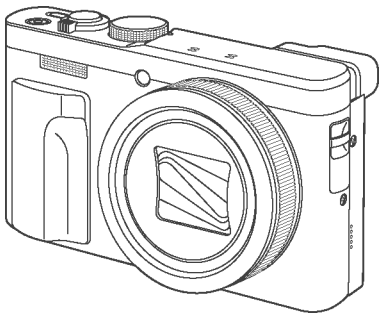
ORDER NO.DSC1602001CE
B26

Service Manual

Digital Camera

Model No. DMC-TZ80EB
DMC-TZ80EE
DMC-TZ80EF
DMC-TZ80EG
DMC-TZ80EP
DMC-TZ80GA
DMC-TZ80GC
DMC-TZ80GN
DMC-TZ81EG
DMC-ZS60P
DMC-ZS60PP
DMC-ZS60GH



Colours

Product Color
(S).....Silver Type (Except GC)
(K).....Black Type

Panasonic

⚠ 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.

TABLE OF CONTENTS

1 Safety Precautions

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.

1.2. 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.

1.3. 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 1.5kΩ, 10 W resistor, in parallel with a 0.15μF capacitor, between each exposed metallic part on the set and 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.

Hot-Check Circuit

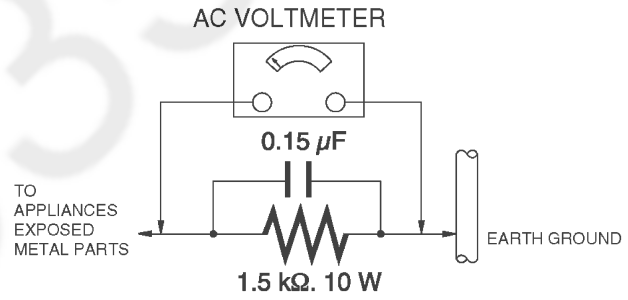


Figure 1

1.4. How to Discharge the Capacitor on Top P.C.B. Unit

CAUTION:

1. **Be sure to discharge the capacitor on Top P.C.B. Unit.**
2. **Be careful of the high voltage circuit on Top P.C.B. Unit when servicing.**

[Discharging Procedure]

1. Refer to the disassemble procedure and remove the necessary parts/unit.
2. Install the insulation tube onto the lead part of Resistor (ERG5SJ102:1kΩ /5W).
   (an equivalent type of resistor may be used.)
3. Place a resistor between both terminals of capacitor on the Top P.C.B. Unit for approx. 5 seconds.
4. After discharging, confirm that the capacitor voltage is lower than 10V using a voltmeter.

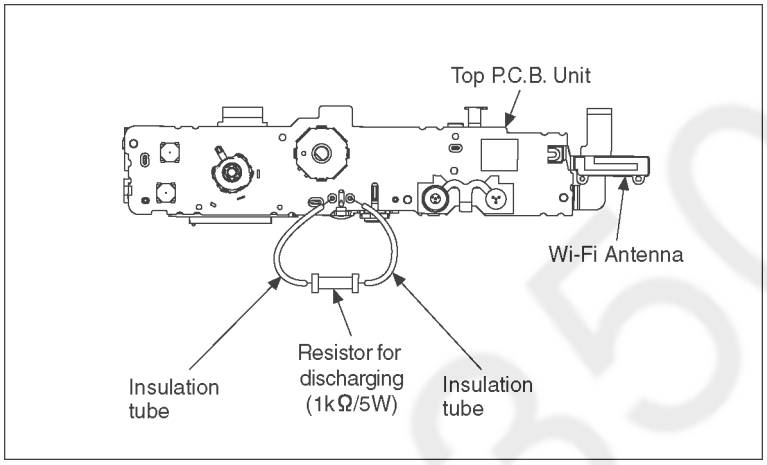


Fig. F1

2 Warning

2.1. Prevention of Electrostatic 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 MOS image sensor, IC (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 electrostatic 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).

2.2. How to Recycle the Lithium Ion Battery (U.S. Only)

ENGLISH

A lithium ion battery that is recyclable powers the product you have purchased. Please call 1-800-8-BATTERY for information on how to recycle this battery.

FRANÇAIS

L'appareil que vous vous êtes procuré est alimenté par une batterie au lithium-ion recyclable. Pour des renseignements sur le recyclage de la batterie, veuillez composer le 1-800-8-BATTERY.

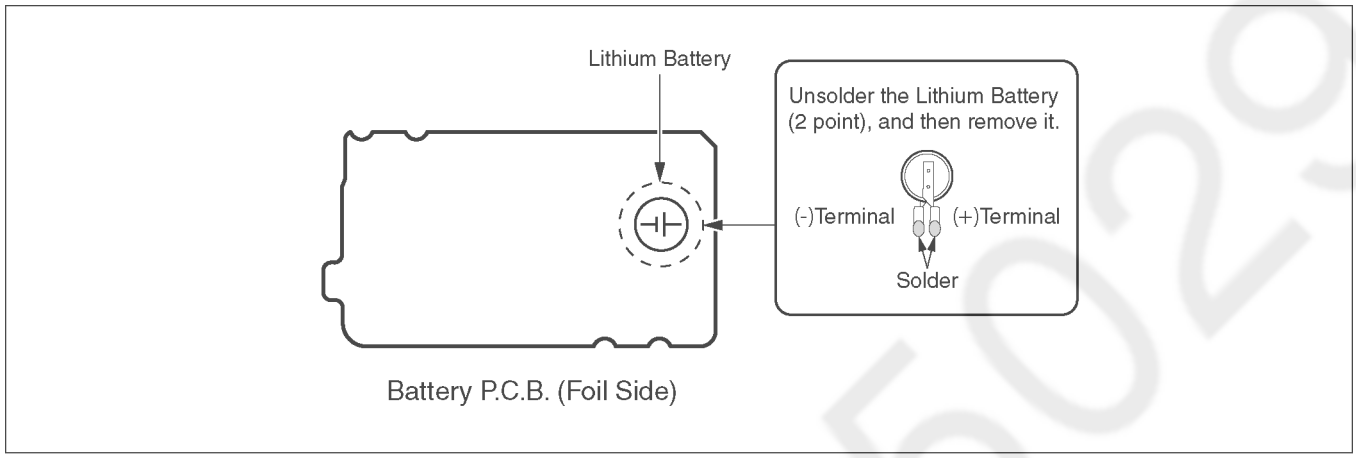
2.3. How to Replace the Lithium Battery

2.3.1. Replacement Procedure

1. Remove the Battery P.C.B. (Refer to Disassembly Procedures.)
2. Unsolder the each soldering point of electric lead terminal for Lithium battery (Ref. No. B9401 at foil side of Battery P.C.B.) and remove the Lithium battery together with electric lead terminal. Then replace it into new one.

Note:

The Lithium battery includes electric lead terminals.



CAUTION
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-421S/DN 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.

Note:

The lithium battery is a critical component.
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.

(For English)

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

(For German)

ACHTUNG
Explosionsgefahr bei falschem Anbringen der Batterie. Ersetzen Sie nur mit einem äquivalentem vom Hersteller empfohlenem Typ.
Behandeln Sie gebrauchte Batterien nach den Anweisungen des Herstellers.

(For French)

MISE EN GARDE
Une batterie de remplacement inappropriée peut exploser. Ne remplacez qu'avec une batterie identique ou d'un type recommandé par le fabricant. L'élimination des batteries usées doit être faite conformément aux instructions du manufacturier.

Note:

Above caution is applicable for a battery pack which is for DMC-TZ80/TZ81/ZS60 series, as well.

3 Service Navigation

3.1. 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, the information will be followed by service manual to be controlled with original service manual.

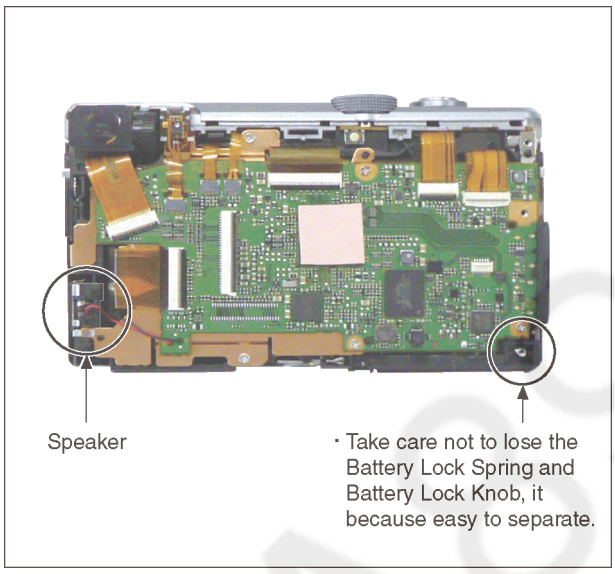
3.2. Important Notice

3.2.1. About lens block

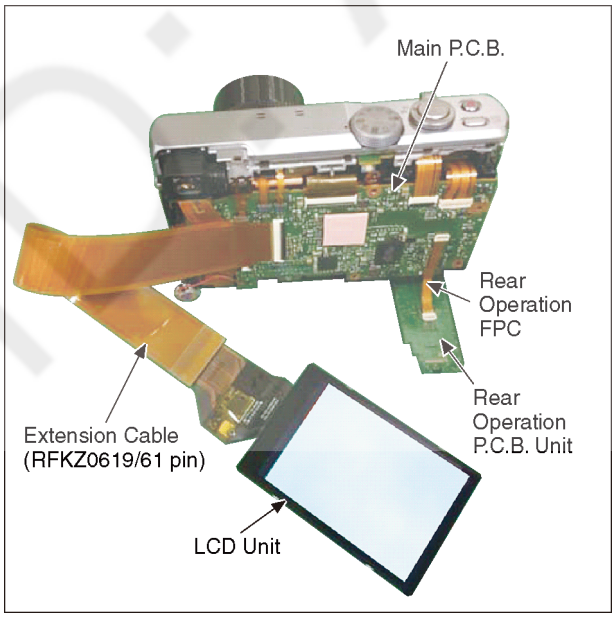
The image sensor (MOS) unit which are connected to the lens unit with 3 screws. 2 of these 3 screws are locked, after performing the Optical tilt adjustment. During servicing, if one of MOS fixing screws are loosened, the Optical tilt adjustment must be performed. (About the Optical tilt adjustment, refer to the "10.3.2 Adjustment Specifications" for details.)

• Using the Extension cable, perform the Optical tilt adjustment according to the following procedure.

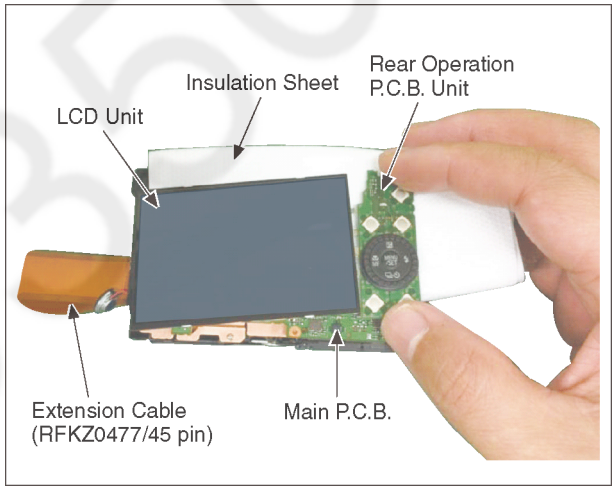
1. Remove the Frame Plate Unit. (Refer to Disassembly Procedures.)
2. Remove the Speaker from the Frame.



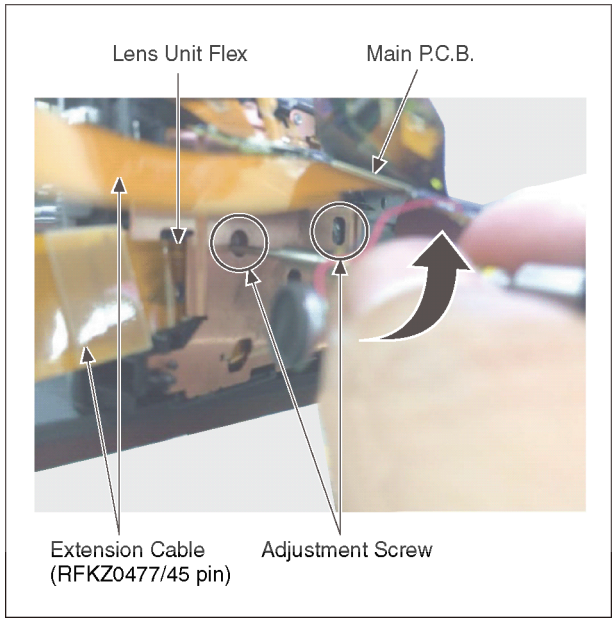
3. Using the Rear Operation FPC, connect the Main P.C.B. to Rear Operation P.C.B. Unit.
4. Using the Extension cable, connect the Main P.C.B. to LCD Unit.



5. Using the Extension cable, connect the Main P.C.B. to Lens Unit Flex.
6. Insulation Sheet is inserted between the LCD Unit, Rear Operation P.C.B. Unit and the Main P.C.B.



7. The Main P.C.B. is lifted, perform the Optical tilt adjustment.

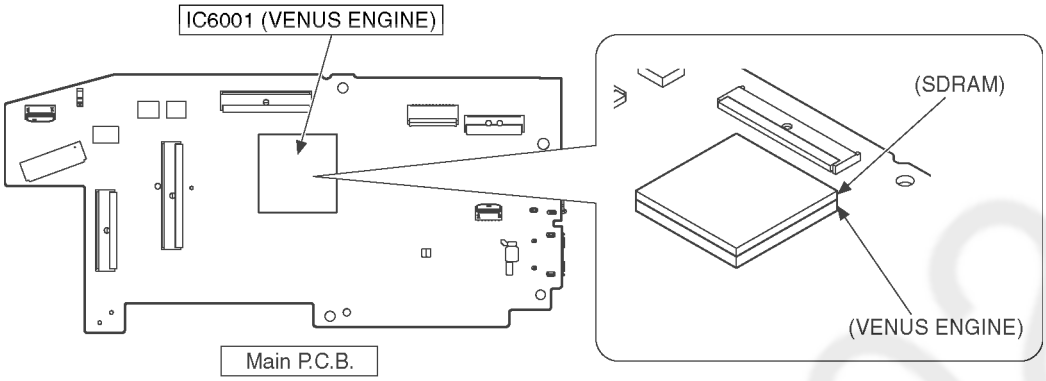


3.2.2. About VENUS ENGINE (IC6001) < Located on the Main P.C.B. >

• The VENUS ENGINE (IC6001) consists of two IC chips, which are fixed together with solder.
(It is so called, "Package On Package" type of IC.)

Caution:

• During servicing, do not press down hard on the surface of IC6001.



3.2.3. About Flash ROM (IC6003) and Charging Control Microcomputer (IC1502)

When the Flash Rom or Charging Control Microcomputer is replaced, it is need to adjust the firmware of the Charging Control Microcomputer to the one of the Flash ROM.
For details, refer to "10.3.2. Adjustment Specifications".
It may takes about 10 seconds. While doing the adjustment, don't turn the power off forcibly.
(It cause the Charging Control Microcomputer crush, then the camera can not turn on.)

3.2.4. About Flexible Cable and Connector

Do not touch carelessly so that the foreign body should not adhere to the terminal part of flexible cable and connector.
Wipe off with a clean cloth and the cotton bud, etc. when the terminal part is dirty.

3.3. Service Notes

3.3.1. About Wi-Fi Function

The page number in this chapter does not show the page number of this service manual.

- **Operating the camera by connecting it to a smartphone**
  You can easily set up a direct connection to your smartphone without entering a password.
  - Taking pictures via a smartphone (→47)
  - Playing back pictures in the camera on a smartphone (→47)
  - Saving pictures in the camera to a smartphone
  - Sending pictures in the camera to social networking services
  - Adding location information to pictures in the camera from a smartphone
  - Combining motion pictures recorded with Snap Movie according to your preference on a smartphone
- **Displaying still pictures on a TV**
- **Wireless printing**
- **Sending pictures to AV device**
- **Sending pictures to a PC**
- **Using WEB services**

3.3.2. Important Notice of Servicing

This Camera unit has the personal information of wireless LAN connection the customer has registered.
For the protection of private information, please erase the personal information after the completion of repair by "INITIAL SETTING".
In addition, please print out the following documents, and pass to the customer with the Camera unit.

Printing Material [Leaflet for Customer]

[For The Customer]

Before using your camera please check the Wi-Fi settings.
Depending on what was serviced, the settings may have been reset to the factory defaults.

1. If the settings were reset you will need to reenter your Lumix Club login ID and password.

If you have forgotten the login ID and/or Password, please connect to the Lumix Club web site and create a new ones.

2.You may also have to reenter the settings for your local Wi-Fi network settings.

We recommend consulting the operating manual if you have any questions.

3.4. 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 °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 P.C.B. 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 P.C.B. 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 P.C.B. 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 °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.
  SVKZ000001----------(0.3mm 100g Reel)
  SVKZ000002----------(0.6mm 100g Reel)
  SVKZ000003----------(1.0mm 100g Reel)

Note:

* Ingredient: Tin (Sn) 96.5%, Silver (Ag) 3.0%, Copper (Cu) 0.5%. (Flex cored)

3.5. How to Define the Model Suffix (NTSC or PAL model)

There are six kinds of DMC-TZ80/TZ81/ZS60, regardless of the colours.

- a) DMC-TZ85 (Japan domestic model.)
- b) DMC-ZS60P/PP
- c) DMC-TZ80EB/EF/EG/EP, TZ81EG
- d) DMC-TZ80EE
- e) DMC-TZ80GN
- f) DMC-TZ80GA/GC, ZS60GH

What is the difference is that the "INITIAL SETTINGS" data which is stored in Flash ROM mounted on Main P.C.B.

3.5.1. Defining methods

To define the model suffix to be serviced, refer to the nameplate which is putted on the bottom side of the Unit.

a) DMC-TZ85 (Japan domestic model)

The nameplate for this model shows the following Safety registration mark.

b) DMC-ZS60P/PP

The nameplate for these models shows the following Safety registration mark.

c) DMC-TZ80EB/EF/EG/EP, TZ81EG

The nameplate for these models shows the following Safety registration mark.

d) DMC-TZ80EE

The nameplate for this model shows the following Safety registration mark.

e) DMC-TZ80GN

The nameplate for this model shows the following Safety registration mark.

f) DMC-TZ80GA/GC, DMC-ZS60GH

The nameplate for these models does not show any above Safety registration mark.

Note:

After replacing the Main P.C.B., be sure to achieve adjustment.

3.5.2. INITIAL SETTINGS:

After replacing the Main P.C.B. and/or Flash-ROM, make sure to perform the initial settings after achieving the adjustment by ordering the following procedure in accordance with model suffix of the unit.

1. IMPORTANT NOTICE:

Before proceeding Initial settings, be sure to read the following CAUTION.

CAUTION :(INITIAL SETTINGS)

--- AFTER REPLACING THE MAIN P.C.B. and/or FLASH-ROM ---

[Except "DMC-TZ80EG/EF/EB/EP and TZ81" models]

*. The model suffix can be chosen **JUST ONE TIME**.
(Effective model suffix : DMC-TZ80 "EE/GA/GC and GN", DMC-ZS60 "P/PP and GH" and "NONE(JAPAN)")

*. Once one of the model suffix has been chosen, the model suffix lists will not be displayed, thus, it can not be changed.

2. PROCEDURES:

- Precautions: Read the above "CAUTION" carefully.
- Preparation:
  1. Attach the fully charged Battery.
  2. Set the mode dial to the PROGRAM AE mode.
     * If the mode dial position is other than PROGRAM AE mode, it does not display the initial settings menu.

- **Step 1. The temporary cancellation of "INITIAL SETTINGS":**
  While keep pressing "RIGHT of Cursor button", MENU/SET button and DISPLAY button simultaneously, turn the Power on.

- **Step 2. The cancellation of "INITIAL SETTINGS":**
  Press PLAYBACK button to switch to the playback screen. (Keep pressing the button.)
  Press " UP of Cursor button" additionally, then turn the Power off.
  The LCD displays the " ! " mark before the unit powers down.

- **Step 3. Turn the Power on:**
  Turn the Power on.

• **Step 4. Display the "INITIAL SETTINGS" menu:**

* If the unit is other than PROGRAM AE mode, it does not display the initial settings menu.

While keep pressing MENU/SET and " RIGHT of Cursor button" simultaneously, turn the Power off.

The "INITIAL SETTINGS" menu is displayed.

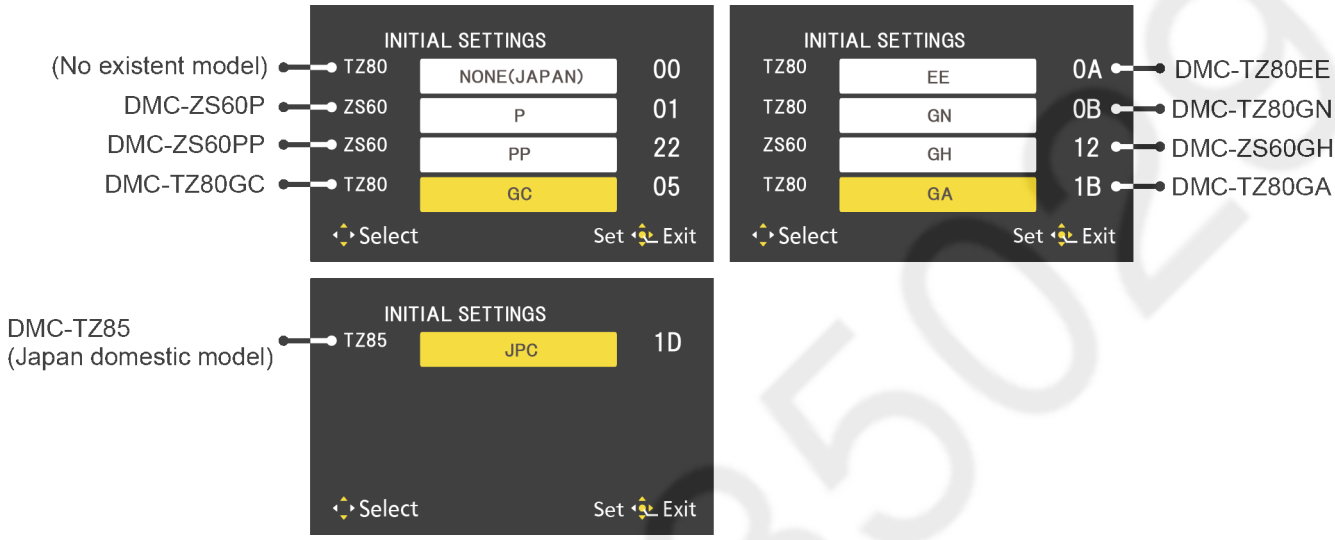
There are two kinds of "INITIAL SETTINGS" menu form as follows:

[CASE 1. After replacing MAIN P.C.B.]

There are three kinds of menu from as follows:

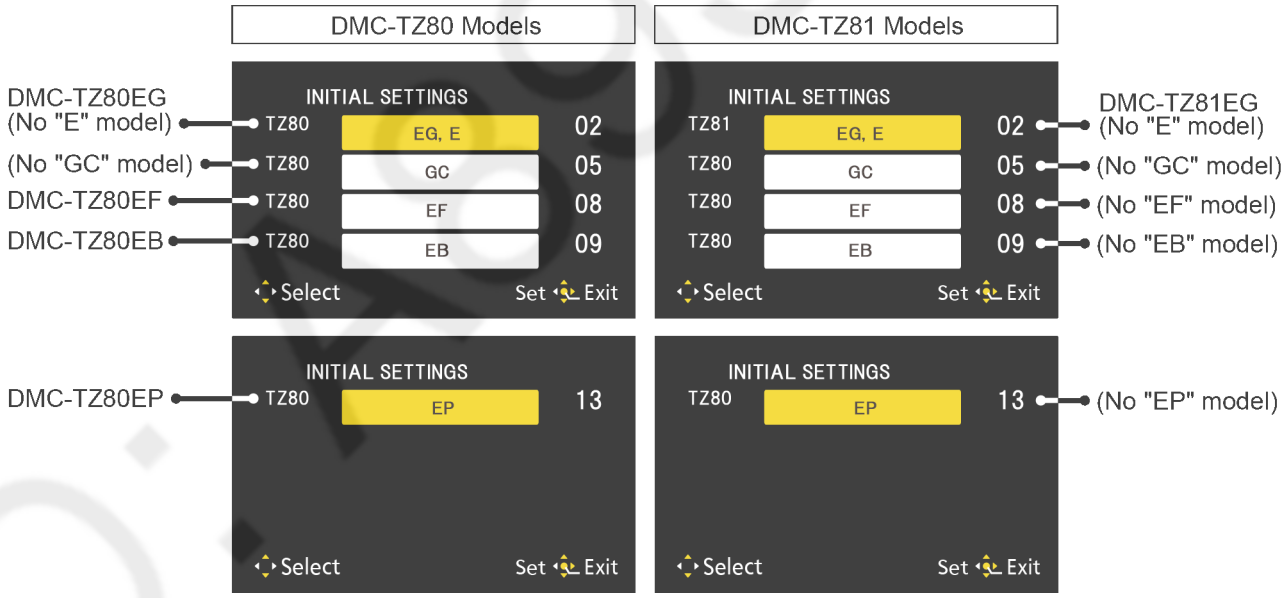
[Except for "DMC-TZ80EG, EF, EB, EP and TZ81EG" models : (SEP0684AC is used as a Main P.C.B.)]

When Main P.C.B. has just been replaced, all of the model suffix are displayed as follows. (Three pages in total)



[Only for "DMC-TZ80EG, EF, EB, EP and TZ81" models : (SEP0684AD is used as a Main P.C.B.)]

