VAA10901-R.3481.A

作成承認印	配布許可印
ニコン 映像事業 CS推進部 GM	サービス計画課 M

03005044

D1

VAA10901
(JAPAN/NTSC)

VAA10902
(USA/EN/NTSC)

VAA10903
(EP/PAL)

REPAIR MANUAL

Nikon | NIKON CORPORATION
Tokyo, Japan

Printed in Japan September 1999

Specifications

1. Specifications

(1) Mechanical configuration

The camera function section of the unit's mechanical block is basically inherited from the F100 and other SLRs.

Changes to the shutter and additions such as a CCD bracket and rear body (required when configuring a digital camera) have also been made.

1) Common camera parts

Front panel assembly: Lens mount, mirror box, AF module, sequence board, prism box, etc.

Top cover assembly: Power switch, various buttons, various dials

Bottom cover: Vertical position release and other operation parts

2) CCD bracket assembly

A CCD board and optical LPF are attached to the CCD bracket to form this assembly. The CCD bracket assembly ensures precision and, when linked with a die-cast boss (machined surface), ensures precision of the installation position of the supported

[Precautions on Handling CCDs]

If dirt gets on the CCD (optical LPF surface), shadows of this dirt will appear as black dots on the image being captured. The optical LPF surface is made from a very easily scratched material and requires particular care when cleaning. Also, since there is a possibility of damage due to static discharge, always use a wristband and conducting mat when handling. If the CCD becomes damaged, replace the entire CCD bracket and perform shooting image adjustments.

3) Rear cover assembly

The unit is equipped with a 2-inch TFT LCD monitor and C/F card socket for displaying the recording image.

4) Shutter assembly

Having a rear shutter construction, the shutter is used to block light from the CCD to reduce CCD output noise.

Exposure control is handled by the CCD electronic shutter.

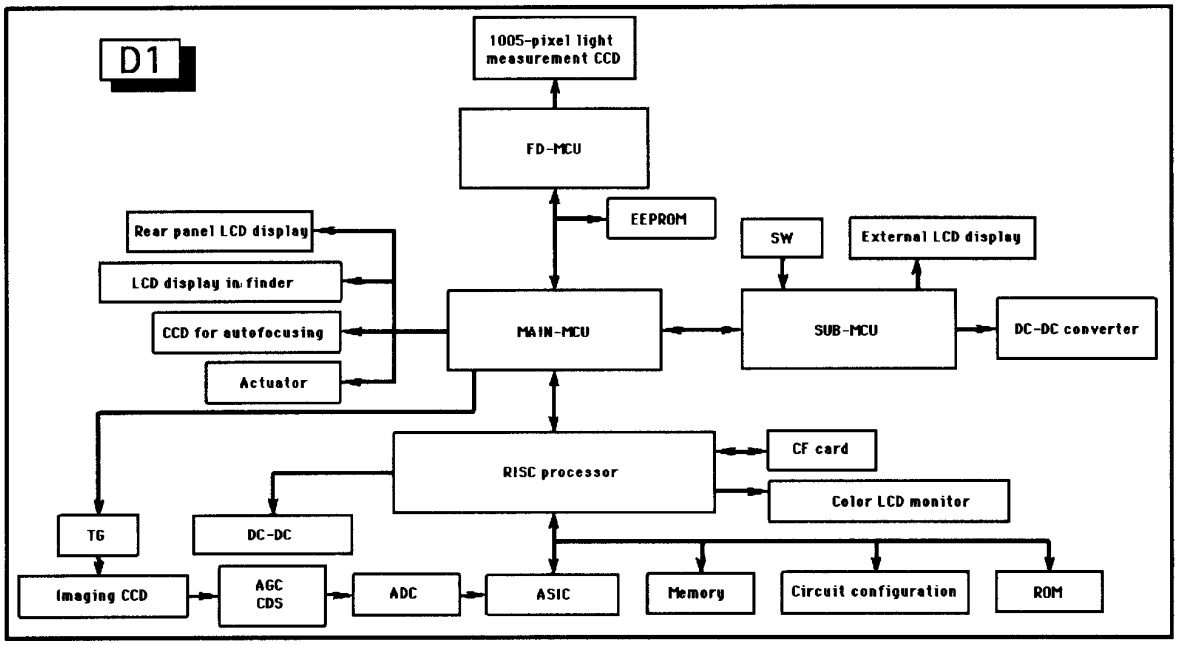
The shutter is painted a gray color (reflectivity 50%) so that it may act as a reflective surface for TTL light adjustment when using a speed light (SB-28DX).

2. Electrical Hardware Configuration

(1) The MCUs built into D1 represent the following microcomputers and processors.

Name	Model No.	Manufacturer	Description
SUB-MCU	H8/3832s	Hitachi	8-bit, w/ built-in LCD driver, 32-KHz sub-clock, ROM/RAM-16K/512
FD-MCU	V850E/MS1	NEC	32-bit RISC
MAIN-MCU	H8S/2355	Hitachi	16-bit, ROM/RAM = 128K/4K, the flash model (H8S/2357) has 128K/8K
Image processing RISC	MPC823	Motorola	32bit RISC

(2) Basic configuration block diagram



(3) Circuit configuration

The circuit configuration of the entire camera can be sorted into three systems: the CCD system, RISC system, and camera system.

●CCD system

This system consists of the CCD board, TG board, and CCD power supply board.

●RISC system

This system consists of the compressed recording board, PC I/F board, TFT drive board, TFT unit (with backlight), and inverter circuit.

● Camera system

Front body: Consists of a main FPC, post-command dial FPC, SQ-FPC, power FPC, DC/DC board, shutter FPC, Aperture FPC, CCD-WFPC, CCD-CFPC, CCD-RFPC, intermediate FPC for rewind side, AF selector FPC, 10-pin terminal FPC, TTL-FPC, AF-PI FPC, AF mode SW board,

f-f0 board, lens contact FPC, and an FPC for writing the main flash memory.

Top cover: Consists of a pre-command dial FPC, three FPC, and top cover FPC.

Bottom cover: Consists of a bottom cover FPC.

Rear cover: Consists of a rear panel display FPC

(4) Description of functions

1) Main FPC

The main functions executed by each MCU are listed below.

●SUB-MCU

- Drives external information LCD
- Starts camera power and controls power during transition to sleep status
- Detects status of setting and operation system switches
- Controls LED illumination for illumination inside finder
- Performs pulse output for adjusting brightness of superimpose LED
- Identifies power
- Communicates with MAIN-MCU

●MAIN-MCU

- AF control
- Mechanical sequence control (aperture control, mechanical shutter control)
- Generates CCD electronic shutter timing signal
- Strobe communications and strobe control
- Retrieves lens information
- Controls display of LCD inside finder and rear panel LCD
- Test communications control
- Information LCD backlight (EL) control
- Detects status of moveable system and operation system switches
- Exposure calculations
- Concentrated management of camera mode and setting information
- Communications with SUB-MCU

- Communications with FD-MCU
- Communications with image processing RISC
- Realtime clock module control
- EEPROM communications control for storing adjustment values and resume data
- Anti-vibration lens control
- Battery check

●FD-MCU

- Light measurement and color measurement calculations
- 1005-division CCD control
- Communications with MAIN-MCU

2) Compressed playback board

The main functions executed by the image processing RISC are listed below.

- Imaging CCD control
- Image data processing
- Image ASIC control
- MAIN-MCU communications
- Monitor LCD control
- PC communications control
- Recording media check and read/write control
- Camera control during communications with PC
- Video signal output control
- DC-DC converter control for imaging CCD and peripheral Circuits

3) Main IC functions (main FPC)

●U1: Main microcomputer (H8S/2355), flash-type

Various mode control, AF control, TTL control, mechanical sequence control, speed light communications, lens communications, 10-pin terminal communications, sub-microcomputer communications, finder microcomputer communications, RISC (U823) communications, creation of rear panel monochrome LCD display data, creation of top panel LCD display data

●U2: Sub-microcomputer (H8/3822S)

Communications with external switches, external LCD communications (lighting), actuator control, camera power system control, DC-DC power board control

●U3: I/F IC (M52966FP)

Speed light communications, chip select function

●U301: Finder microcomputer (V850E/MS1), flash-type

1005-sensor control, light and color measurement calculations

●U4: EEPROM (X25330)

AF adjustment values, finder adjustment values, mechanical adjustment values, TTL adjustment values, 1005-sensor adjustment values, battery check voltage adjustment values, storage of control-related parameters, storage of various settings at power restart

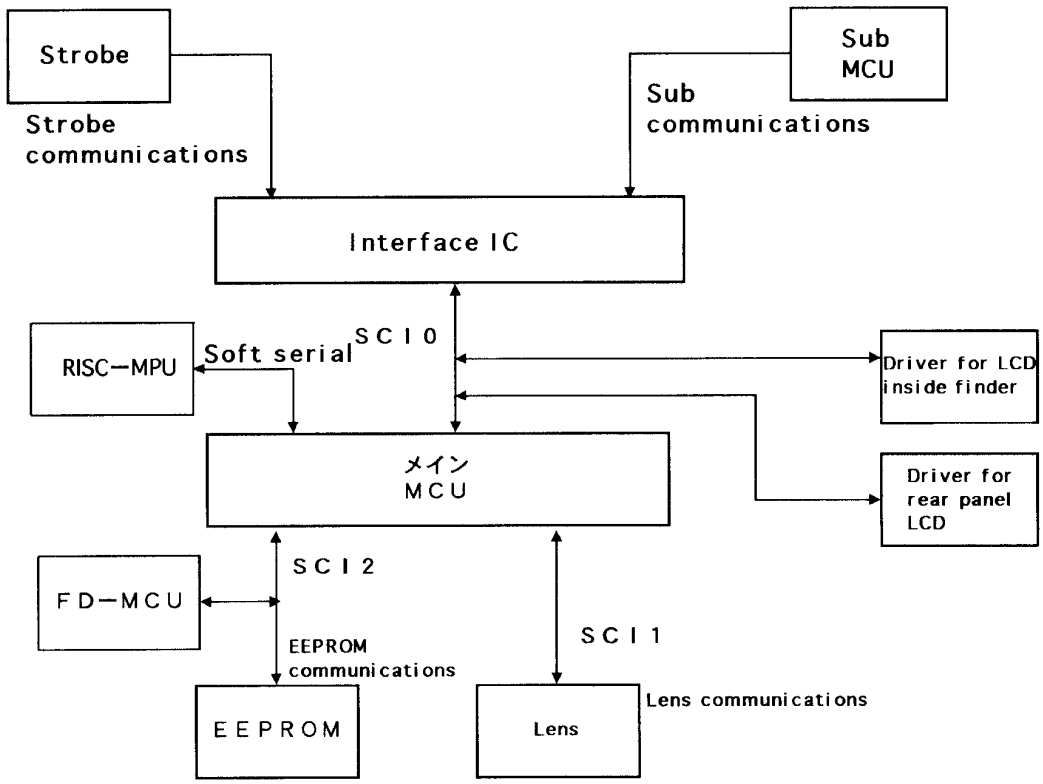
●U5: Realtime clock (S-3511A)

Clock drive (driven by backup battery)

●U302: Driver IC for finder LCD

Finder LCD communications (lighting)

(4) Communications configuration diagram



(5) Main functions of main FPC

1) MAIN-MCU

●AF control

D1 incorporates an "AP4 module" as a focus detection system. With a five-point focus area (center, left-right, top-bottom), dual cross-type sensors are used for each the center and the left-right sensors. Depending on the brightness, the fine sensor (for normal conditions) or rough sensor (for low brightness conditions) is selected and focus detection performed.

Depending on the amount of defocus detected, focusing is performed automatically by controlling the drive of the camera's AF motor when a coupling drive direction lens is attached or by indicating the drive amount via communications with the lens when an intelligent lens (AF-S or AF-I) is attached.

If the photographic subject is determined to be a moving object, moving object tracking control is performed so that the focal image plane of the photo lens matches

the motion curve of the focal position image plane of the moving object.

AF control sequence processing flow is as follows:

AF CCD calculation

⇩

Defocus calculation

⇩

Lens drive amount calculation

⇩

Lens drive control

●Power control

A power supply especially designed for the realtime clock module and the main power for all camera operations is used as the D1 power supply. Main power is supplied from DC-IN by a detachable
Ni-MII pack or a jack plug-in. Realtime clock module power is supplied from a coin-shaped lithium battery built into the body.

Power is always supplied to SUB-MCU when a battery pack is tracking control is performed so that the focal image plane of the photo lens matches attached (when there is external DC-IN input) and camera power (referred to as DC-DC-1 below) is started and controlled by detecting switch operations.
When DC-DC-1 activates, power is supplied to the camera block including MAIN-MCU and to the RISC circuit block including MPC-823. Power to the imaging CCD circuit block (referred to as DC-DC-2 below) is controlled by MPC-823 so that it basically only operates during photo operations. Cut-off of DC-DC-1 is performed by the MAIN-MCU. The MAIN-MCU finds the status of the peripheral circuit unit and manages overall operational status, detects cut-off conditions such as the main switch being turned off or time-up of the focus-hold function, checks that there is no obstacle to performing cut-off, and issues a cut-off command by communication with the SUB-MCU.
Based on the command from the MAIN-MCU, the SUB-MCU cuts off DC-DC-1 and

places itself in low power consumption mode and continues this status until any of the switches are operated.

●Release control

The release sequence starts at the point that releasability is recognized based on release startup identification. At this time, regularly repeated processing such as light measurements and distance measurements stop and processing especially for release sequence control is performed.

Release sequence control can be divided into three categories: mirror up control, electronic shutter control, and mirror down control.

Mirror up control consists of mirror up drive, mirror up error detection, updating of the display during release, preparations for TTL light adjustment control, aperture control, and aperture control error detection.

When self-timer or red eye reduction settings are released, the unit transits to mirror up control after self-timer LED processing and red eye reduction processing (described later) has ended.

Under electronic shutter control, the electronic shutter time signal (seconds) is generated, light adjustment control is performed, and timing control for closing the mechanical shutter is performed.

Under mirror down control, mirror down control, mechanical shutter control error detection, and mirror down error detection are performed.

Other forms of control include: error recover control, preview control, TTL light adjustment timing control, AF lens drive during release, red eye reduction control, anti-vibration control, and cleaning operations control.

●Exposure calculations

Control TV and Control AV are calculated based on light measurement data (BV value) computed by the light measurement function.

●FD communications

Serial communications are performed between FD-MCU, which measures the light and color of the photographic subject, and MAIN-MCU, which performs system control for the entire camera, in order to transmit various types

of information. Clock synchronous, full duplex communications are used.
MAIN-MCU uses serial communications to send image data and other information to FD-MCU. Adjustment data values are also sent to FD-MCU only immediately after power is turned on.
FD-MCU repeatedly obtains the latest light and color measurement data for the photographic subject, and sends the results to MAIN-MCU.
When the camera enters test mode due to communications between an external device and MAIN-MCU, MAIN-MCU uses communications data to send a transit-to-test-mode command to FD-MCU. After this, FD-MCU enters a test communications mode in which each operation is directed and controlled by command.

