VAA11401-R.3557.A

作成承認印	配布許可印
ニコン 映像カンパニー CS推進部 GM	

Nikon

COOLPIX885

VAA11401 (JP-Silver)
VAA11402 (U-Black)
VAA11403 (EP-Black)
VAA11453 (EP-Silver)
VAA11404 (EN-Black)
VAA11454 (EN-Silver)

REPAIR MANUAL

Nikon | NIKON CORPORATION
Tokyo, Japan

Printed in Japan September 2001

CONTENTS

Specifications

Type	Digital camera E885
CCD	1/1.8-inch Interline Charge-Coupled Device (CCD)
Total pixels	3.37 million
Effective pixels	3.21 million
Image size	User can select from: •Full (2048 x 1536 pixels) •XGA (1024 x 768 pixels) •VGA (640 x 480 pixels) Four Small Picture sizes selectable (640 x 480, 320 x 240, 160 x 120 or 96 x 72 pixels)
Lens	•3x Zoom Nikkor •F = 8-24 mm (35 mm camera format equivalent to 38-114 mm): f/2.8-f/4.9 •9 elements in 8 groups
Digital zoom	Use zoom button to zoom in up to 4X in steps of 0.2X
Autofocus (AF) Focus modes Focus range	Contrast-detect through-the-lens (TTL) AF •Continuous AF (monitor on) •Single AF (monitor off) •Manual (49 positions, with focus confirmation indication) •30 cm (1 ft.)- at widest angle, 60 cm (2 ft.)- at telephoto •Macro mode (Autofocus): 4 cm (1.6 in.)- at widest angle, 30 cm (1 ft.)- at telephoto
Viewfinder Frame coverage	Real-image zoom optical viewfinder with LED indication Approximately 80%
Monitor	1.5-inch 110,000-dot, low-temperature polysilicon TFT LCD with brightness and hue adjustment
Frame coverage	Approximately 97% (through/freeze image)
Auto off	Can be selected from 30 sec. (default) and 1, 5 and 30 min.
Storage System Media	Design rule for Camera File systems, Digital Print-Order Format (DPOF) compliant Compression JPEG-baseline-compliant; •HI (uncompressed TIFF-RGB) •FINE (approx. 1/4) •NORMAL (approx. 1/8) •BASIC (approx. 1/16) QuickTime movies CompactFlash™ (CF) Card Type1

Approximate Capacity	16 MB (64 MB) FULL / XGA / VGA HI: 0 (6) / – / – FINE: 10 (40) / 39 (159) / 97 (390) NORMAL: 20 (81) / 76 (309) / 177 (725) BASIC: 39 (159) / 144 (588) / 324 (1300)
Shooting modes	•Auto •Scene: Portrait, Party/Indoor, Night Portrait, Beach/Snow, Landscape, Sunset, Night Landscape, Museum, Fireworks Show, Close Up, Copy and Backlight •Custom (CSM) (includes shooting menu for control of White Balance, Metering, Continuous, Best-Shot Selector, Image Adjustment, Image Sharpening, Lens, Image Size & Quality, Sensitivity, Exposure Options, Focus Options, Auto Bracketing, Noise Reduction and CF Card Format) •Movie (up to 40 sec. of QVGA frames at 15 frames per second)
Capture modes	•Single •Continuous •Multi-Shot 16 (sixteen frames 1/16 in size) •VGA Sequence •Ultra HS (seventy QVGA images at approximately 30 fps)
Exposure Control Range(ISO100 equivalent)	•Exposure modes: Programmed Auto Manual •Exposure compensation (±2.0 EV in steps of 1/3 EV) •Auto Exposure Bracketing •EV -3 to +15 (W) •EV + 1.4 to +16.6 (T)
Shutter Speed	Mechanical and charge-coupled electronic shutter 1-1/1000 sec., Bulb up to 60 sec. in M mode
Aperture Range	Electronically controlled preset aperture Two steps (f/2.8 and f/7.6 [W])
Sensitivity	ISO equivalent 100, 200, 400, Auto; can be set in CSM mode
White balance	Auto with TTL control, 5-mode manual with fine tuning, pre-set white balance, white balance bracketing
Self-timer	10 sec. or 3 sec. duration

Built-in Speedlight Range	0.4 to 3.7 m (1.3 to 12.1 ft.) (W) 0.4 to 2.3 m (1.3 to 7.5 ft.) (T)
Flash control Flash modes	Sensor flash system Auto, Flash Cancel (off), Red-Eye Reduction, Anytime Flash (fill-flash), Slow Sync
Playback Playback modes Image deletion File modes	Single frame, thumbnail (nine or four images), movie, zoom (4x), slide show, histogram indication/highlight point display, focus confirmation indication User can delete all or selected frames User can set transfer, hide and protect attributes for each image
Interface	USB interface
Video output	User can choose from NTSC and PAL
I/O terminals	•DC input •Data output (video/USB)
Power Requiremants	•One rechargeable Nikon EN-EL1 lithium-ion battery, or six-volt 2CR5 (DL245) lithium battery •EH-21 AC adapter/battery charger (available separately)
Battery life	Approximately 90 minutes (EN-EL1) or 100 minutes 2CR5 (DL245) when using monitor at 20°C (68°F)
Operating environmaent Temperature Humidity	 0 - 40°C (32 - 104°F) Under 85% (no condensation)
Dimensions (W x H x D)	Approximately 95 x 69 x 52 mm (3.7 x 2.7 x 2.0 in.)
Weight	Approximately 225 g (7.9 oz.) without battery and CompactFlash card

DISASSEMBLING

⚠ WARNING	
	● There are high voltage 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 after you remove the front cover.

Notes:

(1) Remove the battery prior to disassembly.

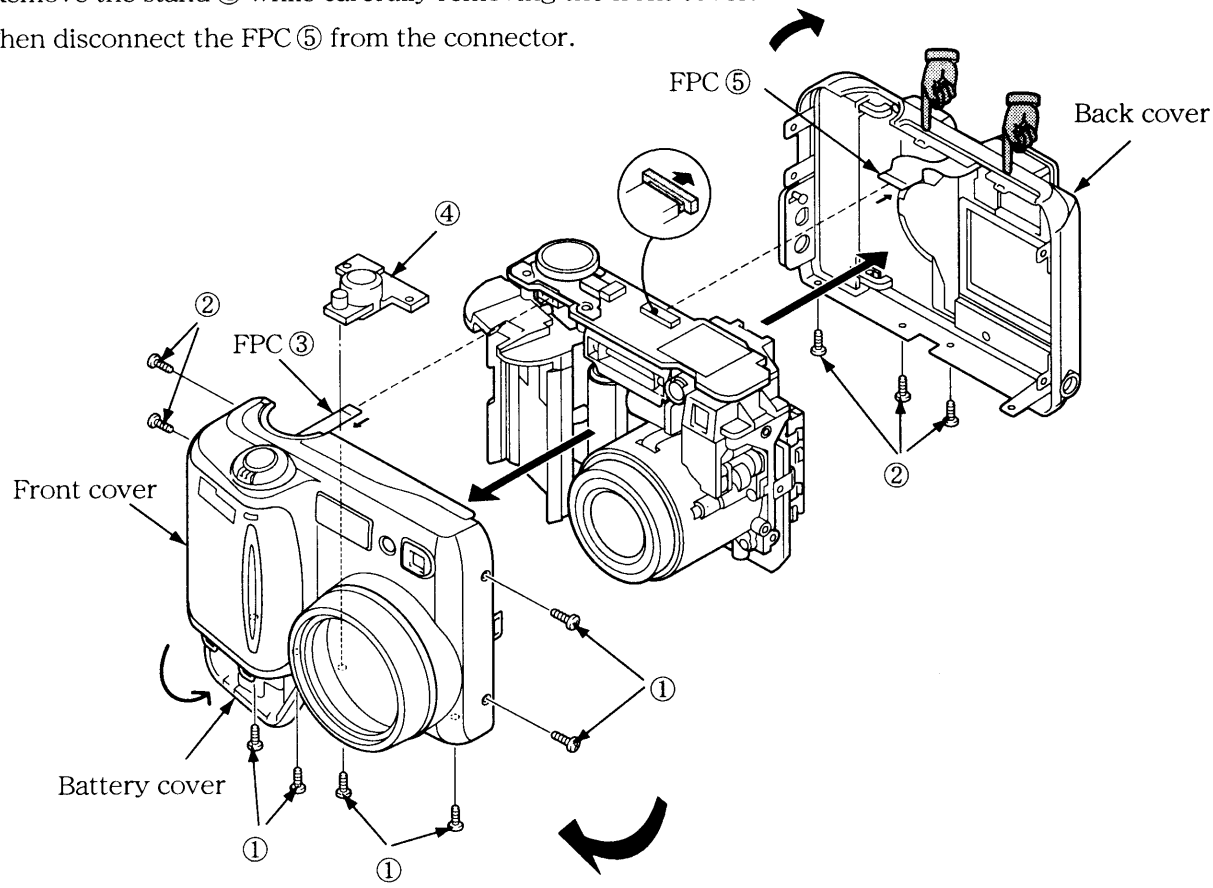
(2) During disassembly, make a note of the routing of the cords, which screws are mounted in which parts, etc.

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

REAR COVER, FRONT COVER

- Open the battery cove.
- Remove the 6 pieces of the screws ① (M 1.7 × 4) .
- Remove the 5 pieces of the screws ② (M 1.7 × 4.5) .
- Lift up the front cover by setting up from the bottom side.
- Remove the hook as pushing the section shown in the diagram with your finger, and then remove the back cover.
- Disconnect the FPC ③ connector.
- Remove the stand ④ while carefully removing the front cover.

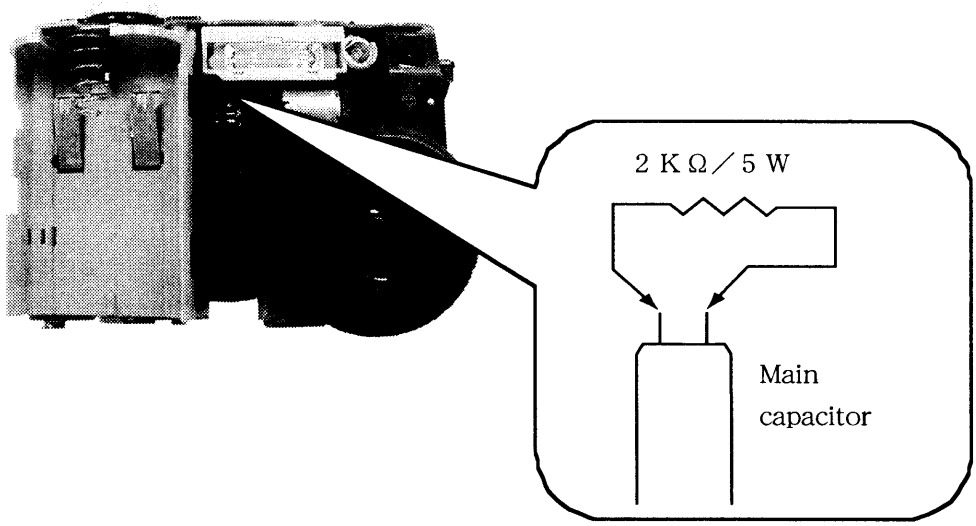
Then disconnect the FPC ⑤ from the connector.



DISCHARGE ELECTRICITY FROM THE MAIN CAPACITOR

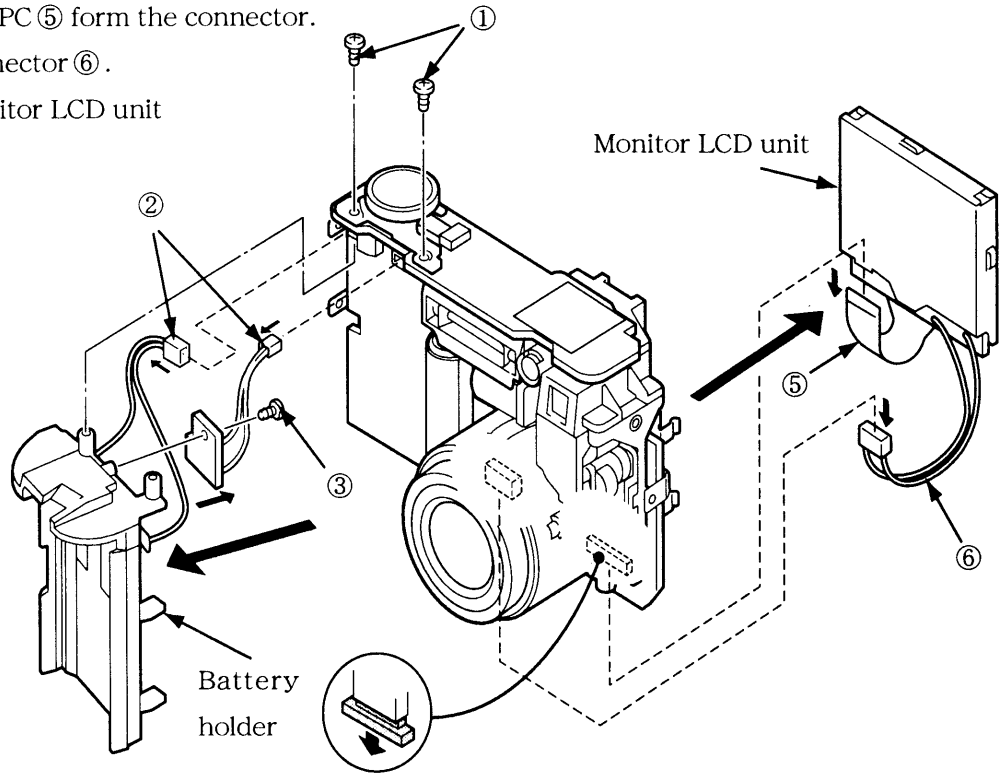
⚠ WARNING

- Due to its internal high voltage area, make sure to check the safety when removing the cover.
- Be sure to discharge the electricity from the main condenser according to the instruction in the repair manual after removing the Front cover.

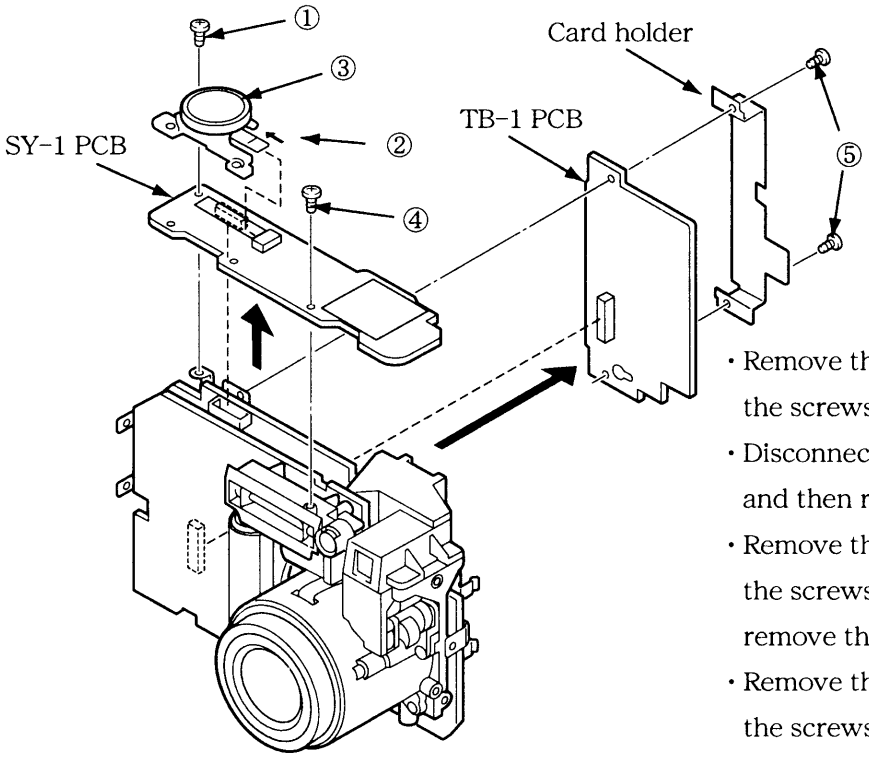


BATTERY HOLDER , LCD

- Remove the 2 pieces of screws ① (M 1.7 × 4) .
- Remove the 2 pieces of connectors ②, and then remove the battery holder.
- Remove the screw ③ (M 1.7 × 4) , and then remove the TB-1 board ④.
- Disconnect the FPC ⑤ form the connector.
- Remove the connector ⑥.
- Remove the monitor LCD unit



