menu and AUTO LEVEL is performed.

MENU: MAINTENANCE

PAGE: AUTO SETUP

ITEM: AUTO LEVEL

Displaying TOP MENU screen

1. Turn the DISPLAY/MENU switch to the MENU side while pressing the MENU SEL knob/ENTER button.
[TOP] appears at the upper right of the screen of the monitor connected to SDI 1 connector.
2. Set the cursor at [TOP] and press the MENU SEL knob/ENTER button.
The TOP MENU screen showing the entire configuration of menu items appears.

Displaying the SERVICE menu.

1. Display the MAINTENANCE menu.
2. Set the cursor at [AUTO SETUP] on MAINTENANCE menu and press the MENU SEL knob/ENTER button for at least 10 seconds.
The cursor shifts to [AUTO BLACK].
3. Set the DISPLAY/MENU switch to OFF, and then turn the switch to the MENU side again.
The SERVICE menu is displayed.

Changing Setting Values

- Select a menu item by turning the MENU SEL knob/ENTER button and it is entered by pressing the MENU SEL knob/ENTER button.
- For items whose values can be modified by turning the MENU SEL knob/ENTER button, set values can be entered or suspended by the following operations.

To enter:

Press the MENU SEL knob/ENTER button.

To suspend:

Set the DISPLAY/MENU switch to OFF.

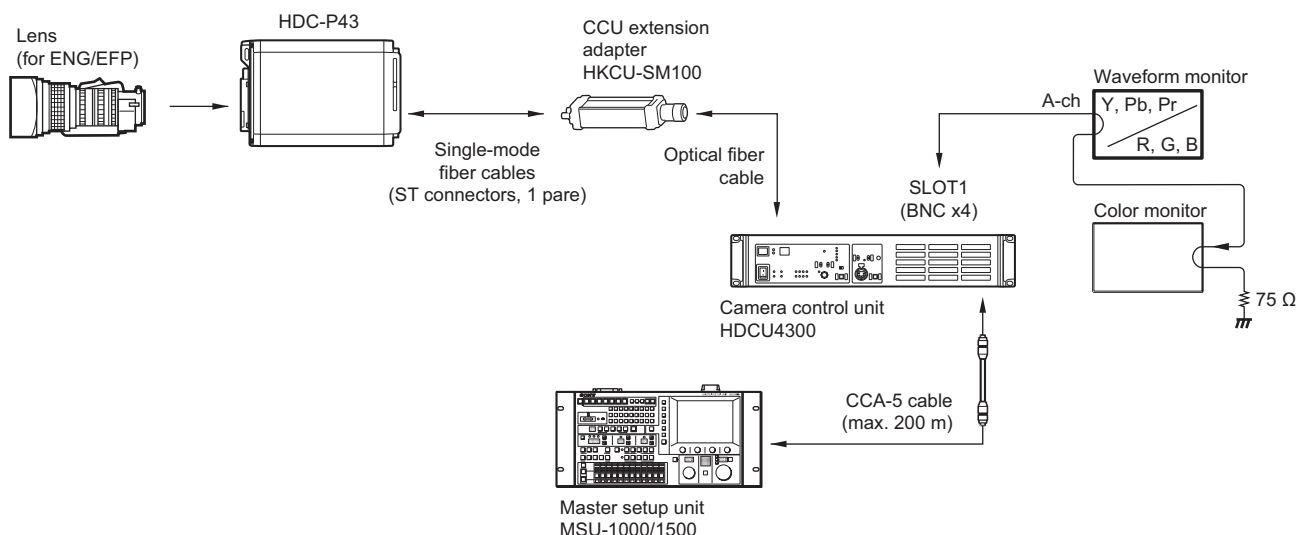
To restart the setting operation, turn the DISPLAY/MENU switch to the MENU side again.

Exiting menu

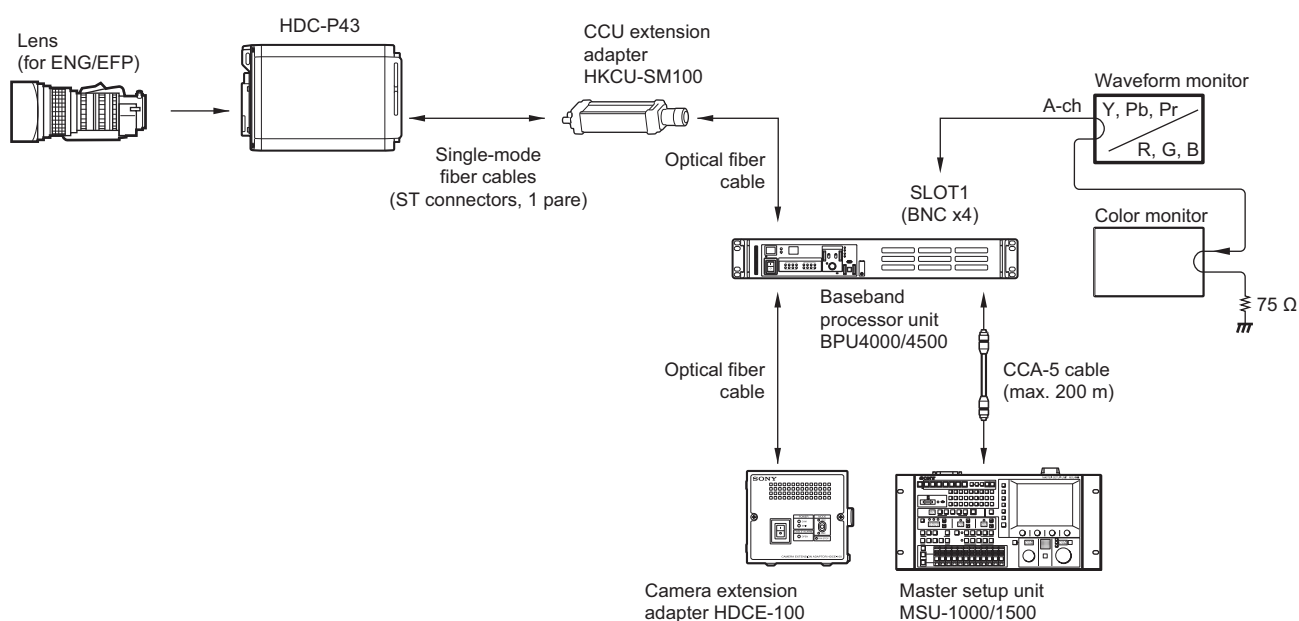
Set the DISPLAY/MENU switch to OFF.

5-1-5. Connection of Equipment

HDCU4300 connection example



BPU4000/4500 connection example (extension mode)



5-1-6. Initial Settings

There are following Initial Settings.

- Set using the MSU.
- Set using setup menu and switches of the camera.

Before starting “5-2. Automatic Adjustment” or later, perform the initial setting.

When Adjusting with the MSU

Set each button on the MSU as follows.

- Power supply and signal switching block
 - ALL button → OFF (unlit)
 - CAM PW button → ON (lit)
 - VF PW button → OFF (unlit)
 - TEST 1 button → OFF (unlit)
 - TEST 2 button → OFF (unlit)
 - BARS button → OFF (unlit)
 - CLOSE button → ON (lit)
- Camera/CCU circuit ON/OFF block
 - KNEE OFF button → OFF (lit)
 - DETAIL OFF button → OFF (lit)
 - MATRIX OFF button → OFF (lit)
 - AUTO KNEE button → OFF (lit)
 - SKIN DETAIL button → OFF (lit)

- Others
 - GAMMA OFF button → ON (unlit)
 - MASTER GAIN → 0 (0 dB)
 - FILTER button (ND) → 1 (CLEAR)
 - FILTER button (CC) → B (3200 K)
 - ON button (shutter control block) → OFF (unlit)

When Adjusting with the Camera Setup Menu

Set each item and the switch, etc., as follows.

- PAINT Menu

Page	Setting Item	Initial Setting
SW STATUS	FLARE	ON
	GAMMA	ON
	BLK GAM	OFF
	KNEE	OFF
	WHT CLIP	OFF
	DETAIL	ON
	LVL DEP	ON
	SKIN DTL	OFF
	MATRIX	OFF
VIDEO LEVEL	TEST	OFF
KNEE	AUTO KNEE	OFF
SHUTTER	SHUTTER	OFF
OPTICAL FILTER	ND	1 (CLEAR)
	CC	B (3200K)

- MAINTENANCE Menu

Page	Setting Item	Initial Setting
BLACK SHADING	MASTER GAIN	0

5-1-7. Setup Menu Correspondence List

The camera setup menu items corresponding to the adjustment items of MSU are described.

Refer to the following tables when using the camera setup menu for electrical adjustments without using MSU.

PAINT Menu

- MSU:
 - [PAINT] button → ON (lit)
- Camera setup menu:
 - Select the [PAINT] men.

Menu item of MSU			Menu item of camera		
Menu	Sub Menu	Adjustment	Menu	Page	Item
Black		R/G/B	PAINT	VIDEO LEVEL	BLACK [R/G/B/M]
		Master			
Flare		R/G/B			FLARE [R/G/B/M]
		Master			
Detail	1/3	Level		DETAIL 1	LEVEL
		Limiter			LIMITER [M]
		Crispening			CRISP
		Level Dep			LEVEL DEPEND
	2/3	H/V Ratio		DETAIL 2	H/V RATIO
	3/3	W Limiter		DETAIL 1	LIMITER [WHT]
		B Limiter			LIMITER [BLK]
Gamma	Gamma	R/G/B		GAMMA	LEVEL [R/G/B/M]
		Master			
Knee	Knee Point	R/G/B		KNEE	K POINT [R/G/B/M]
		Master			
	Knee Slope	R/G/B			K SLOPE [R/G/B/M]
		Master			
White Clip		R/G/B		WHITE CLIP	—
		Master			W CLIP

FILE Menu

- MSU:
[FILE] button → ON (lit)
- Camera setup menu:
Select the [FILE] menu.

Menu item of MSU		Menu item of camera		
Menu	Sub Menu	Menu	Page	Item
Reference	Reference Store	FILE	REFERENCE	STORE FILE
Lens	Lens Store		LENS FILE	STORE FILE
OHB	OHB Store		OHB FILE	STORE FILE

MAINTENANCE Menu

- MSU:
[MAINTENANCE] button → ON (lit)
- Camera setup menu:
Select the [MAINTENANCE] menu.
Select the [PAINT] men.

Menu item of MSU				Menu item of camera		
Menu	Secondary Menu	Sub Menu	Adjust-ment	Menu	Page	Item
Camera	White Shading	R/G/B	H SAW	MAINTENANCE	WHITE SHADING	H SAW [R/G/B]
			H PARA			H PARA [R/G/B]
			V SAW			V SAW [R/G/B]
			V PARA			V PARA [R/G/B]
Lens	Auto Iris Settings		Level	PAINT	AUTO IRIS	IRIS LEVEL
			APL Ratio			APL RATIO
	V Mod Saw		R/G/B		VIDEO LEV-EL	V MOD [R/G/B/M]
			Master			

5-2. Automatic Adjustment

5-2-1. Execute the Automatic Level Setup

1. Press the LEVEL button (AUTO SETUP block) on MSU.
LEVEL button lights. (ON)
2. Press the START/BREAK button (AUTO SETUP block) on MSU.
START/BREAK button lights (ON), automatic adjustment is executed.
After the adjustment is completed, the message “Completed” is displayed.

Tip

When performing automatic level setup using the camera setup menu, set as follows.

MENU: MAINTENANCE

PAGE: AUTO SETUP

ITEM: AUTO LEVEL

5-3. Camera System Adjustment

5-3-1. Black Set Adjustment

Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Preparations

- Setting for the MSU
CLOSE button → ON (lit)
MASTER GAIN → 12 (12 dB)

Procedure

1. Operate the setup menu of MSU, and set the format to “4K/59.94P”.
[CONFIG] button → ON (lit)
 - When using the HDCU4300
Touch panel operation: [Multi Format] → [Base Format] → [4K/HFR Format] → “4096x2160/59.94P”
 - When using the BPU4000/BPU4500
Touch panel operation: [BPU Multi Format] → [Shooting Transmit] → “4096x2160/59.94P”
2. Open following page by camera setup menu.
MENU: SERVICE
PAGE: BLACK SHADING
3. Adjust this using the waveform monitor so that the pedestal level of R channel becomes equal within a range of –6 to +12 dB.
ITEM: BLK SET [R]
4. Also adjust G and B channels in the same way as above step.
ITEM: BLK SET [G]
ITEM: BLK SET [B]
5. Store the file.
MENU: SERVICE
PAGE: BLACK SHADING
ITEM: STORE FILE

6. Make setting to the values adjusted in step 3 and step 4, store the file every following format.

Format

MSU:

[CONFIG] button → ON (lit)

- When using the HDCU4300

Touch panel operation: [Multi Format] → [Base Format] → [4K/HFR Format]

- 4K/59.94P (2×): unsupported
- HD/59.94P (2×):
→ “1920x1080/59.94P(x2)”
- HD/59.94P (4×):
→ “1920x1080/59.94P(x4)”
- HD/59.94P (8×):
→ “1920x1080/59.94P(x8)”

- When using the BPU4000/BPU4500

Touch panel operation: [BPU Multi Format] → [Shooting Transmit]

- 4K/59.94P (2×):
→ “4096x2160/59.94P(x2)”
- HD/59.94P (2×):
→ “1920x1080/59.94P(x2)”
- HD/59.94P (4×):
→ “1920x1080/59.94P(x4)”
- HD/59.94P (8×):
→ “1920x1080/59.94P(x8)”

File store

MENU: SERVICE

PAGE: BLACK SHADING

ITEM: STORE FILE

5-3-2. Sensitivity Adjustment

Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Object: Grayscale chart

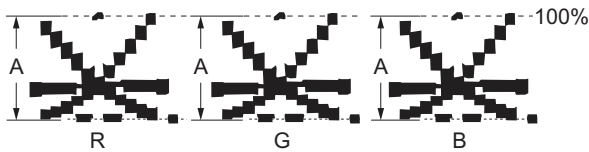
Preparations

- Setting for the MSU
CLOSE button → OFF (dark)
GAMMA OFF button → OFF (lit)
MASTER GAIN → 0 (0 dB)
DETAIL OFF button → OFF (lit)
Touch panel operation: (Page 1) → [Detail] → [1/3] → Level Dep OFF → OFF
- Confirm the amplitude of TEST SAW waveform.
 1. Press the TEST 1 button of MSU to output TEST SAW waveform and to turn ON (lit).
 2. Confirm that the amplitude is 700 mV using the waveform monitor.
 3. If the amplitude is not 700 mV, confirm that R, G and B values are “0” by camera setup menu.
MENU: PAINT
PAGE: VIDEO LEVEL
ITEM: WHITE [R], [G], [B]
 4. Press the TEST 1 button of MSU to stop TEST SAW waveform output and to turn OFF (unlit).
- Shoot the grayscale chart so that it is aligned with the under scanned monitor frame.

- Lens iris:
F8 (59.94P)

Procedure

1. Operate the setup menu of MSU, and set the format to “4K/59.94P”.
[CONFIG] button → ON (lit)
 - When using the HDCU4300
Touch panel operation: [Multi Format] → [Base Format] → [4K/HFR Format] → “4096x2160/59.94P”
 - When using the BPU4000/BPU4500
Touch panel operation: [BPU Multi Format] → [Shooting Transmit] → “4096x2160/59.94P”
2. Set as follows by camera setup menu.
MENU: SERVICE
PAGE: OHB-ADJ1
ITEM: FILTER → OFF
3. Adjust the level of R channel, so that the level of portion A on the waveform becomes the specification.
ITEM: GAIN CONT [R1], [R2] (The values of [R1] and [R2] should be same.)
Specification: A = 700 mV (100%)



4. Also adjust G and B channels in the same way as above step.
ITEM: GAIN CONT [G1], [G2]
ITEM: GAIN CONT [B1], [B2]
5. Store the file.
MENU: SERVICE
PAGE: OHB-ADJ1
ITEM: STORE FILE

6. Make setting to the values adjusted in above steps, store the file every following format.

Format

MSU:

[CONFIG] button → ON (lit)

- When using the HDCU4300

Touch panel operation: [Multi Format] → [Base Format] → [4K/HFR Format]

- 4K/59.94P (2×): unsupported
- HD/59.94P (2×):
→ “1920x1080/59.94P(x2)”
- HD/59.94P (4×):
→ “1920x1080/59.94P(x4)”
- HD/59.94P (8×):
→ “1920x1080/59.94P(x8)”

- When using the BPU4000/BPU4500

Touch panel operation: [BPU Multi Format] → [Shooting Transmit]

- 4K/59.94P (2×):
→ “4096x2160/59.94P(x2)”
- HD/59.94P (2×):
→ “1920x1080/59.94P(x2)”
- HD/59.94P (4×):
→ “1920x1080/59.94P(x4)”
- HD/59.94P (8×):
→ “1920x1080/59.94P(x8)”

File Store

MENU: SERVICE

PAGE: OHB-ADJ1

ITEM: STORE FILE

5-3-3. Black Shading Adjustment

Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Preparations

- Setting for the MSU

CLOSE button → ON (lit)

GAMMA OFF button → OFF (lit)

MASTER GAIN → 12 (12 dB)

MASTER BLACK → 30 (30 dB)

Procedure

1. Operate the setup menu of MSU, and set the format to “4K/59.94P”.

[CONFIG] button → ON (lit)

- When using the HDCU4300

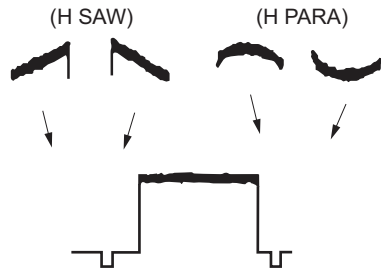
Touch panel operation: [Multi Format] → [Base Format] → [4K/HFR Format] → “4096x2160/59.94P”

- When using the BPU4000/BPU4500

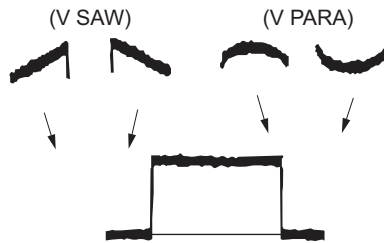
Touch panel operation: [BPU Multi Format] → [Shooting Transmit] → “4096x2160/59.94P”

2. Open following page by camera setup menu.
MENU: SERVICE
PAGE: BLACK SHADING
3. Adjust this using the waveform monitor so that R channel waveform becomes as flat as possible.
ITEM: H SAW [R]
ITEM: H PARA [R]
ITEM: V SAW [R]
ITEM: V PARA [R]

H: LINE



V: FIELD



4. Also adjust G and B channels in the same way as above step.
ITEM: H SAW [G], H PARA [G], V SAW [G], V PARA [G]
ITEM: H SAW [B], H PARA [B], V SAW [B], V PARA [B]
5. Store the file.
MENU: SERVICE
PAGE: BLACK SHADING
ITEM: STORE FILE

6. Make setting to the values adjusted in step 3 and step 4, store the file every following format.

Format

MSU:

[CONFIG] button → ON (lit)

- When using the HDCU4300

Touch panel operation: [Multi Format] → [Base Format] → [4K/HFR Format]

- 4K/59.94P (2×): unsupported
- HD/59.94P (2×):
→ “1920x1080/59.94P(x2)”
- HD/59.94P (4×):
→ “1920x1080/59.94P(x4)”
- HD/59.94P (8×):
→ “1920x1080/59.94P(x8)”

- When using the BPU4000/BPU4500

Touch panel operation: [BPU Multi Format] → [Shooting Transmit]

- 4K/59.94P (2×):
→ “4096x2160/59.94P(x2)”
- HD/59.94P (2×):
→ “1920x1080/59.94P(x2)”
- HD/59.94P (4×):
→ “1920x1080/59.94P(x4)”
- HD/59.94P (8×):
→ “1920x1080/59.94P(x8)”

File store

MENU: SERVICE

PAGE: BLACK SHADING

ITEM: STORE FILE

5-3-4. White Shading Adjustment

Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Subject: Full-white pattern

Note

When the next condition corresponds to even one, white shading is not adjusted correctly.

