

**SONY**<sup>®</sup>

ELECTRONIC VIEWFINDER

**DXF-20W**

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 angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

## **⚠ AVERTISSEMENT**

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

## **X-RAY RADIATION WARNING**

Be sure that parts replacement in the high voltage block and adjustments made to the high voltage circuits are carried out precisely in accordance with the procedures given in this manual.

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# Manual Structure

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## **Purpose of this manual**

This manual is the service manual for Electronic Viewfinder DXF-20W.  
This manual describes the information items necessary when the unit is supplied and installed, items on maintenance, and items that premise the service based on the components parts such as alignment, schematic diagrams, board layouts and spare parts list, assuming use of system and service engineers.

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## **Relative manual**

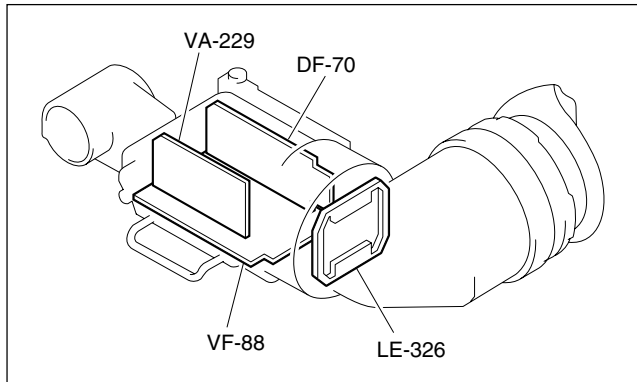
Besides this service manual the following manual is available for this unit.

- **Operating Instructions (Supplied with this unit)**

This manual is necessary for application and operation of this unit.  
Part number: 3-991-782-XX

# Section 1 Service Overview

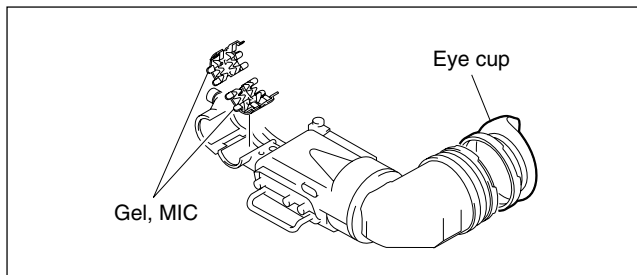
## 1-1. Location of Printed Circuit Boards



## 1-2. Recommended Replacement Parts

Parts listed below are recommended replacement parts. They are subject to cracks with the lapse of time. Check sometimes by visual, and replace as necessary.

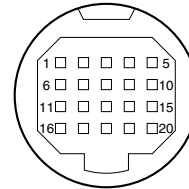
Name	Sony Part No.
Gel, MIC	3-854-132-0X *
EYE CUP KIT (RP)	A-8319-943-B



\*1 It is recommended that the MIC gels are replaced in pairs. In this case, please order two pieces.

## 1-3. Connector Input/Output Signals

VF (20P MALE)



(External view)

Pin No.	Signal	I/O	Specifications
1	PEAKING CONT	IN	$Z_i \geq 5 \text{ k}\Omega$
2	EXT. DC (12 V)	OUT	10.6 V to 17.0 V dc
3	REC TALLY	OUT	$Z_o \leq 500 \Omega$
4	BATT ALARM	OUT	$Z_o \leq 1.1 \text{ k}\Omega$
5	NC	IN	ON : $0 \pm 0.5 \text{ V}$
6	VF VIDEO (X)	OUT	$V = 1.0 \text{ V p-p}$
7	EXT. DC (12 V)	OUT	10.6 V to 17.0 V dc
8	NC		
9	NC		
10	SERIAL DATA	OUT	$Z_o \leq 500 \Omega$ , 5 V p-p
11	VF VIDEO (G)	OUT	GND for VF VIDEO
12	EXT. DC (GND)		GND for +12 V dc
13	NC		
14	DISP ON/OFF	IN	
15	SERIAL CLOCK	OUT	$Z_o \leq 500 \Omega$ , 5 V p-p
16	R-Y	OUT	$V = 830 \text{ mV}$
17	EXT. DC (GND)		GND for +12 V dc
18	B-Y	OUT	$V = 830 \text{ mV}$
19	SYNC	OUT	$V = 5 \text{ V p-p}$
20	SERIAL LOAD	OUT	$Z_o \leq 500 \Omega$ , 5 V p-p

This unit normally operates with the above input signals.

## 1-4. Cleaning

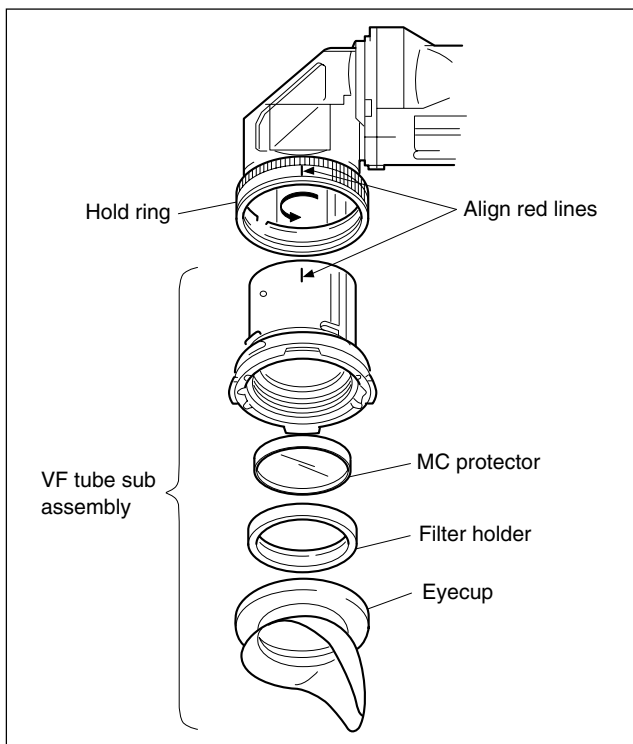
### 1-4-1. Cleaning of Viewfinder

By extracting VF tube sub assembly, lens and MC protector can be easily cleaned. And also dust on the CRT surface or mirror can be easily cleaned off.

1. Turn the hold ring counterclockwise and extract the VF tube sub assembly.
2. Detach the eyecup.
3. Remove the MC protector with the filter holder.
4. Clean the lens and MC protector with a commercially available camera lens cleaner. Blow off dust with a blower carefully so as not to flaw the mirror.
5. After the cleaning is completed, install by reversing the preceding steps. Align red lines of the VF tube and VF tube sub assembly when inserting, and turn the hold ring clockwise until it locks.

#### Note

- Do not use any type of solvent, such as alcohol, benzine or thinner to remove stains.
- Be sure to attach the eyecup to the VF, or the MC protector may come off.
- To protect the viewfinder lens from drops, put the MC protector in the filter holder and attach the eyecup securely.



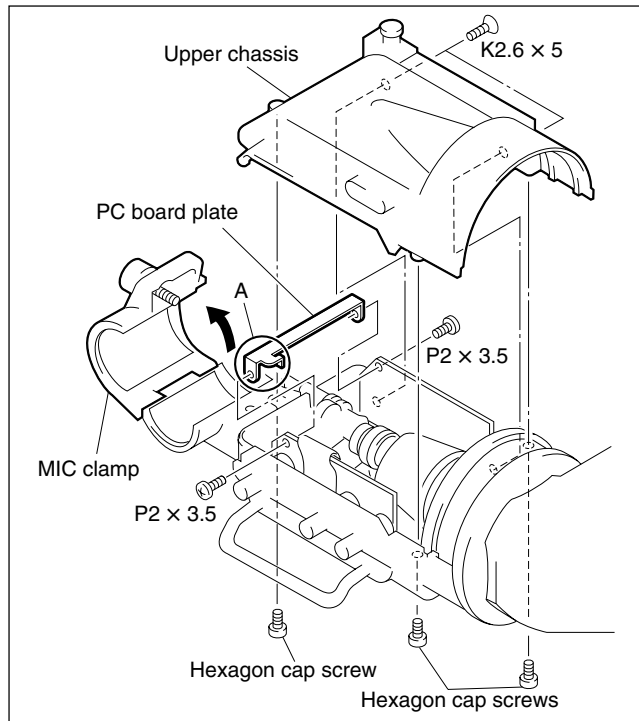
### 1-4-2. Cares after Using under Special Environment

It is recommended to check the following items after gathering the news at seaside, dusty area or spa.

1. Clean off sand and dust in the unit carefully.
2. Do not allow salt in seawater or sulfur in spa to contact the not-painted surface of the cabinet. They may cause corrosion in white. Clean with alcohol immediately if contacted.
3. Clean the connection surface of connectors.
4. Carry out the common operation check.

## 1-5. Replacing CRT/DY Assembly

1. Loosen the MIC clamp screw to open the MIC clamp.
2. Remove the two screws (K2.6 × 5).
3. Remove the three hexagon cap screws (2.6 × 6) to detach the upper chassis.

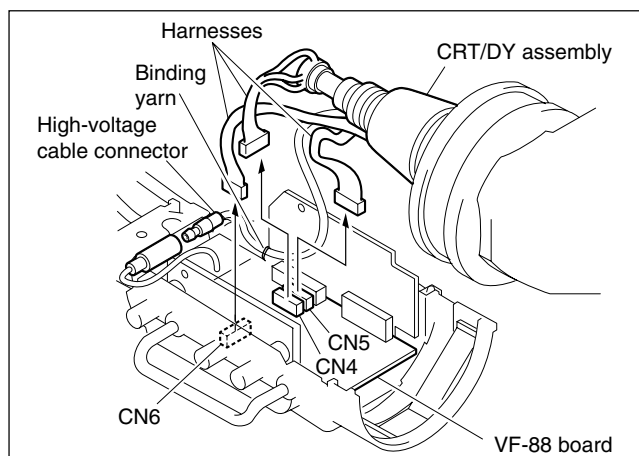


4. Remove the two screws (P2 × 3.5) and remove the PC board plate.

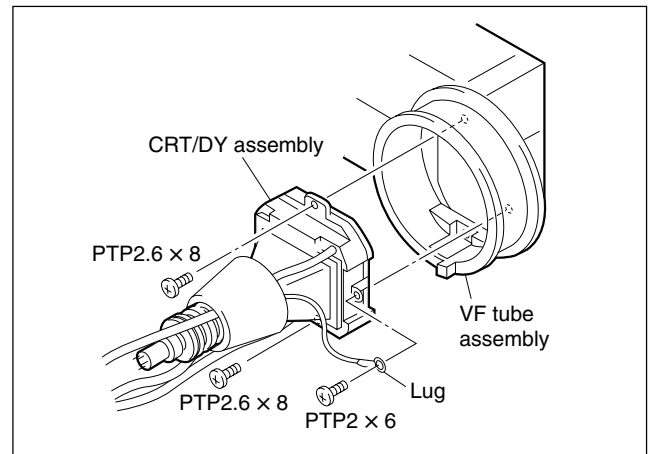
**Note**

When attaching the PC board plate, be careful of its orientation (A in the figure above).

5. Cut the binding yarn of the high-voltage cable.
6. Disconnect the high-voltage cable connector.
7. Disconnect the harnesses from the connectors CN4, CN5, and CN6 on the VF-88 board.



8. Remove the three screws (two : PTP2.6 × 8, one : PTP2 × 6), and remove the CRT/DY assembly from the VF tube assembly. Replace the CRT/DY assembly.
9. Install a new CRT/DY assembly to the VF tube assembly so that the high-voltage cable comes upper.



10. Connect the high-voltage cable and harnesses by reversing steps 6 and 7.
11. Arrange the harnesses referring to Section 1-6.
12. Perform electrical alignment referring to Section 2 “Electrical Alignment”.
13. Reinstall the upper chassis by reversing steps 2 and 3.

**Note**

Be careful so that the harnesses are not caught by the upper chassis.

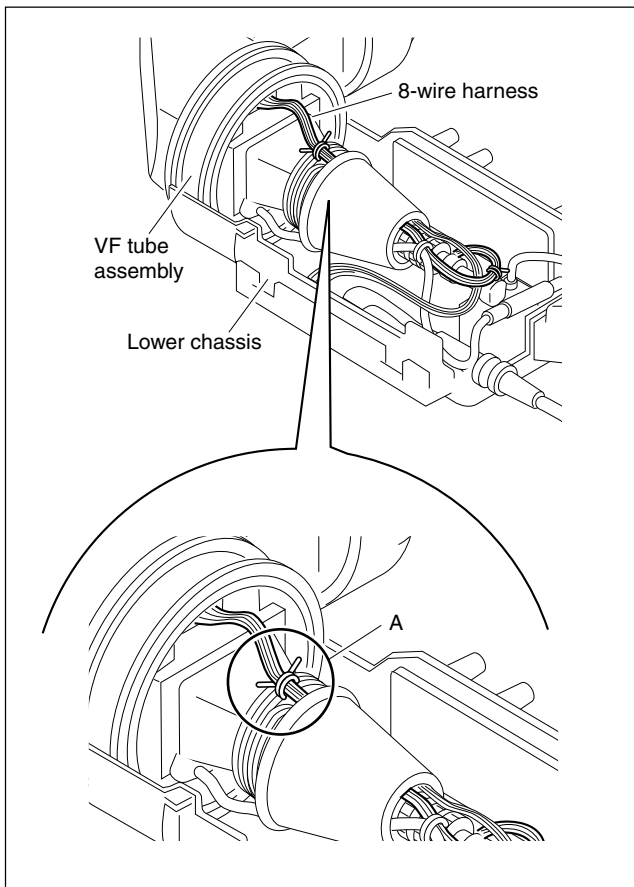
14. Close the MIC clamp and tighten the MIC clamp screw.

