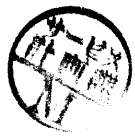
VAA11601-R. 3562. A

作成承認印	配布許可印
	

Nikon

COOLPIX5000

VAA11601 (J)
VAA11602 (U)
VAA11603 (EP)
VAA11604 (EN)

REPAIR MANUAL

Nikon | NIKON CORPORATION
Tokyo, Japan

Recycled paper
再生紙を使用しています

Printed in Japan Nov 2001

CONTENTS

Specifications

CCD	Total pixels : 5.24 million Effective pixels : 5.0 million Recording pixels : 4.92 million $^{2}/_{3}$ inch high-density CCD
Lens	3× Zoom Nikkor F=7.1 ~ 21.4mm (35-mm [135] camera format equivalent: 28 ~ 85mm) f/2.8 ~ f/4.8 Focus range : 50cm (1.8ft) ~∞ ; 2cm (0.8inch) ~∞ in macro
Digital zoom	4.0 ×
Viewfinder	Real-image zoom viewfinder with LED indication Frame coverage : Approximately 82% , Magnification : 0.30× ~ 0.84× Diopter adjustment : -2 ~ +1m^{-1}
Monitor	1.8inch, 110,000-dot, low temperature polysilicon TFT LCD with brightness and hue adjustment Frame coverage : Approximately 97% (through/freeze image) Free- angle
Shutter	Mechanical and charge-coupled electronic shutter 1 ~ $^{1}/_{4000}$ s (programmed auto) ; 8 ~ $^{1}/_{2000}$ s (shutter-priority auto) ; 8 ~ $^{1}/_{4000}$ s (aperture-priority auto) ; Bulb (up to 5 min.) and 8 ~ $^{1}/_{2000}$ s (manual exposure mode)
Aperture	Seven-blade iris diaphragm Range : Ten settings in steps of $^{1}/_{3}$ EV
Sensitivity	ISO equivalent approximately 100, 200, 400, 800, or Auto (auto gain to ISO 800)
Exposure	Metering : Four mode through-the-lens (TTL) metering: Mode : 256-segment matrix , Center-weighted , Spot , AF spot Exposure control: Programmed auto with flexible program, shutter-priority auto, aperture-priority auto, manual, exposure compensation (-2.0 ~ +2.0 EV in steps of $^{1}/_{3}$ EV), autoexposure bracketing Range : W:-2.0 ~ +18.0 EV , T:-0.5 ~ +17.0 EV (ISO 100 equivalent)

Built-in Speedlight	Guide number 10/32 (ISO 100, m/ft) Sync method : Automatic sync control Accessory shoe : Standard ISO hot-shoe contact with safety lock Sync contact : X-contact only Flash modes : Auto, Flash Cancel (off), Red-Eye Reduction, Anytime Flash (fill-flash), Slow Sync
White balance	Auto with TTL control, 5-mode manual with fine tuning, pre-set white balance, white balance bracketing
Auto off	Can be selected from 30 sec. (default) and 1, 5 and 30 min.
Autofocus (AF)	Contrast-detect through-the-lens (TTL) AF Focus-area selection : Five-area multi AF and spot AF available Focus modes : .Continuous AF (monitor on) , Single AF (monitor off) , Manual (50 positions, with focus confirmation indication) ,
Shooting modes	• Auto • Custom setting Sigle , Continuous -L(up to 8 frame ;1.5 fps [FINE]) , Continuous -H(up to 4 frame ; 3 fps) , Sequence (SXGA,XGA,VGA ; 5 fps) , Ultra HS(QVGA 30 frame/sec) , Moive with sound (QVGA 40sec ; 15 fps) , Multi-shot 16 , Best shot selector , Noise reduction , Image adjustment , Saturation control , Image sharpening , Digital tele , Self-timer
Image size	Compression JPEG-baseline-compliant User can select from: Full (2560 × 1920) , .UXGA (1600 × 1200) ,SXGA (1280× 960) , XGA (1024x×768) , VGA (640× 480) , 3 : 2 (2560×1704) Compression : FINE 1/4 , NORMAL 1/8 , BASIC 1/16 Uncompressed : RGB-TIFF
Media	CompactFlash. (CF) Card Type Ⅰ and Type Ⅱ .
File system	Compliant with Design rule for Camera File systems (DCF) and Digital Print Order Format (DPOF)
Approximate Capacity	Image size : FULL

	Hi	Fine	Nomal	Basic
64MB	approx. 4	approx. 24	approx. 48	approx. 96

Playback menu	Full-frame playback , Thumbnail (4/9 segments) , Slide show , Hide image function , Quick review , Moive (with sound) , Zoom Playback (up to 6x) , All shooting data display and histogram indication , Focus confirmation indication , Hihgtlight
Delete function	Delete all frames , delete selected frame(s) , delete folder , Protect function , Disable delete available
Interface	USB interface , Video output : User can choose from NTSC and PAL
Display	LCD-monitor : Electronic viewfinder , Menu of shooting modes and playback modes , Date Black and White-LCD : Shooting modes , Image quality modes , etc Finder-LED : Condition of AF , Condition of Speedlight ,
I/O terminals	DC input , Video (with soun) output , Digital output (USB)
Power sources	• One rechargeable Nikon EN-EL1 lithium-ion battery (supplied) or six-volt 2CR5 (DL245) lithium battery (available separately) • MB-E5000 battery pack (available separately) with six LR6 (AA) alkaline, lithium, NiCad, or NiMH batteries • EH-21 AC adapter/battery charger (available separately)
Battery life	Approximately 100 minutes (EN-EL1) when using monitor at 20°C (68°F)
Dimensions (W,H,D)	101.5×81.5×67.5 mm (4.0×3.2×2.6 in)
Weight	Approximately 360g (12.8oz) without battery and memory card

DISASSEMBLING

⚠ WARNING	
	● There are high voltege parts inside. Be careful of this electric shock, when you remove the cover. ● You must discharge the main condenser according to the instruction of this repair manual before you remove the cover.

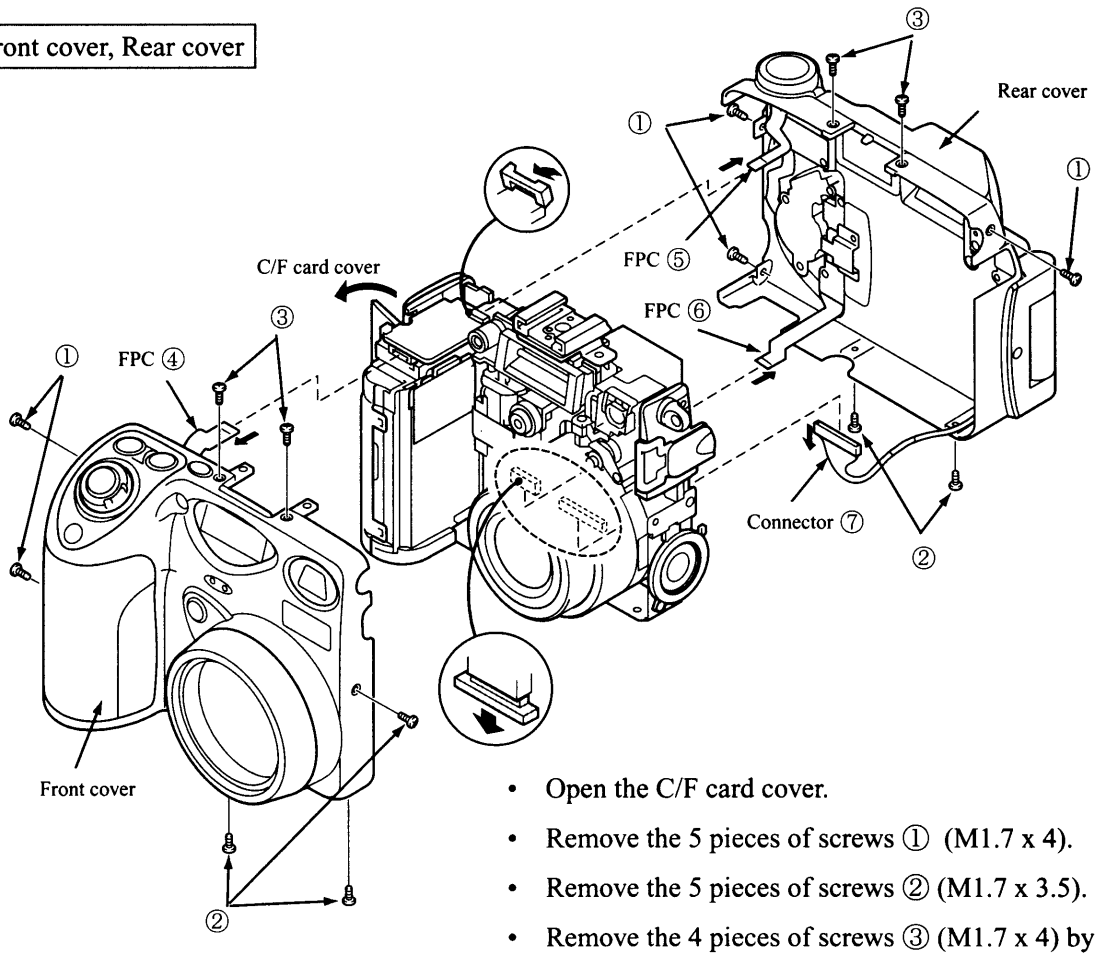
Notes:

① Remove the battery prior to dissassmbly.

② At disassembling, be sure to memorize how the lead wires were arranged, how the screws were fixed and the type of the used screws.

③ Electrical parts must be grounded since they are easily damaged by static.

Front cover, Rear cover

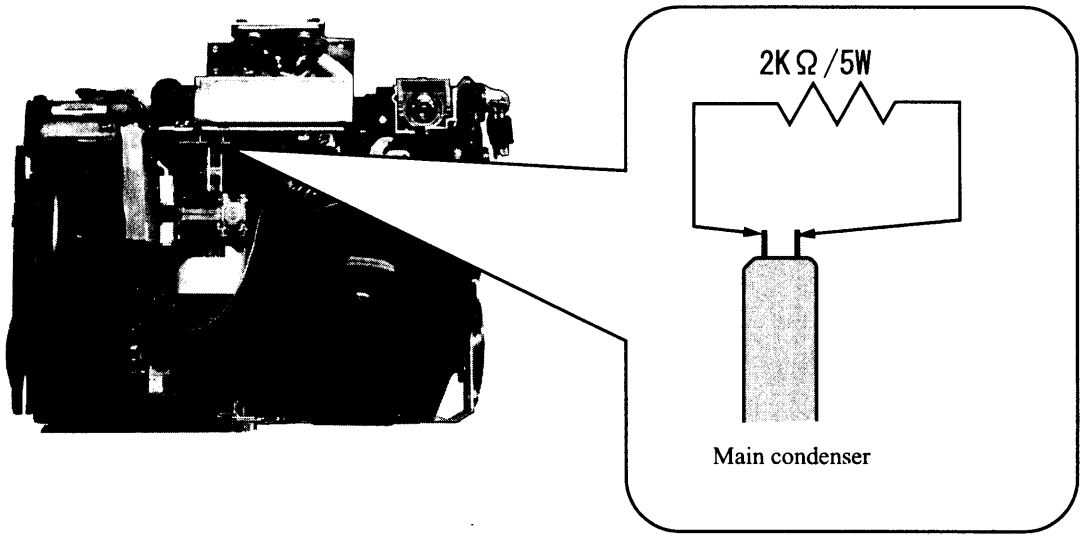


- Open the C/F card cover.
- Remove the 5 pieces of screws ① (M1.7 x 4).
- Remove the 5 pieces of screws ② (M1.7 x 3.5).
- Remove the 4 pieces of screws ③ (M1.7 x 4) by using a screwdriver (J63076).
- Carefully remove the front cover from the camera body.
- Remove the FPC ④ from the connector.
- Remove the front cover.
- Carefully remove the rear cover from the camera body .
- Remove the FPC ⑤ , FPC ⑥ and the connector ⑦ .
- Remove the rear cover.

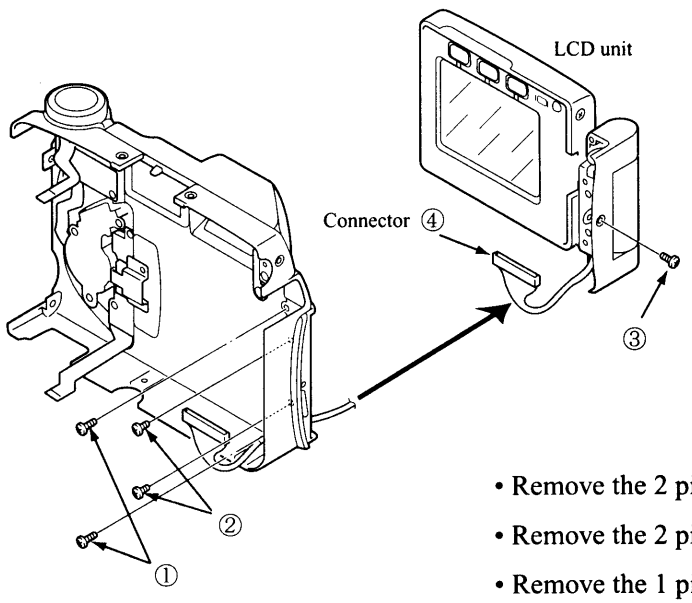
Discharging electricity from the main condenser

⚠ WARNING

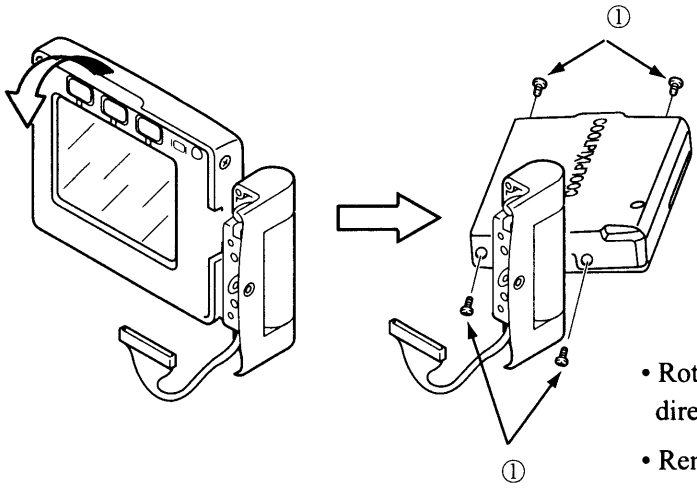
- There are high voltege parts inside. Be careful of this electric shock, when you remove the cover.
- You must discharge the main condenser according to the instruction of this repair manual before you remove the cover.



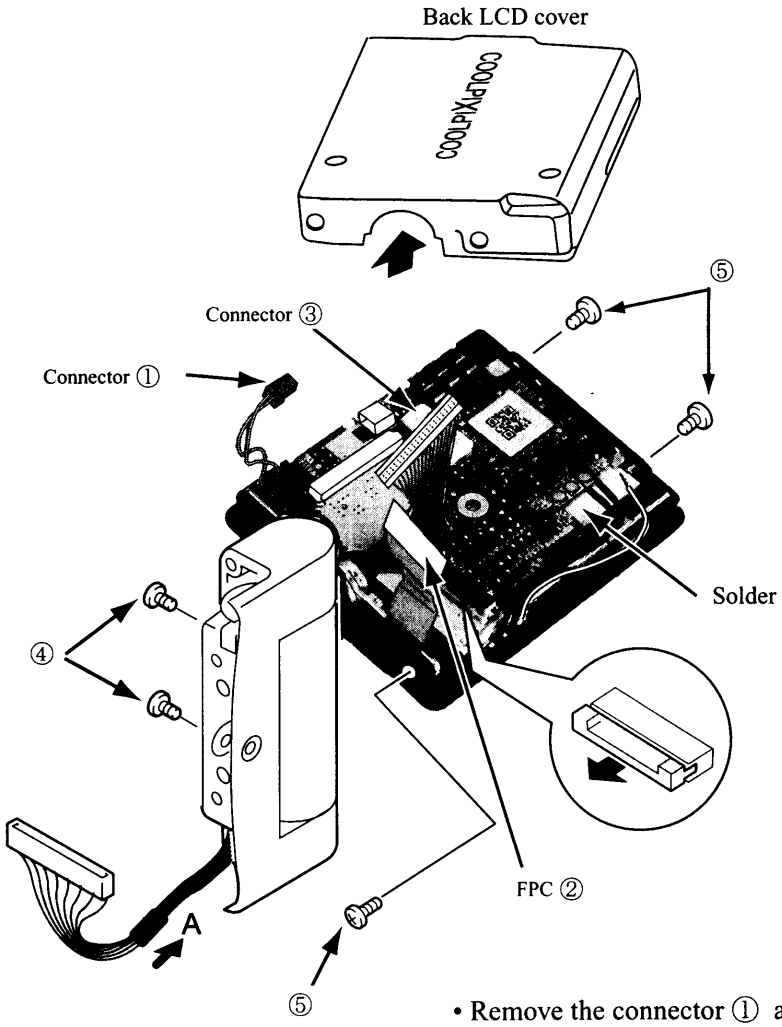
LCD unit



- Remove the 2 pieces of screws ① (M1.7 x 5).
- Remove the 2 pieces of screws ② (M1.7 x 2).
- Remove the 1 piece of screw ③ (M1.7 x 3.5).
- Carefully remove the LCD unit from the rear cover.
- Pull out the connector ④ from the rear cover.
- The LCD unit can be removed from the rear cover.



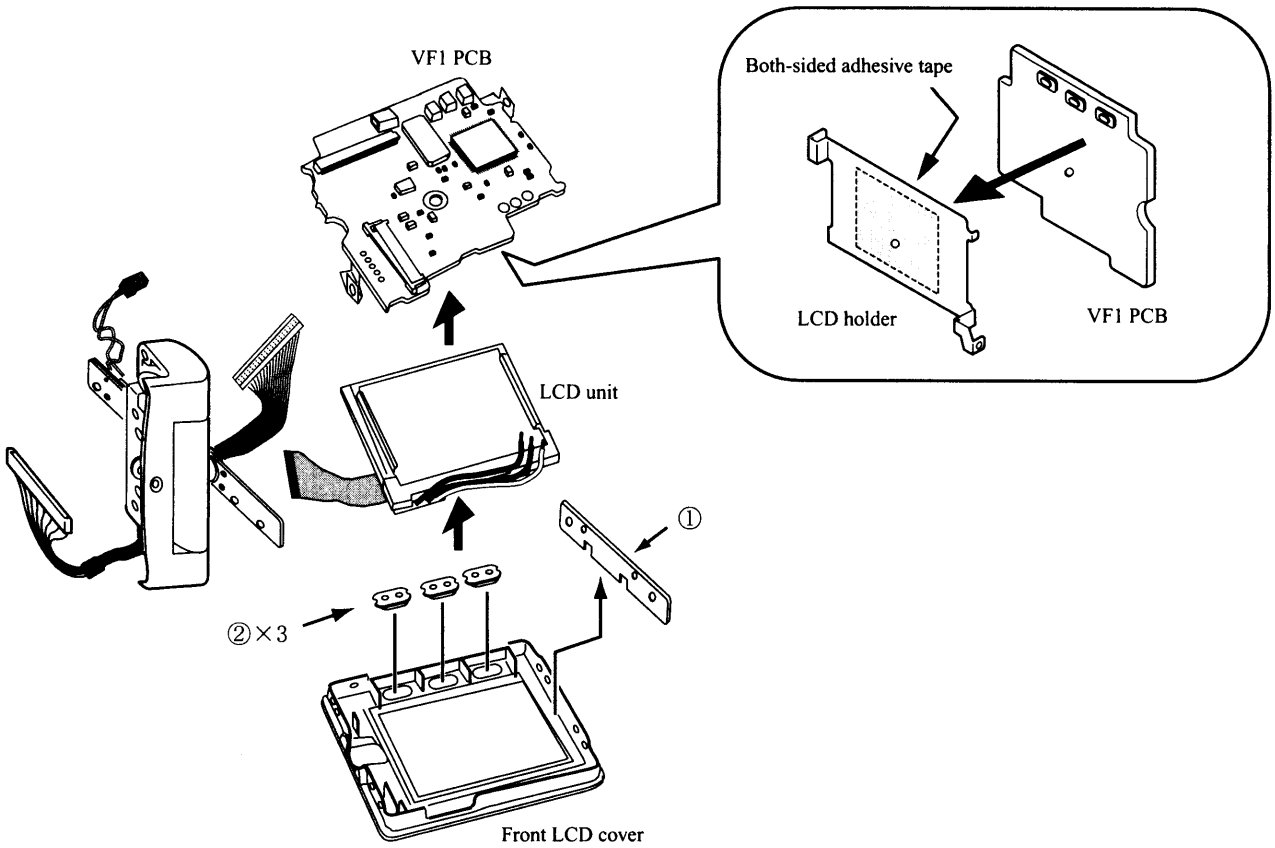
- Rotate the LCD unit approx. 90 degree in an arrow direction.
- Remove the 4 pieces of screws ① (M2 x 3).
- Remove the back LCD cover.



- Remove the connector ① and FPC ② .
- Remove the solders of the blue, red and white lead wires.
- Push the lead wires of the connector ③ a little in arrow A direction.
- Remove the connector ③ .

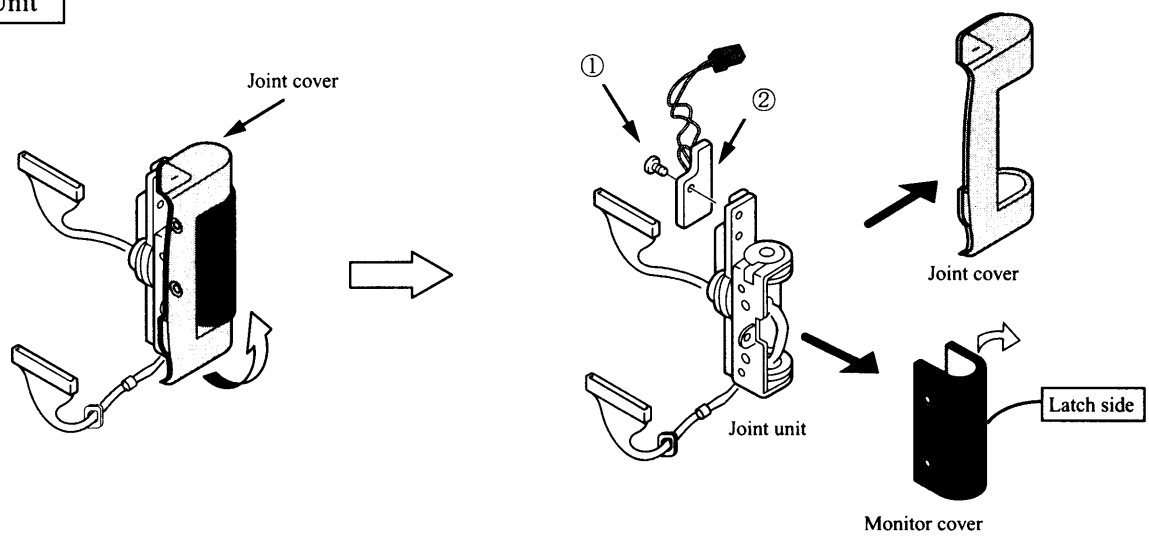
(Remove it by pulling out all the lead wires of the connector ③ .)

- Remove the 2 pieces of screws ④ (M1.7 x 2).
- Remove the 3 pieces of screws ⑤ (M1.7 x 2).



