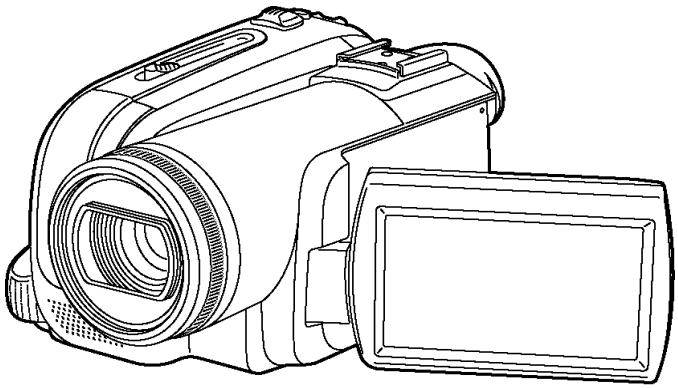
ORDER NO.VM0701006CE

Service Manual

Digital Video Camera/Recorder



NV-GS320EG
NV-GS320E
NV-GS320EB
NV-GS320EP
NV-GS320EE
NV-GS320EF
NV-GS320EK
NV-GS320GC
NV-GS320GN
NV-GS320SG
NV-GS320PL
NV-GS320GT
NV-GS328GK

VOL.1

A-MECHANISM

Colour

(S).....Silver Type

Panasonic®

TABLE OF CONTENTS

PAGE

1 Safety Precaution ---- **3**
1.1. General Guidelines ---- 3
2 Warning ---- **4**
2.1. Caution for AC Cord (VJA0940 type) ---- 4
2.2. Prevention of Electro Static Discharge (ESD) to Electrostatically Sensitive (ES) Devices ---- 5
2.3. Handling the Lead-free Solder ---- 6
2.4. How to Replace the Lithium Battery (PROCEDURE) ---- 7
3 Service Navigation ---- **8**
3.1. Service Information ---- 8
3.2. Service Caution ---- 8
4 Specifications ---- **9**
5 Location of Controls and Components ---- **10**
6 Service Mode ---- **13**
6.1. Error Display ---- 13
6.2. Service Menu ---- 14
7 Service Fixture & Tools ---- **16**
7.1. Service Tools and Equipment ---- 16
8 Disassembly and Assembly Instructions ---- **17**
8.1. Disassembly Frow Chart ---- 17
8.2. P.C.B. Layout ---- 17
8.3. Disassembly Procedures ---- 18
8.4. Disassembly Procedures Mecha. Unit ---- 26
8.5. Disassembly Procedures of Camera Lens Unit ---- 29
9 Measurements and Adjustments ---- **30**
9.1. Service Positions ---- 30
9.2. Location for Connectors of the Main P.C.B. ---- 32
9.3. Electrical Adjustment Procedures ---- 33
9.4. Mechanical Adjustment Procedures ---- 37
10 Maintenace ---- **39**
10.1. Cleaning Lens, Viewfinder and LCD Panel ---- 39

PAGE

1 Safety Precaution

1.1. General Guidelines

1. IMPORTANT SAFETY NOTICE

   There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Layout, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent X-RADIATION, shock fire, or other hazards. Do not modify the original design without permission of manufacturer.
2. An Isolation Transformer should always be used during the servicing of AC Adaptor whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect AC Adaptor from being damaged by accidental shorting that may occur during servicing.
3. When servicing, observe the original lead dress. It a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.1.1. Leakage current cold check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1MΩ and 5.2MΩ. When the exposed metal does not have a return path to the chassis, the reading must be infinity.

1.1.2. Leakage current hot check (See Figure 1)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect A to exposed metallic part on the set. And connect B to a good earth ground, as shown in Figure 1.
3. Use an AC voltmeter, with 1 kΩ/V or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 V RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 mA. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

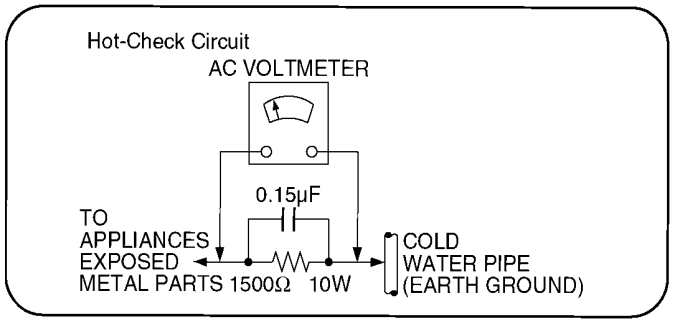


Figure 1

2 Warning

2.1. Caution for AC Cord (VJA0940 type)

2.1.1. 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.

2.1.2. 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.

ASTA mark	BSI mark

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 safety.
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.

2.1.2.1. 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.

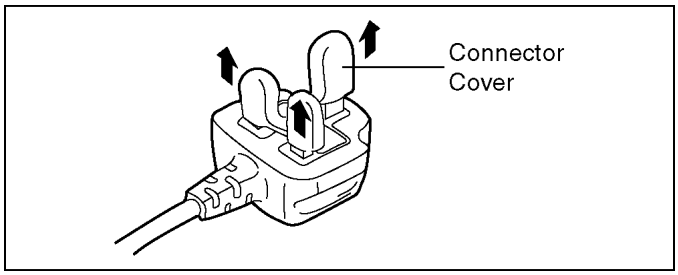
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

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.

Earth Symbol	⏚

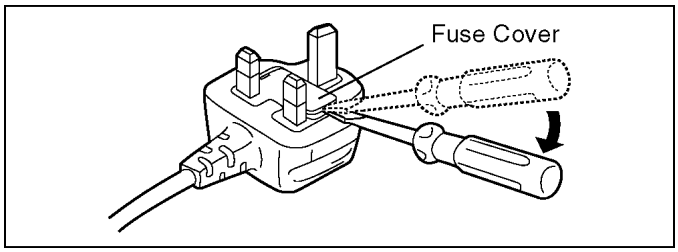
2.1.2.2. Before use

remove the Connector Cover as follows.

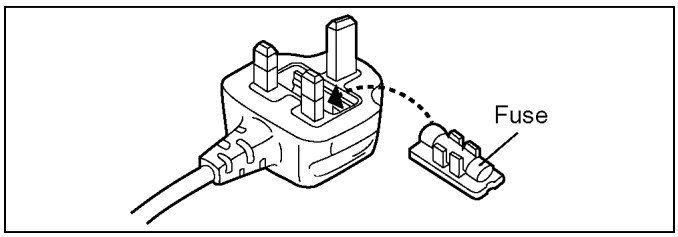


2.1.2.3. How to replace the Fuse

1. Remove the Fuse Cover with a screwdriver.



2. Replace the fuse and attach the Fuse cover.



2.2. Prevention of Electro Static Discharge (ESD) to Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an antistatic solder removal device. Some solder removal devices not classified as antistatic (ESD protected) can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION:
   Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are imporant for safety.
These parts are marked by ⚠ in the schematic diagrams, Exploded Views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

2.3. Handling the Lead-free Solder

2.3.1. General description about Lead Free Solder (PbF)

The lead free solder has been used in the mounting process of all electrical components on the printed circuit boards used for this equipment in considering the globally environmental conservation.

The normal solder is the alloy of tin (Sn) and lead (Pb). On the other hand, the lead free solder is the alloy mainly consists of tin (Sn), silver (Ag) and Copper (Cu), and the melting point of the lead free solder is higher approx.30 degrees C (86 °F) more than that of the normal solder.

Definition of PCB Lead Free Solder being used

The letter of PbF is printed either foil side or components side on the PCB using the lead free solder. (See right figure)	PbF

Service caution for repair work using Lead Free Solder (PbF)

- The lead free solder has to be used when repairing the equipment for which the lead free solder is used.
- (Definition: The letter of PbF is printed on the PCB using the lead free solder.)
- To put lead free solder, it should be well molten and mixed with the original lead free solder.
- Remove the remaining lead free solder on the PCB cleanly for soldering of the new IC.
- Since the melting point of the lead free solder is higher than that of the normal lead solder, it takes the longer time to melt the lead free solder.
- Use the soldering iron (more than 70W) equipped with the temperature control after setting the temperature at 350±30 degrees C (662±86 °F).

Recommended Lead Free Solder (Service Parts Route.)

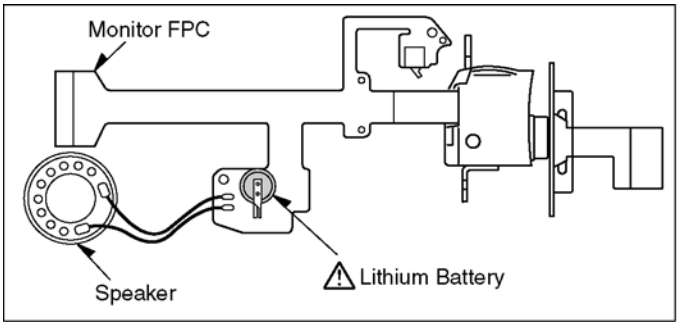
- The following 3 types of lead free solder are available through the service parts route.
  RFKZ03D01K----------(0.3mm 100g Reel)
  RFKZ06D01K----------(0.6mm 100g Reel)
  RFKZ10D01K----------(1.0mm 100g Reel)

Note

* Ingredient: tin (Sn) 96.5%, silver (Ag) 3.0%, Copper (Cu) 0.5%, Cobalt (Co) / Germanium (Ge) 0.1 to 0.3%

2.4. How to Replace the Lithium Battery (PROCEDURE)

1. Remove the Monitor FPC of Side Case (R) Unit. (Refer to Disassembly Procedures.)
2. Unsolder the Lithium Battery ML-621S/F9D and then replace the new one. (See Figure 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 recharfe, disassemble, heat above 100°C (212°F), or incinerate.
Replace battery with Panasonic part nmber 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)
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.
Udskiftning má 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.

3 Service Navigation

3.1. Service Information

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 VSK0644.

Note 2:

1) This service manual does not contain the following information, because of the impossibility of sevicing at component level.
   1. Schematic Diagram, Block Diagram and P.C.B. layout of Main P.C.B.
   2. Parts List for individual parts of Main P.C.B.

2) The following category are recycle module part. Please send them to Central Repair Center.
   *Main P.C.B.
   (VEP03H08B: NV-GS320EG/E/EB/EP/EF, VEP03H08C: NV-GS320EK, VEP03H08D: NV-GS320GC/GN/SG,
   VEP03H08E: NV-GS328GK, VEP03H08G: NV-GS320GT, VEP03H08J: NV-GS320PL, VEP03H08K: NV-GS320EE)

When a part replacement is required for repairing each Main P.C.B., replace the assembly parts.
(Main 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
6. Lens Drive Circuit
7. LCD Circuit
8. Camera Circuit

3.2. Service Caution

3.2.1. 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.

4 Specifications

Digital Video Camera / Recoder

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)
RECORDING FORMAT	Mini DV (Consumer-use Digital Video SD Format)
TAPE USED	6.35 mm digital video tape
RECORDING / PLAYBACK TIME	SP mode: 80 min. with DVM80 LP mode: 120 min. with DVM80
CAMERA	Filter Diameter: 37.0 mm
	Zoom: 10:1 Power Zoom
	Monitor: 2.7-inch LCD
	Lens: Auto Iris, F1.8 to F2.8, Focal Length; 3.0 - 30.0 mm Macro (Full Range AF)
	Image Sensor: 1/6-inch 3CCD Image Sensor
	Viewfinder: Colour Electronic Viewfinder
WEB CAMERA	Compression: Motion JPEG
	Image Size: 320 × 240 pixels (QVGA)
	Frame Rate: Approx. 6fps
VIDEO	Recording System: Digital Component
	Television System: CCIR; 625 Lines, 50 Fields PAL Colour Signal (Except NV-GS320PL/GT) EIA Standard: 525 Lines, 60 Fields NTSC Colour Signal (NV-GS320PL/GT)
	Video Output Level: 1.0 Vp-p 75 ohm (AV Multi Jack) S-Video Output Level: Y Output; 1.0 Vp-p 75 ohm (AV Multi Jack) C Output; 0.3 Vp-p 75 ohm (Except NV-GS320PL/GT) C Output; 0.286 Vp-p 75 ohm (NV-GS320PL/GT)
AUDIO	Recording System: PCM Digital Recording 16 bit (48 kHz/2 ch) 12 bit (32 kHz/4 ch)
	Audio Output Level: 316 mV, 600 ohm (AV Multi Jack)
CARD MEMORY FUNCTIONS	Recording Media: SD Memory Card: 8MB/16MB/32MB/64MB/ 128MB/256MB/512MB/1GB/2GB (Maximum) (FAT12 and FAT16 format corresponding) SDHC Memory Card: 4GB (Maximum) (FAT32 format corresponding) 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; 2048 × 1512 (3.1 million pixels, 4:3 Mode) 2048 × 1152 (2.4 million pixels, 16:9 Mode) 1600 × 1200 (2.0 million pixels, 4:3 Mode) 1280 × 960 (1.0 million pixels, 4:3 Mode) 1280 × 720 (1.0 million pixels, 16:9 Mode) VGA Recording; 640 × 360 (16:9 Mode) 640 × 480 (4:3 Mode)

ITEM	SPECIFICATION
STANDARD ILLUMINATION	1,400 lx
MINIMUM REQUIRED ILLUMINATION	8 lx (Low light mode: 1/50) (Except NV-GS320PL/GT) 8 lx (Low light mode: 1/60) (NV-GS320PL/GT) 1 lx (Colour Night View Mode)
USB	Card reader/writer function, USB 2.0 compliant (Hi-Speed) No copyright protection support Pict Bridge-Compliant
DIGITAL INTERFACE	DV Input/Output Terminal (IEEE1394, 4-pin) (NV-GS320EE/EK/GC/GN/SG/PL/GT, GS328GK) DV Output Terminal (IEEE1394, 4-pin) (NV-GS320EG/E/EB/EP/EF)
MICROPHONE	Stereo (with a zoom function)
SPEAKER	1 round speaker ϕ20 mm
OPERATING TEMPERATURE	0 ˚C - 40 ˚C
OPERATING HUMIDITY	10 % - 80 %
WEIGHT	Approx. 450 g (without supplied Battery and DV cassette) Approx. 515 g (with supplied Battery and DV cassette)
DIMENSIONS	Approx. 78.5 (W) × 72.6 (H) × 136.0 (D) mm (excluding the projection parts)
STANDARD ACCESSORIES	1 pc. AC Adaptor 1 pc. Battery Pack Unit 1 pc. DC Cable 1 pc. AC Cord (Except NV-GS320GC/SG) 2 pcs. AC Cord (NV-GS320GC/SG) 1 pc. AV Multi Cable 1 pc. Remote Controller 1 pc. Bottom-type Battery 1 pc. Head Cleaner (NV-GS320GC/GN/GT/SG, GS328GK) 1 pc. CD-ROM 1 pc. USB cable
SOLDER	This model use lead free solder (PbF).

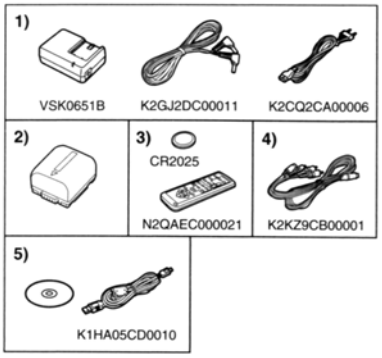
Weight and dimensions are approximate values.
Specifications may change without prior notice.

5 Location of Controls and Components

Followings are the Location of Controls and Components for NV-GS320EP as a sample.
For other models, refer to each Operatin Instructions.

Accessories

The followings are the accessories supplied with this product.



1) AC adaptor, DC input lead, AC mains lead
2) Battery pack
3) Remote control, button-type battery
4) Multi cable
5) USB cable and CD-ROM

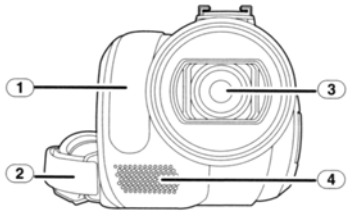
Optional

1) AC adaptor (VW-AD11E)
2) Battery pack (lithium/CGR-DU06/640 mAh)
3) Battery pack (lithium/CGA-DU07/680 mAh)
4) Battery pack (lithium/CGA-DU12/1150 mAh)
5) Battery pack (lithium/CGA-DU14/1360 mAh)
6) Battery pack (lithium/CGA-DU21/2040 mAh)
7) Wide conversion lens (VW-LW3707M3E)
8) Tele conversion lens (VW-LT3714ME)
9) Filter kit (VW-LF37WE)
10) Video DC light (VW-LDC10E)
11) Light bulb for video DC light (VZ-LL10E)
12) Tripod (VW-CT45E)
13) DV cable (VW-CD1E)

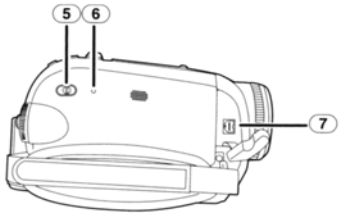
- Some optional accessories may not be available in some countries.

Parts identification and handling

■ Camera

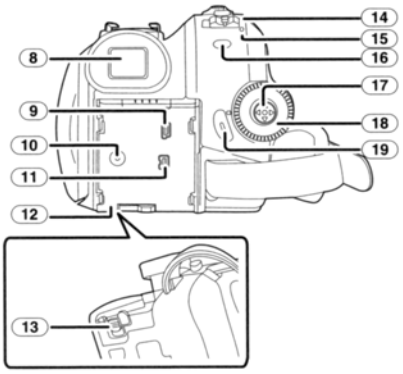


(1) White balance sensor
Remote control sensor
(2) Grip belt
(3) Lens (LEICA DICOMAR)
(4) Microphone (built-in, stereo)



(5) Mode select switch [AUTO/MANUAL/ FOCUS]
(6) Reset button [RESET]
(7) Audio-video/S-Video output terminal [A/V]

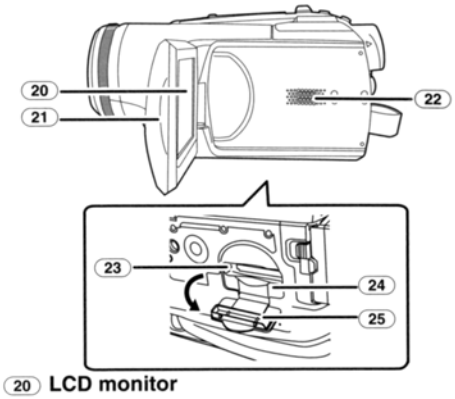
- Use the supplied Multi cable only, otherwise audio may not be played back normally.



(8) Viewfinder

Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the Viewfinder screen. However, this is not a malfunction and does not affect the recorded picture.

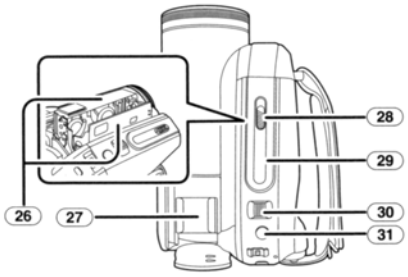
(9) USB terminal [Ψ]
(10) DC input terminal [DC/C.C.IN]
(11) DV output terminal [DV]
(12) Battery holder
(13) Battery release lever [BATTERY]
(14) Power switch [OFF/ON]
(15) Status indicator
(16) Menu button [MENU]
(17) Joystick
(18) Mode dial
(19) Recording start/stop button



(20) LCD monitor

Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the LCD monitor screen. However, this is not a malfunction and does not affect the recorded picture.

(21) LCD monitor open part
(22) Speaker
(23) Card access lamp
(24) Card slot
(25) Card slot cover



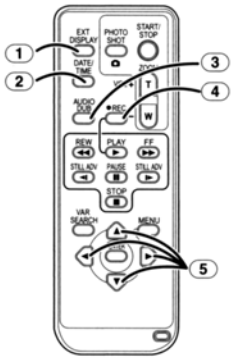
(26) Cassette holder
(27) Accessory shoe
- Accessories, such as a video DC light (VW-LDC10E; optional), are attached here.

(28) Cassette eject lever [OPEN/EJECT]
(29) Cassette cover
(30) Zoom lever [W/T]
Volume lever [−/VOL+]
(31) Photoshot button [📷]

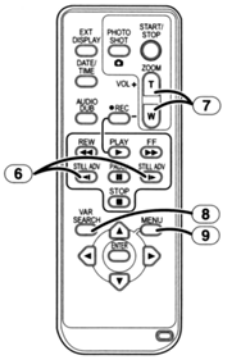
Using the remote control

■ Remote control

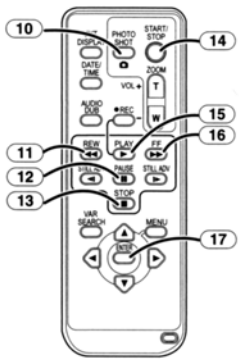
Using the remote control supplied will enable controlling almost all the functions of this camera to be controlled.



① **On-screen display button [EXT DISPLAY]**
② **Date/time button [DATE/TIME]**
③ **Audio dubbing button [AUDIO DUB]**
④ **Record button [●REC] (not operable)**
⑤ **Direction buttons [▲, ◀, ▶, ▼]**



⑥ **Slow/frame-by-frame forward button [◀I, I▶] (◀I: reverse, I▶: forward)**
⑦ **Zoom/volume button [ZOOM/VOL]** ∗
⑧ **Search button [VAR SEARCH]**
⑨ **Menu button [MENU]** ∗



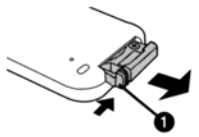
⑩ **Photoshot button [PHOTO SHOT]** ∗
⑪ **Rewind/review button [◀◀]**
⑫ **Pause button [❚❚]**
⑬ **Stop button [■]**
⑭ **Recording start/stop button [START/STOP]** ∗
⑮ **Playback button [PLAY ▶]**
⑯ **Fast forward/cue button [▶▶]**
⑰ **Enter button [ENTER]**

∗ means that these buttons function in the same manner as the corresponding buttons on the movie camera.

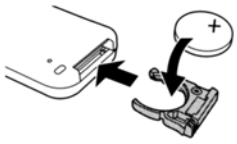
■ Install a button-type battery

Install the button-type battery supplied in the remote control before using it.

1 While pressing the stopper ❶, pull out the battery holder.



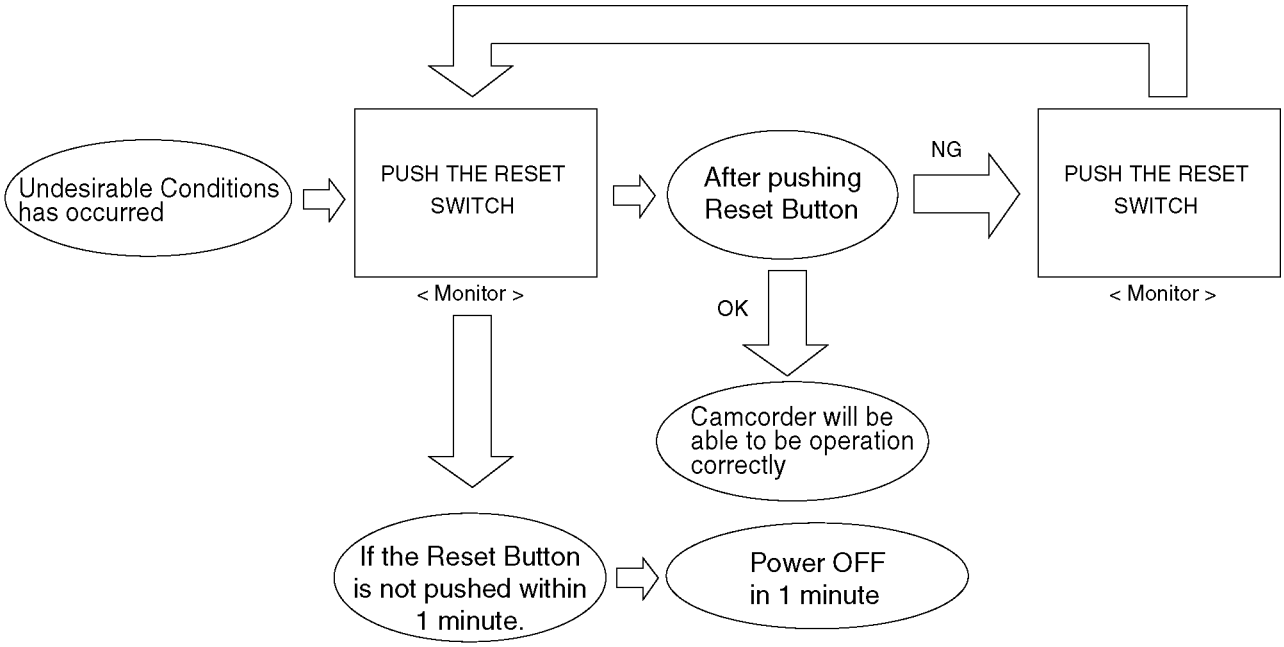
2 Set the button-type battery with its (+) mark facing upward and get the battery holder back in place.



6 Service Mode

6.1. Error Display

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



Note:

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

6.2. 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 [PHOTO SHOT] button and [JOYSTICK LEFT ◀] button and [AUTO/MANUAL/FOCUS switch to FOCUS] 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 [JOYSTICK CENTER] button.