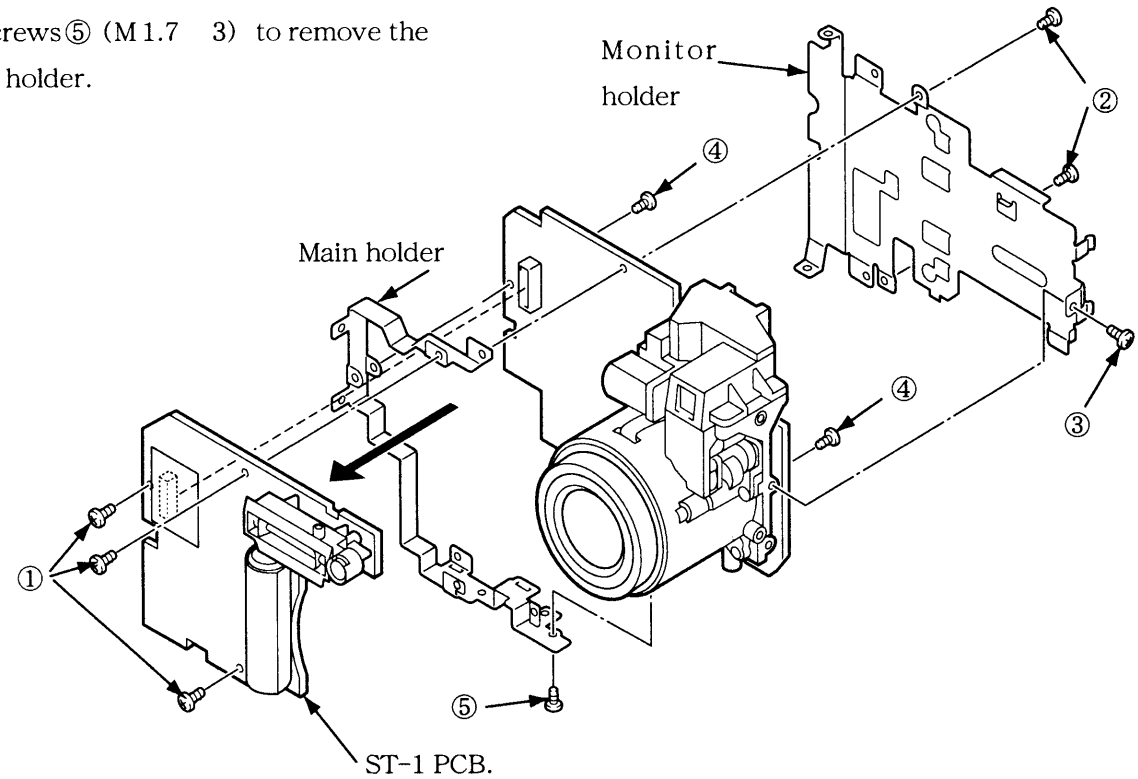
SY-1 PCB / TB-1 PCB



- Remove the 2 pieces of the screws ① (M 1.7 × 2.5)
- Disconnect the FPC ② from the connector, and then remove the control dial unit ③.
- Remove the 2 pieces of the screws ④ (M 1.7 × 4), and them remove the SY-1 PCB.
- Remove the 2 pieces of the screws ⑤ (M 1.7 × 3), and them remove the card holder.
- Remove the TB-1 PCB.

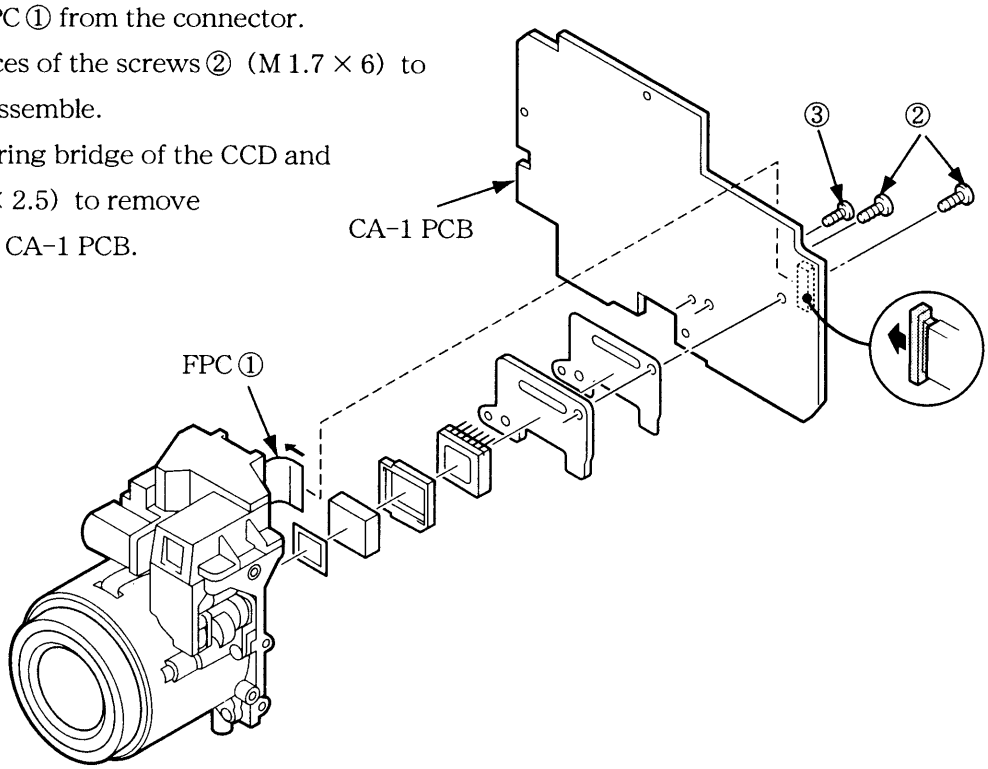
ST-1 PCB / MONITOR HOLDER

- Remove the 3 pieces of the screws ① (M 1.7 × 2.5), and then remove the ST-1 PCB.
- Remove the 2 pieces of the screws ② (M 1.7 × 2,5) and the screws ③ (M 1.7 × 3) to remove the monitor holder.
- Remove the 2 pieces of the screws ④ (M 1.7 × 2,5) and the screws ⑤ (M 1.7 3) to remove the main holder.



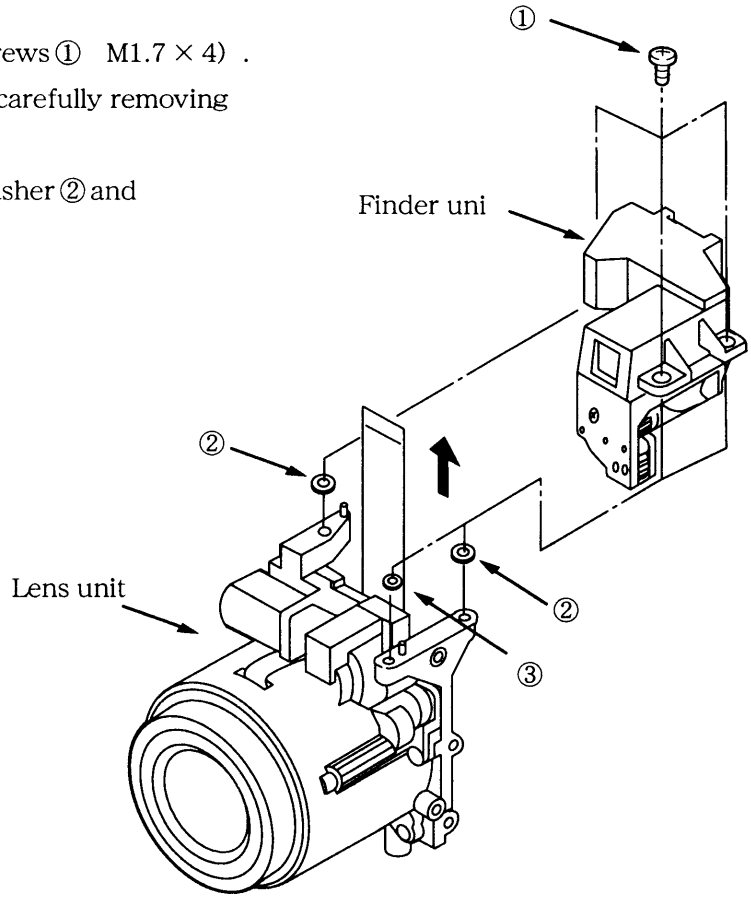
LENS ASSEMBLE

- Disconnect the FPC ① from the connector.
- Remove the 2 pieces of the screws ② (M 1.7 × 6) to remove the lens assemble.
- Remove the soldering bridge of the CCD and screw ③ (M 1.7 × 2.5) to remove the CCD from the CA-1 PCB.



FINDER UNIT

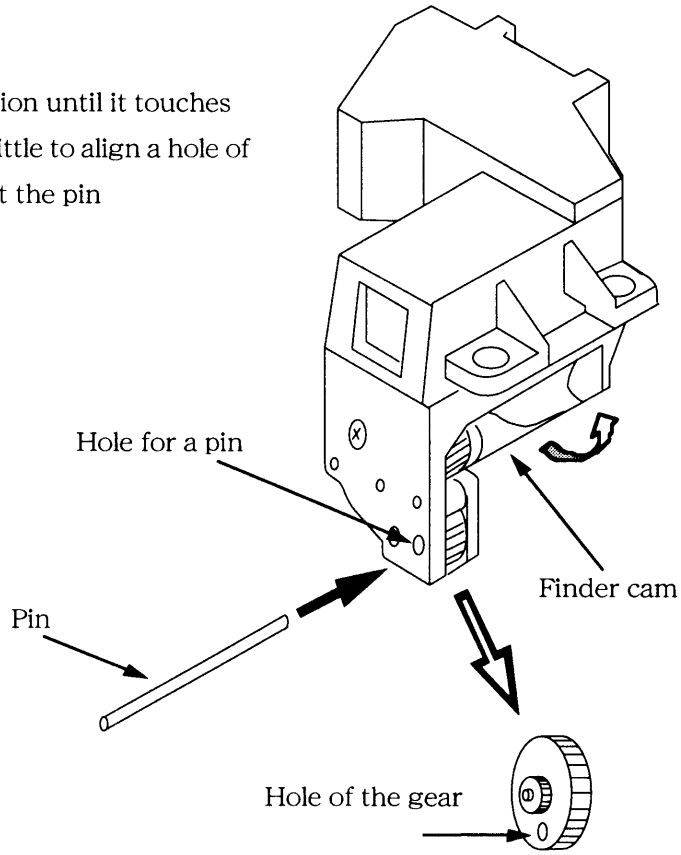
- Remove the 3 pieces of the screws ① M1.7 × 4) .
- Remove the finder unit while carefully removing the lens unit.
- Remove the 2 pieces of the washer ② and the washer ③.



ASSEMBLY

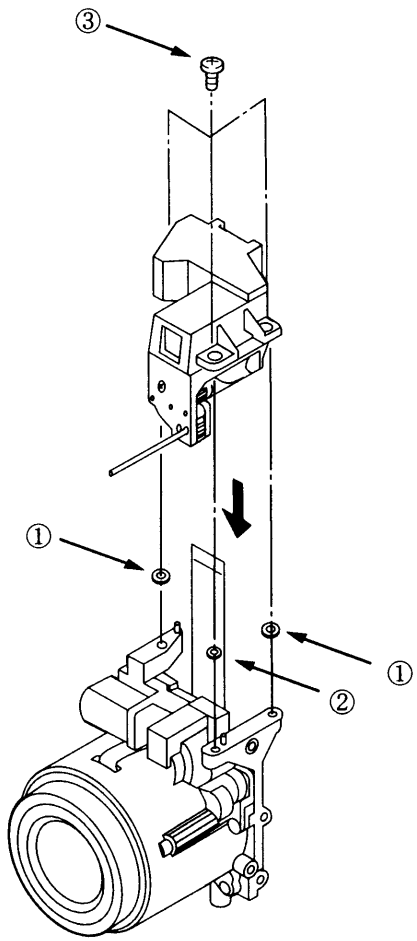
FINDER UNIT

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

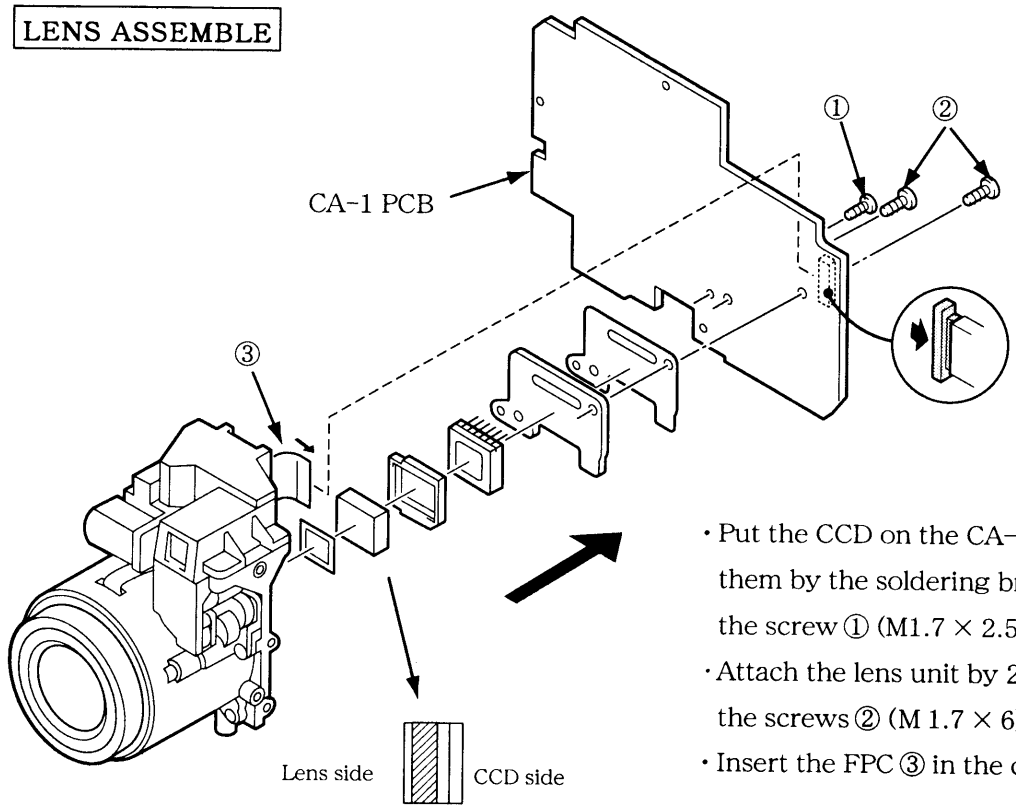


LENS ASSEMBLE

- Set the lens unit to the reset position.
- Put the 2 pieces of the washer ② and the washer ③ on the lens unit.
- Put the finder unit on the lens unit.
- Fix the finder unit by 3 pieces of the screws ③ (M1.7 × 4).
- Remove the pin from the finder unit.