- The brightness of the subject is uneven.
- The brightness is not set correctly.
- Iris value of lens is not set correctly.
- Zoom position is not set correctly.

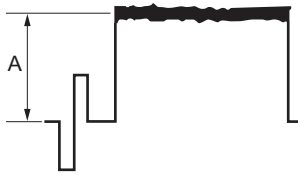
Obey the contents of following preparation and procedure, use calibrated equipment and tools.

Preparations

- Setting for the MSU
KNEE OFF button → OFF (lit)
MASTER GAIN → 0 (0 dB)
- Shoot the full-white pattern so that it is aligned with the under scanned monitor frame.
- Lens iris: F4 to F5.6

- $A = 600 \pm 20 \text{ mV}$

If the lens aperture is greater than F5.6, adjust the light amount with the shutter.

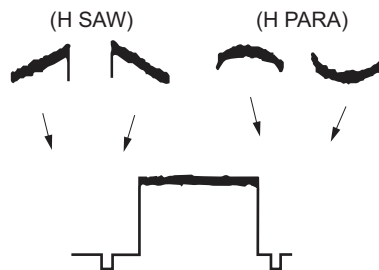


- Lens focus:: ∞
- Set the lens extender and shrinker as follows.
 Lens extender (x2) → OFF
 Lens shrinker (x0.8) → OFF
- Set as follows by camera setup menu.
 MENU: FILE
 PAGE: LENS FILE
 1. Select the file in accordance with the lens attached. If there is no appropriate file, select “NO OFFSET”.
 2. Change the name of lens with MSU.

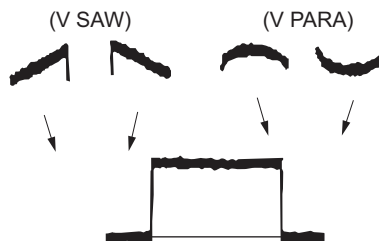
Procedure

1. Operate the control panel of MSU, and perform the automatic white balance adjustment.
 WHITE button → ON (lit)
 After the adjustment is completed, the message “AWB: OK” is displayed.
2. Open the following items with using the MSU.
 - (1) MAINTENANCE button → ON (lit)
 - (2) Touch panel operation: [Camera] → [White Shading] → [R]
3. Adjust the waveform on the monitor so that the waveform levels out it as much as possible.
 Adjustment item : H SAW
 Adjustment item : H PARA
 Adjustment item : V SAW
 Adjustment item : V PARA

H: LINE



V: FIELD



4. Make the same adjustment for channels G and B.

5. Operate the control panel of MSU, and perform the automatic white balance adjustment.
WHITE button → ON (lit)
After the adjustment is completed, the message “AWB: OK” is displayed.

OHB File Store

Store the OHB file in the MSU menu.

Procedure

1. [FILE] button → ON (lit)
2. Touch panel operation: [OHB] → [OHB Store] → [Store]
After the store operation is completed, the message “OHB File Store” is displayed.

Adjustment for Lens Extender or Shrinker

When the WHITE or shading of V is out of alignment by using the lens extender or shrinker, perform the following lens adjustment after storing the OHB file

Procedure

1. Operate the control panel of MSU, and perform the automatic white balance adjustment.
WHITE button → ON (lit)
After the adjustment is completed, the message “AWB: OK” is displayed.
2. Set the lens extender to $\times 1$.
3. Operate the control panel of MSU, and store the lens file.
 - (1) [FILE] button → ON (lit)
 - (2) Touch panel operation: [Lens File] → [Lens Store] → [Store]
4. Set the lens extender and shrinker as follows.
 - Lens extender ($\times 2$) → ON
 - Lens shrinker ($\times 0.8$) → ON
5. Operate the control panel of MSU, and perform the automatic white balance adjustment.
WHITE button → ON (lit)
After the adjustment is completed, the message “AWB: OK” is displayed.
6. Operate the control panel of MSU, and store the lens file.
 - (1) [FILE] button → ON (lit)
 - (2) Touch panel operation: [Lens File] → [Lens Store] → [Store]
7. Return the setting of lens extender and shrinker.
 - Lens extender ($\times 2$) → OFF
 - Lens shrinker ($\times 0.8$) → OFF

5-4. Video System Level Adjustment

Note

Perform the video system level adjustment according to the system that the customer uses.

5-4-1. H/V Ratio Adjustment

Equipment: Waveform monitor (R, G, B)

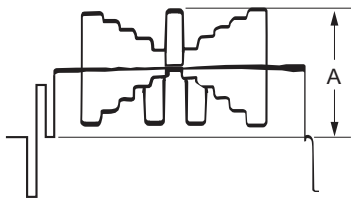
Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Object: Grayscale chart

Preparation

- Setting for the MSU
DETAIL OFF button → ON (unlit)
KNEE OFF button → OFF (lit)
- Shoot the grayscale chart so that it is aligned with the under scanned monitor frame.
- Lens iris: F4 to F5.6
- $A = 600 \pm 20$ mV

If the lens aperture is greater than F5.6, adjust the light amount with the shutter.



Procedure

1. Operate the control panel of MSU, and set as follows.

Note

Customer's settings must be restored after the adjustment. Write down the customer's settings.

- (1) PAINT button → ON (lit)
- (2) Touch panel operation: (Page 1) → [Detail] → [1/3]

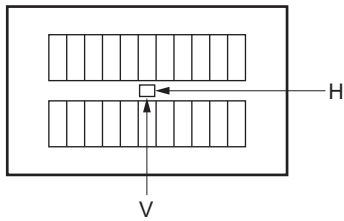
Setting:

- Level → 99
- Limiter → 0
- Crispening → -25
- Level Dep → 25

2. Operate the [PAINT] menu of MSU, and set as follows.

Touch panel operation: (Page 1) → [Detail] → [2/3]

3. Adjust the H/V Ratio adjustment, a ratio between H and V detail amounts (white) to be added shall be equal.
 - Adjustment item : [H/V Ratio] (Reference value: 20 to 40)



4. Change the settings to the recorded customer's settings.
5. Store the reference file.
(Refer to [“5-4-12. File Store”](#).)

5-4-2. Detail Level Adjustment

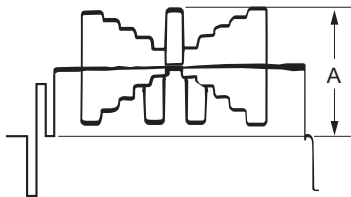
Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Object: Grayscale chart

Preparation

- Setting for the MSU
DETAIL OFF button → ON (unlit)
KNEE OFF button → OFF (lit)
- Shoot the grayscale chart so that it is aligned with the under scanned monitor frame.
- Lens iris: F4 to F5.6
- A = 600 ±20 mV
If the lens aperture is greater than F5.6, adjust the light amount with the shutter.



Procedure

1. Operate the control panel of MSU, and set as follows.
 - (1) PAINT button → ON (lit)
 - (2) Touch panel operation: (Page 1) → [Detail] → [1/3]
2. Adjust the detail level to be added to each step of the grayscale to the desired level.
 - Adjustment item: [Level]
3. Store the reference file.
(Refer to [“5-4-12. File Store”](#).)

5-4-3. Crispening Adjustment

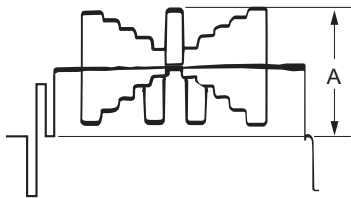
Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Object: Grayscale chart

Preparation

- Setting for the MSU
DETAIL OFF button → ON (unlit)
- Shoot the grayscale chart so that it is aligned with the under scanned monitor frame.
- Lens iris: F4 to F5.6
- $A = 600 \pm 20$ mV
If the lens aperture is greater than F5.6, adjust the light amount with the shutter.



Procedure

1. Operate the control panel of MSU, and perform the automatic white balance adjustment.
WHITE button → ON (lit)
After the adjustment is completed, the message “AWB: OK” is displayed.
2. Operate the control panel of MSU, and set as follows.
 - (1) PAINT button → ON (lit)
 - (2) Touch panel operation: (Page 1) → [Detail] → [1/3]
 - (3) Set adjustment item [Crispening] to “-99”.
3. Adjust the value of crispening.
 - Adjustment item: [Crispening]
 - (1) Turn the adjustment knob of MSU to plus direction slowly.
 - (2) Stop the adjustment knob of MSU at the where the noise at the black level of the waveform just decreases.
4. Store the reference file.
(Refer to [“5-4-12. File Store”](#).)

5-4-4. Level Dependent Adjustment

Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

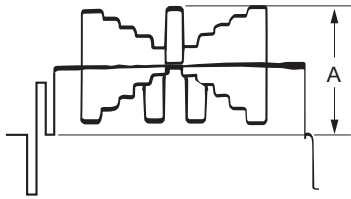
Subject: Grayscale chart

Preparation

- Setting for the MSU
DETAIL OFF button → ON (unlit)
- Shoot the grayscale chart so that it is aligned with the under scanned monitor frame.

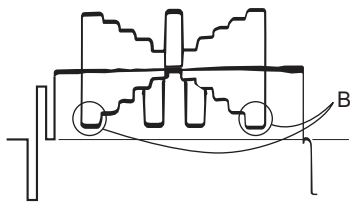
- Lens iris: F4 to F5.6
- $A = 600 \pm 20 \text{ mV}$

If the lens aperture is greater than F5.6, adjust the light amount with the shutter.



Procedure

1. Operate the control panel of MSU, and set as follows.
 - (1) PAINT button → ON (lit)
 - (2) Touch panel operation: (Page 1) → [Detail] → [1/3]
 Setting:
 - Level Dep OFF → OFF
 - (3) Set adjustment item [Level Dep] to “-99”.
2. Adjust the level dependent.
 - Adjustment item: [Level Dep]
 - (1) Turn the adjustment knob of MSU to plus direction slowly.
 - (2) Stop the adjustment knob of MSU at the where the edge of B portion on the waveform just decreases. Or adjust for the desired level.



3. Store the reference file.
 (Refer to [“5-4-12. File Store”](#).)

Note

After adjustment is completed, be sure to perform [“5-4-1. H/V Ratio Adjustment”](#).

5-4-5. Detail Clip Adjustment

Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

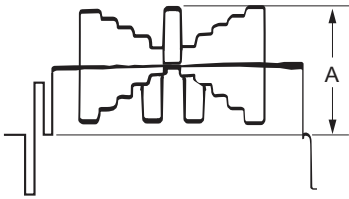
Subject: Grayscale chart

Preparation

- Setting for the MSU
 DETAIL OFF button → ON (unlit)
 KNEE OFF button → OFF (lit)
- Shoot the grayscale chart so that it is aligned with the under scanned monitor frame.
- Lens iris: F4 to F5.6

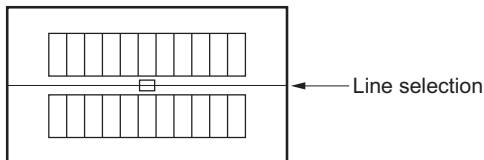
- $A = 600 \pm 20 \text{ mV}$

If the lens aperture is greater than F5.6, adjust the light amount with the shutter.

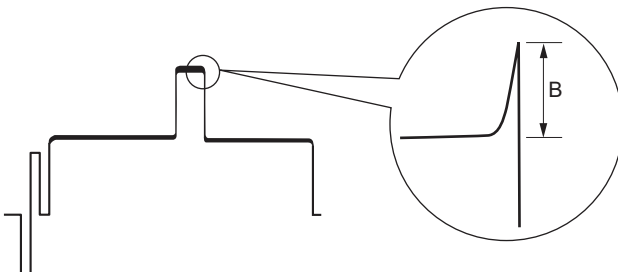


Procedure

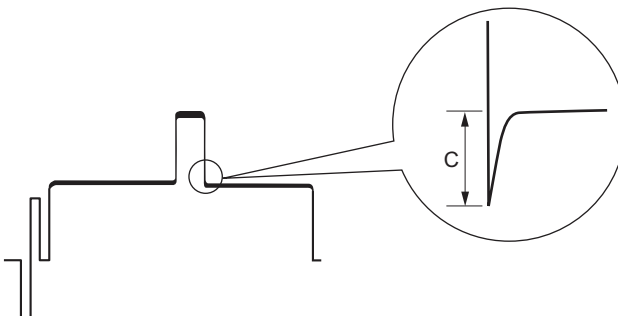
1. Operate the control panel of MSU, and perform the automatic white balance adjustment.
WHITE button → ON (lit)
After the adjustment is completed, the message “AWB: OK” is displayed.
2. Make a line selection at the center white portion of the grayscale chart.



3. Operate the control panel of MSU, and set as follows.
 - (1) PAINT button → ON (lit)
 - (2) Touch panel operation: (Page 1) → [Detail] → [3/3]
4. Adjust the edge at portion B (white) to the desired clip level.
 - Adjustment item: [W Limiter]



5. Adjust the edge at portion C (black) to the desired clip level.
 - Adjustment item: [B Limiter]



6. Store the reference file.
(Refer to “5-4-12. File Store”.)

5-4-6. Auto-iris Adjustment

Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

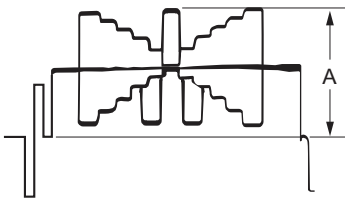
Subject: Grayscale chart

Preparation

- Setting for the MSU
AUTO IRIS button → ON (lit)
DETAIL OFF button → ON (unlit)
KNEE OFF button → OFF (lit)
- Shoot the grayscale chart so that it is aligned with the under scanned monitor frame.

Procedure

1. Operate the control panel of MSU, and perform the automatic white balance adjustment.
WHITE button → ON (lit)
After the adjustment is completed, the message “AWB: OK” is displayed.
2. Operate the control panel of MSU, and set as follows.
 - (1) MAINTENANCE button → ON (lit)
 - (2) Touch panel operation: [Lens] → [Auto Iris Settings]
3. To set the operation mode of auto-iris that is depending on a use, set the reaction degree of auto-iris.
(It can be set between the average and the peak value of video signal.)
 - Adjustment item: [APL Ratio]
(-99: peak value to 99: average)
4. Adjust the convergence level of auto-iris so that the level of portion A on the waveform becomes the specification.
 - Adjustment item: [Level]
 - Specification: $A = 700 \pm 7$ mV



5. Store the reference file.
(Refer to [“5-4-12. File Store”](#).)

5-4-7. Pedestal Level Adjustment

Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Preparation

- Setting for the MSU
CLOSE button → ON (lit)

Procedure

1. Operate the control panel of MSU, and set as follows.
 - (1) PAINT button → ON (lit)
 - (2) Touch panel operation: (Page 1) → [Black]
2. Adjust the levels A to desired level for R, G and B respectively.

To adjust all levels for R, G and B simultaneously, adjust them using [Master].

 - Adjustment item : [R], [G], [B], [Master]
 - Reference value: A = 21 mV



3. Store the reference file.

(Refer to [“5-4-12. File Store”](#).)

5-4-8. Flare Adjustment

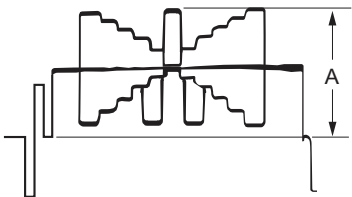
Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Subject: Grayscale chart

Preparation

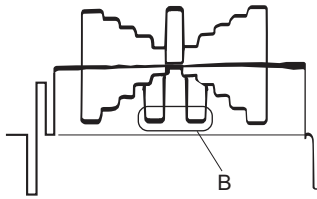
- Setting for the MSU
DETAIL OFF button → ON (unlit)
KNEE OFF button → OFF (lit)
MATRIX OFF button → OFF (lit)
- Shoot the grayscale chart so that it is aligned with the under scanned monitor frame.
- Lens iris: F4 to F5.6
- A = 600 ±20 mV
If the lens aperture is greater than F5.6, adjust the light amount with the shutter.



