SONY

MULTI PURPOSE CAMERA

HDC-P50
HDC-P31

SERVICE MANUAL
1st Edition (Revised 1)

⚠ 警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠ WARNING

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

⚠ WARNUNG

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

⚠ AVERTISSEMENT

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

Model Name	**Serial No.**
HDC-P50 (SY)	10001 and Higher
HDC-P50 (CN)	50001 and Higher
HDC-P31 (SY)	10001 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ーを以下のポートに接続しないでください。
:品 (LAN) 端子
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.
:品 (LAN) connector
Follow the instructions for the above port.

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。

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.

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.

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.

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.

PAS PÅ

Fare for eksplosion, 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.

HUOMIO

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

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。

Table of Contents

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. 3.43 and higher

Software

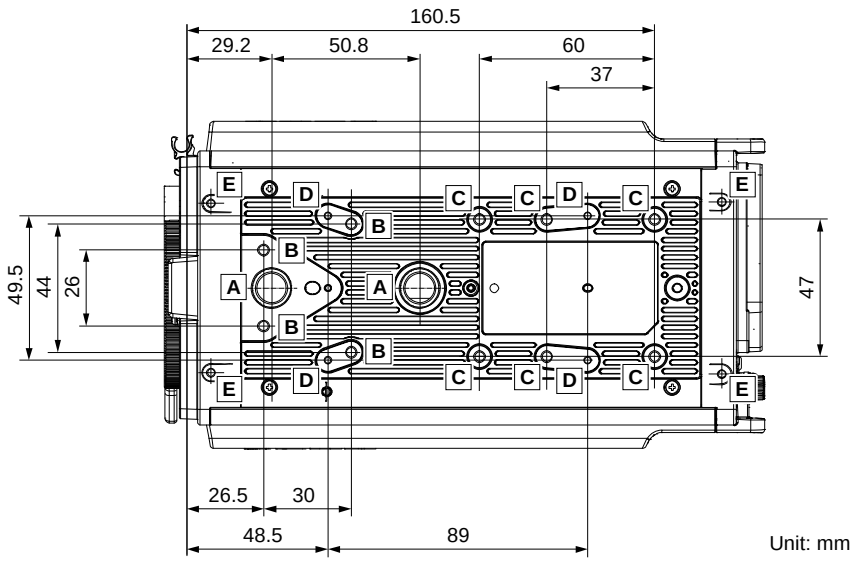
Peripheral Equipment	Board Name	Software Version
RCP-1000/1001	MPU-152 board	Ver. 2.50 and higher
RCP-1500/1501/1530	MPU-153 board	Ver. 3.20 and higher
RCP-3100	AT-195B board	Do not specify software version
RCP-3500/3501	AT-195E board	Do not specify software version
MSU-1000	MPU-150 board	Ver. 3.20 and higher
MSU-1500	MPU-151 board	Ver. 3.20 and higher
MSU-3000/3500	AT-195H board	Do not specify software version

1-2. Screw Positions for Mounting and Hanging

Note

The position of the fixing screws on the upper side is the same as that on the lower side. When attaching the screws to the head, etc., pay attention to the screw position and depth. If the diameter and depth of the screws are not matched, they are not fixed securely, which may cause injury due to the dropping or falling of the camera.

Top view



A: Screw for 3/8 inch tripod (screw depth: 10 mm or less)

B: M4 screw (screw depth: 5 mm or less)
The optional V-shoe (Sony part number: A-8279-993-D) can be attached by this screw.
When attaching it, use the four alok +K4 x 8 screws (Sony part number: 3-729-072-02).
For details on how to purchase the parts, contact your local Sony Sales Office/Service Center.

C: M4 screw (screw depth: 6 mm or less)

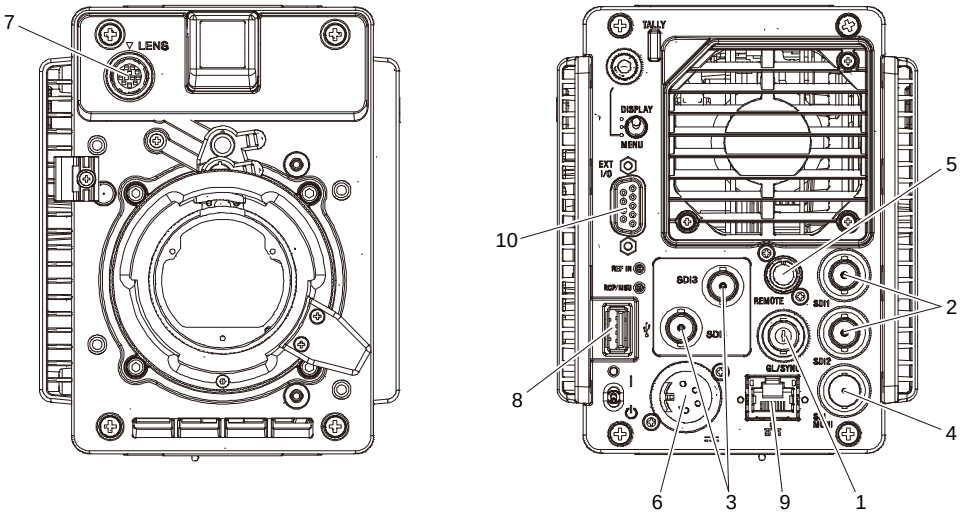
D: M2.6 screw (screw depth: 5 mm or less)

E: M3 screw (screw depth: 7 mm or less)
This screw is used to secure the wire for drop prevention, etc. on the upper side only. Do not use it for securing this unit.

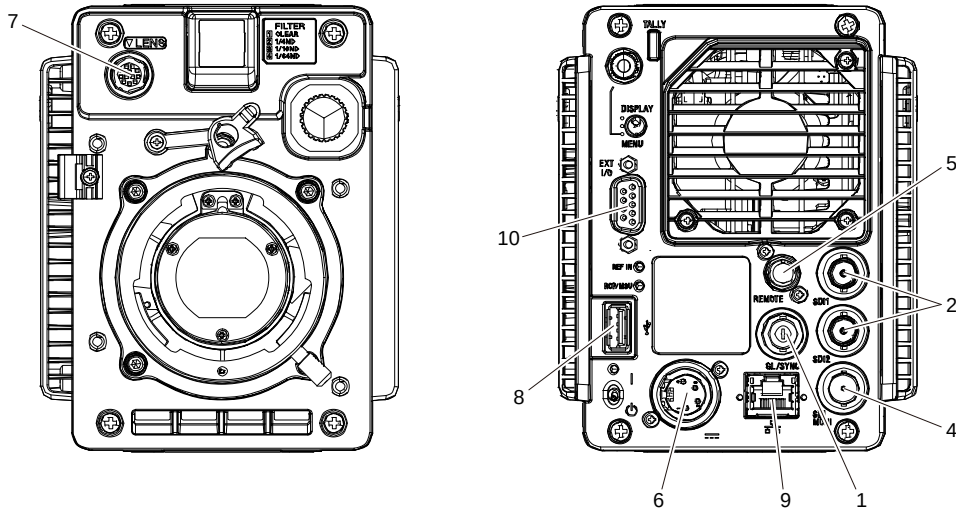
1-3. Connectors and Cables

1-3-1. Connector Input/Output Signals

HDC-P50



HDC-P31



1. GL/SYNC

BNC type
0.6 Vp-p 75 Ω

2. SDI 1/2 (HDC-P50)

BNC type
12G SDI signal
SMPTE ST2082-1 compliant
0.8 Vp-p 75 Ω, 11.88 Gbps/11.8681 Gbps serial
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

2. SDI 1/2 (HDC-P31)

BNC type
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

3. SDI 3/4 (HDC-P50 only)

BNC type
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

4. SDI-MONI

BNC type
HD SDI signal
SMPTE 292M/372M, BTA-S004 compliant
0.8 Vp-p 75 Ω, 1.485 Gbps/1.4835 Gbps serial

5. REMOTE

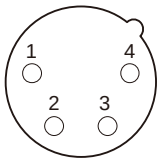
8-pin, Female

- External View -

No.	Signal	I/O	Specifications
1	TX (X)	OUT	SERIAL DATA OUT
2	TX (Y)	OUT	
3	RX (X)	IN	SERIAL DATA IN
4	RX (Y)	IN	
5	TX-GND	–	GND for TX
6	UNREG-OUT	OUT	UNREG +10.5 V to +17 V dc, 500 mA (max)
7	UNREG-GND	–	GND for UNREG OUT
8	NC	–	No connection

6. DC IN

XLR 4-pin, Male



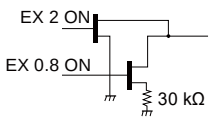
- External View -

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 V to 17 V dc

7. LENS

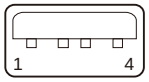
12-pin, Female

- 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
5	IRIS POSITION	OUT	+3.4 V (F16) to +6.2 V (F2.8)
6	UNREG	OUT	+10.5 V to +17 V
7	IRIS POSITION	IN	+3.4 V (F16) to +6.2 V (F2.8)
8	IRIS AT/MA	OUT	• AUTO IRIS: 0 V • MANUAL 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: 7 V
11	FOCUS POSI (LENS RX)	IN	• ∞: 7 V • min.: 2 V
12	FOCUS POSI (LENS TX)	OUT	–

8. USB

USB (Series A), 4-pin
Signal standard: USB standard Ver. 2.0

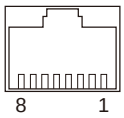


- External View -

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

9. LAN

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

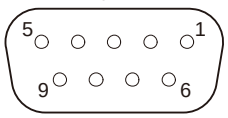


- External View -

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)
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)

10. EXT I/O

D-sub 9-pin, Female

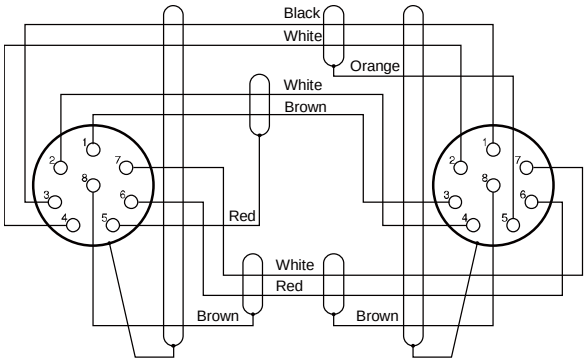


- External View -

No.	Signal	I/O	Specifications
1	UNREG	OUT	+10.5 V to +17 V DC, 0.5 A (max.)
2	POWER CONT (X)	IN	Short circuit between X and Y to turn power supply off.
3	POWER CONT (Y)	IN	–
4	Assignable 1	IN/OUT	OUT: Open-collector (max. 50 mA), IN: GND
5	GND	–	–
6	Assignable 2	IN/OUT	OUT: Open-collector (max. 50 mA), IN: GND
7	Assignable 3	IN/OUT	OUT: Open-collector (max. 50 mA), IN: GND
8	Assignable 4	IN/OUT	OUT: Open-collector (max. 50 mA), IN: GND/MIC IN (X)
9	Assignable 5	IN/OUT	OUT: Open-collector (max. 50 mA), IN: GND/MIC IN (Y)

1-3-2. Wiring Diagrams for Cables

CCA-5 cable (for REMOTE connector)



— 8P CONNECTOR (MALE) —
(WIRING SIDE)

1-3-3. Connection Connectors/Cables

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

Connector Name	Connection Connector/Cable
• SDI 1/2 *1 • SDI 3/4 (HDC-P50 only) • SDI-MONI • GL/SYNC	Plug, BNC (Part No.: 1-569-370-12) or 5C-FB coaxial cable/Recommendation made by Fujikura
DC IN (XLR type 4-pin, Male)	XLR, 4-Pin Female (Part No.: 1-508-362-00) or ITT Cannon XLR-4-11C or equivalent, or Cable assembly (Part No.: 1-551-577-00) (Supplied with AC-550)
REMOTE (8-pin, Female)	• Plug, 8-Pin Male (Part No.: 1-766-848-11) or CCA-5 cable assembly (CCA-5-10 (10 m)/CCA-5-3 (3 m) (optional) *1, *2 • REMOTE cable (Part No.: 1-783-372-11) (Supplied with RM-B150, 10 m) *2 , *3
EXT I/O (D-sub 9-pin, Female)	D-sub 9-pin, Male (Part No.: 1-568-182-11) or JAE DE-9PF-N or equivalent Available shell: JAE DE-C1-J6-R or equivalent

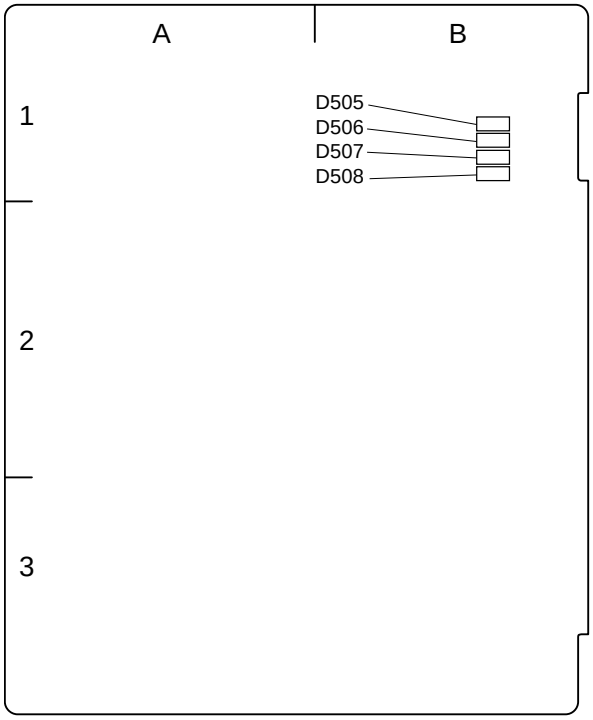
*1: When outputting the 12G-SDI signal from the SDI 1/2 connector, use a cable compatible with 12 G-SDI. (HDC-P50 only)

*2: If using a cable of length different from a standard product, contact your local Sony Sales Office/Service Center.

*3: The pin 8 of CCA-5 cable is GND (ground). The pin 8 of REMOTE cable is not GND (ground).

1-4. Functions of Onboard Switches and LED Indicators

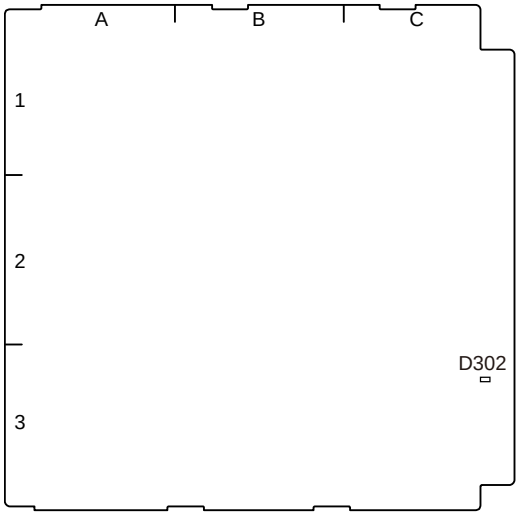
1-4-1. AT-195 Board



AT-195 BOARD (A side)

Ref. No.	Name	Color	Description	Normal State
D505	Debug LED 4	Orange	Core 0 access lamp of the CPU	Blink
D506	Debug LED 3	Orange	Core 1 access lamp of the CPU	Blink
D507	Debug LED 2	Orange	Access lamp of eMMC	Blink
D508	Debug LED 1	Orange	Access lamp of SD Card (ROM30)	Off

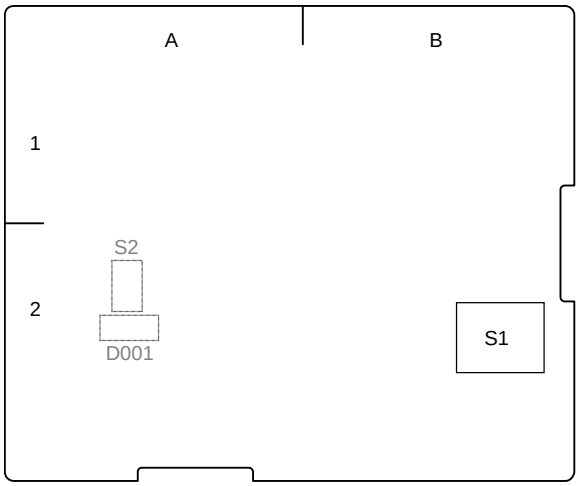
1-4-2. DPR-393 Board



DPR-393 BOARD (A side)

Ref. No.	Name	Color	Description	Normal State
D302	POWER	Green	Lights when the power supply regulators on the board are normal.	Lit

1-4-3. DR-697 Board (HDC-P50)



DR-697 BOARD (A side)
DR-697 BOARD (B side)

Ref. No.	Name	Color	Description	Normal State
D001	–	Green	Blinks while adjusting the filter position.	Off

Note

Do not touch the unused switches.

Ref. No.	Name	Bit	Description	Factory Setting
S1	–	1	Not used	Off
		2	Not used	Off
		3	Not used	Off
		4	Not used	Off
S2	–	–	Filter position adjustment	–

1-4-4. DR-699 Board (HDC-P31)

DR-699 BOARD (A side)

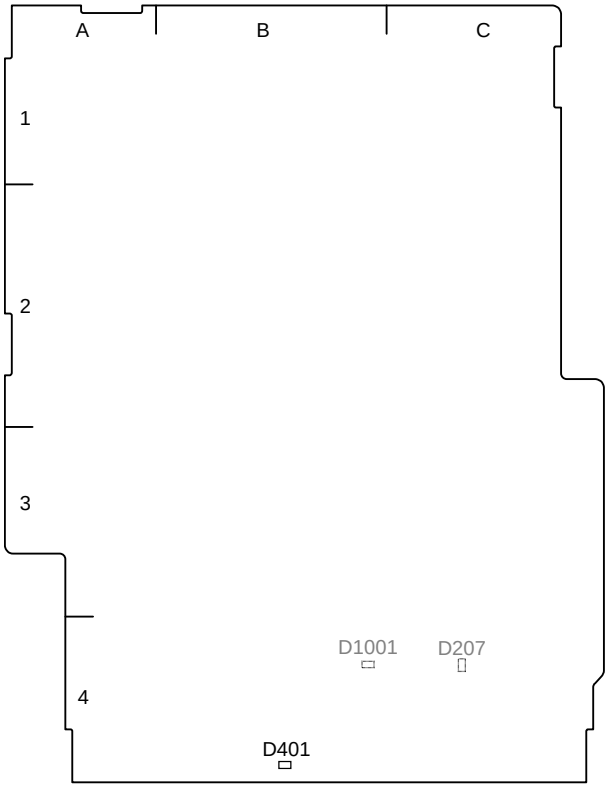
Ref. No.	Name	Color	Description	Normal State
D001	–	Green	Blinks while adjusting the filter position.	Off

Note

Do not touch the unused switches.

Ref. No.	Name	Bit	Description	Factory Setting
S1	–	1	Not used	OFF
		2	Not used	OFF
S2	–	–	Filter position adjustment	–

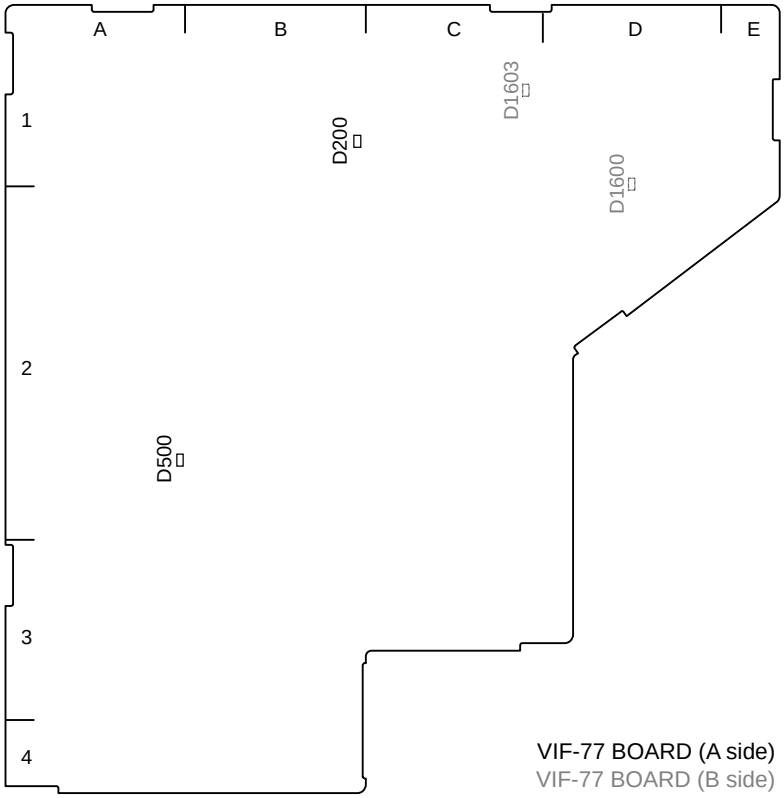
1-4-5. SY-471 Board



SY-471 BOARD (A side)
SY-471 BOARD (B side)

Ref. No.	Name	Color	Description	Normal State
D207	CAM-PW	Green	Lights when the main power is supplied.	Lit
D401	STATUS	Green	For debugging	Lit
D1001	Conf Done	Red	Lights when FPGA (IC1001) cannot normally complete configuration.	Off

1-4-6. VIF-77 Board



Ref. No.	Name	Color	Description	Normal State
D200	POWER	Green	Lights when the power supply regulators on the board are normal.	Lit
D500	CONF-DONE	Red	Off when FPGA normally completed configuration.	Off
D1600	EXT	Green	Lights when receiving the external reference signal.	Off
D1603	PLL-NG	Red	Lights when the PLL is abnormal.	Off

1-5. Flexible Card Wire and Fine-Wire Coaxial Cable

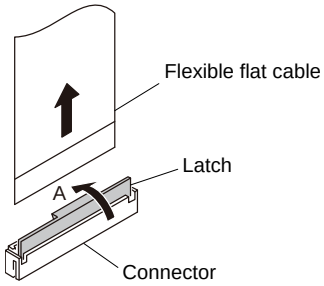
1-5-1. Disconnecting and Connecting Flexible Flat Cable and Flexible Board

Note

- Be very careful not to fold flexible flat cable or flexible board. Life of flexible flat cable and flexible board will be significantly shortened if they are folded.
- Each flexible flat cable and flexible board have conductor side and insulated side. If the flexible flat cable and flexible board are connected in the wrong orientation of the conductor side and the insulated side, the circuit will not function.
- Check that the conductive surface of the flexible flat cable and flexible board wire are not contaminated.
- Insert the flexible flat cable and flexible board straight and firmly in the interior of the connector.

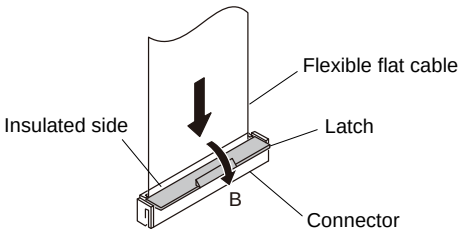
Type A

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.

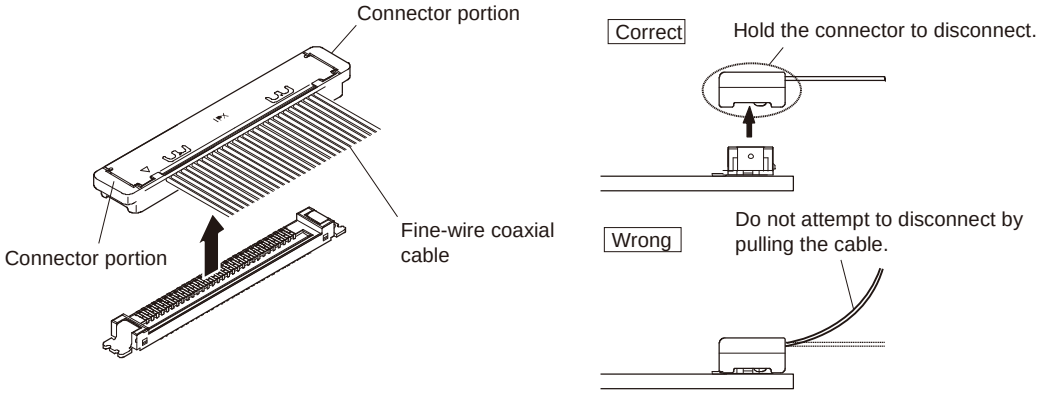
1-5-2. Disconnecting/Connecting Fine-Wire Coaxial Cable

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.

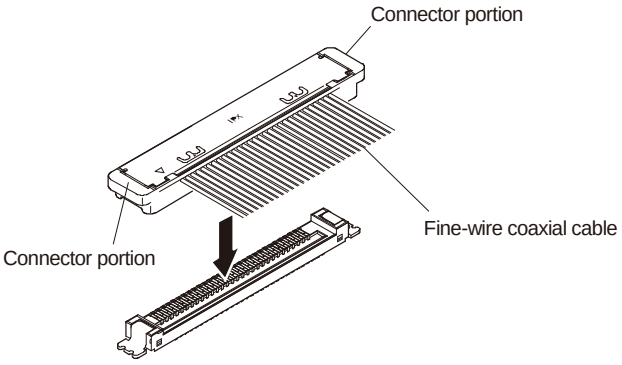
Type A

Disconnecting



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

Connecting



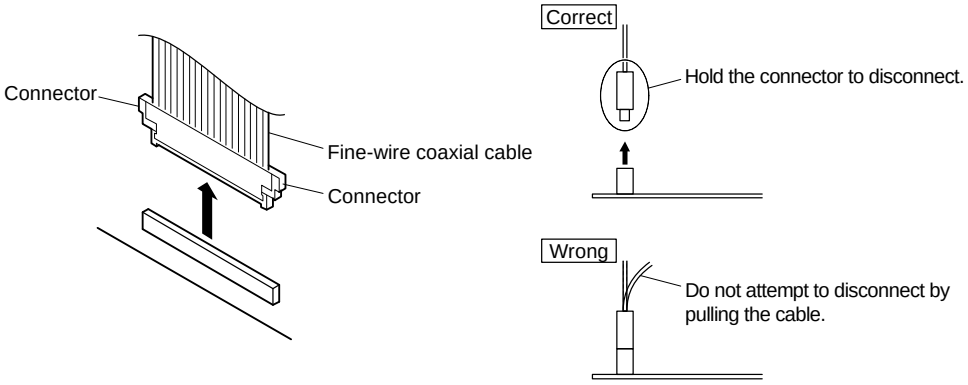
1. Insert the connector of fine-wire coaxial cable in the arrow direction to connect it.

   Note

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

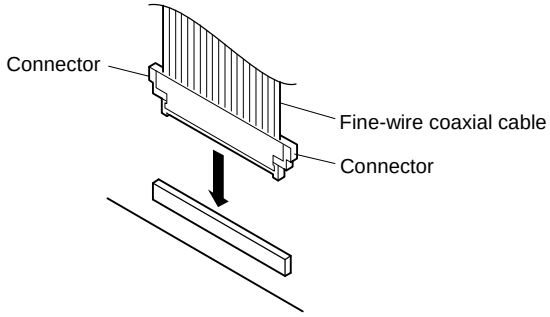
Type B

Disconnecting



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

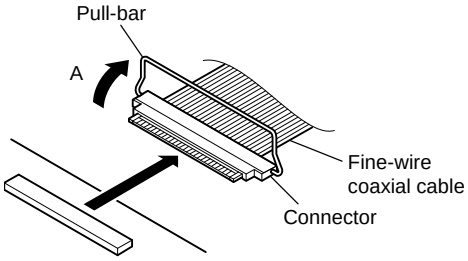
Connecting

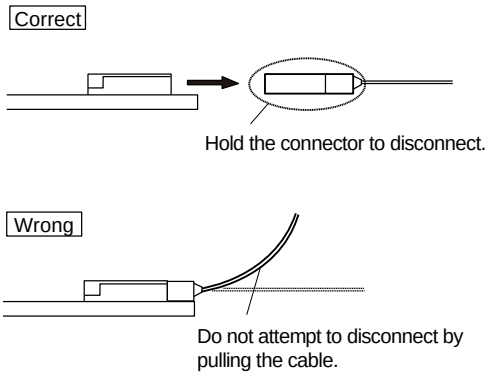


1. Insert the connector straight.

Type C

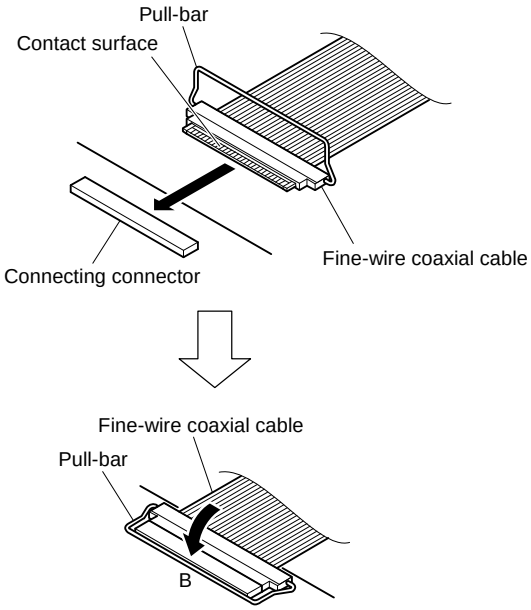
Disconnecting

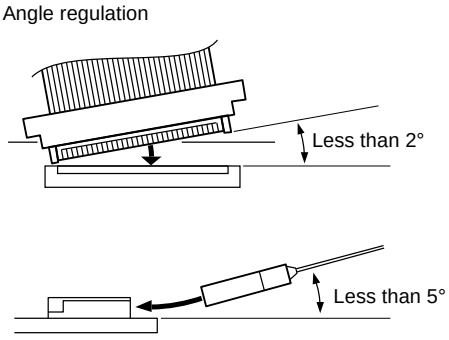




1. Raise the pull-bar in the direction of arrow A to unlock it.
2. Hold both sides of the fine-wire coaxial cable connector, and pull the connector straight to disconnect it.

Connecting





Note

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

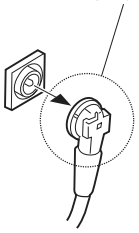
1. Hold both sides of the fine-wire coaxial cable connector with the contact surface facing up.
2. Insert the connector straight to meet the angle specified.
3. Turn the pull-bar in the direction of arrow B and lock it.

1-5-3. Disconnecting/Connecting Coaxial Cable

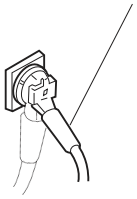
Type A

Disconnecting

Correct Hold the plug to remove.



Wrong Do not pull the cable.

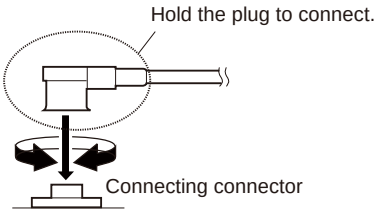


1. Hold the plug of the coaxial cable.
2. Pull the plug straight in the arrow direction to disconnect the coaxial cable.

Note

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

1-5-4. Connecting/Disconnecting Coaxial Cable for SDI 1, 2

Tip

When disconnecting and reconnecting the coaxial cables for SDI 1 and SDI 2 of HDC-P50, refer to this section.

Coaxial Cable

SDI 1: COAXIAL CABLE (D.FL75) (SDI 1) (Part No.: 1-912-828-12)
SDI 2: COAXIAL CABLE (D.FL75) (SDI 2) (Part No.: 1-912-874-12）

Required Tool

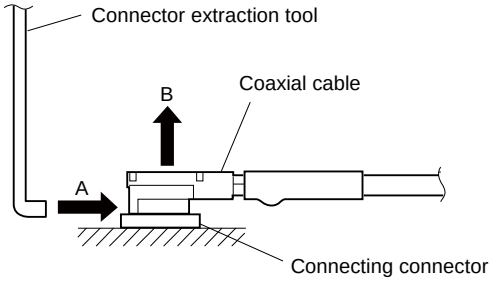
D.FL75-LP-N75 connector extraction tool: Part No.: J-7121-700-A

Disconnecting

1. Insert the tip of the connector extraction tool into the connector area of the coaxial cable in the direction of the arrow A.
2. Pull up the connector extraction tool upwards in the direction of the arrow B to disconnect the connector.

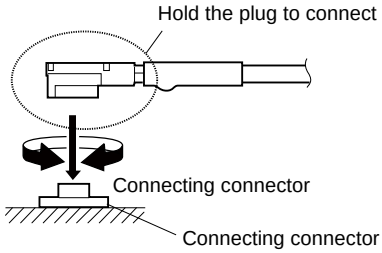
Note

Do not pull the cable of the coaxial cable.



Connecting

1. Hold the plug of the coaxial cable.
2. Push the plug vertical to the connecting connector turning it clockwise and counterclockwise.



1-6. Circuit Protection Parts

1-6-1. Fuses

WARNING

Fuses are essential parts for safe operation. Be sure to use the parts specified in this manual. Replacing a fuse with an unspecified one may cause fire or electric shock.

CAUTION

Replacing any fuse is replaced while power is supplied to the unit may cause electric shock. Before replacing any fuse, turn off the POWER switch and also disconnect the battery pack and the cable from the DC IN connector.
This unit is equipped with fuses. The fuses blow if overcurrent flows in the unit due to an abnormality. In that case, turn off the power of the unit, inspect inside of the unit, and then remove the cause of the overcurrent. After that, replace the defective parts.

Board Name	Ref. No.	Part No.	Part Name/Rating
CN-4066	F001	⚠ 1-576-566-21	Fuse (SMD) 15 A/65 V

1-6-2. 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 Name	Ref. No.	Part No.	Hold Current
IF-1331	TH001	⚠ 1-771-845-21	200 mA/20 ˚C
SY-471	TH201	⚠ 1-803-615-21	500 mA/25 ˚C
	TH202	⚠ 1-805-726-11	0.20 A/25 ˚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-6323-430-A	Torque driver bit (M3)	Screw tightening
J-6325-110-A	Torque driver bit (M1.4)	Screw tightening
J-6325-380-A	Torque driver bit (M2)	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-6326-120-A	Hexagon bit (for torque driver) (size 1.5 mm))	Screw tightening
J-6394-080-A	Grayscale chart	Transparent type (16:9), camera adjustment
J-6480-010-A	Alignment sleeve remover HC-001	For Female connector, DCC.91.312.5LA manufactured by LEMO or equivalent
J-7121-700-A	D.FL75-LP-N75 connector remover	Extracting coaxial plug for HIROSE D.FL series
J-7120-950-A	Chart adaptor	Adaptor that installs ITE test chart (16:9) 310 x 200 in PTB-500 (pattern box)
J-7120-960-A	ITE STANDARD TEST CHART	ITE resolution chart (16:9)
J-7120-970-A	ITE STANDARD TEST CHART	ITE grayscale chart (γ=0.45) (16:9)
J-7120-980-A	ITE STANDARD TEST CHART	ITE in megacycle chart (16:9)
7-600-002-52	Three Bond (TB-1401B)	For preventing screws from being loosened
Commercially available	Loctite (408)	Instant adhesives
Commercially available	Grayscale chart	Reflective type (16:9), camera adjustment
Commercially available	Star chart	Reflective type, camera adjustment
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
HD waveform monitor	Leader Electronics LV5150DA, LV5152DA or equivalent
HD color monitor	Sony BVM-D20F1J/D14H5J or equivalent
Luminance meter	Konica Minolta LS-110 or equivalent
Frequency counter	Advantest TR5821AK or equivalent

1-8. Explanation of Adhering Number

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

HDC-P50:

Prism block assembly (860): A-2227-062-A
Mount assembly number (8-digit): A0000001 and higher

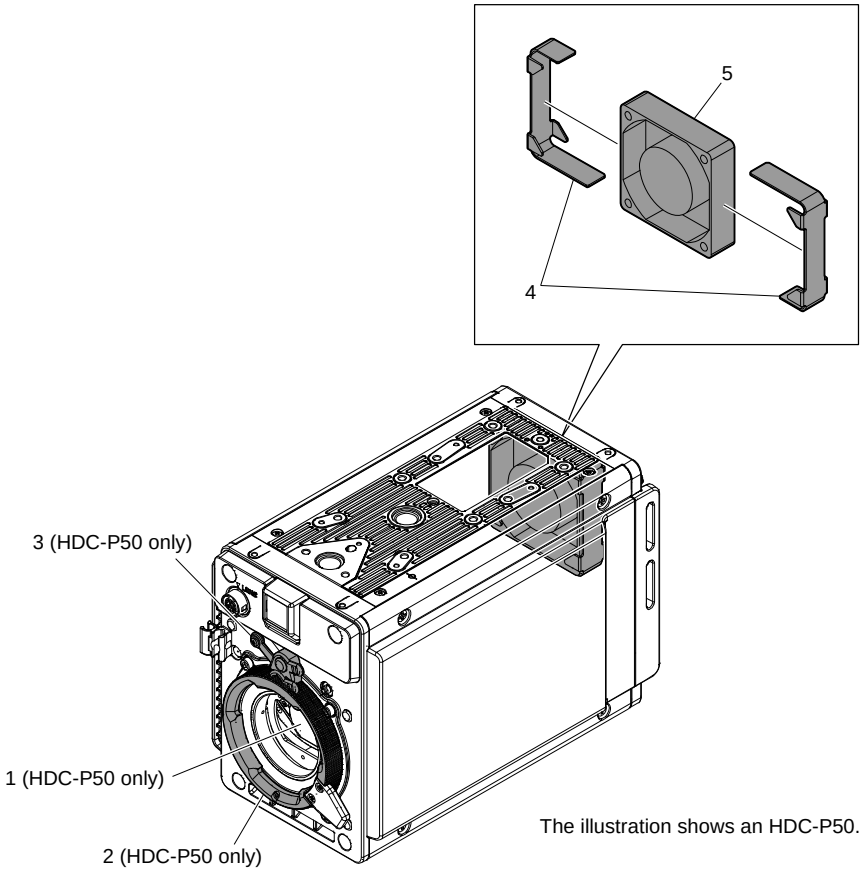
HDC-P31:

Prism block assembly (850): A-2226-901-B
Mount assembly number (8-digit): A0000001 and higher

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.