## 1-6. Arranging Harness

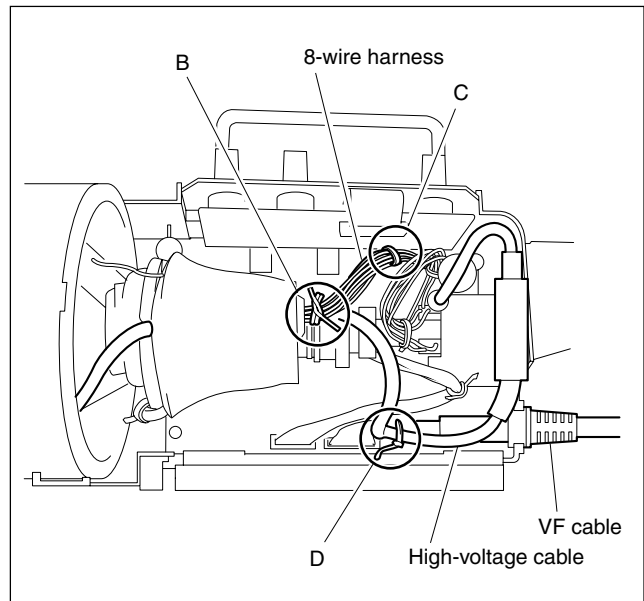
When repairing the unit, arrange and clamp the harness as described in the following steps.

Improper arrangement of the harness may result in a disconnection or awkward turn of the VF tube assembly.

1. Arrange the 8-wire harness as shown in the figure and clamp it at point A so that it is not in contact with the inside of the VF tube assembly or the lower chassis.



2. Clamp the high-voltage cable and the 8-wire harness at point B.
3. Clamp the 8-wire harness at point C.
4. Arrange the high-voltage cable as shown in the figure, and then clamp it with the VF cable at point D.

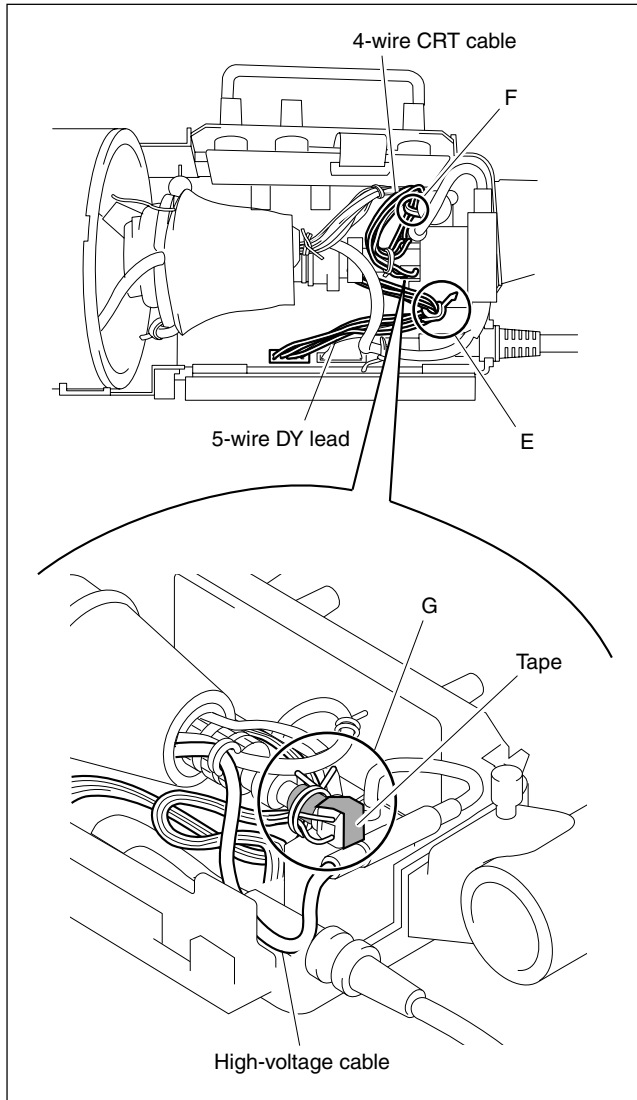




5. Arrange the 5-wire DY lead as shown in the figure, and then clamp it at point E.
6. Clamp the 4-wire CRT cable at point F.
7. Fix the CRT connector with UL tape as shown in the figure, and then clamp the CRT cable at point G.

**Note**

Ensure that the CRT connector is connected firmly.



8. Install the upper chassis.  
Be careful so that the high-voltage cable is not caught.

## 1-7. Disconnecting/Connecting Flexible Card Wire

The flexible card wire is used between the VF-88 board and VA-229 board. Take care not to break this flexible card wire. This shortens the wire life.

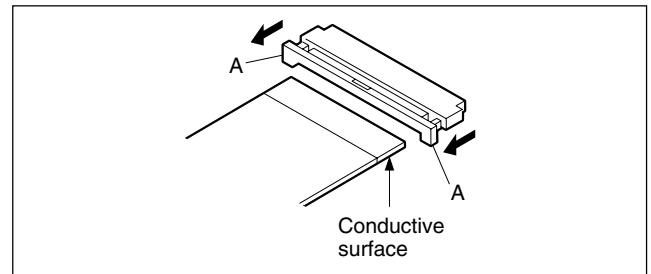
### Disconnecting

1. Turn off the power.
2. Slide portions A in the direction of the arrows to unlock and pull out the flexible card wire.

### Connecting

**Note**

- Be careful not to insert the flexible card wire obliquely.
  - Check that the conductive surface of the flexible card wire is not soiled with dust.
1. Slide portions A in the direction of the arrows and insert the flexible card wire as far as it will go with the conductive surface downside.
  2. Slide portions A in the reverse direction to lock.



## 1-8. Notes on Spare Parts

### 1. Safety Related Components Warning

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

### 2. Standardization of Parts

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

Parts list has the present standardized repair parts.

### 3. Stock of Parts

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

### 4. Harness

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

## 1-9. Unleaded 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

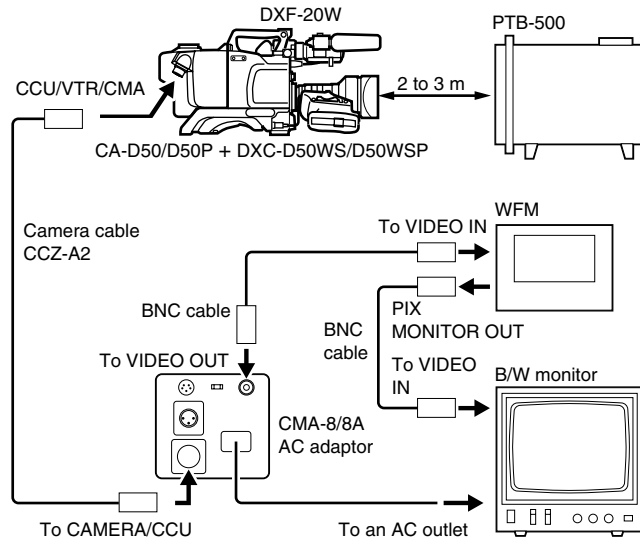
- Be sure to use the unleaded solder for the printed circuit board printed with the lead free mark.
- The unleaded solder melts at a temperature about 40 °C higher than the ordinary solder, therefore, it is recommended to use the soldering iron having a temperature regulator.
- The ordinary soldering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

## Section 2 Alignment

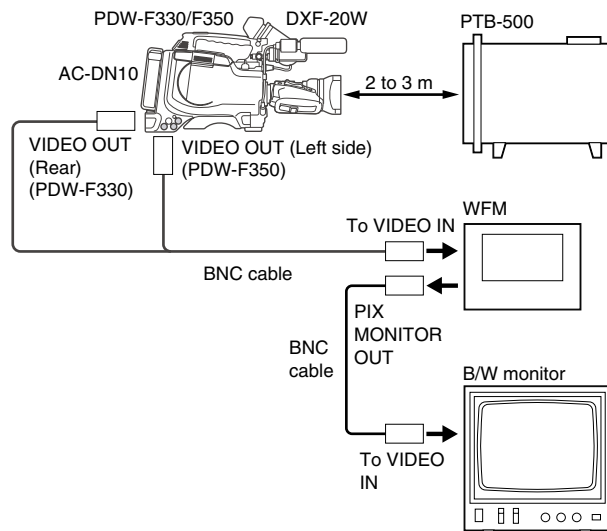
### 2-1. Preparation

#### 2-1-1. Connecting Diagram

##### Using a video camera



##### Using a camcorder



##### Related equipment

- Video camera: DXC-D50WS/D50WSP
- Professional disk camcorder: PDW-F330/F350
- Camera adaptor: CA-D50/D50P
- AC adaptor: CMA-8/8CE/8A/8ACE, AC-DN10
- Camera cable: CCZ-A2
- B/W monitor: PVM-91/91CE or equivalent

#### 2-1-2. Required Equipment

##### Tools/measuring equipment

- Pattern box PTB-500 (Sony part number: J-6029-140-B)
- Resolution chart (4:3) (Sony part number: J-6026-100-A)
- Resolution chart (16:9) (Sony part number: J-6395-320-A)
- Waveform monitor (WFM)
- Digital voltmeter

#### 2-1-3. Notes on Adjustment

- When using the camera or camcorder that can select the aspect ratio 16:9 or 4:3, on some adjustment items, the setting of the aspect ratio needs to be changed. (Refer to Section 2-2-5, Bright Calibration Adjustment.)
- When the aspect ratio is not specified, perform adjustment in the 16:9 mode. As for details on the setting method of the aspect ratio, refer to the operating instructions of the video camera or camcorder to be used.
- This alignment is described for both NTSC/PAL systems. When performing the adjustment, adjust according to the level appropriate for each system.

#### 2-1-4. Initial Setting

##### Video camera or digital camcorder

- Lens: IRIS A (auto)/M (manual) → M (manual)
- OUTPUT/DCC switch → CAM/ON
- GAIN switch → 0 dB
- Selection of 16:9 mode

##### Note

##### When using DXC-D50WS/D50WSP

- Change on the OTHERS page in the MAINTENANCE menu.

##### When using PDW-F350/F330

- Change on the FORMAT page in the USER (or OPERATION) menu.

##### Note

Only when using the camera and camcorder that can select the aspect ratio 16:9 or 4:3, the mode selection is required.

##### Setting of viewfinder

- CONTRAST control → Mechanical center
- BRIGHT control → Mechanical center
- PEAKING control → Fully counterclockwise Ⓞ

## 2-2. Viewfinder System Adjustment

### 2-2-1. Heater Voltage Pre-Adjustment

#### Note

When performing this adjustment, check “2-2-5. Bright Calibration Adjustment”.

#### Preparation

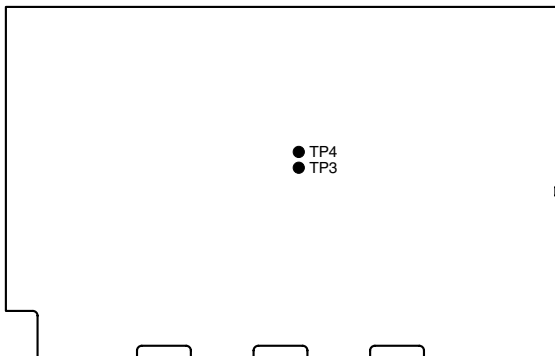
- Measuring equipment: Digital voltmeter (AC mode)

#### Adjustment procedure

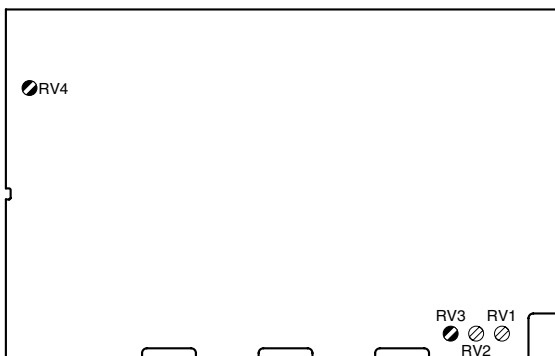
Check the following voltage.