Procedure

1. Operate the control panel of MSU, and set as follows.
 - (1) PAINT button → ON (lit)
 - (2) Touch panel operation: (Page 1) → [Flare]

2. Adjust the levels B to desired level for R, G and B respectively.
To adjust all levels for R, G and B simultaneously, adjust them using [Master].
 - Adjustment item : [R], [G], [B], [Master]



3. Store the reference file.
(Refer to [“5-4-12. File Store”](#).)

5-4-9. Gamma Correction Adjustment

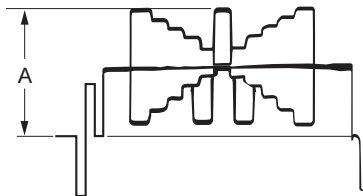
Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Subject: Grayscale chart

Preparation

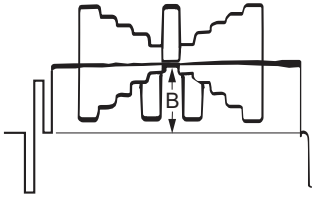
- Setting for the MSU
KNEE OFF button → OFF (lit)
GAMMA OFF button → ON (unlit)
- Shoot the grayscale chart so that it is aligned with the under scanned monitor frame.
- Lens iris: $A = 700 \pm 20 \text{ mV}$



Procedure

1. Operate the control panel of MSU, and perform the automatic white balance adjustment.
WHITE button → ON (lit)
After the adjustment is completed, the message “AWB: OK” is displayed.
2. Operate the control panel of MSU, and set as follows.
 - (1) PAINT button → ON (lit)
 - (2) Touch panel operation: (Page 1) → [Gamma]

3. Adjust the levels B to desired level for R, G and B respectively.
To adjust all levels for R, G and B simultaneously, adjust them using [Master].
 - Adjustment item : [R], [G], [B], [Master]



4. Store the reference file.
(Refer to [“5-4-12. File Store”](#).)

5-4-10. Knee Point and Knee Slope Adjustments

Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Preparation

- Setting for the MSU
MASTER GAIN → 6 (6 dB)
TEST 1 button → ON (lit)
KNEE OFF button → ON (unlit)

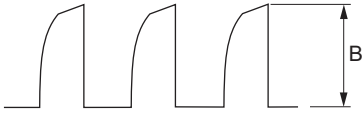
Procedure

1. Operate the control panel of MSU, and set as follows.
 - (1) PAINT button → ON (lit)
 - (2) Touch panel operation: (Page 1) → [Knee] → [Knee Slope]
 - (3) Set adjustment item [Master] to “-99”.
2. Operate the control panel of MSU, and set as follows.
Touch panel operation: (Page 1) → [Knee] → [Knee Point]
3. Adjust the levels A to desired level for R, G and B respectively.
To adjust all levels for R, G and B simultaneously, adjust them using [Master].
 - Adjustment item : [R], [G], [B], [Master]
 - Reference value: A = 686 mV



4. Operate the control panel of MSU, and set as follows.
Touch panel operation: (Page 1) → [Knee] → [Knee Slope]

5. Adjust the levels B to desired level for R, G and B respectively.
To adjust all levels for R, G and B simultaneously, adjust them using [Master].
 - Adjustment item : [R], [G], [B], [Master]
 - Reference value: B = 735 mV



6. Store the reference file.
(Refer to [“5-4-12. File Store”](#).)

Setting after Adjustment

- Setting for the MSU
MASTER GAIN → 0 (0 dB)
TEST 1 button → OFF (unlit)
KNEE OFF button → OFF (lit)

5-4-11. White Clip Level Adjustment

Equipment: Waveform monitor (R, G, B)

Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Preparation

- Setting for the MSU
MASTER GAIN → 12 (12 dB)
TEST 1 button → ON (lit)

Procedure

1. Operate the control panel of MSU, and set as follows.
 - (1) PAINT button → ON (lit)
 - (2) Touch panel operation: (Page 2) → [White Clip]
2. Adjust the levels A to desired level for R, G and B respectively.
To adjust all levels for R, G and B simultaneously, adjust them using [Master].
 - Adjustment item : [R], [G], [B], [Master]
 - Reference value: A = 756 mV



3. Store the reference file.
(Refer to [“5-4-12. File Store”](#).)

Setting after Adjustment

- Setting for the MSU
MASTER GAIN → 0 (0 dB)
TEST 1 button → OFF (unlit)

5-4-12. File Store

After adjustments described in “[5-4. Video System Level Adjustment](#)” are completed, be sure to store the reference file.

Reference File Store

Store the file in the MSU menu.

Procedure

1. FILE button → ON (lit)
2. Touch panel operation: [Ref File] → [Ref Store] → [Start]
After the reference file entry is completed, a message “Completed” is displayed.

5-5. ND Offset Adjustment

5-5-1. White Balance Correction

Note

When the filter disk unit is replaced alone, the correction of white balance is required. Proceed as follows.

Equipment: Waveform monitor (R, G, B)

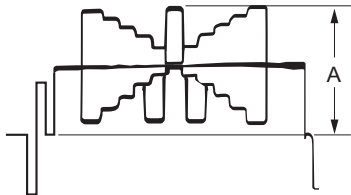
Test point: SLOT1 connectors (BNC x4) on the HDCU4300 or BPU4000/4500

Subject: Grayscale chart

Preparations

- Setting for the MSU
AUTO IRIS button → ON (lit)
MASTER GAIN → 0 (0 dB)
- Shoot the grayscale chart so that it is aligned with the under scanned monitor frame.
- Lens iris: F4 to F5.6
- $A = 600 \pm 20 \text{ mV}$

If the lens aperture is greater than F5.6, adjust the light amount with the shutter.



Procedure

1. Set each button on the MSU as follows.
 - FILTER CONTROL button → ON (lit)
 - ND1 button → ON (lit)
2. Operate the control panel of MSU, and perform the automatic white balance adjustment.
WHITE button → ON (lit)
After the adjustment is completed, the message “AWB: OK” is displayed.

3. Set the GAIN of ND filters 2 to 5 as follows. Perform the automatic white balance adjustment for each ND filter using same procedure.

- ND filter 2
ND2 button → ON (lit)
MASTER GAIN → 0 (0 dB)
- ND filter 3
ND3 button → ON (lit)
MASTER GAIN → 0 (0 dB)
- ND filter 4
ND4 button → ON (lit)
MASTER GAIN → 6 (6 dB)
- ND filter 5
ND5 button → ON (lit)
MASTER GAIN → 12 (12 dB)

Note

Change GAIN values because the iris open end is not used.

OHB File Store

Store the OHB file in the MSU menu.

Procedure

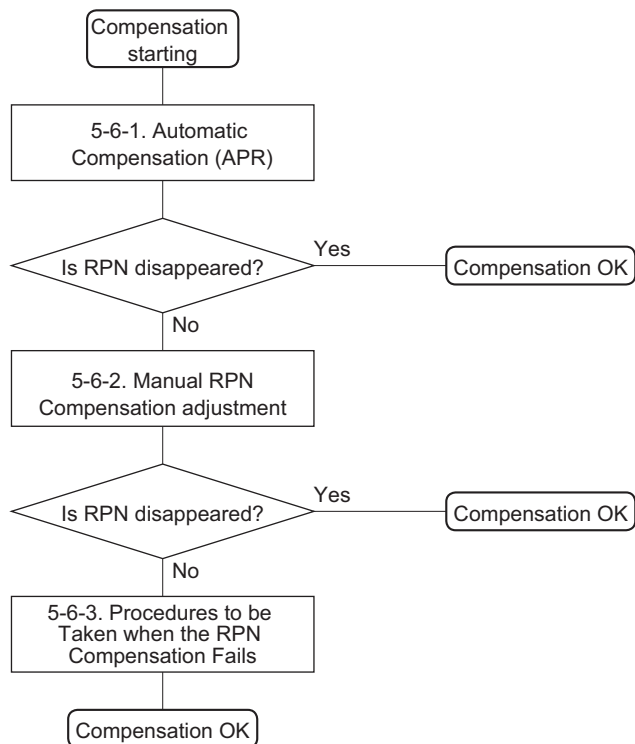
1. [FILE] button → ON (lit)
2. Touch panel operation: [OHB] → [OHB Store] → [Store]
After the store operation is completed, the message “OHB File Store” is displayed.

Setting after Adjustment

- Setting for the MSU
MASTER GAIN → 0 (0 dB)

5-6. RPN Compensation

- To compensate the RPN, age the camera for more than 30 minutes.
- When executing the automatic compensation (APR) from MSU or setting menu, the residual point noise (RPN) of the CMOS image sensor is compensated.
- To compensate the RPN, compensate according to the following chart.



5-6-1. Automatic Compensation (APR)

When an RPN is detected in the screen, perform the automatic compensation (APR).

Automatic RPN Compensation (APR)

Note

- RPN automatic compensation should be performed both HD and 4K.
- Manual RPN compensation adjustment data is not affected by executing the automatic RPN compensation (APR).
- Automatic RPN compensation (APR) take several minutes.

Preparations

- Lens iris → CLOSE
Or remove the lens and attach the lens mount cap to the lens mount.
- Setting for the MSU
BARS button → OFF (dark)
SHUTTER button → OFF (dark)

Procedure

1. Execute automatic RPN compensation (APR) from MSU or camera.

- Execute automatic RPN compensation (APR) from MSU.

[MAINTENANCE] button → ON (lit)

Touch panel operation: [Auto Setup] → [APR]

Note

Confirm that the operation of the Auto Setup menu is enabled in the Item Permission of the MSU. (Refer to Operation manual of MSU.)

- Execute automatic black balance adjustment (ABB) from camera to automatic RPN compensation (APR).

MENU: SERVICE

PAGE: RPN MANAGE

ITEM: AUTO CONCEAL

Note

The history information of the address data of detected RPN is updated each time APR is performed. If no RPN is detected in consecutive five APRs, RPN is excluded from the correction target (by deleting data).

5-6-2. Manual RPN Compensation Adjustment

When RPN is not compensated after RPN automatic compensation was performed, execute the manual RPN compensation adjustment.

Preparation

1. Execute RPN automatic compensation (APR).
(Refer to [“5-6-1. Automatic Compensation \(APR\)”](#).)

Procedure

1. Open following page by camera setup menu.

MENU: SERVICE

PAGE: MANUAL RPN

<MANUAL RPN>		S03 TOP
RPN CH SELECT	:	R
RPN CURSOR	:	OFF
CURSOR H POS.	:	1006
CURSOR V POS.	:	575
CURSOR JUMP	:	CURR
RECORD RPN	:	EXEC
DELETE RPN	:	EXEC

2. Select the channel (R, G, or B) that is to be compensated.
ITEM: RPN CH SELECT → R, G, B
3. Display the cross cursor.
ITEM: RPN CURSOR → ON
4. Set the cross cursor center at the target RPN.
ITEM: CURSOR H POS.
ITEM: CURSOR V POS.

5. Execute record of RPN compensation adjustment data.
ITEM: RECORD RPN → EXEC
A message “RECORD DATA OK? YES → NO” is displayed.

Note

In the case of RPN is disappeared in the screen, perform step 6.

In the case of RPN is appeared in the screen, the cross cursor may not move to the position of RPN. Perform procedures as follows.

- (1) Select (turn the knob) “NO” by rotary encoder and confirm (press the button).
- (2) Shift the center of cross cursor by one line or one pixel and move to position of RPN.
- (3) Perform step 5.

6. Select (turn the knob) “YES” by rotary encoder and confirm (press the button).
A message “COMPLETE” is displayed, the compensation data is recorded.

Tip

If a compensation pixel has been wrongly recorded, delete the RPN data.

ITEM: DELETE RPN → EXEC

7. Repeat steps 4 to 6 to compensate other RPNs.

Tip

If adjust using the MSU, enter the engineer mode and operate in the following page. (Refer to Operation manual of MSU.)

[MAINTENANCE] button → ON (lit)

Touch panel operation: [RPN]

Setting after adjustment

1. Hide the cross cursor.
ITEM: RPN CURSOR → OFF

5-6-3. Procedures to be Taken when the RPN Compensation Fails

When the RPN compensation is not successful even after the manual RPN compensation adjustment was made, the following causes are possible.

- An adjacent wrong position was compensated.
- The compensation failed due to the influence of other RPNs.

Note

Appearance of an RPN next to the pixel to be compensated means that adjacent RPNs exist. If an RPN appears in the diagonal direction, the RPN cannot be compensated. In this case, the CMOS image sensors or the OHB assembly must be replaced.

For more information, contact your local Sony Sales Office/Service Center.

Procedure

1. Open following page by camera setup menu.

MENU: SERVICE

PAGE: MANUAL RPN

<MANUAL RPN>		S03 TOP
RPN CH SELECT	:	R
RPN CURSOR	:	OFF
CURSOR H POS.	:	1006
CURSOR V POS.	:	575
CURSOR JUMP	:	CURR
RECORD RPN	:	EXEC
DELETE RPN	:	EXEC

2. Display the cross cursor.
ITEM: RPN CURSOR → ON
3. Check whether there are any compensated pixels close to the pixel to be compensated.
 - When the target pixel is above the cursor position,
ITEM: CURSOR JUMP → PREV
 - When the target pixel is under the cursor position,
ITEM: CURSOR JUMP → NEXT

Tip

To compensate effectively RPN, perform as follows.

- After placing the cursor in advance close to the pixel to be compensated by using CURSOR H POS. and CURSOR V POS, execute the CURSOR JUMP function.
4. When the cursor stopped at a position near the target pixel, Delete the compensation data at stop position of cursor.
 - (1) Delete the compensation data.
ITEM: DELETE RPN → EXEC
A message “DELETE DATA OK? YES → NO” appears.
 - (2) Select (turn the knob) “YES” by rotary encoder and confirm (press the button).
 5. When the cursor is not moved by executing the CURSOR JUMP, move the cursor in the direction of horizontal or vertical, and execute it again.
ITEM: CURSOR H POS.
ITEM: CURSOR V POS.
 6. Record the RPN compensation adjustment data.
ITEM: RECORD RPN → EXEC
A message “RECORD DATA OK? YES → NO” is displayed.
 7. After confirming that RPN disappears, select (turn the knob) “YES” by rotary encoder and confirm (press the button).
A message “COMPLETE” is displayed, the compensation data is recorded.

Section 6

Software Upgrade

6-1. Upgrading Software Programs

Software programs stored in the ROM (IC401) on the AT-189V board is upgraded by using a USB drive. The software programs include camera application and operating system (OS), which is independently upgraded. Use the following procedures to upgrade the software programs.

6-1-1. Upgrading Camera Application

Equipment Required

- USB drive (commercially available)

Tip

For recommended USB drive, refer to “Using a USB Drive” on the operation manual.

Preparations

Copy the camera application update data to the USB drive using the following procedure.

Note

For how to obtain the data file for update (hdc43_app.pkg), contact your local Sony Sales Office/Service Center.

1. Create the following directory in the USB drive.
\\MSSONY\\PRO\\CAMERA\\HDCP43
2. Copy the data file for update “hdc43_app.pkg” to the directory created.

Procedure

1. Connect the USB drive that contains the program for update to the USB connector of this unit.
2. Turn on the power of the unit.
3. Display the ROM VERSION page of the DIAGNOSIS menu.
4. Confirm that the cursor “?” is displayed to the left of page number, and then press the MENU SEL knob/ENTER button long.
5. Updatable items become selectable. Select “CAMERA APP” and then press the MENU SEL knob/ENTER button.
6. A message “VERSION UP OK?” appears. Select “YES”.
The unit restarts automatically and the version update starts.
Upon completion of the version update, a message “UPDATE SUCCEEDED” appears.
7. Turn off and on the power of the unit and confirm that the version has been updated on the ROM VERSION page of the DIAGNOSIS menu.

6-1-2. Upgrading OS

Equipment Required

- USB drive (commercially available)

Tip

For recommended USB drive, refer to “Using a USB Drive” on the operation manual.

Preparations

Copy the OS update data to the USB drive using the following procedure.

Note

For how to obtain the data file for update (hdc43_os.pkg), contact your local Sony Sales Office/Service Center.

1. Create the following directory in the USB drive.
\\MSSONY\\PRO\\CAMERA\\HDCP43
2. Copy the data file for update “hdc43_os.pkg” to the directory created.

Procedure

1. Connect the USB drive that contains the program for update to the USB connector of this unit.
2. Turn on the power of the unit.
3. Display the ROM VERSION page of the DIAGNOSIS menu.
4. Confirm that the cursor “?” is displayed to the left of page number, and then press the MENU SEL knob/ENTER button long.
5. Updatable items become selectable. Select “OS” and then press the MENU SEL knob/ENTER button.
6. A message “VERSION UP OK?” appears. Select “YES”.
The unit restarts automatically and the version update starts.
Upon completion of the version update, a message “UPDATE SUCCEEDED” appears.
7. Turn off and on the power of the unit and confirm that the version has been updated on the ROM VERSION page of the DIAGNOSIS menu.

6-2. PLD

This unit uses the PLD (Programmable Logic Device) that supports USB drive to write and rewrite the internal data. If the part listed below needs to be replaced or to be upgraded, contact your local Sony Sales Office/Service Center.

Note

The part number of PLD (or ROM for PLD) in which data is not written yet, is shown in “Spare Parts”.

Therefore, if part replacement is required, write the data by the following procedure.

In the case of the PLD type that runs on the program stored in external ROM, data needs not to be written only by replacing the part if the specific PLD only is defective.

6-2-1. Corresponding PLD

Item	File	Board	Ref. No.
DPR	hdcp43_dpr.pkg	DPR-376	IC1001 IC1303 (Config ROM)
SY	hdcp43_sy.pkg	SY-449	IC701 IC804 (Config ROM)

6-2-2. Upgrading PLD Data

Equipment Required

- USB drive (commercially available)

Tip

For recommended USB drive, refer to “Using a USB Drive” on the operation manual.

Preparations

Copy the PLD update data to the USB drive using the following procedure.

Note

For how to obtain the data file for update (hdcp43_dpr.pkg, hdcp43_sy.pkg), contact your local Sony Sales Office/Service Center.

1. Create the following directory in the USB drive.
\\MSSONY\\PRO\\CAMERA\\HDCP43
2. Copy the data files for PLD update to be updated to the directory created.

Procedure

1. Connect the USB drive that contains the program for update to the USB connector of this unit.
2. Turn on the power of the unit.
3. Display the ROM VERSION page of the DIAGNOSIS menu.
4. Confirm that the cursor “?” is displayed to the left of page number, and then press the MENU SEL knob/ENTER button long.
5. Updatable items become selectable. Select the PLD to be upgraded and then press the MENU SEL knob/ENTER button.

6. A message “VERSION UP OK?” appears. Select “YES”.
The unit restarts automatically and the version update starts.
Upon completion of the version update, a message “UPDATE SUCCEEDED” appears.
7. Turn off and on the power of the unit and confirm that the version has been updated on the ROM VERSION page of the DIAGNOSIS menu.

6-3. Forced Version Update

If the version of program or data cannot be updated from the ROM VERSION page of the DIAGNOSIS menu, the software or PLD data version can be updated by the “forced version update.”

6-3-1. Forced Version Upgrade of Software or PLD Data

Equipment Required

- USB drive (commercially available)

Tip

For recommended USB drive, refer to “Using a USB Drive” on the operation manual.

Preparations

Copy the software or PLD data version update data file to the USB drive using the following procedure.

Note

For how to obtain the data files for update, contact your local Sony Sales Office/Service Center.

1. Create the following directory in the USB drive.
\\MSSONY\\PRO\\CAMERA\\HDCP43
2. Copy the data file for update to be updated to the directory created.

Note

Do not copy software or PLD data that is not to be updated.