When Main P.C.B. has just been replaced, only 5 model suffix are displayed as follows. (Two pages in total)

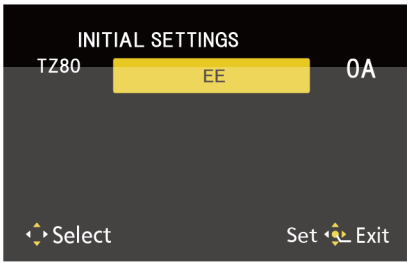


To display the "TZ81" model suffix, press the DELETE button.

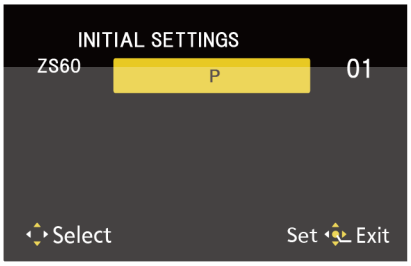
[CASE 2. Other than "After replacing Main P.C.B."]

< Other than "EG/EF/EB and EP" models >

DMC-TZ80 Models

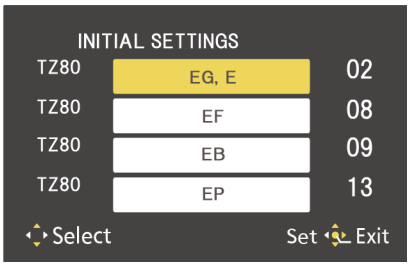


DMC-ZS60 Models

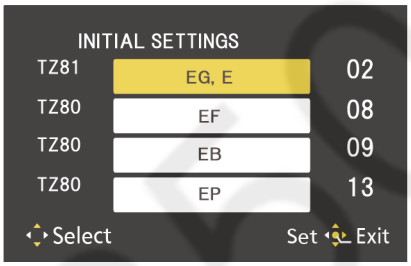


< Only "EG/EF/EB and EP" models >

DMC-TZ80 Models



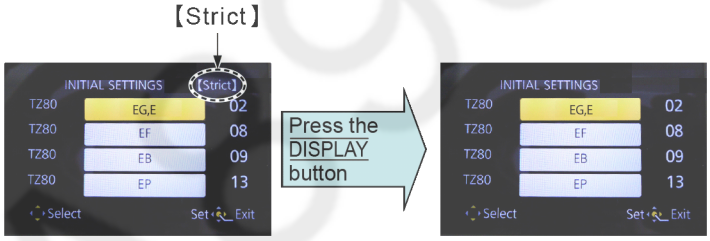
DMC-TZ81 Models



To display the "TZ81" model suffix, press the DELETE button.

- **Step 5. The cancellation of "STRICT MODE":**

Press DISPLAY button, then【Strict】in the upper right corner of the LCD display will disappear.



- **Step 6. Chose the model suffix in "INITIAL SETTINGS": (Refer to "CAUTION")**

[Caution: After replacing Main P.C.B.]

(Especially, other than "DMC-TZ80EG/EF/EB/EP and DMC-TZ81" models)

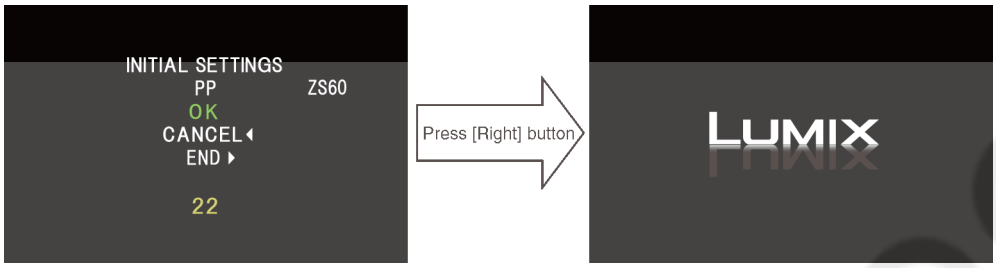
The model suffix can be chosen, JUST ONE TIME.

Once one of the model suffix have been chosen, the model suffix lists will not be displayed, thus, it can not be changed.

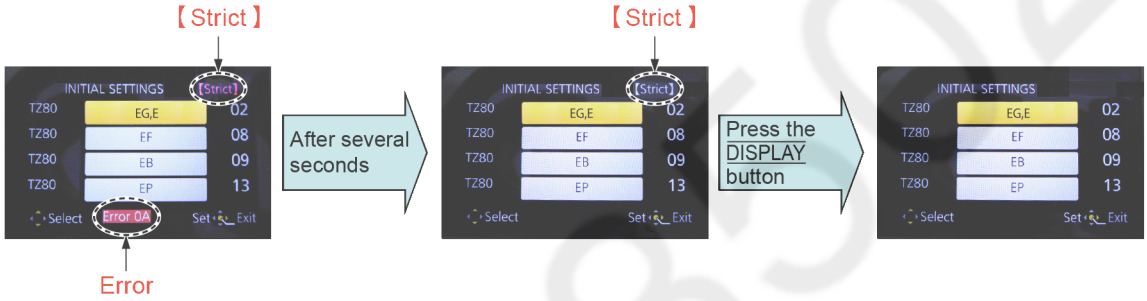
Therefore, select the area carefully.

Select the area with pressing "UP / DOWN of Cursor buttons".

• **Step 7. Set the model suffix at "INITIAL SETTINGS":**
Press the "RIGHT of Cursor buttons".
The only set area is displayed. Press the "RIGHT of Cursor buttons" after confirmation.
(The unit is powered off automatically.)



Note:
It may cause the following error indication without cancellation of "STRICT MODE".
In this case, press DISPLAY button after disappearing error indication.



• **Step 8. CONFIRMATION:**
Confirm the display of "PLEASE SET THE CLOCK" in concerned language when the unit is turned on again.
When the unit is connected to PC with USB cable, it is detected as removable media.

1) As for your reference, major default setting condition is as shown in the following table.

• **Default setting (After "INITIAL SETTINGS")**

	MODEL	VIDEO OUTPUT	LANGUAGE	DATE	REMARKS
a)	DMC-TZ85 (Japan domestic model)	NTSC	Japanese	Year/Month/Date	
b)	DMC-TZ80EB	PAL	English	Date/Month/Year	
c)	DMC-TZ80EE	PAL	Russian	Date/Month/Year	
d)	DMC-TZ80EF	PAL	English	Date/Month/Year	
e)	DMC-TZ80EG	PAL	English	Date/Month/Year	
f)	DMC-TZ80EP	PAL	English	Date/Month/Year	
g)	DMC-TZ80GA	PAL	English	Date/Month/Year	
h)	DMC-TZ80GC	PAL	English	Date/Month/Year	
i)	DMC-TZ80GN	PAL	English	Date/Month/Year	
j)	DMC-TZ81EG	PAL	English	Date/Month/Year	
k)	DMC-ZS60P	NTSC	English	Month/Date/Year	
l)	DMC-ZS60PP	NTSC	English	Month/Date/Year	
m)	DMC-ZS60GH	PAL	English	Date/Month/Year	

4 Specifications

The following specification is for DMC-ZS60P/PP, ZS100P/PP.
Some specifications may differ depending on model suffix.

Digital Camera: Information for your safety

Power Source	DC 8.4 V (⎓ 8.4 V)
Power Consumption	ZS100 2.3 W (When recording with monitor) 2.7 W (When recording with viewfinder) 1.5 W (When playing back with monitor) 1.5 W (When playing back with viewfinder) ZS60 2.2 W (When recording with monitor) 2.6 W (When recording with viewfinder) 1.5 W (When playing back with monitor) 1.5 W (When playing back with viewfinder)

Camera effective pixels	ZS100 20,100,000 pixels ZS60 18,100,000 pixels
Image sensor	ZS100 1″ MOS sensor, total pixel number 20,900,000 pixels Primary color filter ZS60 1/2.3″ MOS sensor, total pixel number 18,900,000 pixels Primary color filter

Lens	ZS100 Optical 10x zoom f=9.1 mm to 91 mm (35 mm film camera equivalent: 25 mm to 250 mm) Max. Wide: F2.8 to F8.0 Max. Tele: F5.9 to F8.0 ZS60 Optical 30x zoom f=4.3 mm to 129 mm (35 mm film camera equivalent: 24 mm to 720 mm) Max. Wide: F3.3 to F8.0 Max. Tele: F6.4 to F8.0
Image Stabilizer	Optical method
Focus range	ZS100 AF: 50 cm (1.6 feet) (Max. Wide)/ 70 cm (2.3 feet) (Max. Tele) to ∞ AF Macro/MF/Intelligent Auto/Motion picture: 5 cm (0.16 feet) (Max. Wide)/ 70 cm (2.3 feet) (Max. Tele) to ∞ ZS60 AF: 50 cm (1.6 feet) (Max. Wide)/ 2 m (6.6 feet) (Max. Tele) to ∞ AF Macro/MF/Intelligent Auto/Motion picture: 3 cm (0.098 feet) (Max. Wide)/ 2 m (6.6 feet) (Max. Tele) to ∞
Shutter system	Electronic shutter + Mechanical shutter

Minimum Illumination	ZS100 Approx. 9 lx (when i-Low light is used, the shutter speed is 1/30th of a second) ZS60 Approx. 10 lx (when i-Low light is used, the shutter speed is 1/30th of a second)
Shutter speed	ZS100 Still picture: T (Time) (Max. approx. 120 seconds), 60 seconds to 1/2000th of a second (When the mechanical shutter is used), 1 second to 1/16000th of a second (When the electronic shutter is used) Motion picture: 1/25th of a second to 1/16000th of a second (When [FHD/24M/24p] is set in [AVCHD], or [4K/100M/24p] is set in [MP4]), 1/2 second to 1/16000th of a second (When [M] is selected in Creative Video Mode, MF), 1/30th of a second to 1/16000th of a second (Other than the above) ZS60 Still picture: 60 seconds to 1/2000th of a second (When the mechanical shutter is used and [Artistic Nightscape] is selected as the Scene Guide Mode), 4 seconds to 1/2000th of a second (When the mechanical shutter is used, in cases other than the above), 1 second to 1/16000th of a second (When the electronic shutter is used) Motion picture: 1/2 second to 1/16000th of a second (When [M] is selected in Creative Video Mode, MF), 1/30th of a second to 1/16000th of a second (Other than the above)

Exposure (AE)	Program AE (P)/Aperture-priority AE (A)/ Shutter-priority AE (S)/Manual exposure (M)/AUTO Exposure Compensation (1/3 EV steps, -5 EV to +5 EV)
[Metering Mode]	Multiple/Center weighted/Spot
Monitor	3.0″ TFT LCD (3:2) (Approx. 1,040,000 dots) (field of view ratio about 100%) Touch screen
Viewfinder	0.2″ Color LCD Live Viewfinder (4:3) (Approx. 1,160,000 dots equivalent) (field of view ratio about 100%) [Magnification approx. 2.59x, 0.46x (35 mm film camera equivalent), with 50 mm lens at infinity; -1.0 m^{-1}] (with diopter adjustment -4.0 to +4.0 diopter)
Flash	ZS100 Built-in pop up flash ZS60 Built-in flash AUTO, AUTO/Red-Eye Reduction, Forced ON, Forced ON/Red-Eye Reduction, Slow Sync., Slow Sync./Red-Eye Reduction, Forced OFF
Microphones	Stereo
Speaker	Monaural
Recording media	SD Memory Card/SDHC Memory Card*/ SDXC Memory Card* * UHS-I UHS Speed Class 3
Recording file format	
Still picture	RAW/JPEG (based on Design rule for Camera File system, based on Exif 2.3 standard/DPOF corresponding)
Motion picture	AVCHD Progressive/AVCHD/MP4

Audio compression format	AVCHD: Dolby® Digital (2 ch) MP4: AAC (2 ch)
Interface	
Digital	USB 2.0 (High Speed)
Terminal	
[HDMI]	Micro HDMI Type D
[CHARGE]	USB 2.0 micro-B
Dimensions	***ZS100*** Approx. 110.5 mm (W) x 64.5 mm (H) x 44.3 mm (D) [4.35″ (W) x 2.54″ (H) x 1.74″ (D)] (excluding the projection part) ***ZS60*** Approx. 112.0 mm (W) x 64.0 mm (H) x 38.0 mm (D) [4.41″ (W) x 2.52″ (H) x 1.50″ (D)] (excluding the projection part)
Mass (weight)	***ZS100*** With card and battery: Approx. 310 g (0.68 lb) Excluding card and battery: Approx. 268 g (0.59 lb) ***ZS60*** With card and battery: Approx. 282 g (0.62 lb) Excluding card and battery: Approx. 240 g (0.53 lb)
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Operating humidity	10%RH to 80%RH
Language select	[ENGLISH] / [DEUTSCH] / [FRANÇAIS] / [ESPAÑOL] / [PORTUGUÊS] / [ITALIANO] / [繁體中文] / [日本語]

■ Wi-Fi

Compliance standard	IEEE 802.11b/g/n (standard wireless LAN protocol)
Frequency range used (central frequency)	2412 MHz to 2462 MHz (1 to 11 ch)
Encryption method	Wi-Fi compliant WPA™/WPA2™
Access method	Infrastructure mode

■ AC adaptor

(Panasonic SAE0012A): Information for your safety

Input:	110 V – 240 V⁓ 50/60 Hz 0.2 A
Output:	5 V ⎓ 1.0 A

■ Battery Pack (lithium-ion)

(Panasonic DMW-BLG10PP): Information for your safety

Voltage/capacity:	7.2 V/1025 mAh

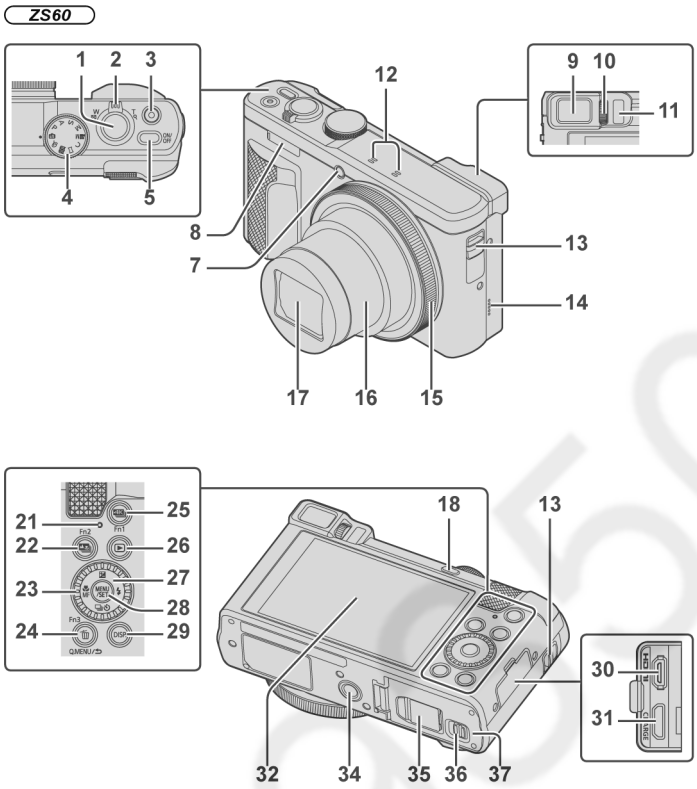
The symbols on this product (including the accessories) represent the following:

⁓	AC
⎓	DC
⧈	Class II equipment (The construction of the product is double-insulated.)

Specifications are subject to change without notice.

5 Location of Controls and Components

The following description is for DMC-ZS60P/PP, ZS100P/PP.
Some description may differ depending on model suffix.
The page number in this chapter does not show the page number of this service manual.



1 Shutter button (→22)
2 Zoom lever (→21)
3 Motion picture button (→37)
4 Mode dial (→23)
5 ZS100
Camera [ON/OFF] switch
ZS60
Camera [ON/OFF] button
6 ZS100
Rear dial (→26)
7 Self-timer indicator/AF assist lamp
8 Flash
9 Viewfinder (→25, 52)
10 Diopter adjustment dial
11 Eye sensor (→25)
12 Stereo microphone
13 Strap eyelet
• To prevent dropping, be sure to attach the supplied strap and fit it to your wrist.
14 ZS60
Speaker
15 Control ring (→26)
16 Lens barrel
17 Lens
18 [LVF] button (→25)/[Fn4] button
19 ZS100
Flash open lever
20 ZS100
[AF/AE LOCK] button
• You can take pictures by locking the focus and/or exposure.
21 Charging lamp (→18)/
Wi-Fi® connection lamp
22 [] ([Post Focus]) button (→33)/
[Fn2] button
23 ZS60
Control dial (→26)
24 [Q.MENU/↩] (Cancel) button/
[] (Delete) button (→41)/
[Fn3] button
• You can easily call some of the menu items and set them during recording.
25 [] (4K photo mode) button (→30)/
[Fn1] button
26 [] (Playback) button (→41)
27 Cursor button (→24)
28 [MENU/SET] button
29 [DISP.] button
• Use this to change display.
30 [HDMI] socket
31 [CHARGE] socket (→18)
32 Touch screen (→27)/monitor (→52)
33 ZS100
Speaker
34 Tripod mount
• Do not attach this unit to tripods that have screws with a length of 5.5 mm (0.22 inch) or more. Doing so may damage this unit or the unit may not be secured properly on the tripod.
35 DC coupler cover (→67)
36 Release lever (→17)
37 Card/Battery door (→17)

6 Service Mode

6.1. Error Code Memory Function

1. **General description**

   This unit is equipped with history of error code memory function, and can be memorized 16 error codes in sequence from the latest. When the error is occurred more than 16, the oldest error is overwritten in sequence.

   The error code is not memorized when the power supply is shut down forcibly (i.e.,when the unit is powered on by the battery, the battery is pulled out) The error code is memorized to Flash ROM when the unit has just before powered off.

2. **How to display**

   The error code can be displayed by ordering the following procedure:

   • **Preparation:**

   1. Attach the fully charged Battery, and insert the memory card (32MB or more).
   2. Set the mode dial to the PROGRAM AE mode.

      Note:

      *Since this unit has built-in memory, it can be performed without inserting Memory Card.

   • **Step 1. The temporary cancellation of "INITIAL SETTINGS":**

   While keep pressing "RIGHT of Cursor button", MENU/SET button and DISPLAY button simultaneously, turn the Power on.

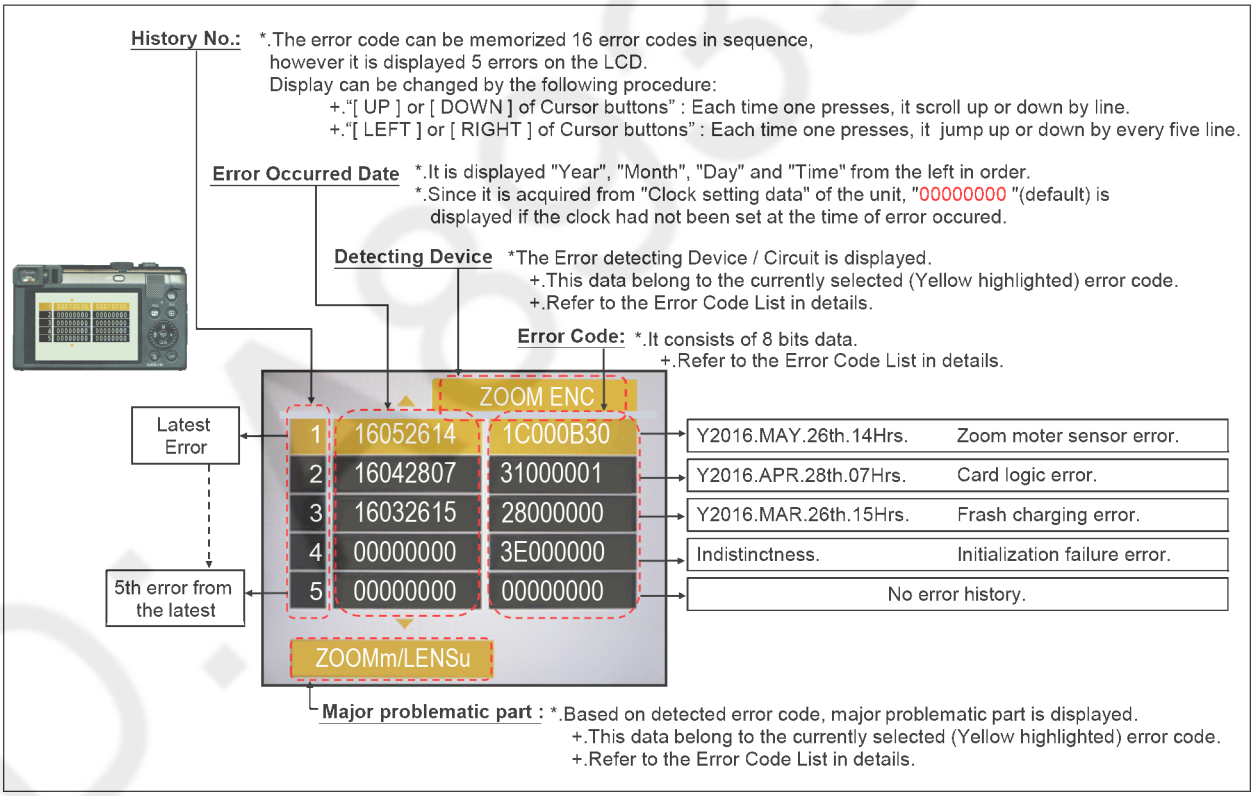
   • **Step 2. Execute the error code display mode:**

   Press the "PLAYBACK button, "LEFT of Cursor button" and MENU/SET button simultaneously.

   The display is changed as shown below when the above buttons are pressed simultaneously.

   Normal display → Error code display → CAMERA INFO → Normal display → .....

Example of Error Code Display



3. **Error Code List**

The error code consists of 8 bits data and it shows the following information.

Attribute	Main item	Sub item	Error code		Contents (Upper)	Error Indication	
			High 4 bits	Low 4 bits	Check point (Lower)	Detecting device	Part/Circuit
LENS	Lens drive	Focus	1C*0	0?01	HP High detect error (Focus encoder always detects High, and not becomes Low)	FOCUS L	LENS FPC/ DSP
					Mechanical lock, FP9004-(43) signal line or IC6001 (VENUS ENGINE)		
				0?02	HP Low detect error (Focus encoder always detects Low, and not becomes High)	FOCUS H	
					Mechanical lock, FP9004-(43) signal line or IC6001 (VENUS ENGINE)		
		Zoom		0?10	Collapsible barrel Low detect error (Collapsible barrel encoder always detects High.)	ZOOM L	ZOOMm/ LENSu
					Mechanical lock, FP9004-(43) signal line or IC6001 (VENUS ENGINE)		
				0?20	Collapsible barrel High detect error (Collapsible barrel encoder always detects Low.)	ZOOM H	
					Mechanical lock, FP9004-(43) signal line or IC6001 (VENUS ENGINE)		
				0?30	Zoom motor sensor error. (Initialized or Terminated)	ZOOM ENC	
					Mechanical lock, FP9004-(4) signal line or IC6001 (VENUS ENGINE)		
				0?40	Zoom motor sensor error. (During monitor mode.)		
					Mechanical lock, FP9004-(4) signal line or IC6001 (VENUS ENGINE)		
				0?50	Zoom motor sensor error. (During monitor mode with slow speed.)		
					Mechanical lock, FP9004-(4) signal line or IC6001 (VENUS ENGINE)		
				0?60	Detection of zoom misregistration by impact such as fails.	(No indication)	(No indication)
					Lens Unit		
		OIS		1000	PSD (X) error. Hall element (X axis) position detect error in OIS unit.	OIS X	LENSu NG
					OIS Unit		
				2000	PSD (Y) error. Hall element (Y axis) position detect error in OIS unit.	OIS Y	
					OIS Unit		
				3000	GYRO (X) error. Gyro (IC7101 : X axis) detect error on Main P.C.B.	GYRO X	GYRO NG
					IC7101 (Gyro element) or IC6001 (VENUS ENGINE)		
				4000	GYRO (Y) error. Gyro (IC7101 : Y axis) detect error on Main P.C.B.	GYRO Y	
					IC7101 (Gyro element) or IC6001 (VENUS ENGINE)		
				5000	GYRO (R) error, Gyro (IC7101 : R axis) detect error on Main P.C.B.	GYRO R	
					IC7101 (Gyro element) or IC6001 (VENUS ENGINE)		
				6000	Drive voltage (X) error.	OISX REF	LENSu/LENS FPC
					LENS Unit, LENS flex breaks, IC6001(VENUS ENGINE) AD value error, etc.		
				7000	Drive voltage (Y) error.	OISY REF	
					LENS Unit, LENS flex breaks, IC6001(VENUS ENGINE) AD value error, etc.		
				8000	OIS GYRO - Digital communication error.	(No indication)	(No indication)
					IC7101 (Gyro element) or IC6001 (VENUS ENGINE)		
		Lens	18*1	0000	Power ON time out error.	LENS DRV	LENSu
					Lens drive system		
			18*2	0000	Power OFF time out error.		
					Lens drive system		

Attribute	Main item	Sub item	Error code		Contents (Upper)	Error Indication	
			High 4 bits	Low 4 bits	Check point (Lower)	Detecting device	Part/Circuit
	Adj.History	OIS	1D*0	2000	OIS adj. Yaw direction amplitude error (small)	OIS ADJ	OIS ADJ
				3000	OIS adj. Pitch direction amplitude error (small)		
				4000	OIS adj. Yaw direction amplitude error (large)		
				5000	OIS adj. Pitch direction amplitude error (large)		
				8000	OIS adj. Yaw direction off set error		
				9000	OIS adj. Pitch direction off set error		
				A000	OIS adj. Yaw direction gain error		
				B000	OIS adj. Pitch direction gain error		
				C000	OIS adj. Yaw direction position sensor error		
				D000	OIS adj. Pitch direction position sensor error		
				E000	OIS adj. other error		
HARD	FLASH	Flash	28*0	0000	Flash charging capacitor did not been fully charged within 20 seconds	STRB CHG	TOP P.C.B./ FPC
	FLASH ROM	Data Area	2B*0	0001	IC6003 (Flash-ROM) data reading error is detected when the unit turns ON	FROM RE	FROM
				0002	IC6003 (Flash-ROM) data writing error is detected when the unit turns OFF	FROM WR	FROM
		Program Area		0005	Firmware update error of IC9101	(No indication)	(No indication)
				0006	Firmware update error of IC1502		
SOFT	CPU	Reset	30*0	0001 | 0007	System error (NMI reset)	NMI RST	MAIN P.C.B.
	Recording Media	Memory card	31*0	0002	Memory card physical error During formatting the memory card, there is no response from the memory card If the mini-SD memory card is used, check the SD memory card adaptor	SD CARD	SD CARD/ DSP
				0004	Memory card writing error Check the memory card. It might be damage one.	SD WRITE	
	Operation	Power on	3B*0	0000	Flash ROM processing early period of camera during movement.	INIT	(No indication)
	Zoom	Zoom	3C*0	0000	Imperfect zoom lens processing	ZOOM	ZOOMm/ LENSu
					Zoom lens		
	Recording	Motion Image Recording	3F*0	0001	File time out error in recording motion image	(No indication)	(No indication)
				0002	File data cue send error in recording motion image		
Wi-Fi			3211	**02 | **0C	Wi-Fi related errors: *Generally, above are unable to specified the, which cannot be used for malfunction diagnosis.		