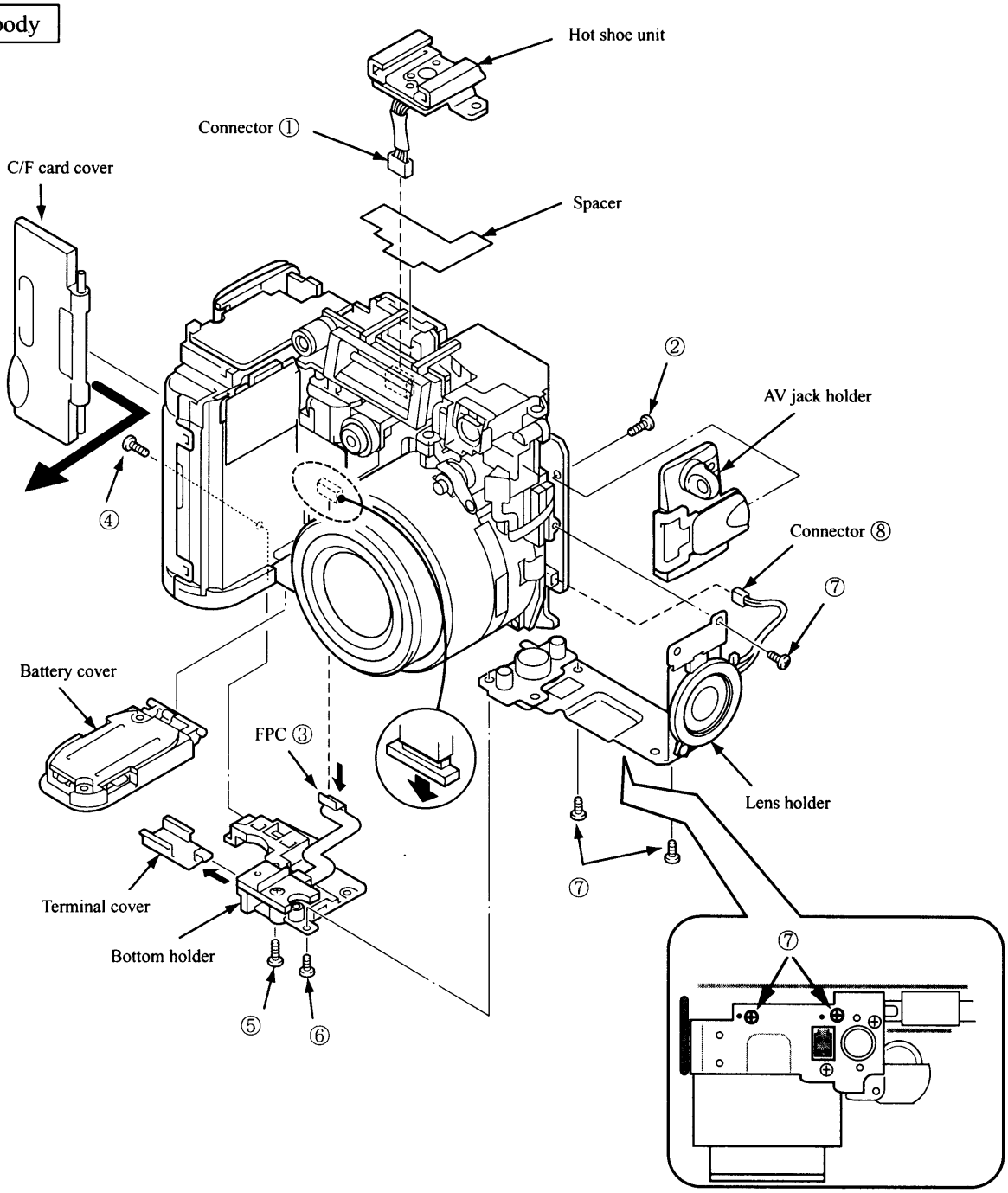
- As holding the front LCD cover, remove the LCD side holder ① .
- The VFI PCB, LCD unit and LCD buttons ② can be removed.
- In the case that the LCD holder is removed from the VF1 PCB, inject alcohol between the VF1 PCB and LCD holder.

Joint Unit



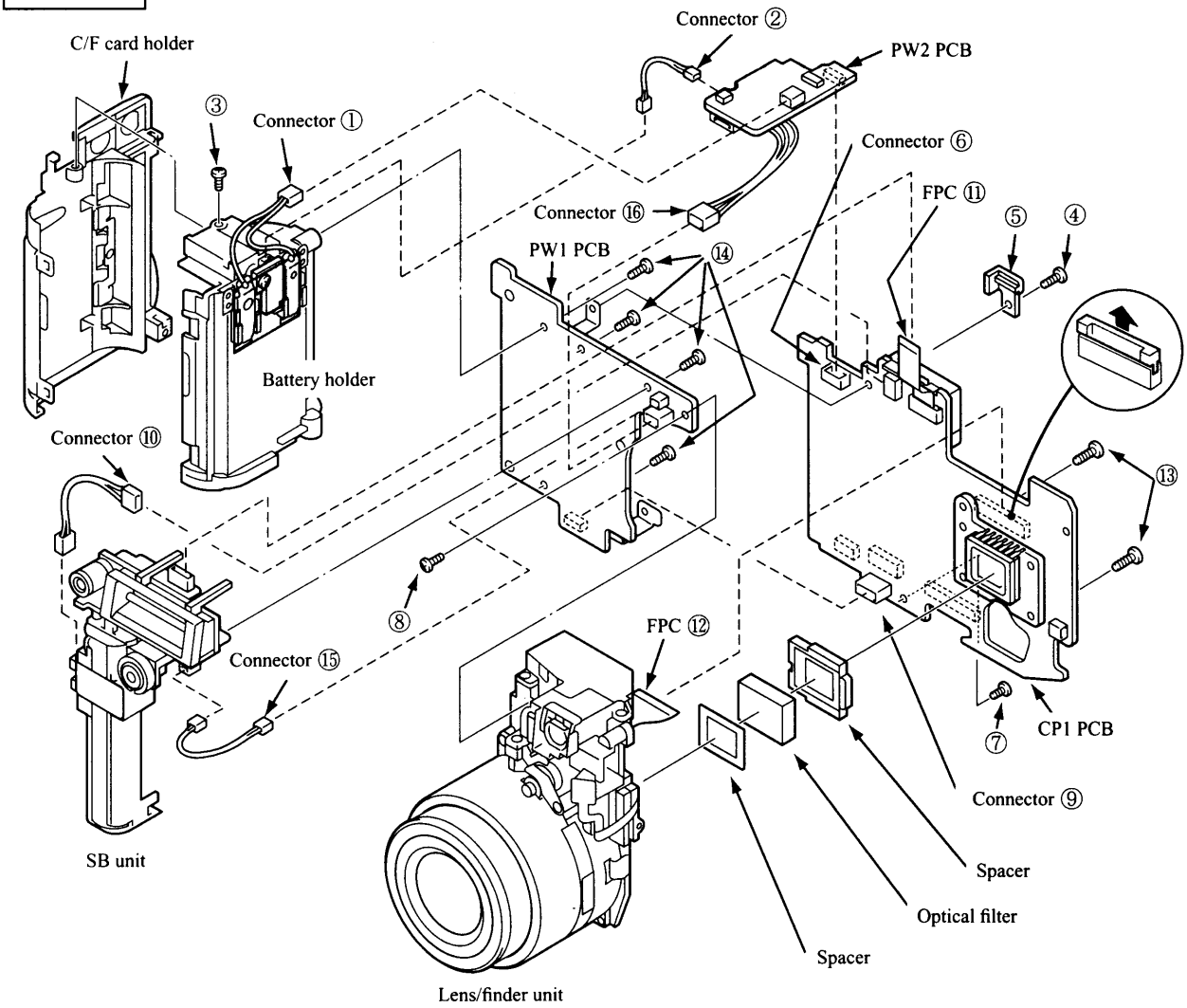
- Remove the joint cover from the joint unit by lifting it up from the bottom.
- Remove the monitor cover from the joint unit by opening the latch side of the monitor cover in an arrow direction.
- Remove the 1 piece of screw ① (M1.7 x 2.5).
- Remove the TB1 PCB ② .

Parts on body



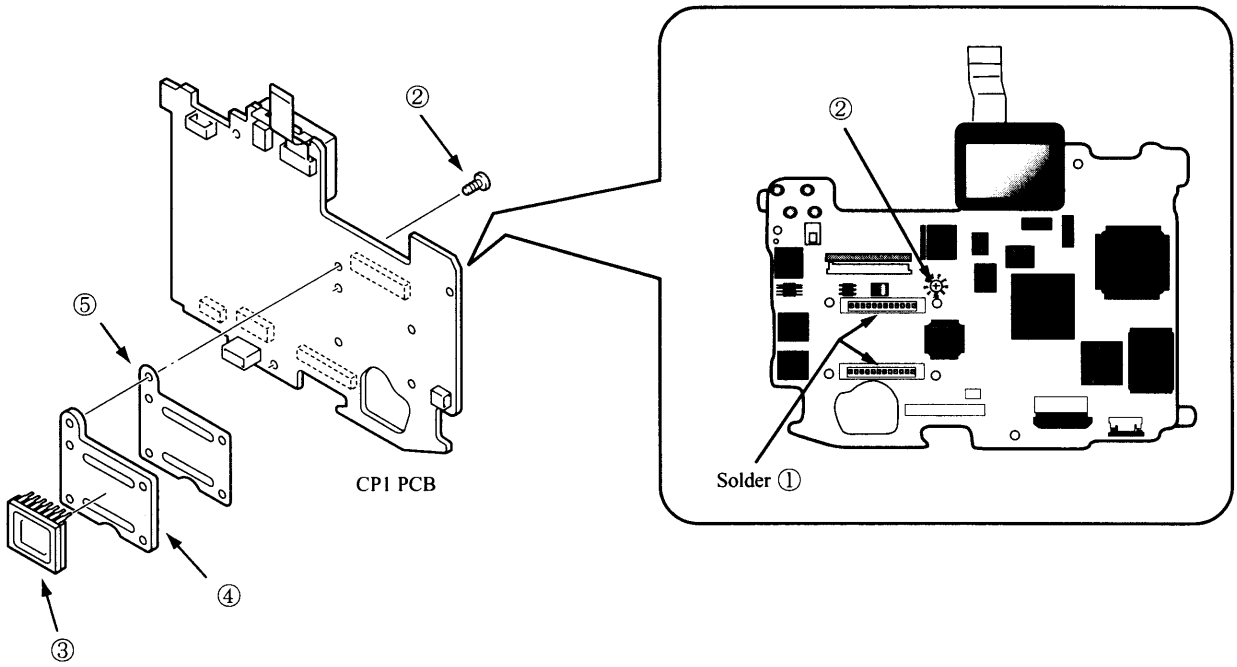
- Remove the spacer.
- Remove the connector ① , and then remove the hot shoe unit.
- Remove the 1piece of screw ② (M1.7 x 4).
- Remove the AV jack holder.
- Remove the battery cover by pulling it out from the joint part.
- Remove the terminal cover by sliding it to the bettery cover side.
- Remove the FPC ③ .
- Remove the screw ④ (M1.7 x 3), screw ⑤ (M1.7 x 4) and screw ⑥ (M1.7 x 2.5).
- The bottom holder can be removed.
- Remove the 3 pieces of screws ⑦ (M1.7 x 3).
- As removing the lens holder, remove the connector.
- As pushing the C/F card cover to the camera body, slide it to the front to remove it.

PCBs



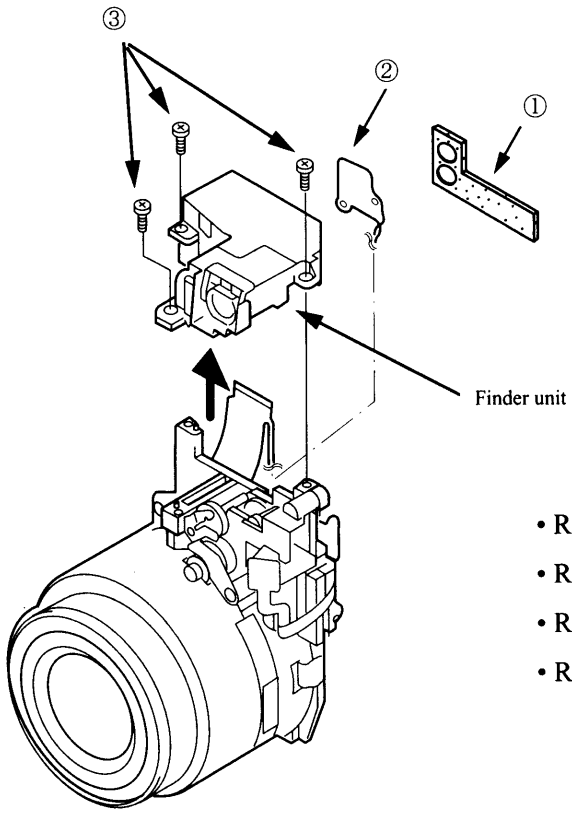
- Remove the connector ① .
- Remove the connector ② .
- Remove the 1 piece of screw ③ (M1.7 x 4).
- Remove the C/F card holder.
- Remove the 1 piece of screw ④ (M1.7 x 2.5).
- Remove the holder PWB ⑤ .
- Remove the connector ⑥ by lifting up the PW2 PCB.
- Remove the 1 piece of screw ⑦ (M1.7 x 2.5) and the 1 piece of screw ⑧ (M1.7 x 4).
- With removing the connector ⑨ , connector ⑩ , FPC ⑪ , PW1 PCB can be removed.
- Remove the FPC ⑫ .
- Remove the 2 pieces of screws ⑬ (M1.7 x 6).
- Remove the lens/finder unit.
- The spacer, optical filter and spacer can be removed.
- Remove the 4 pieces of screws ⑭ (M1.7 x 4).
- Remove the battery holder.
- With removing the connector ⑮ , the SB unit can be removed.
- With removing the connector ⑯ , the PW2 PCB can be removed.

CCD



- Remove the solder ① of the CP1 PCB.
- Remove the 1 piece of screw ② (M1.7x 2.5).
- Remove the image sensor ③ , mounting lens ④ and spacer ⑤ .

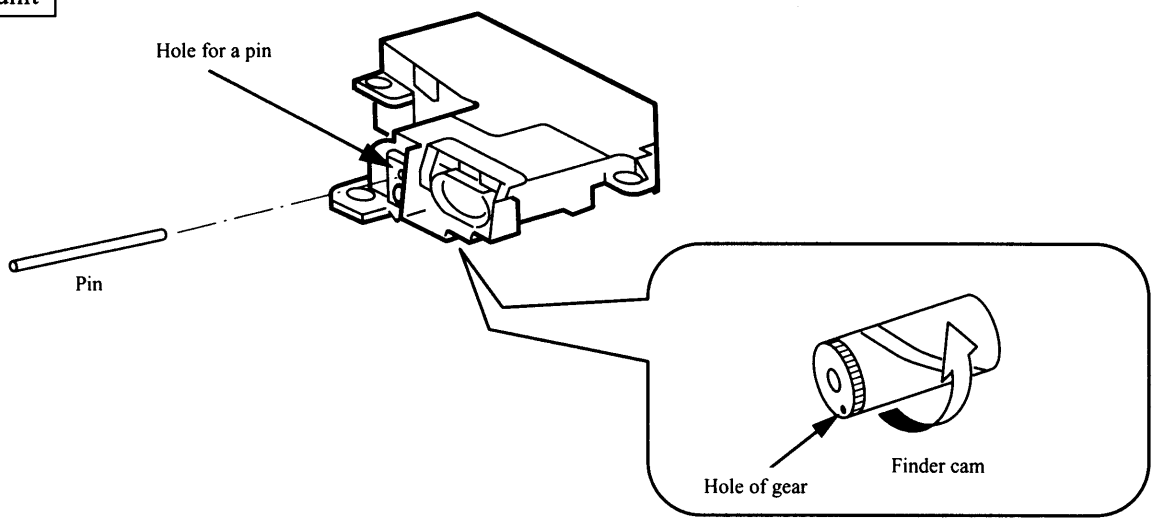
Finder unit



- Remove the molt ① .
- Remove the FPC ② .
- Remove the 3 pieces of screws ③ (M1.7 x 4).
- Remove the finder unit.

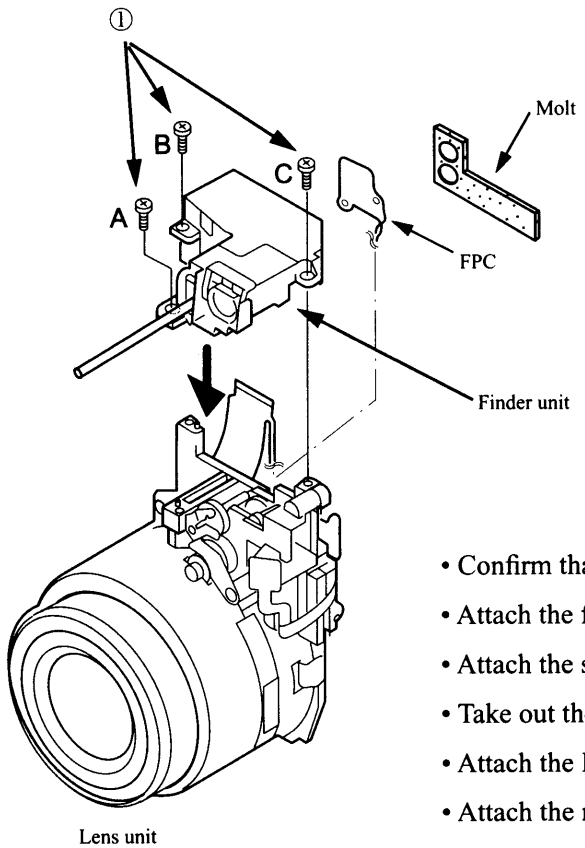
Assembly

Finder unit



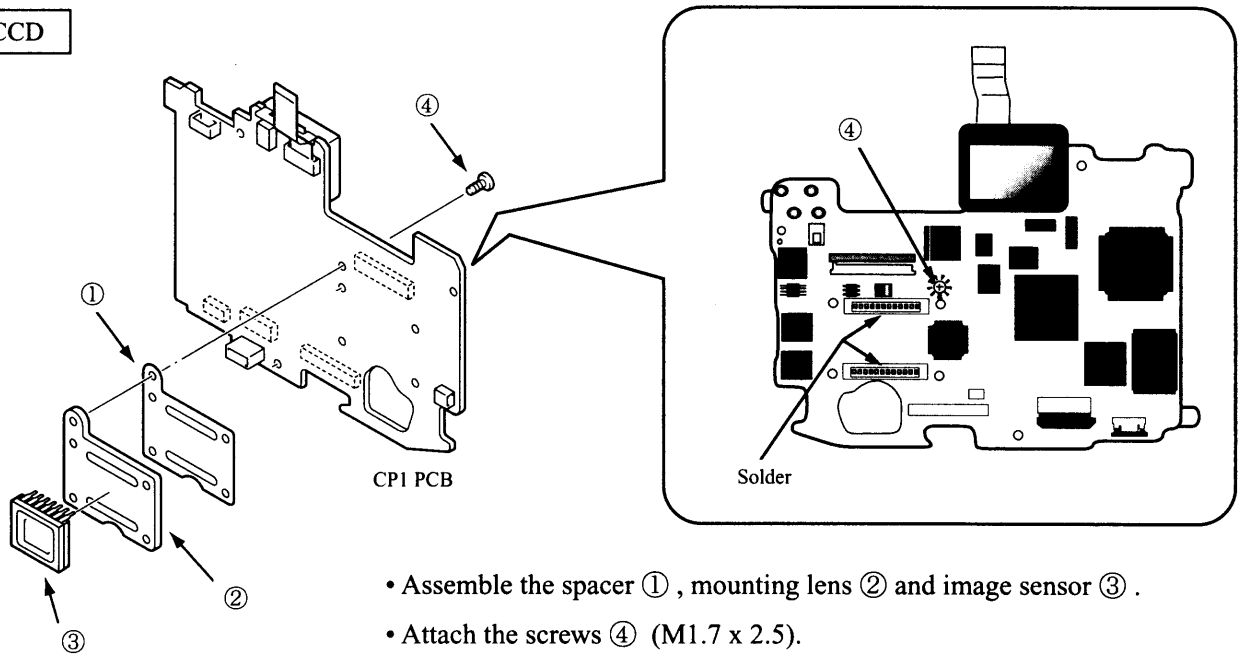
- Rotate the finder cam in an arrow direction until it touches the limit. (End of Wide)
- Rotate the finder cam reversely a little to align the hole of a gear and hole for a pin. Then insert a pin (approx. 0.5mm) into the holes.

Note: When inserting the finder unit into the lens unit, be careful of the dust, etc.



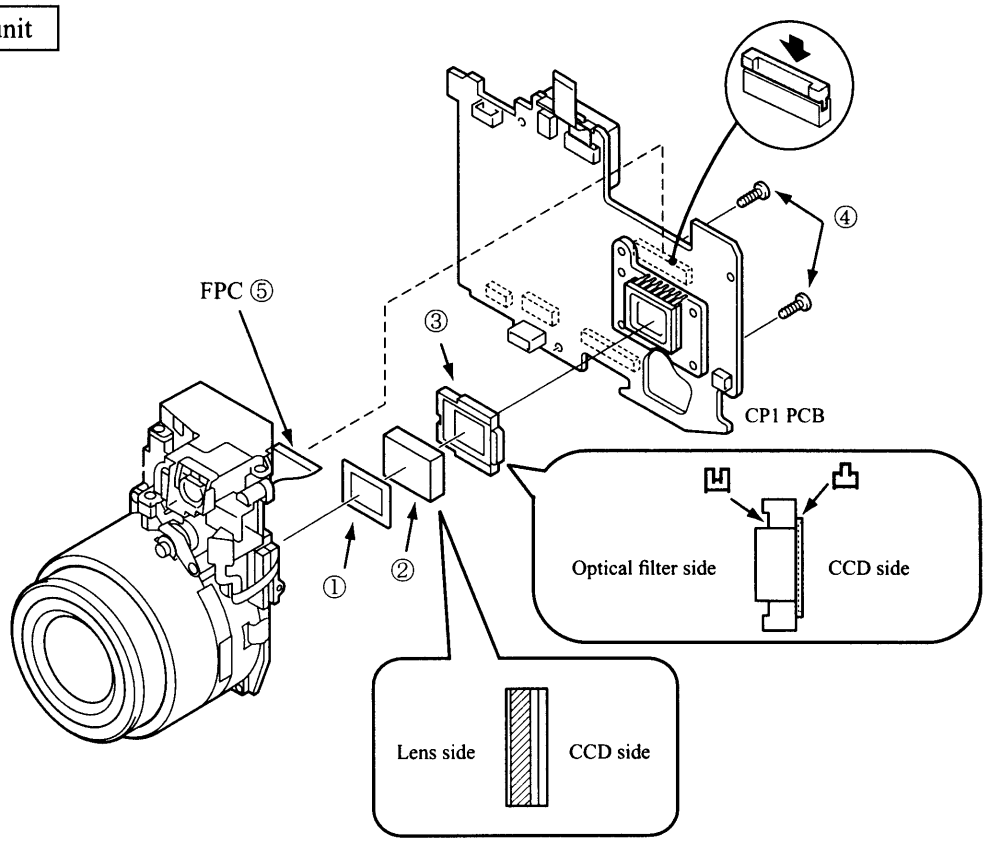
- Confirm that the lens unit is in the reset position.
- Attach the finder unit to the lens unit.
- Attach the screws ① (M1.7 x 4) in order of A, B and C.
- Take out the pin.
- Attach the FPC. (LED should be at the molt side.)
- Attach the molt ② .

CCD



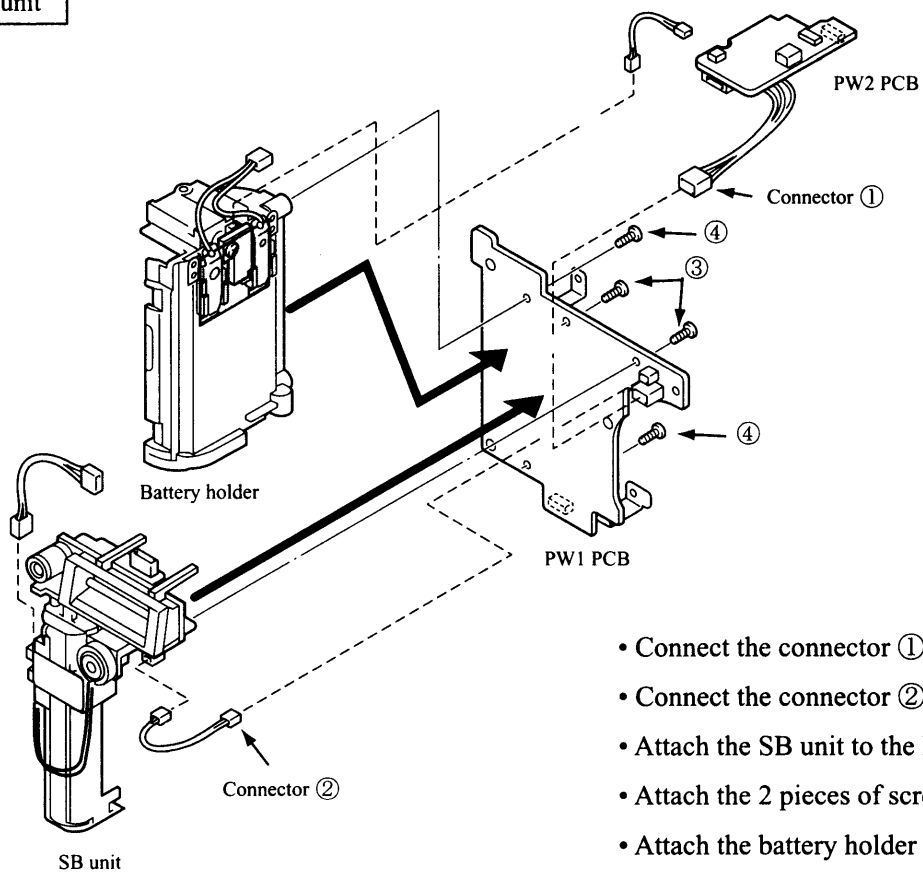
- Assemble the spacer ① , mounting lens ② and image sensor ③ .
- Attach the screws ④ (M1.7 x 2.5).
- Solder the CP1 PCB.