Procedure

1. Connect the USB drive that contains the program for update to the USB connector of this unit.
2. While press the MENU SEL knob/ENTER button on the unit and the VTR button on the lens, turn on the power of the unit.

Each data file for update copied in the USB drive is updated.

Upon completion of the version update, a message “UPDATE SUCCEEDED” appears.

Tip

The version update progress status is displayed on the a monitor connected to the SDI 1 connector.

3. Turn off and on the power of the unit and confirm that the version has been updated on the ROM VERSION page of the DIAGNOSIS menu.

Section 7

File System

This unit is equipped with the file systems for managing data.

In this section, the menu operations are described as follows.

Example: When executing WRITE (CAM → USB) on the OPERATOR FILE page of the OPERATION menu
[OPERATION] → [OPERATOR FILE] → [WRITE (CAM → USB)]

As for the details on the setup menu, refer to “[8. Setup Menu](#)”.

7-1. File Structure

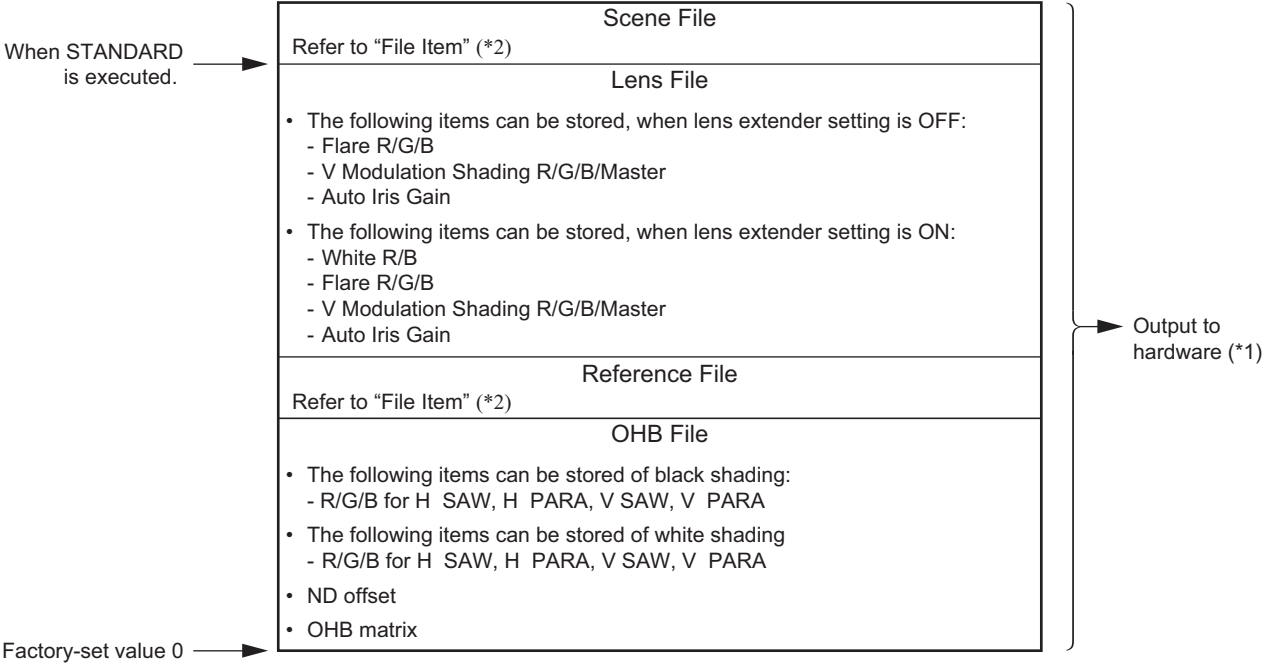
The following six types of files are available. As for the items to be stored in each file, refer to “[7-8. File Items](#)”.

1. Operator File (Refer to “[7-2. Operator File](#)”.)
Stores the items displayed on the viewfinder and switch settings for camera operator.
This file can be stored in a USB drive, yet video data (paint data) cannot be stored.

Tip

When any PAINT menu item is added to USER menu on USER MENU CUSTOMIZE menu, corresponding paint data is stored in the operator file.
2. Preset Operator File (Refer to “[7-3. Preset Operator File](#)”.)
Stores the factory settings of Operator File.
This file can be stored in the camera, yet video data (paint data) cannot be stored.
3. Scene File (Refer to “[7-4. Scene File](#)”.)
Stores the temporary video setting data according to the scene.
This file can be stored in the camera and a USB drive.
4. Reference File (Refer to “[7-5. Reference File](#)”.)
Stores the custom paint data adjusted by the video engineer.
This file can be stored in the camera and a USB drive.
5. Lens File (Refer to “[7-6. Lens File](#)”.)
Used for compensation of the deviation which is generated by switching the lens extender from OFF to ON and for compensation of the difference in the characteristics between lenses.
This file is stored in the camera.
6. OHB File (Refer to “[7-7. OHB File](#)”.)
Used for adjustment of the prism block maintenance.
This file is stored in the camera.

7-1-1. Structure of Paint Related Files



(*1): The additional data of each file is sent to each circuit in the unit.
(*2): For items that can be stored in the scene file and the reference file, refer to [“7-8. File Items”](#).

7-2. Operator File

The operator file can be stored and read in the camera.

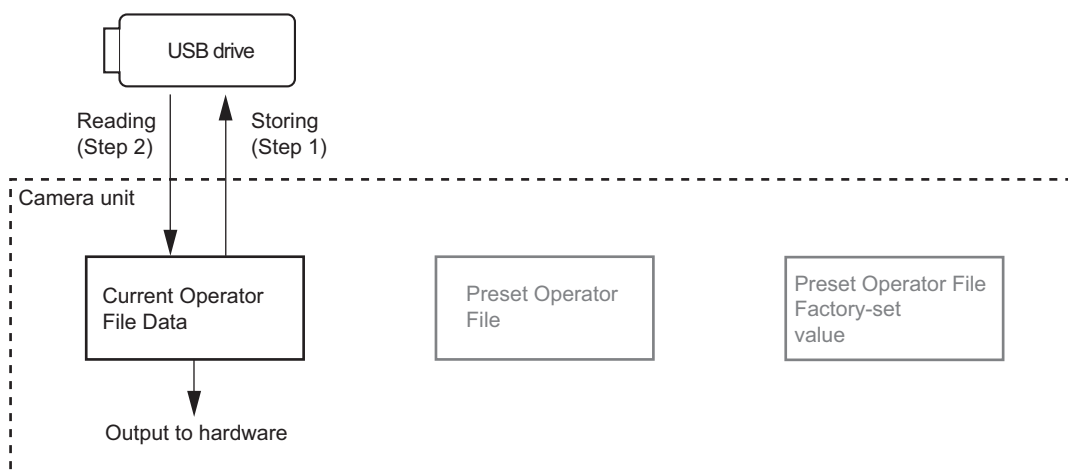
Use the setup menu to store the operator file in and read the operator file from the USB drive.

Note

- Operator file data stored in the USB drive cannot be read when the power is just turned ON.
- The current operator file data is retained even when the power is turned off.

7-2-1. Operator File Operation

Outline Figure of Operation



Storing

Reference: Refer to step 1 of 7-2-1. "Outline Figure of Operation".

Using OPERATION menu of this unit

1. Stores the current status in the USB drive.
[OPERATION] → [OPERATOR FILE] → [WRITE (CAM → USB)]

Reading

Reference: Refer to step 2 of 7-2-1. "Outline Figure of Operation".

Using OPERATION menu of this unit

1. Reads the operator file stored in the USB drive to the camera.
[OPERATION] → [OPERATOR FILE] → [READ (USB → CAM)]

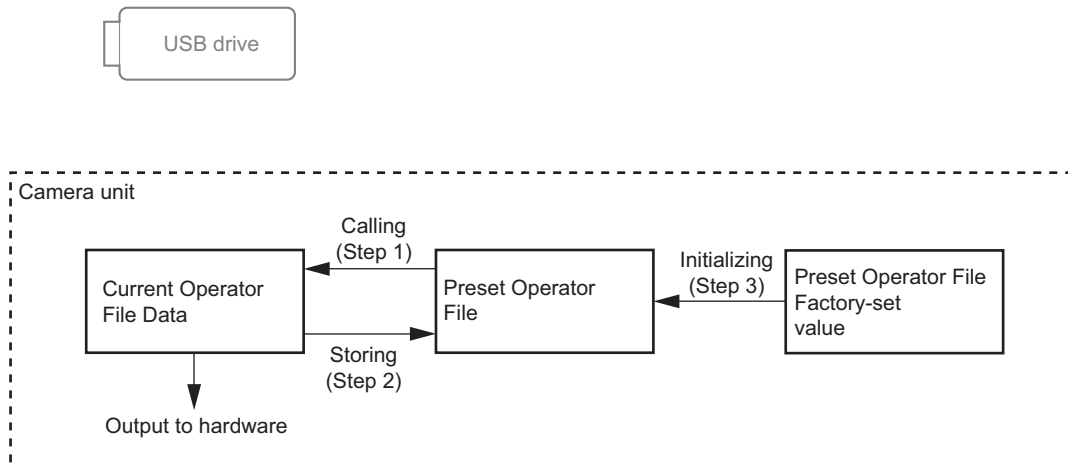
7-3. Preset Operator File

Preset operator file data can be stored in the camera.

Data is called and stored using the setup menu. Items to be stored as preset operator file are the same as operator file.

7-3-1. Preset Operator File Operation

Outline Figure of Operation



Calling

Reference: Refer to step 1 of 7-3-1. "Outline Figure of Operation".

Using OPERATION menu of this unit

1. Loads the preset operator file stored in the camera as the current operator file.
[OPERATION] → [OPERATOR FILE] → [PRESET]

Storing

Reference: Refer to step 2 of 7-3-1. "Outline Figure of Operation".

Using FILE menu of this unit

1. Stores the current operator file as the preset operator file.
[FILE] → [OPERATOR FILE] → [STORE PRESET FILE]

Initializing

Reference: Refer to step 3 of 7-3-1. "Outline Figure of Operation".

Using FILE menu of this unit

1. Introduce preset operator file from the factory settings.
[FILE] → [FILE CLEAR] → [PRESET OPERATOR]

7-4. Scene File

Scene files can be stored in the camera and USB drive.

Scene files can also be stored in the memory stick if the master setup unit (here after MSU) is used. For details, refer to the MSU operation manual.

Data is stored and called using the setup menu or MSU.

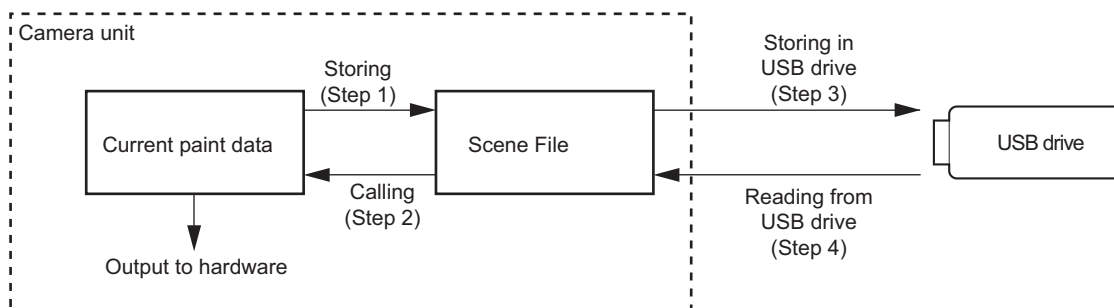
Scene files can be copied between cameras using the USB drive.

Note

- Scene Files are files for storing the differences from the Reference File. Therefore, when the Reference File is changed, output of the Scene File item corresponding to the item changed in the Reference File also varies.
- Scene File data stored in the USB drive cannot be read when the power is just turned on.

7-4-1. Scene File Operation

Outline Figure of Operation



Storing

Reference: Refer to step 1 of 7-4-1. "Outline Figure of Operation".

Using PAINT menu of this unit

1. Change the scene file item to the desired value.
2. Select the scene file number [1] to [5] to be stored.
[PAINT] → [SCENE FILE] → [STORE] → [1] to [5]

With MSU

1. Change the scene file item to the desired value.
2. Press the STORE button in the functional operation area on the operation panel.
3. Press the scene file number button in the functional operation area on the operation panel.

Calling and Clearing the Call

Reference: Refer to step 2 of 7-4-1. "Outline Figure of Operation".

Using PAINT menu of this unit

1. Select the scene file number to be called.
[PAINT] → [SCENE FILE] → [1] to [5]
A file currently being called is indicated with its file number highlighted.

2. Select the number again.
Calling the scene file is canceled and it is resumed in the previous status.

With MSU

1. Press the number button of the scene file you want to call while the STORE button on the operation panel is not lit to lit button.
The scene file of the number is called.
2. Repress the number button.
Calling the scene file is canceled and it is resumed in the previous status.

Storing the Scene File to the USB Drive

Reference: Refer to step 3 of [7-4-1. "Outline Figure of Operation"](#).

Using PAINT menu of this unit

1. Stores the scene file stored in the camera to the USB drive.
[PAINT] → [SCENE FILE] → [WRITE (CAM → USB)]

Reading the Scene File from the USB Drive

Reference: Refer to step 4 of [7-4-1. "Outline Figure of Operation"](#).

Using PAINT menu of this unit

1. Reads the scene file stored in the USB drive to the camera.
[PAINT] → [SCENE FILE] → [READ (USB → CAM)]

Note

Scene File data stored in the USB drive cannot be read when the power is just turned on.

7-5. Reference File

Reference files can be stored in the camera and USB drive.

Scene files can also be stored in the memory stick if the master setup unit (here after MSU) is used. For details, refer to the MSU operation manual.

Data is stored and called using the setup menu or MSU.

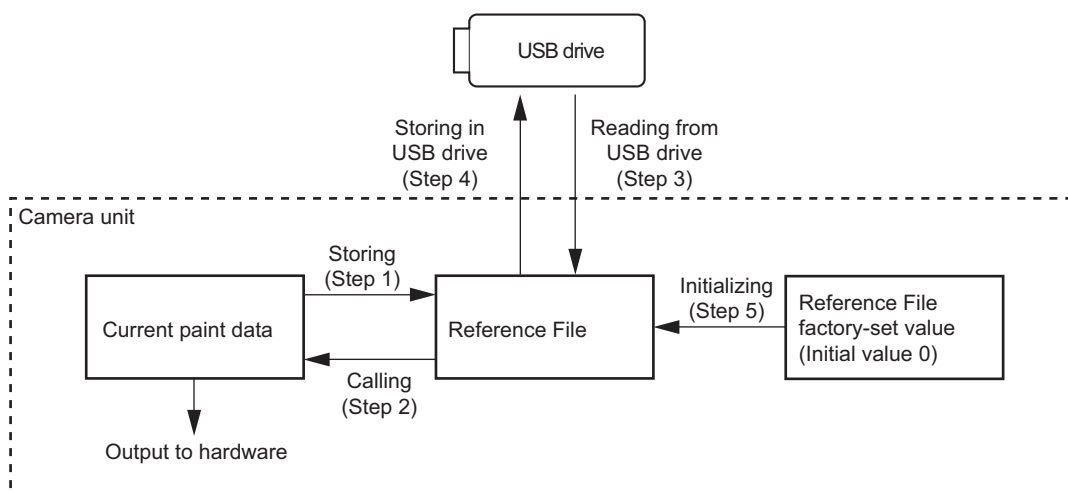
Reference files can be copied between cameras using the USB drive.

Note

- Reference File stores the differential data taking the factory-setting as 0. Therefore, initializing the Reference File brings the settings to the same status at the factory setting. If Lens File or OHB File retains the data, they need to be initialized as well.
To initialize data, use the setup menu. You can select all file items or only specified items to initialize.
- Reference File data stored in the USB drive cannot be read when the power is just turned on.

7-5-1. Reference File Operation

Outline Figure of Operation



Storing

Reference: Refer to step 1 of 7-5-1. "Outline Figure of Operation".

Using FILE menu of this unit

- Store the current status of the reference file.
[FILE] → [REFERENCE] → [STORE FILE]
Reference file data is stored in the camera and numerical data is indicated as 0.
(Except for some data. Refer to "7-8. File Items".)

With MSU

- Press the FILE button in the menu operational area on the operation panel.
- Select [Reference] → [Reference Store] by the menu operation.
Reference file data is stored in the camera and numerical data is indicated as 0.
(Except for some data. Refer to "7-8. File Items".)

Calling

Reference: Refer to step 2 of [7-5-1. "Outline Figure of Operation"](#). Refer to ["7-1-1. Structure of Paint Related Files"](#).

Using PAINT menu of this unit

1. Restore the data at the time when the reference file is stored.
[PAINT] → [SCENE FILE] → [STANDARD]
Temporary paint (values of each item) and selection of scene file are reset, and the state when the reference file was stored is resumed.

With MSU

1. Pressing the STANDARD button in the camera/panel control area on the operation panel.
Reference file is restored at the time when it was stored.

Reading the Reference File from the USB Drive

Reference: Refer to step 3 of [7-5-1. "Outline Figure of Operation"](#).

Using FILE menu of this unit

1. Reads the reference file stored in the USB drive to the camera.
[FILE] → [REFERENCE] → [READ (USB → CAM)]

Note

Reference File data stored in the USB drive cannot be read when the power is just turned on.

Storing the Reference File in the USB Drive

Reference: Refer to step 4 of [7-5-1. "Outline Figure of Operation"](#).

Using FILE menu of this unit

1. Stores the reference file stored in the camera to the USB drive.
[FILE] → [REFERENCE] → [WRITE (CAM → USB)]

Initializing All File Items

Reference: Refer to step 5 of [7-5-1. "Outline Figure of Operation"](#).

Using FILE menu of this unit

1. Re-set the reference file to the factory settings (default value: 0).
[FILE] → [FILE CLEAR] → [REFERENCE (ALL)]

7-6. Lens File

The Lens File stores the differential data from the Reference File.

The lens file is stored white shading generated when the extender is turned on, flare balance, white balance, F value at the lens open end, lens name, and other data. These adjustment data are stored in the camera.

Lens File data of up to 16 files can be stored for a lens that is not compatible with serial communication.

The adjustment data can be called by selecting a Lens File.

Note

Before creating the Lens File, perform the necessary adjustments by using the lens usually used and register the Reference File.