LENS ASSEMBLE

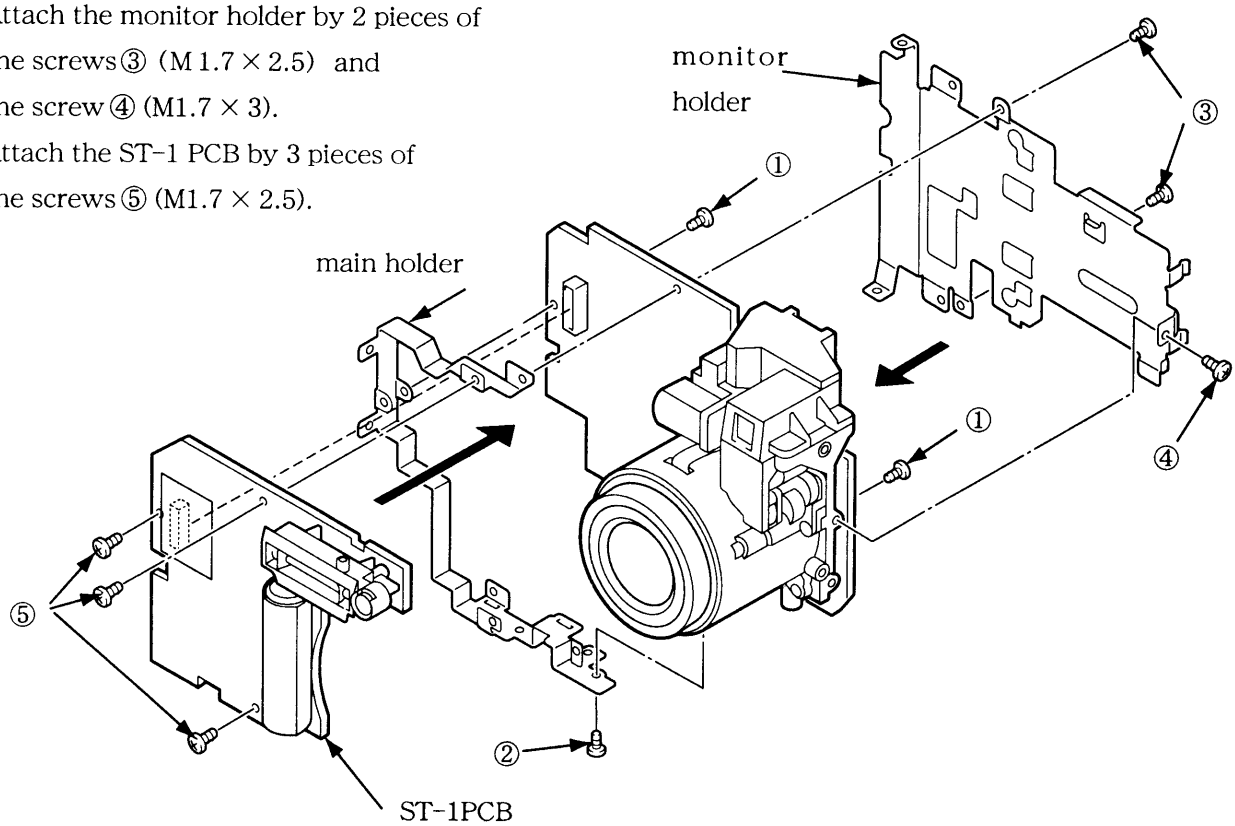


Optical filter

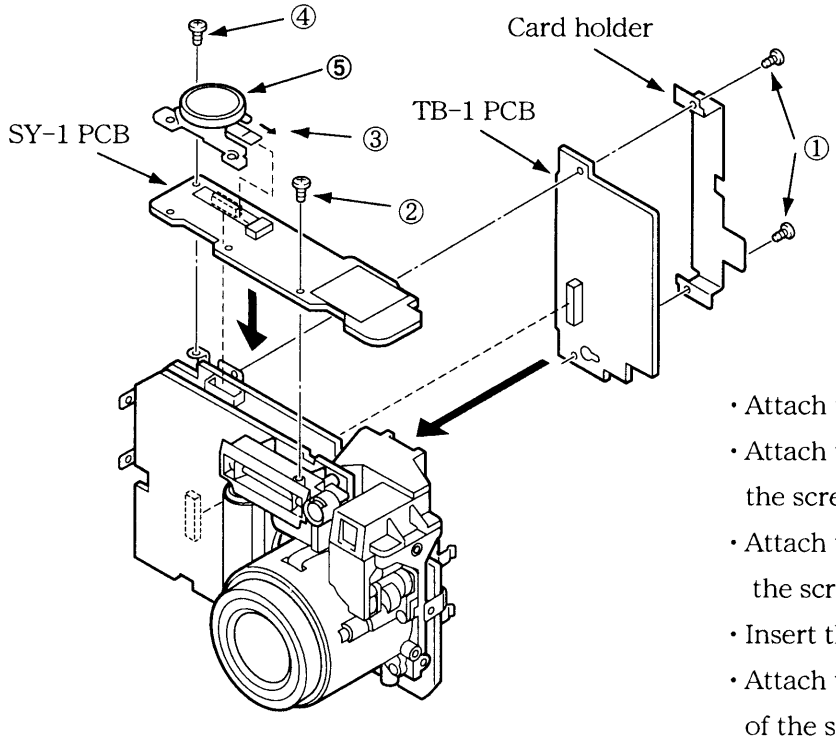
- Put the CCD on the CA-1 PCB, and then attach them by the soldering bridge and the screw ① (M1.7 × 2.5).
- Attach the lens unit by 2 pieces of the screws ② (M 1.7 × 6).
- Insert the FPC ③ in the connector.

ST-1 PCB / MONITOR HOLDER

- Attach the main holder by 2 pieces of the screws ① (M 1.7 × 2,5) and the screw ② (M1.7 × 3).
- Attach the monitor holder by 2 pieces of the screws ③ (M 1.7 × 2.5) and the screw ④ (M1.7 × 3).
- Attach the ST-1 PCB by 3 pieces of the screws ⑤ (M1.7 × 2.5).



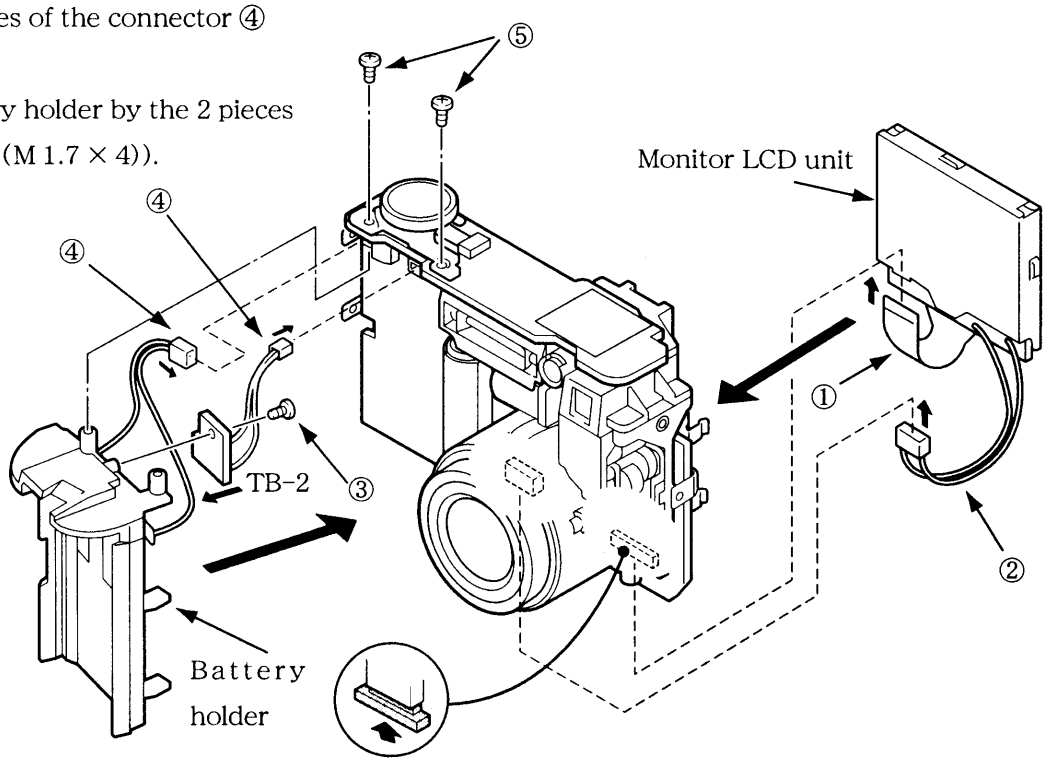
SY-1 PCB / TB-1 PCB



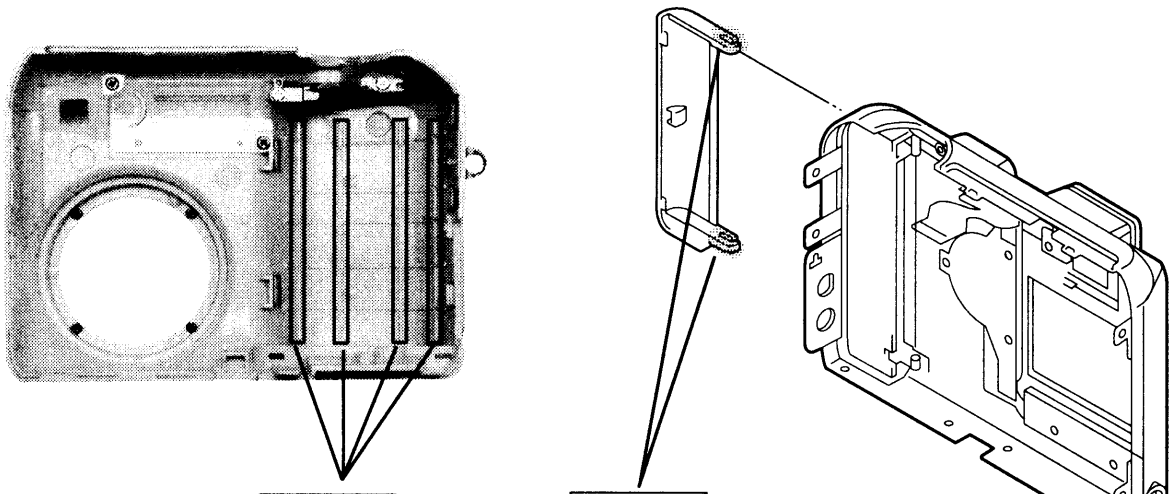
- Attach the TB-1 PCB.
- Attach the card holder by the 2 pieces of the screws ① (M1.7 × 3).
- Attach the SY-1 PCB by the 2 pieces of the screws ②(M1.7 × 4).
- Insert the FPC ③ in the connector.
- Attach the control dial unit ⑤ by the 2 pieces of the screws ④(M1.7 × 2.5).

BATTERY HOLDER , LCD

- Attach the monitor LCD unit.
- Insert the FPC ① in the connector.
- Insert the connector ② in the connector.
- Attach the TB-2 PCB by the screws ③ (M 1.7 × 4) .
- Insert the 2 pieces of the connector ④ in the connector.
- Attach thebattery holder by the 2 pieces of the screws ⑤ (M 1.7 × 4)).



LOCATION WHERE THE GREASE SHOULD BE APPLIED OF THE CARD COVER AND FRONT COVER

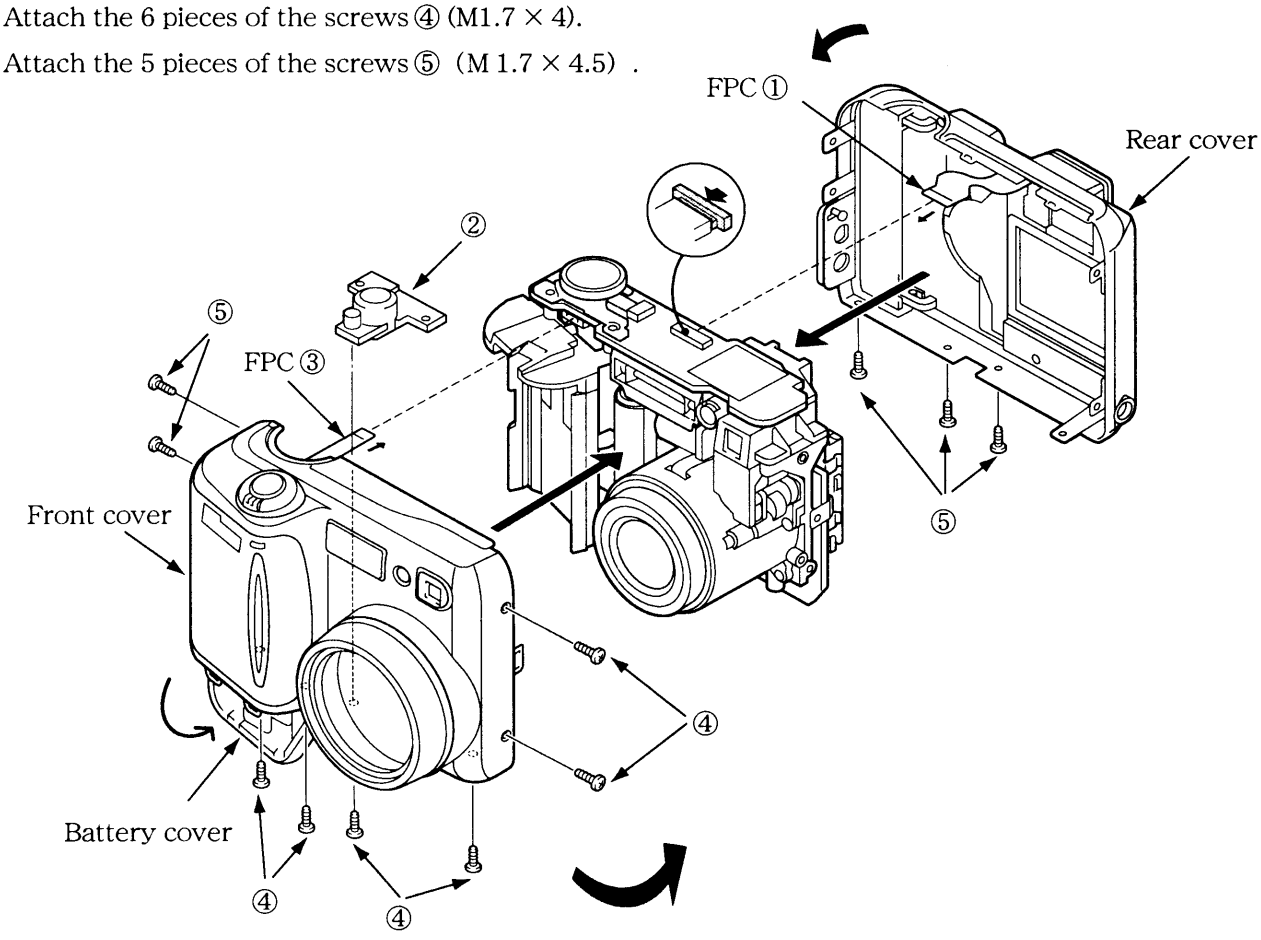


MZ-800S
To the sliding part with the battery

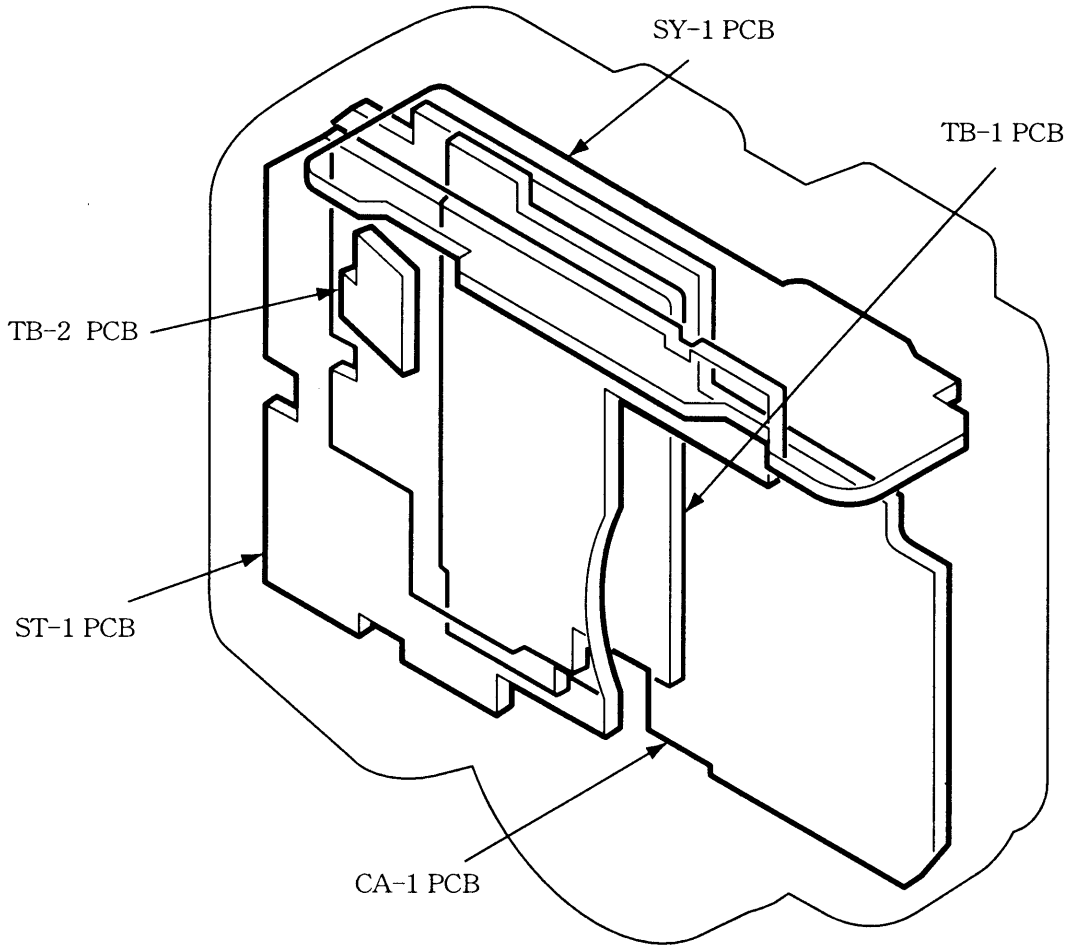
MZ-800S
To the sliding part with the rear cover

REAR COVER, FRONT COVER

- Insert the FPC ① in the connector, and then attach the rear cover while inserting the stand ②.
- Insert the FPC ③ in the connector, and then attach the front cover.
- Attach the 6 pieces of the screws ④ (M1.7 × 4).
- Attach the 5 pieces of the screws ⑤ (M 1.7 × 4.5) .