Important notice about "Error Code List"

1) About "*" indication:

The third digit from the left is different as follows.

+.In case of 0 (example: 18 **0** 01000)

When the third digit from the left shows "0", this error occurred under the condition of INITIAL SETTINGS has been completed.
It means that this error is occurred basically at user side.

+.In case of 8 (example: 18 **8** 01000)

When the third digit from the left shows "8", this error occurred under the condition of INITIAL SETTINGS has been released.
(Example; Factory assembling-line before unit shipment, Service mode etc.)
It means that this error is occurred at service side.

2) About "?" indication: ("18*0 0?01" to "18*0 0?50"):

The third digit from the right shows one of the hexadecimal ("0" to "F") character.

4. How to exit from Error Code display mode:

Simply, turn the power off. (Since Error code display mode is executed under the condition of temporary cancellation of "INITIAL SETTINGS", it wake up with normal condition when turn off the power.)

Note:

The error code can not be initialized.

7 Troubleshooting Guide

7.1. Wi-Fi Module (Top P.C.B. Unit)

7.1.1. How to Remove Wi-Fi Password Protection

To prevent incorrect operation or use of the Wi-Fi function by a third party and to protect saved personal information, this unit protects the Wi-Fi function with a password.
It is unable to service with password locked condition. When accepting for repair, the unit has been set the Wi-Fi password by customer, run the [Reset Wi-Fi Settings] for removing Wi-Fi password, then check the operation.

[Reset Procedure of Wi-Fi Settings]

1. Press the [MENU/SET] button, and select the [SETUP] mode by Cursor buttons, then press the [MENU/SET] button.
2. Select [Reset Wi-Fi Settings] by Cursor buttons, then press the [MENU/SET] button.
3. Select [YES] and press the [MENU/SET] button in several times.
4. (The [Reset Wi-Fi Settings] performs not only resetting Wi-Fi Password but also resetting other all Wi-Fi Settings.)

7.1.2. Checking of trouble caused by Wi-Fi Module on Top P.C.B. Unit or not

The Wi-Fi module works properly if the wireless access point (broadband router) name (SSID) in use is displayed on a screen of [Manual Connection].

(Primary Confirmation)
Confirm that the wireless access point (broadband router) works properly.

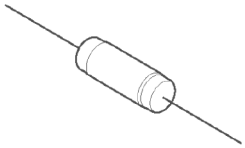
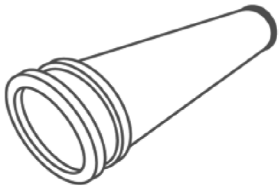
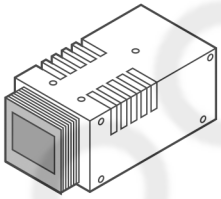
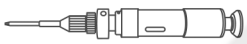
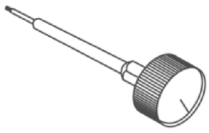
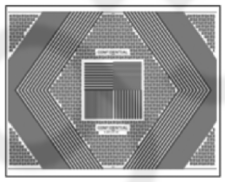
(Procedure)
1) Press [Wi-Fi] button.
2) Select [New Connection] in [Wi-Fi] menu.
3) Select optional function in [select a function] menu, then select [Direct] in [Select connection method] menu.
4) Select [Manual Connection] in [Select connection method] menu.
5) The Wi-Fi module works properly if the wireless access point (broadband router) name (SSID) in use is displayed.

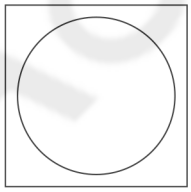
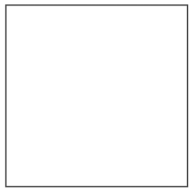
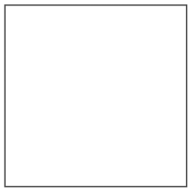
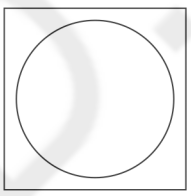
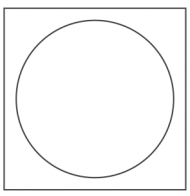
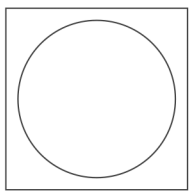
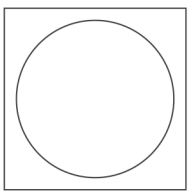
*** Replace the Top P.C.B. Unit, when the above checking detected the abnormal of Wi-Fi module.**

8 Service Fixture & Tools

8.1. Service Fixture and Tools

The following Service Fixture and tools are used for checking and servicing this unit.

Resistor for Discharging (1kΩ /5W) **ERG5SJ102**	COLLIMATOR (built-in Focus Chart) **RFKZ0422**	LIGHT BOX (with DC Cable) **RFKZ0523**
 ∗ An equivalent type of resistor may be used.		
Lens Cleaning Kit (BK) **VFK1900BK**	Torque Driver **RFKZ0542**	Diffuser **RFKZ0591**
 ∗ Only supplied as 10 set/box.		
Driver (for Optical Axis Adjustment) **RFKZ0609**	Optical Axis Adjustment Chart **RFKZ0570**	Camera stand **RFKZ0333J**
 ∗ T3 Torx type		

Gray Card **RFKZ0506**	ND Filter (ND0.3) **RFKZ0513**	ND Filter (ND0.6) **VFK1164ND06**	ND Filter (ND0.9) **VFK1164ND09**
			
CC Filter (CC-C7.5) **RFKZ0511**	CC Filter (CC-Y10) **RFKZ0512**	LB Filter (LBB2) **RFKZ0520**	LB Filter (LBB8) **RFKZ0521**
			

8.2. When Replacing the Main P.C.B.

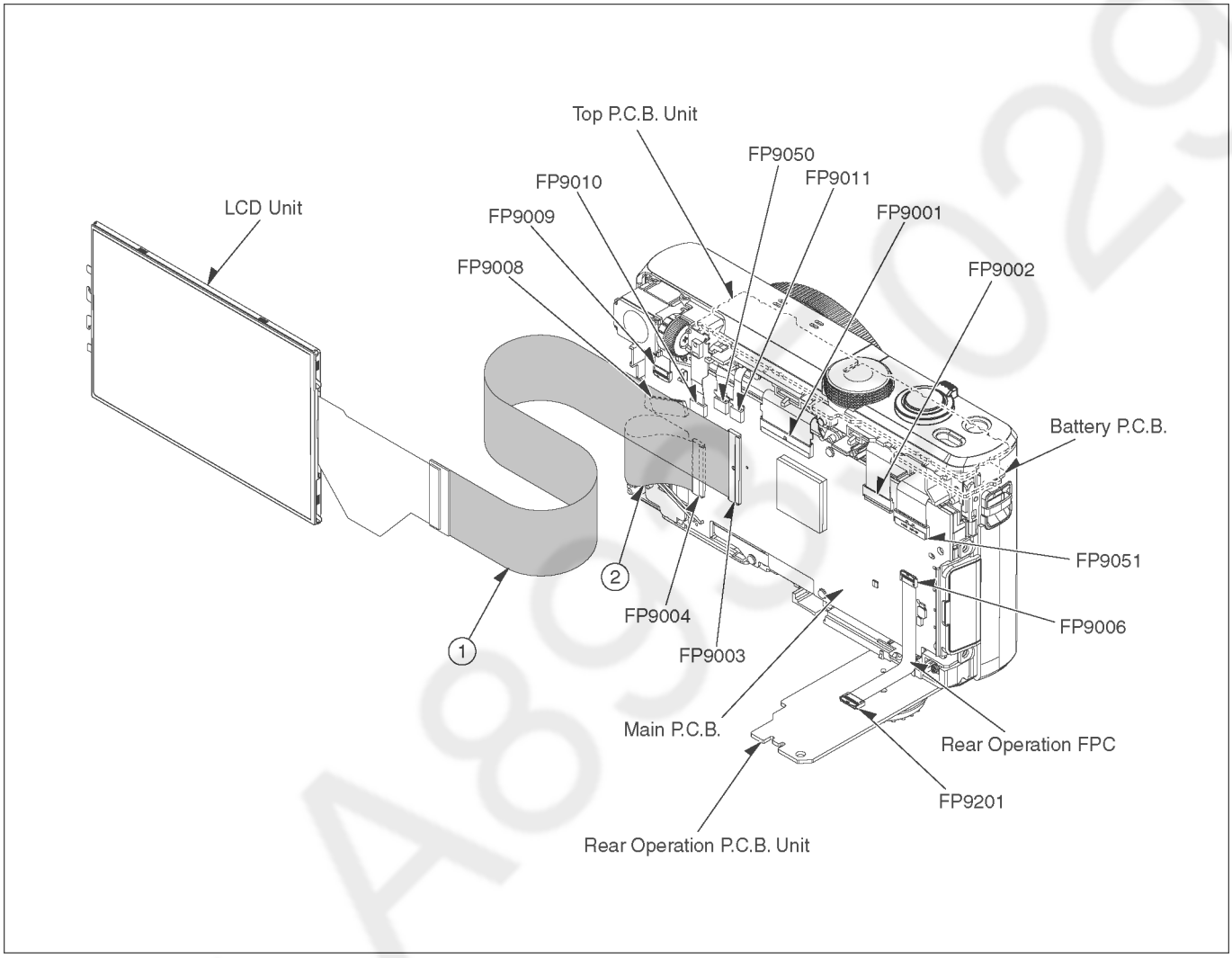
After replacing the Main P.C.B., be sure to achieve adjustment.

8.3. Service Position

This Service Position is used for checking and replacing parts. Use the following Extension cables for servicing.

No.	Parts No.	Connection	Form
1	RFKZ0619	FP9003 (Main P.C.B.) ⟷ LCD Unit	61PIN / 0.3 FFC
2	RFKZ0477	FP9004 (Main P.C.B.) ⟷ Lens Unit	45PIN / 0.3 FFC

8.3.1. Extension Cable Connections



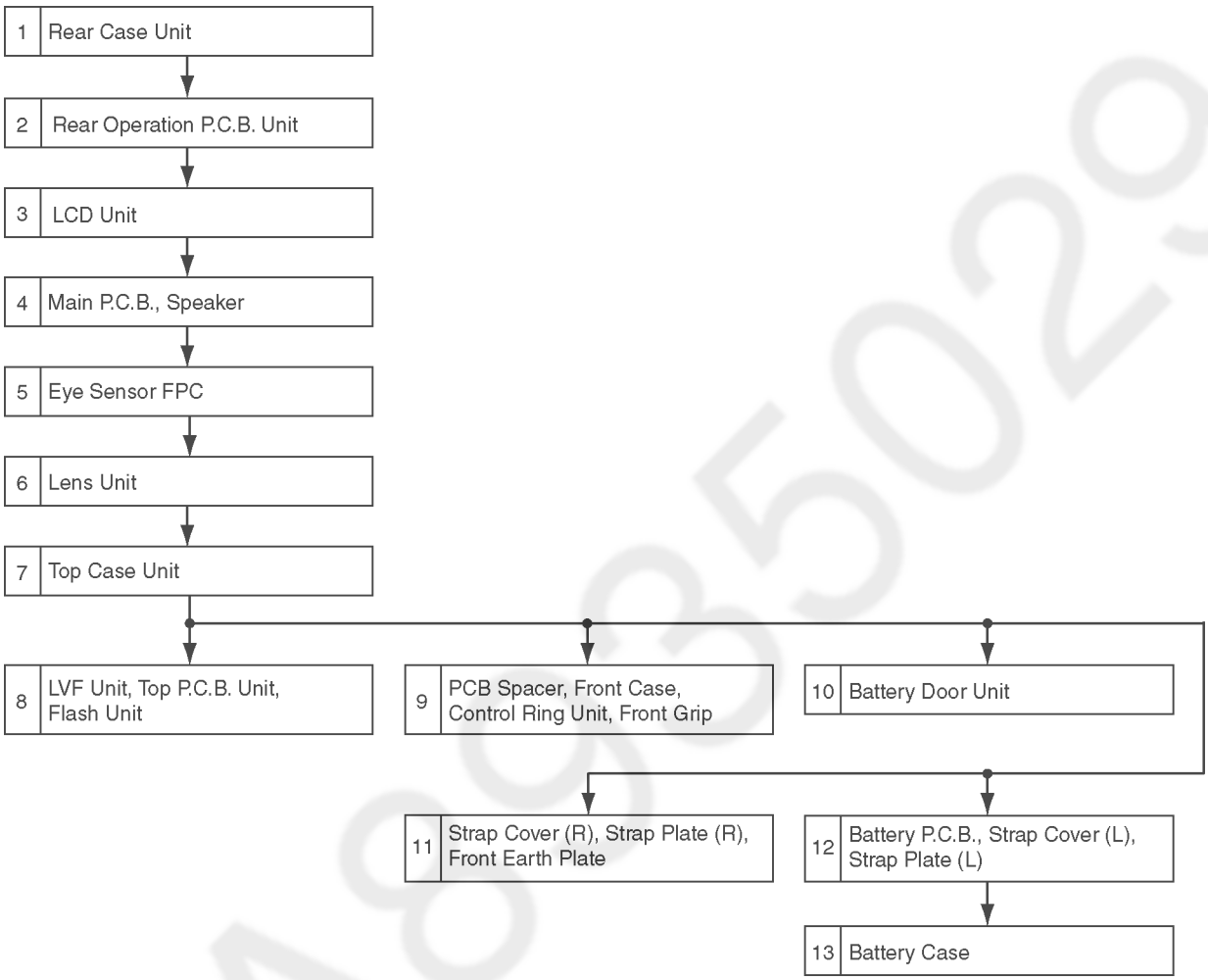
CAUTION (When servicing Top P.C.B. Unit)

1. Be sure to discharge the capacitor on Top P.C.B. Unit.
   Refer to "HOW TO DISCHARGE THE CAPACITOR ON Top P.C.B. Unit".
   The capacitor voltage is not lowered soon even if the AC Cord is unplugged or the battery is removed.
2. Be careful of the high voltage circuit on Top P.C.B. Unit.
3. DO NOT allow other parts to touch the high voltage circuit on Top P.C.B. Unit.

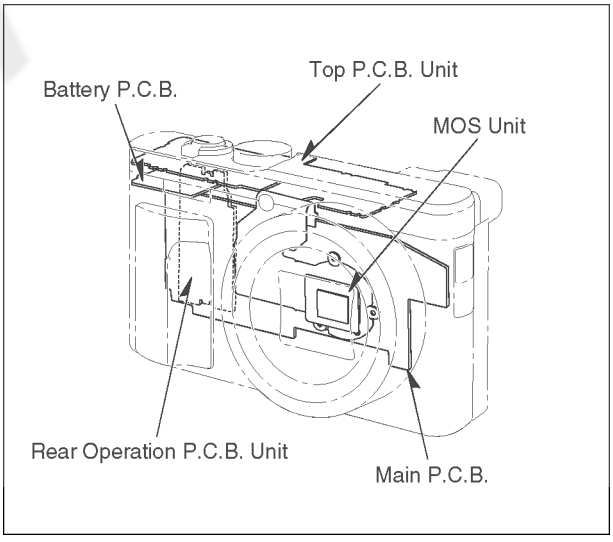
9 Disassembly and Assembly Instructions

9.1. Disassembly Flow Chart

This is a disassembling chart.
When assembling, perform this chart conversely.



9.2. P.C.B. Location



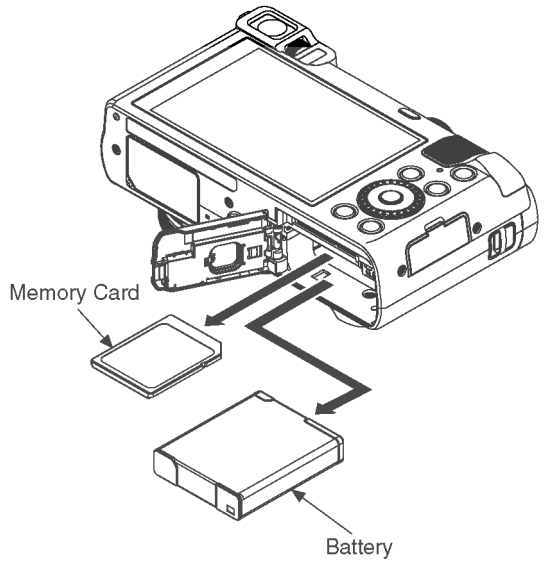
9.3. Disassembly Procedure

No.	Item	Fig.	Removal
1	Rear Case Unit	(Fig. D1)	Screw (A) × 6 Locking tab × 5 Jack Base Unit Jack Cover Rear Case Unit
2	Rear Operation P.C.B. Unit	(Fig. D2)	Locking tab × 1 FP9006 (Flex) Rear Operation FPC Rear Operation P.C.B. Unit
3	LCD Unit	(Fig. D3)	Locking tab (A) × 2 Screw (B) × 2 Locking tab (B) × 1 Frame Plate Unit Battery Lock Spring Battery Lock Knob FP9003 (Flex) LCD Unit
		(Fig. D4)	Note: (When replacing Frame Plate Unit) Frame Plate Sheet
4	Main P.C.B., Speaker	(Fig. D5)	Locking tab × 2 Speaker Plate Unit FP9001 (Flex) FP9002 (Flex) FP9004 (Flex) FP9008 (Flex) FP9009 (Flex) FP9010 (Flex) FP9011 (Flex) FP9050 (Flex) FP9051 (Flex) Screw (C) × 3 Heat Radiation Pad Main P.C.B
		(Fig. D6)	Note: (When replacing Main P.C.B.) Heat Radiation Pad, CU Protection Sheet
		(Fig. D7)	Solder (2 points) Speaker
5	Eye Sensor FPC	(Fig. D8)	Positioning boss × 2 Hooking part × 2 Eye Sensor FPC
6	Lens Unit	(Fig. D9)	Screw (D) × 3 Lens Fix Plate Lens Unit
7	Top Case Unit	(Fig. D10)	Screw (E) × 1 Locking tab × 2 Top Case Unit
8	LVF Unit, Top P.C.B. Unit, Flash Unit	(Fig. D11)	Screw (F) × 3 Locking tab (A) × 2 LVF Unit Top P.C.B. Unit MIC Spacer MIC Unit MIC Damper Solder A (3 points) Locking tab (B) × 2 AF Panel Light Flash Spacer Earth Spring E. Capacitor Solder B (3 points) Flash Unit Top Earth Plate A Top Earth Plate B WiFi FPC Top FPC
		(Fig. D12)	Note: (When replacing Top P.C.B. Unit, LVF Unit)
9	PCB Spacer, Front Case, Control Ring Unit, Front Grip	(Fig. D13)	Hooking part × 2 PCB Spacer Screw (G) × 1 Locking tab (A) × 1 Front Case Screw (H) × 5 Locking tab (B) × 3 Control Ring Unit Front Grip
10	Battery Door Unit	(Fig. D14)	Battery Door Shaft Battery Door Spring Battery Door Unit Tripod
11	Strap Cover (R), Strap Plate (R), Front Earth Plate	(Fig. D15)	Screw (I) × 1 Locking tab (A) × 1 Locking tab (B) × 1 Strap Cover (R) Hooking part × 2 Positioning boss × 2 Strap Plate (R) Front Earth Plate
12	Battery P.C.B., Strap Cover (L), Strap Plate (L)	(Fig. D16)	Screw (J) × 1 Battery FPC Hooking part × 1 Battery P.C.B Locking tab (A) × 1 Locking tab (B) × 2 Strap Cover (L) Strap Plate (L)
13	Battery Case	(Fig. D17)	Hooking part × 4 Battery Case Gasket

・Memory Card
・Battery

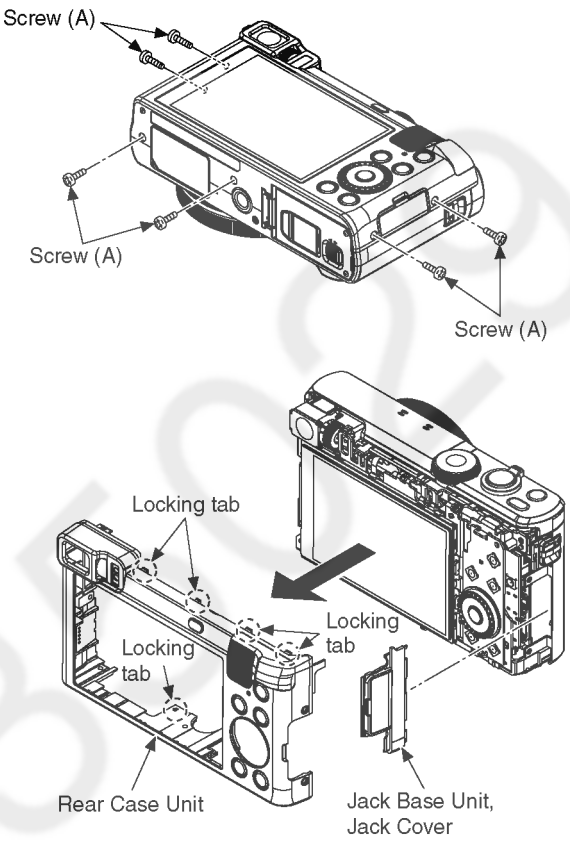
Note:

When servicing and reassembling, remove the Memory Card and Battery from the unit.



9.3.1. Removal of the Rear Case Unit

・Screw (A)×6
・Locking tab ×5



Note: (When Replacing)

・Take care not to lose the Jack Base Unit and Jack Cover, it because easy to separate.

