

SONY®

POWER SUPPLY UNIT

HXCE-FB70

FIBER CONNECTOR KIT

HKC-LC01

FIBER CONNECTOR KIT

HKC-LC02

SERVICE MANUAL

1st Edition

警告

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

WARNING

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

WARNUNG

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

AVERTISSEMENT

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

For kundene i Norge

Dette utstyret kan kobles til et IT-strømfordelingssystem.

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Manual Structure

Purpose of this manual

This manual is the service manual for Power Supply Unit HXCE-FB70.

This manual describes the information items that premise the service based on the components parts assuming use of system and service engineers.

Related manuals

Besides this service manual the following manual is available for this unit.

- Operating Instructions (Supplied with this unit)
This manual is necessary for application and operation of this unit.
- Operating Instructions CD-ROM (Supplied with this unit)
This manual is necessary for application and operation of this unit.
The CD-ROM contains the Japanese, English, French, German, Italian, Spanish, and Chinese operating instructions (PDF).

Trademarks

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

Section 1

Installation

1-1. Power Cord

To get a power cord, please contact your local Sony Sales Office/Service Center.

WARNING

- Use the approved Power Cord (3-core mains lead)/Appliance Connector/Plug with earthing-contacts that conforms to the safety regulations of each country if applicable.
- Use the Power Cord (3-core mains lead)/Appliance Connector/Plug conforming to the proper ratings (Voltage, Ampere).
- Never use an injured power cord.

1-2. Connectors and Cables

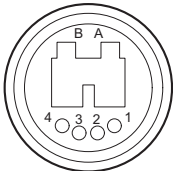
1-2-1. Connector Input/Output Signals

Input/Output Signals

1. CAMERA

Optical fiber connector manufactured by NEUTRIK
(standard equipment)

6-pin, Female

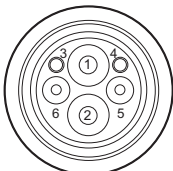


- External View -

No.	Signal	Specifications
A	Optical INPUT	—
B	Optical OUTPUT	—
1	DC OUT (GND)	—
2	NC	No connection
3	NC	No connection
4	DC OUT (+48 V)	—

Optical fiber connector manufactured by LEMO (installed HKC-LC02)

6-pin, Female



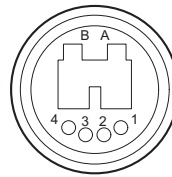
- External View -

No.	Signal	Specifications
1	Optical INPUT	—
2	Optical OUTPUT	—
3	NC	No connection
4	NC	No connection
5	DC OUT (GND)	—
6	DC OUT (+48 V)	—

2. CCU

Optical fiber connector manufactured by NEUTRIK
(standard equipment)

6-pin, Female

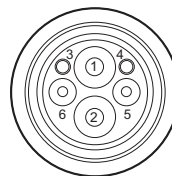


- External View -

No.	Signal	Specifications
A	Optical INPUT	—
B	Optical OUTPUT	—
1	NC	No connection
2	NC	No connection
3	NC	No connection
4	NC	No connection

Optical fiber connector manufactured by LEMO (installed HKC-LC01)

6-pin, Female



- External View -

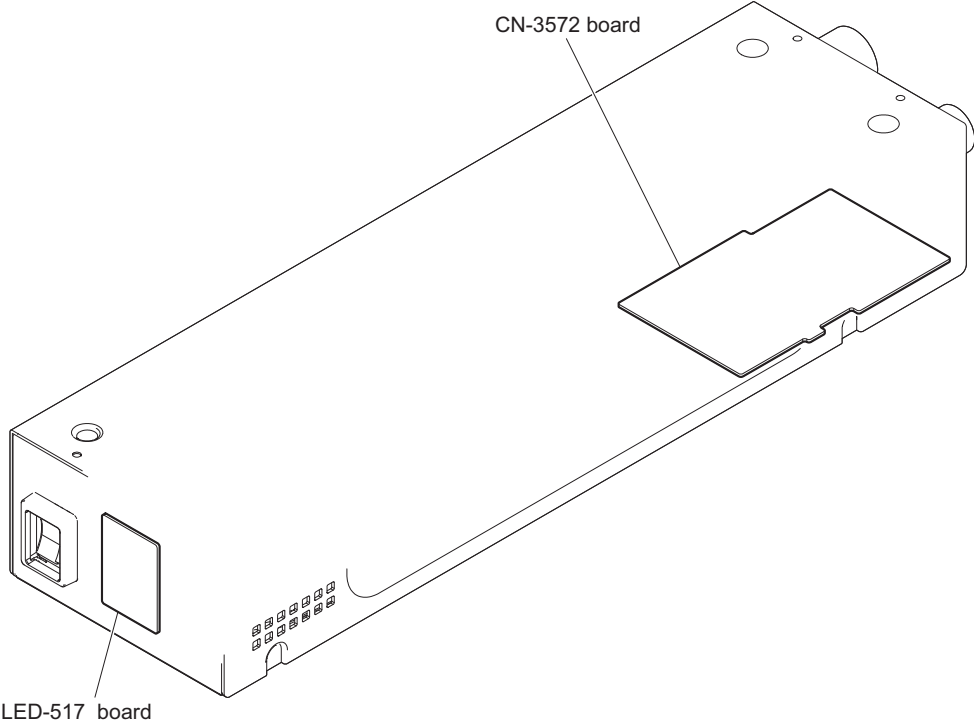
No.	Signal	Specifications
1	Optical OUTPUT	—
2	Optical INPUT	—
3	NC	No connection
4	NC	No connection
5	NC	No connection
6	NC	No connection

1-2-2. Connection Connectors/Cables

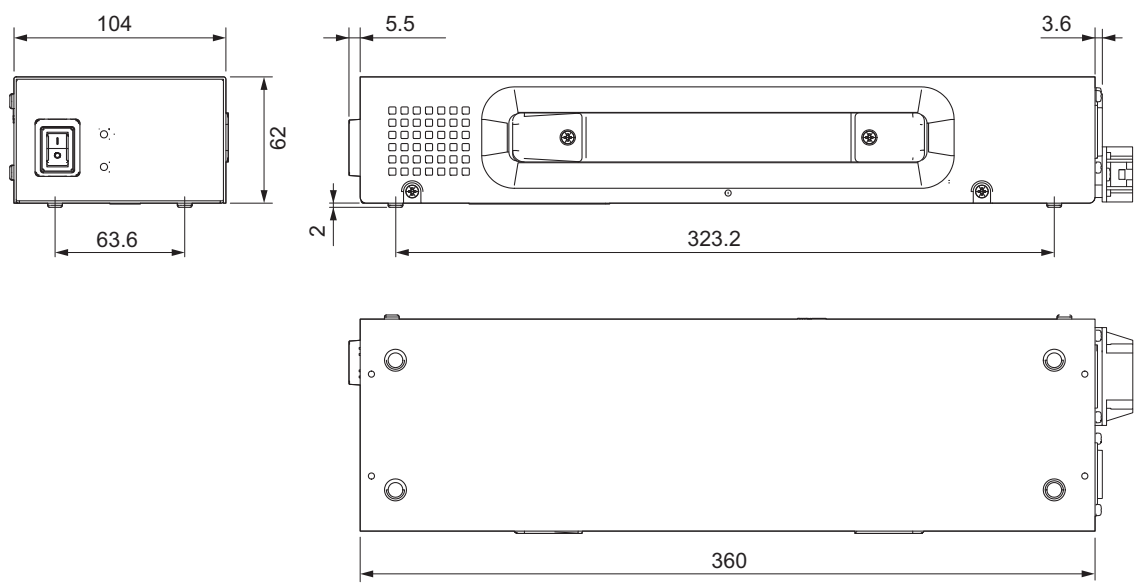
Connection made with the connector panels during installation or service, should be made with the connectors/complete cable assemblies specified in the following list, or equivalent parts.

Connector Name	Connector/Cable
CAMERA (NEUTRIK)	CCFN-25/50/100 cable
CAMERA (LEMO)	LEMO PUW. 3K. 93C. TLCC96
CCU (NEUTRIK)	CCFN-25/50/100 cable or Single-mode optical fiber cable (Terminal shaped: PC (Physical Contact) polishing or Advanced PC etc. PC polishing compatible cable, Wave-length : 1310 nm compliant)
CCU (LEMO)	LEMO FUW. 3K. 93C. TLMC96

1-3. Location of Printed Circuit Boards

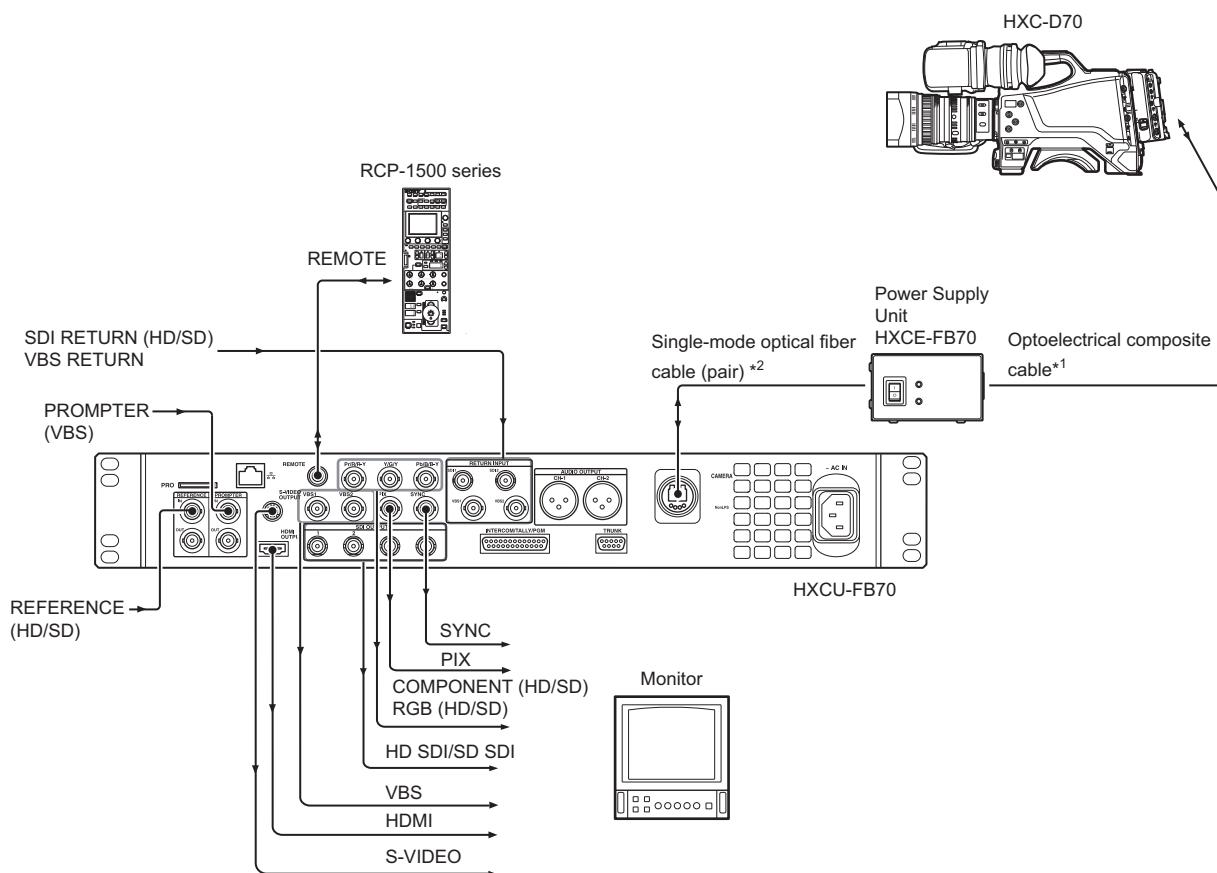


1-4. Outside Dimensions



Unit: mm

1-5. System Connection

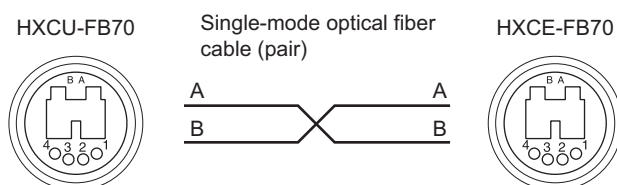


*1: The maximum transmission distance is 250 m (820 ft) when Sony CCFN-25/50/100 Hybrid Fiber Cable is used.

*2: The maximum transmission distance is 10 km (32,800 ft) when a general single-mode optical fiber cable with an LC connector is used.
When using a Sony's hybrid fiber cable CCFN-25/50/100 or an SMPTE cable (LEMO's connector), confirm that the input AC power line of the HXCE-FB70 and HXCU-FB70 is securely grounded.