- Test point: TP3 ↔ TP4/VF-88 board
- Specification:  $0.635 \pm 0.015$  V rms

If the above specification is not met, adjust  $\text{RV4}$  (VH-ADJ)/VF-88 board so that the specification is met.



VF-88 board



VF-88 board

### 2-2-2. Focus Adjustment

#### Note

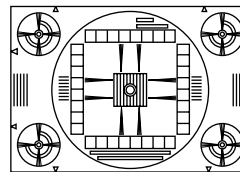
This adjustment and “2-2-3. Horizontal Frame Adjustment”, “2-2-4. Heater Voltage Adjustment” and “2-2-5. Bright Calibration Adjustment” affect with each other. Therefore, repeat the adjustment until all specifications are met.

#### Preparation

- Object: Resolution chart
- Measuring equipment: Waveform monitor
- Lens  
IRIS AUTO/MANU → MANU
- Viewfinder  
BRIGHT control → Mechanical center  
CONTRAST control → Fully clockwise ⤴  
PEAKING control → Fully counterclockwise ⤵

#### Adjustment Procedure

1. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
2. Set the resolution on the monitor screen to the best state with the lens focus.



Monitor screen

3. Adjust the lens iris so that the white level at VIDEO OUT connector on the camera is as follows.  
For NTSC:  $100 \pm 2$  IRE  
For PAL:  $700 \pm 14$  mV
4. Adjust  $\text{RV3}$  (FOCUS)/VF-88 board so that the picture on the viewfinder screen is best focused.

## 2-2-3. Horizontal Frame Adjustment

### Note

This adjustment and “2-2-2. Focus Adjustment”, “2-2-4. Heater Voltage Adjustment” and “2-2-5. Bright Calibration Adjustment” affect with each other. Therefore, repeat the adjustment until all specifications are met.

### Preparation

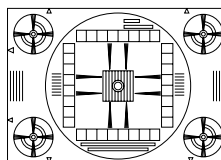
- Object: Resolution chart
- Measuring equipment: Waveform monitor
- Remove the eye cap from the viewfinder.
- Viewfinder
  - BRIGHT control → Mechanical center
  - CONTRAST control → Mechanical center
  - PEAKING control → Fully counterclockwise ⤴

### Adjustment Procedure

1. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
2. Set the resolution on the monitor screen to the best state with the lens focus.
3. Adjust the lens iris so that the white level at VIDEO OUT connector on the camera is as follows.

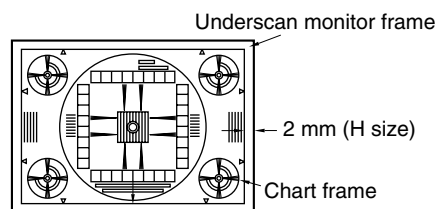
For NTSC:  $100 \pm 2$  IRE

For PAL:  $700 \pm 14$  mV

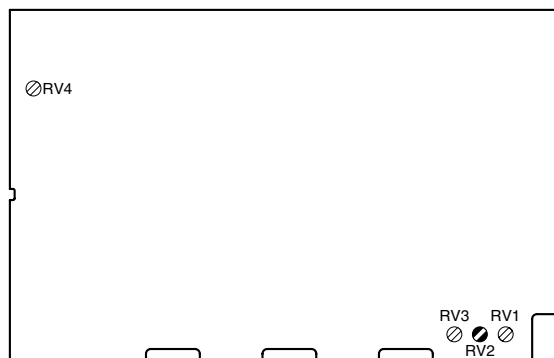


Monitor screen

4. Adjust ⓪RV2 (H-SIZE WIDE)/VF-88 board so that H size of resolution chart is underscanned by approximately 2 mm from the CRT picture frame.



Viewfinder screen



VF-88 board

## 2-2-4. Heater Voltage Adjustment

### Note

When performing this adjustment, check “2-2-5. Bright Calibration Adjustment”.

### Preparation

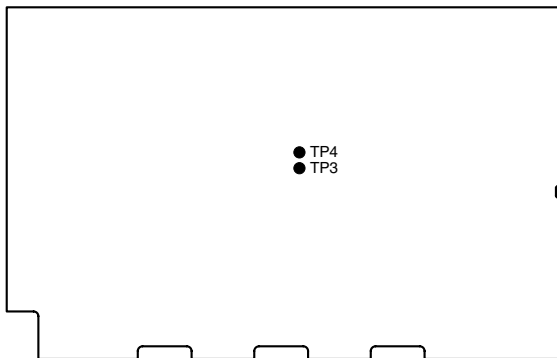
- Measuring equipment: Digital voltmeter (AC mode)

### Adjustment procedure

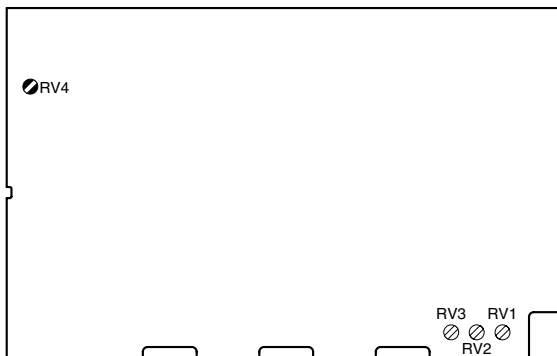
Check the following voltage.

- Test point: TP3 ↔ TP4/VF-88 board
- Specification:  $0.635 \pm 0.015$  V rms

If the above specification is not met, adjust  $\text{RV4}$  (VH-ADJ)/VF-88 board so that the specification is met.



VF-88 board



VF-88 board

## 2-2-5. Bright Calibration Adjustment

### Note

This adjustment and “2-2-2. Focus Adjustment”, “2-2-3. Horizontal Frame Adjustment” and “2-2-4. Heater Voltage Adjustment” affect with each other. Therefore, repeat the adjustment until all specifications are met.

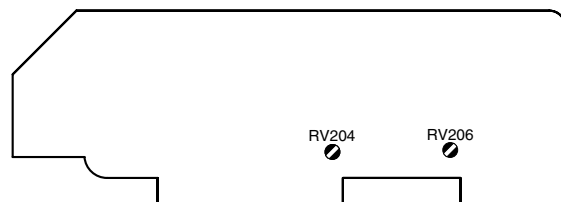
### Preparation

- Viewfinder  
BRIGHT control → Mechanical center  
CONTRAST control → Mechanical center

### Adjustment Procedure

Change the setting of aspect ratio to 4:3 mode.  
Adjust the bright calibration so that the pedestal level becomes the surrounding black level by turning  $\text{RV204}$  (SUS-BRIGHT: 4:3) / the VA-229 board clockwise from the counterclockwise maximum point.

Set the aspect ratio to 16:9 mode again.  
Adjust  $\text{RV206}$  (SUS-BRIGHT: 16:9) / the VA-229 board in the same way as the 4:3 mode.



VA-229 board

## 2-2-6. Horizontal Shift Adjustment (For NTSC)

### Notes

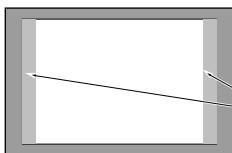
- The following is the adjustment of the NTSC system video camera and viewfinder.
- When adjusting the viewfinder used in the PAL system video camera, perform the “Adjustment procedure (For PAL)”.

### Preparation

- Measuring equipment: Waveform monitor
- Viewfinder
  - BRIGHT control → Fully clockwise ⌚
  - CONTRAST control → Fully counterclockwise ⌚
  - PEAKING control → Fully counterclockwise ⌚

### Adjustment procedure

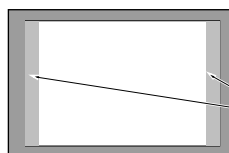
1. Attach the viewfinder to the NTSC system video camera.
2. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
3. Set the resolution on the monitor screen to the best state with the lens focus.
4. Adjust the lens iris so that white level at VIDEO OUT connector on the camera is  $100 \pm 2$  IRE.
5. Adjust the BRIGHT control fully clockwise and the CONTRAST control fully counterclockwise to display the pedestal portion.
6. Adjust ⓪RV101 (H-SHIFT: N)/DF-70 board so that the pedestal portion on both sides are equal.



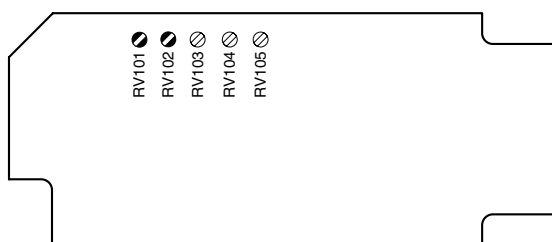
Viewfinder screen

### Adjustment procedure (For PAL)

1. Attach the viewfinder to the PAL system video camera.
2. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
3. Set the resolution on the monitor screen to the best state with the lens focus.
4. Adjust the lens iris so that white level at VIDEO OUT connector on the camera is  $700 \pm 14$  mV.
5. Adjust the BRIGHT control fully clockwise and the CONTRAST control fully counterclockwise to display the pedestal portion.
6. Adjust ⓪RV102 (H-SHIFT: P)/DF-70 board so that the pedestal portion on both sides are equal.



Viewfinder screen



DF-70 board

## 2-2-6. Horizontal Shift Adjustment (For PAL)

### Notes

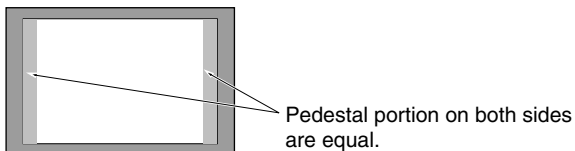
- The following is the adjustment of the PAL system video camera and viewfinder.
- When adjusting the viewfinder used in the NTSC system video camera, perform the “Adjustment procedure (For NTSC)”.

### Preparation

- Measuring equipment: Waveform monitor
- Viewfinder
  - BRIGHT control → Fully clockwise ⌚
  - CONTRAST control → Fully counterclockwise ⌚
  - PEAKING control → Fully counterclockwise ⌚

### Adjustment procedure

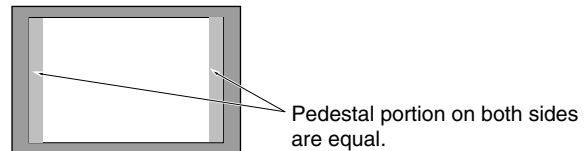
1. Attach the viewfinder to the PAL system video camera.
2. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
3. Set the resolution on the monitor screen to the best state with the lens focus.
4. Adjust the lens iris so that white level at VIDEO OUT connector on the camera is  $700 \pm 14$  mV.
5. Adjust the BRIGHT control fully clockwise and the CONTRAST control fully counterclockwise to display the pedestal portion.
6. Adjust ⓄRV102 (H-SHIFT: P)/DF-70 board so that the pedestal portion on both sides are equal.



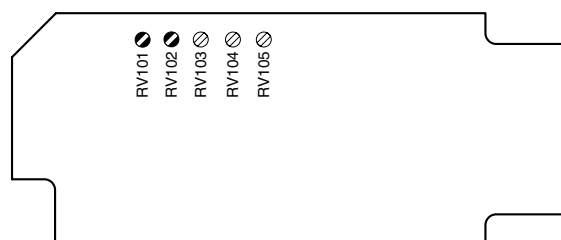
Viewfinder screen

### Adjustment procedure (For NTSC)

1. Attach the viewfinder to the NTSC system video camera.
2. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
3. Set the resolution on the monitor screen to the best state with the lens focus.
4. Adjust the lens iris so that white level at VIDEO OUT connector on the camera is  $100 \pm 2$  IRE.
5. Adjust the BRIGHT control fully clockwise and the CONTRAST control fully counterclockwise to display the pedestal portion.
6. Adjust ⓄRV101 (H-SHIFT: N)/DF-70 board so that the pedestal portion on both sides are equal.



Viewfinder screen



DF-70 board



## 2-2-7. Vertical Frame Adjustment (For NTSC)

### Notes

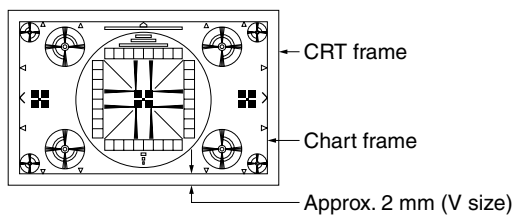
- The following is the adjustment of the NTSC system video camera and viewfinder.
- When adjusting the viewfinder used in the PAL system video camera, perform the “Adjustment procedure (For PAL)”.