Screw (A)

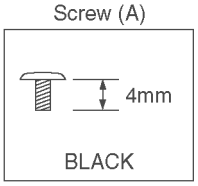
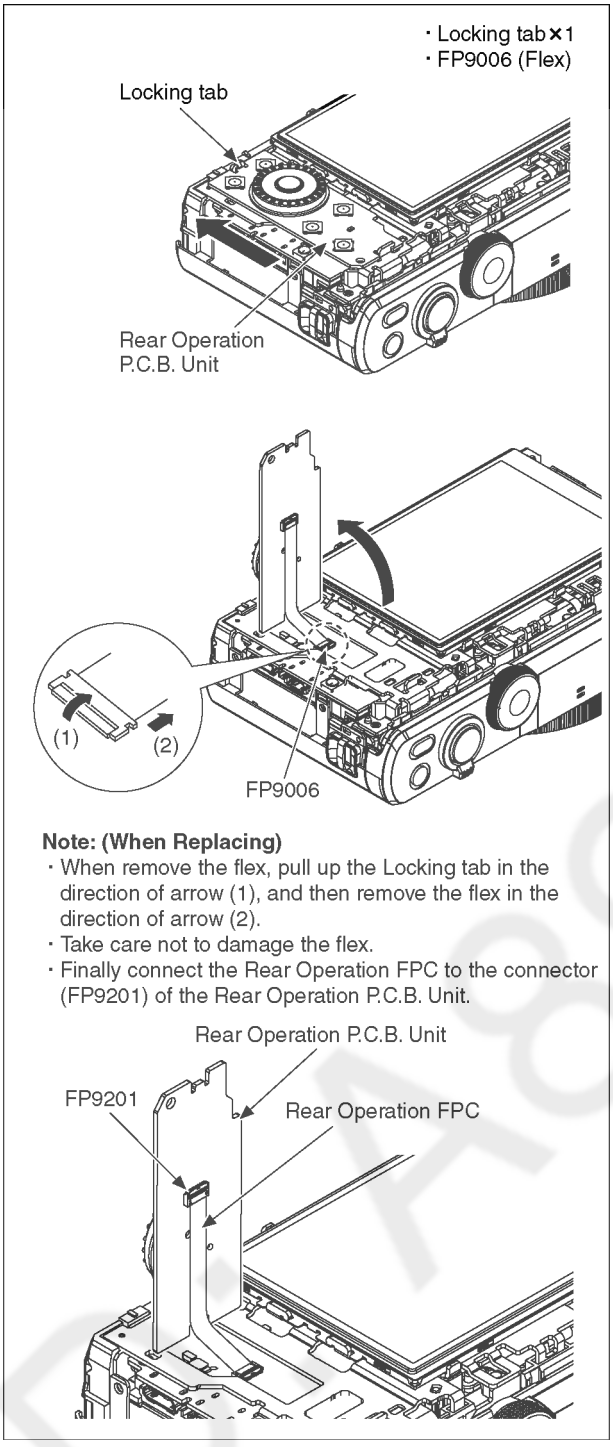


Fig. D1

9.3.2. Removal of the Rear Operation P.C.B. Unit

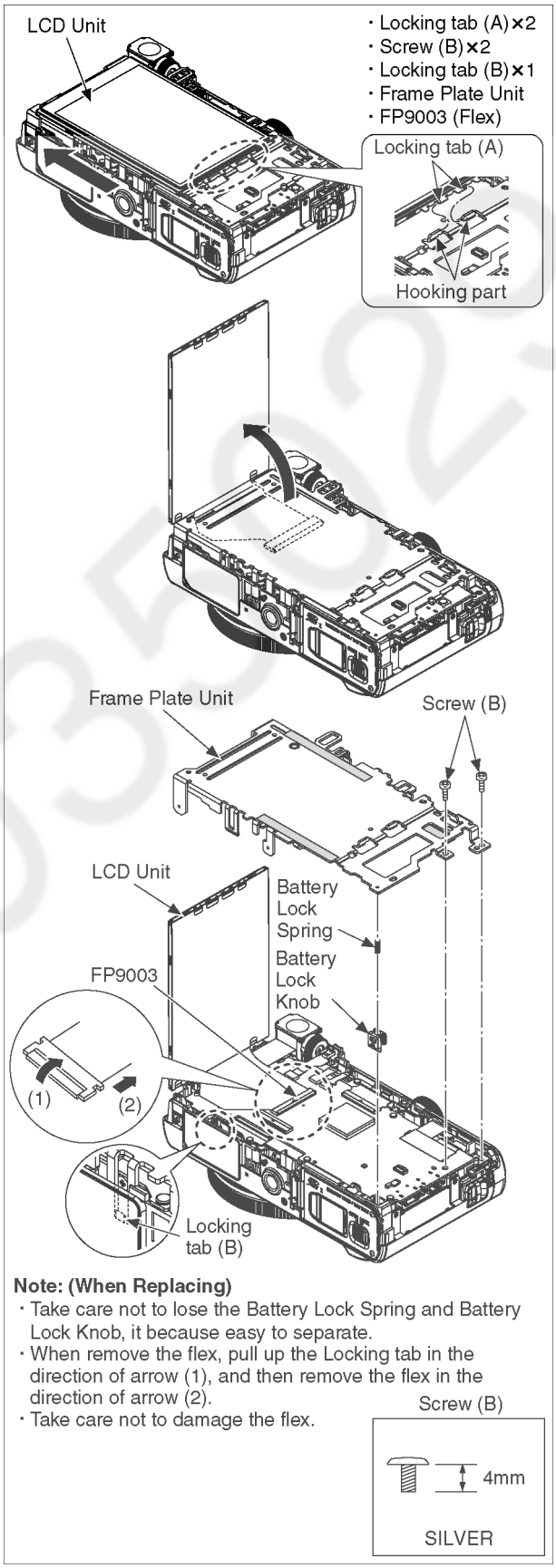


Note: (When Replacing)

・When remove the flex, pull up the Locking tab in the direction of arrow (1), and then remove the flex in the direction of arrow (2).
・Take care not to damage the flex.
・Finally connect the Rear Operation FPC to the connector (FP9201) of the Rear Operation P.C.B. Unit.

Fig. D2

9.3.3. Removal of the LCD Unit



Note: (When Replacing)

・Take care not to lose the Battery Lock Spring and Battery Lock Knob, it because easy to separate.
・When remove the flex, pull up the Locking tab in the direction of arrow (1), and then remove the flex in the direction of arrow (2).
・Take care not to damage the flex.

Fig. D3

Note: (When Replacing)

・When replacing the Frame Plate Unit, replace the Frame Plate Sheet as well.
For how to attach the Frame Plate Sheet, see below.

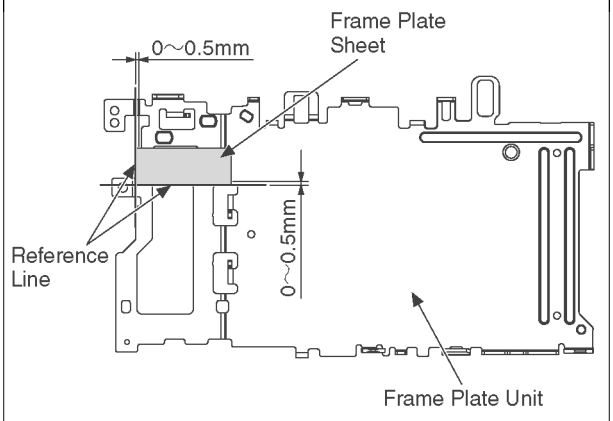
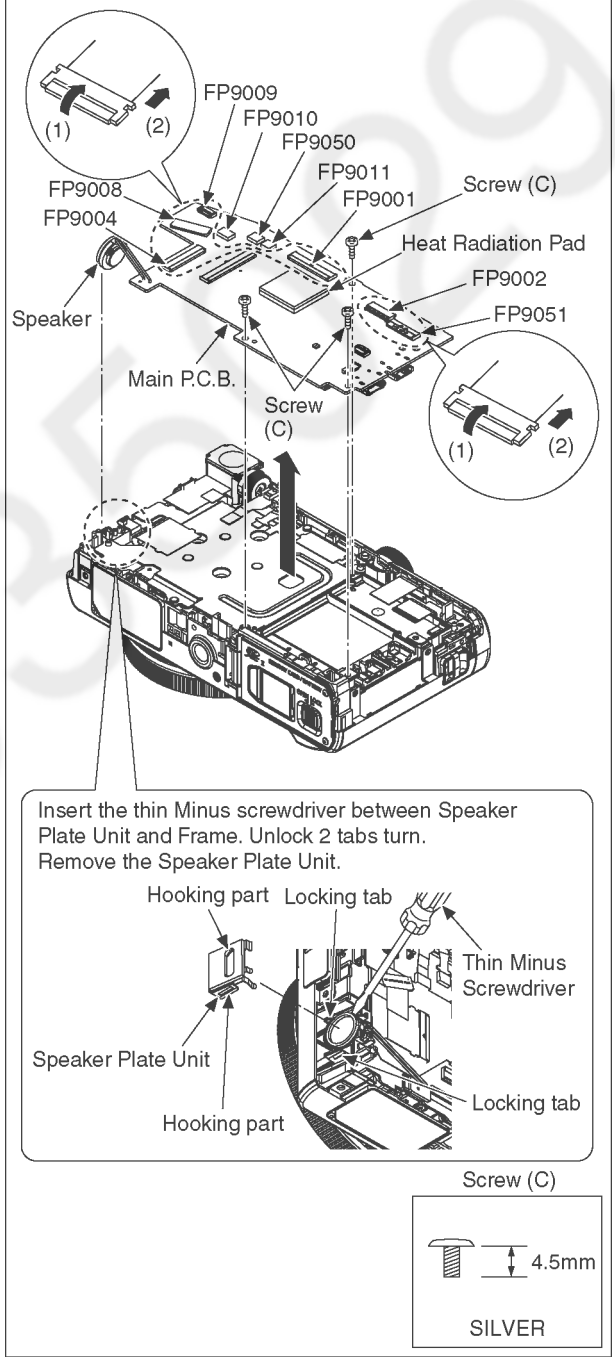


Fig. D4

9.3.4. Removal of the Main P.C.B., Speaker

・Locking tab×2
・Speaker Plate Unit
・FP9001 (Flex)
・FP9002 (Flex)
・FP9004 (Flex)
・FP9008 (Flex)
・FP9009 (Flex)
・FP9010 (Flex)
・FP9011 (Flex)
・FP9050 (Flex)
・FP9051 (Flex)
・Screw (C)×3



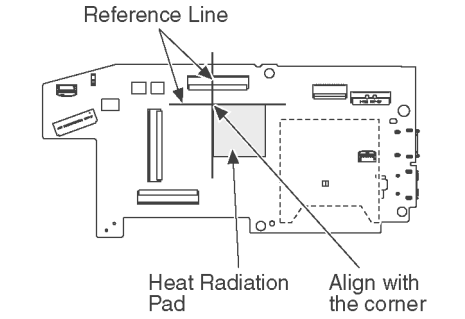
Insert the thin Minus screwdriver between Speaker Plate Unit and Frame. Unlock 2 tabs turn. Remove the Speaker Plate Unit.

Screw (C)

Fig. D5

Note: (When Replacing)

- When remove the flex, pull up the Locking Tab in the direction of arrow (1), and then remove the flex in the direction of arrow (2).
- Take care not to damage the flex.
- When attaching the Heat Radiation Pad, confirm the attaching position to attach.
- When attaching the CU Protection Sheet, confirm the attaching position to attach.