Note

- Connect the single-mode optical fiber cable as shown below so that connecting destinations cross (A to B, B to A) between this unit and the HXCU-FB70.



- The single-mode optical fiber cable used for the connection must use the cable that the following specifications are complied with.
 - Terminal shaped: PC (Physical Contact) polishing or Advanced PC etc. PC polishing compatible cable
 - Wavelength : 1310 nm compliant

1-6. Replacing NEUTRIK's Optical Connector with LEMO's Optical Connector

- A NEUTRIK's optical connector is normally mounted as the CAMERA connector of the unit. The optical connector of the optical connector assembly can be replaced with a LEMO's optical connector by the fiber connector kit (HKC-LC02).
- A NEUTRIK's optical connector is normally mounted as the CCU connector of the unit. The optical connector of the optical connector assembly can be replaced with a LEMO's optical connector by the fiber connector kit (HKC-LC01).

Note

- Carefully handle optical cables because they are likely to be damaged.
- Do not touch the optical cable end with bare hands.
- Use the screws supplied with the HKC-LC01 for use for the part to be replaced.
- Send the removed NEUTRIK's optical connector back to the customer with the cap attached to the end of the optical cable.

1-6-1. HKC-LC01

Preparation

1. Remove the cover. (Refer to [“3-1. Cover”](#))
2. Remove the encapsulated connector (RECE) and the two optical cables. (Refer to [“3-6. Optical Connector \(CCU\) Assembly/Encapsulated Connector \(RECE\)”](#))

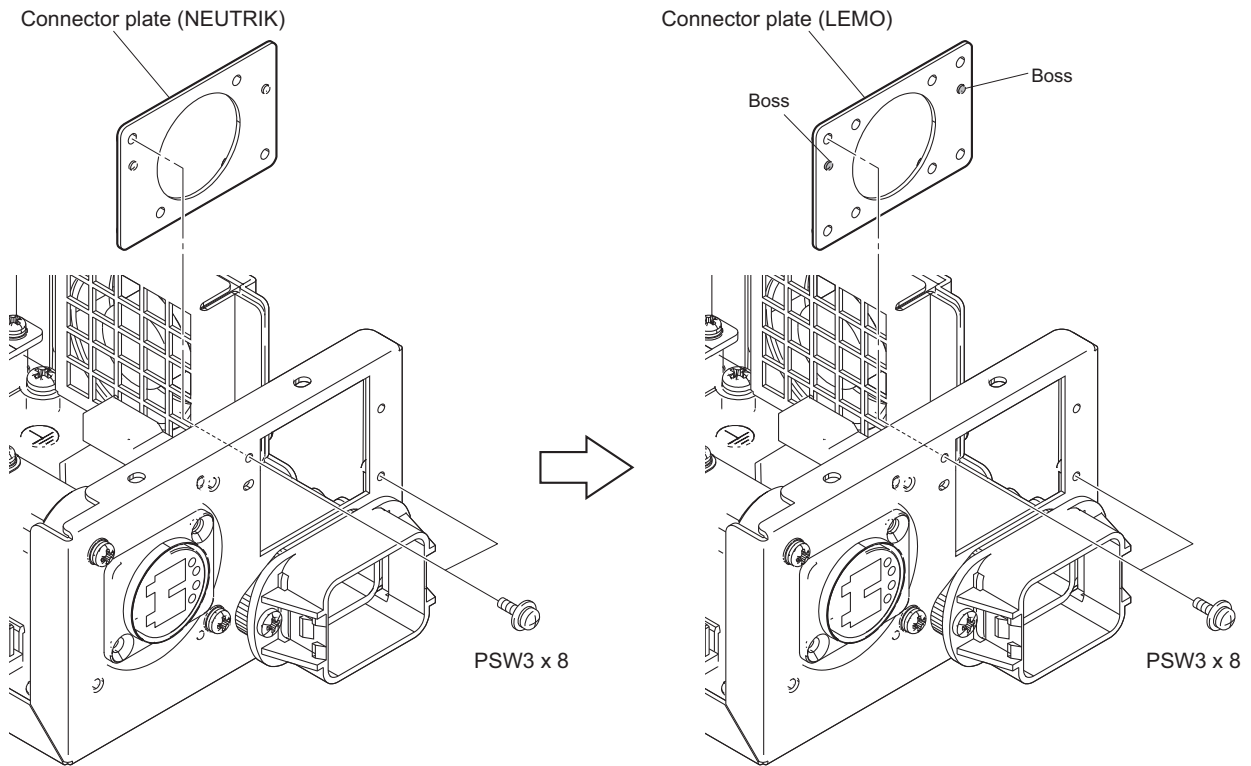
Procedure

1. Remove the two screws to detach the connector plate (NEUTRIK).

2. Install the connector plate (LEMO) to the set by the two screws.

Note

Install the connector plate (LEMO) carefully paying attention to the position of the bosses.



3. Install the connector (LEMO) by the four attached screws.

Note

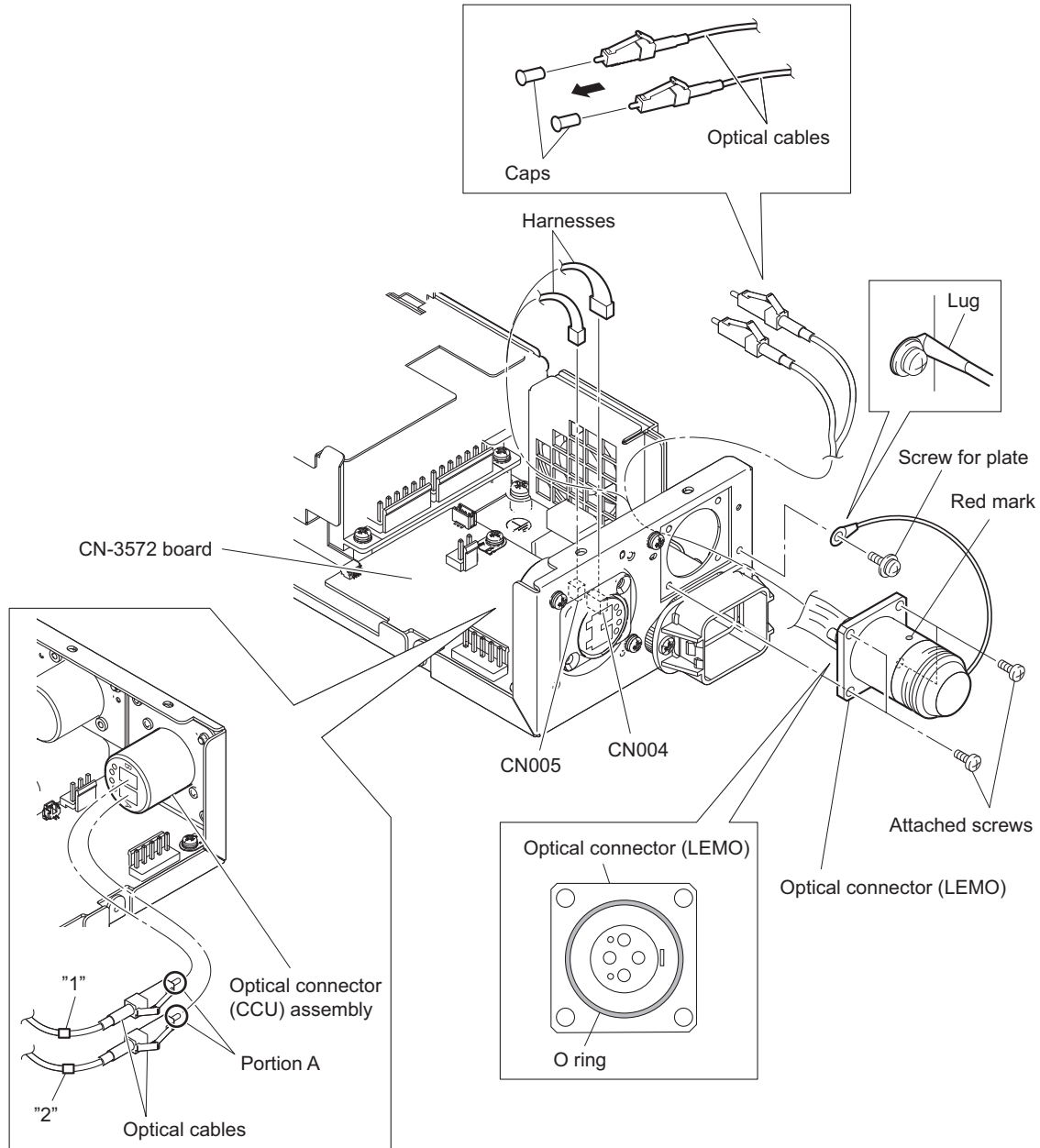
- Confirm that the O-ring is fitted in the groove of the optical connector (LEMO).
- Install the optical connector (LEMO) carefully paying attention to the red mark position.

4. Remove the screw for plate.
5. Install the lug by the screw for plate.
6. Fold the lug as shown in the figure.
7. Connect the two harnesses to the two connectors (CN004, CN005) on the CN-3572 board.
8. Remove the two caps from the optical cables.

9. Connect the optical cable to the optical connector (CCU) assembly.

Notes

- Before connecting an optical fiber cable, clean its end.
- Connect the Optical cables as shown in the figure.



10. Install the cover. (Refer to “3-1. Cover”)

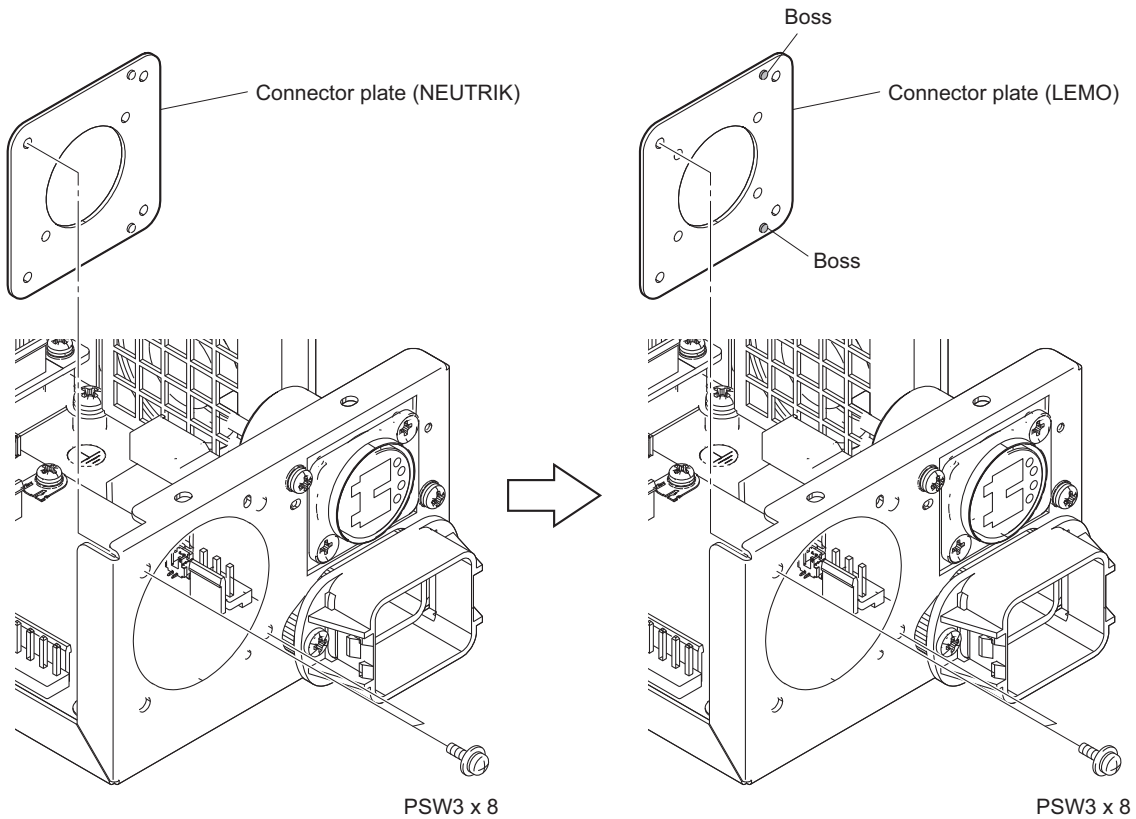
1-6-2. HKC-LC02

Preparation

1. Remove the cover. (Refer to “3-1. Cover”)
2. Remove the optical connector (CCU) assembly and the two optical cables. (Refer to “3-6. Optical Connector (CCU) Assembly/Encapsulated Connector (RECE)”)

Procedure

1. Remove the two screws to detach the connector plate (NEUTRIK).
2. Install the connector plate (LEMO) to the unit by the two screws.



