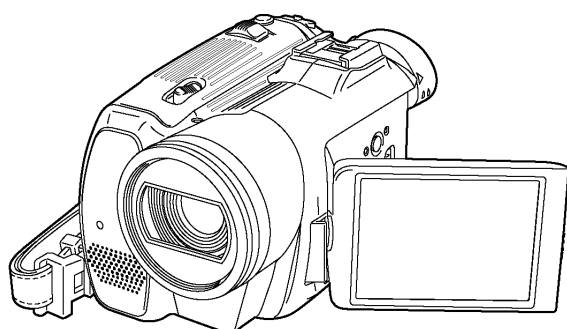


Service Manual

Digital Video Camera/Recorder



- NV-GS180EG
- NV-GS180E
- NV-GS180EB
- NV-GS180EP
- NV-GS180EE
- NV-GS180EF
- NV-GS180EK
- NV-GS180GC
- NV-GS180GN
- NV-GS180SG
- NV-GS180PL
- NV-GS188GK

VOL.1

A-MECHANISM

Colour

(S).....Silver Type

SPECIFICATIONS

Digital Video Camera

ITEM	SPECIFICATION	ITEM	SPECIFICATION
POWER	Source: DC 7.9 / 7.2 V Consumption: Recording 3.6 W (When using Viewfinder) 3.9 W (When using LCD Monitor)	STANDARD ILLUMINATION	1,400 lx
		MINIMUM REQUIRED ILLUMINATION	1 lx (Colour Night View Mode)
RECORDING FORMAT	Mini DV (Consumer-use Digital Video SD Format)	USB	Card reader / writer function, USB 2.0 compliant (Hi-Speed) No copyright protection support Pict Bridge-Compliant
TAPE USED	6.35 mm digital video tape		DV Output Terminal (IEEE1394, 4-pin) (Except NV-GS180EK/PL) DV Input/Output Terminal (IEEE1394, 4-pin) (NV-GS180EK/PL model only)
RECORDING / PLAYBACK TIME	SP mode: 80 min. with DVM80 LP mode: 120 min. with DVM80	DIGITAL INTERFACE	
CAMERA	Filter Diameter: 37.0 mm	MICROPHONE	Stereo (with a zoom function)
	Zoom: 10:1 Power Zoom	SPEAKER	1 round speaker ϕ 20 mm
	Monitor: 2.5-inch LCD	OPERATING TEMPERATURE	0 °C - 40 °C
	Lens: Auto Iris, F1.8 (WIDE)/F2.8 (TELE), Focal Length; 2.45 - 24.5 mm Macro (Full Range AF)	OPERATING HUMIDITY	10 % - 80 %
	Image Sensor: 1/6-inch 3CCD Image Sensor		
	Viewfinder: Colour Electronic Viewfinder Compression: Motion JPEG		
WEB CAMERA	Image Size: 320 × 240 pixels (QVGA) Frame Rate: Approx. 6 fps	WEIGHT	Approx. 410 g (without supplied Battery and DV Cassette) Approx. 480 g (with supplied Battery and DVM60)
VIDEO	Recording System: Digital Component Television System: CCIR; 625 Lines, 50 Fields PAL Colour Signal (Except NV-GS180PL) EIA Standard: 525 Lines, 60 Fields NTSC Colour Signal (NV-GS180PL)	DIMENSIONS	Approx. 71 (W) × 73 (H) × 123 (D) mm
	Video Output Level: 1.0 Vp-p 75 ohm S-Video Output Level: Y Output; 1.0 Vp-p 75 ohm C Output; 0.3 Vp-p 75 ohm (Except NV-GS180PL) C Output; 0.286 Vp-p 75 ohm (NV-GS180PL)	STANDARD ACCESSORIES	1 pc. AC Adaptor 1 pc. Battery Pack Unit 1 pc. DC Cable 1 pc. AC Cord (Except NV-GS180GC) 2 pcs. AC Cord (NV-GS180GC) 1 pc. AV Cable 1 pc. Remote Controller (Except NV-GS180PL) 1 pc. Bottom-type Battery (Except NV-GS180PL) 1 pc. Head Cleaner (NV-GS180EE/GC/GN/SG, GS188GK) 1 pc. CD-ROM 1 pc. USB Connection Cable 1 pc. Shoulder Belt 1 pc. Hood Cap Unit
AUDIO	Recording System: PCM Digital Recording 16 bit (48 kHz/2 ch) 12 bit (32 kHz/4 ch)	SOLDER	This model use lead free solder (PbF).
	Audio Output Level (Line): 316 mV, 600 ohm Mic Input: Mic sensitivity -50dB (0dB=1V/Pa,1kHz) (Stereo Mini Jack)		
CARD MEMORY FUNCTIONS	Recording Media: SD Memory Card Still Picture Recording File Format: JPEG (Design rule for Camera File system, based on Exif 2.2 standard), DPOF corresponding Still Image Size: Mega-pixel Recording; 1760 × 1320 (2.3 million pixels) 1280 × 960 (1.2 million pixels) VGA Recording; 640 × 480		

Weight and dimensions are approximate values.
Specifications may change without prior notice.

WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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1 INTRODUCTION

1.1. INTRODUCTION

This service manual contains technical information which will allow service personnel's to understand and service this model. Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, this information will be followed by supplement service manual to be filed with original service manual.

Note 1:

These movie camera uses AC Adaptor VSK0651A or VSK0651B.

Note 2:

1) This service manual does not contain the following information, because of the impossibility of servicing at component level.

1. Schematic Diagram, Block Diagram and P.C.B. layout of Main P.C.B./ Sub P.C.B.
2. Parts List for individual parts of Main P.C.B./ Sub P.C.B.

2) The following category is/are recycle module part. Please send it/them to Central Repair Center.

- *Main P.C.B. (VEP03G73T: NV-GS180EG/E/EB/EP/EF, VEP03G73U: NV-GS180EK/SG,
VEP03G73W: NV-GS180EE/GC/GN, VEP03G73Z: NV-GS180PL, VEP03G73X: NV-GS188GK)
- *Sub P.C.B. (VEP23612G: NV-GS180EG/E/EB/EP/EE/EF/EK/GC/GN/SG, GS188GK, VEP23612H: NV-GS180PL)

When a part replacement is required for repairing each Main P.C.B. and Sub P.C.B., replace the assembly parts.

(Main P.C.B. and Sub P.C.B.)

The following circuits are contained in Main P.C.B.

1. Main Connection Circuit
2. AVIO Circuit
3. Video Circuit
4. Power Circuit
5. Control Circuit

The following circuits are contained in Sub P.C.B.

1. Sub Connection Circuit
2. LCD Circuit
3. Lens Drive Circuit
4. Sub Power Circuit
5. Camera Circuit

1.2. ABOUT LEAD FREE SOLDER (PbF)

Distinction of PbF P.C.B.:

PCBs (manufactured) using lead free solder will have a PbF printing on the P.C.B..

CAUTION:

- Pb free solder has a higher melting point than standard solder;
Typically the melting point is 50 °F - 70 °F (30 °C - 40 °C) higher.
Please use a soldering iron with temperature control and adjust it to 700 °F±20 °F (370 °C± 10 °C).
In case of using high temperature soldering iron, please be careful not to heat too long.
- Pb free solder will tend to splash when heated too high (about 1100 °F/600 °C).
- All products with the printed circuit board with PbF stamp or printing must be serviced with lead free solder.
When soldering or unsoldering, completely remove all of the solder from the pins or solder area,
and be sure to heat the soldering points with the lead free solder until it melts sufficiently.

Recommendations

Recommended lead free solder composition is Sn96.5 Ag3.0 Cu0.5.

2 CAUTION FOR AC CORD (VJA0940 TYPE)

2.1. INFORMATION FOR YOUR SAFETY

IMPORTANT

Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

To reduce the risk of fire or shock hazard, do not expose this equipment to rain or moisture.

CAUTION

To reduce the risk of fire or shock hazard and annoying interference, use the recommended accessories only.

FOR YOUR SAFETY

DO NOT REMOVE THE OUTER COVER

To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

2.2. CAUTION FOR AC MAINS LEAD

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three-pin mains plug for your safety and convenience.

A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amperes and it is approved by ASTA or BSI to BS1362

Check for the ASRA mark or the BSI mark on the body of the fuse.



If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local Panasonic Dealer.

If the fitted moulded plug is unsuitable for the socket outlet in your home then the fuse should be removed and the plug cut off and disposed of safely.

There is a danger of severe electrical shock if the cut off plug is inserted into any 13-ampere socket.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt, please consult a qualified electrician.

2.2.1. Important

The wires in this mains lead are coloured in accordance with the following code:

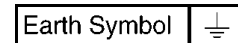
Blue	Neutral
Brown	Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

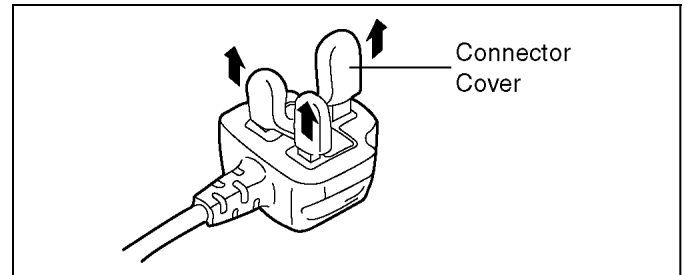
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol.



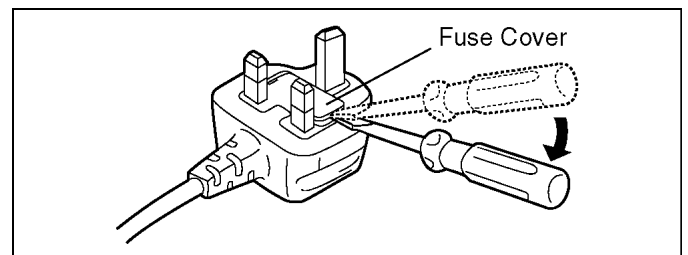
2.2.2. Before use

remove the Connector Cover as follows.

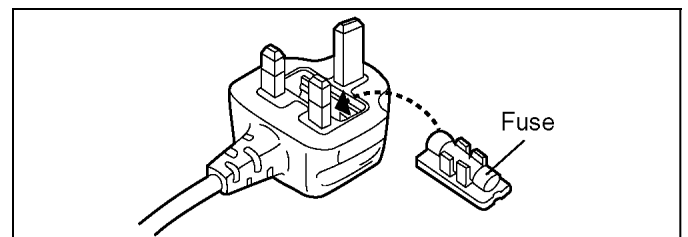


2.2.3. How to replace the Fuse

1. Remove the Fuse Cover with a screwdriver.

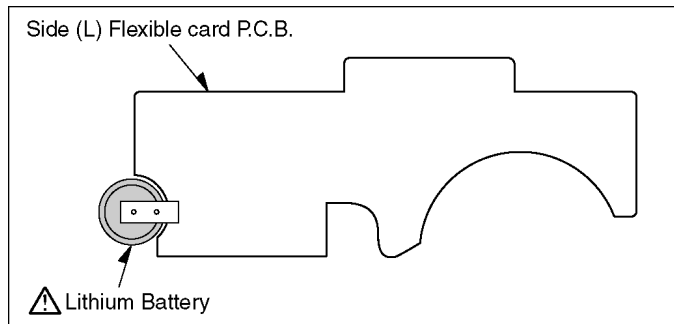


2. Replace the fuse and attach the Fuse cover.



3 HOW TO REPLACE THE LITHIUM BATTERY (PROCEDURE)

1. Remove the Side Case (L) P.C.B.. (Refer to Disassembly Procedures.)
2. Unsolder the Lithium Battery “ML-621S/F9D” and then replace the new one. (See Fig. B1.)
3. Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.



CAUTION

The battery used in this device may present a risk of fire or chemical burn if mistreated.
 Do not recharge, disassemble, heat above 100°C (212°F), or incinerate.
 Replace battery with Panasonic part number ML-621S/F9D only.
 Use of another battery may present a risk of fire or explosion.
 Dispose of used battery promptly.
 Keep away from children.
 Do not disassemble and do not dispose of in fire.

Fig. B1

Note:

The lithium battery is a critical component. (Type No.: ML-621S/F9D Manufactured by Panasonic)
 It must never be subjected to excessive heat or discharge.
 It must therefore only be fitted in equipment designed specifically for its use.
 Replacement batteries must be of the same type and manufacture.
 They must be fitted in the same manner and location as the original battery, with the correct polarity contacts observed.
 Do not attempt to re-charge the old battery or re-use it for any other purpose.
 It should be disposed of in waste products destined for burial rather than incineration.

CAUTION

Danger of explosion if battery is incorrectly replaced.
 Replace only with the same or equivalent type recommended by the equipment manufacturer.
 Discard used batteries according to manufacturer's instructions.

PRECAUTION

Le fait de remplacer incorrectement la pile peut présenter des risques d'explosion.
 Remplacer la pile uniquement par une pile identique ou de type équivalent recommandée par le fabricant. Se débarrasser des piles usagées conformément aux instructions du fabricant.

VORSICHT

Bei einer falsch eingesetzten Batterie besteht Explosionsgefahr. Nur mit einer vom Hersteller empfohlenen Batterie vom gleichen Typ ersetzen.
 Verbrauchte Batterien beim Fachhändler oder einer Sammelstelle für Sonderstoffe abliefern.

VARNING

Explosionsfara vid felaktigt batteribyte.
 Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.
 Kassera använt batteri enligt fabrikantens instruktion.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
 Udsiftning må kun ske med batteri af samme fabrikat og type.
 Levér det brugte batteri tilbage til leverandøren.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
 Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
 Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

4 ADJUSTMENT PROCEDURES

4.1. DISASSEMBLE FLOW CHART

This flow chart indicates the disassembly steps the cabinet parts, P.C.B. and Mecha. Unit in order to access to be serviced. When reinstalling, perform the steps in the reverse order.

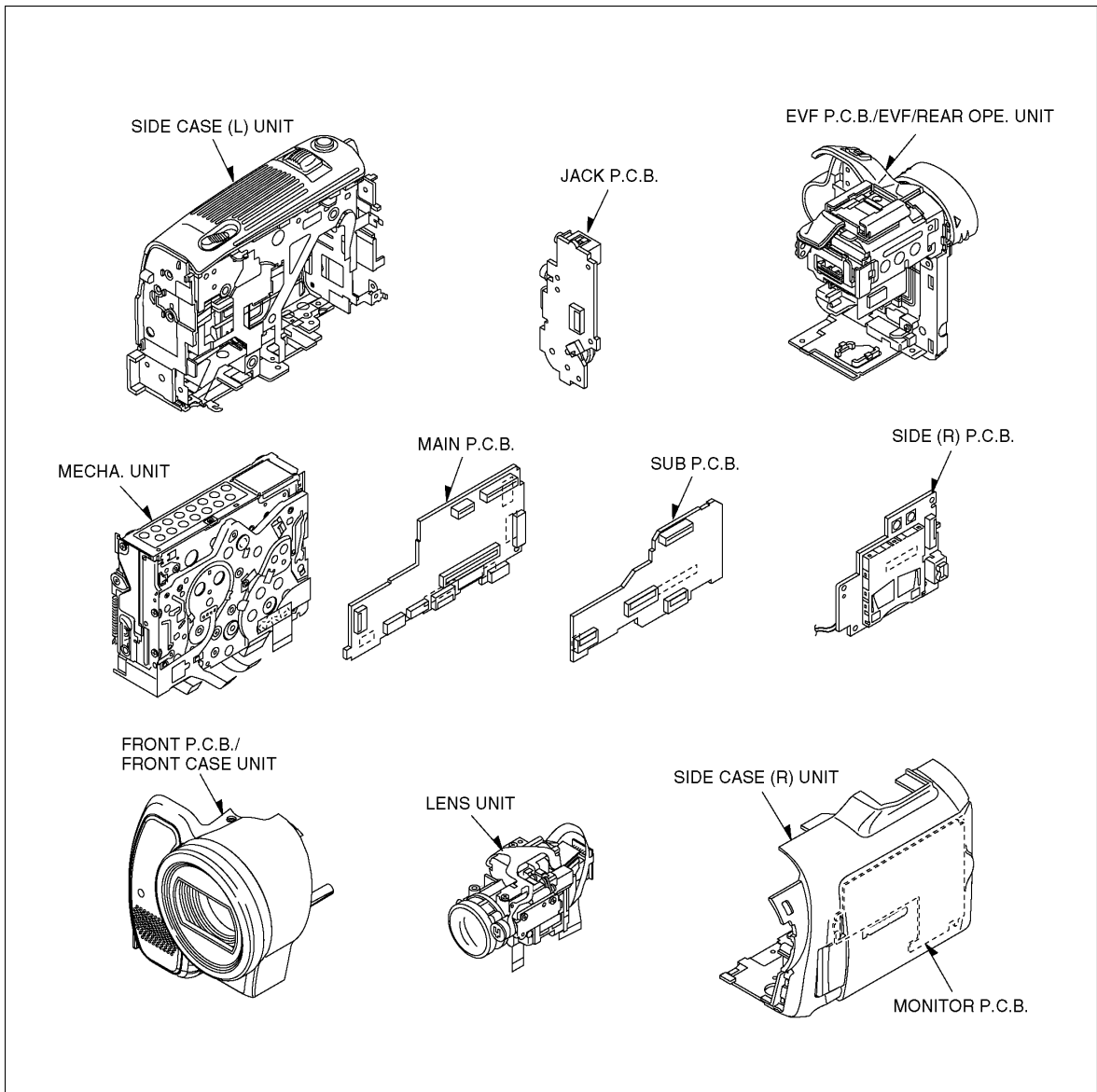
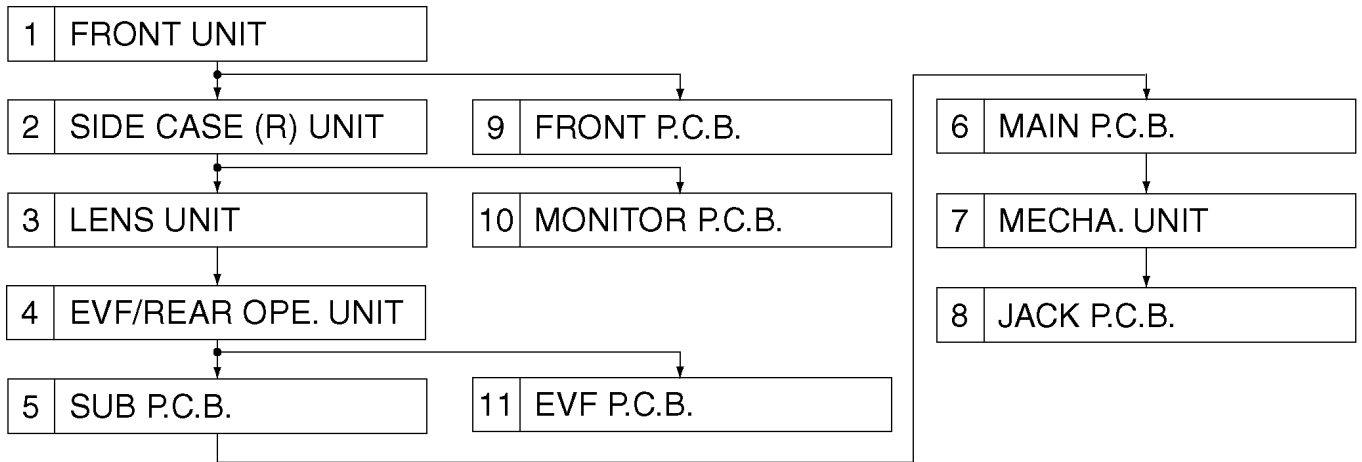


Fig. F1

4.2. DISASSEMBLY PROCEDURES

Flow-Chart for Disassembly Procedure

No.	Item / Part	Fig.	Removal (Screw, Connector, Flex. & Other)
1	Front Case Unit	Fig. D2	1-Screw (A)
		Fig. D3	Open the LCD Unit 1-Screw (B), 2-Screws (C)
		Fig. D4	1-Connector FP4801 Front Case Unit
2	Side Case (R) Unit	Fig. D5	2-Screws (D)
		Fig. D6	2-Screws (E), 1-Screw (F)
		Fig. D7	2-Connectors FP602, FP6503 Side Case (R) Unit
3	Lens Unit	Fig. D8	1-Screw (G) 2-Connectors FP201, FP701 Lens Unit
4	EVF/Rear Operation Unit, Sub P.C.B.	Fig. D9	1-Screw (H), 2-Screws (I), 1-Screw (J) 3-Connectors FP601, FP1001, FP6502 EVF/Rear Operation Unit 1-Connector FS3001 Sub P.C.B.
5	Main P.C.B.	Fig. D10	8-Connectors FP2201, FP2202, FP2203, FP2204, FP5001, FP6501, FP6504, FP6505 1-Screw (K) 4-Tabs Main P.C.B.
6	Mecha. Unit	Fig. D11	Open the Cassette Cover 3-Screws (L) Mecha. Unit
7	Jack P.C.B.	Fig. D12	1-Screw (M), 1-Screw (N), 1-Screw (O) Jack P.C.B.
8	Front P.C.B.	Fig. D13	5-Screws (P) 3-Tabs Front P.C.B.
9	Monitor P.C.B.	Fig. D14	1-Screw (Q), 3-Screws (R) Rear Cover
		Fig. D15	Turning the LCD Unit 2-Screws (S) LCD Unit
		Fig. D16	2-Screws (T) 6-Tabs LCD Case (Upper) Unit
		Fig. D17	1-Connector FP902 LCD Hinge Unit
		Fig. D18	1-Connector FP901 2-Tabs Monitor P.C.B.
		Fig. D19	View ADJ. Unit is Drawn 1-Screw (U) Rear Operation Unit
10	EVF P.C.B.	Fig. D20	2-Tabs EVF Hold Piece
		Fig. D21	2-Screws (V) 2-Tabs View ADJ. Unit 2-Screws (W), 2-Slide Spacers (X) 1-Connector FP801 EVF LCD Unit
		Fig. D22	2-Screws (Y) EVF Plate / Click Spring
		Fig. D23	1-Connector FP802 3-Tabs EVF P.C.B.