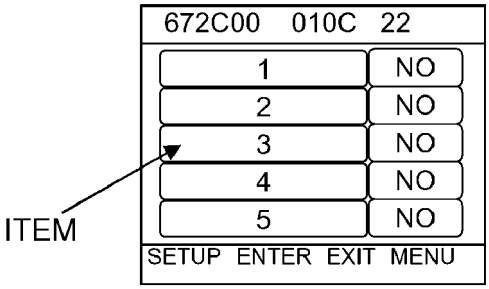
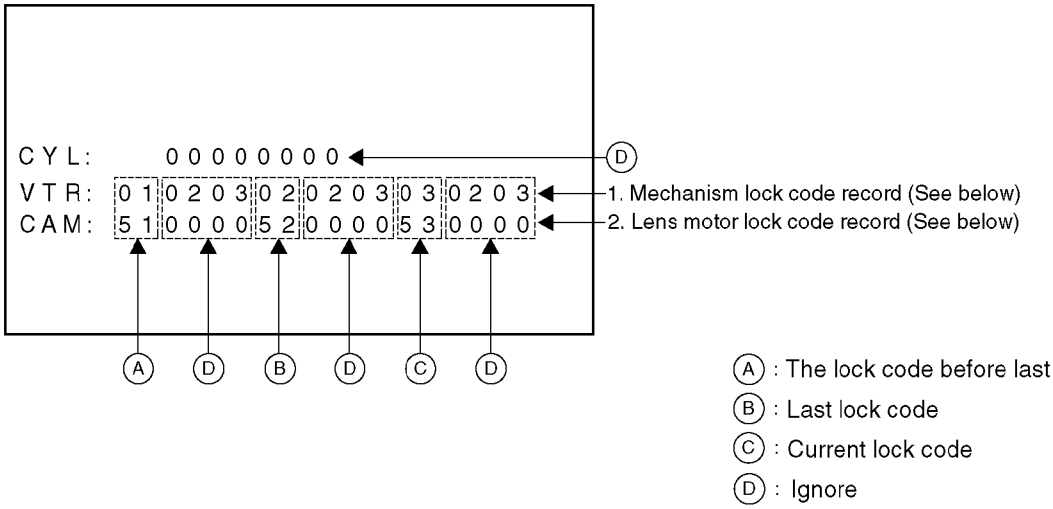


Fig. S1

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 [AUTO/MANUAL/FOCUS switch to FOCUS] button and [RECORDING START/STOP] button simultaneously for 3 seconds.

7 Service Fixture & Tools

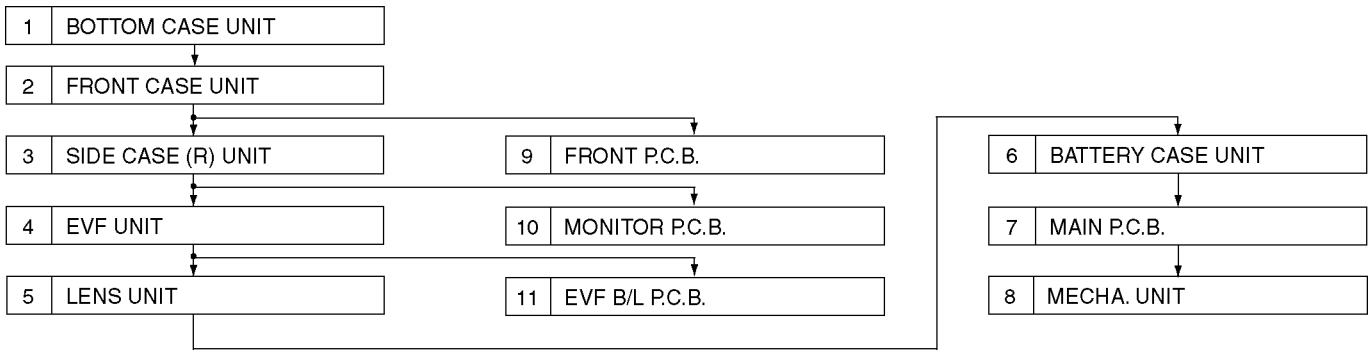
7.1. Service Tools and Equipment

Parts Name	Parts No.	Q'ty	Remarks
Personal Computer	---	1	With Tatsujin Software.
AC Adaptor	---	1	The AC Adaptor for DV Camcorder.
DC Cable	---	1	The AC Adaptor for DV Camcorder.
AV Multi Cable	---	1	
USB Cable	---	1	
Step Up Ring	VFK1164TAR37	1	For Collimator 37mm
TATSUJIN PC-Adjustment Program	VF0D2004DV30	1	
Extension Cable (22pin)	VFK1282	1	FP4801 (Main) - FP6501 (Front)
Extension Cable (33pin)	VFK1575C3320	1	FP701 (Main) - Lens Unit
Extension Cable (40pin)	VFK1895	1	PS101 (Main) - Prism Unit
Extension Cable (30pin)	VFK1174	1	FP602 (Main) - FP902 (LCD)
Extension Cable (18pin)	VFK1443	1	FP603 (Main) - FP8901 (EVF)
Extension Cable (26pin)	VFK1492	1	FP6903 (Main) - Side (L) Operation Unit
Extension Cable (12pin)	VFK1388	1	FP1001 (Main) - Battery Case Unit
Extension Cable (26pin)	VFK1492	1	FP2203 (Main) - Mechanism Unit
Extension Cable (10pin)	VFK1440	1	FP2202 (Main) - Cylinder (Drive)
Extension Cable (8pin)	VFK1441	1	FP5001 (Main) - Cylinder (Head AMP)
Extension Cable (18pin)	VFK1443	1	FP2201 (Main) - Capstan (Drive)

8 Disassembly and Assembly Instructions

8.1. Disassembly Frow 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.



8.2. P.C.B. Layout

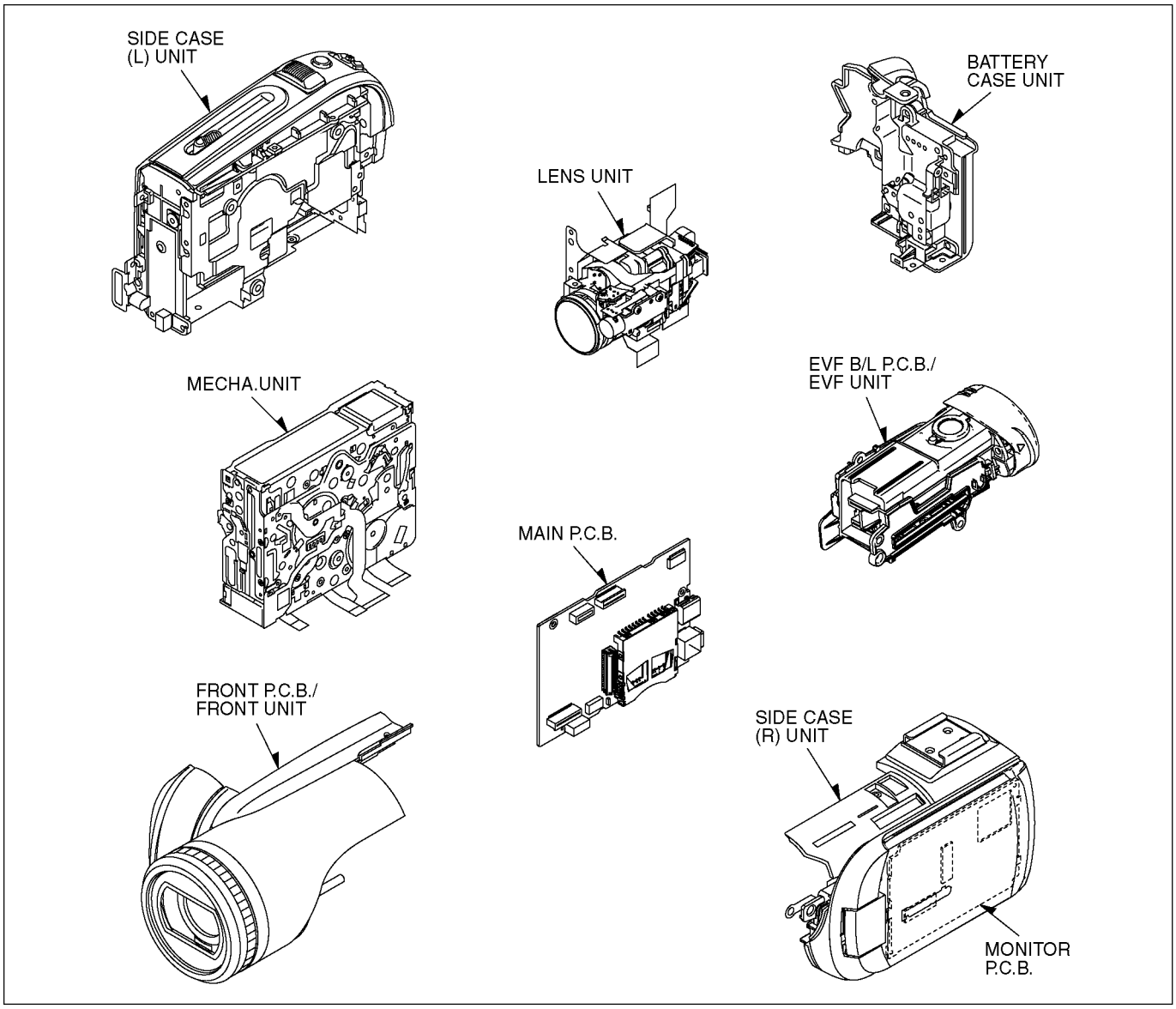


Fig. F1

8.3. Disassembly Procedures

Flow-Chart for Disassembly Procedure

No.	Item / Part	Fig.	Removal (Screw,Connector,Flex. & Other)
1	Bottom Case Unit	Fig.D2	Detach the Grip Belt
		Fig.D3	6-Screws (A), 1-Screw (B) Bottom Case Unit
2	Front Case Unit	Fig.D4	Open the LCD Unit. 1-Screw (C)
		Fig.D5	2-Screws (D),1-Screw (E)
		Fig.D6	1-Screw (F) 1-Connector FP6501 Front Case Unit
3	Side Case (R) Unit	Fig.D7	2-Screws (G)
		Fig.D8	2-Screws (H),1-Screw (I)
		Fig.D9	1-Connector FP602 Side Case (R) Unit
4	EVF Unit	Fig.D10	2-Screws (J),1-Screw (K) 1-Connector FP603 EVF Unit
5	Lens Unit	Fig.D11	1-Screw (L) 2-Connectors FP701,PS101 Lens Unit
6	Battery Case Unit	Fig.D12	Open the Cassette Cover 2-Screws (M) 1-Connector FP1001 Battery Case Unit
7	Main P.C.B.	Fig.D13	6-Connectors FP2201, FP2202, FP2203, FP4801, FP5001, FP6903 2-Screws (N) Main P.C.B.
8	Mecha. Unit	Fig.D14	1-Screw (O)
		Fig.D15	2-Screws (P) Lens Angle 3-Tabs Mecha. Unit
9	Front P.C.B.	Fig.D16	5-Screws (Q) Front P.C.B.
10	Monitor P.C.B.	Fig.D17	Open the LCD Unit and then rotate it 2-Screws (R)
		Fig.D18	6-Tabs LCD Case (Upper) Unit 1-Connector FP8101 LCD Case (Lower) Unit
		Fig.D19	1-Connector FP8102 1-Screw (S) 3-Tabs Monitor P.C.B.
11	EVF B/L P.C.B.	Fig.D20	2-Screws (T) 2-Tabs Earth Plate
		Fig.D21	Remove the 2-Tabs with the procedure of arrow 1,2. 1-Connector FP8901 EVF Case Unit
		Fig.D22	2-Tabs EVF LCD Panel Unit
		Fig.D23	1-Connector FP8902 2-Tabs EVF B/L P.C.B.