Note

Install the connector plate (LEMO) carefully paying attention to the position of the bosses.

3. Install the connector (LEMO) by the four attached screws.

Note

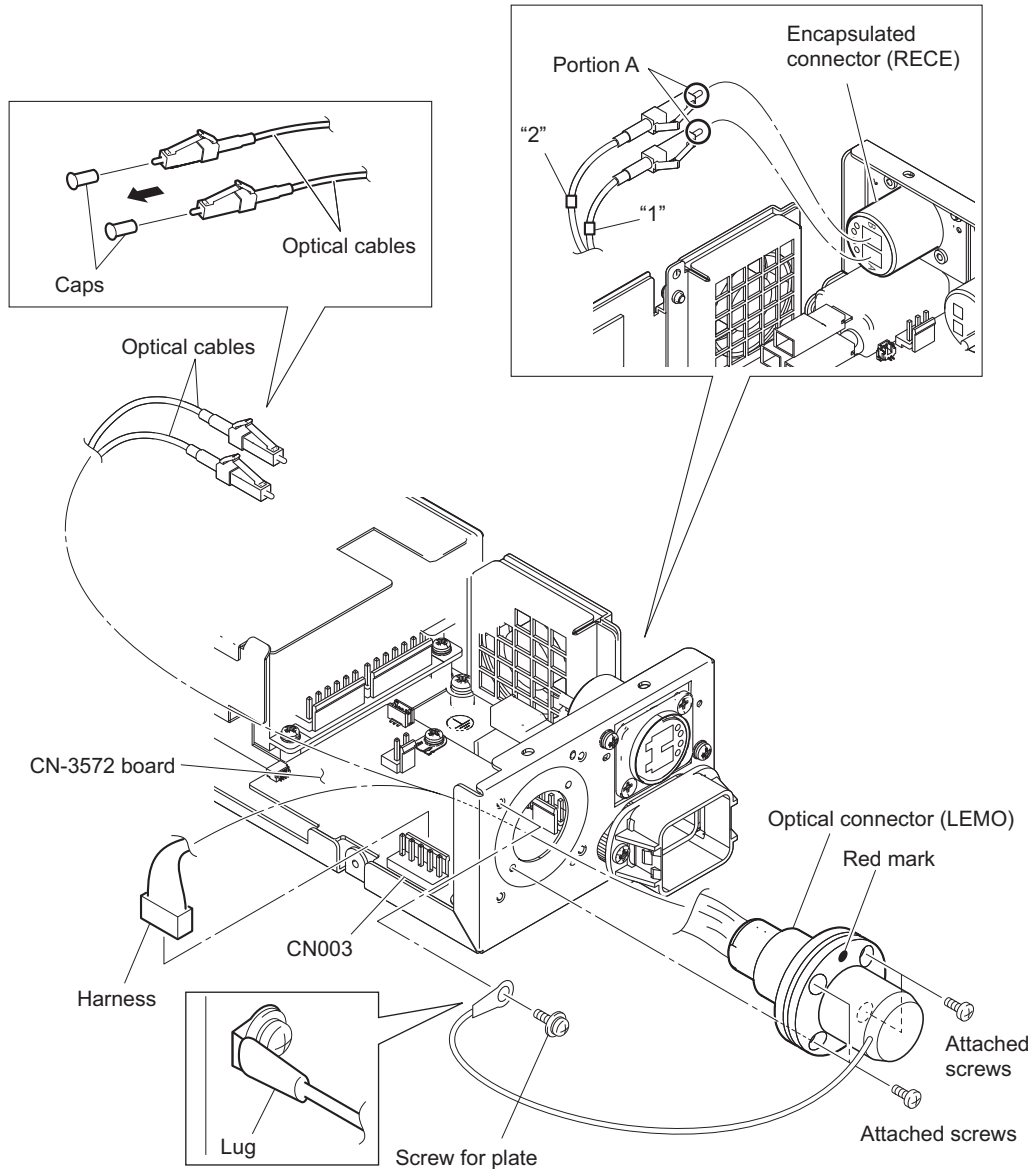
Install the optical connector (LEMO) carefully paying attention to the red mark position.

4. Remove the screw for plate.
5. Install the lug by the screw for plate.
6. Fold the lug as shown in the figure.
7. Connect the harness to the connector (CN003) on the CN-3572 board.
8. Remove the two caps from the optical cables.

9. Connect the optical cables to the encapsulated connector (RECE).

Notes

- Before connecting an optical fiber cable, clean its end.
- Connect the Optical cables as shown in the figure.



10. Install the cover. (Refer to [“3-1. Cover”](#))

1-6-3. HKC-LC01 and HKC-LC02

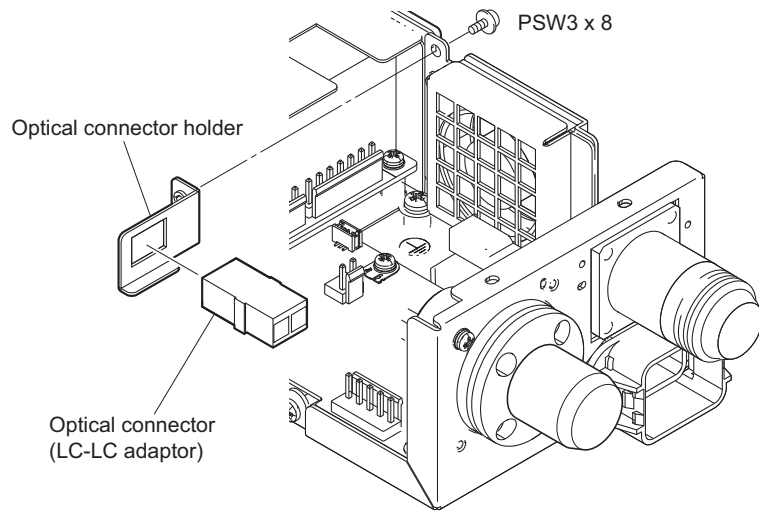
Preparation

1. Remove the cover. (Refer to [“3-1. Cover”](#))
2. Remove the optical connector (CCU) assembly, encapsulated connector (RECE) and two optical cables. (Refer to [“3-6. Optical Connector \(CCU\) Assembly/Encapsulated Connector \(RECE\)”](#))
3. Install the HKC-LC01. (Refer to [“1-6-1. HKC-LC01”](#))
4. Install the HKC-LC02. (Refer to [“1-6-2. HKC-LC02”](#))

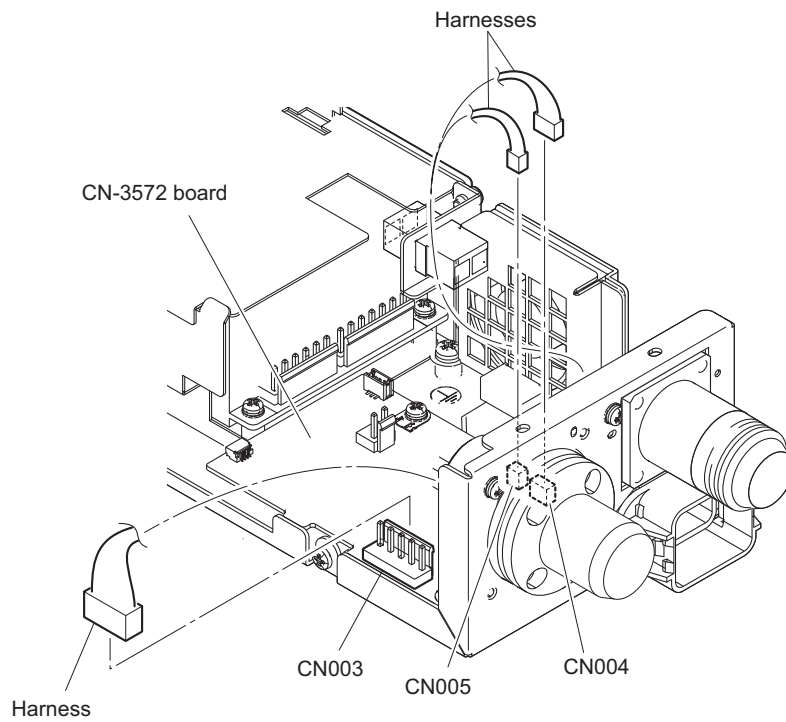
Procedure

1. Install the optical connector holder by the screw.

2. Install the optical connector (LC-LC adaptor).



3. Connector the three harnesses to the three connector (CN003, CN004, CN005) on the CN-3572 board.

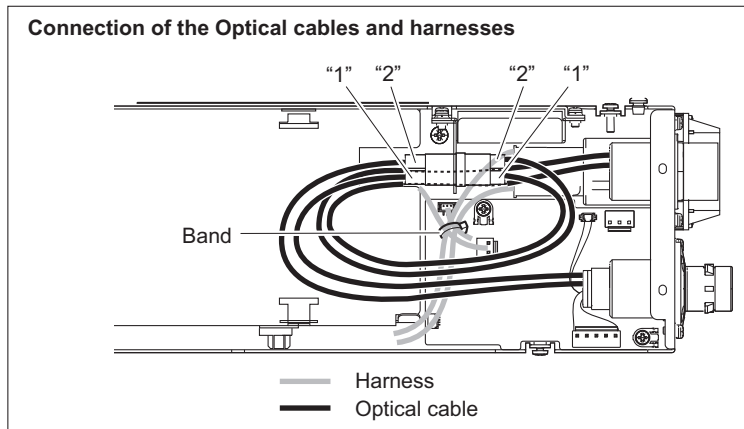
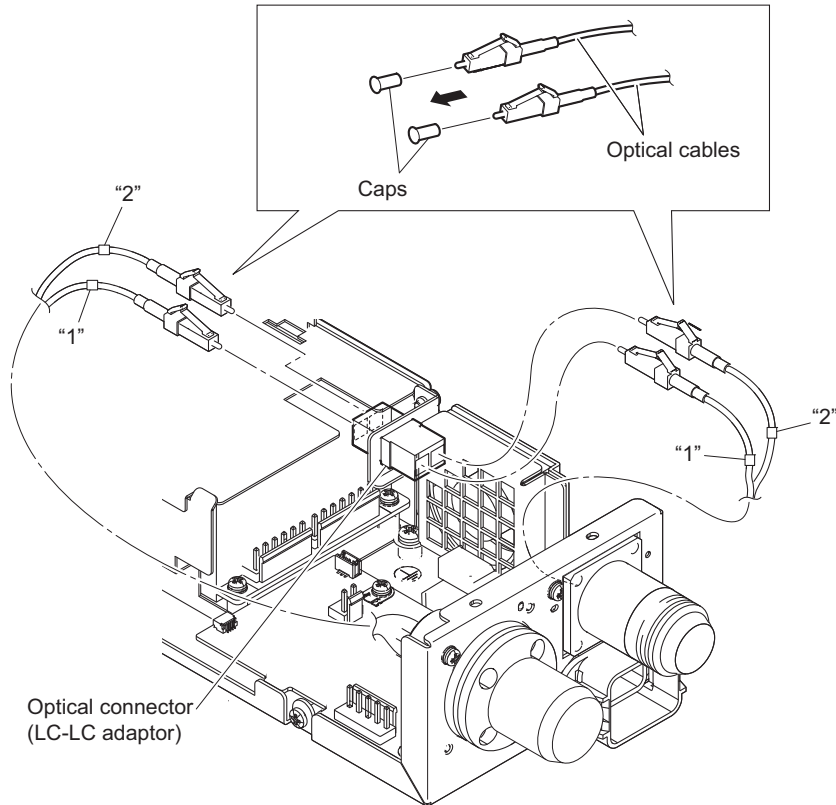


4. Remove the four caps from the optical cables.

5. Connect the four optical cables to the optical connector (LC-LC adaptor).

Notes

- Before connecting an optical fiber cable, clean its end.
- Connect the Optical cables as shown in the figure.



6. Install the cover. (Refer to [“3-1. Cover”](#))

Section 2

Service Overview

2-1. Periodic Replacement Parts

This table does not describe the guarantee period of part.

The replacement period of each part depends on the environment and condition. Refer to “[3. Replacement of Main Parts](#)” for the replacement method of parts.

Part name	Part No.	Check/replacement period
FAN, DC (40 SQUARE)	△ 1-787-899-11	Replace every two years (When used for eight hours a day.)

2-2. Circuit Protective Devices

2-2-1. Thermistor

This unit is provided with positive thermistors for power circuit. If an overcurrent flows in a positive thermistor or it heats up to a certain degree with the increase of the ambient temperature, its internal resistance increases sharply to limit the current flowing in the circuit. When a thermistor is activated, turn off the power and check the circuit of the unit. After the cause of the problem is removed and the device cools down, turn on the power again. The unit will work normally.