Lens unit

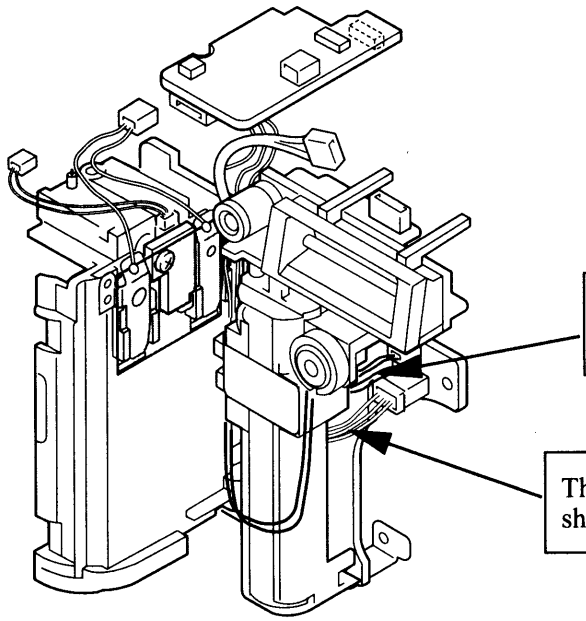


- Assemble the spacer ① , optical filter ② and spacer ③ into the lens unit.
- Attach the CP1 PCB to the lens unit.
- Attach the 2 pieces of screws ④ (M1.7 x 6).
- Connect the FPC ⑤ .

SB unit



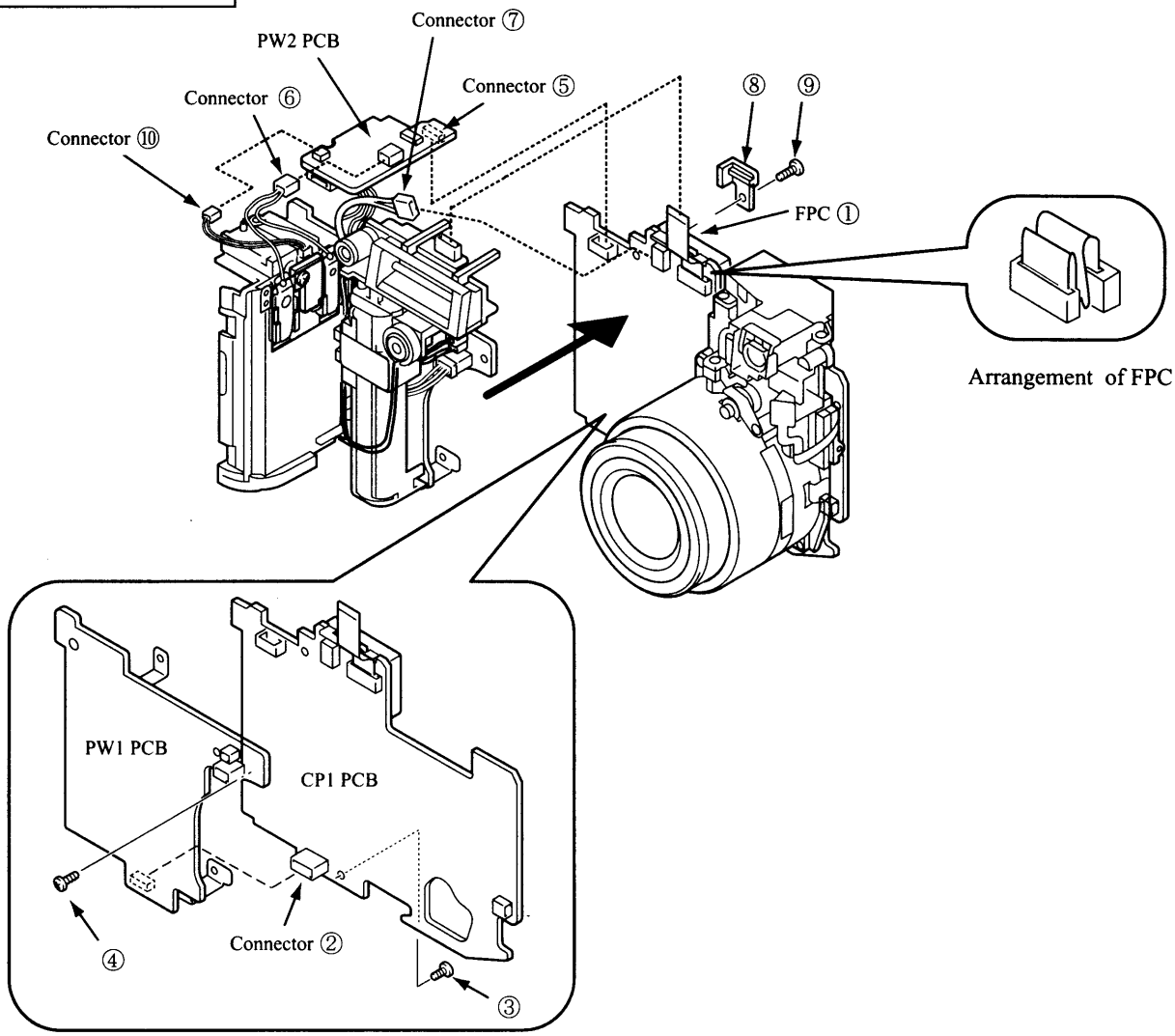
- Connect the connector ① .
- Connect the connector ② .
- Attach the SB unit to the PW1 PCB.
- Attach the 2 pieces of screws ③ (M1.7 x 4).
- Attach the battery holder to the PW1 PCB.
- Attach the 2 pieces of screws ④ (M1.7 x 4).



Arrange the lead wires (red and black) of connector ② behind the microphone.

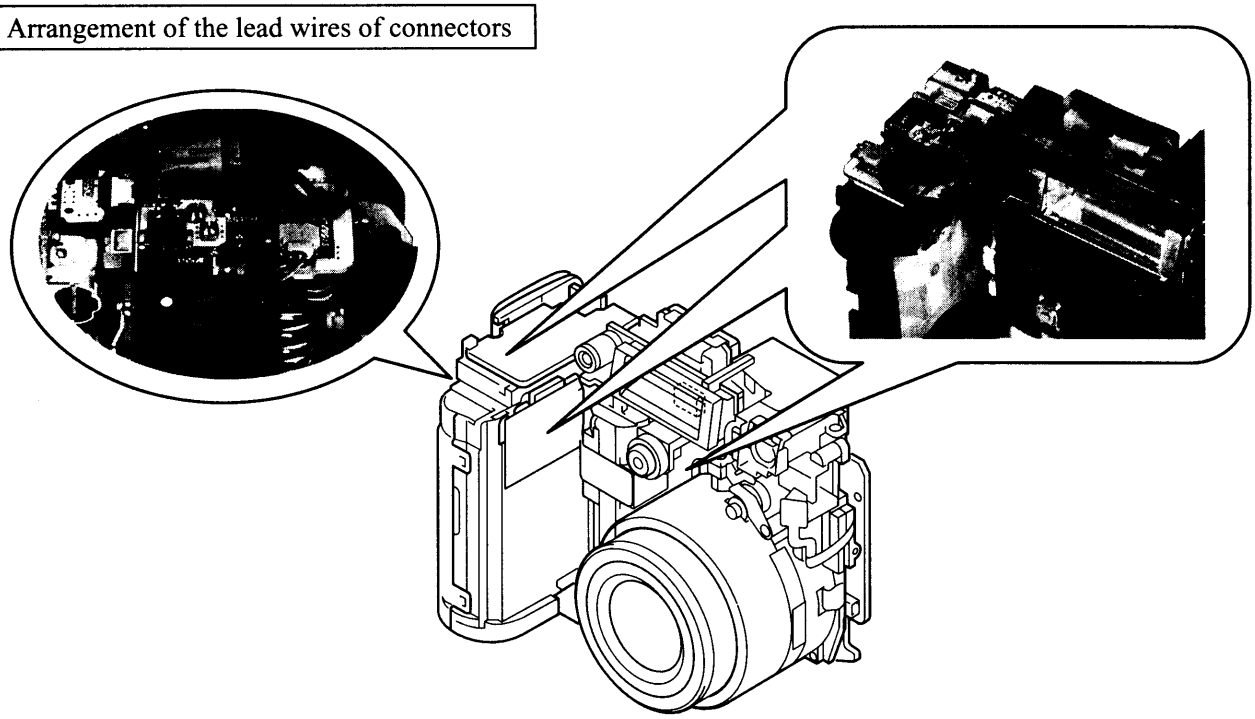
The lead wires (red, blue and black) of connector ① should go through between the PW1 PCB and SB PCB.

PW1 PCB/ PW2 PCB

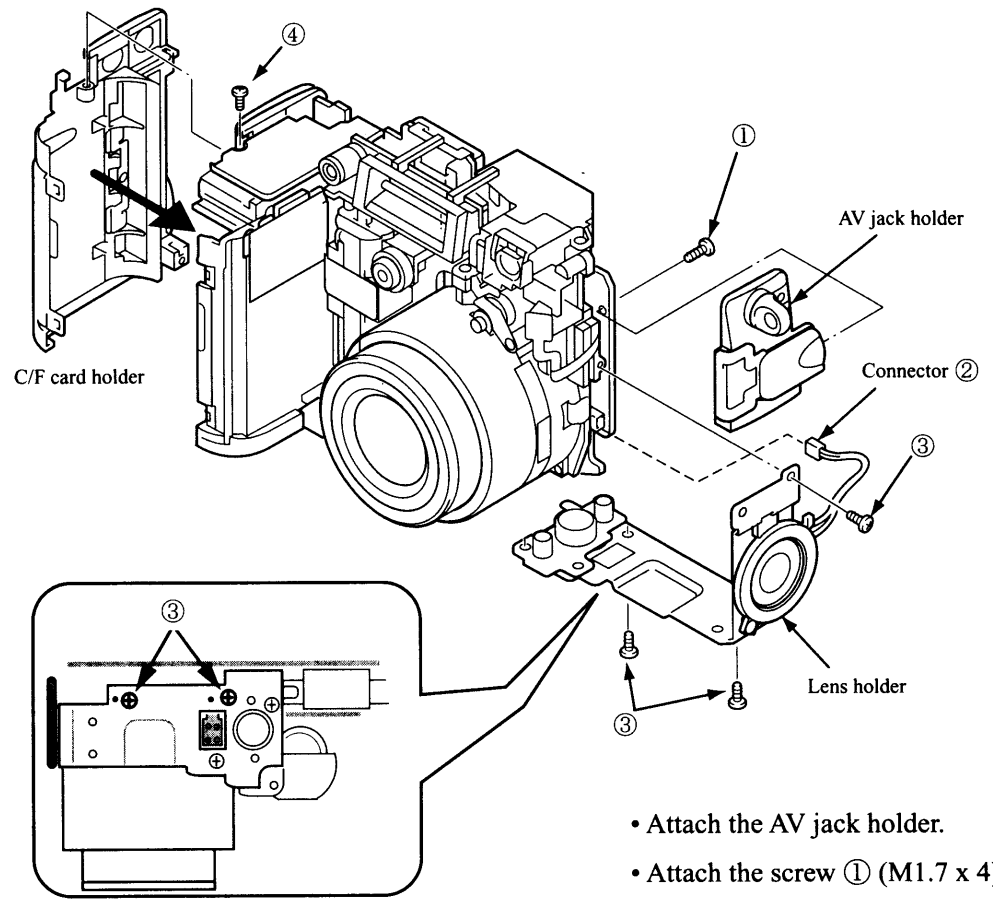


- Connect the FPC ① and arrange the FPC as shown Figure above.
- Connect the PW1 PCB and CP1 PCB by the connector ② .
- Attach the 1 piece of screw ③ (M1.7 x 2.5) and 1 piece of screw ④ (M1.7 x 4).
- Connect the PW2 PCB and CP1 PCB by the connector ⑤ .
- Connect the connector ⑥ and connector ⑦ .
- Attach the holder PWB ⑧ .
- Attach the 1 piece of screw ⑨ (M1.7 x 2.5).
- Connect the connector ⑩ .

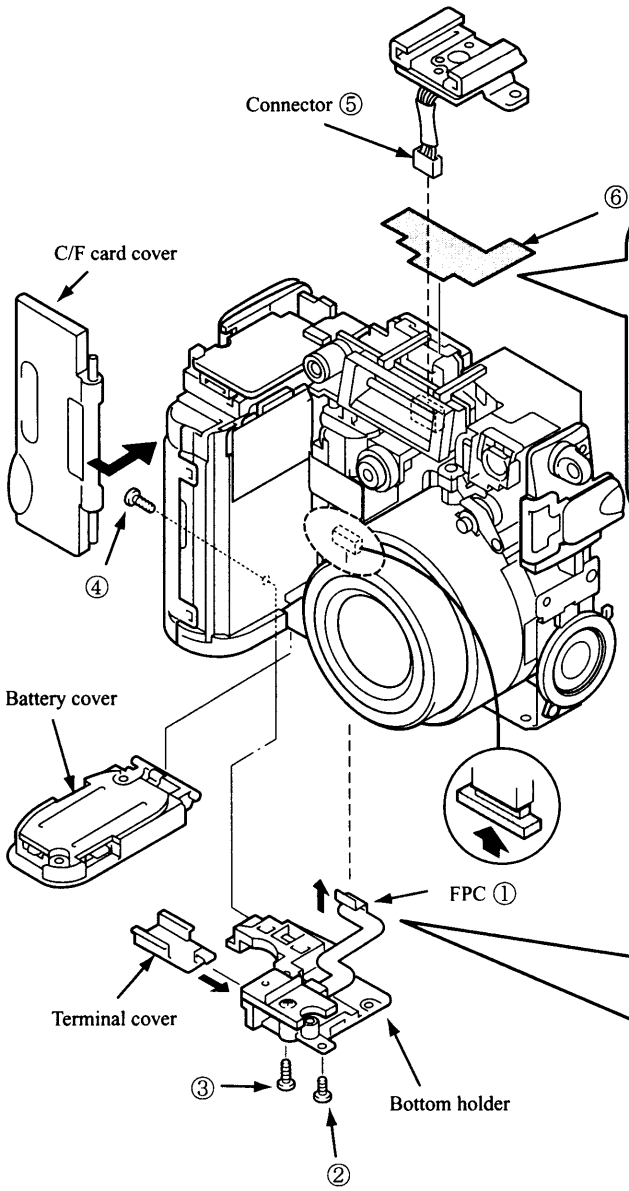
Arrangement of the lead wires of connectors

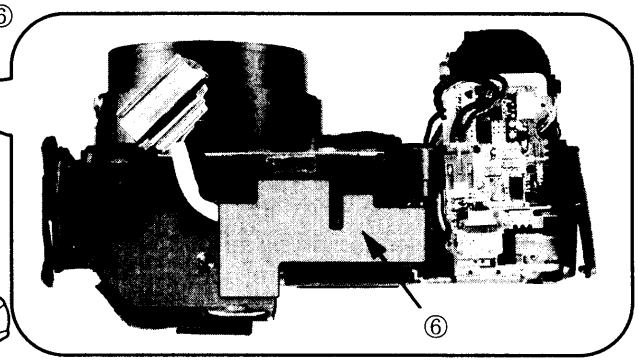


Parts on the body

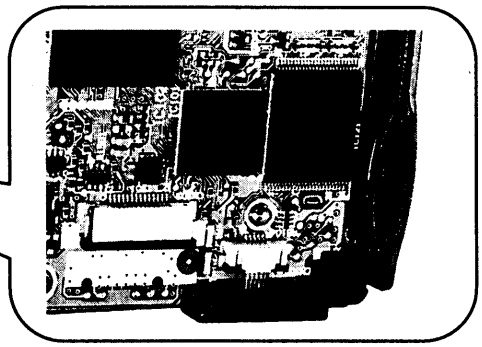


- Attach the AV jack holder.
- Attach the screw ① (M1.7 x 4).
- Connect the connector ② .
- Attach the lens holder.
- Attach the 3 pieces of screws ③ (M1.7 x 3).
- Attach the C/F card holder.
- Attach the 1 piece of screw ④ (M1.7 x 4).





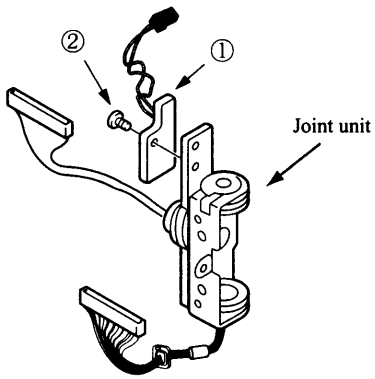
Position where the spacer should be attached



Arrangement of FPC

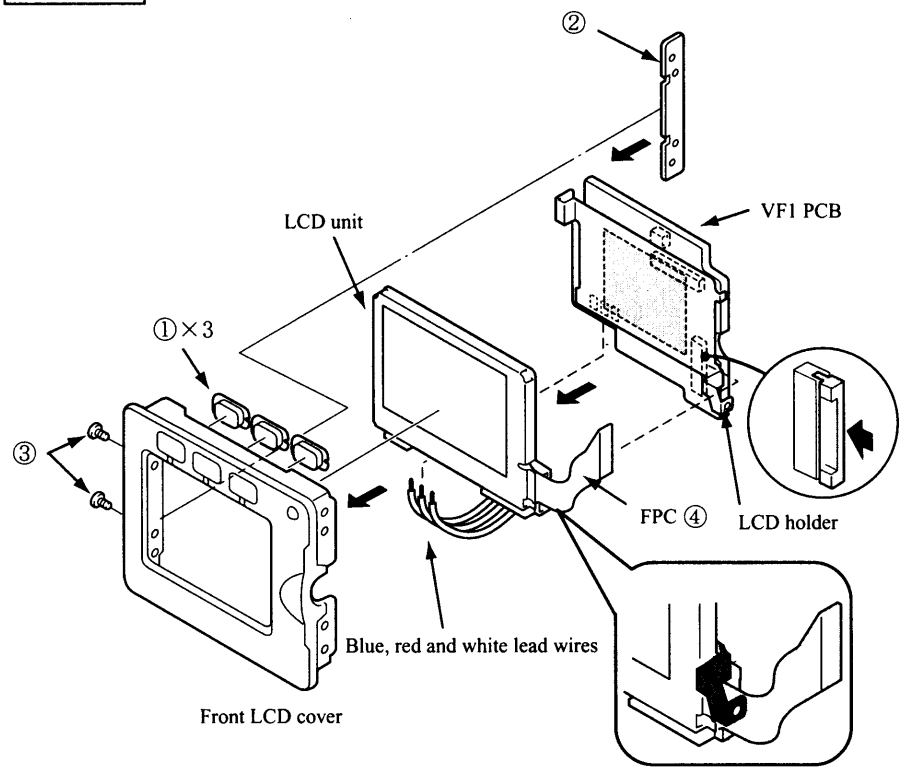
- Connect the FPC ① .
- As arranging the FPC ① , attach the bottom holder.
- Attach the screw ② (M1.7 x 2.5), the screw ③ (M1.7 x 4) and the screw ④ (M1.7 x 3).
- Attach the terminal cover by sliding it in an arrow direction.
- Attach the battery cover by pushing it to the joint unit.
- As pushing the C/F card cover to the camera body side, attach it by sliding it in an arrow direction.
- Connect the connector ⑤ .
- Attach the spacer ⑥ .

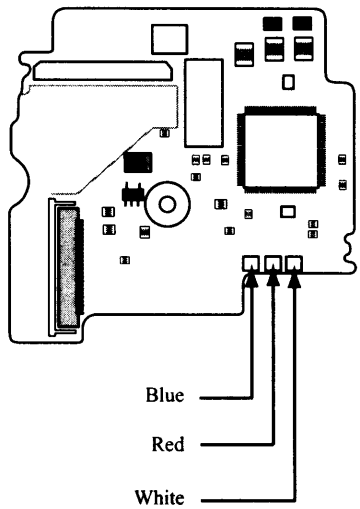
Joint unit



- Attach the TB1 PCB ① to the joint unit.
- Attach the 1 piece of screw ② (M1.7 x 2.5).

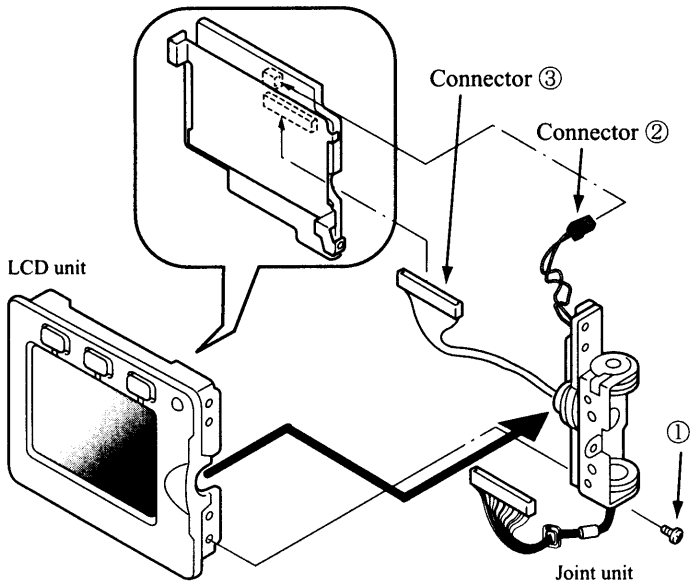
LCD unit



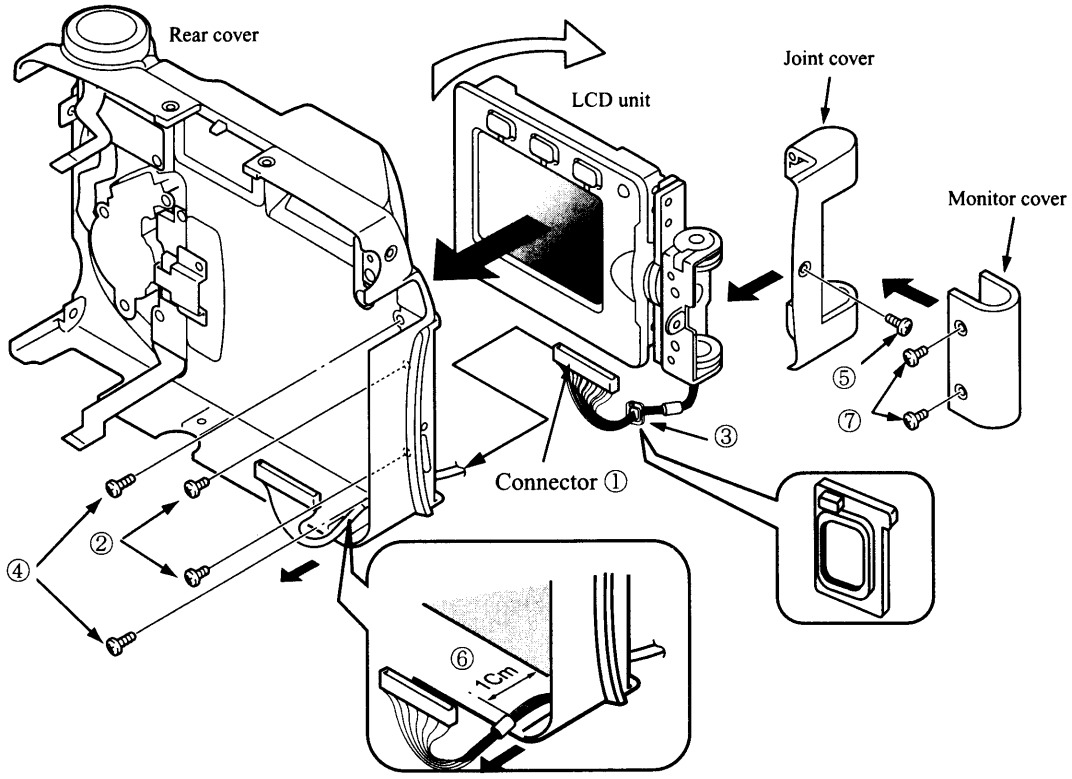


- Attach the LCD buttons ① to the front LCD cover.
- Attach the LCD unit and VF1 PCB.
- Attach the LCD side holder ② .
- Attache the 2 pieces of screws ③ (M1.7 x 2).
- Connect the FPC ④ .
- Solder the blue, red and white lead wires.

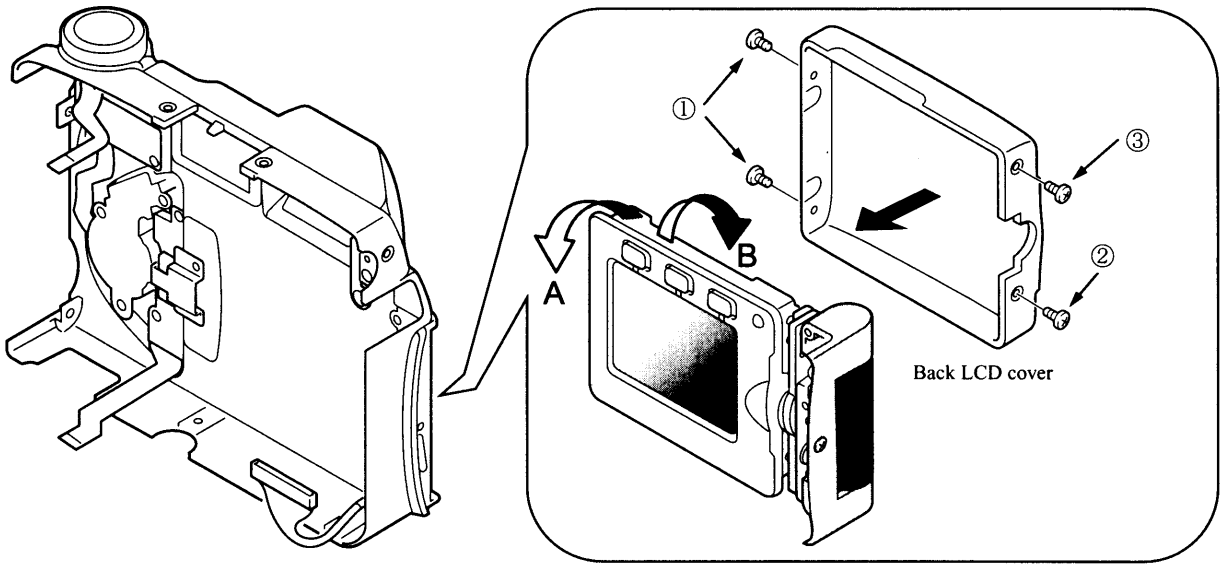
Note: When attaching the VF1 PCB, the part pointed by an arrow of the LCD holder should be under the FPC ④ .