The illustration shows an HDC-P50.

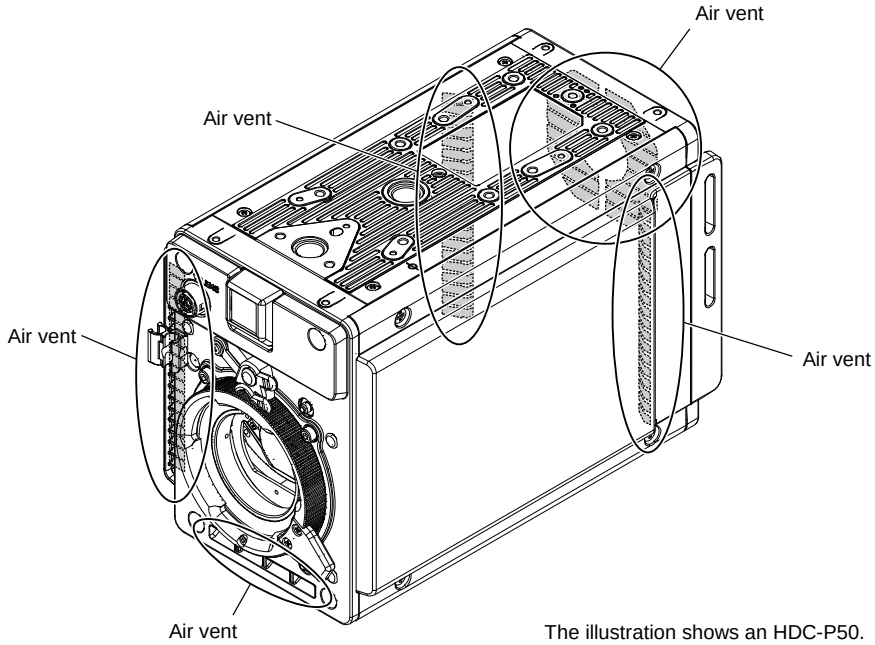
No.	Part Name	Part No.	Recommended Replacement Timing
1	OLPF assembly	A-2144-615-A	It can become nebulous (in transparent and whitened) with elapse of time. Replace it as necessary.
2	Bayonet ring	4-263-184-04	Replace every five years.
3	Lens mount holder	3-796-982-03	Check for deformation and deterioration (abraded or damaged or lost) from time to time. Replace it as necessary.
4	Fan cushion	4-689-064-01	
5	DC fan (60 square)	⚠ 1-855-154-11	Check every five years and replace it if necessary. (When used for eight hours a day.)

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 five air vent areas with a vacuum cleaner.



The illustration shows an HDC-P50.

2-3. Replacing Lithium Battery

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

A lithium battery is mounted on the SY-471 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: ⚠ 1-756-134-18

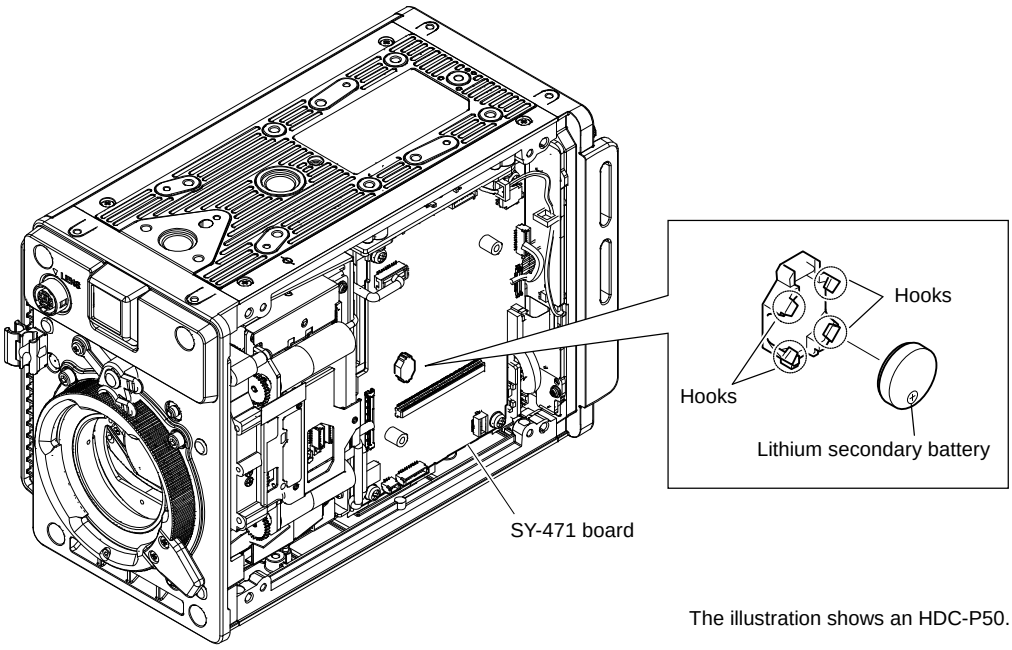
Note on Replacement of Lithium Battery

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 inside assembly. (Refer to "4-5. Inside Assembly".)
2. Remove the AT-195 board. (Refer to "4-20. AT-195 Board".)
3. Remove the Lithium secondary battery (ML621 (U)) from the four hooks of the battery holder, and replace it.



The illustration shows an HDC-P50.