LOCATION OF EACH BOARD



ADJUSTMENT

1 . Equipment

· IBM compatible PC · AC adapter (E H − 2 1) · 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 . Flange-back (Lens) Adjustment
2 . AWB Adjustment
3 . Color Adjustment
4 . CCD White Point Defect Detect Adjustment
5 . CCD Black And White 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

Note) If replacing the lens, CCD, optical filter or CA-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

①System requirements

· Windows® 98 or Me
· IBM R -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

②Installing calibration software

· Insert the calibration software installation diskette into your diskette drive.
· Open Explorer.
· Copy the DscCalDI_127 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.

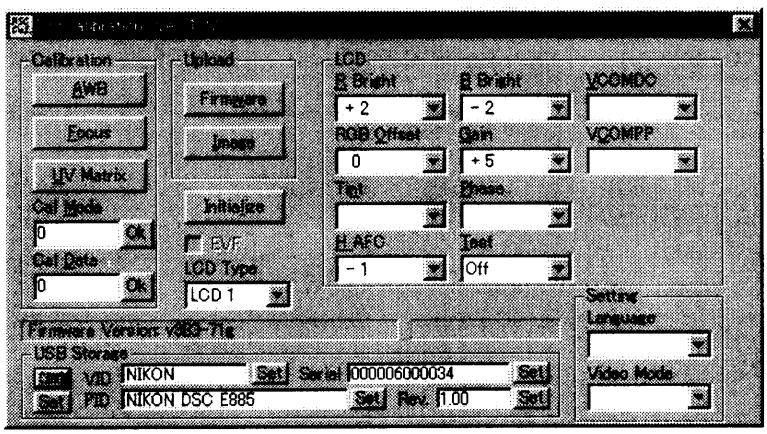
7 . Adjustment items required at replacement of parts

	Flange-back	AWB	Color Adj.	CCD Defect	LCD Panel	USB
Lens Unit	○	○	○	○	×	×
Optical filter	○	○	○	○	×	×
CCD	○	○	○	○	×	×
CA-1	○	○	○	○	△	○
SY-1	○	×	×	×	×	×
PW-1	×	×	×	×	×	×
TB-1	×	×	×	×	×	×

○Adjustment required、×Adjustment not required、△

8 . Calibration software

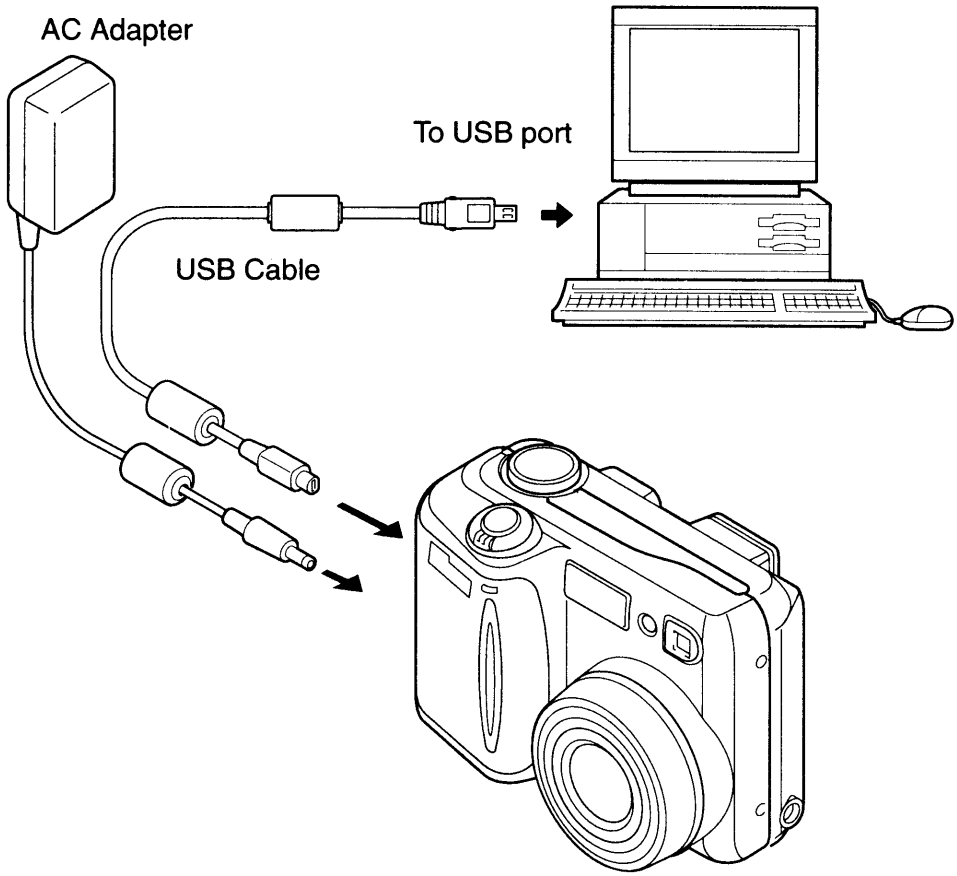
After starting the applicable calibration software, the following is displayed on the PC monitor.



9 . Connecting the camera to the computer

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

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



10. Flange-back (Lens) Adjustment

[Preparation]

- Siemens star chart
- POWER switch: ON (set to A-REC MODE)

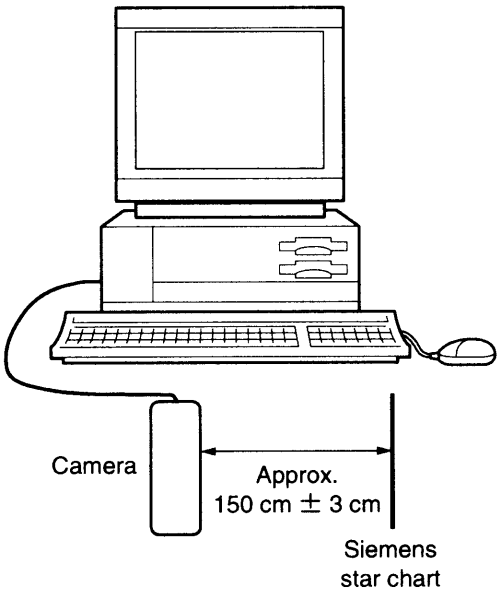
[Adjustment condition]

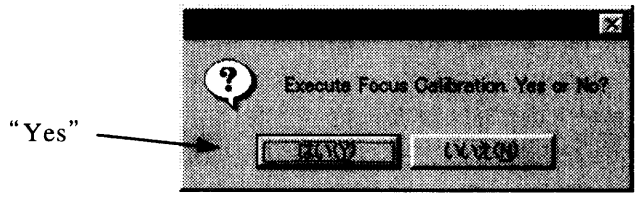
- Make a copy of A4 size siemens chart in enlarged A3 size or larger.
- Illumination above the subject should be 400 lux ± 10 %.
- Set the siemens star chart 150 cm ± 3 cm (between Siemens star chart and the surface of camera ㅗs protection lens)

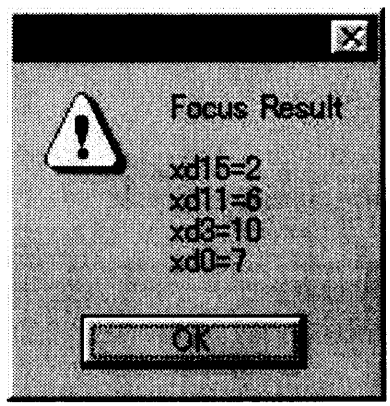
[Adjustment method]

1. Set the siemens star chart 150 cm ± 3 cm so that it be-comes center of the screen.
2. Double-click on the DscCalDi127.
3. Click the Focus, and click the Yes.

4. Lens adjustment value will appear on the screen.
   - (xd adjustment value is 0±50)
5. Click the OK.







Adjustment value

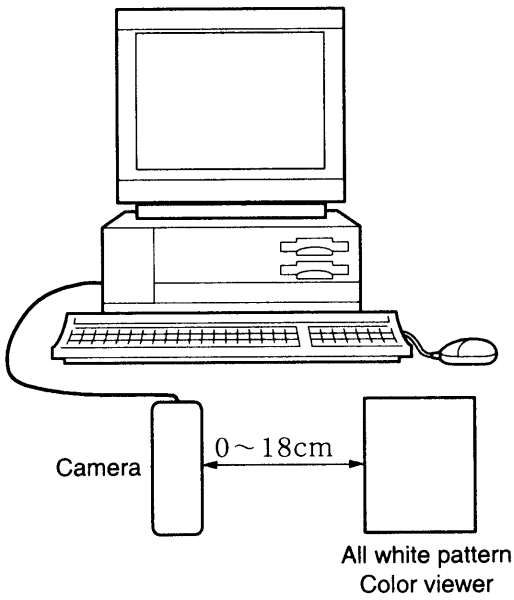
11. AWB Adjustment

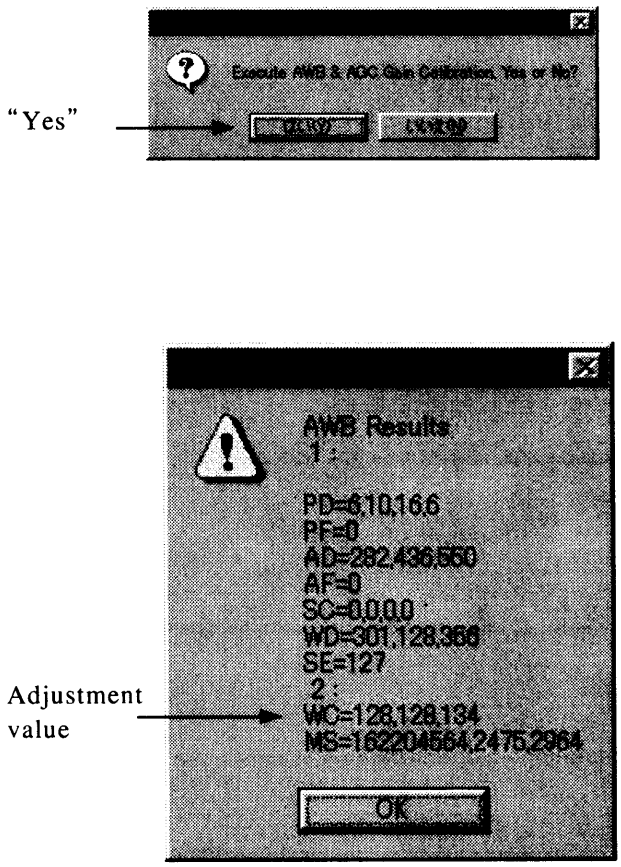
[Preparation]

- 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 DscCalDi127.
3. Click the AWB, and click the Yes.
4. AWB adjustment value will appear on the screen.
   (WC=128±2,128±2,130±30)
5. Click the OK.





1 2 . Color Matrix Adjustment

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

[Adjustment condition]

- Set the color adjustment chart to the color viewer.

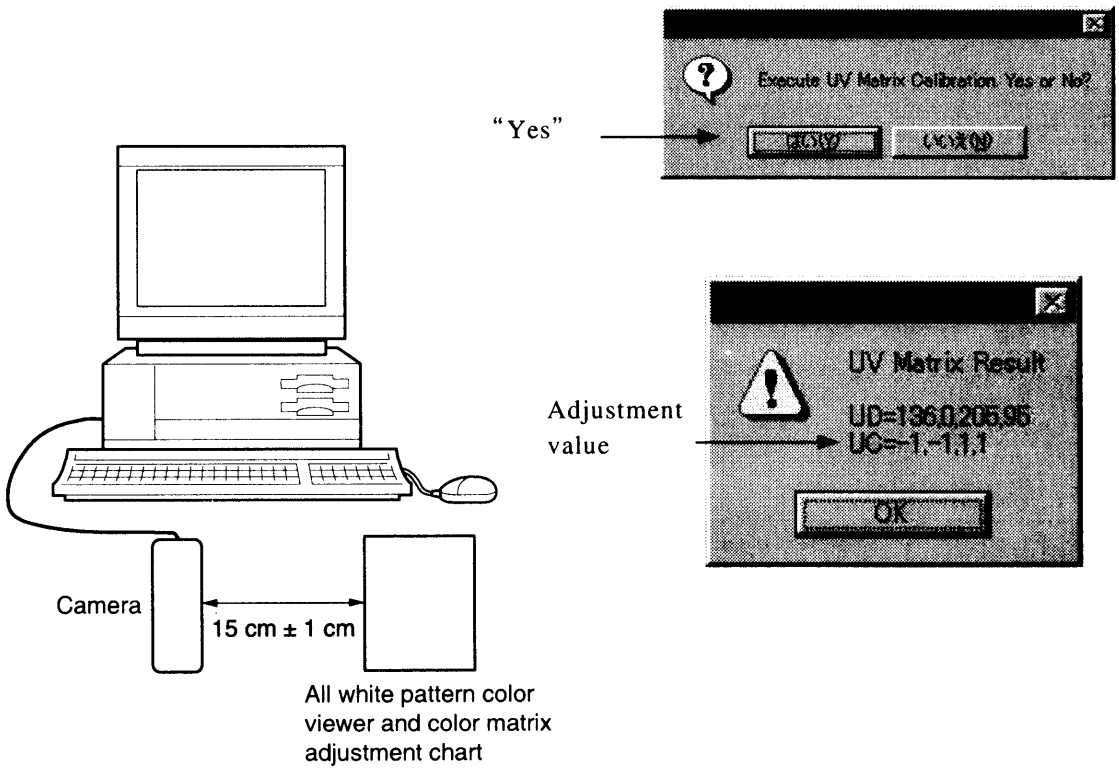
  (Do not enter any light.)

- Set the siemens star chart so that it becomes center of the screen.

[Adjustment method]

- Double-click on the DscCalDi127.
- Click the UV Matrix, and click the Yes.
- Color adjustment values will appear on the screen.

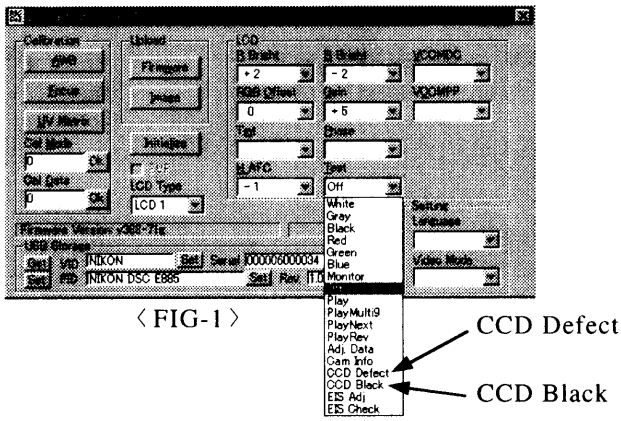
  (UC adjustment value are 0± 2 , 0± 2 , 0± 2 , 0± 2)
- Click the OK.



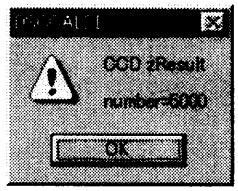
1 3 . CCD Defect Detect Adjustment

[Adjustment method]

- Double-click on the DscCalDi127.
- 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 〉

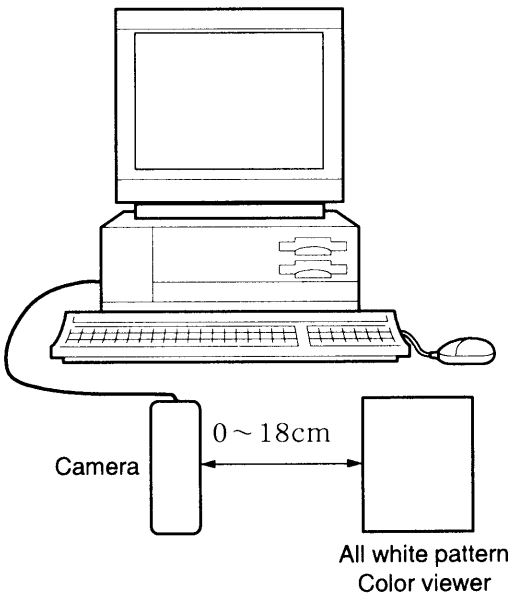


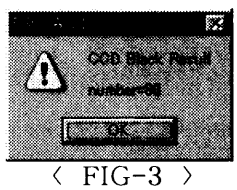
〈 FIG-2 〉

1 3 . CCD Defect Detect Adjustment

[Adjustment method]

- Double-click on the DscCalDi127.
- 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.