7-6-1. Lens File Operation

Adjusting Lens and Setting Lens File

For lens non-compatible with serial communication

1. Attach a lens and select a file with the same name as the lens name from the setup menu.
[FILE] → [LENS FILE] → Select a lens number.
If there is no file with the same name as the lens name, select “NO OFFSET.”
2. Set the lens name and the F value at the lens open end.
[FILE] → [LENS FILE] → [NAME] , [F NO]
3. Turn OFF the lens extender.
4. Shoot the white pattern, and fine-adjust it with V modulation R/G/B/Master so that the video level is around 80% (560 mV) with the lens iris set around F4 and the zoom control in the center of the ring.
[PAINT] → [VIDEO LEVEL] → [V MOD] → [R/G/B/M]
5. Adjust the white balance and flare balance with the grayscale chart.
 - (1) White balance adjustment
[MAINTENANCE] → [AUTO SETUP] → [AUTO WHITE]
 - (2) Flare Balance Adjustment
[PAINT] → [VIDEO LEVEL] → [FLARE] → [R/G/B/M]
6. Display a center marker.
[OPERATION] → [VF MARKER] → [CENTER] → Set to “ON”.
7. Move the lens zoom to set the center marker at a position where the subject does not move.
[FILE] → [LENS FILE] → [CENTER MARKER] → [H POS] , [V POS] , [STORE]

Note

The center marker position is stored in the Lens File immediately after the position is aligned. Note that the center marker position is not stored when Lens File Store is executed.

8. Writing data to lens file.
[FILE] → [LENS FILE] → [STORE FILE]
9. Turn ON the lens extender and repeat steps 4 to 8.

For lens compatible with serial communication

1. Confirm that the lens number is 17.
[FILE] → [LENS FILE] → Confirm lens number 17.
2. Check the automatically set lens name and the F value at the lens open end.
[FILE] → [LENS FILE] → [NAME] , [F NO]

3. Check the shading.

Note

Only when deviation is generated, adjust the white shading or V modulation. In this case, no data is stored in the lens file.

- White Shading Adjustment

Shoot a full-white pattern so that the video level becomes approx. 80 % (560 mV), and then perform the automatic white shading adjustment or adjust white shading V SAW, V PARA, H SAW, and H PARA for R, G, and B.

- Automatic white shading adjustment

[MAINTENANCE] → [WHITE SHADING] → [AUTO WHITE SHADING]

- White shading correction

[MAINTENANCE] → [WHITE SHADING] → [V SAW] , [V PARA] , [H SAW] , [H PARA] → [R/G/B]

- V Modulation Adjustment

Shoot the white pattern, and fine-adjust it with V modulation R/G/B/Master so that the video level is around 80% (560 mV) with the lens iris set around F4 and the zoom control in the center of the ring.

[PAINT] → [VIDEO LEVEL] → [V MOD] → [R/G/B/M]

4. Turn OFF the lens extender.

5. Adjust the white balance and flare balance with the grayscale chart.

(1) White balance adjustment

[MAINTENANCE] → [AUTO SETUP] → [AUTO WHITE]

(2) Flare Balance Adjustment

[PAINT] → [VIDEO LEVEL] → [FLARE] → [R/G/B/M]

6. Display a center marker.

[OPERATION] → [VF MARKER] → [CENTER] → Set to “ON”.

7. Move the lens zoom to set the center marker at a position where the subject does not move.

[FILE] → [LENS FILE] → [CENTER MARKER] → [H POS] , [V POS] , [STORE]

Note

The center marker is not stored by the lens file store, but is stored immediately after adjustment. Note that if the center marker is changed, it is stored in the lens file even in the normal use.

8. Move the lens zoom to compensate F drop.

[MAINTENANCE] → [LENS] → [F DROP COMP] → [ROUNDNESS] , [MAX GAIN] , [DROP POINT]

(1) Set the [F DROP COMP] to “ON” and set the [ROUNDNESS] to “0 dB”.

(2) Adjust the [MAX GAIN] so that the level of TELE end at the time of iris opening becomes same as level of WIDE end.

(3) Adjust the [DROP POINT] so that the level at the time of controlling the zoom slightly to WIDE end from TELE end becomes same as level of TELE end.

(4) Detect the position of lowest level between TELE end and WIDE end by controlling the zoom, and adjust the [ROUNDNESS] so that the level of the position becomes same as level of WIDE end and TELE end.

9. Writing data to lens file.

[FILE] → [LENS FILE] → [STORE FILE]

10. Turn ON the lens extender and repeat steps 5 to 8.

Calling

Using OPERATION menu of this unit

Loads the lens file stored in the camera.

1. Select the set lens file.

[FILE] → [LENS FILE] → Select a lens number.

7-7. OHB File

OHB file is used to store the adjustment values specific to the prism block.

OHB file data is stored in the camera.

OHB file data can be adjusted and stored by using the setup menu or the master setup unit (here after MSU).

Note

Store the OHB file after all items have been adjusted. Before adjusting and storing only specific items, be sure to execute STANDARD in Step 1 below.

7-7-1. OHB File Operation

Adjusting and Storing

Using FILE and MAINTENANCE Menu of This Unit

1. Loads the reference file stored in the camera.
[FILE] → [REFERENCE] → [STANDARD]
2. Adjust the black shading V SAW, V PARA, H SAW, and H PARA for R, G and B.
[MAINTENANCE] → [BLACK SHADING] → [V SAW] , [V PARA] , [H SAW] , [H PARA] → [R/G/B]
3. Perform the automatic black balance adjustment.
[MAINTENANCE] → [AUTO SETUP] → [AUTO BLACK]
4. Shoot a full-white pattern so that the video level becomes approx. 80 % (560 mV).
5. Repeat the automatic white shading adjustment 3 times or more.
[MAINTENANCE] → [WHITE SHADING] → [AUTO WHITE SHADING]
 - (1) When adjustment is not completed correctly, adjust the white shading V SAW, V PARA, H SAW, and H PARA for R, G and B.
[MAINTENANCE] → [WHITE SHADING] → [V SAW] , [V PARA] , [H SAW] , [H PARA] → [R/G/B]
6. Adjust the ND offset.

Note

- Adjust the ND offset for all of ND filter 1 to ND filter 5.
 - (1) Select the ND filter 5, and shoot a full-white pattern so that the video level becomes approx. 50 % (350 mV).
 - (2) Select the ND filter 1, and adjust the lens iris so that the video level becomes approx. 80 to 50 % (560 to 350 mV)
 - (3) Perform the automatic white balance adjustment.
[MAINTENANCE] → [AUTO SETUP] → [AUTO WHITE]
 - (4) Select the ND filter 2, and adjust in the same procedures as step (2) to (3).
 - (5) Select the ND filter 3, and adjust in the same procedures as step (2) to (3).
 - (6) Select the ND filter 4, and adjust in the same procedures as step (2) to (3).
 - (7) Select the ND filter 5, and adjust in the same procedures as step (2) to (3).
7. Store the OHB File.
[FILE] → [OHB FILE] → [STORE FILE]

With MSU

1. Pressing the STANDARD button in the camera/panel control area on the operation panel. (ON: lit)
2. Press the FILE button in the menu operational area on the operation panel. (ON: lit)
3. Adjust the black shading V SAW, V PARA, H SAW, and H PARA for R, G and B.
[OHB] → [Adjusting] → [Black Shading] → [R/G/B] → [V SAW] , [V PARA] , [H SAW] , [H PARA]
4. Perform the automatic black balance adjustment.
Pressing the BLACK button in the camera/panel control area on the operation panel. (ON: lit)
Or select [OHB] → [Auto Black] by the menu operation.
5. Shoot a full-white pattern so that the video level becomes approx. 80 % (560 mV).

6. Repeat the automatic white shading adjustment 3 times or more.

[OHB] → [Auto W Shading]

- (1) When adjustment is not completed correctly, adjust the white shading V SAW, V PARA, H SAW, and H PARA for R, G and B.

[OHB] → [Adjusting] → [White Shading] → [R/G/B] → [V SAW] , [V PARA] , [H SAW] , [H PARA]

7. Adjust the ND offset.

Note

- Adjust the ND offset for all of ND filter 1 to ND filter 5.

- (1) Select the ND filter 5, and shoot a full-white pattern so that the video level becomes approx. 50 % (350 mV).

- (2) Select the ND filter 1, and adjust the lens iris so that the video level becomes approx. 80 to 50 % (560 to 350 mV)

- (3) Select the ND filter 2, and adjust in the same procedures as step (2) to (3).

- (4) Select the ND filter 3, and adjust in the same procedures as step (2) to (3).

- (5) Select the ND filter 4, and adjust in the same procedures as step (2) to (3).

- (6) Select the ND filter 5, and adjust in the same procedures as step (2) to (3).

8. Store the OHB File.

[OHB] → [OHB Store] → [Store]

7-8. File Items

Data that is set by the setup menu can be stored in a file.

This section lists files in which each piece of set data is to be stored on a function basis.

Description on symbols

- : Shows that the item is stored in the file when the file store menu for the file is performed.
(However, ON (OFF) means that the item is set to ON (OFF) in the file.)
- ×: Shows that the item is not stored in the file.
- : Shows that the item is not stored in the file by temporary operation, etc.

Function	Switch item	Analog item	Scene file	Reference file	Lens file	Operator file	OHB file
GAIN	Master Gain Select* ¹		○	○	×	×	×
Iris		IRIS	×	×	×	×	×
	Auto Iris on		○	○	×	×	×
		Level	○	○	×	×	×
		APL	○	○	×	×	×
		Gain	○	○	○	×	×
		Over ride	×	×	×	×	×
	Detect Pattern		○	○	○	×	×
	Close		×	OFF	×	×	×
Shutter	Shutter ON		○	OFF	×	×	×
	Shutter Select		○	×	×	×	×
ECS	ECS ON		○	OFF	×	×	×
		ECS Frequency	○	×	×	×	×
Black Shading		Black Shading H Saw-R	×	×	×	×	○
		Black Shading H Saw-G	×	×	×	×	○
		Black Shading H Saw-B	×	×	×	×	○
		Black Shading V Saw-R	×	×	×	×	○
		Black Shading V Saw-G	×	×	×	×	○
		Black Shading V Saw-B	×	×	×	×	○
		Black Shading H Para-R	×	×	×	×	○
		Black Shading H Para-G	×	×	×	×	○
		Black Shading H Para-B	×	×	×	×	○
		Black Shading V Para-R	×	×	×	×	○
		Black Shading V Para-G	×	×	×	×	○
		Black Shading V Para-B	×	×	×	×	○

Continued

*1: -6 dB to +12 dB

Function	Switch item	Analog item	Scene file	Reference file	Lens file	Operator file	OHB file
	Auto Black Shading		×	×	×	×	×
Black set		Black Set-R	×	×	×	×	○
		Black Set-G	×	×	×	×	○
		Black Set-B	×	×	×	×	○
Test	Test1 on (TEST SAW)		×	×	×	×	×
	Test2 ON		×	×	×	×	×
	Test2 Mode 3step/10step		×	×	×	×	×
Optical filter	Filter1 (ND)		○	×	×	×	×
	Filter2 (CC)		○	×	×	×	×
	Filter Remote/ Local		×	×	×	×	×
5600k	5600K ON		○	OFF	×	×	×
White Shading		White Shading H Saw-R	×	×	×	×	○
		White Shading H Saw-G	×	×	×	×	○
		White Shading H Saw-B	×	×	×	×	○
		White Shading V Saw-R	×	×	×	×	○
		White Shading V Saw-G	×	×	×	×	○
		White Shading V Saw-B	×	×	×	×	○
		White Shading H Para-R	×	×	×	×	○
		White Shading H Para-G	×	×	×	×	○
		White Shading H Para-B	×	×	×	×	○
		White Shading V Para-R	×	×	×	×	○
		White Shading V Para-G	×	×	×	×	○
		White Shading V Para-B	×	×	×	×	○
	Auto White Shading		×	×	×	×	×
V Modulation	V Mod Shading OFF		×	ON	×	×	×
		Mod Shading V Saw-R	×	×	○	×	×
		Mod Shading V Saw-G	×	×	○	×	×
		Mod Shading V Saw-B	×	×	○	×	×
		Master V Mod Saw	×	×	○	×	×
	Dynamic Shading Compensation ON		×	×	×	×	×

Continued

Function	Switch item	Analog item	Scene file	Reference file	Lens file	Operator file	OHB file
White		White-R	○	○	OFFSET	×	×
		White-G	○	○	×	×	×
		White-B	○	○	OFFSET	×	×
		color temp	—	—	—	—	—
		balance	—	—	—	—	—
		Master White Gain	×	×	×	×	×
		Auto White Balance	×	×	×	×	×
Flare	Flare OFF		○	ON	×	×	×
		Flare-R	○	○	○	×	×
		Flare-G	○	○	○	×	×
		Flare-B	○	○	○	×	×
Black		Master Black	○	○	×	×	×
		Black-R	○	○	×	×	×
		Black-G	○	○	×	×	×
		Black-B	○	○	×	×	×
		Auto Black Balance	×	×	×	×	×
Detail	Detail Off		○	ON	×	×	×
		Detail Level	○	○	×	×	×
		Detail Limiter	○	×	×	×	×
		Detail White Limiter	○	○	×	×	×
		Detail Black Limiter	○	○	×	×	×
		Detail Crispening	○	○	×	×	×
		H Detail Frequency	○	○	×	×	×
		Mix Ratio	○	○	×	×	×
		V DTL control mode	×	○	×	×	×
		Detail H/V Ratio	○	○	×	×	×
	Level Dep. Off		○	○	×	×	×
		Detail Level Depend	○	○	×	×	×
	Knee Aperture On		○	○	×	×	×
		Knee Aperture	○	○	×	×	×
HD Detail	Detail Off		○	ON	×	×	×
		Detail Level	○	○	×	×	×
		Detail Limiter	○	×	×	×	×
		Detail White Limiter	○	○	×	×	×
		Detail Black Limiter	○	○	×	×	×
		Detail Crispening	○	○	×	×	×
		H Detail Frequency	○	○	×	×	×
		Detail H/V Ratio	○	○	×	×	×
	Level Dep. Off		○	○	×	×	×

Continued

Function	Switch item	Analog item	Scene file	Reference file	Lens file	Operator file	OHB file
		Detail Level Depend	○	○	×	×	×
Skin Detail	Skin DTL On		○	○	×	×	×
	Natural Skin Detail ON		○	○	×	×	×
	Skin gate ON		×	×	×	×	×
	Skin gate (CCU)		×	×	×	×	×
	Skin Detail Auto Hue (ch1)		×	×	×	×	×
	Skin Detail Auto Hue (ch2)		×	×	×	×	×
	Skin Detail Auto Hue (ch3)		×	×	×	×	×
	Skin 1 On		○	○	×	×	×
	Skin 1 Gate On		×	×	×	×	×
	Skin 1 Level		○	○	×	×	×
	Skin 1 Phase		○	○	×	×	×
	Skin 1 Width		○	○	×	×	×
	Skin 1 Sat		○	○	×	×	×
	Skin 1 Y Limit		○	○	×	×	×
	Skin 2 On		○	○	×	×	×
	Skin 2 Gate On		×	×	×	×	×
	Skin 2 Level		○	○	×	×	×
	Skin 2 Phase		○	○	×	×	×
	Skin 2 Width		○	○	×	×	×
	Skin 2 Sat		○	○	×	×	×
	Skin 2 Y Limit		○	○	×	×	×
	Skin 3 On		○	○	×	×	×
	Skin 3 Gate On		×	×	×	×	×
	Skin 3 Level		○	○	×	×	×
	Skin 3 Phase		○	○	×	×	×
	Skin 3 Width		○	○	×	×	×
	Skin 3 Sat		○	○	×	×	×
	Skin 3 Y Limit		○	○	×	×	×
Matrix	Matrix Off		○	○	×	×	×
	Preset Matrix on		○	○	×	×	×
	Preset Matrix Sel		×	×	×	×	×
	User Matrix on		○	○	×	×	×
	R-G		○	○	×	×	×
	R-B		○	○	×	×	×
	G-R		○	○	×	×	×
	G-B		○	○	×	×	×
	B-R		○	○	×	×	×
	B-G		○	○	×	×	×

Continued

Function	Switch item	Analog item	Scene file	Reference file	Lens file	Operator file	OHB file
	Multi Matrix On		○	○	×	×	×
	gate		×	×	×	×	×
	Phase select		×	×	×	×	×
	Hue		○	○	×	×	×
	Saturation		○	○	×	×	×
	Adaptive Matrix On		○	○	×	×	×
	Adaptive Matrix Level		○	○	×	×	×
Digital liner saturation	saturation on		○	○	×	×	×
	saturation		○	○	×	×	×
OHB matrix	OHB Matrix On		×	○	×	×	×
	Phase select		×	×	×	×	×
	Hue		×	×	×	×	○
	Saturation		×	×	×	×	○
Black Gamma	Black Gamma On		○	○	×	×	×
	R Black Gamma		○	○	×	×	×
	G Black Gamma		○	○	×	×	×
	B Black Gamma		○	○	×	×	×
	M Black Gamma		○	○	×	×	×
	Black Gamma (RGB) Range		○	○	×	×	×
Low key saturation	Low Key Saturation ON		○	○	×	×	×
	Range		○	○	×	×	×
	Low Key Saturation level		○	○	×	×	×
Gamma	Gamma Off		○	ON	×	×	×
	Gamma Category Select		○	○	×	×	×
	STANDARD Gamma Table Select		○	○	×	×	×
	HYPER Gamma Table Select		○	○	×	×	×
	Cine Gamma Table Select		○	○	×	×	×
	User Gamma Table Select		○	○	×	×	×
	Step Gamma (0.90 to 0.35)		○	○	×	×	×
	R Gamma		○	○ (RGB mode)	×	×	×
	G Gamma		○	○	×	×	×
	B Gamma		○	○ (RGB mode)	×	×	×

Continued

Function	Switch item	Analog item	Scene file	Reference file	Lens file	Operator file	OHB file
		M Gamma	○	○	×	×	×
Knee	Knee Off		○	○	×	×	×
		R Knee point	○	○	×	×	×
		G Knee point	○	○	×	×	×
		B Knee point	○	○	×	×	×
		M Knee point	○	○	×	×	×
		R Knee Slope	○	○	×	×	×
		G Knee Slope	○	○	×	×	×
		B Knee Slope	○	○	×	×	×
		M Knee Slope	○	○	×	×	×
	Knee Max On		×	OFF	×	×	×
	Knee Saturation on		○	○	×	×	×
		Knee saturation	○	○	×	×	×
	Auto Knee (DCC) on		○	○	×	×	×
		Auto Knee Point Limit	○	○	×	×	×
		Auto Knee Slope	○	○	×	×	×
White Clip	White Clip Off		○	ON	×	×	×
		R White Clip	○	○	×	×	×
		G White Clip	○	○	×	×	×
		B White Clip	○	○	×	×	×
		M White Clip	○	○	×	×	×
Noise Suppression	Noise Suppression ON		○	○	×	×	×
	Level		○	○	×	×	×
Mono Color	Mono Color On ^{*1}		○	OFF	—	—	—
		Mono Color Saturation ^{*1}	○	○	—	—	—
		Mono Color Hue ^{*1}	○	○	—	—	—
SD Detail	SD Detail Off ^{*1}		○	○	—	—	—
		SD Detail Level ^{*1}	○	○	—	—	—
		SD Detail Limiter ^{*1}	○	○	—	—	—
		SD Detail White Limiter ^{*1}	○	○	—	—	—
		SD Detail Black Limiter ^{*1}	○	○	—	—	—
		SD Detail Crispening ^{*1}	○	○	—	—	—
		SD H Detail Frequency ^{*1}	○	○	—	—	—
		SD Detail H/V Ratio ^{*1}	○	○	—	—	—
		SD Detail Level Depend ^{*1}	○	○	—	—	—