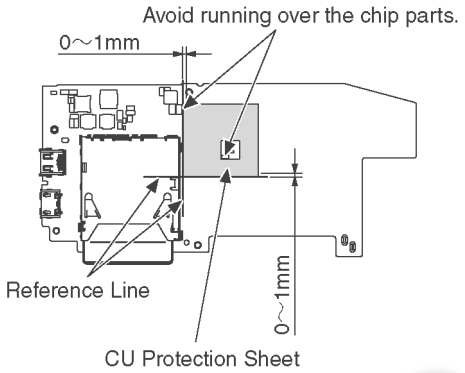


Fig. D6

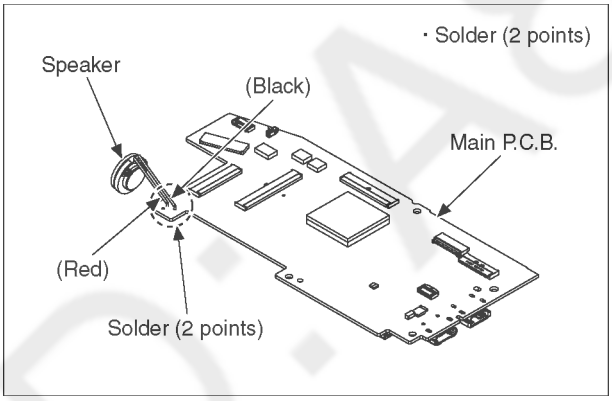


Fig. D7

9.3.5. Removal of the Eye Sensor FPC

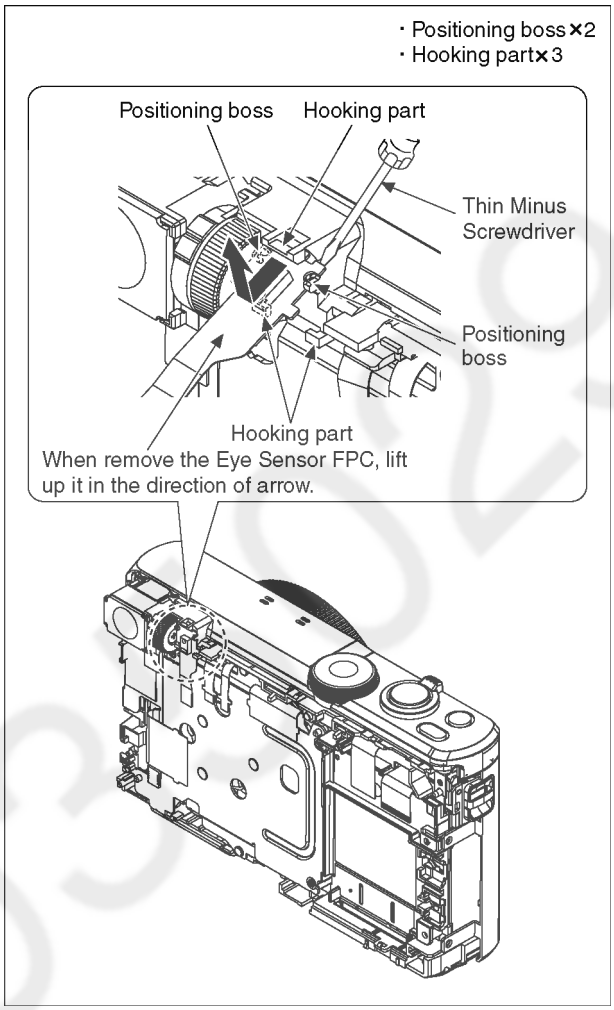


Fig. D8

9.3.6. Removal of the Lens Unit

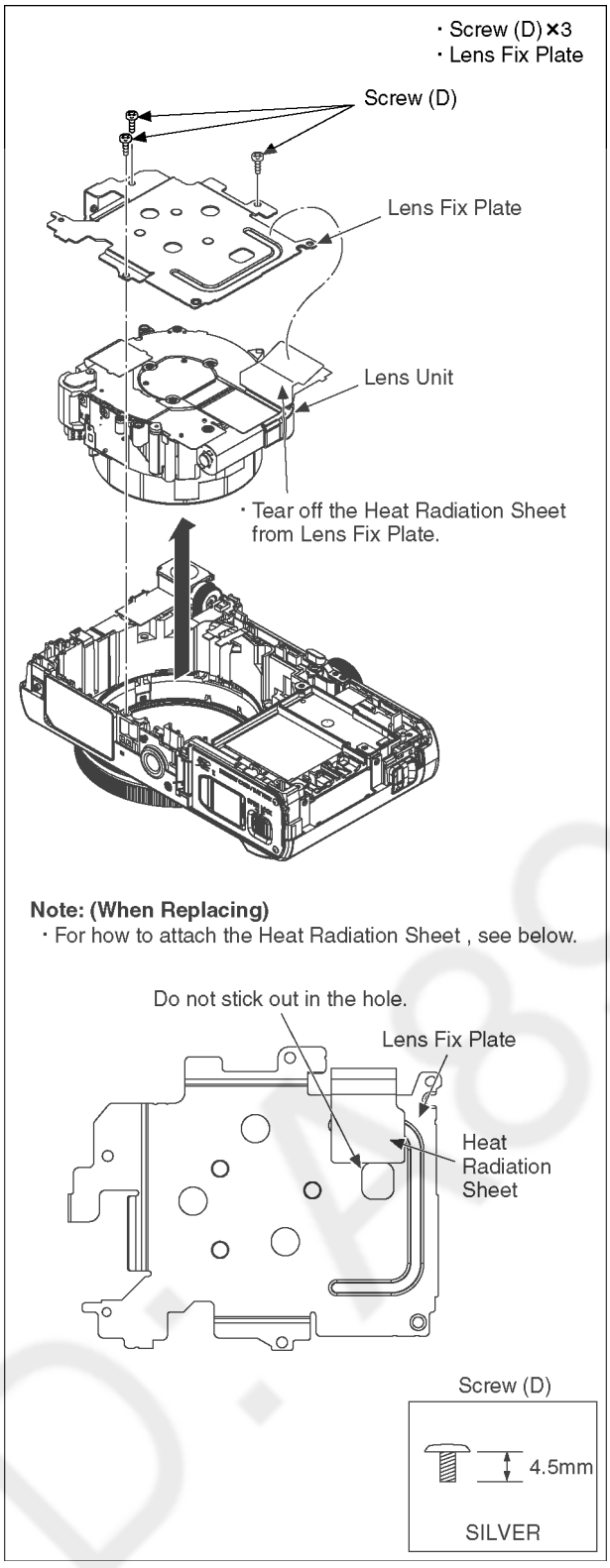


Fig. D9

9.3.7. Removal of the Top Case Unit

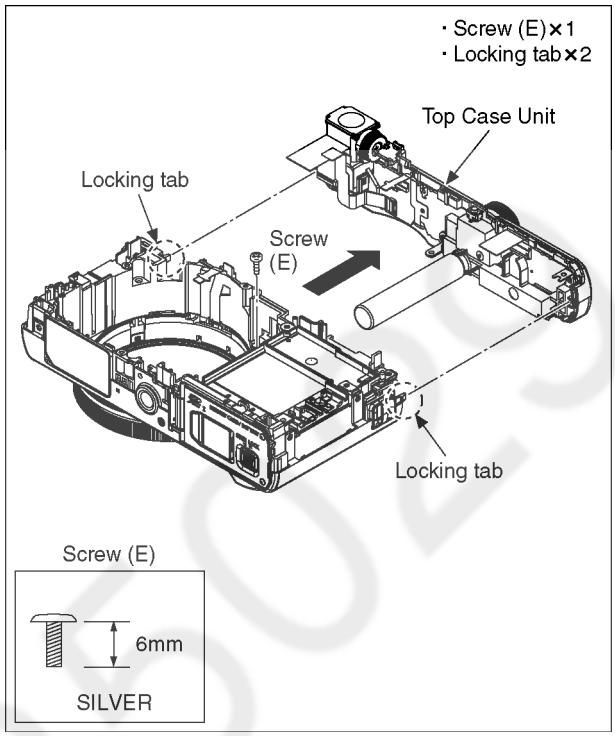


Fig. D10

9.3.8. Removal of the LVF Unit, Top P.C.B. Unit, Flash Unit

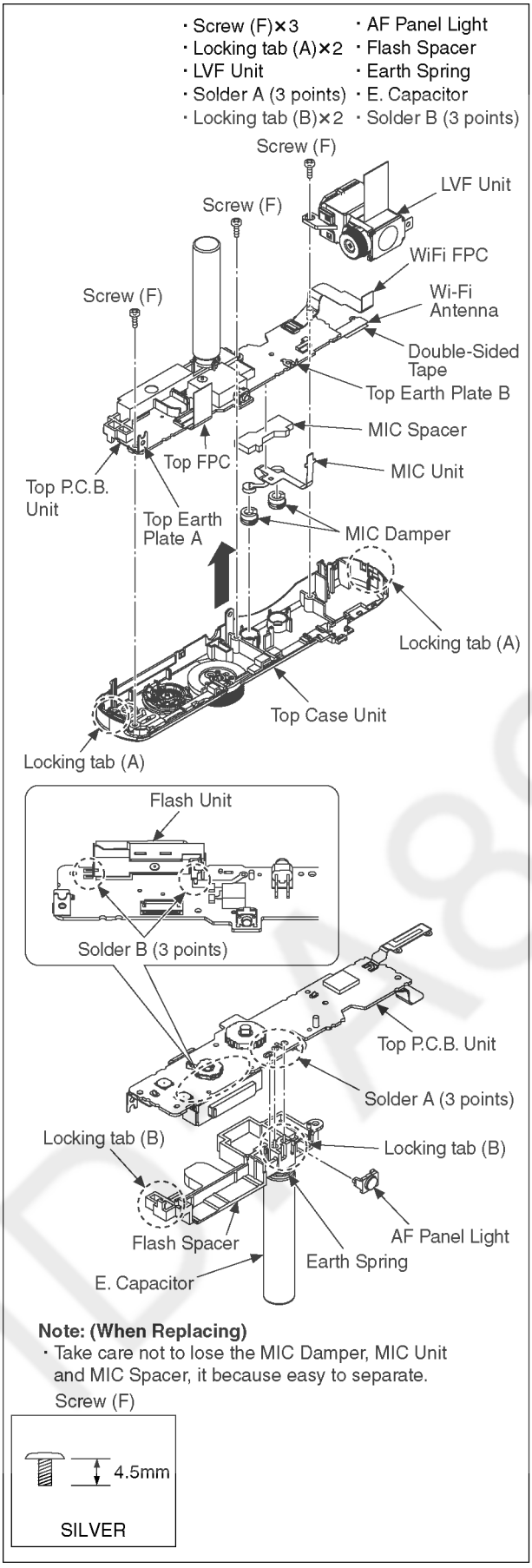


Fig. D11

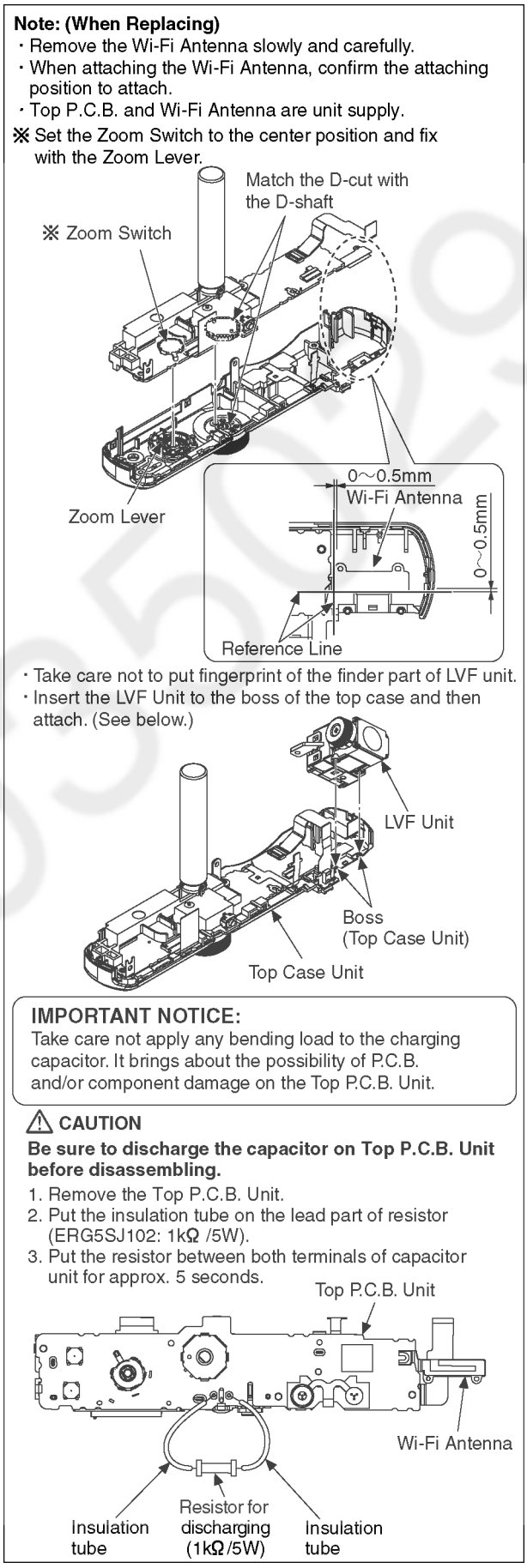


Fig. D12

9.3.9. Removal of the PCB Spacer, Front Case, Control Ring Unit, Front Grip

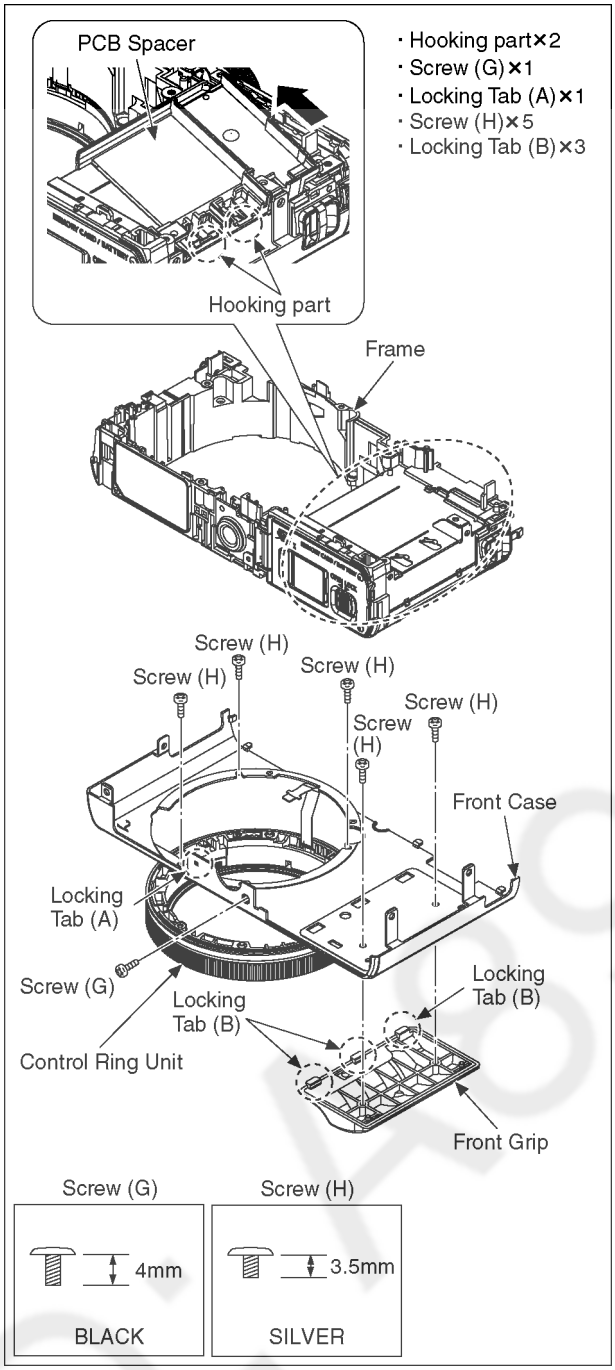


Fig. D13

9.3.10. Removal of the Battery Door Unit

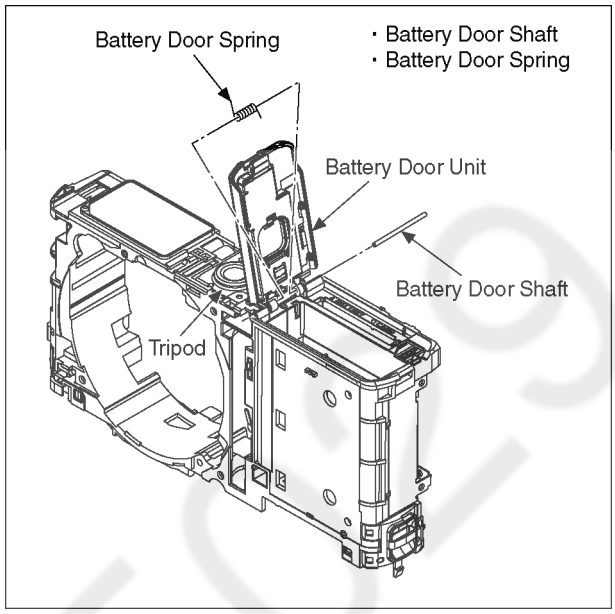


Fig. D14

9.3.11. Removal of the Strap Cover (R), Strap Plate (R), Front Earth Plate

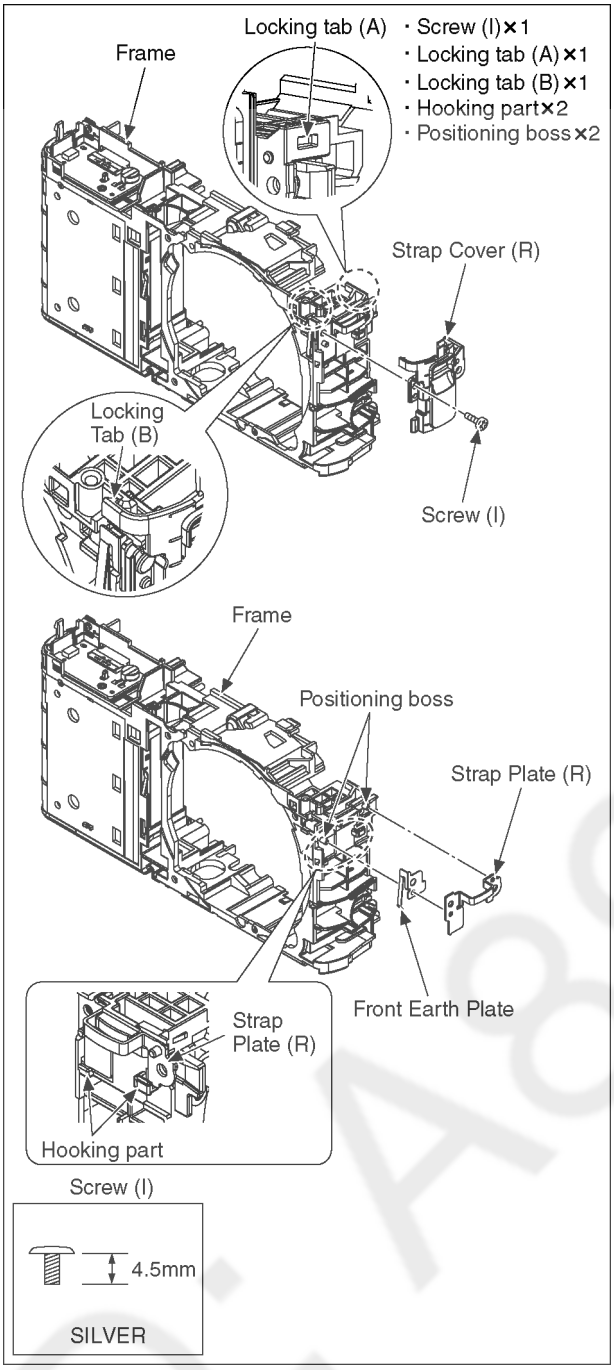


Fig. D15

9.3.12. Removal of the Battery P.C.B., Strap Cover (L), Strap Plate (L)

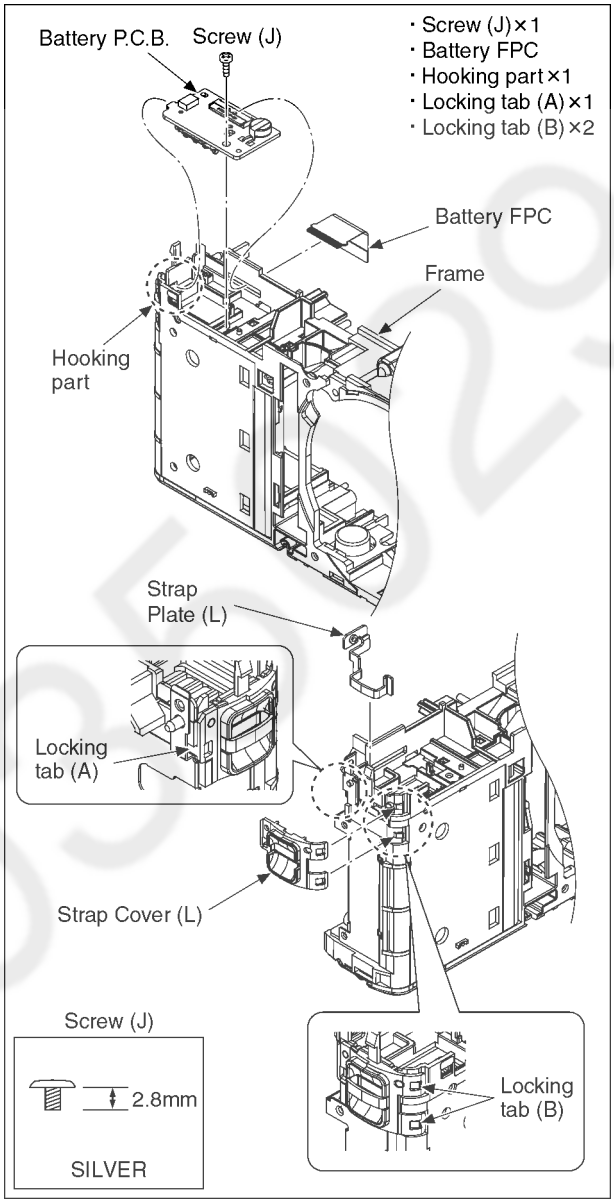


Fig. D16

9.3.13. Removal of the Battrey Case

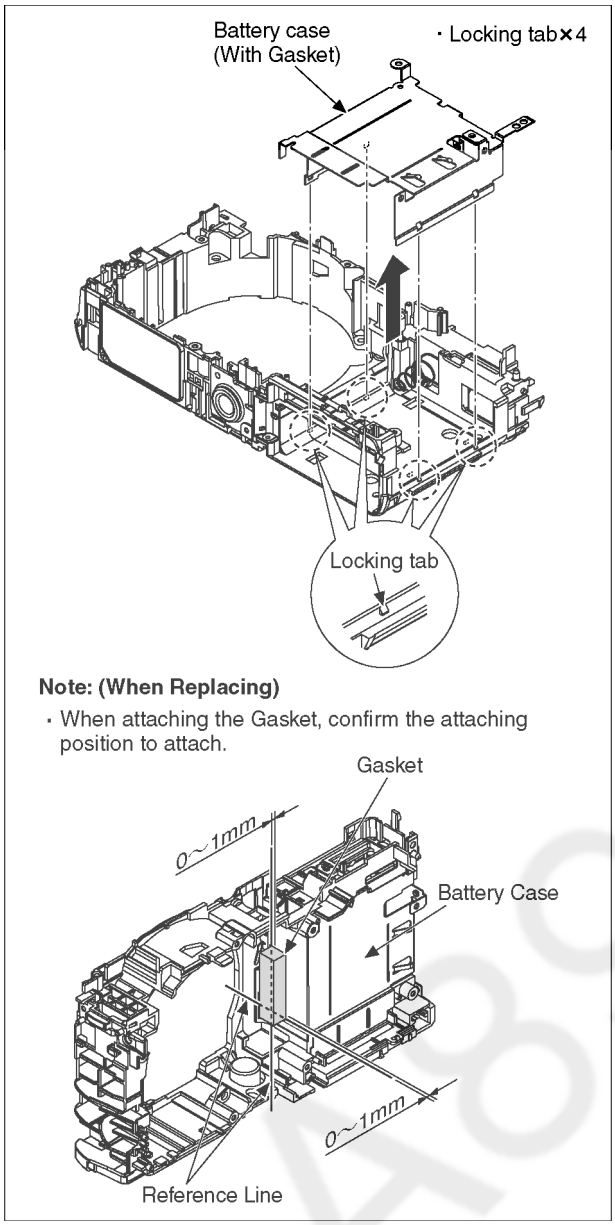


Fig. D17

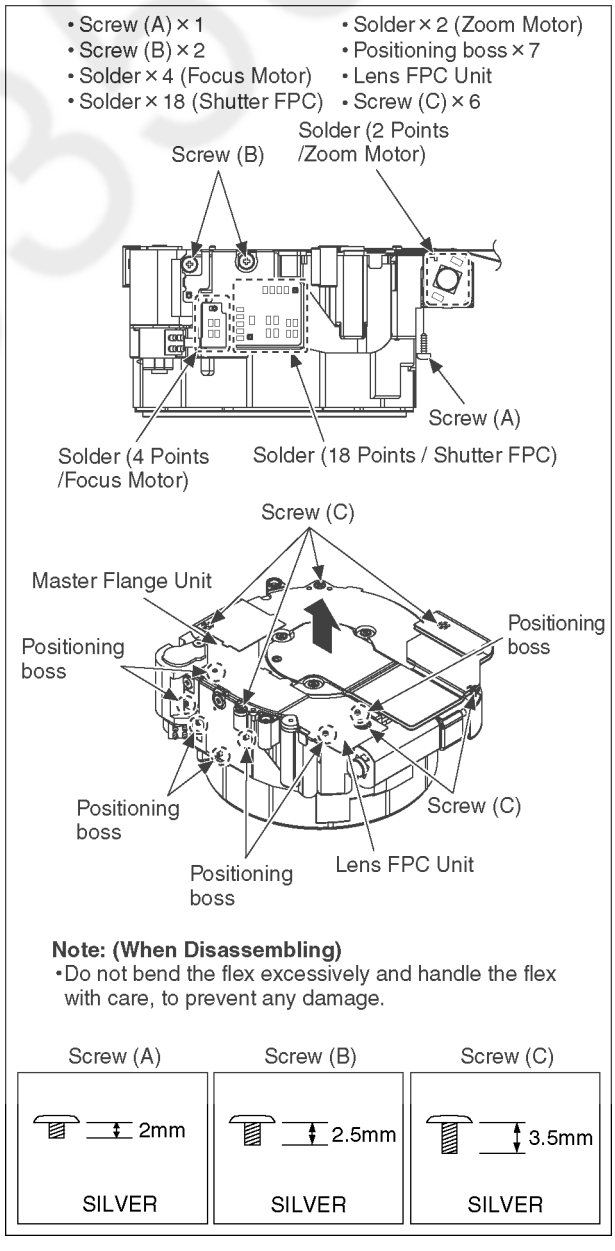
9.4. Lens Disassembly Procedure

Precaution:

1. Do not remove the MOS when disassembling or re-assembling the lens in order to maintain it clean. When remove it, refer to item "9.6".
2. Keep dust or dirt away from the lens.
3. To remove dirt or dust from the lens, blow with dry air.
4. Do not touch the lens surface.
5. Use lens cleaning KIT (BK)(VFK1900BK).

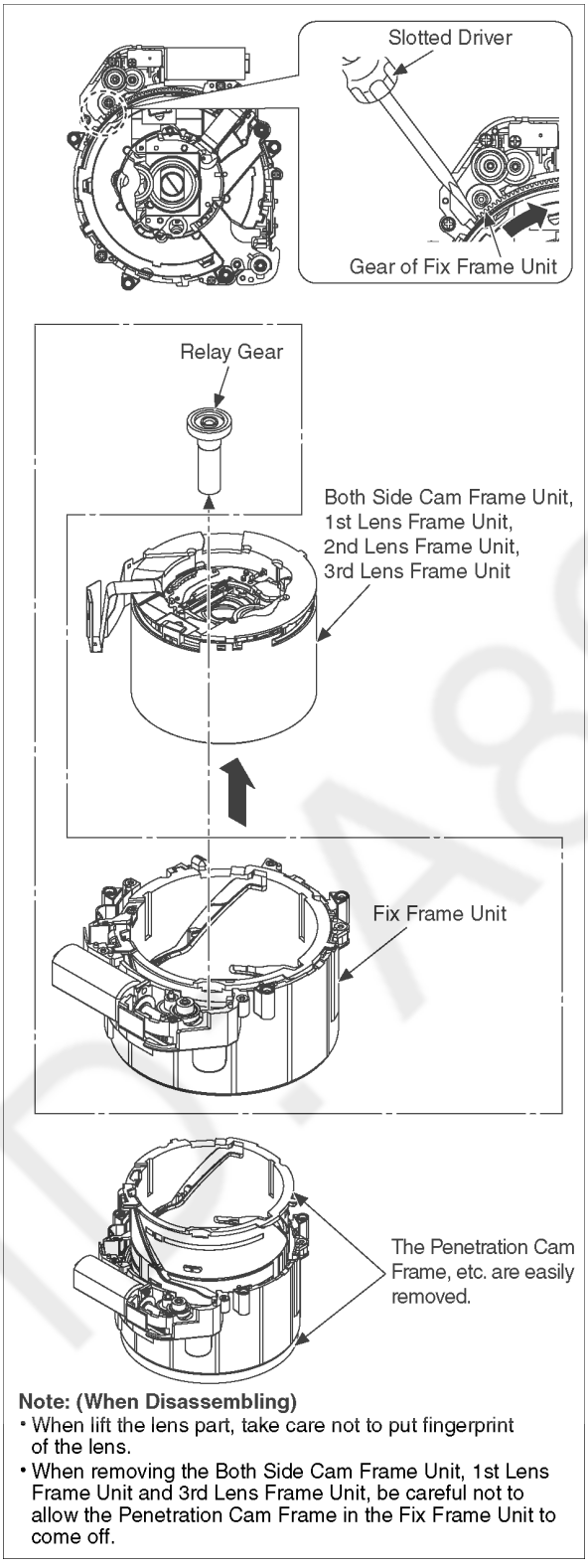
9.4.1. Removal of the Master Flange Unit

1. Unscrew the 1 screw (A) to remove the sensor of Zoom Motor.
2. Unscrew the 2 screws (B) to remove the sensor of Focus Motor.
3. Unsolder 4 points to remove the Focus Motor FPC.
4. Unsolder 18 points to remove the Shutter FPC from Lens FPC Unit.
5. Unsolder 2 points to remove the Lens FPC Unit.
6. Unscrew the 6 screws (C) to remove the Master Flange Unit.



9.4.2. Both Side Cam Frame, 1st Lens Unit, 2nd Lens Unit and 3rd Lens Unit

1. Pull out the Relay Gear using tweezers, etc.
2. Turn the Gear of Fix Frame Unit using Slotted Driver, etc. in the direction of arrow.
3. Push the 1st Lens Frame Unit to the indicated by arrow from lens side, then remove the unit of Both Side Cam Frame Unit, 1st Lens Frame Unit, 2nd Lens Frame Unit and 3rd Lens Unit from Fix Frame Unit.

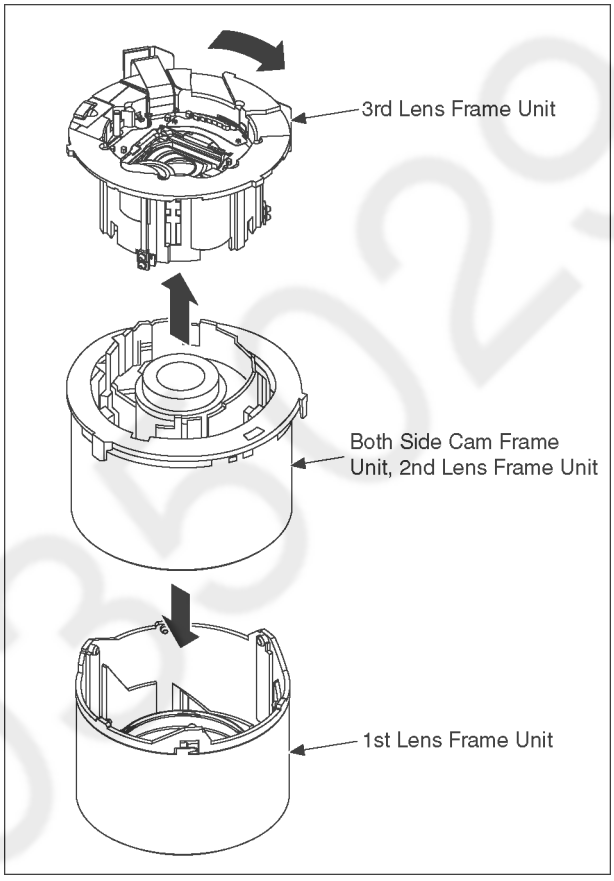


Note: (When Disassembling)

- When lift the lens part, take care not to put fingerprint of the lens.
- When removing the Both Side Cam Frame Unit, 1st Lens Frame Unit and 3rd Lens Frame Unit, be careful not to allow the Penetration Cam Frame in the Fix Frame Unit to come off.

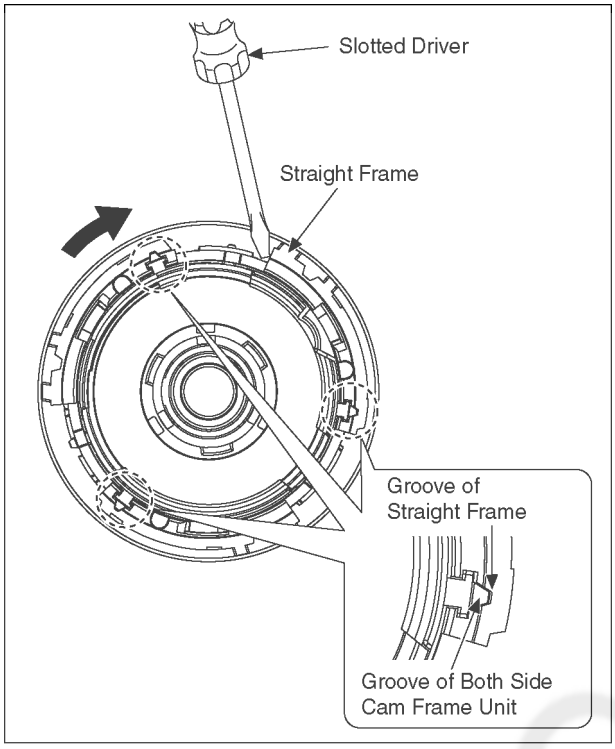
9.4.3. Removal of the 1st Lens Frame Unit and 3rd Lens Frame Unit

1. Turn the 3rd Lens Frame Unit in the direction of arrow fully.
2. Remove the 1st Lens Frame Unit and 3rd Lens Frame Unit from the Both Side Cam Frame Unit.

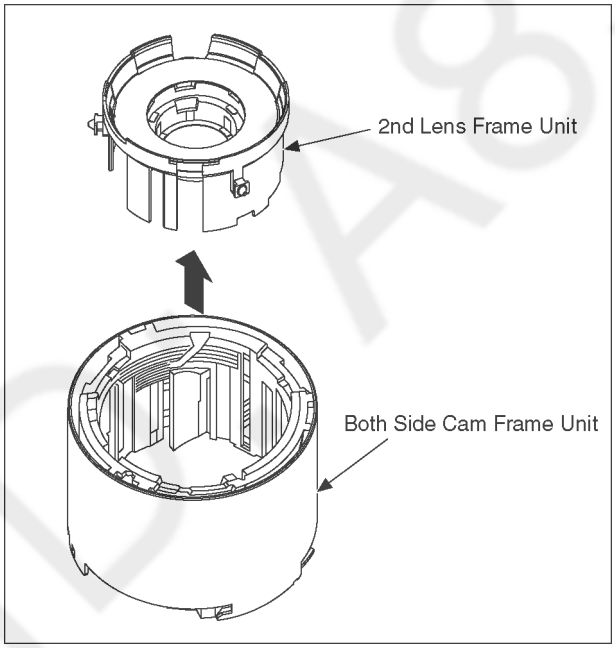


9.4.4. Removal of the 2nd Lens Frame Unit

1. Turn the Straight Frame using Slotted Driver, etc. and then align the Groove of Straight Frame and Groove of Both Side Cam Frame Unit.



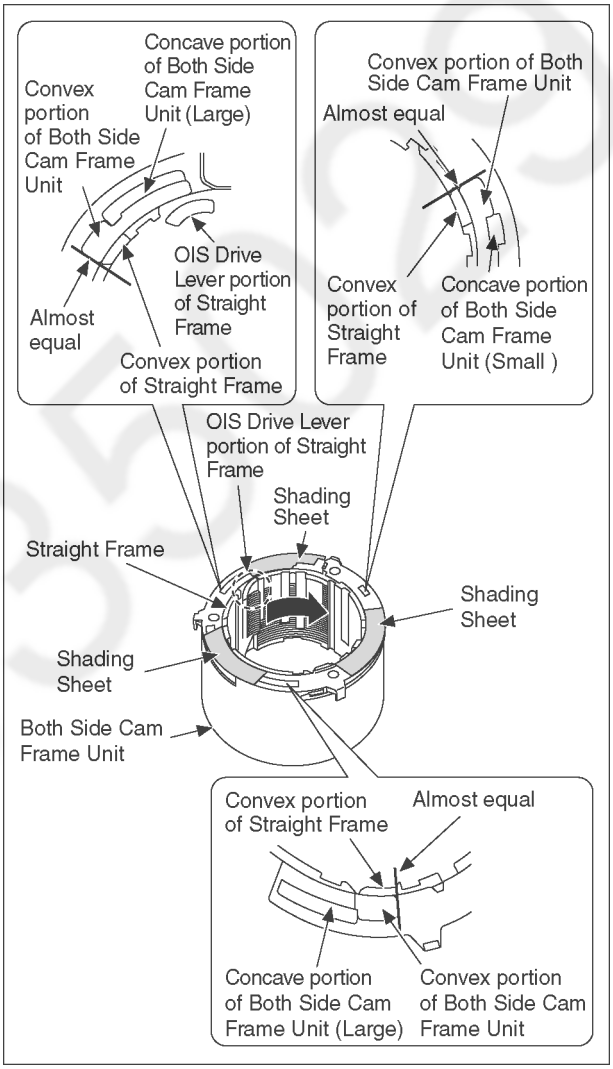
2. Remove the 2nd Lens Frame Unit from the Both Side Cam Frame Unit.



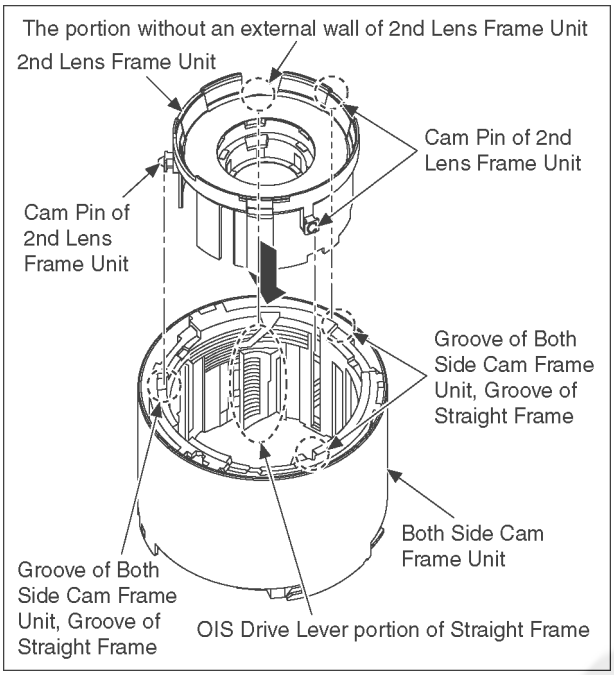
9.5. Assembly Procedure for Lens

9.5.1. Insert the 2nd Lens Frame Unit

1. Turn the Straight Frame in the direction of arrow, then align the convex portion of Straight Frame and the concave portion of Both Side Cam Frame Unit.
   * Refer to the OIS Drive Lever portion of Straight Frame as shown below.

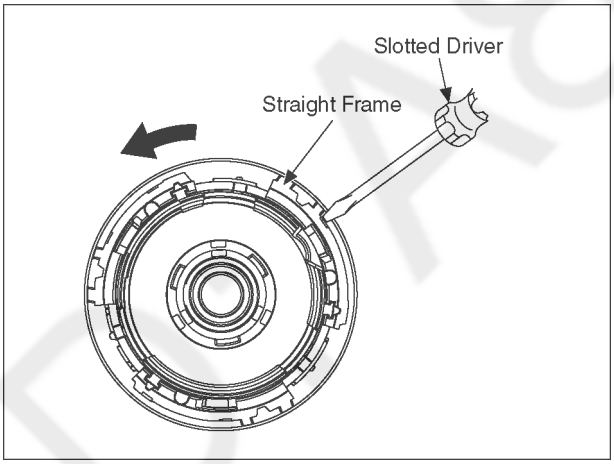


2. Insert the 2nd Lens Frame Unit as the drawing below indicated.
   * Align the portion without an external wall of the 2nd Lens Frame Unit with the OIS Drive Lever portion of the Straight Frame, then put the each Cam Pin of the 2nd Lens Frame in the each Groove of the Both Side Cam Frame Unit and the Straight Frame.

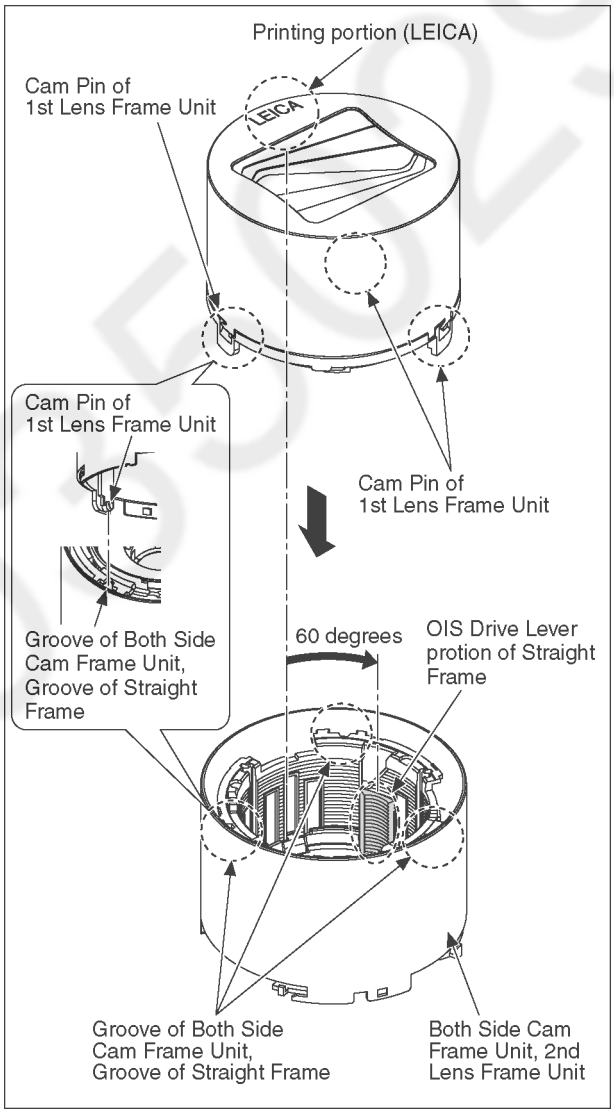


9.5.2. Insert the 1st Lens Frame Unit

1. Turn the Straight Frame using Slotted Driver, etc., then turn it in the direction of arrow fully.
   (Turn the Straight Frame to the "Tele" position.)