It takes about one minute for the device to cool down after power-off.

Board	Ref.No.	Address	Part No.
CN-3572	THP101	A1 (Side A)	 1-810-106-91

2-3. Error Messages

The alarm indicator lights red when an error occurs in the unit.

An alarm is caused by the following.

- No cable is connected to the CAMERA connector and the CCU connector.
- The unit's internal temperature is high.
- The fan is not working.

2-4. Cleaning of Connector/Cable

The photo receptive condition of the optical connector can be checked at OPTICAL CONDITION on the front panel of HD camera control unit.

- When lit in green: Normal (-15 dBm and higher)
- When lit in yellow: Normal (-15 to -18 dBm)
- When lit in red: Abnormal (Less than -18 dBm)

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

When lit in yellow, cleaning is recommended.

The attenuation of the photo-receptive level may cause transmission error between the camera and camera control unit.

In the case of attenuation, be sure to clean optical contact portions proceeding as follows.

Note

Clean the connected optical contact portion all equipment.

Example:

- HD camera adaptor
- HD camera control unit
- Power supply unit
- Optoelectrical composite cable
- Joint adaptor

2-4-1. Cleaning Connectors/Cables of NEUTRIK

The NEUTRIK's connectors are normally mounted as the CAMERA connector and CCU connector of this unit.

When the CAMERA connector and CCU connector have been replaced with a LEMO's connectors by the fiber connector kit (HKC-LC01/HKC-LC02), refer to "[2-4-2. Cleaning Connectors/Cables of LEMO](#)".

When the Optical Connector Cleaner (Commercially Available) is Available

Tool and fixtures

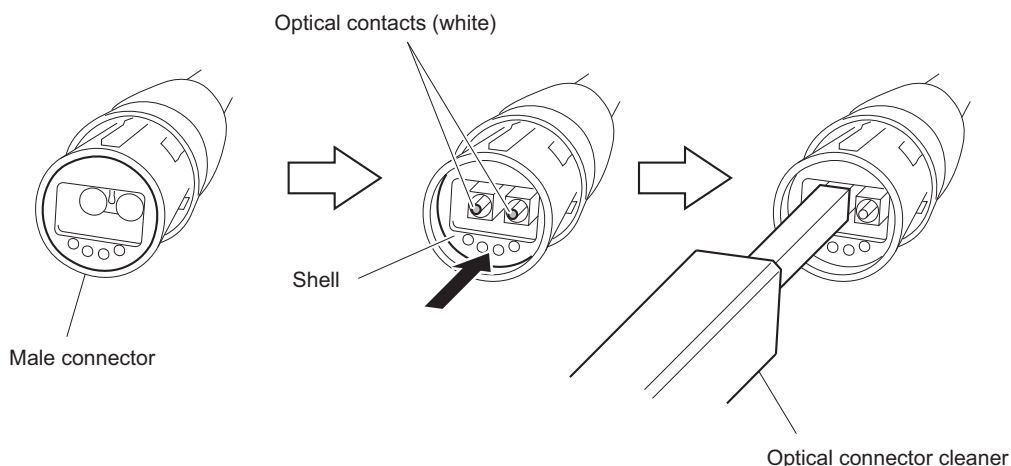
- FOCD-DC125 (DRY Cleaner, 1.25mm) manufactured by NEUTRIK, 9393 (IBC™ Brand Cleaner LC, 1.25mm) manufactured by US CONEC, or equivalent.

Cleaning of male connector

While pushing the shell, clean the tip of the white optical contacts using the optical connector cleaner.

Note

The sealing shutter is released while the shell is being pushed.

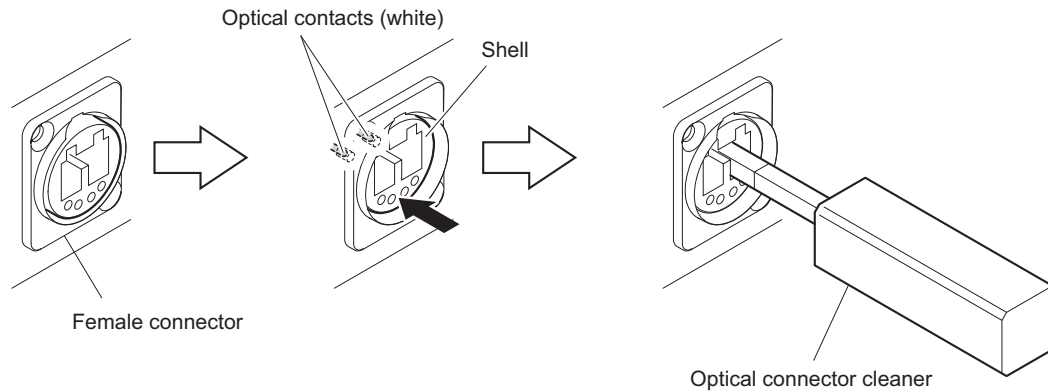


Cleaning of female connector

While pushing the shell, clean the tip of the white optical contacts using the optical connector cleaner.

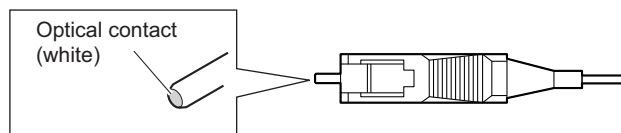
Note

The sealing shutter is released while the shell is being pushed.



Cleaning of connector

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



When the Optical Connector Cleaner (Commercially Available) is not Available

Tool and fixtures

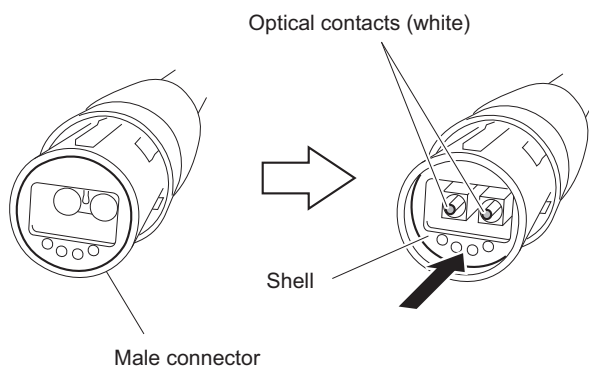
- Alcohol (commercially available)
- Cotton swabs (commercially available)

Cleaning of male connector

While pushing the shell, clean the tip of the white optical contacts with a cotton swab moistened with alcohol.

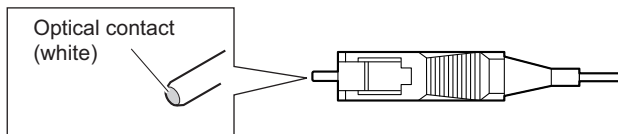
Note

The sealing shutter is released while the shell is being pushed.



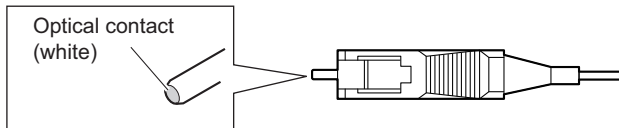
Cleaning of female connector

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



Cleaning of connector

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



2-4-2. Cleaning Connectors/Cables of LEMO

When the Optical Connector Cleaner (Commercially Available) is Available

Tool and fixtures

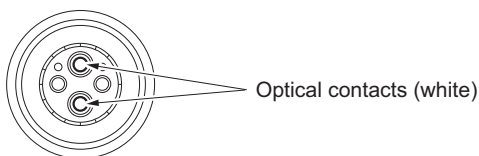
- Optical connector cleaner (commercially available)
 - Product name: CLETOP[®]
 - 14100402 or 14100403 (stick type) or equivalent
 - 14100402: 2.0 mm
 - 14100403: 2.0/2.5 mm double ended

Notes

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

Cleaning of male connector

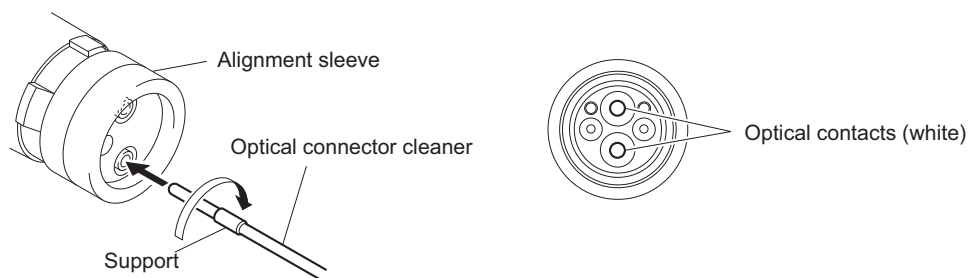
Clean the tip of the white optical contacts using the optical connector cleaner.



Cleaning of female connector

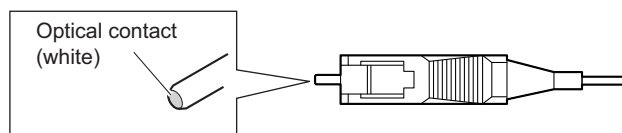
1. Insert the optical connector cleaner straight. Ensure that it is held straight when inserting.
2. Apply sufficient pressure to ensure that the optical contact is a little depressed.
(approximately 600 g to 700 g)

- While pressing the optical connector cleaner against the tip of the optical contact, rotate the optical connector cleaner by 4 to 5 turns clockwise.
Holding the optical connector cleaner at around its support facilitates to apply the pressure.



Cleaning of connector

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



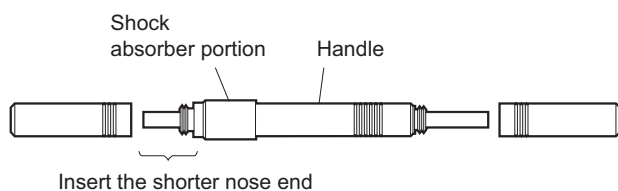
When the Optical Connector Cleaner (Commercially Available) is not Available

Tool and fixtures

- Alignment sleeve remover HC-001 (for female connector)
Sony Part No. : J-6480-010-A or DCC.91.312.5LA manufactured by LEMO, or equivalent

Note

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



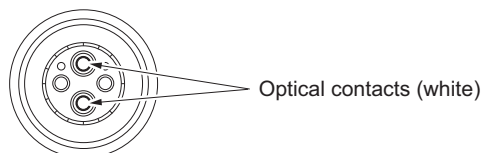
- Alcohol (commercially available)
- Cotton swabs (commercially available)

Note

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

Cleaning of male connector

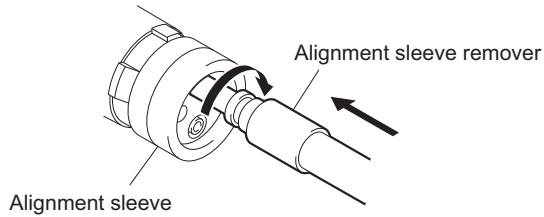
Clean the tip of the white optical contacts with a cotton swab moistened with alcohol.



Cleaning of female connector

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

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

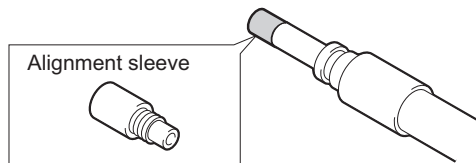


2. When the turn stops, pull out the remover in the straight line forcedly.

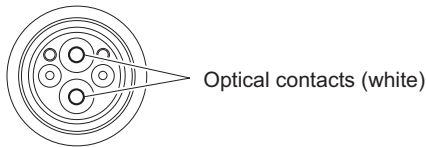
Note

The alignment sleeve can be removed/reinstalled with the sleeve itself attached to the tip of the remover. Great care should be taken so as not to lose or damage the alignment sleeve.

Alignment sleeve: Sony Part No. : 9-980-074-01



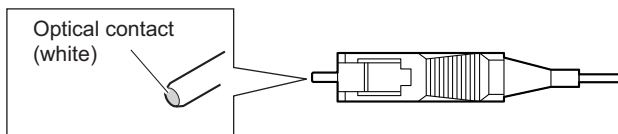
3. Clean the tip of the white optical contacts with a cotton swab moistened with alcohol.



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

Cleaning of connector

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



2-5. Circuit Description

Provided with the internal AC-DC power supply unit, this unit outputs 48 VDC through the CN-3572 board to the camera cable. Q001, Q002, and Q003 on the CN-3572 board detect the potential of the output connector 48 V (L) on the camera side to monitor the cable connection status. Q004 to Q013 control the 48 V output. When Q008 detects an output voltage drop, the output is shut off.