Continued

*1: Connected with CCU only

Function	Switch item	Analog item	Scene file	Reference file	Lens file	Operator file	OHB file
		SD Detail Comb ^{*1}	○	○	—	—	—
Cross Color Reduce	Cross Color Reduce Off ^{*1}		○	○	—	—	—
	Cross Color Reduce Level ^{*1}		○	○	—	—	—
	Cross Color Reduce Coring ^{*1}		○	○	—	—	—
SD Matrix	SD Matrix Off ^{*1}		○	○	—	—	—
	SD Preset Matrix On ^{*1}		○	○	—	—	—
	SD User Matrix On ^{*1}		○	○	—	—	—
	R-G ^{*1}		○	○	—	—	—
	R-B ^{*1}		○	○	—	—	—
	G-R ^{*1}		○	○	—	—	—
	G-B ^{*1}		○	○	—	—	—
	B-R ^{*1}		○	○	—	—	—
	B-G ^{*1}		○	○	—	—	—
	SD Multi Matrix On ^{*1}		○	○	—	—	—
	Phase select ^{*1}		×	×	—	—	—
	Hue ^{*1}		○	○	—	—	—
	Saturation ^{*1}		○	○	—	—	—
SD Gamma	SD Gamma Off ^{*1}		○	ON	—	—	—
	SD M Gamma ^{*1}		○	○	—	—	—
Level auto set up	level auto set up		×	×	×	×	×
	White Setup Mode		×	×	×	×	×
Digital extender	digital extender on		×	×	×	×	×

Menu	Item	Scene file	Reference file	Lens file	Operator file	OHB file
USER MENU customize		—	—	—	○	—

Continued

*1: Connected with CCU only

Menu	Item	Scene file	Reference file	Lens file	Operator file	OHB file
VF DISPLAY	EX	—	—	—	○	—
	ZOOM	—	—	—	○	—
	DISP	—	—	—	○	—
	FOCUS	—	—	—	○	—
	ND	—	—	—	○	—
	CC	—	—	—	○	—
	5600K	—	—	—	○	—
	IRIS	—	—	—	○	—
	GAIN	—	—	—	○	—
	SHUTTER	—	—	—	○	—
	BATT	—	—	—	○	—
	RETURN	—	—	—	○	—
	MESSAGE	—	—	—	○	—
	FOLLOW F	—	—	—	○	—
	FOCUS NAME	—	—	—	○	—
	FOCUS FORM	—	—	—	○	—
VF MARKER	MARKER	—	—	—	○	—
	LEVEL	—	—	—	○	—
	CENTER	—	—	—	○	—
	SAFETY ZONE	—	—	—	○	—
	EFFECT	—	—	—	○	—
	ASPECT	—	—	—	○	—
	MASK	—	—	—	○	—
	SAFETY	—	—	—	○	—
VF DETAIL	VF DETAIL	—	—	—	○	—
	CRISP	—	—	—	○	—
	FREQUENCY	—	—	—	○	—
	FLICKER	—	—	—	○	—
	AREA	—	—	—	○	—
	ZOOM LINK	—	—	—	○	—
	COLOR DETAIL	—	—	—	○	—
	PEAK COLOR	—	—	—	○	—
	CHROMA LEVEL	—	—	—	○	—
	RETURN DISABLE	—	—	—	○	—
FOCUS POSITION METER1	FOCUS POSITION METER	—	—	—	○	—
	NEAR LIMIT	—	—	—	○	—
	FAR LIMIT	—	—	—	○	—
	DIRECTION	—	—	—	○	—
	SIZE	—	—	—	○	—
	RULED LINE	—	—	—	○	—
	INDEX COLOR	—	—	—	○	—
	INDEX WIDTH	—	—	—	○	—
	MARKER WIDTH	—	—	—	○	—

Continued

Menu	Item	Scene file	Refer- ence file	Lens file	Operator file	OHB file
FOCUS POSITION ME- TER2	ADJUSTED SIGN					
	SENSE	—	—	—	○	—
	NAME DISP	—	—	—	○	—
	FRAME DISP	—	—	—	○	—
	FRAME WIDTH	—	—	—	○	—
	MARKER CONFIG					
	DISP MKR1, 2, 3	—	—	—	○	—
	COLOR MKR1, 2, 3	—	—	—	○	—
	NAME MKR1, 2, 3	—	—	—	○	—
	POS MKR1, 2, 3	—	—	—	○	—
FOLLOW FOCUS	FOLLOW FOCUS	—	—	—	○	—
	OFFSET ADJUST SENS	—	—	—	○	—
	OFFSET CANCEL GAIN	—	—	—	○	—
FOCUS ASSIST	INDICATOR	—	—	—	○	—
	MODE	—	—	—	○	—
	LEVEL	—	—	—	○	—
	GAIN	—	—	—	○	—
	OFFSET	—	—	—	○	—
	AREA MAKER	—	—	—	○	—
	SIZE	—	—	—	○	—
	POSITION	—	—	—	○	—
	POSITION H	—	—	—	○	—
	POSITION V	—	—	—	○	—
ZEBRA	ZEBRA	—	—	—	○	—
	ZEBRA1					
	LEVEL	—	—	—	○	—
	WIDTH	—	—	—	○	—
	ZEBRA2	—	—	—	○	—
CURSOR	CURSOR	—	—	—	○	—
	LEVEL	—	—	—	○	—
	BOX/CROSS	—	—	—	○	—
	H POSITION	—	—	—	○	—
	V POSITION	—	—	—	○	—
	WIDTH	—	—	—	○	—
	HEIGHT	—	—	—	○	—
	BOX MEMORY	—	—	—	○	—
	H POSI	—	—	—	○	—
	V POSI	—	—	—	○	—
	WIDTH	—	—	—	○	—
	HEIGHT	—	—	—	○	—

Continued

Menu	Item	Scene file	Refer- ence file	Lens file	Operator file	OHB file
SPIRIT LEVEL	INDICATOR	—	—	—	○	—
	MODE	—	—	—	○	—
	REVERSE	—	—	—	○	—
	SCALE	—	—	—	○	—
	H POSITION	—	—	—	○	—
	V POSITION	—	—	—	○	—
	ANGLE					
	OFFSET	—	—	—	○	—
VF OUT	VF OUT	—	—	—	○	—
	CHARACTER LEVEL	—	—	—	○	—
	PinP	—	—	—	○	—
	POSITION	—	—	—	○	—
	SIZE	—	—	—	○	—
	MODE	—	—	—	○	—
SWITCH ASSIGN	LENS					
	VTR S/S	—	—	—	○	—
	RET	—	—	—	○	—
	D-SUB					
	ASSIGN1	—	—	—	○	—
	ASSIGN2	—	—	—	○	—

Section 8

Setup Menu

8-1. Overview of Setup Menu

Some of adjustments given in this section use the setup menu. The setup menu consists of the following menus. Besides there is a TOP menu indicating the entire configuration of menu items.

- USER menu
- USER MENU CUSTOMIZE menu
- ALL menu
- OPERATION menu
- PAINT Menu
- MAINTENANCE Menu
- FILE Menu
- DIAGNOSIS menu
- SERVICE Menu

8-1-1. How to Display the SERVICE Menu/How to Change the Setting Values

Displaying the SERVICE menu.

1. Display the MAINTENANCE menu.
2. Set the cursor at [AUTO SETUP] on MAINTENANCE menu and press the MENU SEL knob/ENTER button for at least 10 seconds.
The cursor shifts to [AUTO BLACK].
3. Set the DISPLAY/MENU switch to OFF, and then turn the switch to the MENU side again.
The SERVICE menu is displayed.

Changing Setting Values

- Select a menu item by turning the MENU SEL knob/ENTER button and it is entered by pressing the MENU SEL knob/ENTER button.
- For items whose values can be modified by turning the MENU SEL knob/ENTER button, set values can be entered or suspended by the following operations.

To enter:

Press the MENU SEL knob/ENTER button.

To suspend:

Set the DISPLAY/MENU switch to OFF.

To restart the setting operation, turn the DISPLAY/MENU switch to the MENU side again.

Exiting menu

Set the DISPLAY/MENU switch to OFF.

8-1-2. Settable Special Function

The following function is made available by setting it by the SERVICE menu.
Not that this function is limited.

- Settings of the number of scene files, setting of the resume of filter position, etc. (Refer to “8-2. SERVICE Menu” SET UP.)
- Enhancing of master gain, etc. (Refer to “8-2. SERVICE Menu” OPTION.)

8-2. SERVICE Menu

8-2-1. Description of SERVICE Menu

SET UP

```
<SET UP>                S01 TOP
SCENE FILE TYPE :    5
FILTER RESUME    : OFF
LENS IF MODE     : AUTO
RET TRANSITION TIME : 12
```

ITEM	Description	Factory Setting
SCENE FILE TYPE	Setting for the number of scene files that the camera can have. 5: Five scene files can be set. 32: 32 scene files can be set. Note When the setting is changed from 32 to 5 scene files, data of the sixth and subsequent scene files is deleted.	5
FILTER RESUME	When the FILTER LOCAL button is set to ON and OFF, the filter position of camera is decided by this setting. ON: Filter position before the FILTER LOCAL button is set to ON. OFF: Filter position is not changed.	OFF
LENS IF MODE	This item can forcibly change the interface to parallel interface when a lens that allows serial communication with the camera is in use. AUTO: Automatic interface setting PARA: Forcible setting to parallel interface	AUTO
RET TRANSITION TIME	Set the muting time to be inserted when using the RET2 switch after using RET1 switch. If the muting time is short, the noise may be appeared at the time of changing from RET1 to RET2.	12

CC FILTER

```
<CC FILTER>            S02 TOP
A : 3200
B : 3200
C : 4300
D : 6300
```

When the CC filter is replaced with a nonstandard color temperature conversion filter, change this setting. However, when the CC filter is replaced with a filter without color temperature conversion, such as cross filter, set 3200K. This setting is a reference for color temperature display and the color temperature control function.

MANUAL RPN

<MANUAL RPN>		S03 TOP
RPN CH SELECT	:	R
RPN CURSOR	:	OFF
CURSOR H POS.	:	1006
CURSOR V POS.	:	575
CURSOR JUMP	:	CURR
RECORD RPN	:	EXEC
DELETE RPN	:	EXEC

This menu is used for manual RPN compensation. For details, refer to [“5-6-2. Manual RPN Compensation Adjustment”](#).

RPN MANAGE

<RPN MANAGE>		S04 TOP
RPN ALL PRESET	:	EXEC
AUTO CONCEAL	:	EXEC
APR AT ABB	:	ON

This menu is used for RPN compensation setting and management. For details, refer to [“5-6-1. Automatic Compensation \(APR\)”](#).

OHB-ADJ1

<OHB-ADJ1>		S05 TOP
1080-59.94 i [4:2:2]		
	[R1]	[G1] [B1]
GAIN_CONT:	C7 A9	B1
	[R2] [G2]	[B2]
GAIN_CONT:	C2 A2	A6
FILTER	:	ON
STORE FILE:		EXEC

This menu is used for adjustment of the prism block. For details, refer to [“5-3-2. Sensitivity Adjustment”](#).

BLACK SHADING

<BLACK SHADING>		S06 TOP	
1080-59.94i [4:2:2]			
	[R]	[G]	[B]
V SAW :	01	00	03
V PARA :	FF	FF	FF
H SAW :	00	00	00
H PARA :	01	01	02
BLK SET:	00	01	19
OFFSET:	01	00	FB
GAIN:	0dB		
STORE FILE:	EXEC		

This menu is used for adjustment of the black shading. For details, refer to the following sections.

- [“5-3-1. Black Set Adjustment”](#)
- [“5-3-3. Black Shading Adjustment”](#)

WHITE SHADING

<WHITE SHADING>		S07 TOP	
	[R]	[G]	[B]
V SAW :	F6	0F	06
V PARA :	F6	F4	F5
H SAW :	0C	FA	04
H PARA :	FA	F6	F7
WHITE :	0	0	0
STORE FILE: EXEC			
COLOR TEMP SEL: 3200K			

This menu is used for adjustment of the white shading. For detail, refer to [“5-3-2. Sensitivity Adjustment”](#).

SERIAL NO.

<SERIAL NO.>		S08 TOP	
MODEL: HDC-P43			
NO : 10001			
OHB TYPE : OPTION BASIC			

This menu is used displaying the current model name, serial number and the OHB type.

OPTION

<OPTION>		S09 TOP
GAIN EXTEND	:	OFF
CHROMA FILTER	:	FULL
VR OVERFLOW	:	OFF

ITEM	Description
GAIN EXTEND	Master gain is enhanced. ON: -6, -3, 0, 3, 6, 9, 12, 18, 24, 30, 36 dB OFF: -6, -3, 0, 3, 6, 9, 12 dB
CHROMA FILTER	This menu is used for setting the chroma filter.
VR OVERFLOW	Switch the IRIS knob on the control panel of the RCP-1000/1500 series so that the relative value mode turns to OFF and the absolute value mode turns to ON.

CUSTOMIZE

For the function expansion in the future.

Section 9

Circuit Description

9-1. Optical System (OHB Block)

9-1-1. BI-291 Board

This board equips 2/3 inch backside illumination type 4K CMOS image sensor (IC005).
BI-291 boards are used for R, G and B respectively.

9-1-2. IF-1278 Board

This board equips power supply of CMOS image sensor and flash memory for saving the APR data.

9-2. Signal Processing/Transmission System

9-2-1. DPR-376 Board

The inputted R/G/B signals from CMOS block are adjusted the black shading, the RPN compensation (RPN automatic compensation [APR], automatic black balance adjustment [ABB]), the electronic shutter, the noise reduction, the master white and the master gain at the camera signal process LSIs (IC201 to IC203). The main line signals are sent to IC1001. At IC1001, linear RGB signals that are processed at camera signal process LSIs (IC201 to IC203) are compressed and are multiplexed the command signal, they are converted to serial electric signal. This serial electric signal is converted electric to optic and it is sent to BPU4000/BPU4500/HDCU4300.

VF/Moni signal process, embedded audio process and utility system process of each Trunk/Prompter signal, except picture process on the main line signal are performed at IC1001.

And also serial optic signal from BPU4000/BPU4500/HDCU4300 is converted optic to electric, it separates return and command signals.

9-3. Control System

9-3-1. AT-189V Board

This board consists of the CPU (IC200) for the system control and a peripheral device.

This CPU operates by the main program written in the flash memory (IC401).

As for this CPU, it provides with the interface of USB2.0. Storing/reading the setting data and the upgrade are possible according to USB drive.

9-3-2. SY-449 Board

This board consists of the FPGA (IC701), an interface circuit, and an audio circuit.

The FRAM (IC403, IC404) retains system setup data, paint data, and other data.

FPGA and Interface Circuits

This board contains the interface circuits for control the external inputs/outputs and internal devices of the unit.

FPGA (IC701) and the interface circuits have the following functions.

- Communication with AT-189V board and DPR-376 board by parallel bus
- 700 protocol communication between this unit and the baseband processor unit (BPU: BPU4000/BPU4500) or the camera control unit (CCU: HDCU4300)
- TRUNK communication (RS-232C)
- I²C communication with the servo motor (optical ND filter) and SW-1705 board
- Serial lens control
- Parallel lens control
- Fan control
- Tally control
- Rotary encoder input
- Generator of the clock signal for audio PLL and A/D converter

Audio Circuits

This board is provided with 1-channel microphone input from EXT I/O connector on SW-1705 board, and contains an amplifier for microphone input and an A/D converter.

This board also contains circuit for +48 V phantom power. (unsupported AB power)

9-3-3. DR-663 Board

MCU (IC001) acquires the position information of optical ND filter from SE-1093 board and controls the optical ND filter by the servo motor performing by I²C communication with SY-449 board. The internal memory of MCU stores the adjustment data of optical ND filter.

9-4. Power System

9-4-1. PS-921 Board

The unit uses the inputted DC 12V power to DC IN connector (XLR 4-pin).

This board provides the functions of under-voltage and over-voltage cut-off for input power, and function of current limit for UNREG output.

The power circuit generates +3.7 V, +1.8 V for block power, then supplies power to block.

This board supplies the powers (UNREG, +5.3 V, +3.6V and -5.5 V) to each board, and the powers are converted to voltage to be used at each board.

9-5. Interface Boards

9-5-1. CN-3883 Board

This board contains a DC power input connector (XLR 4-pin, male).

9-5-2. CN-3896 Board

This board contains a Network Trunk connector (RJ-45).

9-5-3. IF-1307 Board

This board is provided with 2-channel SDI connector, output the generated SDI signals in DPR-376 board.

HD-Trunk input signal from the SDI 2 connector that is available for input is sent to DPR-376 board.

Generated prompter signal on DPR-376 board is converted to analog signal by IC200.

The converted signal is output to the prompter signal output connector via SW-1705 board.

This board contains PHY for Network Trunk IF, it communicates with DPR-376 board and CN-3896 board, performs the Network Trunk.

9-5-4. LE-411 Board

This board contains an acceleration sensor (SE001), and send tilt information to SY-449 board.

This board also contains front tally LEDs (red, green).

This board also contains lens connector (12-pin round type, female).

9-5-5. SW-1705 Board

This board contains switches (POWER, DISPLAY/MENU) and rotary encoder (MENU) on rear panel.

This board also contains rear tally LEDs (red, blue, green) and indicators (POWER, NETWORK, CONDITION).

This board also contains prompter output connector (BNC), USB connector (USB 2.0 type A 4-pin) and external input/output connector (EXT I/O: D-sub, 15-pin).

DC fan is connected.

Section 10

Spare Parts

10-1. Note on Repair Parts

1. Safety Related Components Warning

WARNING

Components marked △ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.