Note

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

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

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>    D01 TOP

 OHB  : OK
 DPR  : OK
 SY   : OK
 VIF  : OK

 HOURS METER : xxxx H
```

Item	Setting	Function
DPR	Display only	Indicates the status of the LSI (IC500 and IC800) on the DPR-393 board.
VIF	Display only	Indicates the status of the LSI (IC300) on the VIF-77 board.
SY	Display only	Indicates the status of the LSI (IC102) on the MB-1259 board.
OHB	Display only	Indicates the status of BI-358 board.
HOURS METER	Display only	Displays the total working time.

Displaying

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

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.

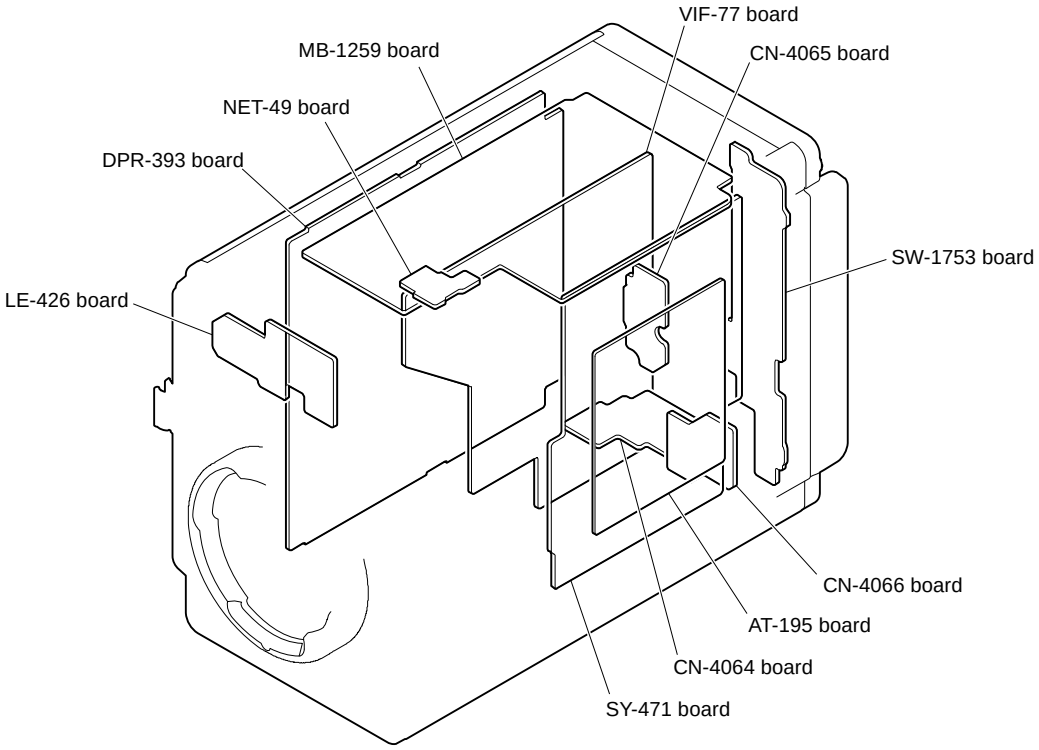
Tightening torque

- B3 x 10: 0.80±0.12 N·m
- M2 x 5: 0.19±0.02 N·m
- P2 x 3: 0.19±0.02 N·m
- P2.6 x 5: 0.53±0.07 N·m
- PSW2 x 5: 0.19±0.02 N·m
- PSW3 x 8: 0.80±0.12 N·m
- Nut (supplied with this unit): 1.40±0.05 N·m
- Hexagonal screws: 0.53±0.07 N·m
- Hexagon socket stainless bolt: 1.10±0.05 N·m

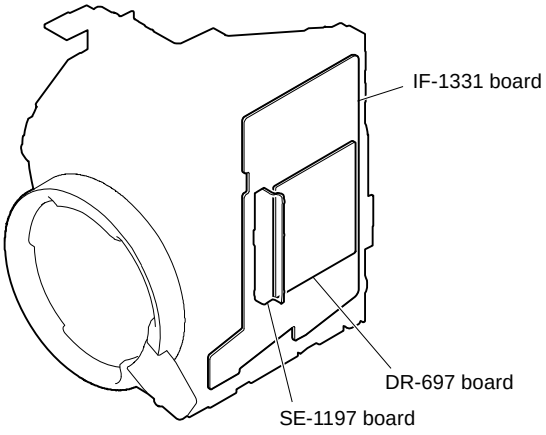
Tip

When using the torque driver with the notation of cN·m, interpret it as follows.
Example: 0.8 N·m = 80 cN·m

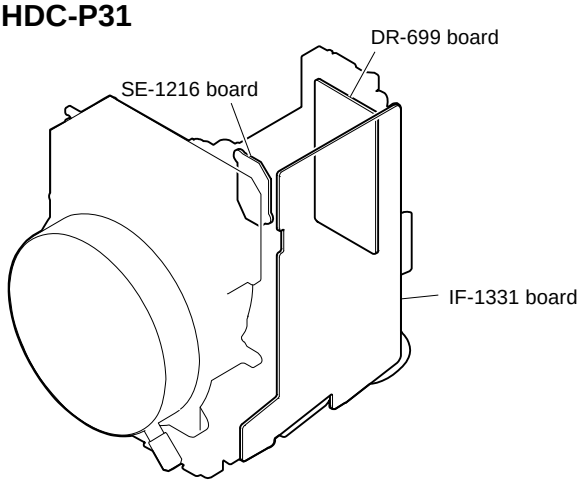
4-2. Location of Printed Wiring Boards



HDC-P50



HDC-P31



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 “Section 10 Spare Parts” is for IC which is not programmed. If replacement is needed, contact your local Sony Sales Office/Service Center.
- When replacing the ICs on the AT-195/NET-49 board, update the model information data on the REFRESH SERIAL NO. page of the SERVICE menu. As for how to update the data, contact your local Sony Sales Office/Service enter.

Board Name	Ref. No.	Stored Data
IF-1331	IC010	CMOS adjustment data, RPN compensation data
AT-195	IC401	Model information data, APR compensation data, File system
MB-1259	IC102	MAC address, 27 MHz VCO Free-Running Adjustment date, Paint data, etc.
NET-49	IC1	Model information data

4-3-2. Alignment and Setting Required when Replacing AT-195 Board

Camera setting status and files are stored in the AT-195 board. When the AT-195 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 AT-195 board.
The content of the OHB file stored in the OHB assembly is not lost.

Procedure

1. Store the reference file, scene file, and operator file in a USB drive.
   - Reference file (Refer to “7-5. Reference File”.)
   - Scene file (Refer to “7-4. Scene File”.)
   - Operator file (Refer to “7-2. Operator File”.)
2. Replace the AT-195 board.
3. Update to the latest version of the software. (Refer to “6-1. Upgrading Software Programs”.)
4. Execute ALL PRESET on the FILE CLEAR 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 reference file, scene file, and operator file stored in the USB drive in step 1.
   - Reference file (Refer to “7-5. Reference File”.)
   - Scene file (Refer to “7-4. Scene File”.)
   - Operator file (Refer to “7-2. Operator File”.)
8. Execute AUTO LEVEL on the AUTO SETUP page of the MAINTENANCE menu. (Refer to “7-5. Reference File”.)

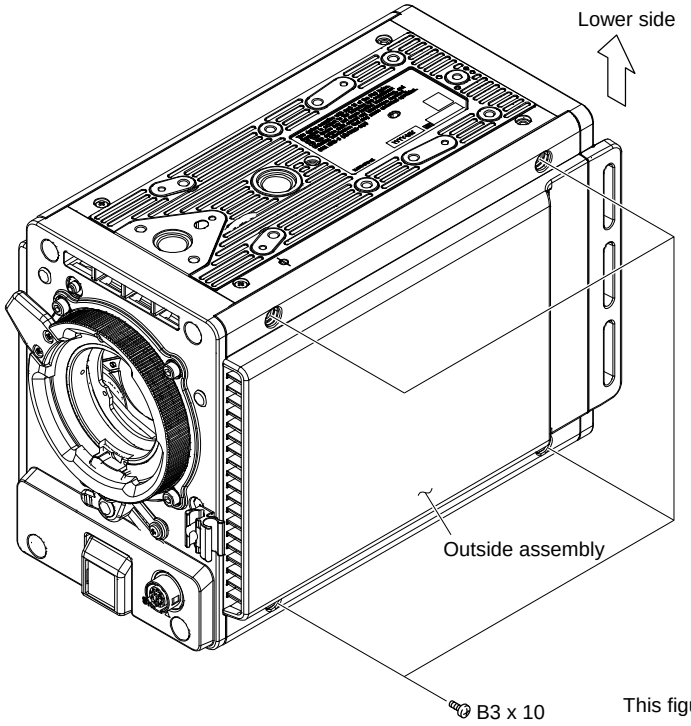
4-3-3. Alignment and Setting Required when Replacing MB-1259 Board or VIF-77 Board

The 27 MHz VCO circuit is stored in the VIF-77 board and the 27 MHz VCO free -run adjustment data is stored in the MB-1259 board.
When replacing MB-1259 board or VIF-77 board, adjustment of 27 MHz VCO free-run is necessary.
For details, refer to the “5-7-1. 27 MHz VCO Free-Running Adjustment”.

4-4. Outside Assembly

Procedure

1. Place this unit with the bottom side facing upward.
2. Remove the four screws.



This figure shows HDC-P50.

3. Remove the outside assembly in the direction of the arrow (A), and then disconnect the B to B connector.
4. Lay down the outside assembly in the direction of the arrow (B) and place it near this unit.

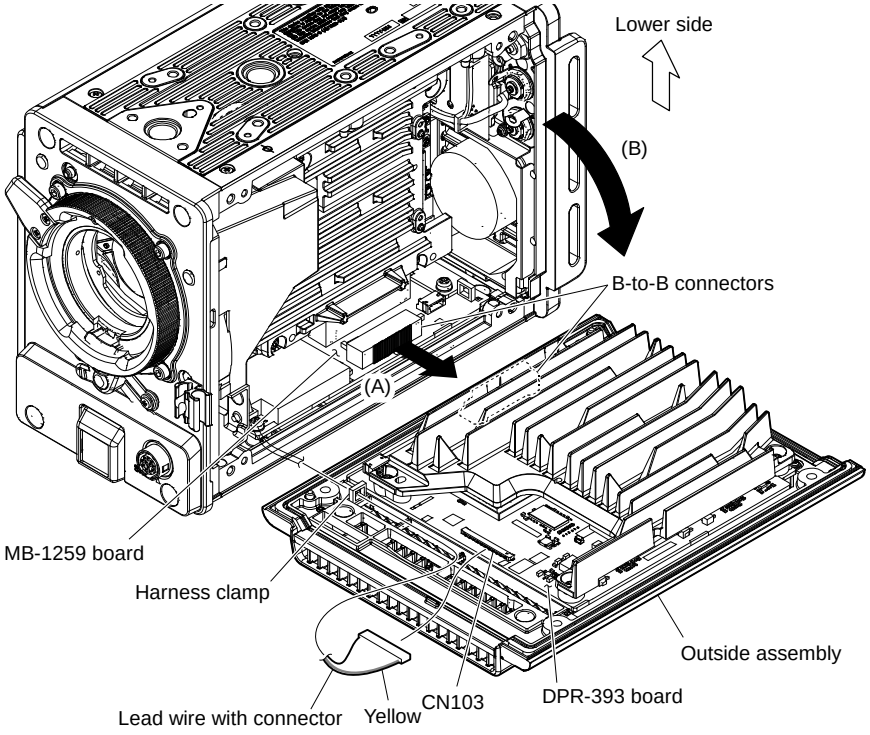
Note

- The DPR-393 board and MB-1259 board are connected with the B to B connector. Be careful not to damage them.
- Be careful not to damage the lead wire with connector connected to the DPR-393 board.

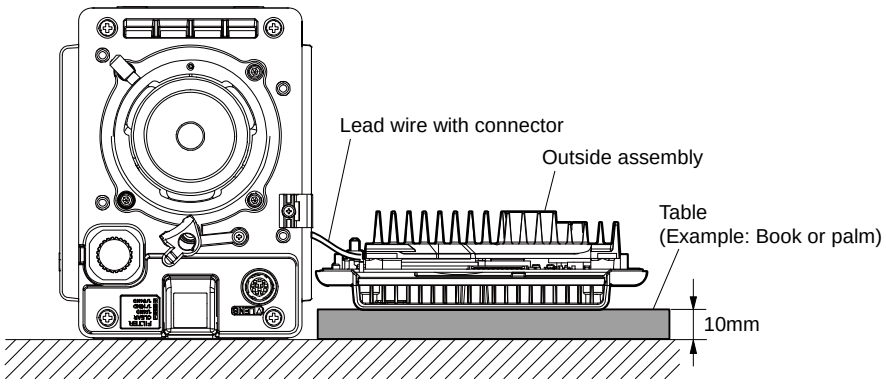
Note

[HDC-P31 only]
Place the outside assembly on a table (example: book, palm) of about 10 mm, so that the lead wire with connector connected to the DPR-393 board is short.

5. Disconnect the lead wire with connector from the connector (CN103) on the DPR-393 board.
6. Remove the lead wire with connector from the harness clamp, and then remove the outside assembly.



How to place outside assembly (HDC-P31 only)



Note

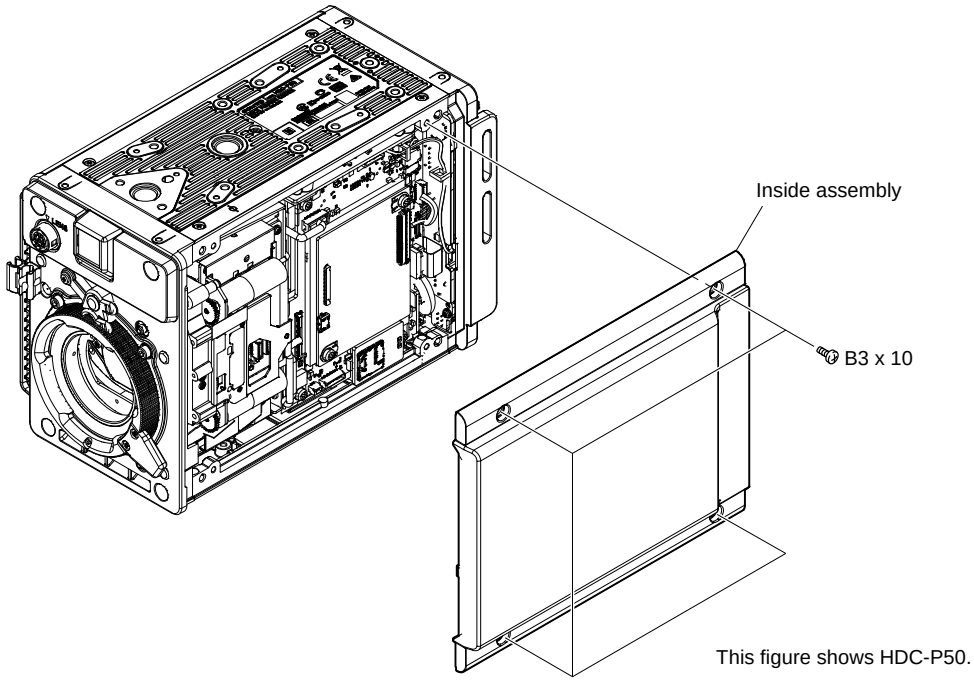
When attaching the outside assembly, be careful not to catch the lead wire with connector.

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

4-5. Inside Assembly

Procedure

1. Remove the four screws, and then remove the inside assembly.



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

4-6. DPR-393 Board

Preparation

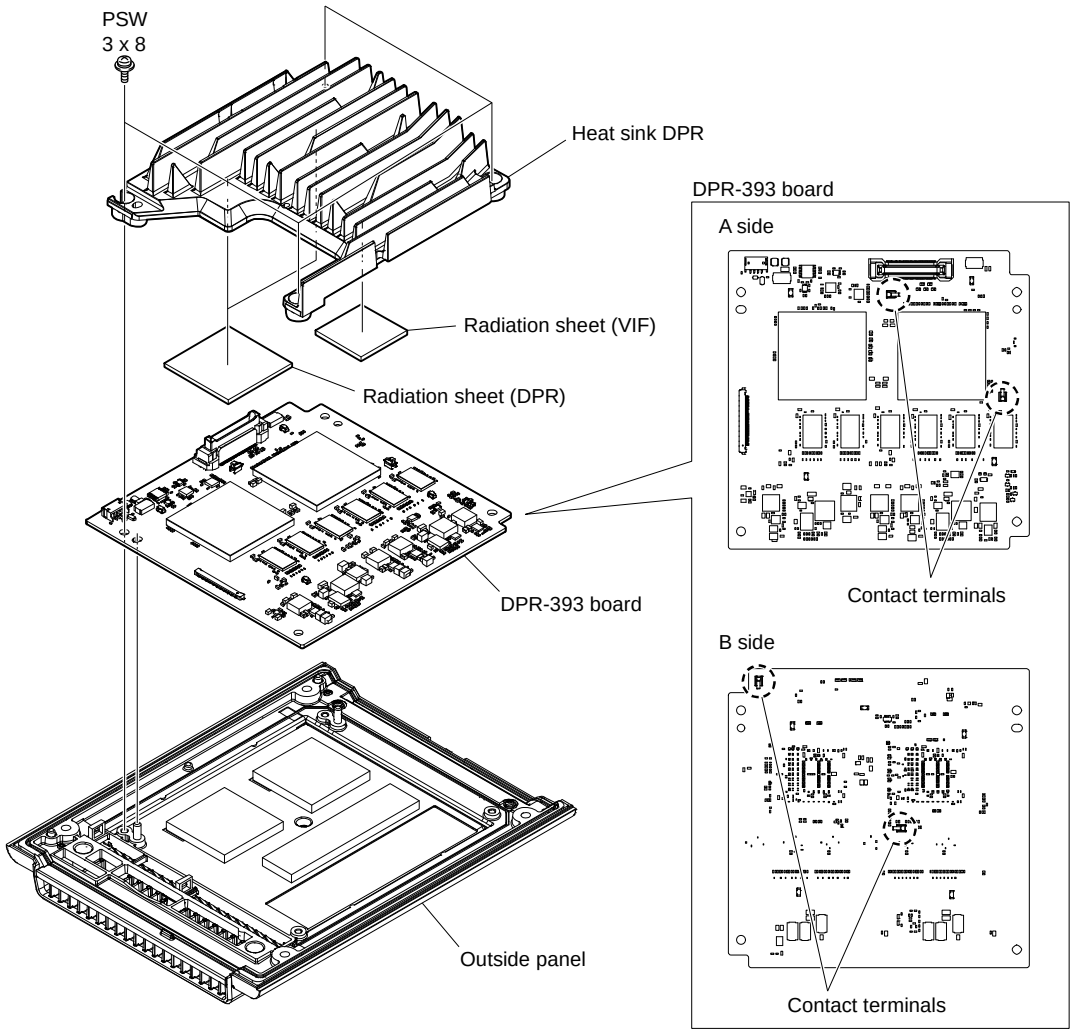
1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")

Procedure

1. Remove the four screws, and then remove the heat sink DPR.
2. Remove the DPR-393 board.

Note

- Be careful that the contact terminals (two portions each on side A and side B) on the DPR-393 board are not deformed.
- When handling the radiation sheet, care should be taken because it is easily deformed. If the radiation sheet is deformed or damaged, replace it with the new one.
- The radiation sheet may be strongly attached. When removing the board, remove the heat sink DPR being careful not to apply load to the mounted parts.



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

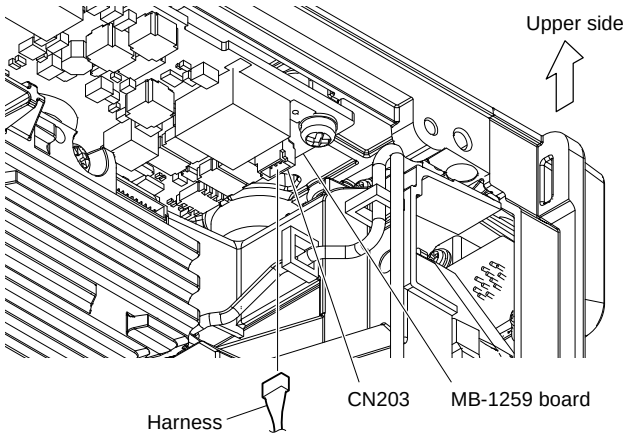
4-7. Front Panel Block

Preparation

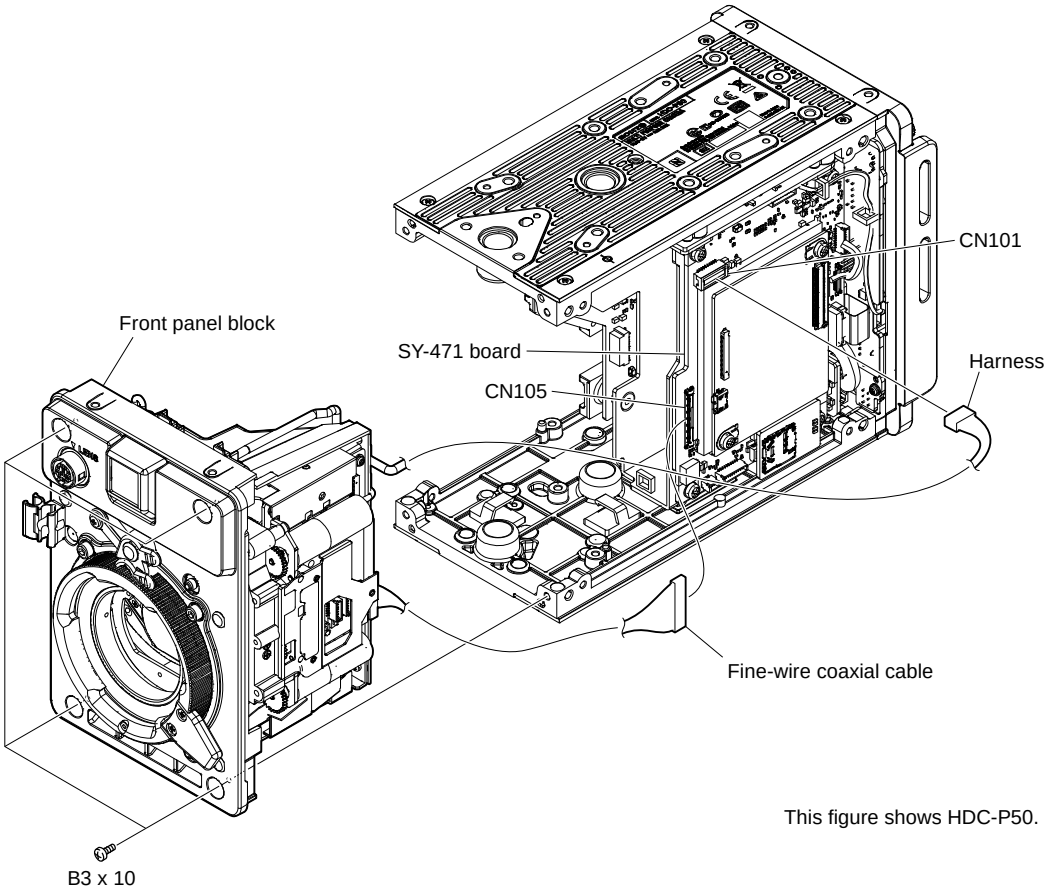
1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")

Procedure

1. Disconnect the harness from the connector (CN203) on the MB-1259 board.



2. Disconnect the fine-wire coaxial cable from the connector (CN105) on the SY-471 board.
3. Disconnect the harness from the connector (CN101) on the SY-471 board.
4. Remove the four screws, and then remove the front panel block.



This figure shows HDC-P50.

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

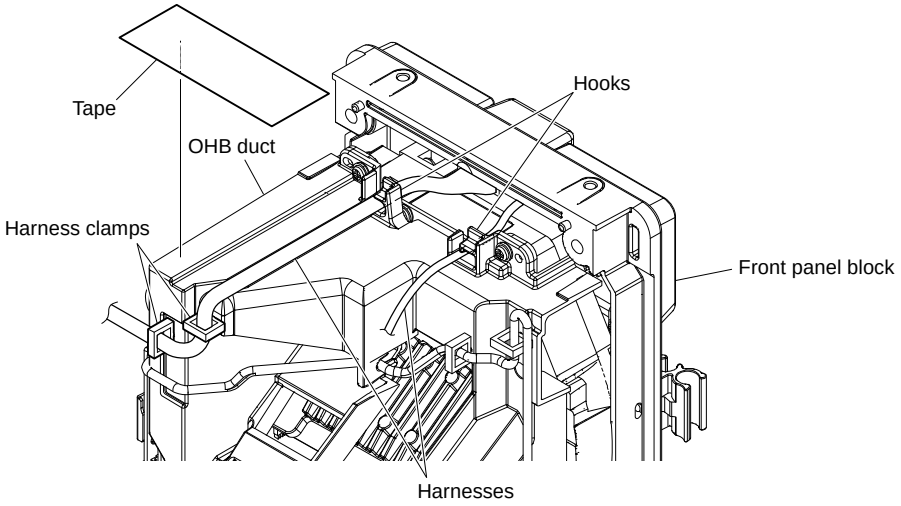
4-8. CMOS Block Assembly (HDC-P50)

Preparation

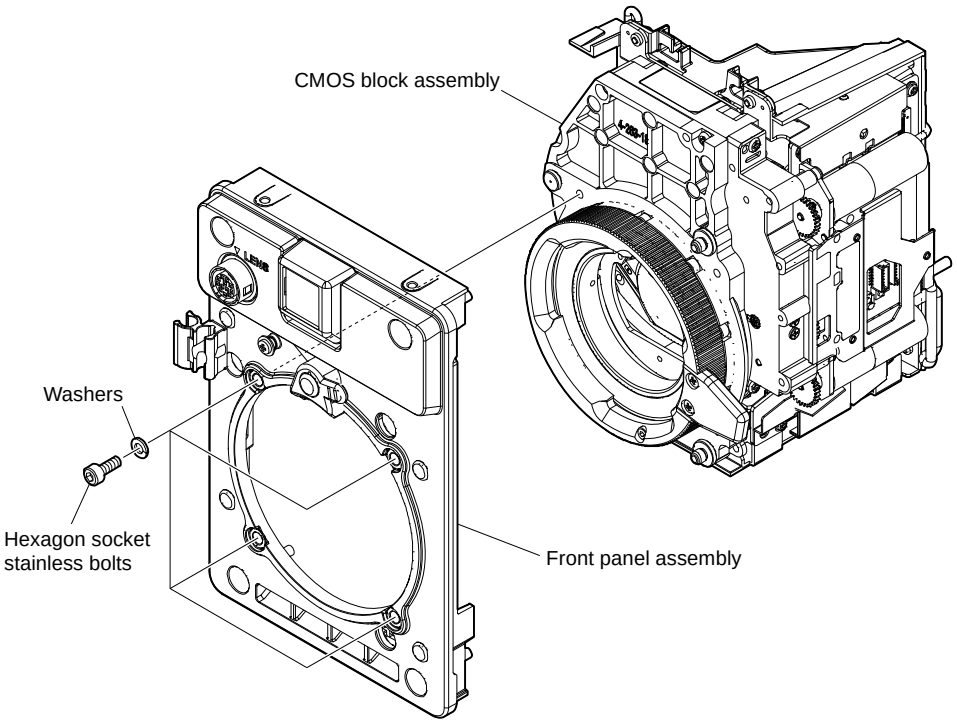
1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the front panel block. (Refer to "4-7. Front Panel Block")

Procedure

1. Peel the tape.
2. Remove the two harnesses from the two hooks of the OHB duct.
3. Remove the harness from the two harness clamps.



4. Remove the four hexagon socket stainless bolts and four washers, and then remove the front panel block.



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

4-9. FD Assembly (HDC-P50)

Note

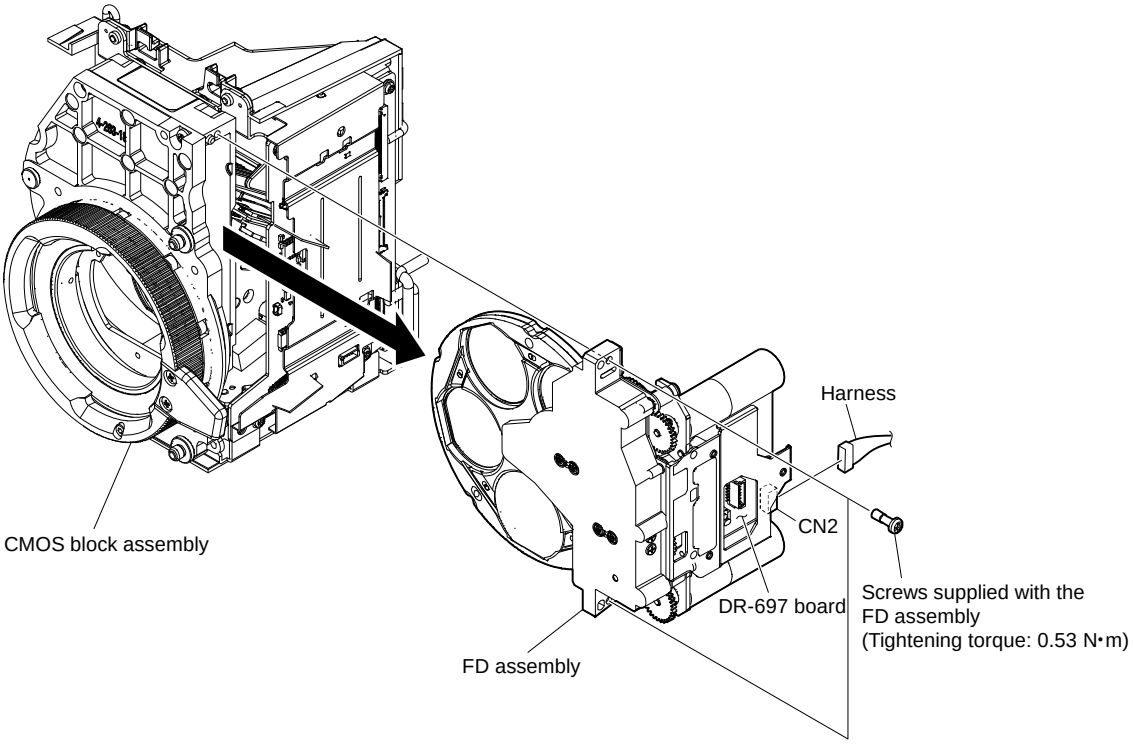
When removing the FD assembly, be careful that the dust does not enter inside of the prism block.
If possible, work in the clean area.

Preparation

1. Remove the inside assembly. (Refer to "4-5. Inside Assembly")

Procedure

1. Disconnect the harness from the connector (CN2) on the DR-697 board.
2. Remove the two screws supplied with the FD assembly, and then remove the FD assembly.



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

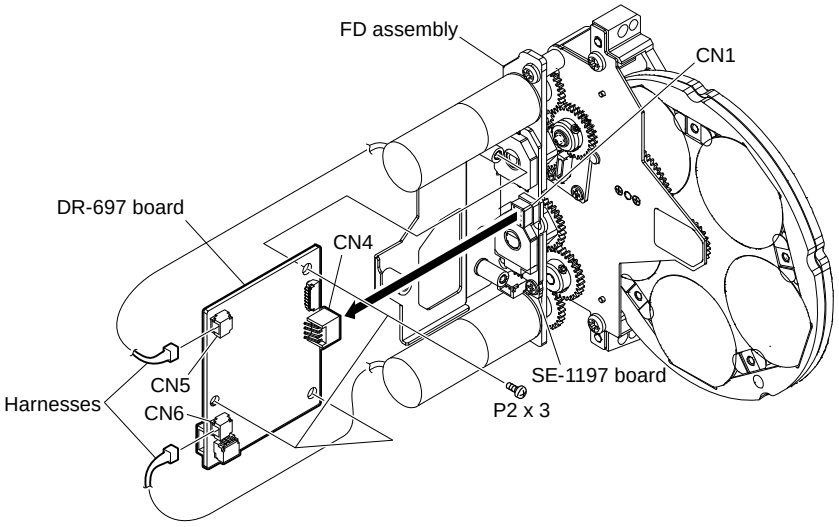
4-10. DR-697 Board (HDC-P50)

Preparation

1. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
2. Remove the FD assembly. (Refer to "4-9. FD Assembly (HDC-P50)")

Procedure

1. Disconnect the two harnesses from the two connectors (CN5 and CN6) on the DR-697 board.
2. Remove the three screws.
3. Pull out the connector (CN4) on the DR-697 board from the connector (CN1) on the SE-1197 board in the direction of the arrow to remove the DR-697 board.



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

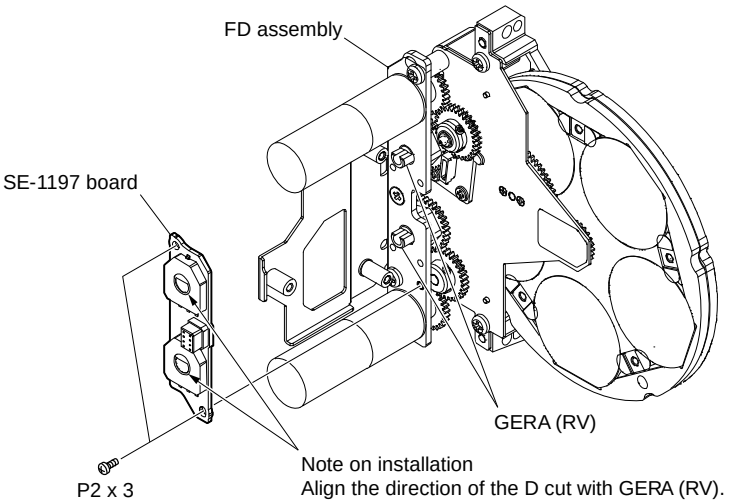
4-11. SE-1197 Board (HDC-P50)

Preparation

1. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
2. Remove the FD assembly. (Refer to "4-9. FD Assembly (HDC-P50)")
3. Remove the DR-697 board. (Refer to "4-10. DR-697 Board (HDC-P50)")

Procedure

1. Remove the two screws, and then remove the SE-1197 board.



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

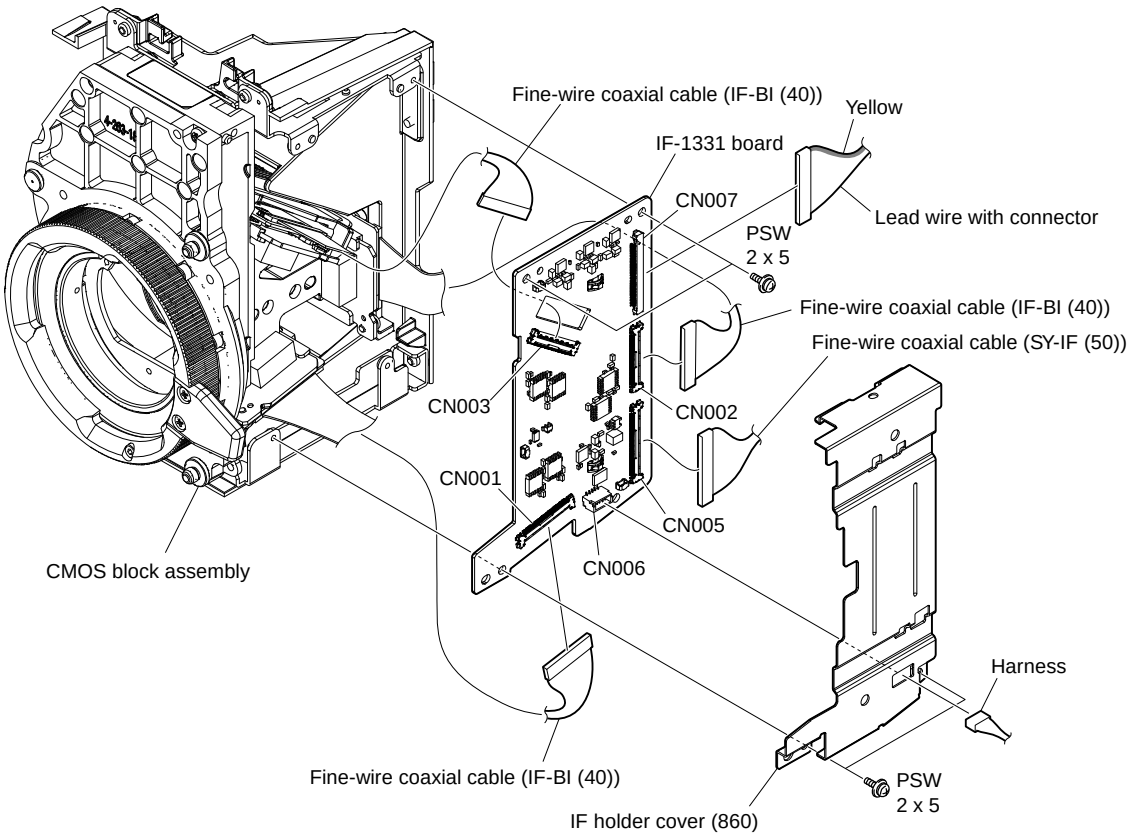
4-12. IF-1331 Board (HDC-P50)

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the front panel block. (Refer to "4-7. Front Panel Block")
4. Remove the CMOS block assembly. (Refer to "4-8. CMOS Block Assembly (HDC-P50)")
5. Remove the FD assembly. (Refer to "4-9. FD Assembly (HDC-P50)")

Procedure

1. Disconnect the harness from the connector (CN006) on the IF-1331 board.
2. Remove the two screws, and then remove the IF holder cover (860).
3. Disconnect the four fine-wire coaxial cables from the four connectors (CN001 to CN003 and CN005) on the IF-1331 board.
4. Disconnect the lead wire with connector from the connector (CN007) on the IF-1331 board.
5. Remove the two screws, and then remove the IF-1331 board.



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

4-13. CMOS Block Assembly (HDC-P31)

Tip

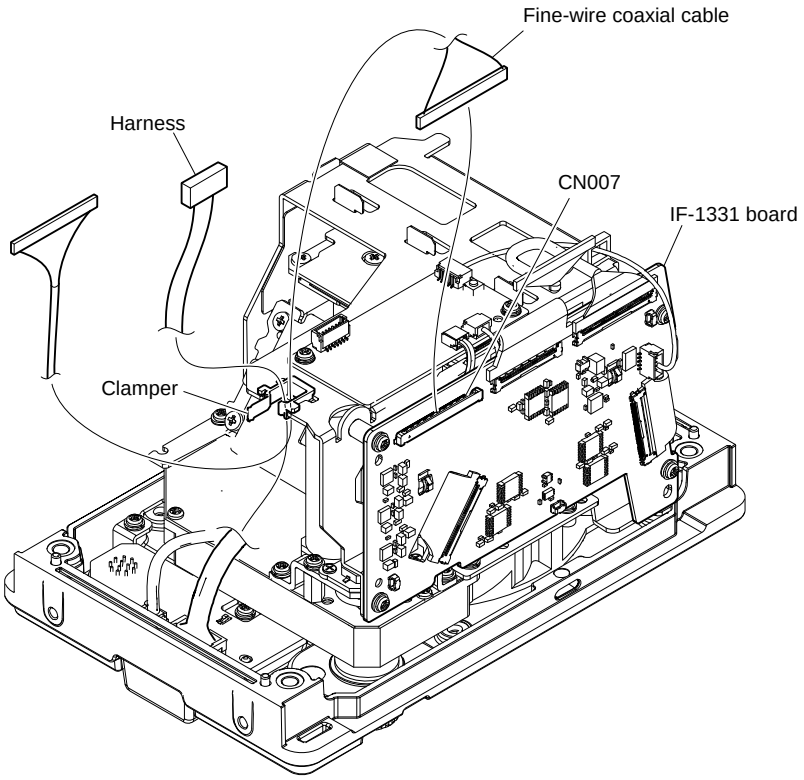
Hexagonal wrench (Width across : 1.5 mm, 2.5 mm) are necessary as tools.

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the front panel block. (Refer to "4-7. Front Panel Block")

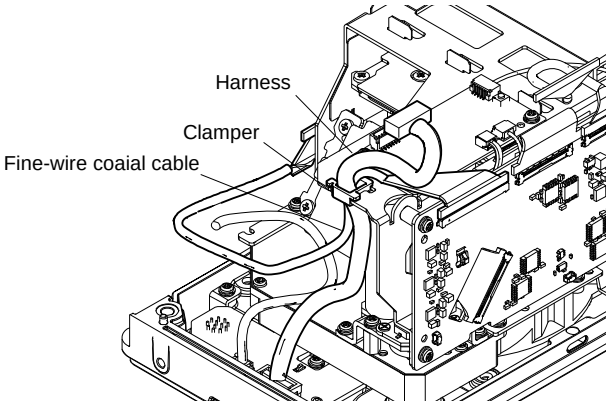
Procedure

1. Release the harness and the fine-wire coaxial cable from the clamper.
2. Disconnect the fine-wire coaxial cable from the connector (CN007) on the IF-1331 board.

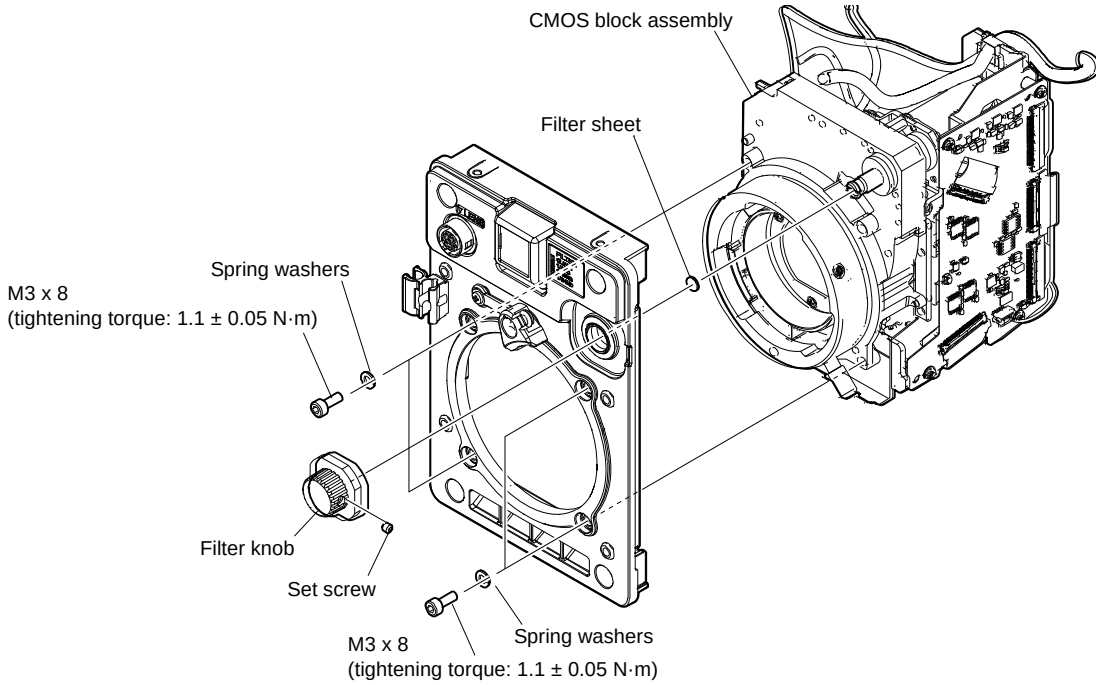


Note

When installing the CMOS block assembly, arrange the harnesses as shown figure.



3. Remove the set screw, and then remove the filter knob.
4. Remove the four bolts (M3 x 8) and the four spring washers, and then remove the CMOS block assembly.
5. Remove the filter sheet.

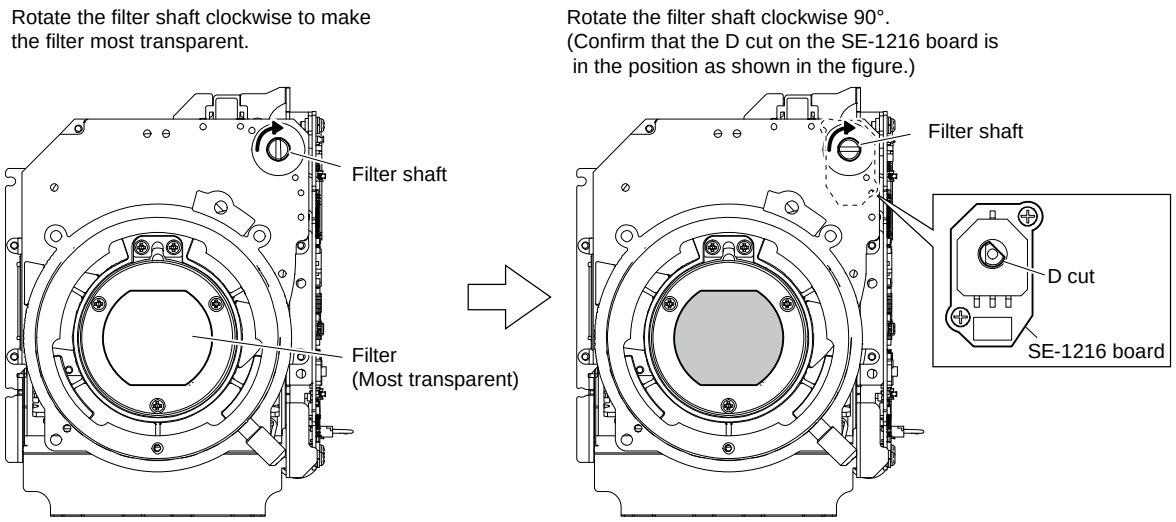


6. Install the removed parts by reversing the steps of removal.

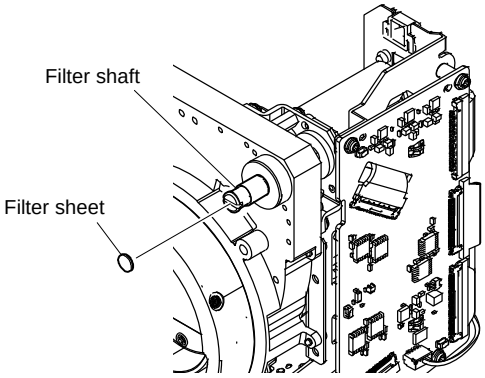
Note

- When installing the filter knob, install the filter knob as follows.

  (1) Align the position of the filter shaft as follows.



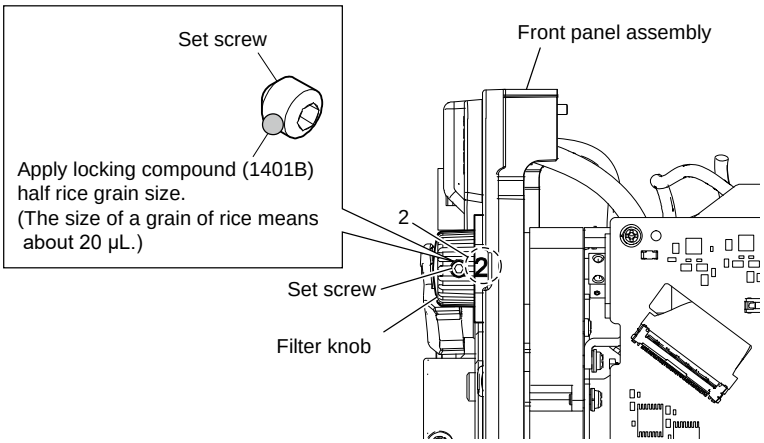
  (2) Attach the filter sheet.



  (3) Install the front panel assembly.

  (4) Align the filter knob number “2” with the inside, and then attach the filter knob.

  (5) Apply locking compound (1401B), and then tighten the set screw.



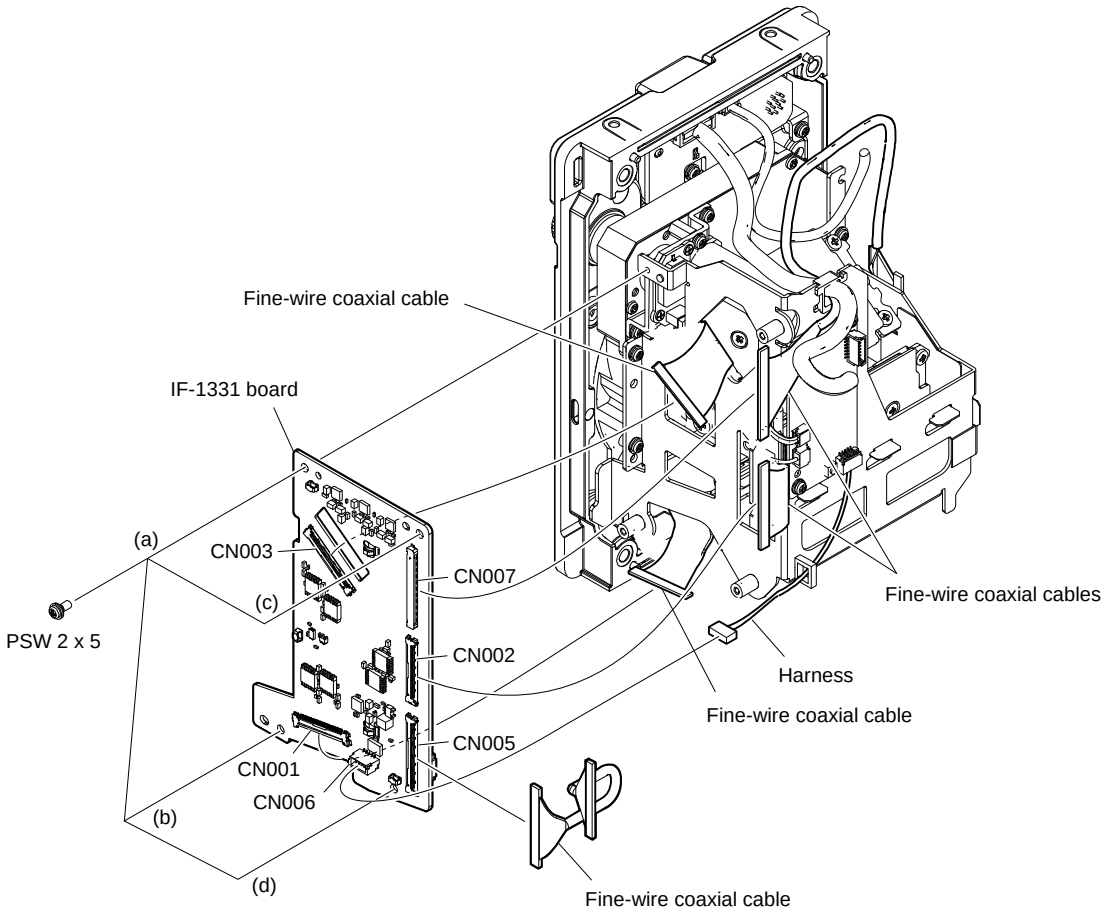
4-14. IF-1331 Board (HDC-P31)

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the front panel block. (Refer to "4-7. Front Panel Block")

Procedure

1. Disconnect the harness from the connector (CN006) on the IF-1331 board.
2. Disconnect the five fine-wire coaxial cables from the connectors (CN001, CN002, CN003, CN005, CN007) on the IF-1331 board.
3. Remove the four screws, and then remove the IF-1331 board.



Note

When installing the IF-1331 board, tighten the screws in the following sequence: (a), (b), (c), (d).

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

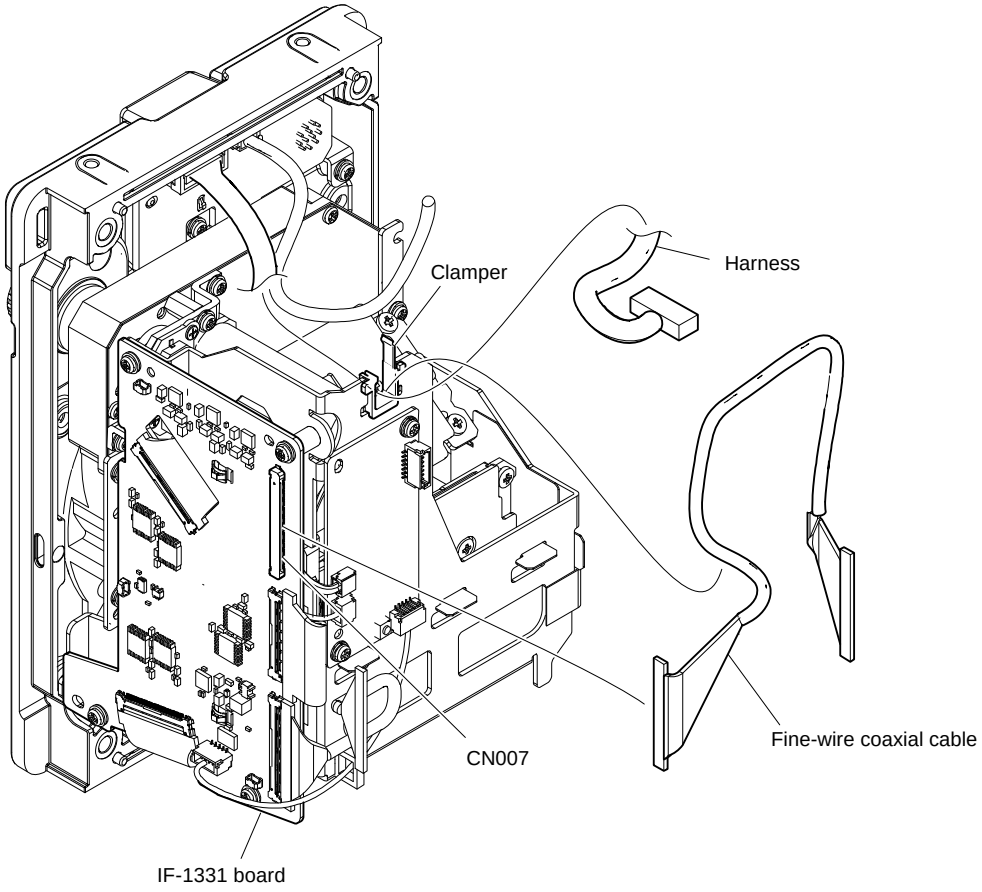
4-15. DR-699 Board (HDC-P31)

Preparation

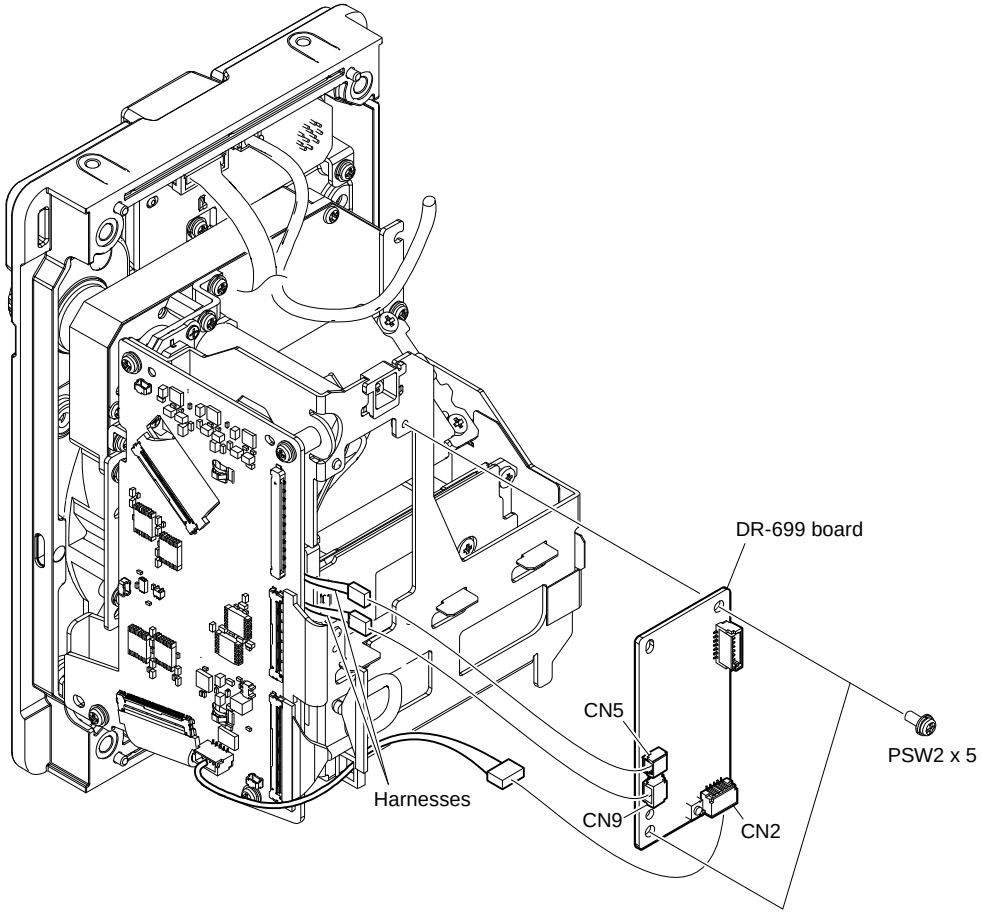
1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the front panel block. (Refer to "4-7. Front Panel Block")

Procedure

1. Disconnect the fine-wire coaxial cable from the connector (CN007) on the IF-1331 board.
2. Release the harness and the fine-wire coaxial cable from the cable.



3. Disconnect the three harnesses from the connectors (CN2, CN5, CN9) on the DR-699 board.
4. Remove the two screws, and then remove the DR-699 board.



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

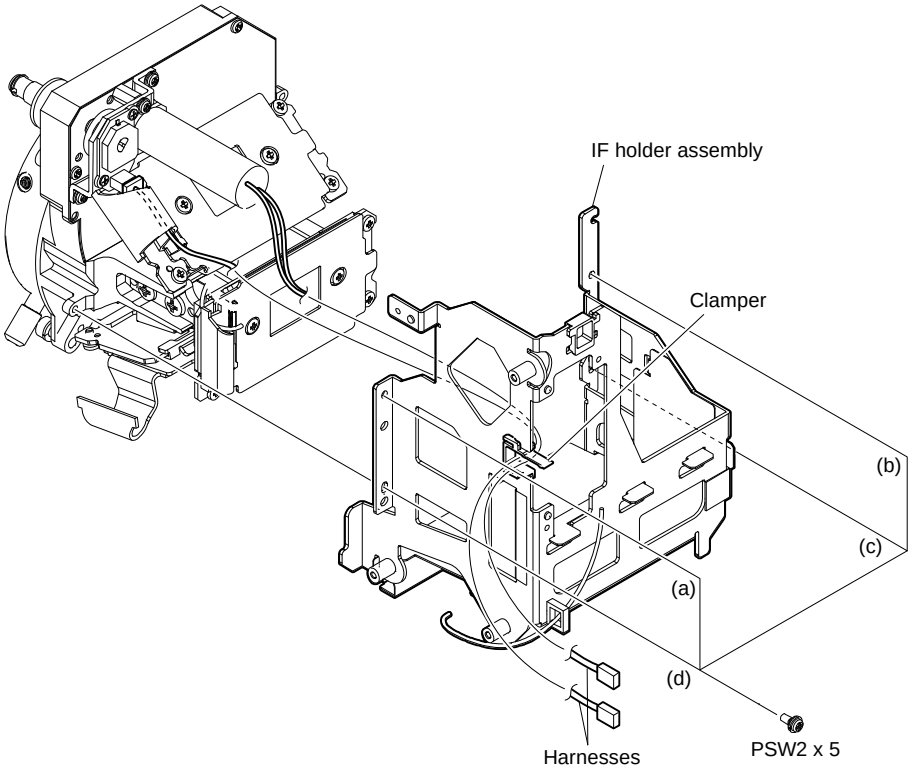
4-16. SE-1216 Board (HDC-P31)

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the front panel block. (Refer to "4-7. Front Panel Block")
4. Remove the IF-1331 board. (Refer to "4-14. IF-1331 Board (HDC-P31)")
5. Remove the DPR-699 board. (Refer to "4-15. DR-699 Board (HDC-P31)")
6. Remove the CMOS block assy. (Refer to "4-13. CMOS Block Assembly (HDC-P31)")

Procedure

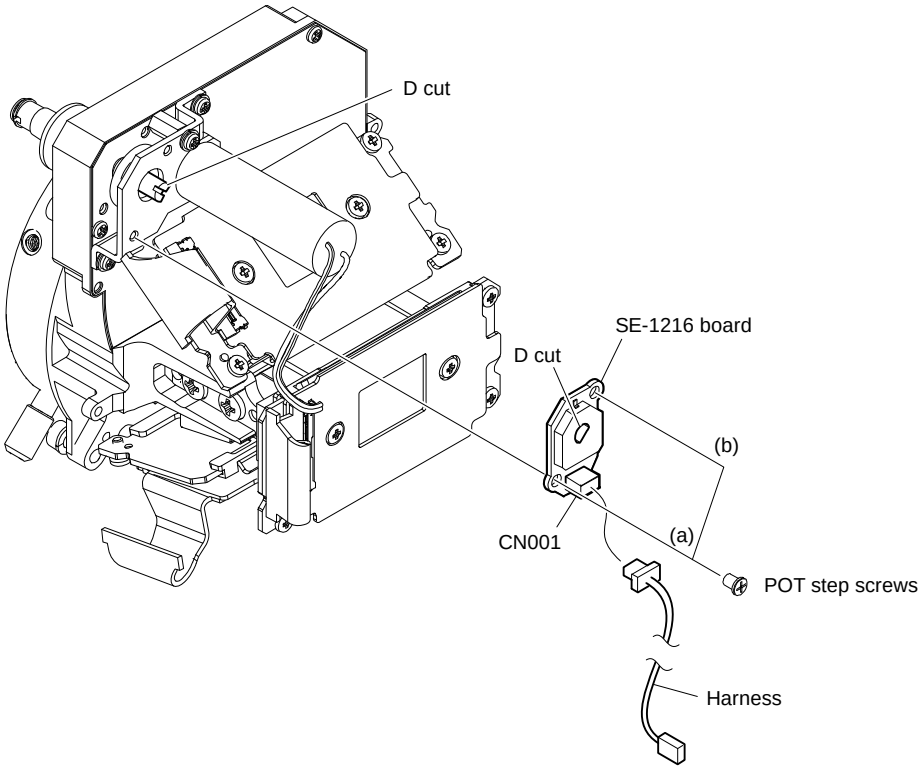
1. Release the two harnesses from the clamper.
2. Remove the four screws, and then remove the IF holder assembly.



Note

When installing the IF holder assembly, tighten the screws in the following sequence: (a), (b), (c), (d).

3. Disconnect the harness from the connector (CN001) on the SE-1216 board.
4. Remove the two screws, and then remove the SE-1216 board.



Note

- When attaching the SE-1216 board, match the D cut direction
- When installing the SE-1216 board, tighten the POT step screws in the following sequence: (a), (b).

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

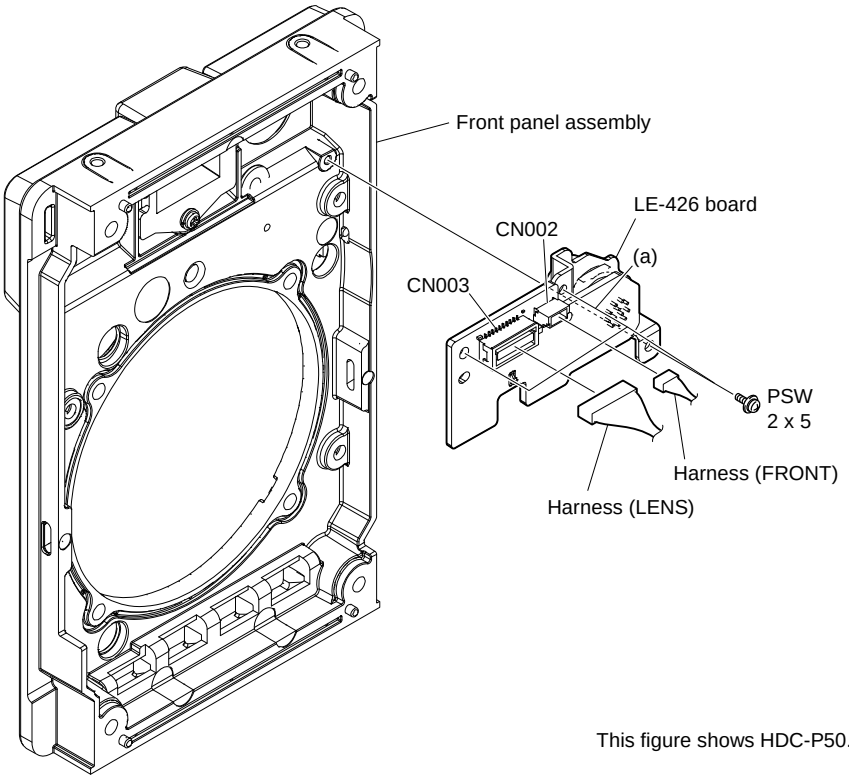
4-17. LE-426 Board

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the front panel block. (Refer to "4-7. Front Panel Block")
4. Remove the CMOS block assembly. (Refer to "4-8. CMOS Block Assembly (HDC-P50)" or "4-13. CMOS Block Assembly (HDC-P31)")

Procedure

1. Disconnect the two harnesses from the two connectors (CN002 and CN003) on the LE-426 board.
2. Remove the three screws, and then remove the LE-426 board.



This figure shows HDC-P50.

Tip

When installing the LE-426 board, tighten the screw (a) first, and then tighten the remaining two screws.

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

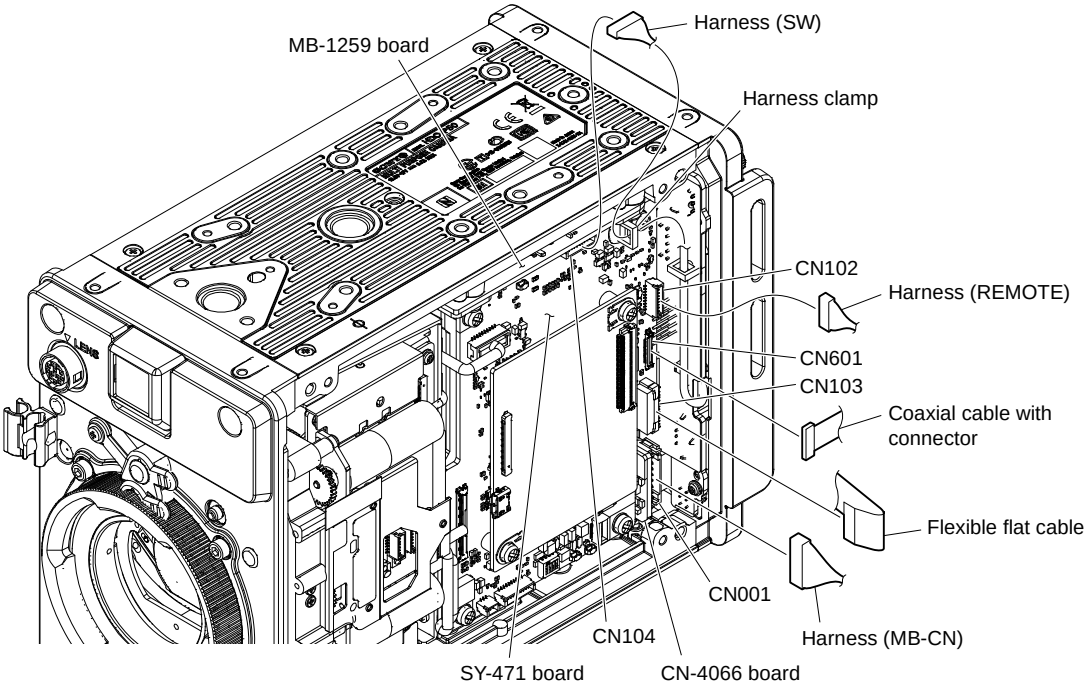
4-18. Rear Panel Assembly

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")

Procedure

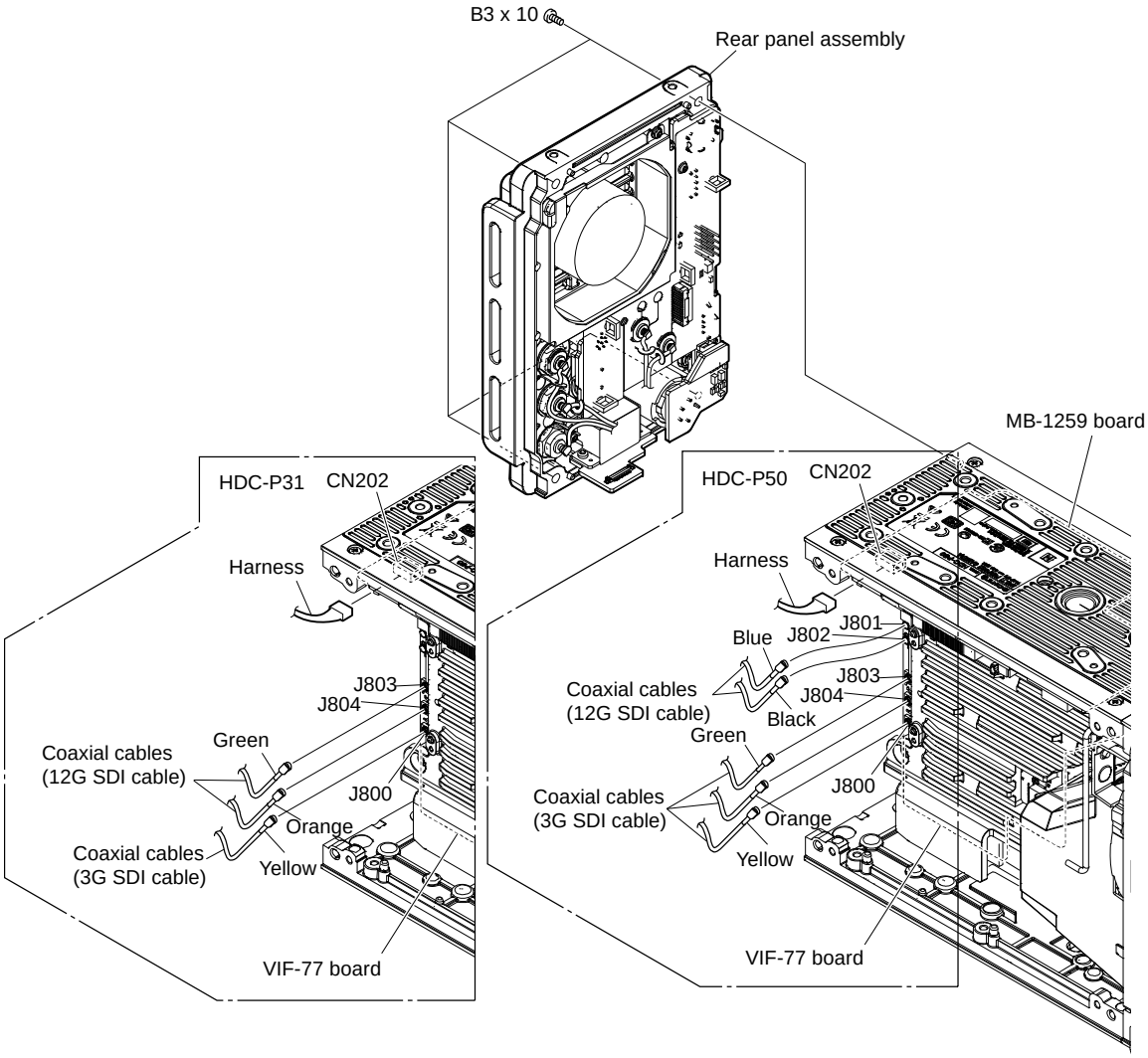
1. Disconnect the harness from the connector (CN102) on the SY-471 board.
2. Disconnect the flexible flat cable from the connector (CN103) on the SY-471 board.
3. Disconnect the coaxial cable with connector from the connector (CN601) on the SY-471 board.
4. Remove the harness from the harness clamp.
5. Disconnect the harness from the connector (CN104) on the MB-1259 board.
6. Disconnect the harness from the connector (CN001) on the CN-4066 board.



Note

When connect the coaxial cable with connector, carefully handle these coaxial cable with connector so that they are not disconnected.

7. Disconnect the harness from the connector (CN202) on the MB-1259 board.
8. For HDC-P50: Disconnect the five coaxial cables from the five connectors (J800 to J804) on the VIF-77 board.
   For HDC-P31: Disconnect the three coaxial cables from the five connectors (J800, J803, J804) on the VIF-77 board.
9. Remove the four screws, and then remove the rear panel assembly.



Note

- When connecting the coaxial cables, make sure that they are connected to the correct connectors.
- The connector type varies depending on the color of the coaxial cable.
  Care should be taken because if the coaxial cable is inserted into the wrong connector, the connector or cable shell may be damaged.

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

4-19. DC Fan

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

- Fan cushion: 2 pcs

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the rear panel assembly. (Refer to "4-18. Rear Panel Assembly")

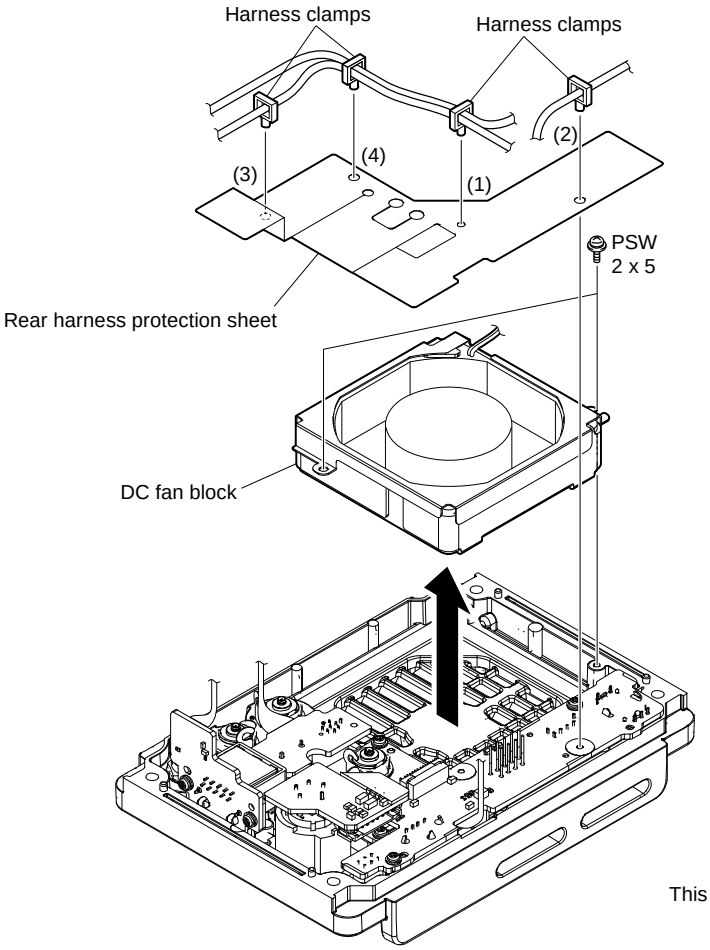
Procedure

1. Remove the four harness clamps.

   Tip

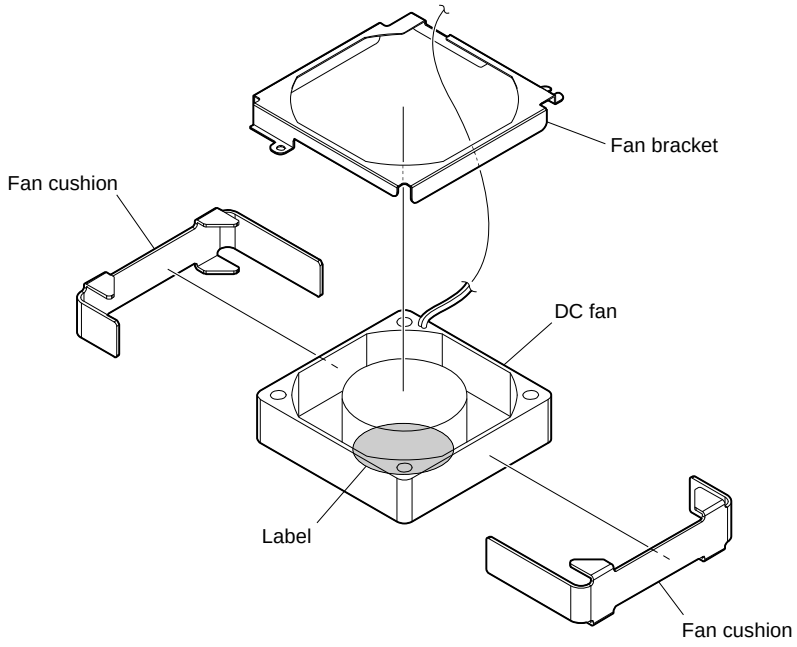
   When attaching the harness clamps, attach them in the order from (1) to (4).

2. Remove the rear harness protection sheet.
3. Remove the two screws, and then remove the DC fan block.



This figure shows HDC-P50.

4. Remove the fan bracket.
5. Remove the two fan cushions from the DC fan.



Note

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

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

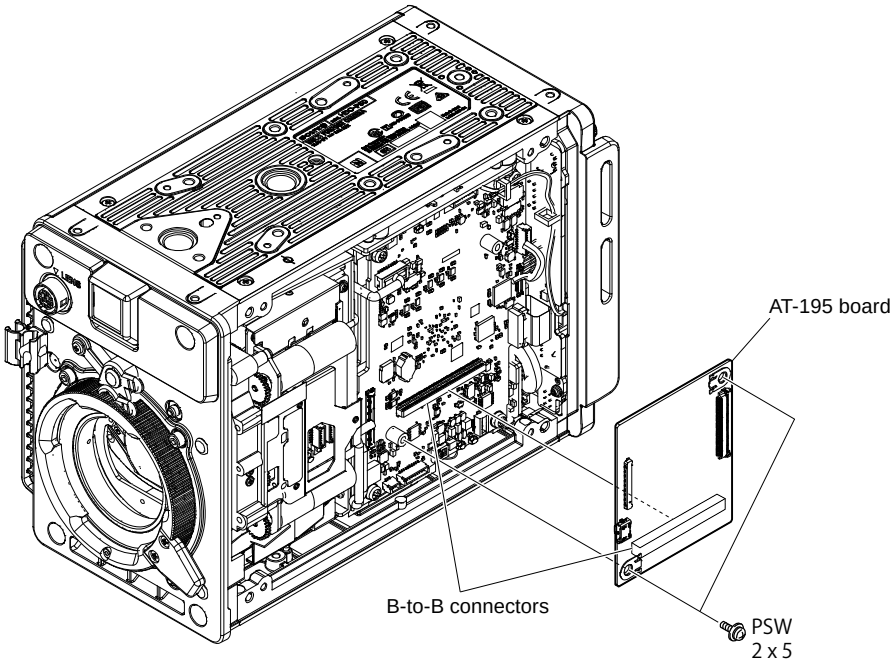
4-20. AT-195 Board

Preparation

1. Remove the inside assembly. (Refer to "4-5. Inside Assembly")

Procedure

1. Remove the two screws, and then remove the AT-195 board.



This figure shows HDC-P50.

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

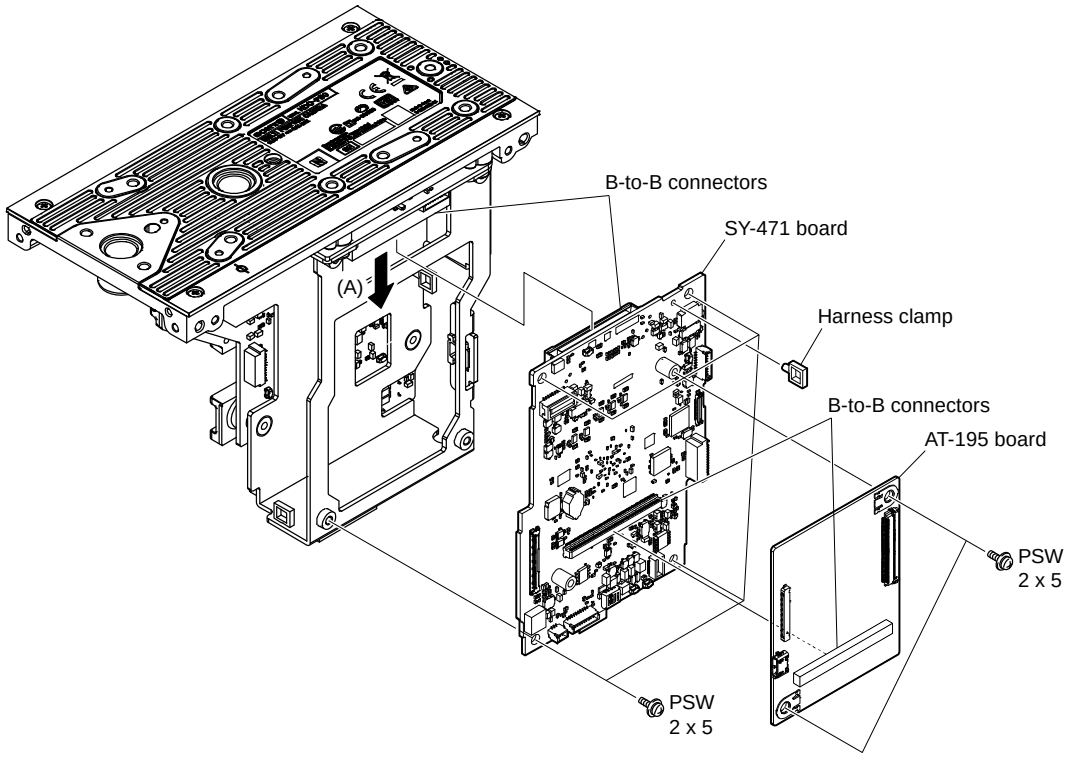
4-21. SY-471 Board

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the front panel block. (Refer to "4-7. Front Panel Block")