IC001 on the CN-3572 board detects the board temperature. When the board temperature exceeds the set temperature, Q103 shuts off the 48 V output. IC201 is 48 V - 12 V switching power supply and is the fan's power circuit. Q203 monitors rotation of the fan. When Q203 detects fan stop, it causes the alarm indicator on the front panel to light.

2-6. Lead-free Solder

Boards requiring use of unleaded solder are printed with a lead free mark (LF) indicating the solder contains no lead. (Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)



: LEAD FREE MARK

Notes

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

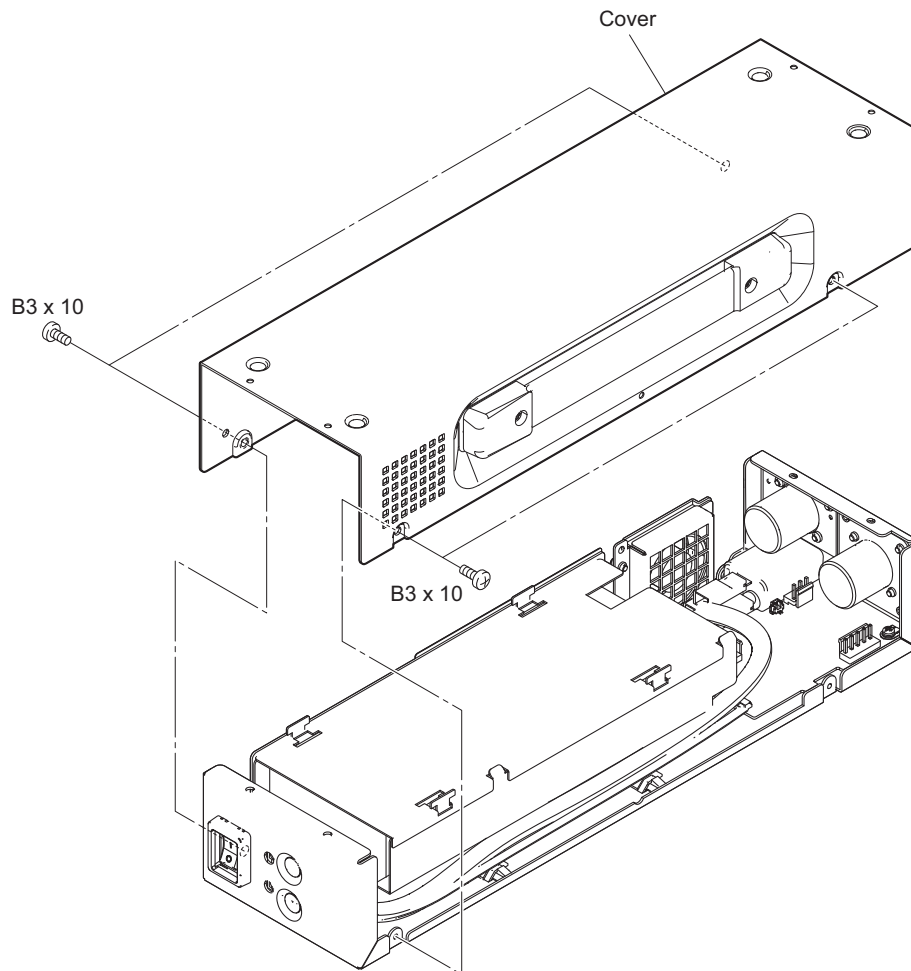
Section 3

Replacement of Main Parts

3-1. Cover

Procedure

1. Remove the four screws to detach the cover.



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

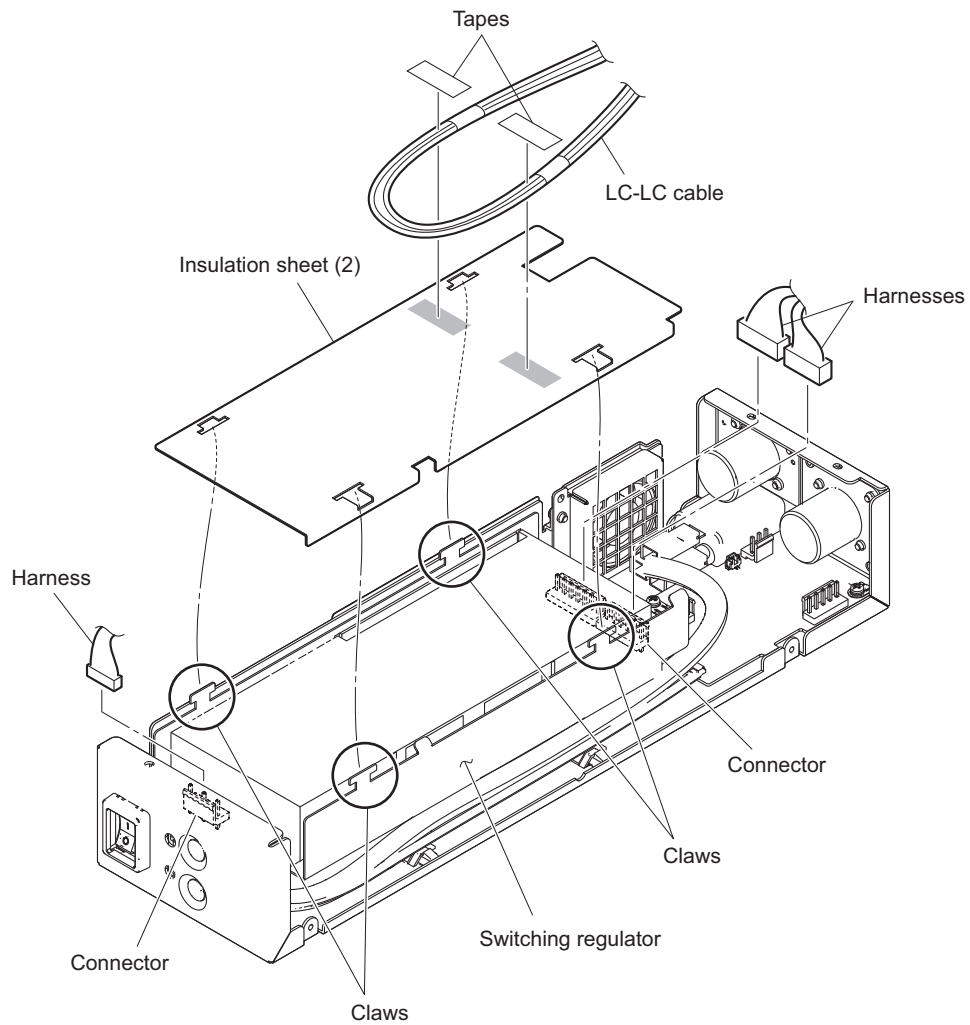
3-2. Switching Regulator

Preparation

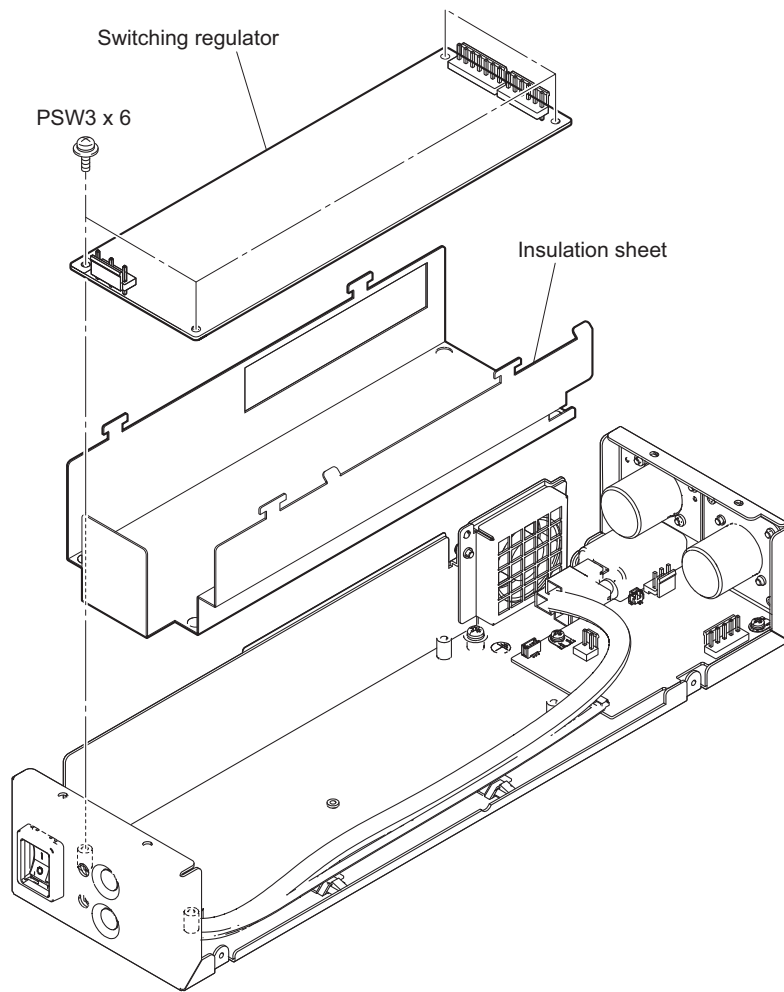
1. Remove the cover. (Refer to “3-1. Cover”)

Procedure

1. Remove the two tapes to detach the LC-LC cable.
2. Remove the four claws to detach the insulation sheet (2).
3. Disconnect the three harnesses from the three connectors on the switching regulator.



4. Remove the four screws to detach the switching regulator and the insulation sheet.



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

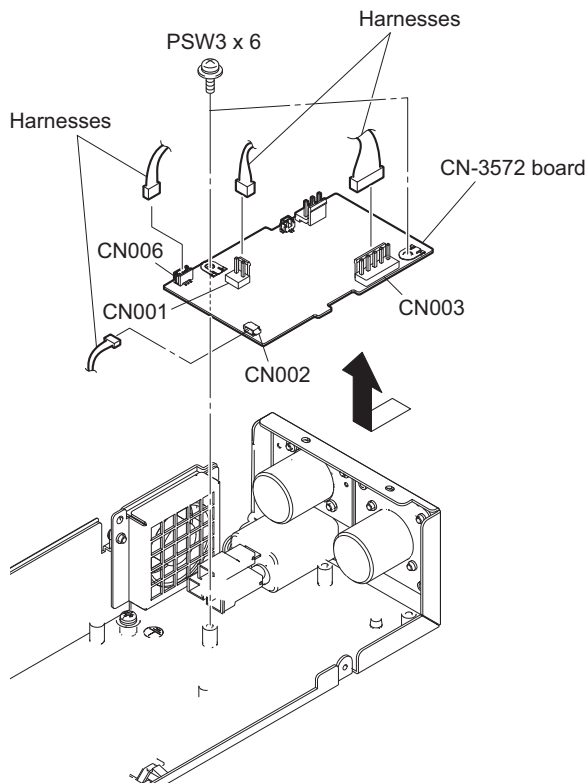
3-3. CN-3572 Board

Preparation

1. Remove the cover. (Refer to “3-1. Cover”)

Procedure

1. Disconnect the four harnesses from the four connectors (CN001, CN002, CN003, CN006) on the CN-3572 board.
2. Remove the two screws to detach the CN-3572 board.



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

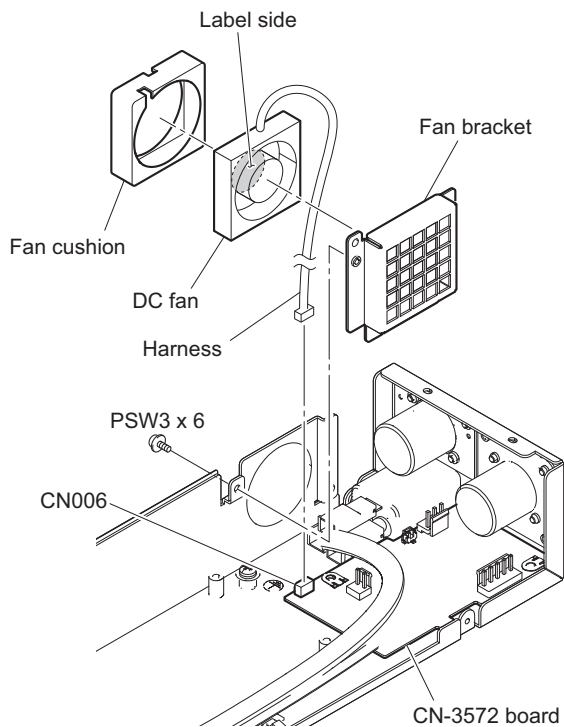
3-4. DC Fan

Preparation

1. Remove the cover. (Refer to “3-1. Cover”)

Procedure

1. Disconnect the harness from the connector (CN006) on the CN-3572 board.
2. Remove the two screws to detach the fan bracket.
3. Remove the fan cushion and DC fan from the fan bracket.
4. Remove the DC fan from the fan cushion.