3. Stock of Parts

Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

4. Harness

Harnesses with no part number are not registered as spare parts.

1. 安全重要部品

△警告

△印のついた部品は安全性を維持するために重要な部品です。したがって、交換する時は必ず指定の部品を使ってください。

2. 部品の共通化

ソニーから供給する補修用部品は、セットに使われているものと異なることがあります。これは部品の共通化、改良等によるものです。

3. 部品の在庫

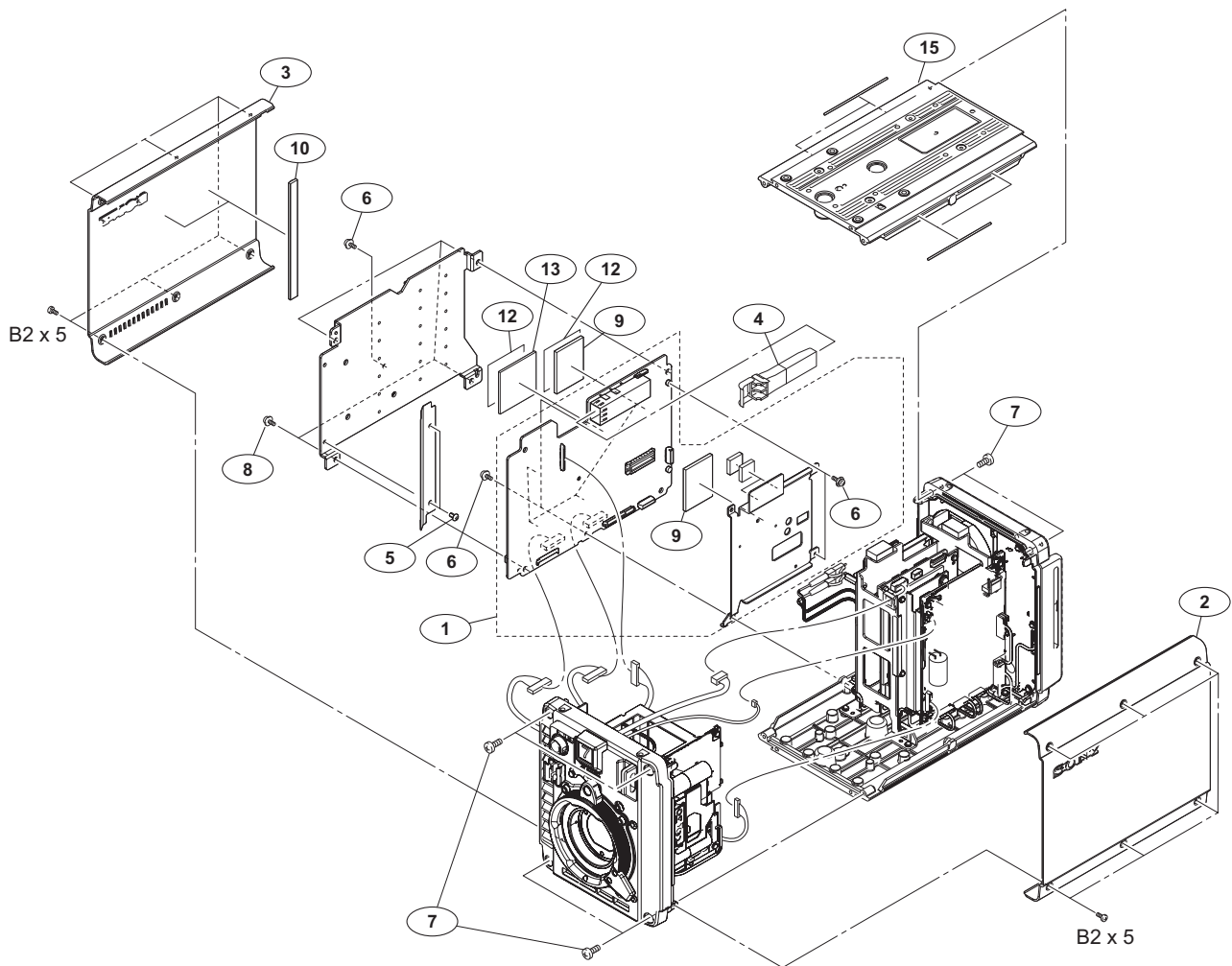
部品表の SP (Supply code) 欄に “o” で示される部品は在庫していないことがあります。納期が長くなる場合があります。

4. ハーネス

部品番号の記載されていないハーネスは、サービス部品として登録されていません。

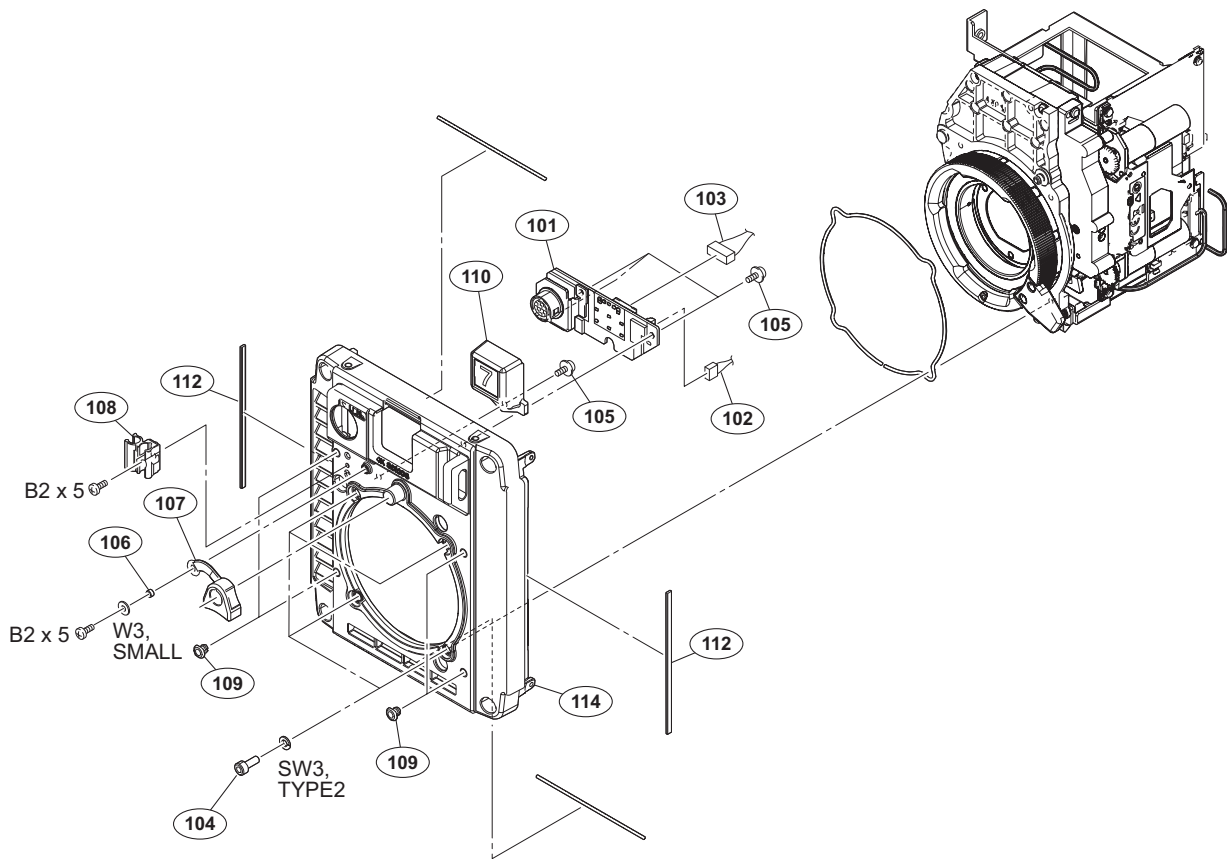
10-2. Exploded Views

Overall-1



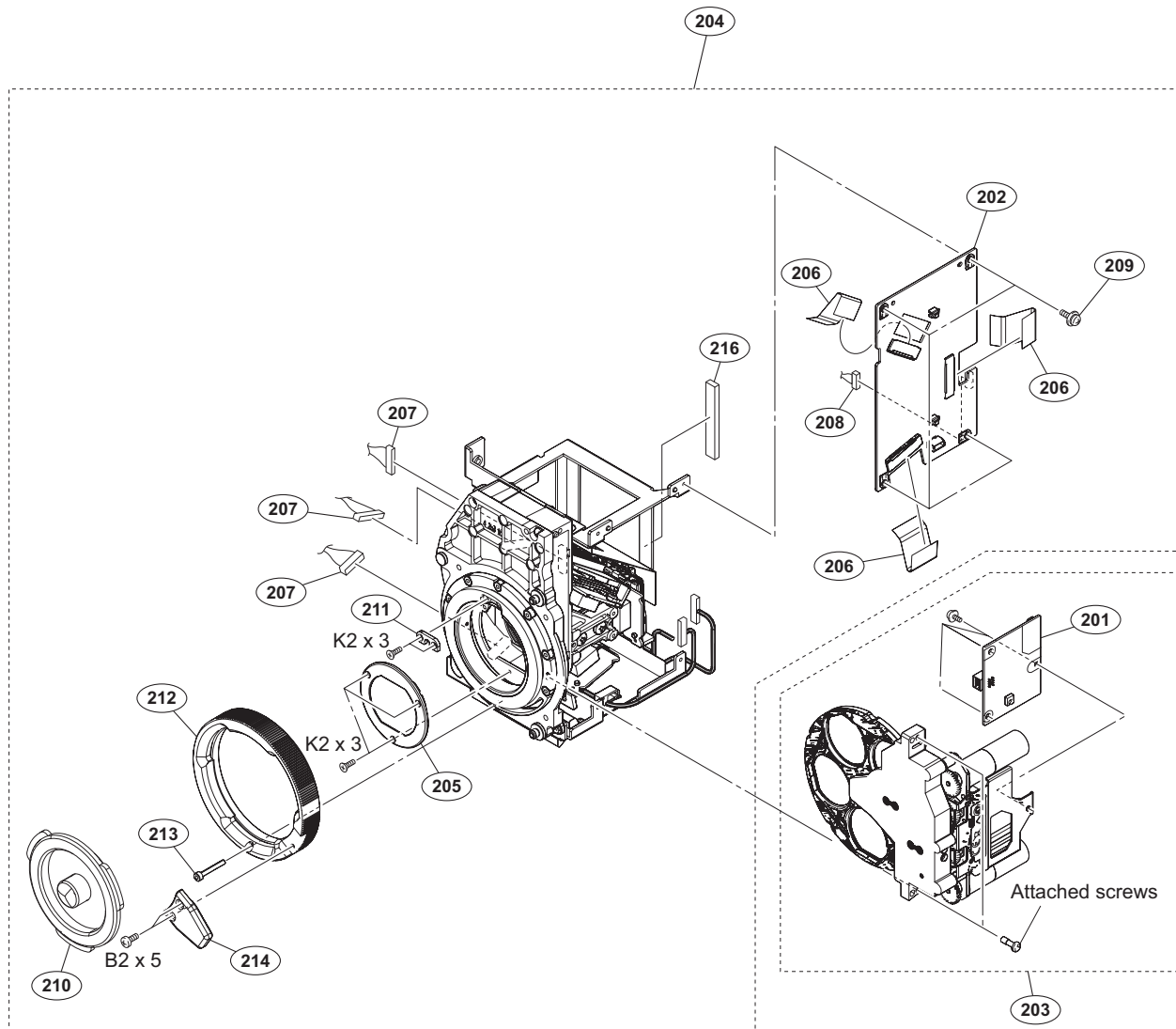
No.	Part No.	SP Description
1	A-2178-388-A s	DPR-376 COMPL
2	A-2178-391-A s	PANEL (R) ASSY, SIDE
3	A-2178-392-A s	PANEL (L) ASSY, SIDE
4	 1-458-776-21 s	MODULE, OPTICAL (SFP+)
5	2-279-715-21 s	RIVET, NYLON
6	2-640-315-02 o	SCREW (M2X5), SMALL, +P, SW
7	3-603-679-02 s	STAINLESS SCREW +B3X10
8	4-382-854-01 s	SCREW (M3X8), P, SW (+)
9	4-409-534-01 s	SHEET, PS CASE THERMAL
10	4-468-138-02 s	FOAM (7X2), SHIELD
12	4-584-940-01 s	SHEET, SLIDE
13	4-587-426-01 s	SHEET (2 (35X35)), RADIATION
15	4-688-996-01 s	PANEL, BOTTOM
	7-621-772-20 s	SCREW +B 2X5

Front Block



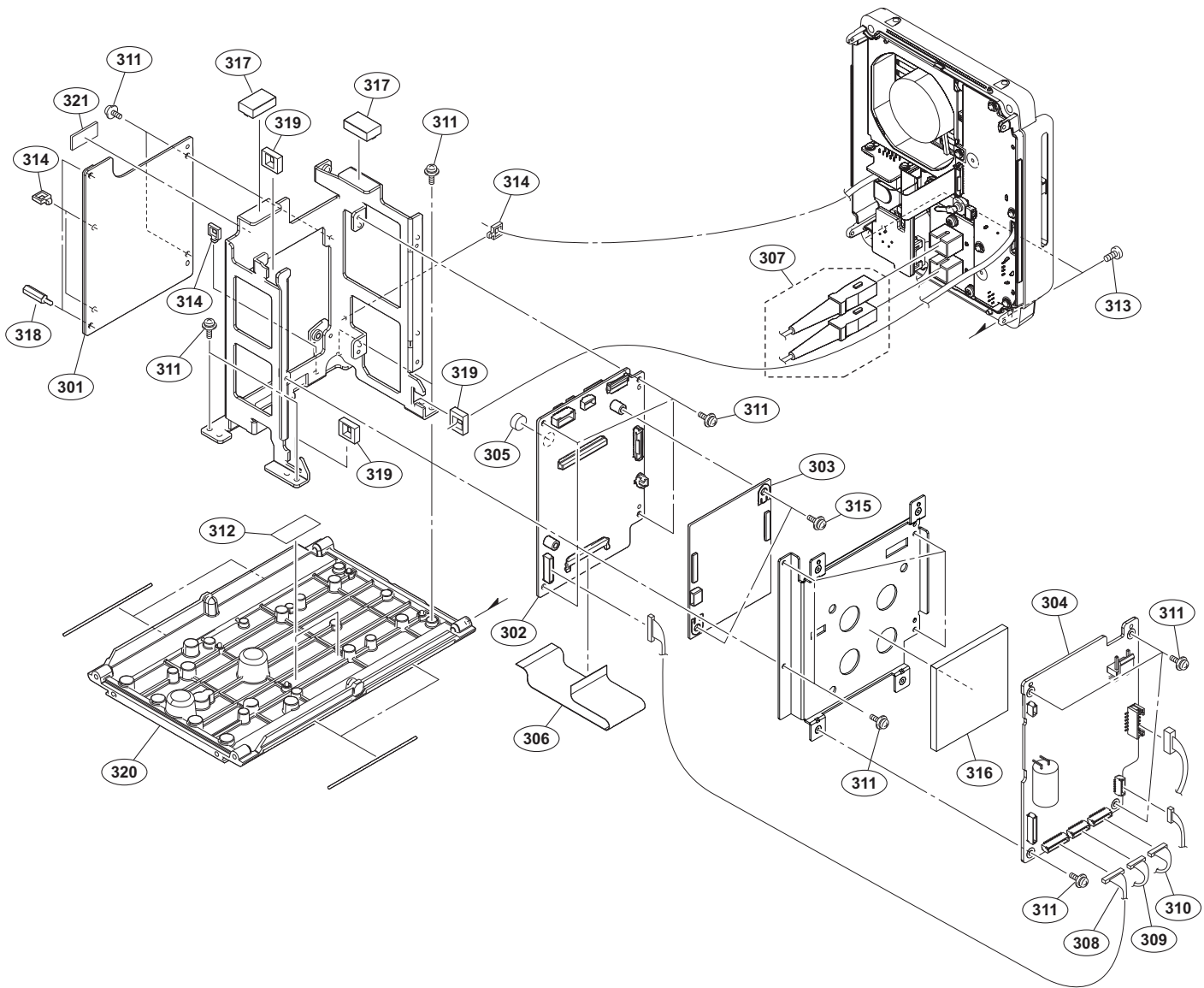
No.	Part No.	SP Description
101	A-2170-621-A	s LE-411 MOUNT
102	1-971-527-11	s HARNESS, SUB (FRONT)
103	1-971-528-11	s HARNESS, SUB (LENS)
104	2-623-773-11	s BOLT (M3X8), STAINLESS
105	2-640-315-02	o SCREW (M2X5), SMALL, +P, SW
106	3-657-841-31	o SPACER (2X2.5)
107	3-796-982-03	s HOLDER, LENS MOUNT
108	4-138-678-01	s CLAMP, CABLE
109	4-138-679-01	s SCREW, BLIND
110	4-170-403-01	s COVER, TALLY
112	4-442-619-32	s FORM, SHIELD
114	4-688-994-01	s PANEL, FRONT
	7-621-772-20	s SCREW +B 2X5
	7-623-208-22	s SW 3,TYPE 2
	7-688-003-02	o W3, SMALL