4. Remove the rear panel assembly. (Refer to "4-18. Rear Panel Assembly")

Procedure

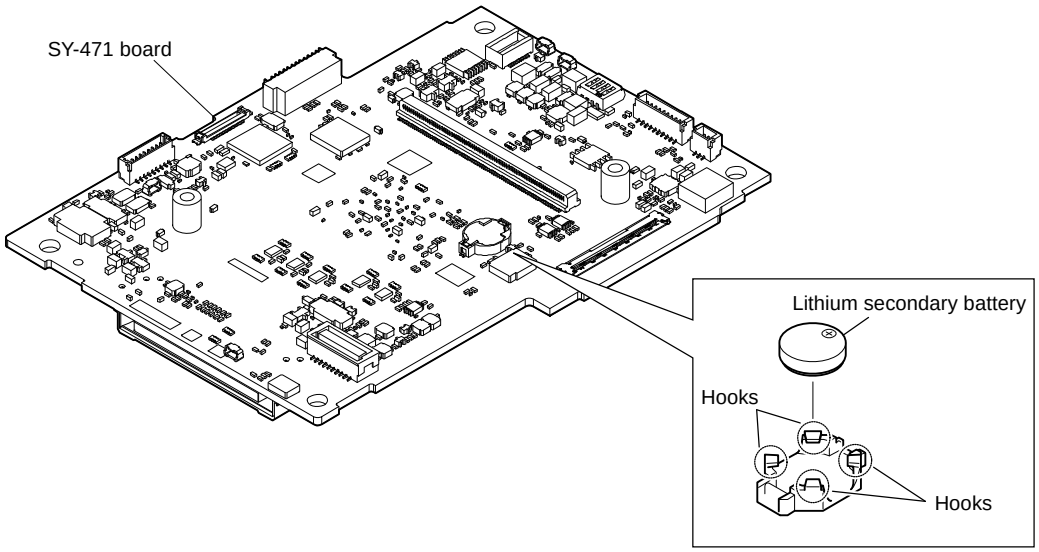
1. Remove the harness clamp.
2. Pull out the B to B connector on the SY-471 board in the direction of the arrow (A).
3. Remove the four screws, and then remove the SY-471 board.
4. Remove the two screws, and then remove the AT-195 board. the arrow.



Note

When removing the SY-471 board, pull out the B to B connector by moving it straight down with the minimum distance. If the SY-471 board is pulled out forcibly, the parts mounted on the back side may be damaged.

5. Remove the lithium battery.



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

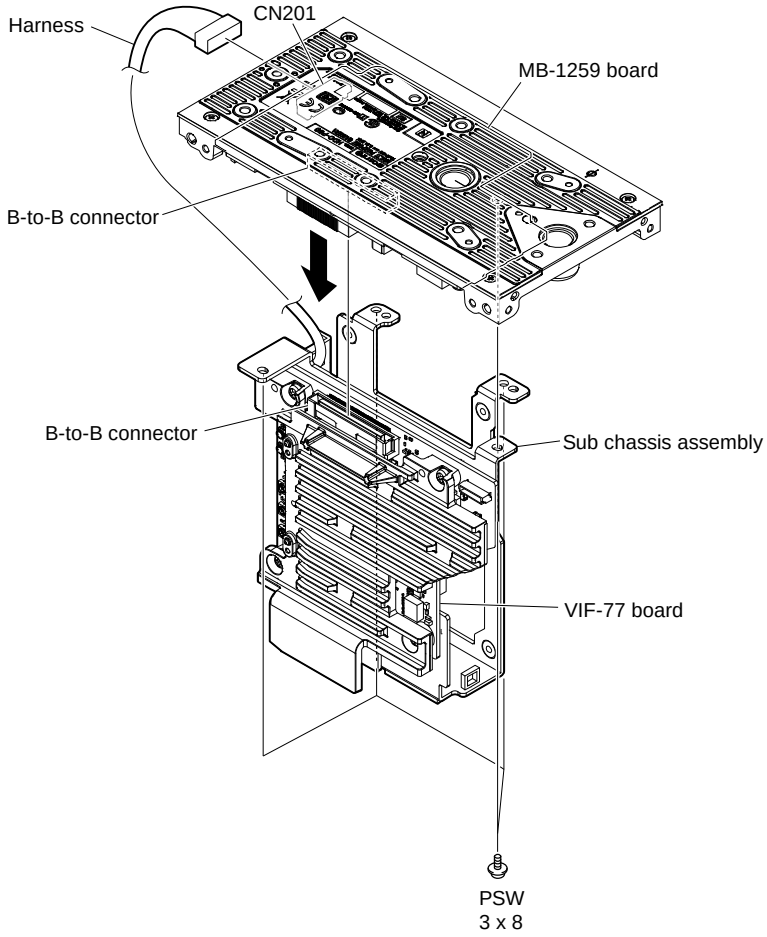
4-22. VIF-77 Board

Preparation

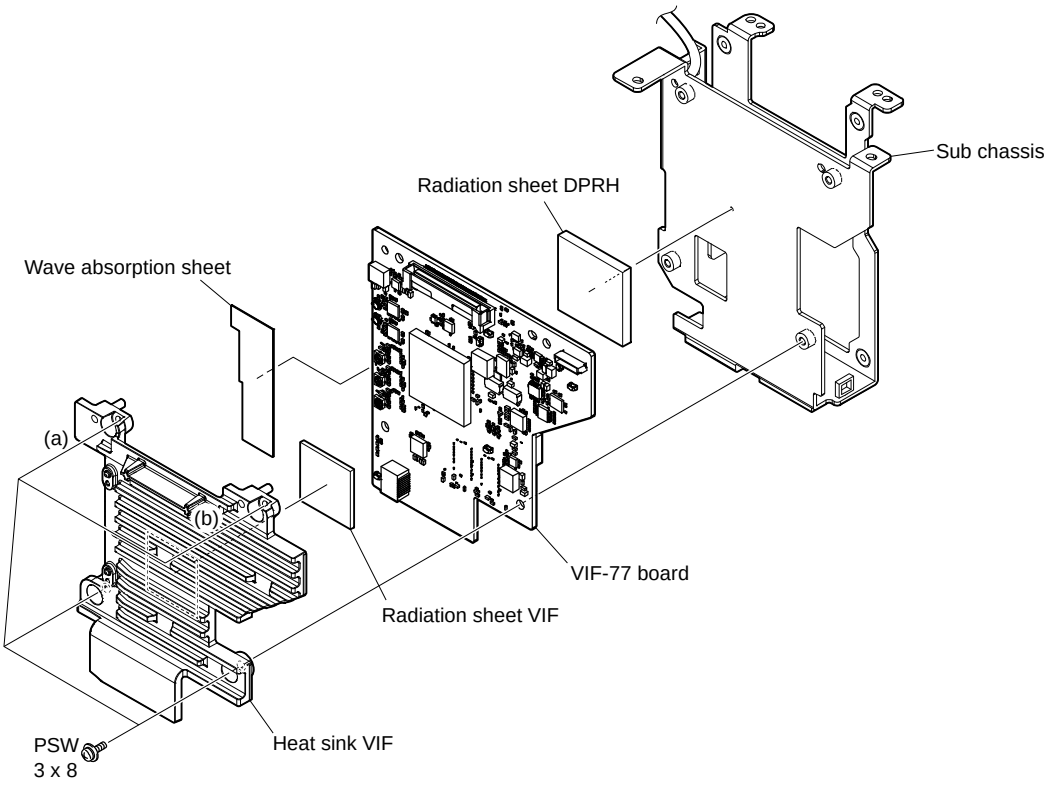
1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the front panel block. (Refer to "4-7. Front Panel Block")
4. Remove the rear panel assembly. (Refer to "4-18. Rear Panel Assembly")

Procedure

1. Disconnect the harness from the connector (CN201) on the MB-1259 board.
2. Remove the four screws.
3. Remove the sub chassis assembly from the B to B connector in the direction of the arrow.



4. Remove the four screws, and then remove the heat sink VIF.
5. Remove the radiation sheet VIF.
6. Remove the wave absorption sheet.
7. Remove the VIF-77 board.



Note

- When attaching the heat sink VIF, tighten the screws in the following sequence: (a), (b) and others.
- When handling the radiation sheet, care should be taken because it is easily deformed. If the radiation sheet is deformed or damaged, replace it with the new one.
- The radiation sheet may be strongly attached. When removing the board, remove the heat sink VIF being careful not to apply load to the mounted parts.

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

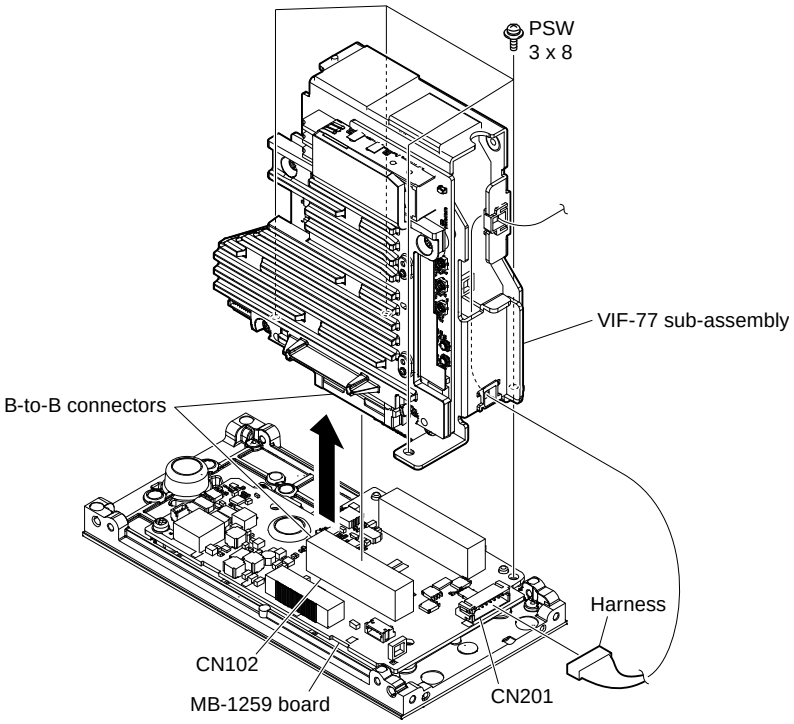
4-23. MB-1259 Board

Preparation

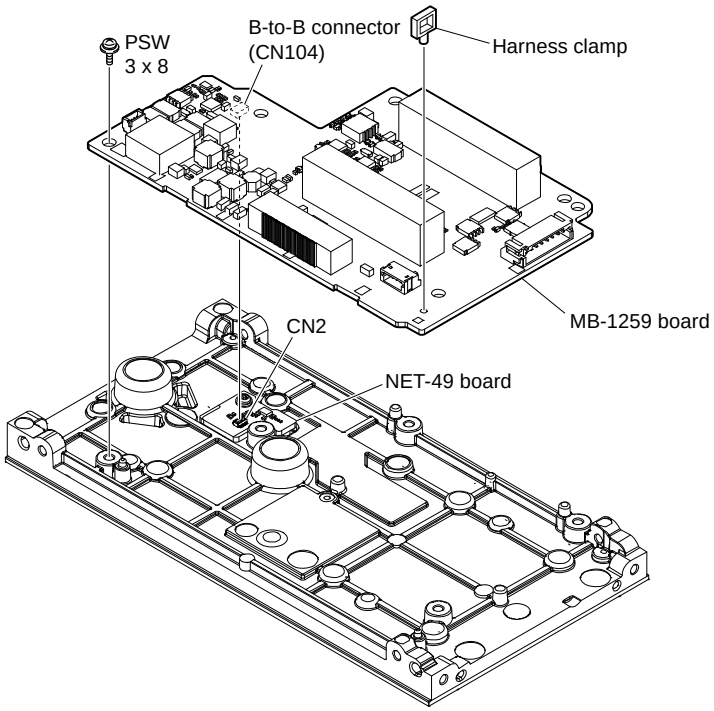
1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the front panel block. (Refer to "4-7. Front Panel Block")
4. Remove the rear panel assembly. (Refer to "4-18. Rear Panel Assembly")
5. Remove the SY-471 board. (Refer to "4-21. SY-471 Board")

Procedure

1. Disconnect the harness from the connector (CN201) on the MB-1259 board.
2. Remove the four screws.
3. Remove the VIF-77 board subassembly from the B to B connector (CN102) on the MB-1259 board in the direction of the arrow.



4. Remove the harness clamp.
5. Remove the screw.
6. Remove the MB-1259 board from the B to B connector (CN2) on the NET-49 board.



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

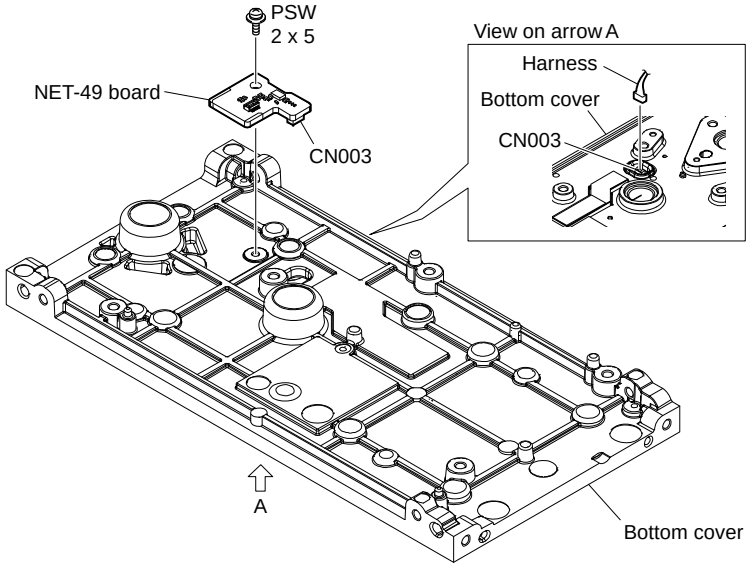
4-24. NET-49 Board

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the front panel block. (Refer to "4-7. Front Panel Block")
4. Remove the rear panel assembly. (Refer to "4-18. Rear Panel Assembly")
5. Remove the SY-471 board. (Refer to "4-21. SY-471 Board")
6. Remove the MB-1259 board. (Refer to "4-23. MB-1259 Board")

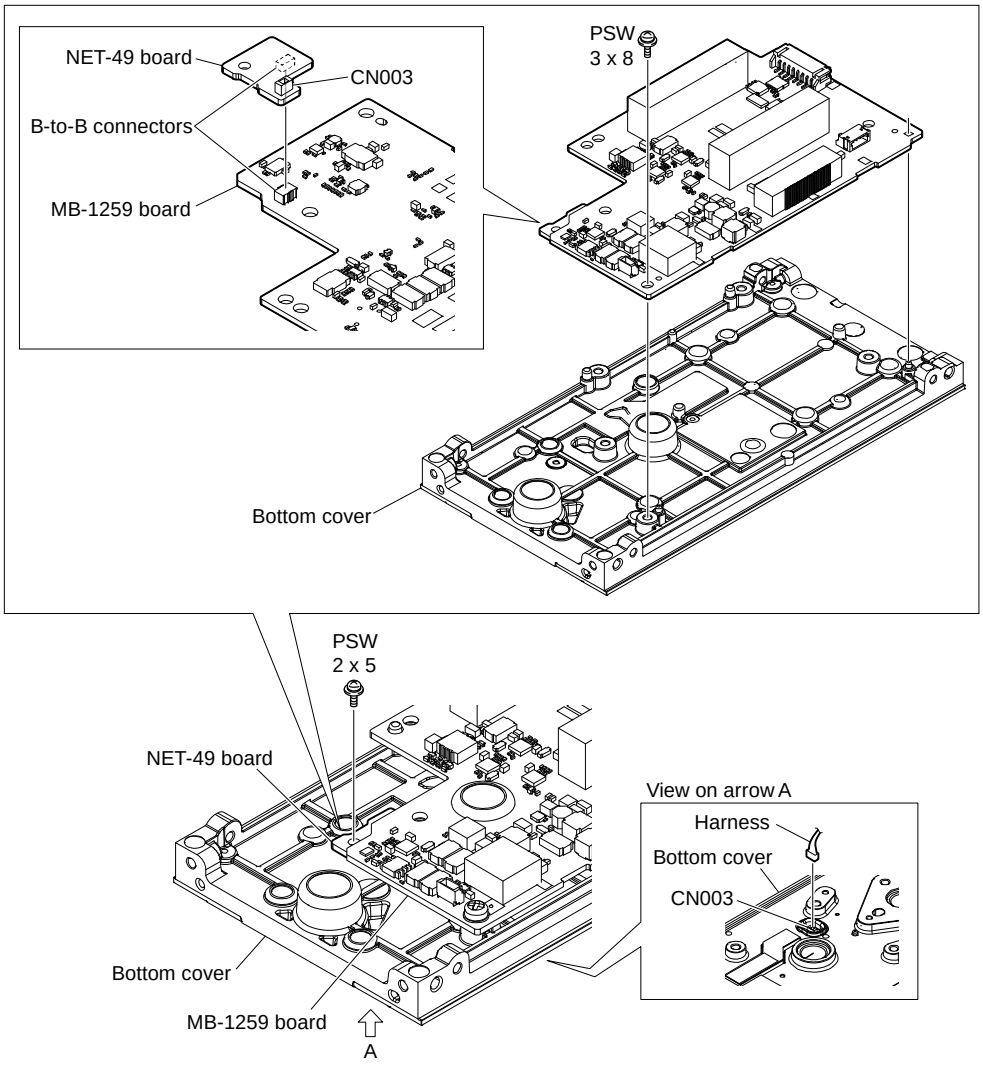
Procedure for removal

1. Disconnect the harness from the connector (CN003) on the NET-49 board.
2. Remove the screw, and then remove the NET-49 board.



Procedure for installation

1. Connect the connector on the NET-49 board to the B to B connector on the MB-1259 board.
2. Install the MB-1259 board to which the NET-49 board is installed with the screw (PSW3 x 8).
3. Install the NET-49 board with the screw (PSW2 x 5).
4. Connect the harness to the connector (CN003) on the NET-49 board.



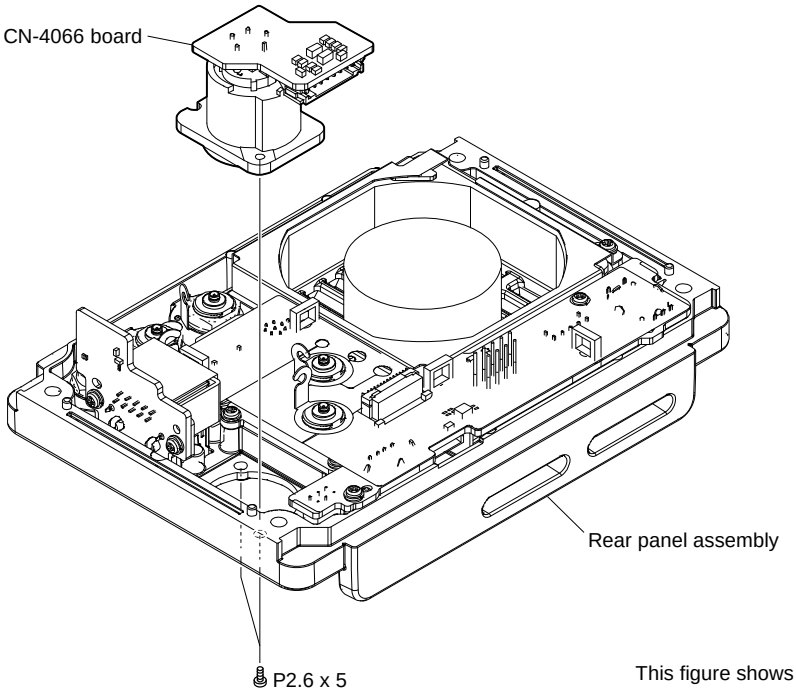
4-25. CN-4066 Board

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the rear panel assembly. (Refer to "4-18. Rear Panel Assembly")

Procedure

1. Remove the two screws, and then remove the CN-4066 board.



This figure shows HDC-P50.

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

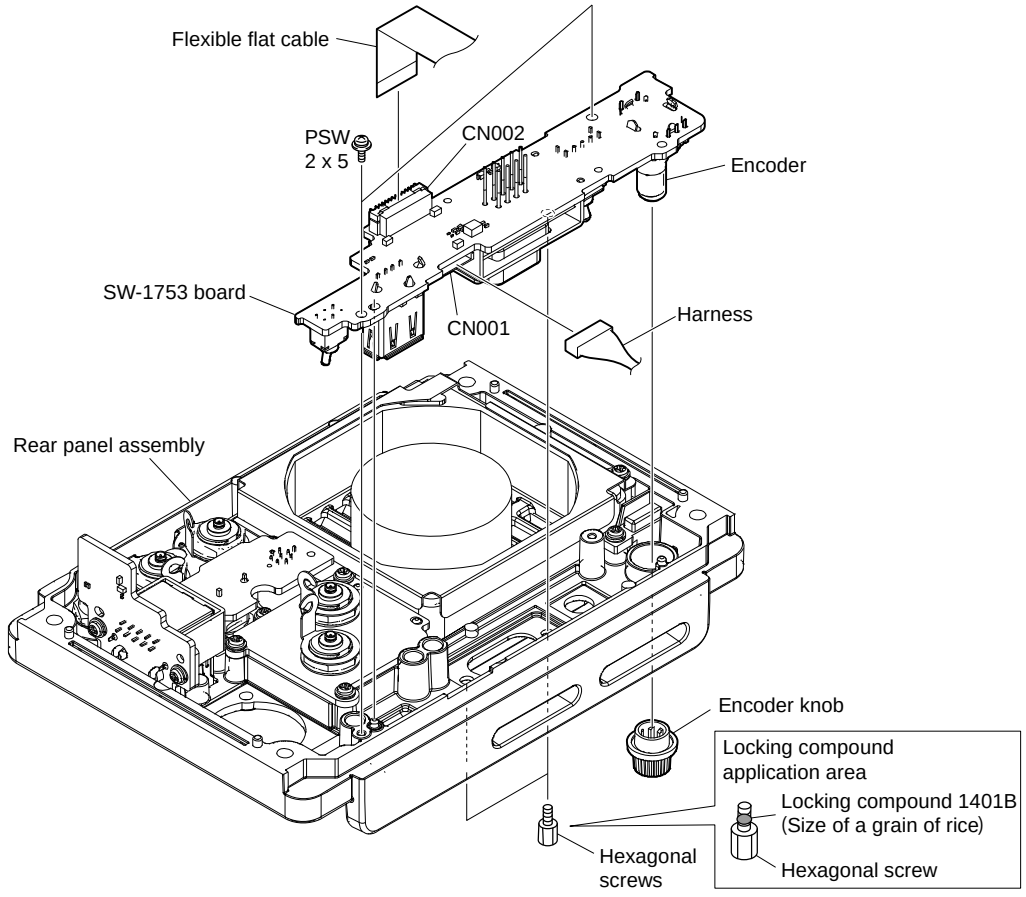
4-26. SW-1753 Board

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the rear panel assembly. (Refer to "4-18. Rear Panel Assembly")
4. Remove the CN-4066 board. (Refer to "4-25. CN-4066 Board")
5. Remove the rear harness protection sheet. (Refer to steps 1 and 2 in "4-19. DC Fan")

Procedure

1. Disconnect the flexible flat cable from the connector (CN002) on the SW-1753 board.
2. Remove the two hexagonal screws.
3. Remove the encoder knob.
4. Remove the two screws, and then remove the SW-1753 board.
5. Disconnect the harness from the connector (CN001) on the SW-1753 board.



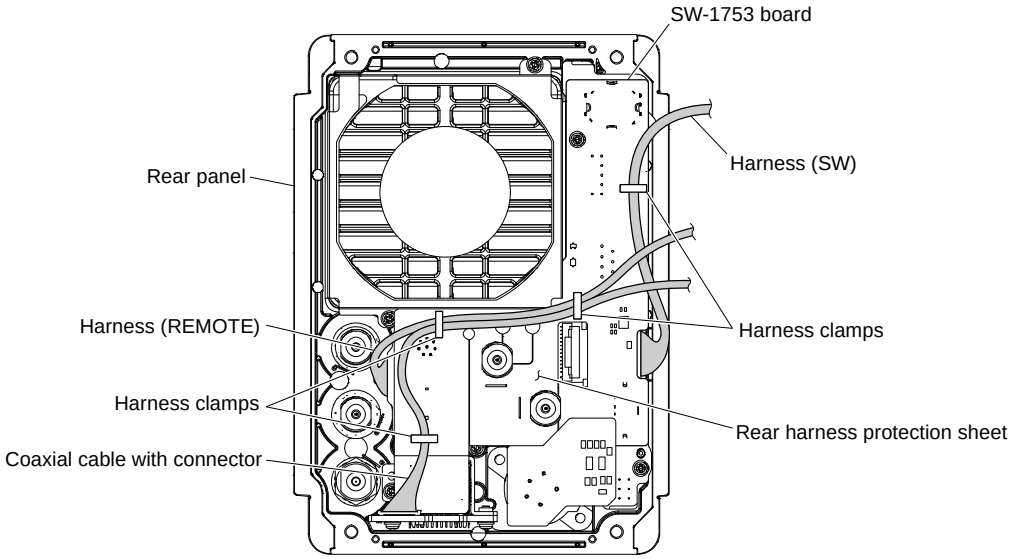
This figure shows HDC-P50.

Note

- When attaching the two hexagonal screws, apply the locking compound.
- When attaching the encoder knob, pay attention to the direction of the encoder knob and the D cut of the encoder. If the direction is not aligned, the encoder knob may be damaged.

Note

When installing the SW-1753 board, route the harnesses and coaxial cable with connector as shown in the illustration.



This figure shows HDC-P50.

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

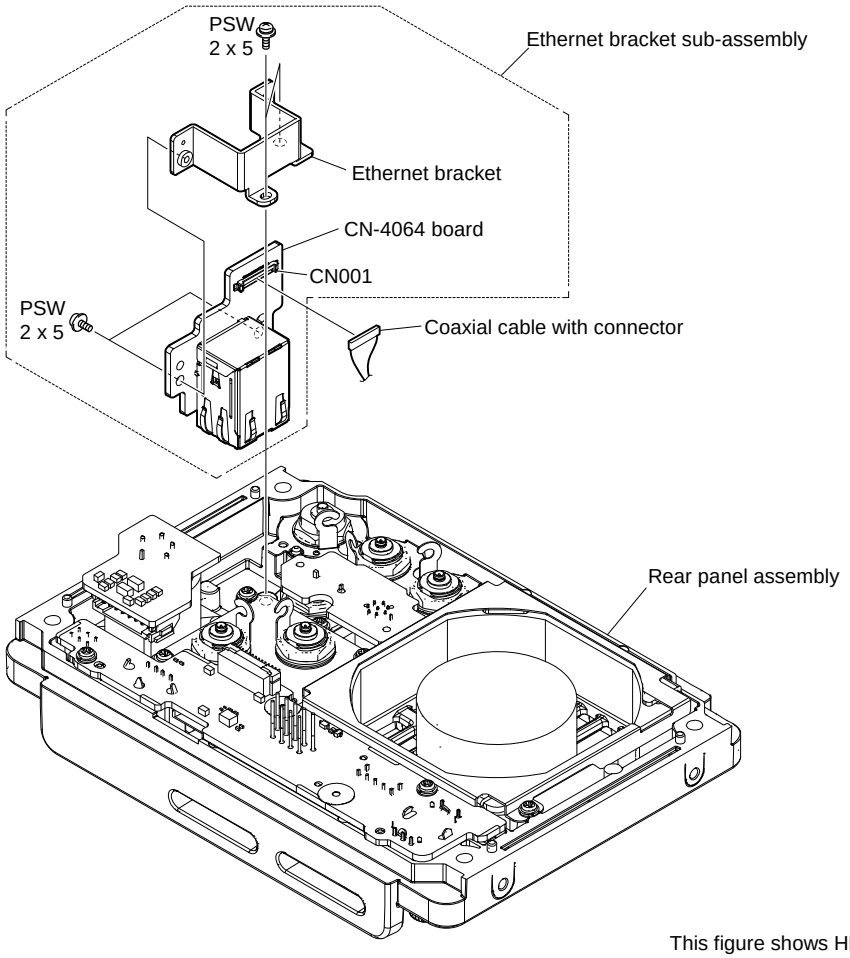
4-27. CN-4064 Board

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the rear panel assembly. (Refer to "4-18. Rear Panel Assembly")
4. Remove the rear harness protection sheet. (Refer to steps 1 and 2 in "4-19. DC Fan")

Procedure

1. Disconnect the coaxial cable with connector from the connector (CN001) on the CN-4064 board.
2. Remove the two screws, and then remove the Ethernet bracket sub-assembly.
3. Remove the two screws, and then remove the CN-4064 board.



This figure shows HDC-P50.

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

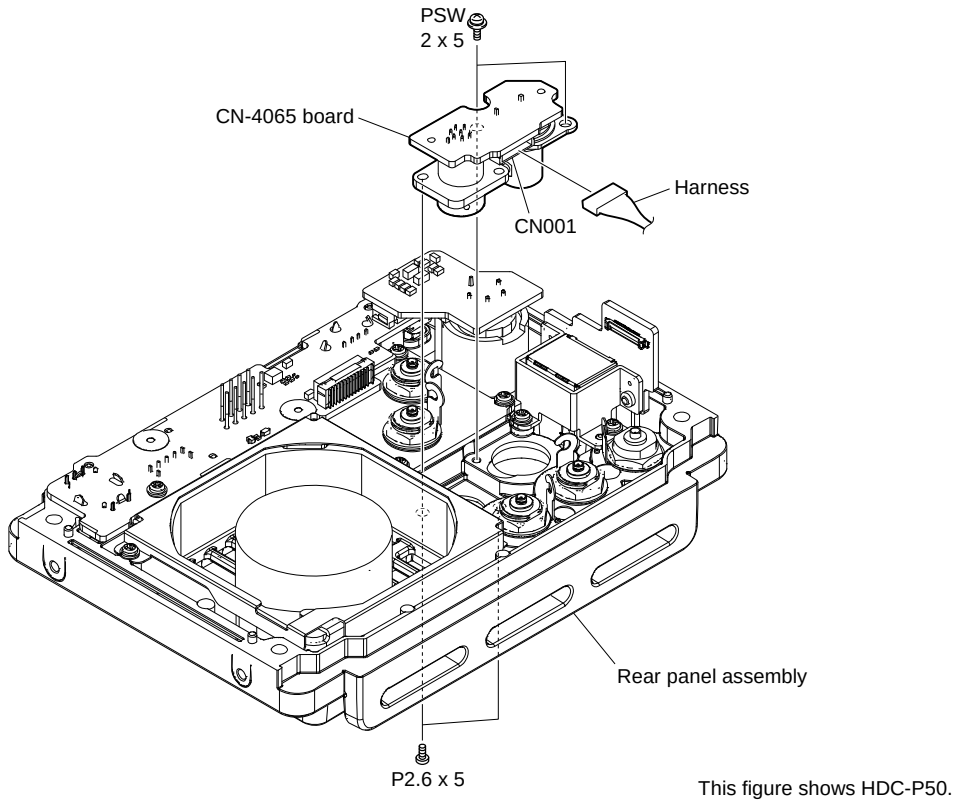
4-28. CN-4065 Board

Preparation

1. Remove the outside assembly. (Refer to "4-4. Outside Assembly")
2. Remove the inside assembly. (Refer to "4-5. Inside Assembly")
3. Remove the rear panel assembly. (Refer to "4-18. Rear Panel Assembly")
4. Remove the rear harness protection sheet. (Refer to steps 1 and 2 in "4-19. DC Fan")

Procedure

1. Remove the two screws (PSW2 x 5) and two screws (P2.6 x 5), and then remove the CN-4065 board.
2. Disconnect the harness from the connector (CN001) on the CN-4065 board.



This figure shows HDC-P50.

3. 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-1000/1500/3000/3500 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-1000/1500/3500) or setting menu of the camera.
  Refer to “5-1-7. Setup Menu Correspondence List” for detail of setup menu.

5-1. Preparations

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

5-1-1. Required Equipment and Tool

Note

Use calibrated equipment and tools.

Equipment Required

Name	Equipment
HD waveform monitor	Leader Electronics LV5152DA (multi waveform monitor) or equivalent
HD color monitor	Sony BVM-E171 or equivalent
Master setup unit	Sony MSU-1000/1500
Lens	Canon HJ18 or equivalent
Frequency counter	Advantest TR5821AK 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	
Chart adaptor	J-7120-950-A	Adaptor that installs ITE test chart (16:9) 310×200 in PTB-500 (pattern box)
ITE standard test chart	J-7120-970-A	ITE grayscale chart (γ=0.45) (16:9)

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 “Section 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 customers actually use.

OHB File

- OHB file is used for the CMOS 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 precaution

- 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 30 minutes to an hour once or twice a month.

Setting Illumination

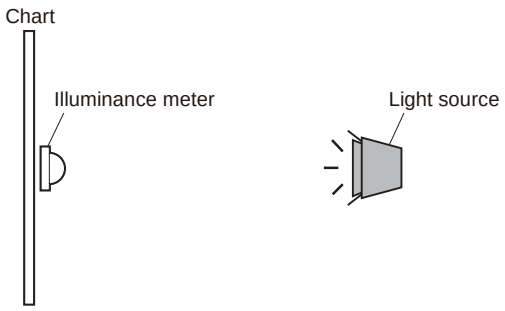
Measuring equipment: Illuminance meter (Calibrated)

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 precaution

Use calibrated pattern box.

Setting Illumination

Measuring equipment: Illuminance meter
(KONICA MINOLTA LS-110 or equivalent, Calibrated)

Preparation

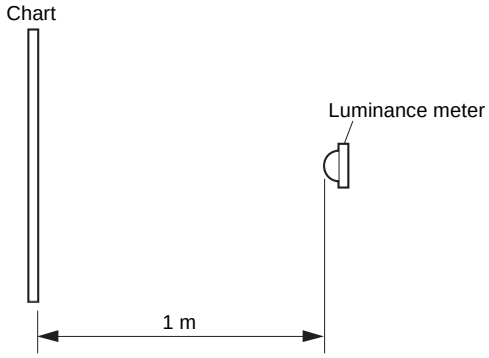
1. Place the pattern box where the chart is not exposed to light.
   (Such as a darkroom, or cover the pattern box with a cover whose inside is painted in black.)
2. Light the pattern box.
3. Warm up the pattern box for about 30 minutes.

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 ±6 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

As for how to display the SERVICE menu, refer to “Displaying the SERVICE menu”.

The setup menu operation is described as follows.
Example: AUTO SETUP in the MAINTENANCE menu of TOP MENU screen is selected and AUTO LEVEL is performed.
MENU: MAINTENANCE
PAGE: AUTO SETUP
ITEM: AUTO LEVEL

Displaying TOP MENU screen

1. Turn the DISPLAY switch to the MENU side while pressing 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.

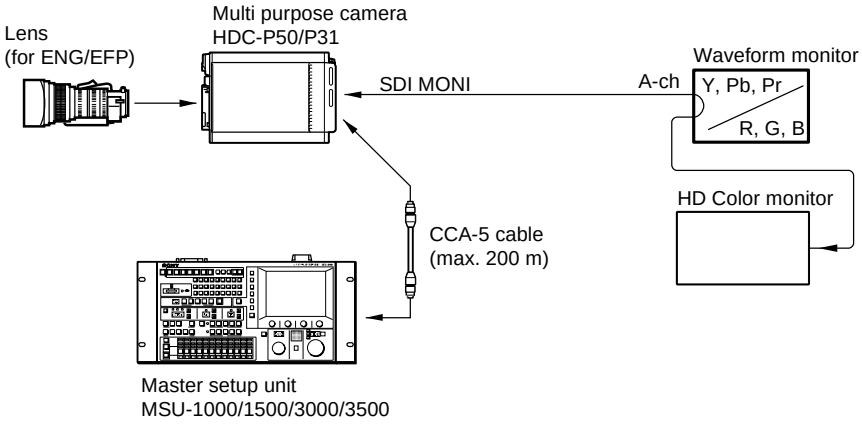
Changing setting values

- 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



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 (unlit)
  - SKIN DETAIL button → OFF (unlit)
- Others
  - GAMMA OFF button → ON (unlit)
  - MASTER GAIN → 0 (0 dB)
  - FILTER button (ND) → 1 (CLEAR)
  - FILTER button (CC) →B (3200K)
  - 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
SHUTTER	SHUTTER	OFF

- MAINTENANCE Menu

Page	Setting Item	Initial Setting
BLACK SHADING	MASTER GAIN	0

Camera setting

- Filter position
  - ND filter → 1 (CLEAR)
  - CC filter → B (3200K)

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] menu.

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.

Menu Item of MSU				Menu Item of Camera		
Menu	**Secondary Menu**	**Sub Menu**	**Adjustment**	**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		AUTO IRIS	IRIS LEVEL
			APL Ratio			APL RATIO

5-2. Automatic Adjustment

5-2-1. Execute the Automatic Level Setup

1. Press the LEVEL button (AUTO SETUP block) on MSU.
   The LEVEL button lights up. (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 on the camera setup menu, set as follows.
MENU: MAINTENANCE
PAGE: AUTO SETUP
ITEM: AUTO LEVEL

5-3. Camera System Adjustment

5-3-1. Sensitivity Adjustment

Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector
Subject: ITE grayscale chart (γ=0.45) (16:9)

Note

Adjust the luminance control of the pattern box so that the white portion in the center of the chart is 573 ±10 cd/m².

Preparation

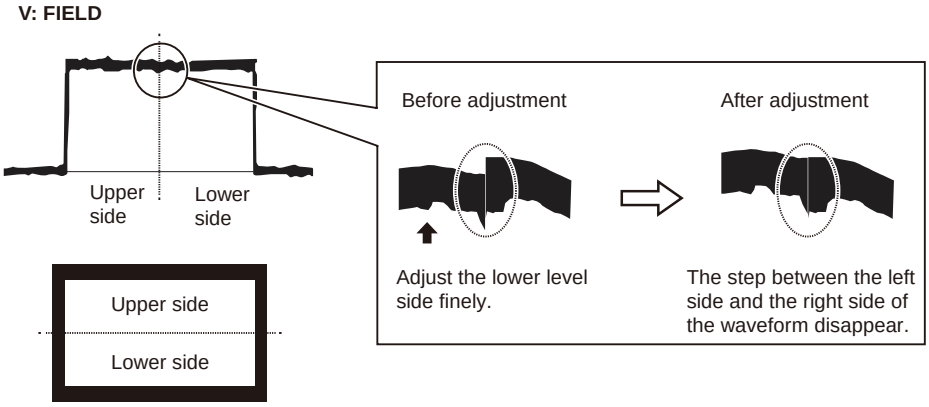
- Setting for the MSU
  CLOSE button → OFF (unlit)
  GAMMA OFF button → OFF (lit)
  MASTER GAIN → 0 (0 dB)
  DETAIL OFF button → OFF (lit)
  KNEE OFF button → OFF (lit)
- Shoot the ITE grayscale chart so that it is aligned with the under scanned monitor frame.

Procedure

1. Set as follows on the camera setup menu.
   MENU: MAINTENANCE
   PAGE: OUTPUT FORMAT
   ITEM: CURRENT 1080/59.94P
2. Open the following page on the camera setup menu.
   MENU: SERVICE
   PAGE: OHB-ADJ1
3. Adjust the level of G channel roughly, so that the level of portion A on the waveform becomes the specification.
   ITEM: GAIN CONT [G1], [G2]
   Specification: A = 700 mV
   (1) Adjust the [G1] so that the waveform level of the lower side of the white portion in the chart center becomes the specification.
   (2) Adjust the [G2] so that the waveform level of the upper side of the white portion in the chart center becomes the specification.

4. Also adjust R and B channels roughly in the same way as above step.
   ITEM: GAIN CONT [R1], [R2]
   ITEM: GAIN CONT [B1], [B2]
5. Remove the ITE grayscale chart, and shoot the full-white pattern so that it is aligned with the under scanned monitor frame.
   If waveform is saturated, adjust the light amount with the shutter.

6. Confirm the waveform of G channel in the verticalness direction, and adjust the lower level side finely, so that the step between the left side and the right side of the waveform disappear.
   ITEM: MONITOR SEL → G
   - Right side of waveform (waveform of lower side in full-white pattern)
     ITEM: GAIN CONT [G1]
   - Left side of waveform (waveform of upper side in full-white pattern)
     ITEM: GAIN CONT [G2]



7. Also adjust R and B channels finely in the same way as above step.
   ITEM: GAIN CONT [R1], [R2]
   ITEM: GAIN CONT [B1], [B2]
8. Repeat steps 2 to 7 to adjust sensitivity of G, R and B channels.
9. Store the file.
   MENU: SERVICE
   PAGE: OHB-ADJ1
   ITEM: STORE FILE

5-3-2. Black Shading Adjustment

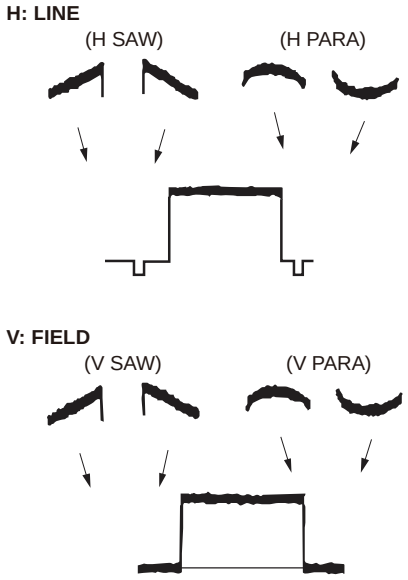
Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector

Preparation

- Setting for the MSU
  CLOSE button → ON (lit)
  GAMMA OFF button → OFF (lit)
  MASTER GAIN → 12 (12 dB)
  MASTER BLACK → 30

Procedure

1. Set as follows on the camera setup menu.
   MENU: MAINTENANCE
   PAGE: OUTPUT FORMAT
   ITEM: CURRENT 1080/59.94P
2. Open the following page on the camera setup menu.
   MENU: SERVICE
   PAGE: BLACK SHADING
3. Adjust R channel waveform on the monitor so that it becomes as flat as possible.
   ITEM: H SAW [R]
   ITEM: H PARA [R]
   ITEM: V SAW [R]
   ITEM: V PARA [R]



4. Also adjust G and B channel waveforms 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

5-3-3. White Shading Adjustment

Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector
Subject: Full-white pattern

Note

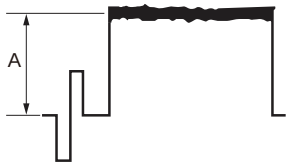
In the case of any of the following case is applicable, white shading is not adjusted correctly.

- 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 content of the following preparation and procedure, use calibrated equipment and tools.

Preparation

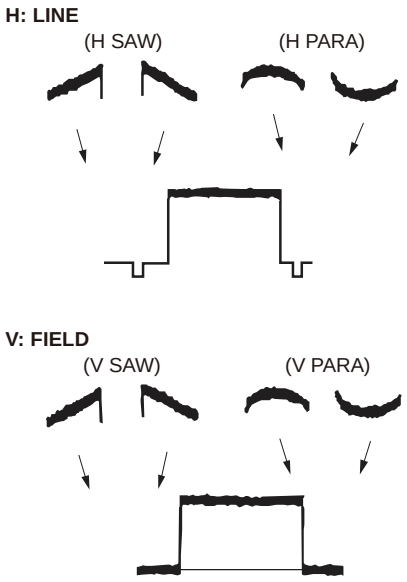
- Setting for the MSU
  KNEE OFF button → OFF (lit)
  MASTER GAIN → 0 (0 dB)
- Shoot the full-white pattern so that it is aligned with the under scanned monitor frame.
- Lens iris: F4 to F5.6
- A = 600 ±20 mV
  If the lens aperture is greater than F5.6, adjust the light amount with the shutter.



- Lens focus: ∞
- Set the lens extender or the lens shrinker to the following settings.
  Lens extender (×2) → OFF
  Lens shrinker (×0.8) → OFF
- Set as follows on the camera setup menu.
  MENU: OPERATION
  PAGE: LENS FILE
  ITEM: 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 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 it becomes as flat as possible.
   Adjustment item: H SAW
   Adjustment item: H PARA
   Adjustment item: V SAW
   Adjustment item: V PARA



4. Make the same adjustment to channel 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.

Storing the OHB file in the MSU menu

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 lens 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 ×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 as follows.
   - Lens extender (×2) → ON
   - Lens shrinker (×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 lens shrinker.
   - Lens extender (×2) → OFF
   - Lens shrinker (×0.8) → OFF

5-4. Video System Level Adjustment

Note

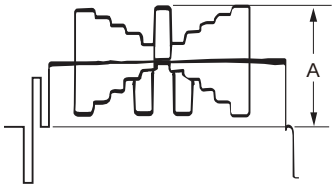
Perform the video system level adjustment according to the system that the customer uses.

5-4-1. H/V Ratio Adjustment

Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector
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

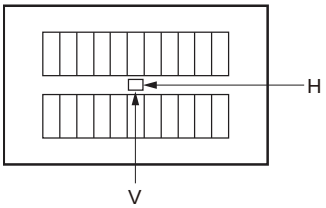
1. Operate the control panel of MSU, and set as follows.

Note

Customers' settings must be restored after the adjustment. Write down the customers' 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)



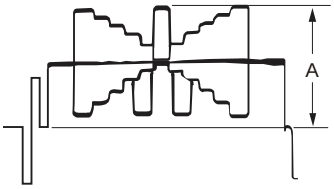
4. Change the settings to the recorded customers' settings.
5. Store the reference file.
   (Refer to “5-4-12. File Store”.)

5-4-2. Detail Level Adjustment

Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector
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

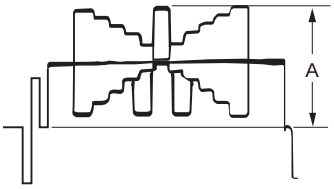
1. Operate the control panel of MSU, and set as follows.
   (1) PAINT button → ON (lit)
   (2) Touch panel operation: (Page 1) → [Detail] → [1/3]
2. Adjust the detail level to be added to each step of the grayscale to the desired level.
   - Adjustment item: [Level]
3. Store the reference file.
   (Refer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

5-4-3. Crispening Adjustment

Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector
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 ± 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]

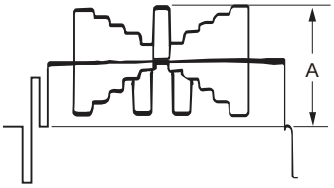
   (1) Turn the adjustment knob of MSU to plus direction slowly.