●Lens communications

Communications are performed with the CPU lens via the lens contacts.

●Typical CPU lenses (excludes the IX NIKKOR)

Communications for obtaining the LDATA for all the various types of lenses including the latest D28 lens are performed, and that data is used by main functions such as AE and AF.

●AF-S, AF-I lenses

Communications necessary for controlling the AF motor drive built into these types of lenses are performed.

●VR lenses

Communications necessary for controlling the anti-vibration motor drive built into these types of lenses are performed.

●TC16AS

Although determination as to whether or not a TC16AS is attached is performed, no communications are performed.

●SB communications

Communications are performed with an external strobe via a hot shoe.

●RISC communications

Various information is transmitted between the RISC-MCU, used for image processing, and MAIN-MCU, which controls camera systems. Photographic operations, playback, and PC connection functions are achieved through this linked operation. There are two types of communications between MAIN-MCU and RISC-MCU: serial communications and special communications using the MCU port.
In photographic mode, release requests, changes in operation mode, checking for memory cards, and other operations are started by communications from MAIN-MCU and information is exchanged as necessary.
In playback mode, RISC-MCU is operational, and information mainly representing the status of switches and so on is sent from MAIN-MCU to RISC-MCU.

In PC mode, RISC-MCU becomes the focus of communications as data for controlling camera operations according to commands from the PC are sent to MAIN-MCU.
Excluding statuses unique to test mode, in non-release sequences during photographic mode the RISC-MCU is placed in low power consumption mode. Wake-up is performed by communication startup.

●MAIN-MCU - imaging CCD I/F

MAIN-MCU determines the exposure time (in seconds) based on the photographic mode and light measurement values, and sends an

2) SUB-MCU: Description of basic operations

There are two operational power modes of the camera. The first is "camera power on" mode in which photographic and playback operations are possible. The second is "camera power off" mode in which the supply of power is stopped except to SUB-MCU. During this mode, SUB-MCU controls the external LCD display (including shut-off) and monitors for various causes to start camera power. If a cause occurs, camera power is quickly turned on.

SUB-MCU directly controls the camera power modes described above.
Specifically, SUB-MCU turns on/off the camera's power by controlling the on/off of the stabilized power supply (referred to as the "DC-DC converter" below) built into the camera. When the DC-DC converter is on (during power-on mode), power is supplied

to many circuits in the camera so that the camera may quickly begin photographic and other operations. When the DC-DC converter is off (during power-off mode), SUB-MCU operates the sub-clock and minimizes the power being consumed.
The transition from power-on mode to power-off mode is made based on a communications command from MAIN-MCU, which handles all camera control.
The transition from power-off mode to power-on mode is made when a startup request is input to the wake-up pin or interrupt pin of SUB-MCU or when a cause for wake-up is detected.
Also, there are various operational switches and mechanism switches located on the camera. One function of SUB-MCU is to detect the status of these switches without missing any changes. It sends that information to MAIN-MCU, which controls the entire camera, and a transition from power-off mode to power-on mode is made as necessary to reflect any changes in switch status.
In addition to this, SUB-MCU includes a built-in LCD driver so that various information regarding camera status can be displayed on an external LCD for easy recognition by the user. The content of this display is basically all the data sent by serial communications from MAIN-MCU. Since the received data itself corresponds to which LCD segments are lit and unlit, SUB-MCU does not need to perform decoding or any other operations.

Finally, SUB-MCU controls the backlight LED for the LCD inside the camera's finder and the superimpose LED. Backlight LED control is performed using PWM output for brightness modulation based on commands from MAIN-MCU.
The backlight LED is also turned off when release is recognized. As for the superimpose LED, pulse output is performed for brightness modulation based on commands from MAIN-MCU. SUB-MCU is not directly involved in turning on/off the superimpose LED, as this is controlled by MAIN-MCU.

(7) Compressed recording board

1) Description of operation

Digital data from the CCD is used to read the image and perform image processing with the image processing IC by controlling the RISC microcomputer on this board, and the image data is recorded on the CF card. The board also includes a function which sends that image data through a video controller IC to output a video output signal.

RISC(U101): The microcomputer which controls each IC on the compressed recording board

16MFLASH(U104): Flash memory in which the RISC program is stored.

16-bit 64MEDODRAM: RISC working memory and video memory (U105, U106)

EI-105(U301): Processes digital image data from the CCD. This is also the IC which reads/writes the CF card.

8-bit 64MEDODRAM: Image processing memory for EI-105 control(U302-U309)

Video controller: Accepts digital video data from the RISC and converts into a composite signal and Y/BY/RY signals for output

2) Description of operations

Release (image recording)

After the release command is received by the RISC (U101) from the camera control block via CN102, the RISC (U101) starts reading the image for EI-105 (U301). Then, EI-105 (U301) reads the 12-bit image data sent from CN301 into EDODRAM 8-bit (U302-U309) and performs various types of image processing. After EI-105 (U301) image processing ends, the RISC (U101) is notified, and the RISC (U101) once again controls the CF card control block of EI-105 (U301) in order to record image data on the CF card attached toCN302.

3) Image data playback

After the RISC (U101) receives an image playback command from the camera control block via CN102, the RISC (U101) controls the CF card control block of EI-101 (U301) to temporarily store image data in the 16-bit 64MEDODRAM (U105, U106). That image data is again converted into video image data by the EI-105 (U301) and stored in the video memory area of the 16-bit 64MEDODRAM (U105, U106). After this, image data is sent to the video controller (U110) by the video controller built into the RISC (U101). This video controller (U110) outputs a video signal and Y/BY/RY signals to the TFT control block via CN104.

Note that selection of NTSC and PAL is performed via software control and that hardware is shared.

4) PC I/F (IEEE1394) transfer

The IEEE1394 controller on the PC I/F board is controlled via CN103 for communications with the PC.

5) Crude operations

Power is supplied to this board via CN102. When a RISC (U101) reset signal is input, initialization is performed by a reset configuration circuit consisting of U102 and U111, and the RISC (U101) starts program-based operations by accessing 16MFLASH (U104).

(8) TFT peripheral circuits

Description of basic operations

1) TFT controller circuit

R, G, and B signals are output by inputting a Y color difference signal.

15.5 V, 12.0 V, 4.5 V, and 3.3 V are output by inputting 15.5 V, 5.25 V, or 3.3 V.

The above voltages are output in the order 3.3 V, 4.5 V, 15.5 V or 12.0 V by inputting a supply voltage on signal.

Image is adjusted by using serial transfer to control TFT controller EVR and external EVR.

2) Inverter circuit

An output voltage of 7 V is output by inputting a DC output 5 V to 9.9 V max. signal. (Output voltage is fixed.) DC/DC

output is controlled by inputting a backlight on/off signal.

Backlight brightness is controlled by inputting an HD signal having a cycle of 63 us and pulse width of 2.0 to 2.8 us.

3) TFT

The specified image is output by inputting R, G and B signals.

(9) Recording format

(Image file format)

1) JPEG compressed files

●Compression method: Conforms to ISO/IEC 10918-1 (JPEG Baseline)

●Image data format: YCbCr4:2:2

●Number of pixels: 2000 (horizontal) x 1312 (vertical)

●File format: Conforms to Exif Version 2.1

- Supplied data: Conforming to the DCF standard, supplied data is recorded in the APP1 Marker Segment.
- Thumbnail image: JPEG compressed data (YCbCr4:2:2, 160x120)
- Various photographic data
- Various management data

2) 2700,000-pixel raw data file

●Image data format: 12-bit Bayer CFA raw data

●Number of pixels: 2012 (horizontal) x 1324 (vertical)

●File format: Conforms to ISO/DIS 12234-2 Part-2: Image data format-TIFF/EP

- Supplied data: Conforming to the TIFF/EP standard, supplied data is recorded in a file in tag format.
- Thumbnail image: Uncompressed data (RGB4:4:4, 160x120)
- Various photographic data
- Various management data

3) RGB uncompressed files

● Image data format: RGB:444

●Number of pixels: 2000 (horizontal) x 1312 (vertical)

●File format: Conforms to Exif Version 2.1

●Supplied data: Conforming to Exif Version 2.1, supplied data is recorded in a file in tag format.

- Thumbnail image: Uncompressed data (RGB4:4:4, 160x120)
- Various photographic data
- Various management data

4) YCbCr uncompressed files

● Image data format: YCbCr:422

● Number of pixels: 2000 (horizontal) x 1312 (vertical)

●File format: Conforms to Exif Version 2.1

●Supplied data: Conforming to Exif Version 2.1, supplied data is recorded in a file in tag format.

- Thumbnail image: Uncompressed data (RGB4:4:4, 160x120)
- Various photographic data
- Various management data

5) File Size

format	Number of Pixels Recorded	Size	Number of Images Recorded*1
JPEG (Basic mode)	2000 x 1312 x 2 x compression ratio	Approx. 328 KB	195
JPEG (Normal mode)		Approx. 656 KB	97
JPEG (Fine mode)		Approx. 1.32 MB	78
TIFF-RGB	2000 x 1312 x 3 *3colors	7.88MB	8
	2000 x 1312 2	5.25MB	12
JPEG (Normal mode)	2012 x 1324 1.5 *Recorded with 12 bit	4.00MB	16

*1: Estimate assumes the use of a 64MB card.

(6) Main features of the light measurement FPC

1) Finder MCU

Description of basic operations

When the DC-DC converter is started by SUB-MCU, camera power is turned on and the specified power is applied to FD-MCU. A set interval of time after power is applied, SUB-MCU releases the reset status of the reset pin of FD-MCU, and FD-MCU begins operating.

FD-MCU functions to control the 1005-division CCD upon which TTL photographic subject light from the photographic scene is projected and constantly calculate optimum photographic subject brightness for the photographic scene as update data. In this way, proper exposure can be achieved using the appropriate numerical values based on these results when photographic operations are started by a release operation by the photographer. In addition, once photographic subject brightness has been calculated, photographic subject temperature, gamma parameters, and white balance for the photographic scene may also be similarly calculated at the same time. These calculation results are used in the signal processing of the image data obtained through photography.

The results calculated for photographic subject brightness, photographic subject temperature, gamma parameters, and white balance are actually passed periodically to MAIN-MCU via serial communications and used during photographic operations.

If during communications with MAIN-MCU, MAIN-MCU commands a transition to test mode, FD-MCU transits to test mode and performs the operations specified in the data sent from MAIN-MCU. Another operation performed by FD-MCU is to load adjustment values to be executed one time only immediately after power-on.

Immediately after power-on, MAIN-MCU accesses and retrieves adjustment values stored in the EEPROM. MAIN-MCU then transmits these adjustment values to FD-MCU. FD-MCU stores the adjustment values received in RAM and performs subsequent operations.

The inspection and cleaning of contamination / dust

1. How to inspect :

In the following conditions, get the D1-attached lens very close to the Color Viewer and take a picture of it.

Then, open the recorded image files through PC operation for visual check.

In the out-of-criteria case, refer to the page of 'Cleaning the CCD' in the D1's operation manual, and set the applicable product to the Custom Setting 8-1 and the bulb condition.

Then, clean it with a dust cleaner, or the alcohol and the paper wiper named Clean Wipe -P.

2. The tools to be used for the inspection :

*The D1 camera body

*105 mm / F2.8 micro Nikkor, or equivalent

*The CF card with 8 Mbyte or higher

*The AC adapter or a battery ;

The usage of battery is prohibited when cleaning due to theset conditions as mentioned above.

*The Color Viewer with no charts.

Set it to LV13 and leave it alone for approximately 10 minutes for aging.

*A personal computer / Macintosh or Windows 95 / 98 OS

*The application software Adobe's 'Photoshop' ver. 4.0 or higher.

*The card slot ;

Just in case of no card slot, also available through PC operation with the application software Nikon View DX in the configuration of the IEEE1394 board and a cable.

3. Setting up the applicable camera :

*The single frame (S) shooting

*Manual focus ; Setting to 'Infinity focus mode' on the lens

*The A mode

*F16 for aperture

*±0 for compensation

*ISO 200

*Automatic White Balance mode

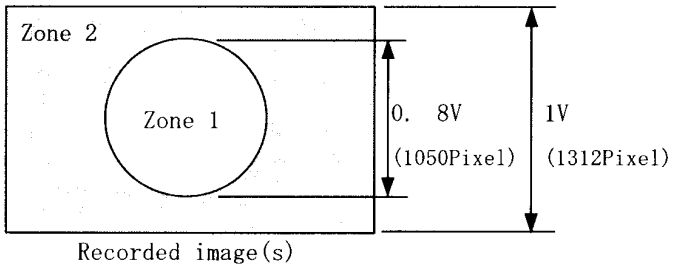
*Fine mode

*In the Custom-settings :

Refer to '23. Sharpening' in the manual and select the option No. 3, which is 'None', in the sharpening.

Besides, refer to '24. Tone Compensation' in the manual and select the option No. 1, which is 'Normal', in the Tone Compensation.

4. Criteria of contamination / dust :



*For the zone 1 :

Size : Less than 15 pixel

Quantity : Less than 2 pieces

Contrast : Less than 15% (※)

*For the zone 2 :

Size : Less than 15 pixel
Quantity : Less than 6 pieces
Contrast : Less than 15% (※) ;

OR

Size : Less than 15 pixel
Quantity : Less than 2 pieces
Contrast : Less than 25% (※)

In addition, the dust in the total quantity of less than 8 pieces shall be allowable.

サービス計画課 M

Note : Do not count the number(s) of dust if it is in the size of less than 20 pixel and the contrast of less than 5%.
The sizes shall be a root drawn from the formula of 'the longest diameter of the dust is multiplied by the shortest diameter of the dust'.
The distance from a particle to another should be taken at least 50 pixel or further.

※ The calculation for drawing the contrast

$$\text{Contrast} = \left\{1 - \left\{\frac{\text{Lowest luminosity level in the target dust}}{\text{Average luminosity around the target}}\right\}^{\frac{1}{\gamma}}\right\} \times 100\%$$

$\gamma = 0.6$

Enter the values to the following columns programmed for calculation in EXCEL file, which has been already provided to each local office / company overseas, and then draw the value(s) of contrast through the calculation.