- Attach the LCD unit to the joint unit.
- Attach the 1 piece of screw ① (M1.7 x 2).
- Connect the connectors ② and ③ .

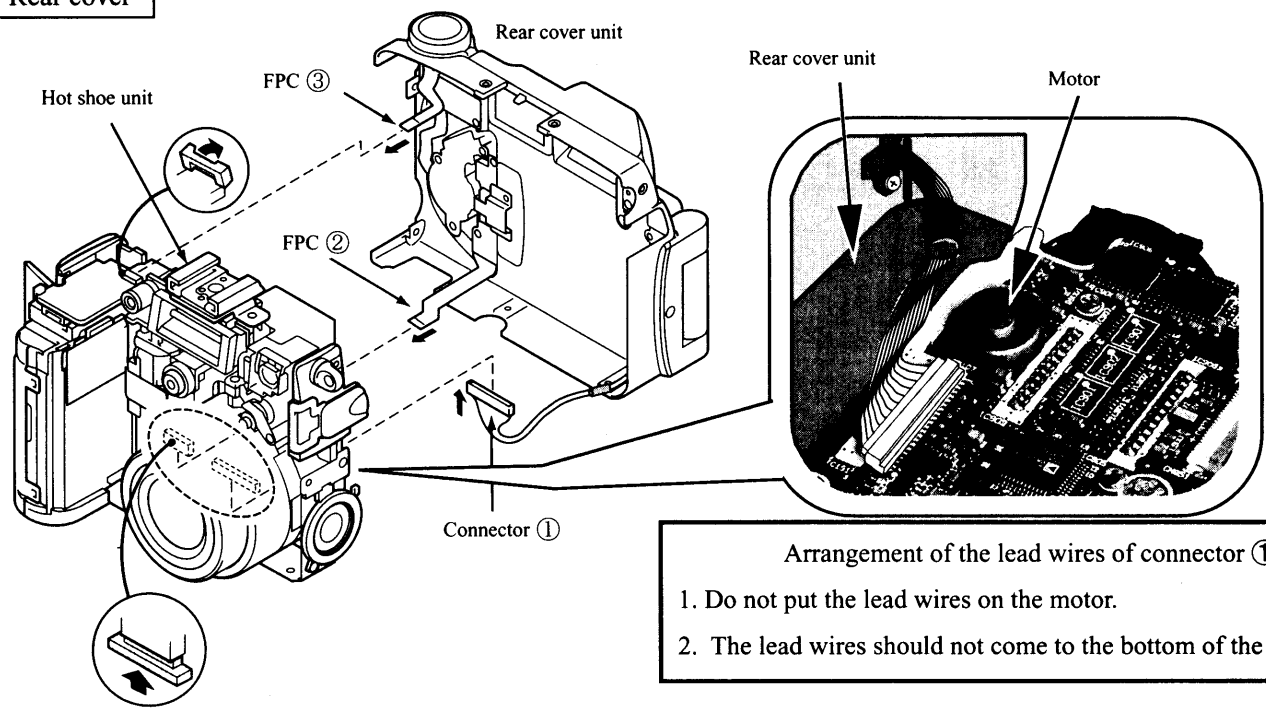


- Pass the connector ① through the hole of the rear cover and then pull it out to the front side of the rear cover.
- Attach the LCD unit to the rear cover.
- Attach the 2 pieces of screws ② (M1.7 x 2).
- Attach the holder ③ to the rear cover at the position shown in Figure above.
- Attach the joint cover, and then attach the 2 pieces of screws ④ (M1.7 x 5) and 1 piece of screw ⑤ (M1.7 x 3.5).
- Pull the lead wires until the tape attached to the connector ① comes to the position ⑥ .
- Attach the monitor cover. Open the LCD unit 180 degree horizontally and attach the 2 pieces of screws ⑦ (M1.7 x 2).



- Attach the back LCD cover.
- Attach the 2 pieces of screws ① (M1.7 x 3).
- Open the LCD unit 90 degree horizontally and rotate it in 90 degree in arrow A direction. Then attach the 1 piece of screw ② (M1.7 x 3).
- Rotate the LCD unit 180 degree in arrow B direction and attach the 1 piece of screw ③ (M1.7 x 3).

Rear cover

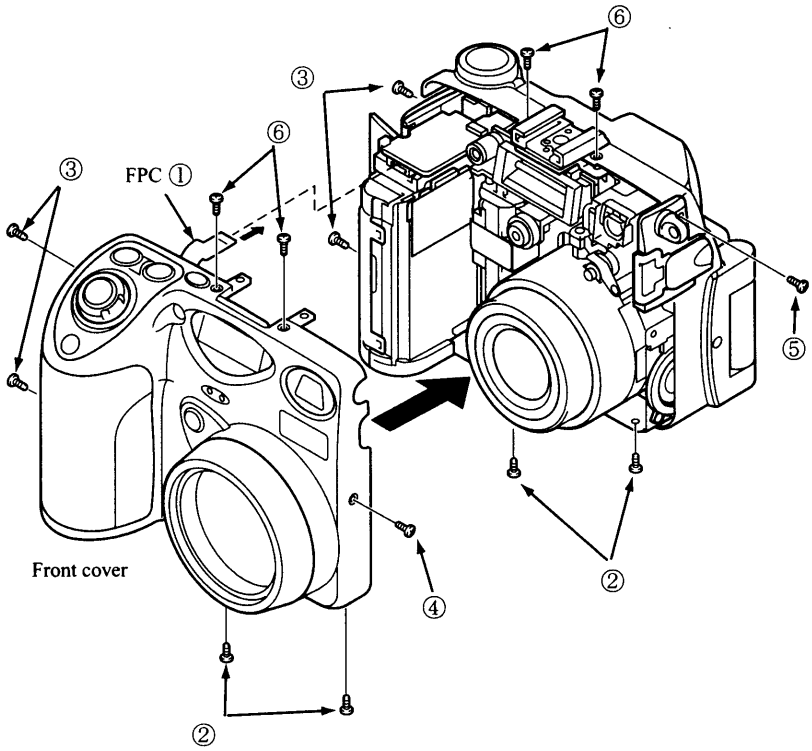


Arrangement of the lead wires of connector ①

1. Do not put the lead wires on the motor.
2. The lead wires should not come to the bottom of the body.

- Connect the connector ① .
- Connect the FPC ② .
- Arrange the lead wires of connector ① as shown in Figure above and connect the FPC ③ .
- Set the hot shoe unit to the position shown in Figure above, and then attach the rear cover unit to the camera body.

Front cover



- Connect the FPC ① .
- Attach the front cover to the camera body.
- Attach the 4 pieces of screws ② (M1.7 x 3.5).
- Attach the 4 pieces of screws ③ (M1.7 x 4).
- Attach the 1 piece of screw ④ (M1.7 x 3.5).
- Attach the 4 pieces of screws ⑤ (M1.7 x 4).
- Attach the 4 pieces of screws ⑥ (M1.7 x 4) by using a screwdriver (J63076).
- Note: As holding the both of front cover and rear cover, attach the screws so that clearance would not be made between them.

ADJUSTMENT

1. Equipment

・IBM compatible PC ・AC adapter (EH-21) ・USB cable (UC-E1) ・Oscilloscope

2. Servicing Tools

・Color viewer 5,100 K ・Siemens star chart ・Calibration software ・Chart for color adjustment

3. Adjustment Items and Order

1. Lens Adjustment
2. AWB Adjustment
3. Color Adjustment
4. CCD White Point Defect Detect Adjustment
5. CCD Black Point Defect Detect Adjustment
6. USB Storage information registration
7. LCD Panel Adjustment
   - 7-1. LCD H AFC Adjustment
   - 7-2. LCD RGB Offset Adjustment
   - 7-3. LCD Gain Adjustment
   - 7-4. LCD Blue Brightness Adjustment
   - 7-5. LCD Red Brightness Adjustment
   - 7-6. LCD VcomPP Adjustment

Note) If replacing the lens, CCD, optical filter or CP-1 board, it is necessary to perform the above 1-5 adjustments. 2-5 adjustments other than these should be carried out in sequence.

4. Setup

1) System requirements

・Windows98 or Me
・IBM®-compatible PC with Pentium processor
・CD-ROM drive
・3.5-inch high-density diskette drive
・USB port
・40 MB RAM
・Hard disk drive with at least 15 MB available
・VGA or SVGA monitor with at least 256-color display

2) Installing calibration software

・Insert the calibration software installation diskette into your diskette drive.
・Open Explorer.
・Copy the DscCalDI_128 folder on the floppy disk in the FD drive to a folder on the hard disk.

5. Installing USB drive

Install the USB drive with camera or connection kit for PC.

6. Color Viewer

Turn on the switch and wait for 30 minutes for aging to take place before using Color Pure.

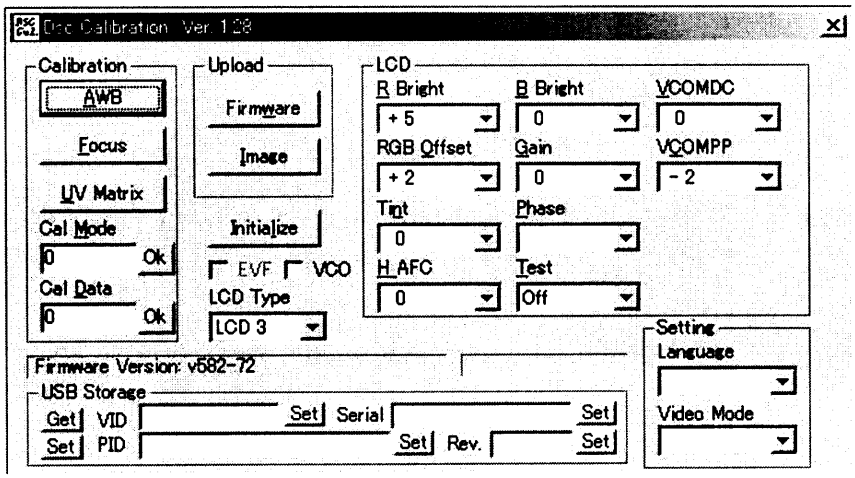
7. Adjustment items required at replacement of parts

	Lens Adj.	AWB	Color Adj.	CCD Defect	LCD Panel	USB
Lens Unit	○	○	○	○	×	×
Optical filter	○	○	○	○	×	×
CCD	○	○	○	○	×	×
CP-1	○	○	○	○	△	○
PW-1	×	×	×	×	×	×
PW-2	×	×	×	×	×	×
VF-1	×	×	×	×	△	×

○Adjustment required, ×Adjustment not required, △

8. Calibration software

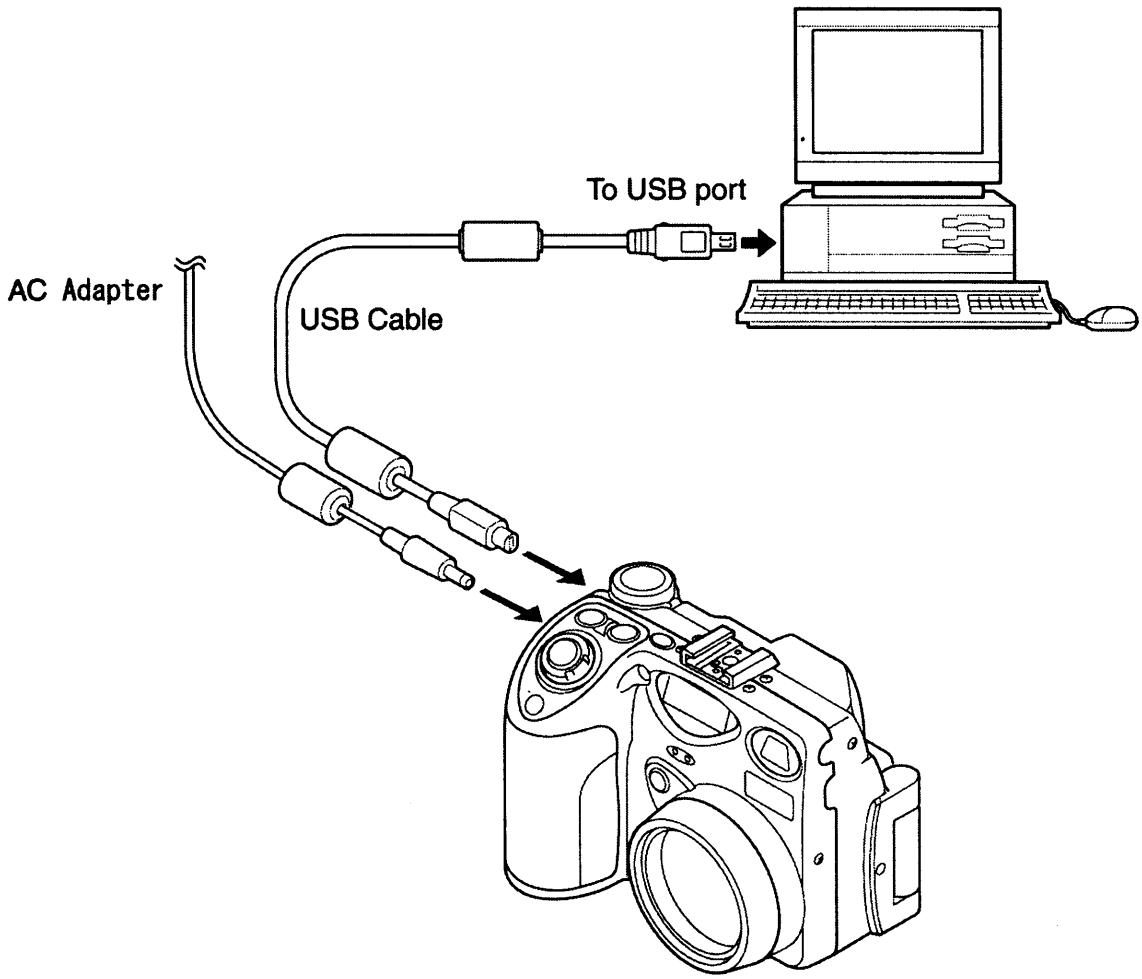
After starting the applicable calibration software, the following is displayed on the PC monitor.



9. Connecting the camera to the computer

1) Line up the arrow on the cable connector with the notch on the camera's USB port. Insert the connector.

2) Locate a USB port on the back of your computer.



10. Lens Adjustment

[Preparation]

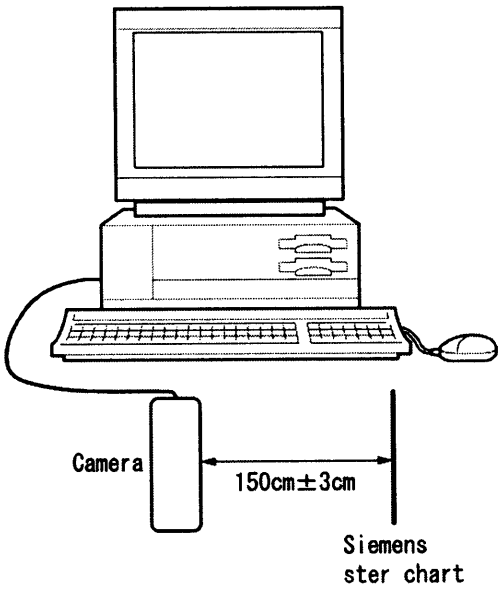
- Siemens star chart
- POWER switch: ON

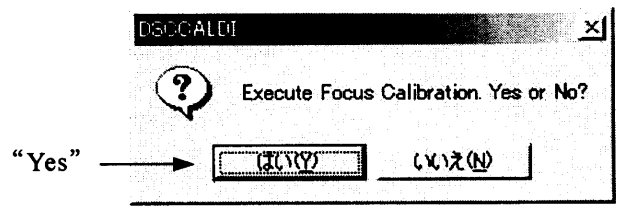
[Adjustment condition]

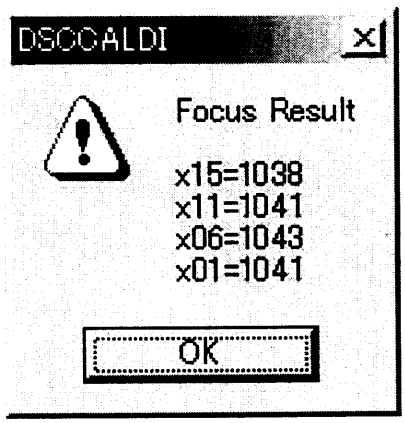
- Make a copy of A4 size siemens chart in enlarged A3 size or larger.
- Illumination above the subject should be 400 lux ± 10 %.
- Set the siemens star chart 150 cm ± 3 cm (between Siemens star chart and the surface of camera's protection lens)

[Adjustment method]

1. Set the siemens star chart 150 cm ± 3 cm so that it be-comes center of the screen.
2. Double-click on the DscCalDi128.
3. Click the Focus, and click the Yes.
4. Lens adjustment value will appear on the screen.
   adjustment value is 1000 ± 64
5. Click the OK.







Adjustment value

11. AWB Adjustment

[Preparation]

・Color viewer

・POWER switch: ON (set to Any MODE)

[Adjusting method]

1.When setting the camera in place, set it to an angle so that nothing appears in any part of the color viewer except the white section. (Do not enter any light.)

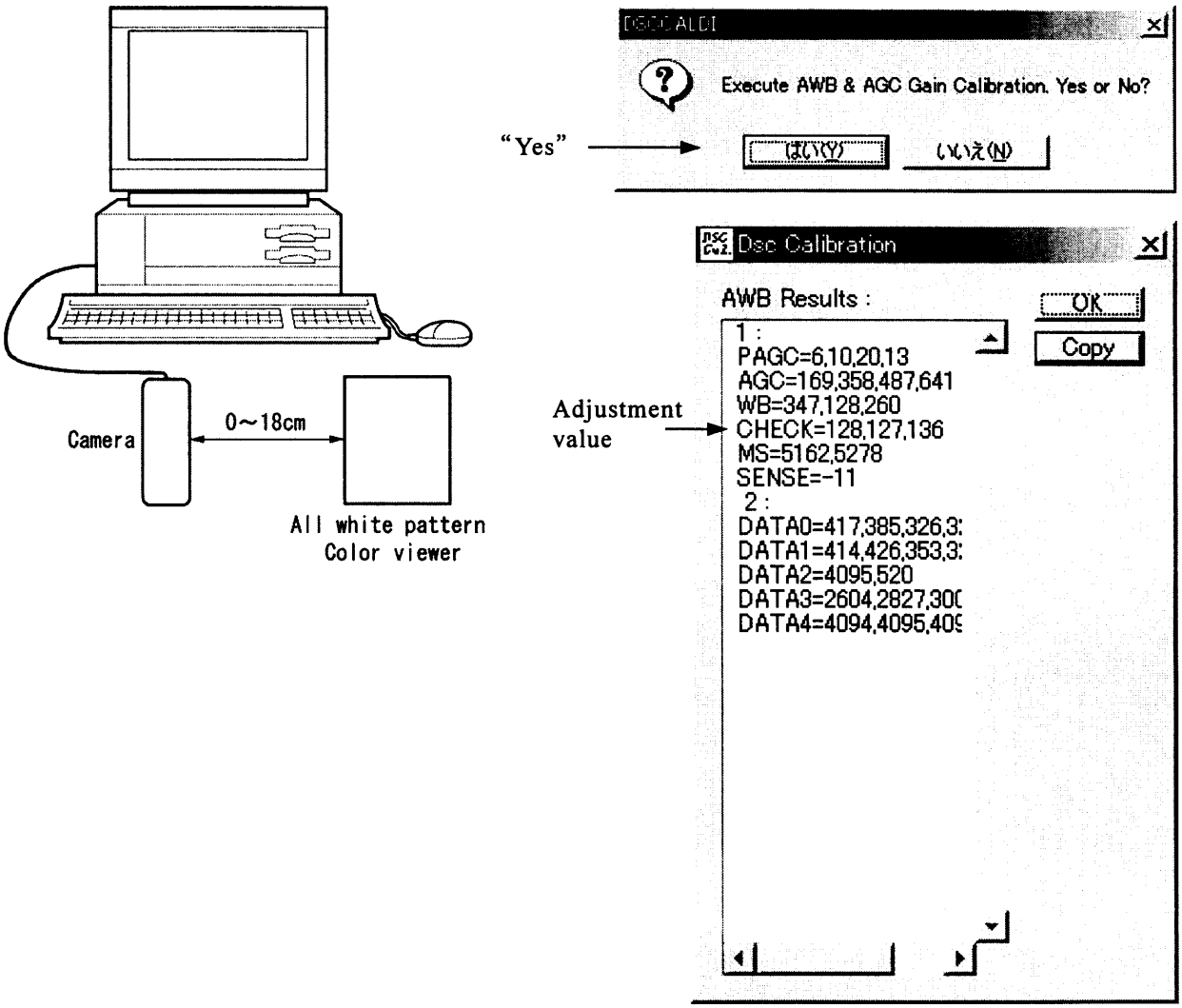
2. Double-click on the DscCalDi128.

3. Click the AWB, and click the Yes.

4. AWB adjustment value will appear on the screen.

CHECK=128±2, 128±2, 130±30

5. Click the OK.



12. Color Adjustment

[Note] AWB adjustment should always be carried out first.

[Adjustment condition]

・Set the color adjustment chart to the color viewer.

(Do not enter any light.)

・Set the color adjustment chart so that it becomes center of the screen.

[Adjustment method]

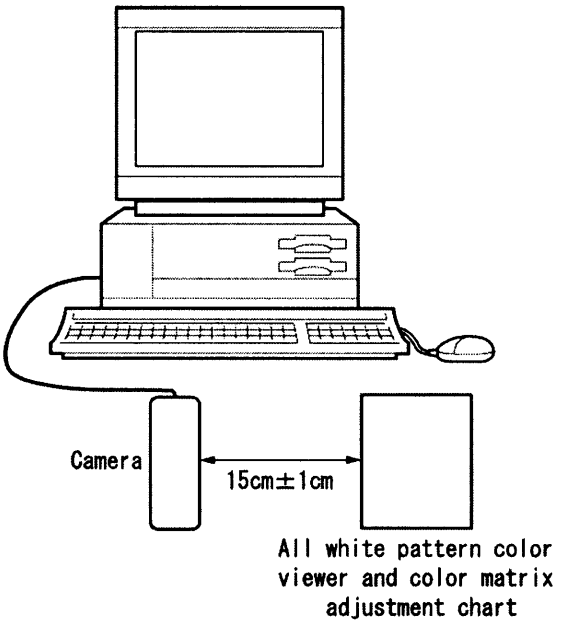
・Double-click on the DscCalDi128.

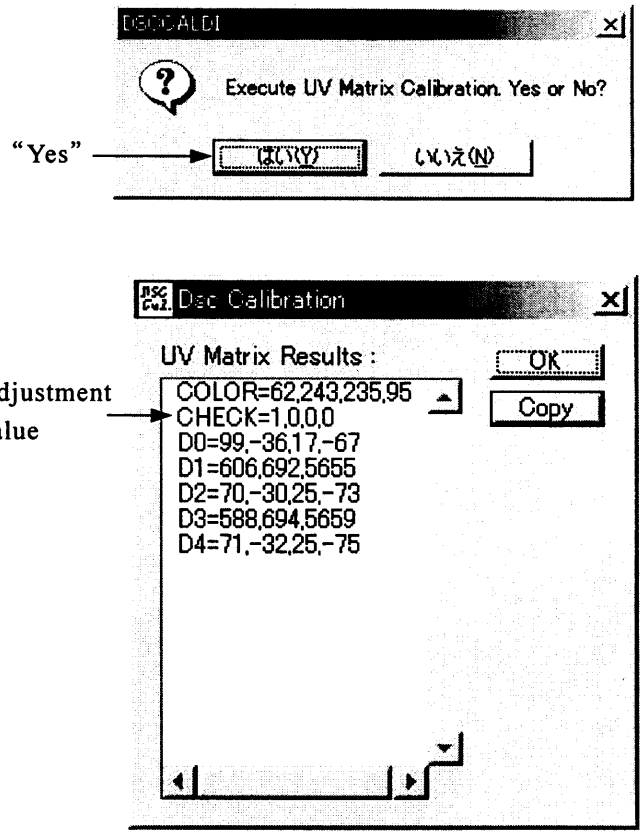
・Click the UV Matrix, and click the Yes.

・Color adjustment values will appear on the screen.

CHECK=0± 2, 0± 2, 0± 2, 0± 2

・Click the OK.