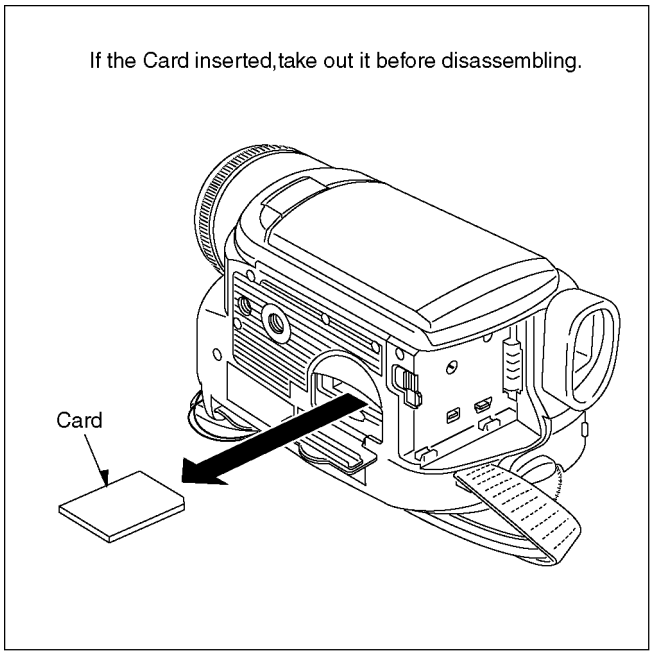


Fig. D1

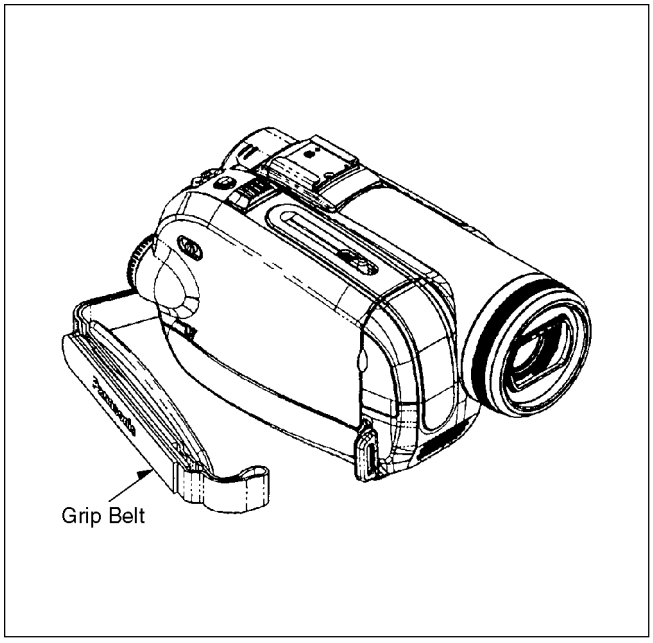


Fig. D2

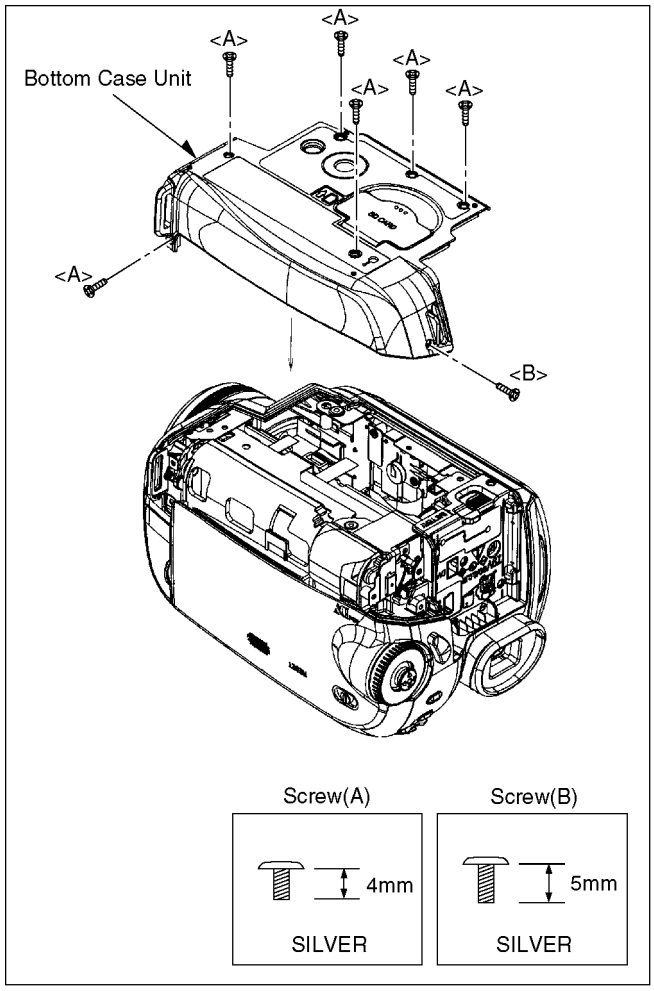


Fig. D3

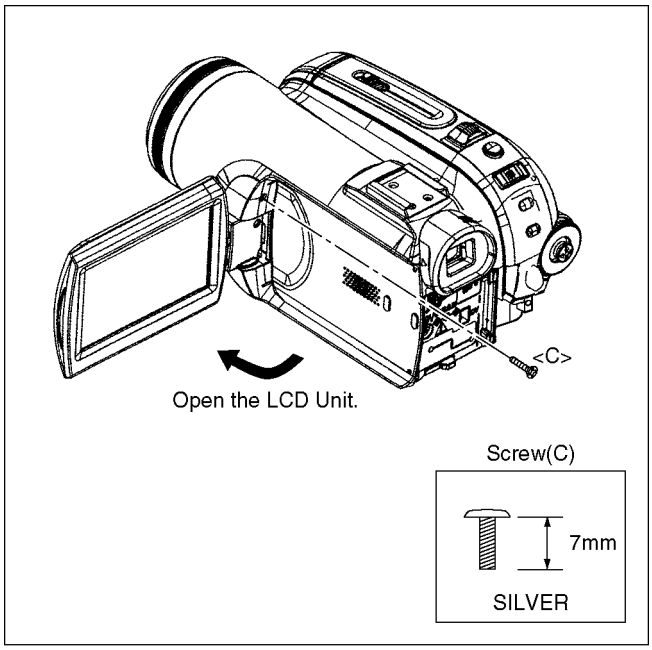


Fig. D4

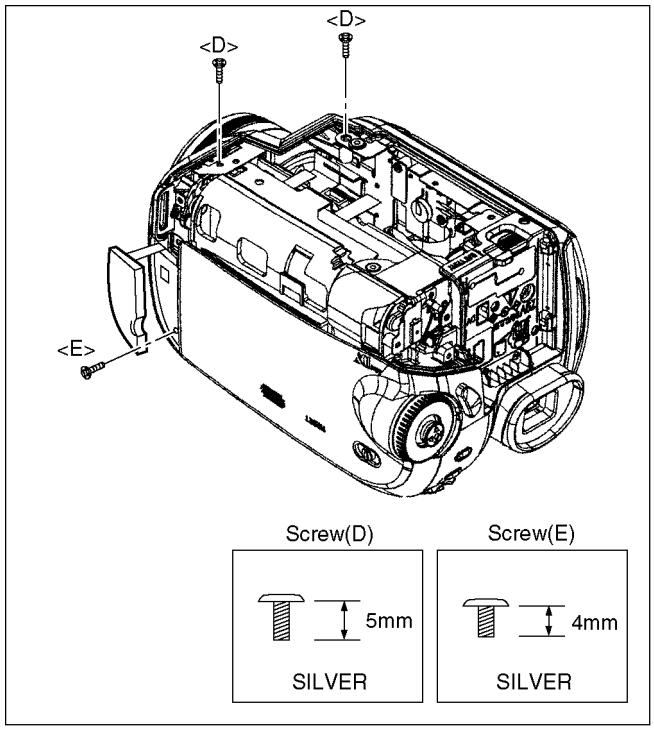


Fig. D5

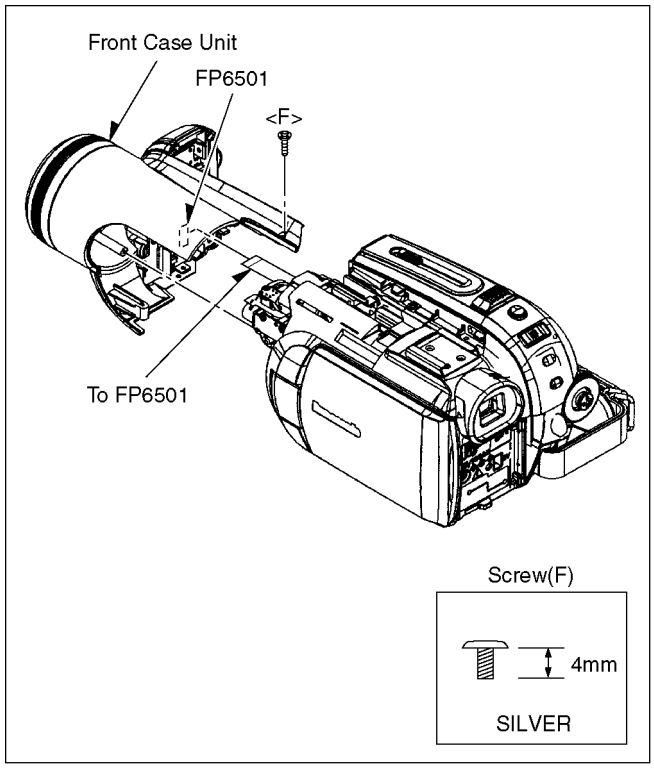


Fig. D6

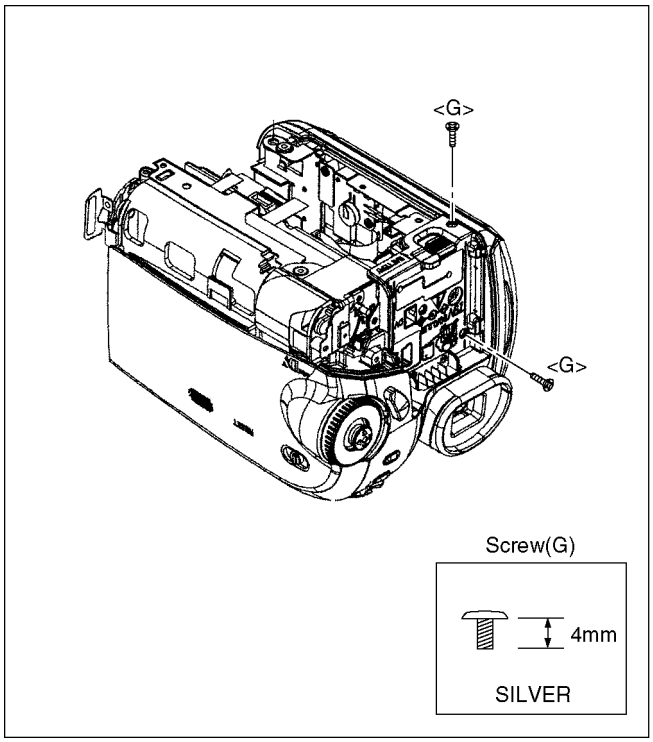


Fig. D7

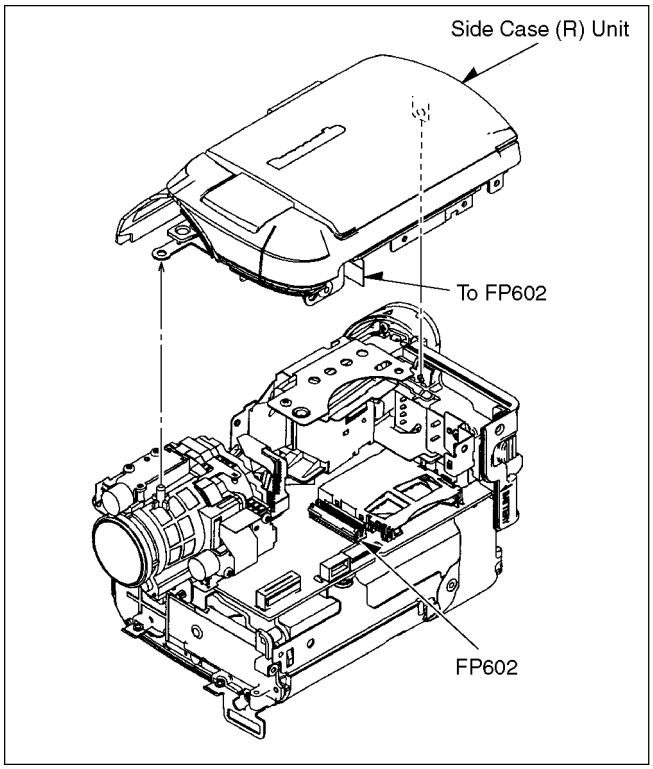


Fig. D9

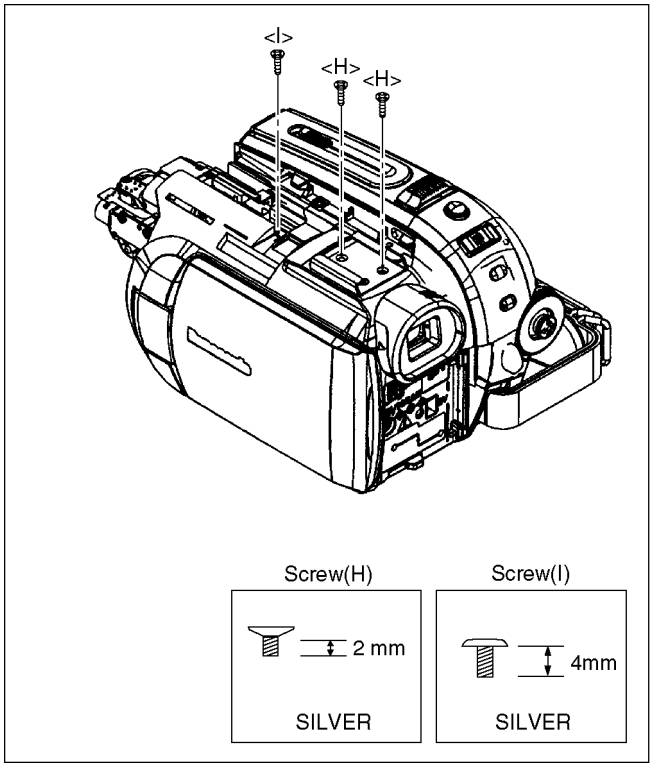


Fig. D8

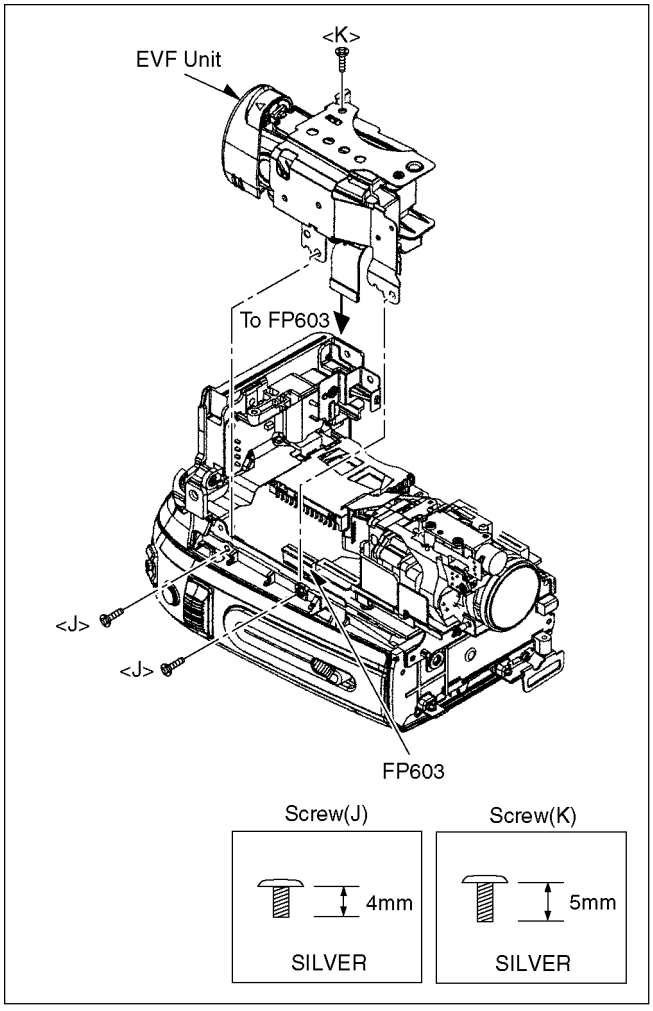


Fig. D10

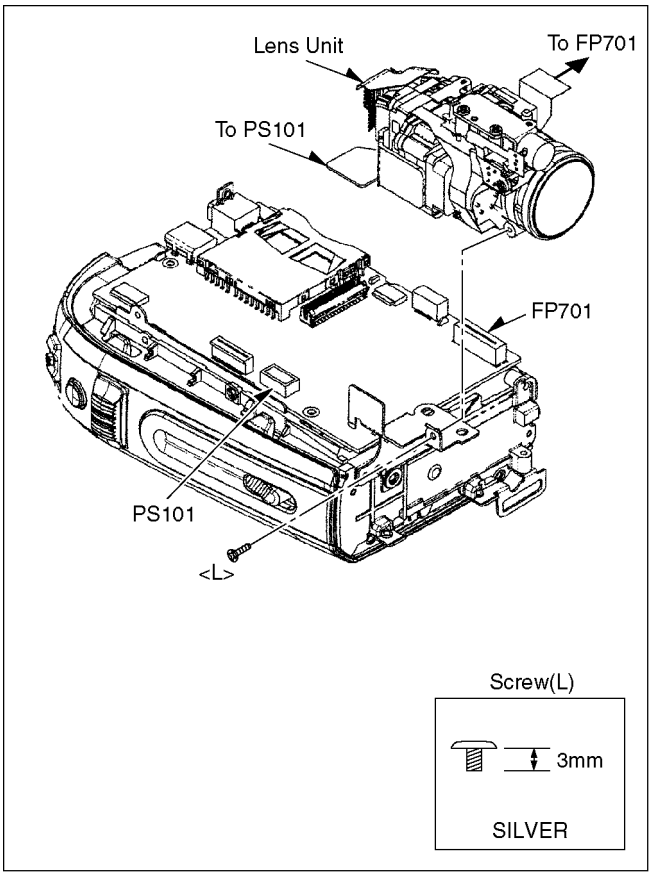


Fig. D11

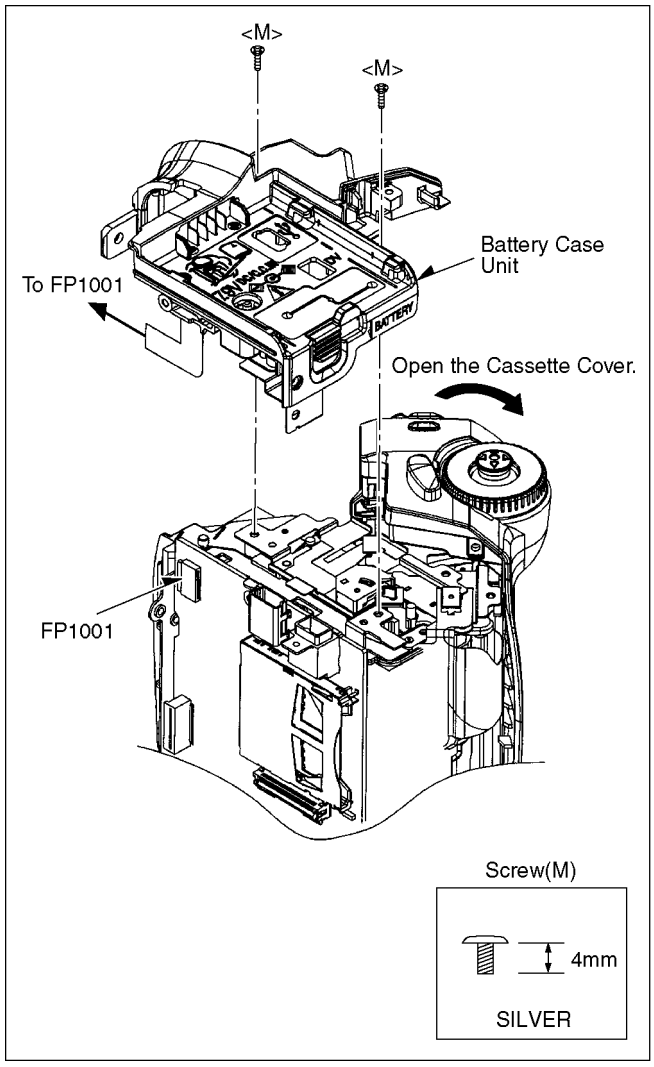


Fig. D12

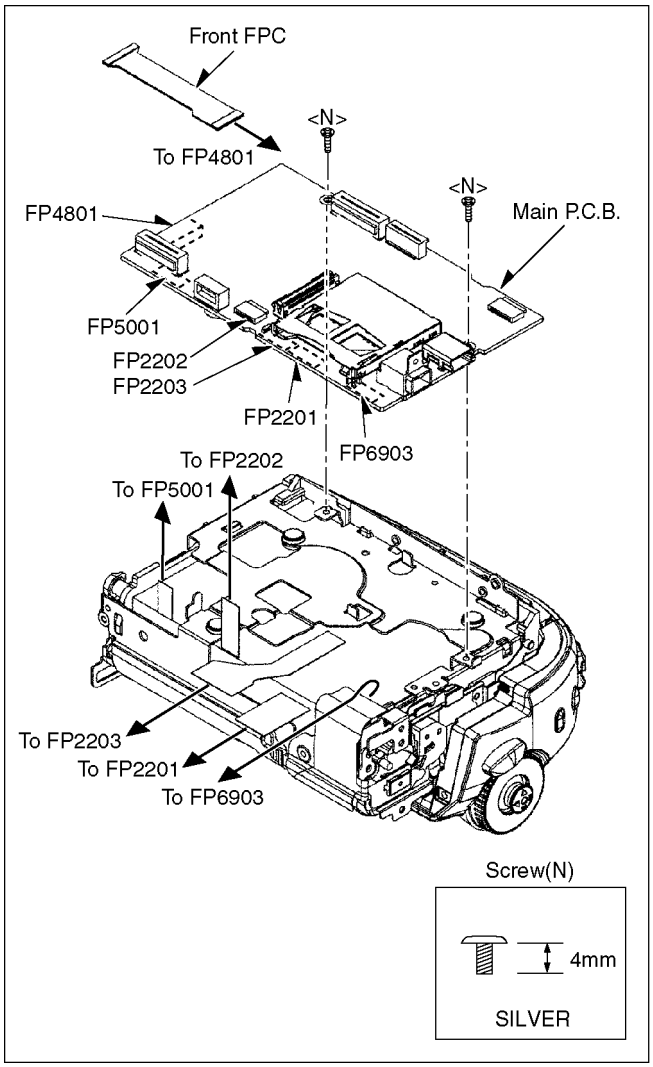


Fig. D13

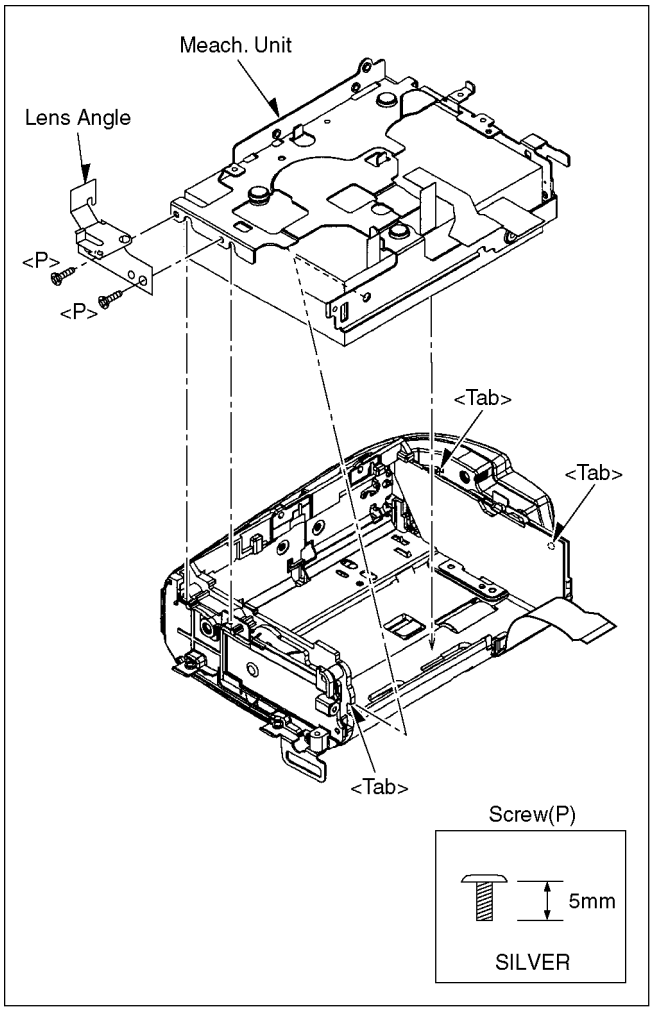


Fig. D15

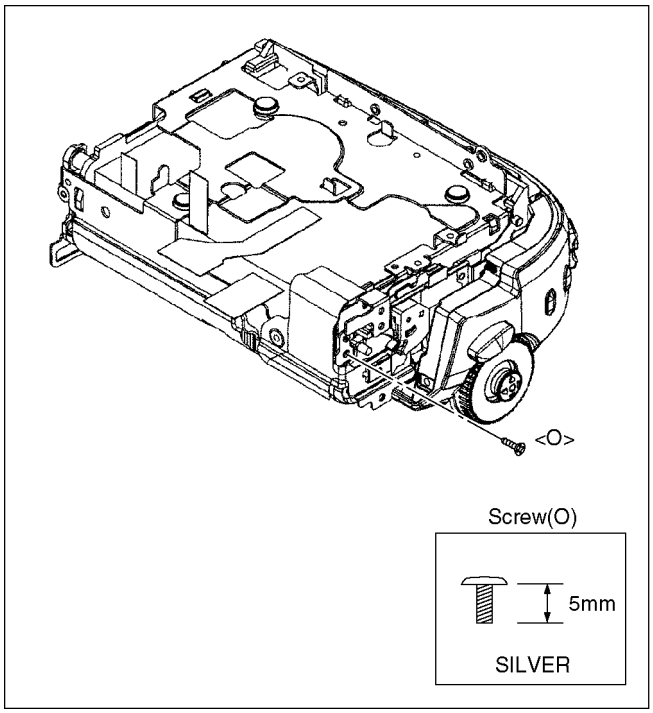


Fig. D14

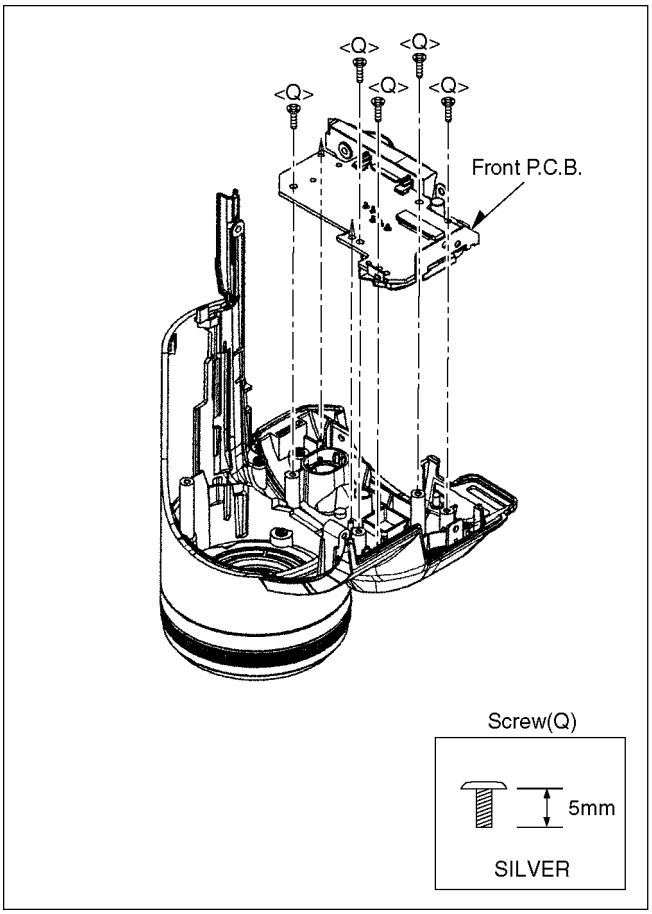


Fig. D16

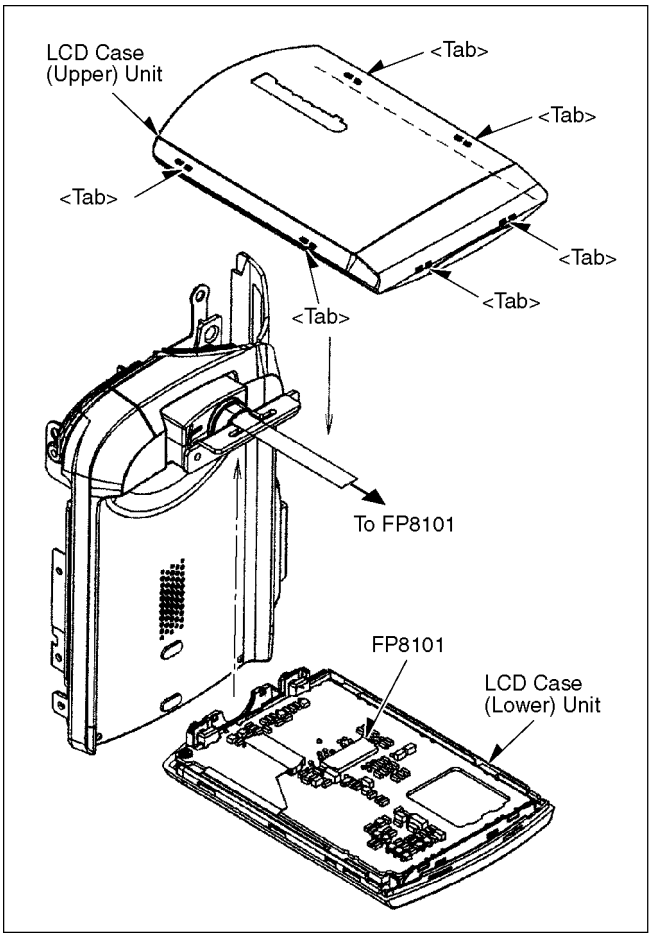


Fig. D18

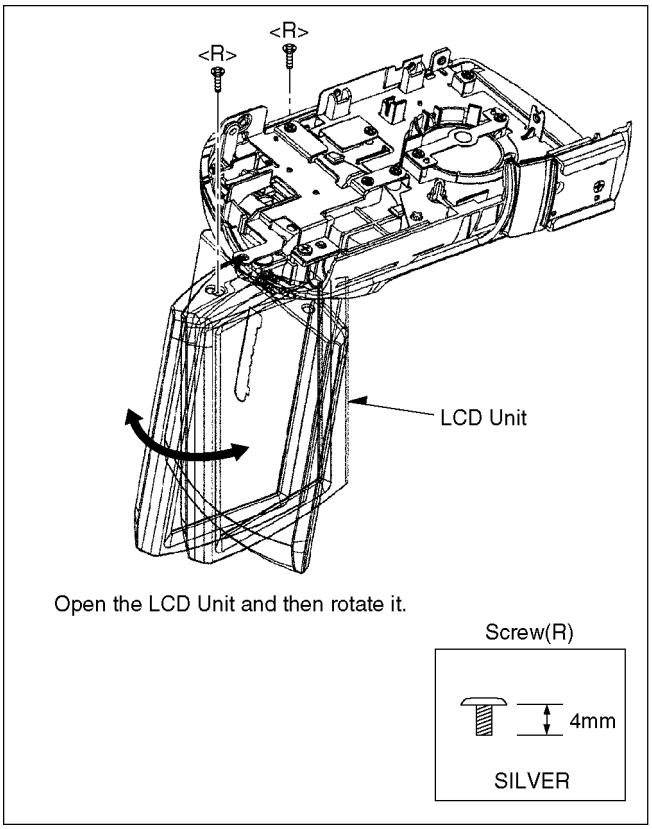


Fig. D17

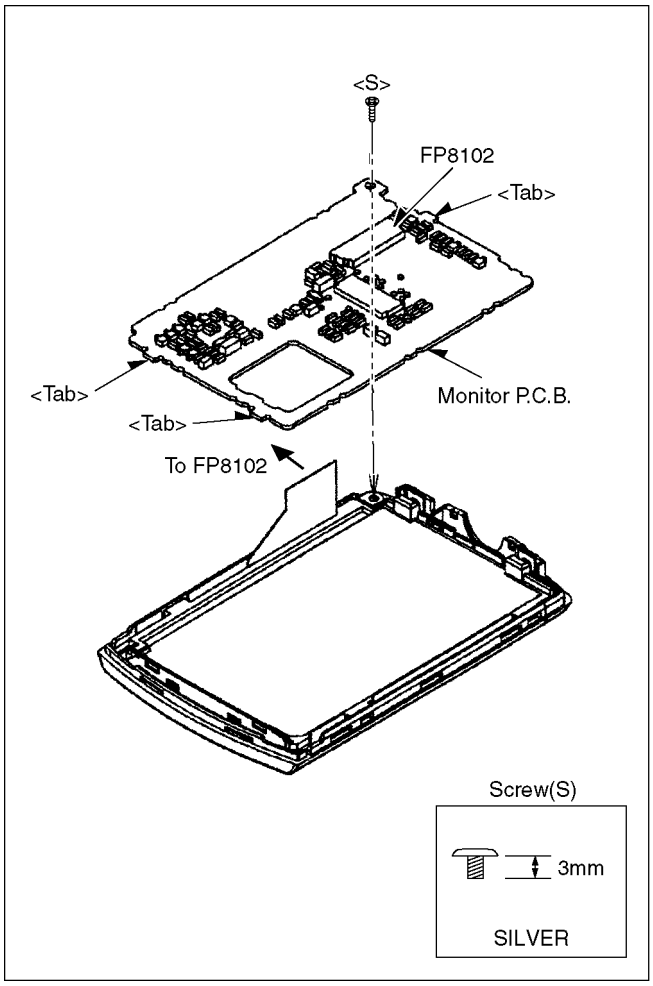


Fig. D19

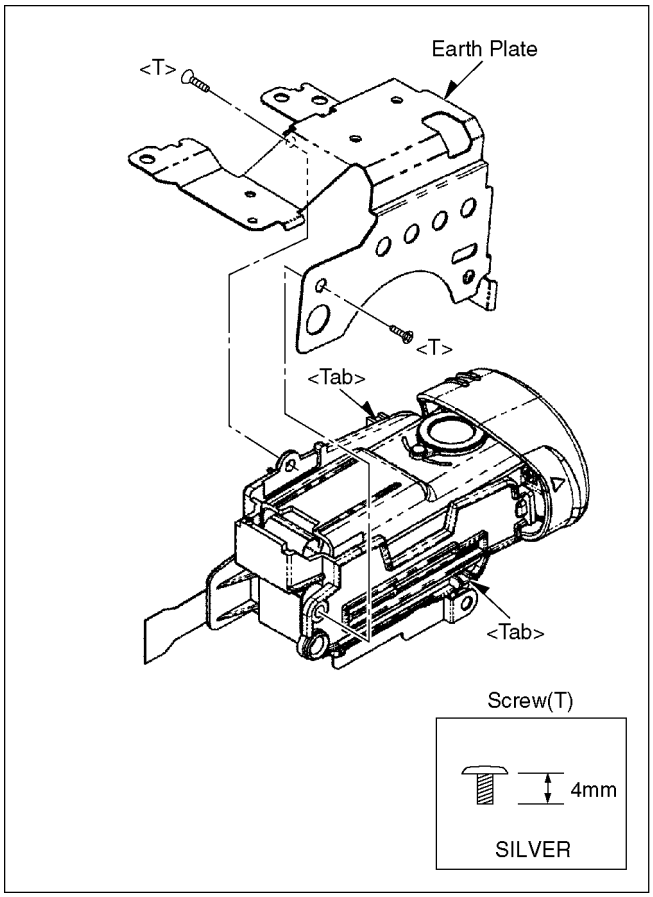


Fig. D20

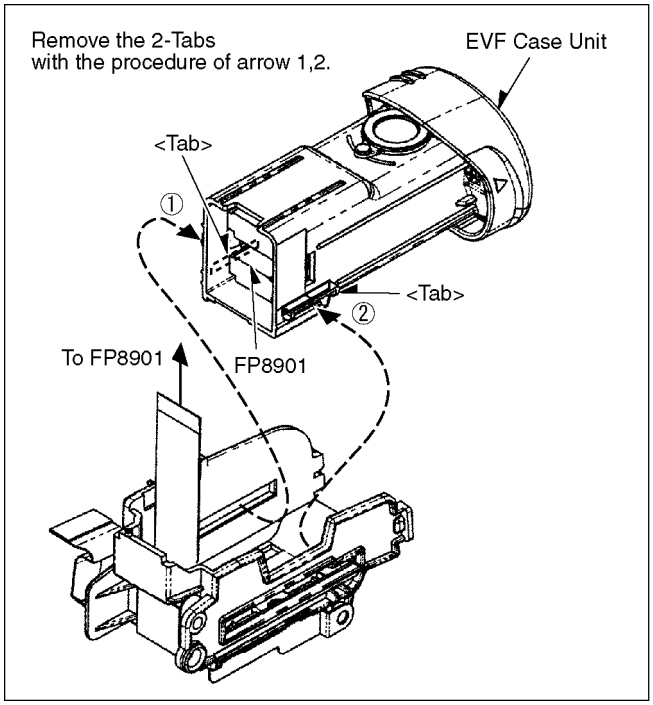


Fig. D21

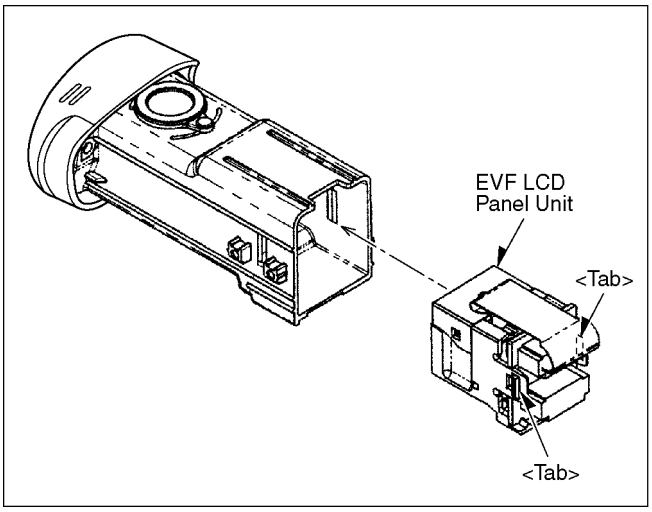


Fig. D22

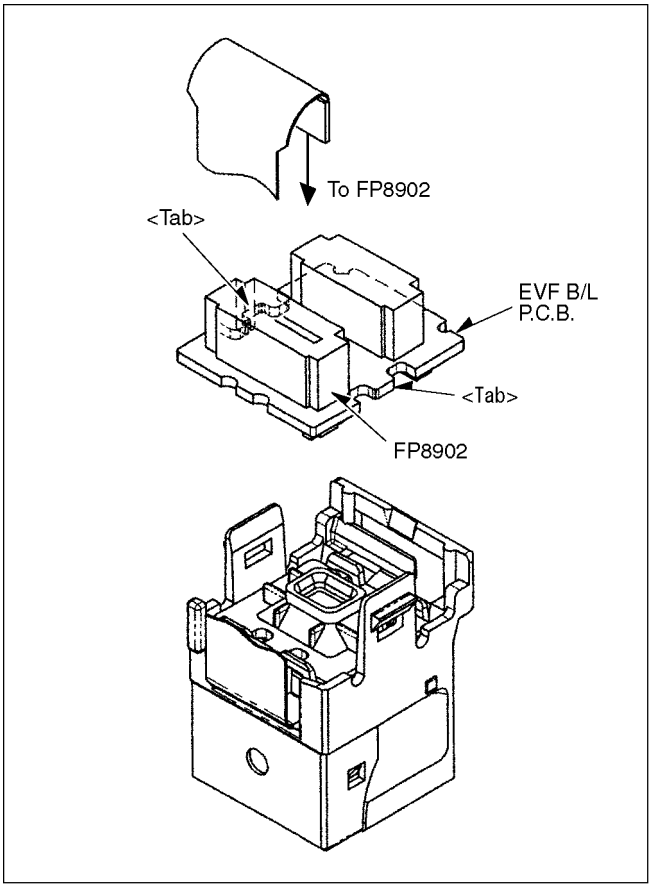


Fig. D23

8.4. Disassembly Procedures Mecha. Unit

Flow-Chart for Disassembly Procedure

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	Raise the Cassette Up Unit while pushing 2 ridbs. Remove the Cassette Up Unit from rail department.
2	Cylinder Unit	Fig.M3	1-Screw (A)
		Fig.M4	3-Screw (B) Cylinder Unit