OHB Block



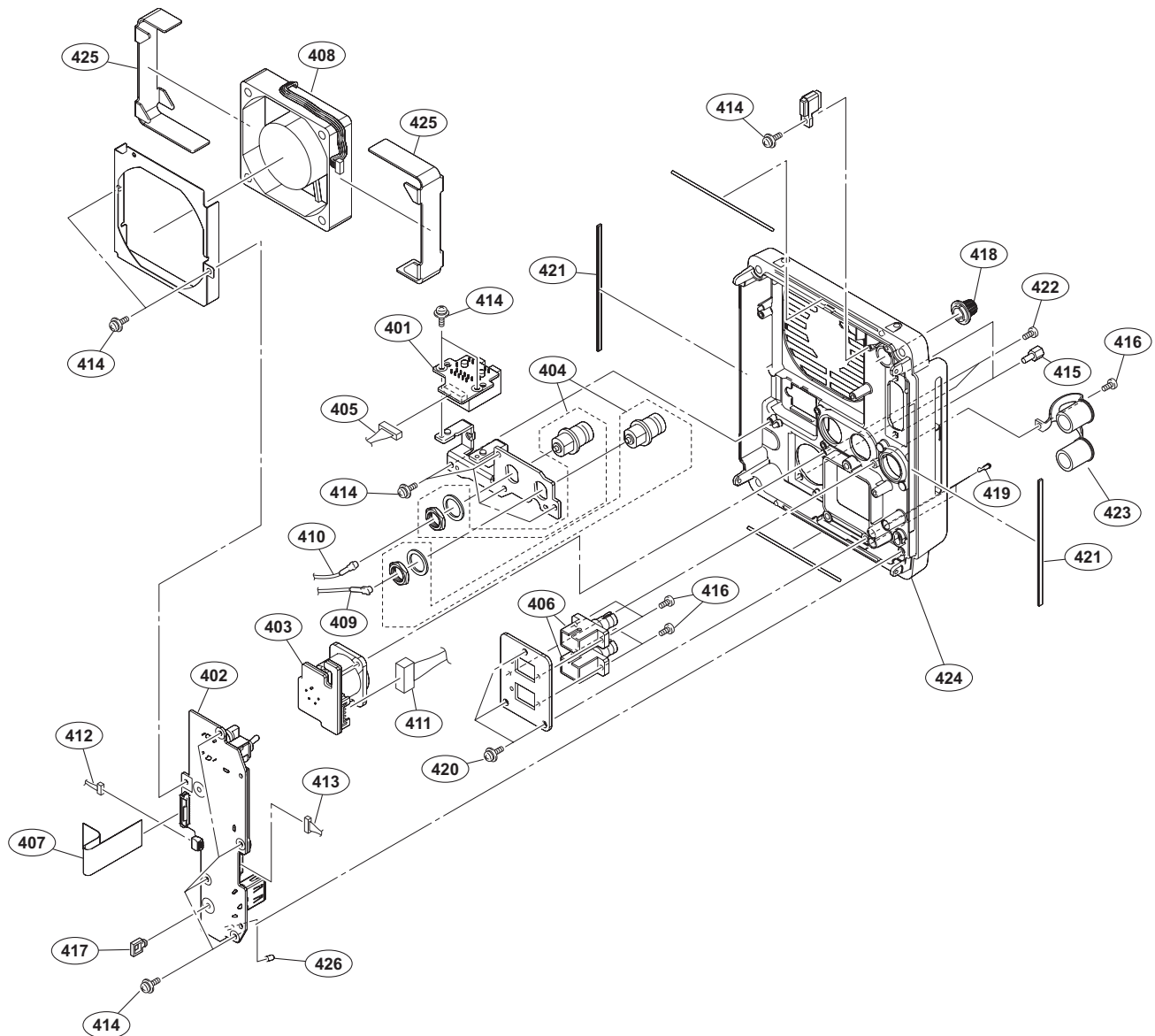
No.	Part No.	SP	Description
201	A-1813-088-A	s	DR-663 COMPL
202	A-2076-813-A	s	IF-1278 MOUNT
203	A-2081-672-A	s	FD ASSY
204	A-2178-390-A	s	CMOS BLOCK ASSY (RP)
205	1-856-701-11	s	OPTICAL FILTER UNIT
206	1-970-786-11	s	HARNESS, SUB (BI-IF)
207	1-970-787-11	s	WIRE,CONNECTOR WITH LEAD
208	1-970-788-11	s	HARNESS, SUB (CIS-PWR)
209	2-640-315-02	o	SCREW (M2X5), SMALL, +P, SW
210	3-699-048-01	s	CAP, MOUNT
211	3-776-897-02	s	GUIDE PLATE
212	4-263-184-04	s	RING, BAYONET
213	4-264-474-01	s	BOLT,BHS M2X15
214	4-562-323-01	s	LEVER, MOUNT
216	4-414-140-01	s	GASKET (3X7) (L=45)
	7-621-772-20	s	SCREW +B 2X5
	7-627-452-18	s	SCREW,Precision +K 2X3

Overall-2



No.	Part No.	SP Description
301	A-2170-628-A s	IF-1307 MOUNT
302	A-2178-386-A s	SY-449 COMPL
303	A-2178-387-A s	AT-189V COMPL
304	A-2178-389-A s	PS-921 COMPL
305	△ 1-756-134-16 s	BATTERY, LITHIUM (SECONDARY)
306	1-831-122-11 s	CABLE, FLEXIBLE FLAT (50 CORE)
307	1-849-778-11 s	SC-LC OPTICAL FIBER CABLE
308	1-971-525-11 s	HARNESS, SUB (SY)
309	1-971-529-11 s	HARNESS, SUB (DPR2)
310	1-971-530-11 s	HARNESS, SUB (DPR1)
311	2-640-315-02 o	SCREW (M2X5), SMALL, +P, SW
312	3-079-115-01 s	TAPE AS
313	3-603-679-02 s	STAINLESS SCREW +B3X10
314	3-742-419-01 o	CLAMP, HARNESS
315	4-382-854-01 s	SCREW (M3X8), P, SW (+)
316	4-414-114-01 s	PAD (SLOT), HEAT CONDUCT
317	4-468-534-02 s	FOAM (10X5), SHIELD
318	4-584-992-01 s	SUPPORT (2SQ-13)
319	4-641-552-01 o	SADDLE, LOCK EDGE
320	4-688-996-01 s	PANEL, BOTTOM
321	4-544-481-01 s	SHEET (VF), CM RADIATION

Rear Block



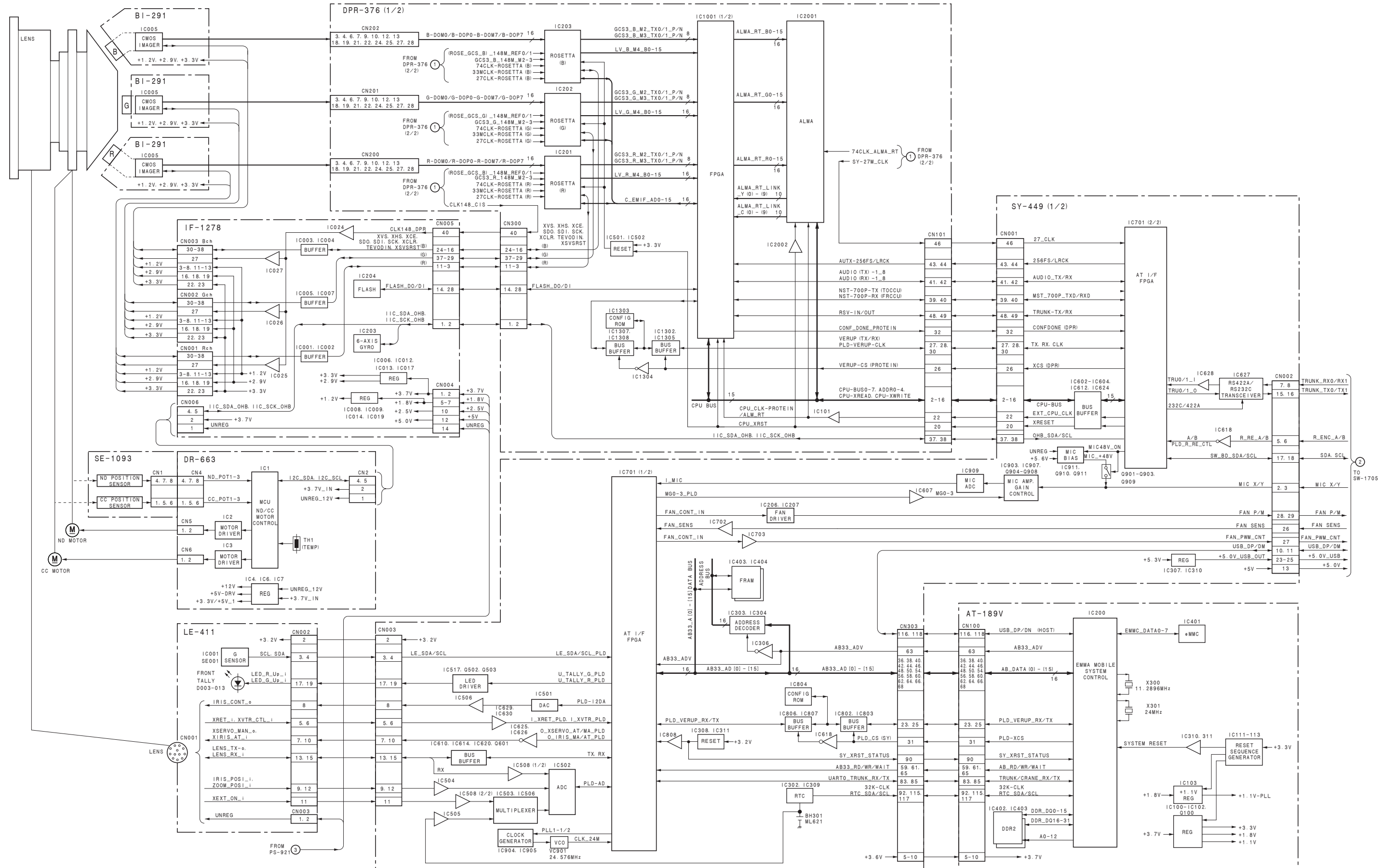
No.	Part No.	SP Description	No.	Part No.	SP Description
401	A-2170-622-A	s CN-3896 MOUNT	422	4-559-446-02	s SCREW, +P2.6X5 NEW TRUSTER
402	A-2170-626-A	s SW-1705 MOUNT	423	4-579-333-01	s CAP, ST CONNECTER
403	A-2170-627-A	s CN-3883 MOUNT	424	⚠ 4-688-995-01	s PANEL, REAR
404	1-784-240-11	s CONVERTER, COAXIAL CONNECTOR	425	4-689-064-01	s CUSHION, FAN
405	1-839-914-11	s CABLE, CONNECTOR WITH COAXIAL	426	3-869-842-01	s CAP,SW
406	1-843-839-11	s SC-ST OPTICAL FIBER ADAPTOR			
407	1-849-299-11	s CABLE, FLEXIBLE FLAT (30 CORE)			
408	⚠ 1-855-154-11	s FAN, DC (60 SQUARE)			
409	1-968-301-11	s HARNESS, COAXIAL			
410	1-970-794-11	s COAXIAL CABLE WITH CONNECTOR			
411	1-971-526-11	s HARNESS, SUB (XLR)			
412	1-971-527-11	s HARNESS, SUB (FRONT)			
413	1-971-531-11	s HARNESS, SUB (REAR)			
414	2-640-315-02	o SCREW (M2X5), SMALL, +P, SW			
415	3-673-910-32	s SCREW, CONNECTOR			
416	3-719-381-22	s SCREW (M2X6)			
417	3-742-419-01	o CLAMP, HARNESS			
418	4-138-683-02	s KNOB, ENCODER			
419	4-170-412-02	s GUIDE, LIGHT			
420	4-382-854-01	s SCREW (M3X8), P, SW (+)			
421	4-442-619-32	s FORM, SHIELD			

10-3. Supplied Accessories

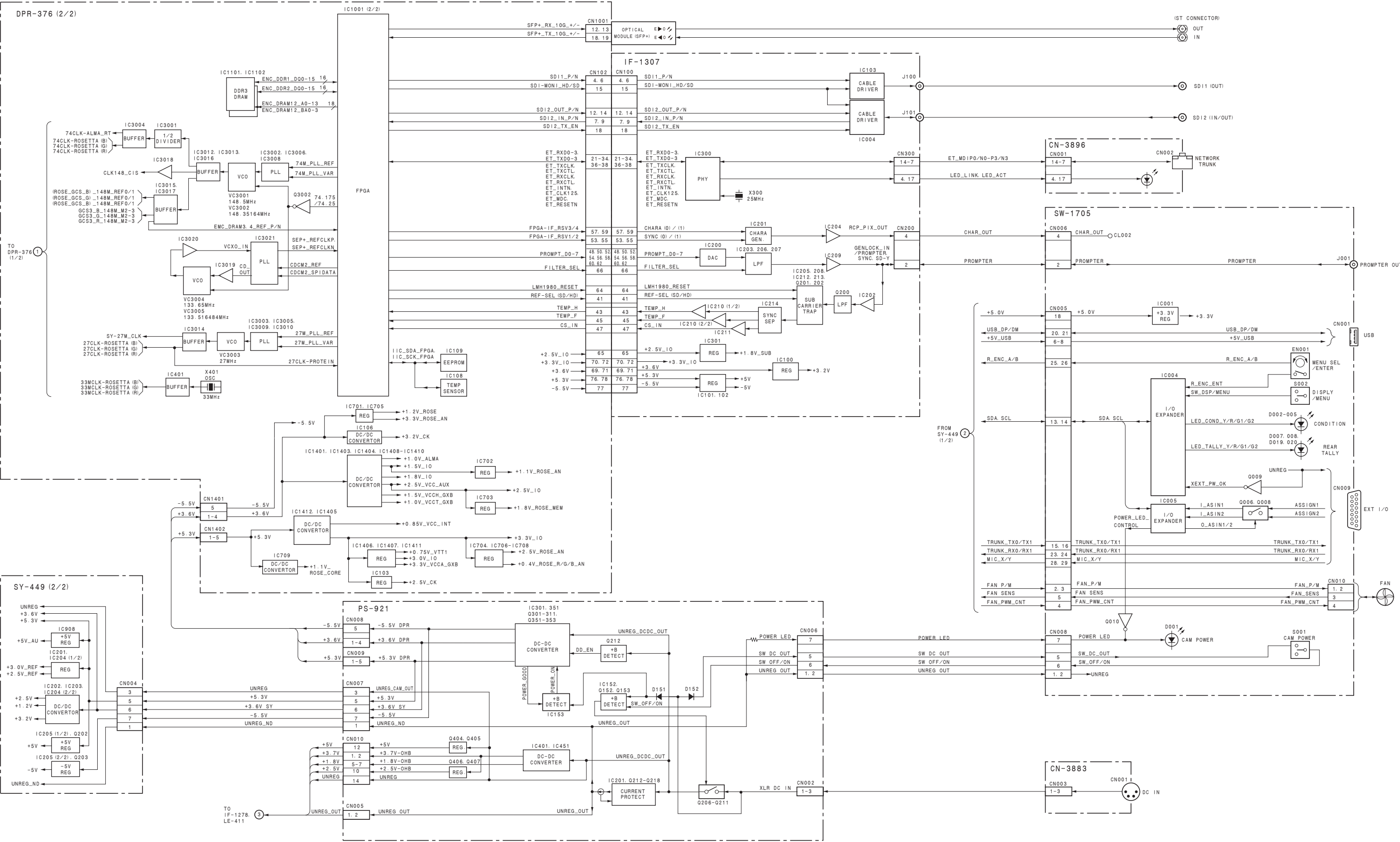
Q'ty	Part No.	SP Description
1pc	4-170-413-01	s PLATE, NUMBER
1pc	 4-689-988-01	s CD-ROM PACK

Section 11 Diagrams

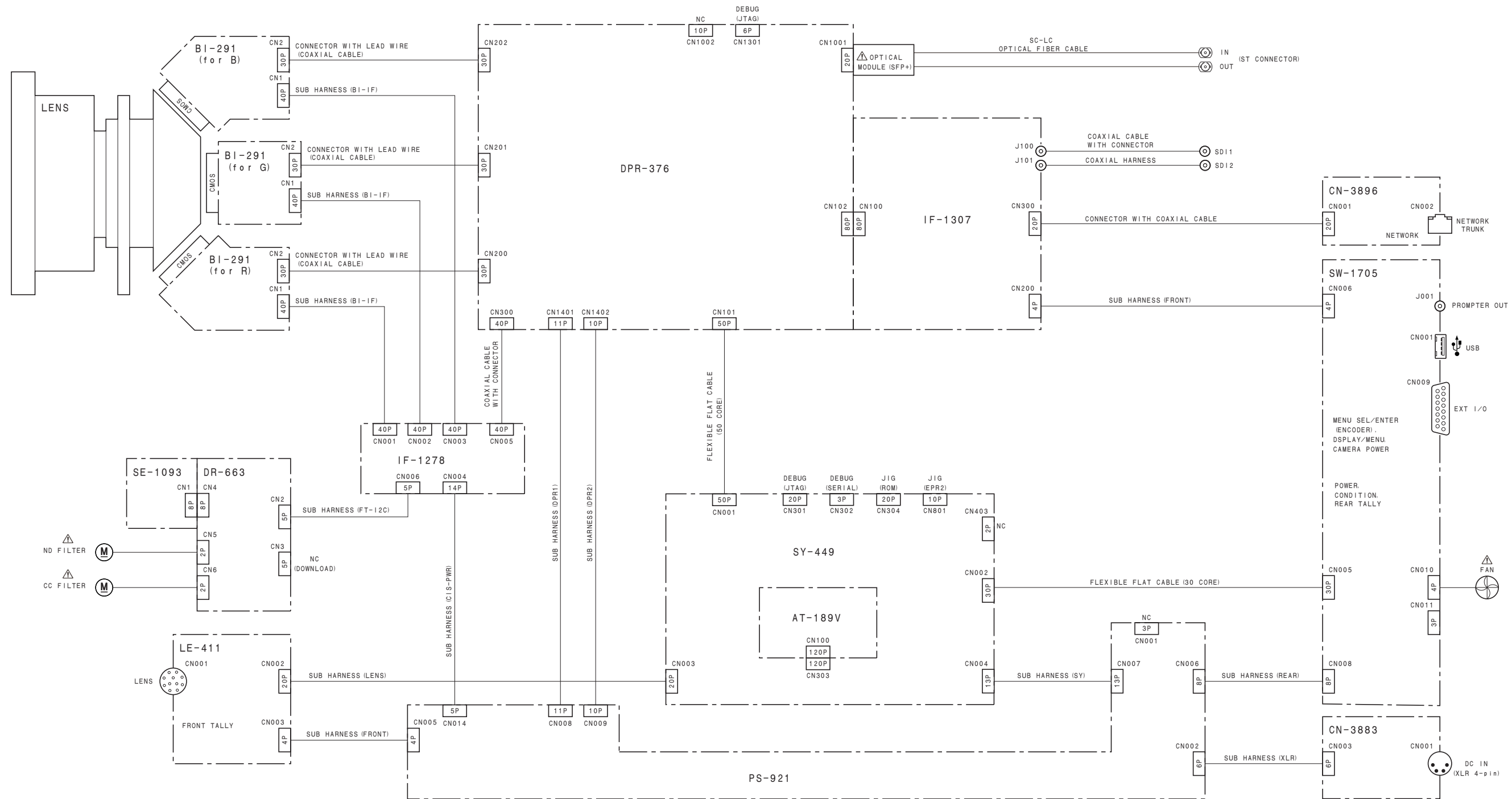
Overall Overall (1/2)



Overall (2/2)



Frame Wiring



Revision History

Date	History	Contents
2016. 11	1st Edition 9-932-506-01	—

HDC-P43 (SY)
HDC-P43 (CN)
HDC-P43 (J) J, E
9-932-506-01

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