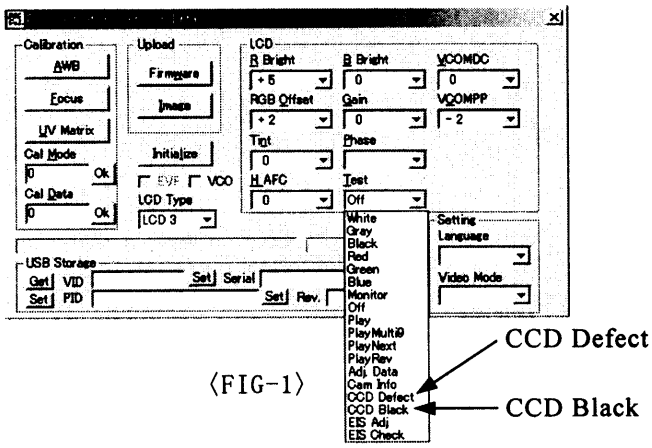




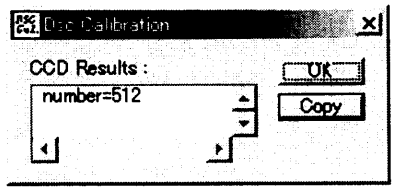
13. CCD White point Defect Detect Adjustment

[Adjustment method]

- Double-click on the DscCalDi128.
- Select the CCD Defect from Test menu of Calibration Soft and click the OK. Refer to FIG-1.
- After adjustment, An adjustment value will appear on the screen. Refer to FIG-2.



〈FIG-1〉

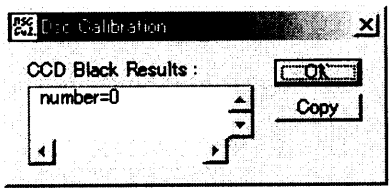


〈FIG-2〉

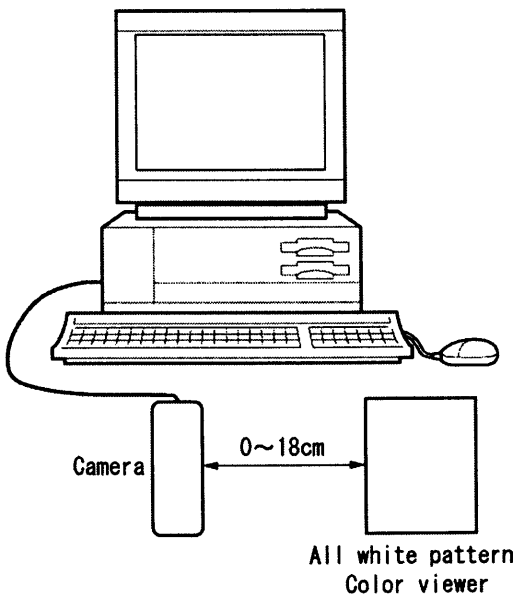
14. CCD Black point Defect Detect Adjustment

[Adjustment method]

- Double-click on the DscCalDi128.
- Select the CCD Defect from Test menu of Calibration Soft and click the OK. Refer to FIG-1.
- After adjustment, An adjustment value will appear on the screen. Refer to FIG-3.



〈FIG-3〉

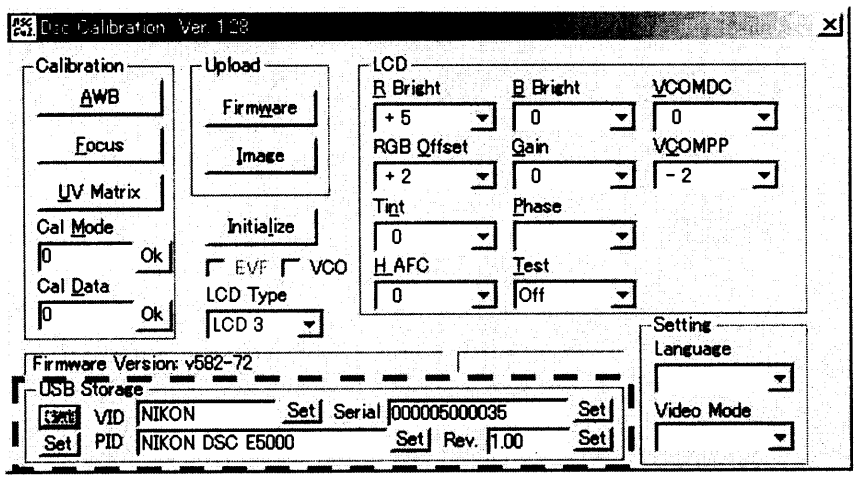


15. USB STORAGE INFORMATION REGISTRATION

USB storage data is important for when the camera is connected to a computer via a USB connection. If there are any errors in the USB storage data, or if it has not been saved, the USB specification conditions will not be satisfied, so always check and save the USB storage data.

[Adjustment method]

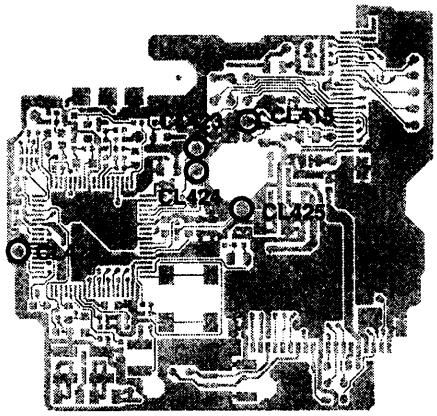
1. Connect the camera to a computer. (Refer to 9. Connecting the camera to the computer on the page 8.)
2. Double-click on the DscCalDi128.
3. Click on the Get button in the USB storage window and check the USB storage data.
   VID: NIKON
   PID: NIKON DSC E5000
   Serial:
   Rev. : 1.00
4. Check the "Serial" in the above USB storage data. If the displayed value is different from the serial number printed on the base of the camera, enter the number on the base of the camera. Then click the Set button.
5. Next, check VID and Rev. entries in the USB storage data. If any of them are different from the values in 3. above, make the changes and then click the corresponding Set button.



USB storage

16. LCD Panel Adjustment

[VF1 board (Side B)]



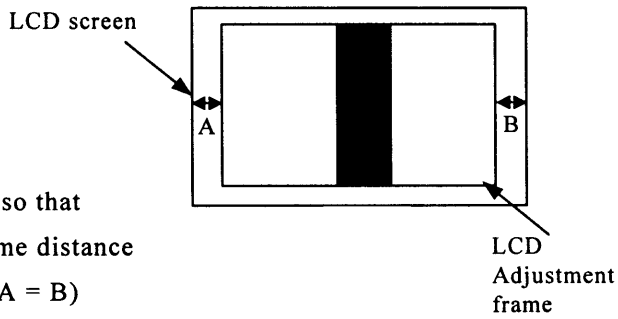
16-1. LCD H AFC Adjustment

[Preparation]

·POWER switch: ON

[Adjusting method]

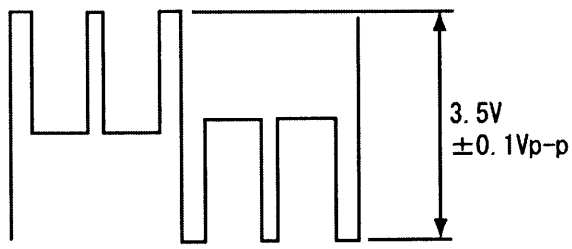
1. Double-click on the DscCalDi128.
2. Select 0 on the LCD H AFC.
3. While watching the LCD monitor, adjust H AFC so that the edge of the LCD adjustment frame are the same distance from the left and right edge of the LCD screen. (A = B)



16-2. LCD RGB Offset Adjustment

[Adjusting method]

1. Adjust LCD "RGB Offset" so that the amplitude of the CL424 waveform is 3.5 V ±0.1 Vp-p.



CL424 waveform

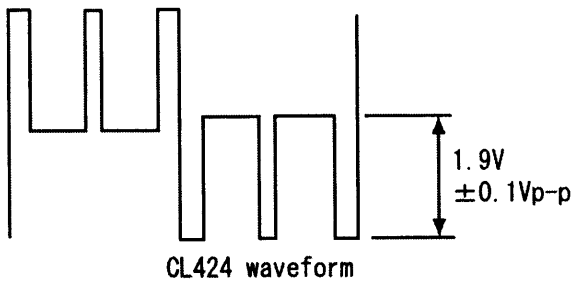
16-3. LCD Gain Adjustment

[Adjusting method]

1. Adjust LCD "Gain" so that the amplitude of the CL424 waveform is 7.2 V ± 0.2 Vp-p.

[Note]

16-2. LCD RGB Offset adjustment should always be carried out first.



CL424 waveform

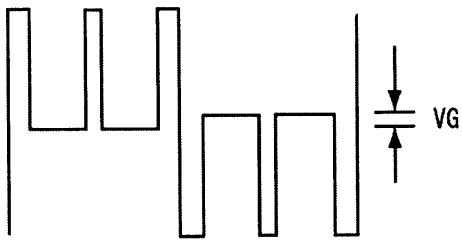
16-4. LCD Blue Brightness Adjustment

[Adjusting method]

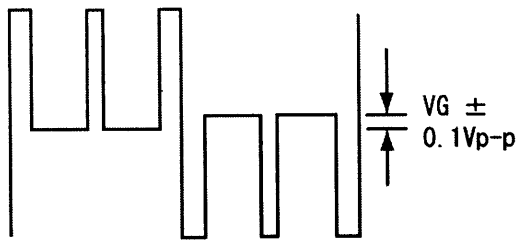
1. Adjust LCD "B Bright" so that the amplitude of the CL425 waveform is VG±0.1 Vp-p with respect to the CL424 (VG) waveform.

[Note]

16-2. LCD RGB Offset adjustment and
16-3. LCD Gain adjustment should always be carried out first



CL424 waveform



CL425 waveform

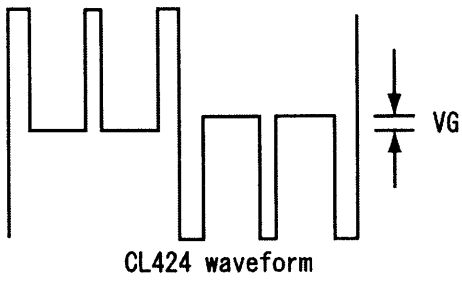
16-5. LCD Red Brightness Adjustment

[Adjusting method]

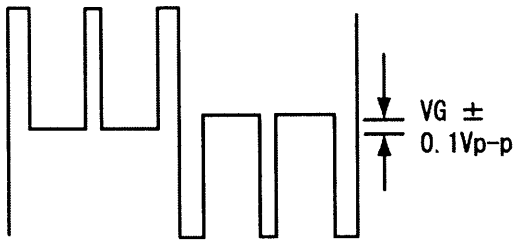
1. Adjust LCD "R Bright" so that the amplitude of the CL423 waveform is VG±0.1 Vp-p with respect to the CL424 (VG) waveform.

[Note]

16-2. LCD RGB Offset adjustment and
16-3. LCD Gain adjustment have done.



CL424 waveform

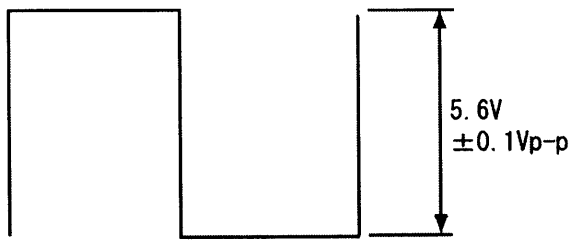


CL423 waveform

16-6. LCD VcomPP Adjustment

[Adjusting method]

1. Adjust LCD "VcomPP" so that the amplitude of the CL415 waveform is 5.6V±0.1 Vp-p.



CL415 waveform

OUTLINE OF CIRCUIT DESCRIPTION

1-1. CP1 CIRCUIT DESCRIPTION

Around CCD block

1. IC Configuration

IC903 (ICX282AK-B) CCD imager
IC904, IC906 (CDX3400N) V driver
IC905 (AD9849KST) H driver, CDS, AGC, A/D converter

2. IC903 (CCD)

[Structure]
Interline type CCD image sensor
Optical size Diagonal 11 mm (2/3 type)
Effective pixels 2588 (H) x 1960 (V)
Pixels in total 2658 (H) x 1970 (V)
Optical black
Horizontal(H)direction: Front12pixels, Rear58pixels
Vertical(V)direction : Front 8pixels, Rear 2pixels

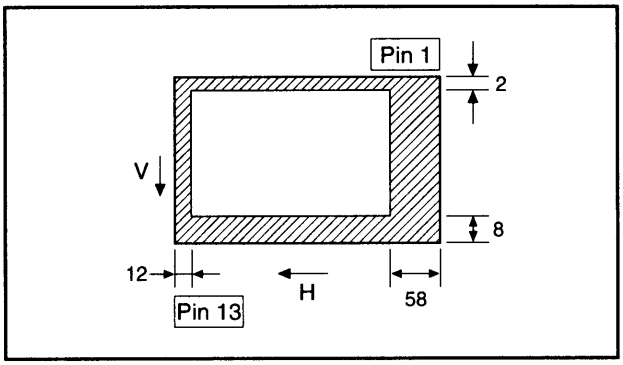


Fig. 1-1. Optical Black Location (Top View)

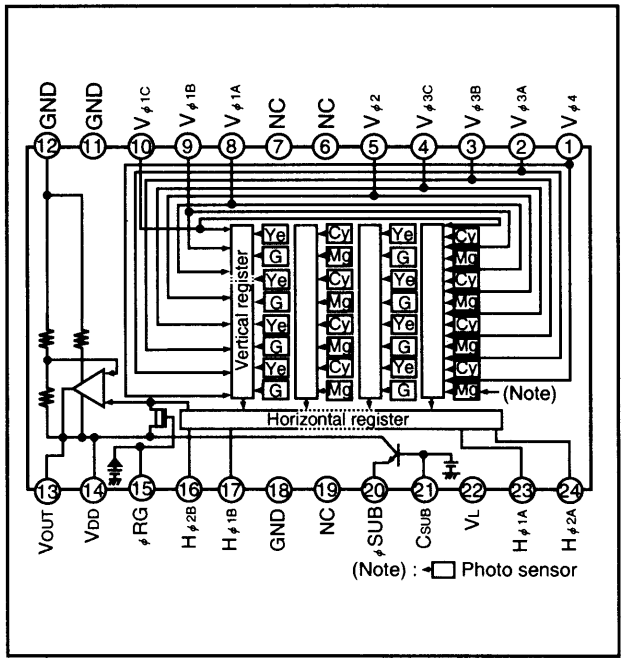


Fig. 1-2. CCD Block Diagram

Pin No.	Symbol	Pin Description	Waveform	
1	V φ 4	Vertical register transfer clock		-7.5 V, 0 Voltage
2, 3, 4	V φ 3A, V φ 3B, V φ 3C	Vertical register transfer clock		-7.5 V, 0 V, 15 V
5	V φ 2	Vertical register transfer clock		-7.5 V, 0 V
6, 7	NC			
8, 9, 10	V φ 1A, V φ 1B, V φ 1C	Vertical register transfer clock		-7.5 V, 0 V, 15 V
11, 12, 18	GND	GND	GND	0 V
13	VOUT	Signal output		Aprox. 10 V
14	VDD	Circuit power	DC	15 V
15	φ RG	Reset gate clock		12.5 V, 16 V
16, 24	H φ 2B, H φ 2A	Horizontal register transfer clock		0 V, 3.3 V
17, 23	H φ 1B, H φ 1A	Horizontal register transfer clock		0 V, 3.3 V
20	φ SUB	Substrate clock	DC	Aprox. 8 V
21	CSUB	Substrate bias	DC	Aprox. 8 V
22	VL	Protection transistor bias	DC	-7.5 V

Table 1-1. CCD Pin Description ----When sensor read-out

3. IC904 and IC906 (V Driver)

IC904 and IC906 are vertical clock driver for image sensor. The ternary pulse of Vϕ1 (A, B and C) and Vϕ3 (A, B and C) for CCD which are output from ASIC (IC102) are generated to add the sensor reading clock (XSG**) and the vertical transfer clock (XV*). Vϕ2, Vϕ4 and the two pulse of ϕSUB for CCD which are output from ASIC (IC102) are generated from vertical transfer clock (XV*).

4. IC905 (H Driver, CDS, AGC and A/D converter)

IC905 contains the functions of H driver, CDS, AGC and A/D converter. As horizontal clock driver for CCD image sensor, Hϕ1 (A and B) and Hϕ2 (A and B) are generated inside, and output to CCD.

The video signal which is output from the CCD is input to pins (29) of IC905. There are sample hold blocks inside IC905 generated from the SHP and SHD pulses, and it is here that CDS (correlated double sampling) is carried out.

After passing through the CDS circuit, the signal passes through the AGC amplifier (PGA: Programmable Gain Amplifier). It is A/D converted internally into a 12-bit signal, and is then input to ASIC (IC102). The gain of the AGC amplifier is controlled by pin (36)-(38) serial signal which is output from ASIC (IC102).

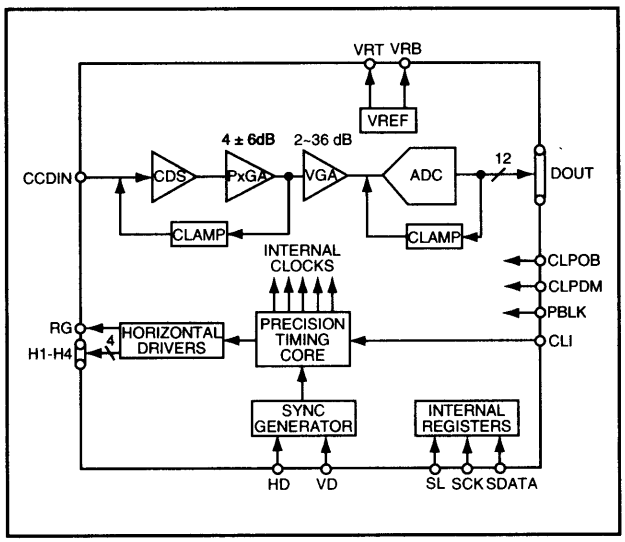


Fig. 1-3. IC902 Block Diagram

5. Lens drive block

5-1. Focus drive

The focus stepping motor drive signals (FM RESETB, FM CW, FM CLK and FM OEB) which are output from ASIC expansion port (IC107) are used to drive micro step by the motor driver (IC951). Detection of the standard focusing positions is carried out by means of the photointerruptor (FPI) inside the lens block.

5-2. Zoom drive

The DC motor drive signals (ZIN1 and ZIN2) which are output from 8-bit microprocessor (IC301) are used to drive by the motor driver (IC953). Counting and detection of the standard zoom positions is carried out by means of photoreflector (ZPI) inside the lens block.

5-3. Iris drive

The iris stepping motor drive signals (IIN1, IIN2, IIN3 and IIN4) which are output from the ASIC expansion port (IC106) are converted into drive by the motor drive (IC952), and are then used to drive the iris steps.

5-4. Shutter drive

The two shutter motor drive signals (SIN1, SIN2) which are output from the ASIC expansion port (IC106) are converted into drive pulses by the motor drive (IC953), and the mecha shutter is opened and closed by regular current drive.

1-2. CP1 & VF1 CIRCUIT DESCRIPTION

1. Circuit Description

1-1. Digital clamp

The optical black section of the CCD extracts averaged values from the subsequent data to make the black level of the CCD output data uniform for each line. The optical black section of the CCD averaged value for each line is taken as the sum of the value for the previous line multiplied by the coefficient k and the value for the current line multiplied by the coefficient 1-k.

1-2. Signal processor

1. γ correction circuit

This circuit performs (gamma) correction in order to maintain a linear relationship between the light input to the camera and the light output from the picture screen.

2. Color generation circuit

This circuit converts the CCD data into RGB signals.

3. Matrix circuit

This circuit generates the Y signals, R-Y signals and B-Y signals from the RGB signals.

4. Horizontal and vertical aperture circuit

This circuit is used gemerate the aperture signal.

1-3. AE/AWB and AF computing circuit

The AE/AWB carries out computation based on a 64-segment screen, and the AF carries out computations based on a 6-segment screen.

1-4. SDRAM controller

This circuit outputs address, RAS, CAS and AS data for controlling the SDRAM. It also refreshes the SDRAM.

1-5. Communication control

1. SIO

This is the interface for the 8-bit microprocessor.

2. PIO/PWM/SIO for LCD

8-bit parallel input and output makes it possible to switch between individual input/output and PWM input/output.

1-6. TG/SG

Timing generated for 2 million/3 million/4 million/5 million pixels CCD control.

1-7. Digital encorder

It generates chroma signal from color difference signal.

1-8. JPEG encorder and decorder

It is compressed and elongated the data by JPEG system.

2. Outline of Operation

When the shutter opens, the reset signals (ASIC (IC102) and CPU (IC101)) and the serial signals (take a picture commands) from the 8-bit microprocessor are input and operation starts. When the TG/SG drives the CCD, picture data passes through the A/D and CDS, and is then input to the ASIC as 10-bit data. The AF, AE, AWB, shutter, and AGC value are computed from this data, and three exposures are made to obtain the optimum picture. The data which has already been stored in the SDRAM is read by the CPU and color generation is carried out. Each pixel is interpolated from the surrounding data as being either Ye, Cy, Mg and Gr primary color data to produce R, G and B data. At this time, correction of the lens distortion which is a characteristic of wide-angle lenses is carried out. After AWB and γ processing are carried out, a matrix is generated and aperture correction is carried out for the Y signal, and the data is then compressed by the JPEG method by (JPEG) and is then written to card memory (compact flash).

When the data is to be output to an external device, it is taken data from the memory and output via the UART. When played back on the LCD and monitor, data is transferred from memery to the SDRAM, and the data elongated by JPEG decorder is displayed over the SDRAM display area.

3. LCD Block

LCD Block is in the VF1 board, and it is constructed by LCD driver (IC171) and around circuits.

The video signal (Y/C signals) from the ASIC are converted into RGB signals by the LCD driver, and these RGB signals and the control signal which is output by the LCD driver are used to drive the LCD panel. The RGB signals are 1H transposed so that no DC component is present in the LCD element, and the two horizontal shift register clocks drive the horizontal shift registers inside the LCD panel so that the 1H transposed RGB signals are applied to the LCD panel. Because the LCD closes more as the difference in potential between the COM (common polar voltage) and the R, G and B signals becomes greater, the display becomes darker; if the difference in potential is smaller, the element opens and the LCD become brighter.

1-3. PW1 & PW2 POWER CIRCUIT DESCRIPTION

1. PW1 Circuit Outline

The switching regulator consists of a DC-DC converter, and it uses a digital power supply, CCD power supply, LCD panel power supply and LED backlight power supply. The controller is used BD9731KV.

1-1. Switching Controller (IC501)

This is the basic circuit which is necessary for controlling the power supply for a PWM-type switching regulator, and is provided with five built-in channels.

CH1: digital 3.4 V power supply circuit
CH2: CCD power supply circuit
CH3: digital 1.8 V power supply circuit
CH4: LCD panel power supply circuit
CH5: LED backlight circuit

1-2. Short-circuit protection circuit

If output is short-circuited for the length of time determined by the condenser which is connected to Pin (29) of IC501, all output is turned off. The power is restored by ON and OFF.

1-3. Digital 3.4 V Power Supply Output

Consists of a step-down type switching regulator, and outputs 3.35 V ± 2.5 %.

1-4. Digital 1.8 V Power Supply Output

Consists of a step-down type switching regulator, and outputs 1.85 V ± 2 %.

1-5. CCD Power Circuit and Digital 5 V Power Supply Circuit

15.1 V ± 0.5 V, -7.7 V ± 0.5 V and 5.1 V ± 0.1 V are output by flyback transformer (T5001). The voltage is adjusted to 5.1 V. Digital 5 V and CCD 5.1 V are shared.

1-6. LCD Panal Power Supply Circuit

15 V ± 0.6 V and 5.1 V ± 0.3 V are output by flyback transformer (T5002). The voltage is adjusted to 5.0 V.

1-7. LED Backlight Power Supply Circuit

Consists of a step-up switching regulator, and carries out constant-current control for the LEDs.

2. AC Adaptor and Battery Distinction

Differentiated by the voltage at pin 56 of the 8-bit microprocessor. When an AC adaptor is being used, transistor Q3010 on the SY1 circuit board is turned on, so that pin 56 becomes low. When a battery is being used, D3016 stops the current from flowing, so that the transistor turns off and the voltage at pin 56 becomes high.

2. PW2 Circuit Outline

2-1. Battery Charging Protection Circuit

A FET (CPH6312) switch is inserted into the (+) end of the battery harness so that charging current does not flow to the battery by mistake when a battery and an AC adaptor are being used together. When a voltage is being generated by the AC adapter, Q5151 is turned off, so that the battery circuit is isolated. If there is no voltage coming from the AC adaptor, Q5151 turns on and power is supplied from the battery.

1-4. SY-A CIRCUIT DESCRIPTION

1. Configuration and Functions

For the overall configuration of the SY-A block, refer to the block diagram. The configuration of the SY-A block centers around a 8-bit microprocessor (IC301).
The 8-bit microprocessor handles the following functions.
1. Operation key input, 2. Mode LCD display, 3. Clock control, 4. Power ON/OFF, 5. Storobe charge control, 6. Signal output for lens control of zoom, focus and so on.