   (2) Stop the adjustment knob of MSU at the position where the noise at the black level of the waveform just decreases.
4. Store the reference file.
   (Refer to “5-4-12. File Store”.)

5-4-4. Level Dependent Adjustment

Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector
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 ±20 mV
  If the lens aperture is greater than F5.6, adjust the light amount with the shutter.

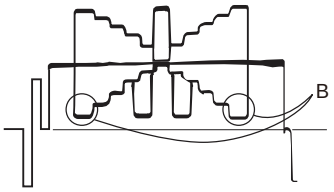


Procedure

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]
   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 point where the edge of B portion on the waveform just decreases. Or adjust to the desired level.



3. Store the reference file.
   (Refer to "5-4-12. File Store".)

Note

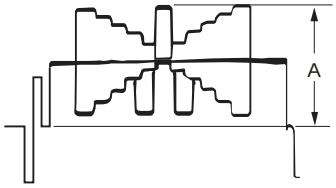
After adjustment is completed, be sure to perform "5-4-1. H/V Ratio Adjustment".

5-4-5. Detail Clip Adjustment

Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector
Object: Grayscale chart

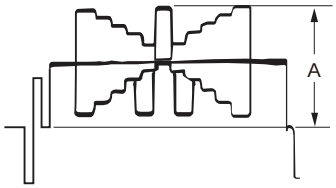
Preparation

- 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.

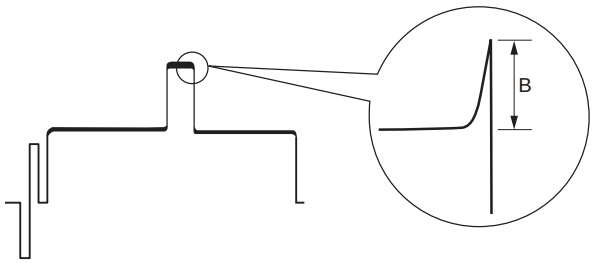


Procedure

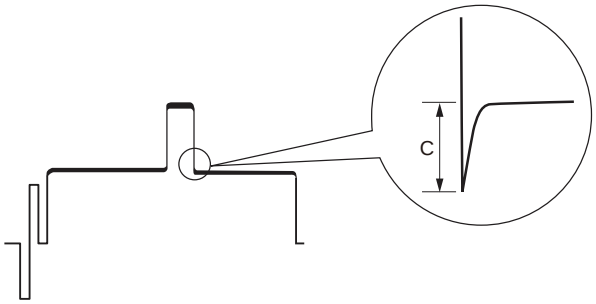
1. Operate the control panel of MSU, and perform the automatic white balance adjustment.
   WHITE button → ON (lit)
   After the adjustment is completed, the message “AWB: OK” is displayed.
2. Make a line selection at the center white portion of the grayscale chart.



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: SDI 1 connector
Object: Grayscale chart

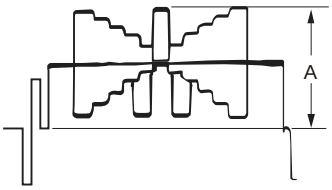
Preparation

- 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±7 mV



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

5-4-7. Pedestal Level Adjustment

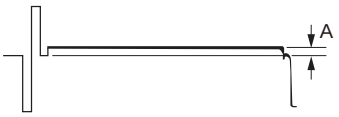
Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector

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



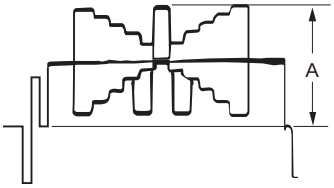
3. Store the reference file.
   (Refer to “5-4-12. File Store”.)

5-4-8. Flare Adjustment

Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector
Object: Grayscale chart

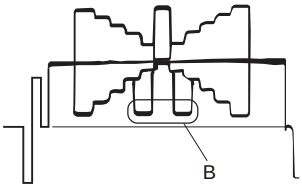
Preparation

- 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]



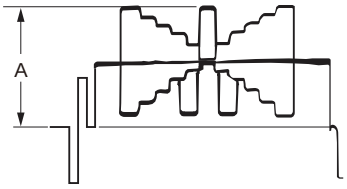
3. Store the reference file.
   (Refer to “5-4-12. File Store”.)

5-4-9. Gamma Correction Adjustment

Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector
Object: Grayscale chart

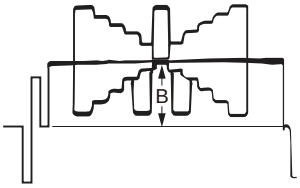
Preparation

- 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 ±20 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: SDI 1 connector

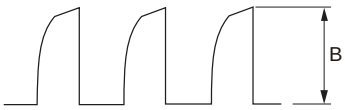
Preparation

- 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

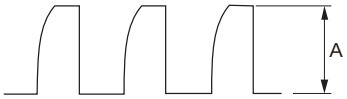
Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector

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

Operate the control panel of MSU, and store file.

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.

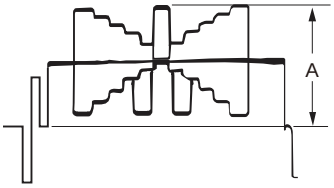
5-5. ND Offset Adjustment

5-5-1. White Balance Correction

Equipment: Waveform monitor (R, G, B)
Test Point: SDI 1 connector
Object: Grayscale chart

Preparation

- 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 ±20 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 each button on the MSU as follows.
   - ND2 button → ON (lit)
   - MASTER GAIN → 0 (0 dB)
4. 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.
5. Set each button on the MSU as follows.
   - ND3 button → ON (lit)
   - MASTER GAIN → 0 (0 dB)
6. 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.
7. Set each button on the MSU as follows.
   - ND4 button → ON (lit)
   - MASTER GAIN → 6 (6 dB)
8. Operate the control panel of MSU, and perform the automatic white balance adjustment.
9. Set each button on the MSU as follows.
   - ND5 button → ON (lit)
   - MASTER GAIN → 12 (12 dB)
10. 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.

Storing the OHB file in the MSU menu

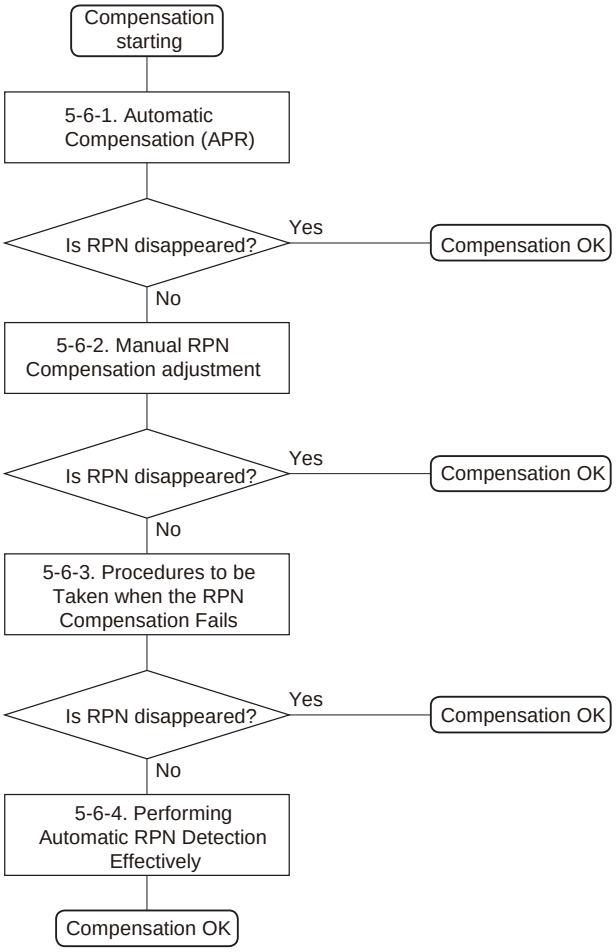
1. Operate the control panel of MSU, and set as follows.
   (1) [FILE] button → ON (lit)
   (2) Touch panel operation: [OHB File] → [OHB Store] → [Store]
   After the store operation is completed, the message “OHB File Store” is displayed.

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

- Manual RPN compensation adjustment data is not affected by executing the automatic RPN compensation (APR).
- Automatic RPN compensation (APR) take several minutes.

Preparation

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

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

5-6-2. Manual RPN Compensation Adjustment

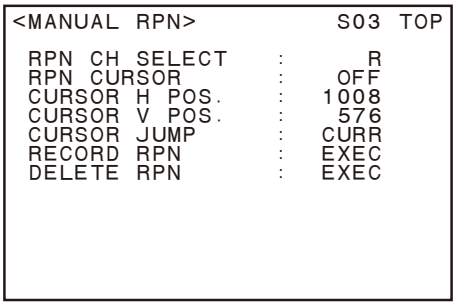
When RPN is not compensated after RPN automatic compensation was performed, execute the manual RPN compensation adjustment.

Preparation

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

Procedure

1. Open the following page on the camera setup menu.
   MENU: SERVICE
   PAGE: MANUAL RPN



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 the cross cursor by one line or one pixel and move to the 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.

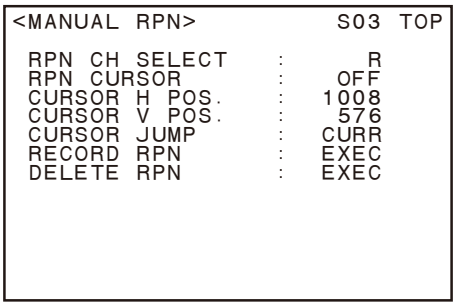
- An adjacent wrong position was compensated.
- The compensation failed due to the influence of other RPNs.

Note

Appearance of an RPN next to the pixel to be compensated means that adjacent RPNs exit. 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 the following page on the camera setup menu.
   MENU: SERVICE
   PAGE: MANUAL RPN



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.

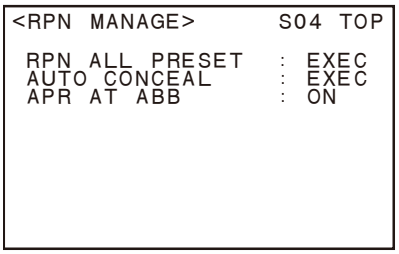
5-6-4. Performing Automatic RPN Detection Effectively

Preparation

- Lens iris→ CLOSE
- Setting for the MSU
  BARS button → OFF (unlit)
  SHUTTER button → OFF (unlit)

Procedure

1. Open the following page on the camera setup menu.
   MENU : SERVICE
   PAGE : RPN MANAGE



2. Perform the APR of RPNs.
   ITEM: AUTO CONCEAL → EXEC

5-7. Reference Signal System Adjustment

5-7-1. 27 MHz VCO Free-Running Adjustment

Equipment: Frequency counter
Test Point: GL/SYNC connector

Preparation

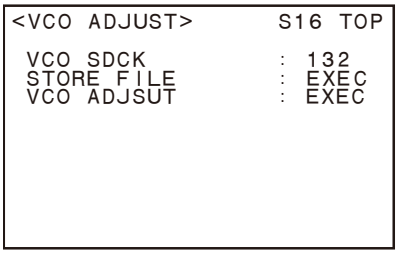
1. Connect a frequency counter to the GL/SYNC terminal with a BNC cable.

   Note

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

Procedure

1. Open the following page on the camera setup menu.
   MENU : SERVICE
   PAGE : VCO ADJUST



2. Set the cursor at [VCO ADJUST : EXEC] and press the MENU SEL knob/ENTER button.
3. A message “ADJUST START?” appears. Set the cursor at [YES] and press the MENU SEL knob/ENTER button.
4. Adjust the value of [VCO SDCK] so that the frequency output from the GL / SYNC terminal becomes the specification.
   Specification: 13,500,000 ±25 Hz
5. After this adjustment is completed, set the cursor at [STORE FILE : EXEC] and press the MENU SEL knob/ENTER button.
6. A message “SAVE OK?” appears. Set the cursor at [YES] and press the MENU SEL knob/ENTER button.
7. Turn off the power.

Section 6
Software Upgrade

6-1. Upgrading Software Programs

Software programs stored in the ROM (IC401) on the AT-195 board are 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 operating instructions.

Preparation

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

Note

As for how to obtain the data file for update (hdcp50_app.pkg), contact your local Sony Sales Office/Service Center.

1. Create the following directory in the USB drive.
   \MSSONY\PRO\CAMERA\HDCP50
2. Copy the data file for update “hdcp50_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 D02, and then press ENTER button long.
5. Updatable items become selectable. Select “CAMERA APP” and then press ENTER button.
6. A message “VERSION UP OK?” appears. Select “YES”.
7. The unit restarts automatically and the version update starts.
   Upon completion of the version update, a message “UPDATE SUCCEEDED” appears.
8. 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 operating instructions.

Preparation

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

Note

As for how to obtain the data file for update (hdcp50_os.pkg), contact your local Sony Sales Office/Service Center.

1. Create the following directory in the USB drive.
   \MSSONY\PRO\CAMERA\HDCP50
2. Copy the data file for update “hdcp50_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 D02, and then press ENTER button long.
5. Updatable items become selectable. Select “OS” and then press ENTER button.
6. A message “VERSION UP OK?” appears. Select “YES”.
7. The unit restarts automatically and the version update starts.
   Upon completion of the version update, a message “UPDATE SUCCEEDED” appears.
8. 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 numbers of PLD (or ROM for PLD) shown in “Section 10 Spare Parts” are the ones in which data is not written yet.
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, not a data writing but instead parts replacement is needed only if the specific PLD is defective.

6-2-1. Corresponding PLD

PLD (Ref. No./Board Name)	File Name
IC1001/SY-471 IC1002/SY-471*1	hdcp50_sy.pkg
IC300/VIF-77 IC509/VIF-77*2	hdcp50_vif.pkg

*1: IC1002/SY-471 is the ROM for IC1001/SY-471.

*2: IC509/VIF-77 is the ROM for IC300/VIF-77.

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 operating instructions.

Preparation

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

Note

As for how to obtain the data file for update (hdcp50_sy.pkg, hdcp50_vif.pkg), contact your local Sony Sales Office/Service Center.

1. Create the following directory in the USB drive.
   \MSSONY\PRO\CAMERA\HDCP50
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 D02, and then press the ENTER button long.
5. Updatable items become selectable. Select the PLD to be updated and then press the ENTER button.
6. A message “VERSION UP OK?” appears. Select “YES”.
7. The unit restarts automatically and the version update starts.
   Upon completion of the version update, a message “UPDATE SUCCEEDED” appears.
8. 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 operating instructions.

Preparation

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

Note

As 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\HDCP50
2. Copy the data file for update to be updated to the directory created.

   Note

   Do not copy the 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 pressing the MENU SEL knob/ENTER button and the VTR button of the lens, turn on the power of the unit.
   Each data file for update copied in the USB drive is updated.

   Tip

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

3. Upon completion of the version update, a message “UPDATE SUCCEEDED” appears.
4. 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

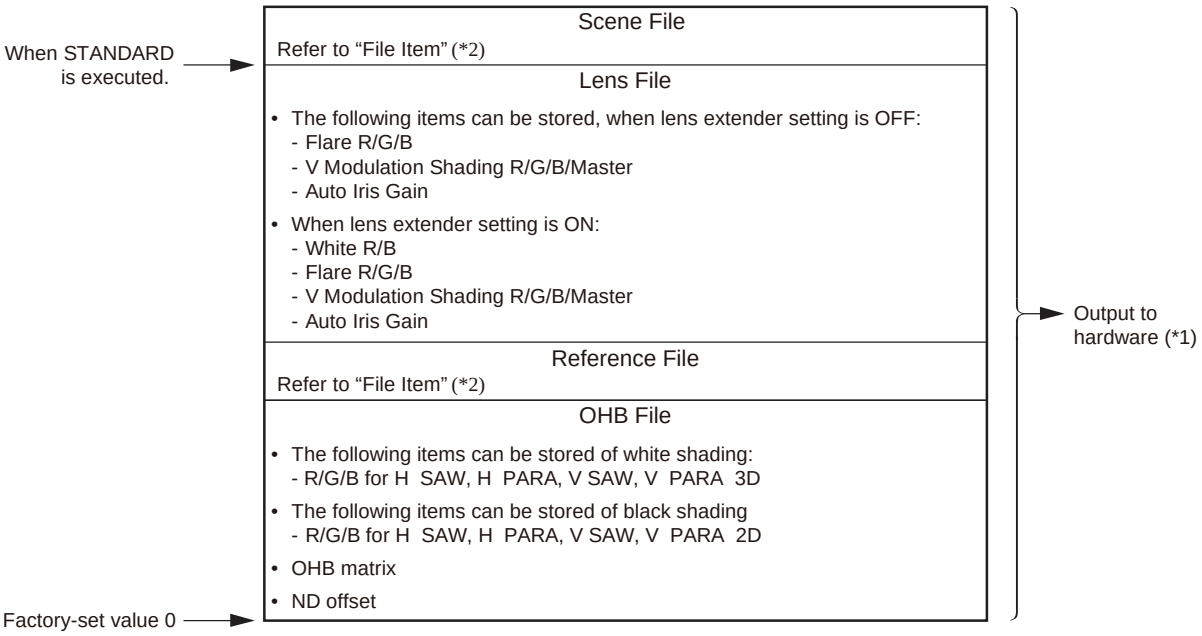
This unit is equipped with the file systems for managing data.
In this section, the menu operations are described as follows.
Example: When executing WRITE (CAM → USB) on the OPERATOR FILE page of the OPERATION menu
[OPERATION] → [OPERATOR FILE] → [WRITE (CAM → USB)]
For the details on the setup menu, refer to “Section 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.
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 CCD block maintenance.
   This file can be 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

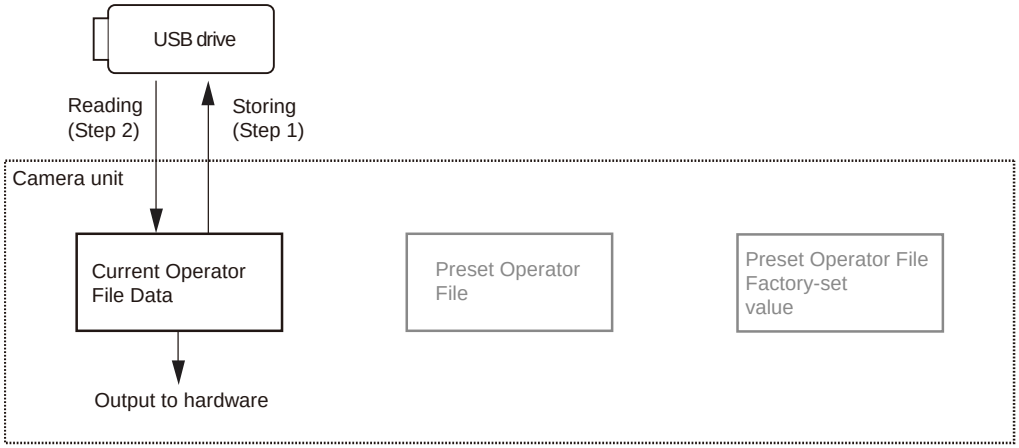
The operator file can be stored and read in the camera.
Use the setup menu to store the operator file in and read the operator file from the USB drive.

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 “Outline Figure of Operation”.

Using OPERATION menu of this unit

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

Reading

Reference: Refer to step 2 of “Outline Figure of Operation”.

Using OPERATION menu of this unit

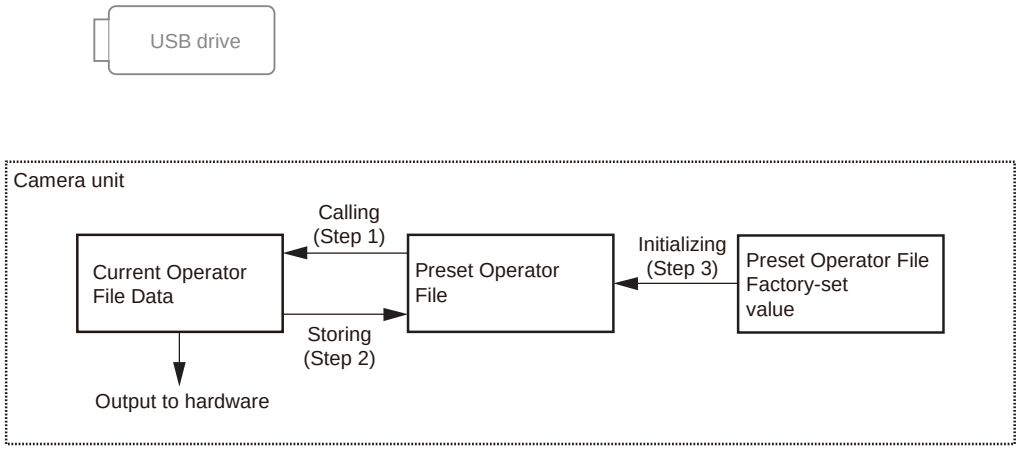
Read the operator file stored in the USB drive to the camera.
[OPERATION] → [OPERATOR FILE] → [READ (USB → CAM)]

7-3. Preset Operator File

Preset Operator File can be stored data 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 “Outline Figure of Operation”.

Using OPERATION menu of this unit

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

Storing

Reference: Refer to step 2 of “Outline Figure of Operation”.

Using FILE menu of this unit

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

Initializing

Reference: Refer to step 3 of “Outline Figure of Operation”.

Using FILE menu of this unit

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

7-4. Scene File

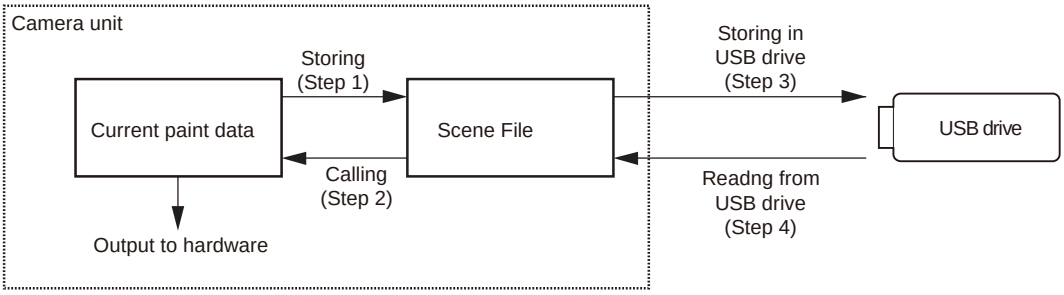
Scene files can be stored in the camera and USB drive.
Scene files can also be stored in the USB drive if the master setup unit (MSU) is used. For details, refer to the MSU operation manual.
Data is stored and called using the setup menu or MSU.
Scene files can be copied between cameras using the USB 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.

7-4-1. Scene File Operation

Outline figure of operation



Storing

Reference: Refer to step 1 of “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] ～ [5]

With MSU (master setup unit)

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 “Outline Figure of Operation”.

Using PAINT menu of this unit

Select the scene file number to be called on the SCENE FILE page.
[PAINT] →[SCENE FILE] → [1] to [5]
A file currently being called is indicated with its file number highlighted. Select the number again to cancel the call and resume the previous status.

With MSU (Master Setup Unit)

When the number button of the scene file you want to call is pressed and lit while the STORE button on the operation panel is not lit, the scene file of the number is called. Repressing the number button cancels calling of the scene file and the state before calling is restored.

Storing the scene file to the USB drive

Reference: Refer to step 3 of “Outline Figure of Operation”.

Using PAINT menu of this unit

Store 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 “Outline Figure of Operation”.

Using PAINT menu of this unit

Read 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

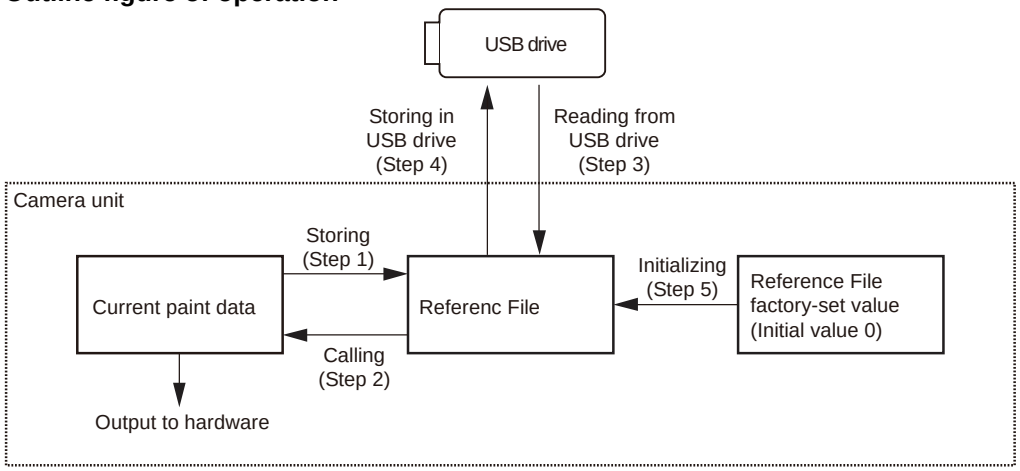
Reference files can be stored in the camera and USB drive.
Reference files can also be stored in the memory stick if the master setup unit (MSU) is used. For details, refer to the MSU operation manual.
Data is stored and called using the setup menu or MSU.
Reference files can be copied between cameras 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.

7-5-1. Reference File Operation

Outline figure of operation



Storing

Reference: Refer to step 1 of “Outline Figure of Operation”.

Using FILE menu of this unit

Reference file is stored in the camera and the numerical data is displayed as 0. (Excluding some items. Refer to “7-8. File Items”.)
[FILE] → [REFERENCE] → [STORE FILE]

With MSU (master setup unit)

1. Press the FILE button in the functional operation area on the operation panel.
2. Select [Reference] → [Reference Store] by the menu operation.
   Reference file is stored in the camera and the numerical data is displayed as 0. (Excluding some items. Refer to “7-8. File Items”.)

Calling

Reference: Refer to step 2 of “Outline Figure of Operation”. Refer to “7-1-1. Structure of Paint Related Files”.

Using PAINT menu of this unit

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

With MSU (master setup unit)

Pressing the STANDARD button in the camera/panel control area on the operation panel restores the state when the reference file was stored.

Reading the reference file from the USB drive

Reference: Refer to step 3 of “Outline Figure of Operation”.

Using FILE menu of this unit

Reference File data stored in the camera can be changed by reading the Reference File data stored in the USB drive.
[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 “Outline Figure of Operation”.

Using FILE menu of this unit

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

Initializing all file items

Reference: Refer to step 5 of “Outline Figure of Operation”.

Using FILE menu of this unit

Reset the reference file to the factory settings (default value: 0).
[FILE] → [REFERENCE] → [ALL PRESET]