### Preparation

- Measuring equipment: Waveform monitor
- Remove the eye cap from the viewfinder.
- Viewfinder
  - BRIGHT control → Mechanical center
  - CONTRAST control → Mechanical center
  - PEAKING control → Fully counterclockwise  $\odot$

### Adjustment procedure

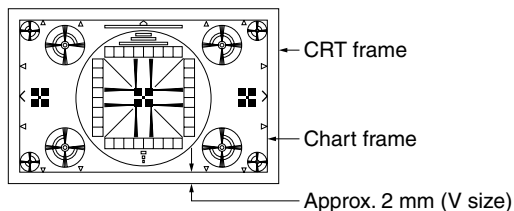
1. Attach the viewfinder to the NTSC system video camera.
2. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
3. Set the resolution on the monitor screen to the best state with the lens focus.
4. Adjust the lens iris so that white level at VIDEO OUT connector on the camera is  $100 \pm 2$  IRE.
5. Adjust  $\odot$ RV103 (V-SIZE: N)/DF-70 board so that the V size of resolution chart is underscanned by approximately 2 mm from the CRT picture frame.



Viewfinder screen

### Adjustment procedure (For PAL)

1. Attach the viewfinder to the PAL system video camera.
2. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
3. Set the resolution on the monitor screen to the best state with the lens focus.
4. Adjust the lens iris so that white level at VIDEO OUT connector on the camera is  $700 \pm 14$  mV.
5. Adjust  $\odot$ RV104 (V-SIZE: P)/DF-70 board so that the V size of resolution chart is underscanned by approximately 2 mm from the CRT picture frame. (When  $\odot$ RV103 is not adjusted, the adjustment may not be performed by just  $\odot$ RV104. In such case, adjust  $\odot$ RV104 after roughly adjusting by  $\odot$ RV103.)



Viewfinder screen



DF-70 board

## 2-2-7. Vertical Frame Adjustment (For PAL)

### Notes

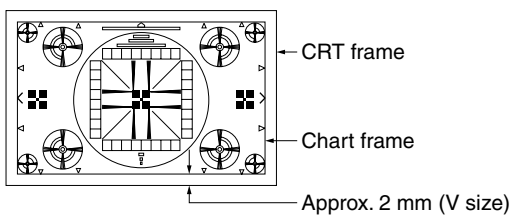
- The following is the adjustment of the PAL system video camera and viewfinder.
- When adjusting the viewfinder used in the NTSC system video camera, perform the “Adjustment procedure (For NTSC)”. After the “Adjustment procedure (For NTSC)”, perform the check or adjustment of the PAL system again.

### Preparation

- Measuring equipment: Waveform monitor
- Remove the eye cap from the viewfinder.
- Viewfinder
  - BRIGHT control → Mechanical center
  - CONTRAST control → Mechanical center
  - PEAKING control → Fully counterclockwise ☺

### Adjustment procedure

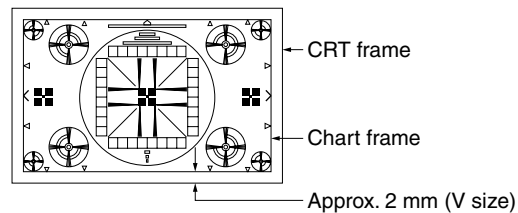
1. Attach the viewfinder to the PAL system video camera.
2. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
3. Set the resolution on the monitor screen to the best state with the lens focus.
4. Adjust the lens iris so that white level at VIDEO OUT connector on the camera is  $700 \pm 14$  mV.
5. Adjust ⓄRV104 (V-SIZE: P)/DF-70 board so that the V size of resolution chart is underscanned by approximately 2 mm from the CRT picture frame.  
(When ⓄRV104 is not adjusted, the adjustment may not be performed by just ⓄRV103. In such case, adjust ⓄRV103 after roughly adjusting by ⓄRV104.)



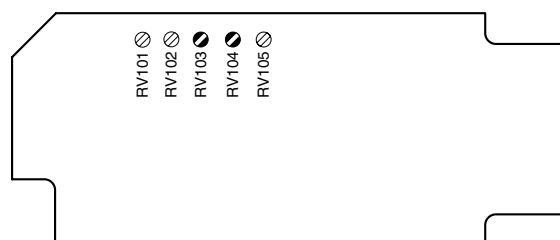
Viewfinder screen

### Adjustment procedure (For NTSC)

1. Attach the viewfinder to the NTSC system video camera.
2. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
3. Set the resolution on the monitor screen to the best state with the lens focus.
4. Adjust the lens iris so that white level at VIDEO OUT connector on the camera is  $100 \pm 2$  IRE.
5. Adjust ⓄRV103 (V-SIZE: N)/DF-70 board so that the V size of resolution chart is underscanned by approximately 2 mm from the CRT picture frame.



Viewfinder screen



DF-70 board

## 2-2-8. Screen Centering Check

### Note

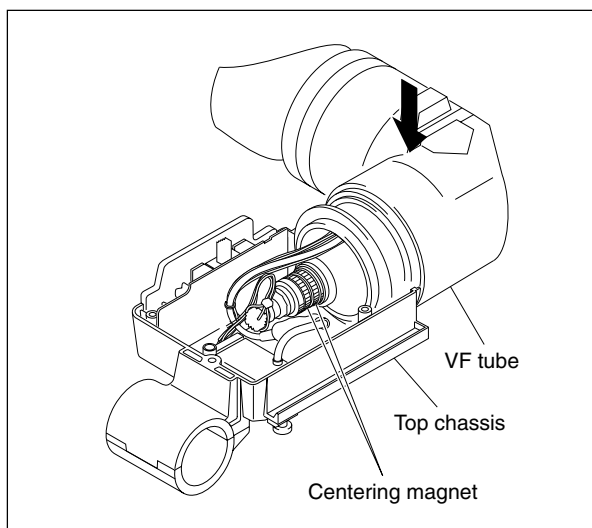
When performing the centering magnet adjustment in the check of this section, perform “2-2-3. Horizontal Frame Adjustment” and “2-2-7. Vertical Frame Adjustment”.

### Preparation

- Measuring equipment: Waveform monitor
- Viewfinder  
BRIGHT control → Mechanical center  
CONTRAST control → Mechanical center  
PEAKING control → Fully counterclockwise Ⓞ

### Adjustment procedure

1. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
2. Set the resolution on the monitor screen to the best state with the lens focus.
3. Adjust the lens iris so that the white level at VIDEO OUT connector on the camera is as follows.  
For NTSC:  $100 \pm 2$  IRE  
For PAL:  $700 \pm 14$  mV
4. Push the VF tube against the top chassis on the horizontal position as shown in the illustration below. Check that the image is in the center when it is viewed through the viewfinder in the normal state. If the image is not in the center, perform the centering magnet adjustment to adjust the image to the center.



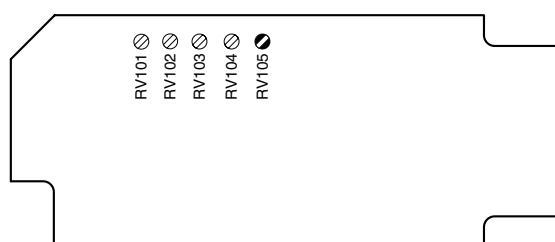
## 2-2-9. Vertical Linearity Adjustment

### Preparation

- Measuring equipment: Waveform monitor
- Viewfinder  
BRIGHT control → Mechanical center  
CONTRAST control → Mechanical center  
PEAKING control → Fully counterclockwise Ⓞ

### Adjustment procedure

1. Adjust the lens zoom so that the resolution chart frame coincides with the underscanned picture frame on the monitor screen.
2. Set the resolution on the monitor screen to the best state with the lens focus.
3. Adjust the lens iris so that the white level at VIDEO OUT connector on the camera is as follows.  
For NTSC:  $100 \pm 2$  IRE  
For PAL:  $700 \pm 14$  mV
4. Adjust ⓄRV105 (V-LIN)/DF-70 board so that each circle at the four corners of resolution chart is the perfect circle (symmetrical in top and bottom).