The calculation for drawing the contrast

Average luminosity around the target dust	=	
Lowest luminosity level in the target dust	=	
γ	=	0.6
Contrast	=	

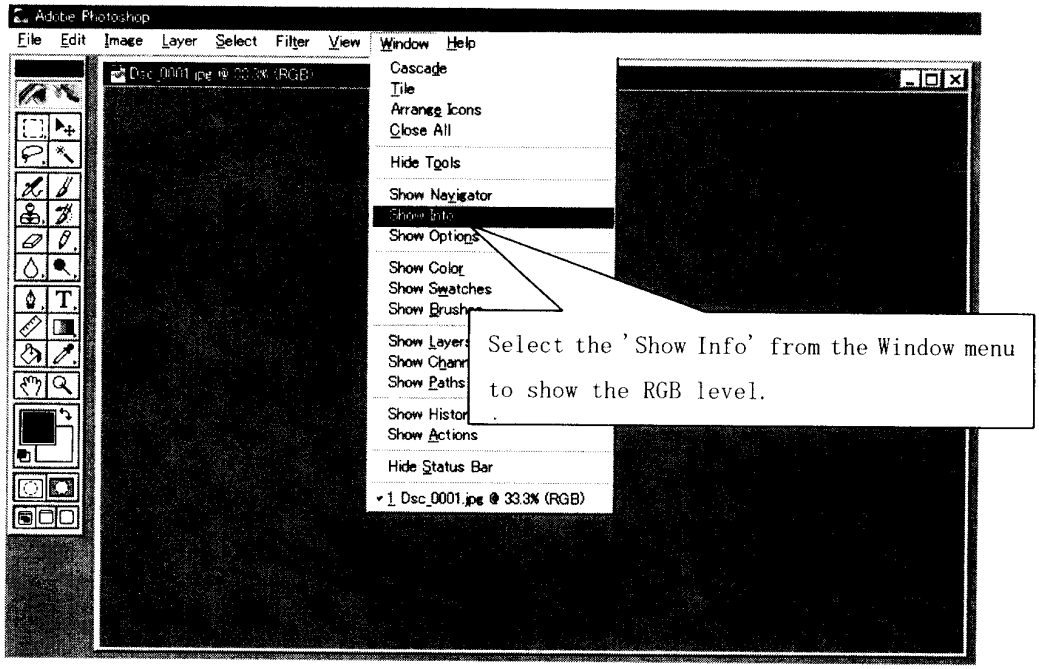
5. Judging whether or not it is contamination / dust :

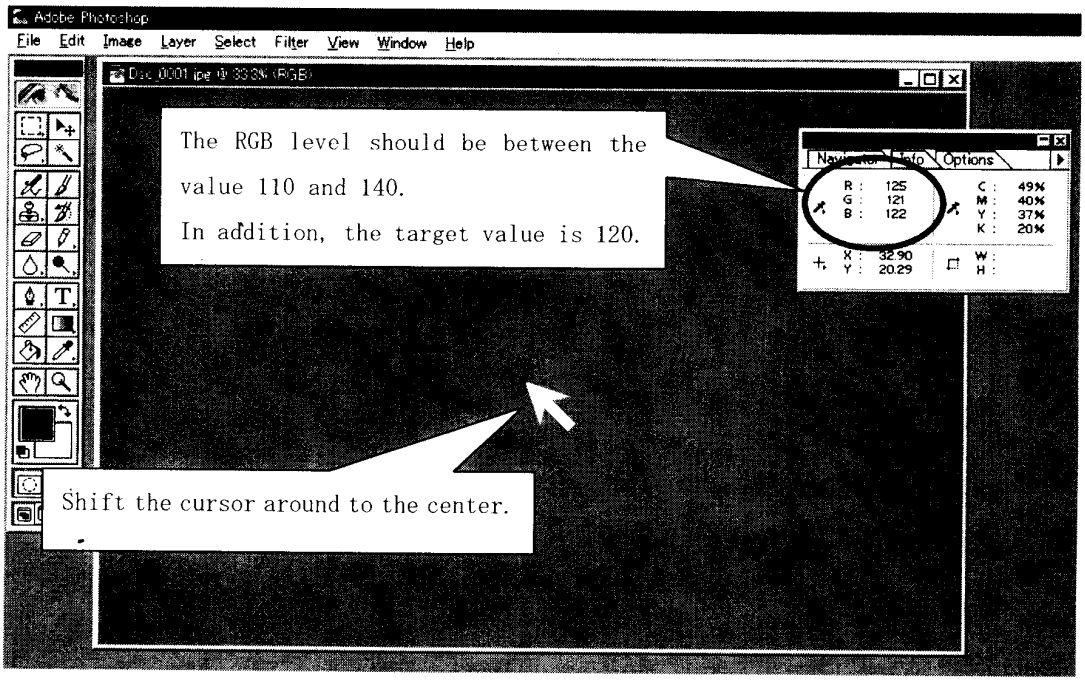
5-1. Opening the image files stored in the Photoshop

Check that the luminosity around the center of image is between 110 and 140.
For reference, its target value is 120.
If not achieved in this range of luminosity, additionally operate the exposure compensation and take a picture again.

サービス計画課 M

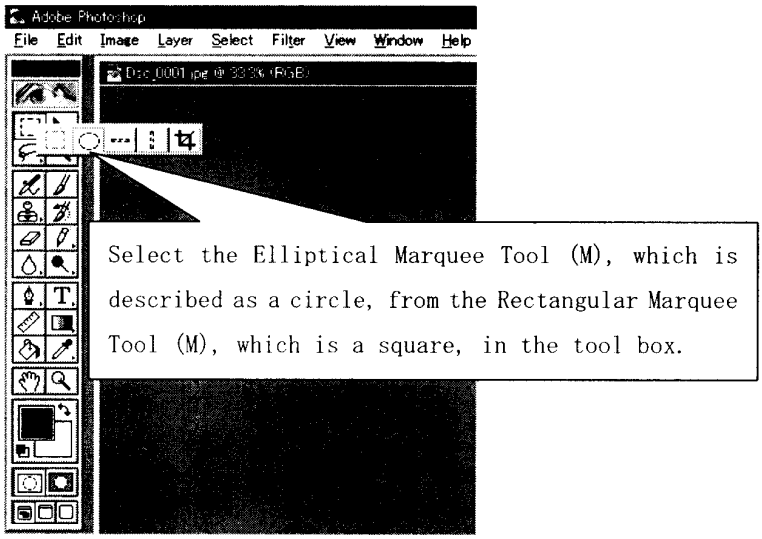
In addition, check the RGB level from 'Show Info.' in the Window menu.





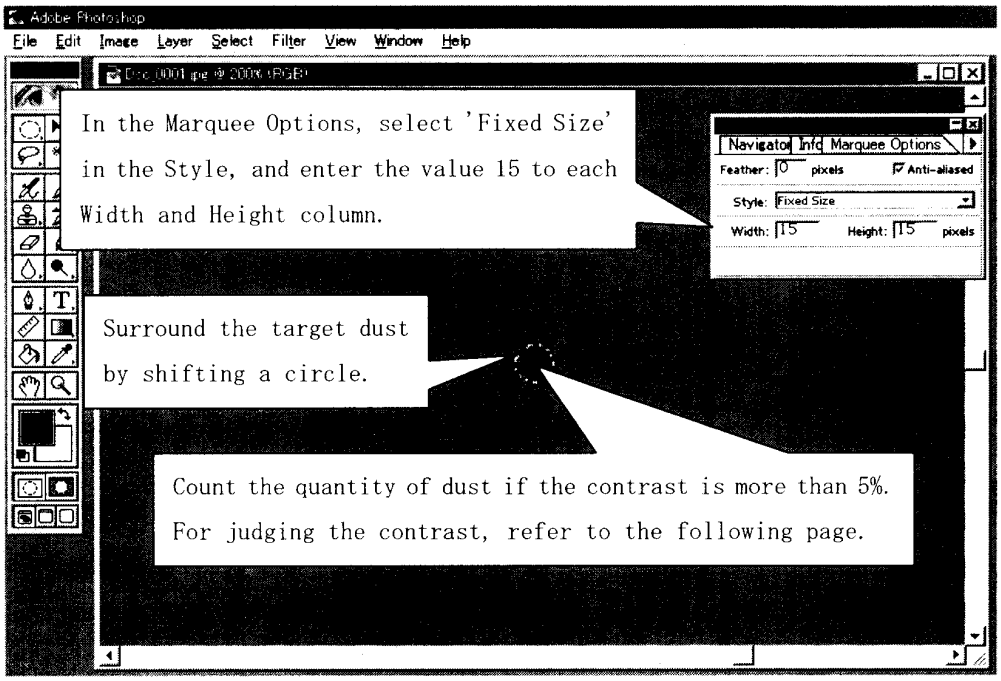
5-2. Counting the quantity of dust in every zone :

For checking the sizes of dust, select the 'Elliptical Marquee Tool (M)', which is a circle' from the 'Rectangular Marquee Tool (M)', which is a square.
Then, double-click on the Elliptical Marquee Tool (M) and the Marquee Options just shows up.
In the Marquee Options, select the 'Fixed size' in the Style, and enter 15 (pixel) each to both the Width and Height columns.
Then, surround a target dust with a circle on the screen.
(Selecting the tool from the tool box : Select the 'Elliptical Marquee Tool (M)', which is a circle' from the 'Rectangular Marquee Tool (M)', which is a square.)



サービス計画課 M

(Double-click on the Elliptical Marquee Tool (M) and the Marquee Options just shows up. In the Marquee Options, select the 'Fixed size' in the Style, and enter 15 (pixel) each to both the Width and Height columns.)



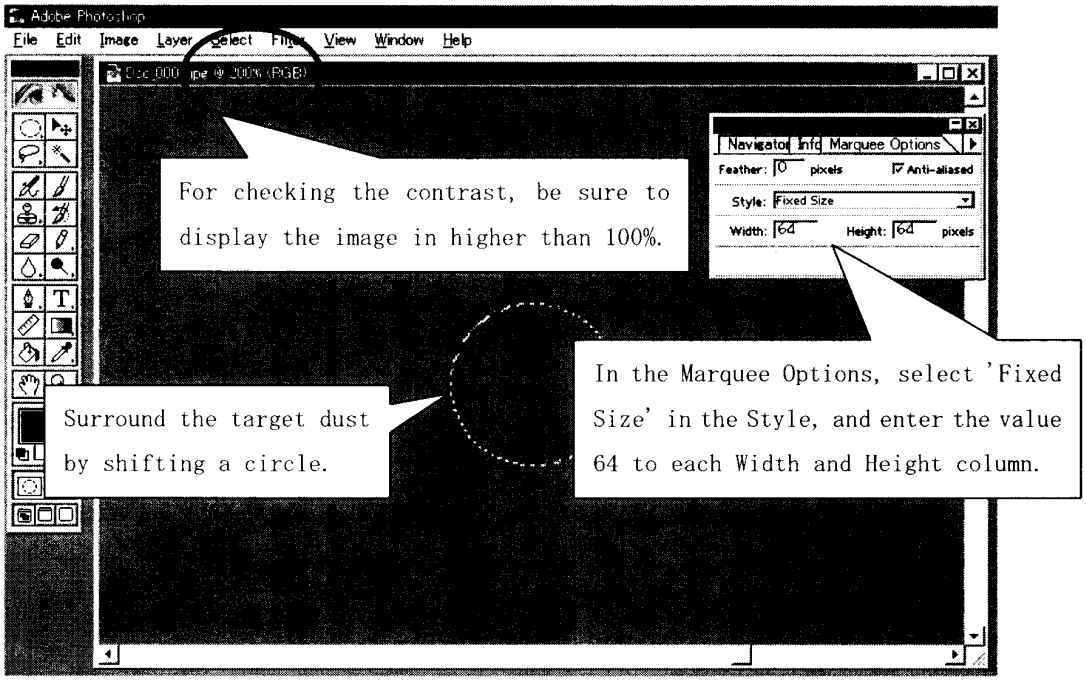
5-3. Observing the contrast of target dust :

Using the Histogram, compare the 'Mean' value to the 'Level' one, and then judge the contrast.

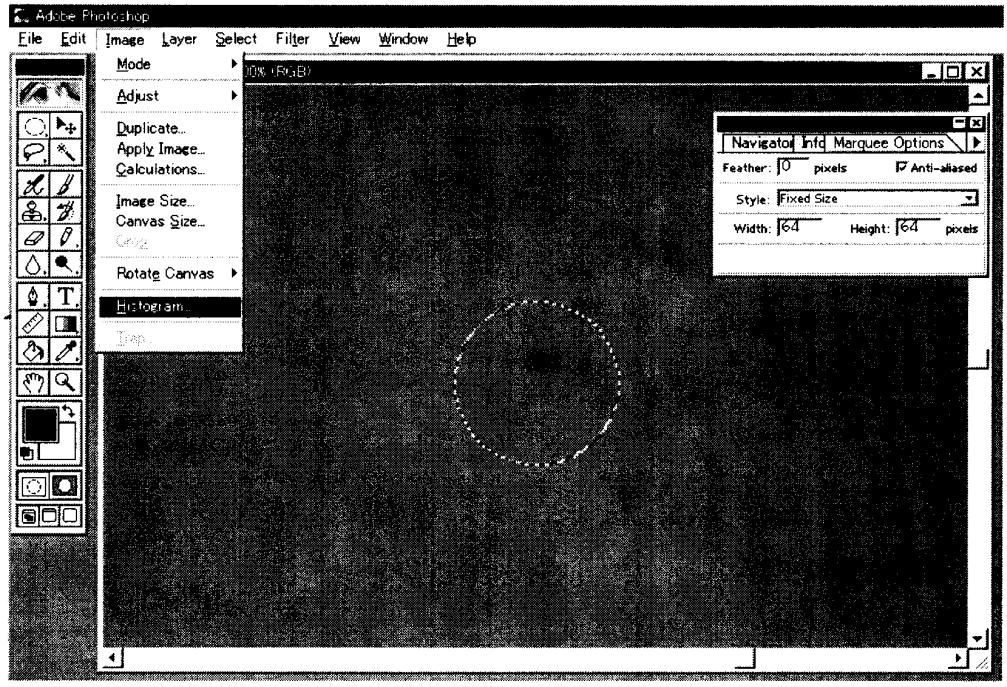
For checking the contrast, Double-click on the Elliptical Marquee Tool (M) and the Marquee Options just shows up.
In the Marquee Options, select the 'Fixed size' in the Style, and enter 64 (pixel) each to both the Width and Height columns.
Then, surround a target dust with a circle on the screen.

サービス計画課 M

(Double-click on the Elliptical Marquee Tool (M) and the Marquee Options just shows up. In the Marquee Options, select the 'Fixed size' in the Style, and enter 64 (pixel) each to both the Width and Height columns.)



(Displaying the histogram : Select the 'Histogram' from the 'Image' menu.)