Note

Install the DC fan carefully paying attention to the label side .

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

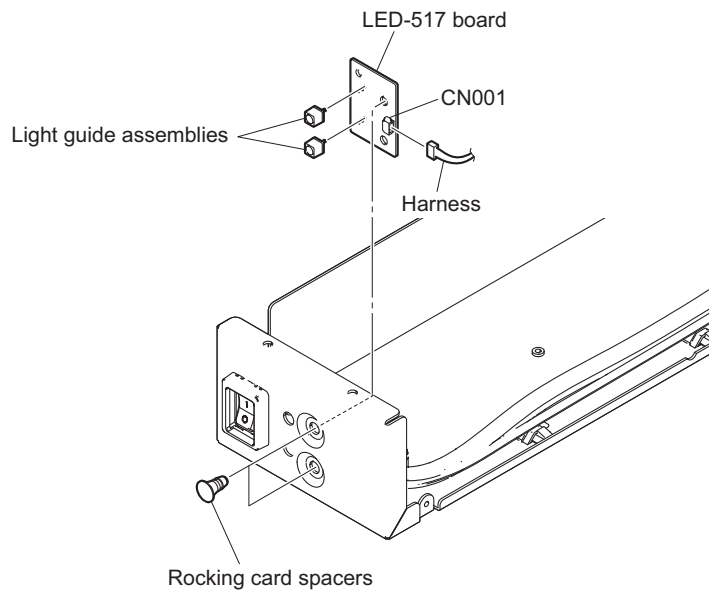
3-5. LED-517 Board

Preparation

1. Remove the cover. (Refer to “3-1. Cover”)
2. Remove the switching regulator. (Refer to “3-2. Switching Regulator”)

Procedure

1. Remove the two rocking card spacers to detach the LED board.
2. Disconnect the harness from the connector (CN001) on the LED-517 board.
3. Remove the two light guide assemblies.



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

3-6. Optical Connector (CCU) Assembly/Encapsulated Connector (RECE)

Preparation

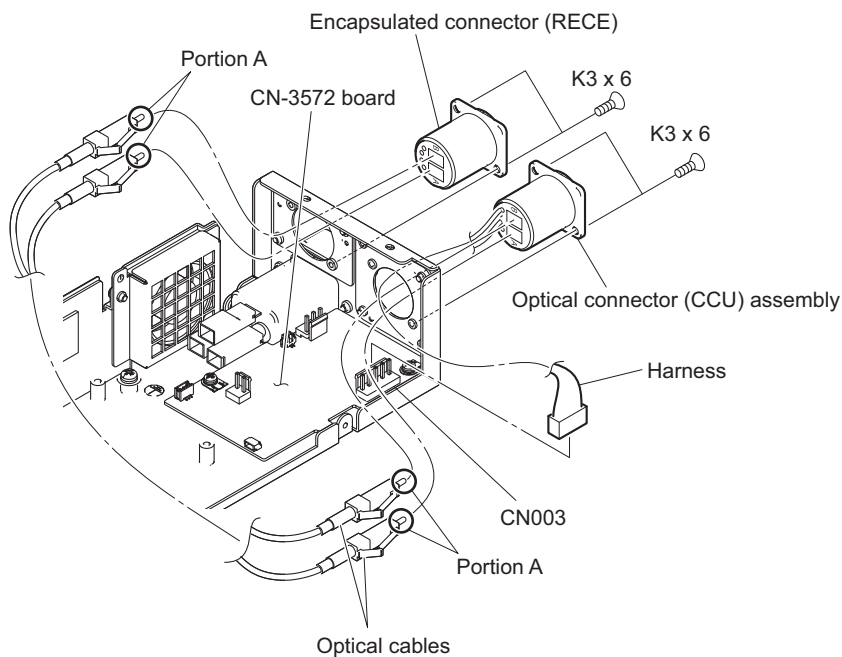
1. Remove the cover. (Refer to “3-1. Cover”)

Procedure

1. Disconnect the two optical cables.

Notes

- Carefully handle optical cables because they are likely to be damaged.
 - Do not touch portion A of the optical cable with your bare hands.
2. Disconnect the harness from the connector (CN003) on the CN-3572 board.
 3. Remove the two screws to detach the optical connector (CCU) assembly.
 4. Remove the two screws to detach the encapsulated connector (RECE).



Notes

Before connecting an optical fiber cable, clean its end.

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

Section 4

Spare Parts

4-1. Note on Repair Parts

1. Safety Related Components Warning

WARNING

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

2. Standardization of Parts

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

3. Stock of Parts

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

4. Harness

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

1. 安全重要部品

△警告

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

2. 部品の共通化

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

3. 部品の在庫

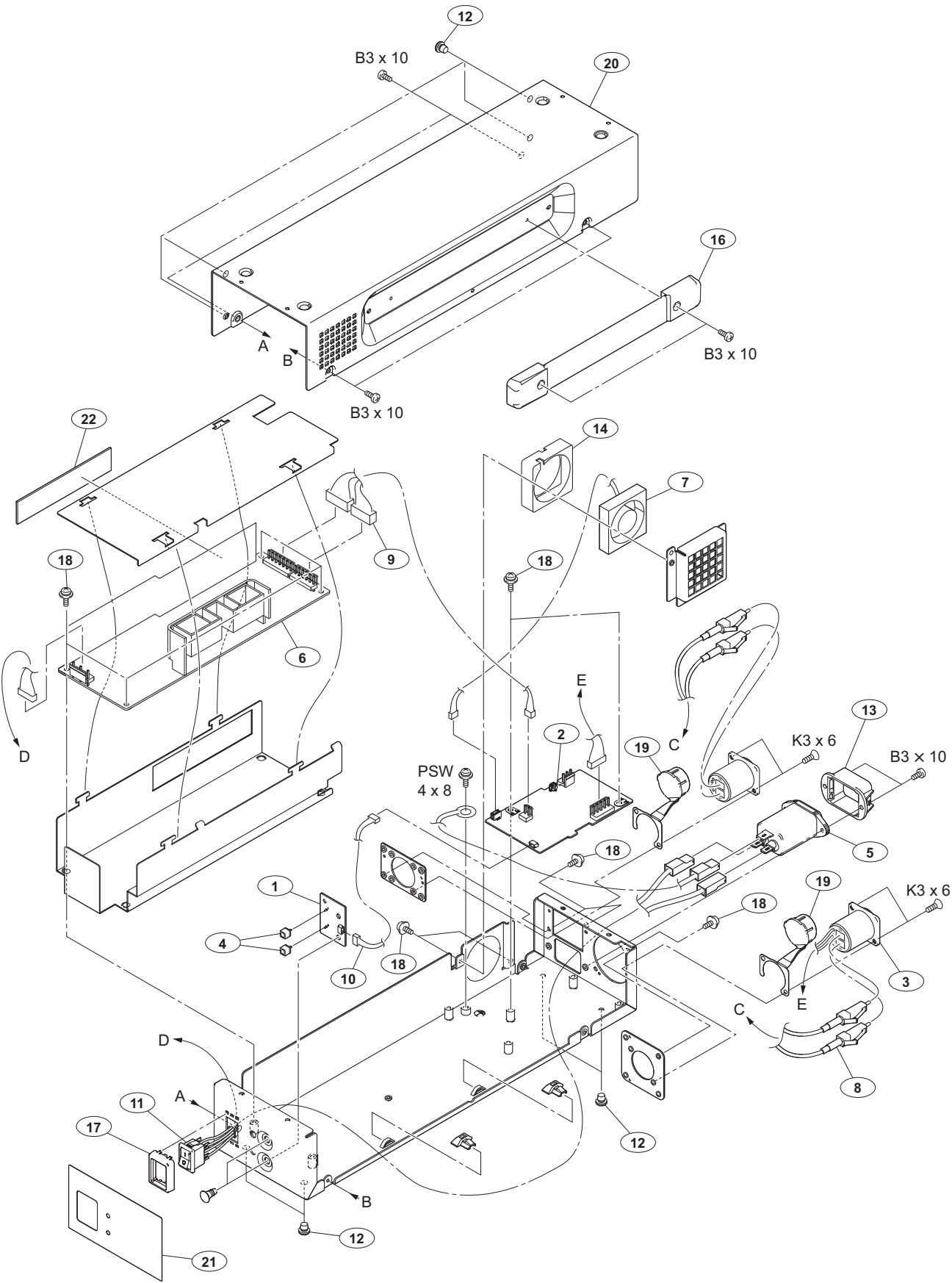
部品表の SP (Supply code) 欄に “o” で示される部品は在庫していないことがあります。納期が長くなる場合があります。

4. ハーネス

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

4-2. Exploded Views

Overall



Overall

No.	Part No.	SP Description
1	A-1903-389-A	s MOUNTED CIRCUIT BOARD, LED-517
2	A-1903-390-A	s MOUNTED CIRCUIT BOARD, CN-3572
3	A-1906-334-A	s OPTICAL CONNECTOR (CCU) ASSY
4	X-2584-891-1	s ASSY, LIGHT GUIDE
5	1-251-378-12	s INLET (WITH NOISE FILTER)
6	1-474-293-11	s REGULATOR, SWITCHING
7	1-787-899-11	s FAN, DC (40 SQUARE)
8	1-846-443-11	s CABLE, LC-LC
9	1-969-020-11	s HARNESS, SUB (DC OUT)
10	1-969-021-11	s HARNESS, SUB (LED)
11	1-969-022-11	s HARNESS (AC IN)
12	2-362-365-02	s FOOT, RUBBER
13	2-990-241-02	s HOLDER (A), PLUG
14	3-097-054-12	s CUSHION, FAN (40X10)
15	3-691-877-01	s BAND, BINDING
16	3-815-708-01	s HANDLE
17	4-171-340-01	s GUARD, SWITCH AC
18	4-382-854-51	s SCREW (M3X6), P, SW (+)
19	4-444-729-02	s CAP, NEUTRIK FIBER
20	4-444-875-02	s COVER
21	4-444-876-02	s SHEET, FRONT
22	4-444-883-01	s RADIATION SHEET
	7-682-247-04	s SCREW +K 3X6
	7-682-549-09	s SCREW +B 3X10
	7-682-961-01	s SCREW +PSW 4X8