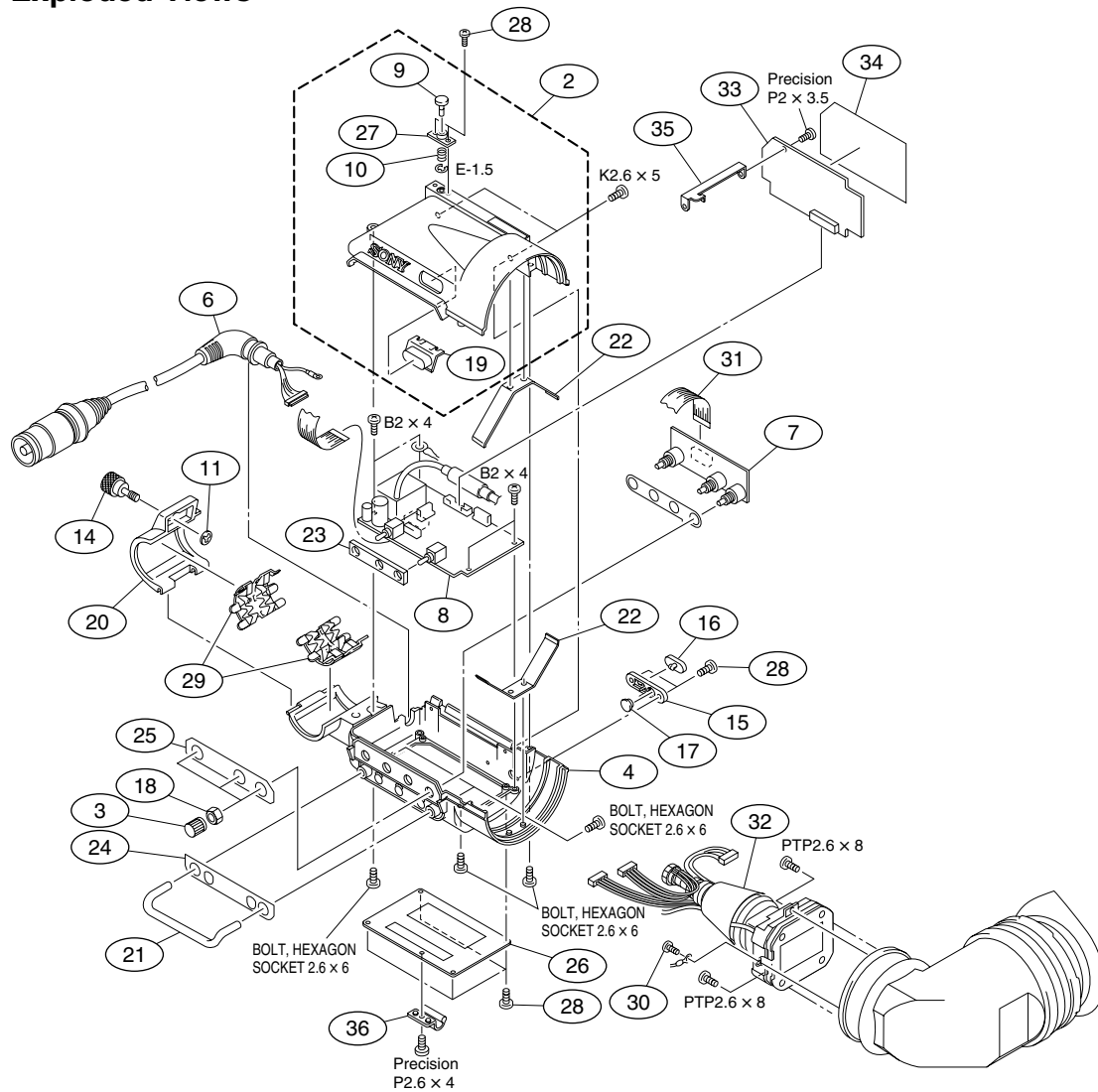


DF-70 board



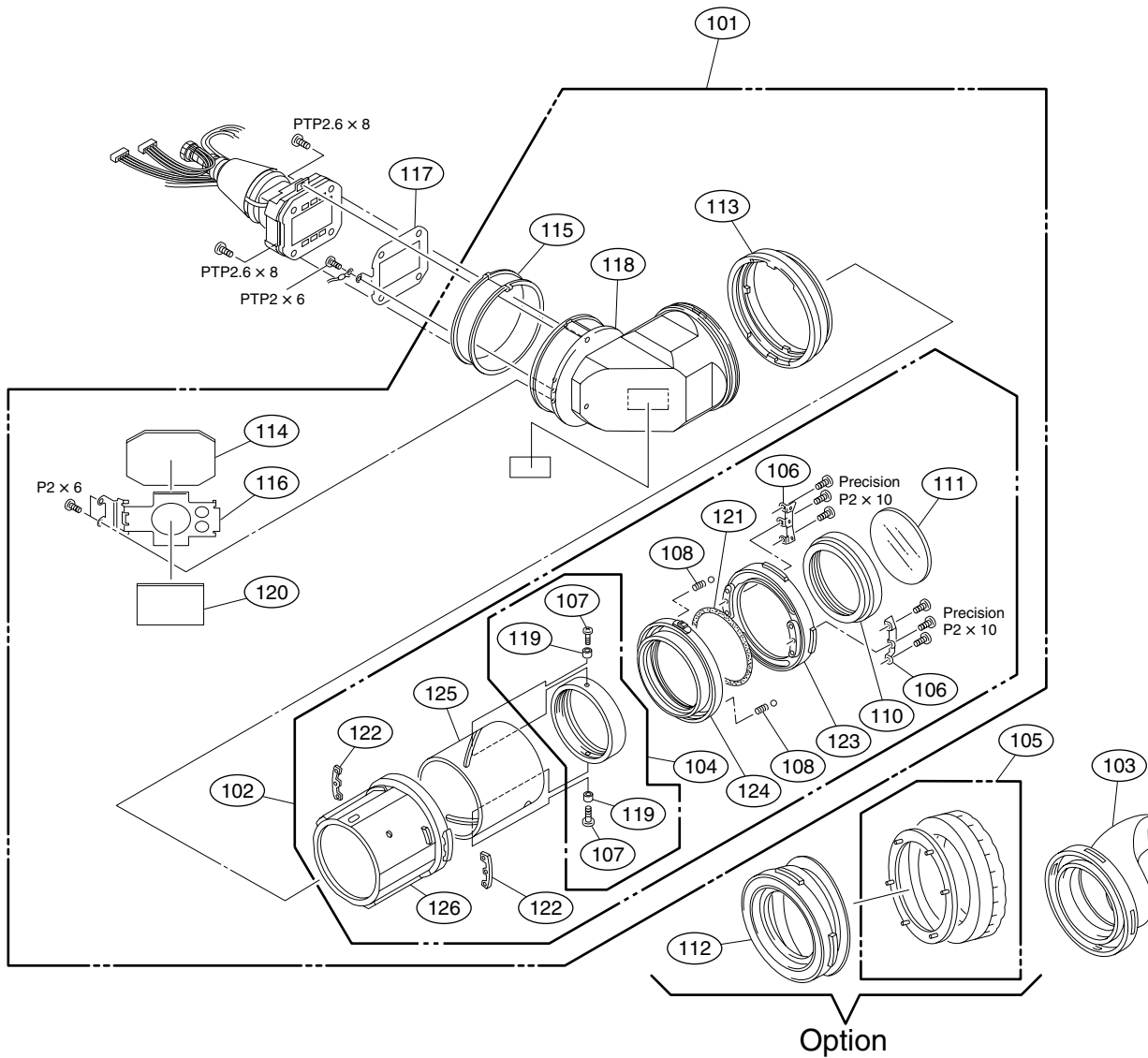
## Section 3 Spare Parts

### 3-1. Exploded Views



No.	Part No.	SP Description	No.	Part No.	SP Description
2	A-1123-253-A	s CASE ASSY, TOP	22	3-697-152-01	o SPRING, LEAF (2)
3	X-3604-579-2	s VOLUME KNOB ASSY	23	3-697-156-01	o CUSHION, DROP PROTECTION (2)
4	X-3678-575-5	s CHASSIS B ASSY, BOTTOM (LOWER)	24	3-991-416-01	s LABEL, VF
5			25	3-697-160-01	o LABEL, VF (C)
6	1-832-197-11	s CORD, CONNECTION (VF)	26	3-991-434-01	s LID, COVER
7	9-885-107-97	s MOUNTED CIRCUIT BOARD, VA-229	27	3-710-008-02	s HOUSING, STOPPER
8	9-885-107-93	s MOUNTED CIRCUIT BOARD, VF-88	28	3-719-381-02	s SCREW +P M2X4 (ZNBK) (LOCK)
9	2-277-457-01	s KNOB, STOPPER	29	3-854-132-01	s GEL, MIC
10	2-277-466-01	s SPRING, COMPRESSION (STEEL)	30	9-885-083-47	s SCREW
11	3-165-904-01	s WASHER, SCREW STOPPER (PLA)	31	9-885-107-24	s CABLE, FLAT
12			32	△ 9-885-107-22	s CRT/DY+ CONNECTOR ASSY
13			33	9-885-107-95	s MOUNTED CIRCUIT BOARD, DF-70
14	3-657-657-02	s SCREW (M5)	34	3-609-583-02	s SHEET, INSULATING
15	3-679-693-01	o BASE, SLIDE	35	3-609-582-02	o PLATE, PC BOARD
16	3-679-694-01	o COVER, SLIDE	36	3-678-684-01	s HOLDER, CABLE
17	3-679-695-01	o COVER, TALLY	7-621-772-18	s SCREW +B M2X4	
18	3-685-104-01	s NUT (M6), CONTROL (STEEL)	7-624-102-04	s STOP RING 1.5 TYPE-E	
19	3-692-132-03	o COVER, TALLY	7-627-454-38	s SCREW, PRECISION +K2.6X5	
20	3-692-134-01	o MIC CLAMP	7-683-412-05	s BOLT, HEXAGON SOCKET 2.6X6 (ST)	
21	3-692-147-01	o GUARD BAR	7-685-134-19	s SCREW +PTP2.6X8 (EP-FE/ZNBK/CM2)	

# Viewfinder (2)



No.	Part No.	SP Description
101	A-1123-171-A	s TUBE ASSY, VF
102	A-1127-099-A	s TUBE SUB ASSY, VF
103	A-8319-943-B	s EYE CUP KIT (RP)
104	X-3608-271-5	s ASSY, VF LENS
105	X-3678-187-2	s CUSSION,EYE CUP ASSY
106	3-176-414-01	o RETAINER, RING
107	3-335-207-02	s SHAFT, MOTOR
108	3-573-150-01	s SPRING, COMPRESSION
109		
110	3-623-709-01	o MC, HOLDER
111	3-623-710-01	s MC, GLASS
112	3-682-494-02	o EYE,CUP (S)
113	3-692-136-03	s FIXED RING
114	3-692-139-01	s MIRROR(2)
115	3-697-151-01	s RING, VF
116	3-697-154-01	s HOLDER,MIRROR(3)
117	3-991-417-01	s PLATE A, DISPLAY

No.	Part No.	SP Description
118	3-697-167-04	s VF TUBE(4)
119	3-722-485-01	o ROLLER, SLIDE
120	3-723-073-01	s CUSHION, MIRROR
121	3-726-904-01	s RING (MT), O
122	3-742-038-01	s NUT (2), PLATE
123	3-742-052-03	s HOLDER, EYE CUP
124	3-742-053-02	s RING
125	3-742-054-01	o TUBE
126	3-742-060-02	o HOLDER, RING
127		
	7-627-553-78	s SCREW,PRECISION +P 2X10
	7-671-158-01	s BALL, STAINLESS (2.5 DIA)
	7-685-104-19	s SCREW +PTP 2X6 (EP-FE/ZNBK/CM2)
	7-685-134-19	s SCREW +PTP 2.6X8 (EP-FE/ZNBK/CM2)

## 3-2. Electrical Parts List

ここに記載されていないICや他の部品は、供給できません。

IC or other parts which are not described here cannot be supplied.

-----  
DF-70 BOARD  
-----

Ref. No. or Q'ty	Part No.	SP Description
1pc	9-885-107-95	s MOUNTED CIRCUIT BOARD, DF-70
IC101	8-759-394-25	s IC LA7858-E

-----  
LE-326 BOARD  
-----

Ref. No. or Q'ty	Part No.	SP Description
1pc	9-885-107-99	s MOUNTED CIRCUIT BOARD, LE-326

-----  
VA-229 BOARD  
-----

Ref. No. or Q'ty	Part No.	SP Description
1pc	9-885-107-97	s MOUNTED CIRCUIT BOARD, VA-229

-----  
VF-88 BOARD  
-----

Ref. No. or Q'ty	Part No.	SP Description
1pc	9-885-107-93	s MOUNTED CIRCUIT BOARD, VF-88
CP1	△ 1-576-805-11	s FUSE (SMD/FAST ACTING)
FBT	△ 9-885-107-19	s FLYBACK TRANSFORMER
HLC	△ 9-885-083-37	s COIL, HORIZONTAL LINEARITY
IC2	9-885-107-20	s REGULATOR CONTROL IC
L2	△ 9-885-083-50	s COIL, INDUCTOR
SW1	1-762-488-11	s SWITCH, TOGGLE
SW2	1-762-489-11	s SWITCH, TOGGLE

## 3-3. Supplied Accessories

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8278-412-H	s SHOE ASSY, VF
1pc	3-991-782-01	s OPERATING INSTRUCTIONS
1pc	7-700-736-04	s WRENCH, L-SHAPED HEX. (2.5MM)

## 3-4. Optional Fixtures

Part No.	SP Description
J-6026-100-A	o RESOLUTION CHART (3:4)
J-6029-140-B	o PATTERN BOX PTB-500
J-6395-320-A	o RESOLUTION CHART (16:9)