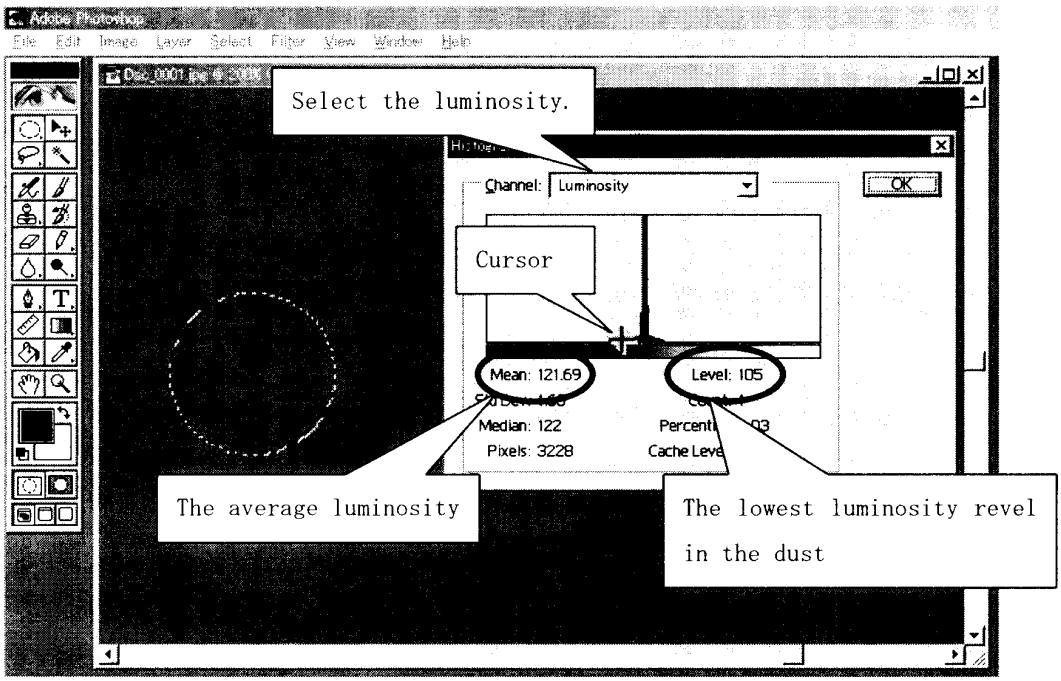


サービス計画課 M

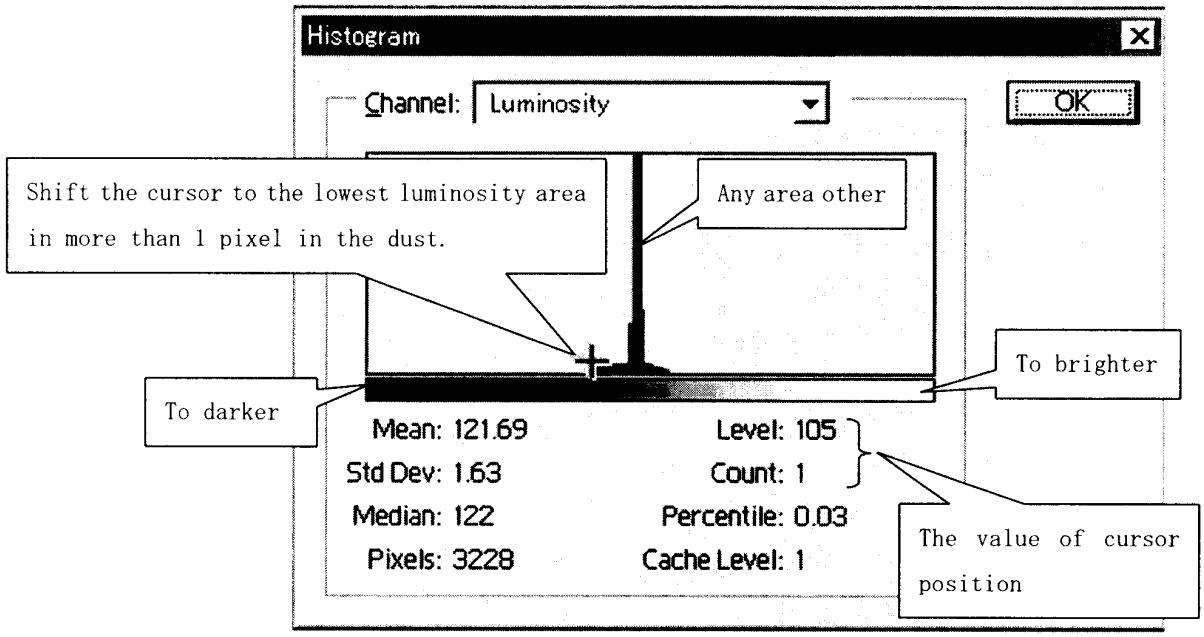
(Drawing the value of contrast :

Shift a cursor to the lowest luminosity revel in the target dust in the graph of the histogram.

Then, read its luminosity, and, as shown in the item 4 'Criteria of contamination / dust', enter each value of 'the luminosity of highest density in the dust' and 'the average luminosity' to the appropriate columns in the formula for calculating and drawing the value of contrast.)



サービス計画課 M



6. Wiping off the dust and cleaning :

*Remove the lens from the camera and then connect the AC adaptor with the DC input terminal.
*Select the Custom Setting 8-1(cleaning mirror up)
*Carefully observe the low pass filter by naked eyes or through a stereomicroscope of 8 magnifications, and check whether any contamination / dust exists on the filter or not.
*Clean the surface of filter with the dust cleaner J63072.

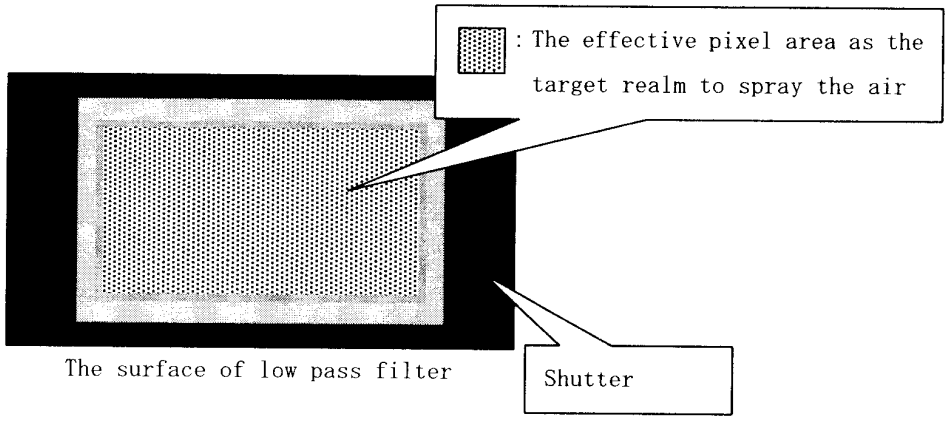
Note : If cleaning as any metallic particle(s) / dust still remains, the surface of filter may be scratched. In this accord, be aware of it when cleaning.

Note : In the usage of the dust cleaner J63072, place the tip of nozzle 5 mm close to the filter surface, and then spray the air to the center.
Then, be aware of the gas to begin to blow if inclining the dust cleaner while using it.

サービス計画課 M

As shown in the right figure, place the dust cleaner's nozzle horizontally straight to the center of filter of the camera, and then spray the air to it.

Since dust may get into the filter, pay attention in case of spraying the air around to the effective pixel area.

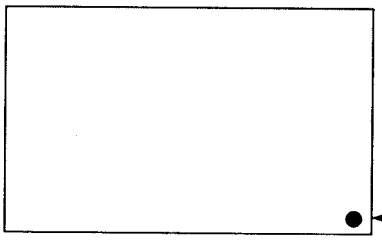


*Wrap the Clean Wipe -P J63073 around a stick and wipe off the filter with the alcohol.
*Using the blower or the dust cleaner J63072, clean the surface of filter again.
*Turn the main switch off, and then release the mirror-up mode.
*Conduct the test shooting and check that any dust(s) is(are) within the criteria.
Now, a series of the cleaning is complete.

サービス計画課 M

Where the dust / contamination is situated on the low pass filter

In case of finding a presence of dust on upper right of the low pass filter



Recorded image(s) on a display

The position of dust is displayed upside down on the recorded image(s).

サービス計画課 M

Disassembly

6. Top cover unit

7. Back door unit

★ : For disassembly in details, refer to the service manual for F100.

CAUTIONS FOR DISASSEMBLY AND ASSEMBLY

① In disassembly and assembly, carry out the work by using the conductive mat (J5033) and list straps (J5033-5) to protect the electric parts from static electricity.

② The low-pass filter of the image CCD bracket unit is liable to damage. Handle it very carefully.

③ D1 uses many parts common to F100.The chapters of disassembly and assembly in this repair manual describe only the points differenct from F100. Refer to the repair manual of F100 for the points not mentioned in this manual.

④ When disassembling, remember the processed condition of lead wires and FPC, the setting positions and kinds of screws, etc.

⑤ Before disassembling, remove the batteries or the AC power cord.

⑥ In disassembly, a large assembly unit is sometimes removed. If such a large unit must be disassembled furthermore, refer to the exploded drawings.

● ⑦ The chapters of disassembly and assembly do not mention the waterproof sponge. When covers and others are replaced, refer to the exploded drawings and set a waterproof sponge. For the setting position, refer to the original part to be replaced.

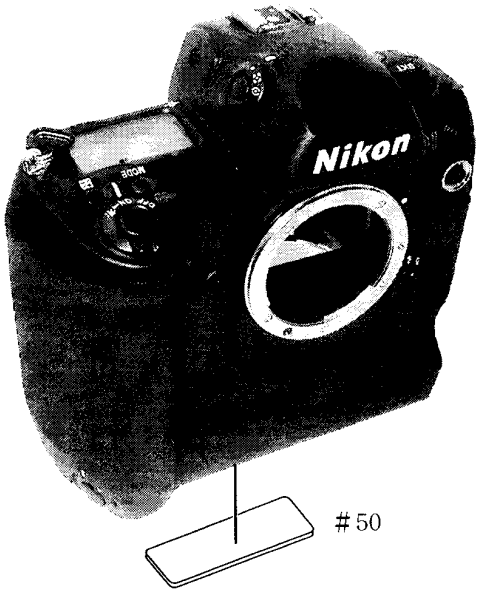
⑧ Some lead wires are adhered with the adhesive (SC608Z). When assembling, adhere the lead wires with the specified adhesive.

⑨ The battery for backup is mounted on the TFT drive PCB. For replacing the battery for backup, accordingly, disassemble the TFT drive PCB as well. Refer to the page A30.

DISASSEMBLY

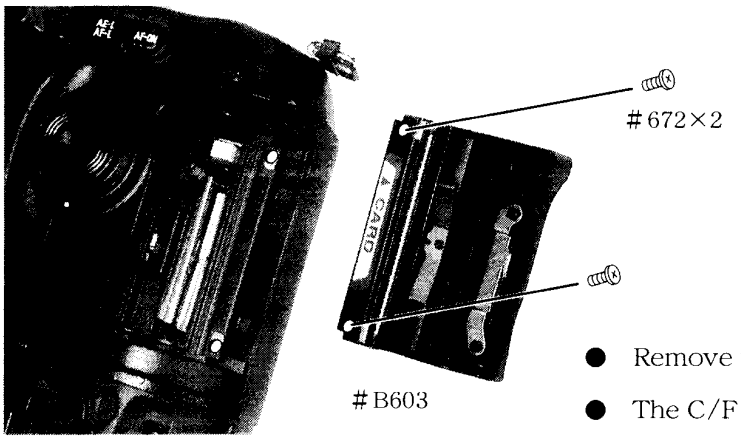
1. External units and image PCBs

● Rating plate



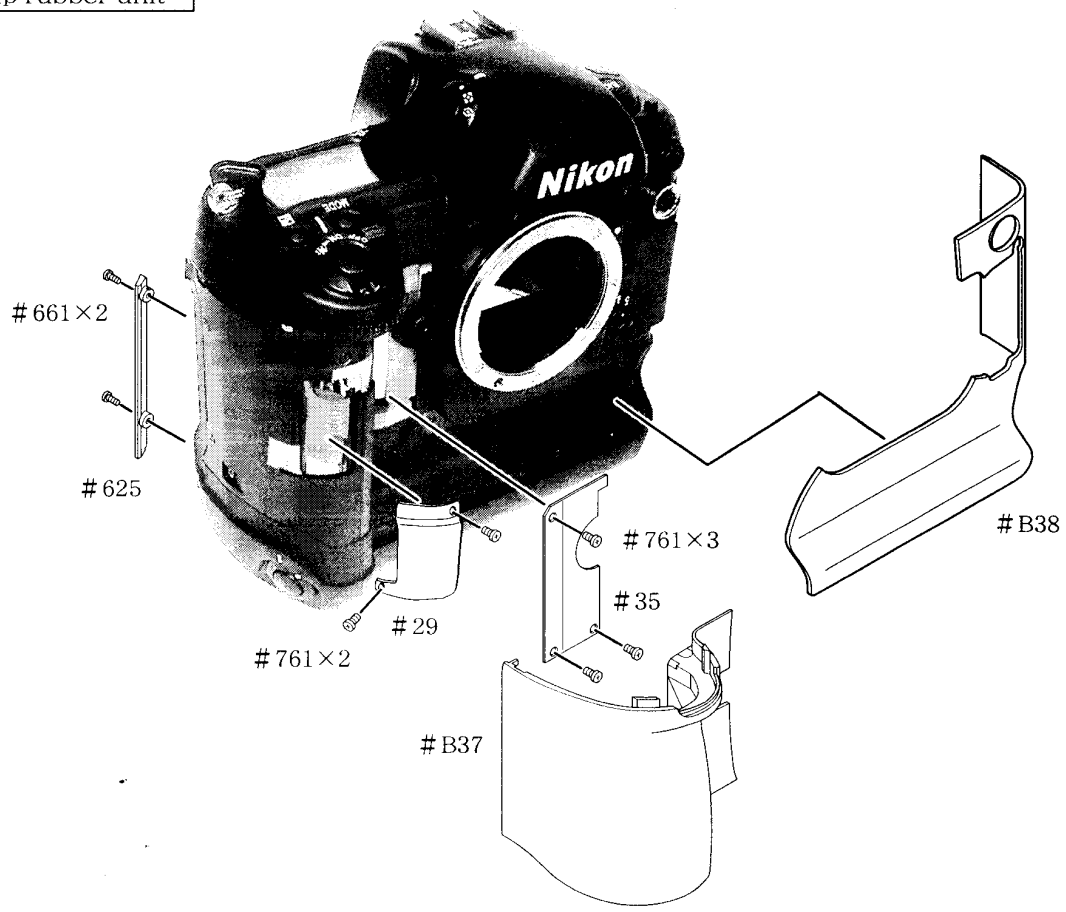
● Remove the rating plate(#50).

C/F cover unit



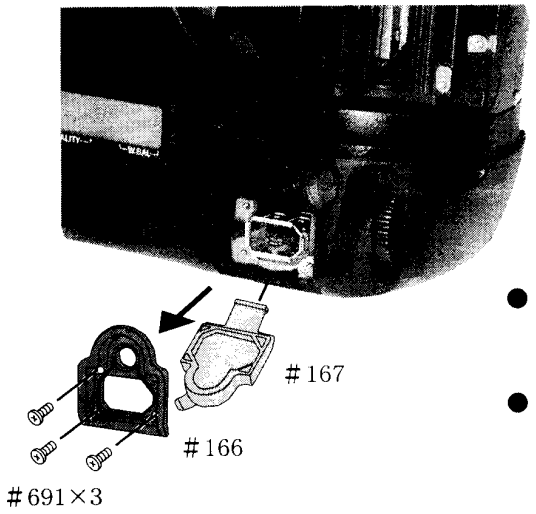
- Remove the two screws (#672).
- The C/F cover unit (#B603) can be removed.