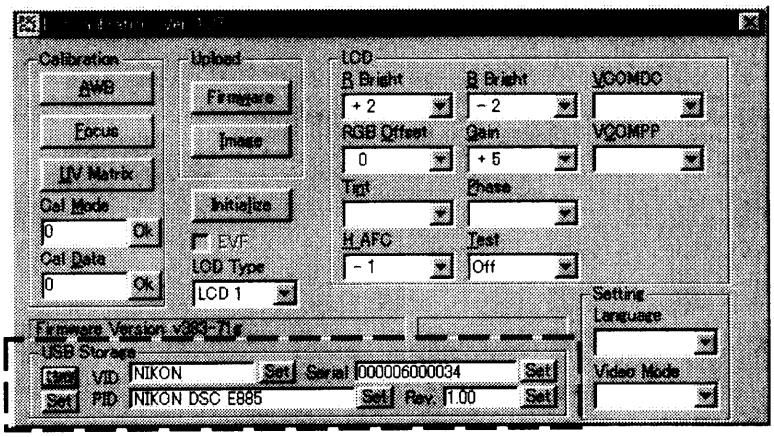
〈 FIG-3 〉

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 DscCalDi127.
3. Click on the Get button in the USB storage window and check the USB storage data.
   VID: NIKON
   PID: NIKON DSC E885
   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

[CA1 board (Side B)]

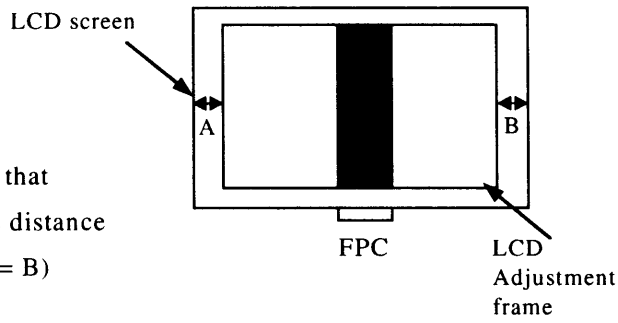
16-1. LCD H AFC Adjustment

[Preparation]

・ POWER switch: ON

[Adjusting method]

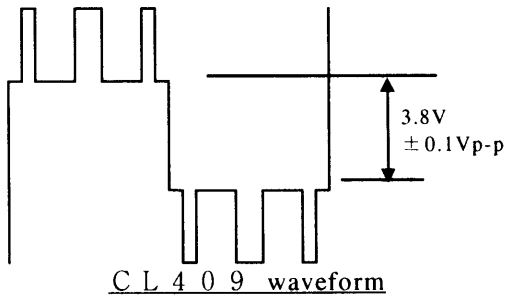
1. Double-click on the DscCalDi127.
2. Select 0 on the LCD H AFC.
3. While watching the LCD monitor, adjust H AFC so that the edge of the LCD adjustment frame are the same distance from the left and right edge of the LCD screen. (A = B)



16-2. LCD RGB Offset Adjustment

[Adjusting method]

1. Adjust LCD "RGB Offset" so that the amplitude of the CL409 waveform is 3.8 V ±0.1 Vp-p.



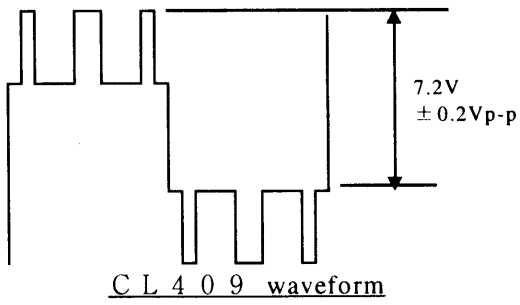
16-3. LCD Gain Adjustment

[Adjusting method]

1. Adjust LCD Gain so that the amplitude of the CL409 waveform is 7.2 V ± 0.2 Vp-p.

[Note]

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



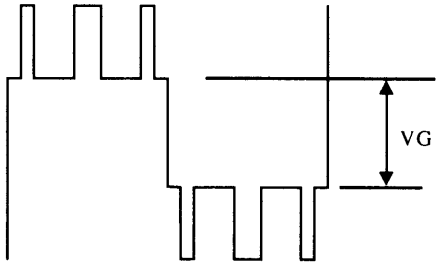
16-4. LCD Red Brightness Adjustment

[Adjusting method]

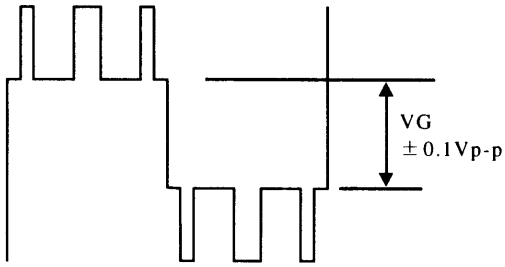
1. Adjust LCD "R Bright" so that the amplitude of the CL410 waveform is VG±0.1 Vp-p with respect to the CL409 (VG) waveform.

[Note]

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



CL409 waveform



CL410 waveform

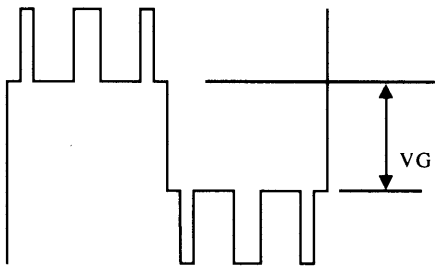
16-5. LCD Blue Brightness Adjustment

[Adjusting method]

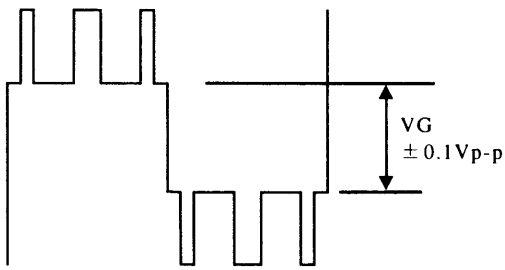
1. Adjust LCD "B Bright" so that the amplitude of the CL409 waveform is VG±0.1 Vp-p with respect to the CL411 (VG) waveform.

[Note]

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



CL409 waveform



CL411 waveform

1. OUTLINE OF CIRCUIT DESCRIPTION

1-1. CA1 CIRCUIT DESCRIPTION

1. IC Configuration

IC903 (RJ21P1AA0PT) CCD imager
IC904 (LR366854) V driver

2. IC903 (CCD)

[Structure]

Interline type CCD image sensor

Optical size	1/1.8 inch format
Effective pixels	2080 (H) x 1544 (V)
Pixels in total	2096 (H) x 1560 (V)
Optical black	
Horizontal (H) direction:	Front 2 pixels, Rear 52 pixels
Vertical (V) direction:	Front 5 pixels, Rear 2 pixels
Dummy bit number	Horizontal : 28 Vertical :2

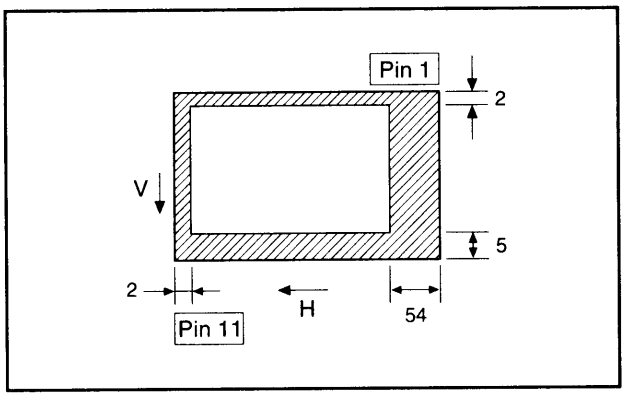


Fig. 1-1.Optical Black Location (Top View)

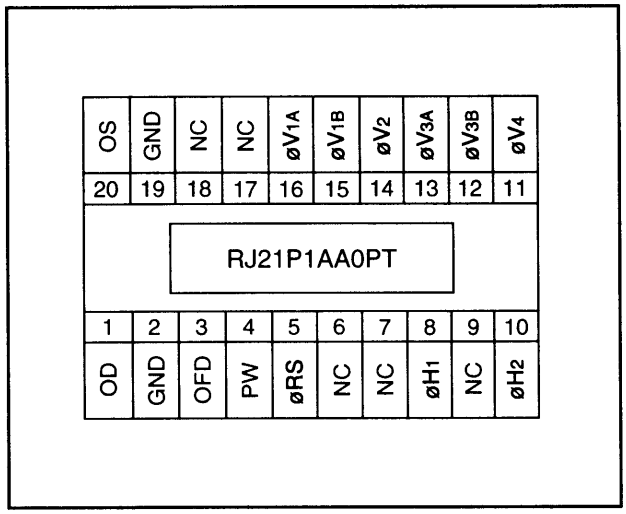


Fig. 1-2. Terminal Name and Arrangement

Pin No.	Symbol	Pin Description	Waveform	Voltage
1	OD	Circuit power	DC	15 V
2, 19	GND	GND	GND	0 V
3	OFD	Substrate clock	DC	Aprox. 8.5 V
4	PW	Protection transister bias	DC	-7.0 V
5	ØRG	Reset gate clock		12.5 V, 17.5 V
6, 9, 17, 18	NC			
7	OOFD	Substrate voltage bias	DC	Aprox. 10 V (Different from every CCD)
8	HØ1	Horizontal register transfer clock		0 V, 5 V
10	HØ2	Horizontal register transfer clock		0 V, 5 V
11	VØ4	Vertical register transfer clock		-7.0 V, 0 V
12, 13	VØ3A, VØ3B	Vertical register transfer clock		-7.0 V, 0 V, 15 V
14	VØ2	Vertical register transfer clock		-7.0 V, 0 V
15, 16	VØ1A, VØ1B	Vertical register transfer clock		-7.0 V, 0 V, 15 V
20	OS	Signal output		Aprox. 10 V

Table 1-1. CCD Pin Description

----When sensor read-out

3. IC904 (V Driver)

A V driver (IC904) is necessary in order to generate the clocks (vertical transfer clock and electronic shutter clock) which driver the CCD.

In addition the XV1-XV4 signals which are output from IC102 are the vertical transfer clocks, and the XSG1 and XSG signal which is output from IC102 is superimposed onto XV1 and XV3 at IC904 in order to generate a ternary pulse. In addition, the XSUB signal which is output from IC102 is used as the sweep pulse for the electronic shutter, and the RG signal which is output from IC102 is the reset gate clock.

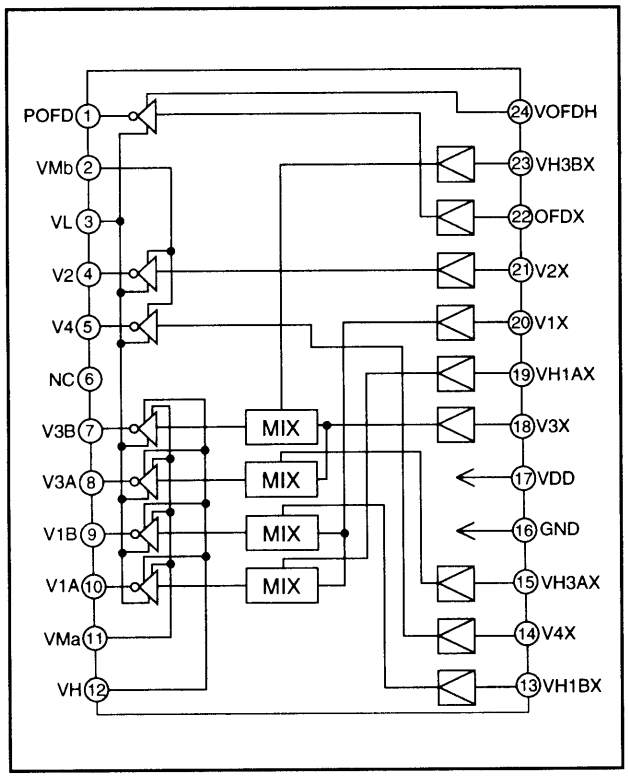


Fig. 1-3. IC904 Block Diagram

4. Lens drive block

4-1. Focus drive

The four control signals (FIN1, FIN2, FIN3 and FIN4) with different phases which are output from the ASIC expansion port (IC106) are converted into drive pulses (FOUT1, FOUT2, FOUT3 and FOUT4) by the motor driver (IC953), and are then used to drive the stepping motor for focusing operation. Detection of the standard focusing positions is carried out by means of the photointerruptor (FOCUS PI) inside the lens block.

4-2. Iris and shutter drive

The two control signals (IIN1 and IIN2) which are output from the ASIC expansion port (IC106) are converted into drive pulses (SHUTTER 3, SHUTTER 4) by the motor driver (IC953), and are then iris opened/middle/little and moved.

The two control signals (SIN1 and SIN2) which is output from the ASIC expansion port (IC106) is converted into a drive pulse (SHUTTER 1 and SHUTTER 2) by the motor driver (IC953), and are then shutter opened and closed.

4-3. Zoom drive

The two control signals (ZIN1 and ZIN2) which are output from 8-bit micro-processor are converted into drive pulses (DC_M_P and DC_M_M) by the motor drive (IC951), and are then used to drive the DC motor for zoom operation.

Detection of the standard zoom positions is carried out by means of the photointerruptor (ZOOM RESET1) inside the lens block. Getting of the zoom positions is carried out by means of the two photo-interrupters (ZOOM PLUSE1 and ZOOM PLUSE2) by counting 8-bit micro-processor inside the lens block.

5. Circuit Description

5-1. 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.

5-2. 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.

5-3. 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.

5-4. SDRAM controller

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

5-5. Communication control

1. UART

The RS-232C can be sued for both synchronous and asynchronous transmission.

2. SIO

This is the interface for the 8-bit microprocessor.

3. PIO/PWM/SIO for LCD

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

5-6. TG/SG

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

5-7. Digital encorder

It generates chroma signal from color difference signal.

5-8. JPEG encorder and decorder

It is compressed and elongated the data by JPEG system.

6. 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.

7. LCD Block

LCD Block is in the CA3 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: fixed at DC) 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.

1-2. ST1 POWER CIRCUIT DESCRIPTION

1. Outline

This is the main power circuit, and is comprised of the following blocks.
Switching controller (IC501)
Digital 5 V and analog system power output (T5001, Q5001)
Digital 2.5 V system power supply (Q5007)
Digital 3.4 V system power supply (Q5018)
LCD system power supply (Q5008, T5002)
Backlight power supply output (Q5013)
Inverter output (T5003, Q5017)

2. 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, only CH2 (digital 5 V, analog system), CH4 (LCD system), CH3 (digital 2.5 V), CH1 (digital 3.4 V) and CH5 (backlight system) are used. Feedback from 5 V (D) (CH2), 2.5 V (D) (CH3) , 12.4 V (L) (CH4), 3.4 V (D) (CH1) and 9 V (L) (CH5) power supply outputs are received, and the PWM duty is varied so that each one is maintained at the correct voltage setting level.

2-1. 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 control signal (P ON) are recontrolled to restore output.

3. Digital 3.4 V Power Output

3.4 V (D) is output. Feedback is sent to pin (41) of the switching controller (IC501) for PWM control to be carried out.

4. Digital 5 V and Analog System Power Output

5.1 V (D) , 15.0 V (A), -7.0 V (A) and 5.1 V (A) are output. Feedback for the 5.1 V (D) is provided to the switching controller (Pins (35) of IC501) so that PWM control can be carried out.

5. Digital 2.5 V System Power Output

2.5 V (D) is output. Feedback is provided to the swiching controller (Pin (23) of IC501) so that PWM control can be carried out.

6. LCD System Power Output

12.4 V (L) is output. Feedback for the 12.4 V (L) is provided to the switching controller (Pins (22) of IC501) so that PWM control can be carried out.

7. Backlight Power Supply output

9.0 V (L) is output. Feedback is sent to pin (17) of the switching controller (IC501) for PWM control to be carried out.

8. Inverter Output

The backlight uses a flat picture tube. When INV CLK is input, Q5017 carries out switching operations, so that T5003 is energized and a high-voltage pulse is generated between pins (5) and (8) of T5003. This high-voltage pulse is applied to the backlight to make it illuminate.

1-3. SY1 CIRCUIT DESCRIPTION

1. Configuration and Functions

For the overall configuration of the SY1 circuit board, refer to the block diagram. The SY1 circuit board centers around a 8-bit microprocessor (IC301), and controls camera system condition (mode).
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 input and output for zoom and lens control.