Pin	Signal	I/O	Outline
1	CHG VOL	I	Strobo charge voltage detection (analog input)
2	FM PI	I	Focusing motor standard position detection (analog input)
3	P_MUTE	O	Mute IC power ON/OFF signal H : ON
4~7	$\overline{\text{SCAN IN 0~3}}$	I	Key matrix input
8	AVDD	-	Analog power input terminal
9	AVREF	I	Analog standard voltage input terminal
10	$\overline{\text{FINDER LED (G)}}$	O	Finder LED (green) drive L : LED light
11	$\overline{\text{FINDER LED (R)}}$	O	Finder LED (red) drive L : LED light
12	VSS	-	GND
13	FM RESETB	O	Focusing motor drive phase reset signal
14	LCD ON	O	DC/DC converter (LCD system) ON/OFF signal
15	PWM	O	Dimmer D/A PWM output
16	EX ST	I	External strobo detection terminal
17	COM REQ	I	ASIC serial communication requirement
18	FM OEB	O	Focusing motor output enable signal
19	FM CKI	I	Focusing motor drive clock count
20	ZRESET	I	Zoom reset
21	BEEP	O	Buzzer output
22	CHG ON	O	Strobe charge control circuit
23~26	COM1~4	O	Mode LCD common output 1~4
27	BIAS	-	Mode LCD drive power supply(connect to VLCO terminal)
28~30	VLC0~2	-	Mode LCD power input terminal(connect to outside resister connection)
31	VSS	-	GND
32~55	S1~S24	O	LCD segment output 1~24
56	DCINCHK	I	Outside DC power detection L : AC adaptor
57	$\overline{\text{PICTL}}$	O	Photo interaptor ON/OFF control L : ON
58	BL ON	O	LCD backlight ON/OFF signal H : ON
59	SCAN IN 5	I	Key matrix input
60	$\overline{\text{SCAN OUT 0}}$	O	Key matrix output
61	ZPULSE 2	I	Zoom motor drive pulse count 2
62~63	ZOOM IN 2~1	O	Zoom motor drive signal 2~1
64	WAKE UP	O	SPARC wake up terminal
65	$\overline{\text{ADVREF ON}}$	O	AD VREF ON/OFF signal L : ON
66	CHG LIMIT	O	F-D terminal
67	CMD IN1	I	Command input 1
68	BKUPCTL	O	Back up battery charge control
69	$\overline{\text{SCAN IN 0}}$	I	Key matrix input 0
70	PA ON	O	DC/DC converter (analog) ON/OFF signal H : ON
71	P ON	O	DC/DC converter (digital) ON/OFF signal H : ON
72	SELF LED	O	Self-timer LED ON/OFF signal H : LED light
73	SP_MUTE	O	Speaker mute ON/OFF signal H : ON
74	MUTE_ON	O	Mute ON/OFF signal H : ON

See next page →

75	SI	I	Serial data input (←ASIC)	
76	SO	O	Serial data output (→ASIC)	
77	SCK	O	Serial clock output (→ASIC)	
78	IC	-	Inside connection (connect to VSS terminal directly)	
79	XOUT	O	Main clock oscillation terminal	
80	XIN	I	Main clock oscillation terminal (3 MHz)	
81	VDD	-	VDD	
82	XCIN	I	Clock oscillation termianl (32.768 kHz)	
83	XCOUT	O	Clock oscillation terminal	
84	$\overline{\text{RESET}}$	I	Reset input	
85	$\overline{\text{BAT OFF}}$	I	Battery OFF detection signal	
86	RXD	I	Host wake-up input terminal	L : OFF
87	$\overline{\text{SREQ}}$	I	Serial communication request signal	L : Serial request
88	ZPULSE 1	I	Zoom motor drive pulse count 1	
89	USB CONNECT	I	USB connection detection	
90	CMD IN2	I	Command input 2	
91	MAIN RESET	O	SPARC reset signal	L : Reset output
92~95	$\overline{\text{SCAN OUT 1~4}}$	O	Key matrix output	
96	$\overline{\text{ASIC TEST}}$	O	ASIC control signal	
97	$\overline{\text{ASIC RESET}}$	O	ASIC reset signal	L : Reset output
98	SCAN IN 4	I	Key matrix input	
99	AVSS	-	Analog GND input terminal	
100	BATTERY	I	Battery check (analog input)	

2. Internal Communication Bus

The SY-A block carries out overall control of camera operation by detecting the input from the keyboard and the condition of the camera circuits. The 8-bit microprocessor reads the signals from each sensor element as input data and outputs this data to the camera circuits (ASIC) or to the LCD display device as operation mode setting data. Fig. 4-1 shows the internal communication between the 8-bit microprocessor, ASIC and SPARC lite circuits.

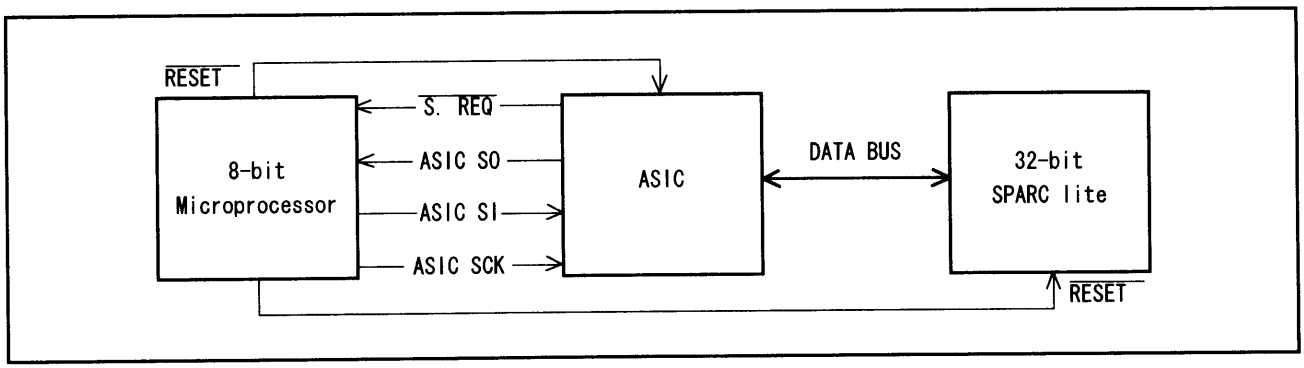


Fig. 4-1 Internal Bus Communication System

3. Key Operaiton

For details of the key operation, refer to the instruction manual.

SCAN OUT \ SCAN IN	0	1	2	3	4	5	6
0	FUNC	+/≷	AF-L/AE-L	MOD	PW ON	TEST	-
1	AFM	SBS	QSW	REC	PLAY	S2	-
2	MENU	MTR	S2	S1	LCD REV	ZOOM UP	S1
3	LEFT	RIGHT	UP	DOWN	QUICK/NET	ZOOM DOWN	EX BAT
4	AV JACK	CARD	DIN CONNECT	-	CHARGE BAT	LCD O/C	-

Table 4-2. Key Operation

4. Power Supply Control

The 8-bit microprocessor controls the power supply for the overall system.
The following is a description of how the power supply is turned on and off. When the battery is attached, a regulated 3.2 V voltage is normally input to the 8-bit microprocessor (IC301) by IC302, so that clock counting and key scanning is carried out even when the power switch is turned off, so that the camera can start up again. When the battery is removed, the 8-bit microprocessor opererates in sleep mode using the backup lithum ion battery. At this time, the 8-bit microprocessor only carries out clock counting, and waits in standby for the battery to be attached again. When a switch is operated, the 8-bit microprocessor supplies power to the system as required.
The 4-bit microprocessor first sets both the $\overline{\text{P (A) ON}}$ signal at pin (70) and the $\overline{\text{P ON}}$ signal at pin (71) to High, and then turns on the DC/DC converter. After this, High signals are output from pins (97) and (98) so that the ASIC and the SPARC lite are set to the active condition. If the LCD monitor is on, the $\overline{\text{LCD ON}}$ signal at pin (14) set to High, and the DC/DC converter for the LCD monitor is turned on. Once SPARC lite processing is completed, the ASIC and the SPARC lite return to the reset condition, all DC/DC converters are turned off and the power supply to the whole system is halted.

			SPARC Lite	ASIC, memory	CCD	8 bit CPU	MODE LCD	LCD MONITOR
Power voltage			3.3 V	3.3 V	5 V (A) +15 V -7.7 V	3.3 V (ALWAYS)	3.3 V (ALWAYS)	5V (L) +12V etc.
SLD	OFF		OFF	OFF	OFF	32 KHz	OFF	OFF
	PLAY		ON	ON	OFF	3 MHz	ON	ON
	M-REC A-REC	Power switch ON-Auto power OFF	OFF	OFF	OFF	3 MHz	ON	OFF
		Shutter switch ON	ON	ON	ON → OFF	3 MHz	ON	OFF
		MOS, QSW, SBS etc. ON	OFF	OFF	OFF	3 MHz	ON	OFF
		LCD finder	ON	ON	ON	3 MHz	ON	ON

Table 4-3. Camera Mode

			SPARC Lite	ASIC, memory	CCD	8 bit CPU	MODE LCD	LCD MONITOR
Power voltage			3.3 V	3.3 V	5 V (A) +15 V -7.7 V	3.3 V (ALWAYS)	3.3 V (ALWAYS)	5 V (L) +12V etc.
SLD	OFF		OFF	OFF	OFF	32 KHz	OFF	OFF
	M-REC A-REC PLAY	Power switch ON-Auto power OFF	OFF	OFF	OFF	3 MHz	ON	OFF
		Take a picture	ON	ON	ON → OFF	3 MHz	ON	OFF
		Erase image	ON	ON	OFF	3 MHz	ON	OFF
		Download image	ON	ON	OFF	3 MHz	ON	OFF
		Continuous image	ON	ON	ON	3 MHz	ON	OFF
		Message from host	ON	ON	ON	3 MHz	ON	OFF

Note) 3 MHz = Main clock operation, 32 kHz = Sub clock operation

Table 4-4. Host Mode

総合結線図
OVERALL WIRING

MIC

CN672 (INT MIC, GND) 1AV4J10EZ020G

CN671 (INT MIC, GND, SCANIN2A, SCANOUT0) 1AV4J10EZ040G

CN182 (INT MIC, GND, SCANIN2A, SCANOUT0) 1AV4J10EZ040G

FLEXIBLE PWB (STROBO UNIT)

AV JACK — JK131 1AV4J12B216GN

USB — CN131 (USB DETECT, DIN DETECT, TXD, RXD, GND, DATA(+), DATA(-), USB GND) 1AV4J11B3970G

COMPACT FLASH — CN141 (GND, D03, D04, D05, D06, D07, -CE1, A10, -OE, A09, A08, A07, VCC, A06, A05, A04, A03, A02, A01, A00, D00, D01, D02, WP, -CD2, -CD1, D11, D12, D13, D14, D15, -CE2, -VS1, -IORD, -IOWR, -WE, RDY/BSY, VCC, -CSEL, -VS2, RESET, WAIT, -INPACK, -REG, BVD2, BVD1, D08, D09, D10, GND) 1AV4J10B120G

CP1_DMA
(MAIN, LENS)
CP1_CAA

CN103 (GND, -7.7V(A), +15.1V(P), +15.2V(A), +5.1V(A), +5.1V(D), GND, +3.35V(L), +3.35V(D), +3.35V(D), +1.85V(D), +1.85V(D), GND, GND, +15.0V(L), +5.0V(L), GND, MGND, MGND, MGND, UNREG(M), UNREG(M), BL ON, LCD ON, PA ON, P ON, DC IN, UNREG-SY, LED AN, LED CA) 1AV4J10QW301G

CN501 (GND, -7.7V(A), +15.1V(P), +15.2V(A), +5.1V(A), +5.1V(D), GND, +3.35V(L), +3.35V(D), +3.35V(D), +1.85V(D), +1.85V(D), GND, GND, +15.0V(L), +5.0V(L), GND, MGND, MGND, MGND, UNREG(M), UNREG(M), BL ON, LCD ON, PA ON, P ON, DC IN, UNREG-SY, LED AN, LED CA) 1AV4J10QW301G

PW1

CN502 (UNREG+B, DC IN, GND) 1AGOW31B37700

CN503 (UNREG, GND) 1AV4J10EX020G

TB2 — CN651 (SCAN IN 4, SCAN OUT 4D) 1AV4J10GL020G

CMD

CN556 (SCAN IN 4, SCAN OUT 4D) 1AV4J10GL020G

CN555 (GND, SIGNAL B, COMMON(GND), SIGNAL B, GND) 1AV4J11RV050G

CN552 (UNREG+B, DC IN, GND) 1AGOW31B37700

DC JACK — JK551 1AV4J11B092GN

PW2

CN554 (SCAN OUT 2, SCAN IN 2C, SCAN IN 3C, SELF LED, ALWAYS 3.2V, SCAN IN 4A, SCAN IN 1A, SCAN IN 3A, SCAN IN 0A, NC, SCAN OUT 0) 1AV4J11RM110G

FPC SW(PW&SW)

CN551 (BATTERY +, BATTERY -) 1AV4J10HD020N — BATTERY

CN553 (SIGNAL B, COMMON(GND), SIGNAL A, SCAN OUT 2, SCAN IN 3C, SCAN IN 2C, SCAN IN 0A, SCAN IN 4A, SCAN IN 1A, GND, SCAN IN 3A, SCAN OUT 0, ALWAYS 3.2V, SELF LED, GND, GND, GND, SCAN IN 4, SCAN OUT 4D, GND) 1AV4J10GS201G

STROBO UNIT

CN304 (DSC, RDY, TG, XE, FSW, F_ANA, GND, GND, STRG, D_SB, D_RDY, VSB, AF_TG, AF_OFF)

CN301 (SIGNAL B, COMMON(GND), SIGNAL A, SCAN OUT 2, SCAN IN 3C, SCAN IN 2C, SCAN IN 0A, SCAN IN 4A, SCAN IN 1A, GND, SCAN IN 3A, SCAN OUT 0, ALWAYS 3.2V, SELF LED, GND, GND, GND, SCAN IN 4, SCAN OUT 4D, GND) 1AV4J10GS201G

CN107 (GND, LCDY, LCDSYNC, 3.35V(L), 5.0V(L), 15.0V(L), LCDLD, LCDCK, LCDDT, GND, LCDC, SCANOUT3, SCANOUT2, SCANINOC, SCANIN1C, SCANIN4D, SCANIN4C, LED CA, LED AN, GND) 1AV4J10CC200G

CN181 (SP, SP) 1AV4J10EZ020G

CN951 (PIA-K, PIV, PIA-E, FOUT 2, FOUT 1, FOUT 4, FOUT 3, PIV, PIZ-E, PIZ-K, PIV, PIS_E1, PIS_E2, PIS_K, ZOUT 1, ZOUT 2, VO.3, VO.4, SD.2, SD.1, HSW, GND, VO.1, VO.2, VF.LED(R), AL3.2V, VF.LED(G)) 1AV4J10B112GG

LENS

CN172 (GND, LCDY, LCDSYNC, 3.35V(L), 5.0V(L), 15.0V(L), LCDLD, LCDCK, LCDDT, GND, LCDC, SCANOUT3, SCANOUT2, SCANINOC, SCANIN1C, SCANIN4D, SCANIN4C, LED CA, LED AN, GND) 1AV4J10UC200G

JW171 LEDCA
JW172 LEDAN
JW173 GND

CN171 (VGH, VSS, C1+, C1-, VGL, VDD, CP, GRES, GPCK, GSRT, STBYB, RESET, VCOM, VBC, STBYB, SRT, OE, CLR, MCLK, HCNT, VR, VG, VB, VSS, VDD, VSH) 1AV4J11MJ260G

VF1

LCD

CN173 (SCAN OUT 2, SCAN IN 4C) 1AV4J10EZ020G

TB1

CN303 (SCAN OUT 1, SCAN IN 2B, SCAN IN 0B, SCAN IN 3B, SCAN IN 4B, SCAN IN 1B, SCAN IN 2D, SCAN IN 5B, SCAN IN 5D, SCAN IN 0D, SCAN OUT 2, SCAN OUT 3, SCAN IN 1D, SCAN IN 3D) 1AV4J11EB140G

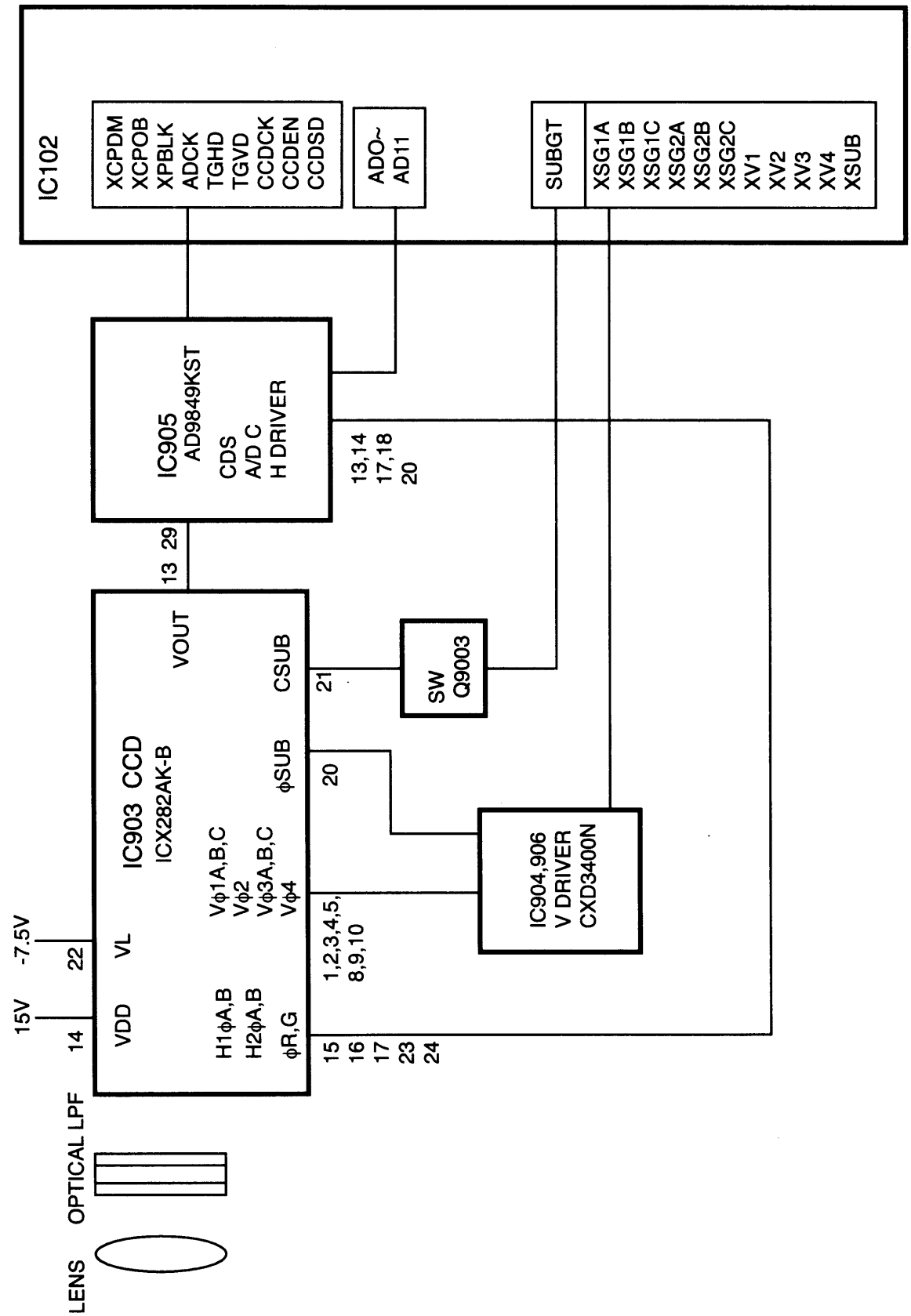
FPC SW(BACK)