Grip rubber unit



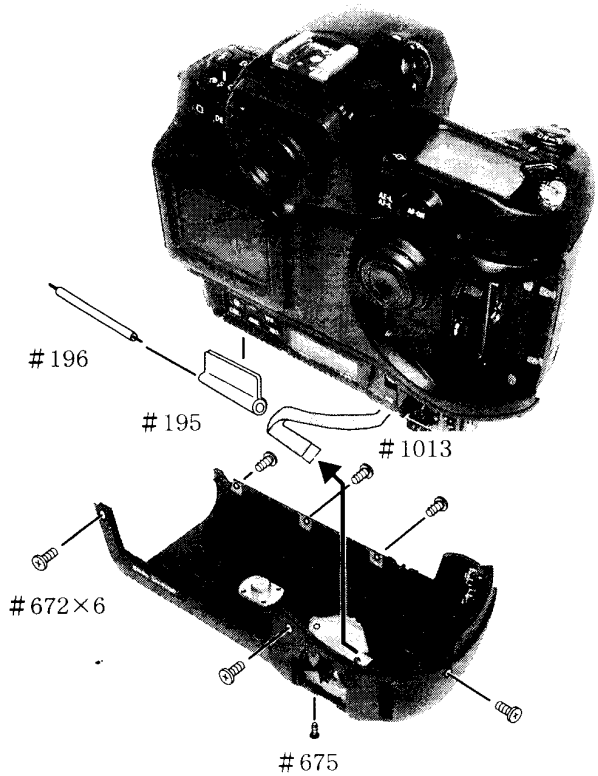
- Remove the two screws (#661) and then remove the grip rubber retainer (#625).
- Remove the grip rubbers (#B38) and (#B37).
- Remove the two screws (#761) and then remove the grip cover (#29).
- Remove the three screws (#761) and then remove the acceptor (#35).

I/F connector blind plate unit



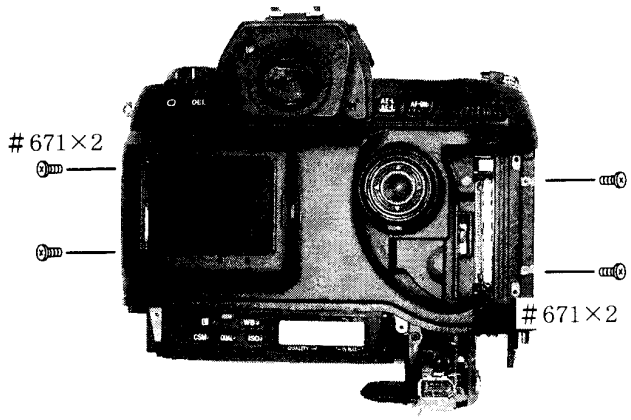
- Remove the three screws (#691) and then remove the blind plate (#166).
- Remove the blind rubber (#167).

Bottom cover assembly unit

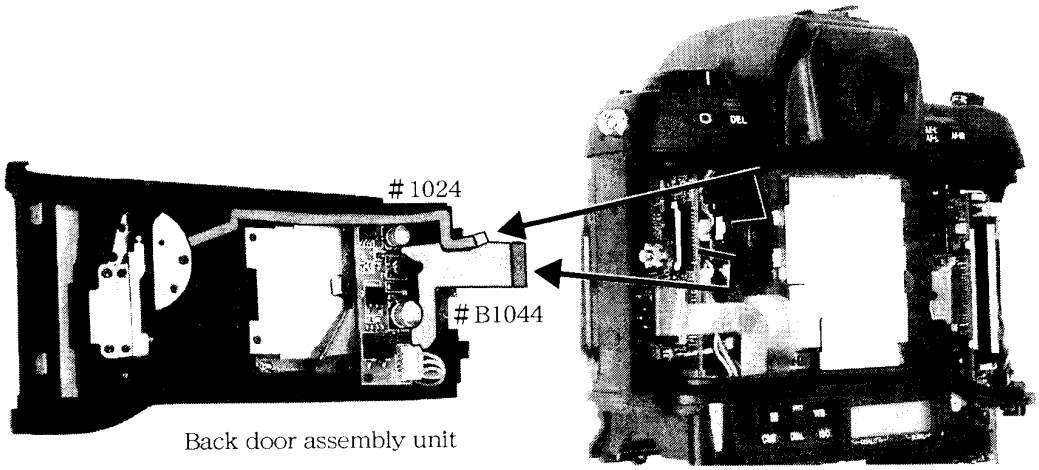


- Remove the six screws (#672) and (#675).
- Remove the bottom cover assembly unit slowly.
- Remove the FPC (#1013) from the connector of the bottom cover.
- Remove the shaft (#196) and LCD cover (#195).

Back door assembly unit

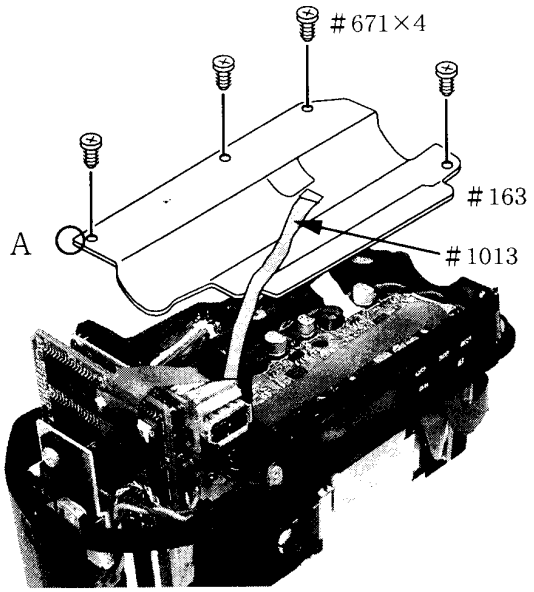


- Remove the four screws (#671).
- Remove the back door assembly unit slowly.
- Remove the FPC (#1024) from the connector.
- Remove the FPC (#B1044) from the connector.



Back door assembly unit

Battery chamber: Roof plate



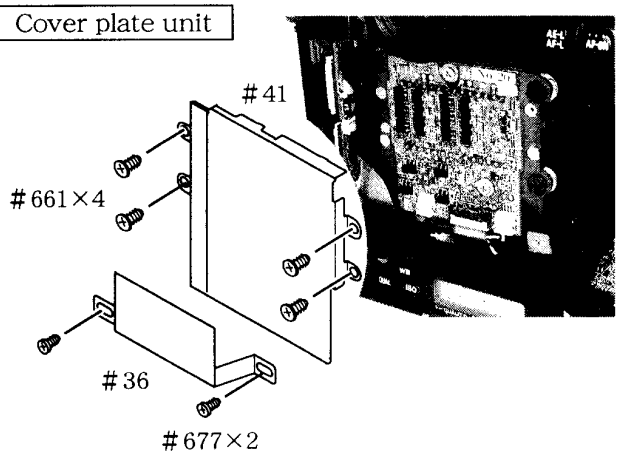
- Remove the four screws (#671).
- Remove the roof plate of the battery chamber (#163).

Note:

Remember the setting position of the unit "A".

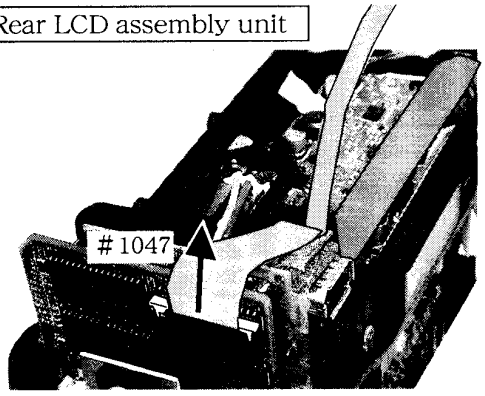
Remember the processing of the FPC (#1013).

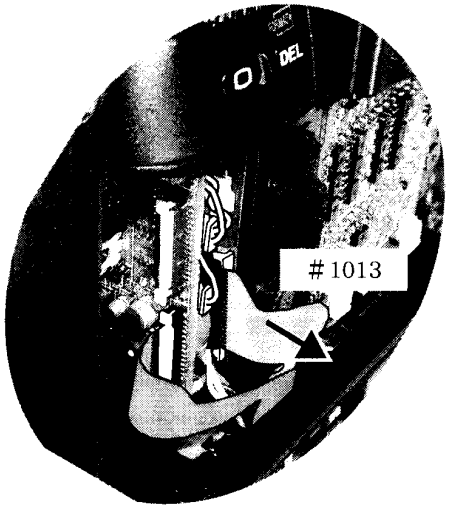
Cover plate unit



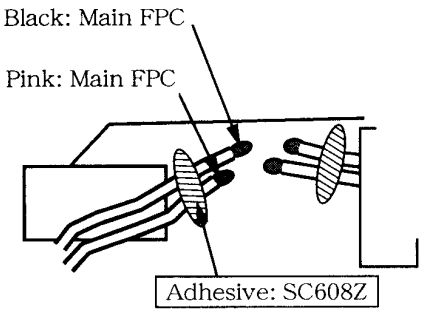
- Remove the two screws (#677).
- The CCD flexible cover plate (#36) can be removed.
- Remove the four screws (#661).
- The cover plate (#41) can be removed.

Rear LCD assembly unit



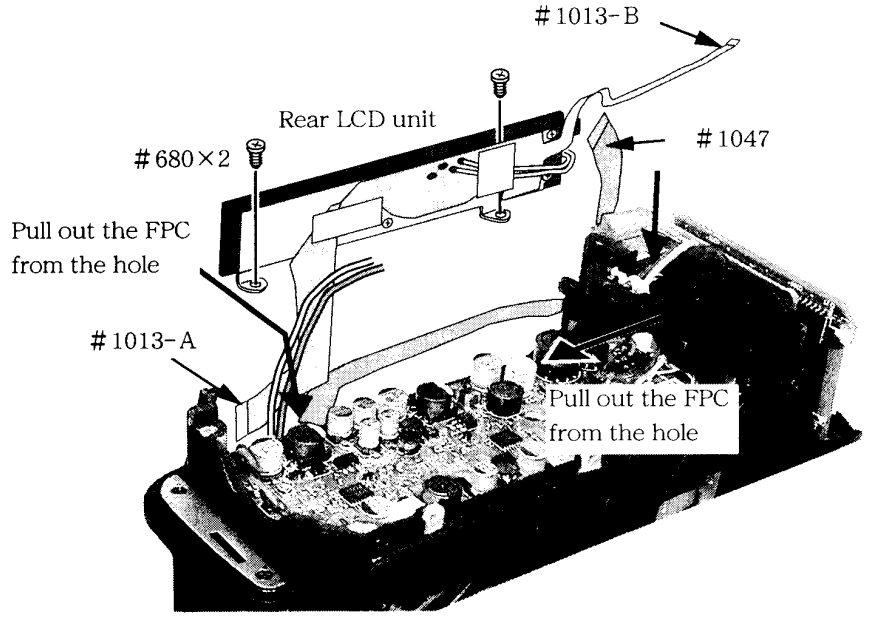


- Remove the FPC (#1047) from the connector.
- Remove the FPC (#1013) from the connector.

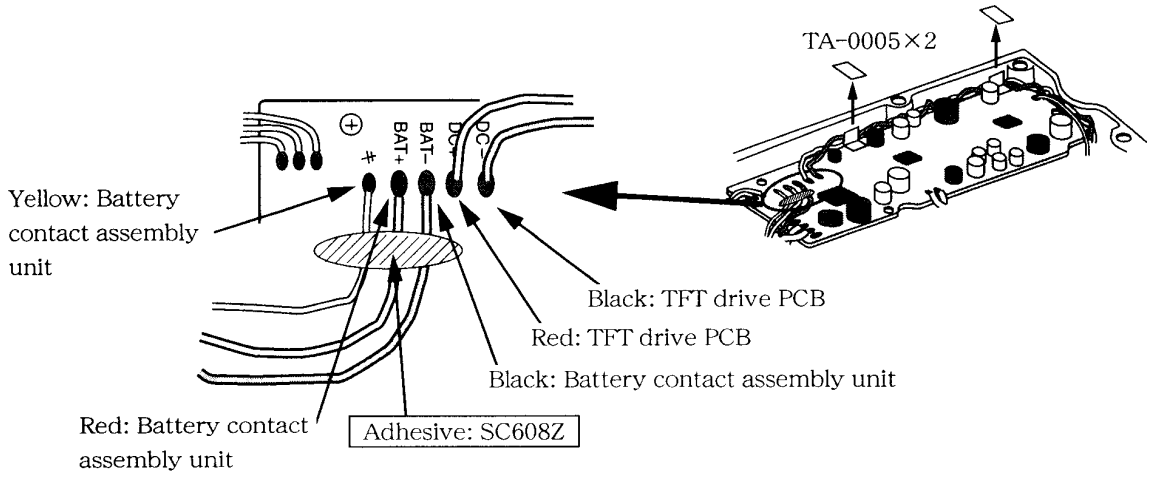


- Remove the adhesive (SC608Z) which retains the pink and black lead wires.
- Unsolder the pink and black lead wires.

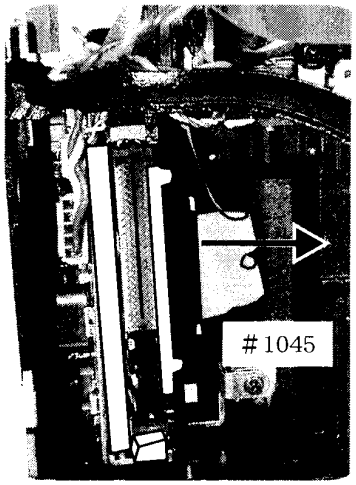
- Remove the two screws (#680).
- Remove the rear LCD unit slowly.
- Pull out the FPC (#1013-A) from the hole.
- Pull out the FPC (#1013-B) in the arrow mark direction through the hole.
- Pull out the FPC (#1047) in the arrow mark direction through the hole.