4-3. Electrical Parts List

CN-3572 BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-1903-390-A s	MOUNTED CIRCUIT BOARD, CN-3572
C001	1-114-868-11 s	CAP, CERAMIC 0.1MF X7R 1608
C002	1-114-868-11 s	CAP, CERAMIC 0.1MF X7R 1608
C003	1-165-467-21 s	CAP, ELECT 47MF 8X10
C004	1-165-467-21 s	CAP, ELECT 47MF 8X10
C005	1-165-467-21 s	CAP, ELECT 47MF 8X10
C101	1-100-591-91 s	CAP, CHIP CERAMIC 1MF B 2012
C102	1-100-591-91 s	CAP, CHIP CERAMIC 1MF B 2012
C103	1-100-567-81 s	CAP,CHIP CERAMIC 0.01MF B 1005
C104	1-116-707-11 s	CAP, CERAMIC 47MF X5R 3216
C151	1-112-317-11 s	CAP, CHIP CERAMIC 0.1MF (2012)
C153	1-112-317-11 s	CAP, CHIP CERAMIC 0.1MF (2012)
C154	1-165-467-21 s	CAP, ELECT 47MF 8X10
C155	1-112-317-11 s	CAP, CHIP CERAMIC 0.1MF (2012)
C156	1-112-317-11 s	CAP, CHIP CERAMIC 0.1MF (2012)
C157	1-112-317-11 s	CAP, CHIP CERAMIC 0.1MF (2012)
C159	1-165-467-21 s	CAP, ELECT 47MF 8X10
C162	1-112-317-11 s	CAP, CHIP CERAMIC 0.1MF (2012)
C164	1-112-317-11 s	CAP, CHIP CERAMIC 0.1MF (2012)
C165	1-165-467-21 s	CAP, ELECT 47MF 8X10
C167	1-114-868-11 s	CAP, CERAMIC 0.1MF X7R 1608
C201	1-164-874-81 s	CAP,CHIP CERAMIC 100PF CH 1005
C204	1-164-936-81 s	CAP, CHIP CERAMIC 680PF B 1005
C205	1-164-874-81 s	CAP,CHIP CERAMIC 100PF CH 1005
C206	1-107-819-81 s	CAP,CHIP CERAMIC 22000PF B1005
C207	1-165-467-21 s	CAP, ELECT 47MF 8X10
C208	1-112-317-11 s	CAP, CHIP CERAMIC 0.1MF (2012)
C209	1-114-479-91 s	CAP, CERAMIC 2.2UF B 3225
C210	1-114-479-91 s	CAP, CERAMIC 2.2UF B 3225
C212	1-100-591-91 s	CAP, CHIP CERAMIC 1MF B 2012
C213	1-100-591-91 s	CAP, CHIP CERAMIC 1MF B 2012
C214	1-112-317-11 s	CAP, CHIP CERAMIC 0.1MF (2012)
C215	1-165-467-21 s	CAP, ELECT 47MF 8X10
C216	1-164-939-81 s	CAP, CHIP CERAMIC 2200PF B 1005
C217	1-164-939-81 s	CAP, CHIP CERAMIC 2200PF B 1005
C218	1-112-792-11 s	CAP, ELECT 220MF
C219	1-114-507-11 s	CAP, CERAMIC 1UF X7R
C220	1-100-591-91 s	CAP, CHIP CERAMIC 1MF B 2012
C221	1-100-591-91 s	CAP, CHIP CERAMIC 1MF B 2012
C222	1-100-591-91 s	CAP, CHIP CERAMIC 1MF B 2012
C223	1-114-419-21 s	CAP, CERAMIC 10MF B (2012)
C224	1-100-591-91 s	CAP, CHIP CERAMIC 1MF B 2012
CN001	1-764-101-11 s	PIN, CONNECTOR (PC BOARD) 2P
CN002	1-770-621-21 s	PIN, CONNECTOR 4P
CN003	1-766-175-11 o	PIN, CONNECTOR (PC BOARD) 5P
CN004	1-580-837-11 o	PIN, CONNECTOR (PC BOARD) 3P
CN005	1-695-480-21 o	PIN, CONNECTOR (PC BOARD) 2P
CN006	1-691-550-21 s	PIN, CONNECTOR (1.5MM) (SMD) 3P
D001	8-719-069-28 s	DI 1SS400FJTE61
D002	8-719-069-28 s	DI 1SS400FJTE61
D003	8-719-083-83 s	DI UDZSUSTE-1715B
D201	8-719-069-28 s	DI 1SS400FJTE61
D202	6-501-123-01 s	DIODE RB160M-60TR
FB151	1-469-324-21 s	FERRITE, EMI (SMD) (2012)
FB152	1-469-324-21 s	FERRITE, EMI (SMD) (2012)
FB153	1-469-324-21 s	FERRITE, EMI (SMD) (2012)
FB154	1-469-324-21 s	FERRITE, EMI (SMD) (2012)
FB155	1-469-324-21 s	FERRITE, EMI (SMD) (2012)
FB156	1-469-324-21 s	FERRITE, EMI (SMD) (2012)

CN-3572 BOARD

Ref. No. or Q'ty	Part No.	SP Description
IC001	8-759-337-40 s	IC NJM2904V (TE2)
L151	1-419-491-21 s	COIL, CHOKE 10UH
L152	1-419-491-21 s	COIL, CHOKE 10UH
L153	1-419-491-21 s	COIL, CHOKE 10UH
L154	1-419-491-21 s	COIL, CHOKE 10UH
L201	1-481-213-11 s	INDUCTOR (WIREWOUND) 22UH
L202	1-481-182-21 s	INDUCTOR 22UH
L203	1-481-182-21 s	INDUCTOR 22UH
Q001	8-729-928-05 s	TRANSISTOR 2SC4617TL-QR
Q002	8-729-928-28 s	TRANSISTOR DTA144EE-TL
Q003	8-729-928-05 s	TRANSISTOR 2SC4617TL-QR
Q004	8-729-928-05 s	TRANSISTOR 2SC4617TL-QR
Q005	8-729-928-25 s	TRANSISTOR 2SA1774TL-QR
Q006	8-729-928-82 s	TRANSISTOR DTC144EE-TL
Q007	8-729-928-05 s	TRANSISTOR 2SC4617TL-QR
Q008	8-729-928-28 s	TRANSISTOR DTA144EE-TL
Q009	8-729-928-05 s	TRANSISTOR 2SC4617TL-QR
Q010	8-729-928-25 s	TRANSISTOR 2SA1774TL-QR
Q012	8-729-928-28 s	TRANSISTOR DTA144EE-TL
Q013	8-729-928-05 s	TRANSISTOR 2SC4617TL-QR
Q014	6-550-843-02 s	TRANSISTOR 2SJ599-Z-E2-AZ
Q015	8-729-928-05 s	TRANSISTOR 2SC4617TL-QR
Q016	8-729-928-82 s	TRANSISTOR DTC144EE-TL
Q101	8-729-928-25 s	TRANSISTOR 2SA1774TL-QR
Q102	8-729-928-05 s	TRANSISTOR 2SC4617TL-QR
Q103	8-729-928-82 s	TRANSISTOR DTC144EE-TL
Q201	6-550-842-01 s	TRANSISTOR 2SK3377-Z-E2-AZ
Q202	6-550-842-01 s	TRANSISTOR 2SK3377-Z-E2-AZ
Q203	8-729-928-05 s	TRANSISTOR 2SC4617TL-QR
R002	1-208-943-81 s	RES, CHIP 220K (1005)
R003	1-208-943-81 s	RES, CHIP 220K (1005)
R004	1-208-935-81 s	RES, CHIP 100K (1005)
R006	1-208-943-81 s	RES, CHIP 220K (1005)
R007	1-208-935-81 s	RES, CHIP 100K (1005)
R008	1-208-943-81 s	RES, CHIP 220K (1005)
R009	1-208-943-81 s	RES, CHIP 220K (1005)
R010	1-208-943-81 s	RES, CHIP 220K (1005)
R011	1-208-943-81 s	RES, CHIP 220K (1005)
R012	1-208-863-81 s	RES, CHIP 100 (1005)
R013	1-208-943-81 s	RES, CHIP 220K (1005)
R014	1-208-943-81 s	RES, CHIP 220K (1005)
R017	1-208-943-81 s	RES, CHIP 220K (1005)
R018	1-208-935-81 s	RES, CHIP 100K (1005)
R019	1-208-943-81 s	RES, CHIP 220K (1005)
R020	1-208-943-81 s	RES, CHIP 220K (1005)
R021	1-208-935-81 s	RES, CHIP 100K (1005)
R022	1-208-935-81 s	RES, CHIP 100K (1005)
R024	1-208-935-81 s	RES, CHIP 100K (1005)
R025	1-208-911-81 s	RES, CHIP 10K (1005)
R26	1-208-935-81 s	RES, CHIP 100K (1005)
R028	1-208-943-81 s	RES, CHIP 220K (1005)
R029	1-208-935-81 s	RES, CHIP 100K (1005)
R030	1-208-927-81 s	RES, CHIP 47K (1005)
R031	1-208-911-81 s	RES, CHIP 10K (1005)
R032	1-208-911-81 s	RES, CHIP 10K (1005)
R033	1-208-911-81 s	RES, CHIP 10K (1005)
R034	1-208-943-81 s	RES, CHIP 220K (1005)
R035	1-208-911-81 s	RES, CHIP 10K (1005)
R036	1-208-927-81 s	RES, CHIP 47K (1005)
R101	1-208-911-81 s	RES, CHIP 10K (1005)
R102	1-208-911-81 s	RES, CHIP 10K (1005)
R103	1-208-935-81 s	RES, CHIP 100K (1005)
R104	1-216-809-91 s	RES, CHIP 100 (1608)

CN-3572 BOARD

Ref. No. or Q'ty	Part No.	SP Description
R105	1-208-911-81 s	RES, CHIP 10K (1005)
R107	1-208-895-81 s	RES, CHIP 2.2K (1005)
R108	1-208-911-81 s	RES, CHIP 10K (1005)
R109	1-218-953-81 s	RES, CHIP 1.0K
R110	1-208-935-81 s	RES, CHIP 100K (1005)
R111	1-208-939-81 s	RES, CHIP 150K (1005)
R112	1-208-935-81 s	RES, CHIP 100K (1005)
R113	1-208-943-81 s	RES, CHIP 220K (1005)
R114	1-208-943-81 s	RES, CHIP 220K (1005)
R115	1-208-943-81 s	RES, CHIP 220K (1005)
R116	1-208-935-81 s	RES, CHIP 100K (1005)
R201	1-208-935-81 s	RES, CHIP 100K (1005)
R202	1-208-911-81 s	RES, CHIP 10K (1005)
R203	1-208-919-81 s	RES, CHIP 22K (1005)
R204	1-208-935-81 s	RES, CHIP 100K (1005)
R205	1-208-895-81 s	RES, CHIP 2.2K (1005)
R207	1-208-911-81 s	RES, CHIP 10K (1005)
R209	1-208-927-81 s	RES, CHIP 47K (1005)
R210	1-208-939-81 s	RES, CHIP 150K (1005)
R211	1-208-943-81 s	RES, CHIP 220K (1005)
R212	1-218-990-81 s	CONDUCTOR, CHIP (1005)
R213	1-218-990-81 s	CONDUCTOR, CHIP (1005)
R214	1-218-990-81 s	CONDUCTOR, CHIP (1005)
R215	1-218-990-81 s	CONDUCTOR, CHIP (1005)
R216	1-218-929-81 s	RES, CHIP 10
R217	1-242-967-81 s	RES, CHIP 1.0 (1005)
R218	1-242-967-81 s	RES, CHIP 1.0 (1005)
R219	1-242-967-81 s	RES, CHIP 1.0 (1005)
R220	1-218-965-81 s	RES, CHIP 10K 1005
R221	1-218-977-81 s	RES, CHIP 100K
R222	1-208-935-81 s	RES, CHIP 100K (1005)
THP101 	1-810-106-91 s	THERMISTOR, POSITIVE LINEAR
TP001	1-780-925-11 s	TERMINAL, LUG
TP002	1-780-925-11 s	TERMINAL, LUG

LED-517 BOARD

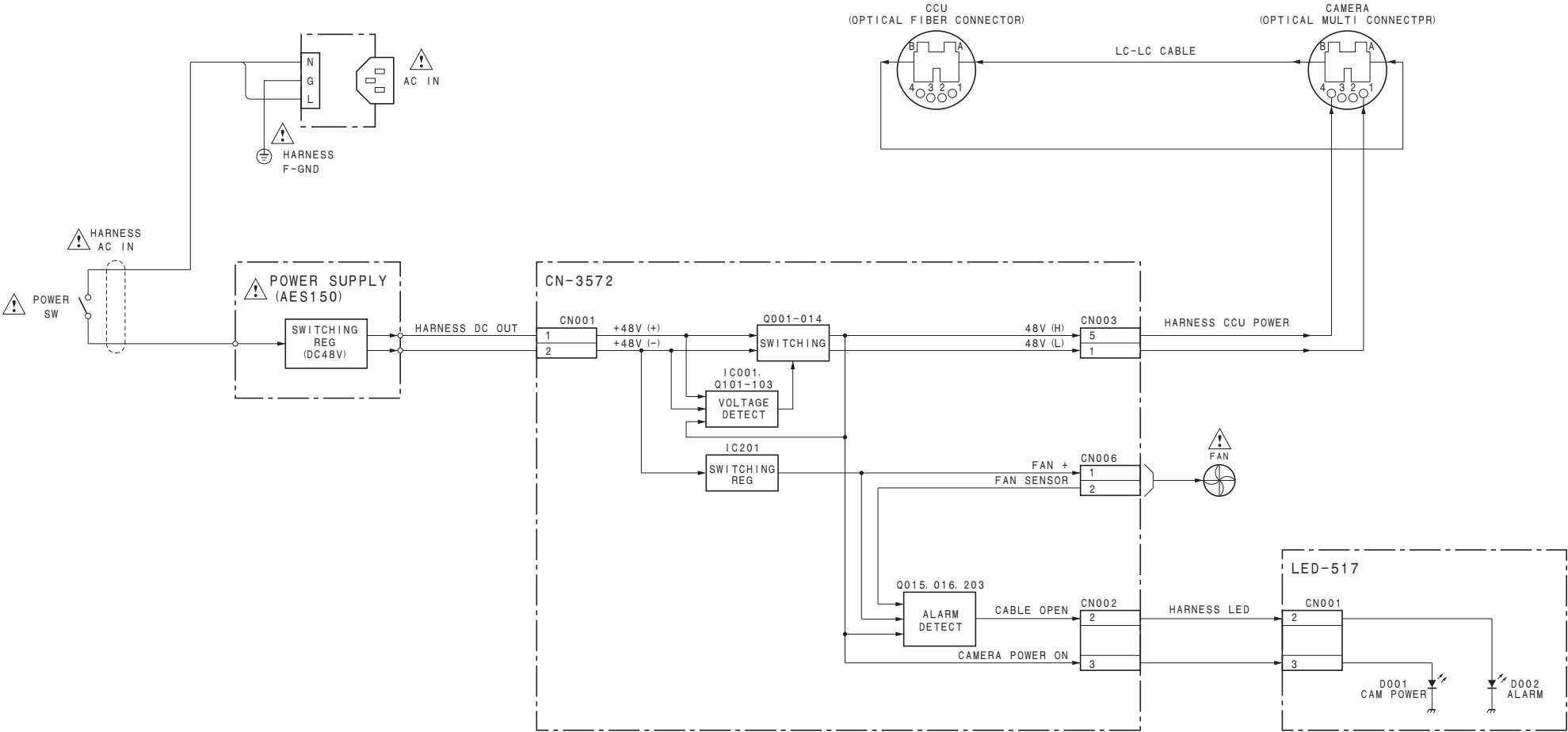
Ref. No. or Q'ty	Part No.	SP Description
1pc	A-1903-389-A s	MOUNTED CIRCUIT BOARD, LED-517
CN001	1-770-621-21 s	PIN, CONNECTOR 4P
D001	6-501-358-01 s	DIODE CL-197HG5-CD-T
D002	6-502-598-01 s	DI SML-D12U8WT86
R001	1-208-887-81 s	RES, CHIP 1.0K (1005)
R002	1-208-887-81 s	RES, CHIP 1.0K (1005)