Pin	Signal	I/O	Outline	
1~4	SCAN OUT 0~3	O	Key matrix output	
5	P ON	O	DC/DC converter ON/OFF signal	H : ON
6	PA ON	O	DC/DC converter (analog) ON/OFF signal	H : ON
7	LCD ON	O	LCD monitor power ON/OFF signal	H : ON
8	PICTL	O	Photo interrupter ON/OFF control	L : ON
9	VSS	-	GND	
10	VDD	-	Power supply terminal	
11	SELF	O	Red-eye reduction, self, AF assistance luminous drive	H : Lamp lighting
12	LED 1 (VF LED R)	O	VF LED (red) ON/OFF signal	L : LED lighting
13	NOT USED	-	-	
14	NOT USED	-	-	
15	LED 2 (VF LED G)	O	VF LED (green) ON/OFF signal	L : LED lighting
16	WAKE UP	O	SPARC wake up terminal	
17	NOT USED	-	-	
18	SI/PRG SI	I	Serial communication data input (used flash rewrite)	
19	SO/PRG SO	O	Serial communication data output (used flash rewrite)	
20	SCK/PRG SCK	O	Serial communication clock output (used flash rewrite)	
21	V JACK	I	Video output cable connection detection signal	L : Connection
22	DIN CONNECT	I	Serial cable connection detection	
23	CHG ON	O	Flash charge ON/OFF signal	H : ON
24	VDD	-	Power supply terminal	
25	AVSS	-	A/D converter GND power terminal	
26~29	SCAN IN 0~3	I	Key matrix input	
30~31	NOT USED	-	-	
32	CHG VOL	I	Storobe charge voltage input (analog input)	
33	BATTERY	I	Battery voltage input	
34	AVREF	I	A/D converter standard voltage input terminal	
35	AVDD	-	A/D converter analog power terminal	
36	RESET	I	Reset input	
37	XCOUT	O	Sub clock oscillation terminal (32.768 kHz)	
38	XCIN	I	Sub clock oscillation terminal	
39	IC	-	Connect to VSS	
40	XOUT	O	Main clock oscillation terminal (4MHz)	
41	XIN	I	Main clock oscillation terminal	
42	VSS	-	GND	
43	BAT OFF	I	Battery off detection signal	
44	SREQ	I	Serial communication requirement signal	L : Requirement
45	SCAN IN4	I	Key matrix input	
46	ZPULSE1	I	Zoom motor drive pulse count 1	
47	DC CHK	I	DC power detection terminal	L : Connection
48	COM REQ	I	ASIC serial communication requirement	

See next page →

49	ZM IN 1	O	Zoom drive pulse output (normal)
50	ZM IN 2	O	Zoom drive pulse output (reversal)
51	CARD	I	Expansion memory card attachment detection signal L : Attachment
52	NOT USED	-	-
53	SCAN IN 5	I	Key matrix input
54	AVREF ON	I	A/D converter standard voltage input terminal
55	ZRESET	I	Zoom reset
56	ZPULSE 2	I	Zoom moter drive pulse count 2
57	USB	I	USB cable connection detection signal
58	RXD	I	Host wake up input terminal
59	SELF BPS	O	Red-eye reduction lamp rush electric current limitation
60	SCAN OUT4	O	Key matrix output
61	NOT USED	-	-
62	ASIC TEST	O	ASIC reset control signal
63	ASIC RESET	O	ASIC reset signal
64	MAIN RESET	O	SPARC reset signal

Table 4-1. 8-bit Microprocessor Port Specification

2. Internal Communication Bus

The SY1 circuit board 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.

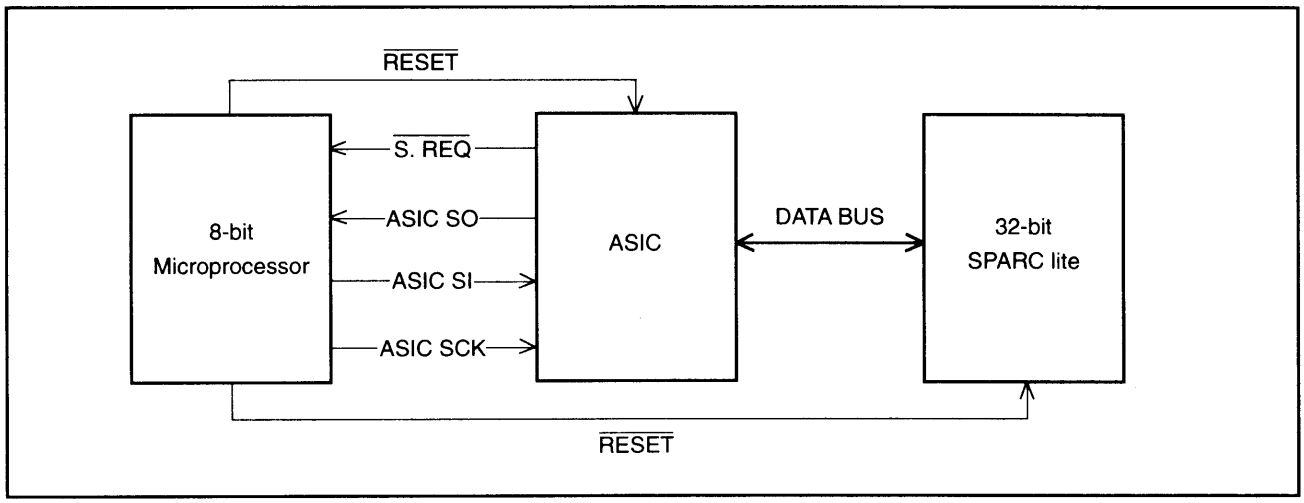


Fig. 4-1 Internal Bus Communication System

3. Key Operaiton

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

SCAN OUT \ SCAN IN	0	1	2	3	4	5
0	RIGHT	LEFT	UP	DOWN	POWER ON/OFF	TEST
1	AFM	SBM	RELEASE (S2)	HALF-PUSH (S1)	-	NET
2	MENU	TELE	QUICK	+/–	WIDE	BAT SW
3	CSM	MOVIE	SET UP	PLAY	AUTO	SCENE

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 IC304, 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 memory backup capacitor. 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	RS232C driver	CCD	8 bit CPU	LCD MONITOR
Power voltage			3.3 V	3.3 V	3.3 V	5 V (A) +15 V -7.5 V	3.3 V (ALWAYS)	5V (L) +12V etc.
SLD	OFF		OFF	OFF	OFF	OFF	32 KHz	OFF
	PLAY		ON	ON	ON	OFF	3 MHz	ON
	M-REC A-REC	Power switch ON- Auto power OFF	OFF	OFF	OFF	OFF	3 MHz	OFF
		Shutter switch ON	ON	ON	ON	ON↔OFF	3 MHz	OFF
		MOS, QSW, SBM etc. ON	OFF	OFF	OFF	OFF	3 MHz	OFF
		LCD finder	ON	ON	ON	ON	3 MHz	ON

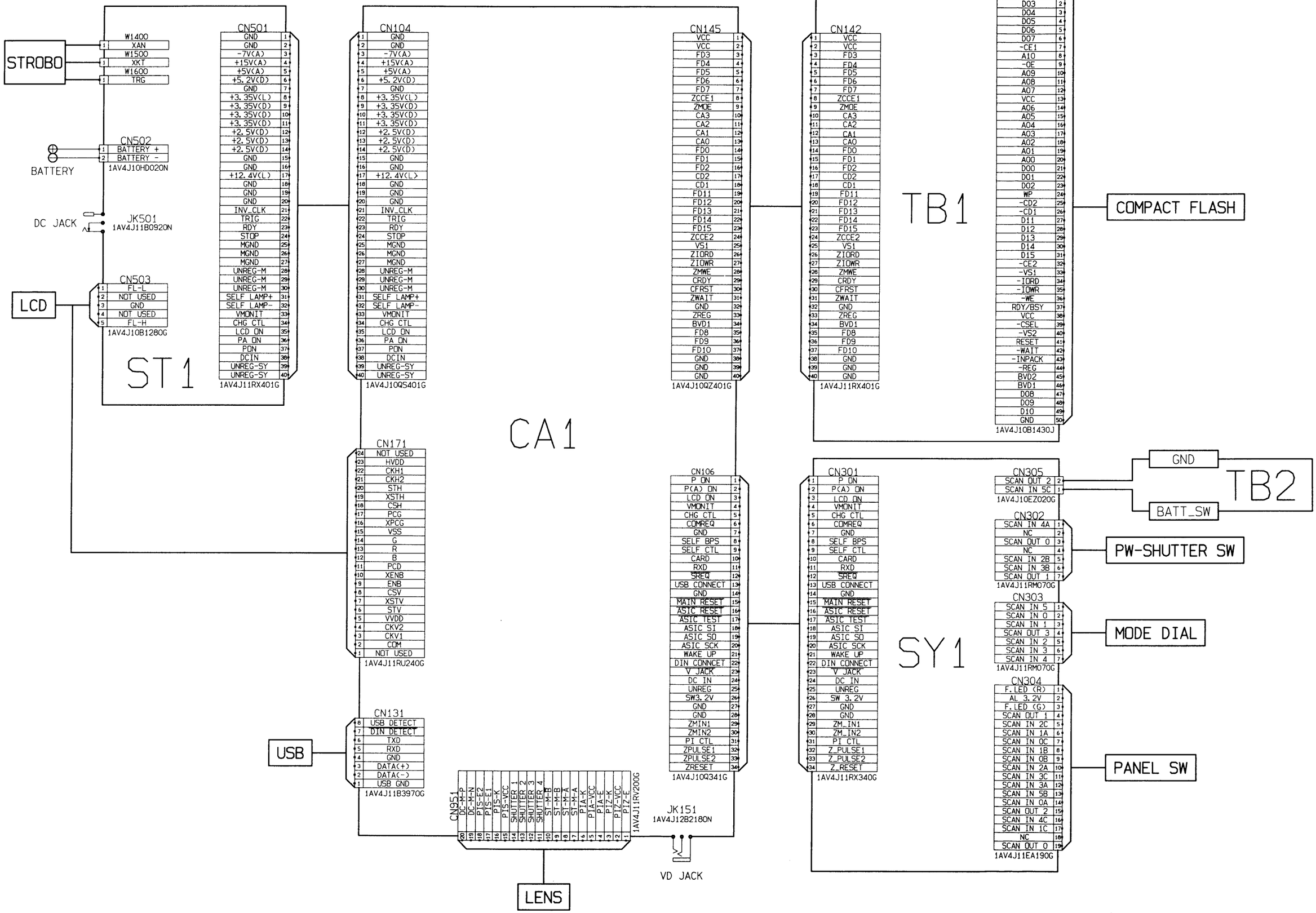
Table 4-3. Camera Mode

			SPARC Lite	ASIC, memory	RS232C Driver	CCD	8 bit CPU	LCD MONITOR
Power voltage			3.3 V	3.3 V	3.3 V	5 V (A) +15 V -7.5 V	3.3 V (ALWAYS)	5 V (L) +12V etc.
SLD	OFF		OFF	OFF	OFF	OFF	32 KHz	OFF
	M-REC A-REC PLAY	Power switch ON- Auto power OFF	OFF	OFF	OFF	OFF	3 MHz	OFF
		Take a picture	ON	ON	ON	ON↔OFF	3 MHz	OFF
		Erase image	ON	ON	ON	OFF	3 MHz	OFF
		Download image	ON	ON	ON	OFF	3 MHz	OFF
		Continuous image	ON	ON	ON	ON	3 MHz	OFF
		Message from host	ON	ON	ON	OFF	3 MHz	OFF

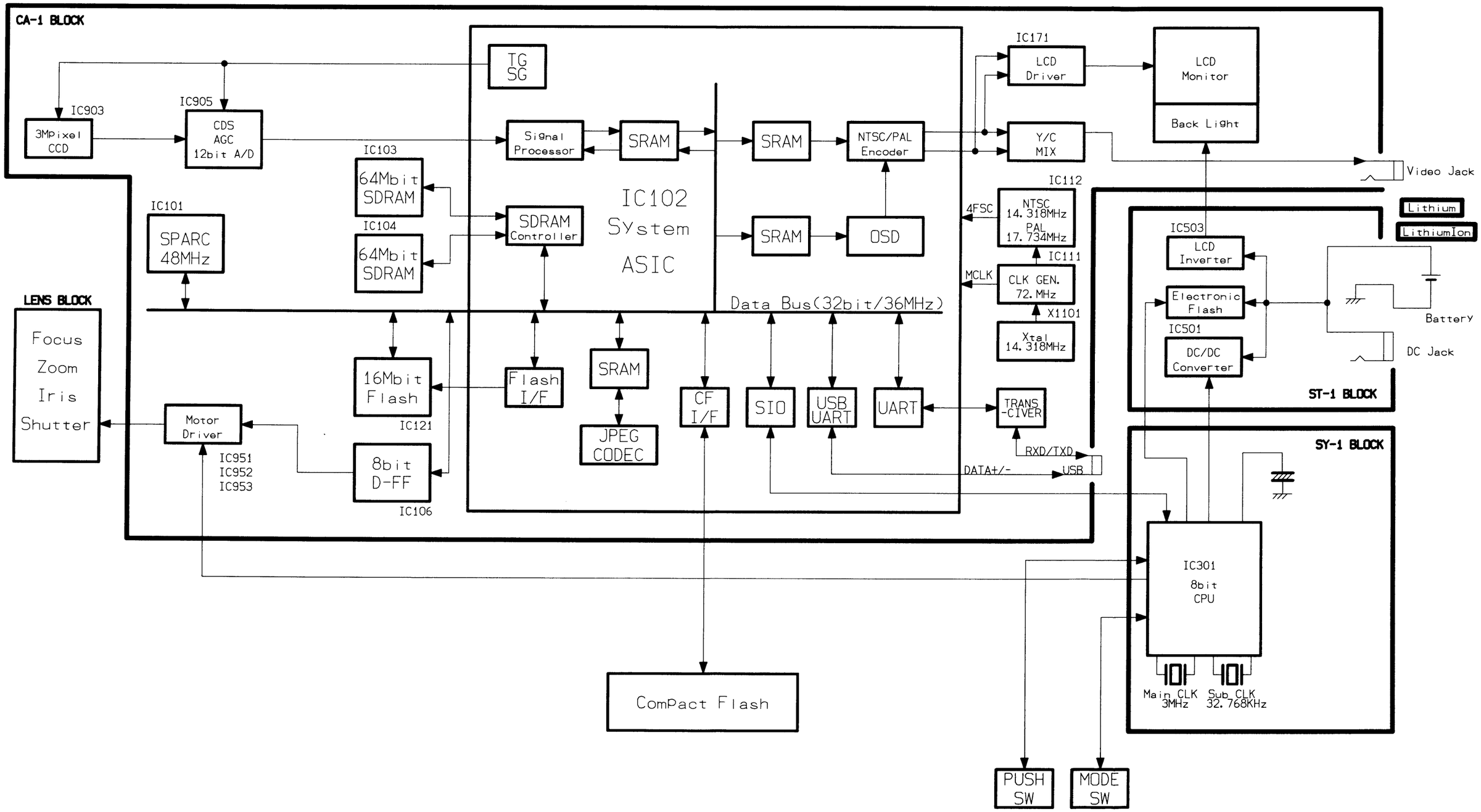
Note) 3 MHz = Main clock operation, 32 kHz = Sub clock operation