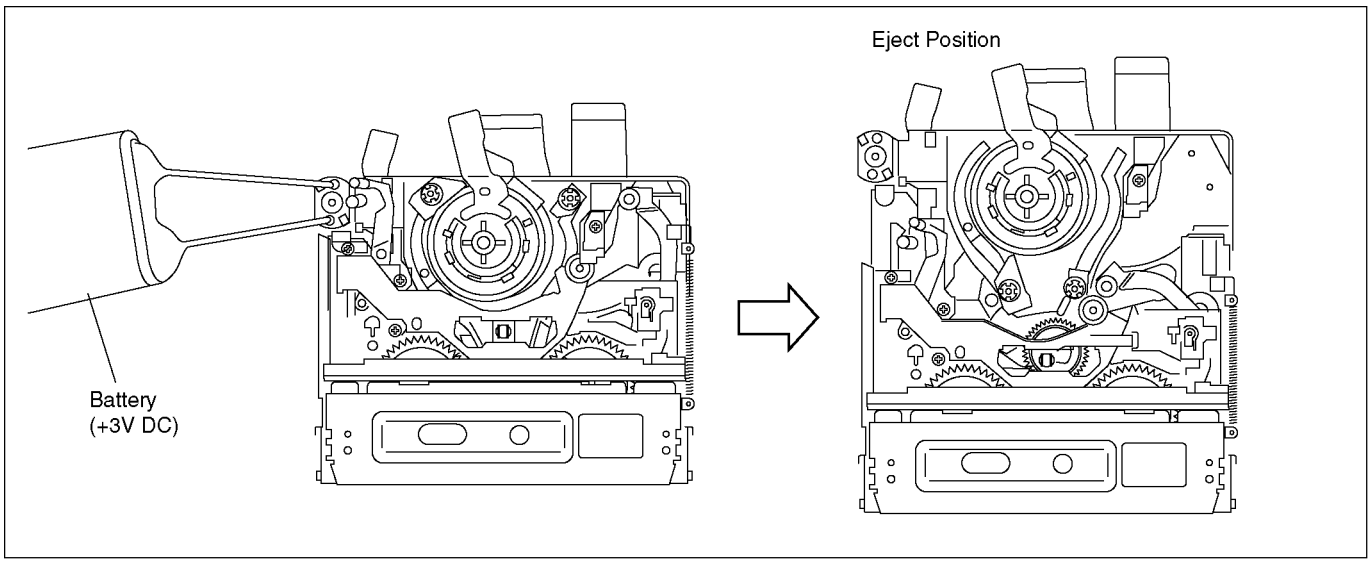


Fig. M1

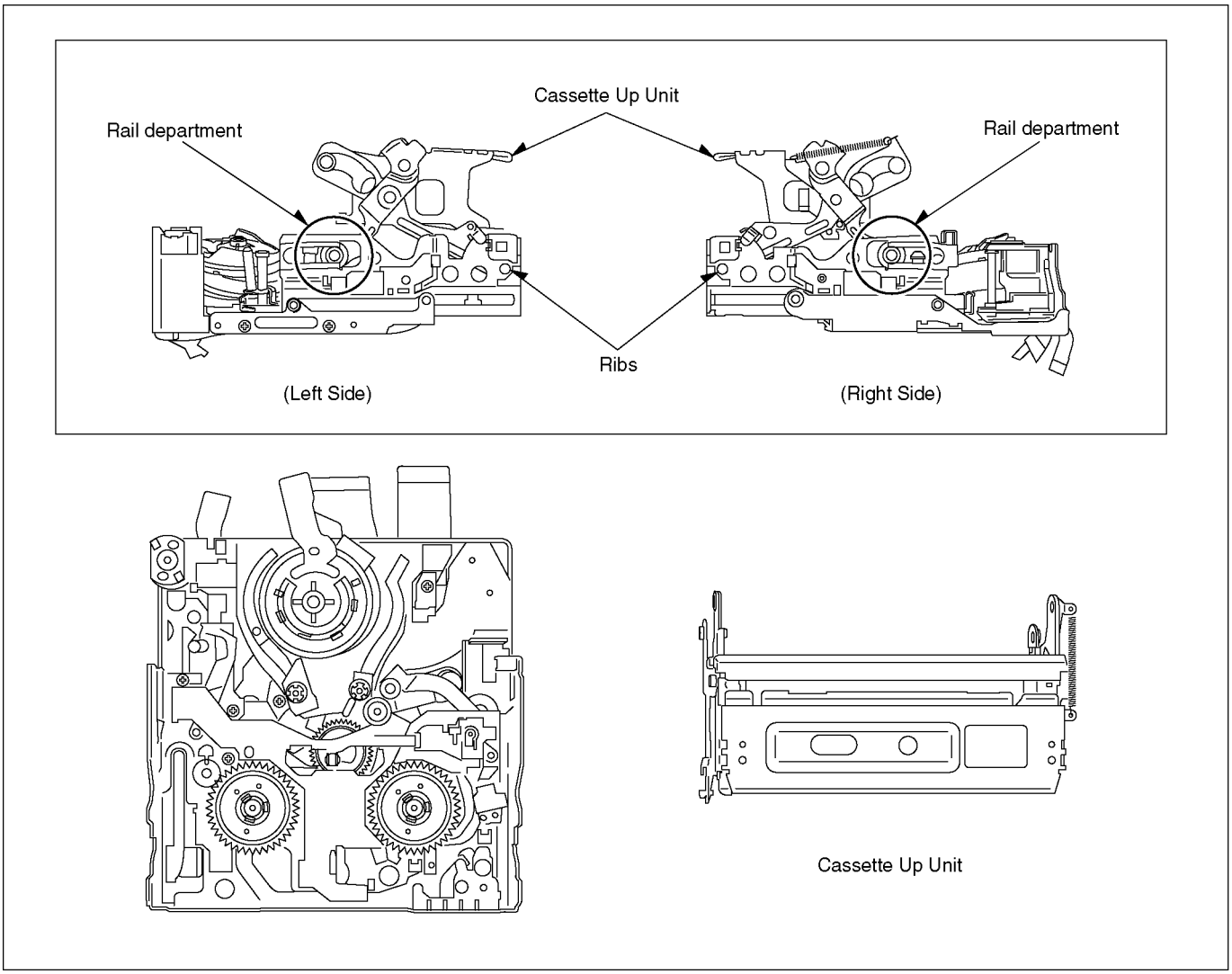

Cassette Up Unit
Rail department
Rail department
Ribs
(Left Side)
(Right Side)
Cassette Up Unit

Fig. M2

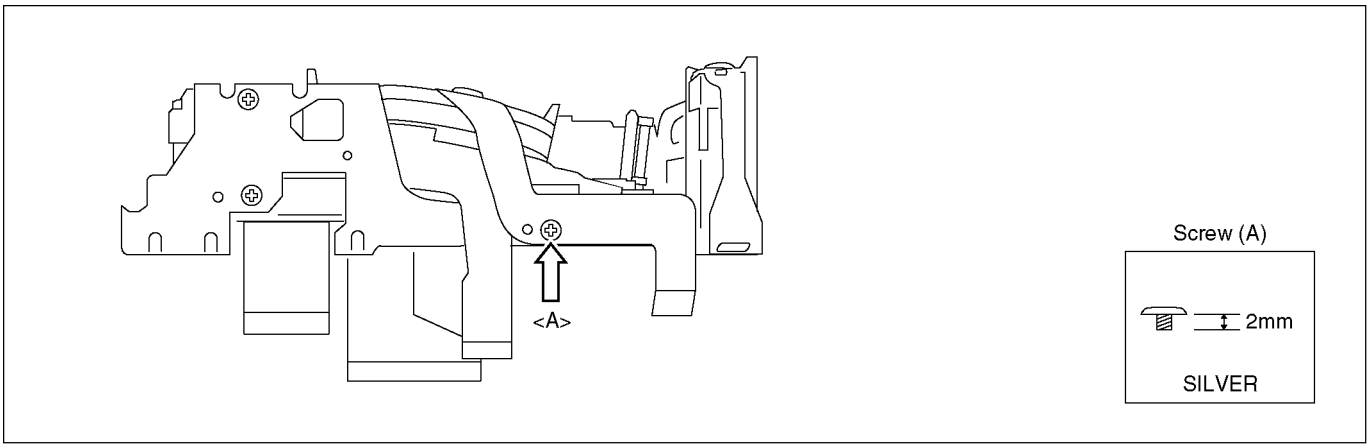

<A>
Screw (A)
2mm
SILVER

Fig. M3

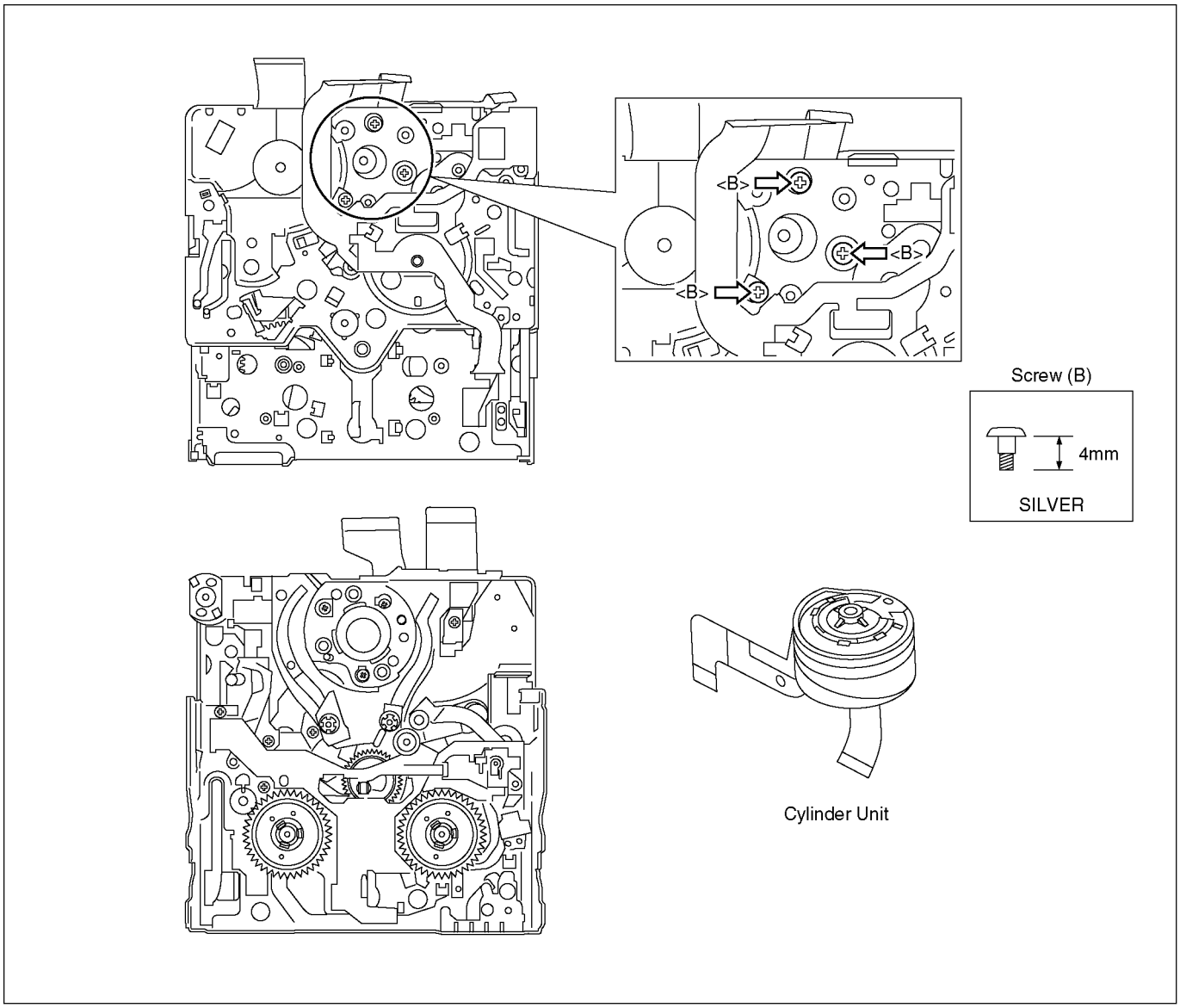


Fig. M4

8.5. 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.

1. Prism Unit	Ref.-No.301
2. Optical Filter	Ref.-No.302
3. IRIS Unit	Ref.-No.304-3
4. Focus Motor Unit	Ref.-No.304-10
5. Master Flange Unit	Ref.-No.304-8
6. 4th Lens Frame Move Unit	Ref.-No.304-5
7. OIS Unit	Ref.-No.304-13
8. 2nd Lens Frame Move Unit & Guide Pole	Ref.-No.304-2/304-6/304-7
9. 1st Lens Frame Move Unit & Zoom Motor Unit	Ref.-No.304-1/304-9

Note 1: Each Ref.numbers are equivalent to number of Fig.L2 and Parts List.

Fig. L1

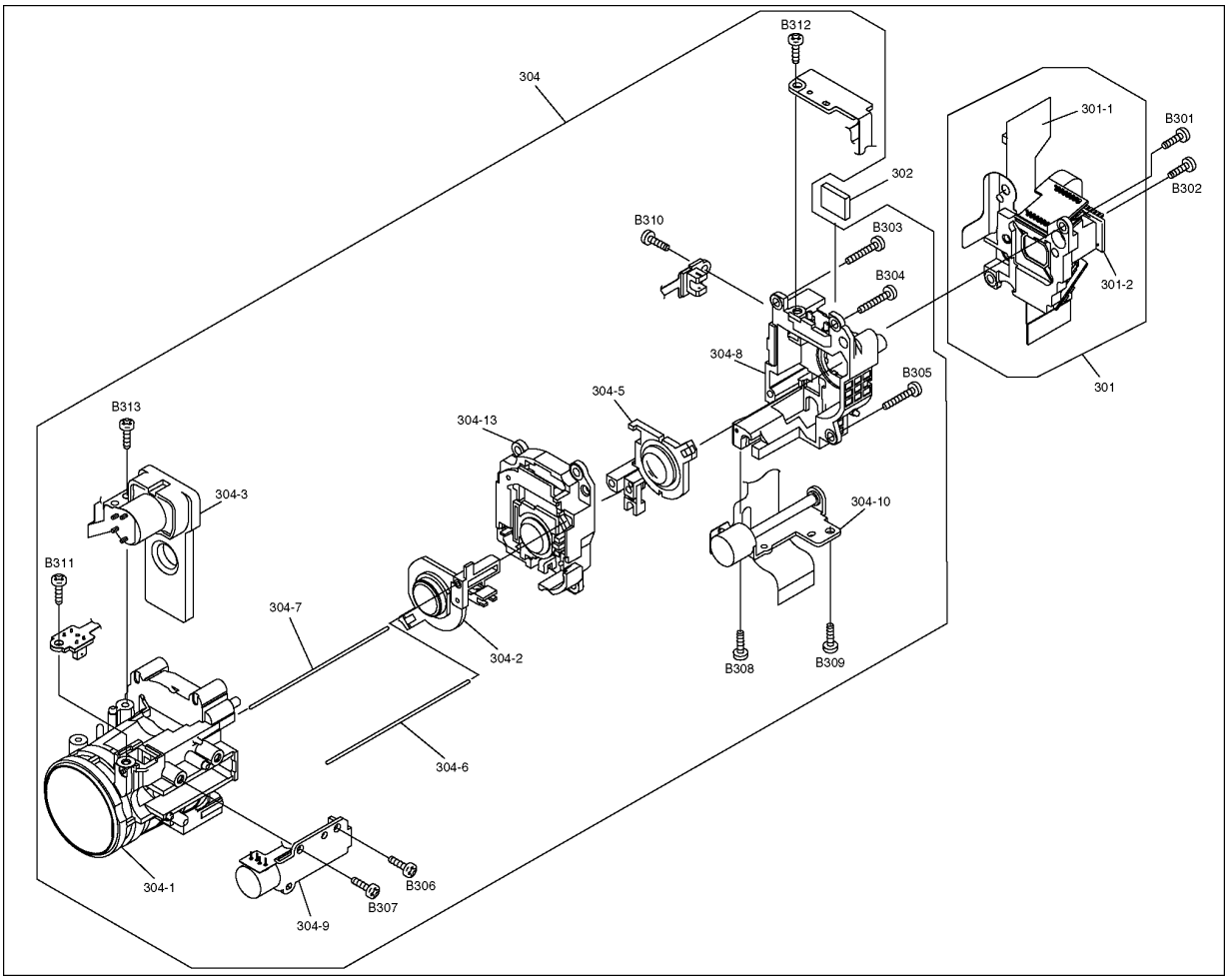


Fig. L2

9 Measurements and Adjustments

9.1. Service Positions

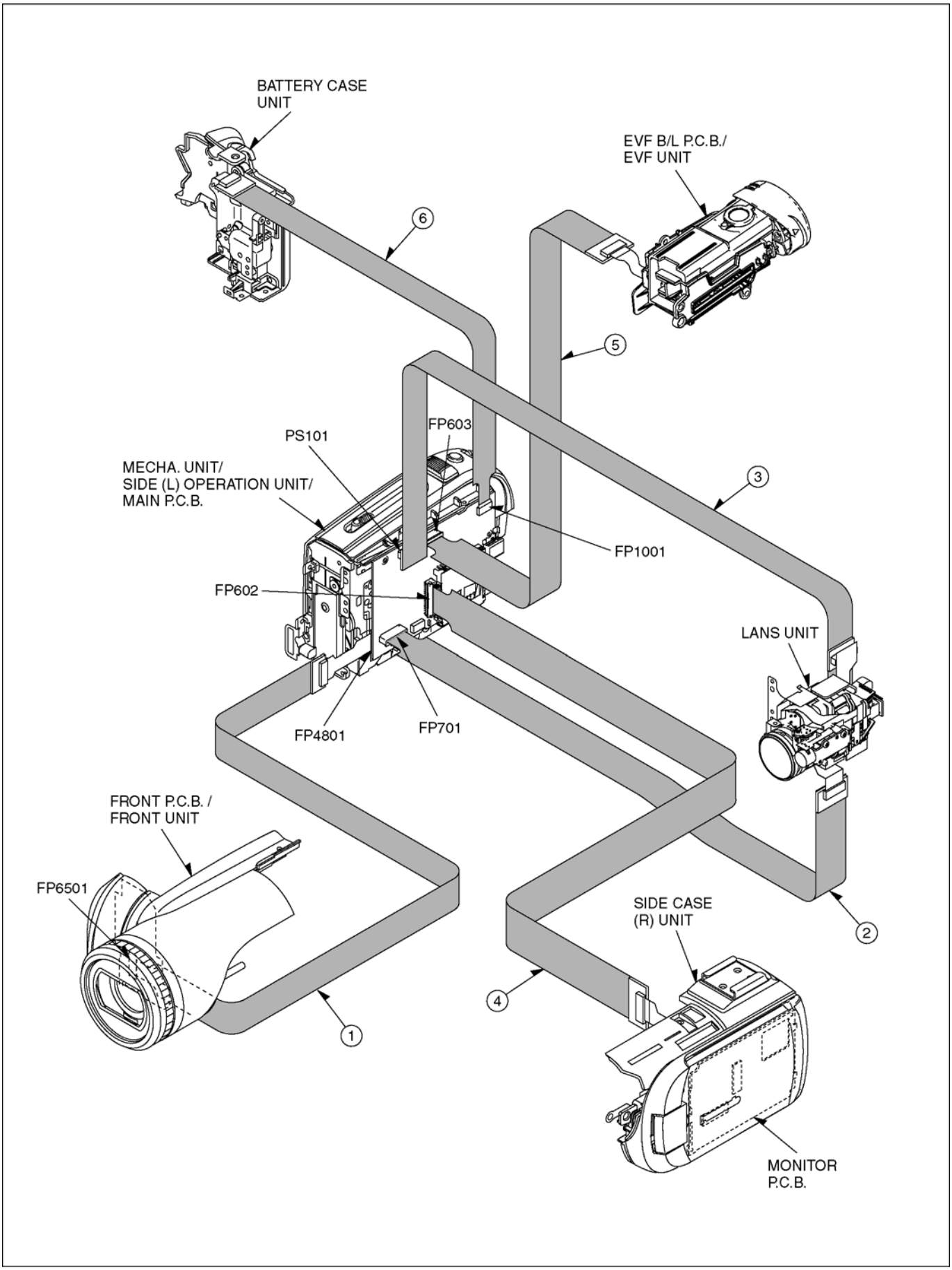
9.1.1. List of the extension cables

Use the following extension cables when checking or adjusting individual circuit boards except module Parts (Main P.C.B.).

Ref.	Part No.	Pin	Part Name	Connection	Q'ty	Remarks
(1)	VFK1282	22	Flat Cable	FP4801 (Main) - FP6501 (Front)	1	as NV-DP1
(2)	VFK1575C3320	33	Flat Cable	FP701 (Main) - Lens Unit	1	as NV-GS200
(3)	VFK1895	40	Flat Cable	PS101 (Main) - Prism Unit	1	as SV-AV50
(4)	VFK1174	30	Flat Cable	FP602 (Main) - FP902 (Monitor)	1	as NV-DS7
(5)	VFK1443	18	Flat Cable	FP603 (Main) - FP8901 (EVF)	1	as NV-DS7
(6)	VFK1388	12	Flat Cable	FP1001 (Main) - Battery Case Unit	1	as NV-DS5

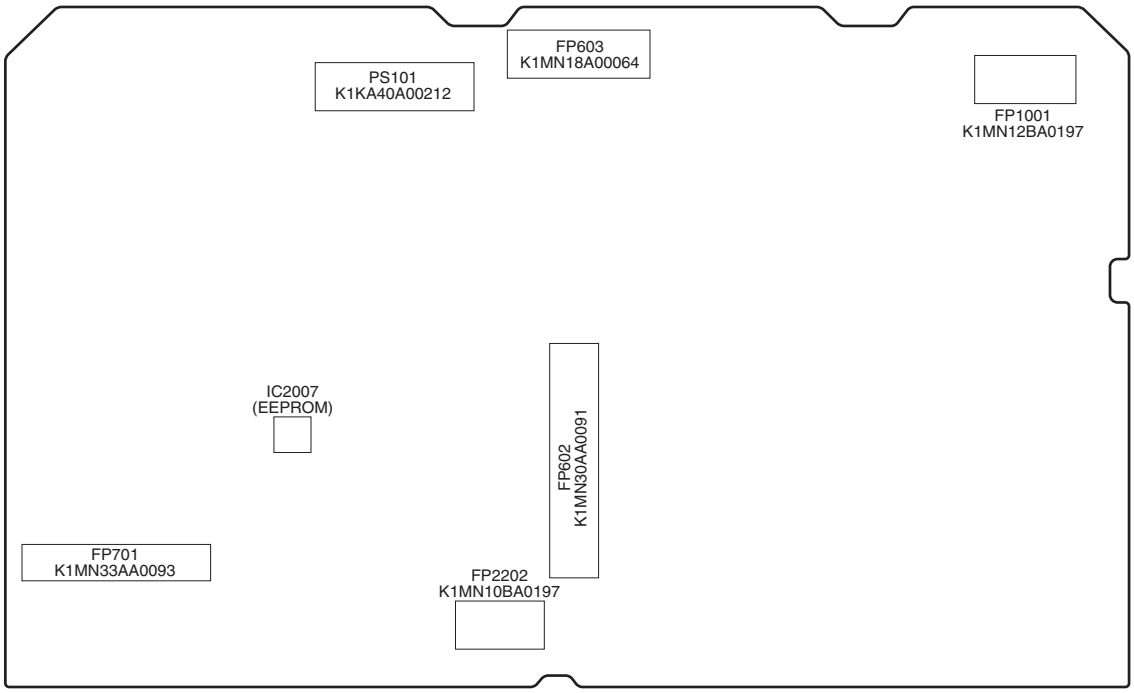
9.1.2. Checking and repairing individual circuit boards except module parts (Main P.C.B.)

How to use extension cables.