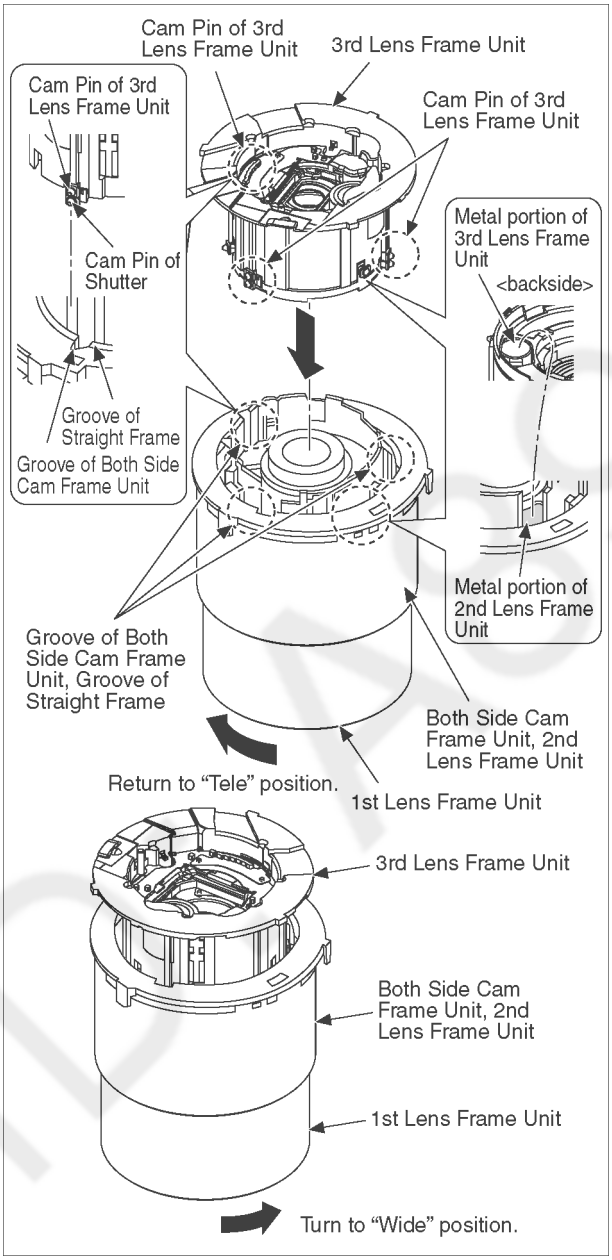


2. Insert the 1st Lens Frame Unit as the drawing below indicated.
   (1) Position the printing portion (LEICA) of the 1st Lens Frame Unit and the OIS Drive Lever portion of the Both Side Cam Frame Unit as shown below. (deviated approx. 60 degrees)
   (2) Insert the each Cam Pin of the 1st Lens Frame Unit in the each Groove of the Both Side Cam Frame Unit and the Straight Frame.
   * Check if the 2nd Lens Frame Unit moves smoothly when the 1st Lens Frame Unit is rotated.



9.5.3. Insert the 3rd Lens Frame Unit

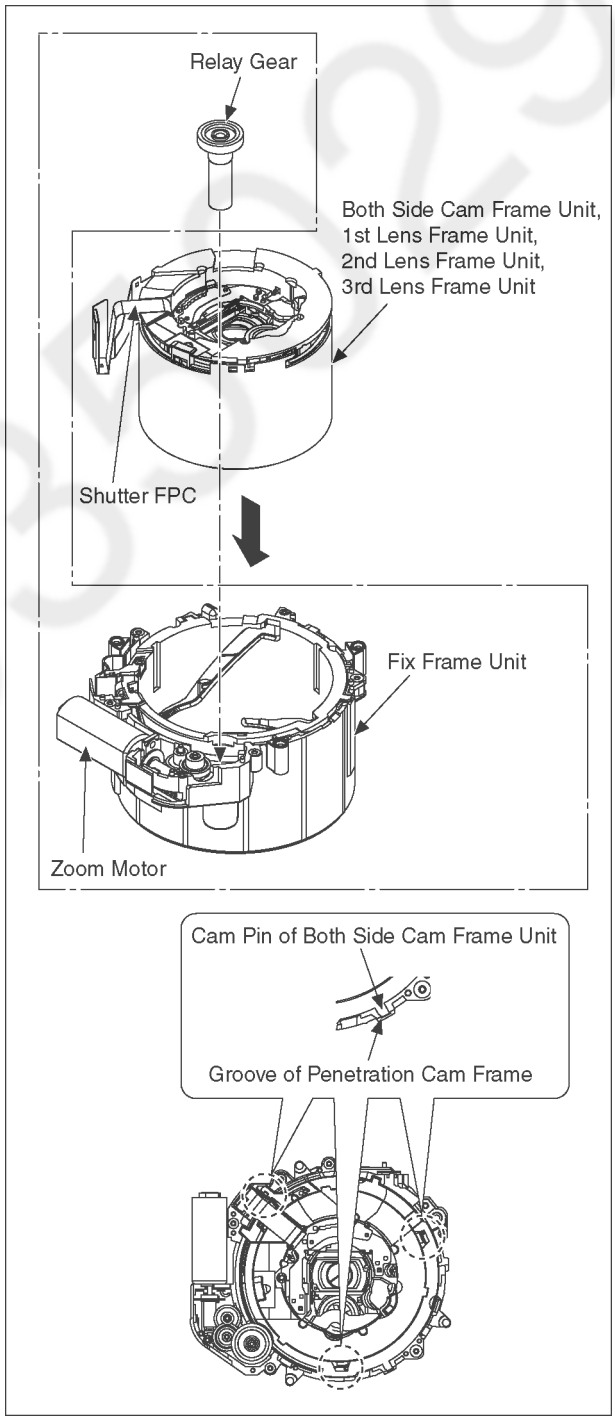
1. Insert the 3rd Lens Frame Unit as the drawing below indicated.
   (1) Restore the position to the state ("Tele" position) when the 1st Lens Frame Unit is inserted.
   (Align the each Groove of the Straight Frame and the each Groove of the both Side Cam Frame Unit.)
   (2) Align the metal part of the 3rd Lens Frame Unit with the metal part of the 2nd Lens Frame Unit.
   (3) Insert the each Cam Pin of the 3rd Lens Frame Unit and Shutter Cam Pin in the each Groove of the Both Side Cam Frame Unit and the Straight Frame.
2. Make the lens into a retracted position state. ("Wide" position)
   (Turn the 1st Lens Frame Unit and 3rd Lens Frame Unit in the direction of arrow fully.)



9.5.4. Insert the Fix Frame Unit

Note: (When Installing)
When using the Fix Frame Unit of service part, remove the Master Flange Unit (used to prevent fall of the gear) and the Relay Gear before assembling the Fix Frame Unit.

1. Align the Zoom Motor of the Fix Frame Unit with the Shutter FPC, then put the each Cam Pin of the Both Side Cam Frame Unit in the each Groove of Penetration Cam Frame.
2. Insert the Relay Gear to the Fix Frame Unit.



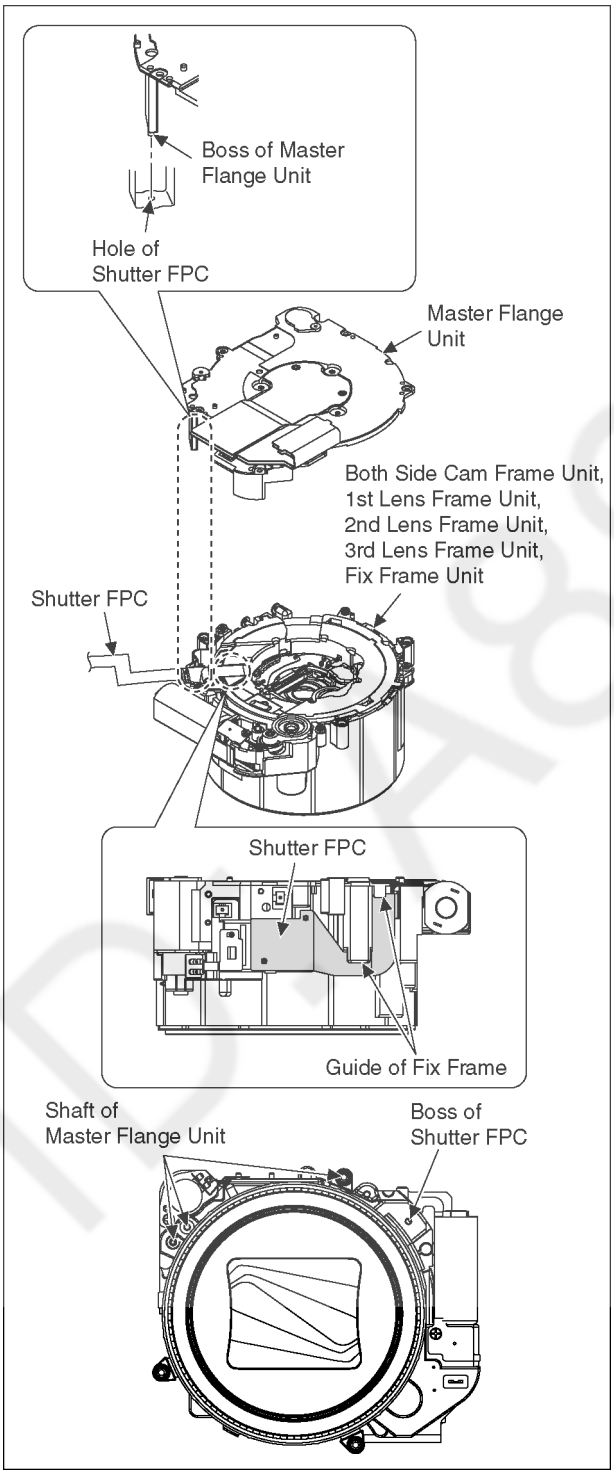
9.5.5. Insert the Master Flange Unit

Note: (When Installing)

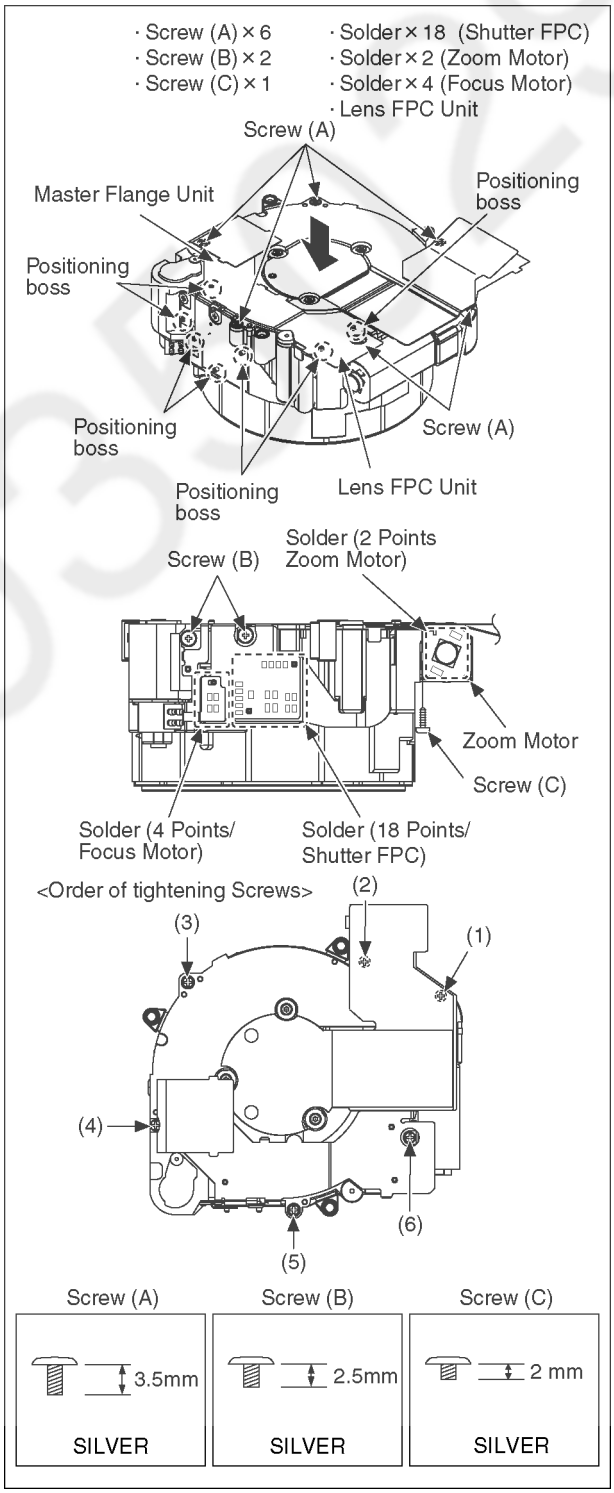
Take Care not to damage the flex.

Take Care not to tuck in to the Master Flange Unit, When inserting the Shutter FPC.

1. Push the Hole of the Shutter FPC to the Boss of the Master Flange Unit tightly.
2. Place the Shutter FPC following the Guide of the Fix Cam Frame, and install the Master Flange Unit to the Unit of Both Side Cam Frame Unit, 1st Lens Frame Unit, 2nd Lens Frame Unite, 3rd Lens Frame Unit and Fix Frame Unit.
3. Check if the positioning boss of the Shutter PFC and shaft of the Master Flange Unit are inserted into the designated hole of the Both Side Cam Frame Unit.

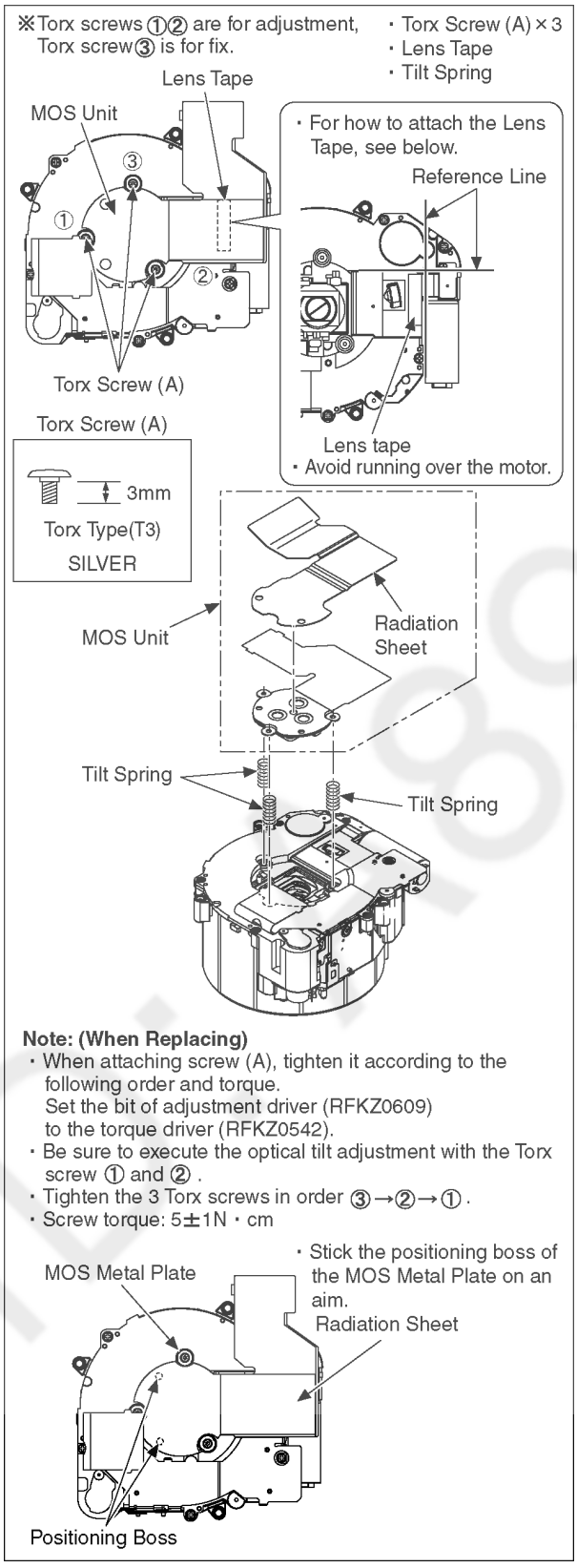


4. Attach the Master Flange Unit, then tighten 6 screws (A).
5. Attach the sensor for Focus Motor of Lens FPC Unit, then tighten 2 screws (B).
6. Attach the sensor for Focus Motor of Lens FPC Unit, then tighten 1 screw (C).
7. Soldering the Lens FPC Unit and the Shutter FPC. (18 points)
8. Soldering the Lens FPC Unit and the Zoom Motor. (2 points)
9. Soldering the Lens FPC Unit and the Focus Motor FPC. (4 points)



9.6. Removal of the MOS Unit

When remove the MOS Unit once (the Torx screw (A) is loosened even a little), the optical tilt adjustment is required.
When loosen the Torx screw (A), necessary the optical tilt adjustment at the end of assembling. (Refer to item "10.3.2.")
To prevent the MOS Unit from catching the dust and dirt, do not remove the MOS Unit except for replacing.



10 Measurements and Adjustments

10.1. Introduction

When servicing this unit, make sure to perform the adjustments necessary based on the part(s) replaced.
When trouble occurs, it is recommended to backup the Flash-rom data before disassembling the unit.

NOTICE: (When replacing the Lens unit, Master flange unit and MOS unit)

- When the MOS unit is unavoidably removed for Lens unit, Master flange unit and MOS unit replaced, an optical adjustment is necessary after parts are exchanged.
- It is necessary to use the "DSC_Tilt" software to allow the "Optical tilt adjustment".
- The Adjustment software "DSC_Tilt" is available at "TSN Website".

NOTICE (When replacing the Flash ROM(IC6003) or Charging Control Microcomputer(IC1502))

When the Flash Rom or Charging Control Microcomputer is replaced, it is need to adjust the firmware of the Charging Control Microcomputer to the one of the Flash ROM.
For details, refer to "10.3.2. Adjustment Specifications".
It may takes about 10 seconds. While doing the adjustment, don't turn the power off forcibly.
(It cause the Charging Control Microcomputer crush, then the camera can not turn on.)

NOTICE (When replacing the Main P.C.B.)

Number of necessary adjustment items decreases by copying the backup data to new Main P.C.B. when adjustment data in old Main P.C.B. can be read by ROM_BACKUP "DSC→SD" in "10.2.2. Flash-Rom Data Backup".
For more details, please refer an item "MAIN PCB (to which the backup data was copied)" in the table of "10.3.2. Adjustment Specifications".

IMPORTANT NOTICE (After replacing the Main P.C.B.)

After replacing the Main P.C.B., it is necessary to achieve adjustment.

10.2. Before Disassembling the unit

10.2.1. Initial Setting Release

The cameras specification are initially set in accordance with model suffix (such as EB, EG, GK, GC, and so on.).
Unless the initial setting is not released, an automatic alignment software in the camera is not able to be executed when the alignment is carried out.

Note:

The initial setting should be again done after completing the alignment. Otherwise, the camera may not work properly.
Therefore as a warning, the camera display a warning symbol " ! " on the LCD monitor every time the camera is turned off.
Refer to the procedure described in "3.5.2. INITIAL SETTINGS" for details.

[How to Release the camera initial setting]
Preparation:

Attach the fully charged Battery, and insert the memory card (32MB or more).
Set the recording mode dial to PROGRAM AE mode.

Step 1. Temporary cancellation of "INITIAL SETTINGS":

While pressing the "RIGHT of Cursor button", MENU/SET button and DISPLAY button simultaneously, turn the Power on.

Step 2. Cancellation of "INITIAL SETTINGS":

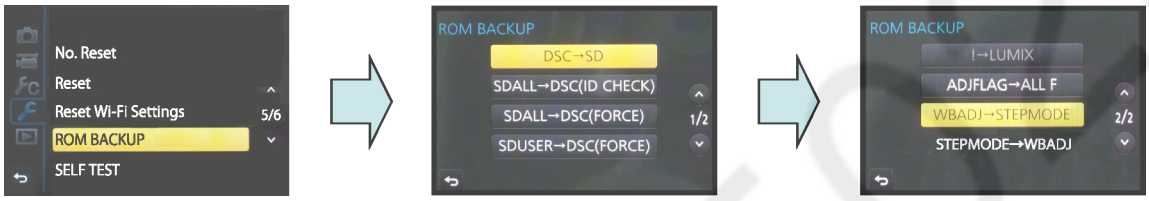
Press PLAYBACK button to switch to the playback screen. (Keep pressing the button.)
Press " UP of Cursor button" additionally.
Turn the Power off. (The warning symbol " ! " is displayed on the LCD monitor.)

10.2.2. Flash-Rom Data Backup

Number of necessary adjustment items decreases by copying the backup data to new Main P.C.B. when adjustment data in old Main P.C.B. can be read by ROM_BACKUP "DSC→SD".
It is recommended to backup the Flash-rom data as the way of return when trouble occurs before disassembling the unit depending on each case.

[ROM_BACKUP (Method of Non-PC backup)]

1. Insert the Memory Card into the camera.
2. Set the camera to "Temporary cancellation of the initial settings".
3. Select the "SETUP" menu.
   From the "SETUP" menu, select "ROM BACKUP".
   Note:
   This item is not listed on the customer's "SET UP" menu.
4. When this "ROM_BACKUP" item is selected, the following submenus are displayed.



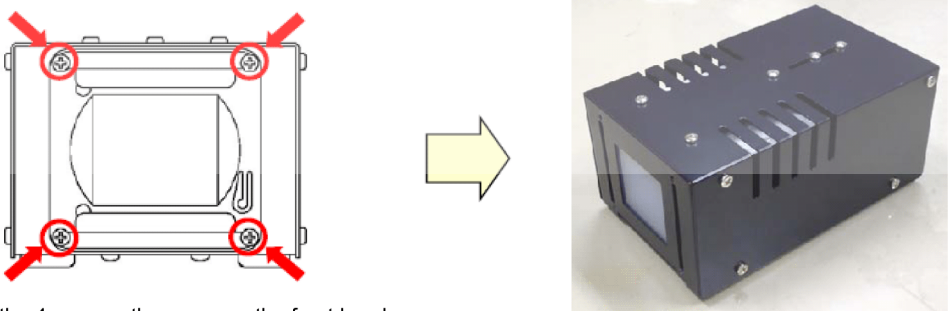
Item	Function	Details
DSC → SD	Save all the DSC's Flash-rom data to Memory Card	・DSC's Flash-rom data is saved to the Memory Card as a data file. (DATA BACKUP) -File location: ROOT DIRECTORY in Memory Card. -File Name: 1) User Setup Information data: <Model No.>U.txt [Depending on the model, more than one file may be generated (e.g. <Model No.>U.TXT and <Model No.>U3.TXT).] 2) Electrical Adjustment data: <Model No.>F.txt [Depending on the model, more than one file may be generated (e.g. <Model No.>F.TXT and <Model No.>F3.TXT).] ・If the concerned file already exists, "OVERWRITE?" message is displayed.
SDALL→ DSC (ID CHECK)	Write the all data to DSC's Flash-rom from Memory Card	・The backup data stored in the Memory Card is transferred to DSC unit. ・ID CHECK: When the model ID is different, data is not transferred. ・FORCE: Even if the model ID is different, data is transferred. * If the main PCB is replaced, select "SDALL→DSC(FORCE)".
SDALL → DSC (FORCE)	Write the all data to DSC's Flash-rom from Memory Card	
SDUSER → DSC (FORCE)	Only "User setup information" is written from the saved file in the Memory Card to DSC's Flash-rom.	・Only the user's "setup" setting condition is transferred to DSC unit. ・FORCE: Even if the model ID is different, the data is transferred.
I → LUMIX	Shipping set without initializing "User setup information"	・Initial setting is executed without initializing the user's set up setting condition. * The initial setting must be performed while the Self-timer LED is blinking, * The picture data stored in the built-in memory of the DSC is not erased, with this operation.
ADJFLAG → ALL F	Set all adjustment flags completion	・Status of the all adjustment flags are changed to "F"(completion).
WBADJ → STEPMODE	ISO: Adjustment WBL, WBM: Setting	・ISO: Sensitivity adjustment. ・WBL: Setting up the white in low color temperature. ・WBM: Setting up the white in high color temperature.
STEPMODE → WBADJ	Cancel "STEPMODE"	・Cancel the "STEPMODE" mode.

10.2.3. About Light Box

How to remove the Front Hood

In order to utilize maximum of the diffusing surface of light box, some adjustment items need the distance between diffusing surface of light box and camera body becomes several cent-meters.
Before the adjustments, remove the front hood of light box following steps below.

[For RFKZ0523 Light Box]



Unscrew the 4 screws, then remove the front hood.

10.3. Details of Electrical Adjustment

10.3.1. How to execute the Electrical Adjustment

It is not necessary to connect the camera to a PC to perform adjustments.
"Flag reset operation" and "Initial setting operation" are required when carrying out the alignment, follow the procedure below.