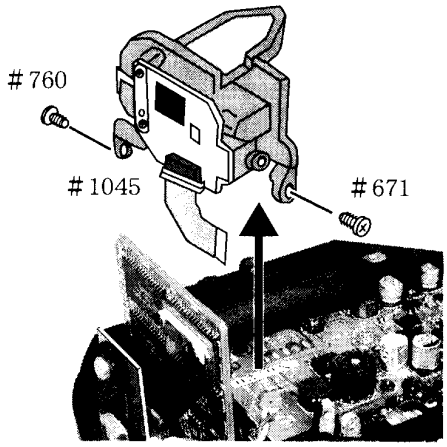


Battery contact assembly unit



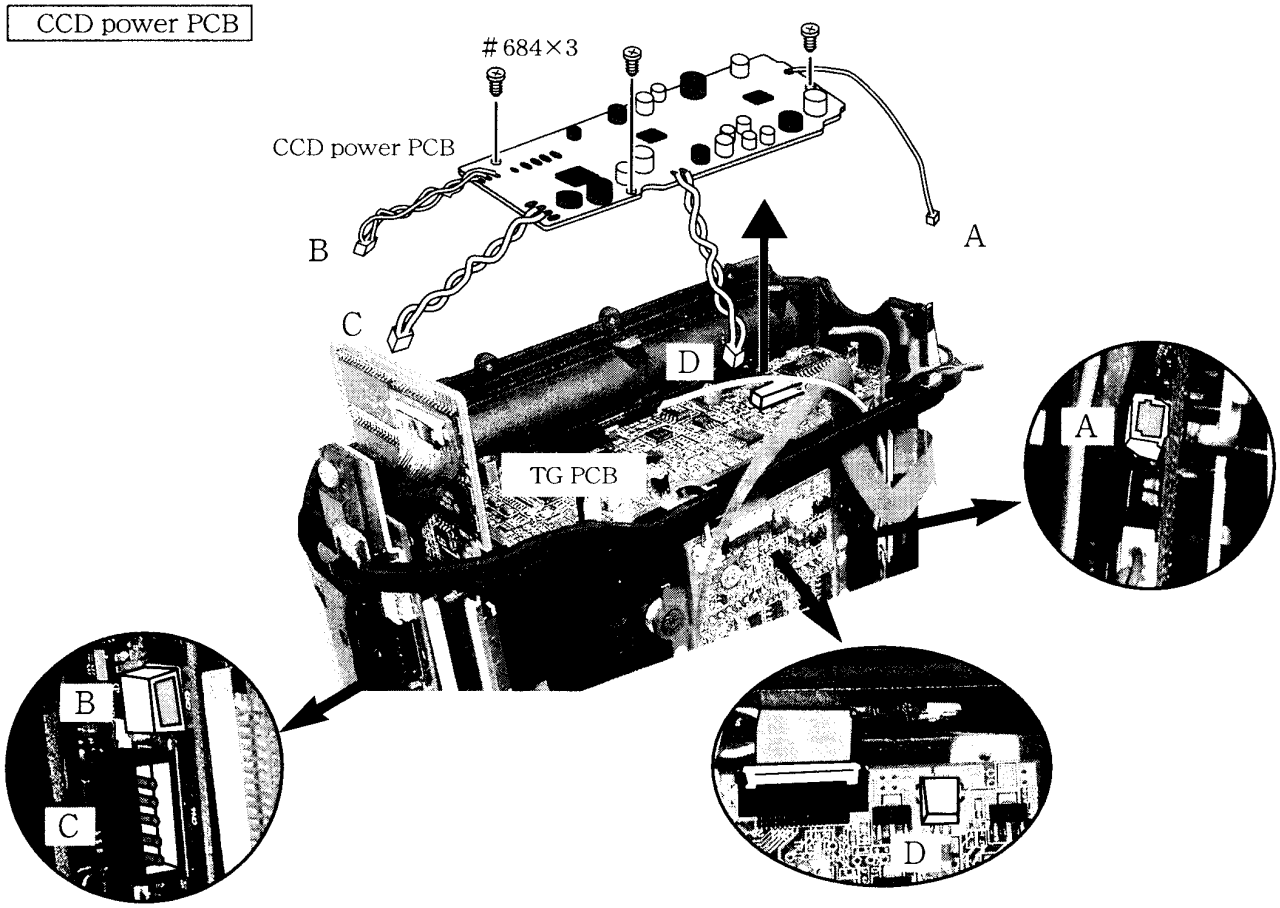
- Remove the adhesive (SC608Z) which retains the red, black and yellow lead wires sent from the battery contact assembly unit.
- Remove the tape (TA-0005) which retains the red and black lead wires sent from the TFT drive PCB.
- Unsolder the red and black lead wires sent from the TFT drive PCB on the CCD power PCB.
- Unsolder the red, black and yellow lead wires sent from the battery contact assembly unit on the CCD power PCB.





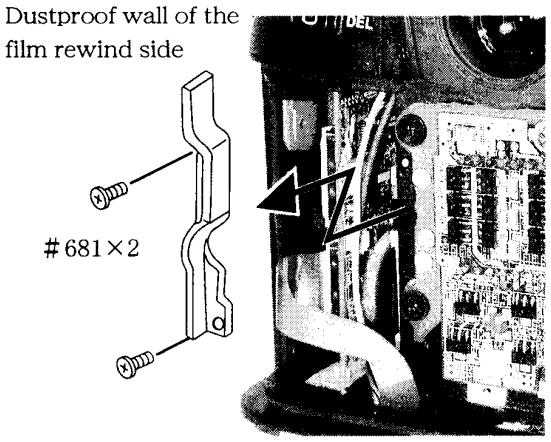
- Remove the FPC (#1045) from the connector.
- Remove the screws (#671) and (#760).
- Remove the battery contact assembly unit.

CCD power PCB

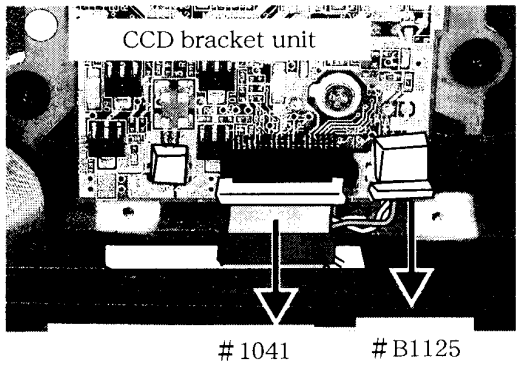


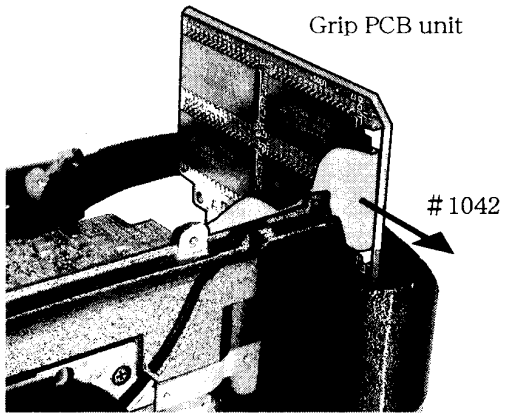
- Remove the lead wire connectors. [A-A] · [B-B] · [C-C] · [D-D]
- Remove the three screws (#684).
- Remove the CCD power PCB. (It is connected to the TG PCB with connectors.)

TG PCB

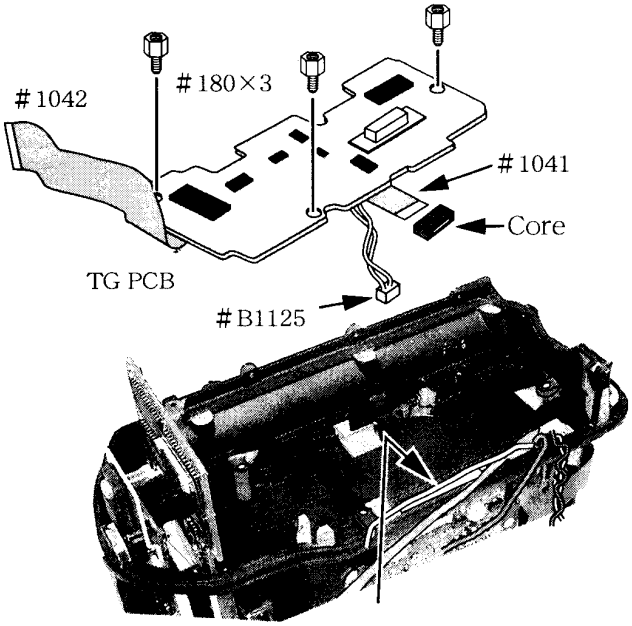


- Remove the two screws (#681).
- Remove the dustproof wall of the film rewind side.





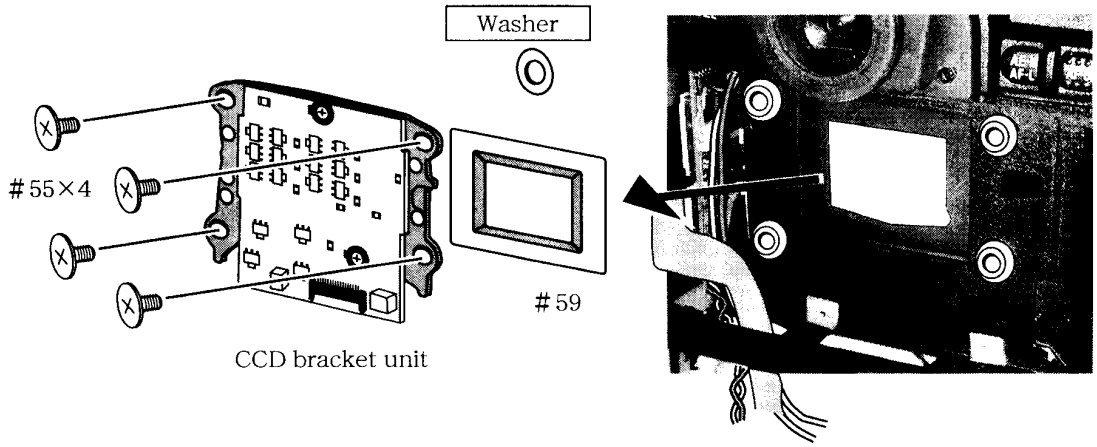
- Remove the FPC (#1041) and the lead wire connector (#B1125) from the CCD bracket unit.
- Remove the FPC (#1042) from the grip PCB unit.



- Remove the three screws (#180) with the tool (T93003).
- Remove the TG PCB.
  Pull out the FPC (#1041) and the lead wire connector (#B1125) from the hole.
- The core can be removed.

Pull out the FPC and code connector from the hole.

CCD bracket unit



- Remove the four screws (#55).
- Remove the CCD bracket unit.

Note:

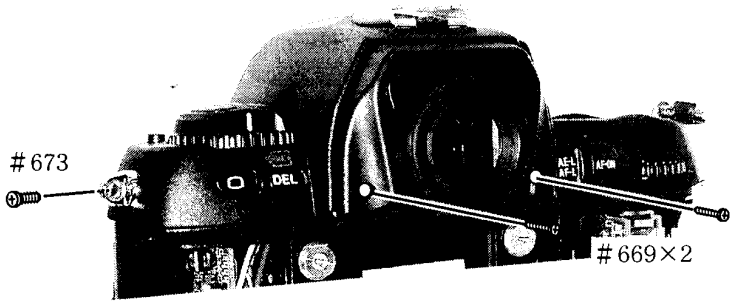
A washer is sometimes put in one of the four places on the setting surface of the CCD bracket unit. If a washer is used, put it into the original place when assembling.

- Remove the mask (#59).
- Pull out the following lead wires and FPC from the hole: the red and black lead wires sent from the TFT drive PCB, the FPC and the pink and black lead wires sent from the main FPC

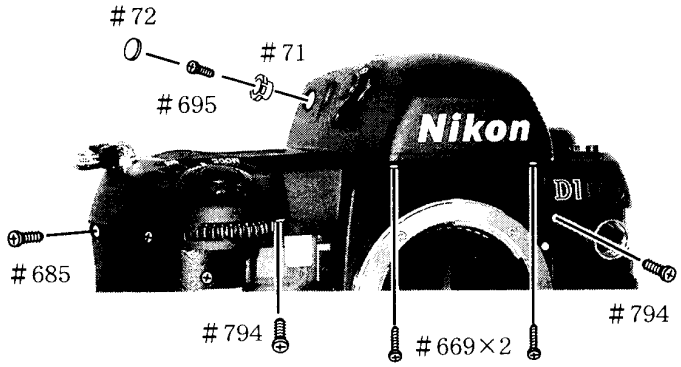
Note:Handle the CCD bracket unit very carefully.

2. Top cover unit

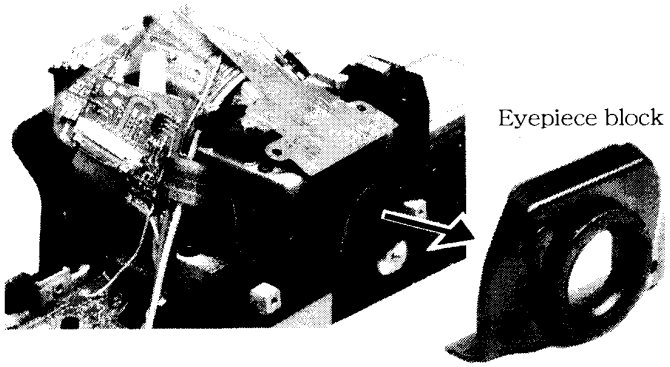
Top cover unit



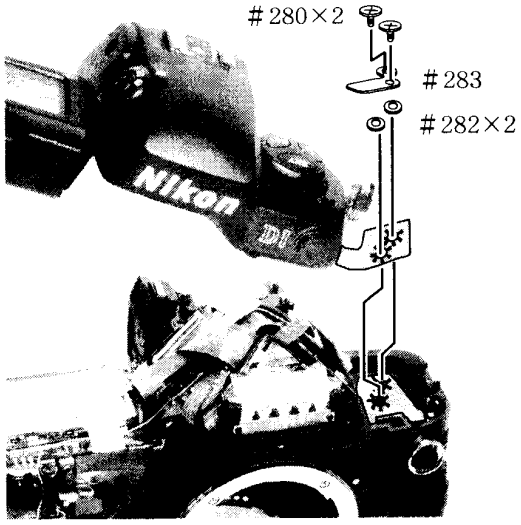
- Remove the two screws (#669).
- Remove the screw (#673).



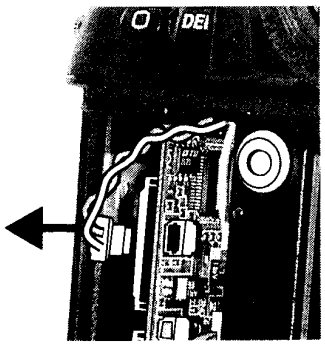
- Remove the diopter adjusting knob (#72).
- Remove the screw (#695).
- Remove the diopter adjusting dial (#71).
- Remove the two screws (#669).
- Remove the two screws (#794).
- Remove the screw (#685).



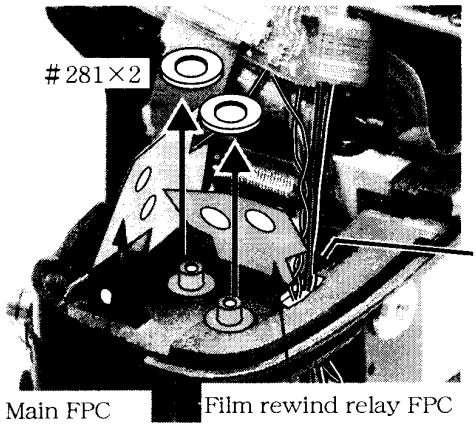
- Lift up the top cover unit slowly and then remove the eyepiece block unit.