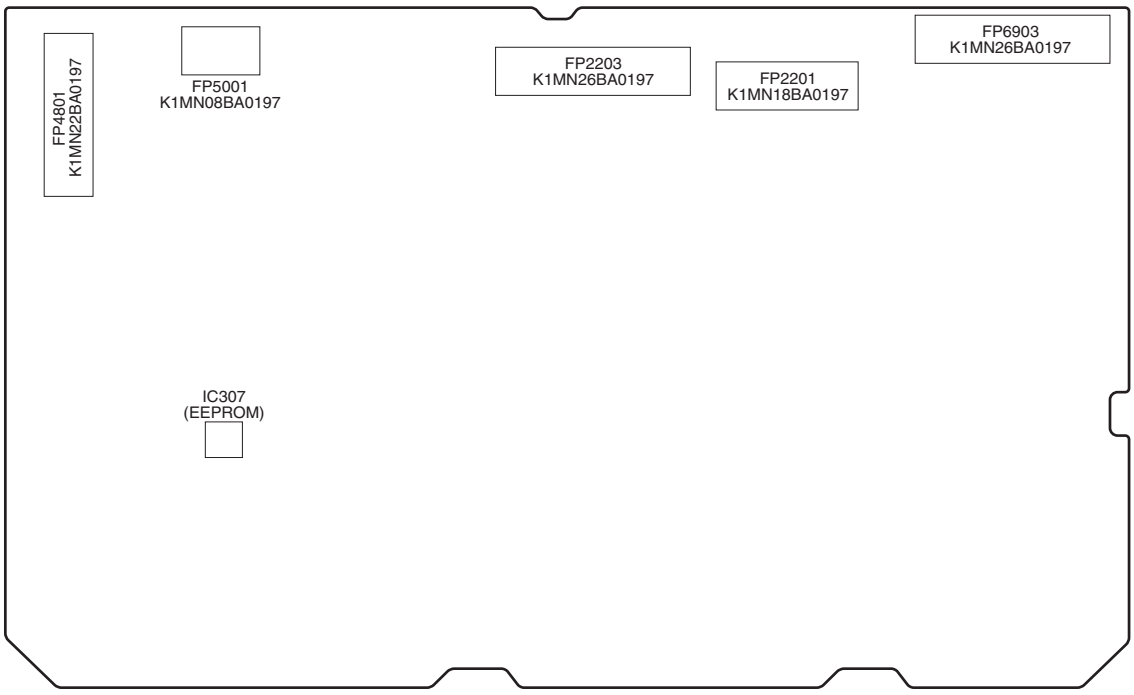


9.2. Location for Connectors of the Main P.C.B.

9.2.1. Main P.C.B.



(COMPONENT SIDE)



(FOIL SIDE)

9.3. Electrical Adjustment Procedures

9.3.1. Computer assisted adjustment system <TATSUJIN> adjustment

This unit employs the computer assisted system named; TATSUJIN PC-Adjustment for Electrical adjustment.
It is required to install a USB driver for service which can be download only from TSN-WEB.

9.3.2. Set-up manual for DV-Camcorder.

Pay attention, because the adjustment method is different from this machine.

1. Save the software
   Install the effective model's TATSUJIN Software to PC: Personal Computer.
2. Set-Up
   a. It need the connection between the PC and this unit with USB cable.
   b. Connect the PC and DV Camcoder as shown in Fig. E1 and E2.
   c. The adjustment instruction is available at Software download on the Support Information from NWBG-PAVC web-site in TSN System, together with maintenance software.

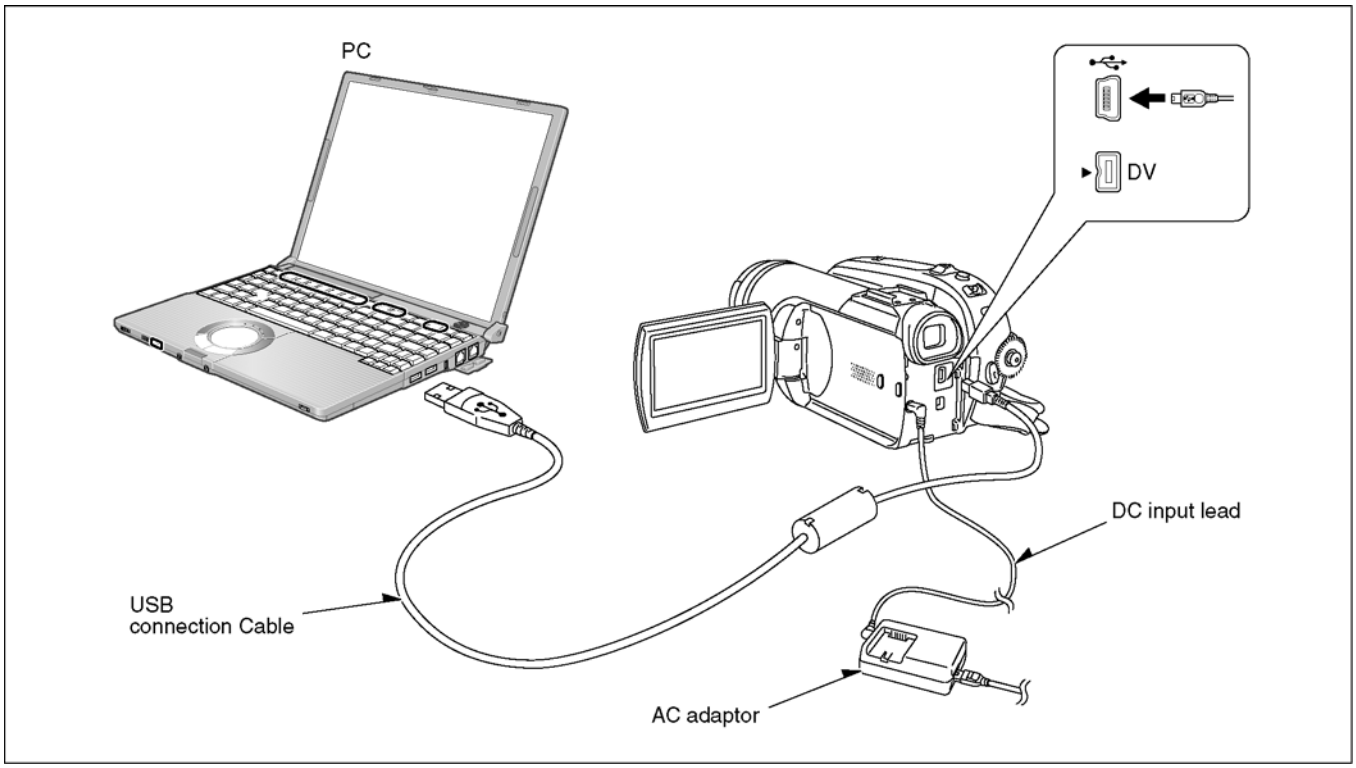


Fig. E1

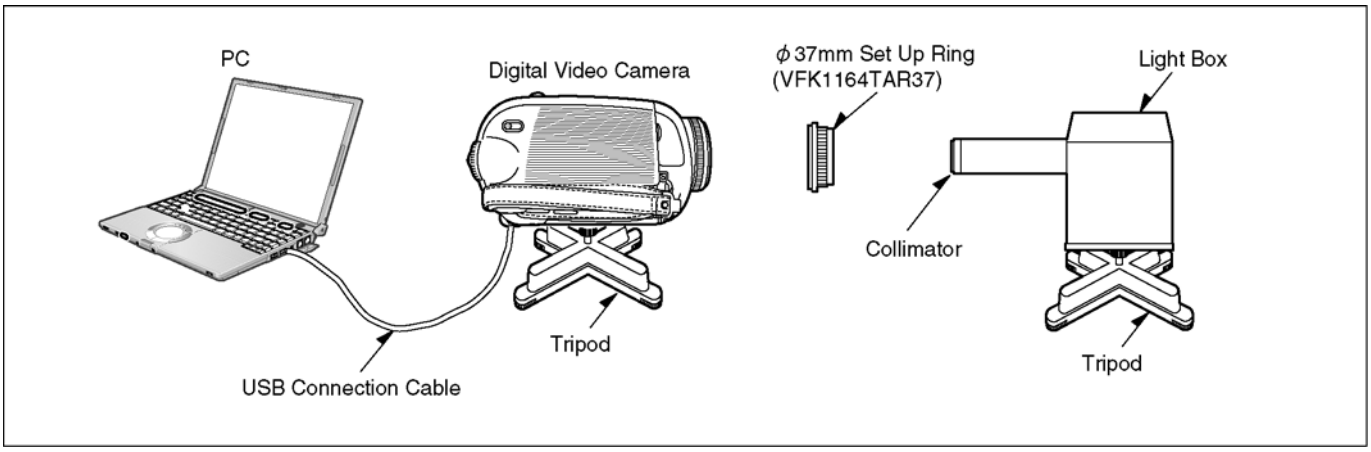


Fig. E2 Rough image of set-up connection

Ref	Parts Name	Parts No.	Q'ty	Remarks
1	Personal Computer	---	1	With Tatsujin Software.
2	AC Adaptor	---	1	The AC Adaptor for DV Camcorder.
3	DC Cable	---	1	The AC Adaptor for DV Camcorder.
4	AV Multi Cable	---	1	
5	USB Cable	---	1	
6	Step Up Ring	VFK1164TAR37	1	For Collimator 37mm
7	TATSUJIN PC-Adjustment Program	VF0D2004DV30	1	

9.3.3. 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-GS320 Series]

Fig. E3-1

   The main menu display will be displayed.
3. Select the desired model.
4. Turn on the camcorder. Then, click Start.

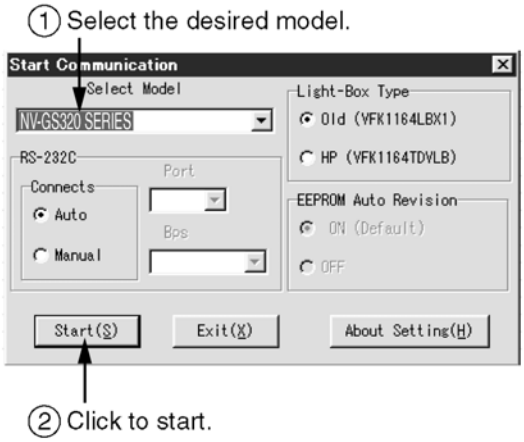


Fig. E3-2

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

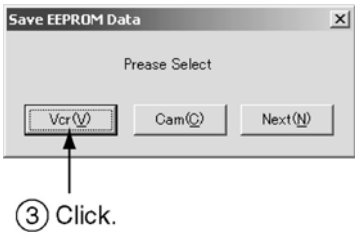


Fig. E3-3

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.

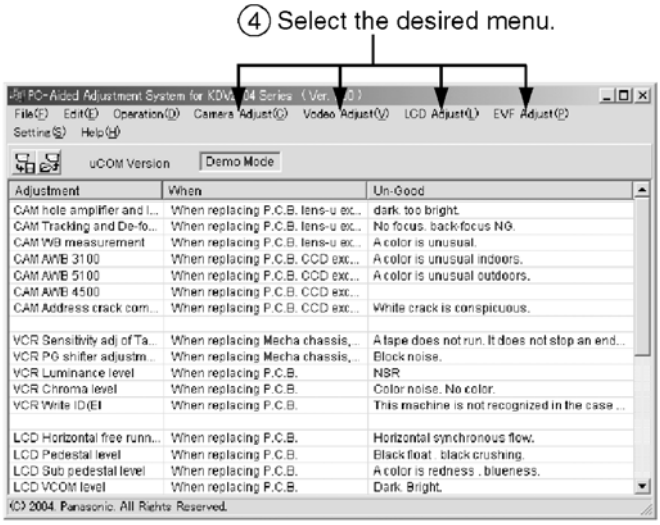


Fig. E3-4

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.

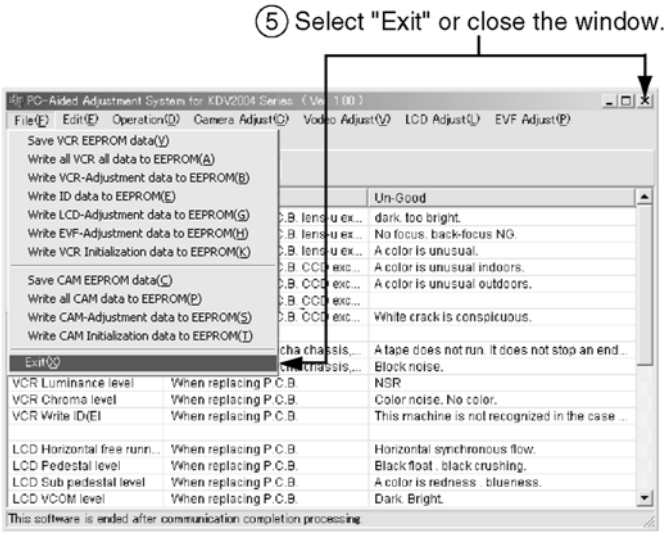


Fig. E3-5

9.3.4. 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		Main P.C.B.	IC307 (EEPROM)	IC2007 (EEPROM)	Lens Unit	Prism Unit	Iris Unit	4th Lens Frame Unit	Cylinder Unit	Main Chassis Unit	
Camera	CAM hole amplifier / Iris PWM	○	○		○	○	○				
	CAM Tracking and De-focus	○	○	○	○	○	○	○			
	CAM Revision CCD scratch	○	○			○					
	CAM AWB adjustment	○	○			○					
Video	VCR Sensitivity ADJ. of Tape sensors	○		○						○	
	VCR PG shifter adjustment	○		○					○	○	
	VCR Luminance level	○		○							

Note : ○ : Adjustment Item

9.4. Mechanical Adjustment Procedures

9.4.1. Adjustment item

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

9.4.2. Adjustment procedures

Pay attention, because the adjustment method is different from this machine.

lLinearlty adjustment & BER value confirmation

1. Remove the 6 Screws (A), 1 Screw (B) and remove the Botton Case Unit as shown in Fig. D1.
2. The enbelope detection spcial tool board (VFK1641) is connected to this machine as shown in Fig. D2 and D3.
   Note:
   Be careful not to damage when the Passive Probe is connectied to the connection terminal of Main P.C.B..
   It exists the possibility of the damage.
3. The enbelope detection spcial tool board is connected to oscilloscope as shown in Fig. D2 and D3.
   Connect the AV Jack of this machine and the oscilloscope by using the Multi cable.
4. The post is adjusted with the post driver(VFK1899) so that recycles the normal tape which recorded NTSC signal and the detection wave-link become a flat as shown in Fig. D4.
   *At the time of the clyinder unit exchange unnecessary.
5. The post is adjusted with the post driver so that recycles a alignment tape(VFM3110EDS) and the detection wave-link become a flat once again.
6. Recycling the tape that video-taped it wirh this machine after adjustment, the BER value is confirmed withthe item of the BER the item of the BER confirmation of expert soft inside.

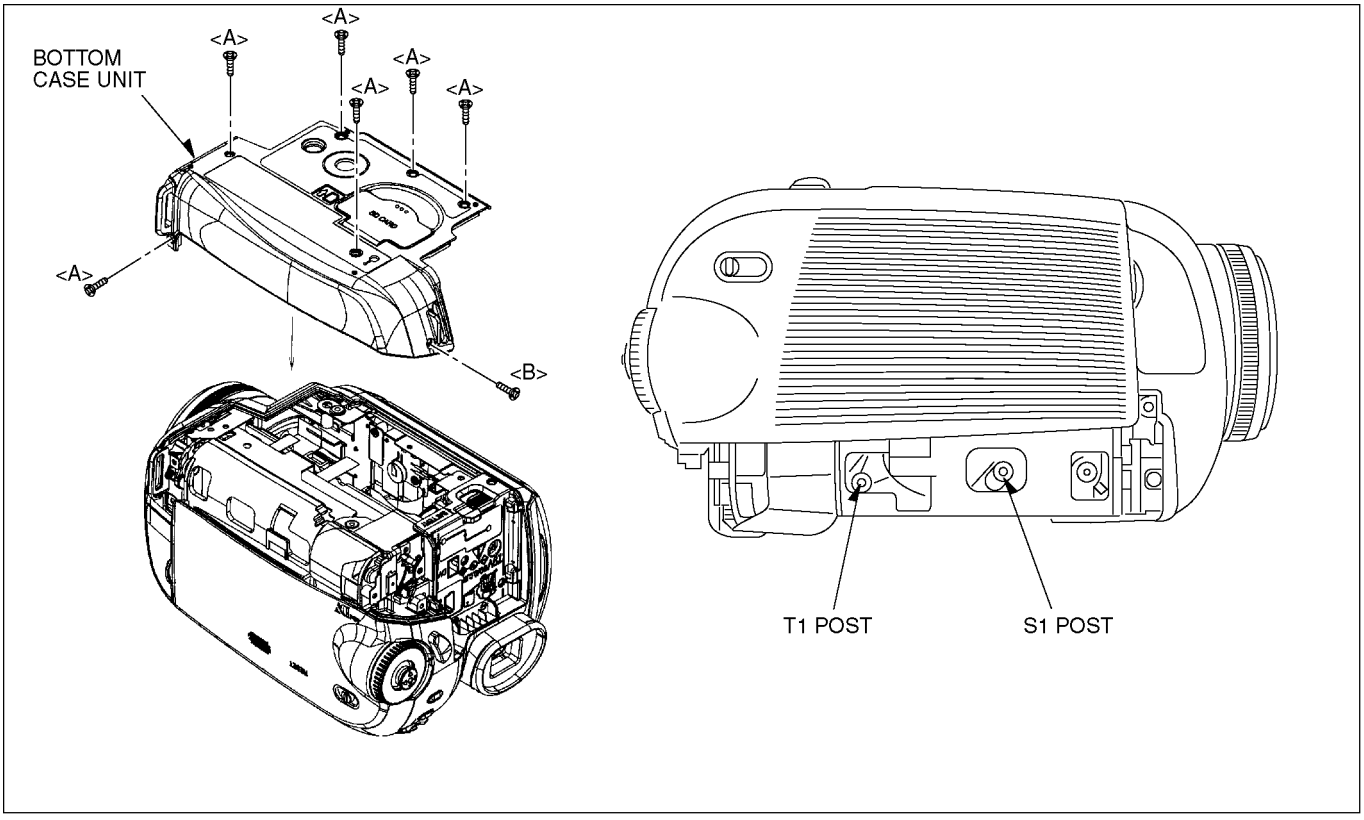


Fig. D1

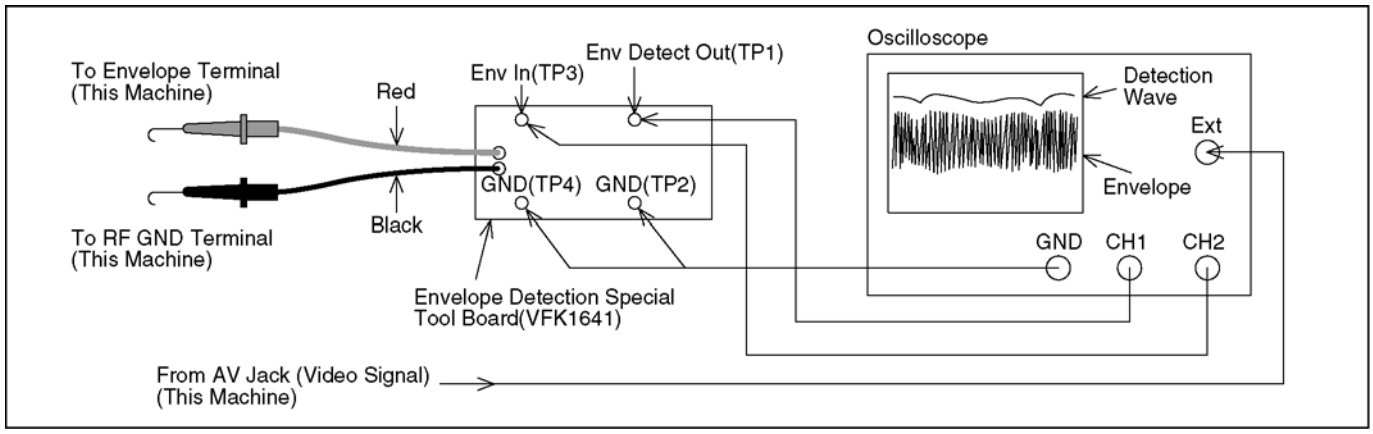


Fig. D2

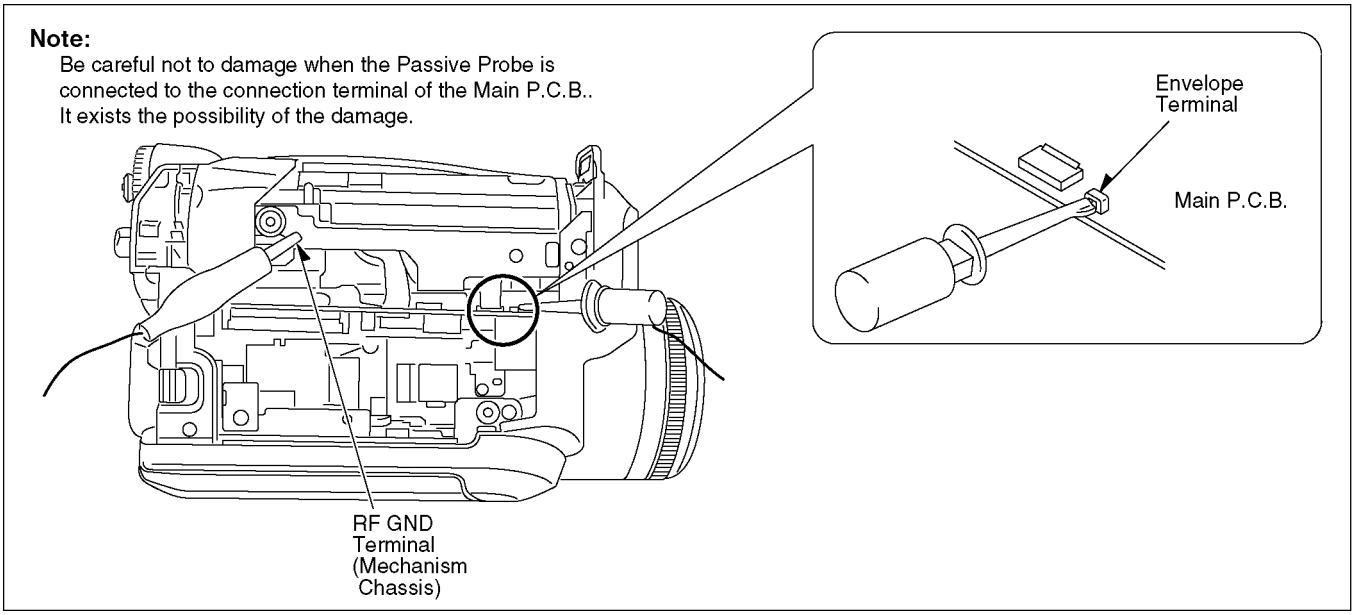


Fig. D3

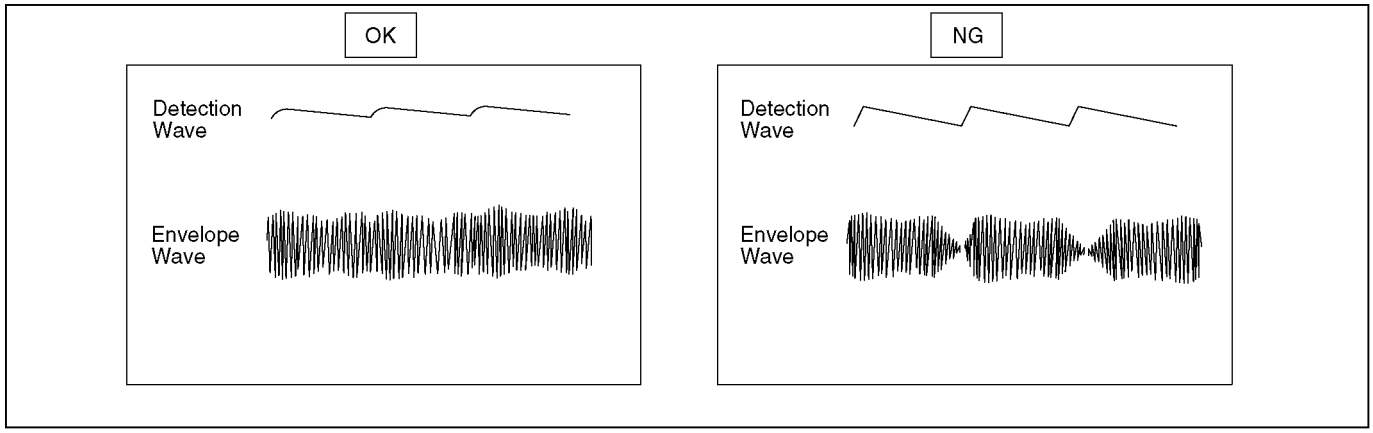


Fig. D4

10 Maintenace

10.1. Cleaning Lens, Viewfinder and LCD Panel

Do not touch the surface of lens, Viewfinder and LCD Panel with your hand.
When cleaning the lens, use air-Blower to blow off the dust.
When cleaning the LCD Panel, dampen the lens cleaning paper with lens cleaner, and the gently wipe the their surface.

Note:

A lens cleaning paper and lens cleaner are available at local camera shops and market place.

VM0701006CE

Service Manual

Diagrams and Replacement Parts List

Digital Video Camera/Recorder

Model No.