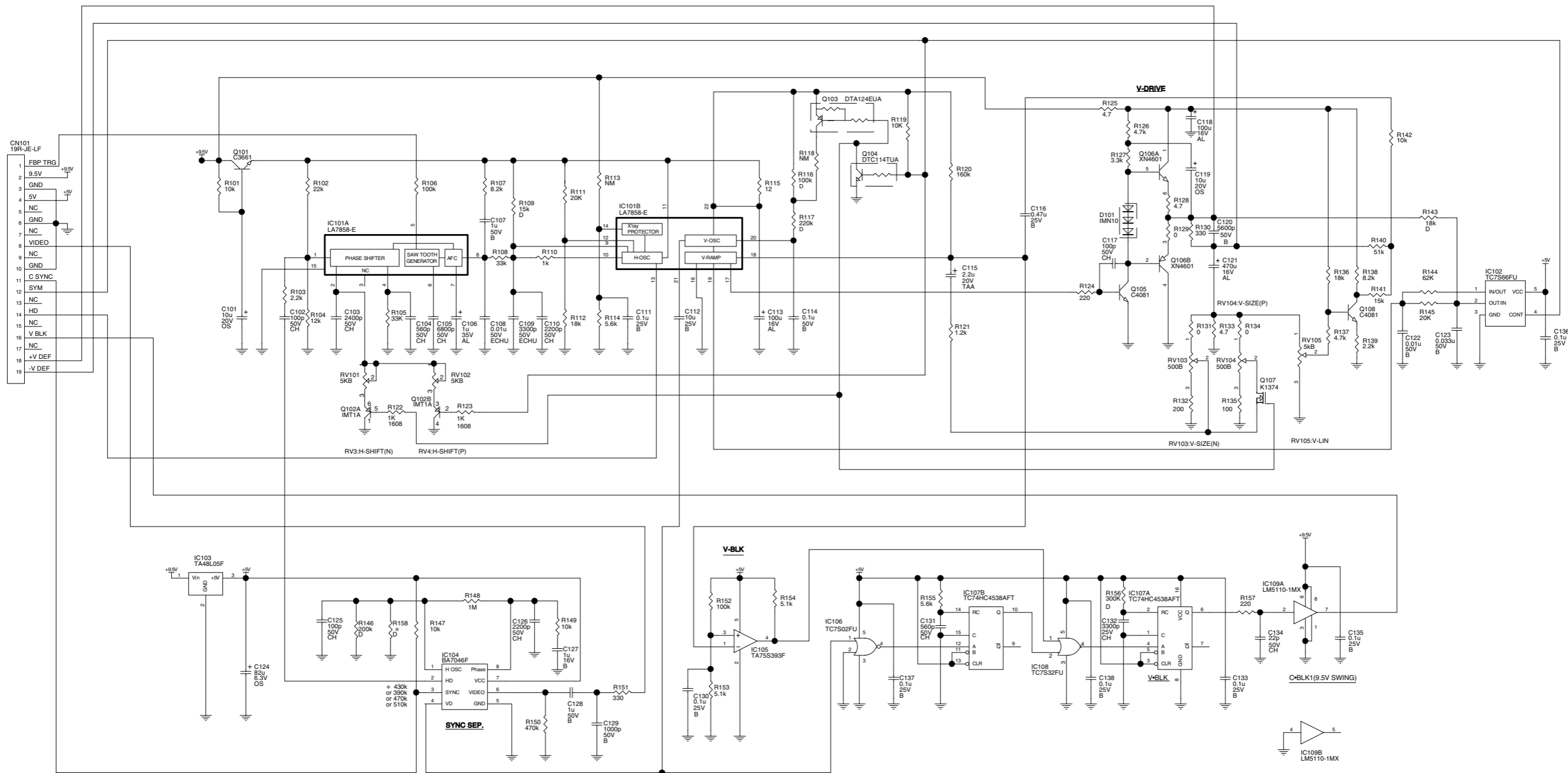








# Section 5 Schematic Diagrams



**DF-70**  
BOARD NO. 1-868-570-11

1

2

3

4

5

RV201: CONTRAST

RV203: SUB CONTRAST

1

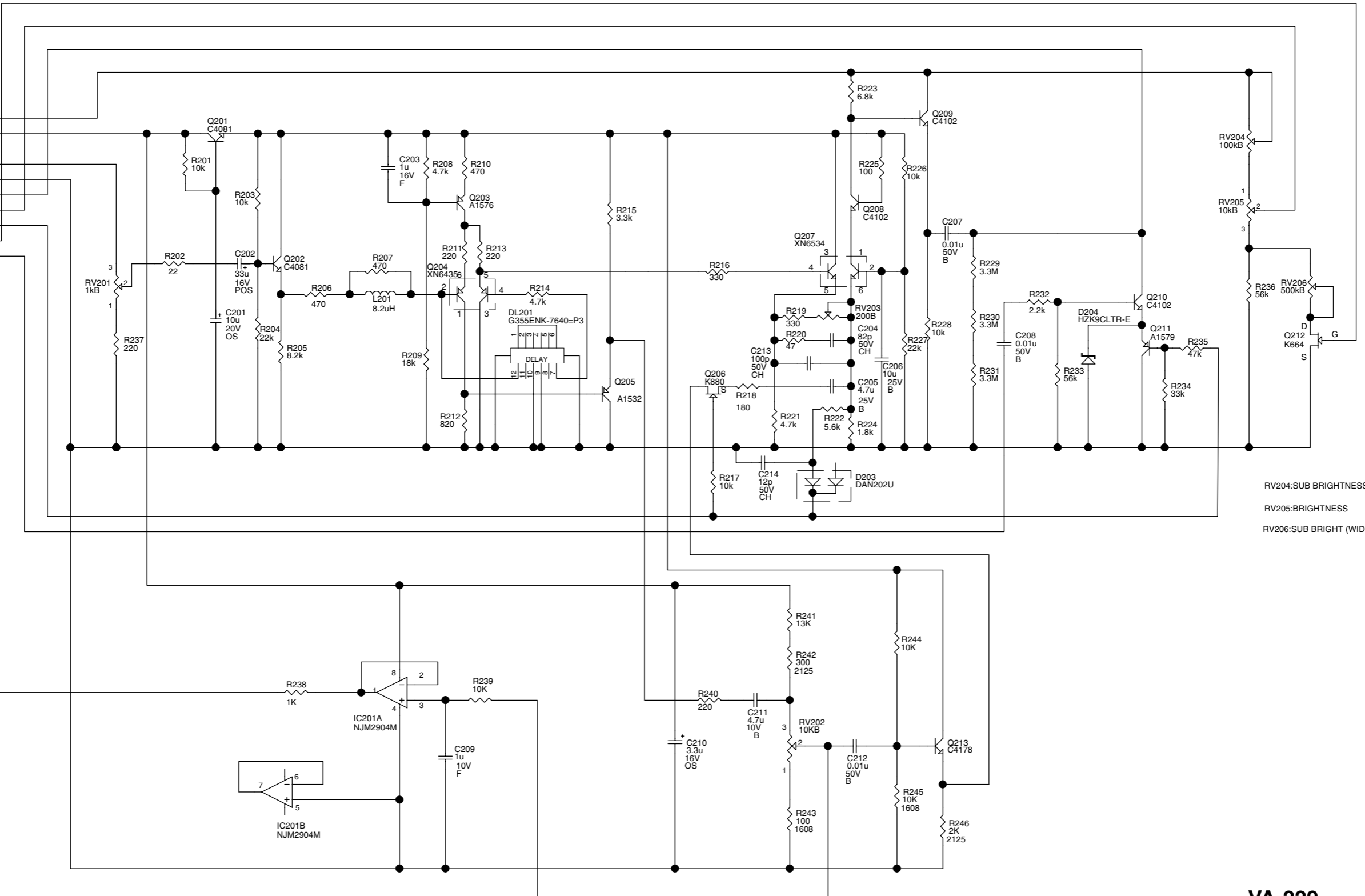
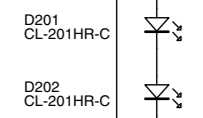
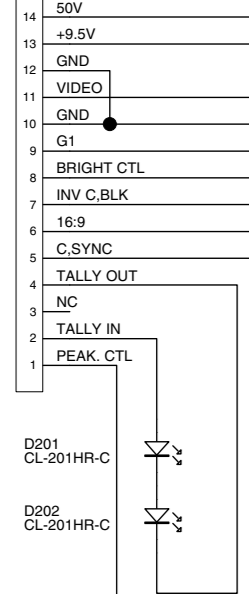
2

3

4

5

CN201  
SFR-14R-1STE1-LF



RV204: SUB BRIGHTNESS  
RV205: BRIGHTNESS  
RV206: SUB BRIGHT (WIDE)

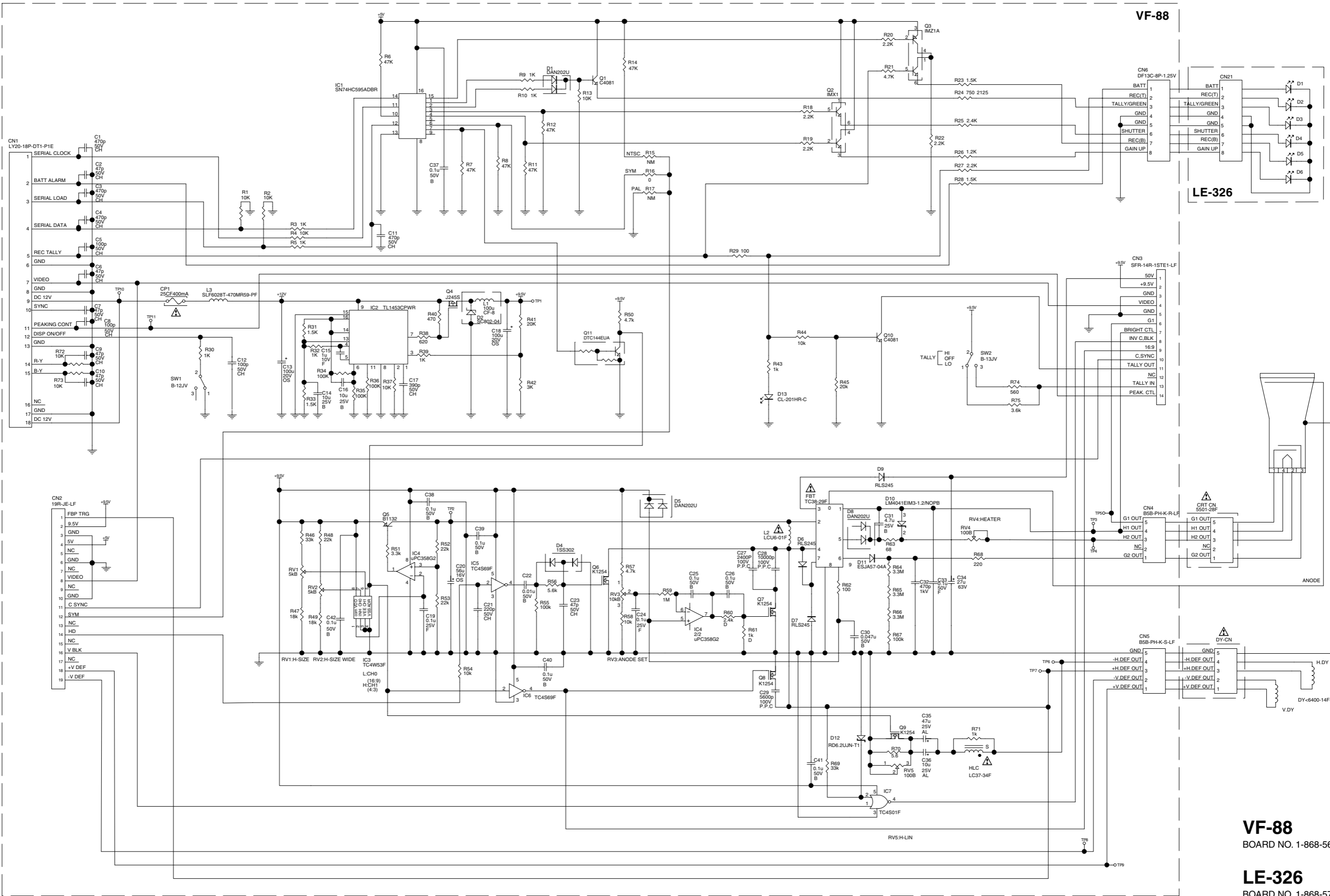
**VA-229**  
BOARD NO. 1-868-571-11

5-2

5-2

A B C D E F G H

DXF-20W



VF-88

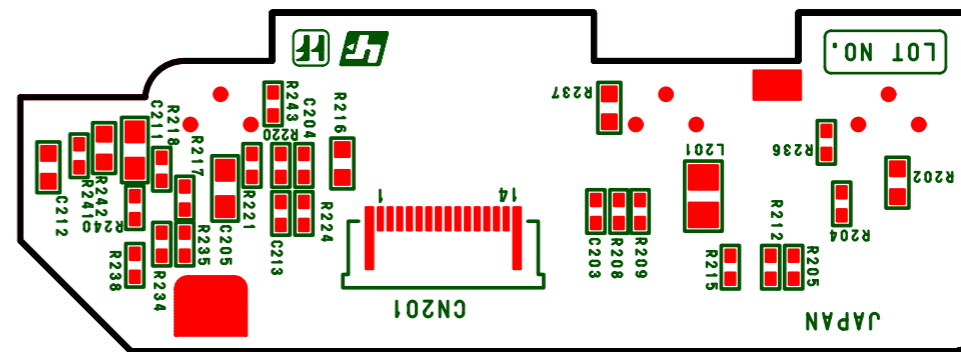
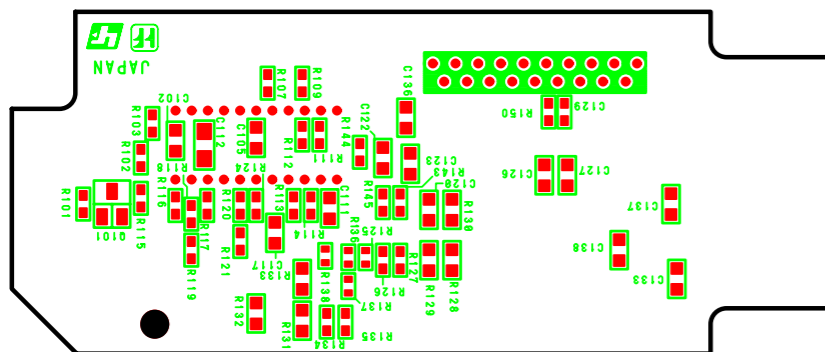
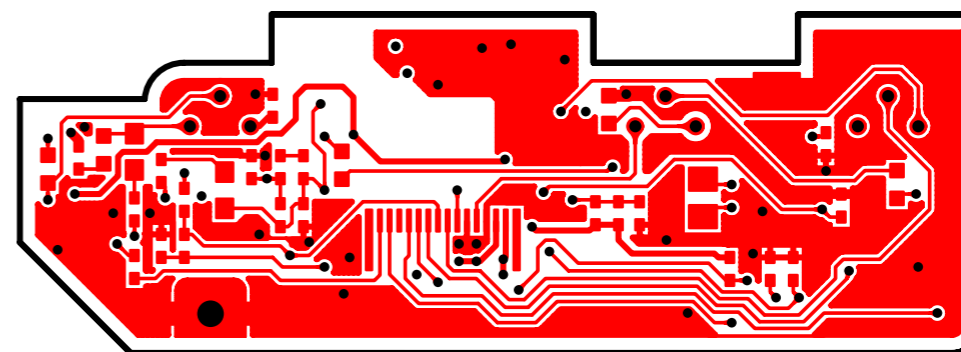
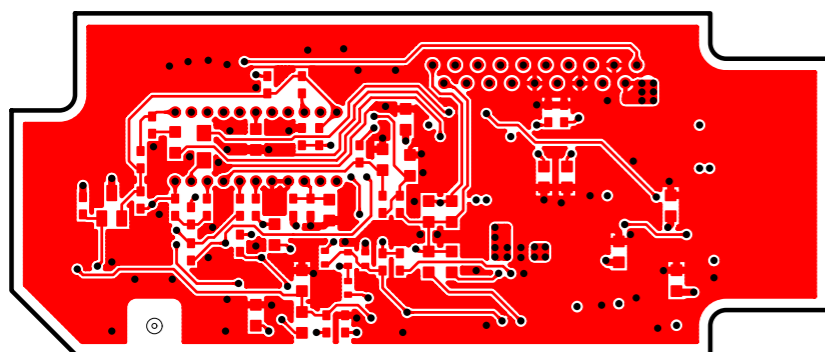
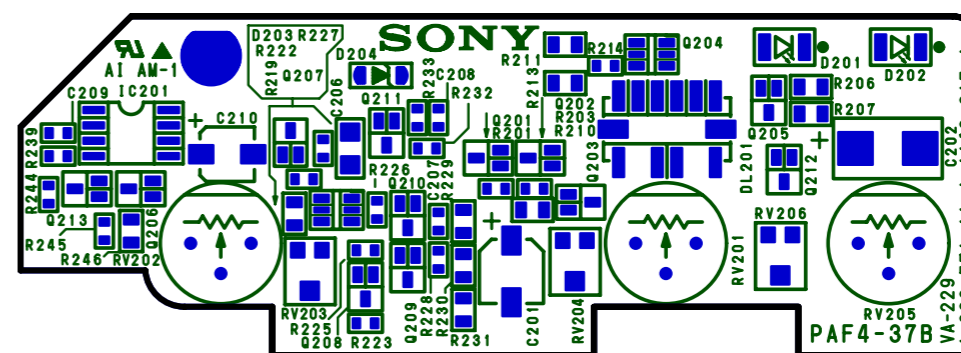
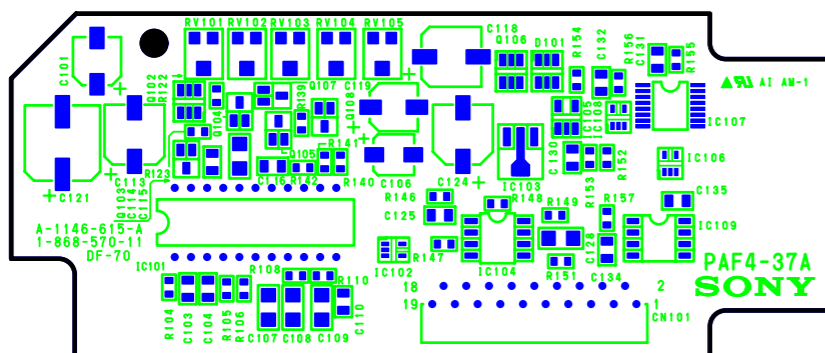
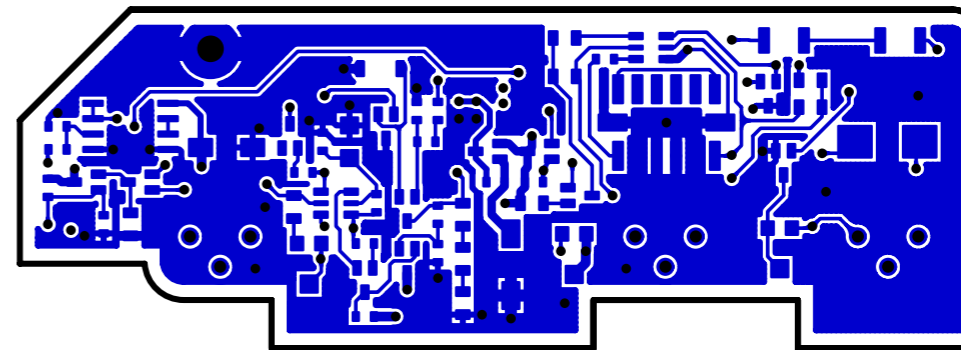
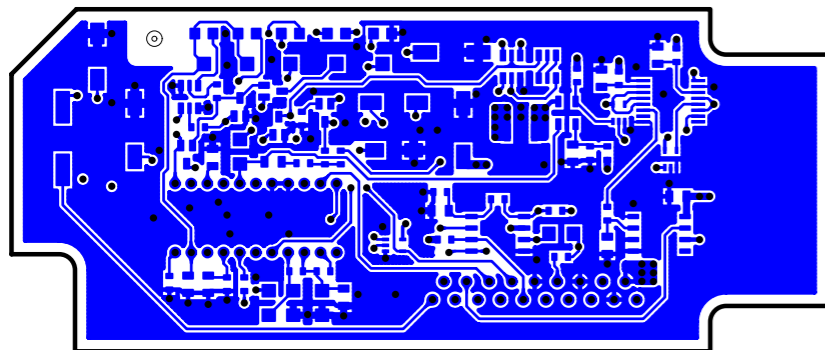
LE-326