7-6. Lens File

The Lens File stores the differential data from the Reference File.
Lens File stores the data to compensate the differences of the white shading, flare balance, and white balance, which occur when the lens extender is set to ON. It also stores the minimum f-stop value and name of the lens. 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 and Lens File data of up to 25 files can be stored for a lens 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 the lens file data

Using a lens that is not compatible with serial communication

1. Mount the lens and select the file with the same name as the mounted lens from the setup menu. If no file with the same name as the lens exists, select NO OFFSET.
   [FILE] → [LENS FILE] → [No.] (Select a lens number)
2. Set the lens name and minimum f-stop value.
3. Set the lens extender to OFF.
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.
6. Zoom the lens and adjust the center marker to a position at which the object does not deviate.

   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.

7. Execute Lens File Store.
   [FILE] → [LENS FILE] → [STORE FILE]
8. Set the lens extender to ON and repeat steps 4 to 7.

For lens compatible with serial communication

1. Check that the lens number is No. 17.
2. Also check that the name of the lens and minimum f-stop value.
3. Turn on the dynamic shading.

   Note

   If using the lens compatible with serial communication with the dynamic shading turned on, you do not require the V modulation adjustment. Adjust the white shading or V modulation only when the deviation occurs. In this case, the data will not be stored in the Lens File.
   - Automatic white shading adjustment:
     Shoot the white pattern so that the video level is around 80% (560 mV).
     [MAINTENANCE] → [WHITE SHADING] → [AUTO WHITE SHADING]
     Or adjust the R/G/B/ white shading V SAW, V PARA, H SAW, and H PARA.
     [MAINTENANCE] → [WHITE SHADING] → [V SAW R/G/B], [V PARA R/G/B], [H SAW R/G/B], [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. Set the lens extender to OFF.
5. Adjust the white balance and flare balance with the grayscale chart.
6. Zoom the lens and adjust the center marker to a position at which the object does not deviate.

   Note

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

7. Execute Lens File Store.
   [FILE] → [LENS FILE] → [STORE FILE]
8. Set the lens extender to ON and repeat steps 5 to 7.

Calling

Using OPERATION menu of this unit

Call the lens file stored in the camera.
[FILE] → [LENS FILE] → [No.]

7-7. OHB File

OHB File is used to store the adjustment values specific to the CCD block.
OHB File data is stored in the camera.

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. Load the reference file stored in the camera.
   [FILE] → [REFERENCE] → [STANDARD]
2. Perform the automatic black balance adjustment.
   [MAINTENANCE] → [AUTO SETUP] → [AUTO BLACK]
3. Adjust the ND offset for all of ND filter 1 to ND filter 5.

   Tip

   To change ND filters, select from the menu.
   [PAINT] → [OPTICAL FILTER]

   (1) Select 5 with the ND filter knob, and shoot the white pattern so that the video level is 50% (350 mV) or more.
   (2) Select 1 with the ND filter knob, and adjust the lens iris so that the video level is 80 to 50% (560 to 350 mV), and then perform the automatic white balance adjustment.
   (3) Select 2 with the ND filter knob, and adjust in the same manner as step (2).
   (4) Select 3 with the ND filter knob, and adjust in the same manner as step (2).
   (5) Select 4 with the ND filter knob, and adjust in the same manner as step (2).
   (6) Select 5 with the ND filter knob, and adjust in the same manner as step (2).
4. Store the OHB File.
   [FILE] → [OHB FILE] → [STORE FILE]

With MSU (master setup unit)

1. Press the STANDARD button in the camera/panel control area on the operation panel (ON: lit).
2. Press the FILE button in the menu operation area on the operation panel (ON: lit).
3. Perform the automatic black balance adjustment.
   Press the BLACK button in the camera/panel control area on the operation panel (ON: lit).
   Or select [OHB] → [Auto Black] by the menu operation.
4. Adjust the ND offset for all of ND filter 1 to ND filter 5.

   Tip

   To change ND filters, switch with the ND filter control switch on the MSU.

   (1) Select 5 with the ND filter knob, and shoot the white pattern so that the video level is 50% (350 mV) or more.
   (2) Select 1 with the ND filter knob, and adjust the lens iris so that the video level is 80 to 50% (560 to 350 mV), and then perform the automatic white balance adjustment.
   (3) Perform the automatic white shading adjustment.
   Press the WHITE button in the camera/panel control area on the operation panel (ON: lit).
   Or select [OHB] → [Auto White] by the menu operation.
   (4) Select 2 with the ND filter knob, and adjust in the same manner as step (2) to (3).
   (5) Select 3 with the ND filter knob, and adjust in the same manner as step (2) to (3).
   (6) Select 4 with the ND filter knob, and adjust in the same manner as step (2) to (3).
   (7) Select 5 with the ND filter knob, and adjust in the same manner as step (2) to (3).
5. Store the OHB File.
   [OHB] → [OHB Store] → [Store]

7-8. File Items

You can save the data that is set with the setup menu in files.
This section lists the destination files in which the respective setting data can be stored.
This section also shows the indication mode (absolute or relative) of each setting and the default settings when the unit was shipped from the factory.

Description on symbols

○: When executing each file store, it indicates items that can be stored in the file. (If ON or OFF is described in the list, the setting is stored as it is.)
×: Setting is not stored in the file.
—: Unstorable because of temporary operation, etc.

Function	Switch Item	Analog Item	SCENE File	REFERENCE File	LENS File	OPERATOR File	OHB File	Note
GAIN	Master Gain Select		○	○	×	×	×	-6 dB to +12 dB
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	×	×	×	×	○	
Black set		Black Set-R	×	×	×	×	○	
		Black Set-G	×	×	×	×	○	
		Black Set-B	×	×	×	×	○	
Test	Test1 on (TEST SAW)		×	×	×	×	×	
	Test2 ON		×	×	×	×	×	
Optical filter	Filter1 (ND)		○	×	×	×	×	
	Filter2 (CC)		○	×	×	×	×	
5600k	5600K ON		○	OFF	×	×	×	

Continued

Function	Switch Item	Analog Item	SCENE File	REFERENCE File	LENS File	OPERATOR File	OHB File	Note
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	×	×	×	×	○	
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	×	×	○	×	×	
White		White-R	○	○	OFF SET	×	×	
		White-G	○	○	×	×	×	
		White-B	○	○	OFF SET	×	×	
		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		×	×	×	×	×	

Continued

Function	Switch Item	Analog Item	SCENE File	REFERENCE File	LENS File	OPERATOR File	OHB File	Note
Detail	Detail Off		○	ON	×	×	×	
		Detail Level	○	○	×	×	×	
		Detail Limiter	○	○	×	×	×	
		Detail White Limiter	○	○	×	×	×	
		Detail Black Limiter	○	○	×	×	×	
		Detail Crispening	○	○	×	×	×	
		H Detail Frequency	○	○	×	×	×	
		Mix Ratio	○	○	×	×	×	
		HD Detail Level	○	○	×	×	×	
		HD Detail Limiter	○	×	×	×	×	
		HD Detail Crispening	○	○	×	×	×	
		HD Detail H Detail Frequency	○	○	×	×	×	
		HD Detail Mix Ratio	○	○	×	×	×	
		HD Detail White Limiter	○	○	×	×	×	
		HD Detail Black Limiter	○	○	×	×	×	
		4K Detail Level	○	○	×	×	×	
		4K Detail Limiter	○	×	×	×	×	
		4K Detail Crispening	○	○	×	×	×	
		4K Detail Frequency	○	○	×	×	×	
		4K Detail Mix Ratio	○	○	×	×	×	
		4K Detail White Limiter	○	○	×	×	×	
		4K Detail Black Limiter	○	○	×	×	×	
	V DTL control mode		×	○	×	×	×	
		Detail H/V Ratio	○	○	×	×	×	
		HD Detail H/V Ratio	○	○	×	×	×	
		4K Detail H/V Ratio	○	○	×	×	×	
	Level Dep. Off		○	○	×	×	×	
		Detail Level Depend	○	○	×	×	×	
		HD Detail Level Depend	○	○	×	×	×	
		4K Detail Level Depend	○	○	×	×	×	
	Knee Aperture On		○	○	×	×	×	
		Knee Aperture	○	○	×	×	×	
		HD Detail Knee Aperture	○	○	×	×	×	
		4K Detail Knee Aperture	○	○	×	×	×	
HDR Operation	Live HDR		×	×	×	×	×	
		SDR Gain	×	×	×	×	×	
		HDR Black Offset	×	×	×	×	×	
	HDR Knee ON		×	×	×	×	×	
		Knee Point	×	×	×	×	×	
		Knee Slope	×	×	×	×	×	
	HDR White Clip ON		×	×	×	×	×	
		HDR White Clip	×	×	×	×	×	

Continued

Function	Switch Item	Analog Item	SCENE File	REFERENCE File	LENS File	OPERATOR File	OHB File	Note
Skin Detail	Skin DTL On		○	○	×	×	×	
	Natural Skin Detail ON		○	○	×	×	×	
	Skin gate ON		×	×	×	×	×	
	Skin Detail Auto Hue (ch1)		×	×	×	×	×	
	Skin Detail Auto Hue (ch2)		×	×	×	×	×	
	Skin Detail Auto Hue (ch3)		×	×	×	×	×	
	Skin 1 On		ON	ON	×	×	×	
	Skin 1 Gate On		×	×	×	×	×	
		Skin 1 Level	○	○	×	×	×	
		Skin 1 Phase	○	○	×	×	×	
		Skin 1 Width	○	○	×	×	×	
		Skin 1 Sat	○	○	×	×	×	
		Skin 1 Limit	○	○	×	×	×	
	Skin 2 On		○	○	×	×	×	
	Skin 2 Gate On		×	×	×	×	×	
		Skin 2 Level	○	○	×	×	×	
		Skin 2 Phase	○	○	×	×	×	
		Skin 2 Width	○	○	×	×	×	
		Skin 2 Sat	○	○	×	×	×	
		Skin 2 Limit	○	○	×	×	×	
	Skin 3 On		○	○	×	×	×	
	Skin 3 Gate On		×	×	×	×	×	
		Skin 3 Level	○	○	×	×	×	
		Skin 3 Phase	○	○	×	×	×	
		Skin 3 Width	○	○	×	×	×	
		Skin 3 Sat	○	○	×	×	×	
		Skin 3 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	○	○	×	×	×	
	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		×	○	×	×	×	
Black Gamma	Black Gamma On		○	○	×	×	×	
		R Black Gamma	○	○	×	×	×	
		G Black Gamma	○	○	×	×	×	
		B Black Gamma	○	○	×	×	×	
		M Black Gamma	○	○	×	×	×	
	Black Gamma (RGB) Range		○	○	×	×	×	

Continued

Function	Switch Item	Analog Item	SCENE File	REFERENCE File	LENS File	OPERATOR File	OHB File	Note
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		○	○	×	×	×	
	User Gamma Table Select		○	○	×	×	×	
	Step Gamma (0.90 ～ 0.35)		○	○	×	×	×	
		R Gamma	○	○ (RGB mode)	×	×	×	
		G Gamma	○	○	×	×	×	
		B Gamma	○	○ (RGB mode)	×	×	×	
		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		○	○	×	×	×	
Digital extender	digital extender on		×	×	×	×	×	

Menu	Item	SCENE File	REFERENCE File	LENS File	OPERATOR File	OHB File	Note
USER MENU customize		–	–	–	○	–	
VF DISPLAY	EX	–	–	–	○	–	
	ZOOM	–	–	–	○	–	
	DISP	–	–	–	○	–	
	FOCUS	–	–	–	○	–	
	ND	–	–	–	○	–	
	CC	–	–	–	○	–	
	5600K	–	–	–	○	–	
	IRIS	–	–	–	○	–	
	D.EXT	–	–	–	○	–	
	GAIN	–	–	–	○	–	
	SHUTTER	–	–	–	○	–	
	BATT	–	–	–	○	–	
	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	–	–	–	○	–	
FOCUS POSITION METER1	FOCUS POSITION METER	–	–	–	○	–	
	NEAR LIMIT	–	–	–	○	–	
	FAR LIMIT	–	–	–	○	–	
	DIRECTION	–	–	–	○	–	
	SIZE	–	–	–	○	–	
	RULED LINE	–	–	–	○	–	
	INDEX COLOR	–	–	–	○	–	
	INDEX WIDTH	–	–	–	○	–	
	MARKER WIDTH	–	–	–	○	–	
FOCUS POSITION METER2	ADJUSTED SIGN	–	–	–	○	–	
	SENSE	–	–	–	○	–	
	NAME DISP	–	–	–	○	–	
	FRAME DISP	–	–	–	○	–	
	FRAME WIDTH	–	–	–	○	–	
	MARKER CONFIG	–	–	–	–	–	

Continued

Menu	Item	SCENE File	REFERENCE File	LENS File	OPERATOR File	OHB File	Note
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	–	–	–	○	–	
SPIRIT LEVEL	INDICATOR	–	–	–	○	–	
	MODE	–	–	–	○	–	
	REVERSE	–	–	–	○	–	
	SCALE	–	–	–	○	–	
	H POSITION	–	–	–	○	–	
	V POSITION	–	–	–	○	–	
	OFFSET	–	–	–	○	–	
VF OUT	VF OUT	–	–	–	○	–	
	CHARACTER LEVEL	–	–	–	○	–	

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
- OPERATION menu
- PAINT menu
- MAINTENANCE menu
- FILE menu
- DIAGNOSIS menu
- SERVICE menu

In this section, describes the setup menu operation as follows.
For example: When AUTO LEVEL in AUTO SETUP page of MAINTENANCE menu is performed:
MENU: MAINTENANCE
PAGE: AUTO SETUP
ITEM: AUTO LEVEL

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.

8-1-2. Settable Special Function

The following functions are made available by settings in the SERVICE menu. Note that they are limited functions.
Refer to the description in “8-2. SERVICE Menu”.

- 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

This unit is provided with the SERVICE menu that is useful for maintenance and adjustment of the camera.
The menu content is displayed on the monitor connected to the SDI MONI connector.
As for how to display the SERVICE menu, refer to “8-1-1. How to Display the SERVICE Menu/ How to Change the Setting Values”.

8-2-1. SERVICE Menu List

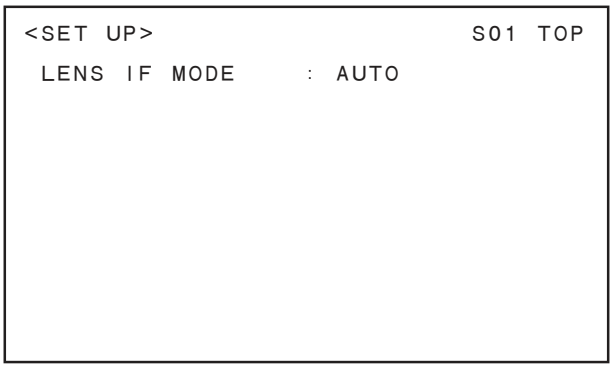
Menu No.	Menu Page Name	Remarks	Reference Page
S01	SET UP	Lens communications setting	Page 127
S02	CC FILTER	Color temperature conversion filter setting	Page 127
S03	MANUAL RPN	Manual RPN compensation	Page 128
S04	RPN MANAGE	RPN automatic detection	Page 128
S05	OHB-ADJ1	Sensitivity adjustment	Page 128
S06	BLACK SHADING	Black shading adjustment	Page 129
S07	WHITE SHADING	White shading adjustment	Page 129
S08	SERIAL NO.	Model name displaying, Serial number displaying	Page 129
S09	OPTION	Gain extend, Chroma filter characteristic setting	Page 130
S10	SCENE FILE CUSTOMIZE	Additional items to SCENE FILE setting	Page 130
S11	UPDATE	Executing version up or displaying version. * ALL IN PACKAGE FILE is not used in this model.	Page 131
S12	RF MONITOR	Reception state of the RF signal displaying	Page 131
S13	CD BASEBAND MONITOR 1	Reception state of the sync and the audio displaying	Page 131
S14	CD BASEBAND MONITOR 2	Used at the time of factory shipment	Page 132
S15	REFRESH SERIAL NO.	Model name, recovery data of the serial number reading FeliCa ID displaying	Page 132
S16	VCO ADJUST	VCO oscillation frequency adjustment	Page 132
S17	LOG	Log acquisition, Log clear	Page 133

8-2-2. Description of SERVICE Menu

Tip

The display screen appearing in this section shows the factory settings.

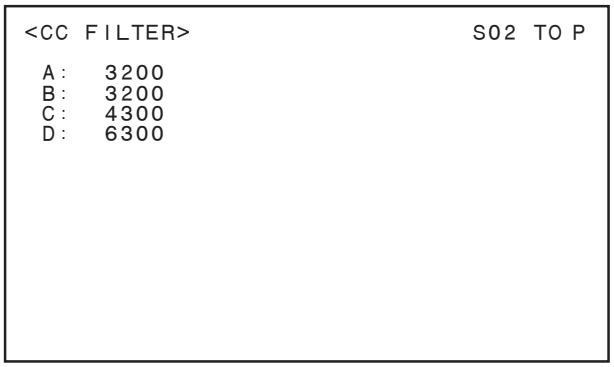
SET UP



LENS IF MODE

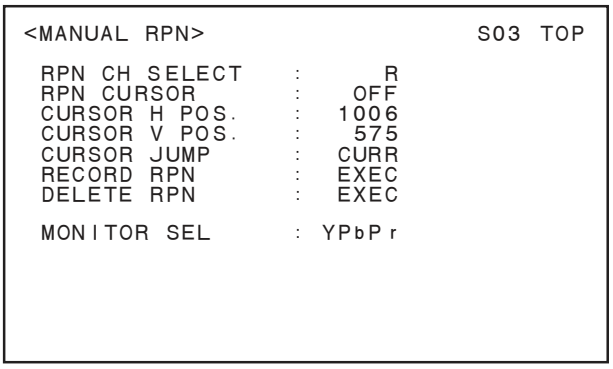
When a lens that is able to communicate with a camera through the serial interface, the interface mode can be changed forcibly to the parallel interface.
AUTO: Sets an interface automatically.
PARA: Sets a parallel interface forcibly.

CC FILTER



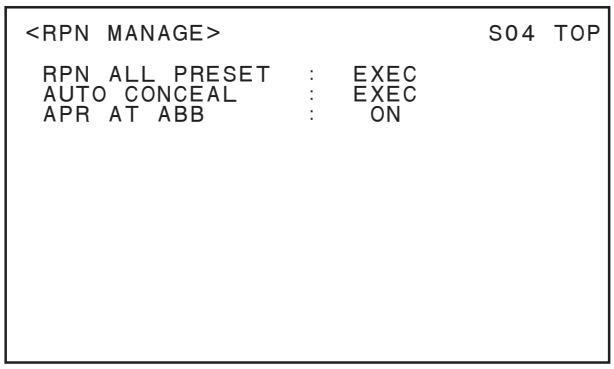
When the CC filter is replaced with a nonstandard color temperature conversion filter, change this setting. However, when the CC filter is replaced with a filter without color temperature conversion, such as cross filter, set 3200K. This setting is a reference for color temperature display and the color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

MANUAL RPN



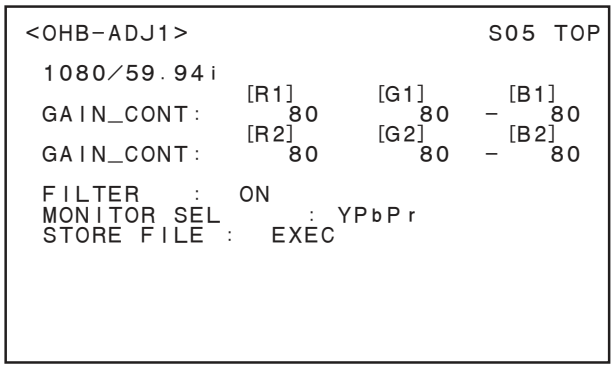
The MANUAL RPN menu is used for manual RPN compensation. For details, refer to “5-6-2. Manual RPN Compensation Adjustment”.

RPN MANAGE



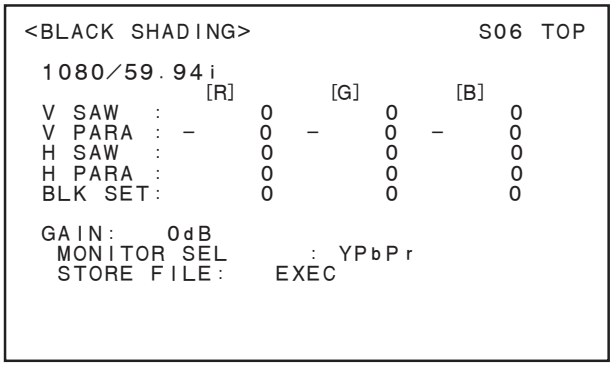
The RPN MANAGE menu is used for RPN compensation setting and management. For details, refer to “5-6-4. Performing Automatic RPN Detection Effectively”.

OHB-ADJ1



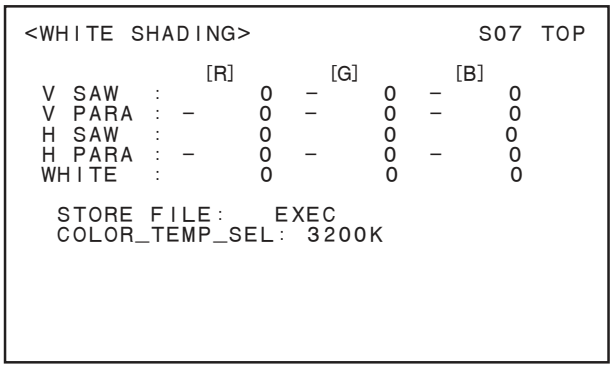
The OHB_ADJ1 menu is used for adjustment of the CMOS block. For details, refer to “5-3-1. Sensitivity Adjustment”.

BLACK SHADING



The BLACK SHADING menu is used for adjustment of the black shading. For details, refer to “5-3-2. Black Shading Adjustment”.

WHITE SHADING

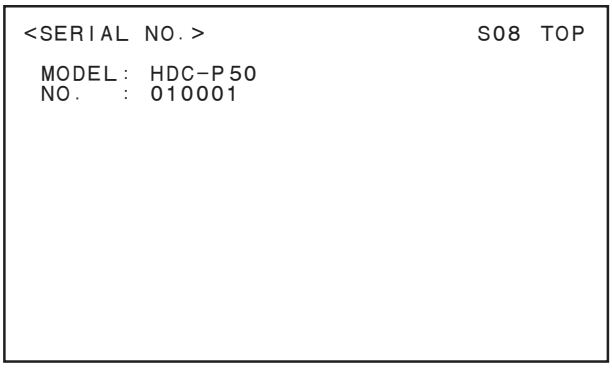


The WHITE SHADING menu is used for adjustment of the white shading. For details, refer to “5-3-3. White Shading Adjustment”.

SERIAL NO.

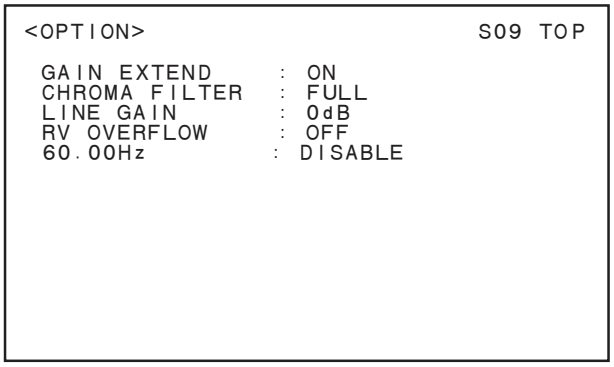
Tip

The display screen is the case of serial number 10001 of HDC-P50.



The SERIAL NO. menu is used for displaying the current model name and serial number.

OPTION



GAIN EXTEND

When GAIN EXTEND is set to “ON”, the master gain is extended up to +36 dB.
When it is set to “OFF”, the master gain is extended to +12 dB.

CHROMA FILTER

CHROMA FILTER is used for Chroma filter characteristic setting.

LINE GAIN

Not used. Leave this setting (0 dB) unchanged.

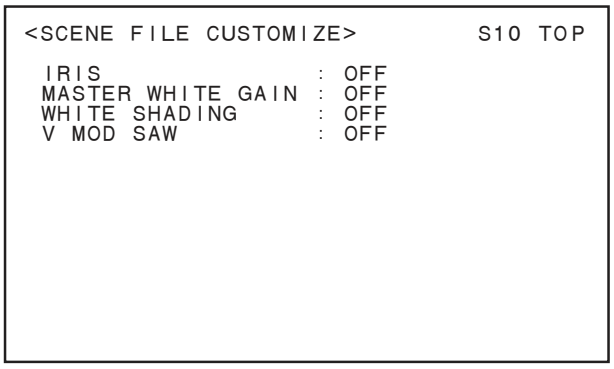
RV OVERFLOW

Not used. Leave this setting (OFF) unchanged.

60.00 Hz

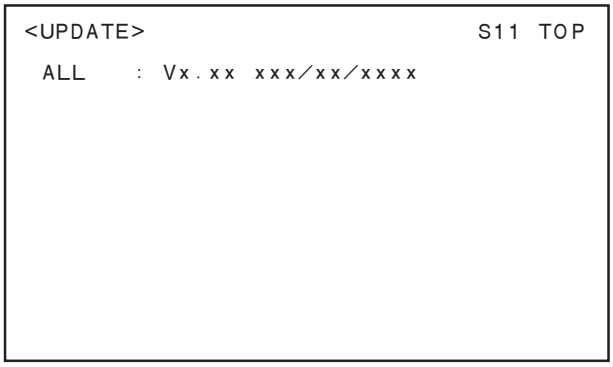
60.00 Hz is additionally selectable from the system format.

SCENE FILE CUSTOMIZE



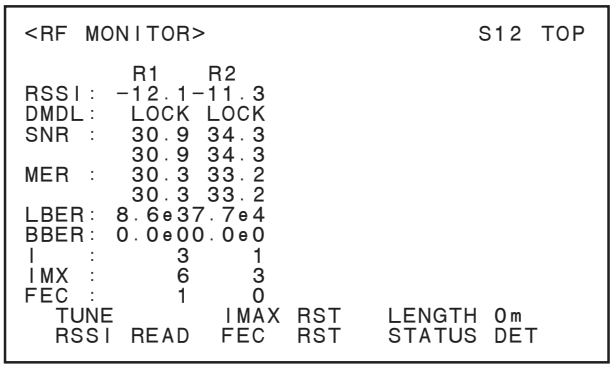
The SCENE FILE CUSTOMIZE menu is used for applying additional options.
Set the additional items to “ON” if necessary.

UPDATE



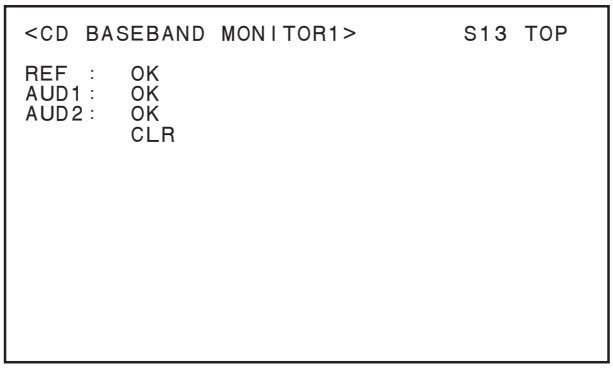
The UPDATE menu is used for executing VERSION UP or displaying VERSION on the ALL IN PACKAGE FILE.
The ALL IN PACKAGE FILE menu is not used in this model.

RF MONITOR



The RF MONITOR menu displays the signal reception status of the Digital-Triax model.
This menu is used for adjustment and confirmation in manufacturing.

CD BASEBAND MONITOR1



This menu is used for adjustment and confirmation in manufacturing.

CD BASEBAND MONITOR2