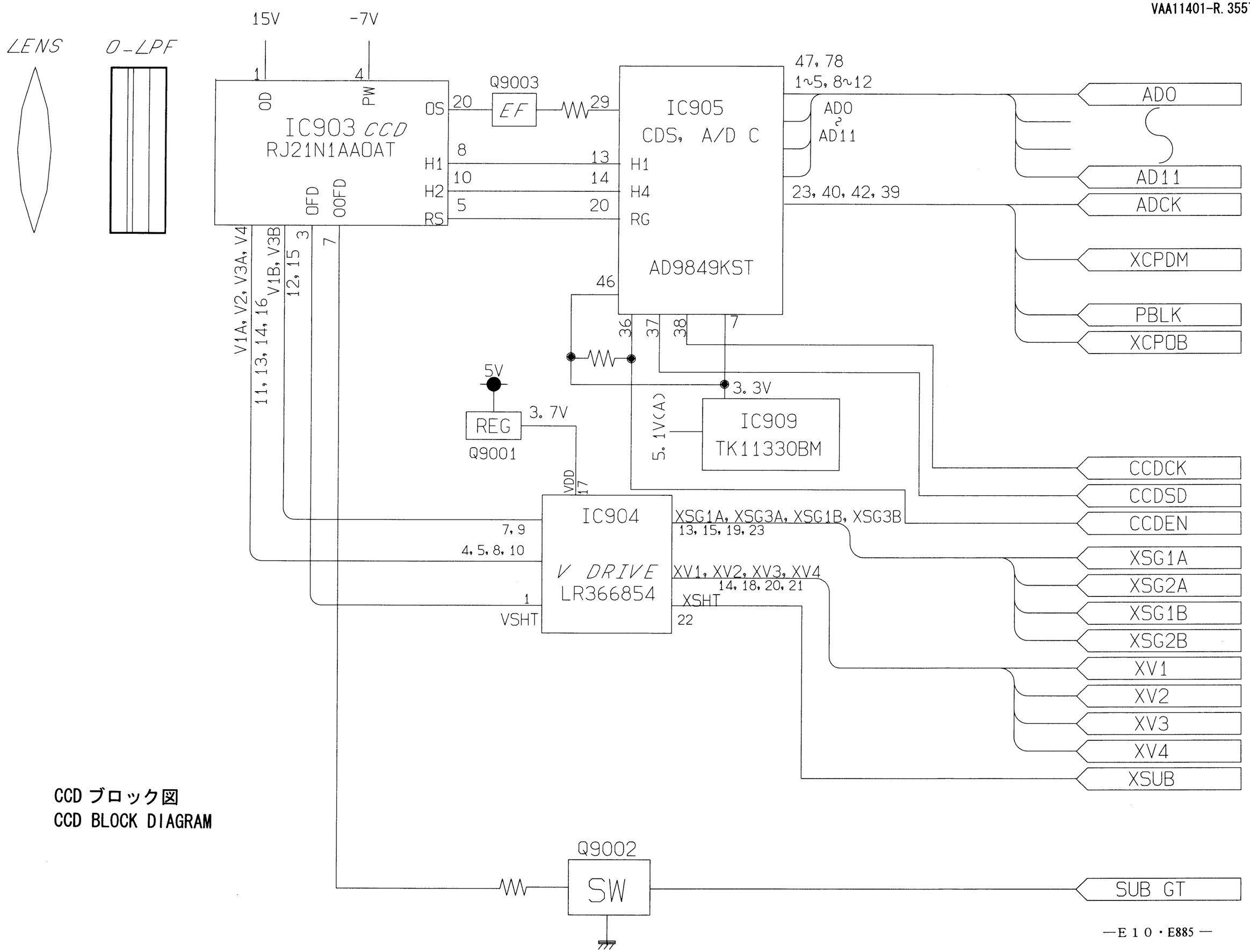
Table 4-4. Host Mode

総合結線図
OVERALL WIRING



総合ブロック図
OERALL BLOCK DIAGRAM





CCD ブロック図
CCD BLOCK DIAGRAM

CA1_CCD

C1-29200/SX383-JNK

TO CA/ MAIN

TGHD
TGVD
XSG1B
XV4
XSG2A
XV3
XSG1A
XV1
XV2
XSUB
XSG2B
SUBGT

IC904
LR366854
V. DRIVER

IC903
CCD
RJ21NAA0AT

IC905
AD9849KST
CDS A/D_C

IC909
TK11330BM

Q9001 2SD1819A
Q9002 2SD1819A
Q9003 2SC3931
Q9004 DTC114EE
D9001 MA727
D9002 05H01S
D9003 05H01S

CCDEN
CCDSD
CCDCK
XCPOB
XCPDM
XPBLK
ADCK

+5.1V(A)
-7V(A)
+15V(A)
VDD3

L9001 MPZ2012S331AT

RB901 220
RB902 220
RB903 220

+5. IV(A)

CCD 回路図
CCD CIRCUIT DIAGRAM

CA-1 基板
CA-1 P.C.B

TO COMPACT FLASH
TB1
CN145
-REG
-CE
IC145
TC7W74FK
IC146
TC7W74FK
WAKE UP
RESET/SREQ/SO
SCK/SI
CN106
TO SY-1
IC131
SP3232ECY
RXD/TXD
RXD/TXD
X1101
IC111
IMIC6002ATD
Clock Gen.
NTSC:14.31818MHZ
PAL :17.734476MHZ
DATA+/DATA-
Serial
USB
CN131
JK151
VIDEO OUT
Video Jack
IC101
MB86836PMT2-G-BND
BGA
RISC CPU
CKIN1
CKIN2
IC102
KS5M9U1262CBP
BGA
SYSTEM ASIC
ZCCE
ZREG
FD[0::15]
CA[0:3]
A[0:24]
D[0:31]
ADDRESS
DATA
COUT
YOUT
Q1502
Q1501
Q1503
AMP
IC152
TK15405TM
INVCLK
CN104
TO ST-1
LCD C
LCD Y
LCD Driver
IC171
LV4137W
LCD BLOCK
CN171
TO LCD
XHC1:2]
XVC1:4]
XSG[1A:2B]
XSUB
V
SG
SUB
CCD
BLOCK
SA[0:13]
SD[0:15]
SD[16:31]
CCD[0:11]
AD[0:11]
ADCK/PBLK
IC121
MBM29LV160
-TE90PCV
16Mbit FLASH
IC103
UPD45163G5
64Mbit SDRAM
IC104
UPD45163G5
64Mbit SDRAM