**VF-88**  
BOARD NO. 1-868-569-11

**LE-326**  
BOARD NO. 1-868-572-11

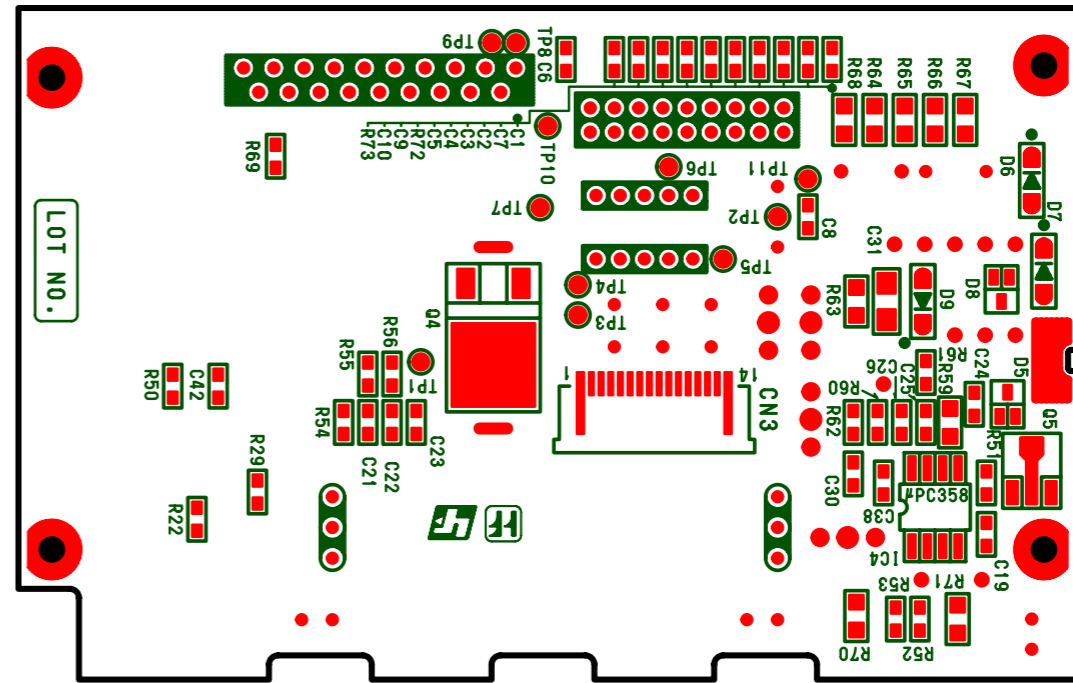
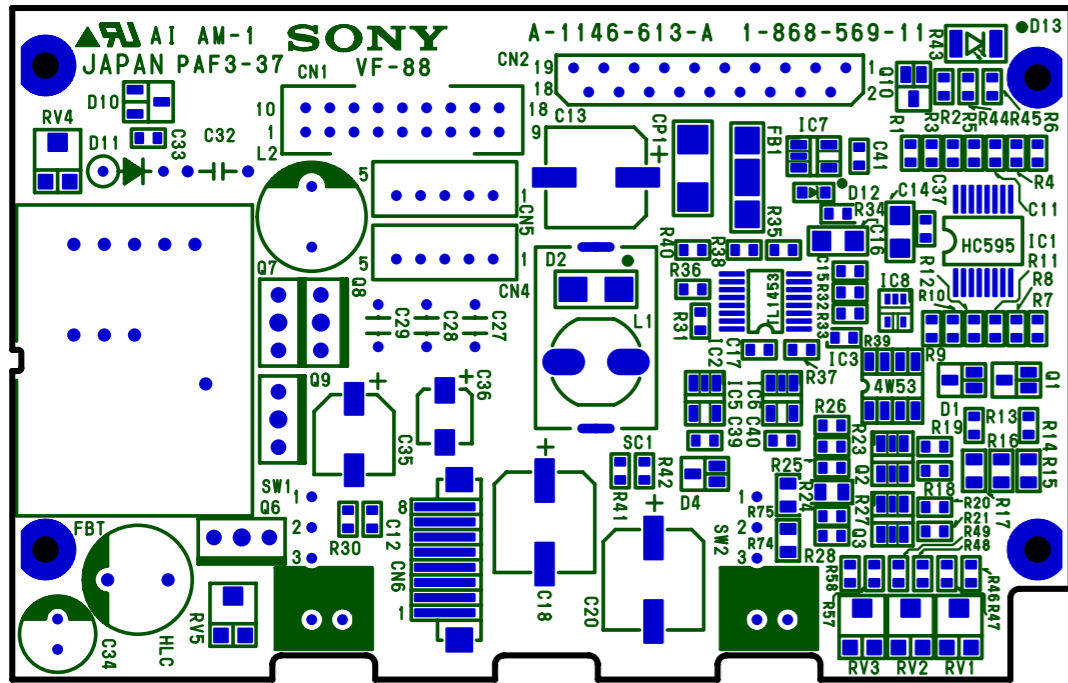
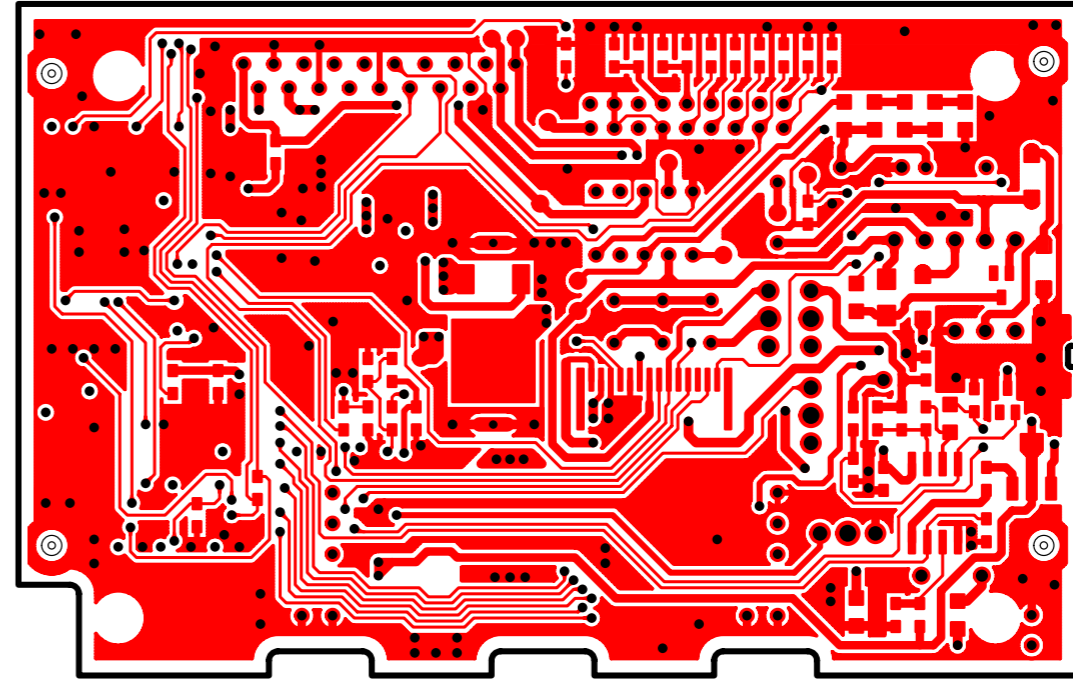
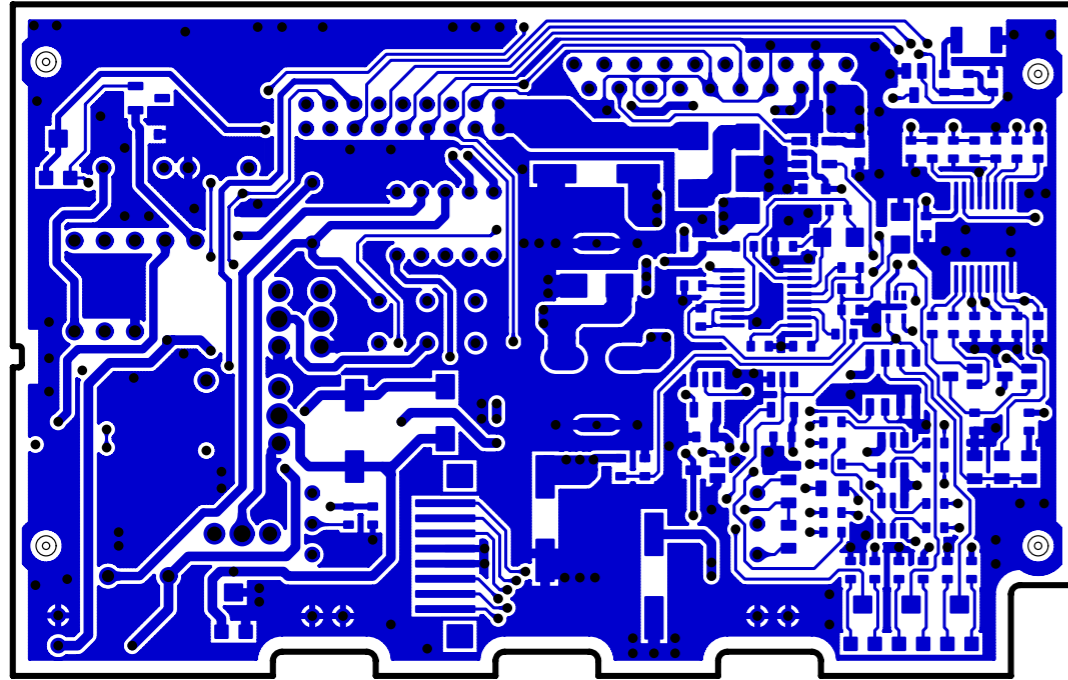