NV-GS320EG	NV-GS320GC
NV-GS320E	NV-GS320GN
NV-GS320EB	NV-GS320SG
NV-GS320EP	NV-GS320PL
NV-GS320EE	NV-GS320GT
NV-GS320EF	NV-GS328GK
NV-GS320EK	

Vol. 1
Colour
(S).....Silver Type

Table of contents

S1. About Indication of The Schematic Diagram S-1
S1.1. Important Safety Notice S-1

S2. Voltage Chart S-2
S2.1. Monitor P.C.B. S-2
S2.2. Front P.C.B. S-2
S2.3. EVF P.C.B. S-2

S3. Block Diagram S-3
S3.1. Overall Block Diagram S-3

S4. Schematic Diagram S-4
S4.1. Interconnection Diagram S-4
S4.2. Monitor Schematic Diagram S-5
S4.3. Front Schematic Diagram S-6
S4.4. EVF Schematic Diagram S-7
S4.5. CCD Flex Schematic Diagram S-8

S5. Print Circuit Board S-9
S5.1. Monitor P.C.B. S-9
S5.2. Front P.C.B. S-10
S5.3. EVF P.C.B. S-10
S5.4. CCD Flex P.C.B. S-11

S6. Replacement Parts List S-13

S7. Exploded View S-19
S7.1. Frame and Casing Section (1) S-19
S7.2. Frame and Casing Section (2) S-20
S7.3. LCD Section S-21
S7.4. Camera Lens Section S-22
S7.5. Video Mechanism Section S-23
S7.6. Packing Parts and Accessories Section S-24

S1. About Indication of The Schematic Diagram

S1.1. 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.

1.Although reference number of the parts is indicated on the P.C.B. drawing and/or schematic diagrams, it is NOT mounted on the P.C.B. when it is displayed with "$" mark.

2.It is only the "Test Round" and no terminal (Pin) is available on the P.C.B. when the TP (Test Point) indicated as "●" mark.

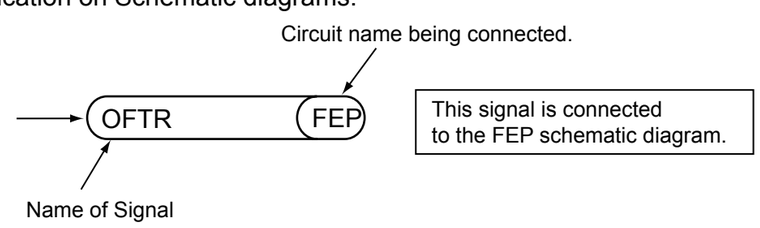
3.The voltage being indicated on the schematic diagram is measured in "Standard-Playback" mode when there is no specify mode is mentioned.

4.Although the voltage and waveform available on here is measured with standard frame, it may be differ from actual measurement due to modification of circuit and so on.

5.The voltage being indicated here may be include observational-error (deviation) due to internal-resistance and/or reactance of equipment. Therefore, handle the value indicated on here as reference.

6.Use the parts number indicated on the Replacement Parts List .

7.Indication on Schematic diagrams:



S2. Voltage Chart

Note) Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.
Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

S2.1. Monitor P.C.B.

REFNO	PINNO	REC	PB	EE
Q8101	E	0.3	0.3	0.3
Q8101	C	1.4	1.4	1.4
Q8101	B	1.1	1.1	1.4
Q8102	E	0.3	0.3	0.3
Q8102	C	1.4	1.4	1.4
Q8102	B	1.1	1.1	1.1
Q8104	E	0.3	0.3	0.32
Q8104	C	1.4	1.4	1.4
Q8104	B	1.1	1.1	1.1
Q8105	E	0.3	0.3	0.3
Q8105	C	1.4	1.4	1.4
Q8105	B	1.1	1.1	1.1
Q8107	E	1.4	1.4	1.4
Q8107	C	0	0	0
Q8107	B	0.8	0.8	0.8
Q8108	E	0.3	0.3	0.3
Q8108	C	1.4	1.4	1.4
Q8108	B	1.1	1.1	1.1
Q8112	E	1.1	1.1	1.1
Q8112	C	0	0	0
Q8112	B	0.5	0.5	0.5
Q8113	E	0	0	0
Q8113	C	-5.6	-5.6	-5.6
Q8113	B	0	0	0

S2.2. Front P.C.B.

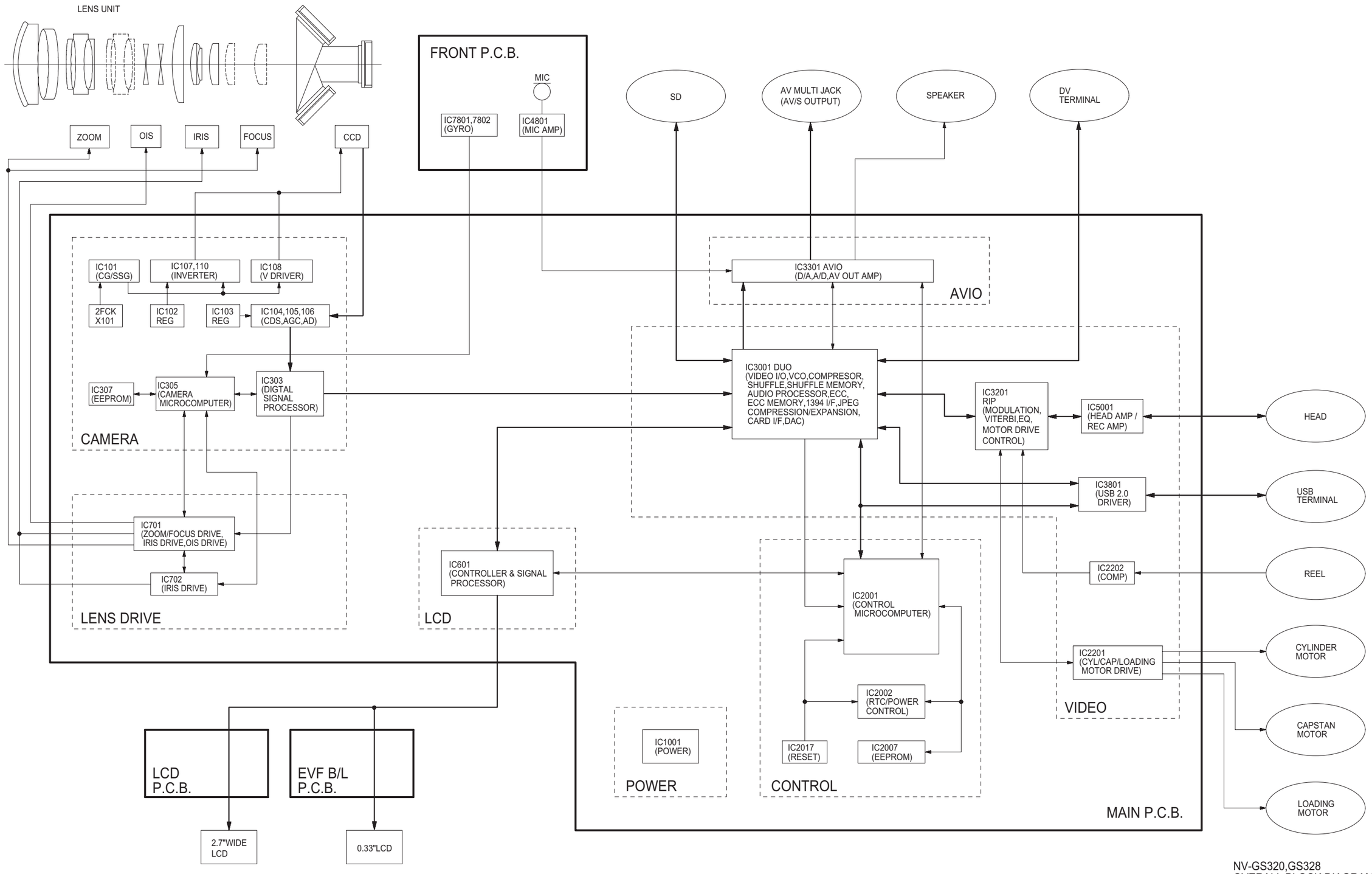
REFNO	PINNO	REC	PB	EE
IC4801	1	2.4	2.4	2.4
IC4801	2	2.4	2.4	2.4
IC4801	3	2.4	2.4	2.4
IC4801	4	0	0	0
IC4801	5	2.4	2.4	2.4
IC4801	6	2.4	2.4	2.4
IC4801	7	2.4	2.4	2.4
IC4801	8	4.9	4.9	4.9
IC7801	1	1.3	1.3	1.3
IC7801	2	0	0	0
IC7801	3	2.9	2.9	2.9
IC7801	4	1.2	1.2	1.2
IC7802	1	1.3	1.3	1.3
IC7802	2	0	0	0
IC7802	3	2.9	2.9	2.9
IC7802	4	1.2	1.2	1.2
IC7803	1	1.4	1.4	1.4
IC7803	2	1.4	1.4	1.4
IC7803	3	1.4	1.4	1.4
IC7803	4	0	0	0
IC7803	5	1.4	1.4	1.4
IC7803	6	1.4	1.4	1.4
IC7803	7	1.4	1.4	1.4
IC7803	8	2.9	2.9	2.9
Q4801	E	4.8	4.8	4.8
Q4801	C	4.9	4.9	4.9
Q4801	B	4.2	4.2	4.2
Q6501	E	3.7	3.7	3.7
Q6501	C	4.9	4.9	4.9
Q6501	B	3.4	3.4	3.4
Q6502	E	3.2	3.2	3.2
Q6502	C	4.9	4.9	4.9
Q6502	B	3.7	3.7	3.7
Q7801	1	1.4	1.4	1.4
Q7801	2	0	0	0
Q7801	3	1.4	1.4	1.4
Q7801	4	1.4	1.4	1.4
Q7801	5	0	0	0
Q7801	6	1.4	1.4	1.4

S2.3. EVF P.C.B.

REFNO	PINNO	REC	PB	EE
Q8901	E	0.6	0.6	0.6
Q8901	C	1.7	1.7	1.7
Q8901	B	1.2	1.2	1.2

S3. Block Diagram

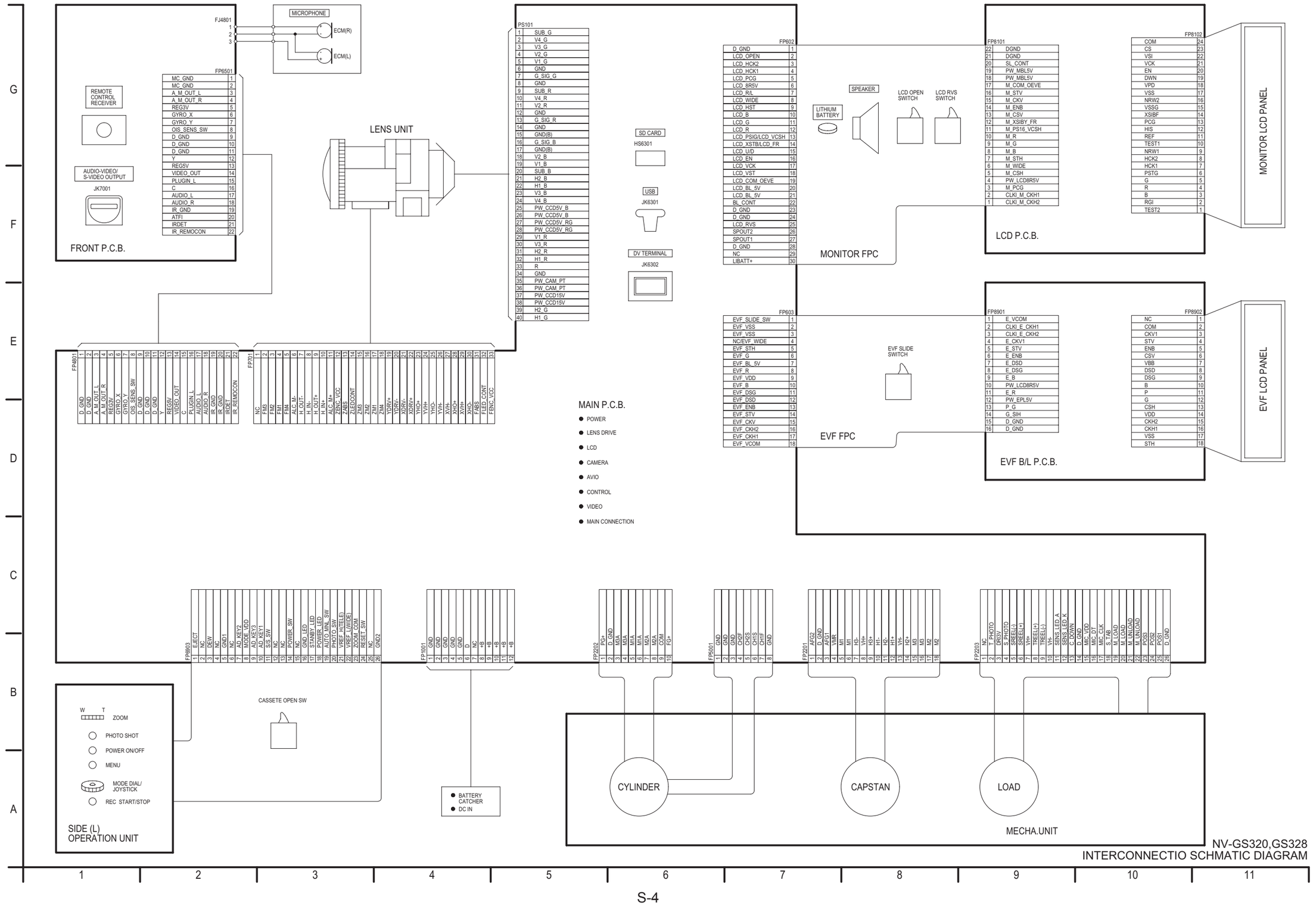
S3.1. Overall Block Diagram



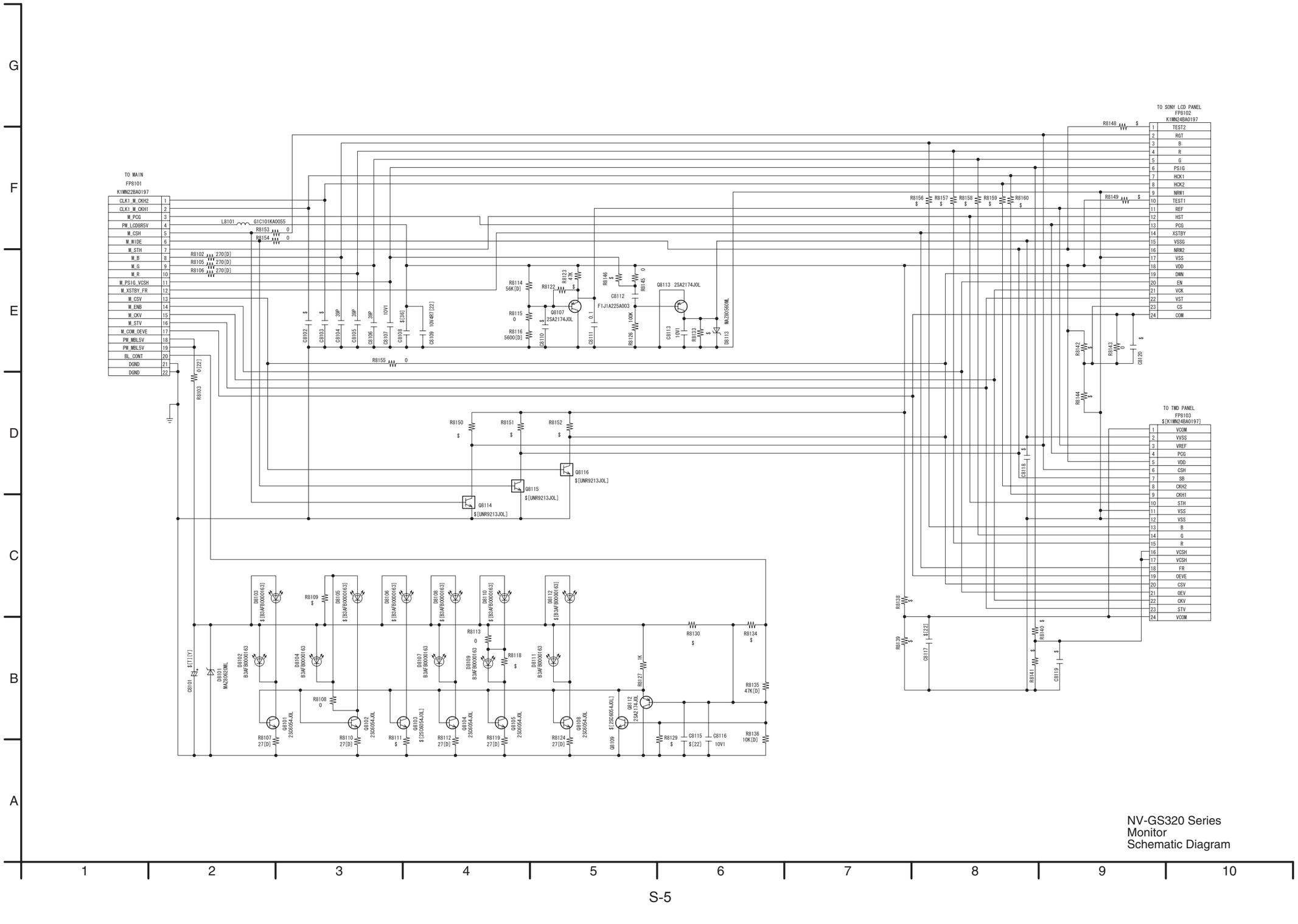
NV-GS320,GS328
OVERALL BLOCK DIAGRAM

S4. Schematic Diagram

S4.1. Interconnection Diagram

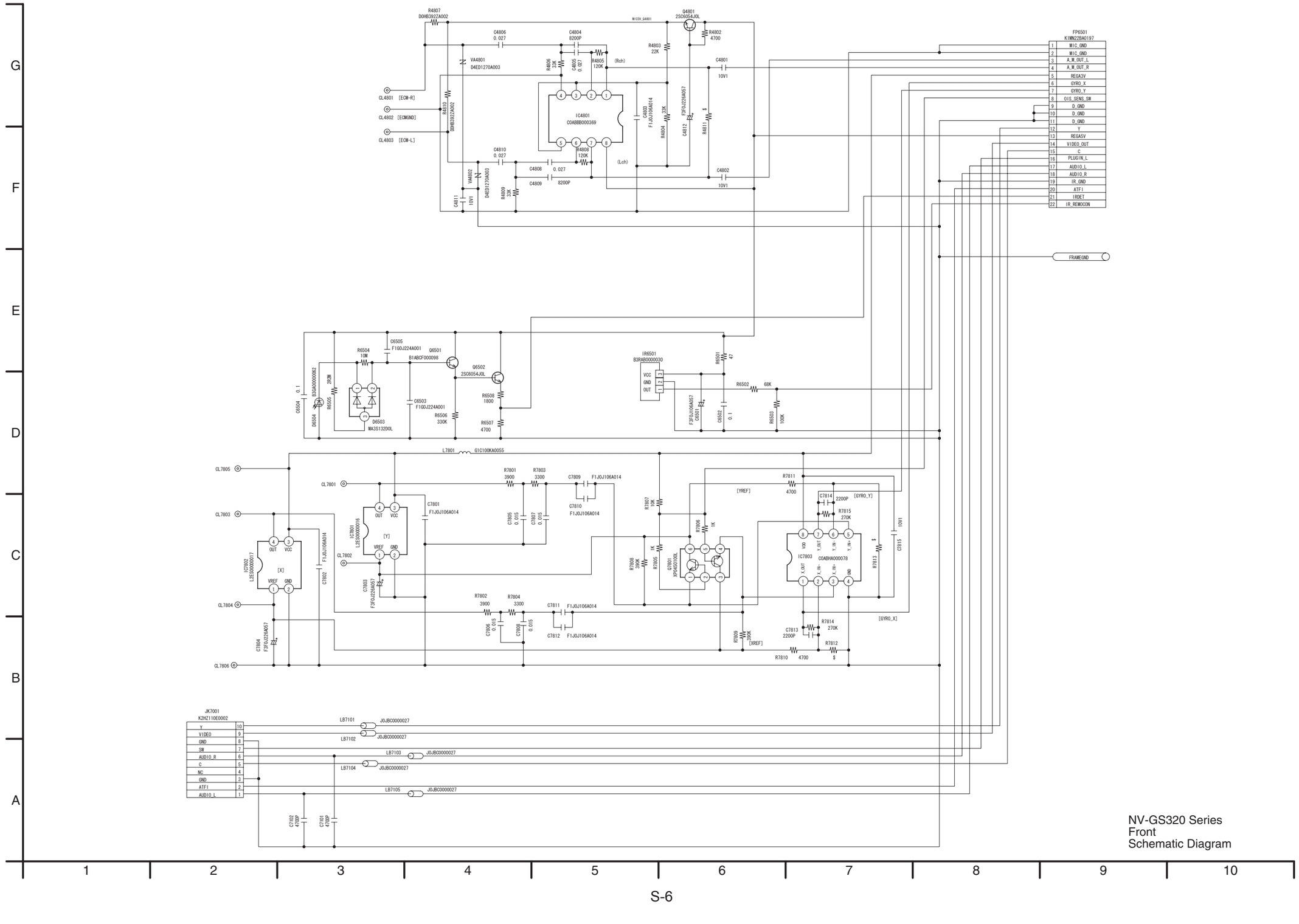


S4.2. Monitor Schematic Diagram



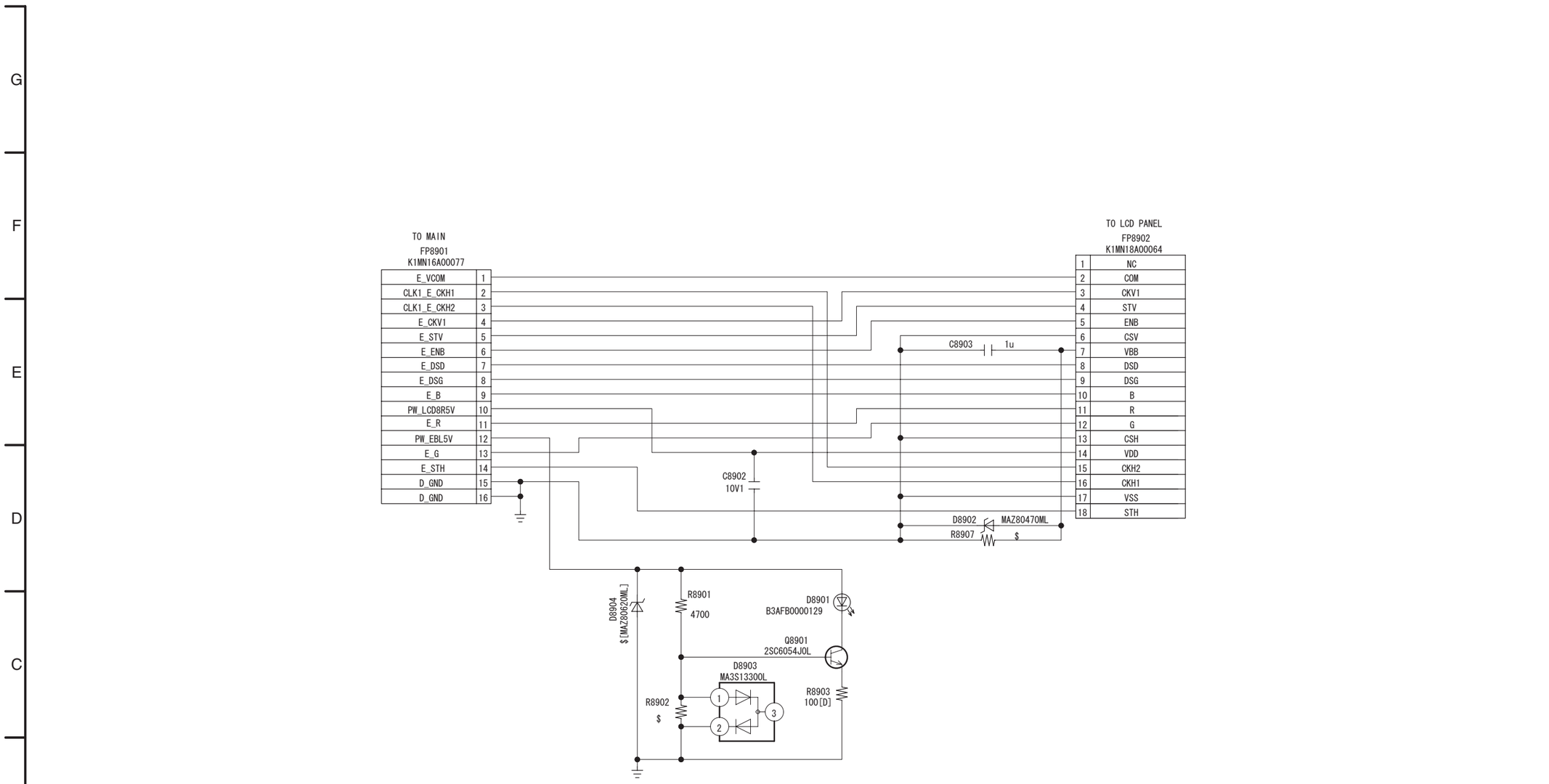
NV-GS320 Series
Monitor
Schematic Diagram