ブロック図
BLOCK DIAGRAM

CA-1 基板
CA-1 P. C. B

回路図
CIRCUIT DIAGRAM

CA1_LENS

C1-29200/SX383-JNK

TO MAIN

IC952
S-8520B33MC-ARC-T2

ZOOM AND FOCUS DRIVE
IC953
UPD16810 1MA-6A5

TO LENS
CN951

CA1_LCD

C1-29200/SX383-JNK

VOLTAGE: PLAY & LCD ON

LCD DRIVER
IC171
LV4137W

IC173
IC113302M
REGULATOR

CN171
TO LCD

CA1_MAIN

C1-29200/SX383-JNK

VOLTAGE: PLAY & LCD ON

CN104
TO ST1 CN501

TO CCD

TO LENS

CPU
IC101
MB86836PMT2-G-BND

IC102
KS5M0U1387CBP
ASIC

JTAG

IC121
MBM29LV160TE90PCV
PROGRAM-FLASH

IC103
SDRAM
UPD45616365-A10B-9J

IC104 SDRAM
UPD45616365-A10B-9J

CLOCK-GENERATOR
IC1101
IMC600A7D

X1101
RIVER

IC145
TC7W74FK

IC146
TC7W74FK

IC144
TC7W32FK

IC106
SN74LV273ADB

IC152
TK15420M
VIDEO AMP

CN145
TO TB1 CN142

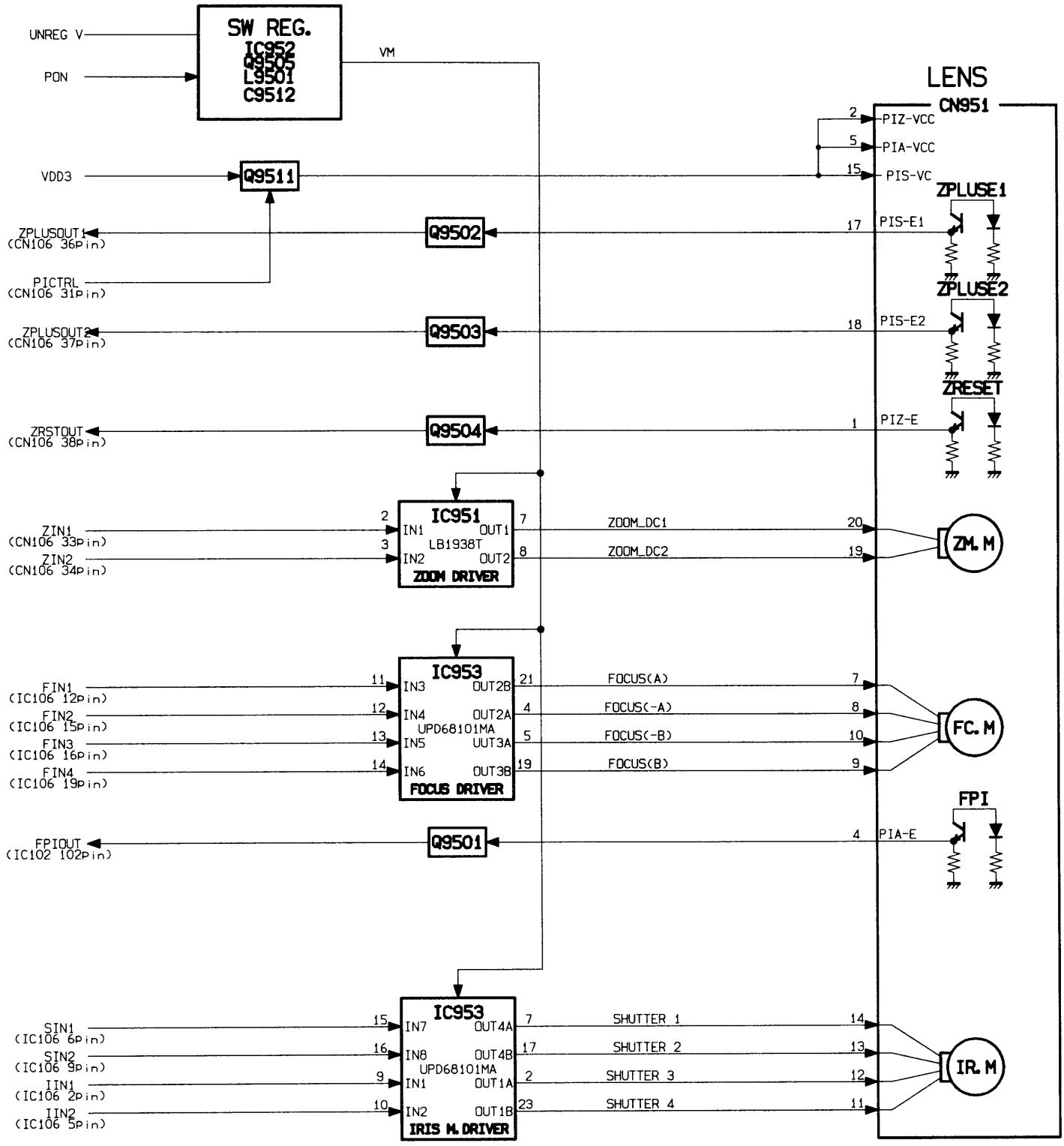
CN106
TO SY1 CN301

JK151
VD JACK

TO USB
CN131

—E 1 3 · E885 —

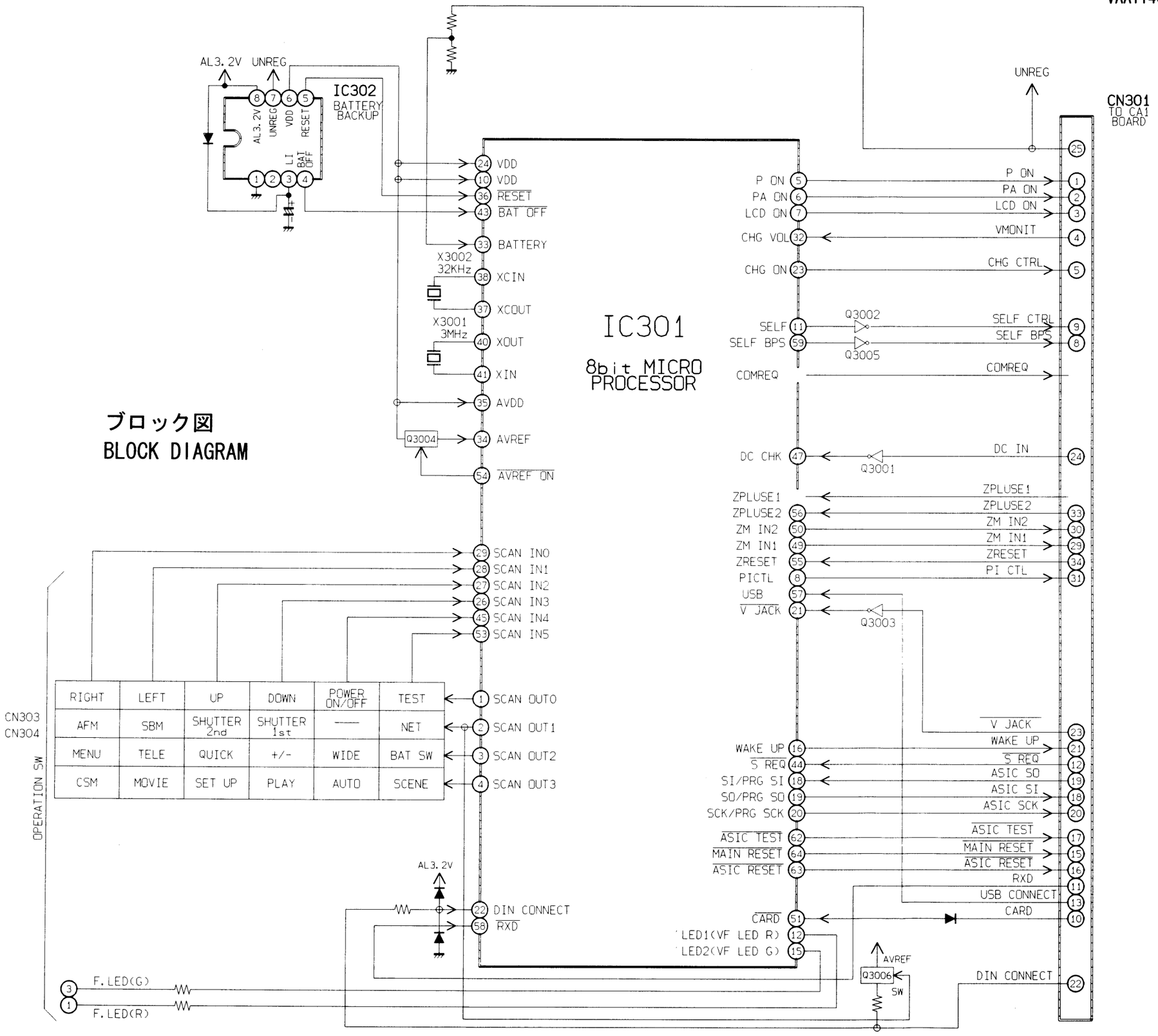
CA-1 基板
CA-1 P.C.B



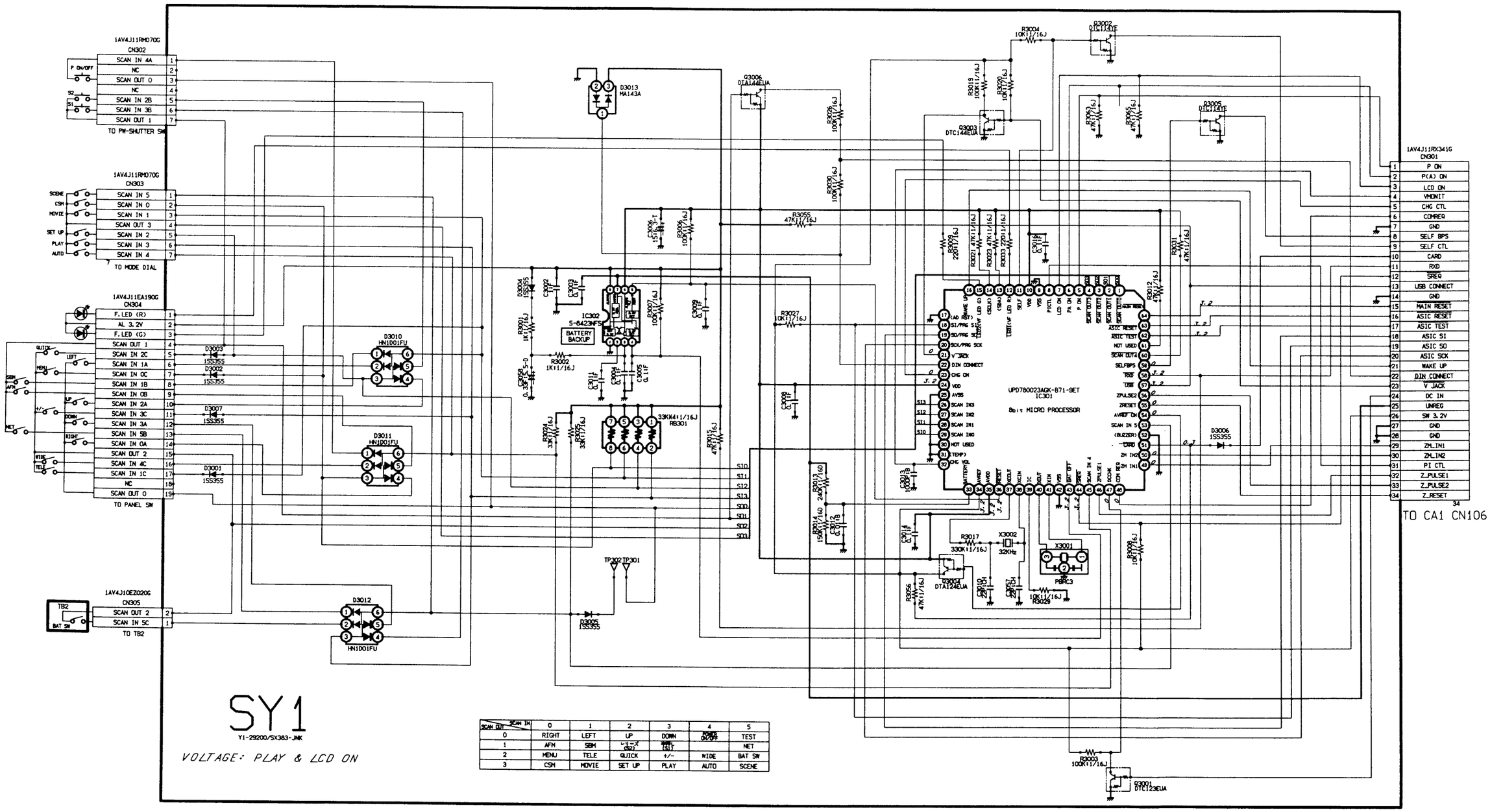
レンズ　回路図
CIRCUIT　DIAGRAM

SY-1 基板
SY-1 P.C.B

ブロック図
BLOCK DIAGRAM



SY-1 基板
SY-1 P.C.B

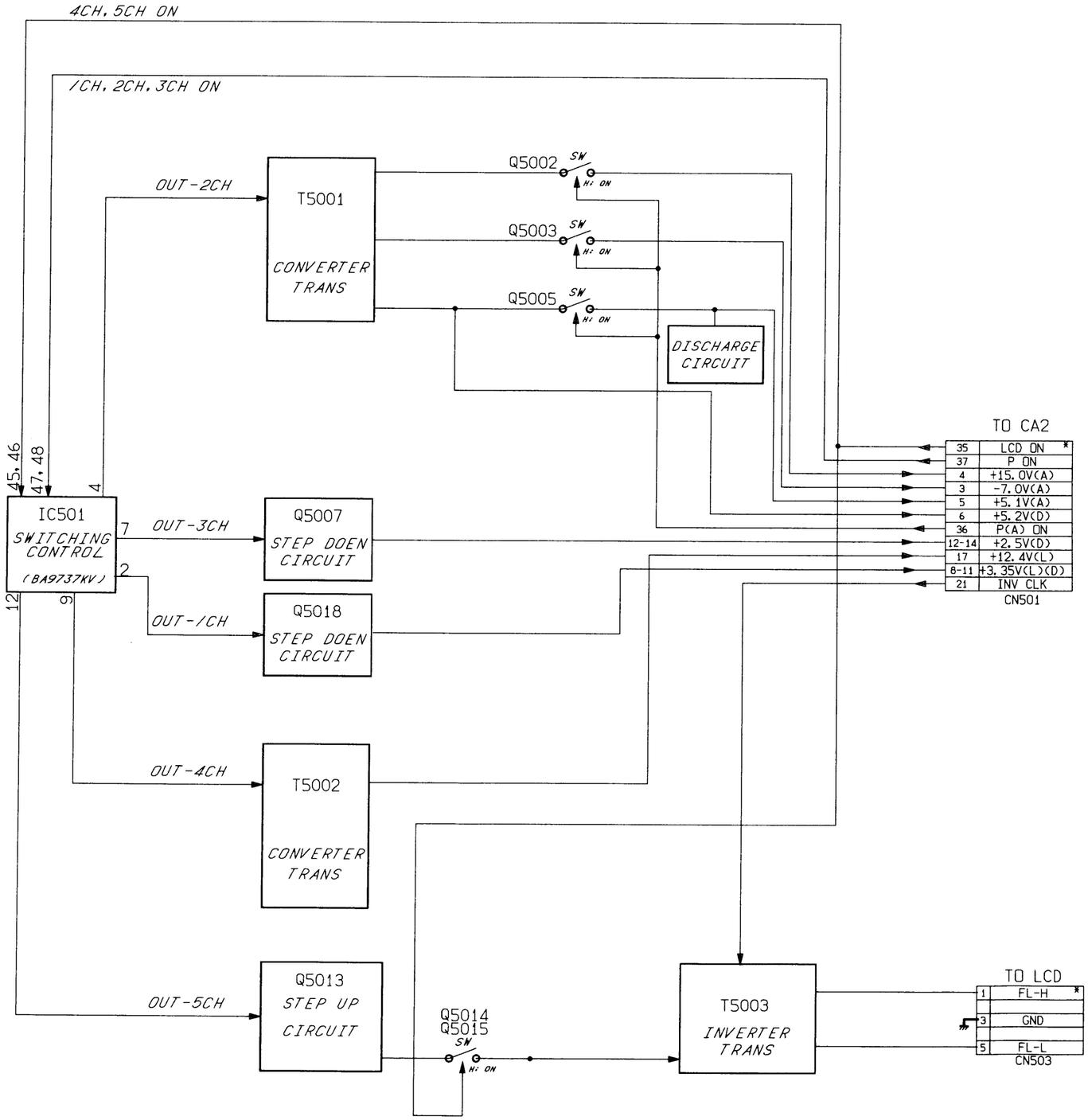


SCAN OUT \ SCAN IN	0	1	2	3	4	5
0	RIGHT	LEFT	UP	DOWN	POWER ON/OFF	TEST
1	AFH	SBM	W-Z (REC)	W-T (PLAY)		NET
2	MENU	TELE	QUICK	+/-	WIDE	BAT SW
3	CSH	MOVIE	SET UP	PLAY	AUTO	SCENE

回路図
CIRCUIT DIAGRAM

ST-1 基板
ST-1 P.C.B

ST-1 POWER BLOCK DIAGRAM



ブロック図
BLOCK DIAGRAM

ST-1 基板
ST-1 P.C.B

回路図
CIRCUIT DIAGRAM

ST1

S1-29200/SX383-JNK

VOLTAGE: PLAY & LCD-ON

R & C IS 1005 SIZE OTHERWISE NOTED

FLASH REFLECTOR

W1400 RED XAN
W1600 GRAY TRG
W1500 BLACK XKT

T5402 1AV4L17B00400

T5401 1AV4L17B0110G

D5405 CR0BAS-8

Q5409 CY25AAJ-8

DC JACK JK501 1AV4J11B518ON

HEC3110-01-0100ID510EN

2 CN502 BATTERY + / BATTERY -

BATTERY 1AV4J10HD020N

IC501 BD9731KV SWITCHING CONTROL

CH2 (CCD)

T5001 1AV4L51B4440G

CH1 (DIGITAL3.35V)

CH3 (DIGITAL2.55V)

CH4 (LCD)

T5002 1AV4L51B4310G

CH5 (BACK LIGHT)

T5003 1AV4L51B2170G

+15.0V(A)
-7.0V(A)
+5.1V(A)
+5.2V(D)
+3.35V(D)
+2.55V(D)
+12.4V(L)
+5.1V(D)
+9.0V(L)
+3.35V(D)
+2.55V(D)
+12.4V(L)

SYNC

1AV4J11RX401G

CN501

1	GND
2	GND
3	-7V(A)
4	+15V(A)
5	+5V(A)
6	+5.2V(D)
7	GND
8	+3.35V(L)
9	+3.35V(D)
10	+3.35V(D)
11	+3.35V(D)
12	+2.5V(D)
13	+2.5V(D)
14	+2.5V(D)
15	GND
16	GND
17	+12.4V(L)
18	GND
19	GND
20	GND
21	INV CLK
22	TRIG
23	RDY
24	STOP
25	MGND
26	MGND
27	MGND
28	UNREG-M
29	UNREG-M
30	UNREG-M
31	SELF LAMP+
32	SELF LAMP-
33	VMONIT
34	CHG CTL
35	LCD ON
36	PA ON
37	PON
38	DCIN
39	UNREG-SY
40	UNREG-SY

TO CA1 CN104

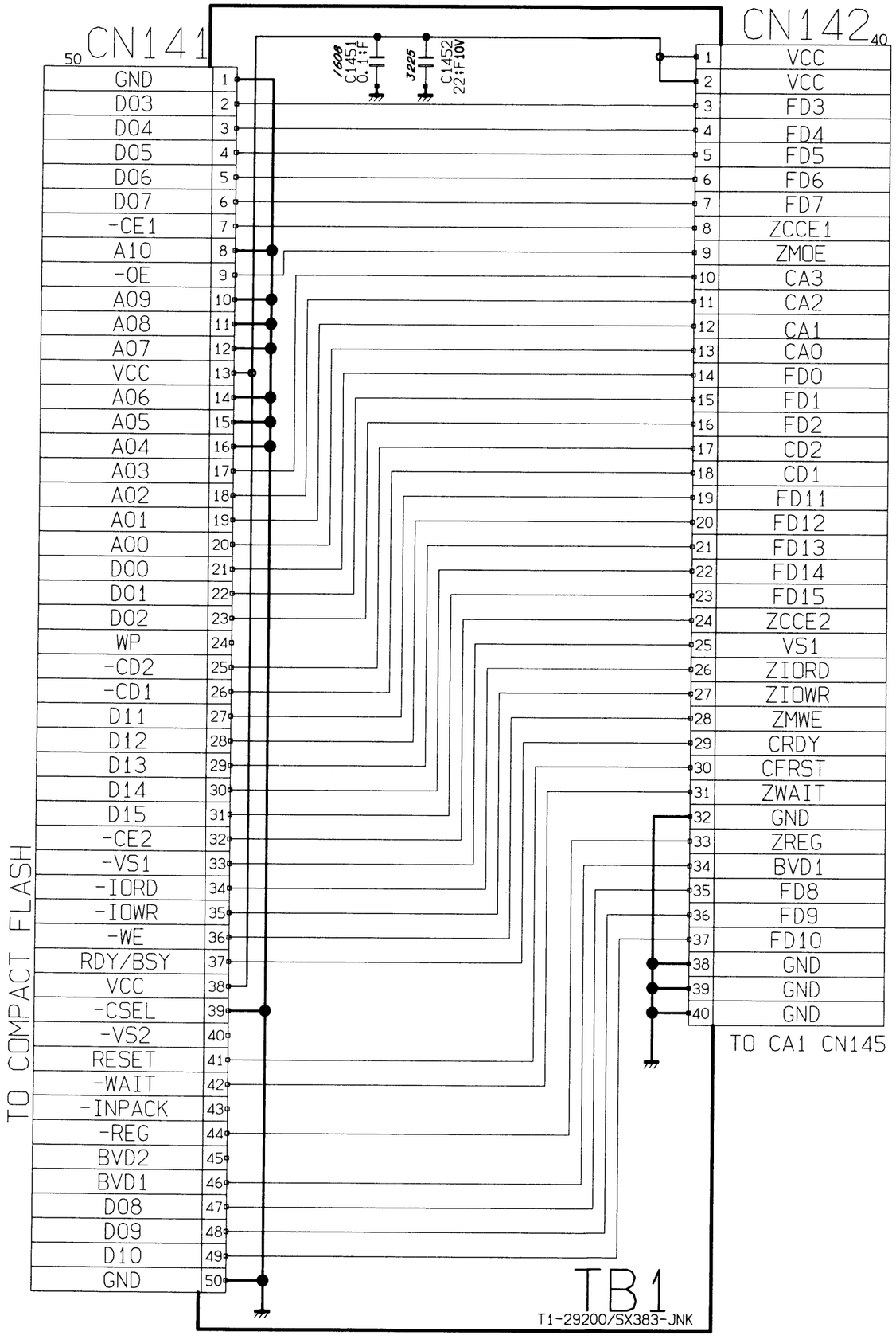
CN503 (TO LCD)

1	FL-L
2	NOT USED
3	GND
4	NOT USED
5	FL-H

1AV4J10B1280G

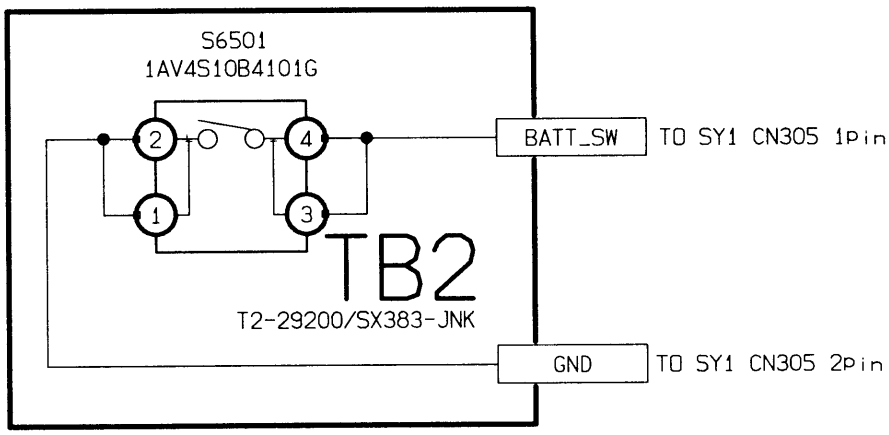
FILAMENT LAMP

TB-1 基板
TB-1 P.C.B



回路図
CIRCUIT DIAGRAM

TB-2 基板
TB-2 P.C.B



回路図
CIRCUIT DIAGRAM

The contents of inspection standards and tools for E885

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, use a Sanyo 2CR5 lithium battery (within four months of manufacture).

   When using various manufacturers, conduct the inspection using a Sanyo, Matsushita or Duracell 2CR5 lithium 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.)

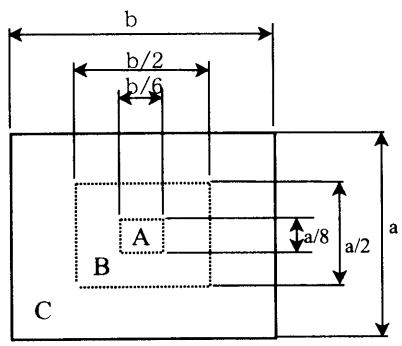
4. Standard power supply :

   Specified AC power supply EH-21 shall be required.

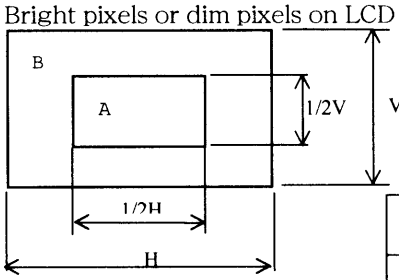
[1] Inspection standards

	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 0.5 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 ∞) 8.4 mm ±4% -Tele-end position (Compelling ∞) 23.3 mm ±4%	Dedicated tool(s)
	Open aperture F No.	-Wide-end position (Compelling ∞) F2.9 ±4% -Tele-end position (Compelling ∞) F5.2 ±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 - 6.9 ±0.4EV After charging for 10 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 5.5 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 : 1000lines Vertical center : 1000lines Horizontal line(s) at each corner : 700lines Vertical line(s) at each corner : 700lines -Set the conditions of 'Fine as the quality of image', 'AWB', 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-convertor
	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>210±20</td><td>215±20</td><td>215±20</td></tr>
<tr><td>Y e</td><td>210±20</td><td>215±20</td><td>80±15</td></tr>
<tr><td>R</td><td>210±20</td><td>25±15</td><td>10±10</td></tr>
</table>
-Set the conditions of 'Fine as the quality of image', 'AWB', 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>9μm or smaller</td><td>0pc</td><td>2pcs. or less</td><td>3pcs. or less</td></tr>
<tr><td>10~20μm</td><td>0pc</td><td>0pc</td><td>1pcs. or less</td></tr>
<tr><td>21μm or larger</td><td>0pc</td><td>0pc</td><td>0pc</td></tr>
</table>


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

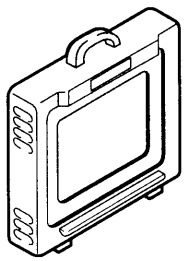
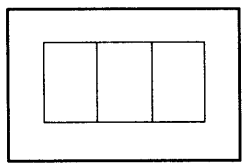
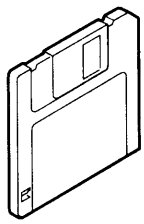
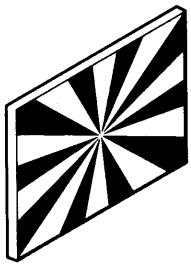
<table>
<tr><th></th><th>Item</th><th>Criteria</th><th>Applied tool(s)</th></tr>
<tr><td rowspan="2">LCD
and others</td><td>Monitor LCD</td><td>External view
-No vignetting or shading on the LCD shall be required.V
-Inclination between the monitor and the monitor frame shall not be so outstanding.
Field 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>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 rowspan="2">Electrical Characters-tics</td><td>For consumption current</td><td>Stand-by
- Less than 0.15 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 rowspan="2">Standard power supply

Ammeter</td></tr>
<tr><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)
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)
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)
While lowering the power supply voltage, lightly press the shutter release button.
Then, when the LCD is turned off, measure the voltage</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 E900,E950 E700,E800 E990,E880 E995,E775 E885 共通 Common
J63056	色調整用チャート Chart for Colour Adjustment		E900,E910 E900,E950 E700,E800 E990,E880 E995,E775 E885 共通 Common
J65042	キャリブレーションソフト Calibration Software		E995,E775 E885 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 E900,E950 E700,E800 E990,E880 E995,E775 E885 共通 Common