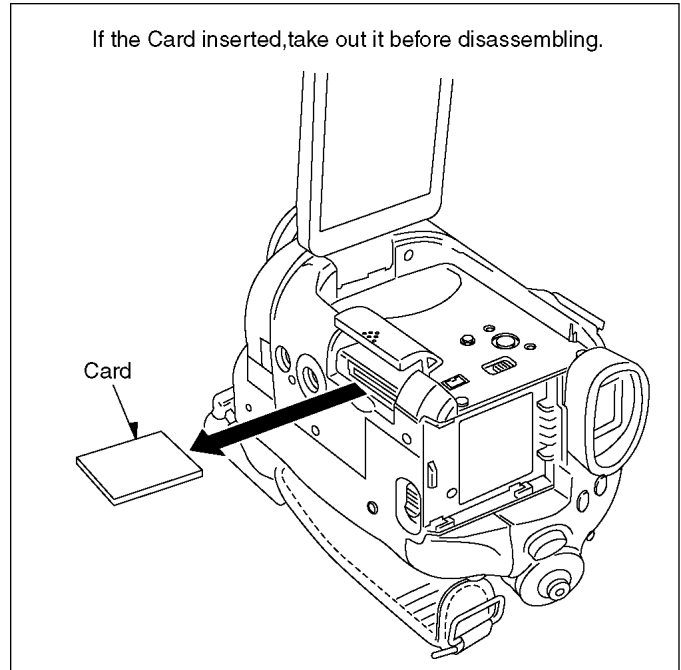


Fig. D1

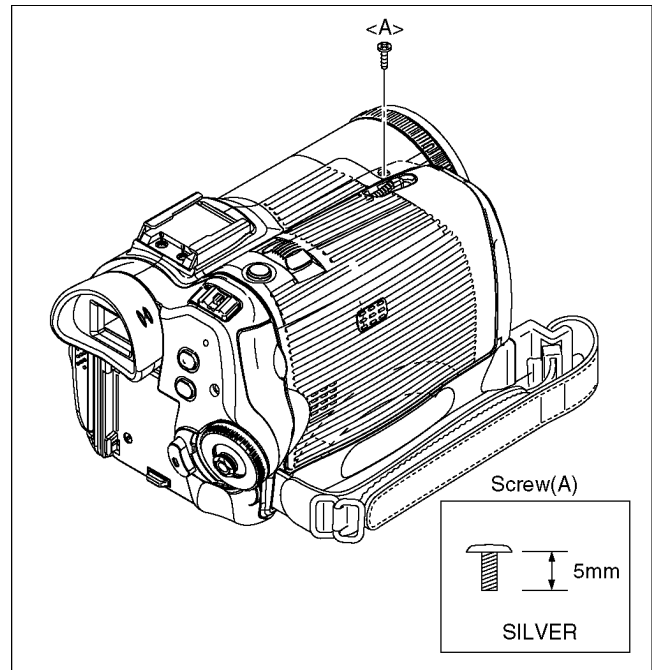


Fig. D2

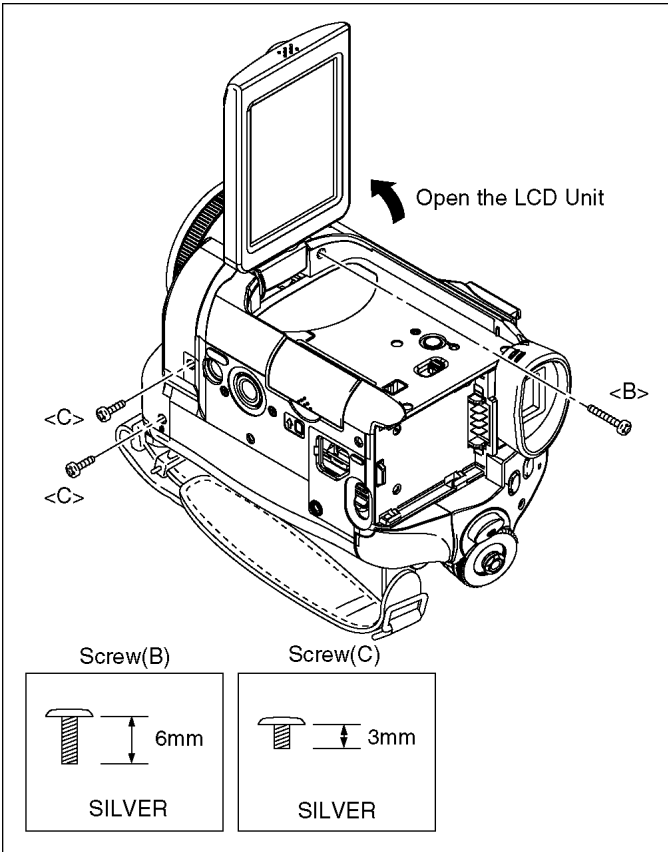


Fig. D3

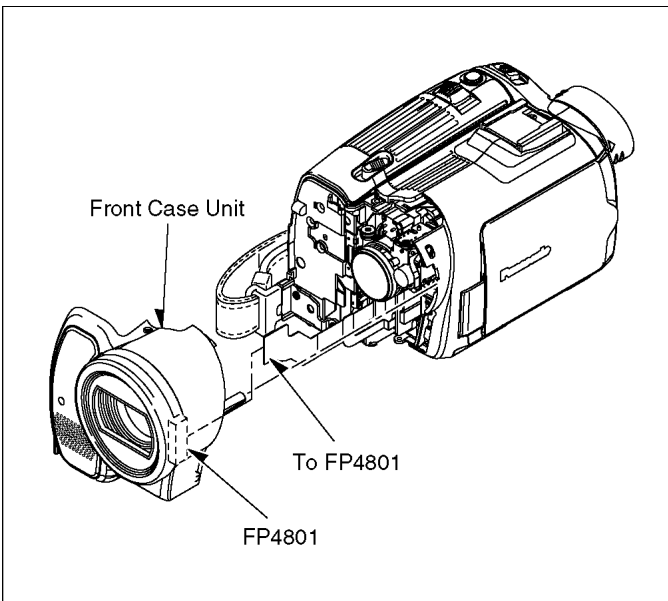


Fig. D4

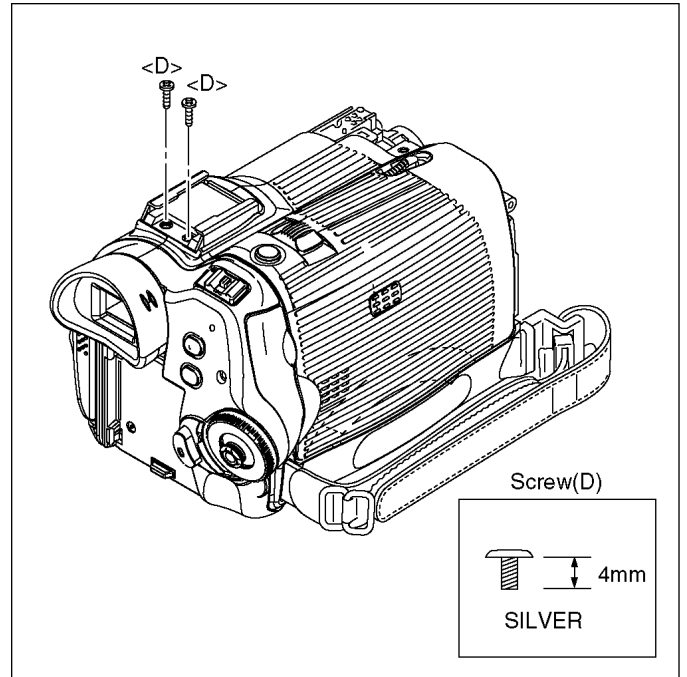


Fig. D5

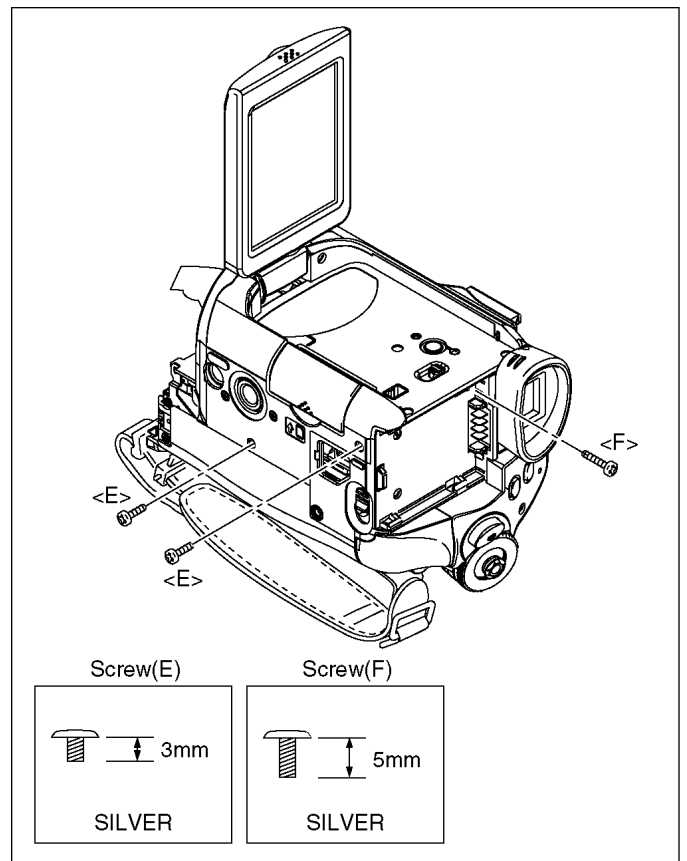


Fig. D6

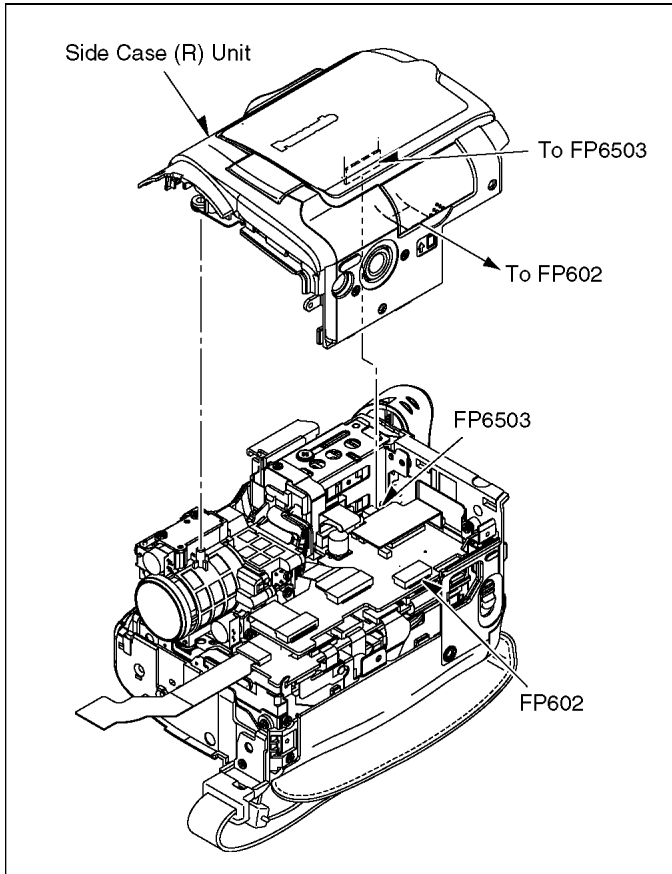


Fig. D7

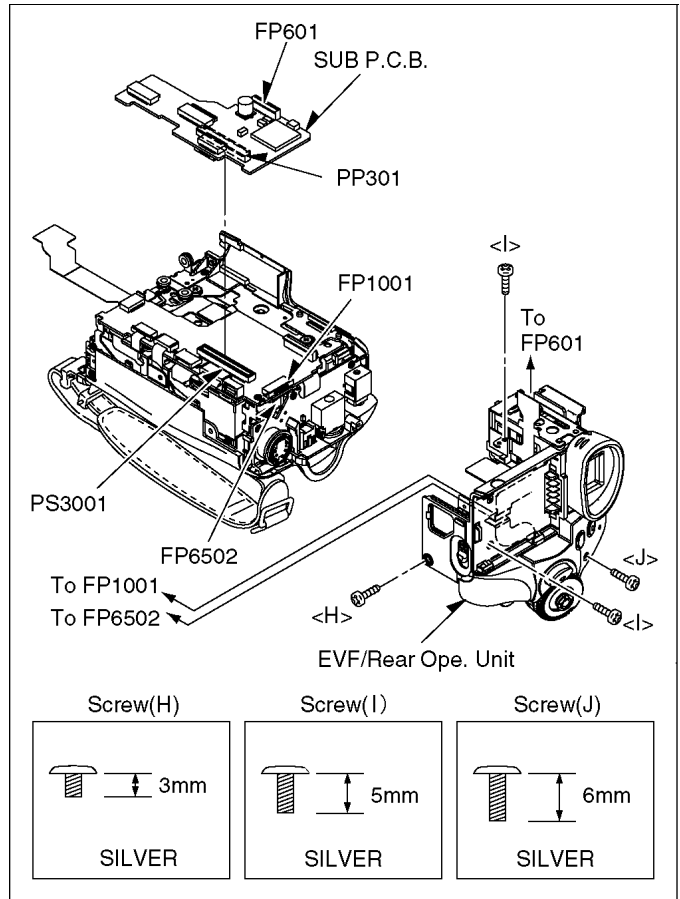


Fig. D9

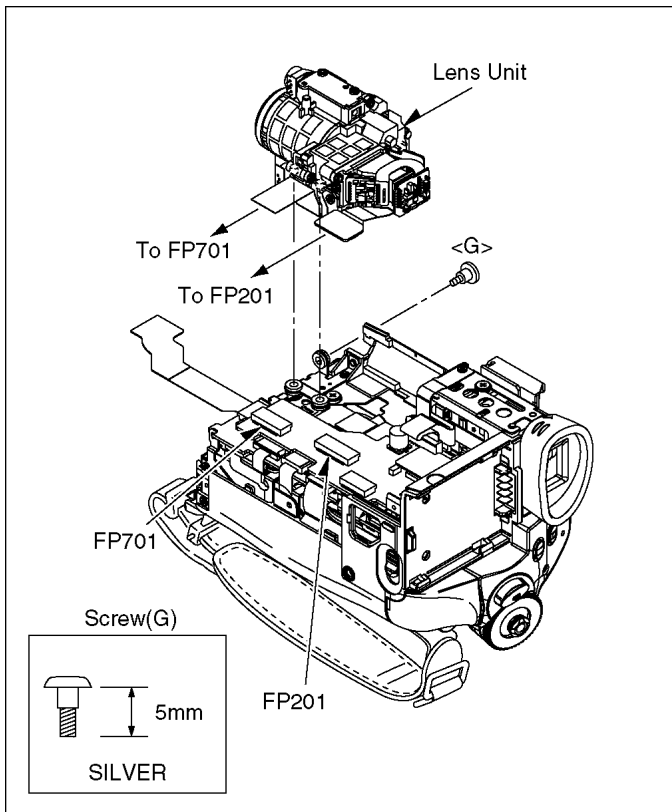


Fig. D8

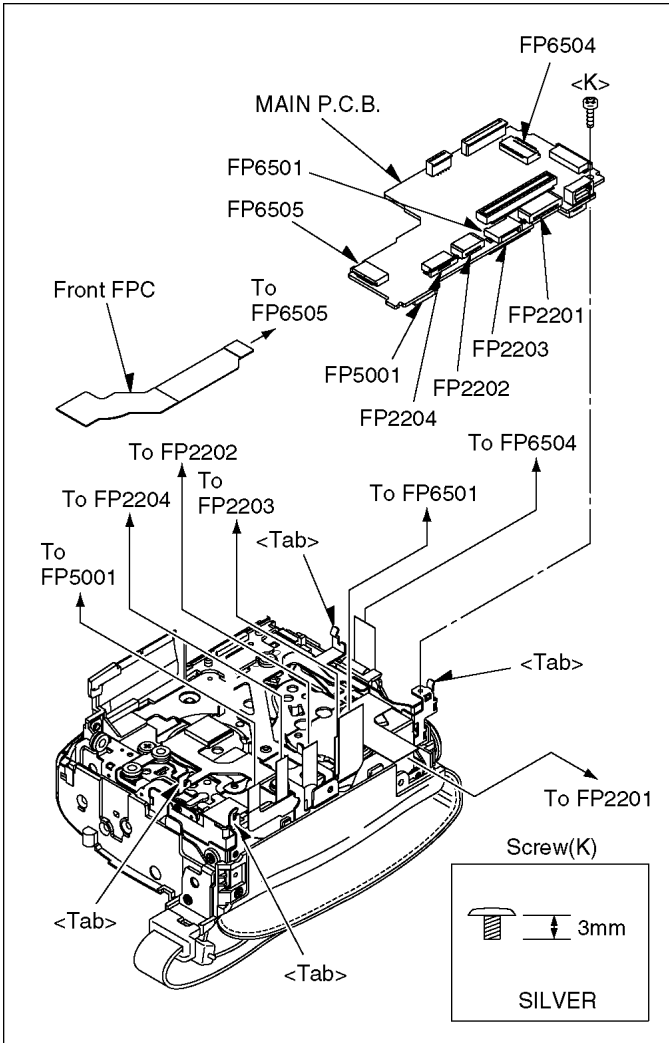


Fig. D10

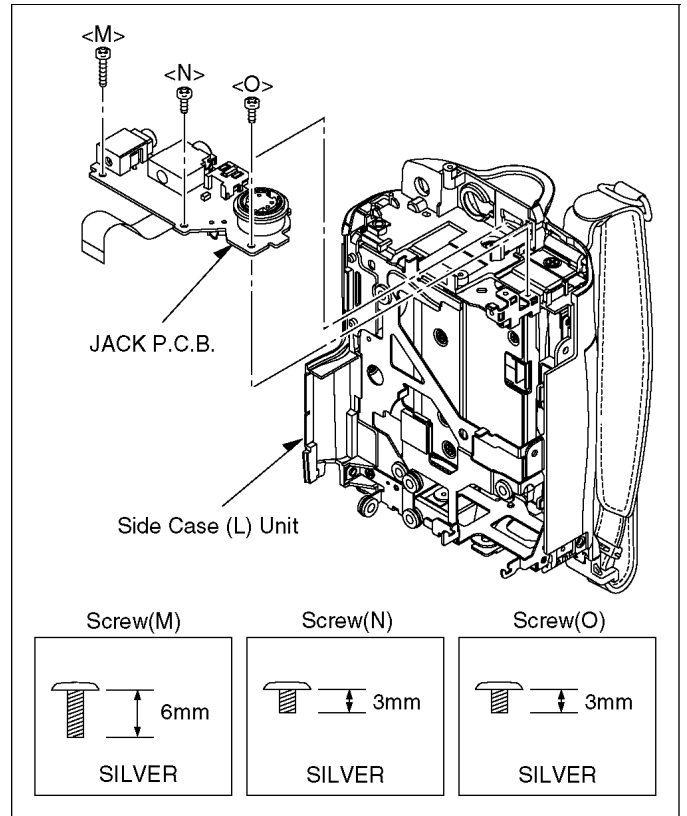


Fig. D12

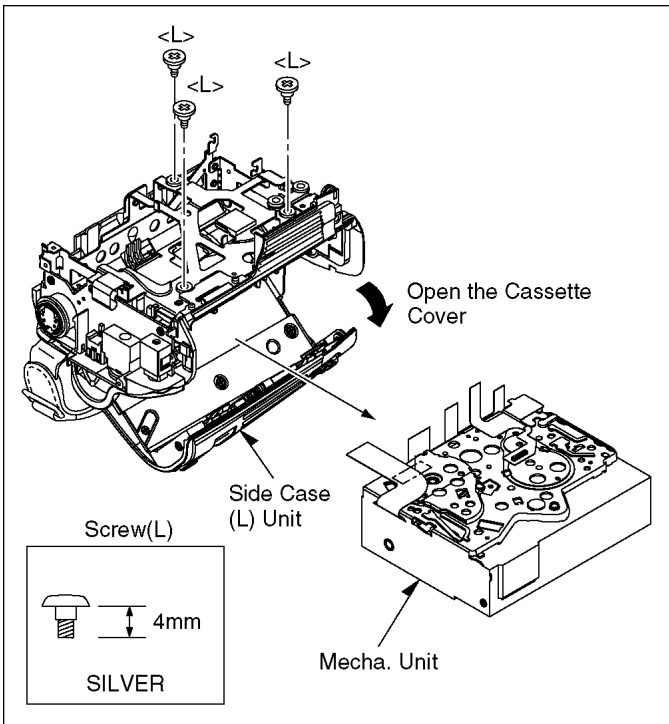


Fig. D11

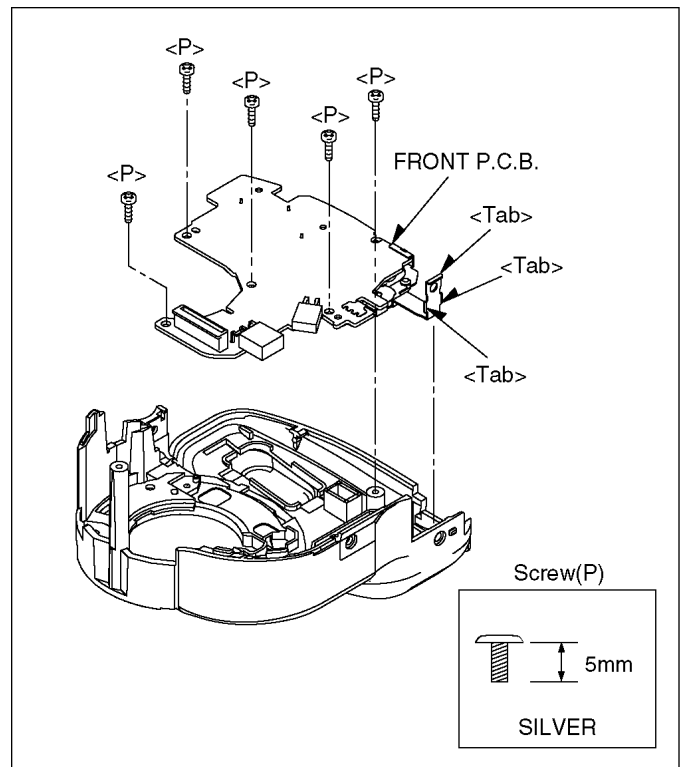


Fig. D13

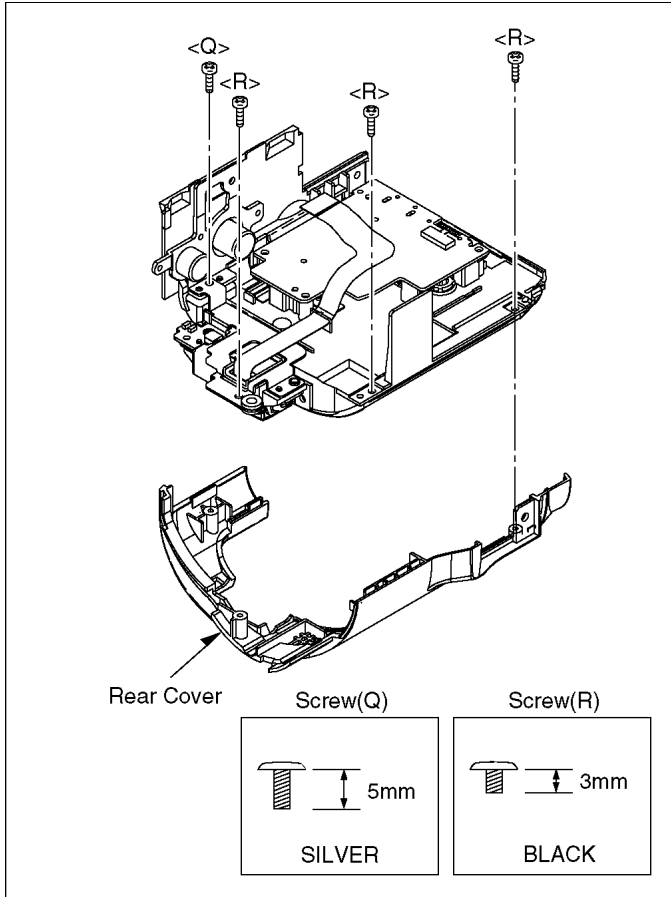


Fig. D14

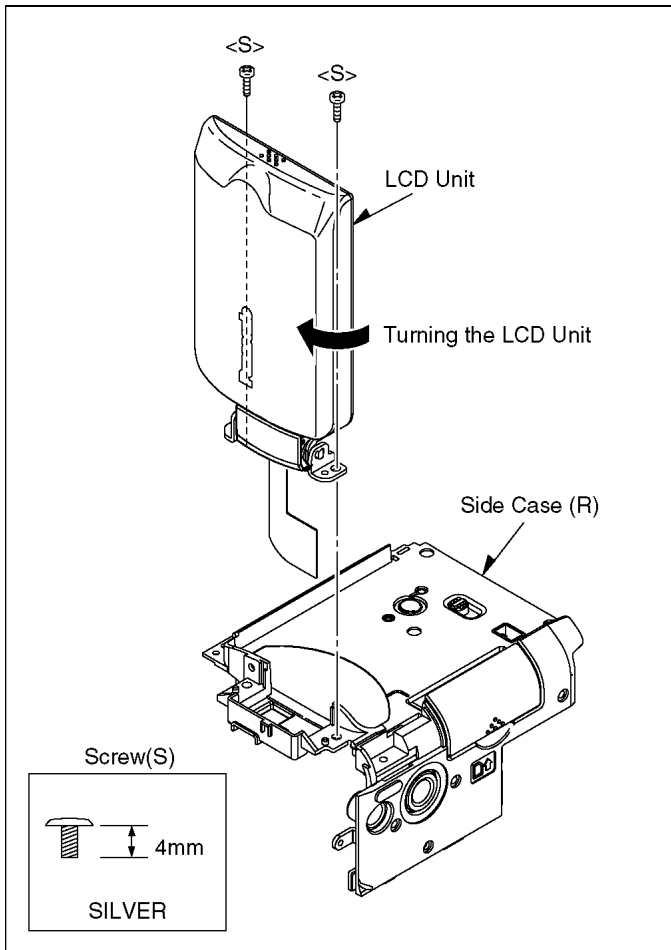


Fig. D15

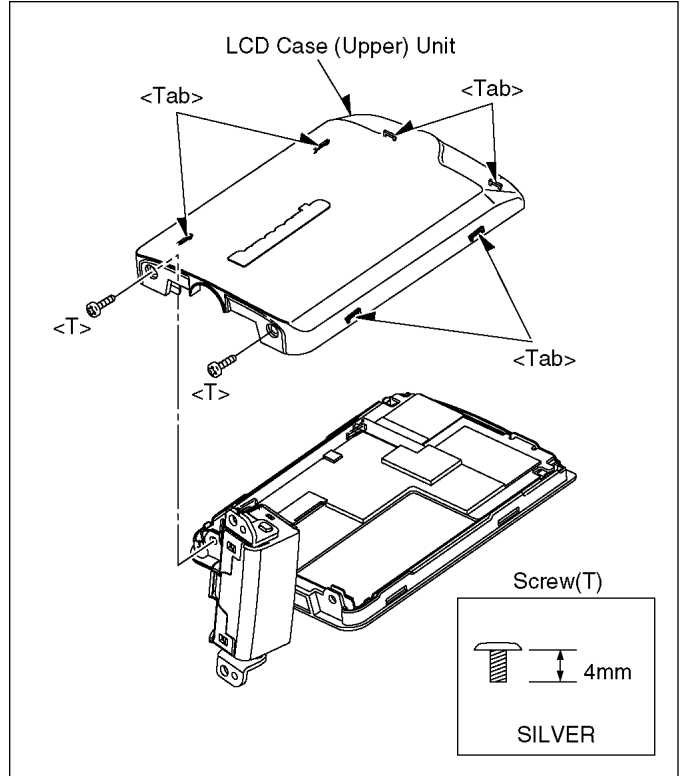


Fig. D16

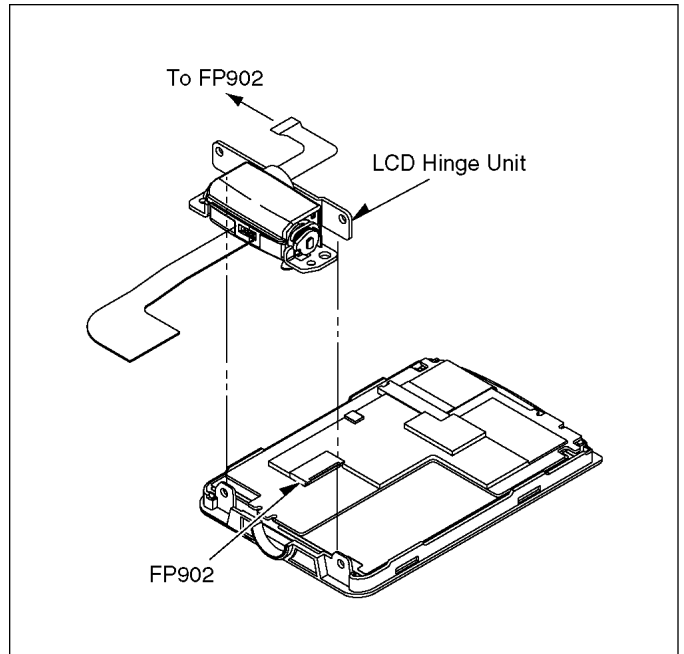


Fig. D17

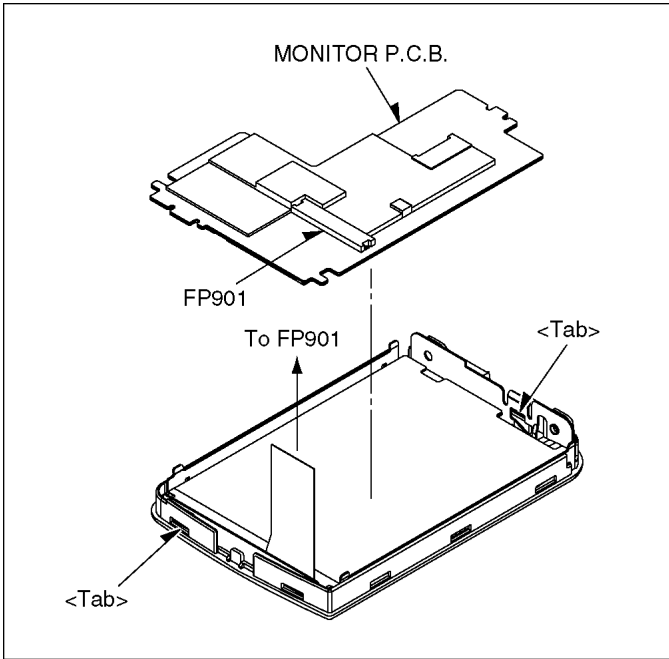


Fig. D18

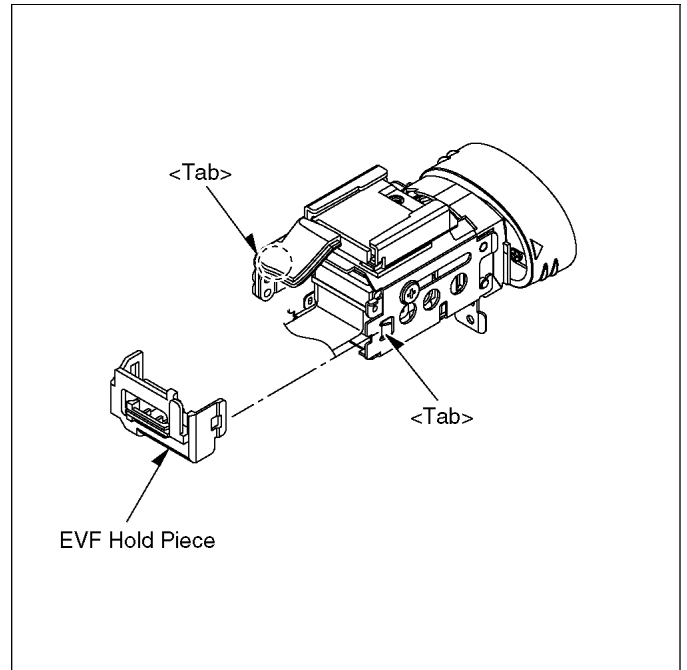


Fig. D20

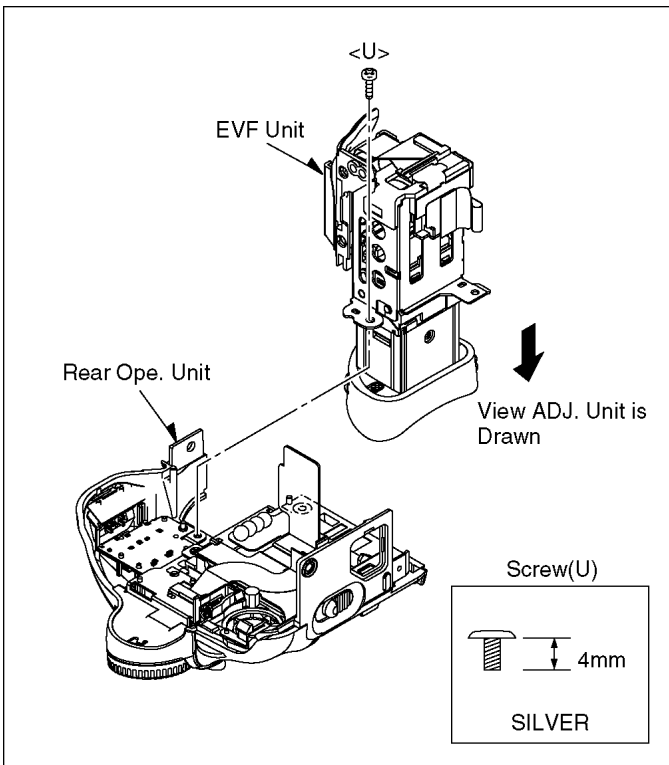


Fig. D19

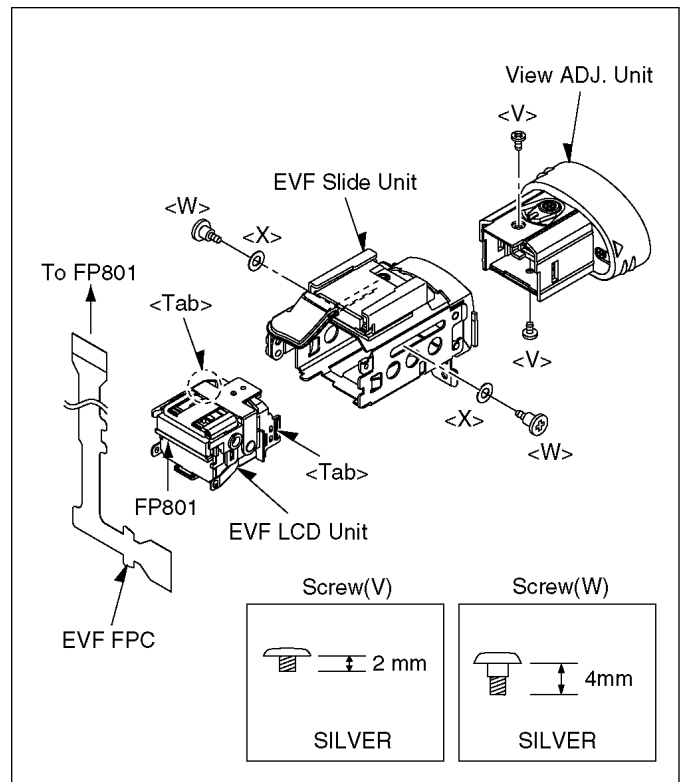


Fig. D21

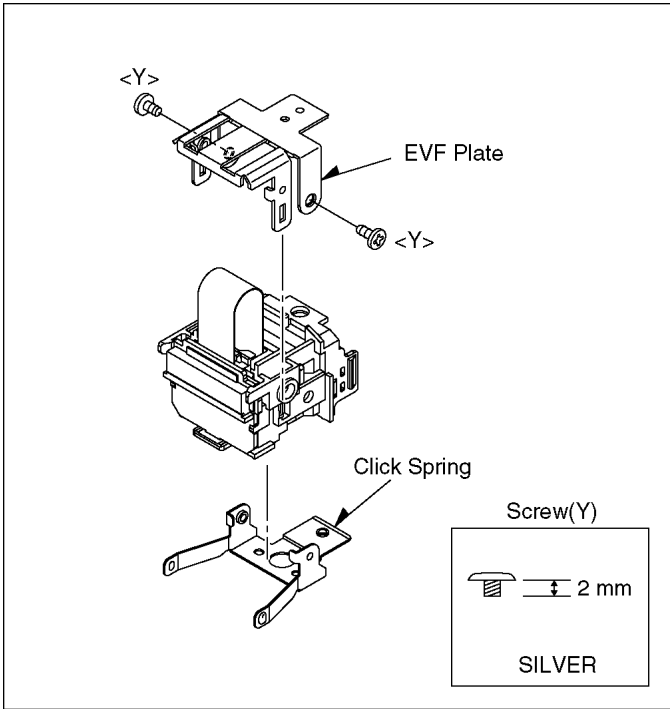


Fig. D22

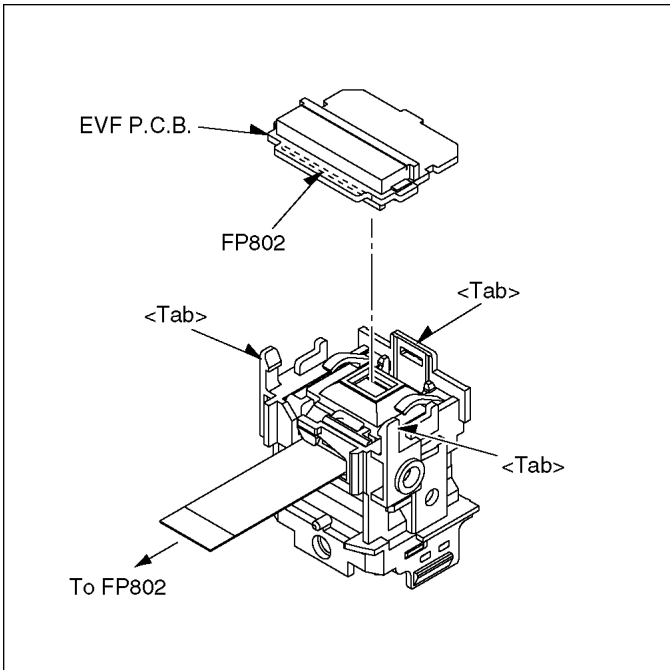


Fig. D23

4.3. DISASSEMBLY PROCEDURES MECHA. UNIT

Flow-Chart for Disassembly Procedures

No.	Item / Part	Fig.	Removal (Screw, Connector, Flex. & Other)
1	Cassette Up Unit	Fig. M1	It makes the mechanism position in Eject condition (For Battery)
		Fig. M2	3-Screws (A)
		Fig. M3	3-Tabs I remove the piece arrangement unit from rail department
2	Cylinder Unit	Fig. M4	1-Screw (B)
		Fig. M5	3-Screw (C) Cylinder Unit