CN302 (SCAN OUT 1, SCAN OUT 3, SCAN IN 6, SCAN IN 5, SCAN OUT 2) 1AV4J11RU050G

EXT BATTERY

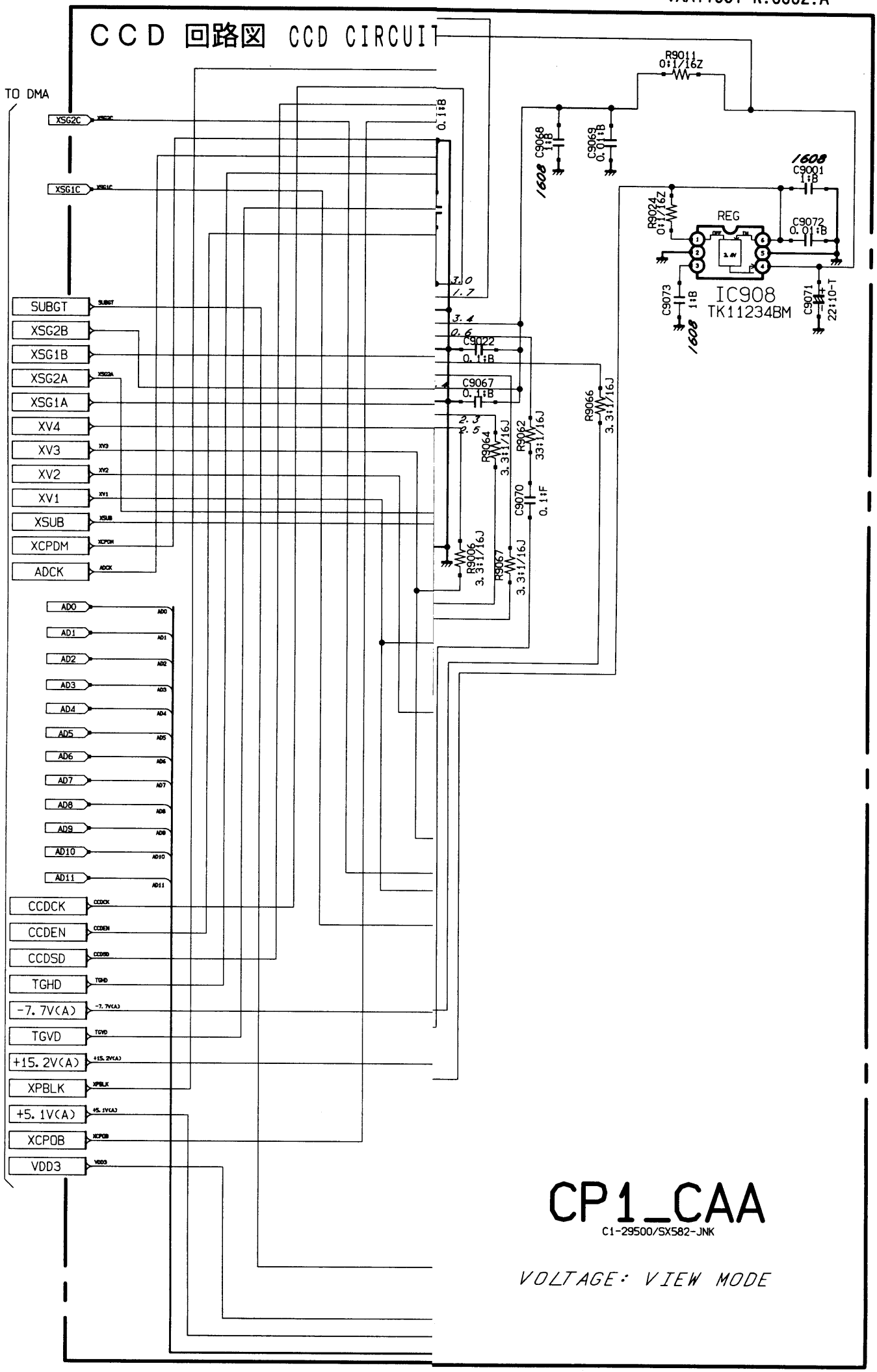
CP1_SYA

ＣＣＤブロック図
CCD BLACK DIAGRAM

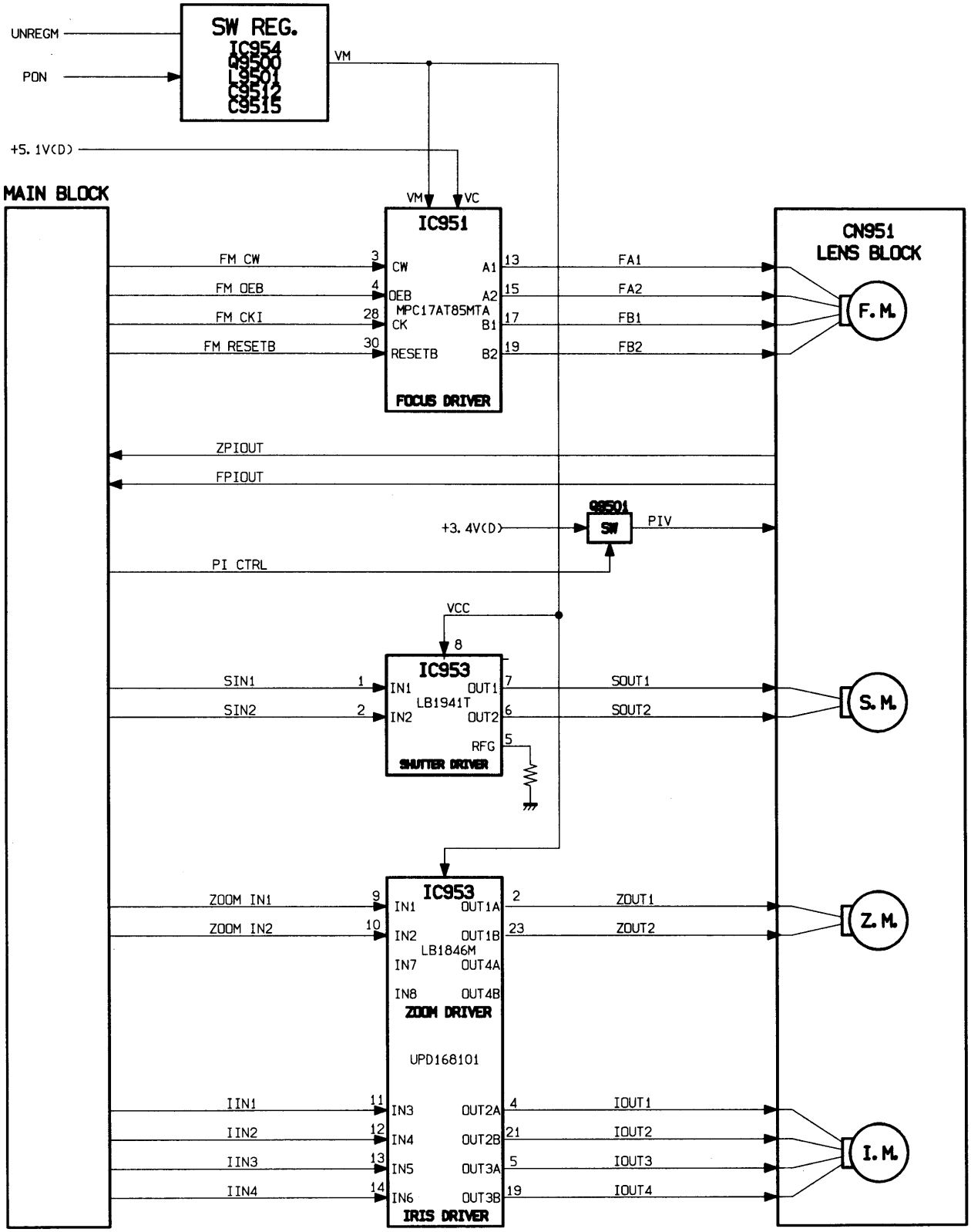


SX582_CCD_BLOCK

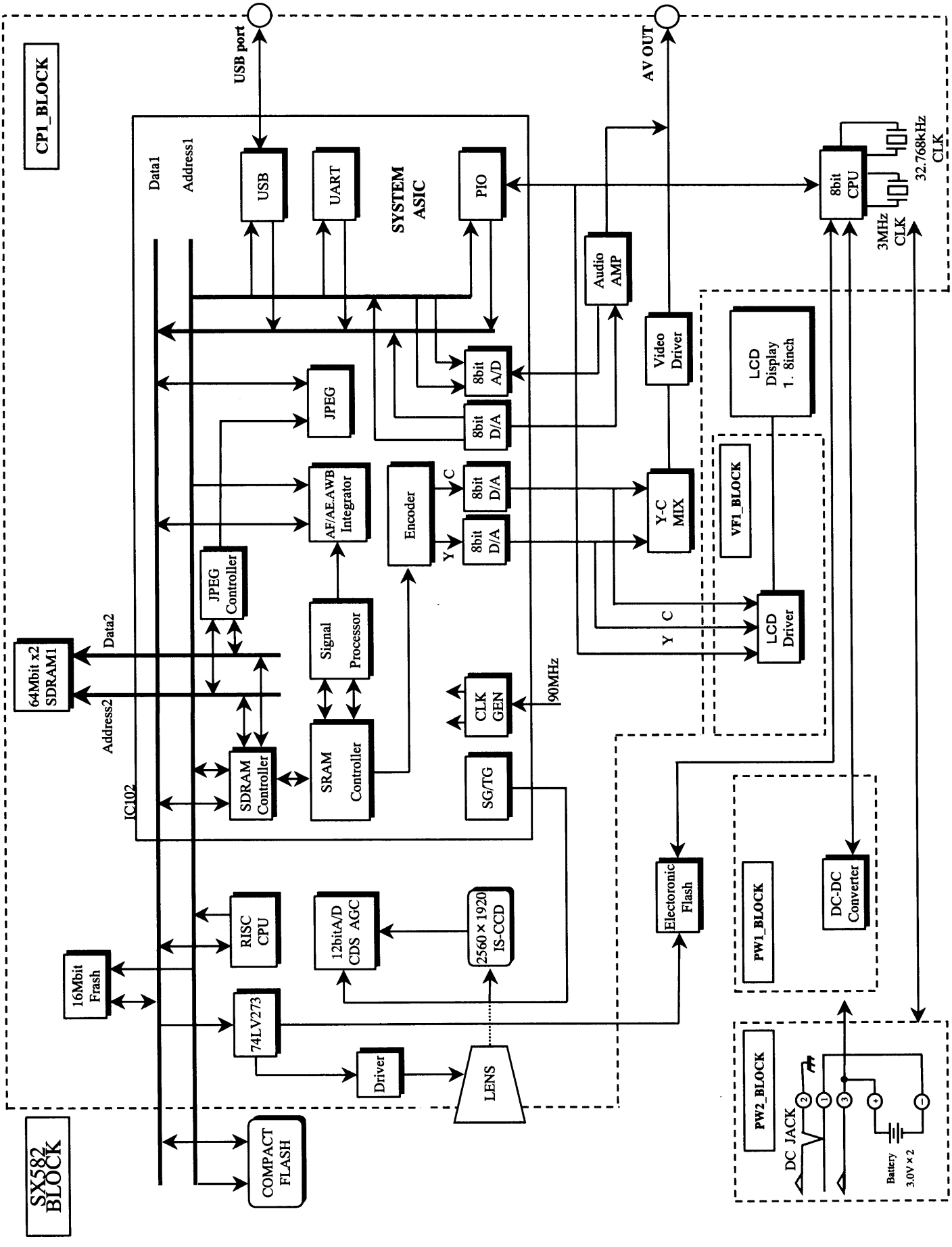
CCD 回路図 CCD CIRCUIT



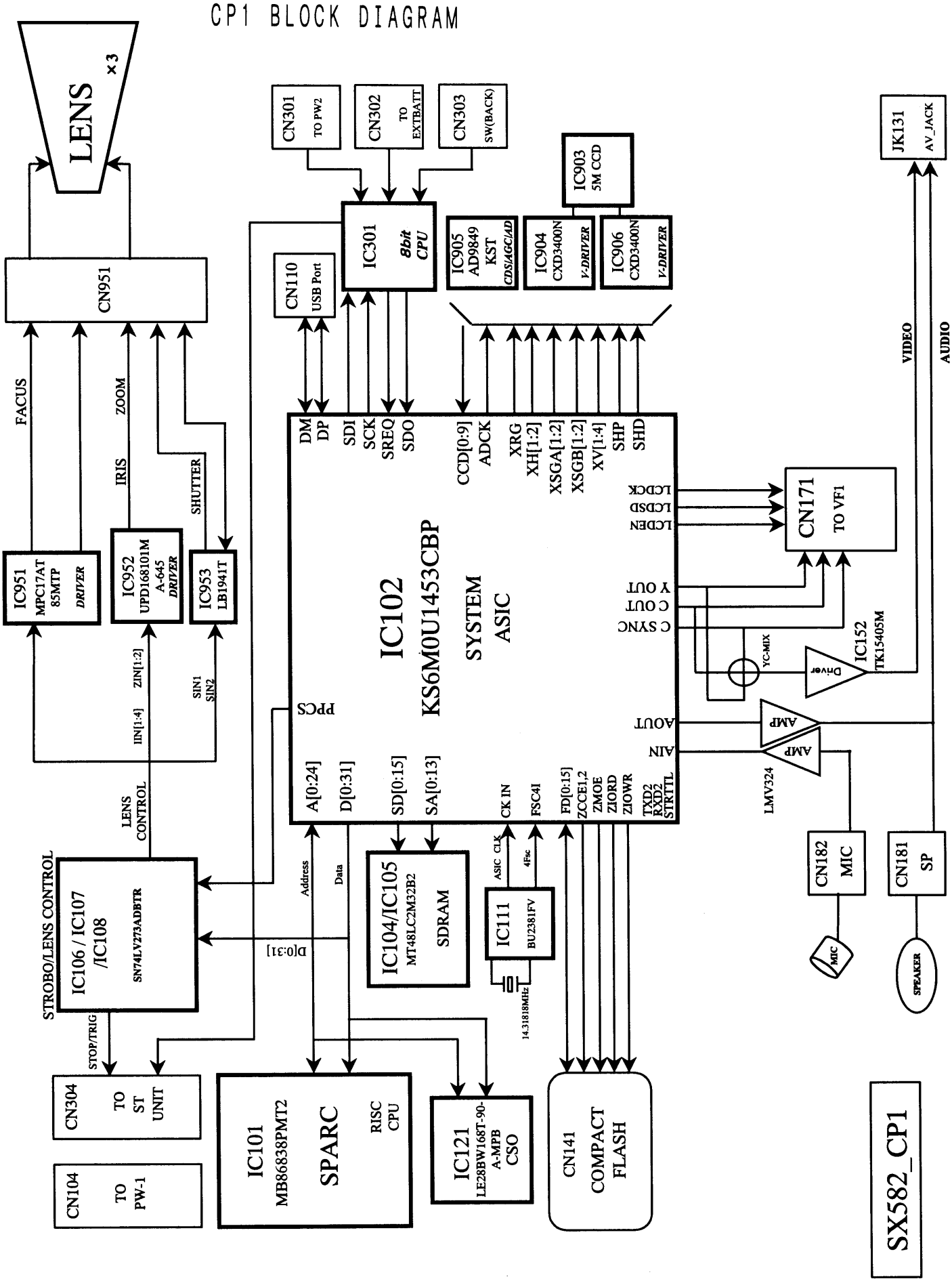
レンズ駆動ブロック図
LENS DRIVE BLOCK DIAGRAM

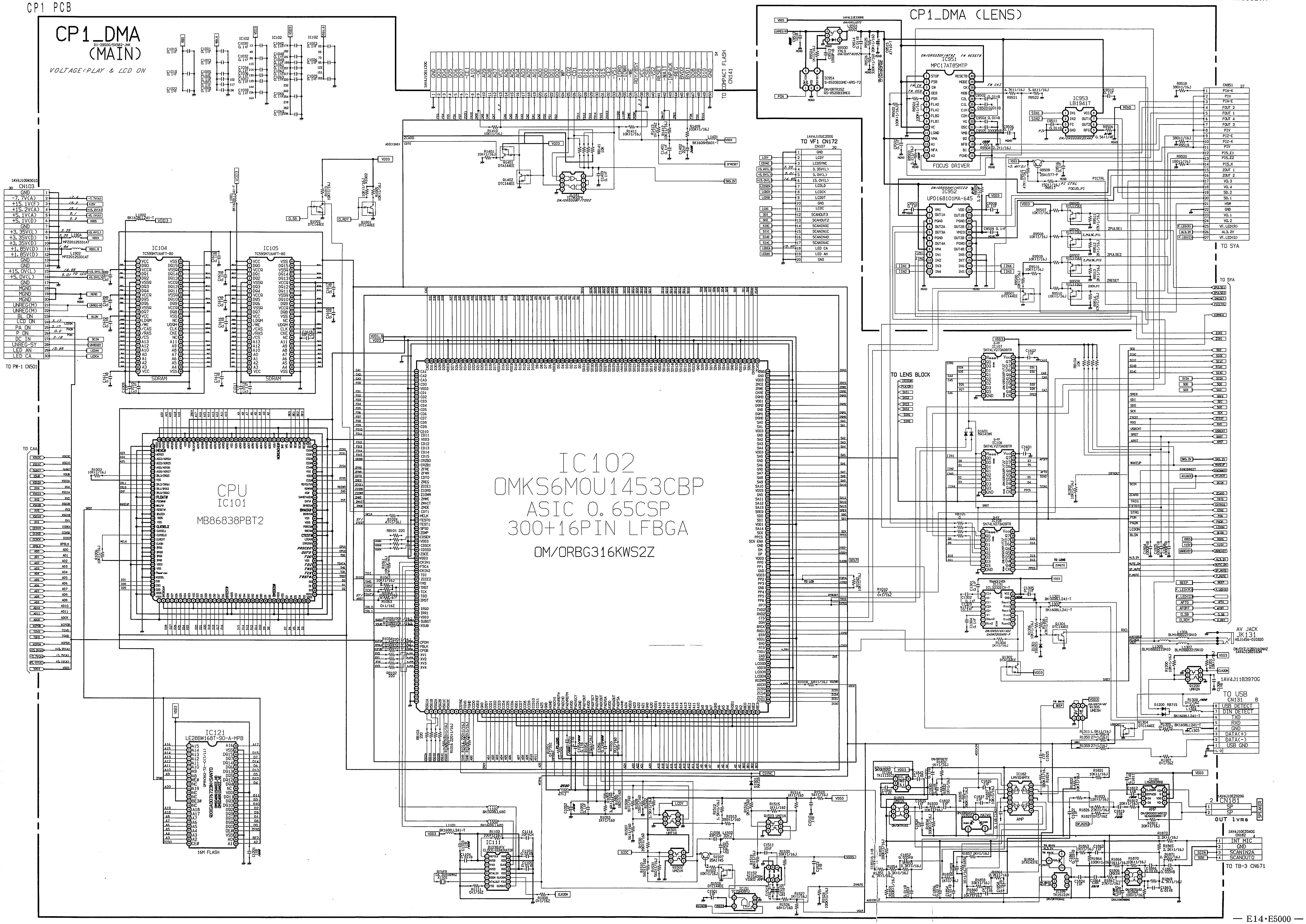


総合ブロック図
OVERALL BLOCK DIAGRAM

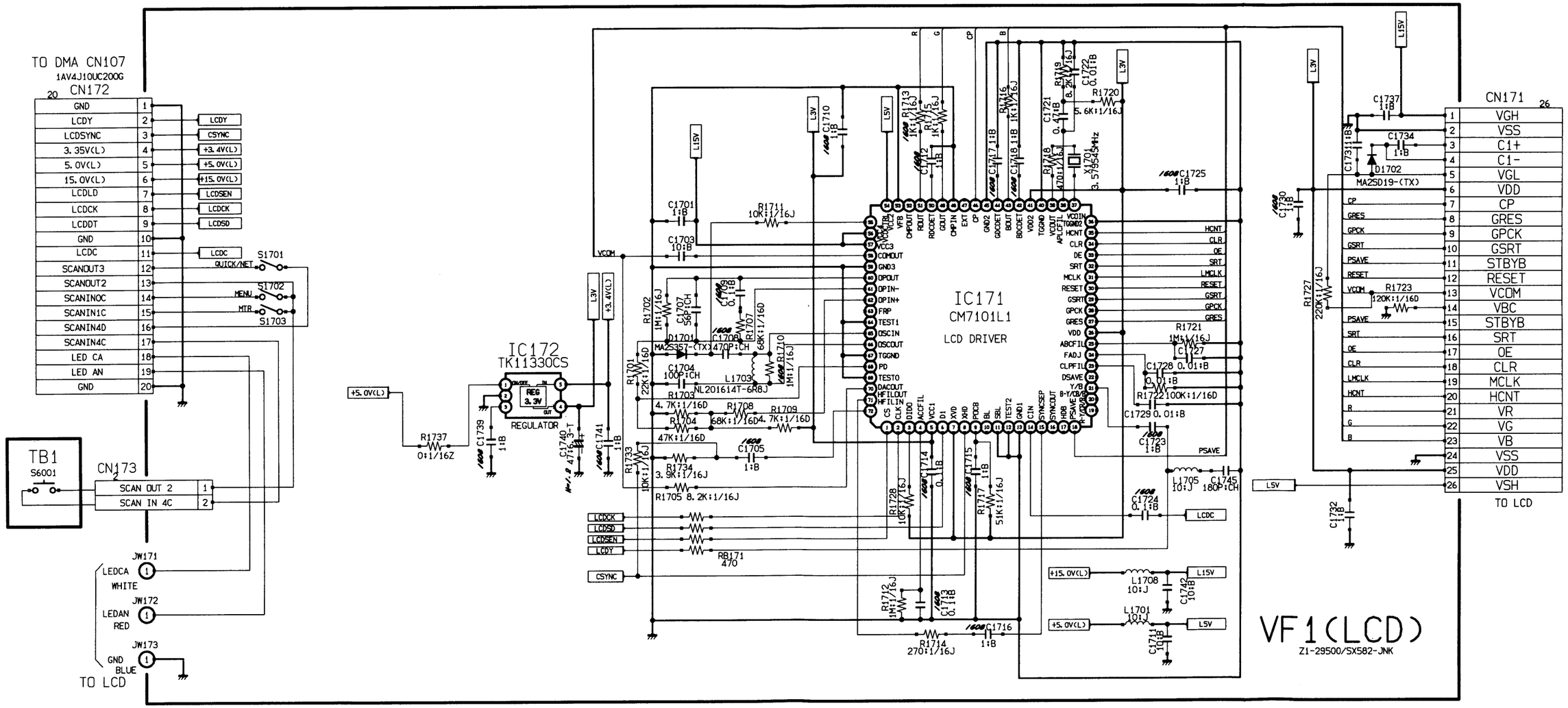


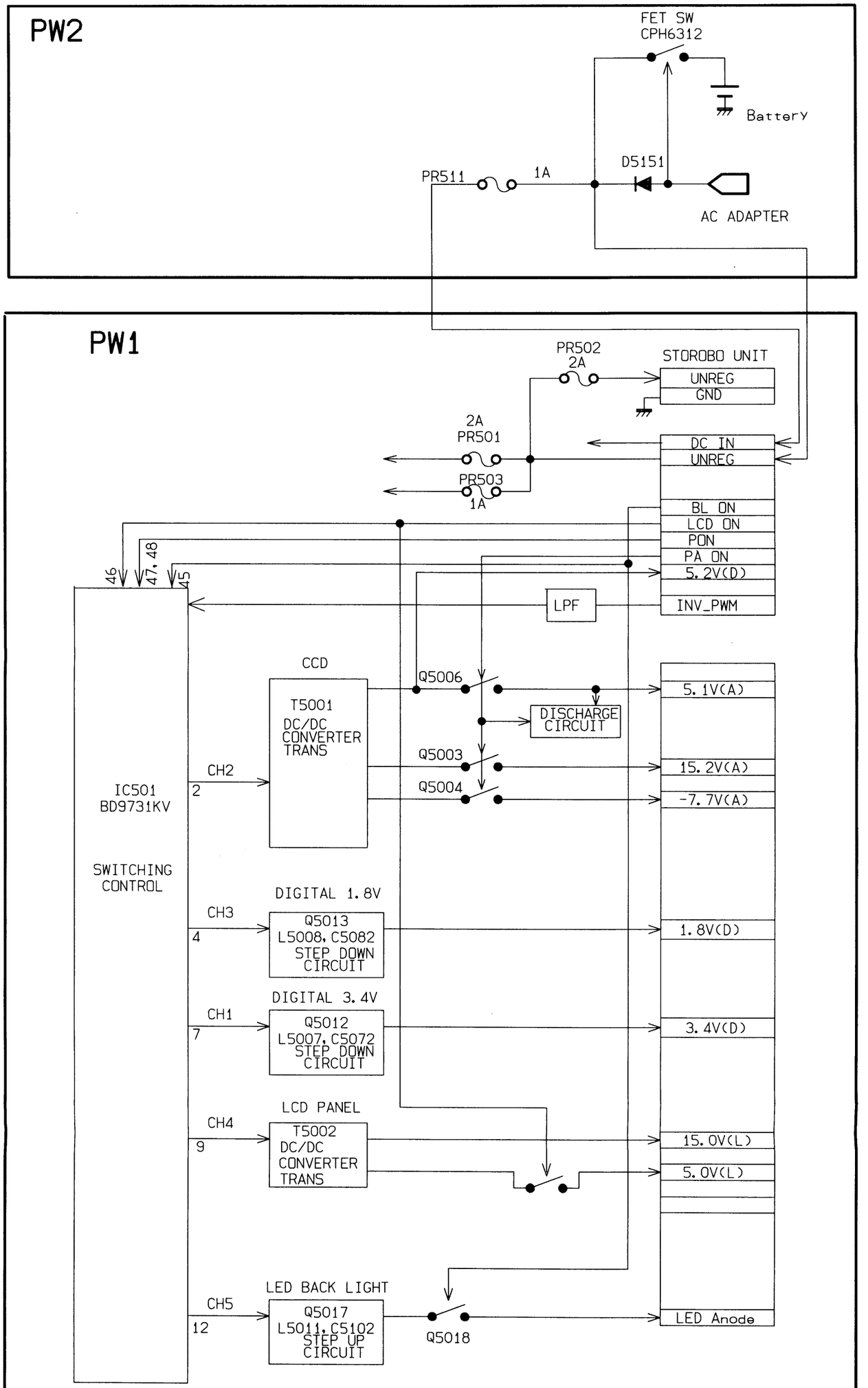
CP1 ブロック図
CP1 BLOCK DIAGRAM



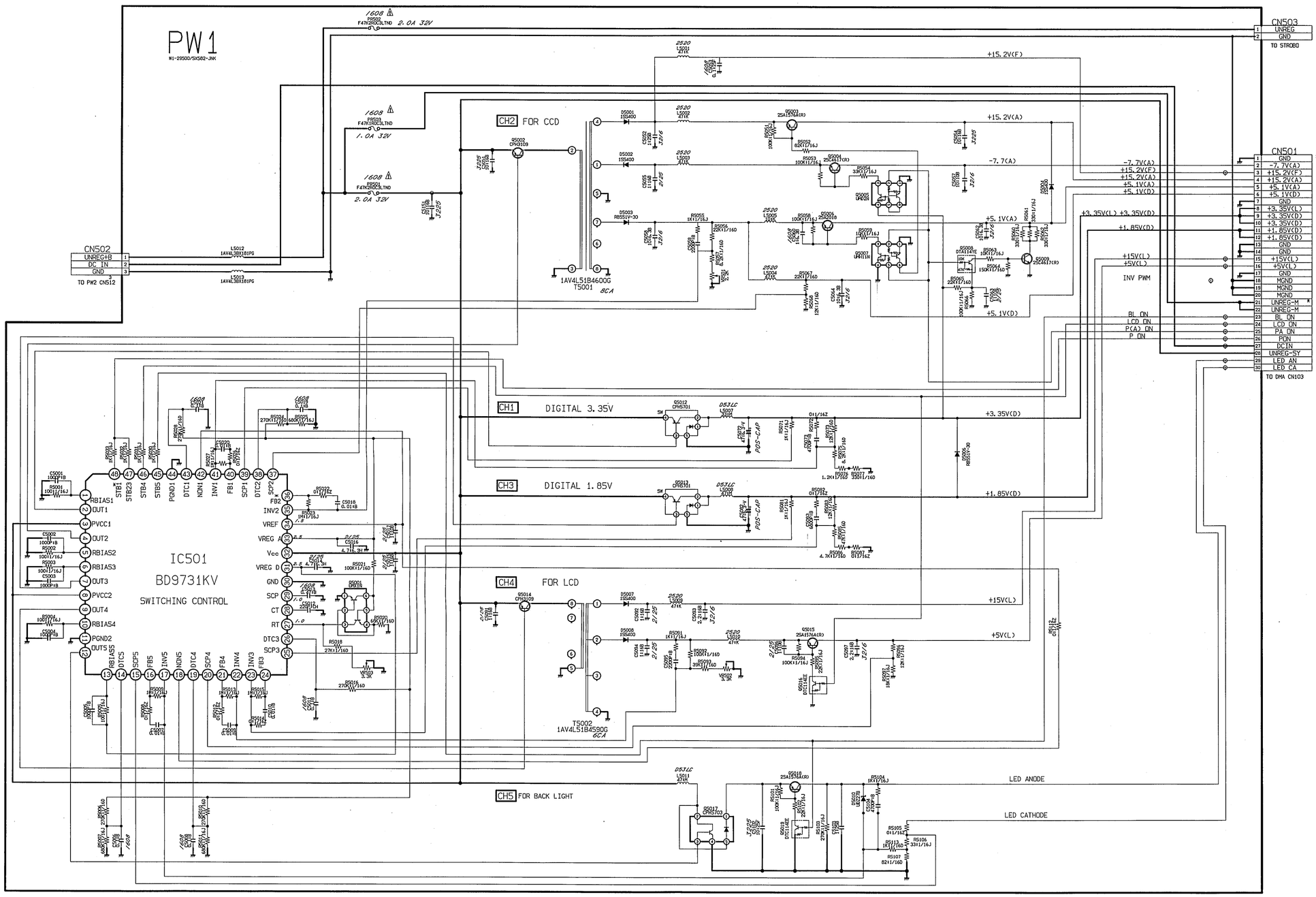

CP1_DMA
(MAIN)
VOLTAGE: PLAY & LCD ON
CP1_DMA (LENS)
TO COMPACT FLASH CN141
TO VF1 CN172
IC951
MPC17AT85MTP
FOCUS DRIVER
IC953
LB1941T
IC952
UPD168101MA-645
TO SYA
TO PW-1 CN501
IC104
IC105
SDRAM
TO CAA
CPU
IC101
MB86838PBT2
IC102
OMKS6M0U1453CBP
ASIC 0.65CSP
300+16PIN LFBGA
OM/ORBG316KWS2Z
TO LENS BLOCK
IC121
LE28BW16BT-90-A-MPB
16M FLASH
AV JACK
JK131
TO USB
CN131
USB DETECT
DIN DETECT
TXD
RXD
GND
DATA(+)
DATA(-)
USB GND
CN181
OUT 1vms
INT MIC
GND
SCANIN2A
SCANOUTO
TO TB-3 CN671