### Section 6 Board Layouts



**DF-70**  
SUFFIX: -11

**VA-229**  
SUFFIX: -11



VF-88  
SUFFIX: -11

VF-88  
SUFFIX: -11

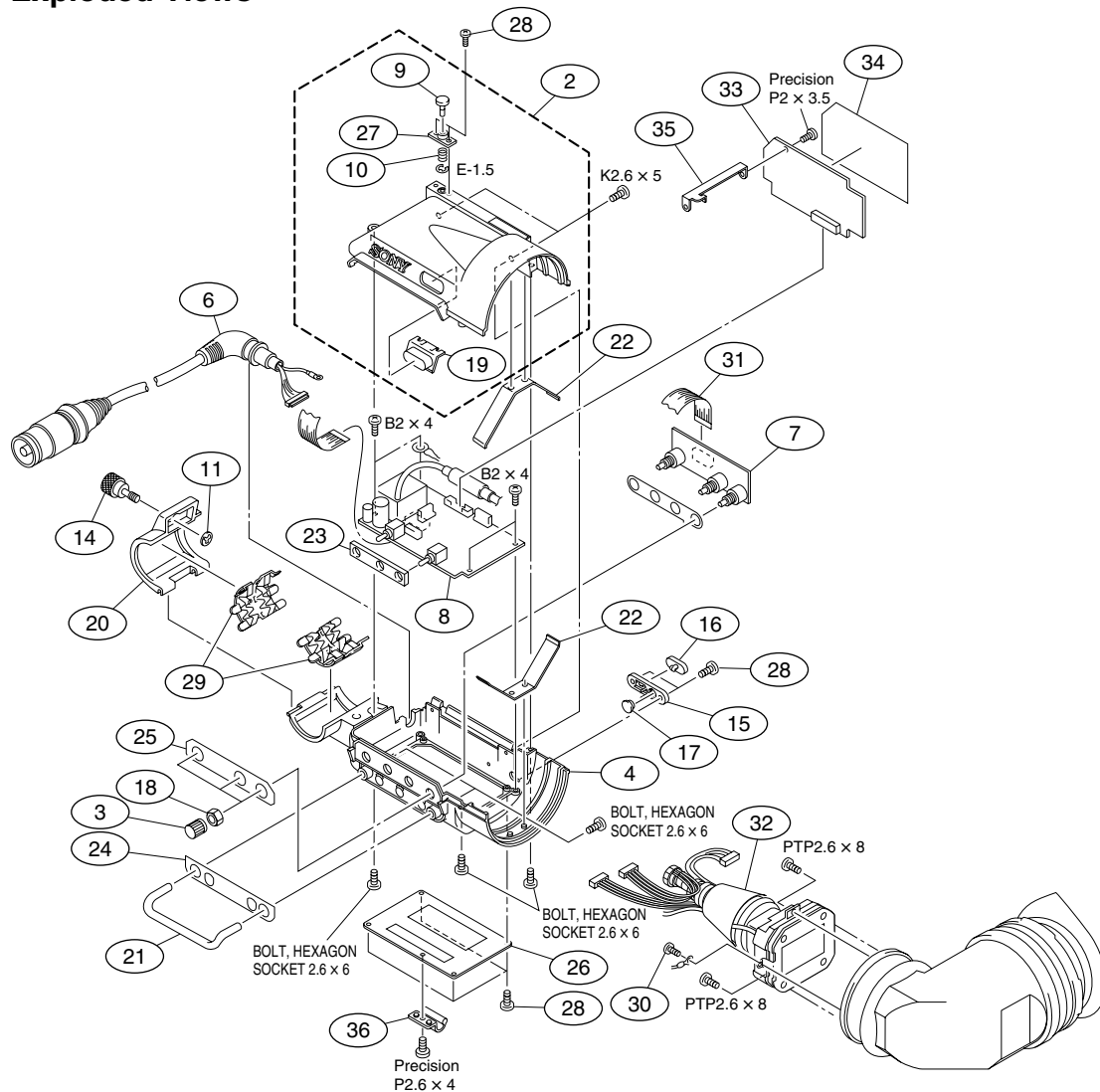






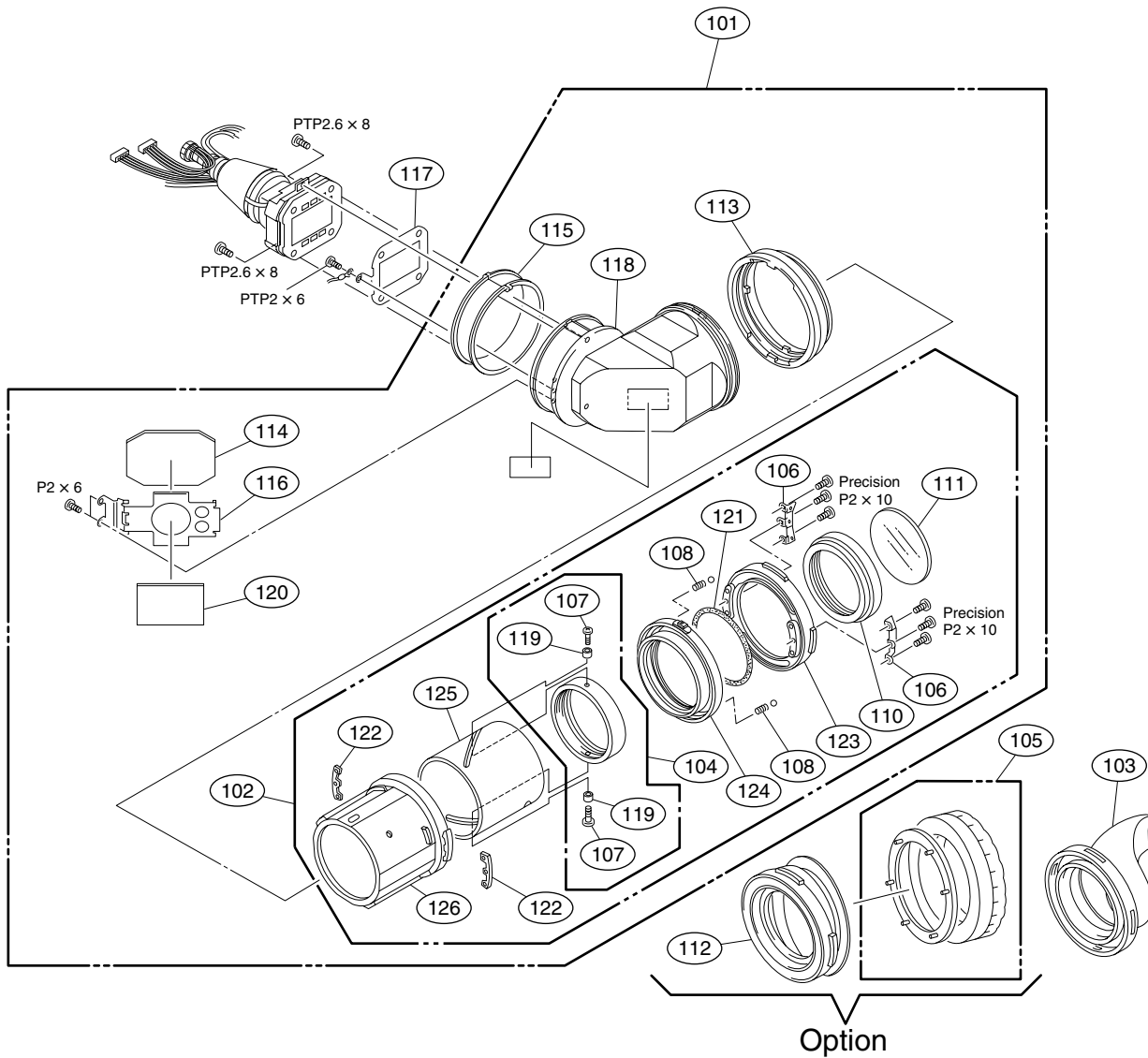
## Section 3 Spare Parts

### 3-1. Exploded Views



No.	Part No.	SP Description	No.	Part No.	SP Description
2	A-1123-253-A	s CASE ASSY, TOP	22	3-697-152-01	o SPRING, LEAF (2)
3	X-3604-579-2	s VOLUME KNOB ASSY	23	3-697-156-01	o CUSHION, DROP PROTECTION (2)
4	X-3678-575-5	s CHASSIS B ASSY, BOTTOM (LOWER)	24	3-991-416-01	s LABEL, VF
5			25	3-697-160-01	o LABEL, VF (C)
6	1-832-197-11	s CORD, CONNECTION (VF)	26	3-991-434-01	s LID, COVER
7	9-885-107-97	s MOUNTED CIRCUIT BOARD, VA-229	27	3-710-008-02	s HOUSING, STOPPER
8	9-885-107-93	s MOUNTED CIRCUIT BOARD, VF-88	28	3-719-381-02	s SCREW +P M2X4 (ZNBK) (LOCK)
9	2-277-457-01	s KNOB, STOPPER	29	3-854-132-01	s GEL, MIC
10	2-277-466-01	s SPRING, COMPRESSION (STEEL)	30	9-885-083-47	s SCREW
11	3-165-904-01	s WASHER, SCREW STOPPER (PLA)	31	9-885-107-24	s CABLE, FLAT
12			32	△ 9-885-107-22	s CRT/DY+ CONNECTOR ASSY
13			33	9-885-107-95	s MOUNTED CIRCUIT BOARD, DF-70
14	3-657-657-02	s SCREW (M5)	34	3-609-583-02	s SHEET, INSULATING
15	3-679-693-01	o BASE, SLIDE	35	3-609-582-02	o PLATE, PC BOARD
16	3-679-694-01	o COVER, SLIDE	36	3-678-684-01	s HOLDER, CABLE
17	3-679-695-01	o COVER, TALLY	7-621-772-18	s SCREW +B M2X4	
18	3-685-104-01	s NUT (M6), CONTROL (STEEL)	7-624-102-04	s STOP RING 1.5 TYPE-E	
19	3-692-132-03	o COVER, TALLY	7-627-454-38	s SCREW, PRECISION +K2.6X5	
20	3-692-134-01	o MIC CLAMP	7-683-412-05	s BOLT, HEXAGON SOCKET 2.6X6 (ST)	
21	3-692-147-01	o GUARD BAR	7-685-134-19	s SCREW +PTP2.6X8 (EP-FE/ZNBK/CM2)	

# Viewfinder (2)



No.	Part No.	SP Description
101	A-1123-171-A	s TUBE ASSY, VF
102	A-1127-099-A	s TUBE SUB ASSY, VF
103	A-8319-943-B	s EYE CUP KIT (RP)
104	X-3608-271-5	s ASSY, VF LENS
105	X-3678-187-2	s CUSSION,EYE CUP ASSY
106	3-176-414-01	o RETAINER, RING
107	3-335-207-02	s SHAFT, MOTOR
108	3-573-150-01	s SPRING, COMPRESSION
109		
110	3-623-709-01	o MC, HOLDER
111	3-623-710-01	s MC, GLASS
112	3-682-494-02	o EYE,CUP (S)
113	3-692-136-03	s FIXED RING
114	3-692-139-01	s MIRROR(2)
115	3-697-151-01	s RING, VF
116	3-697-154-01	s HOLDER,MIRROR(3)
117	3-991-417-01	s PLATE A, DISPLAY

No.	Part No.	SP Description
118	3-697-167-04	s VF TUBE(4)
119	3-722-485-01	o ROLLER, SLIDE
120	3-723-073-01	s CUSHION, MIRROR
121	3-726-904-01	s RING (MT), O
122	3-742-038-01	s NUT (2), PLATE
123	3-742-052-03	s HOLDER, EYE CUP
124	3-742-053-02	s RING
125	3-742-054-01	o TUBE
126	3-742-060-02	o HOLDER, RING
127		
	7-627-553-78	s SCREW,PRECISION +P 2X10
	7-671-158-01	s BALL, STAINLESS (2.5 DIA)
	7-685-104-19	s SCREW +PTP 2X6 (EP-FE/ZNBK/CM2)
	7-685-134-19	s SCREW +PTP 2.6X8 (EP-FE/ZNBK/CM2)