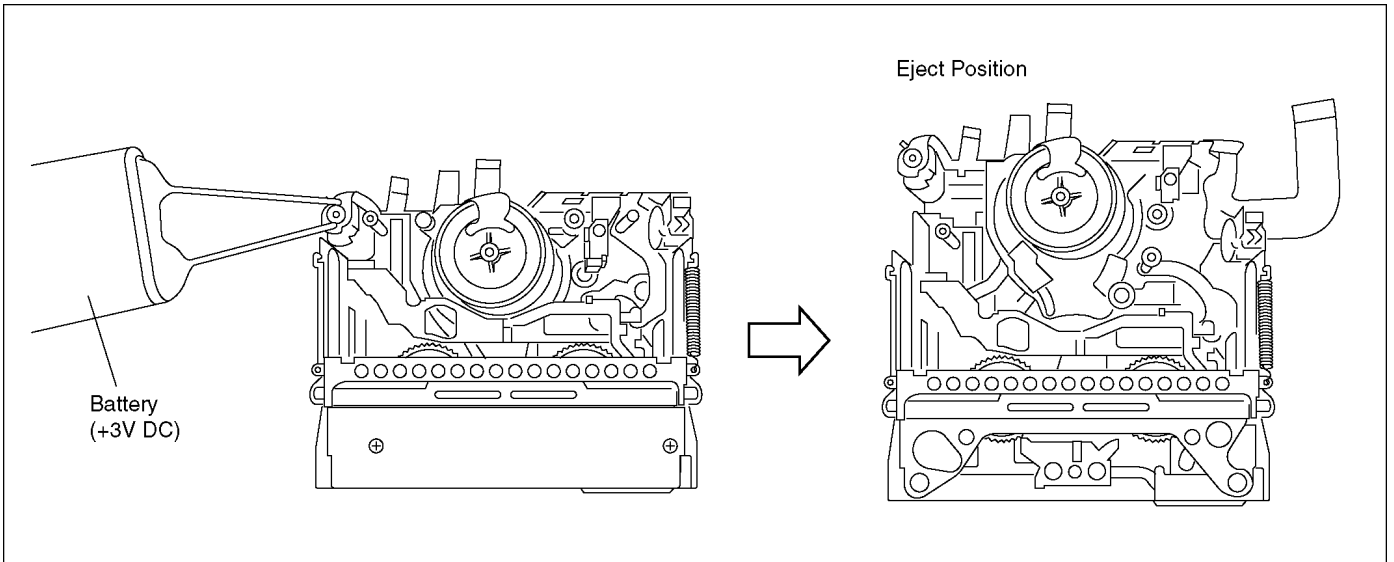


Fig. M1

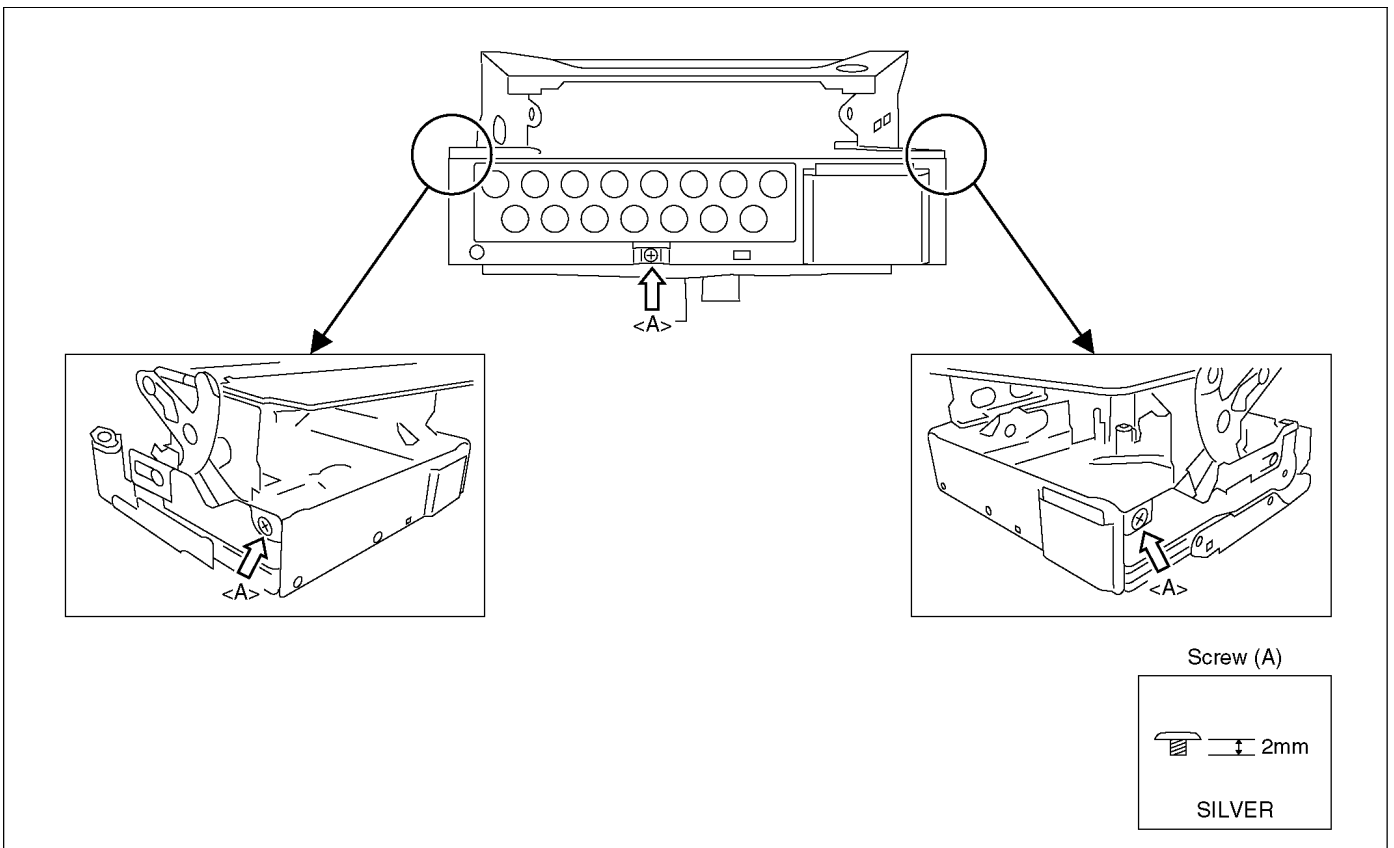


Fig. M2

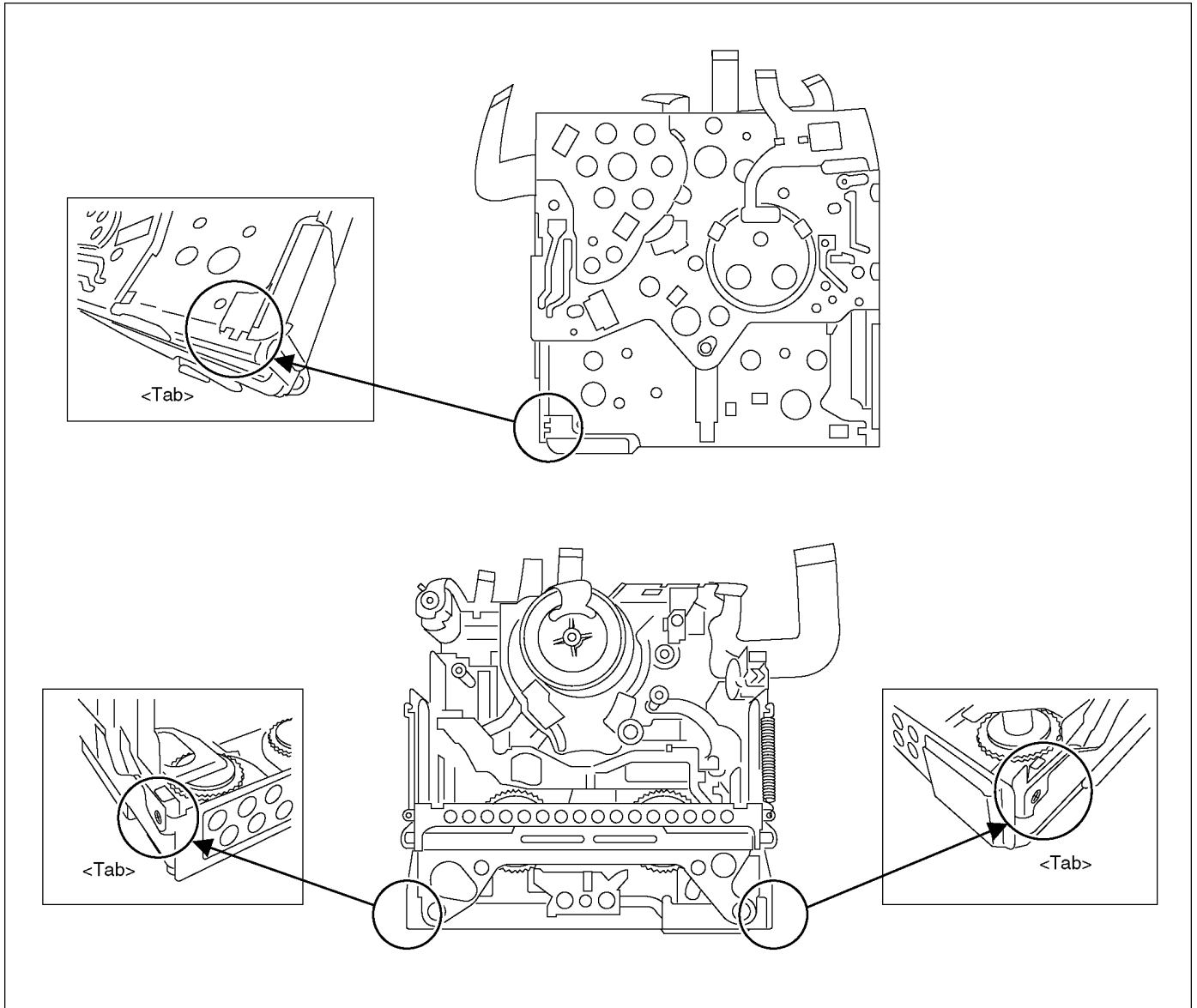


Fig. M3

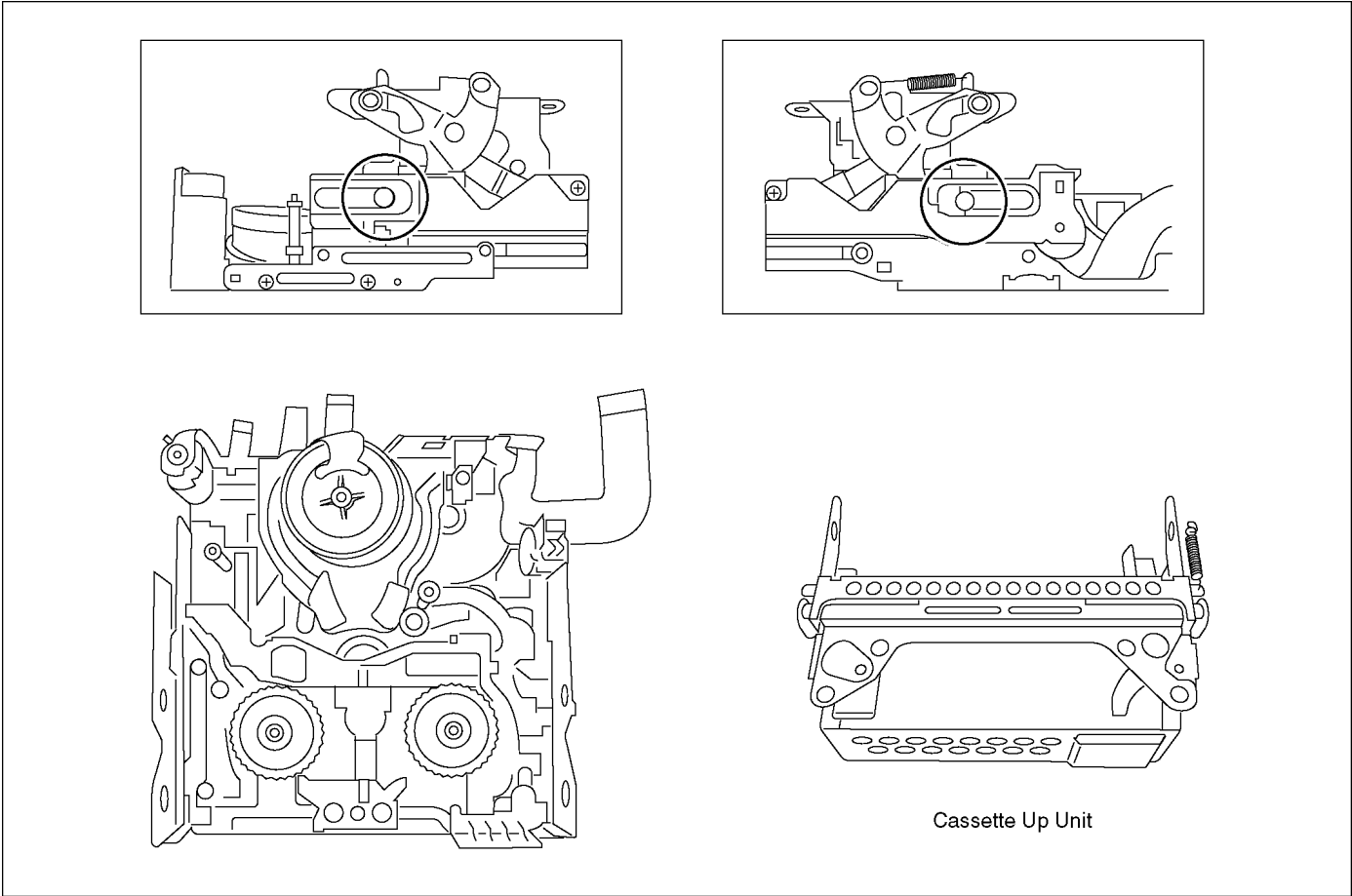


Fig. M4

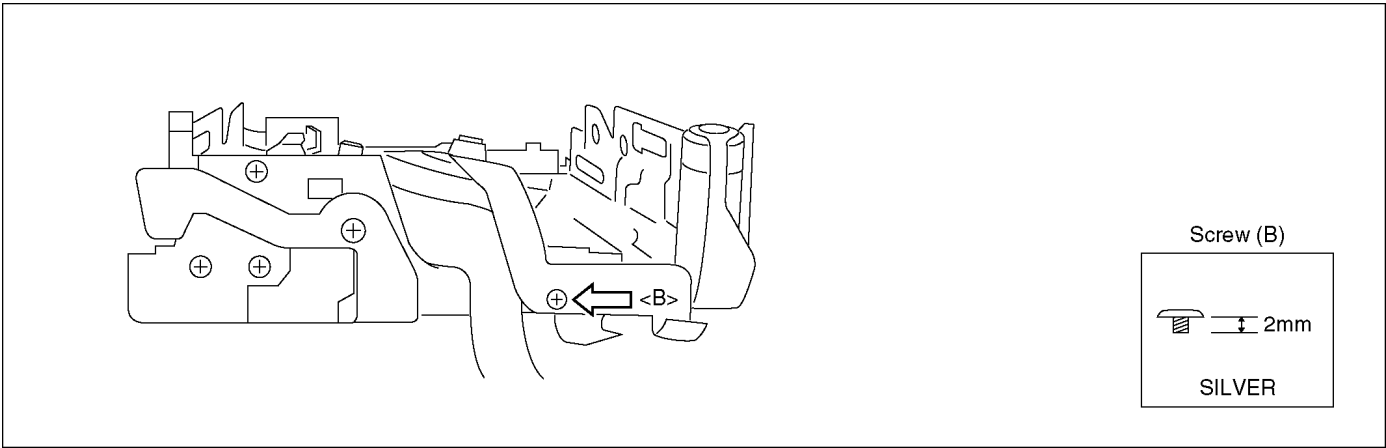


Fig. M5

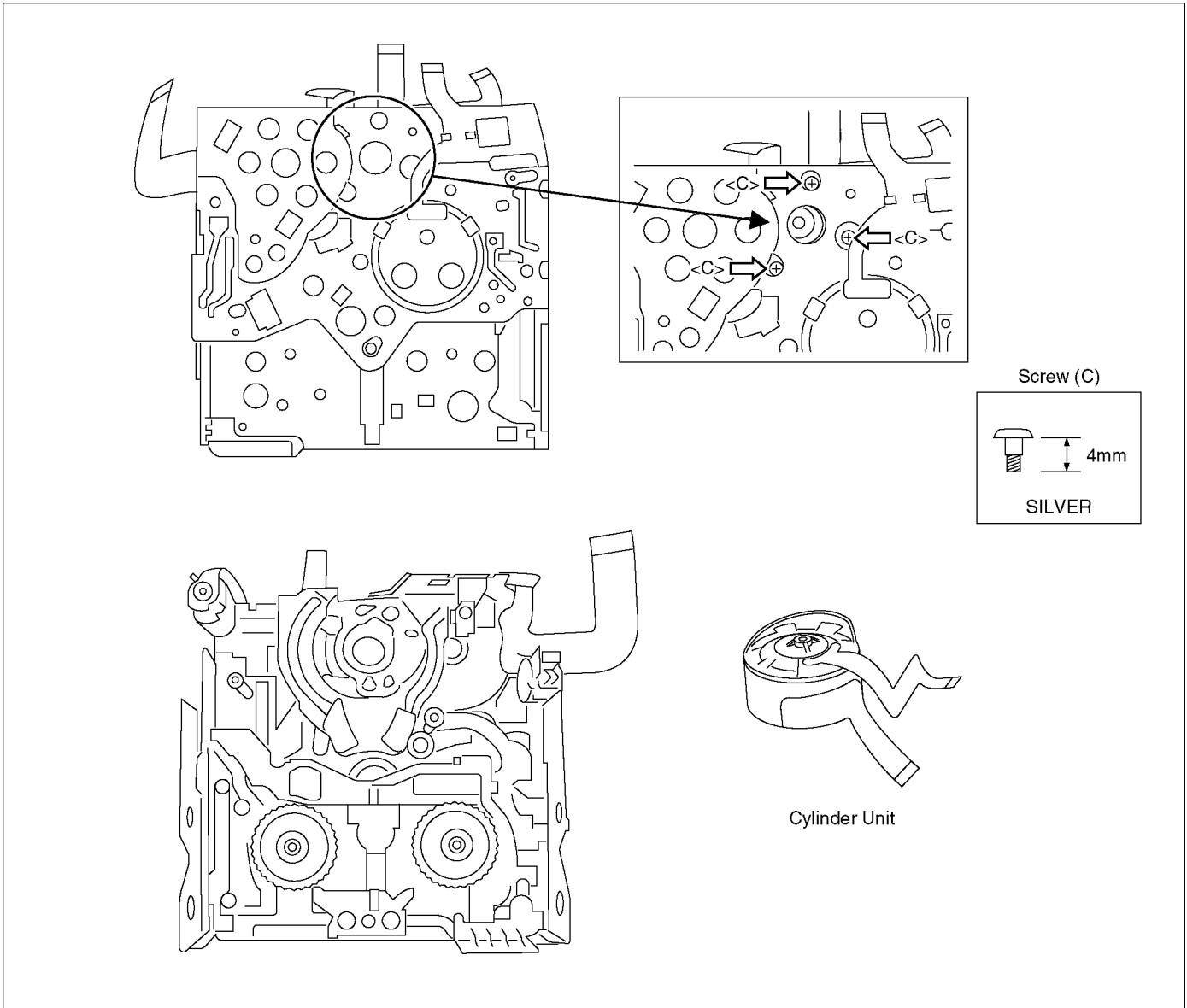


Fig. M6

4.4. DISASSEMBLY PROCEDURES OF CAMERA LENS UNIT

The following flowchart describes order or steps for removing the Camera lens unit and certain printed circuit boards in order to make access to the item needing service.

To reassemble the unit follow the steps in reverse order.

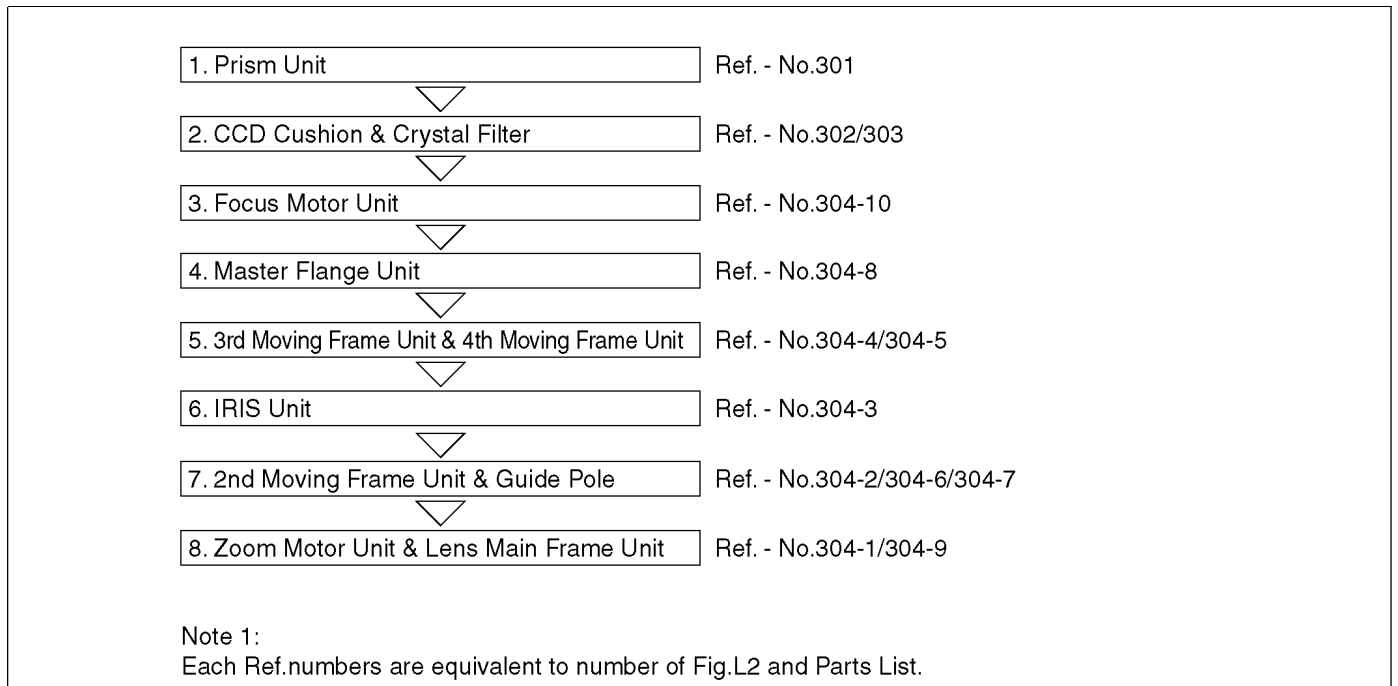


Fig. L1

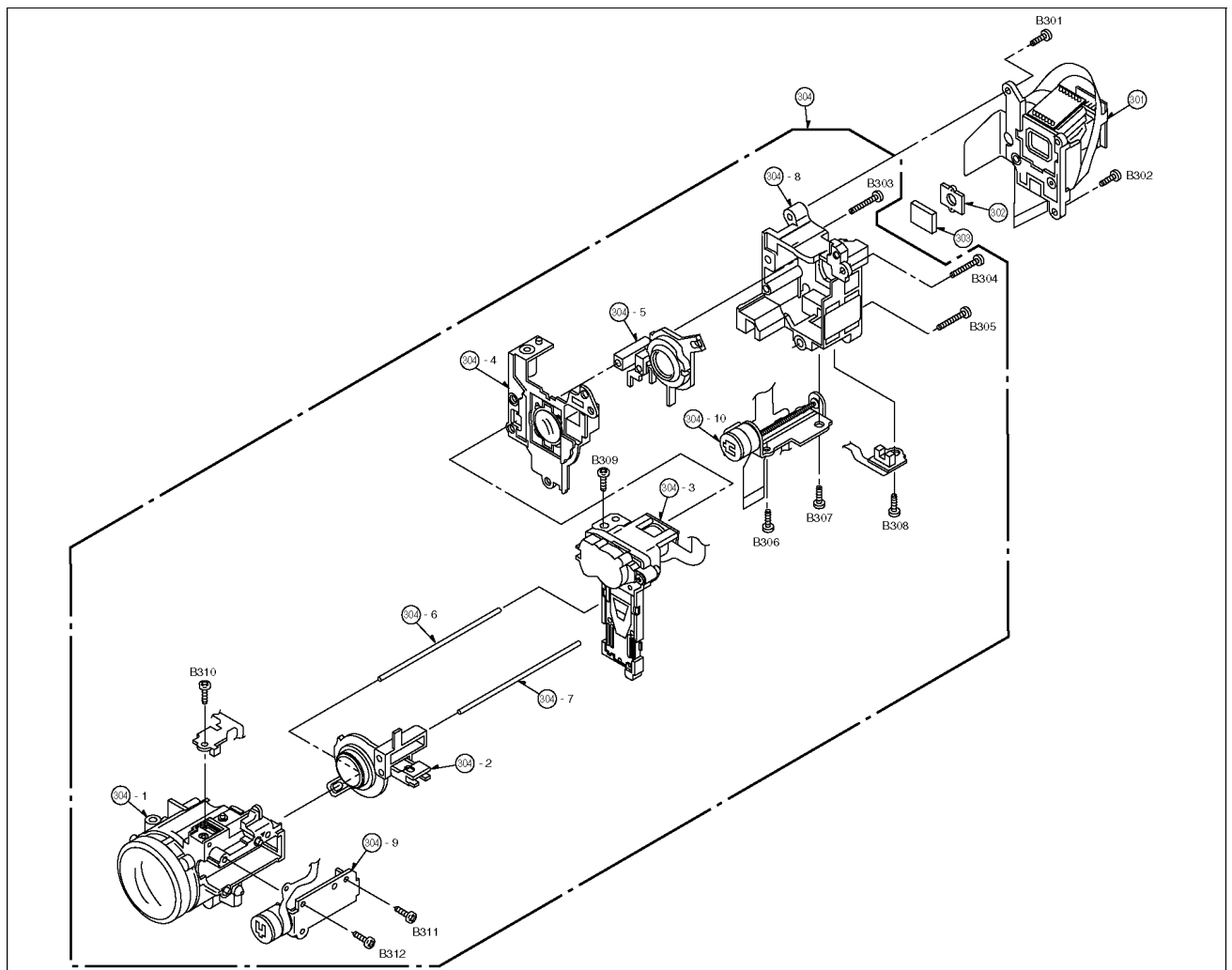


Fig. L2

5 SERVICE CAUTION

5.1. EEPROM DATA FOR SPARE PARTS OF THE MAIN P.C.B.

When the Main P.C.B. is replaced, the fixed and average data must be changed by Tatsujin kit according to the Movie Camera's suffix.

Then, confirm and/or adjust the VTR and Camera section one by one.

5.2. SERVICE EXTENSION CABLES

This models is required the following extension cables for all connections.

Note 1:

Use the following extension cables when checking or adjusting individual circuit boards except module Parts.

(Main P.C.B. and Sub P.C.B.)

Ref.	Part No.	Pin	Part Name	Connection	Q'ty	Remarks
(1)	VFK1173	14	Flat Cable	FP6502 (Main) - Rear Operation Unit	1	as NV-DS7
(2)	VFK1442	21	Flat Cable	FP6505 (Main) - FP4801 (Front)	1	as NV-DS7
(3)	VFK1442	21	Flat Cable	FP701 (Sub) - Lens Unit	1	as NV-DS7
(4)	VFK1459	39	Flat Cable	FP201 (Sub) - PP201 (Prism Unit)	1	as NV-DS7
(5)	VFK1492	26	Flat Cable	FP6503 (Main) - FP6301 (Side R)	1	as NV-DS9
(6)	VFK1491	27	Flat Cable	FP602 (Sub) - FP902 (Monitor)	1	as NV-DS9
(7)	VFK1173	14	Flat Cable	FP1001 (Main) - Battery Catcher	1	as NV-DS7
(8)	VFK1491	27	Flat Cable	FP6504 (Main) - FP6201 (Jack)	1	as NV-DS9
(9)	VFK1282	22	Flat Cable	FP601 (Sub) - FP801 (EVF)	1	as NV-DP1

How to use extension cables.

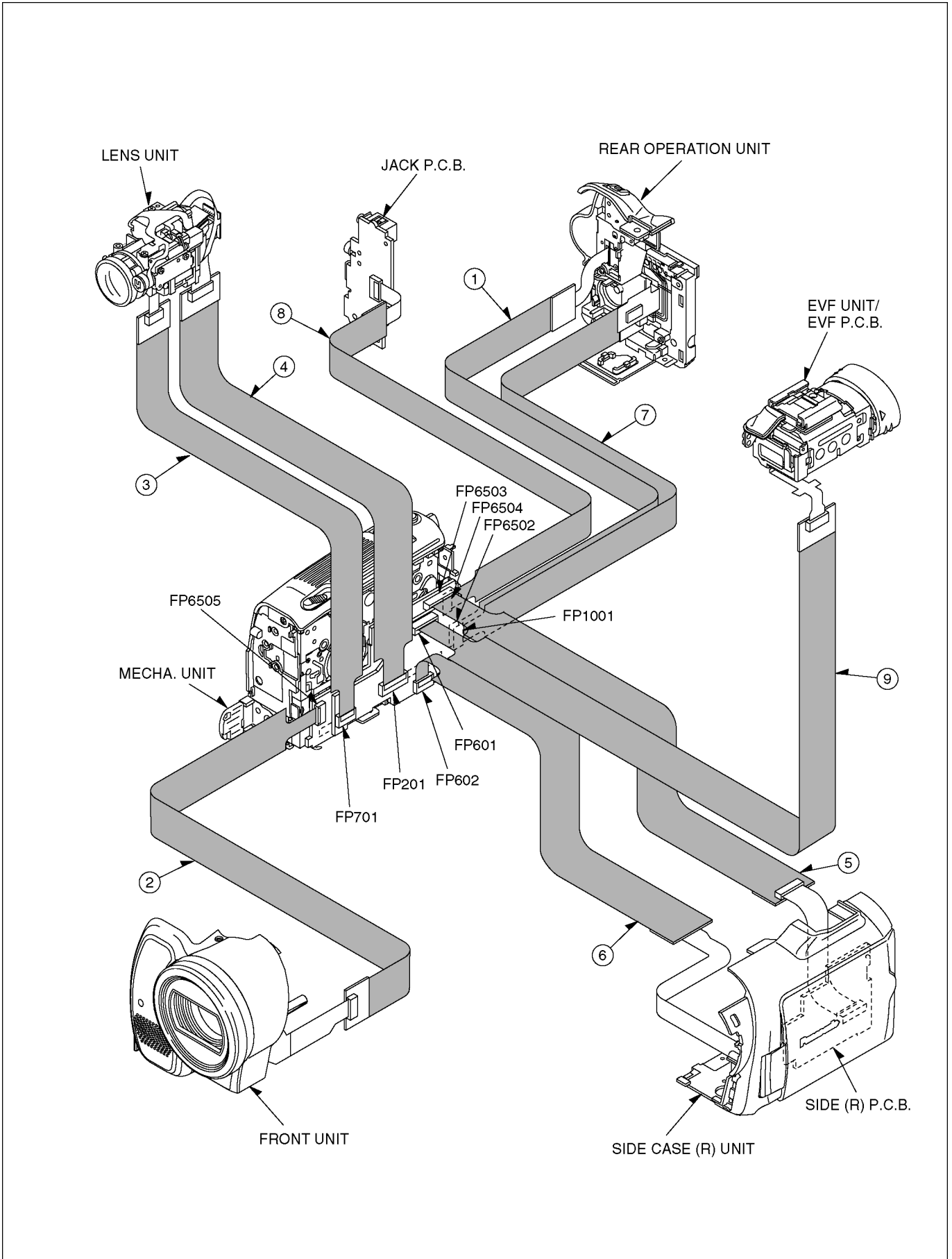
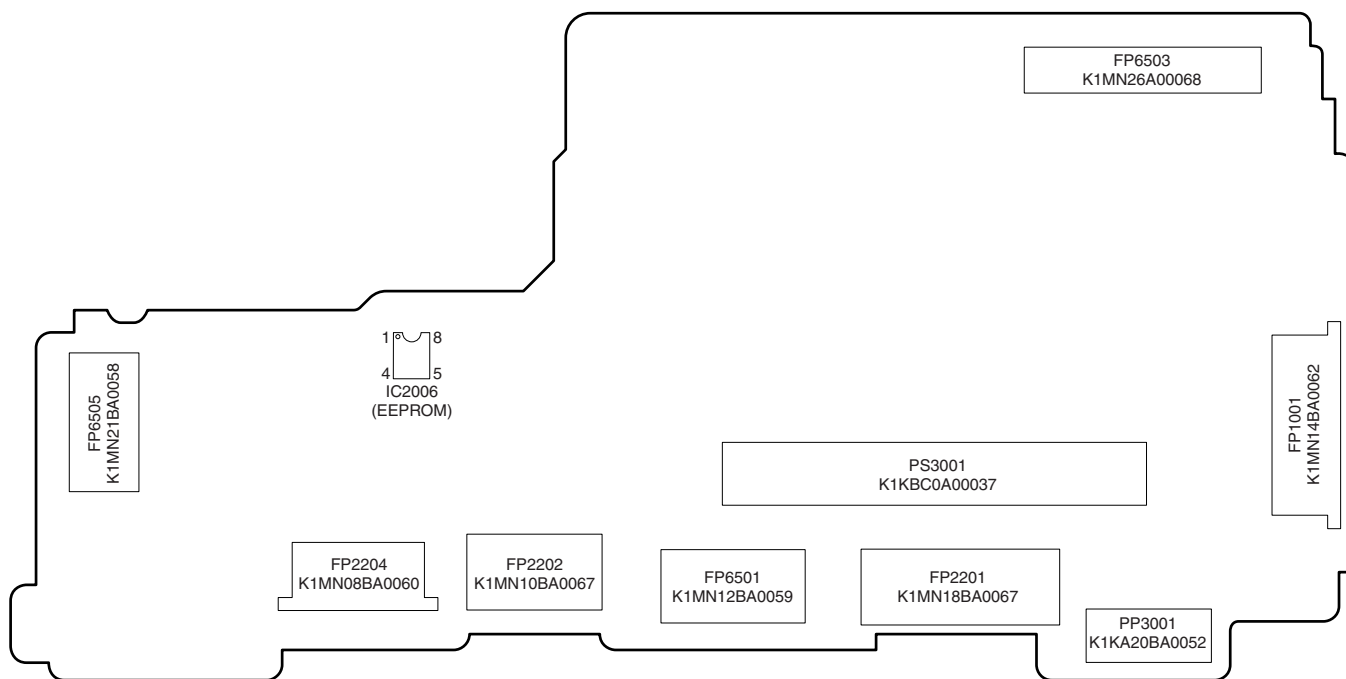