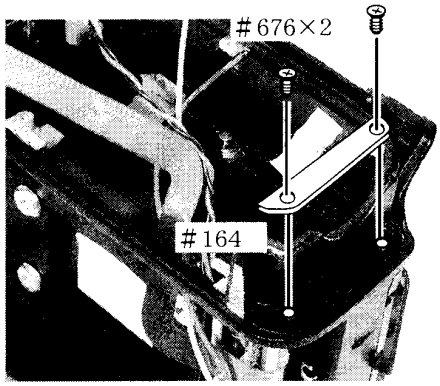
- Remove the two screws (#280).
- Remove the press-contact plate (#283).
- Remove the two press-contact rubbers B(#282).
- The top cover unit can be removed.



- Remove the red and blue lead wire connector.



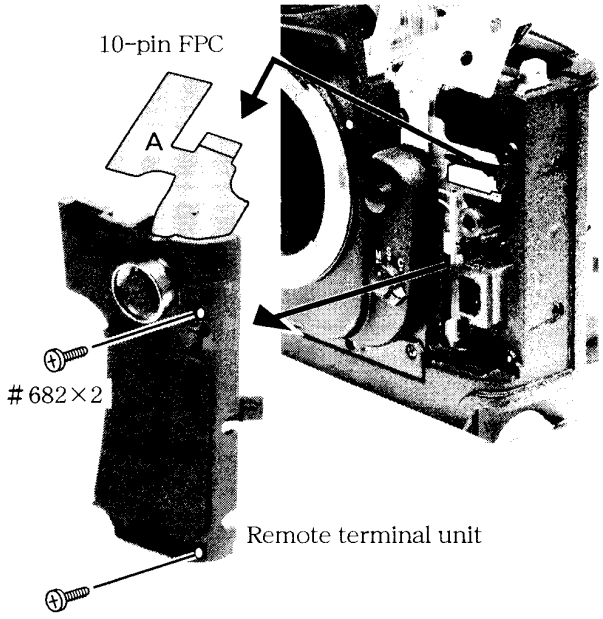
- Remove the two press-contact rubbers A (#281).
- Pull out the four lead wires.



- Remove the two screws (#676).
- The battery P remove plate (#164) can be removed.

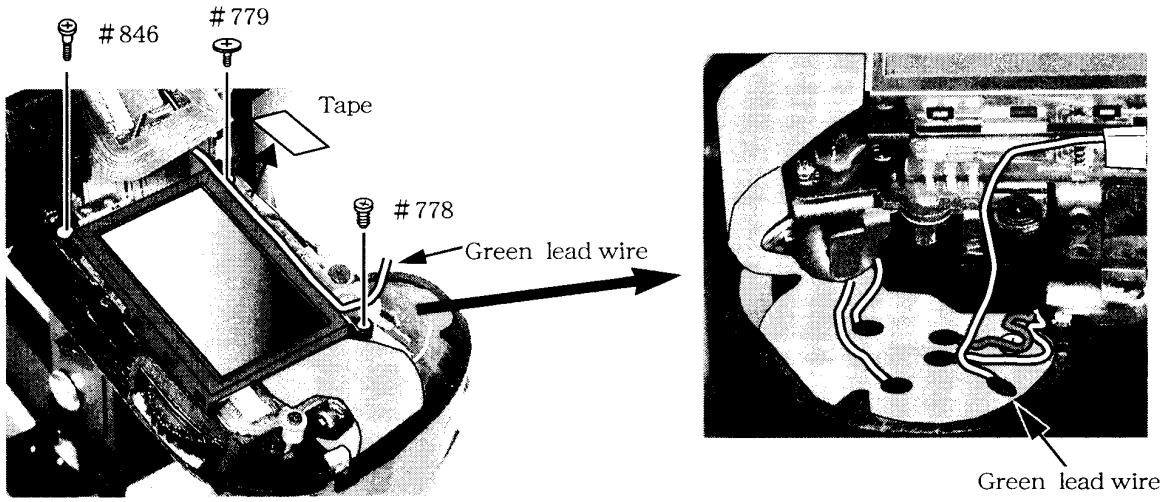
3. Separation of the front body from the rear body

Remote terminal unit

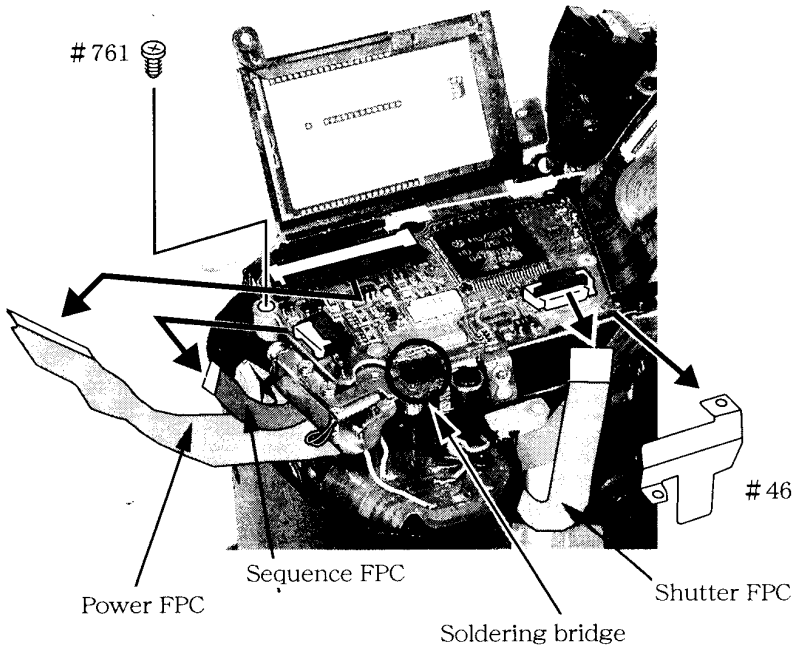


- Remove the two screws (#682).
- Remove the remote terminal unit slowly.
- Pull out the unit "A" of the 10-pin FPC from the front body.
- Remove the 10-pin FPC from the connector.

Disconnecting the connector/Unsoldering the soldering bridge

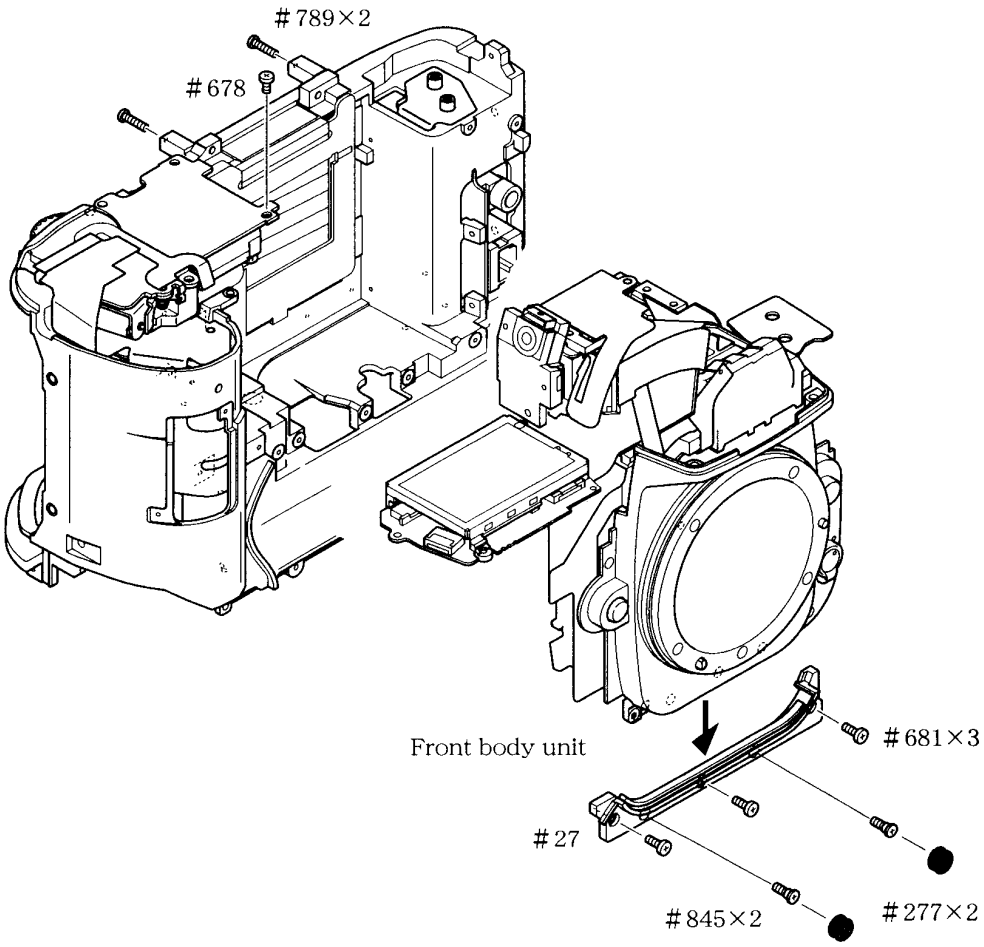


- Remove the tape (TA-0005).
- Unsolder the green lead wire..
- Remove the screws (#846), (#779) and (#778).



- Remove the screw (#761).
- Remove the FPCs from the connector
- Unsolder the soldering bridge.
- Remove the sequence PCB continuity plate (#46).

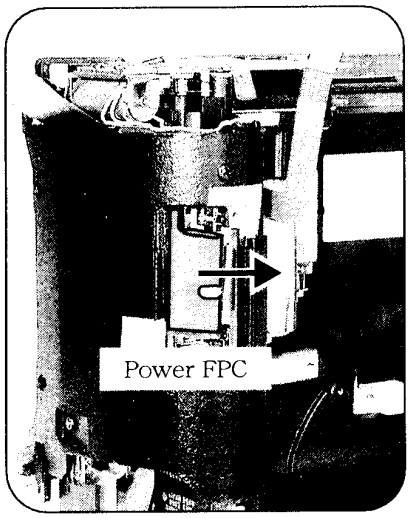
Separation of the front body unit from the camera body

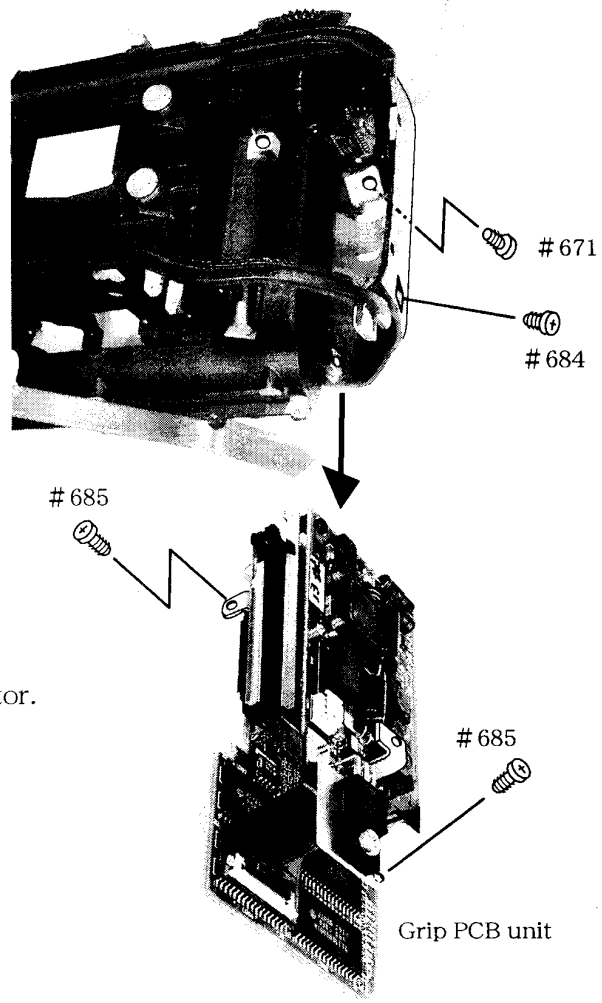


- Remove the two sponges (#277).
- Remove the two screws (#845).
- Remove the two screws (#789).
- Remove the three screws (#681).
- Remove the screw (#678).
- Separate the front body unit from the camera body.
- The apron lower cover (#27) can be removed from the front body unit.

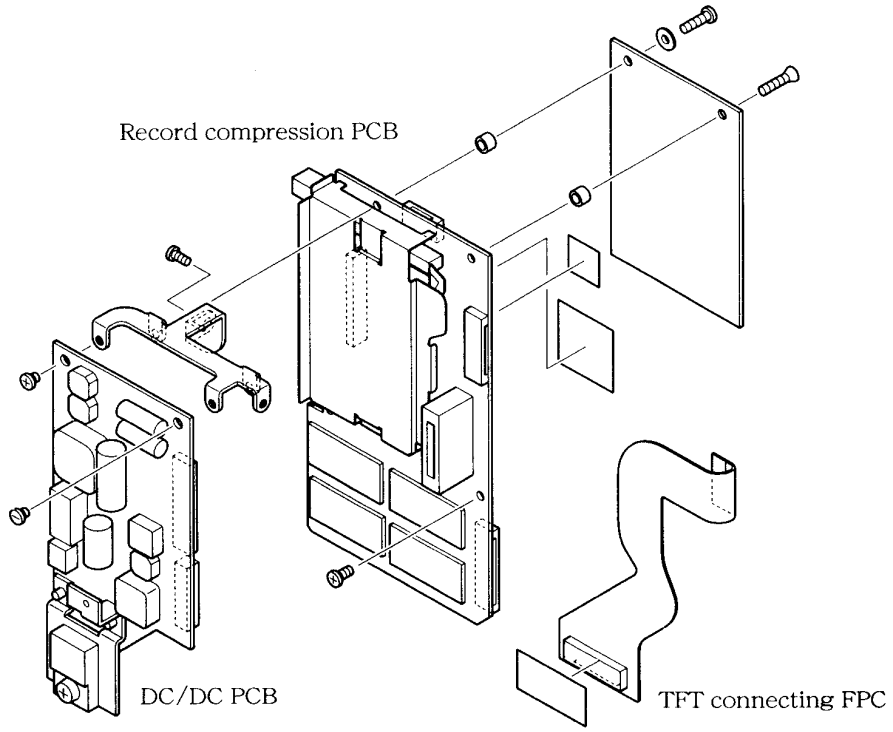
4. Rear body

Grip PCB unit

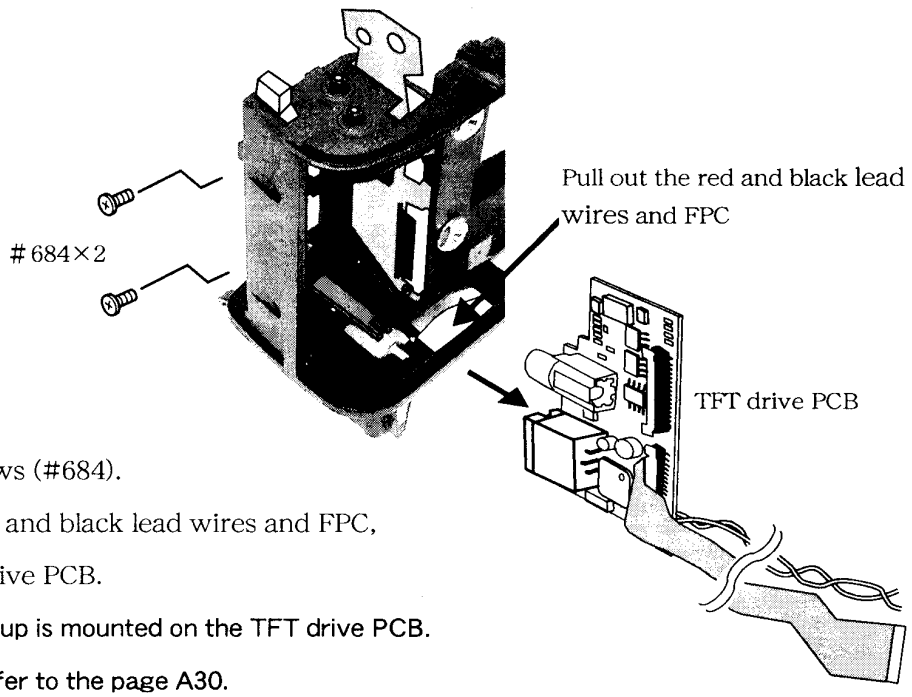




- Remove the power FPC from the connector.
- Remove the two screws (#685).
- Remove the screw (#684).
- Remove the screw (#671).
- Remove the grip PCB unit.