```
<CD BASEBAND MONITOR2>          S14 TOP

RXV ERR

 PCT   : 00 PDET 0: 0000 PDET11: 0000
 UPD   : 00 PDET 1: 0000 PDET12: 0000
 PAC   : 00 PDET 2: 0000 PDET13: 0000
 TU    : 00 PDET 3: 0000 PDET14: 0000
 BUSY  : 00 PDET 4: 0000
 PSLOT: 00 PDET 5: 0000 PDET_E: 0000
           PDET 6: 0000
           PDET 7: 0000
           PDET 8: 0000
           PDET 9: 0000
           PDET10: 0000
      CLR
```

This menu is used for adjustment and confirmation in manufacturing.

REFRESH SERIAL NO.

```
<REFRESH SERIAL NO.>            S15 TOP

 READ (USB→CAM)


 FeliCa ID
 00:00:00:00:00:00:00:00
 00:00:00:00:00:00:00:00
```

READ

READ is used for reading the model name stored in the USB drive and the recovery data on the serial number.
After replacement of AT board or NET board, perform this menu.

FeliCa ID

FeliCa ID displays ID of the FeliCa chip mounted on the camera.

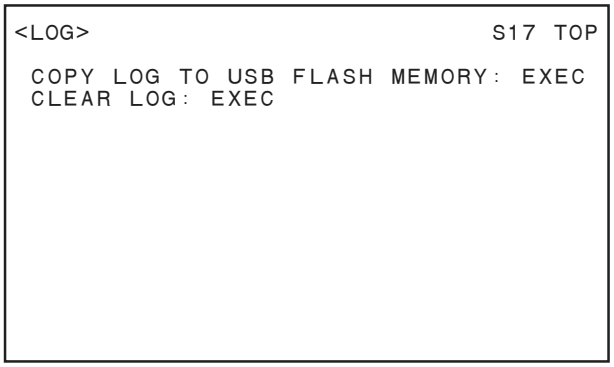
VCO ADJUST