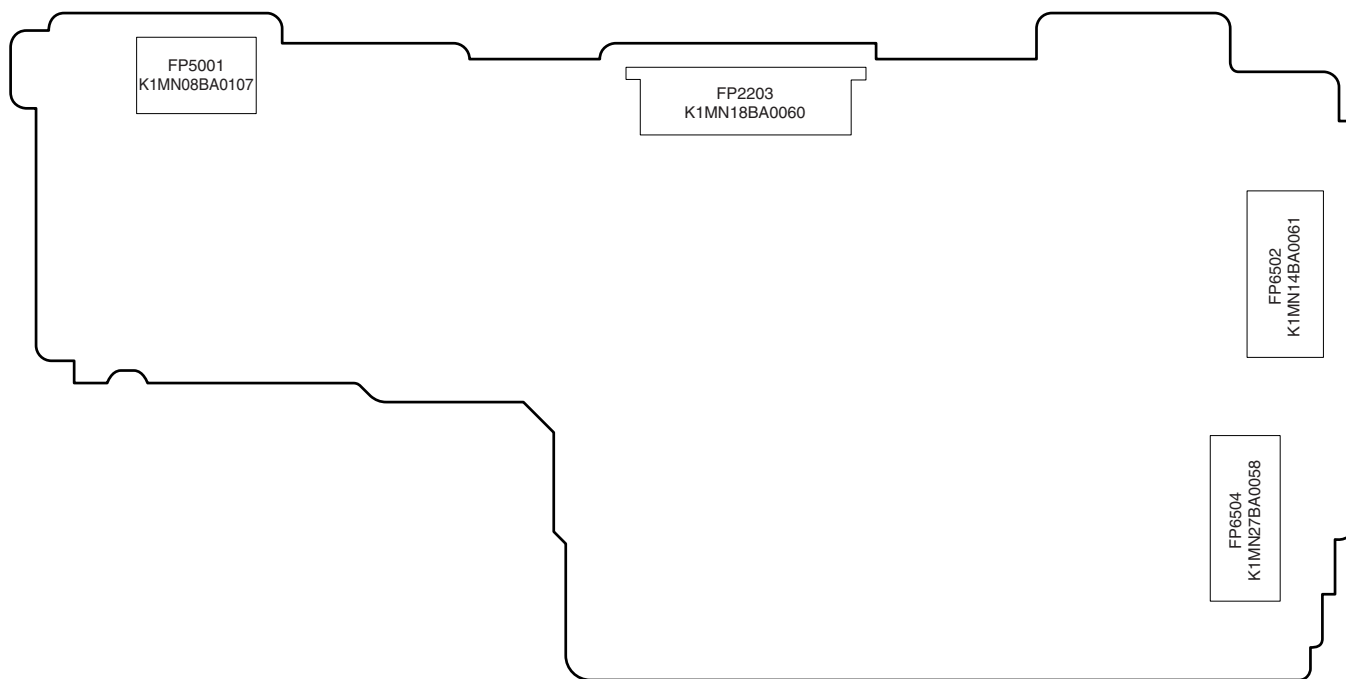
Fig. T1

5.3. LOCATION FOR CONNECTORS OF THE MAIN P.C.B. & SUB P.C.B.

5.3.1. MAIN P.C.B.

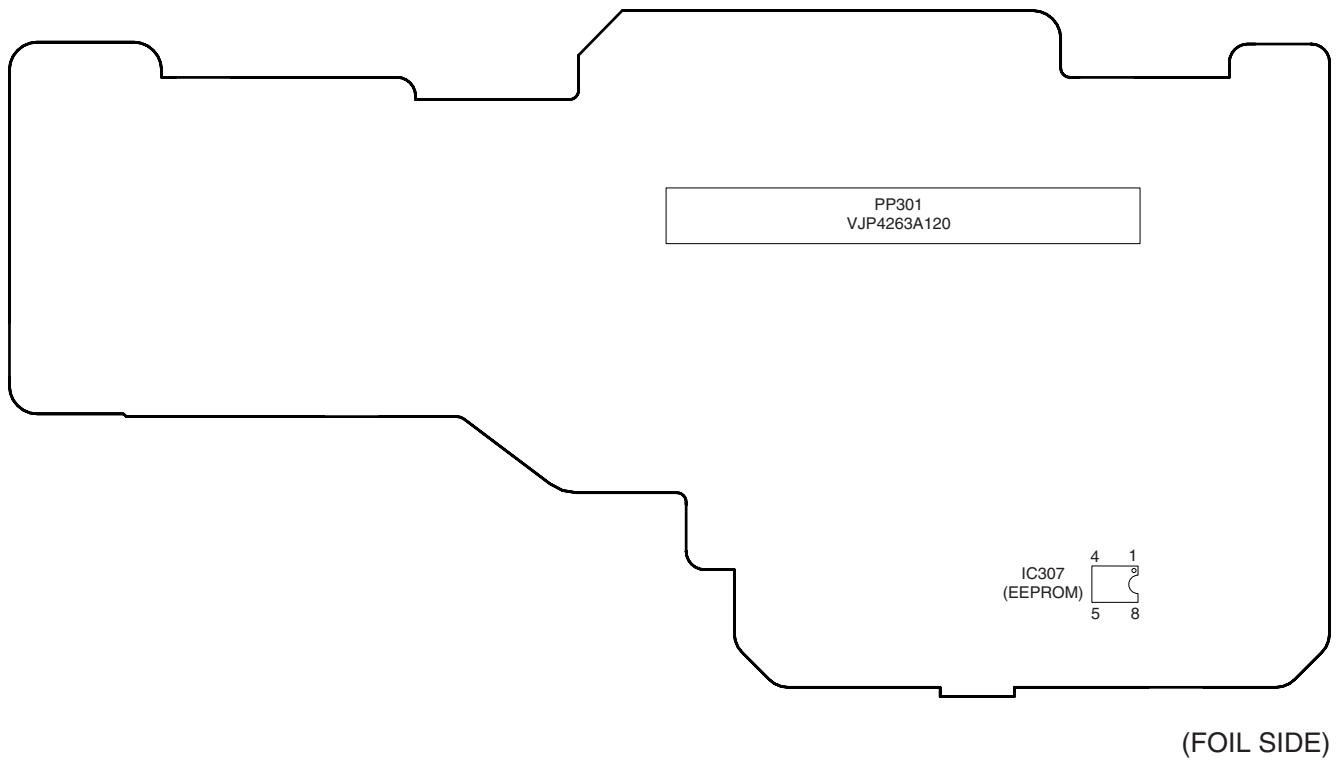
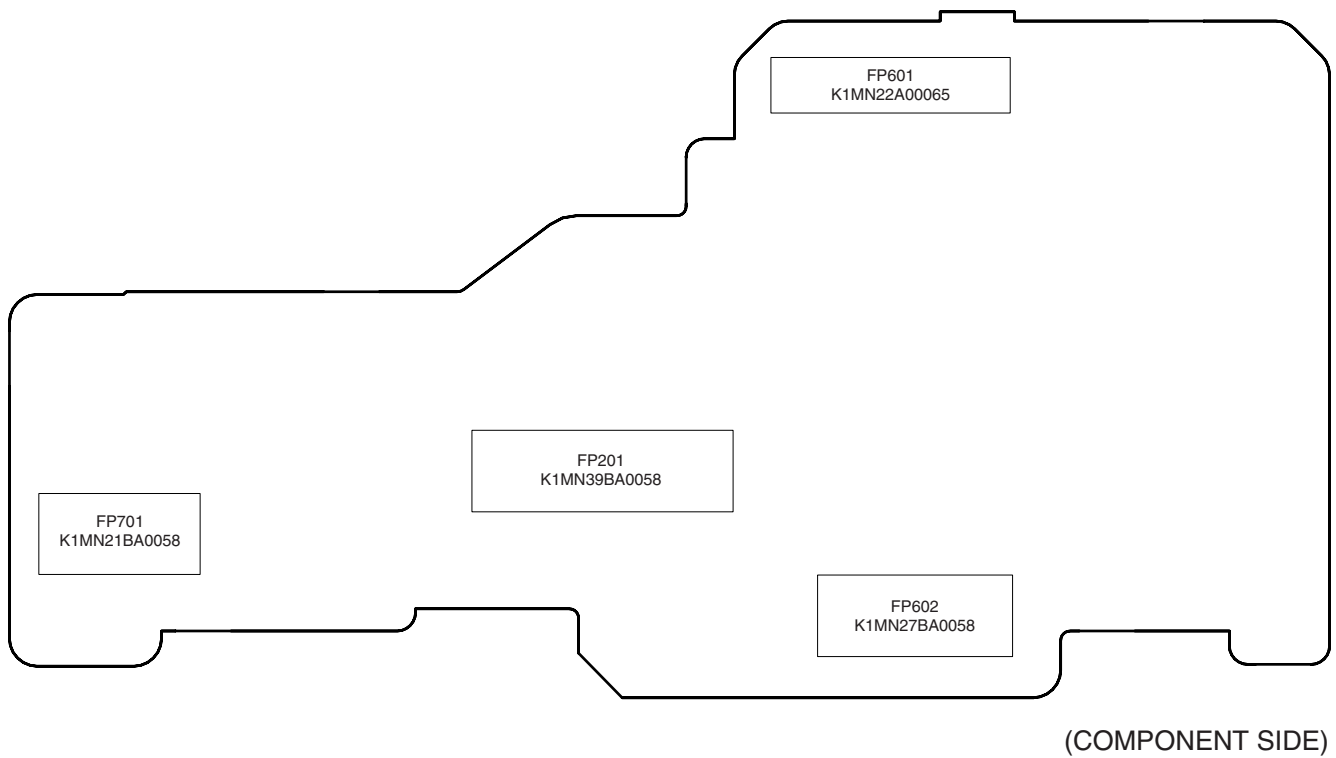


(COMPONENT SIDE)



(FOIL SIDE)

5.3.2. SUB P.C.B.



6 ELECTRICAL ADJUSTMENT PROCEDURES

6.1. COMPUTER ASSISTED ADJUSTMENT SYSTEM <TATSUJIN> ADJUSTMENT

This unit employs the computer assisted system named; "TATSUJIN PC-Adjustment" for Electrical adjustment.

6.2. SET-UP MANUAL FOR DV-Camcorder

1. SAVE THE SOFTWARE

Install the effective model's TATSUJIN Software to PC: Personal Computer.

2. SET-UP (CONNECTION)

a. Remove the EVR cover of the DV Camcorder.

Unlock the locking tab and remove the EVR cover as shown in Fig. E1.

b. Make a connection.

Connect the PC, the PC/IF Unit and the DV Camcorder as shown in Fig.E2 and E3.

c. Check the SW position on Measuring Board.

The position of SW on Measuring Board checks as shown in Fig. E4.

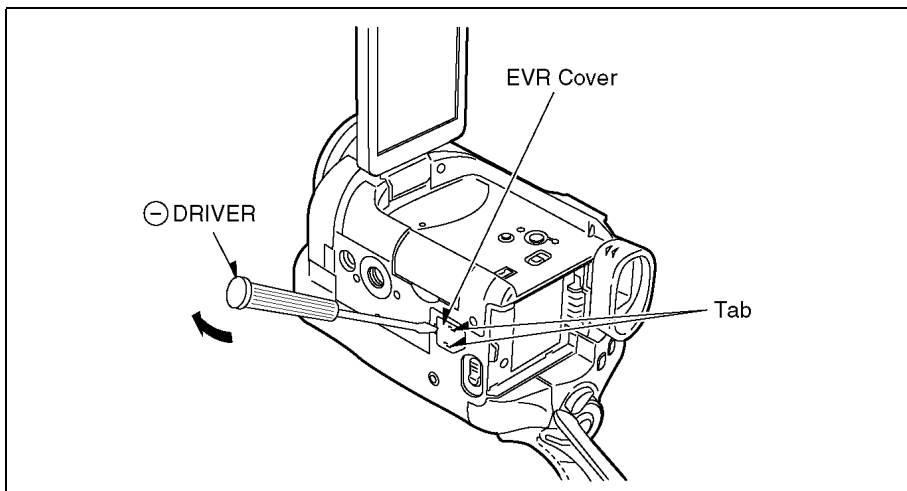


Fig. E1

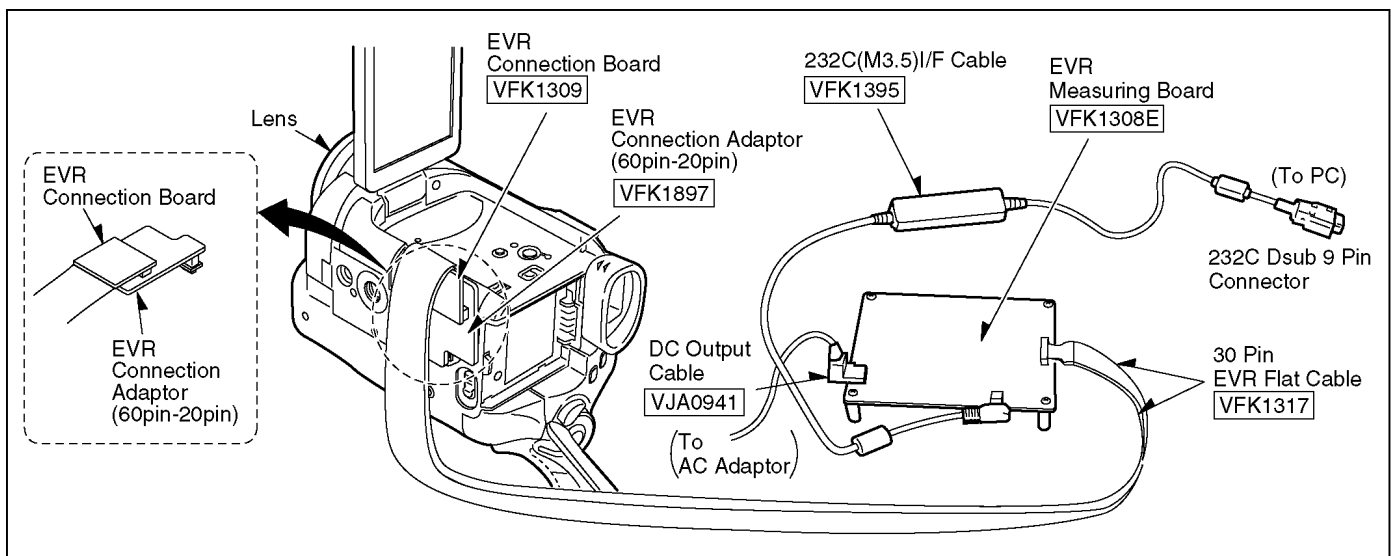


Fig. E2 Necessary Equipment & Tools for Connection.

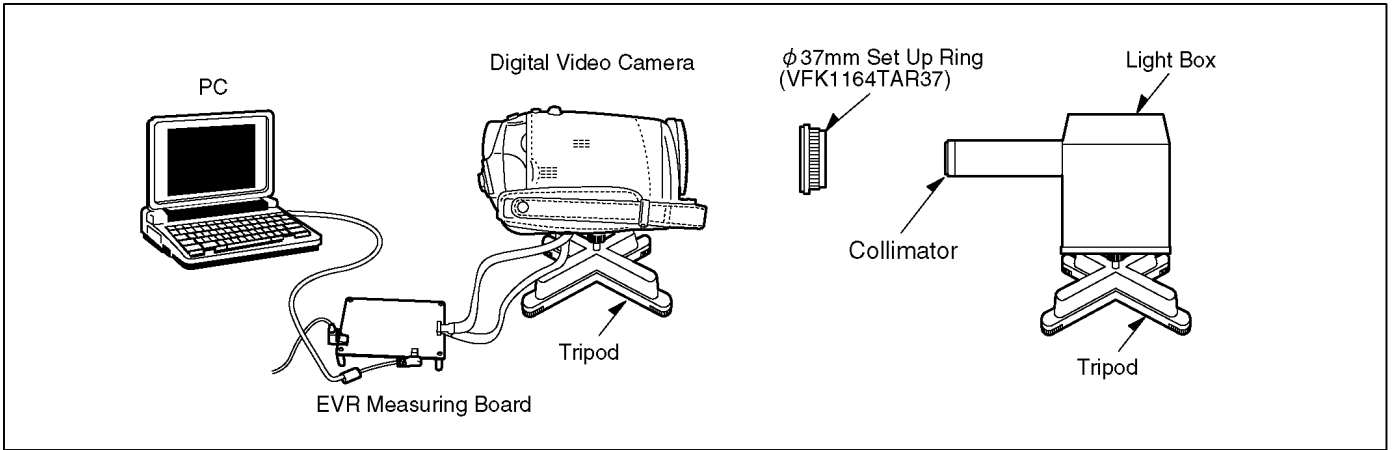


Fig. E3 Rough image of set-up connection

Ref	Name	Parts No.	Q'ty	Remarks
1	DV Camcorder	---	1	The Camcorder being adjusted.
2	Personnel Computer	---	1	With Tatsujin Software.
3	AC Adaptor	---	2	The AC Adaptor for DV Camcorder. The AC Adaptor for M. Board.
4	DC output Cable	---	2	The AC Adaptor for DV Camcorder. The AC Adaptor for M. Board.
5	232C (M3.5) I/F Cable	VJA0941	1	
6	Measuring Board	VFK1308E	1	
7	30 pin Flat Cable	VFK1317	2	
8	Step Up Ring	VFK1164TAR37	1	For Collimator 37mm
9	Connection Board	VFK1309	1	
10	Connection Adaptor (60-20pin)	VFK1897	1	
11	TATSUJIN PC-Adjustment Program	VF0D2003AV30	1	

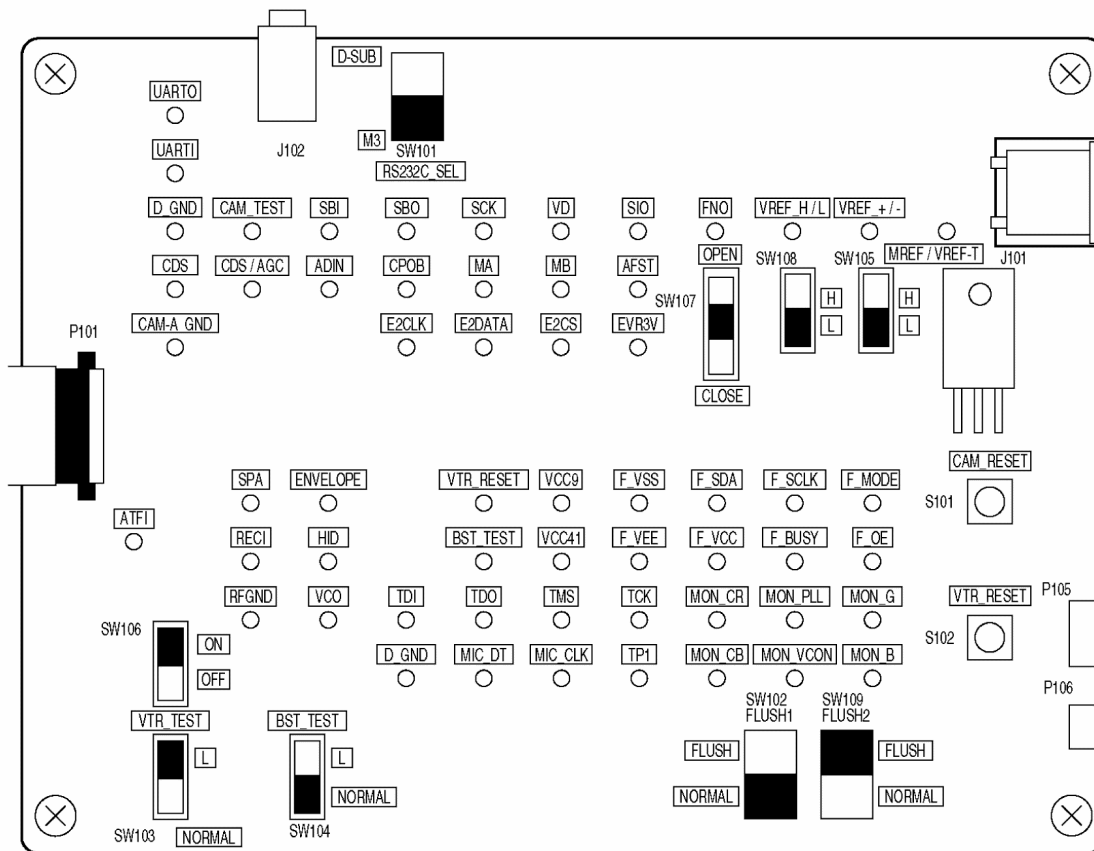
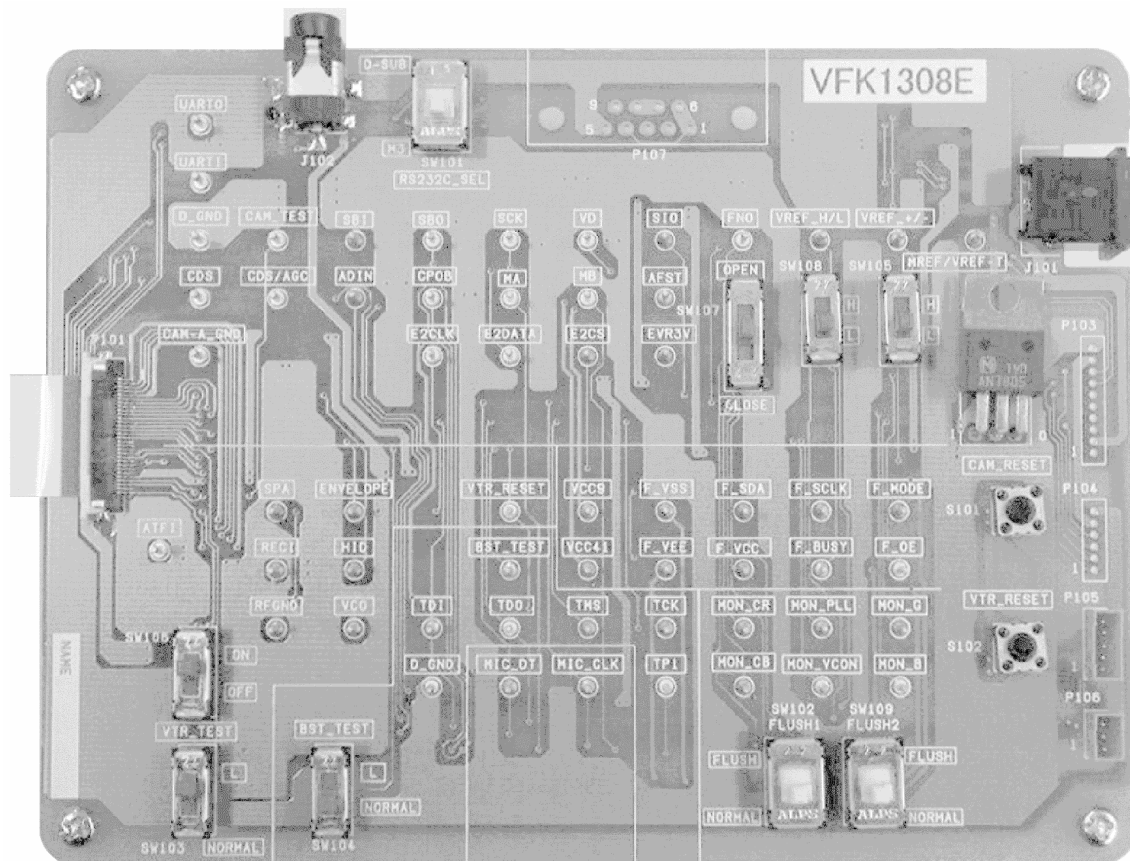


Fig. E4

(Extension cables (VFK1317 × 2pcs) ----- Measuring Board (VFK1308E) ----- 232C I/F Cable (VFK1395))

6.3. SET-UP PC-EVR ADJUSTMENT PROGRAM

1. Turn on the PC and install the TATSUJIN Adjustment Program into the PC.
2. TATSUJIN PC-Adjustment Program start in the following procedure.

PC Menu : [Start] → [Program] → [win Tatsujin] → [DV Movie] → [NV-GS180 Series]

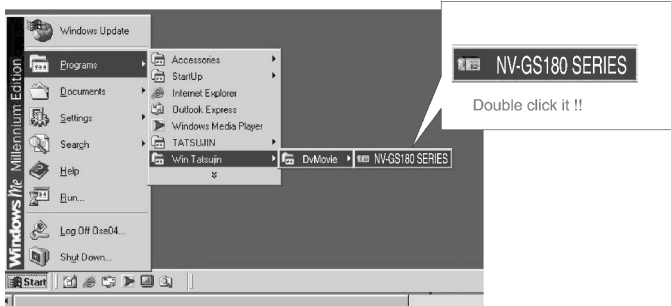


Fig. E5-1

The main menu display will be displayed.

3. Select the desired model.
4. Turn on the camcorder. Then, click “Start.”

① Select the desired model.

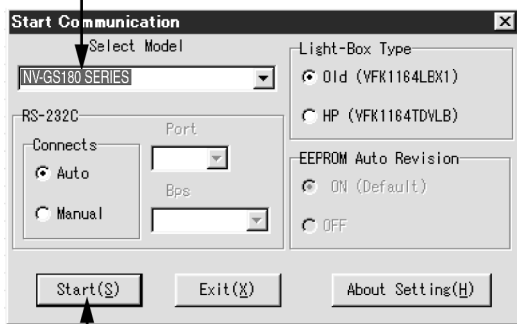


Fig. E5-2

5. The communication is complete, and the dialog will appear. Then, click “VCR (V) or Cam (C)” to save the EEPROM data,

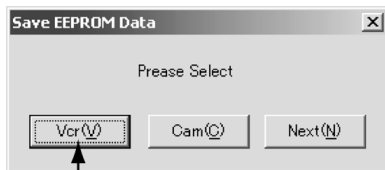


Fig. E5-3

6. Saving for EEPROM data is complete, menu will appear. To perform each adjustment, display the adjustment menu by selecting the desired menu from “Camera Adjust,” “Video Adjust,” “LCD Adjust” or “EVF Adjust” and select each adjustment item.

④ Select the desired menu.

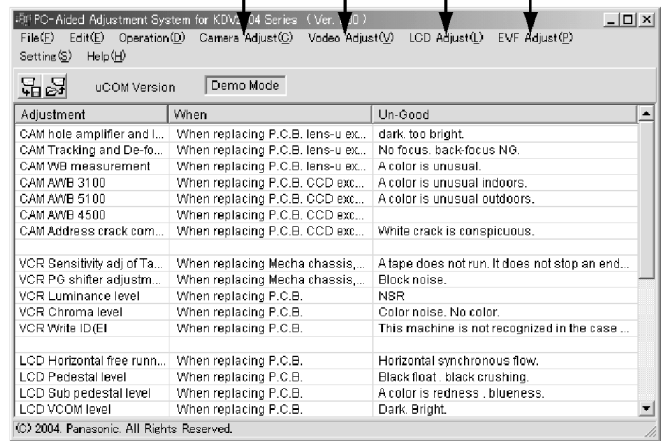


Fig. E5-4

Note:

The adjustment data is stored to the EEPROM IC after each adjustment.

7. After adjustment, to end the software, select “Exit” in File menu or close the window.

⑤ Select "Exit" or close the window.

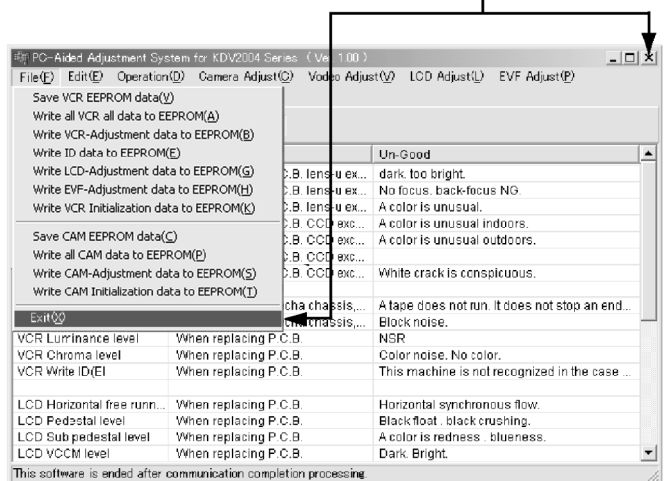


Fig. E5-5

6.4. INITIAL GUIDELINE

The table below shows which adjustments are necessary according to the unit parts and individual parts to be replaced. Make sure to perform these adjustments shown below as necessary.

Adjustment Item		Replacement Parts											
		Sub P.C.B.	Main P.C.B.	IC307 (EEPROM)	IC2006 (EEPROM)	Lens Unit	Prism Unit	Iris Unit	4ht Moving Frame Unit	Cylinder Unit	Main Chassis Unit	LCD Panel	EVF P.C.B.
Camera	CAM hole amplifier / Iris PWM	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
	CAM Tracking and De-focus	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
	CAM Revision CCD scratch	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
	CAM ALC adjustment	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
	CAM AWB adjustment	<input type="radio"/>		<input type="radio"/>			<input type="radio"/>						
Video	VCR Sensitivity ADJ. of Tape sensors		<input type="radio"/>		<input type="radio"/>						<input type="radio"/>		
	VCR PG shifter adjustment		<input type="radio"/>		<input type="radio"/>				<input type="radio"/>	<input type="radio"/>			
	VCR Luminance level		<input type="radio"/>		<input type="radio"/>								
	VCR Chroma level		<input type="radio"/>		<input type="radio"/>								
LCD	LCD Contrast		<input type="radio"/>		<input type="radio"/>						<input type="radio"/>		
	LCD Pedestal level		<input type="radio"/>		<input type="radio"/>						<input type="radio"/>	<input type="radio"/>	
	LCD PLL		<input type="radio"/>		<input type="radio"/>						<input type="radio"/>	<input type="radio"/>	
	LCD COM bias		<input type="radio"/>		<input type="radio"/>						<input type="radio"/>	<input type="radio"/>	
	LCD COM level		<input type="radio"/>		<input type="radio"/>						<input type="radio"/>	<input type="radio"/>	
	LCD White balance		<input type="radio"/>		<input type="radio"/>						<input type="radio"/>		
EVF	LED Rank Adjustment		<input type="radio"/>		<input type="radio"/>							<input type="radio"/>	

Note : : Adjustment Item

7 MECHANICAL ADJUSTMENT PROCEDURES

7.1. ADJUSTMENT ITEM

Item	Adjustment at the time of the part exchange		
	Half finished goods mechanism	Cylinder	Remarks
Linearity adjustment & BER value confirmation	○	○	

7.2. ADJUSTMENT PROCEDURES

Linearity adjustment & BER value confirmation

1. Remove the mechanism adjustment cover of this machine as shown in Fig. D1.
2. The special tool at the time of electricity adjustment is connected.
Reference of the connection figure of electricity adjustment.
3. The envelope detection special tool board (VFK1641) is connected to EVR adjustment board as shown in Fig. D2.
4. The envelope detection special tool board is connected to oscilloscope as shown in Fig. D2.
5. The post is adjusted with the post driver (VFK1899) so that the recycled normal tape which recorded NTSC signal and the detection wave-link become a flat as shown in Fig. D3.
*At the time of the cylinder unit exchange unnecessary.
6. The post is adjusted with the post driver so that the recycled alignment tape (VFM3110EDS) and the detection wave-link become a flat once again.
7. Recycling the tape that video-taped it with this machine after adjustment, the BER value is confirmed with the item of the BER the item of the BER confirmation of expert soft inside.

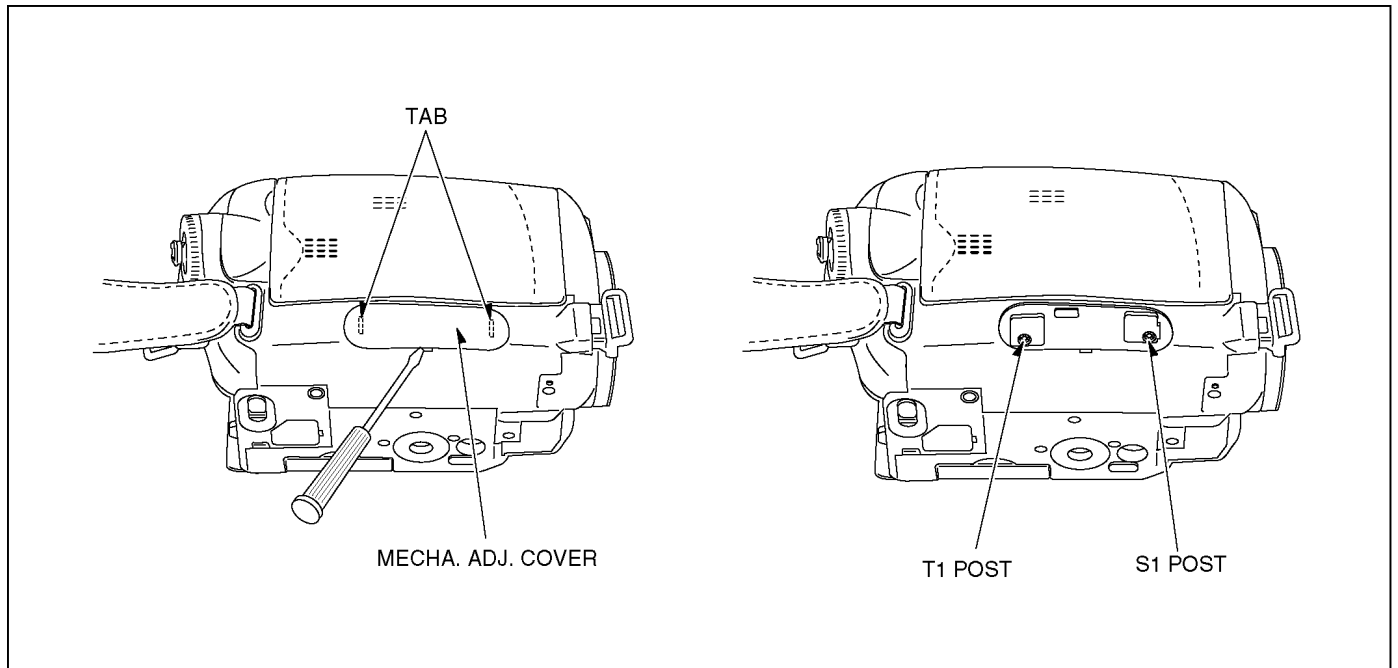


Fig. D1

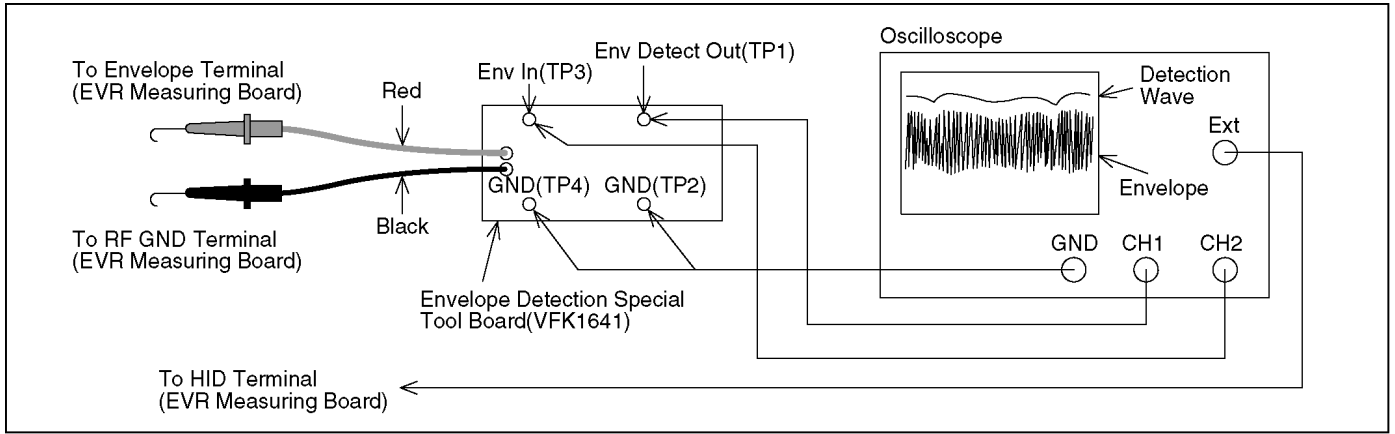


Fig. D2

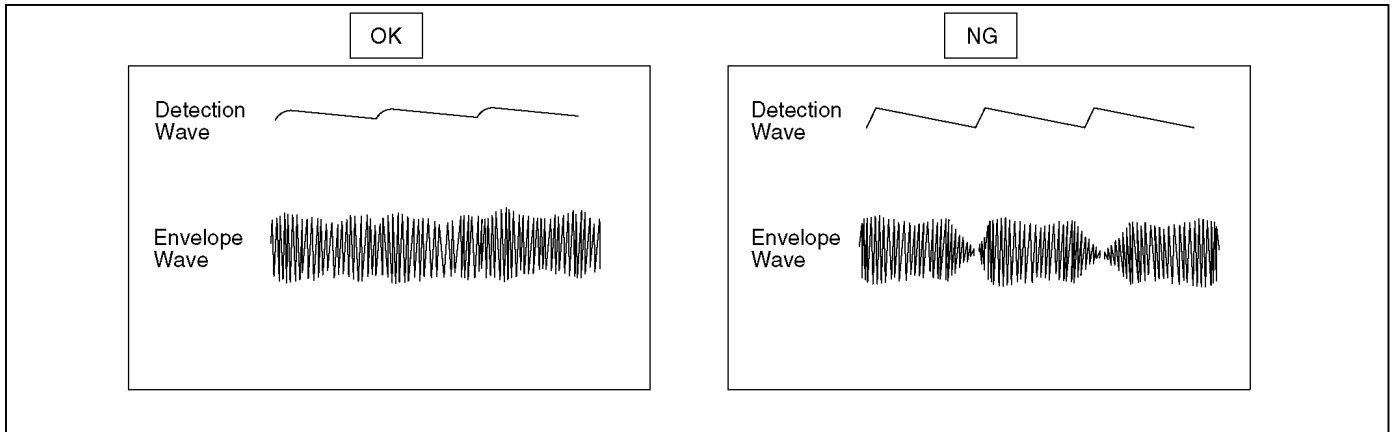
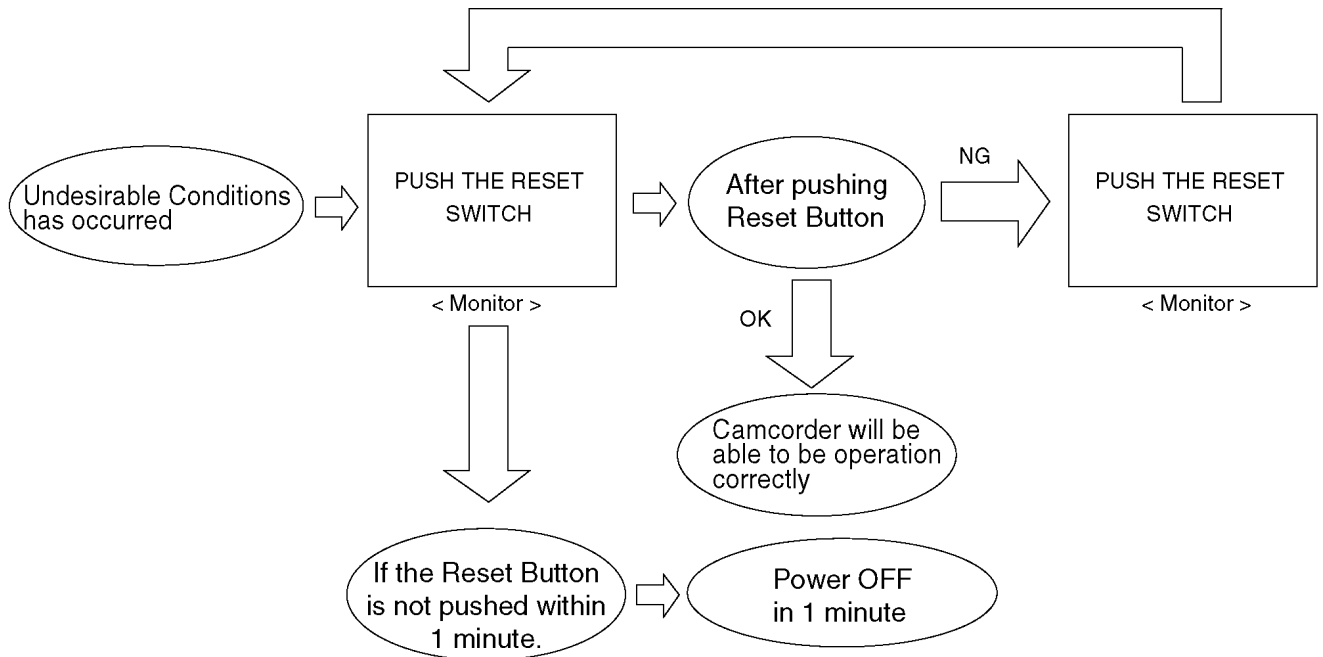


Fig. D3

8 SERVICE MODE

8.1. ERROR DISPLAY

"PUSH THE RESET SWITCH" is displayed automatically on the EVF or the LCD Monitor when an undesirable condition has occurred.