S4.3. Front Schematic Diagram



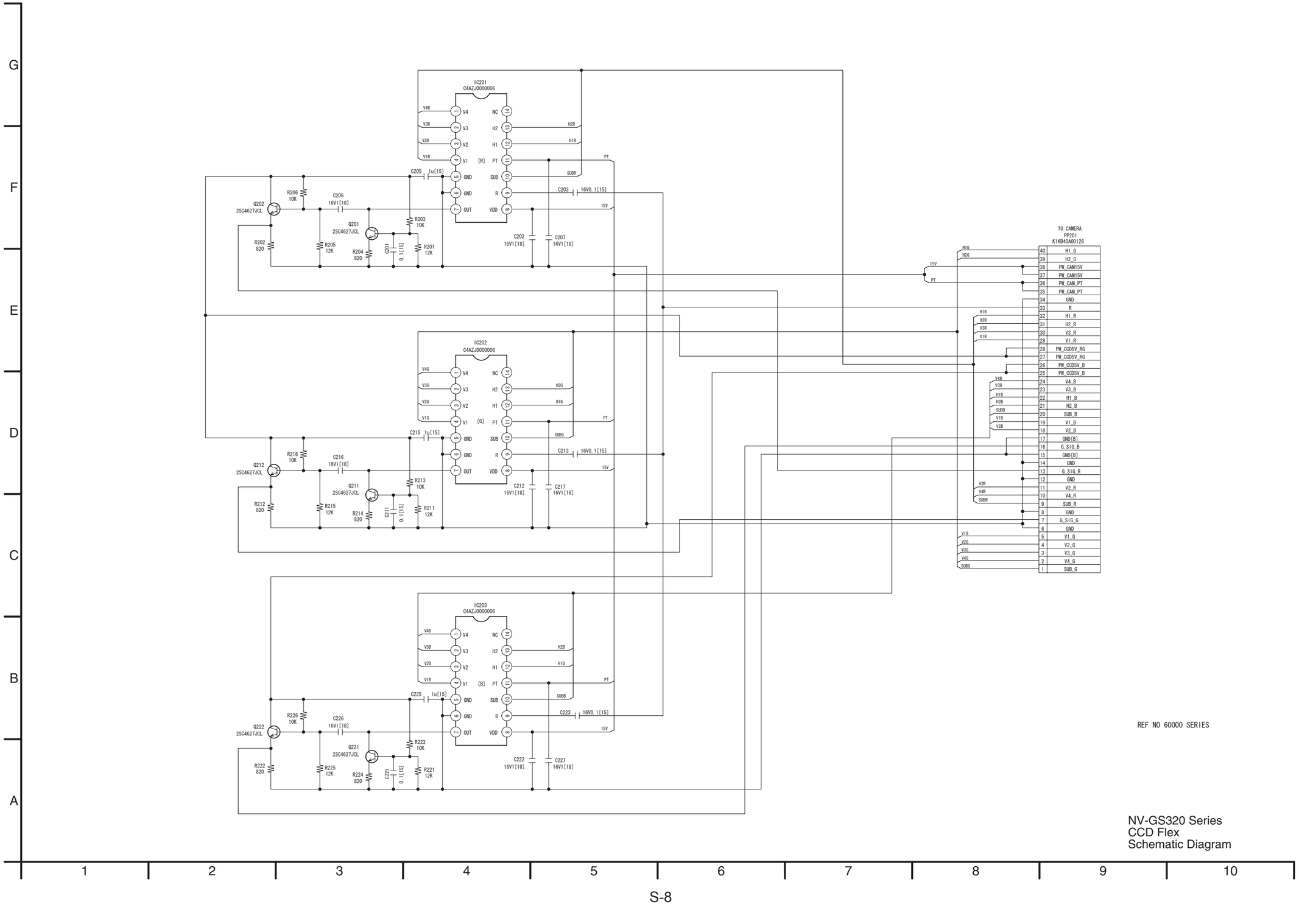
NV-GS320 Series
Front
Schematic Diagram

S4.4. EVF Schematic Diagram



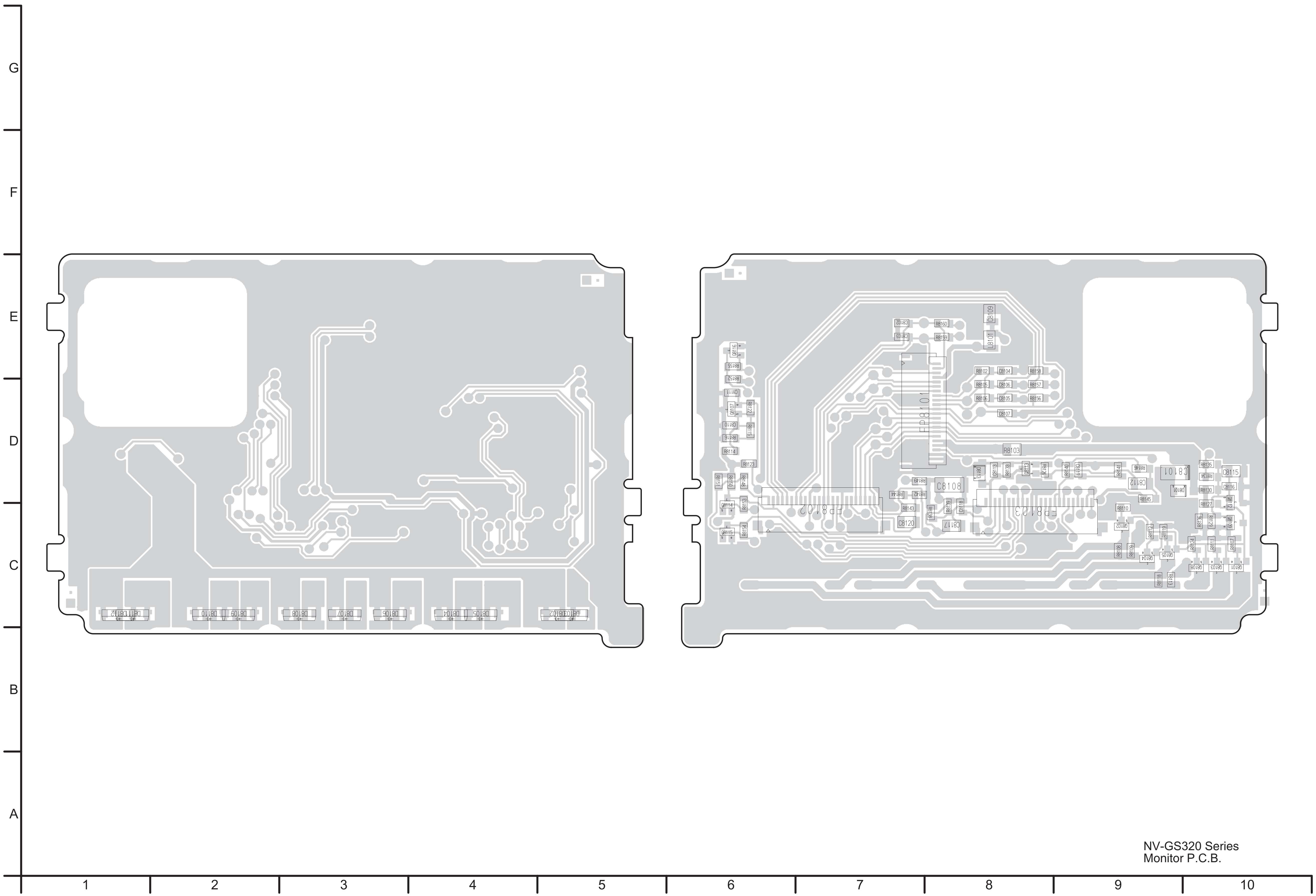
NV-GS320 Series
EVF
Schematic Diagram

S4.5. CCD Flex Schematic Diagram



S5. Print Circuit Board

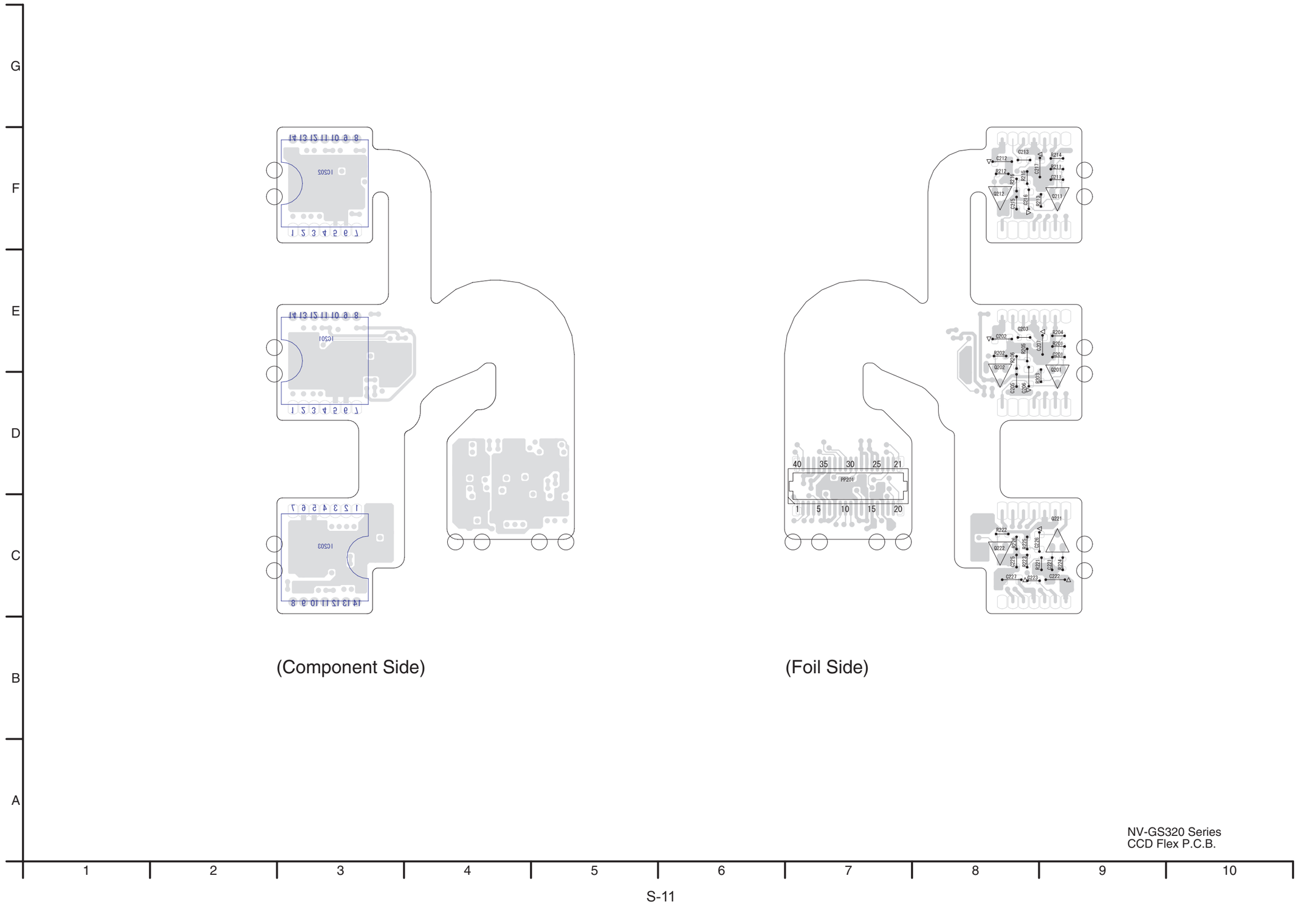
S5.1. Monitor P.C.B.



NV-GS320 Series
Monitor P.C.B.

S5.2. Front P.C.B. / S5.3. EVF P.C.B.

S5.4. CCD Flex P.C.B.



NV-GS320 Series
CCD Flex P.C.B.

S6. 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 MICRO-FARADS (uf), P=uuF.
4. 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.

E.S.D. standards for Electrostatically Sensitive Devices, refer to "PREVENTION OF ELECTROSTATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section.

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
##	VEP03H08B	MAIN P.C.B.	1	(RTL) GS320EG/EF/E/EB/EP
##	VEP03H08C	MAIN P.C.B.	1	(RTL) GS320EK
##	VEP03H08D	MAIN P.C.B.	1	(RTL) GS320GC/SG/EE/GN
##	VEP03H08J	MAIN P.C.B.	1	(RTL) GS320PL
##	VEP03H08G	MAIN P.C.B.	1	(RTL) GS320GT
##	VEP03H08E	MAIN P.C.B.	1	(RTL) GS328GK
##	VEP08367A	MONITOR P.C.B.	1	(RTL)
##	VEP04916A	FRONT P.C.B.	1	(RTL)
##	VEP08365A	EVF P.C.B.	1	(RTL)
##	VEP08367A	MONITOR P.C.B.		(RTL)
C8104	ECJ1VC1H390J	C.CAPACITOR CH 50V 39P	1	
C8105	ECJ1VC1H390J	C.CAPACITOR CH 50V 39P	1	
C8106	ECJ1VC1H390J	C.CAPACITOR CH 50V 39P	1	
C8107	ECJ1VB1A105K	C.CAPACITOR CH 10V 1U	1	
C8109	F1J1A475A023	C.CAPACITOR CH 10V 4.7U	1	
C8111	ECJ1XB1C104K	C.CAPACITOR CH 16V 0.1U	1	
C8112	F1J1A2250007	C.CAPACITOR CH 10V 2.2U	1	
C8113	ECJ1VB1A105K	C.CAPACITOR CH 10V 1U	1	
C8116	ECJ1VB1A105K	C.CAPACITOR CH 10V 1U	1	
D8101	MAZ80620ML	DIODE	1	
D8102	B3AFB0000163	DIODE	1	
D8104	B3AFB0000163	DIODE	1	
D8107	B3AFB0000163	DIODE	1	
D8109	B3AFB0000163	DIODE	1	
D8111	B3AFB0000163	DIODE	1	
D8113	MAZ80560ML	DIODE	1	
FP8101	K1MN22BA0197	CONNECTOR 22P	1	
FP8102	K1MN24BA0197	CONNECTOR 24P	1	
L8101	G1C101KA0055	CHIP INDUCTOR 100UH	1	
Q8101	2SC6054J0L	TRANSISTOR	1	
Q8102	2SC6054J0L	TRANSISTOR	1	
Q8104	2SC6054J0L	TRANSISTOR	1	
Q8105	2SC6054J0L	TRANSISTOR	1	
Q8107	2SA2174J0L	TRANSISTOR	1	
Q8108	2SC6054J0L	TRANSISTOR	1	
Q8112	2SA2174J0L	TRANSISTOR	1	
Q8113	2SA2174J0L	TRANSISTOR	1	
R8102	ERJ3RBD271	M.RESISTOR CH 1/16W 270	1	
R8103	ERJ6GEY0R00V	M.RESISTOR CH 1/10W 0	1	D0GBR00JA017
R8105	ERJ3RBD271	M.RESISTOR CH 1/16W 270	1	
R8106	ERJ3RBD271	M.RESISTOR CH 1/16W 270	1	
R8107	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	
R8108	ERJ3GEY0R00	M.RESISTOR CH 1/10W 0	1	
R8110	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	
R8112	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	
R8113	ERJ3GEY0R00	M.RESISTOR CH 1/10W 0	1	
R8114	ERJ3RBD563	M.RESISTOR CH 1/16W 56K	1	ERJ3RBD563V
R8115	ERJ3GEY0R00	M.RESISTOR CH 1/10W 0	1	
R8116	ERJ3RBD562	M.RESISTOR CH 1/16W 5.6K	1	
R8119	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	
R8123	D0GB473JA057	M.RESISTOR CH 1/10W 47K	1	
R8124	ERJ3RED270	M.RESISTOR CH 1/16W 27	1	
R8126	ERJ3GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R8127	D0GB102JA057	M.RESISTOR CH 1/10W 1K	1	
R8135	ERJ3RBD473	M.RESISTOR CH 1/16W 47K	1	
R8136	ERJ3RBD103	M.RESISTOR CH 1/16W 10K	1	
R8143	ERJ3GEY0R00	M.RESISTOR CH 1/10W 0	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R8145	ERJ3GEY0R00	M.RESISTOR CH 1/10W 0	1	
R8153	ERJ3GEY0R00	M.RESISTOR CH 1/10W 0	1	
R8154	ERJ3GEY0R00	M.RESISTOR CH 1/10W 0	1	
R8155	ERJ3GEY0R00	M.RESISTOR CH 1/10W 0	1	
##	VEP04916A	FRONT P.C.B.		(RTL)
C4801	ECJ1VB1A105K	C.CAPACITOR CH 10V 1U	1	
C4802	ECJ1VB1A105K	C.CAPACITOR CH 10V 1U	1	
C4803	ECJ2FB0J106K	C.CAPACITOR CH 6.3V 10U	1	
C4804	ECJ1VB1H822K	C.CAPACITOR CH 50V 8200P	1	
C4805	ECJ1VB1E273K	C.CAPACITOR CH 25V 0.027U	1	F1H1E273A050
C4806	ECJ1VB1E273K	C.CAPACITOR CH 25V 0.027U	1	F1H1E273A050
C4808	ECJ1VB1E273K	C.CAPACITOR CH 25V 0.027U	1	F1H1E273A050
C4809	ECJ1VB1H822K	C.CAPACITOR CH 50V 8200P	1	
C4810	ECJ1VB1E273K	C.CAPACITOR CH 25V 0.027U	1	F1H1E273A050
C4811	ECJ1VB1A105K	C.CAPACITOR CH 10V 1U	1	
C4812	F3F0J226A057	E.CAPACITOR CH 6.3V 22U	1	
C6501	F3F0J106A057	E.CAPACITOR CH 6.3V 10U	1	
C6502	ECJ1XB1C104K	C.CAPACITOR CH 16V 0.1U	1	
C6503	F1G0J224A004	C.CAPACITOR CH 6.3V 0.22U	1	
C6504	ECJ1XB1C104K	C.CAPACITOR CH 16V 0.1U	1	
C6505	F1G0J224A004	C.CAPACITOR CH 6.3V 0.22U	1	
C7101	ECJ1VB1H472K	C.CAPACITOR CH 50V 4700P	1	
C7102	ECJ1VB1H472K	C.CAPACITOR CH 50V 4700P	1	
C7801	ECJ2FB0J106K	C.CAPACITOR CH 6.3V 10U	1	
C7802	ECJ2FB0J106K	C.CAPACITOR CH 6.3V 10U	1	
C7803	F3F0J226A057	E.CAPACITOR CH 6.3V 22U	1	
C7804	F3F0J226A057	E.CAPACITOR CH 6.3V 22U	1	
C7805	ECJ1VB1H153K	C.CAPACITOR CH 50V 0.015U	1	
C7806	ECJ1VB1H153K	C.CAPACITOR CH 50V 0.015U	1	
C7807	ECJ1VB1H153K	C.CAPACITOR CH 50V 0.015U	1	
C7808	ECJ1VB1H153K	C.CAPACITOR CH 50V 0.015U	1	
C7809	ECJ2FB0J106K	C.CAPACITOR CH 6.3V 10U	1	
C7810	ECJ2FB0J106K	C.CAPACITOR CH 6.3V 10U	1	
C7811	ECJ2FB0J106K	C.CAPACITOR CH 6.3V 10U	1	
C7812	ECJ2FB0J106K	C.CAPACITOR CH 6.3V 10U	1	
C7813	ECJ1VB1H222K	C.CAPACITOR CH 50V 2200P	1	
C7814	ECJ1VB1H222K	C.CAPACITOR CH 50V 2200P	1	
C7815	ECJ1VB1A105K	C.CAPACITOR CH 10V 1U	1	
D6503	MA3S132D0L	DIODE	1	
D6504	B3GA00000062	DIODE	1	
FP6501	K1MN22BA0197	CONNECTOR 22P	1	
IC4801	C0ABBB000369	IC	1	
IC7801	L2ES00000016	IC	1	
IC7802	L2ES00000017	IC	1	
IC7803	C0ABHA000078	IC	1	
IR6501	B3RAB0000030	IR RECEIVER	1	
JK7001	K2HZ110E0002	JACK	1	
L7801	G1C100KA0055	CHIP INDUCTOR 10UH	1	
LB7101	VLF1144A102	COIL 1000UH	1	
LB7102	VLF1144A102	COIL 1000UH	1	
LB7103	VLF1144A102	COIL 1000UH	1	
LB7104	VLF1144A102	COIL 1000UH	1	
LB7105	VLF1144A102	COIL 1000UH	1	
Q4801	2SC6054J0L	TRANSISTOR	1	
Q6501	B1ABCF000098	TRANSISTOR	1	
Q6502	2SC6054J0L	TRANSISTOR	1	
Q7801	XP4501	TRANSISTOR	1	XP04501
R4802	ERJ3GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R4803	ERJ3GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R4804	ERJ3GEYJ333	M.RESISTOR CH 1/10W 33K	1	
R4805	D0GB124JA057	M.RESISTOR CH 1/10W 120K	1	
R4806	ERJ3GEYJ333	M.RESISTOR CH 1/10W 33K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R4807	VRE0071E392	M.RESISTOR CH 1/10W 3.9K	1	D0HB392ZA002
R4808	D0GB124JA057	M.RESISTOR CH 1/10W 120K	1	
R4809	ERJ3GEYJ333	M.RESISTOR CH 1/10W 33K	1	
R4810	VRE0071E392	M.RESISTOR CH 1/10W 3.9K	1	D0HB392ZA002
R6501	ERJ3GEYJ470	M.RESISTOR CH 1/10W 47	1	
R6502	ERJ3GEYJ683	M.RESISTOR CH 1/10W 68K	1	
R6503	ERJ3GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R6504	ERJ3GEYJ106	M.RESISTOR CH 1/10W 10M	1	
R6505	D0GB225JA057	M.RESISTOR CH 1/10W 2.2M	1	
R6506	ERJ3GEYJ334	M.RESISTOR CH 1/10W 330K	1	D0GB334JA002
R6507	ERJ3GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R6508	D0GB182JA057	M.RESISTOR CH 1/10W 1.8K	1	
R7801	ERJ3GEYJ392	M.RESISTOR CH 1/10W 3.9K	1	
R7802	ERJ3GEYJ392	M.RESISTOR CH 1/10W 3.9K	1	
R7803	ERJ3GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R7804	ERJ3GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R7805	D0GB102JA057	M.RESISTOR CH 1/10W 1K	1	
R7806	D0GB102JA057	M.RESISTOR CH 1/10W 1K	1	
R7807	D0GB103JA057	M.RESISTOR CH 1/10W 10K	1	
R7808	D0GB394JA057	M.RESISTOR CH 1/10W 390K	1	
R7809	D0GB394JA057	M.RESISTOR CH 1/10W 390K	1	
R7810	ERJ3GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R7811	ERJ3GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R7814	ERJ3GEYD274V	M.RESISTOR CH 1/10W 270K	1	ERA3YKD274V
R7815	ERJ3GEYD274V	M.RESISTOR CH 1/10W 270K	1	ERA3YKD274V
VA4801	D4ED1270A003	SURGE ABSORBER	1	
VA4802	D4ED1270A003	SURGE ABSORBER	1	
##	VEP08365A	EVF P.C.B.		(RTL)
C8902	ECJ1VB1A105K	C.CAPACITOR CH 10V 1U	1	
C8903	ECJ1VB0J105K	C.CAPACITOR CH 6.3V 1U	1	
D8901	B3AFB0000129	DIODE	1	
D8902	MAZ80470ML	DIODE	1	
D8903	MA3S13300L	DIODE	1	
FP8901	K1MN16A00077	CONNECTOR 16P	1	
FP8902	K1MN18A00064	CONNECTOR 18P	1	
Q8901	2SC6054J0L	TRANSISTOR	1	
R8901	ERJ3GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R8903	ERJ3RBD101	M.RESISTOR CH 1/16W 100	1	ERJ3RBD101V

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks

M1

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	LSYK1910	SIDE (R) SHAFT U	1	
2	LSYK1913	FRONT CASE U	1	
3	VEP04916A	FRONT P.C.B.	1	(RTL)
3-1	VGQ9235	JACK PIECE	1	
3-2	VEK0K66	ECM U	1	
4	LSKF0670	JACK COVER	1	
5	VGQ9238	EYE BASE FRAME	1	
6	LSXK0305	EVF SPRING	1	
7	VGQ9239	EVF MASK CASE	1	
8	VGQ9240	EVF MASK TOP COVER	1	
9	L5BDDXH00025	LCD PANEL	1	
10	VGL1237	PROTECT PLATE	1	
11	VGL1237	PROTECT PLATE	1	
12	VGQ9241	EVF REFLECT PIECE	1	
13	VEP08365A	EVF P.C.B.	1	(RTL)
14	VGL1236	DIFFUSION SHEET	1	
15	VGQ9242	EVF SHEET HOLDER	1	
16	VGQ9243	EVF CASE	1	
17	VGU0A70	EYE SIGHT LEVER	1	
18	LSFL0176	EVF LENS	1	
19	VGQ9244	LENS HOLDER	1	
20	VGQ9245	EYE CAP	1	
21	LSEP8372A1	EVF FPC	1	
22	LSXK0306	EVF EARTH PLATE	1	
B1	VHD1680	SCREW	1	
B2	VHD1680	SCREW	1	
B3	XQN16+BJ5FN	SCREW	1	
B4	XQN16+BJ5FN	SCREW	1	
B5	XQN16+BJ5FN	SCREW	1	
B6	XQN16+BJ5FN	SCREW	1	
B7	XQN16+BJ5FN	SCREW	1	
B8	XQN16+AJ4FN	SCREW	1	
B9	XQN16+AJ4FN	SCREW	1	
B10	XQN16+B4FN	SCREW	1	
B11	XQN16+B4FN	SCREW	1	
B12	XQN16+B4FN	SCREW	1	
B13	XQN16+BJ5FN	SCREW	1	
B14	XQN16+BJ5FN	SCREW	1	
B15	XQN16+BJ5FN	SCREW	1	
B16	XQN16+BJ7FN	SCREW	1	
B17	XQN16+B4FN	SCREW	1	
B18	XQN16+B4FN	SCREW	1	
B19	XQN16+B4FN	SCREW	1	
B28	XQS2+A35FN	SCREW	1	
B29	XQS2+A35FN	SCREW	1	