10.3.1.1. Startup Electrical Adjustment mode

1. Release the initial settings.
2. Insert a recordable Memory Card (32MB or more).
   (Without a Memory Card, the automatic adjustment can not executed.)
3. Procedure to set the camera into adjustment mode:
   a. Set the mode dial to PROGRAM AE mode.
   b. Turn the Power off.
   c. While pressing the "LEFT of Cursor button" and MENU/SET button simultaneously, turn the Power on.
   LCD monitor displays "SERVICE MODE".
   (Refer to Fig.F3-1)

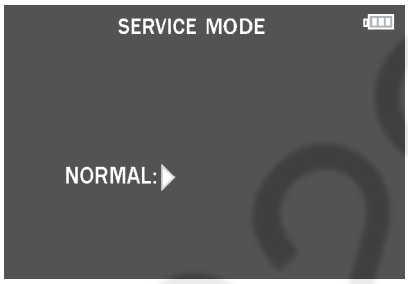


Fig. 3-1

10.3.1.2. Status Adjustment Flag Setting

Reset (Not yet adjusted) the status flag condition.

1. After pressing the DISPLAY button, the LCD monitor displays the Flag status screen (Refer to Fig.3-2.)
2. Select item by pressing the Cursor buttons. (Gray cursor is moved accordingly.)
3. Press the DELETE button.

Note:
The selected item's flag has been changed from "F (green)" to "0 (yellow)".

*Flag conditions:
F (green)
means that the alignment has been completed and the status flag condition is set. In this case, the flag condition should be reset, if you try to carry out the automatic alignment.
0 (yellow)
means that the alignment has been not "completed" and the status flag condition is "reset". In this case, automatic alignment is available.

Fig. 3-2

- To display the "BK2" flag, choose the "WNZ" and press the DOWN of Cursor button.
- In case of setting the status flag into set condition again without completion of the alignment, the status flag should be SET by using PC, or UNDO by using ROM BACKUP function.

10.3.1.3. Execute Adjustment

1. Perform step "10.3.1.1." to "10.3.1.2.", to reset the OIS flag status "F" (Set) to "0" (Reset).
2. Press DISPLAY button after Flag reset.
   OIS Adjustment screen is displayed on the LCD panel. (Refer to Fig.3-3)
3. Press the shutter button. The adjustment will start automatically.

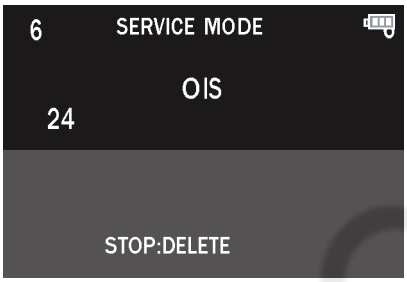


Fig. 3-3

4. When the adjustment is completed successfully, adjustment report menu appears with Green OK on the LCD monitor. (Refer to Fig.3-4)

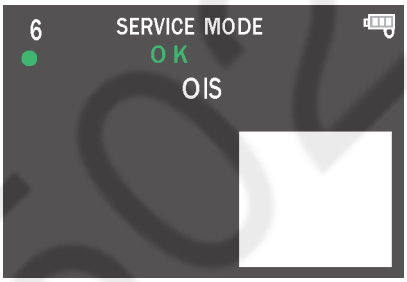


Fig. 3-4

10.3.1.4. Attention point during Adjustment

1. Step "10.3.1.3." procedure shows OIS adjustment as an example. To perform the adjustment, refer to the "10.3.2. Adjustment Specifications" table which shows key point for each adjustment.
2. Do not move the light box, the camera or the chart while adjusting. If one of these is moved accidentally, start the adjustment again.
3. Do not press any buttons/keys until the default menu (Fig.3-5) is displayed on the LCD monitor. Otherwise, adjustment data may not be stored properly.
4. If the adjustment is interrupted accidentally, the alignment data may not be properly saved in the Flash-ROM.

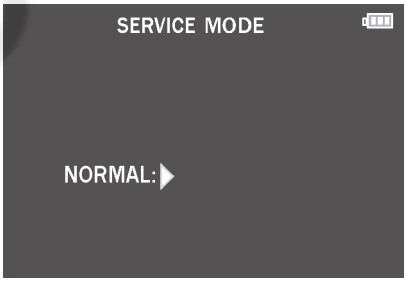


Fig. 3-5

10.3.1.5. Finalizing the Adjustment

1. Several adjustment flags can be reset ("F" into "0") at the same time. In this case, when the adjustment has been completed, the screen will change showing the adjustment for the next item until all reset items are completed.
   Also, when the shutter button is pressed, the screen jump to the next adjustment item.
2. To cancel the adjustment mode while in the process of performing the adjustment, follow this procedures.
   (1) Press "DISPLAY button.
   (2) Press "RIGHT of Cursor button".

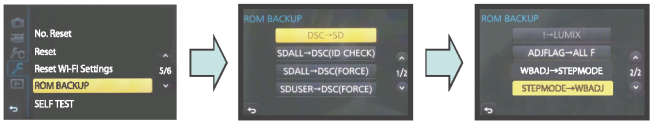
Note:

*.If adjustment is cancelled with above procedure, adjustment is not completed. Make sure to adjust it later.

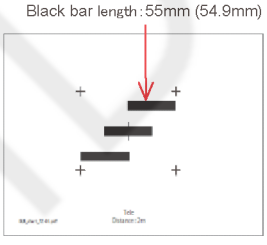
10.3.2. Adjustment Specifications

The following matrix table shows the relation between the replaced part and the Necessary Adjustment.
When a part is replaced, make sure to perform the necessary adjustment(s) in the order indicated.
The table below shows all the information necessary to perform each adjustment.

Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts: MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written Backup data)	Flash-ROM (IC6003)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor	Microphone	Flash Part	Electronic Level (IC6201)	Eye Sensor	JIG/TOOLS	SET UP	How to Operate
1	Synchronization of Flash-ROM with the charge control micro computer	—	Executing synchronization (optimization) of Flash-ROM with the charge control micro computer (Upgrading the software version)	—	—	○	○	—	—	—	—	—	—	● Do adjust the firmware of the Charging Control Microcomputer to the firmware of the one of the Flash ROM by the following procedure. 1) Release the camera initial setting. 2) Insert a memory card (32MB or more). 3) Turn the power off. The camera check the firmware of both the Flash ROM and the Charging Control Microcomputer. If they are not match, the firmware of the Charging Control Microcomputer is updated and the camera is turned the power off automatically. *While doing adjustment, don't turn the power off forcibly. It takes about 10 seconds to update the firmware of the Charging Control Microcomputer. While updating, the camera is displaying a warning symbol " ! " on the LCD and lighting the AF Assist Lamp. (If the firmware of the camera(Flash ROM) is old, the AF Assist Lamp does not light.)		
2	Optical Tilt	—	Adjustment of MOS Unit installation angle to the Lens	—	—	—	—	○	○	—	—	—	—	Note: It is necessary to use the "DSC_Tilt" software to allow the "Optical tilt adjustment". The Adjustment software "DSC_Tilt" is available at "TSN Website". ・Optical Tilt Adjustment Chart RFKZ0570 ・Optical Tilt Adjustment Driver RFKZ0609: T3 ・Camera Stand RFKZ0333J ・Torque Driver RFKZ0542		
3	Zoom Home Position	ZHP	Zoom Home Position inspection	—	—	○	—	○	○	—	—	—	—	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
4	Venus Zoom *4	PZM	Venus Zoom inspection	○	○	○	—	—	—	—	—	—	—	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
5	OIS sensor	OIS	OIS sensor output level adjustment	○	—	○	—	○	○	—	—	—	—	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
6	Backfocus / GYRO *4	BF	To have the focus tracking curve be appropriate shape and GYRO sensor adjustment	○	○	○	—	○	○ *1	—	—	○	—	・Collimator RFKZ0422	1) Set the camera in front of collimator so that the distance between collimator and camera body becomes 7.5 cm as shown in Fig. A. (It is not distance between lens barrel top and diffusing surface of light box.) * Set the camera on a tripod to prevent it from falling down.	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the star chart is displayed to the center, and press the shutter button fully. (Green● mark is displayed on LCD.) 3) Press the shutter button fully, again. (When a result is OK, it is the completion of an inspection.)
7	Iris	IRS	Iris adjustment	○	—	○	—	○	○	—	—	—	—	・Light Box RFKZ0523	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B. (It is not distance between lens barrel top and diffusing surface of light box.)	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the full of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
8	Shutter	SHTs	Shutter speed adjustment	○	—	○	—	○	○	—	—	—	—	・Light Box RFKZ0523	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B. (It is not distance between lens barrel top and diffusing surface of light box.)	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
		SHD	Do not use "SHD" adjustment flag for this unit. Use "BK2" adjustment flag, instead.													

Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts: MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written Backup data)	Flash-ROM (IC6003)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor	Microphone	Flash Part	Electronic Level (IC6201)	Eye Sensor	JIG/TOOLS	SET UP	How to Operate
● Set “STEPMODE” to adjust 7: ISO, 8: WBL and 9: WBM. ＜How to switch to “STEPMODE”＞ 1. Perform “10.2.2. Flash-ROM Data Backup”, and select “WBADJ → STEPMODE” for ROM_BACKUP. 2. Press “SET”, and move to the flag setting screen at “STEPMODE”. ⇒ The screen appears on the LCD. (See Fig. on the right.)															Normal flag setting screen  [STEPMODE] flag setting screen 	
9	ISO	ISO	ISO sensitivity adjustment	○	—	○	—	○	○	—	—	—	—	・Light Box RFKZ0523 ・ND0.3 Filter RFKZ0513	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B. (It is not distance between lens barrel top and diffusing surface of light box.)	1) Change the flag into the “0”, and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
10	White balance (Low color temp.)	WBL	Setting up the white in low color temperature	○	—	○	—	○	○	—	—	—	—	・Light Box RFKZ0523 ・ND0.9 Filter VFK1164ND09 ・ND0.3 Filter RFKZ0513 ・CC-C7.5 Filter RFKZ0511	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B. (It is not distance between lens barrel top and diffusing surface of light box.)	1) Change the flag into the “0”, and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
11	White balance (High color temp.)	WBM	Setting up the white in high color temperature	○	—	○	—	○	○	—	—	—	—	・Light Box RFKZ0523 ・ND0.9 Filter VFK1164ND09 ・ND0.3 Filter RFKZ0513 ・CC-C7.5 Filter RFKZ0511 ・CC-Y10 Filter RFKZ0512 ・LBB2 Filter RFKZ0520 ・LBB8 Filter RFKZ0521	1) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B. (It is not distance between lens barrel top and diffusing surface of light box.)	1) Change the flag into the “0”, and then proceed to the adjustment mode. 2) Set the camera angle so that the diffusing surface of light box is displayed on the center of LCD monitor, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
● After adjusting 7. ISO, 8: WBL and 9: WBM, perform Initial Settings once. Then, cancel “STEPMODE”. ＜How to release of “STEPMODE”＞ ・Perform “10.2.2. Flash-ROM Data Backup”, and select “STEPMODE → WBADJ” for ROM_BACKUP. Press “SET”. Then again, cancel the Initial Settings. Move to the servicing mode, and continue the subsequent adjustment.																
12	Offset gain	SAT	Setting up the offset gain	○	—	○	—	○	○	—	—	—	—	・Light Box RFKZ0523 ・ND0.6 Filter VFK1164ND06	1) Set the ND0.6 filter to diffusing surface of light box. 2) Set the camera in front of light box so that the distance between diffusing surface of light box and camera body becomes 5.0 cm as shown in Fig. B.	1) Change the flag into the “0”, and then proceed to the adjustment mode. 2) Set the camera angle so that whiten is displayed on the LCD monitor fully. 3) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
13	Eye sensor	EYE	Inspecting sensitivity of eye sensor	○	—	○	—	—	—	—	—	—	○	・Gray Card RFKZ0506	1) Set the camera in front of gray card so that the distance between gray card and eye sensor of camera body becomes 5.5 cm as shown in Fig. C.	1) Change the flag into the “0”, and then proceed to the adjustment mode. 2) Set the camera angle so that the attachment side of eye sensor and center of the gray card is perpendicular, and press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
14	Flash adjustment *4	STB	Flash adjustment	○	○	○	—	—	—	—	○	—	—	NONE	NONE	1) Change the flag into the “0”, and then proceed to the adjustment mode. 2) Press the shutter button fully. 3) Check that a flash shines. (It is different for every model how many times it shines.) * When a flash does not shine, there is a possibility that the flash unit is out of oder. 4) Check a test result. * Results of the tests are usually NG. (When a result is OK, it is the completion of an inspection.) 5) When a result is NG, rewrite STB flag to an adjustment using ADJFLAG → ALL F of ROM BACKUP. * The flag “STB” is an item which checks shines operation of a flash automatically at a Manufacturing facility. For this reason,except environment for exclusive use, a result will be NG. but it is no problem if shines operation can be checked visually.

Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts: MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written Backup data)	Flash-ROM (IC6003)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor	Microphone	Flash Part	Electronic Level (IC6201)	Eye Sensor	JIG/TOOLS	SET UP	How to Operate
15	MOS sensor Temp. white missing pixels *2	SKI	Registration of the Temp. white missing pixels	○	—	○	—	○	○	—	—	—	—	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
16	MOS sensor FD white missing pixels *2	WKI	Registration of the FD (floating diffusion) white missing pixels	○	—	○	—	○	○ *1	—	—	—	—	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.)
		BKI	Do not use "BKI" adjustment flag for this unit. Use "BK2" adjustment flag, instead. (In case of most DSC models, the adjustment flag for MOS SENSOR Missing Pixels is "BKI". But, in this model, "BK2" the adjustment flag for MOS SENSOR Missing Pixels.)													
17	Color reproduction inspection Microphone check	COL	Color reproduction inspection and Microphone check	○	—	○	—	○	○	○	—	—	—	NONE	NONE	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. 3) Utter the voice for about 5 seconds into the microphone, just before pushing a shutter release. * Utter the voice at the above the MIC. * Comparatively high voice is ideal. (Standard: about 1KHz) (When a result is OK. It is the completion of an inspection.)
18	Linear adjustment	OLN	Linear adjustment	○	—	○	—	○	○	—	—	—	—	• Linear Adjustment Chart	Download the "Linear Adjustment chart .pdf" and print it by the actual size. ("Linear Adjustment chart .pdf" is available at "TSN Website". (Fig. 1) To download, click on "Support information from NWBG/VDBG -AVC") * Black Bar length: 55 mm	1) Change the flag into the "0", and then proceed to the adjustment mode. 2) Press the shutter button fully. Error occurs, but zoom position becomes "Tele". ("720" is displayed on left center of the LCD screen.) (Fig.2) 3) Clear the error flag, and then proceed to the adjustment mode. (Press the delete button. → Press the display button, then the flag status screen is displayed. → Select "OLN" by pressing the cursor button. → Press the delete button. → Press the display button, then adjustment screen is displayed.) 4) Set the camera so that the distance between the lens and the linear adjustment chart becomes 200 cm as shown in Fig. 3. *Adjust the height and position of the camera to keep the middle black bar in the guide for adjustable of view angle. 5) While keeping "Tele" zoom position (confirm "720" display), press the shutter button fully. (When a result is OK, it is the completion of an inspection.) *If "720" is not displayed, do procedure from 2) to 4) again.



Linear adjustment chart
Fig.1

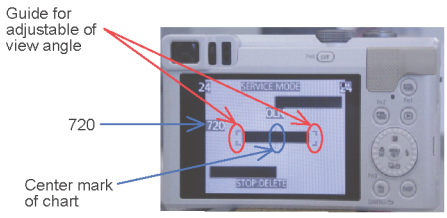


Fig.2

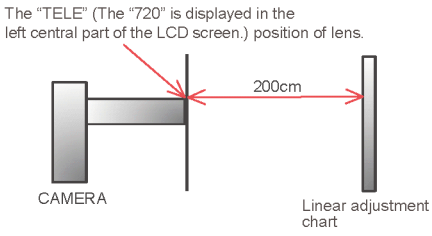
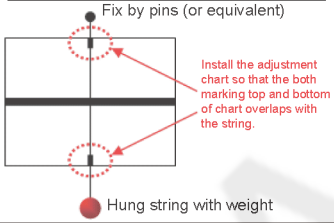
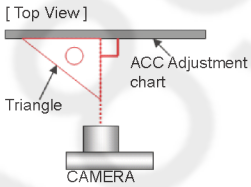


Fig.3

Adjustment order	Adjustment Item	FLAG	Purpose	Replacing Parts: MAIN P.C.B./VENUS ENGINE	MAIN P.C.B. (When written Backup data)	Flash-ROM (IC6003)	Charging Control Microcomputer (IC1502)	Lens Part (Excluding Image Sensor)	Image Sensor	Microphone	Flash Part	Electronic Level (IC6201)	Eye Sensor	JIG/TOOLS	SET UP	How to Operate
19	Electronic Level	AA2 + AA3	Electronic Level adjustment	○	○	○	—	—	—	—	—	○	—	・ACC Adjustment Chart	1) Download the "ACC Adjustment chart .pdf" and print it to A3 size (or equivalent size) paper. ("ACC Adjustment chart .pdf" is available at "TSN Website". To download, click on "Support information from NWBG/VDBG-AVC") 2) Hang in the string with weight, then put the printed ACC adjustment chart on the wall or panel horizontally. (Fig. 4) * After putting the adjustment chart horizontally, remove the string with weight. * Attach the camera to tripod. <Setup procedures> 3-1) Adjust the height of tripod to match the lens of camera and center of the adjustment chart. 3-2) Apply the triangle (or equivalent) in center of the chart, then adjust center of the lens of camera on the vertical extension. 3-3) Confirm that the chart is displayed on the LCD monitor fully. 3-4) Fine adjust the camera angle so that the horizontal bar of chart is displayed horizontally on the LCD monitor and matches the cross guide line of the LCD monitor. (Fig. 5)	1) Change the flag "AA2" and "AA3" into the "0", and then press DISPLAY button and proceed to the adjustment mode. <Offset adjustment> 2) Set the camera to the horizontal position. Then set the distance between adjustment chart and camera body becomes 29 cm. And optical axis of the lens and center of the chart crosses right-angled. (Fig. 6) 3) Press the shutter button fully. (When a result is OK, it is the completion of an inspection.) <Tilt adjustment> 4) Rotate the camera to the 90 degrees, so that the grip side down, and press the shutter button. (Fig. 7) 5) Set the camera to the horizontal position, and press the shutter button. (Fig. 8) 6) Rotate the camera to the 90 degrees, so that the grip side up, and press the shutter button. (Fig. 9) (When a result is OK, it is the completion of an inspection.)
	Fig.4: Setting of the adjustment chart horizontally  			Fig.5: Setting of the camera to the front of adjustment chart  										Fig.6: [Offset] (Horizontal Position) 	Fig.7: [Vertical Position] (Grip side Down) 	Fig.8: [Horizontal Position] 	Fig.9: [Vertical Position] (Grip side Up) 
20	Shading Compensation and MOS SENSOR Missing Pixels (Black) *3	BK2	Compensation of Shading and Compensation of MOS SENSOR Missing Pixels (Black)	○	—	○	—	○	○ *1	—	—	—	—	・Light Box RFKZ0523 ・Diffuser RFKZ0591	1) Set the Diffuser to diffusing surface of light box.	1) Change the flag into the "0", and then proceed to the adjustment mode. (BK2 flag is 2nd pages.) 2) Press the shutter button fully. → Green● mark is displayed on LCD. 3) Attach the Camera Lens on the Diffuser. And set the camera angle so that the diffusing surface of light box is displayed on the full of LCD monitor, and press the shutter button fully. → The 1st adjustment is executed, and then Green● mark is displayed on LCD. 4) Separate the camera body from light box, and press the shutter button fully. → The lens starts zooming and stops automatically, then green● mark is displayed on LCD. 5) Attach the Camera Lens on the Diffuser. And set the camera angle so that the diffusing surface of light box is displayed on the full of LCD monitor, and press the shutter button fully. → The 2nd adjustment is executed, and then Green● mark is displayed on LCD. 6) Separate the camera body from light box, and press the shutter button fully. → The lens starts zooming and stops automatically, then green● mark is displayed on LCD. 7) Attach the Camera Lens on the Diffuser. And set the camera angle so that the diffusing surface of light box is displayed on the full of LCD monitor, and press the shutter button fully. → The 3rd adjustment is executed. When a result is OK, it is the completion of an inspection.
	Wi-Fi check	WiFi	Do not use "WiFi" adjustment flag for servicing. This adjustment is for factory procedure. (For confirmation of Wi-Fi function, use the reception of Wi-Fi access point as usual.)													

*1: This adjustment must be performed not only replacing the MOS unit, but also simply removing the MOS unit.
*2: The pixel that always lights while shaded is called a white wound.
*3: The pixel that does not light while complete exposed is called a black wound. This unit does not have the LCD adjustment of the camera (LCD flicker adjustment etc.).
*4: If the adjusted data is backed up from the main board before replacement or repair, write the data to the new main board. If parts other than the main board are not replaced, adjustment is not necessary for items other than "Venus Zoom(PZM)/Backfocus/GYRO(BF)/Flash(STB)".

Fig.A Distance between Collimator and Camera

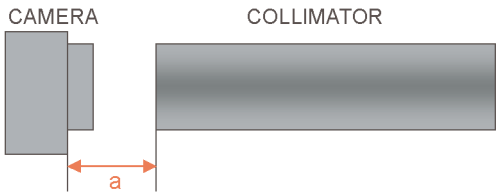


Fig.B Distance between Light Box and Camera

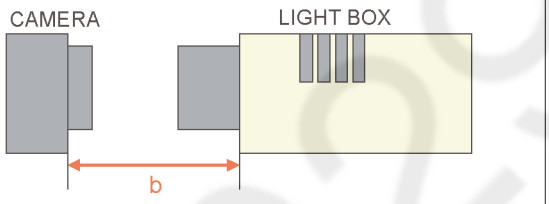
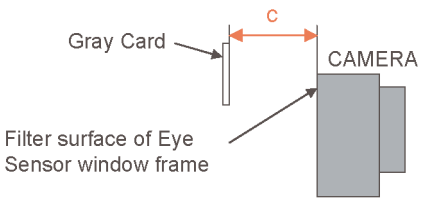


Fig.C Distance between Gray Card and Camera



■ **IMPORTANT NOTICE (After replacing the Main P.C.B.)**

After replacing the Main P.C.B., make sure to perform the "INITIAL SETTINGS" first, then release the "INITIAL SETTINGS" in order to proceed the electrical adjustment.

Note:

1. If electrical adjustment or data re-writing is executed before "INITIAL SETTINGS", suffix code list is never displayed, and it cannot be chosen suitable suffix code.
2. Never remove the battery during initial setting in process.

10.4. After Adjustment

10.4.1. Initial Setting

Since the initial setting has been released to execute the built-in adjustment software, it should be set up again before shipping the camera to the customer.
Refer to the procedure described in "3.5.2. INITIAL SETTINGS" for details.

[IMPORTANT]

1. The initial setting should be done again after completing the alignment. Otherwise, the camera will not work properly. Therefore as a warning, the camera display a warning symbol " ! " on the LCD monitor every time the camera is turned off.
2. Confirm that status of all adjustment flag show "F". Even if one of the adjustment flag shows "0", initial setting programmed is never executed.

11 Maintenance

11.1. Cleaning Lens, Viewfinder and LCD Panel

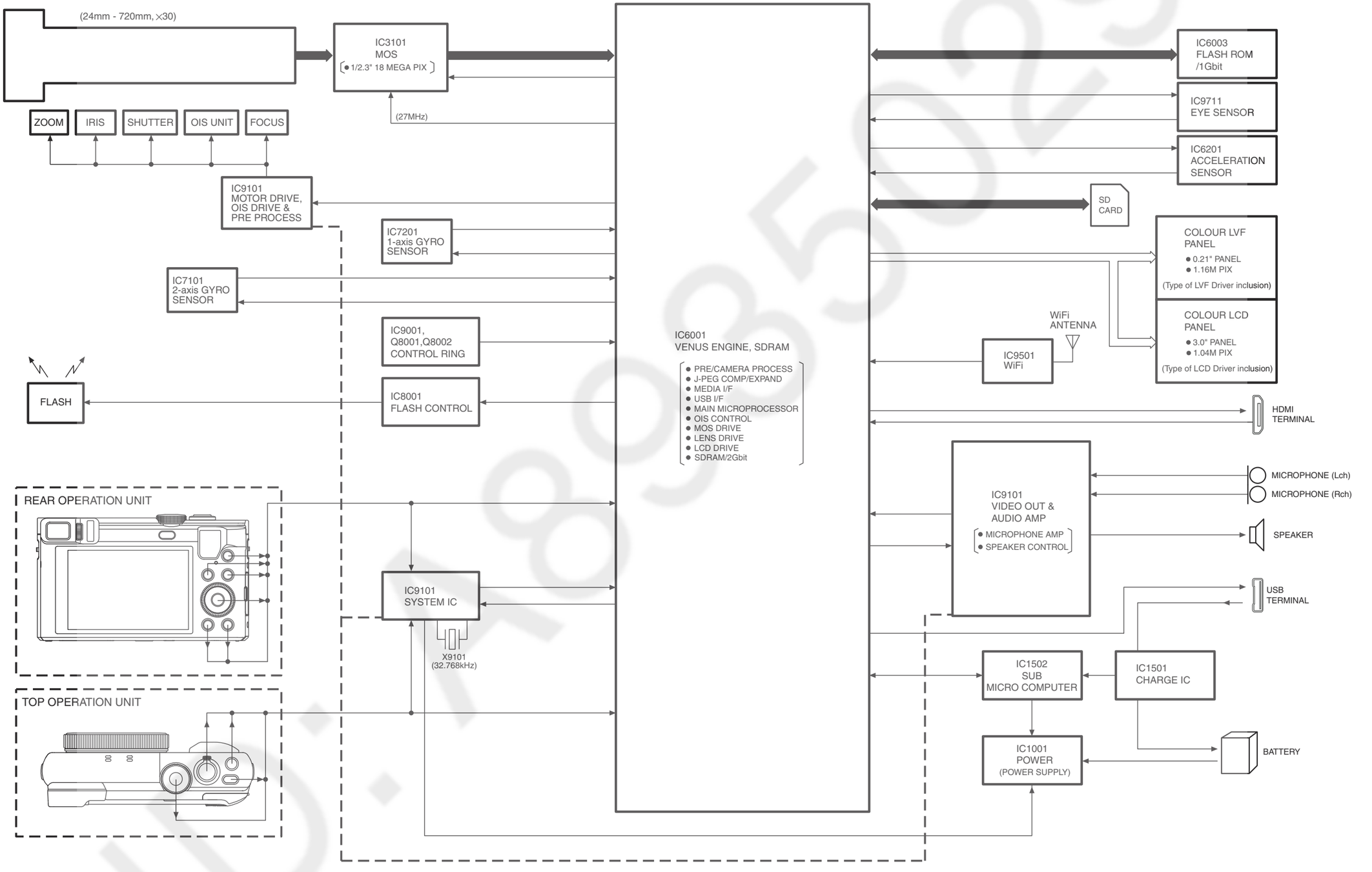
Do not touch the surface of lens, Viewfinder and LCD Panel with your hand.
When cleaning the lens, use air-Blower to blow off the dust.
When cleaning the LCD Panel, dampen the lens cleaning paper with lens cleaner, and the gently wipe the their surface.