Note:

When "PUSH THE RESET SWITCH" is displayed repeatedly, required. Check the Error Code which is listed in the Service Menu.

8.2. Service Menu

When abnormal detection contents are confirmed a When I do the following operation automatic diagnosis cord is displayed.

1. Preparation
Remove the card and tape from this machine.
2. Service menu is dieplayed. (see Fig. S1)
Pushed [QUICK START] button and [JOYSTICK LEFT ◀] button and [PHOTO SHOT] button simmultaneously for 3 seconds.
3. Operating automatic diagnosis cord is displayed.
Item [3] is selected with the [JOYSTICK UP or DOWN ▲/▼] button.
[NO] is selected with the [JOYSTICK RIGHT ▶] button.
[YES] is selected with the [JOYSTICK UP or DOWN ▲/▼] button.
Press the [CURSOR CENTER] button.

672C00 010C 22	
1	NO
2	NO
3	NO
4	NO
5	NO
SETUP ENTER EXIT MENU	

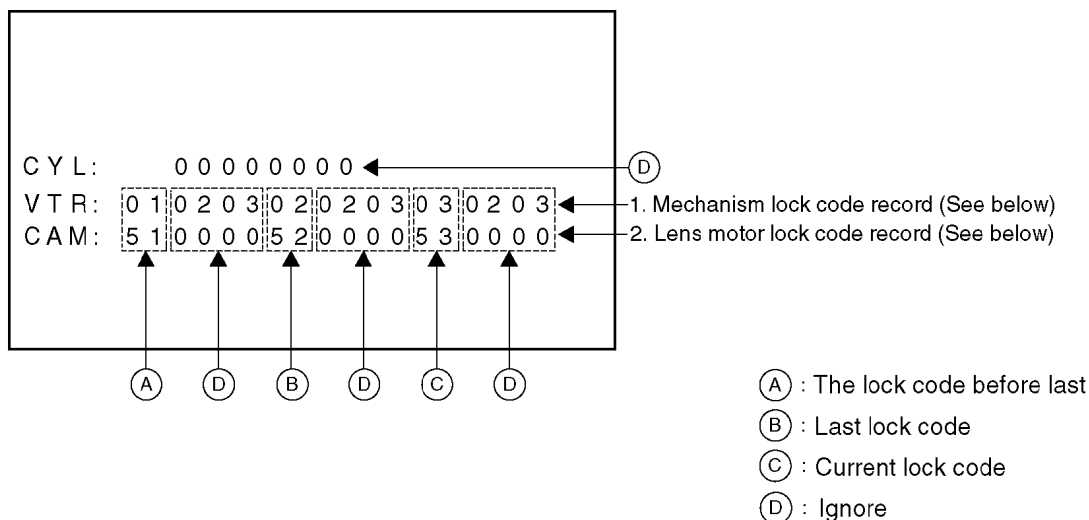
ITEM →

Fig. S1

NOTE:

Do not operate items Except for 3 in the Service Menu.

Self diagnosis cord contents are as follows.



Display contents (self diagnosis cord contents)

Mechanism & Lens motor lock code	
DISPLAY	CONDITION
01	T-REEL LOCK
02	S-REEL LOCK
03	UNLOADING LOCK
04	LOADING LOCK
05	CYLINDER
51	ZOOM MOTOR LOCK
52	FOCUS MOTOR LOCK

Turn off the power supply after confirmation.


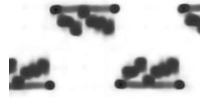

Please do the error cord backup record the clear after repair completion.

CLEAR METHOD

If the Card and tape inserted, take out it before Service Mode operation.

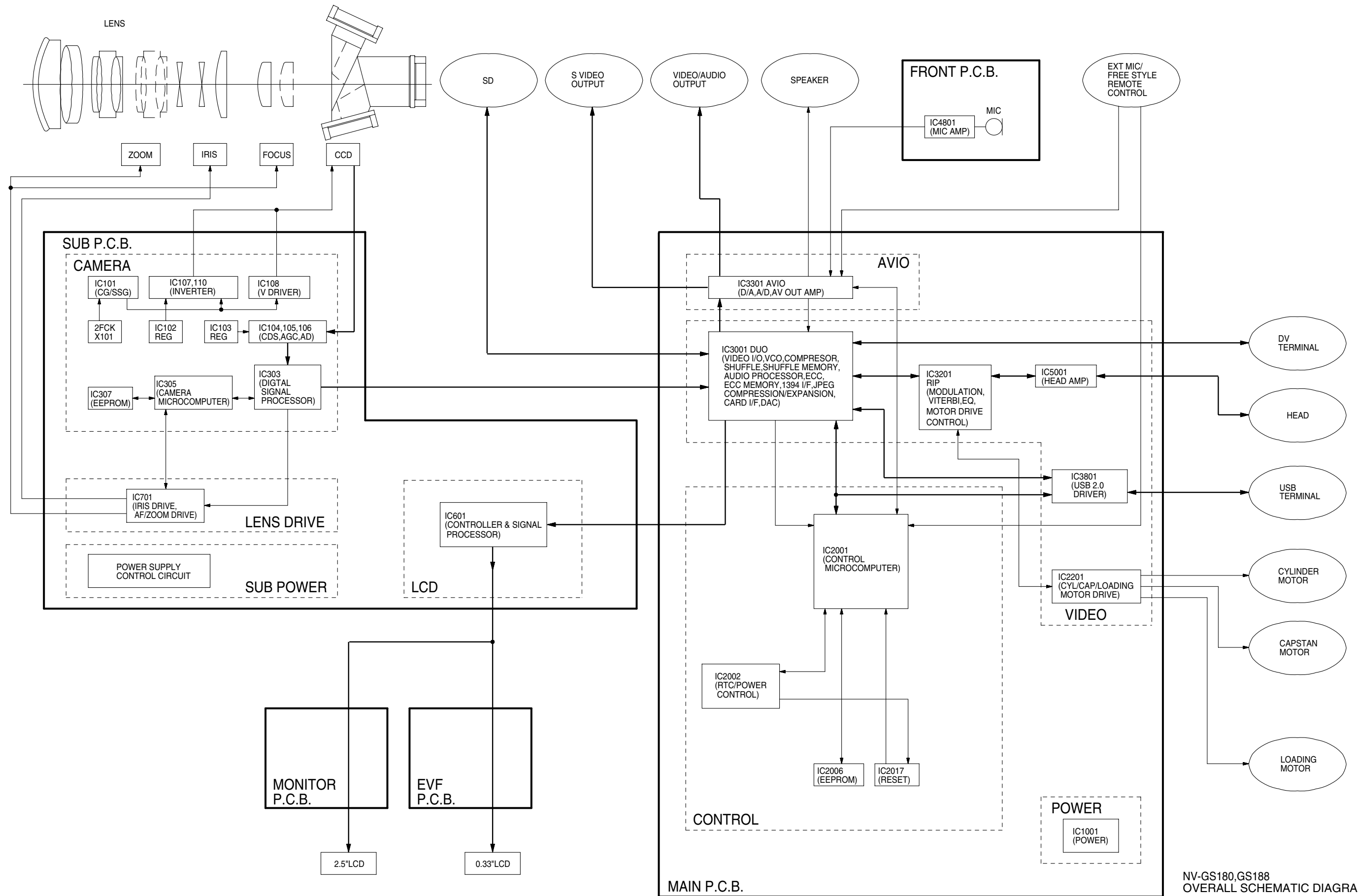
Making the mode dial of This Machine a tape recording mode, push [JOYSTICK LEFT ◀] button and [QUICK START] button and [RECORDING START/STOP] button simultaneously for 3 seconds.

9 WAVEFORM TABLE

 <p>R908 REC/PLAY 3.0Vp-p (20usec.div.)</p>	 <p>R909 REC/PLAY 3.0Vp-p (20usec.div.)</p>	 <p>R907 REC/PLAY 3.0Vp-p (20usec.div.)</p>		

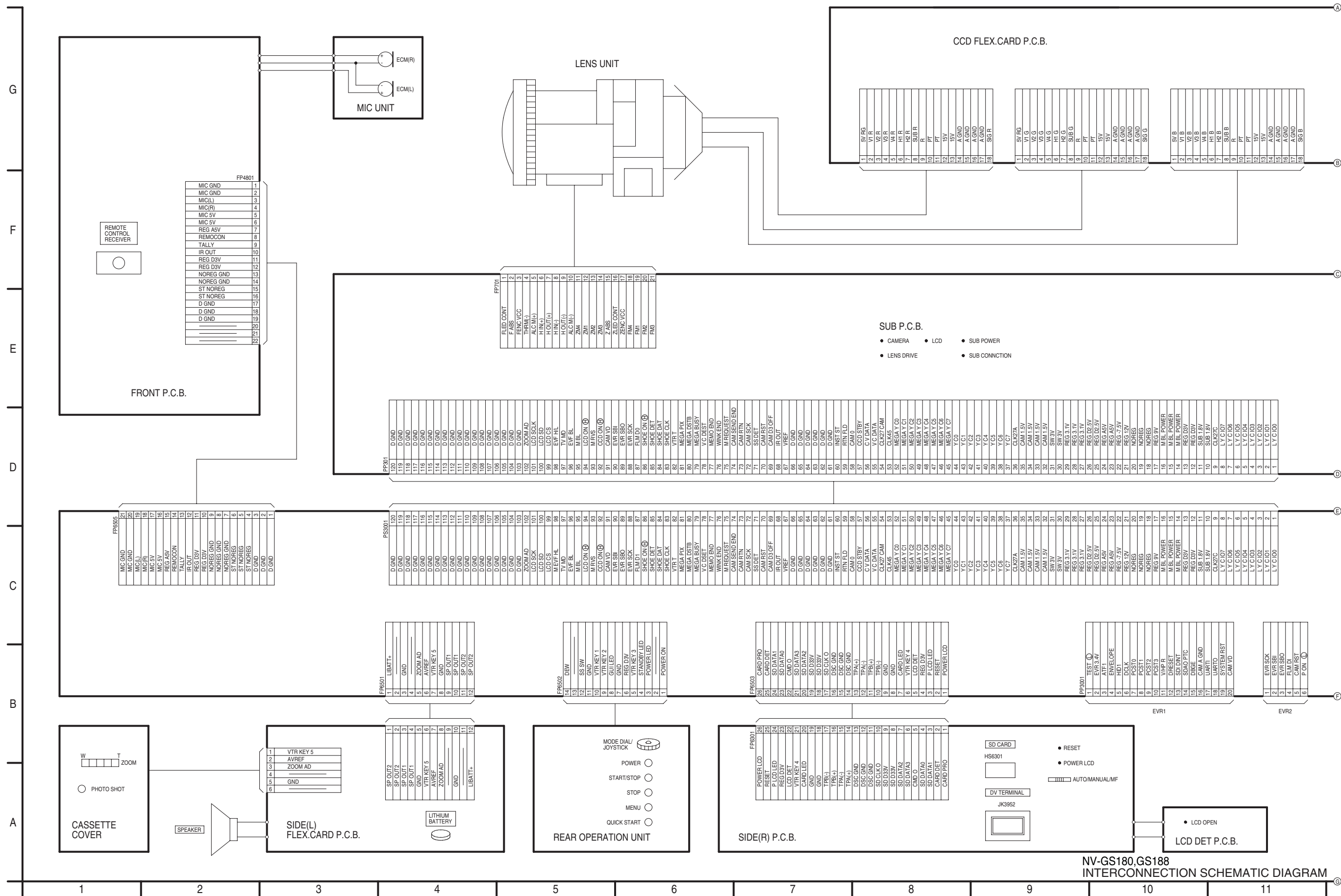
10 SCHEMATIC DIAGRAM

10.1. OVERALL SCHEMATIC DIAGRAM

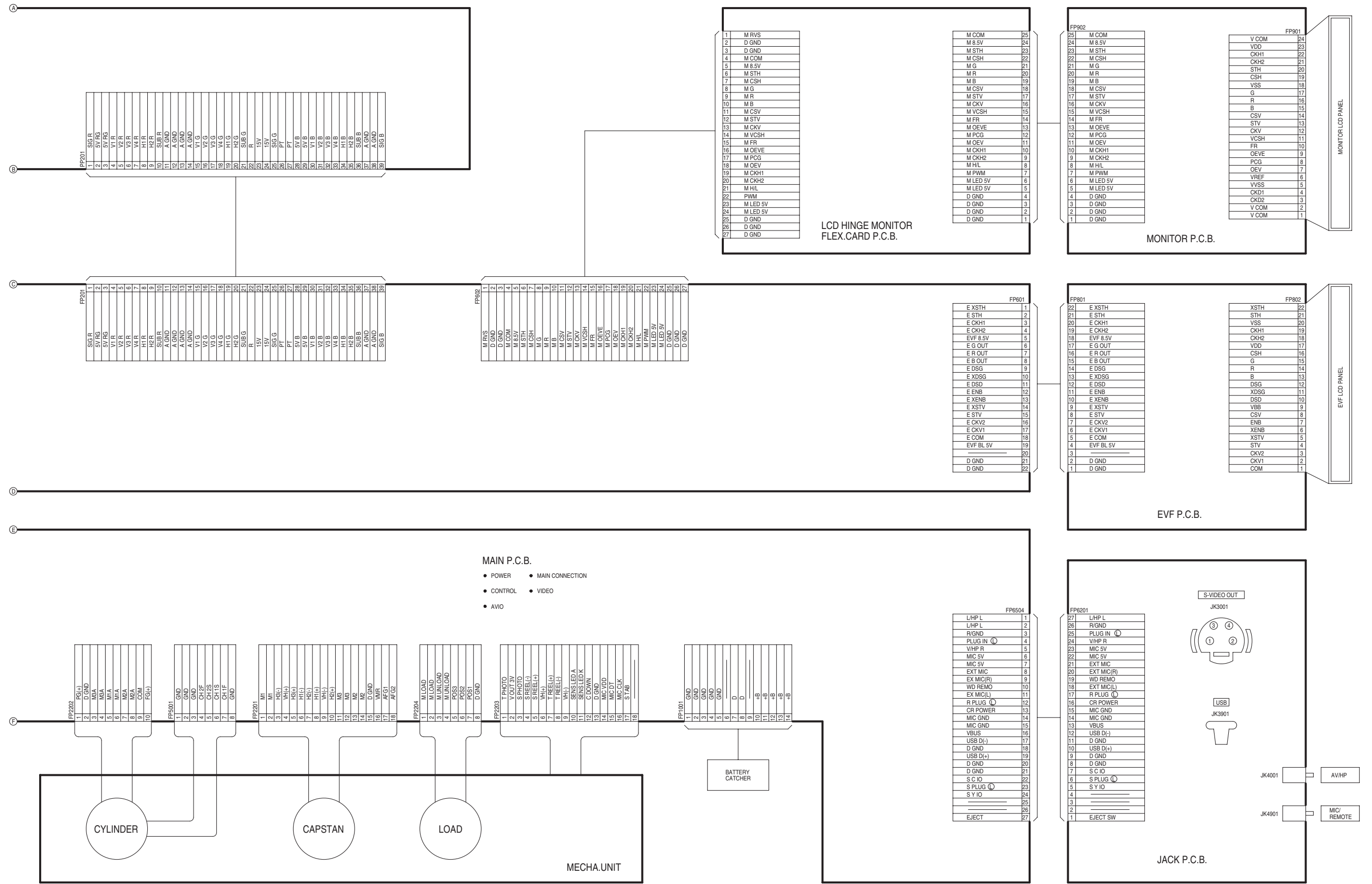


NV-GS180,GS188 OVERALL SCHEMATIC DIAGRAM

10.2. INTERCONNECTION SCHEMATIC DIAGRAM



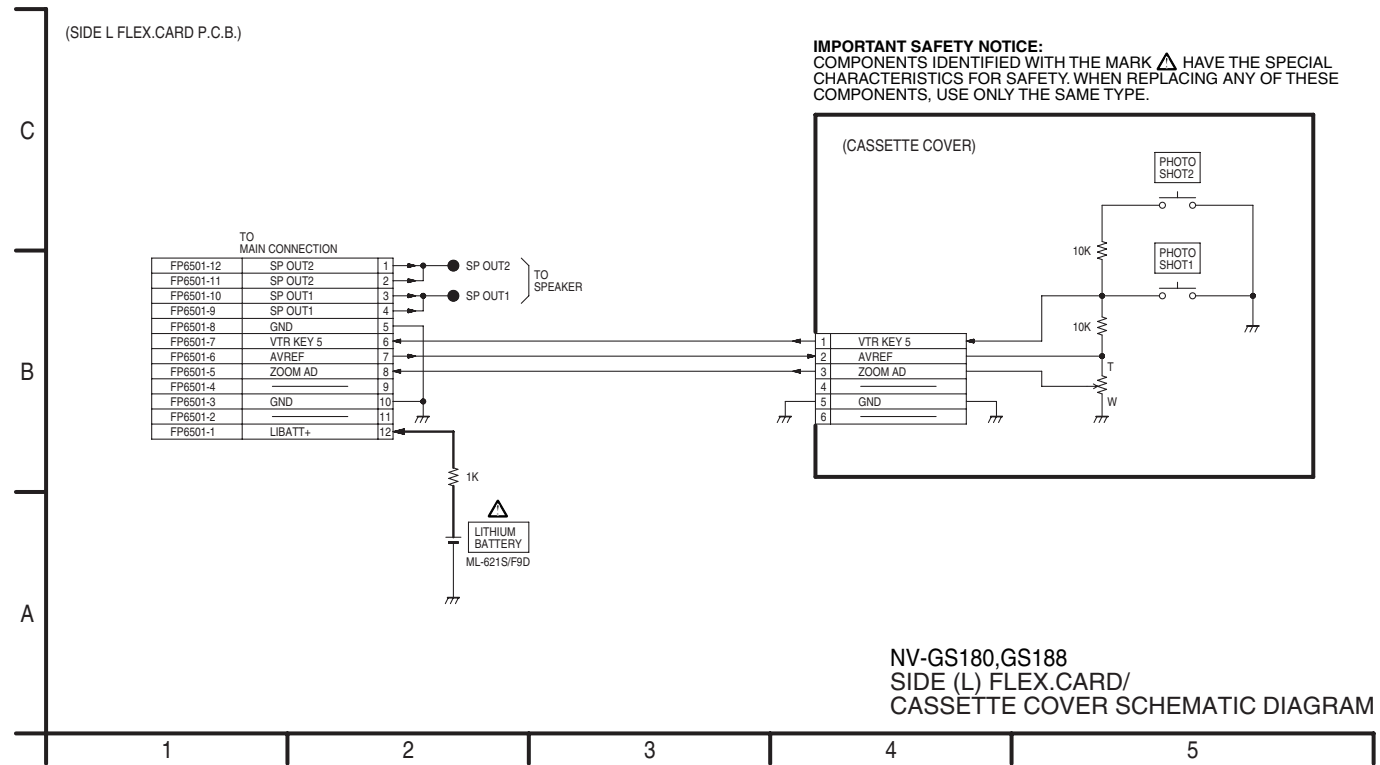
NV-GS180,GS188 INTERCONNECTION SCHEMATIC DIAGRAM



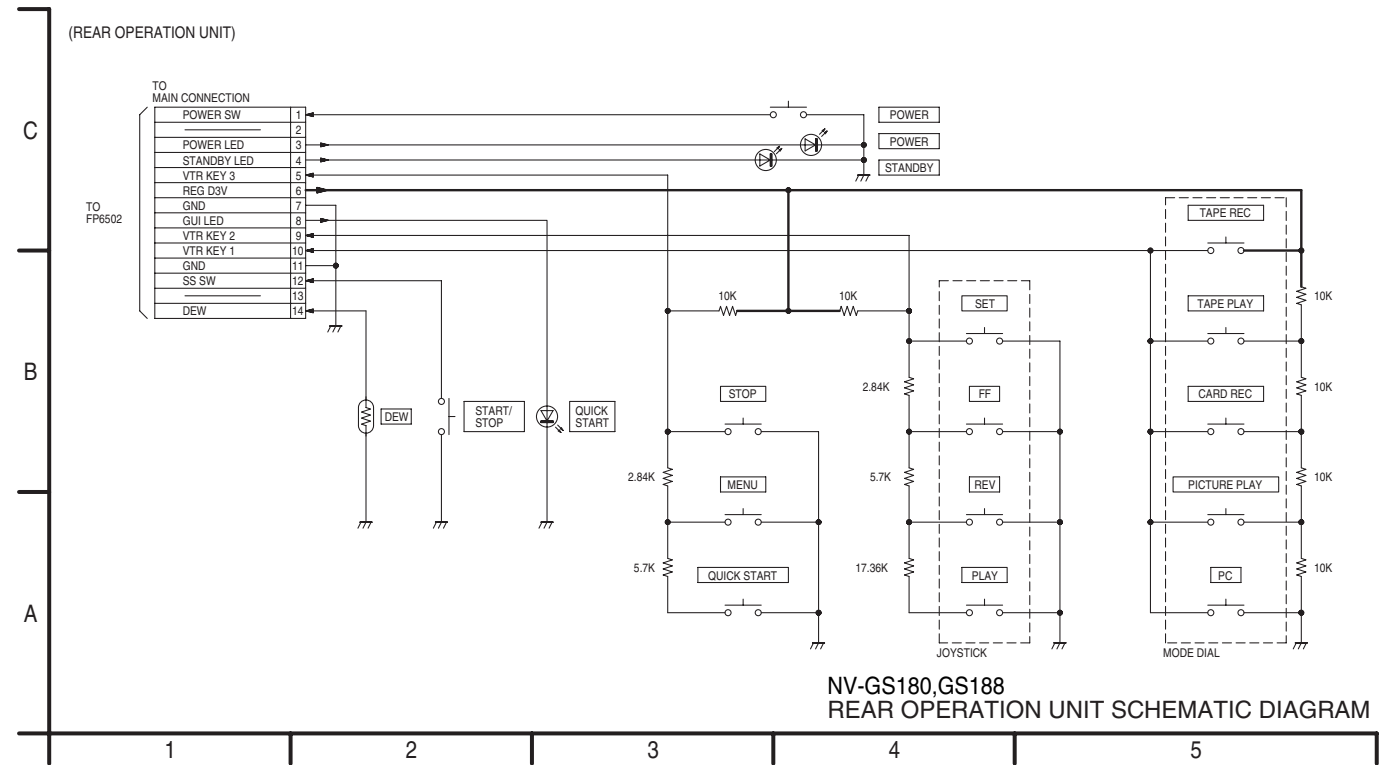
NV-GS180,GS188 INTERCONNECTION SCHEMATIC DIAGRAM

NV-GS180,GS188 INTERCONNECTION SCHEMATIC DIAGRAM

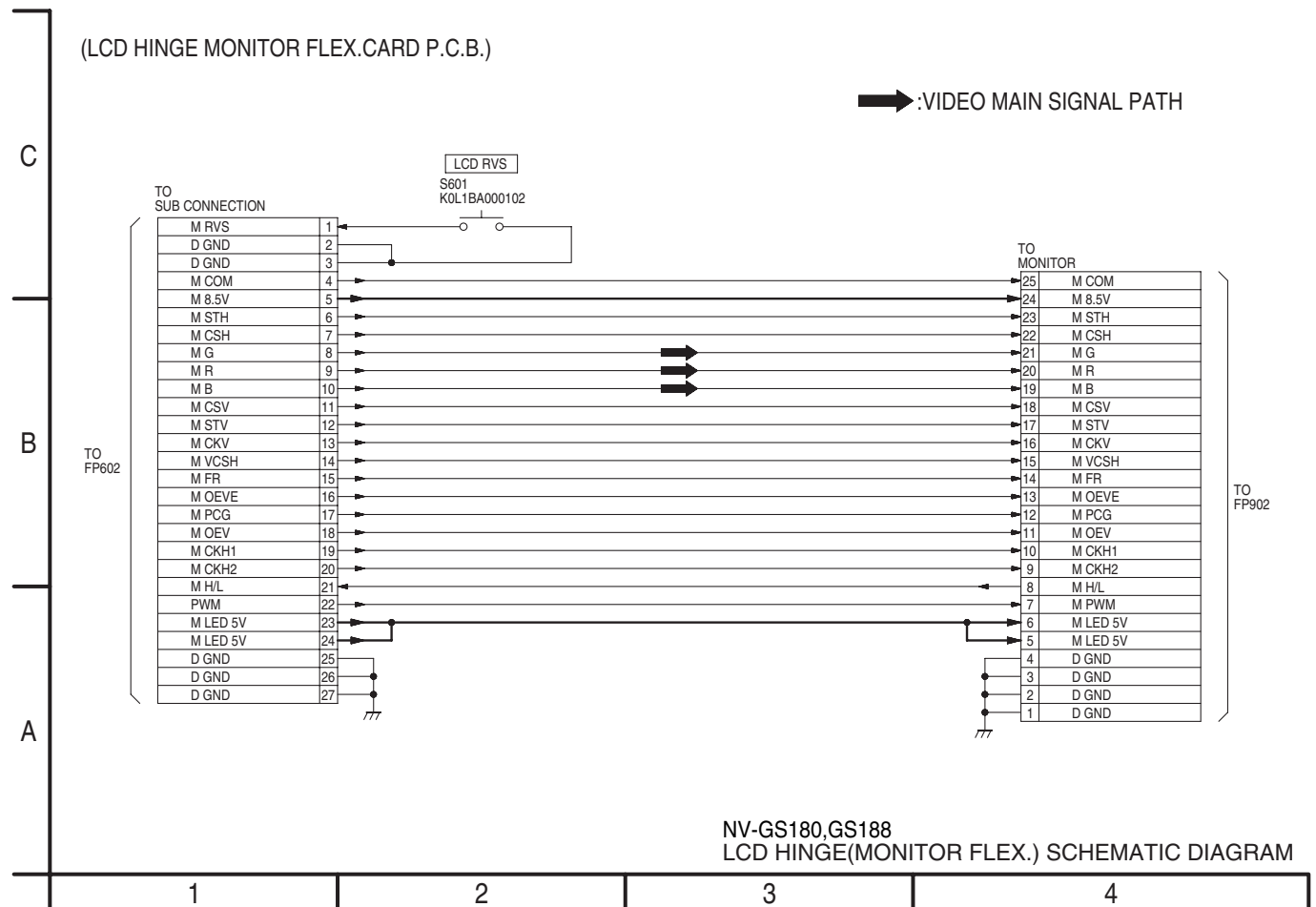
10.3. SIDE (L) FLEX. CARD / CASSETTE COVER SCHEMATIC DIAGRAM



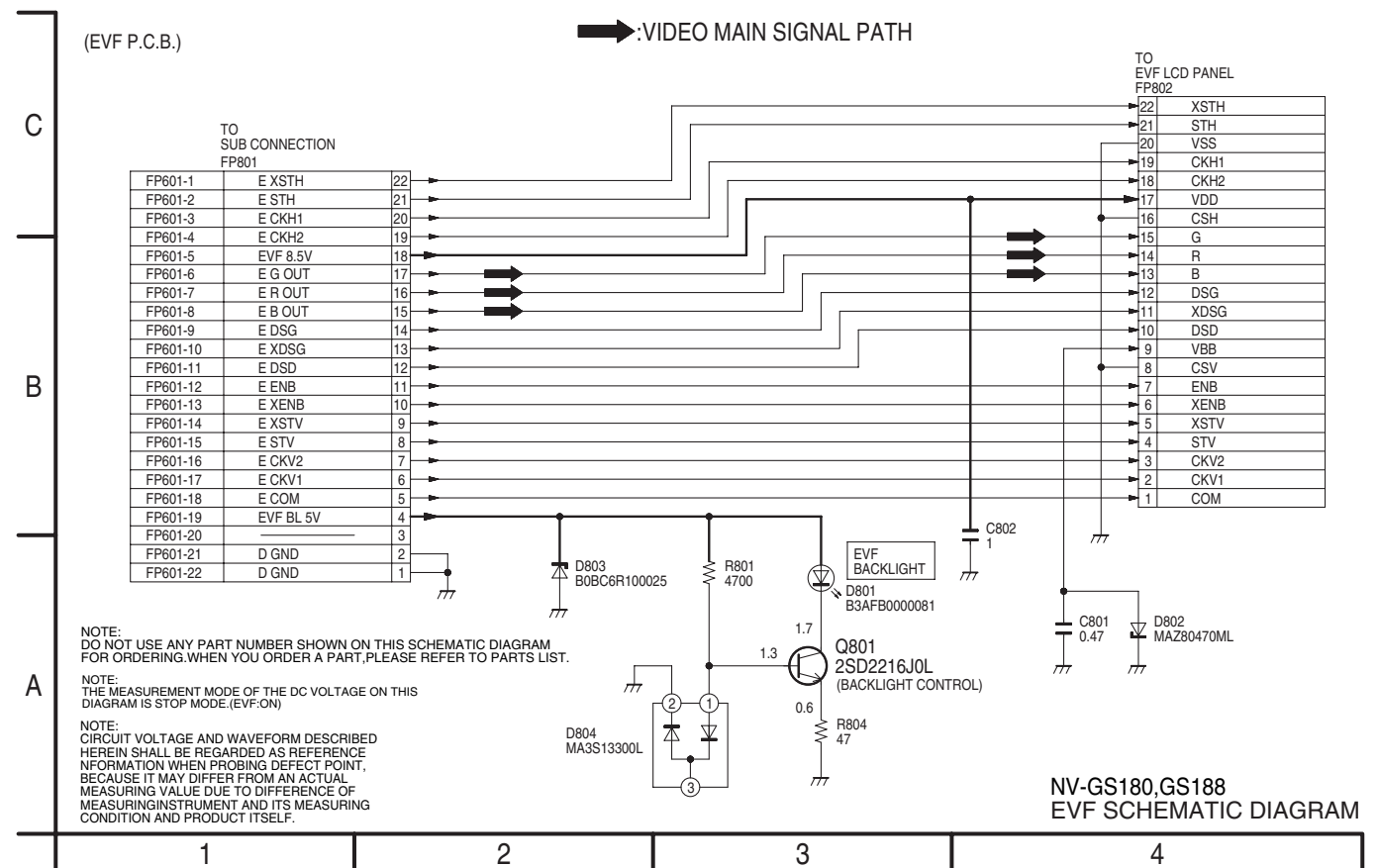
10.5. REAR OPERATION UNIT SCHEMATIC DIAGRAM