```
<VCO ADJUST>                    S16 TOP

 VCO SDCK     :  132
 STORE FILE   :  EXEC
 VCO ADJUST   :  EXEC
```

The VCO ADJUST menu is used to adjust the VCO oscillation frequency. For details, refer to “5-7. Reference Signal System Adjustment”.

LOG



COPY LOG TO USB FLASH MEMORY

Acquires the following log information and then stores it in the USB drive installed in the unit.

- Detection of out-of-synchronization and clock unlocking of each device
- Internal video signal error detection and signal detection
- DRAM reset
- Abnormal temperature detection
- Format change
- S700P connection status change
- Connection status change of lens serial communication
- Startup information

Tip

Acquired log information is stored in the following directory of the USB drive.
\MSSONY\PRO\CAMERA\HDCP50

CLEAR LOG

Deletes the log data stored in the unit.

Section 9
Circuit Description

9-1. Optical System (OHB Block)

9-1-1. BI-358 Board

The BI-358 board contains a 2/3-inch CMOS image sensor (IC001), a thermometer (IC007), and power ICs (IC003, IC005) for analog circuits.
The common BI-358 board is used for R, G, and B respectively.

9-1-2. IF-1331 Board

The IF-1331 board contains a CMOS image sensor power circuit and a flash memory IC (IC010) that stores RPN automatic compensation (APR) data and sensor adjustment data.

9-1-3. DR-697 Board (HDC-P50)

The DR-697 board contains a CPU (IC001) and Motor Drivers (IC002, IC006) that control Filter Disc Unit.

9-1-4. DR-699 Board (HDC-P31)

The DR-699 board contains a CPU (IC001) and Motor Drivers (IC002) that control Filter Disc Unit.

9-1-5. SE-1197 Board (HDC-P50)

The SE-1197 board contains a potentiometer that detects a position of the Filter Disc Unit.

9-1-6. SE-1216 Board (HDC-P31)

The SE-1216 board contains a potentiometer that detects a position of the Filter Disc Unit.

9-2. Signal Processing/Transmission System

9-2-1. DPR-393 Board

The imaging signal that is input from the BI-358 board (R/G/B) is corrected by the camera signal processor ASIC IC (IC500). Then paint processing is added to the corrected signal in the camera processor IC (IC800).
The ASIC ICs have the following functions.

- Correction processor AISC (IC500)
  Correction processing (defects, shading, etc.)
- Paint processor ASIC ASIC (IC800)
  Camera process processing (Knee, Gamma, etc.) and enhanced processing

9-2-2. VIF-77 Board

The signals painted on the DPR-393 board are baseband processed in the FPGA (IC300).
The FPGA (IC300) has the following functions.

- Baseband processor FPGA (IC300)
  Generating SDI signal
  Multiplexing audio signal with the main-line signal
  Generating video signal for the viewfinder
- Equipped with a synchronization signal D/A converter and a reference clock signal generator

9-3. System Control System

9-3-1. AT-195 Board

The AT-195 board consists of a system control microcomputer IC (IC001) and a peripheral circuit. The flash memory (IC401) on the board stores the main program.
The AT-195 board is connected to the SY-471 board.

9-3-2. SY-471 Board

The SY-471 board consists of an FPGA IC (IC1001) and its peripheral devices. The SY-471 board also contains an interface control circuit, a video amplifier circuit, an audio signal processing circuit, and a sync separator circuit.

Interface control circuits

The interface control circuits are equipped with the following functions.

- Parallel bus communication among the AT-195 board, the DPR-393 board, VIF-77 board and other transmission system boards
- SPI communication with image sensors
- I^2C communication with the FDU
- 700 protocol communication between the main unit and the remote control unit (RM)
- Serial/parallel lens control
- Fan control
- Tally control
- Rotary encoder input
- Switch input
- Clock generation for audio PLL and A/D and D/A converters
- Power supply to NFC and sensors and communication control

Audio signal processing circuit

The MIC 1 input audio A/D converters and analog/digital signal processing circuits are provided.

9-4. Interface Boards

9-4-1. SW-1753 Board

The SW-1753 board contains switches, a rotary encoder, LEDs and connectors for external interface.

- CAMERA POWER (camera power) switch (S001)
- DISPLAY/MENU switch (S002)
- MENU SEL/ENTER rotary encoder (EN001)
- Rear lamp red, green, blue (D002 and D003)
- CAMERA POWER indicator (D001)
- REF IN indicator (D004)
- RCP/MSU indicator (D005)
- USB connector (USB2.0 type A: CN003)
- EXT I/O (external input/output) connector (9-pin D-sub: CN004)

In addition to these parts, this board contains an LED driver (IC004) and an IO expander for switches (IC001).

9-4-2. CN-4064 Board

The CN-4064 board contains a NETWORK connector.

- RJ45 connector (J001)

9-4-3. CN-4065 Board

The CN-4065 board contains a synchronization signal output/external synchronization signal input connector and a remote control connector.

- GL/SYNC connector (BNC type: J001)
- REMOTE connector (8-pin round type: CN002)

9-4-4. CN-4066 Board

The CN-4066 board contains a DC power input connector.

- DC IN connector (4-pin XLR: CN001)

9-4-5. LE-426 Board

The LE-426 board contains a lens connection connector and front tally LEDs (red and green).

- LENS connector (12-pin round type, CN001)

9-4-6. NET-49 Board

The NET-49 board contains an NFC IC (IC1).

9-4-7. MB-1259 Board

The MB-1259 board contains an interface connector (for the SY board, DPR board, VIF board and NET board), an FRAM IC (IC102) for storing set values, an acceleration sensor (SE101), and ICs for monitoring power consumption of each board (IC205, IC206, IC207 and IC215).

9-5. Power Supply System

9-5-1. MB-1259 Board

The MB-1259 board monitors the input voltage and controls each output of LENS, EXT I/O and REMOTE with IC210 to IC213. This board contains the following as a power supply circuit.

- +5.5 V DC/DC converter (IC202)
- -5.5 V DC/DC converter (IC203)
- Fan DC/DC converter (IC201)

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

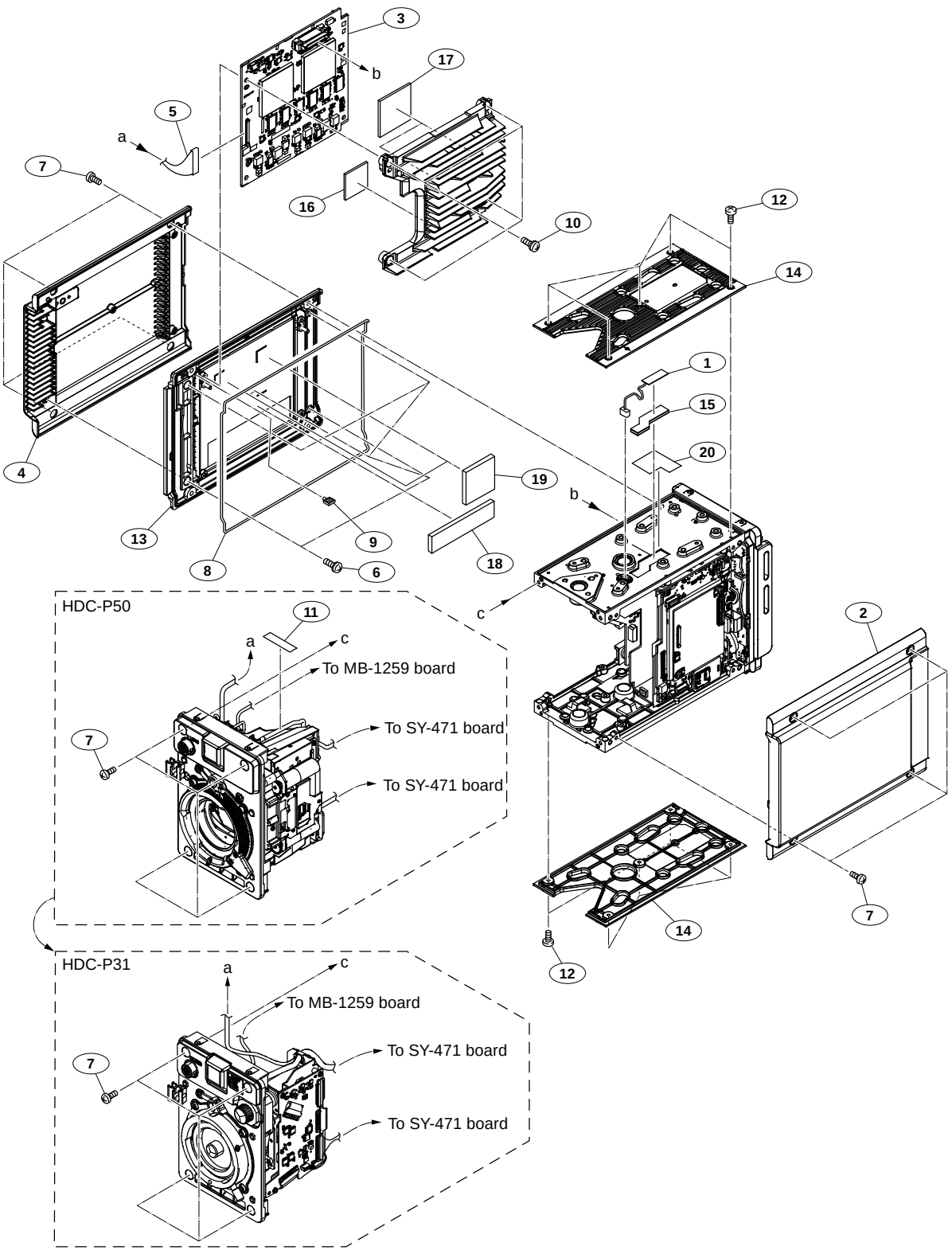
部品表のSP（Supply code）欄に “o” で示される部品は在庫していないことがあり，納期が長くなることがあります。

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。

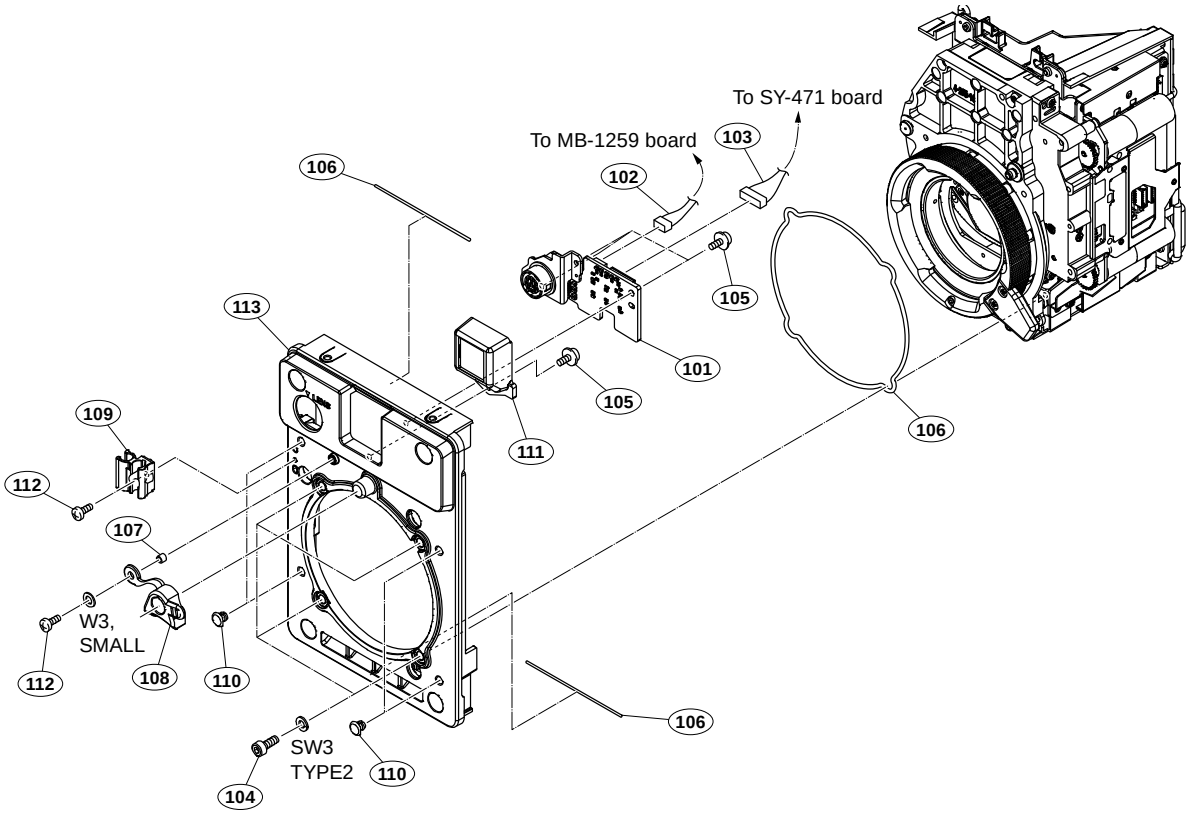
10-2. Exploded Views

Overall-1



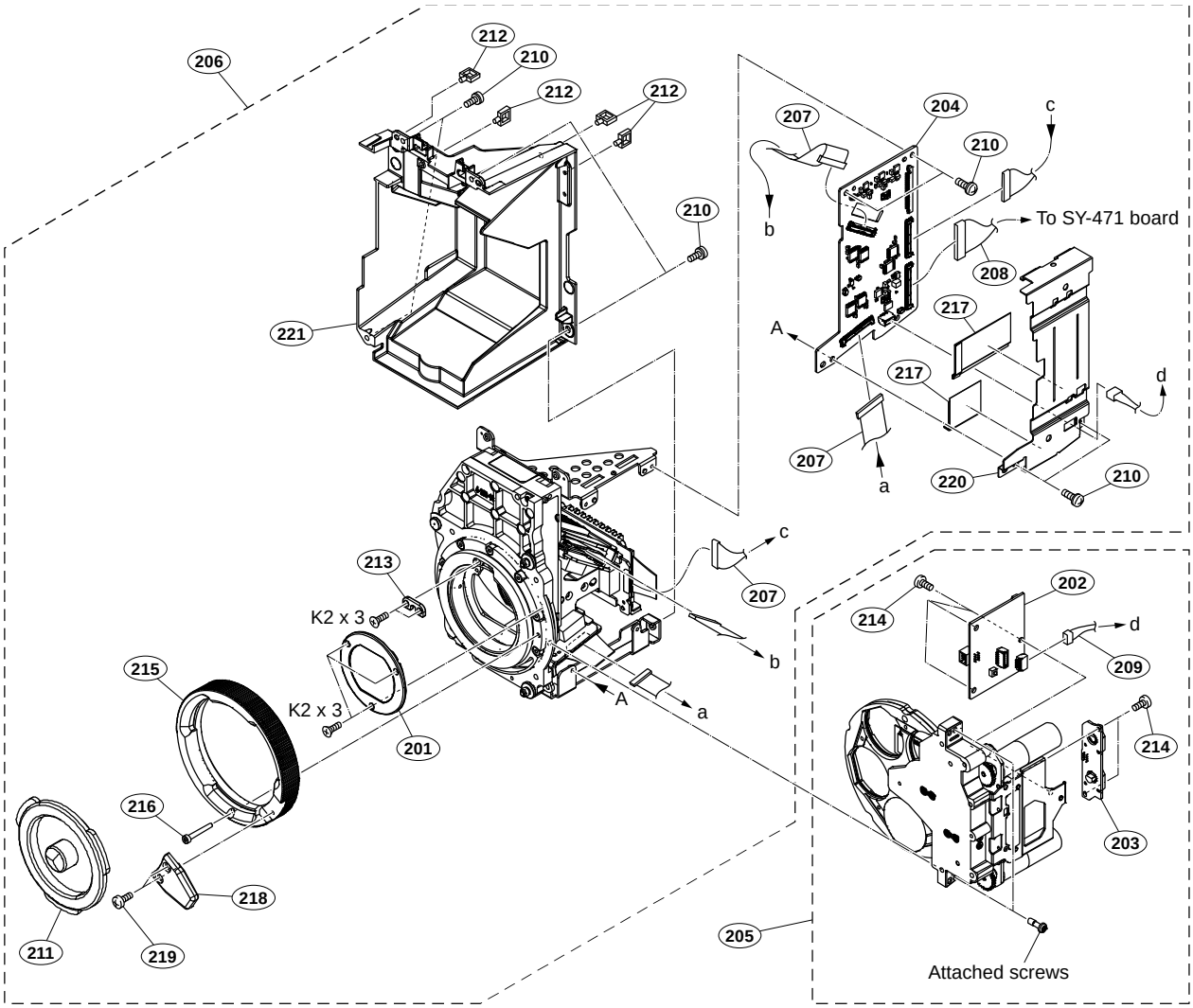
No.	Part No.	SP	Description
1	A-2227-055-A	s	ANTENNA ASSY
2	A-2227-674-A	s	INSIDE ASSY
3	A-5003-619-A	s	DPR-393 COMPL (HDC-P50)
	A-5023-889-A	s	DPR-393(HD) COMPL (HDC-P31)
4	A-5005-450-A	s	OUTSIDE COVER ASSY (RP)
5	1-970-071-21	s	WIRE, CONNECTOR WITH LEAD (DPR
6	2-640-315-02	o	SCREW (M2X5), SMALL, +P, SW
7	3-603-679-02	s	STAINLESS SCREW +B3X10
8	3-624-456-01	s	TUBE,SHIELD
9	3-742-419-01	o	CLAMP, HARNESS
10	4-382-854-01	s	SCREW (M3X8), P, SW (+)
11	4-446-014-01	s	TAPE AS (2040)
12	4-696-019-01	s	SCREW IB-LOCK(M2,BINDING HEAD)
13	4-745-672-02	s	PANEL, OUT SIDE
14	4-745-688-01	s	COVER, BOTTOM
15	4-746-465-01	s	CUSHION, NFC
16	⚠ 4-747-401-01	s	SHEET (VIF), RADIATION
17	⚠ 4-747-402-01	s	SHEET (DPR), RADIATION
18	⚠ 5-001-321-01	s	SHEET (DDRH), RADIATION
19	⚠ 5-001-322-01	s	SHEET (DPRH), RADIATION
20	5-003-016-01	s	NFC FERRITE SHEET

Front Block (HDC-P50)



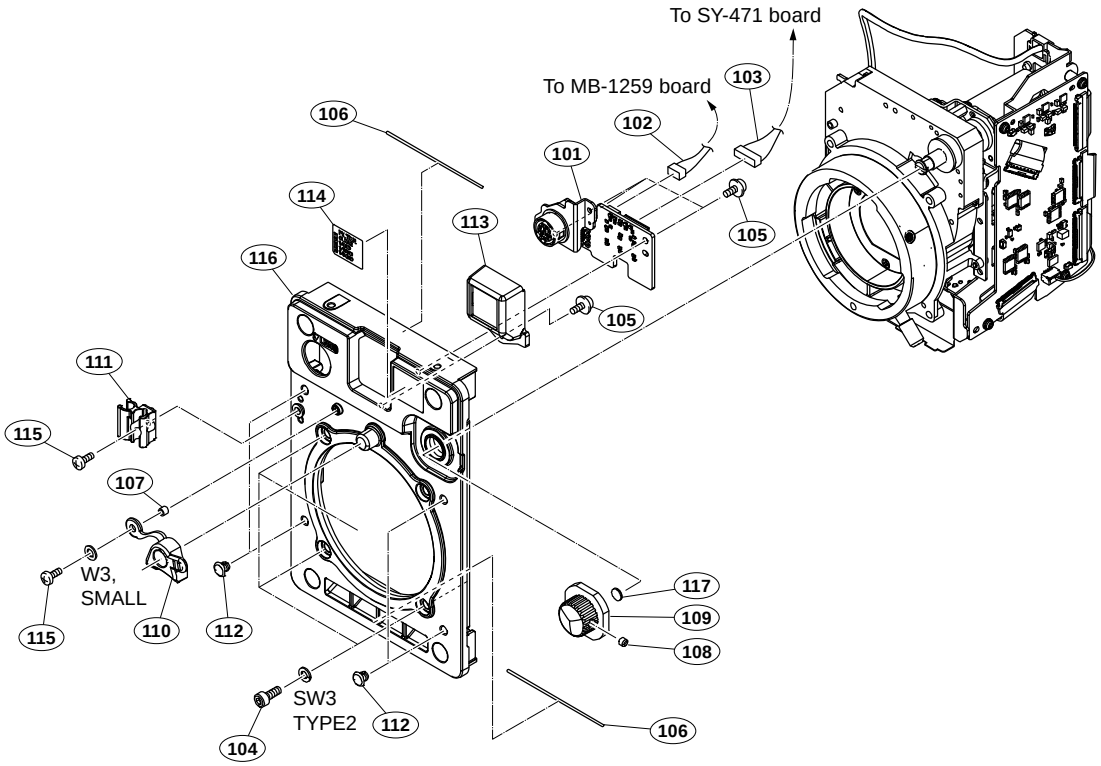
No.	Part No.	SP	Description
101	A-2226-693-A	s	MOUNT, LE-426
102	1-001-816-11	s	SUB HARNESS(FRONT)
103	1-001-817-11	s	SUB HARNESS(LENS)
104	2-623-773-11	s	BOLT (M3X8), STAINLESS
105	2-640-315-02	o	SCREW (M2X5), SMALL, +P, SW
106	3-624-456-01	s	TUBE,SHIELD
107	3-657-841-31	s	SPACER (2X2.5)
108	3-796-982-03	s	HOLDER, LENS MOUNT
109	4-138-678-01	s	CLAMP, CABLE
110	4-138-679-01	s	SCREW, BLIND
111	4-170-403-02	s	COVER, TALLY
112	4-696-019-01	s	SCREW IB-LOCK(M2,BINDING HEAD)
113	4-745-687-01	s	PANEL, FRONT
	7-623-208-22	s	SW 3,TYPE 2
	7-688-003-02	s	W 3, SMALL

CMOS Block (HDC-P50)



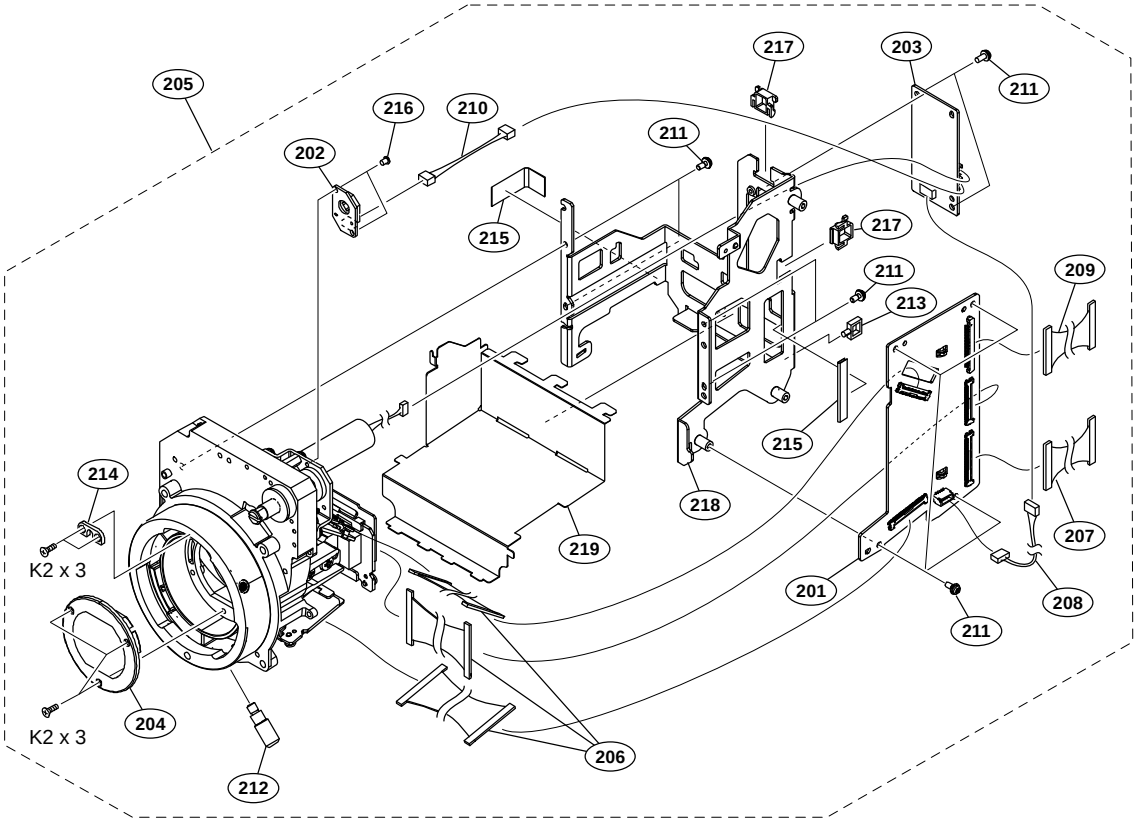
No.	Part No.	SP	Description
201	A-2144-615-A	s	OLPF ASSY
202	A-2197-779-A	s	DR-697 MOUNT
203	A-2197-780-A	s	SE-1197 MOUNT
204	A-2197-795-A	s	IF-1331 MOUNT
205	A-2229-264-A	s	FD ASSY(Z) (RP)
206	A-5005-448-A	s	CMOS BLOCK ASSY (RP)
207	1-912-824-11	s	MICRO COAXIAL CABLE (IF-BI(40)
208	1-912-825-11	s	MICRO COAXIAL CABLE (SY-IF(50)
209	1-967-833-11	s	HARNESS, SUB (FT-I2C)
210	2-640-315-02	o	SCREW (M2X5), SMALL, +P, SW
211	3-699-048-02	s	CAP, MOUNT
212	3-742-419-01	o	CLAMP, HARNESS
213	3-776-897-02	s	GUIDE PLATE
214	3-968-729-82	s	SCREW (M2), NEW TRUSTER, P2
215	4-263-184-04	s	RING, BAYONET
216	4-264-474-01	s	BOLT,BHS M2X15
217	4-446-014-01	s	TAPE AS (2040)
218	4-562-323-01	s	LEVER, MOUNT
219	4-696-019-01	s	SCREW IB-LOCK(M2,BINDING HEAD)
220	4-740-597-01	s	COVER (860), IF HOLDER
221	4-745-685-01	s	DUCT, OHB
	7-627-452-18	s	SCREW,PRECISION +K 2X3

Front Block (HDC-P31)



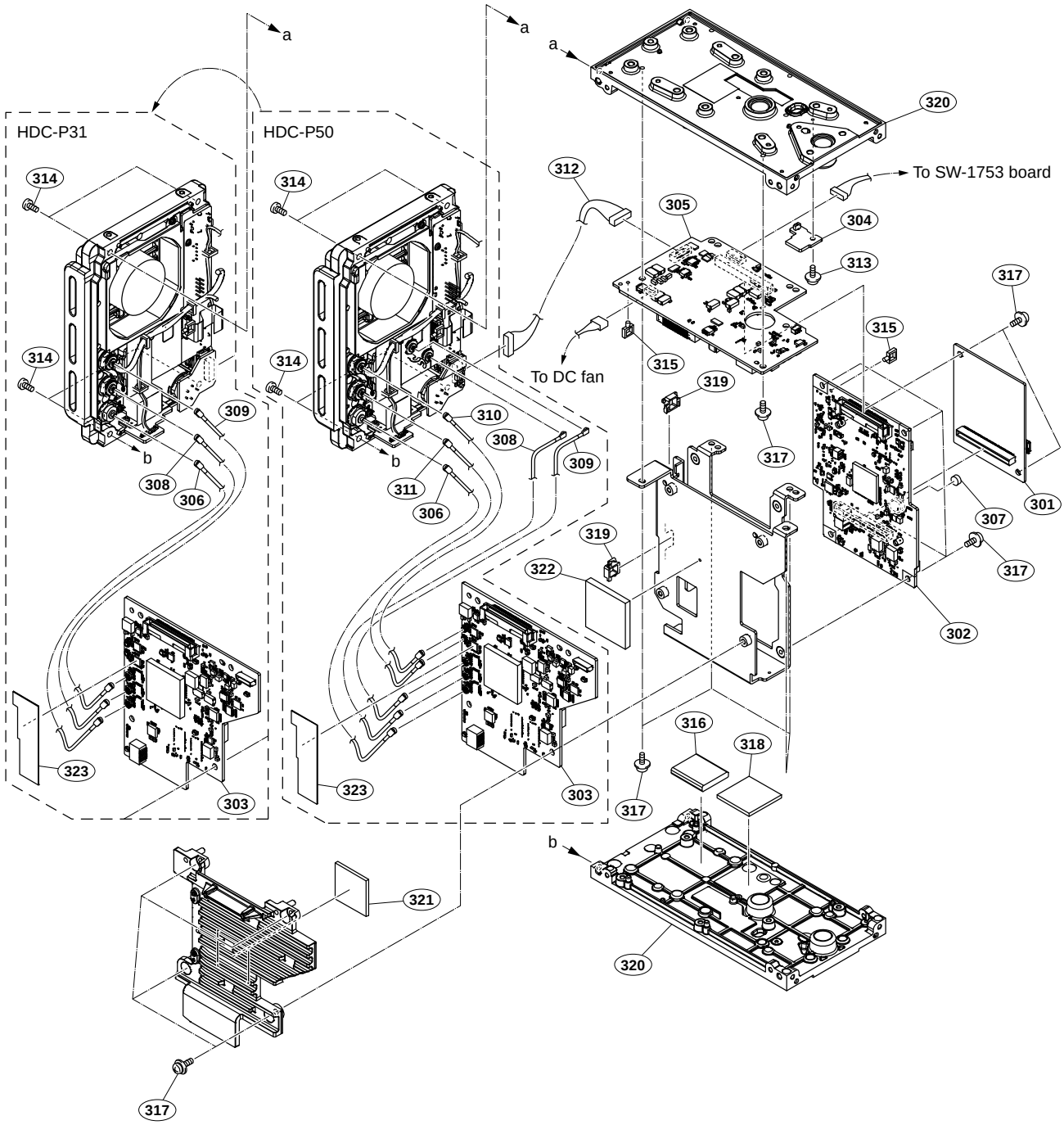
No.	Part No.	SP	Description
101	A-2226-693-A	s	MOUNT, LE-426
102	1-001-816-11	s	SUB HARNESS(FRONT)
103	1-001-817-11	s	SUB HARNESS(LENS)
104	2-623-773-11	s	BOLT (M3X8), STAINLESS
105	2-640-315-02	s	SCREW (M2X5), SMALL, +P, SW
106	3-624-456-01	s	TUBE,SHIELD
107	3-657-841-31	s	SPACER (2X2.5)
108	3-701-505-01	s	SET SCREW, DOUBLE POINT 3X3
109	3-710-054-01	s	KNOB, FILTER
110	3-796-982-03	s	HOLDER, LENS MOUNT
111	4-138-678-01	s	CLAMP, CABLE
112	4-138-679-01	s	SCREW, BLIND
113	4-170-403-02	s	COVER, TALLY
114	4-574-532-01	s	LABEL, FILTER INDICATION
115	4-696-019-01	s	SCREW IB-LOCK(M2,BINDING HEAD)
116	5-022-298-01	s	PANEL (P31), FRONT
117	5-022-299-01	s	SHEET, FILTER
	7-623-208-22	s	SW 3,TYPE 2
	7-688-003-02	s	W 3, SMALL

CMOS Block (HDC-P31)



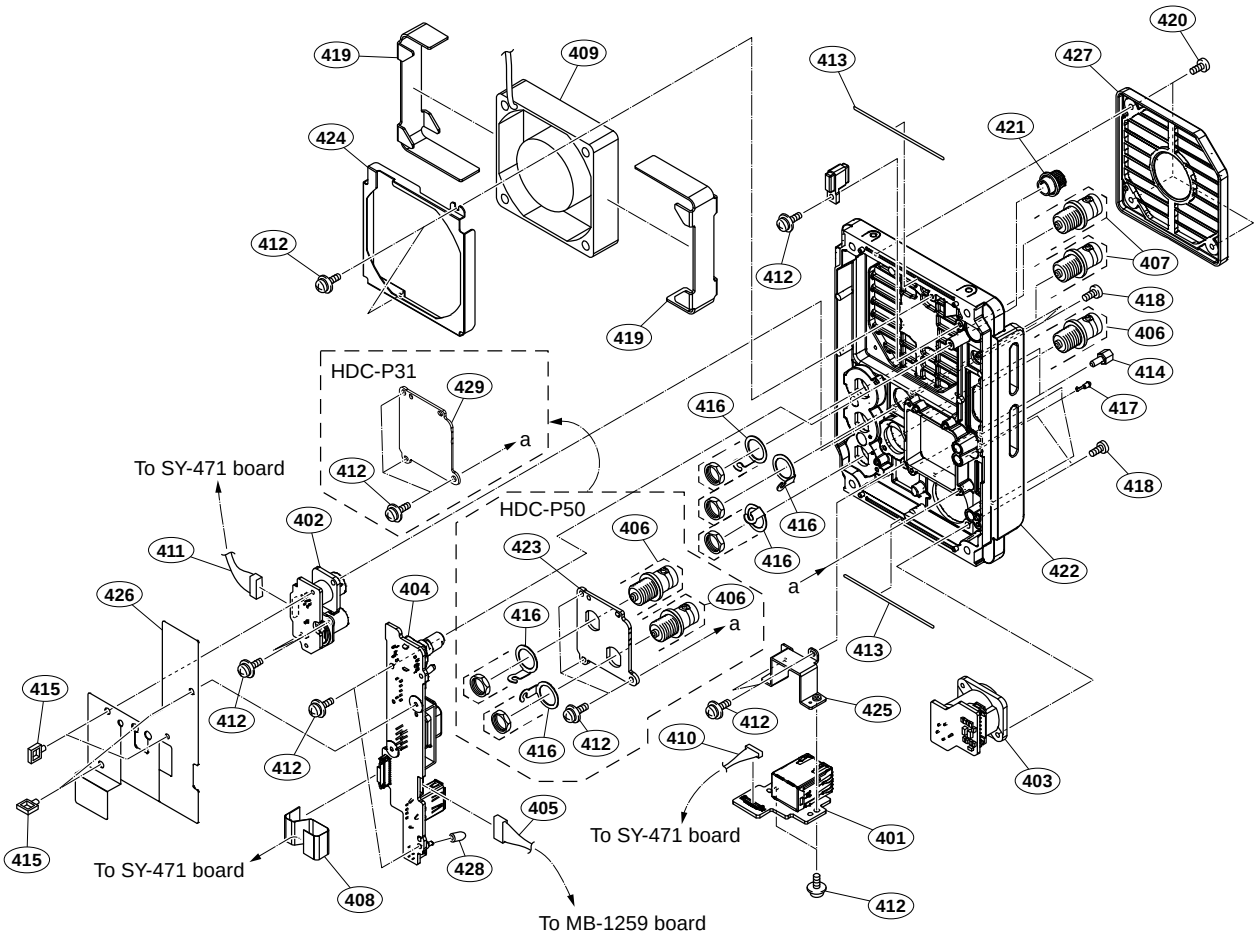
No.	Part No.	SP	Description
201	A-2197-795-A	s	IF-1331 MOUNT
202	A-2225-143-A	s	SE-1216 MOUNT
203	A-2225-144-A	s	DR-699 MOUNT
204	A-2225-693-A	s	OLPF ASSY (Z)
205	A-5026-095-A	s	CMOS BLOCK ASSY (RP)
206	1-912-824-11	s	MICRO COAXIAL CABLE (IF-BI(40)
207	1-912-825-11	s	MICRO COAXIAL CABLE (SY-IF(50)
208	1-967-833-21	s	HARNESS, SUB (FT-I2C)
209	1-970-071-21	s	WIRE, CONNECTOR WITH LEAD (DPR
210	1-971-166-12	s	HARNESS, SUB (POT)
211	2-640-315-02	s	SCREW (M2X5), SMALL, +P, SW
212	3-678-629-04	s	LEVER, MOUNT
213	3-742-419-01	o	CLAMP, HARNESS
214	3-776-897-02	s	GUIDE PLATE
215	4-431-734-01	s	TAPE AS
216	4-590-492-02	s	SCREW, POT STEP
217	4-641-552-01	o	SADDLE, LOCK EDGE
218	5-022-296-01	s	HOLDER (P31), IF
219	5-022-297-01	s	DUCT SHEET (P31), OHB
	7-627-452-18	s	SCREW,PRECISION +K 2X3

Overall-2


HDC-P31
HDC-P50
a
b
To SW-1753 board
To DC fan
320
312
305
304
313
317
315
319
314
309
310
308
306
311
307
301
322
302
316
318
323
303
321

No.		Part No.	SP	Description
301		A-5003-617-A	s	AT-195C COMPL
302		A-5003-618-A	s	SY-471 COMPL
303		A-5003-620-A	s	VIF-77 COMPL
304		A-5003-621-A	s	NET-49 COMPL
305		A-5003-622-A	s	MB-1259 COMPL
306		1-001-819-11	s	COAXIAL HARNESS(60MM)(YELLOW)
307	⚠	1-756-134-18	s	BATTERY, LITHIUM (SECONDARY)
308		1-846-804-11	s	HARNESS, COAXIAL(85MM)(ORANGE)
309		1-846-805-11	s	HARNESS, COAXIAL(85MM)(GREEN)
310		1-912-828-12	s	COAXIAL CABLE(SDI1)
311		1-912-874-12	s	COAXIAL CABLE (D.FL75)(SDI 2)
312		1-966-073-11	s	HARNESS, SUB (MB-CN)
313		2-640-315-02	o	SCREW (M2X5), SMALL, +P, SW
314		3-603-679-02	s	STAINLESS SCREW +B3X10
315		3-742-419-01	o	CLAMP, HARNESS
316		4-000-494-01	s	FOAM (MFT), SHIELD
317		4-382-854-01	s	SCREW (M3X8), P, SW (+)
318		4-471-145-01	s	SHEET, RADIATION (L)
319		4-641-552-01	o	SADDLE, LOCK EDGE
320		4-745-689-01	s	PANEL, BOTTOM
321	⚠	4-747-401-01	s	SHEET (VIF), RADIATION
322	⚠	5-001-322-01	s	SHEET (DPRH), RADIATION
323		5-004-072-01	s	WAVE ABSORPTION SHEET

Rear Block



No.	Part No.	SP	Description
401	A-2226-687-A	s	MOUNT, CN-4064
402	A-2226-688-A	s	MOUNT, CN-4065
403	A-2226-689-A	s	MOUNT, CN-4066
404	A-2226-695-A	s	MOUNT, SW-1753
405	1-001-818-11	s	SUB HARNESS(SW)
406	1-784-240-11	s	CONVERTER, COAXIAL CONNECTOR
407	1-844-930-11	s	CONNECTOR, COAXIAL (BNC) (HDC-P50)
	1-784-240-11	s	CONVERTER, COAXIAL CONNECTOR (HDC-P31)
408	1-848-790-11	s	FLEXIBLE FLAT CABLE (24 CORE)
409	⚠ 1-855-154-11	s	FAN, DC (60 SQUARE)
410	1-912-393-11	s	CONNECTION CABLE WITH COAXIAL
411	1-968-154-11	s	HARNESS, SUB (REMOTE)
412	2-640-315-02	o	SCREW (M2X5), SMALL, +P, SW
413	3-624-456-01	s	TUBE,SHIELD
414	3-673-910-33	s	SCREW, CONNECTOR
415	3-742-419-01	o	CLAMP, HARNESS
416	4-136-517-01	s	WASHER, BNC COAXIAL FIXED
417	4-170-412-02	s	GUIDE, LIGHT
418	4-559-446-02	s	SCREW, +P2.6X5 NEW TRUSTER
419	4-689-064-01	s	CUSHION, FAN
420	4-696-019-01	s	SCREW IB-LOCK(M2,BINDING HEAD)
421	4-742-807-01	s	KNOB, ENCODER
422	4-745-678-01	s	PANEL, REAR
423	4-745-679-01	s	BRACKET (BNC)
424	4-745-680-01	s	BRACKET, FAN
425	4-745-681-01	s	BRACKET, ETHERNET
426	4-745-682-01	s	SHEET, REAR HARNESS PROTECTION
427	⚠ 4-745-683-01	s	COVER, FAN
428	3-869-842-01	s	CAP,SW
429	5-022-295-01	s	BRACKET, (P31), BNC

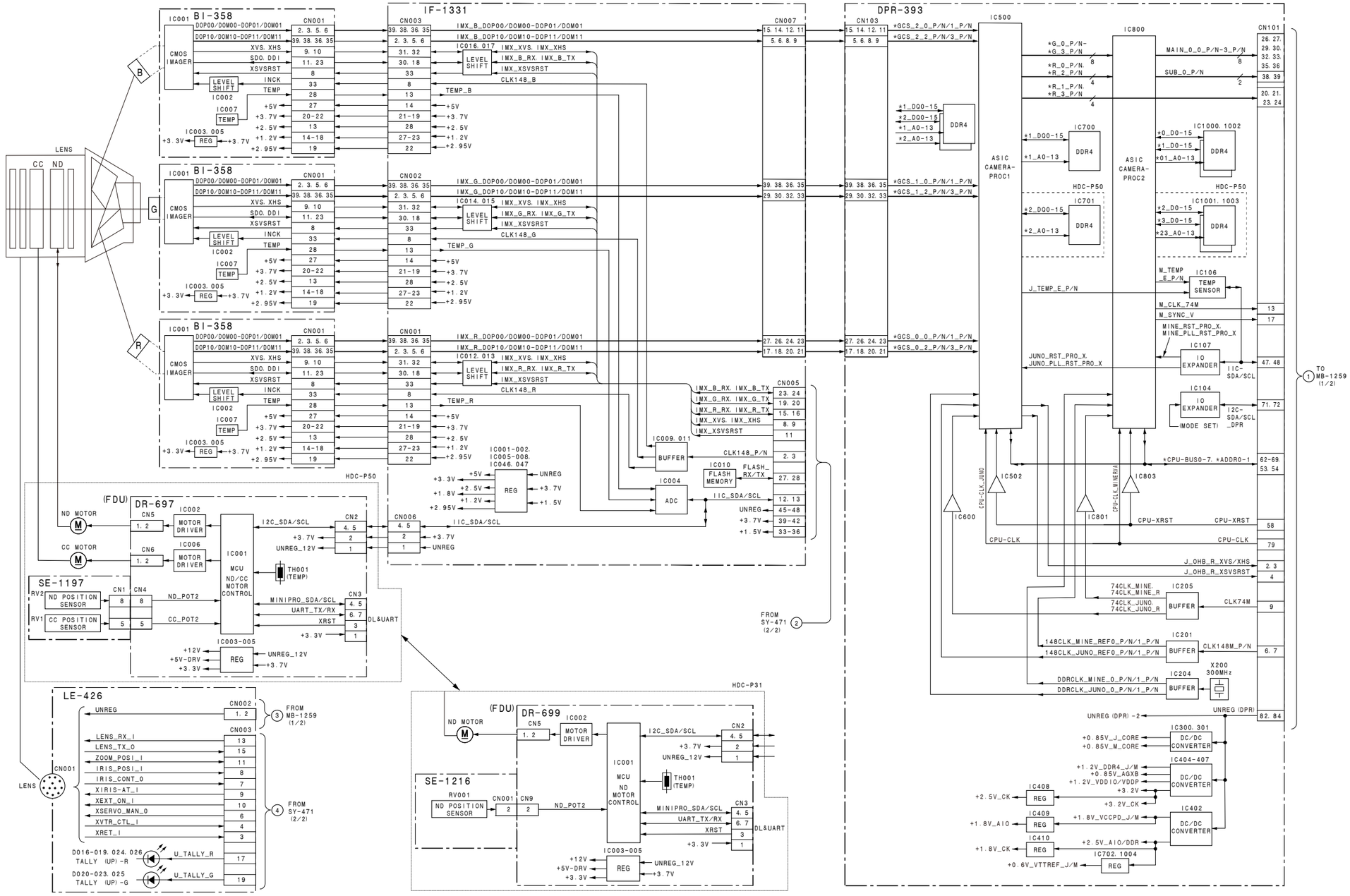
10-3. Supplied Accessories

Q'ty	Part No.	SP	Description
1pc	4-170-413-01	s	PLATE, NUMBER

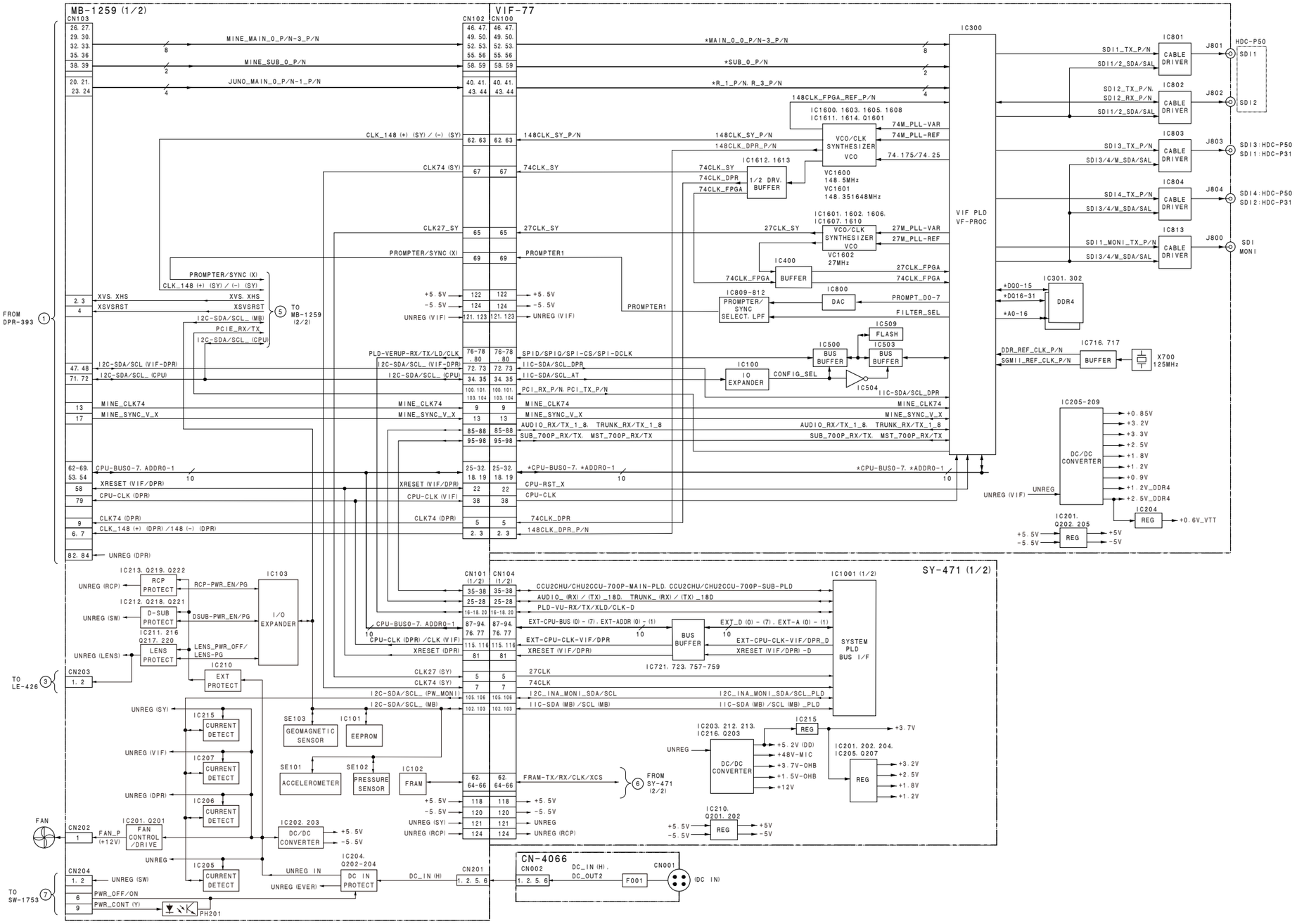
Section 11
Diagrams

Overall

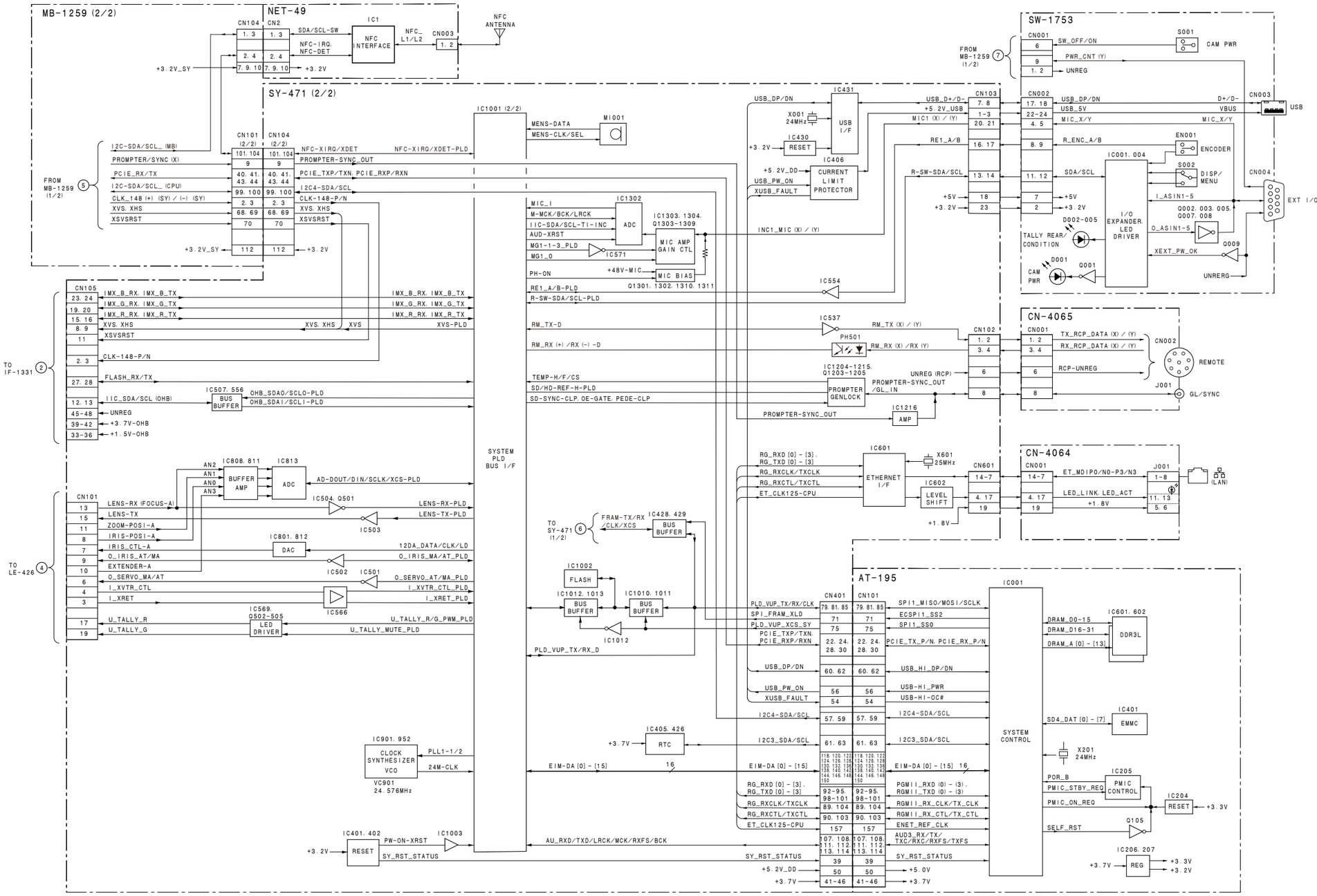
Overall (1/3)



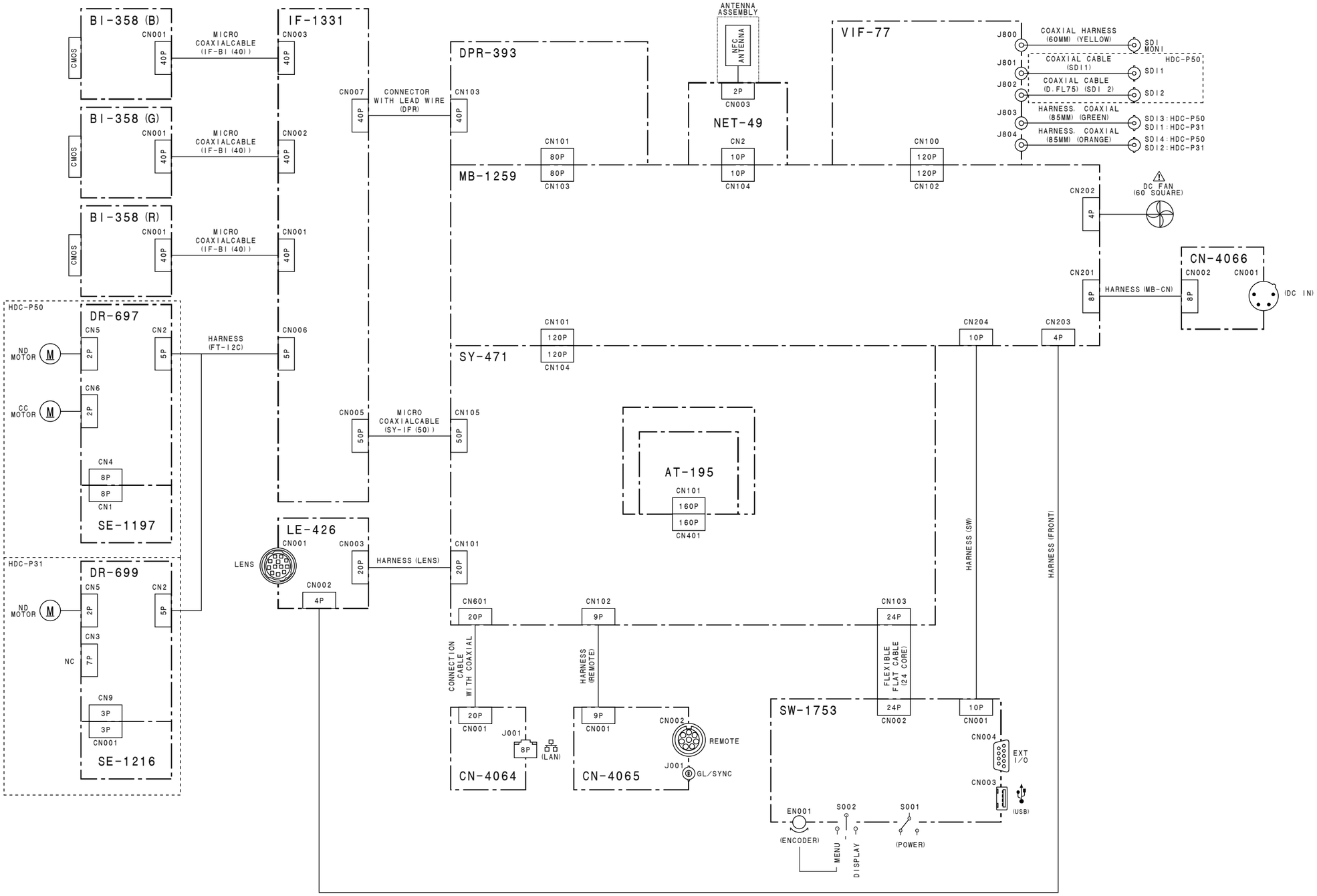
Overall (2/3)


MB-1259 (1/2)
VIF-77
SY-471 (1/2)
CN-4066
FROM DPR-393
TO MB-1259 (2/2)
TO LE-426
TO SW-1753
FROM SY-471 (2/2)
MINE_MAIN_0_P/N-3_P/N
MINE_SUB_0_P/N
JUNO_MAIN_0_P/N-1_P/N
*MAIN_0_0_P/N-3_P/N
*SUB_0_P/N
*R_1_P/N, R_3_P/N
148CLK_FPGA_REF_P/N
CLK_148 (+) (SY) / (-) (SY)
148CLK_SY_P/N
148CLK_DPR_P/N
CLK74 (SY)
74CLK_SY
CLK27_SY
27CLK_SY
PROMPTER/SYNC (X)
PROMPTER1
XVS, XHS
XSVSRST
I2C-SDA/SCL_ (MB)
PCIE_RX/TX
I2C-SDA/SCL_ (CPU)
+5.5V
-5.5V
UNREG (VIF)
PLD-VERUP-RX/TX/LD/CLK
I2C-SDA/SCL_ (VIF-DPR)
SPID/SPIQ/SPI-CS/SPI-DCLK
IIC-SDA/SCL_DPR
IIC-SDA/SCL_AT
PCI_RX_P/N, PCI_TX_P/N
MINE_CLK74
MINE_SYNC_V_X
AUDIO_RX/TX_1_8, TRUNK_RX/TX_1_8
SUB_700P_RX/TX, MST_700P_RX/TX
CPU-BUS0-7, ADDR0-1
XRESET (VIF/DPR)
CPU-CLK (DPR)
CPU-CLK (VIF)
CPU-RST_X
CLK74 (DPR)
74CLK_DPR
UNREG (DPR)
IC300
VIF PLD VF-PROC
IC1600, 1603, 1605, 1608
IC1611, 1614, Q1601
VCO/CLK SYNTHESIZER VCO
74M_PLL-VAR
74M_PLL-REF
74.175/74.25
VC1600 148.5MHz
VC1601 148.351648MHz
IC1612, 1613
1/2 DRV. BUFFER
IC1601, 1602, 1606, IC1607, 1610
27M_PLL-VAR
27M_PLL-REF
VC1602 27MHz
IC400
BUFFER
27CLK_FPGA
74CLK_FPGA
IC809-812
PROMPTER/ SYNC SELECT, LPF
IC800
DAC
PROMPT_D0-7
FILTER_SEL
IC500
BUS BUFFER
IC509
FLASH
IC503
BUS BUFFER
IC100
IO EXPANDER
CONFIG_SEL
IC504
IIC-SDA/SCL_DPR
IC801
IC802
IC803
IC804
IC813
CABLE DRIVER
SDI1_TX_P/N
SDI1/2_SDA/SAL
SDI2_TX_P/N,
SDI2_RX_P/N
SDI3_TX_P/N
SDI3/4/M_SDA/SAL
SDI4_TX_P/N
SDI1_MONI_TX_P/N
J801
J802
J803
J804
J800
HDC-P50
SDI1
SDI2
SDI3:HDC-P50
SDI1:HDC-P31
SDI4:HDC-P50
SDI2:HDC-P31
SDI MONI
IC301, 302
DDR4
*D00-15
*D016-31
*A0-16
IC716, 717
BUFFER
DDR_REF_CLK_P/N
SGMII_REF_CLK_P/N
X700 125MHz
IC205-209
DC/DC CONVERTER
+0.85V
+3.2V
+3.3V
+2.5V
+1.8V
+1.2V
+0.9V
+1.2V_DDR4
+2.5V_DDR4
IC204
REG
+0.6V_VTT
IC201, Q202, 205
+5V
-5V
IC213, Q219, Q222
RCP PROTECT
RCP-PWR_EN/PG
IC212, Q218, Q221
D-SUB PROTECT
DSUB-PWR_EN/PG
IC211, 216 Q217, 220
LENS PROTECT
LENS_PWR_OFF/ LENS-PG
IC210
EXT PROTECT
I/O EXPANDER
IC103
UNREG (RCP)
UNREG (SW)
UNREG (LENS)
CN203
CN101 (1/2)
CN104 (1/2)
CCU2CHU/CHU2CCU-700P-MAIN-PLD, CCU2CHU/CHU2CCU-700P-SUB-PLD
AUDIO_ (RX) / (TX) _18D, TRUNK_ (RX) / (TX) _18D
PLD-VU-RX/TX/XLD/CLK-D
EXT-CPU-BUS (0) - (7), EXT-ADDR (0) - (1)
EXT-CPU-CLK-VIF/DPR
XRESET (VIF/DPR)
BUS BUFFER
EXT_D (0) - (7), EXT-A (0) - (1)
EXT-CPU-CLK-VIF/DPR_D
XRESET (VIF/DPR) -D
IC721, 723, 757-759
IC1001 (1/2)
SYSTEM PLD BUS I/F
CPU-BUS0-7, ADDR0-1
CPU-CLK (DPR) /CLK (VIF)
XRESET (DPR)
CLK27 (SY)
CLK74 (SY)
27CLK
74CLK
I2C_INA_MONI_SDA/SCL
I2C_INA_MONI_SDA/SCL_PLD
I2C-SDA/SCL_ (PW_MONI)
I2C-SDA/SCL_ (MB)
IIC-SDA (MB) /SCL (MB)
IIC-SDA (MB) /SCL (MB) _PLD
UNREG (SY)
UNREG (VIF)
UNREG (DPR)
IC215
IC207
IC206
IC205
CURRENT DETECT
SE103
GEOMAGNETIC SENSOR
IC101
EEPROM
SE101
ACCELEROMETER
SE102
PRESSURE SENSOR
IC102
FRAM
FRAM-TX/RX/CLK/XCS
IC203, 212, 213, IC216, Q203
DC/DC CONVERTER
+5.2V (DD)
+48V-MIC
+3.7V-OHB
+1.5V-OHB
+12V
IC215
REG
+3.7V
IC201, 202, 204, IC205, Q207
REG
+3.2V
+2.5V
+1.8V
+1.2V
IC210, Q201, 202
REG
+5V
-5V
FAN
CN202
FAN_P (+12V)
IC201, Q201
FAN CONTROL /DRIVE
IC202, 203
DC/DC CONVERTER
+5.5V
-5.5V
UNREG
IC204, Q202-204
DC IN PROTECT
UNREG IN
UNREG (EVER)
DC_IN (H)
CN201
CN204
UNREG (SW)
PWR_OFF/ON
PWR_CONT (Y)
PH201
CN002
DC_IN (H), DC_OUT2
F001
CN001
(DC IN)

Overall (3/3)


MB-1259 (2/2)
NET-49
SY-471 (2/2)
AT-195
SW-1753
CN-4065
CN-4064
NFC ANTENNA
NFC INTERFACE
FROM MB-1259 (1/2)
TO IF-1331
TO LE-426
TO SY-471 (1/2)
SYSTEM PLD BUS I/F
USB I/F
CURRENT LIMIT PROTECTOR
I/O EXPANDER. LED DRIVER
ENCODER
DISP/ MENU
EXT I/O
USB
REMOTE
GL/SYNC
ETHERNET I/F
LEVEL SHIFT
PROMPTER GENLOCK
AMP
BUFFER AMP
ADC
DAC
LED DRIVER
BUS BUFFER
FLASH
RESET
RTC
CLOCK SYNTHESIZER VCO
VC901 24.576MHz
MIC AMP GAIN CTL
MIC BIAS
SYSTEM CONTROL
DDR3L
EMMC
PMIC CONTROL
REG

Frame Wiring



Revision History

Date	History	Contents
2019. 3	1st Edition 9-932-680-01	—
2020. 10	Revised-1 9-932-680-02	Added the models: HDC-P31 • **Modifications:** 1-1-1. Checking the ROM and Software Version, 1-3. Connectors and Cables, 1-5-4. Connecting/Disconnecting Coaxial Cable for SDI 1, 2, 1-8. Explanation of Adhering Number, 2-1. Recommended Replacement Parts, 2-3-2. Replacing Lithium Battery, 4-2. Location of Printed Wiring Boards, 4-18. Rear Panel Assembly, Section 5 Electrical Alignment, 5-1-5. Connection of Equipment, 8-2-1. SERVICE Menu List • **Additions:** 1-4-4. DR-699 Board (HDC-P31), 4-13. CMOS Block Assembly (HDC-P31), 4-14. IF-1331 Board (HDC-P31), 4-15. DR-699 Board (HDC-P31), 4-16. SE-1216 Board (HDC-P31), 9-1-4. DR-699 Board (HDC-P31), 9-1-6. SE-1216 Board (HDC-P31) • **Modifications of the exploded views:** Overall-1, Overall-2, Rear Block • **Additions of the exploded view:** Front Block (HDC-P31), CMOS Block (HDC-P31) • **Modifications of the block diagrams and frame wiring:** Overall (1/3), Overall (2/3), Frame Wiring

HDC-P50 (SY)
HDC-P50 (CN)
HDC-P31 (SY) J, E
9-932-680-02

Sony Corporation

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