M2

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
101	VEP03H08B	MAIN P.C.B.	1	(RTL) EG,E,EB,EF,EP
101	VEP03H08C	MAIN P.C.B.	1	(RTL) EK
101	VEP03H08D	MAIN P.C.B.	1	(RTL) GC,SG,GN,EE
101	VEP03H08J	MAIN P.C.B.	1	(RTL) PL
101	VEP03H08G	MAIN P.C.B.	1	(RTL) GT
101	VEP03H08E	MAIN P.C.B.	1	(RTL) GK
102	VWJ1924	FRONT FPC	1	
103	LSYK1901	SIDE (L) OPERATION U	1	
104	LSYK1885	MAIN FRAME U	1	
105	LSYK1916	BATTERY CASE U	1	
106	LSXK0287	BOTTOM CASE U	1	
107	VSC5761	CCD HEAT SINK PLATE	1	
108	VMP8734	LENS ANGLE	1	
B20	XQN16+B4FN	SCREW	1	
B21	XQN16+B4FN	SCREW	1	
B22	XQN16+B4FN	SCREW	1	
B23	XQN16+B4FN	SCREW	1	
B24	XQN16+B4FN	SCREW	1	
B25	XQN16+B4FN	SCREW	1	
B26	XQN16+B4FN	SCREW	1	
B27	XQN16+BJ5FN	SCREW	1	
B101	VHD1133	SCREW	1	
B102	VHD1133	SCREW	1	
B103	VHD1133	SCREW	1	
B104	XQN16+BJ5FN	SCREW	1	
B105	XQN16+BJ5FN	SCREW	1	
B106	XQN16+BJ5FN	SCREW	1	
B107	XQN16+B4FN	SCREW	1	
B108	XQN16+B4FN	SCREW	1	
B109	XQN16+B4FN	SCREW	1	
B110	XQN16+B4FN	SCREW	1	
B111	XQN16+B4FN	SCREW	1	
B112	XQN16+B4FN	SCREW	1	
B113	XQN16+B4FN	SCREW	1	
B114	XQN16+BJ4FN	SCREW	1	
B115	XQN16+BJ3FN	SCREW	1	

M3

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
201	LSYK1922	LCD CASE (A) U	1	(EXCEPT GK)
201	LSYK1930	LCD CASE (A) U	1	GK
202	LSKM1232	LCD CASE (B) U	1	
203	LSSC0924	LCD SHIELD CASE	1	
204	L5BDDYH00022	LCD PANEL	1	
205	LSYK1924	LCD PANEL HOLDER U	1	
206	LSGL0444	PRISM SHEET A	1	
207	LSGL0443	PRISM SHEET B	1	
208	LSGL0511	DIFFUSION SHEET	1	
209	LSGL0505	LIGHTING PLATE	1	
210	LSGL0506	REFLECTION SHEET	1	
211	VEP08367A	MONITOR P.C.B.	1	(RTL)
B201	XQN16+BJ4FN	SCREW	1	

M4

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
301	VXQ1472	PRIZM U	1	
301-1	VEP22376A	CCD FPC	1	
301-2	VGQ9217	CCD HEAT TRANSFER SHEET	1	
302	VDL1748	OPTICAL FILTER	1	
304	VXW0767	LENS UNIT	1	
304-1	VXQ1368	1ST LENS FRAME MOVE UNIT	1	
304-2	VXP2530	2ND LENS FRAME MOVE UNIT	1	
304-3	VXP2538	IRIS UNIT	1	
304-5	VXP2531	4TH LENS FRAME MOVE UNIT	1	
304-6	VMS7638	GUIDE POLE	1	
304-7	VMS7638	GUIDE POLE	1	
304-8	VDW1213	MASTER FLANGE	1	
304-9	L6HA64NC0003	ZOOM MOTOR UNIT	1	
304-10	L6HA64NC0004	FOCUS MOTOR UNIT	1	
304-13	VXQ1369	OIS 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	
B313	XQN16+CJ5FJ	SCREW	1	

M5

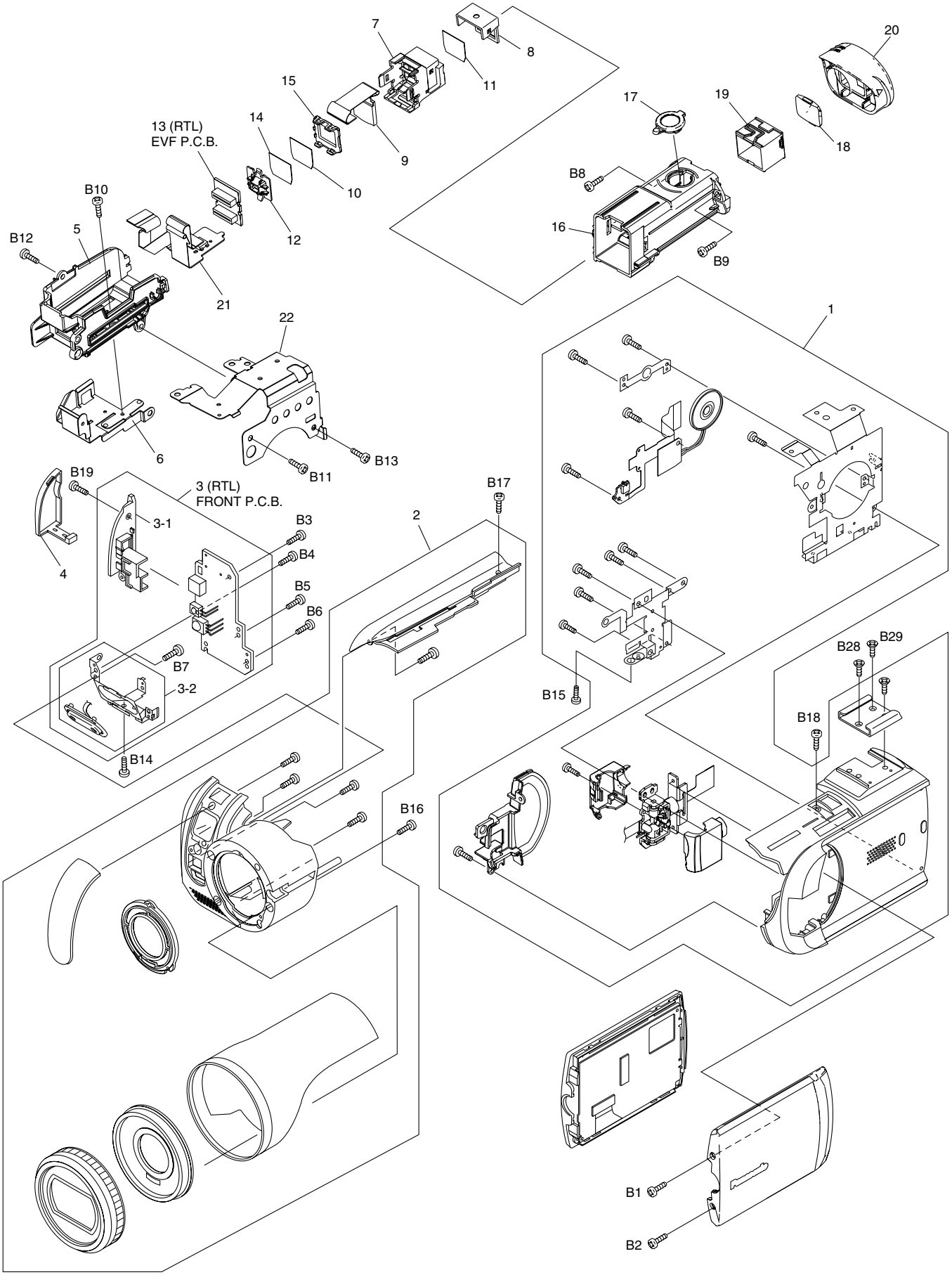
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
501	VXK1860-SER	MECHANISM U	1	
501-1	VXA8334	CASSETTE UP U	1	
502	VEG1704	CYLINDER U	1	
B501	VHD1632	SCREW	1	
B502	VHD1861	SCREW	1	
B503	VHD1861	SCREW	1	
B504	VHD1861	SCREW	1	

M6

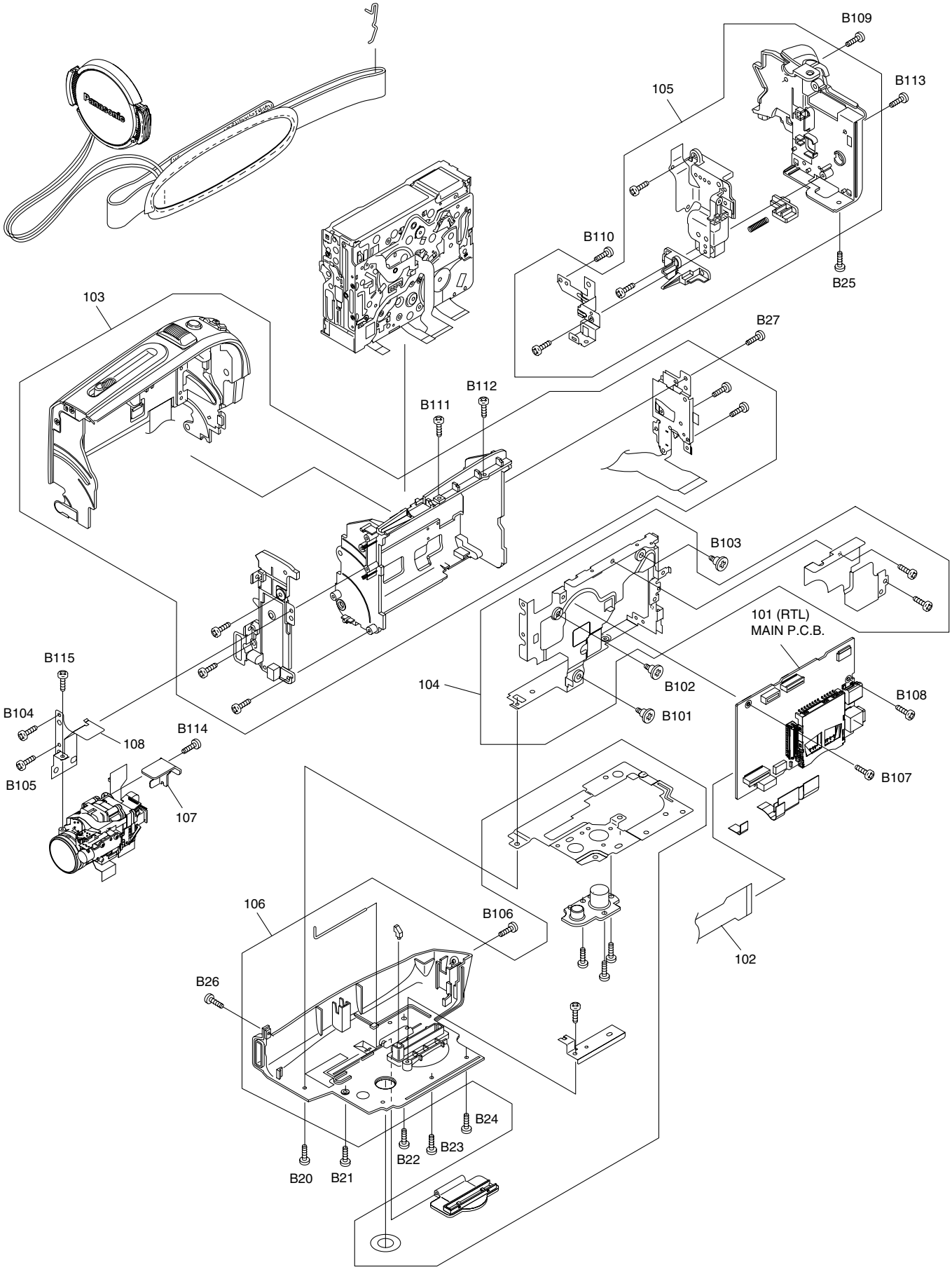
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
401	LSPG2322	PACKING CASE	1	(EXCEPT GK)
401	LSPG2324	PACKING CASE	1	GK
402	LSPN0786	PAD	1	
405	K2GJ2DC00011	DC CABLE	1	
406	K2KZ9CB00001	AV CABLE	1	
⚠ 407	K2CQ2CA00006	AC CORD	1	EG,E,EF,EP,EK,GC,SG,EE
⚠ 407	K2CT3CA00004	AC CORD	1	EB,GC,SG
⚠ 407	K2CJ2DA00008	AC CORD	1	GN
⚠ 407	K2CA2CA00029	AC CORD	1	PL
⚠ 407	K2CA2CA00027	AC CORD	1	GT
⚠ 407	K2CA2CA00020	AC CORD	1	GK
408	N2QAEC000021	REMOTE CONTROLLER	1	
409	K1HA05CD0010	USB CABLE	1	
⚠ 410	VSK0651B-2	AC ADAPTOR	1	(EXCEPT GT/GK)
⚠ 410	VSK0679	AC ADAPTOR	1	GT
⚠ 410	VSK0651A-1	AC ADAPTOR	1	GK
⚠ 411	VQT1A41	O/I(GE/IT)	1	EG,EK
⚠ 411	VQT1A42	O/I(FR/DU)	1	EG,EF,EK
⚠ 411	VQT1A83	O/I(TK)	1	EG,EK
⚠ 411	VQT1A43	O/I(PR/SP)	1	E
⚠ 411	VQT1A44	O/I(SW/DA)	1	E
⚠ 411	VQT1A47	O/I(EN)	1	EB
⚠ 411	VQT1A45	O/I(EN/PO)	1	EP
⚠ 411	VQT1A46	O/I(CZ/HU)	1	EP
⚠ 411	VQT1A48	O/I(CN/EN)	1	GC,SG
⚠ 411	VQT1A49	O/I(PE/AR)	1	GC,SG
⚠ 411	VQT1A50	O/I(TA/HD)	1	GC,SG
⚠ 411	VQT1A52	O/I(EN)	1	GN
⚠ 411	VQT1A51	O/I(UR/RU)	1	EE
⚠ 411	VQT1A38	O/I(EN/SP)	1	PL
⚠ 411	VQT1A39	O/I(CN)	1	GT
⚠ 411	VQT1A53	O/I(CN)	1	GK
412	VFF0305-S	CD-ROM (MADE IN KOREA)	1	See "Notes"

S7. Exploded View

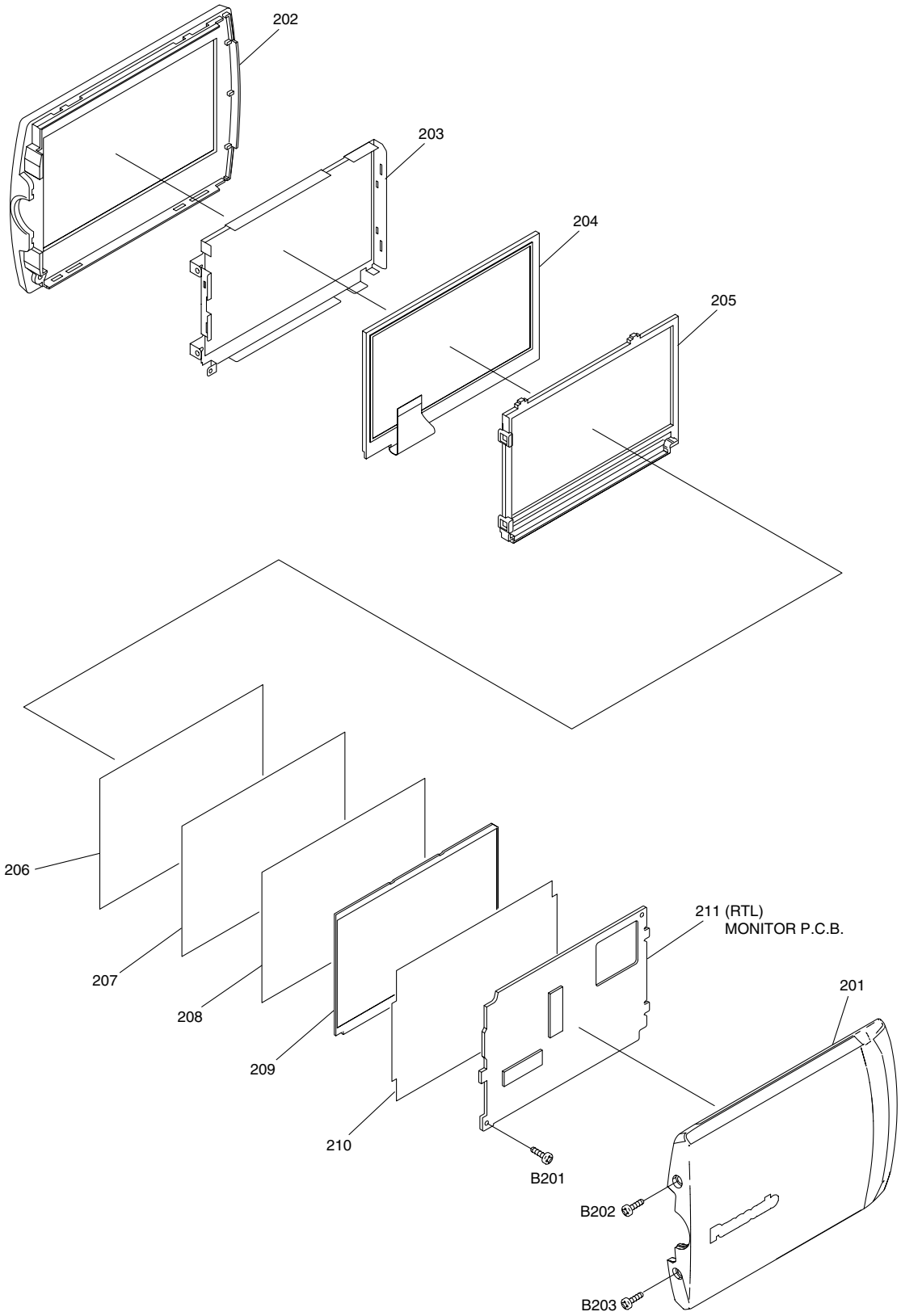
S7.1. Frame and Casing Section (1)



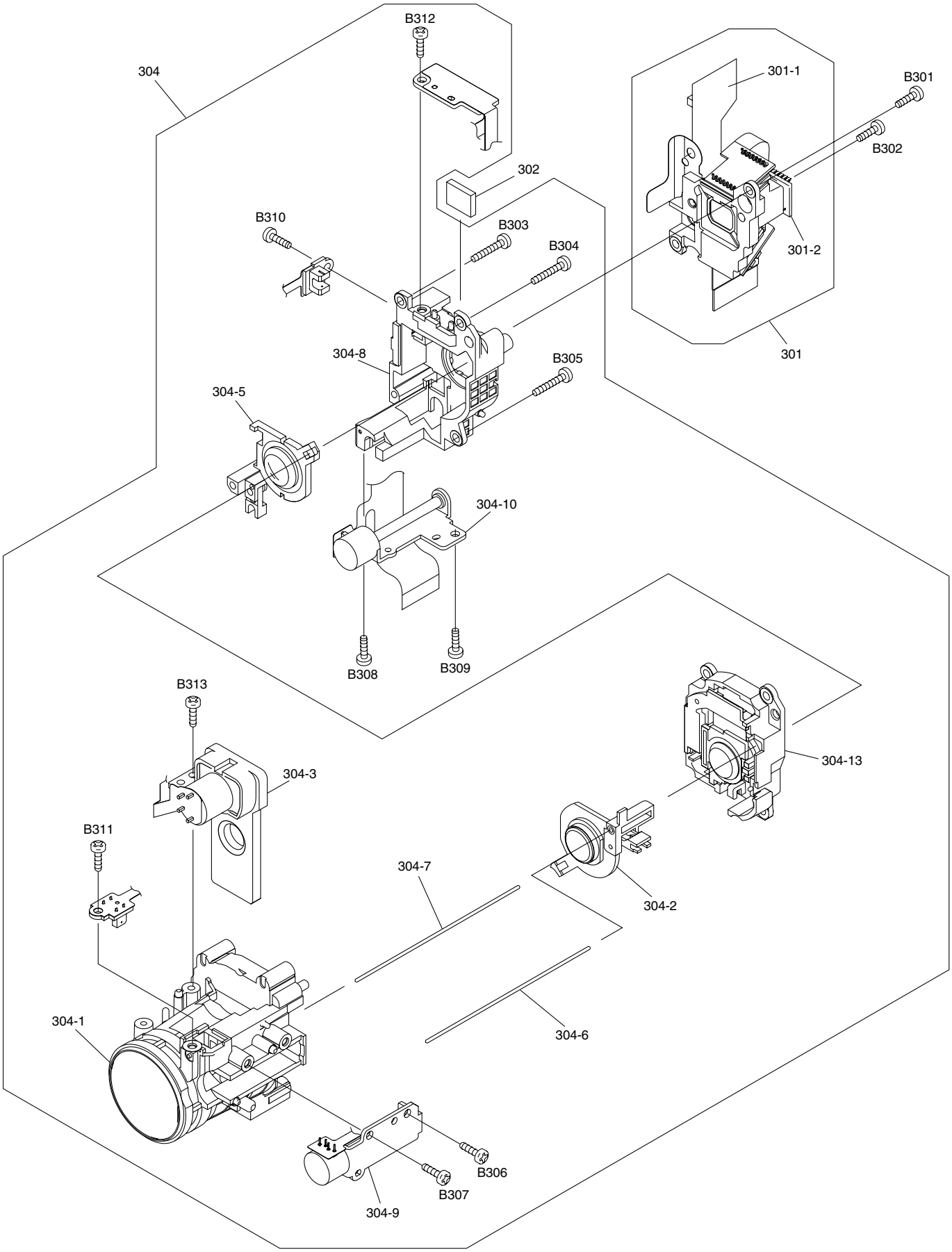
S7.2. Frame and Casing Section (2)



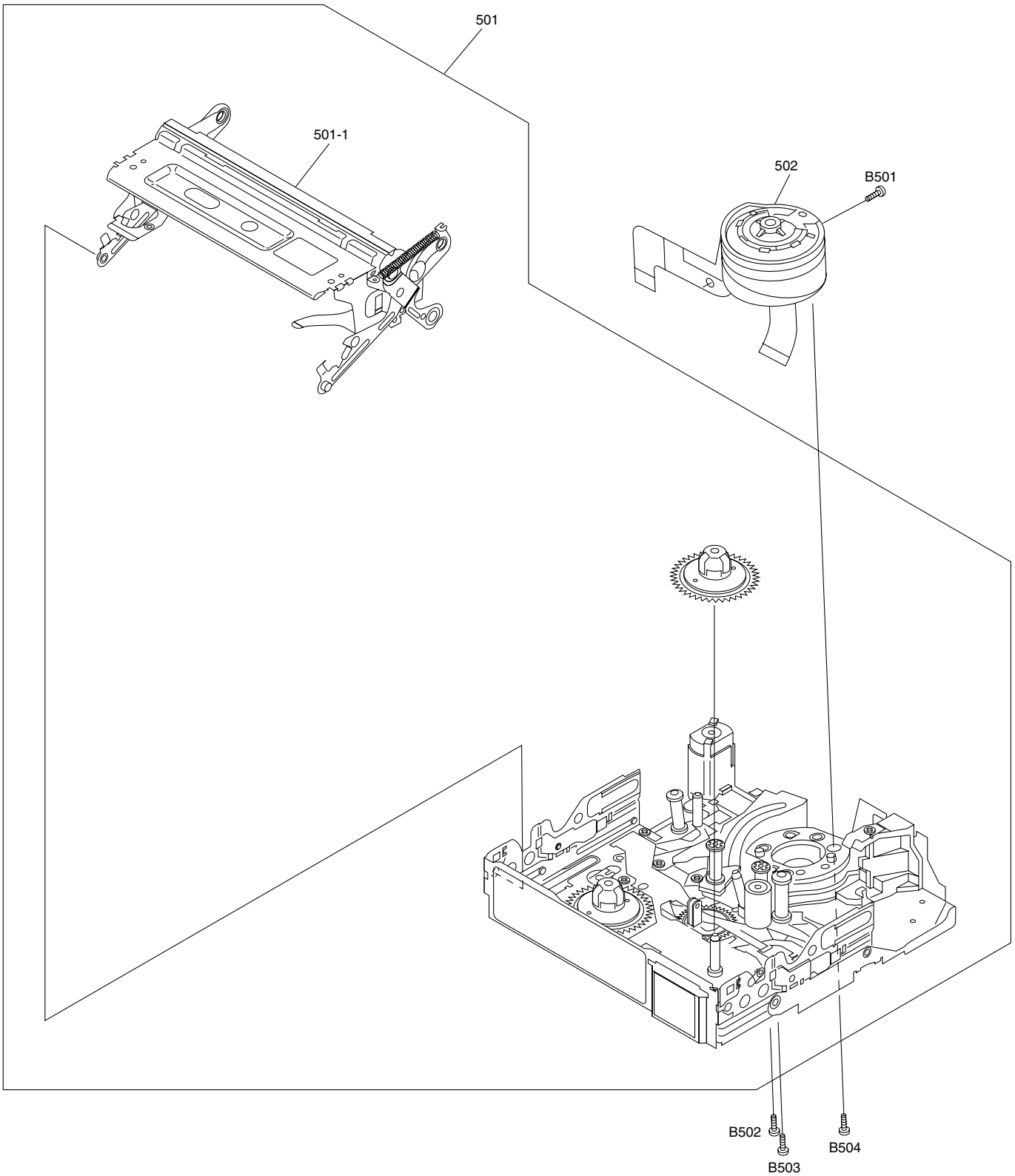
S7.3. LCD Section



S7.4. Camera Lens Section



S7.5. Video Mechanism Section



S7.6. Packing Parts and Accessories Section