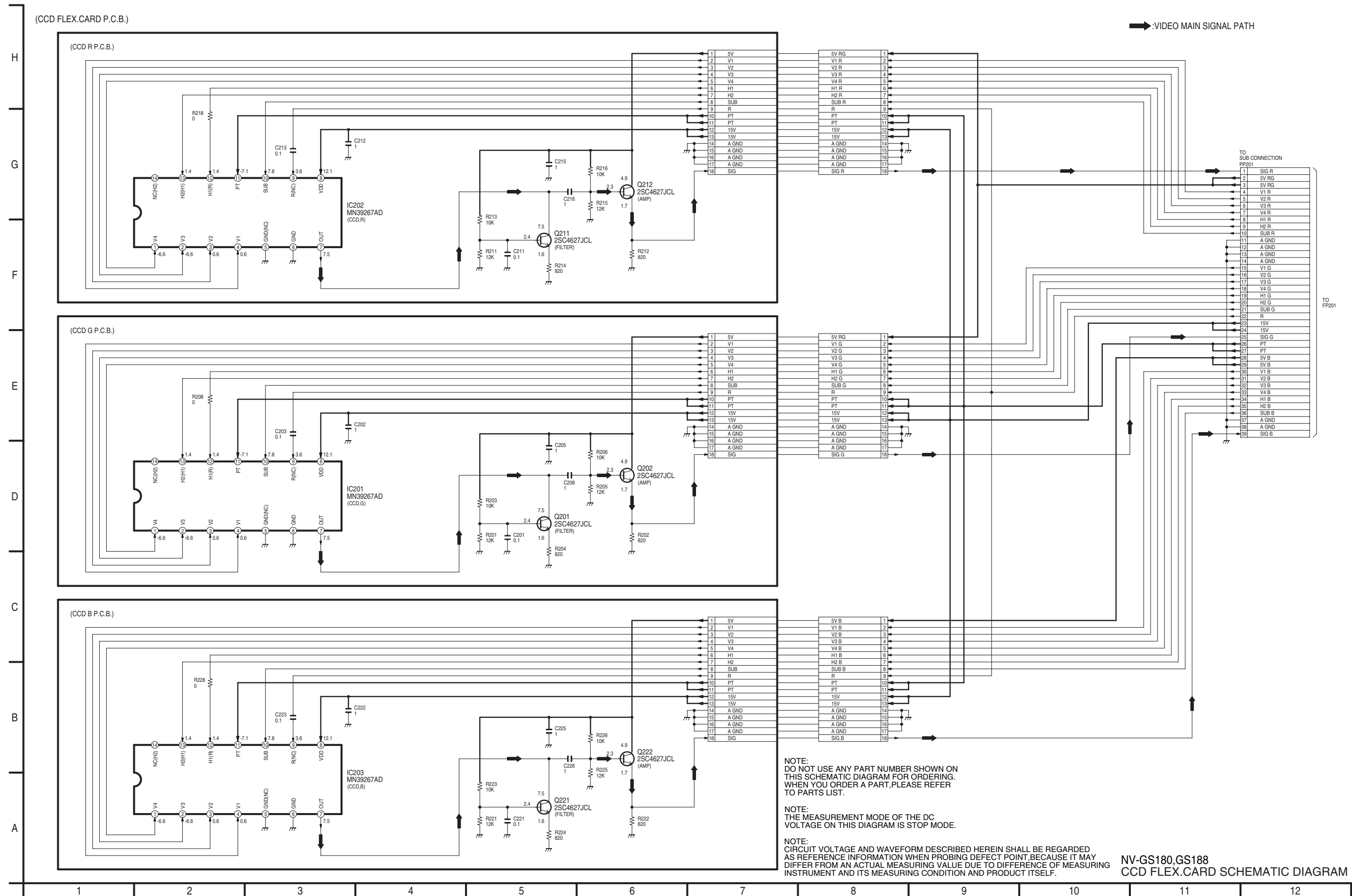
10.4. LCD HINGE (MONITOR FLEX.) SCHEMATIC DIAGRAM



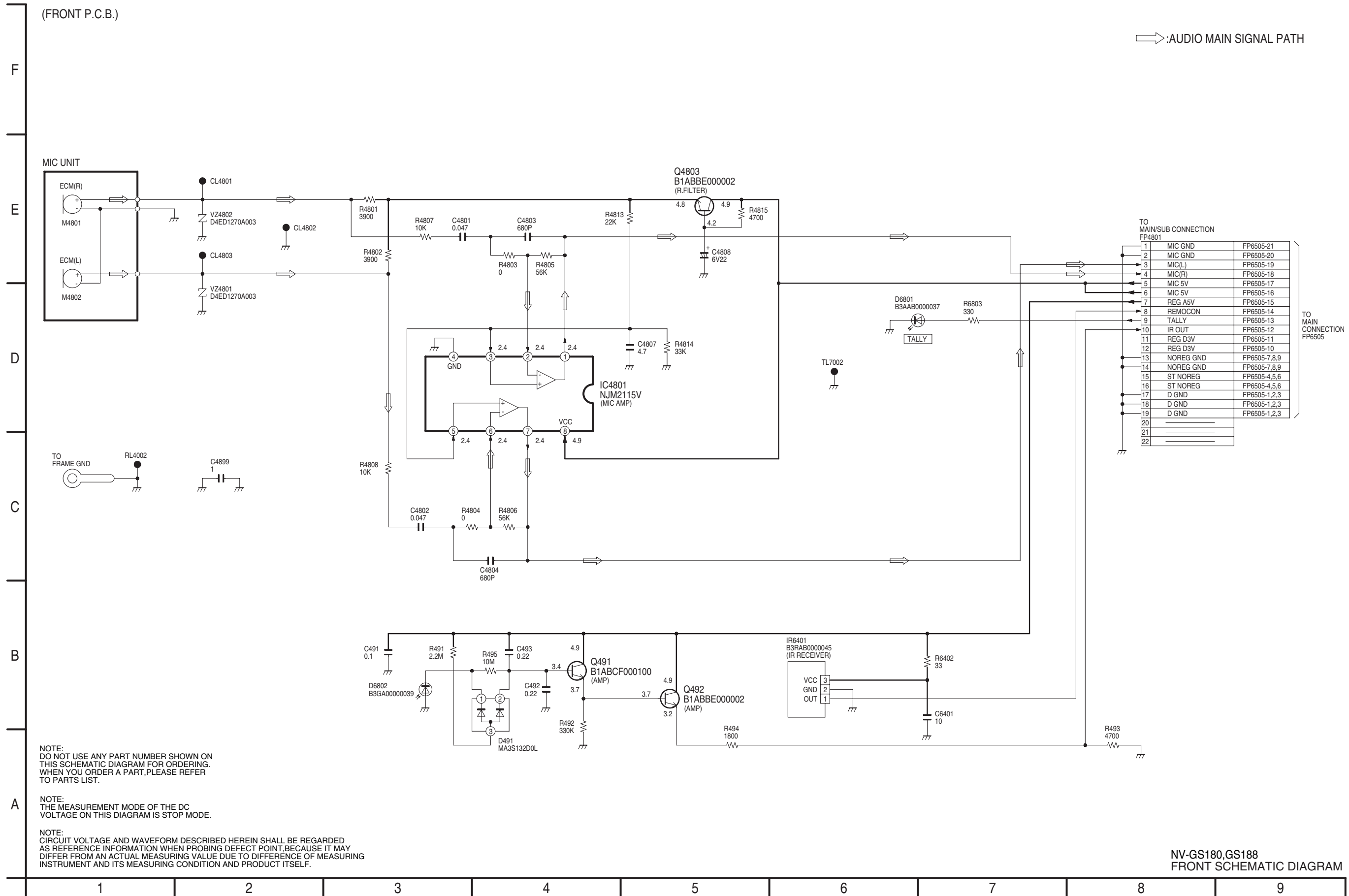
10.6. EVF SCHEMATIC DIAGRAM



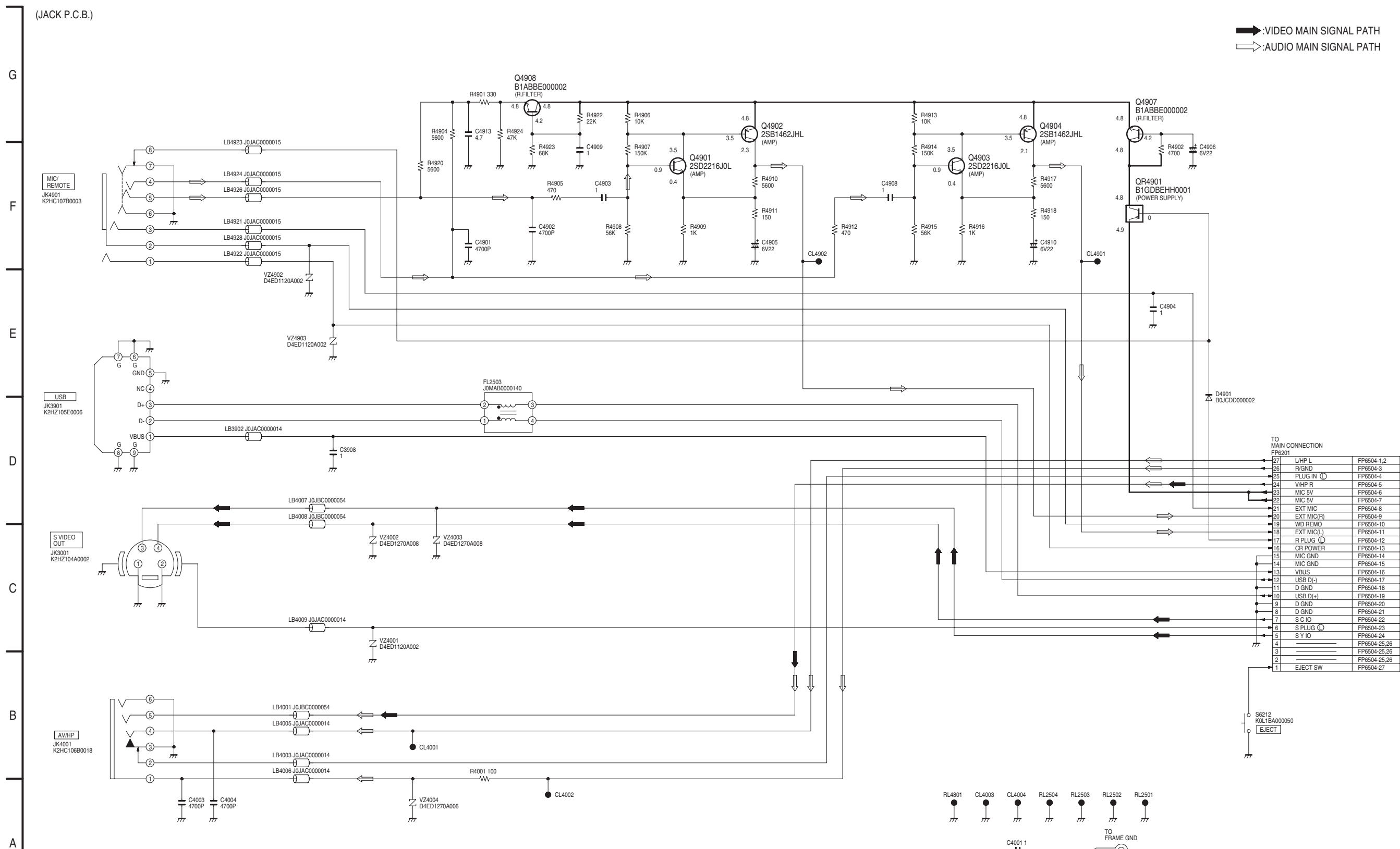
10.7. CCD FLEX. CARD SCHEMATIC DIAGRAM



10.8. FRONT SCHEMATIC DIAGRAM



10.9. JACK SCHEMATIC DIAGRAM



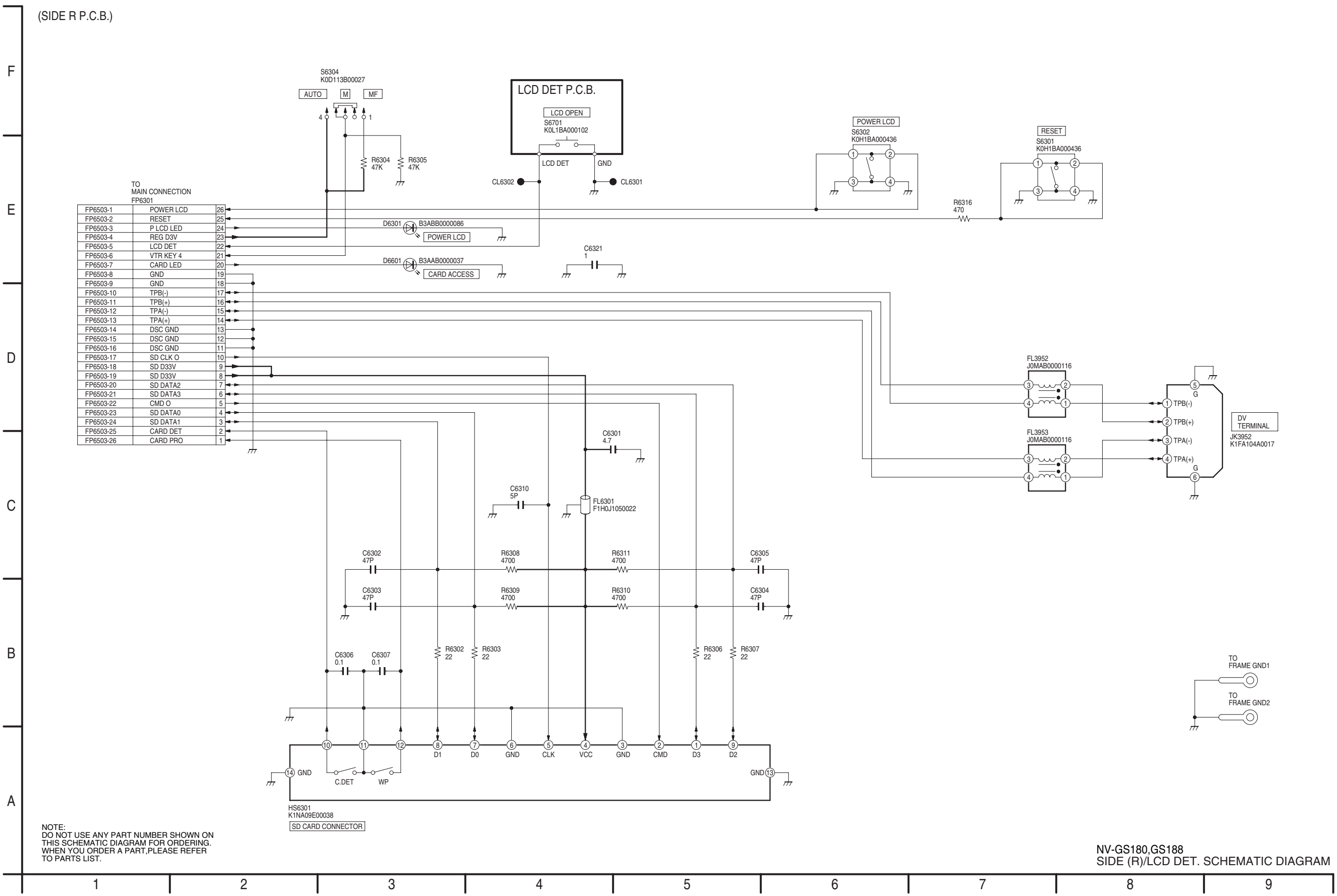
NOTE:
DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

NOTE:
THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

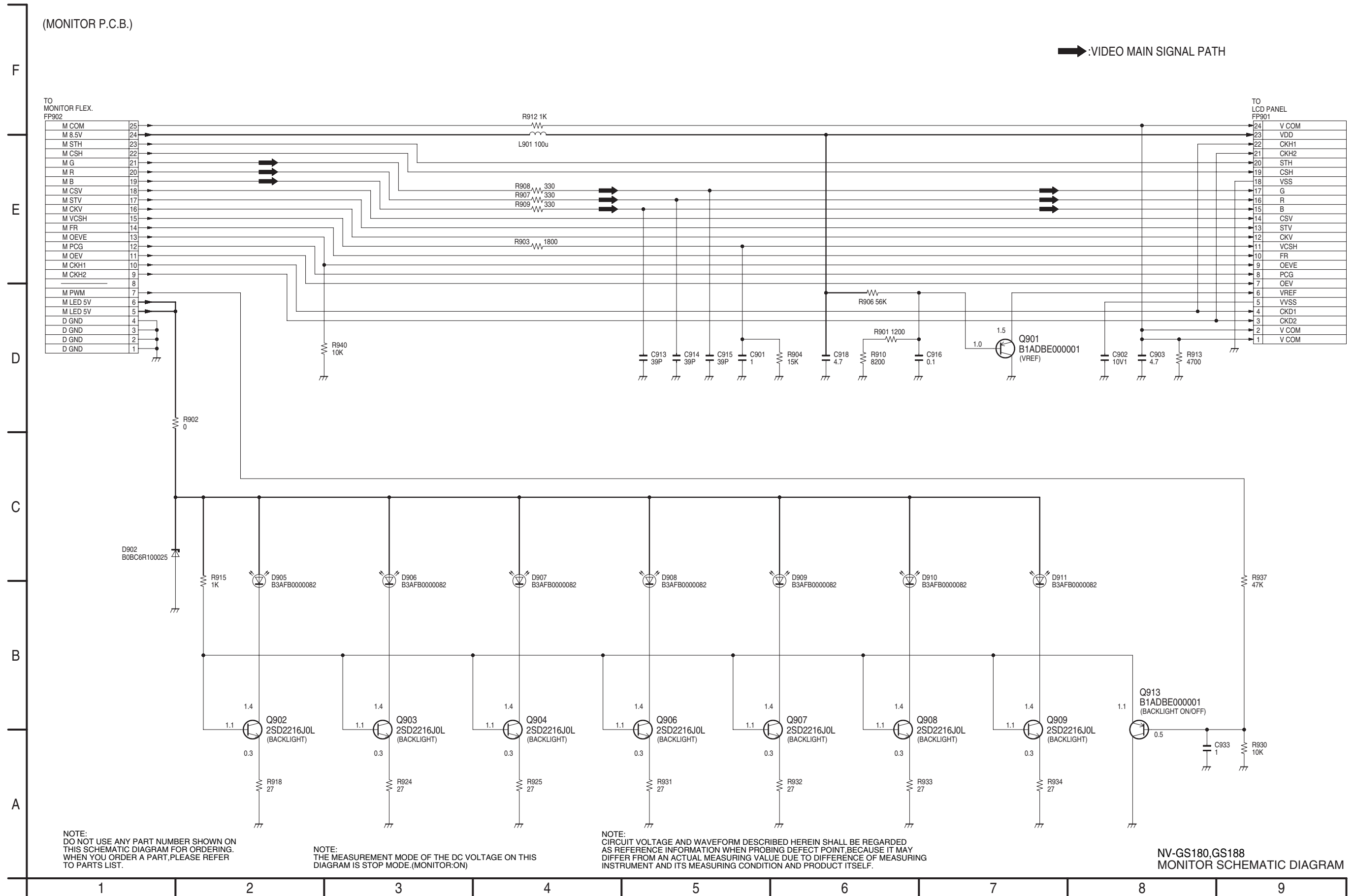
NOTE:
CIRCUIT VOLTAGE AND WAVEFORM DESCRIBED HEREIN SHALL BE REGARDED AS REFERENCE INFORMATION WHEN PROBING DEFECT POINT, BECAUSE IT MAY DIFFER FROM AN ACTUAL MEASURING VALUE DUE TO DIFFERENCE OF MEASURING INSTRUMENT AND ITS MEASURING CONDITION AND PRODUCT ITSELF.

NV-GS180,GS188 JACK SCHEMATIC DIAGRAM

10.10. SIDE (R) / LCD DET. SCHEMATIC DIAGRAM

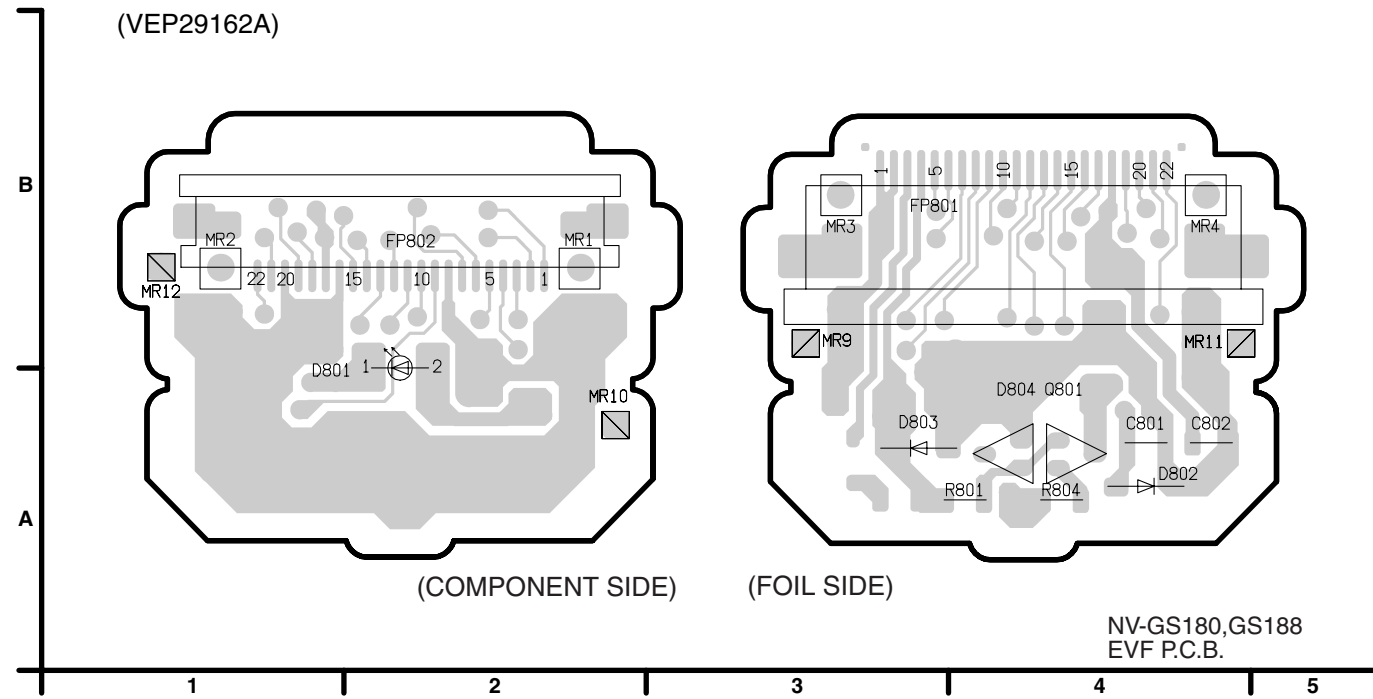


10.11. MONITOR SCHEMATIC DIAGRAM

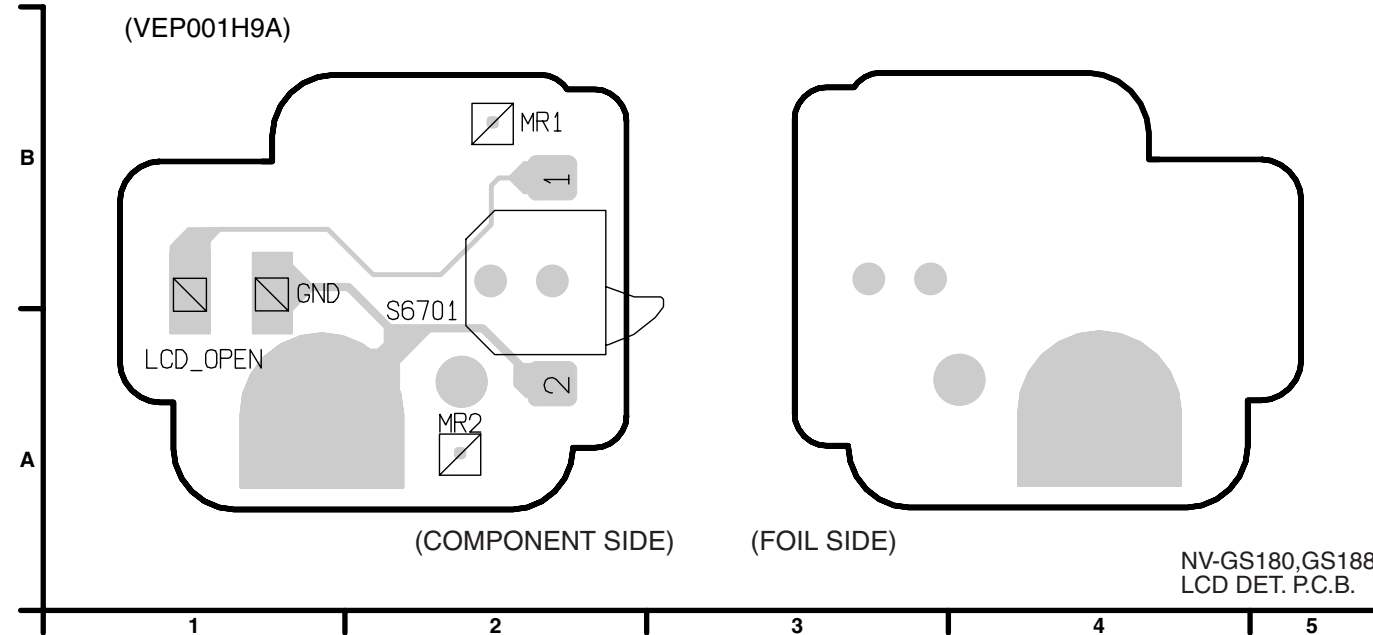


11 CIRCUIT BOARD ASSEMBLIES

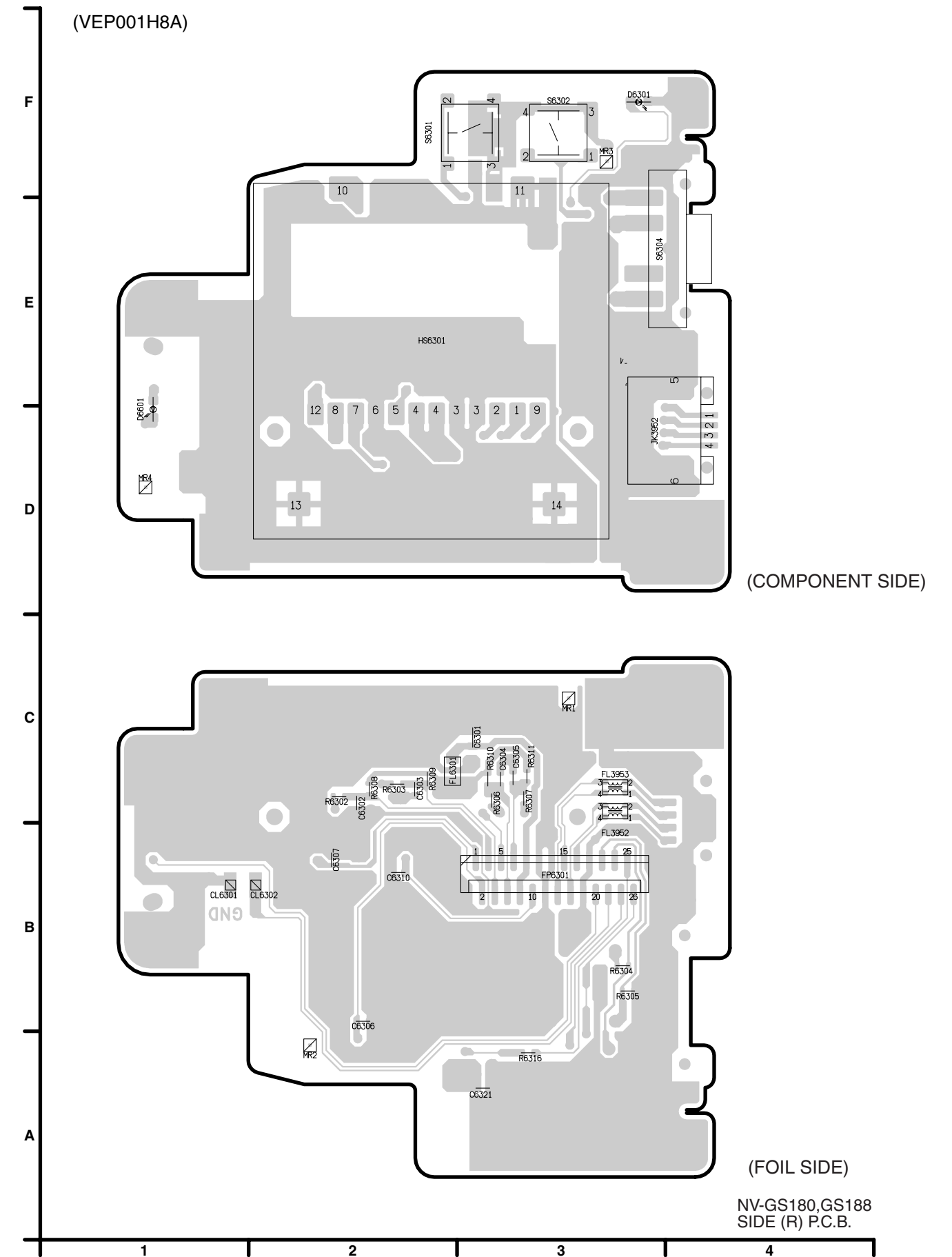
11.1. EVF P.C.B.



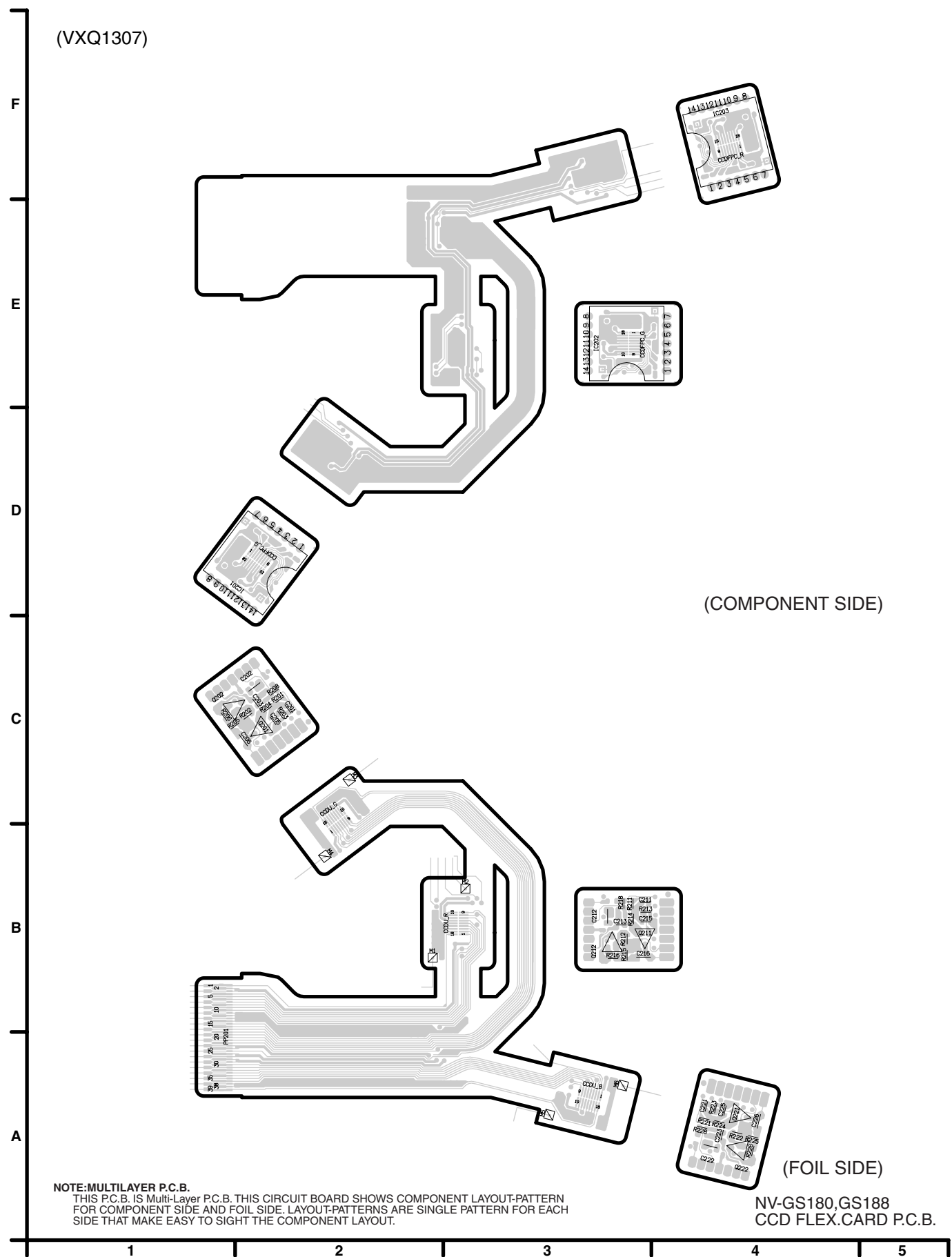
11.2. LCD DET. P.C.B.