VF1 基板
VF1 PCB

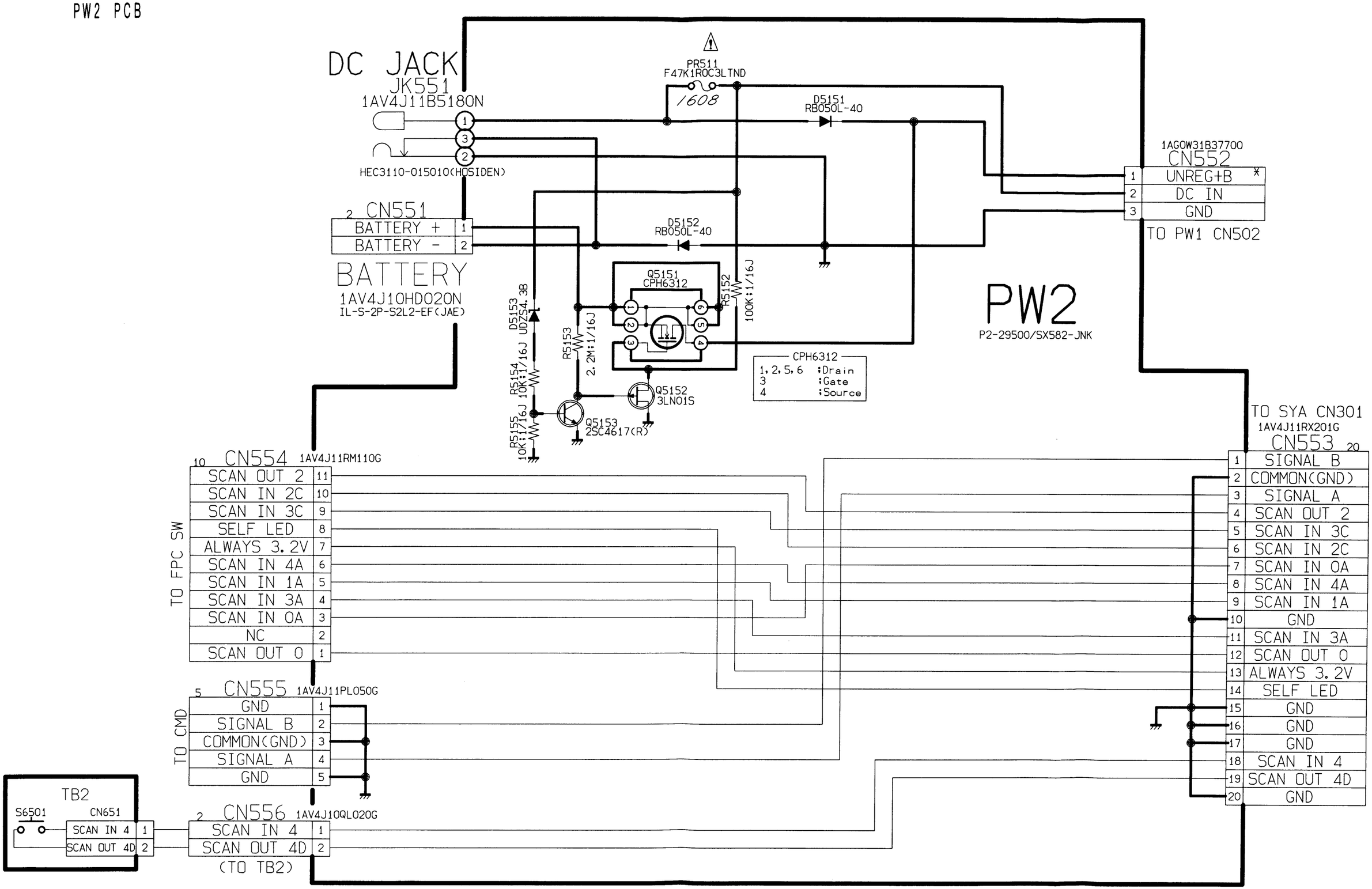



PW2
FET SW
CPH6312
Battery
D5151
PR511
1A
AC ADAPTER
PW1
PR502
2A
STOROBO UNIT
UNREG
GND
2A
PR501
PR503
1A
DC IN
UNREG
BL ON
LCD ON
PON
PA ON
5.2V(D)
INV_PWM
LPF
46
47,48
45
CCD
T5001
DC/DC
CONVERTER
TRANS
Q5006
DISCHARGE
CIRCUIT
Q5003
Q5004
5.1V(A)
15.2V(A)
-7.7V(A)
CH2
2
IC501
BD9731KV
SWITCHING
CONTROL
DIGITAL 1.8V
CH3
4
Q5013
L5008, C5082
STEP DOWN
CIRCUIT
1.8V(D)
DIGITAL 3.4V
CH1
7
Q5012
L5007, C5072
STEP DOWN
CIRCUIT
3.4V(D)
LCD PANEL
CH4
9
T5002
DC/DC
CONVERTER
TRANS
15.0V(L)
5.0V(L)
LED BACK LIGHT
CH5
12
Q5017
L5011, C5102
STEP UP
CIRCUIT
Q5018
LED Anode

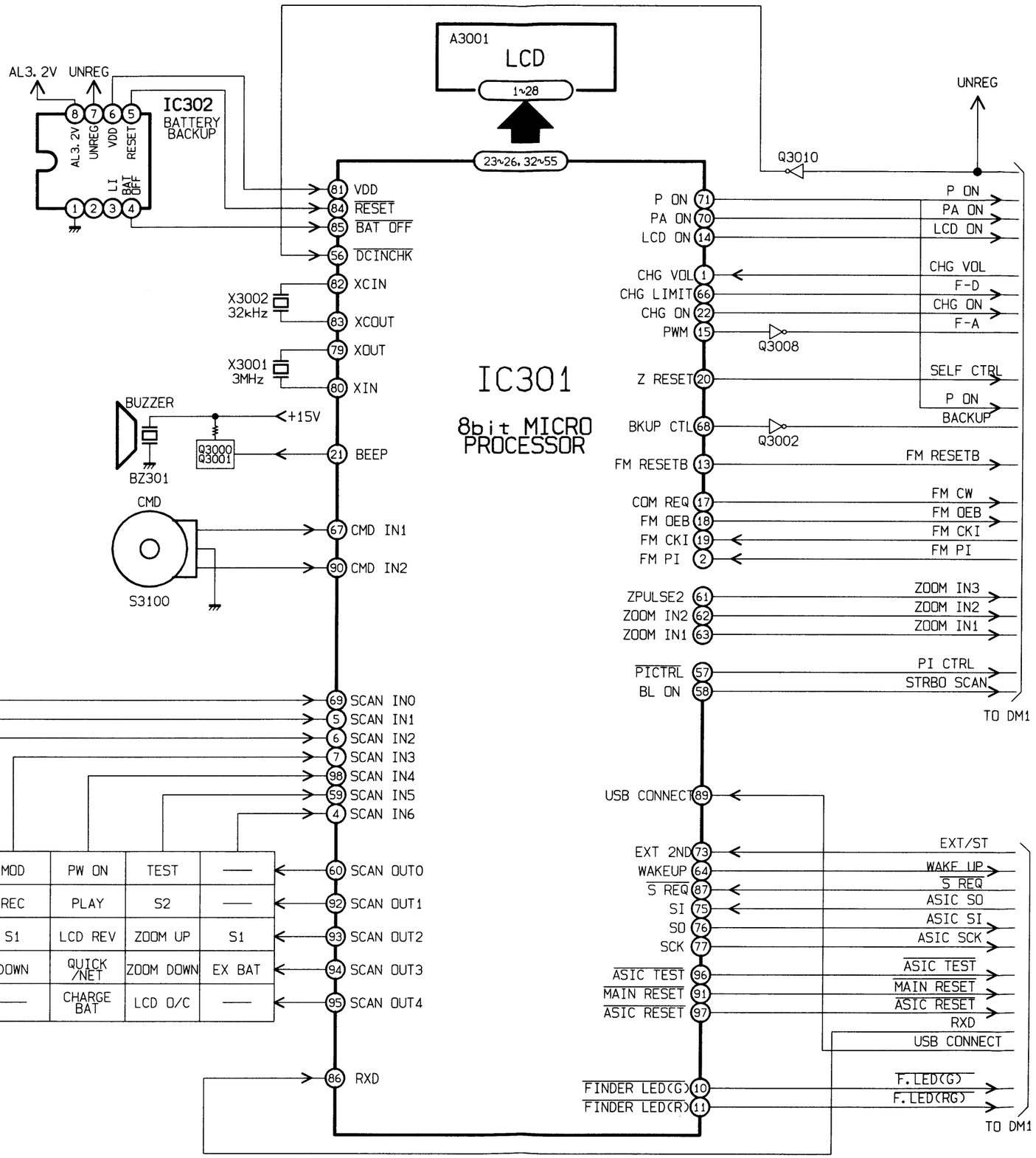
PW1 基板
PW1 PCB



PW2 基板
PW2 PCB



SYA ブロック図
SYA BLOCK DIAGRAM



FUNC	+/-	AF-L/AE-L	MOD	PW ON	TEST	——
AFM	SBS	QSW	REC	PLAY	S2	——
MENU	MTR	S2	S1	LCD REV	ZOOM UP	S1
LEFT	RIGHT	UP	DOWN	QUICK /NET	ZOOM DOWN	EX BAT
AV JACK	CARD	DIN CONNECT	——	CHARGE BAT	LCD O/C	——

CP1 (SYA)基板
CP1 (SYA) PCB

CP1_SYA

Y1-29500/SX582-JNK

VOLTAGE: PLAY & LCD ON

SCAN IN / SCAN OUT	0	1	2	3	4	5	6
0	FUNC	+/-	AF-L/AE-L	MOD	PW ON	TEST	
1	AFH	SBS	QSW	REC	PLAY	S2	
2	MENU	MTR	S2	S1	LCD REV	ZOOM UP	S1
3	LEFT	RIGHT	UP	DOWN	QUICK/NET	ZOOM DOWN	EX BAT
4	AV JACK	CARD	DIN CONNECT		CHARGE BAT	LCD D/C	

1AV4J10QS201G
CN301
20
SIGNAL B 1
COMMON(GND) 2
SIGNAL A 3
SCAN OUT 2 4
SCAN IN 3C 5
SCAN IN 2C 6
SCAN IN 0A 7
SCAN IN 4A 8
SCAN IN 1A 9
GND 10
SCAN IN 3A 11
SCAN OUT 0 12
ALWAYS 3.2V 13
SELF LED 14
GND 15
GND 16
GND 17
SCAN IN 4 18
SCAN OUT 4D 19
GND 20
CMD2
CMD1
S1
S2
FUNC
PW ON
+/-
MOD
CHG BAT
TO PW2 CN553

1AV4J11RU050G
CN302
5
SCAN OUT 1 1
SCAN OUT 3 2
SCAN IN 6 3
SCAN IN 5 4
SCAN OUT 2 5
TO EXT BATTERY

1AV4J11EB140G
CN303
14
SCAN OUT 1 1
SCAN IN 2B 2
SCAN IN 0B 3
SCAN IN 3B 4
SCAN IN 4B 5
SCAN IN 1B 6
SCAN IN 2D 7
SCAN IN 5B 8
SCAN IN 5D 9
SCAN IN 0D 10
SCAN OUT 2 11
SCAN OUT 3 12
SCAN IN 1D 13
SCAN IN 3D 14
QSW
ANF
REC
PLAY
SBS
UP
ZOOM UP
ZOOM DOWN
LEFT
RIGHT
DOWN
TO FPC SW(BACK)

1AV4J11RM140G
CN304
OSC 1
RDY 2
TG 3
XE 4
FSW 5
F_ANA 6
GND 7
GND 8
STRG 9
O_SB 10
O_RDY 11
VSB 12
AF_TG 13
AF_OFF 14
TRIG
EXTRIG
LMT
FAOUT
STRG
O_RDY
VDD5
AFTG
AFOFF
TO STROBO UNIT

IC301
UPD78064GC-A55-8EU
8bit MPU

IC302
S-8423NFS

IC309
BA10358FV

X3001
PBRC3.00BR-A

X3002
32.768KHz-T

Z3001
K1220-1T2

D3001 1SS355
D3002 HN1D01FU
D3003 HN1D01FU
D3004 HN1D01FU
D3005 HN1D01FU
D3006 HN1D01FU
D3007 HN1D01FU
D3008 HN1D01FU
D3009 HN1D01FU
D3010 HN1D01FU
D3014 DAN222
D3015 DAP222
D3029 1SS355

Q3001 DTA144EE
Q3002 DTA144EE
Q3003 DTC115EE
Q3004 DTA144EE
Q3005 DTC144EE
Q3006 DTC144EE
Q3007 DTA114EE
Q3008 DTA144EE
Q3009 DTC144EE
Q3010 DTC123EE
Q3011 DTC144EE

S3001 LCD D/C

TP301 TP302

RB301 33KX4I1/32J
RB302 100KX4I1/32J
RB303 33KX4I1/32J

A3001

ISO 88.88
HI
NORM
BASIC
AUTO
M·F
888

AVREF
ALWAYS 3.2V
ALWAYS3.2V
ALL3.2V
SW3.2V
BATTERY BACKUP
PICTRL
TO DMA
TO DMA

— E20·E5000 —

The contents of inspection standards and tools for E5000

Conditions to be set and prepared for inspections

1. Physical stance to measure :

On the applicable product, its lens shall be set flat and its monitor shall be set to vertically stand up.

2. Room temperature and constantly controlled humidity :

25 ± 5℃ Relative humidity : 65 ± 20 %

3. Battery to be employed :

Primary battery:

Unless otherwise specified, us a Sanyo 2CR5 lithium battery (within four months of manufacture).

When using various manufacturers, conduct the inspection using a Sanyo, Matsushita or Duracell 2CR5lithium battery.

Secondary battery:

Use the dedicated rechargeable battery EN-EL1.

(Use after it has been fully charged with the dedicated AC adapter EH-21 or battery charger MH-52.)

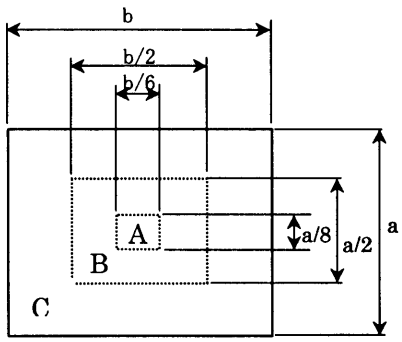
4. Standard power supply :

Specified AC power supply EH-21 shall be required.

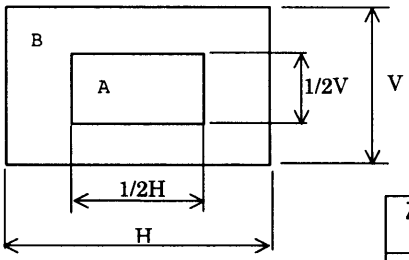
[1] Inspection standards

	Item	Criteria	Applied tool(s)
External view	Gap/ Difference in height	- When closing the battery cover a gap between the cover and the body shall be less than 0.6 mm. -Difference in height between the body and the cover shall be less than 0.3mm. Check the condition by loading a battery and closing the cover	Vernier caliper
	External view	- Any conspicuous scratches or dirt shall not be required. Check it by naked eyes under fluorescent lamp or natural sunshine.	Visual observation
Operation-ability / Operation mode	Operational mode	- While operating, any irregularities or irregular noise shall not be required. Check it by shaking the camera while operating, or by intentionally lightly hitting the camera on to the linoleum-laid desk while operating.	Primary battery Secondary battery Visual observation
	Operate-on ability Button(s)	- While operating, any irregularities / Malfunctions shall not be required. No cave-ins of the buttons shall be required.	
	On the lever, Knob, command dial	- When clicking, normal touch shall be required. Any outstanding 'caught-in-mechanism' touch or 'rubbed-in-mechanism' touch shall not be required. Check and observe the condition through normal operation.	
	Operation touch	-While operating, any irregular conditions shall not be required.	
	Each cover	- Opening / closing each cover shall be smoothly made.	
Monitor	Shooting image	- Inclined degree of image shall be less than 0.5 degree.	Photoshop Printer
Lens capacity	Focal distance	-Wide-end position (Compelling ∞) 7.1 mm +7% -4% -Tele-end position (Compelling ∞) 21.4 mm ±7%	Dedicated tool(s)
	Open aperture F No.	-Wide-end position (Compelling ∞) F2.8 +7.8% -3.4% -Tele-end position (Compelling ∞) F4.8 +7.8% -3.4%	
AF	AF accurately	-The area which was chosen must focus	Visual observation
	Command infinite focus mode	-Both the distance view mark and the flash cancel mark shall appear on the LCD. Check it by setting to the command infinite focus mode and light pressing the shutter release button. -The speed light shall not work. Check it by releasing the shutter in the command Infinite focus mode.	

	Item	Criteria	Applied tool(s)
AF	LED blinking for impossibility in metering	-The LED shall blink in 8 Hz after lightly pressing the shutter release button. Check it by lightly pressing the shutter release button.	Visual observation
Shooting with a speed light	Guide No. (ISO100・m)	-FULL 10 ±2.7EV After charging for 18 sec. by a fully charged fresh battery, measure the guide No. within 1 sec.	Flash meter, Full charged fresh battery, Visual Observation
	Red-eye reduction lamp	-Except the self-timer blinking, it shall not be turned on for any other functions / modes. While changing the mode, check that the lamp does not work.	
	Recycle time	The recycle time shall be within 8 sec.	
	The shutter unable to release	-While lightly pressing the shutter release button, the red LED shall blink. Then, the shutter shall not be released. Unless it is in flashing mode, or the charged condition is not enough, LED blinking mode and shutter release lock can not work.	
	Flash	-In response to any button operations for some functions, light impact from outside, or shutter release, unexpected flashing shall not be required.	
Quality of image	Resolution	-The solution shall be in compliance with the following values. -Horizontal center : 1250lines Vertical center : 1250lines Horizontal line(s) at each corner : 850ines Vertical line(s) at each corner : 850lines -Set the conditions of 'Fine as the quality of image', 'AWB', 'Center-weighted', and P mode, ISO100, 0.3 m of a distance from the chart' and equipping the 5100K viewer , a subject shall be taken in the full range of angle of view. Then, its recorded image data file shall be opened by the dedicated software Photoshop, and its solution level shall be Judged by observing.	EIAJ chart 5100K viewer Photoshop Fisheye-convert or
	Incorrect centering of image	-When taking a fisheye shot, confirm that a range of 183 degrees is attained, and that the circle is free of vignetting.	

<table>
<tr><th></th><th>Item</th><th>Criteria</th><th>Applied tool(s)</th></tr>
<tr><td>Quality of image</td><td></td><td>
<table>
<tr><td></td><td>R</td><td>G</td><td>B</td></tr>
<tr><td>W</td><td>190-230</td><td>190-230</td><td>190-230</td></tr>
<tr><td>Ye</td><td>190-230</td><td>180-210</td><td>40-70</td></tr>
<tr><td>R</td><td>200-220</td><td>0-20</td><td>0-5</td></tr>
</table>
-Set the conditions of 'Fine as the quality of image', 'AWB', 'Center-weighted', and P mode, ISO100.
-Equip the chart with the 5100K viewer and take a subject in the full range of angle of view. Then, open the recorded image data file through the dedicated software Photoshop. Using the Marquee tool (M), pick up the image's central area 64 x 64 picture element, and read the histogram's RGB.
</td><td>Color bar chart
5100K viewer
Photoshop
Visual observation</td></tr>
<tr><td>Finder</td><td>Operation mode</td><td>- Only smooth operation mode shall be required. 'Caught-in-mechanism' touch or any unstable or unsteadily zooming mode shall not be required.</td><td>Visual observation</td></tr>
<tr><td></td><td>Dust, Fluff, Scratch(es)</td><td>Position and number must be as follows.
Total 3 pieces or less
Distance Apart b/2 or more
<table>
<tr><td></td><td>Area A</td><td>Area B</td><td>Area C</td></tr>
<tr><td>9 μm or smaller</td><td>0pc</td><td>2pcs. or less</td><td>3pcs. or less</td></tr>
<tr><td>10～20 μm</td><td>0pc</td><td>0pc</td><td>1pcs. or less</td></tr>
<tr><td>21 μm or larger</td><td>0pc</td><td>0pc</td><td>0pc</td></tr>
</table>


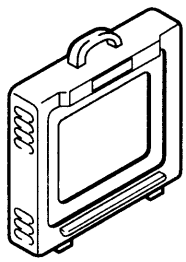
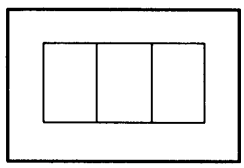
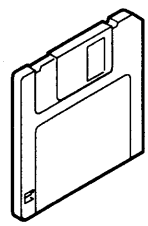
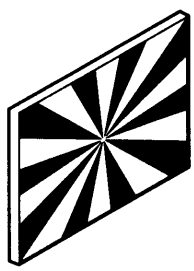
</td><td></td></tr>
</table>

<table>
<tr><th></th><th>Item</th><th>Criteria</th><th>Applied tool(s)</th></tr>
<tr><td>LCD
and others</td><td>Monitor LCD</td><td>External view
-No vignetting or shading on the LCD shall be required.
-Inclination between the monitor and the monitor frame shall not be so outstanding.
Field of view
-Through-the-monitor image :96 to 100 %
-Play-back image : 98 to 100 %
Bright pixels or dim pixels on LCD
 
<table><tr><th>Zone</th><th>Bright pixel</th><th>Dim pixel</th></tr><tr><td>A</td><td>1</td><td>6</td></tr><tr><td>B</td><td>3</td><td>6</td></tr><tr><td>Total</td><td>3</td><td>6</td></tr></table>
Bright pixels:Visible normally throught 5% ND filter
Dim pixels: Visible normally</td><td>Visual observation</td></tr>
<tr><td></td><td>Self-timer</td><td>-10 ± 3 sec. / 3 ± 1 sec.
-Blinking for 9 sec. and then lighting for 1 sec.
-Blinking for 2 sec. and then lighting for 1 sec.</td><td>Visual Observation
Stop watch</td></tr>
<tr><td>Electrical Characters-tics</td><td>For consumption current</td><td>Stand-by
- Less than 0.2 mA while turning off the main powerswitch.
Less than 0.3 mA while sleeping.
Supply 6.0V from the regulated voltage power supply to the camera, and measure the consumption current value after 12 hours from the time of supplied.
Start-up
- Select 'AUTO' from the select dial and check that any image appears on the LCD.
Then, leave it for 15 sec. or a bit longer and then measure the consumption current value.
The value shall be less than 1A.</td><td>Standard power supply

Ammeter</td></tr>
<tr><td></td><td>For battery-check voltage</td><td>Level 1(Half battery mark)
- 4.9 ± 0.2 V(Primary battery)
7.4 ± 0.2 V(Secondary battery)
6.5 ± 0.2 V(External battery)
While lowering the power supply voltage, lightly press the shutter release button.
Then, when the battery mark appears on the LCD, measure the voltage.
Level 2(The battery mark blinks)
- 4.0 ± 0.25 V (Primary battery)
6.7 ± 0.25 V(Secondary battery)
5.9 ± 0.2 V(External battery)
While lowering the power supply voltage, lightly press the shutter release button.
Then, when the battery mark blinks on the LCD, measure the voltage.
Level 3(The LCD is turned off / The shutter release mode is locked)
- 3.8 ± 0.2 V (Primary battery)
6.3 ± 0.2 V(Secondary battery)
5.7 ± 0.2 V(External battery)
While lowering the power supply voltage, lightly press the shutter release button.
Then, when the LCD is turned off, measure the voltage</td><td></td></tr>
</table>

[2] 工具一覧表　Tool List

※：新規工具
※：New tool

工具番号 Tool No.	名　称 Name	略　図 Illustration	備　考 Remarks
J63070 (100-240Volts)	カラービューアー　5100K Colour Viwer 5100K		E900, E910 E950, E700 E800, E990 E880, E995 E775, E885 E5000 共通 Common
J63056	色調整用チャート Chart for Colour Adjustment		E900, E910 E950, E700 E800, E990 E880, E995 E775, E885 E5000 共通 Common
J65042	キャリブレーションソフト Calibration Software		E995, E775 E885, E5000 共通 Common
サービスマニュアル添付 Attached in Service Manual	ジーメンスチャート Siemens chart		E900, E910 E950, E700 E800, E990 E880, E995 E775, E885 E5000 共通 Common

[2] 工具一覧表　Tool List

※：新規工具
※：New tool

工具番号 Tool No.	名　称 Name	略　図 Illustration	備　考 Remarks
※ J63076	ドライバービット driver bit