Note:

The Lens Cleaning KIT; VFK1900BK(Only supplied as 10 set/Box) is available as Service Aid.

12 Block Diagram

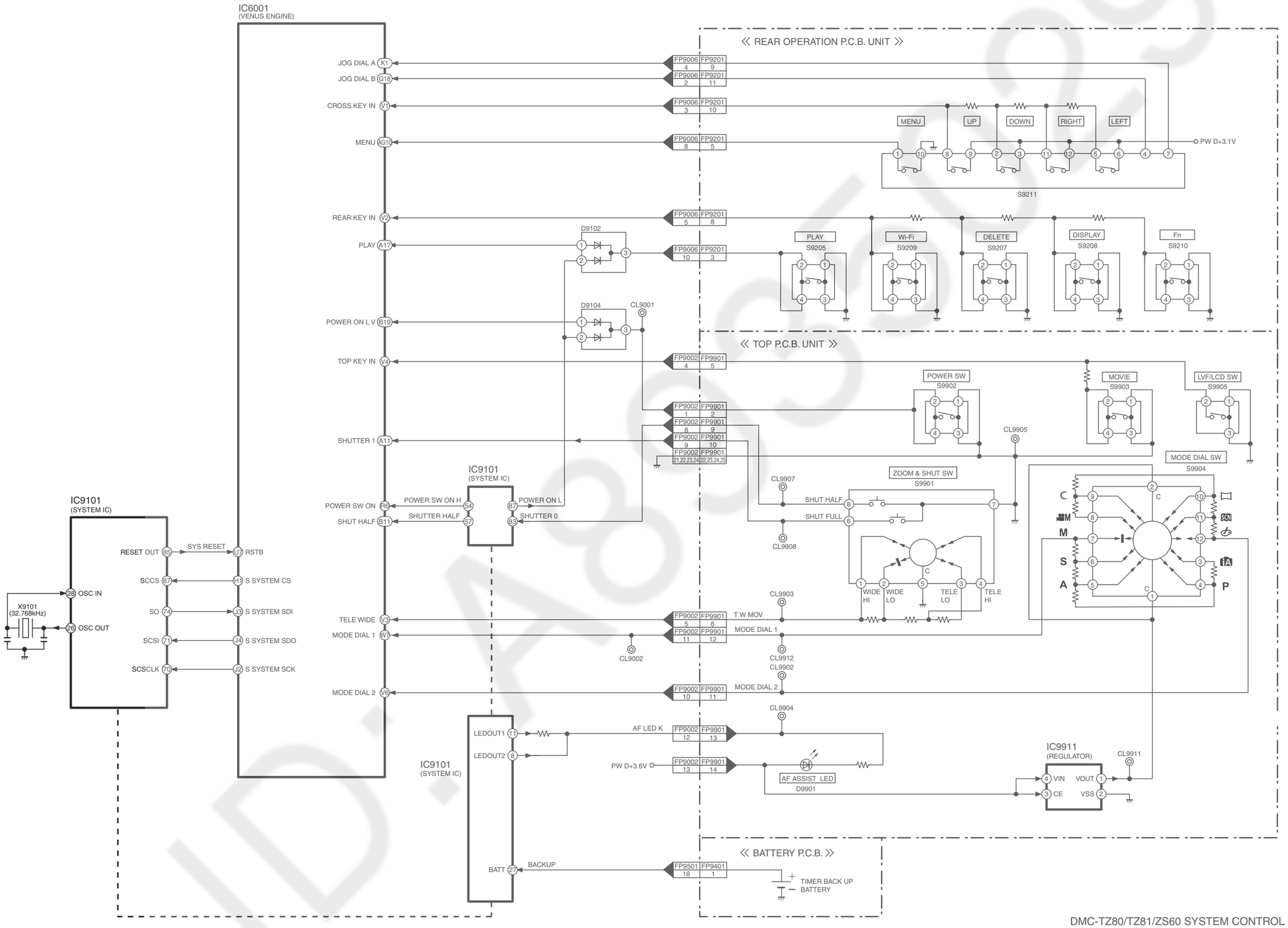
12.1. Overall Block Diagram



DMC-TZ80/TZ81/ZS60 OVERALL BLOCK DIAGRAM

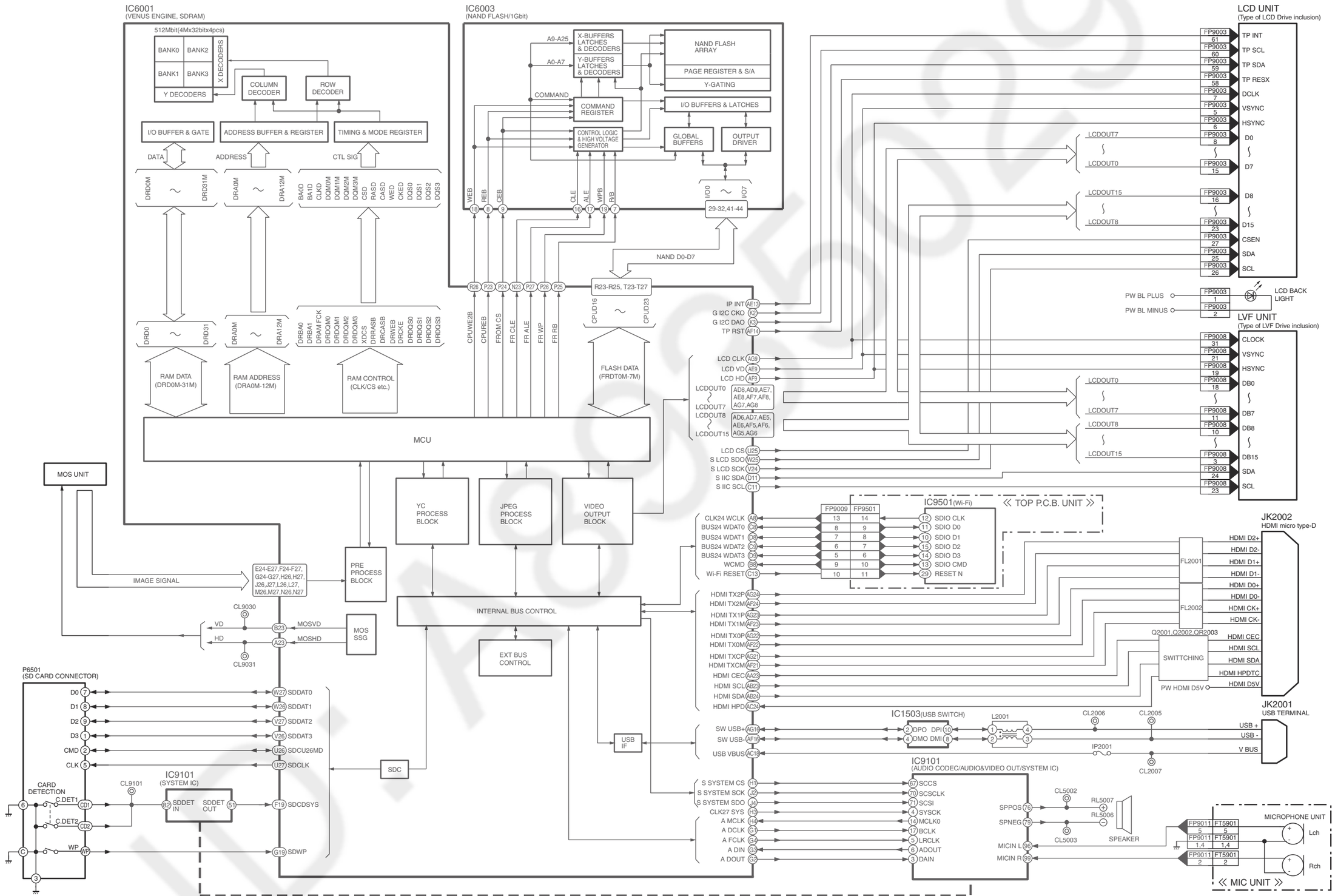
12.2. System Control Block Diagram

≪ MAIN P.C.B. ≫



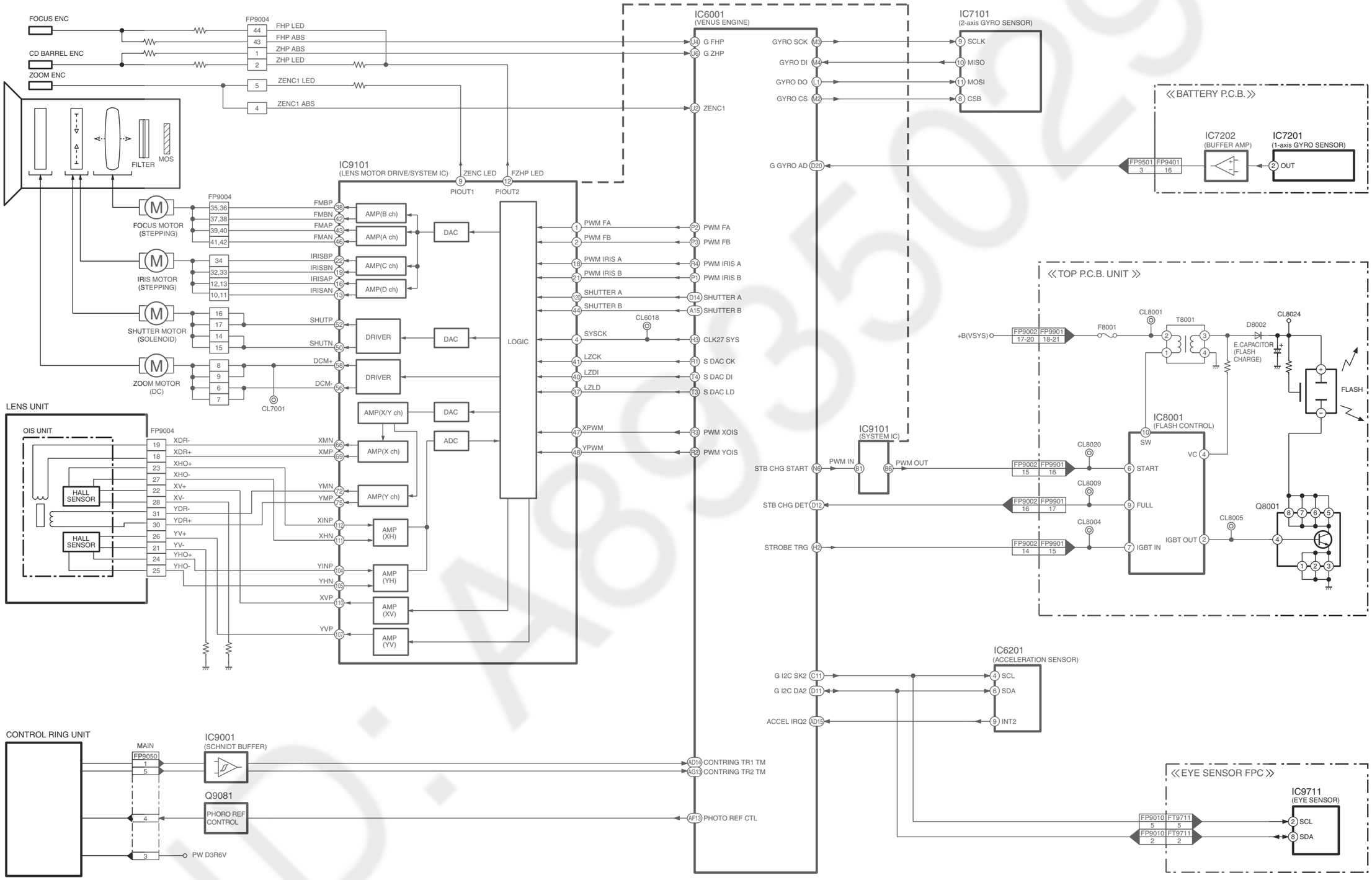
DMC-TZ80/TZ81/ZS60 SYSTEM CONTROL BLOCK DIAGRAM

12.3. Audio/Video Process/ HDMI Block Diagram



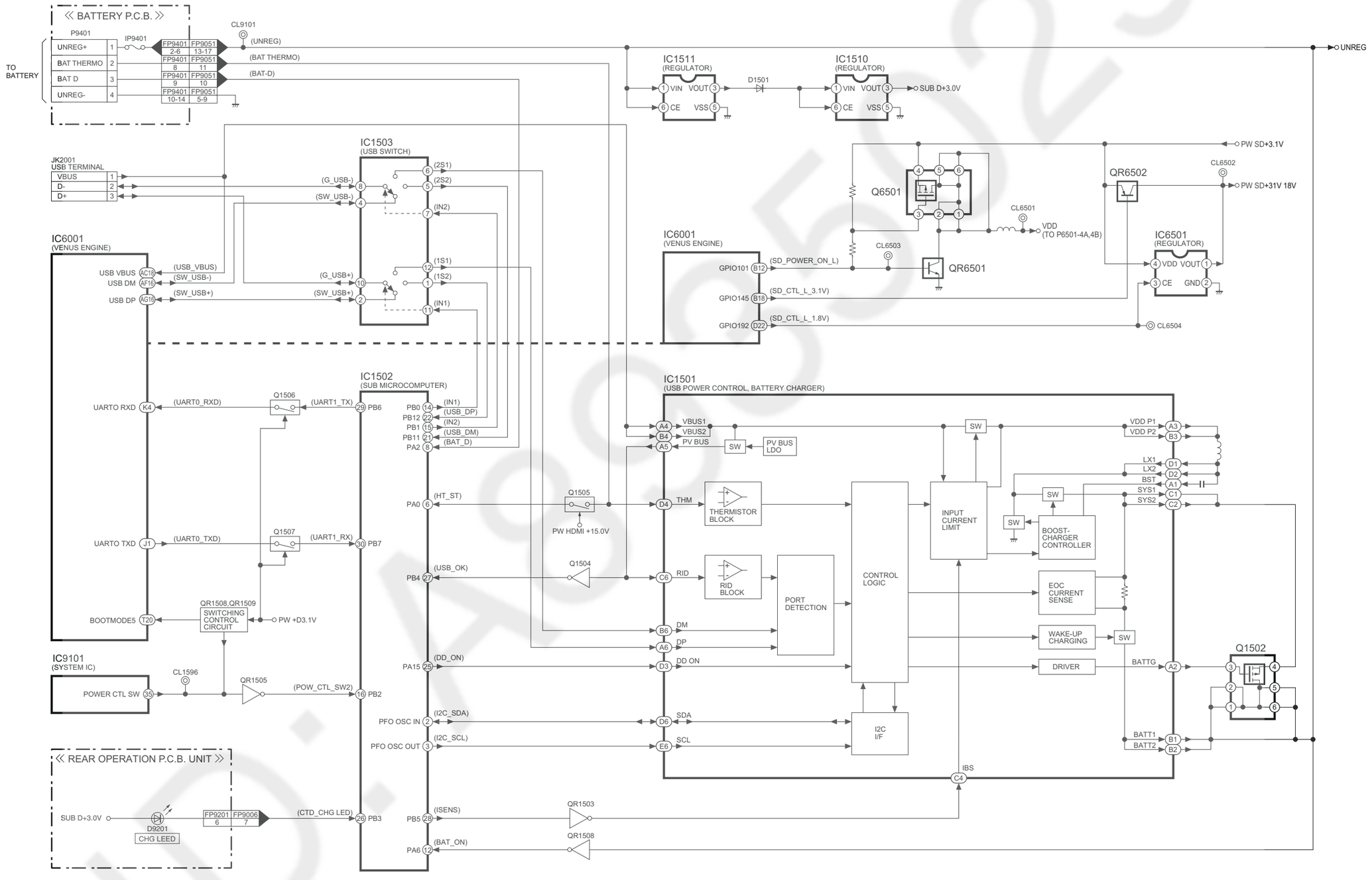
DMC-TZ80/TZ81/ZS60 AUDIO/VIDEO PROCESS/ HDMI BLOCK DAIGRAM

12.4. Lens/Flash Block Diagram



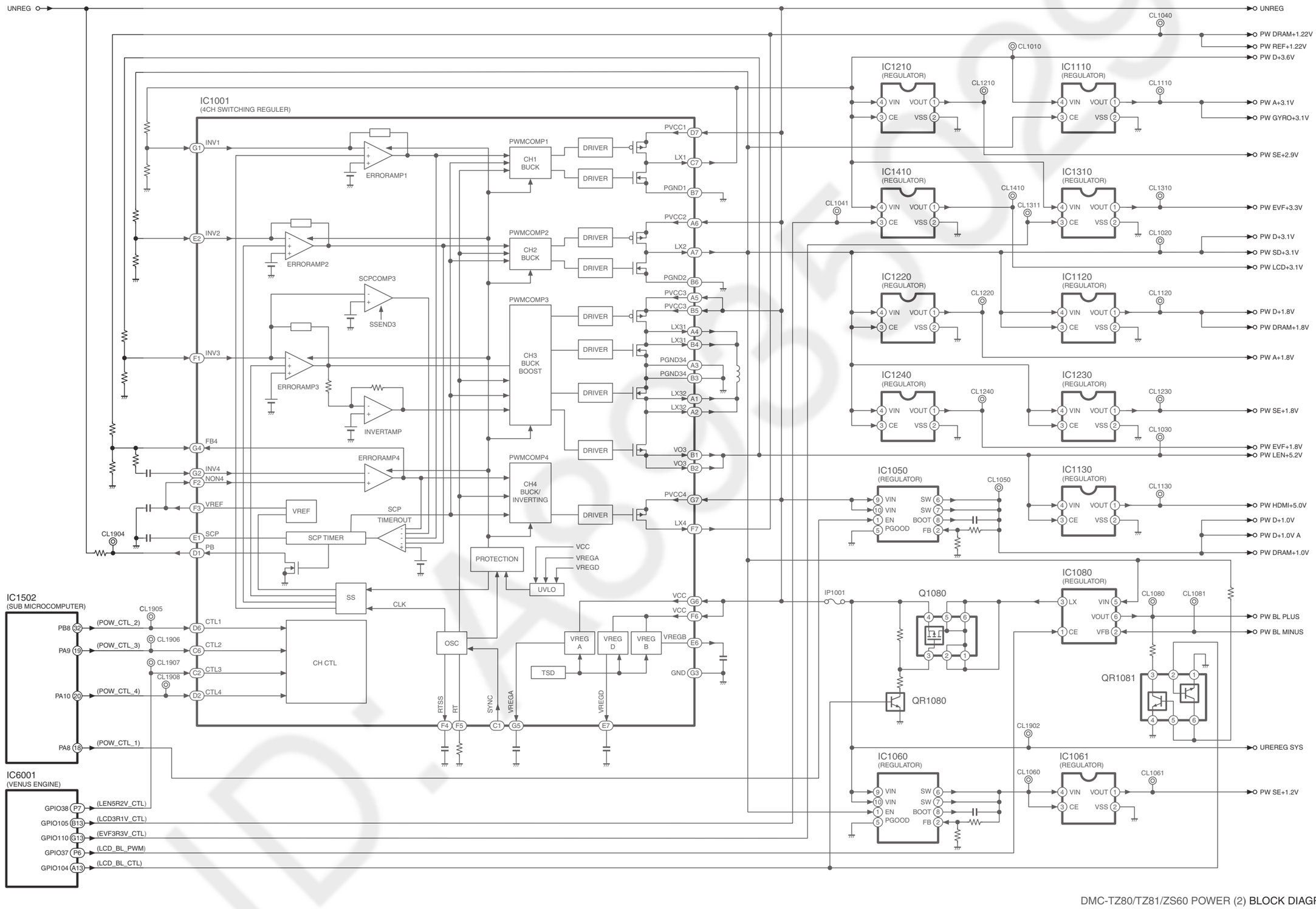
DMC-TZ80/TZ81/ZS60 LENS/FLASH BLOCK DIAGRAM

12.5. Power (1) Block Diagram



DMC-TZ80/TZ81/ZS60 POWER(1) BLOCK DIAGRAM

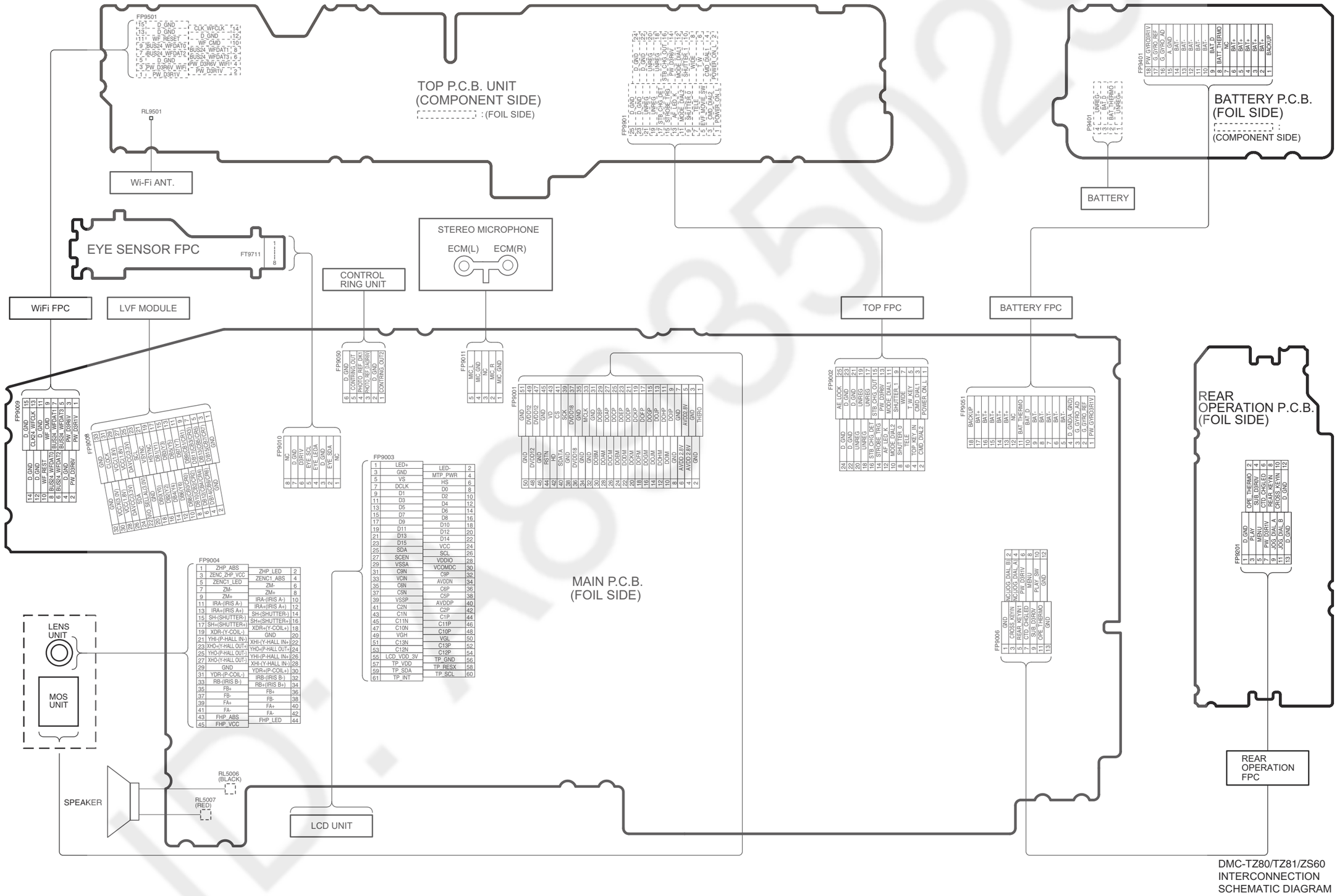
12.6. Power (2) Block Diagram



DMC-TZ80/TZ81/ZS60 POWER (2) BLOCK DIAGRAM

13 Wiring Connection Diagram

13.1. Interconnection Schematic Diagram



14 Schematic Diagram

Please click the radio button for "Diagrams II / Parts List" on the menu bar in XML Service Manual.
If you want to print, please click the icon button for "Print" on the icon bar and select the item.

15 Printed Circuit Board

Please click the radio button for "Diagrams II / Parts List" on the menu bar in XML Service Manual.
If you want to print, please click the icon button for "Print" on the icon bar and select the item.

16 Exploded View and Replacement Parts List

Please click the radio button for "Diagrams II / Parts List" on the menu bar in XML Service Manual.
If you want to print, please click the icon button for "Print" on the icon bar and select the item.