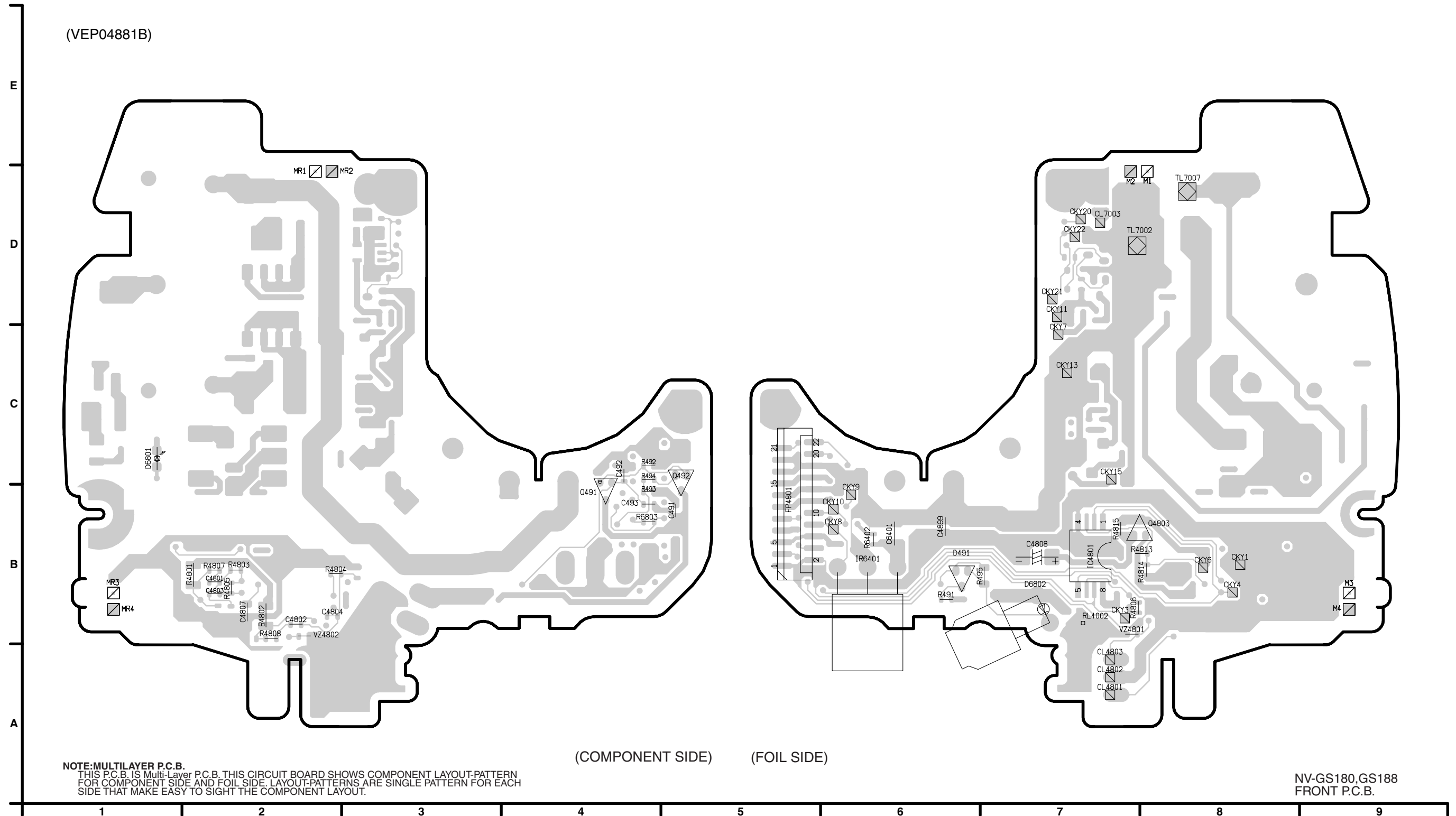
11.3. SIDE (R) P.C.B.



11.4. CCD FLEX. CARD C.B.A.



11.5. FRONT P.C.B.

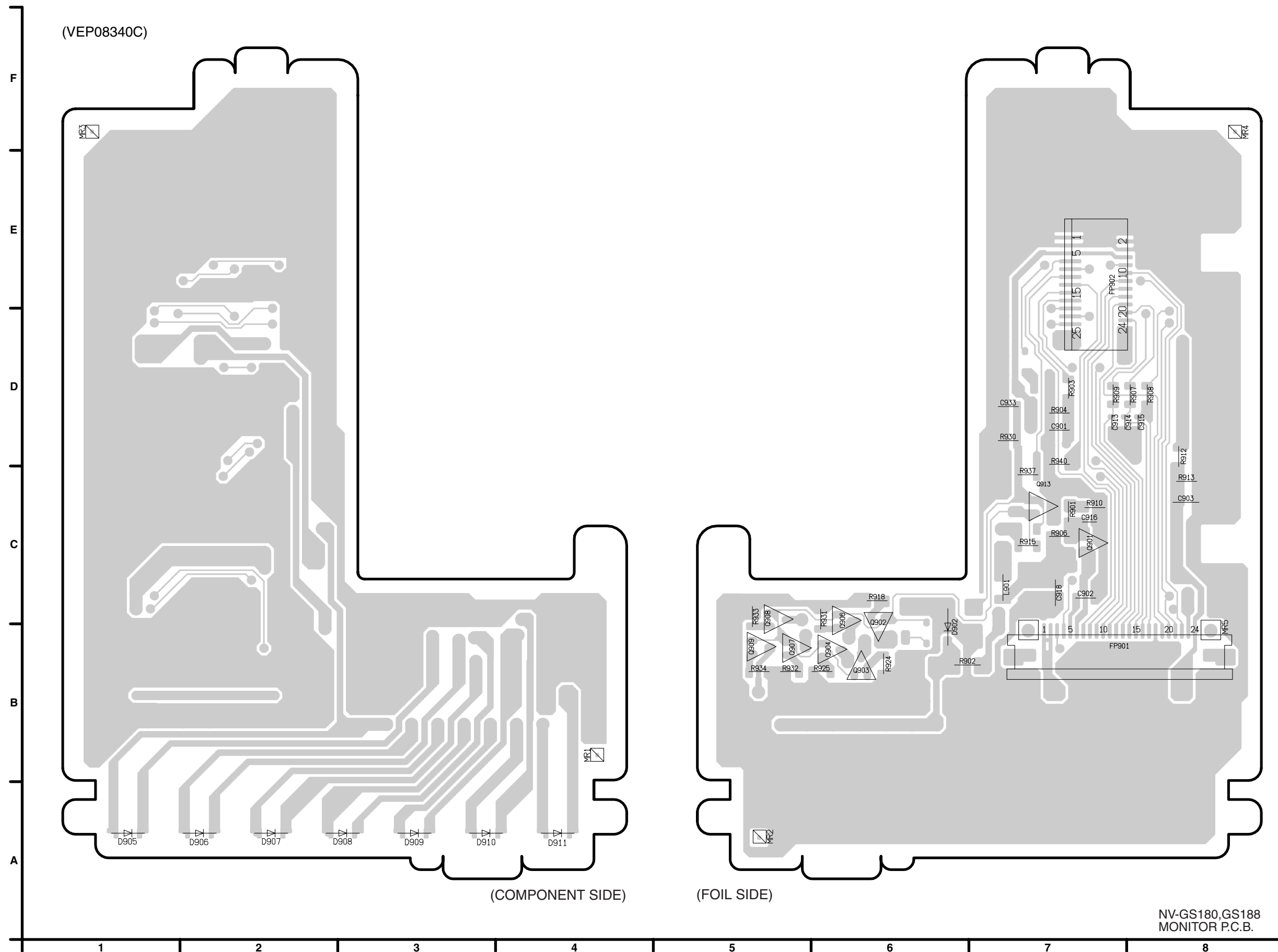


11.6. JACK P.C.B.



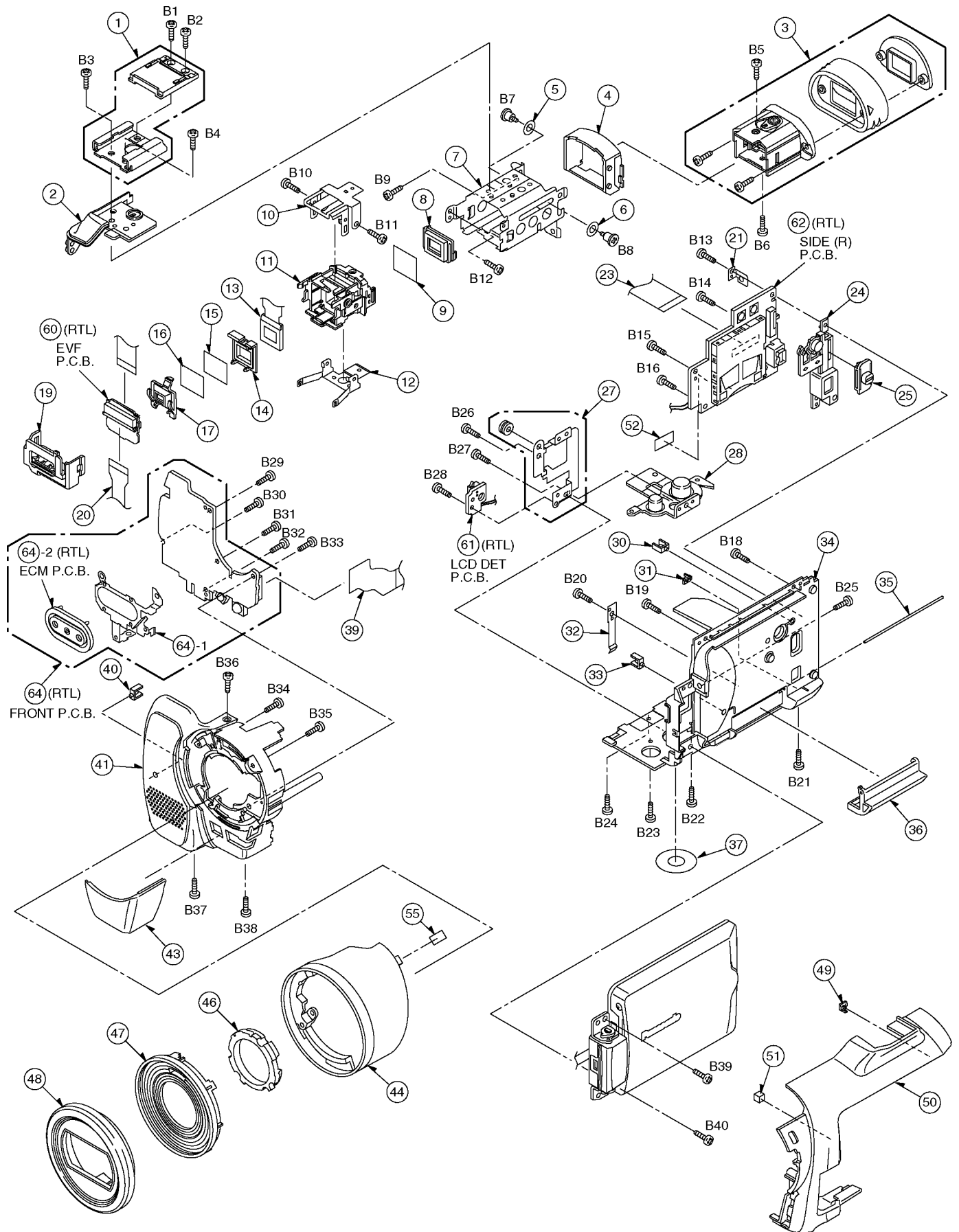
Jack C.B.A.			
Transister		LB4007	B-5
Q4901	E-5	LB4008	B-4
Q4902	E-2	LB4009	B-5
Q4903	E-1	LB4921	E-5
Q4904	D-2	LB4922	C-5
Q4907	D-1	LB4923	D-5
Q4908	D-5	LB4924	D-5
Transister & Resister		LB4926	E-5
QR4901	D-2	LB4928	E-5
Test Point		Capacitor	
CL4001	E-6	C3908	C-2
CL4002	D-5	C4001	C-2
CL4003	C-6	C4003	F-5
CL4004	D-6	C4004	F-5
CL4901	C-5	C4901	D-5
CL4902	D-5	C4902	E-5
RL2501	F-1	C4903	E-5
RL2502	E-6	C4904	E-5
RL2503	A-5	C4905	E-1
RL2504	A-2	C4906	D-1
RL4801	E-1	C4908	D-5
Connector		C4909	D-5
FP6201	C-5	C4910	E-2
Jack		C4913	E-5
JK3001	B-2	Resistor	
JK3901	C-3	R4001	D-5
JK4001	F-2	R4901	D-5
JK4901	D-2	R4902	D-1
Diode		R4904	D-5
D4901	D-1	R4905	E-5
Absorber		R4906	E-2
VZ4001	B-5	R4907	E-5
VZ4002	C-5	R4908	E-5
VZ4003	B-5	R4909	E-5
VZ4004	F-5	R4910	E-2
VZ4902	E-5	R4911	E-2
VZ4903	C-5	R4912	D-5
Filter		R4913	D-2
FL2503	C-2	R4914	E-2
Switch		R4915	D-5
S6212	B-5	R4916	E-1
Coil		R4917	D-2
LB3902	C-2	R4918	E-2
LB4001	E-5	R4920	E-5
LB4003	E-5	R4922	D-6
LB4005	E-5	R4923	D-5
LB4006	F-5	R4924	D-5

11.7. MONITOR P.C.B.

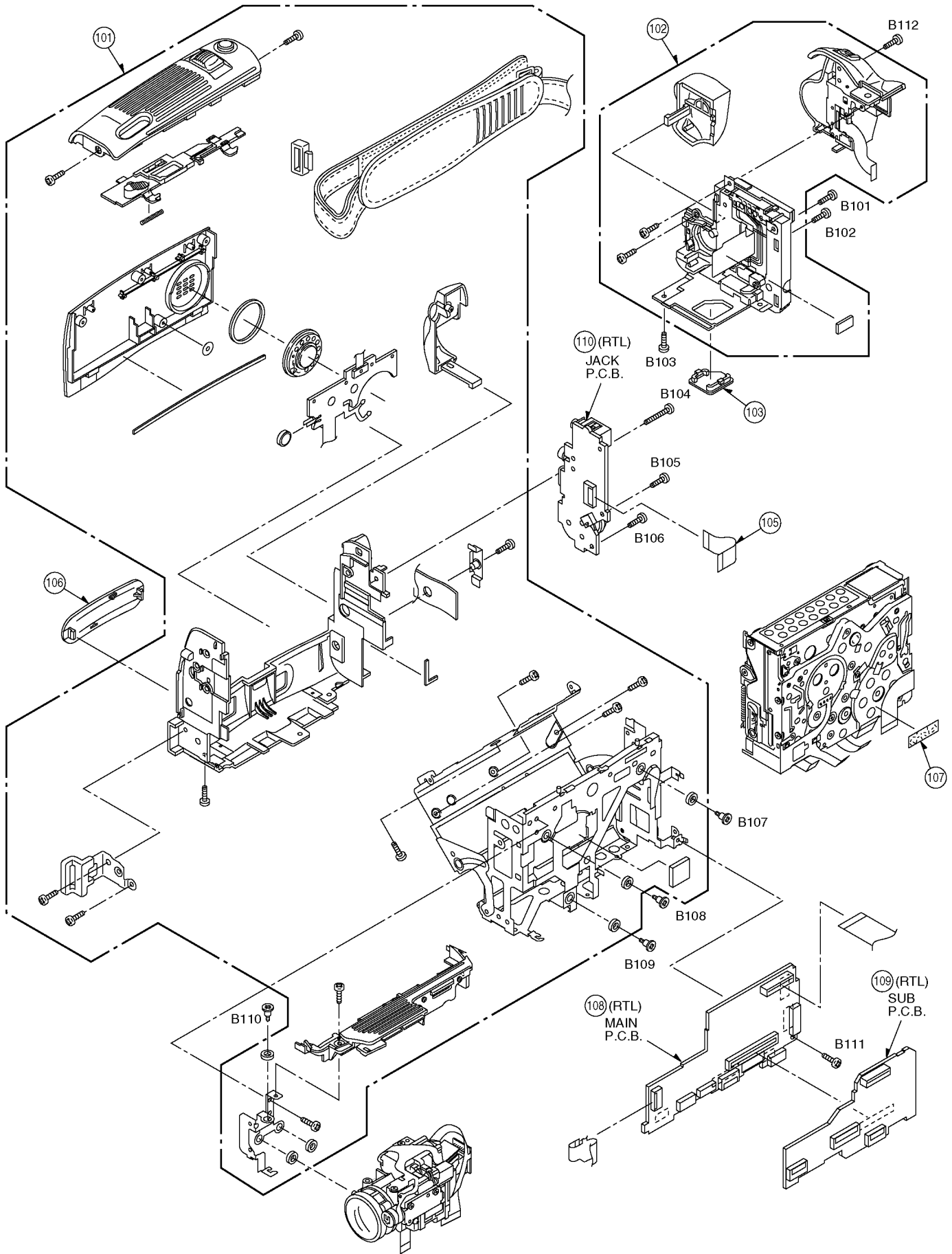


12 EXPLODED VIEWS

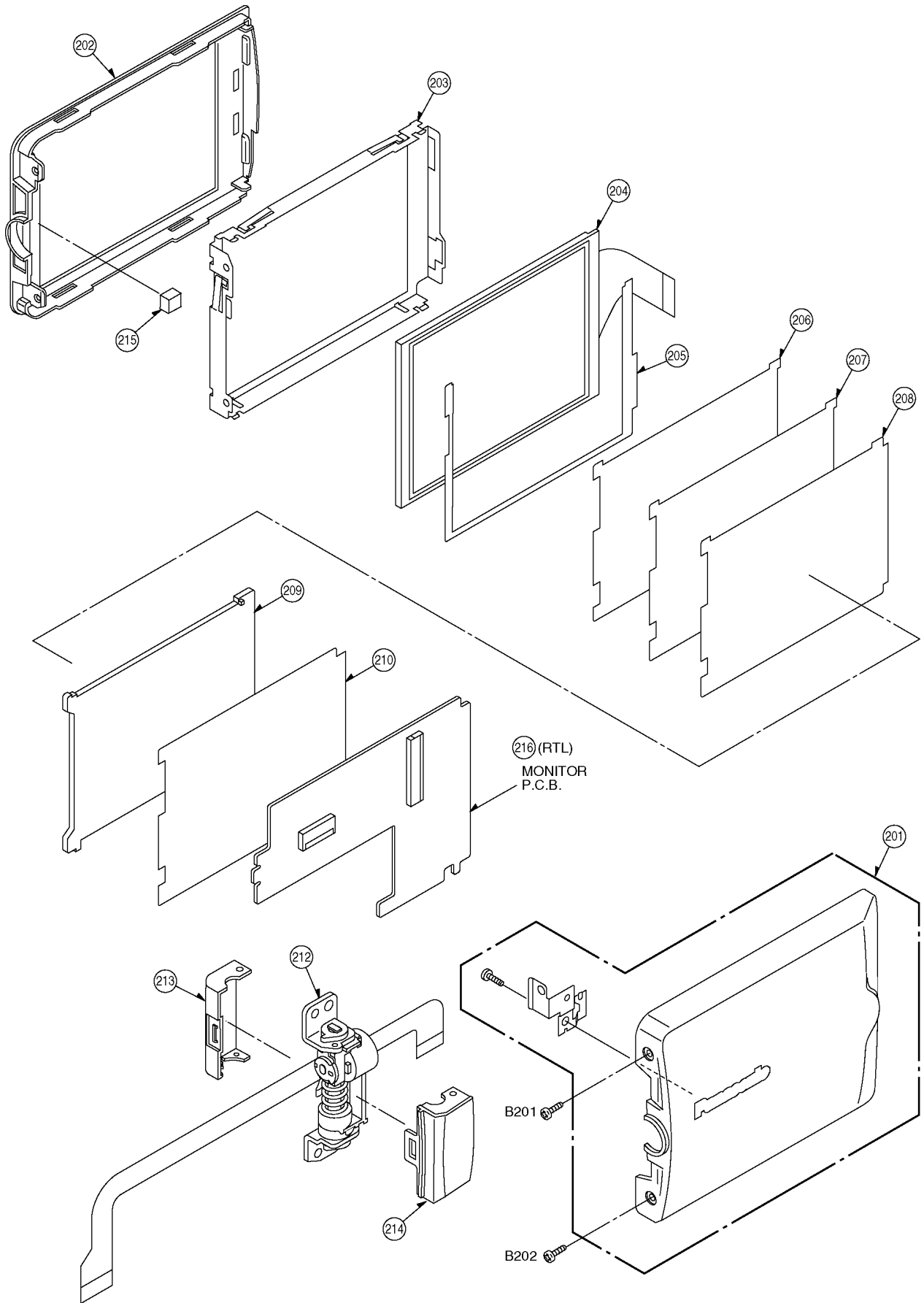
12.1. FRAME & CASING SECTION (1)



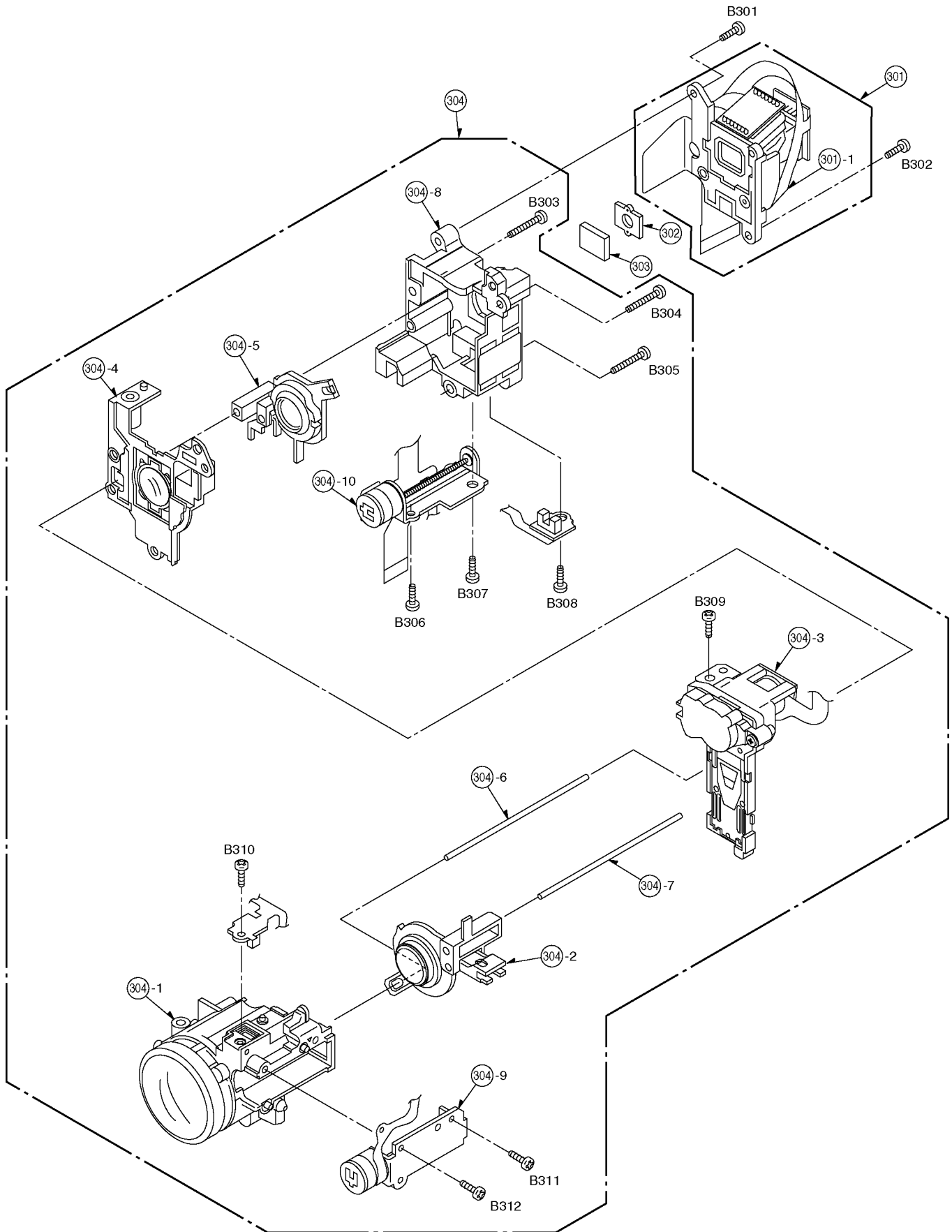
12.2. FRAME & CASING SECTION (2)



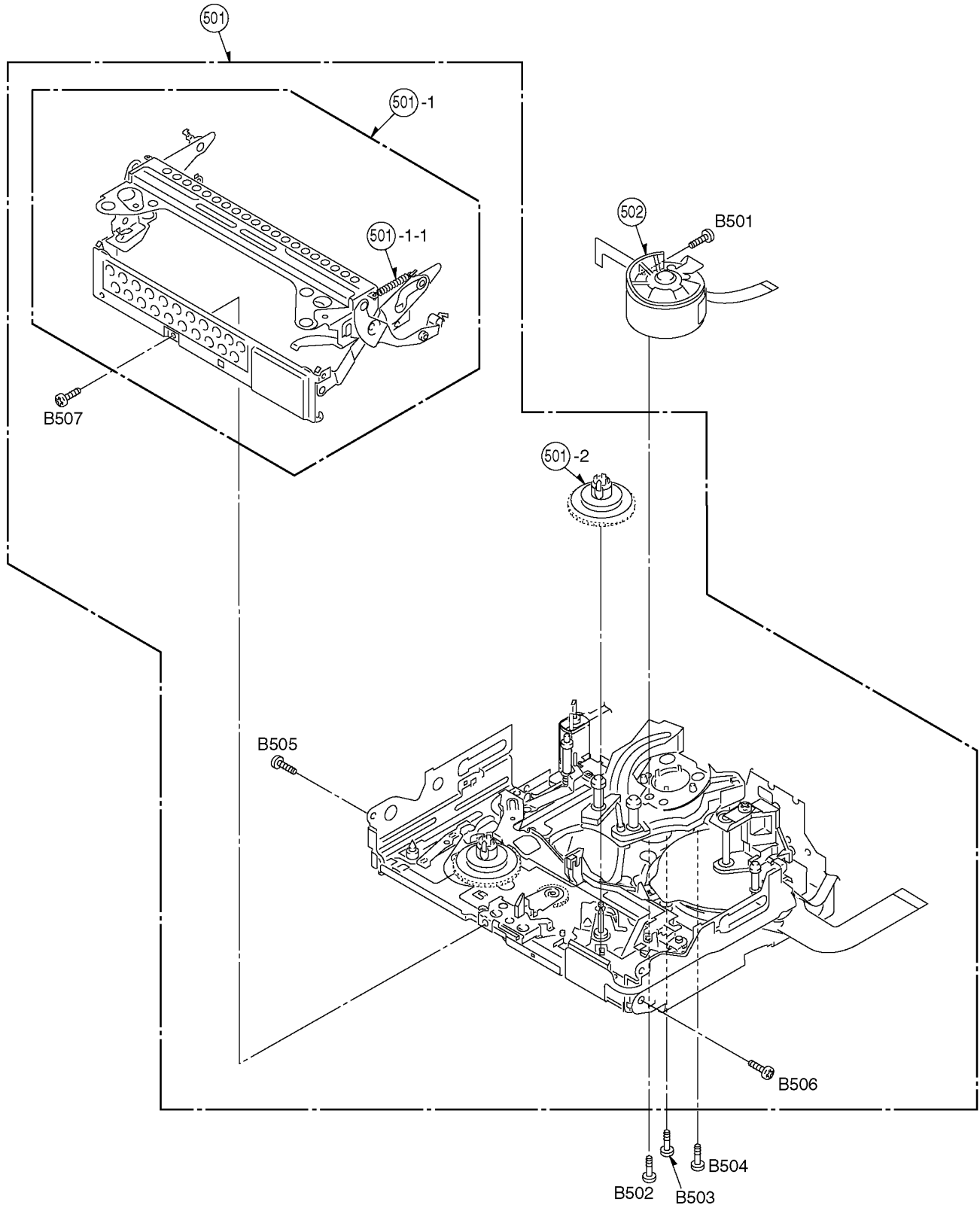
12.3. LCD SECTION



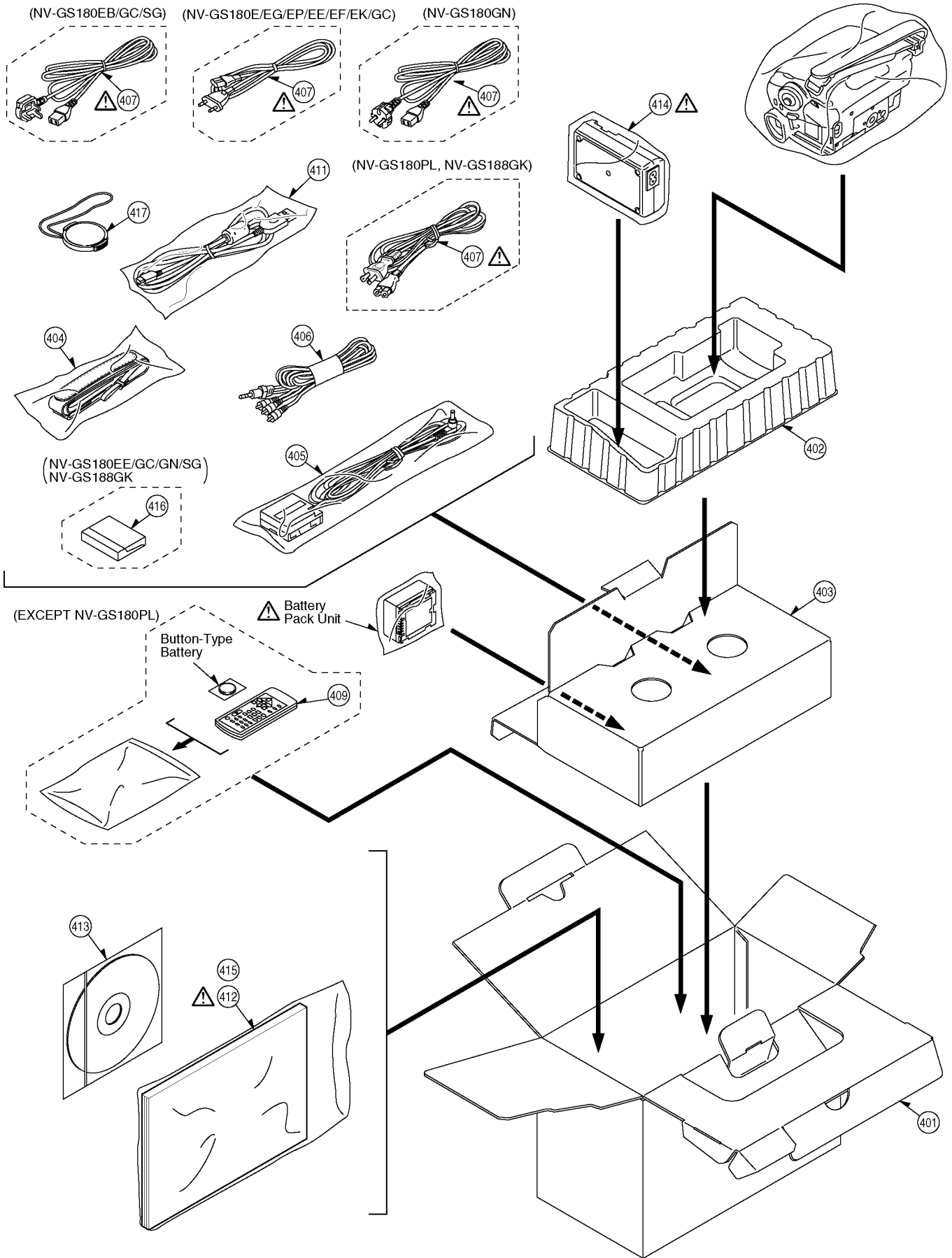
12.4. CAMERA LENS SECTION



12.5. VCR MECHANISM SECTION



12.6. PACKING PARTS & ACCESSORIES SECTION



13 REPLACEMENT PARTS LIST

13.1. FRAME & CASING SECTION

(1) PARTS LIST

Note: 1. *Be sure to make your orders of replacement parts according to this list.
 2. IMPORTANT SAFETY NOTICE
 Components identified with the mark △ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	VXA7765	COLD SHOE	1	
2	VGQ8290	SHOE DECORATION	1	
3	VYK1R78	EVF VIEW ADJ. UNIT	1	
4	VGQ8289	SLIDE CASE HOLDER	1	
5	VGQ7249	SLIDE SPACER	1	
6	VGQ7249	SLIDE SPACER	1	
7	VMP8212	EVF FRAME -3	1	
8	VGQ7689	PLATE HOLDING PIECE	1	
9	VGL1136	LENS PANEL	1	
10	VMP8211	EVF PLATE	1	
11	VGQ8284	LCD HOLDER PIECE	1	
12	VMC1951	EVF CLICK SPRING	1	
13	L5BDDXH00014	EVF PANEL	1	
14	VGQ8346	LCD PIECE	1	
15	VGL1145	BL PRISM PANEL	1	
16	VGL1144	EVF DEFUSION SHEET	1	
17	VGQ7102	BL PIECE	1	
19	VGQ8291	EVF PIECE	1	
20	VWJ1755	EVF FPC	1	
21	VMP8208	SR PLATE	1	
23	VWJ1753	R FPC	1	
24	VGQ8280	KNOB HOLDER	1	
25	VGU9729	MODE CHANGE KNOB	1	
27	VXA7974	HINGE HOLD PLATE	1	
28	VMP8207	TRIPOD PLATE	1	
30	VGL1142	PANEL LIGHT	1	
31	VGQ8352	R PIECE	1	
32	VMC1956	SD DOOR SPRING	1	
33	VGL1142	PANEL LIGHT	1	
34	VYK1M27	SIDE CASE (R) 1 UNIT	1	
35	VMS7555	SD SHAFT	1	
36	VKF3961	SD DOOR	1	
37	VGQ8212	SHEET	1	
39	VWJ1842	FRONT FPC	1	
40	VGL1135	PANEL LIGHT	1	
41	VYK1R86	FRONT (2) UNIT	1	
43	VKW3262	SENSOR WINDOW	1	
44	VGK3184	LENS ORNAMENT	1	
46	VMG1672	RUBBER	1	
47	VDW1247	SHUTTER PLATE	1	
48	VYK1R72	LENS HOOD UNIT	1	
49	VGQ8352	R PIECE	1	
50	VKM6833	R COVER	1	
51	VGQ8316	SR PORON	1	
52	VGQ6816	SHEET	1	
55	VGQ8439	FRONT SHEET	1	
60	VEP29162A	EVF P.C.B.	1	(RTL)
61	VEP001H9A	LCD DET P.C.B	1	(RTL)
62	VEP001H8A	SIDE (R) P.C.B.	1	(RTL)
64	VEP04881B	FRONT P.C.B.	1	(RTL)
64-1	VMP8214	MIC ANGLE	1	
64-2	VEP04882A	ECM P.C.B.	1	(RTL)
B1	VHD1741	SCREW	1	
B2	VHD1741	SCREW	1	
B3	XQS2+A3FN	SCREW	1	
B4	XQS2+A3FN	SCREW	1	
B5	VHD1775	SCREW	1	
B6	VHD1775	SCREW	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
B7	VHD1642	SCREW	1	
B8	VHD1642	SCREW	1	
B9	XQN16+BJ4FN	SCREW	1	
B10	VHD1393	SCREW	1	
B11	VHD1393	SCREW	1	
B12	XQN16+B5FN	SCREW	1	
B13	XQN16+BJ6FN	SCREW	1	
B14	XQN16+BJ6FN	SCREW	1	
B15	XQN16+BJ6FN	SCREW	1	
B16	XQN16+BJ5FJK	SCREW	1	
B18	XQN16+BJ35FN	SCREW	1	
B19	XQN16+BJ35FN	SCREW	1	
B20	XQN16+BJ35FN	SCREW	1	
B21	XQN16+B3FN	SCREW	1	
B22	XQN16+B3FN	SCREW	1	
B23	XQN16+B3FN	SCREW	1	
B24	XQN16+B3FN	SCREW	1	
B25	XQN16+BJ6FN	SCREW	1	
B26	XQN16+BJ35FN	SCREW	1	
B27	XQN16+BJ6FN	SCREW	1	
B28	XQN16+B3FN	SCREW	1	
B29	XQN16+BJ5FN	SCREW	1	
B30	XQN16+BJ5FN	SCREW	1	
B31	XQN16+BJ5FN	SCREW	1	
B32	XQN16+BJ5FN	SCREW	1	
B33	XQN16+BJ5FN	SCREW	1	
B34	XQN16+BJ5FN	SCREW	1	
B35	XQN16+BJ5FN	SCREW	1	
B36	XQN16+B5FN	SCREW	1	
B37	XQN16+B3FN	SCREW	1	
B38	XQN16+B3FN	SCREW	1	
B39	VHD1411	SCREW	1	
B40	VHD1411	SCREW	1	