4-4. Supplied Accessories

Q'ty	Part No.	SP Description
1pc	△ 4-445-035-01 s	OPERATING INSTRUCTIONS
1pc	△ 4-445-036-01 s	CD-ROM PACK

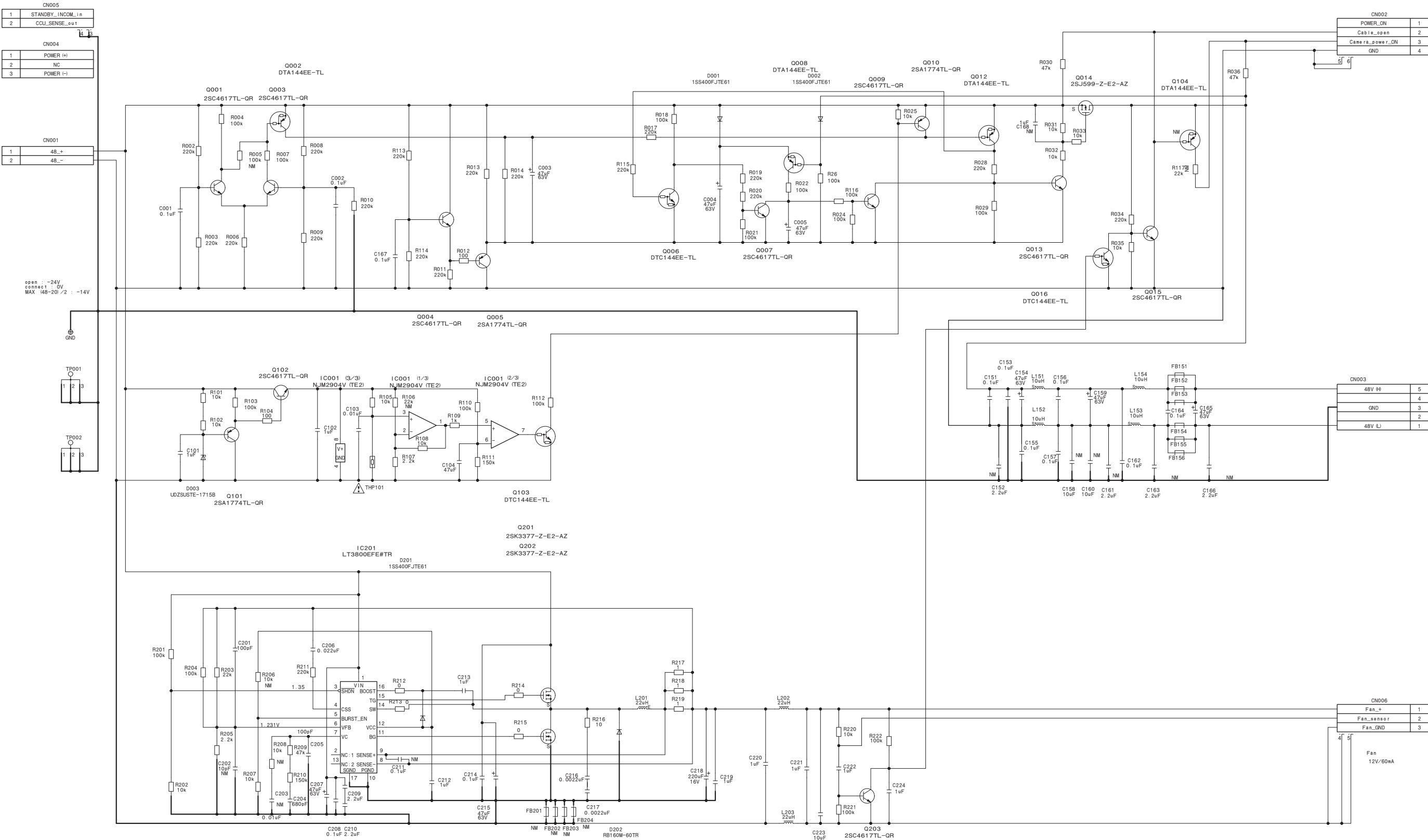
Section 5
Block Diagrams and Frame Wiring

Overall



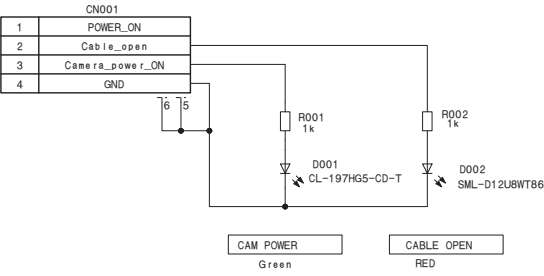
Section 6
Schematic Diagrams

CN-3572



CN-3572
BOARD NO. 1-887-835-11
CN-3572_1

LED-517

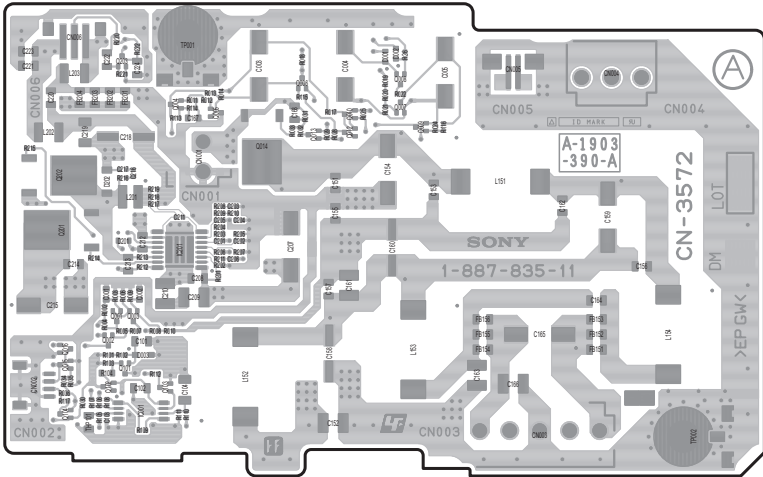


LED-517
BOARD NO. 1-887-834-11
LED-517_1

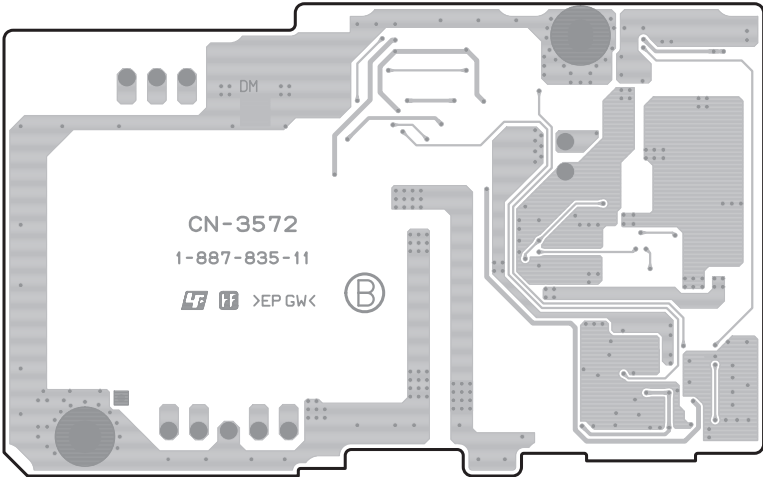
Section 7
Board Layouts

CN-3572

The location is described at the end in this section.



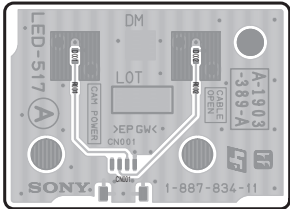
CN-3572 -A SIDE-
SUFFIX: -11



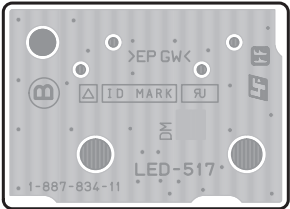
CN-3572 -B SIDE-
SUFFIX: -11

LED-517

The location is described at the end in this section.



LED-517 -A SIDE-
SUFFIX: -11



LED-517 -B SIDE-
SUFFIX: -11

Board Parts Location

CN-3572		FB204	A1	R004	A1	LED-517	
1-887-835-11		IC001	A1	R005	A1	1-887-834-11	
*: B SIDE		IC201	A1	R006	A1	*: B SIDE	
C101	A1			R007	A1	CN001	A1
C102	A1	L151	A1	R008	A1		
C103	A1	L152	A1	R009	A1	D001	A1
C104	A1	L153	A1	R010	A1	D002	A1
C151	A1	L154	A1	R011	A1		
C152	A1	L201	A1	R012	A1	R001	A1
C153	A1	L202	A1	R013	A1	R002	A1
C154	A1	L203	A1	R014	A1		
C155	A1			R017	A1		
C156	A1	Q101	A1	R018	A1		
C157	A1	Q102	A1	R019	A1		
C158	A1	Q103	A1	R020	A1		
C159	A1	Q104	A1	R021	A1		
C160	A1	Q201	A1	R022	A1		
C161	A1	Q202	A1	R024	A1		
C162	A1	Q203	A1	R025	A1		
C163	A1			R028	A1		
C164	A1	Q001	A1	R029	A1		
C165	A1	Q002	A1	R030	A1		
C166	A1	Q003	A1	R031	A1		
C167	A1	Q004	A1	R032	A1		
C168	A1	Q005	A1	R033	A1		
C201	A1	Q006	A1	R034	A1		
C202	A1	Q007	A1	R035	A1		
C203	A1	Q008	A1	R036	A1		
C204	A1	Q009	A1	THP101	A1		
C205	A1	Q010	A1				
C206	A1	Q012	A1	TP001	A1		
C207	A1	Q013	A1	TP002	A1		
C208	A1	Q014	A1				
C209	A1	Q015	A1				
C210	A1	Q016	A1				
C211	A1						
C212	A1	R26	A1				
C213	A1	R101	A1				
C214	A1	R102	A1				
C215	A1	R103	A1				
C216	A1	R104	A1				
C217	A1	R105	A1				
C218	A1	R106	A1				
C219	A1	R107	A1				
C220	A1	R108	A1				
C221	A1	R109	A1				
C222	A1	R110	A1				
C223	A1	R111	A1				
C224	A1	R112	A1				
		R113	A1				
C001	A1	R114	A1				
C002	A1	R115	A1				
C003	A1	R116	A1				
C004	A1	R117	A1				
C005	A1	R201	A1				
		R202	A1				
CN001	A1	R203	A1				
CN002	A1	R204	A1				
CN003	A1	R205	A1				
CN004	A1	R206	A1				
CN005	A1	R207	A1				
CN006	A1	R208	A1				
		R209	A1				
D201	A1	R210	A1				
D202	A1	R211	A1				
		R212	A1				
D001	A1	R213	A1				
D002	A1	R214	A1				
D003	A1	R215	A1				
		R216	A1				
FB151	A1	R217	A1				
FB152	A1	R218	A1				
FB153	A1	R219	A1				
FB154	A1	R220	A1				
FB155	A1	R221	A1				
FB156	A1	R222	A1				
FB201	A1						
FB202	A1	R002	A1				
FB203	A1	R003	A1				

SAFETY CHECK-OUT

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

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

LEAKAGE TEST

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

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