13.2. FRAME & CASING SECTION

(2) PARTS LIST

Note: 1. *Be sure to make your orders of replacement parts according to this list.
 2. IMPORTANT SAFETY NOTICE
 Components identified with the mark △ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
101	N9ZZ00000318	SIDE CASE (L) 1 UNIT	1	
102	N9ZZ00000291	REAR OPERATION UNIT	1	
103	VKF3963	EVF COVER	1	
105	VWJ1752	JACK FPC	1	
106	VKF3965	MECHA. ADJ. COVER	1	
107	VGQ8455	CAPSTAN FPC SHEET	1	
108	VEP03G73T	MAIN P.C.B.	1	(RTL) EG, E, EB, EP, EF
108	VEP03G73W	MAIN P.C.B.	1	(RTL) EE, GC, GN
108	VEP03G73U	MAIN P.C.B.	1	(RTL) EK, SG
108	VEP03G73Z	MAIN P.C.B.	1	(RTL) PL
108	VEP03G73X	MAIN P.C.B.	1	(RTL) GK
109	VEP23612G	SUB P.C.B.	1	(RTL) (EXCEPT PL)
109	VEP23612H	SUB P.C.B.	1	(RTL) PL
110	VEP001H7A	JACK P.C.B.	1	(RTL)
B101	XQN16+BJ6FN	SCREW	1	
B102	XQN16+B5FN	SCREW	1	
B103	XQN16+B3FN	SCREW	1	
B104	XQN16+B6FN	SCREW	1	
B105	XQN16+BJ3FN	SCREW	1	
B106	XQN16+B3FN	SCREW	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
B107	VHD1133	SCREW	1	
B108	VHD1133	SCREW	1	
B109	VHD1133	SCREW	1	
B110	VHD1353	SCREW	1	
B111	XQN16+B3FN	SCREW	1	
B112	XQN16+B5FN	SCREW	1	

13.3. LCD SECTION PARTS LIST

Note: 1. *Be sure to make your orders of replacement parts according to this list.
 2. IMPORTANT SAFETY NOTICE
 Components identified with the mark Δ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
201	VYK1R73	LCD CASE (UPPER) UNIT	1	EG, E, EB, EP, EK
201	VYK1T79	LCD CASE (UPPER) UNIT	1	EE
201	VYK1U40	LCD CASE (UPPER) UNIT	1	EF
201	VYK1S55	LCD CASE (UPPER) UNIT	1	GC, GN, SG
201	VYK1U61	LCD CASE (UPPER) UNIT	1	PL
201	VYK1S56	LCD CASE (UPPER) UNIT	1	GK
202	VKM6643	LCD CASE (UNDER)	1	
203	VSC5681	LCD SHIELD CASE	1	
204	L5BDDYH00019	LCD PANEL UNIT	1	
205	VGQ8351	MONITOR SHEET	1	
206	VGL1137	PRISM SHEET A	1	(EXCEPT PL)
206	VGL1147	PRISM SHEET A	1	PL
207	VGL1138	PRISM SHEET B	1	(EXCEPT PL)
207	VGL1148	PRISM SHEET B	1	PL
208	VGL1109	SHEET	1	
209	VKW3178	POLARIZATION PLATE	1	
210	VGL1194	REFLECTION SHEET	1	
212	VXD0441	LCD HINGE (1) UNIT	1	
213	VGQ8282	HINGE COVER (B)	1	
214	VGQ8281	HINGE COVER (T)	1	
215	VGQ8445	LCD PORON	1	
216	VEP08340C	MONITOR P.C.B.	1	(RTL)
B201	VHD1828	SCREW	1	
B202	VHD1828	SCREW	1	

13.4. CAMERA LENS SECTION PARTS LIST

Note: 1. *Be sure to make your orders of replacement parts according to this list.
 2. IMPORTANT SAFETY NOTICE
 Components identified with the mark Δ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
301	VXQ1307	PRISM UNIT	1	
301-1	VEK0H35	CCD FPC	1	
302	VMX3456	CCD CUSHION	1	
303	VDL1646	CRYSTAL OPTICS FILTER	1	
304	VXW0701	LENS UNIT	1	
304-1	VXQ1308	LENS MAIN FRAME UNIT	1	
304-2	VXP2429	2ND MOVING FRAME UNIT	1	
304-3	VXP2434	IRIS UNIT	1	
304-4	VXQ1309	3RD MOVING FRAME UNIT	1	
304-5	VXP2431	4TH MOVING FRAME UNIT	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
304-6	VMS7312	GUIDE POLE	1	
304-7	VMS7312	GUIDE POLE	1	
304-8	VDW1109	MASTER FLANGE	1	
304-9	L6HA64NC0001	ZOOM MOTOR UNIT	1	
304-10	L6HA64NC0002	FOCUS MOTOR UNIT	1	
B301	XQN16+CJ5FJ	SCREW	1	
B302	XQN16+CJ5FJ	SCREW	1	
B303	XQN16+CJ7FJ	SCREW	1	
B304	XQN16+CJ7FJ	SCREW	1	
B305	XQN16+CJ7FJ	SCREW	1	
B306	XQN16+CJ5FJ	SCREW	1	
B307	XQN16+CJ5FJ	SCREW	1	
B308	XQN16+CJ5FJ	SCREW	1	
B309	XQN16+CJ5FJ	SCREW	1	
B310	XQN16+CJ5FJ	SCREW	1	
B311	XQN16+CJ5FJ	SCREW	1	
B312	XQN16+CJ5FJ	SCREW	1	

13.5. VCR MECHANISM SECTION PARTS LIST

Note: 1. *Be sure to make your orders of replacement parts according to this list.
 2. IMPORTANT SAFETY NOTICE
 Components identified with the mark Δ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
501	VXA8276	MECHA CHASSIS UNIT	1	
501-1	VXA8198	CASSETTE UP UNIT	1	
501-1-1	VMB3766	CASSETTE UP SPRING	1	
501-2	VXR0403	T REEL MOTOR	1	
502	VEG1663	CYLINDER UNIT	1	
B501	VHD1632	SCREW	1	
B502	VHD1757	SCREW	1	
B503	VHD1757	SCREW	1	
B504	VHD1757	SCREW	1	
B505	VHD1754	SCREW	1	
B506	VHD1754	SCREW	1	
B507	VHD1755	SCREW	1	

13.6. PACKING PARTS & ACCESSORIES SECTION PARTS LIST

Note: 1. *Be sure to make your orders of replacement parts according to this list.
 2. IMPORTANT SAFETY NOTICE
 Components identified with the mark Δ have the special characteristics for safety. When replacing any of these components, use only the same type.
 3. Supply of CD-ROM, in accordance with license protection, is allowable as replacement parts only for customers who accidentally damaged or lost their own.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
401	VPG1F15	PACKING CASE	1	EG, E, EB, EP, EE, EF, EK, GC, GN, SG
401	VPG1G07	PACKING CASE	1	PL
401	VPG1F16	PACKING CASE	1	GK
402	VPN6275	CUSHION	1	
403	VPK2940	ACCESSORIES BOX	1	
404	VFC3506-1A	SHOULDER BELT	1	
405	K2GJ2DZ00018	DC CORD	1	
406	K2KC4CB00018	AV CABLE	1	
407	K2CQ2CA00006	AC CORD	1	EG, E, EP, EE, EF, EK, GC Δ
407	RJA0053-3X	AC CORD	1	EB, GC, SG Δ
407	K2CJ2DA00008	AC CORD	1	GN Δ
407	K2CA2CA00029	AC CORD	1	PL Δ

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
407	K2CA2CA00020	AC CORD	1	GK △
409	VFA0456	IR REMOTE CONTROLLER	1	(EXCEPT PL)
411	VFA0453	USB CABLE	1	
412	VQT0T81	OPERATING INSTRUCTIONS (GERMAN/ITALIAN)	1	EG,EK △
412	VQT0T82	OPERATING INSTRUCTIONS (FRENCH/DUTCH)	1	EG,EF,EK △
412	VQT0W11	OPERATING INSTRUCTIONS (TURKISH)	1	EG,EK △
412	VQT0T83	OPERATING INSTRUCTIONS (PORTUGUESE/SPANISH)	1	E △
412	VQT0T84	OPERATING INSTRUCTIONS (SWEDISH/DANISH)	1	E △
412	VQT0T87	OPERATING INSTRUCTIONS (ENGLISH)	1	EB △
412	VQT0T85	OPERATING INSTRUCTIONS (ENGLISH/POLISH)	1	EP △
412	VQT0T86	OPERATING INSTRUCTIONS (CZECO/HUNGARY)	1	EP △
412	VQT0T91	OPERATING INSTRUCTIONS (UKRAINIAN/RUSSIAN)	1	EE △
412	VQT0T92	OPERATING INSTRUCTIONS (RUSSIAN)	1	EE △
412	VQT0T88	OPERATING INSTRUCTIONS (CHINESE/ENGLISH)	1	GC,SG △
412	VQT0T89	OPERATING INSTRUCTIONS (RUSSIAN/ARABIC)	1	GC,SG △
412	VQT0T93	OPERATING INSTRUCTIONS (ENGLISH)	1	GN △
412	VQT0V34	OPERATING INSTRUCTIONS (ENGLISH/SPANISH)	1	PL △
412	VQT0T94	OPERATING INSTRUCTIONS (CHINESE)	1	GK △
413	VFF0264-S	CD-ROM	1	(EXCEPT PL) SEE "NOTES"
413	VFF0306-S	CD-ROM	1	PL SEE "NOTES"
414	VSK0651B	AC ADAPTOR	1	(EXCEPT GK) △
414	VSK0651A	AC ADAPTOR	1	GK △
415	VQT0N39	O/I CD-ROM (GERMAN/ITALIAN/FRENCH/DUTCH)	1	EG,EK
415	VQT0W12	O/I CD-ROM (TURKISH)	1	EG,EK
415	VQT0N42	O/I CD-ROM (PORTUGUESE/SPANISH/SWEDISH/DANISH)	1	E
415	VQT0N44	O/I CD-ROM (ENGLISH)	1	EB,GN
415	VQT0P90	O/I CD-ROM (ENGLISH/POLISH/CZECO/HUNGARY)	1	EP
415	VQT0U78	O/I CD-ROM (UKRAINIAN/RUSSIAN)	1	EE
415	VQT0R63	O/I CD-ROM (FRENCH)	1	EF
415	VQT0U77	O/I CD-ROM (CHINESE/ENGLISH/RUSSIAN/ARABIC)	1	GC,SG
415	VQT0V35	O/I CD-ROM (ENGLISH/SPANISH)	1	PL
415	VQT0P34	O/I CD-ROM (CHINESE)	1	GK

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
416	VFK1451	MINI DV CLEANING TAPE	1	EE,GC,GN,SG,GK
417	VYF3031	HOOD CAP UNIT	1	

13.7. ELECTRICAL REPLACEMENT PARTS LIST

Note: 1. Be sure to make your orders of replacement parts according to this list.
 2. IMPORTANT SAFETY NOTICE: Components identified with the mark △ have the special characteristics for safety. When replacing any of these components, use only the same type.
 3. Unless otherwise specified, All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICROFARADS (uf), P=uuF.
 4. The P.C. Board units marked with "■" show below the main assembled parts.
 5. The marking (RTL) indicates the retention time is limited for this item.
 After the discontinuation of this assembly in production, it will no longer be available.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
##	03	VEP001H8A (SIDE (R) P.C.B)		(RTL)
C6301	F1H0J475A009	C.CAPACITOR CH 6.3V 4.7U	1	
C6302	F1G1H470A566	C.CAPACITOR CH 50V 47P	1	
C6303	F1G1H470A566	C.CAPACITOR CH 50V 47P	1	
C6304	F1G1H470A566	C.CAPACITOR CH 50V 47P	1	
C6305	F1G1H470A566	C.CAPACITOR CH 50V 47P	1	
C6306	ECJ0EB1A104K	C.CAPACITOR CH 10V 0.1U	1	
C6307	ECJ0EB1A104K	C.CAPACITOR CH 10V 0.1U	1	
C6310	ECJ0EC1H050C	C.CAPACITOR CH 50V 5P	1	
C6321	F1G0J105A001	C.CAPACITOR CH 6.3V 1U	1	
D6301	B3ABB0000086	DIODE	1	
D6601	B3AAB0000137	DIODE	1	
FL3952	J0MAB0000116	FILTER	1	
FL3953	J0MAB0000116	FILTER	1	
FL6301	F1H0J1050022	C.CAPACITOR CH 6.3V 1U	1	
FP6301	K1MN26A00068	CONNECTOR 26P	1	
HS6301	K1NA09E00038	CONNECTOR 9P	1	
JK3952	K1FA104A0017	JACK	1	
R6302	ERJ2GEJ220	M.RESISTOR CH 1/16W 22	1	
R6303	ERJ2GEJ220	M.RESISTOR CH 1/16W 22	1	
R6304	ERJ2GEJ473Y	M.RESISTOR CH 1/16W 47K	1	
R6305	ERJ2GEJ473Y	M.RESISTOR CH 1/16W 47K	1	
R6306	ERJ2GEJ220	M.RESISTOR CH 1/16W 22	1	
R6307	ERJ2GEJ220	M.RESISTOR CH 1/16W 22	1	
R6308	ERJ2GEJ472	M.RESISTOR CH 1/16W 4.7K	1	
R6309	ERJ2GEJ472	M.RESISTOR CH 1/16W 4.7K	1	
R6310	ERJ2GEJ472	M.RESISTOR CH 1/16W 4.7K	1	
R6311	ERJ2GEJ472	M.RESISTOR CH 1/16W 4.7K	1	
R6316	ERJ2GEJ471	M.RESISTOR CH 1/16W 470	1	
S6301	K0H1BA000436	SWITCH	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
S6302	KOH1BA000436	SWITCH	1	
S6304	VSS0533	SWITCH	1	K0D112A00116
##	04	VEP001H9A(LCD DET P.C.B.)		(RTL)
S6701	KOL1BA000102	SWITCH	1	
##	05	VEP001H7A(JACK P.C.B.)		(RTL)
C3908	F1G0J105A001	C.CAPACITOR CH 6.3V 1U	1	
C4001	F1G0J105A001	C.CAPACITOR CH 6.3V 1U	1	
C4003	ECJ0EB1E472K	C.CAPACITOR CH 25V 4700P	1	
C4004	ECJ0EB1E472K	C.CAPACITOR CH 25V 4700P	1	
C4901	ECJ0EB1E472K	C.CAPACITOR CH 25V 4700P	1	
C4902	ECJ0EB1E472K	C.CAPACITOR CH 25V 4700P	1	
C4903	F1G0J105A001	C.CAPACITOR CH 6.3V 1U	1	
C4904	F1G0J105A001	C.CAPACITOR CH 6.3V 1U	1	
C4905	F3F0J226A054	E.CAPACITOR CH 6.3V 22U	1	
C4906	F3F0J226A054	E.CAPACITOR CH 6.3V 22U	1	
C4908	F1G0J105A001	C.CAPACITOR CH 6.3V 1U	1	
C4909	ECJ1VB0J105K	C.CAPACITOR CH 6.3V 1U	1	
C4910	F3F0J226A054	E.CAPACITOR CH 6.3V 22U	1	
C4913	F1H0J475A009	C.CAPACITOR CH 6.3V 4.7U	1	
D4901	B0JCDD000002	DIODE	1	
FL2503	JOMAB0000140	FILTER	1	
FP6201	K1MN27B00036	CONNECTOR 27P	1	
JK3001	VJJ0670	S-JACK	1	K2HZ104A0002
JK3901	K2HZ105E0008	JACK	1	
JK4001	K2HC106B0018	JACK	1	
JK4901	K2HC107B0003	JACK	1	
LB3902	J0JAC0000014	FILTER	1	J0JAC0000016
LB4001	J0JBC0000054	FILTER	1	J0JBC0000059
LB4003	J0JAC0000014	FILTER	1	J0JAC0000016
LB4005	J0JAC0000014	FILTER	1	J0JAC0000016
LB4006	J0JAC0000014	FILTER	1	J0JAC0000016
LB4007	J0JBC0000054	FILTER	1	J0JBC0000059
LB4008	J0JBC0000054	FILTER	1	J0JBC0000059
LB4009	J0JAC0000014	FILTER	1	J0JAC0000016
LB4921	J0JAC0000015	FILTER	1	J0JAC0000017
LB4922	J0JAC0000015	FILTER	1	J0JAC0000017
LB4923	J0JAC0000015	FILTER	1	J0JAC0000017
LB4924	J0JAC0000015	FILTER	1	J0JAC0000017
LB4926	J0JAC0000015	FILTER	1	J0JAC0000017
LB4928	J0JAC0000015	FILTER	1	J0JAC0000017
Q4901	2SD2216J0L	TRANSISTOR	1	
Q4902	2SB1462JHL	TRANSISTOR	1	
Q4903	2SD2216J0L	TRANSISTOR	1	
Q4904	2SB1462JHL	TRANSISTOR	1	
Q4907	B1ABBE000002	TRANSISTOR	1	
Q4908	B1ABBE000002	TRANSISTOR	1	
QR4901	B1GDBEH0001	TRANSISTOR-RESISTOR	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R4001	ERJ2GEJ101	M.RESISTOR CH 1/16W 100	1	
R4901	ERJ3RBD331	M.RESISTOR CH 1/16W 330	1	
R4902	ERJ2GEJ472	M.RESISTOR CH 1/16W 4.7K	1	
R4904	ERJ3RBD562	M.RESISTOR CH 1/16W 5.6K	1	
R4905	ERJ2GEJ471	M.RESISTOR CH 1/16W 470	1	
R4906	ERJ3RBD103	M.RESISTOR CH 1/16W 10K	1	
R4907	VRE0071E154	M.RESISTOR 150K	1	D0HB154ZA004
R4908	ERJ3RBD563	M.RESISTOR CH 1/16W 56K	1	ERJ3RBD563V
R4909	ERJ2GEJ102X	M.RESISTOR CH 1/16W 1K	1	ERJ2RMJ102X
R4910	ERJ2GEJ562	M.RESISTOR CH 1/16W 5.6K	1	
R4911	ERJ2GEJ151	M.RESISTOR CH 1/16W 150	1	
R4912	ERJ2GEJ471	M.RESISTOR CH 1/16W 470	1	
R4913	ERJ3RBD103	M.RESISTOR CH 1/16W 10K	1	
R4914	VRE0071E154	M.RESISTOR 150K	1	D0HB154ZA004
R4915	ERJ3RBD563	M.RESISTOR CH 1/16W 56K	1	ERJ3RBD563V
R4916	ERJ2GEJ102X	M.RESISTOR CH 1/16W 1K	1	ERJ2RMJ102X
R4917	ERJ2GEJ562	M.RESISTOR CH 1/16W 5.6K	1	
R4918	ERJ2GEJ151	M.RESISTOR CH 1/16W 150	1	
R4920	ERJ3RBD562	M.RESISTOR CH 1/16W 5.6K	1	
R4922	ERJ2GEJ223	M.RESISTOR CH 1/16W 22K	1	
R4923	ERJ2GEJ683	M.RESISTOR CH 1/16W 68K	1	
R4924	ERJ2GEJ473Y	M.RESISTOR CH 1/16W 47K	1	
S6212	KOL1BA000121	SWITCH	1	
VZ4001	D4ED1120A002	SURGE ABSORBER	1	
VZ4002	D4ED1270A008	TRANSIENT/SURGE ABSORBER	1	
VZ4003	D4ED1270A008	TRANSIENT/SURGE ABSORBER	1	
VZ4004	D4ED1270A006	SURGE ABSORBER	1	
VZ4902	D4ED1120A002	SURGE ABSORBER	1	
VZ4903	D4ED1120A002	SURGE ABSORBER	1	
##	06	VEP29162A(EVF P.C.B.)		(RTL)
C801	ECJ1VB0J474K	C.CAPACITOR CH 6.3V 0.47U	1	
C802	ECJ1VB1A105K	C.CAPACITOR CH 10V 1U	1	
D801	B3AFB0000081	LED	1	
D802	MA8047M	DIODE	1	MAZ80470M
D803	B0BC6R100025	DIODE	1	
D804	MA3S13300L	DIODE	1	
FP801	K1MN22BA0056	CONNECTOR 22P	1	
FP802	K1MN22BA0055	CONNECTOR 22P	1	
Q801	2SD2216J0L	TRANSISTOR	1	
R801	ERJ3GEJ472	M.RESISTOR CH 1/10W 4.7K	1	
R804	ERJ3RED470	M.RESISTOR CH 1/16W 47	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
##	07	VEP04881B (FRONT P.C.B.)		(RTL)
C491	ECJ0EB1A104K	C.CAPACITOR CH 10V 0.1U	1	
C492	F1G0J224A004	C.CAPACITOR CH 6.3V 0.22U	1	
C493	F1G0J224A004	C.CAPACITOR CH 6.3V 0.22U	1	
C4801	ECJ0EB1A473K	C.CAPACITOR CH 10V 0.047U	1	
C4802	ECJ0EB1A473K	C.CAPACITOR CH 10V 0.047U	1	
C4803	ECUX1E681KBQ	C.CAPACITOR CH 25V 680P	1	ECJ0EB1E681K
C4804	ECUX1E681KBQ	C.CAPACITOR CH 25V 680P	1	ECJ0EB1E681K
C4807	F1H0J475A009	C.CAPACITOR CH 6.3V 4.7U	1	
C4808	F3F0J226A055	E.CAPACITOR CH 6.3V 22U	1	
C4899	ECJ1VB0J105K	C.CAPACITOR CH 6.3V 1U	1	
C6401	F1J0J106A025	C.CAPACITOR CH 6.3V 10U	1	
D491	MA3S132D0L	DIODE	1	
D6801	B3AAB0000137	DIODE	1	
D6802	B3GA00000039	PHOTO DIODE	1	
FP4801	K1MN22A00065	CONNECTOR 22P	1	
IC4801	NJM2115V	IC	1	C0ABBB000104
IR6401	B3RAB0000045	IR RECEIVER	1	
Q491	B1ABCF000100	TRANSISTOR	1	
Q492	B1ABBE000002	TRANSISTOR	1	
Q4803	B1ABBE000002	TRANSISTOR	1	
R491	ERJ2GEJ225	M.RESISTOR CH 1/16W 2.2M	1	ERJ2RMJ225X
R492	ERJ2GEJ334	M.RESISTOR CH 1/16W 330K	1	
R493	ERJ2GEJ472	M.RESISTOR CH 1/16W 4.7K	1	
R494	ERJ2GEJ182	M.RESISTOR CH 1/16W 1.8K	1	
R495	ERJ3GEYJ106	M.RESISTOR CH 1/10W 10M	1	
R4801	ERJ6GEYG392	M.RESISTOR CH 1/10W 3.9K	1	
R4802	ERJ6GEYG392	M.RESISTOR CH 1/10W 3.9K	1	
R4803	D0YAR0000007	M.RESISTOR CH 1/16W 0	1	
R4804	D0YAR0000007	M.RESISTOR CH 1/16W 0	1	
R4805	ERJ2GED563X	M.RESISTOR CH 1/16W 56K	1	ERJ2RHD563X
R4806	ERJ2GED563X	M.RESISTOR CH 1/16W 56K	1	ERJ2RHD563X
R4807	ERJ2GEJ103	M.RESISTOR CH 1/16W 10K	1	
R4808	ERJ2GEJ103	M.RESISTOR CH 1/16W 10K	1	
R4813	ERJ2GEJ223	M.RESISTOR CH 1/16W 22K	1	
R4814	ERJ2GEJ333	M.RESISTOR CH 1/16W 33K	1	
R4815	ERJ2GEJ472	M.RESISTOR CH 1/16W 4.7K	1	
R6402	ERJ2RKD330	M.RESISTOR CH 1/16W 33	1	
R6803	ERJ2GEJ331	M.RESISTOR CH 1/16W 330	1	
VZ4801	D4ED1270A003	SURGE ABSORBER	1	
VZ4802	D4ED1270A003	SURGE ABSORBER	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
##	08	VEP08340C (MONITOR P.C.B.)		(RTL)
C901	ECJ1VB0J105K	C.CAPACITOR CH 6.3V 1U	1	
C902	ECJ1VB1A105K	C.CAPACITOR CH 10V 1U	1	
C903	F1J1A475A023	C.CAPACITOR CH 10V 4.7U	1	
C913	ECJ0EC1H390J	C.CAPACITOR CH 50V 39P	1	
C914	ECJ0EC1H390J	C.CAPACITOR CH 50V 39P	1	
C915	ECJ0EC1H390J	C.CAPACITOR CH 50V 39P	1	
C916	ECJ0EB1A104K	C.CAPACITOR CH 10V 0.1U	1	
C918	F1J1A475A023	C.CAPACITOR CH 10V 4.7U	1	
C933	ECJ1VB0J105K	C.CAPACITOR CH 6.3V 1U	1	
D902	B0BC6R100025	DIODE	1	
D905	B3AFB0000082	LED	1	
D906	B3AFB0000082	LED	1	
D907	B3AFB0000082	LED	1	
D908	B3AFB0000082	LED	1	
D909	B3AFB0000082	LED	1	
D910	B3AFB0000082	LED	1	
D911	B3AFB0000082	LED	1	
FP901	K1MN24BA0055	CONNECTOR 24P	1	
FP902	K1MN25B00072	CONNECTOR 25P	1	
L901	G1C101KA0055	CHIP INDUCTOR 100UH	1	
Q901	B1ADBE000001	TRANSISTOR	1	
Q902	2SD2216J0L	TRANSISTOR	1	
Q903	2SD2216J0L	TRANSISTOR	1	
Q904	2SD2216J0L	TRANSISTOR	1	
Q906	2SD2216J0L	TRANSISTOR	1	
Q907	2SD2216J0L	TRANSISTOR	1	
Q908	2SD2216J0L	TRANSISTOR	1	
Q909	2SD2216J0L	TRANSISTOR	1	
Q913	B1ADBE000001	TRANSISTOR	1	
R901	ERJ3RBD122	M.RESISTOR CH 1/16W 1.2K	1	
R902	ERJ6GEY0R00V	M.RESISTOR CH 1/10W 0	1	D0GBR00JA017
R903	ERJ3RBD182	M.RESISTOR CH 1/16W 1.8K	1	
R904	ERJ3RBD153	M.RESISTOR CH 1/16W 15K	1	
R906	ERJ3RBD563	M.RESISTOR CH 1/16W 56K	1	ERJ3RBD563V
R907	ERJ3GEYJ331	M.RESISTOR CH 1/10W 330	1	
R908	ERJ3GEYJ331	M.RESISTOR CH 1/10W 330	1	
R909	ERJ3GEYJ331	M.RESISTOR CH 1/10W 330	1	
R910	ERJ3RBD822	M.RESISTOR CH 1/16W 8.2K	1	
R912	ERJ3RBD102	M.RESISTOR CH 1/16W 1K	1	
R913	ERJ3RBD472	M.RESISTOR CH 1/16W 4.7K	1	
R915	D0GB102JA057	M.RESISTOR CH 1/10W 1K	1	
R918	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	
R924	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	
R925	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R930	ERJ3RBD103	M.RESISTOR CH 1/16W 10K	1	
R931	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	
R932	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	
R933	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	
R934	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	
R937	ERJ3RBD473	M.RESISTOR CH 1/16W 47K	1	
R940	DOGB103JA057	M.RESISTOR CH 1/10W 10K	1	
##	09	VEK0H35 (CCD FPC)		(RTL)
C201	ECJ0EB1A104K	C.CAPACITOR CH 10V 0.1U	1	
C202	ECJ1VB1C105K	C.CAPACITOR CH 16V 1U	1	
C203	F1G1C104A080	C.CAPACITOR CH 16V 0.1U	1	
C205	F1G0J105A001	C.CAPACITOR CH 6.3V 1U	1	
C206	ECJ1VB1C105K	C.CAPACITOR CH 16V 1U	1	
C211	ECJ0EB1A104K	C.CAPACITOR CH 10V 0.1U	1	
C212	ECJ1VB1C105K	C.CAPACITOR CH 16V 1U	1	
C213	F1G1C104A080	C.CAPACITOR CH 16V 0.1U	1	
C215	F1G0J105A001	C.CAPACITOR CH 6.3V 1U	1	
C216	ECJ1VB1C105K	C.CAPACITOR CH 16V 1U	1	
C221	ECJ0EB1A104K	C.CAPACITOR CH 10V 0.1U	1	
C222	ECJ1VB1C105K	C.CAPACITOR CH 16V 1U	1	
C223	F1G1C104A080	C.CAPACITOR CH 16V 0.1U	1	
C225	F1G0J105A001	C.CAPACITOR CH 6.3V 1U	1	
C226	ECJ1VB1C105K	C.CAPACITOR CH 16V 1U	1	
Q201	2SC4627JCL	TRANSISTOR	1	
Q202	2SC4627JCL	TRANSISTOR	1	
Q211	2SC4627JCL	TRANSISTOR	1	
Q212	2SC4627JCL	TRANSISTOR	1	
Q221	2SC4627JCL	TRANSISTOR	1	
Q222	2SC4627JCL	TRANSISTOR	1	
R201	ERJ2GEJ123	M.RESISTOR CH 1/16W 12K	1	
R202	ERJ2GEJ821	M.RESISTOR CH 1/16W 820	1	
R203	ERJ2GEJ103	M.RESISTOR CH 1/16W 10K	1	
R204	ERJ2GEJ821	M.RESISTOR CH 1/16W 820	1	
R205	ERJ2GEJ123	M.RESISTOR CH 1/16W 12K	1	
R206	ERJ2GEJ103	M.RESISTOR CH 1/16W 10K	1	
R208	DOYAR0000007	M.RESISTOR CH 1/16W 0	1	
R211	ERJ2GEJ123	M.RESISTOR CH 1/16W 12K	1	
R212	ERJ2GEJ821	M.RESISTOR CH 1/16W 820	1	
R213	ERJ2GEJ103	M.RESISTOR CH 1/16W 10K	1	
R214	ERJ2GEJ821	M.RESISTOR CH 1/16W 820	1	
R215	ERJ2GEJ123	M.RESISTOR CH 1/16W 12K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R216	ERJ2GEJ103	M.RESISTOR CH 1/16W 10K	1	
R218	DOYAR0000007	M.RESISTOR CH 1/16W 0	1	
R221	ERJ2GEJ123	M.RESISTOR CH 1/16W 12K	1	
R222	ERJ2GEJ821	M.RESISTOR CH 1/16W 820	1	
R223	ERJ2GEJ103	M.RESISTOR CH 1/16W 10K	1	
R224	ERJ2GEJ821	M.RESISTOR CH 1/16W 820	1	
R225	ERJ2GEJ123	M.RESISTOR CH 1/16W 12K	1	
R226	ERJ2GEJ103	M.RESISTOR CH 1/16W 10K	1	
R228	DOYAR0000007	M.RESISTOR CH 1/16W 0	1	