TFT drive PCB

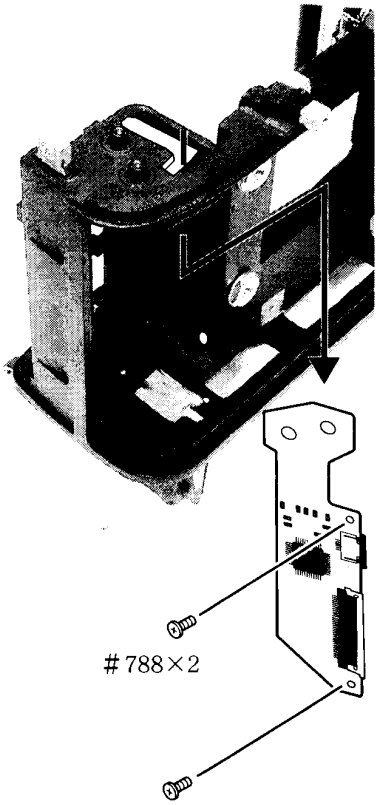


- Remove the two screws (#684).
- As pulling out the red and black lead wires and FPC, remove the TFT drive PCB.

Note : The battery for backup is mounted on the TFT drive PCB.

For replacement, refer to the page A30.

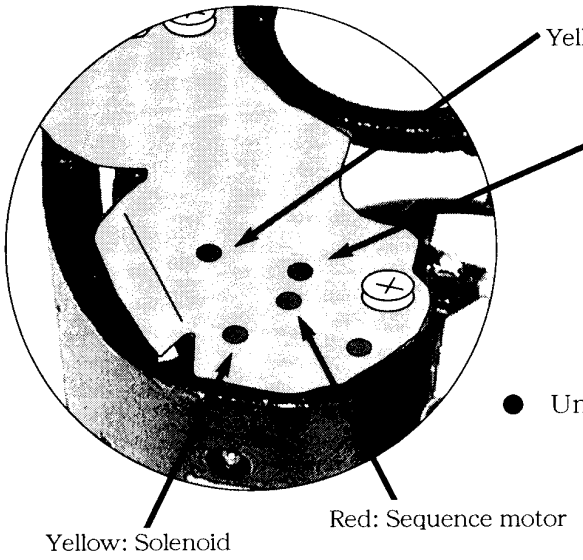
Film rewind relay FPC



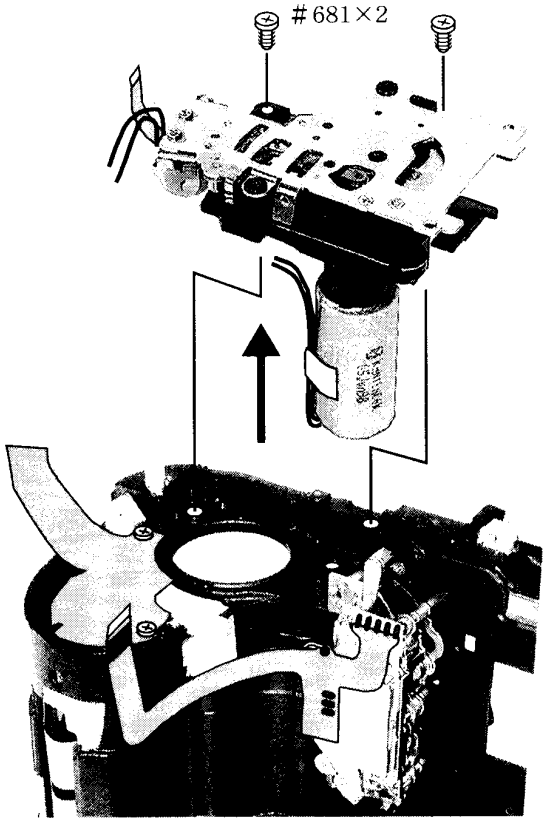
- Remove the two screws (#788).
- Remove the film rewind relay FPC.

Main C/D assembly unit

Sequence unit

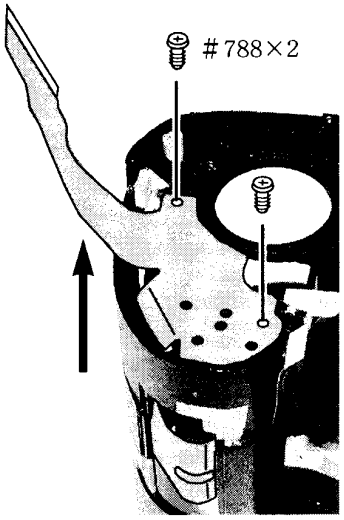


- Unsolder the four lead wires on the power FPC.



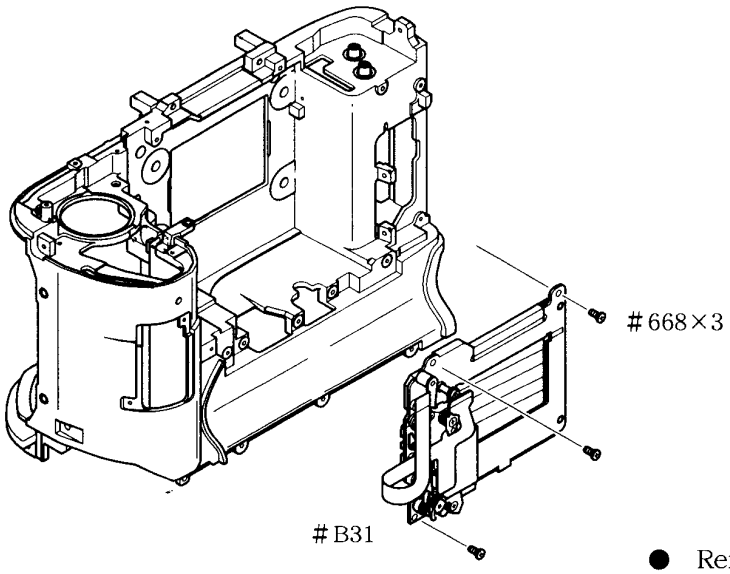
- Remove the two screws (#681).
- Remove the sequence PCB.

Power FPC



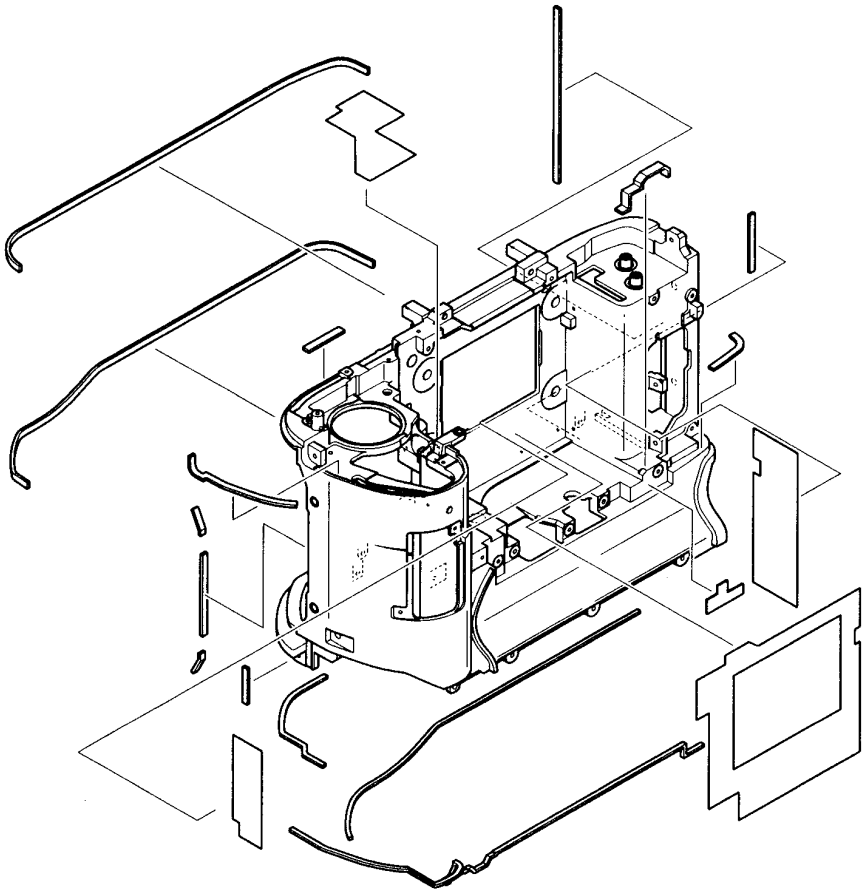
- Remove the two screws (#788).
- Remove the power FPC.

Shutter assembly unit



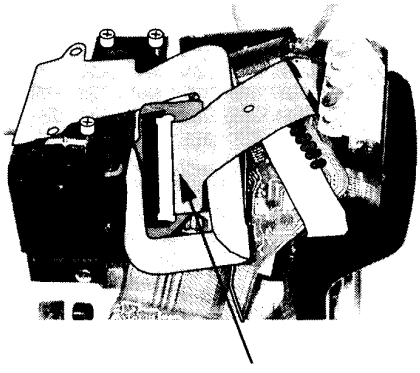
- Remove the three screws (#668).
- Remove the shutter unit (#B31).

Other parts

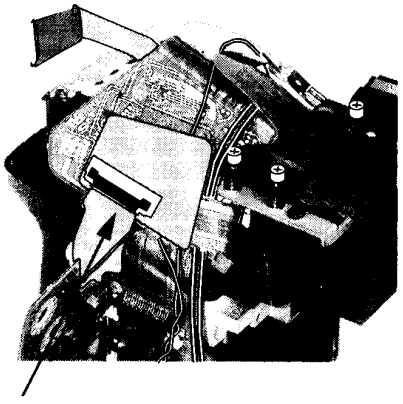


5. Front body unit

Removing connectors from the front body unit



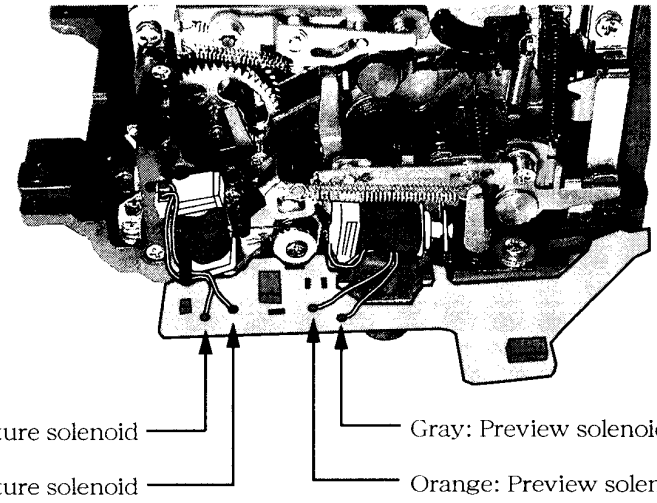
Connector

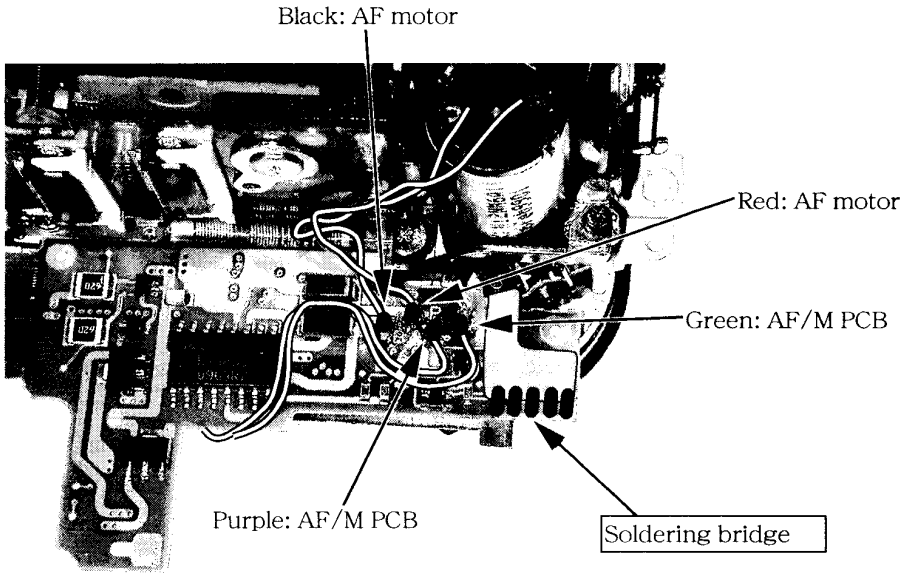


Connector

- Remove the FPCs from the connectors.

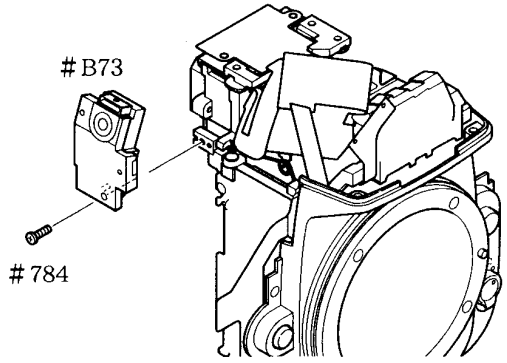
Unsoldering on the front body unit





- Unsolder the lead wires and soldering bridges.

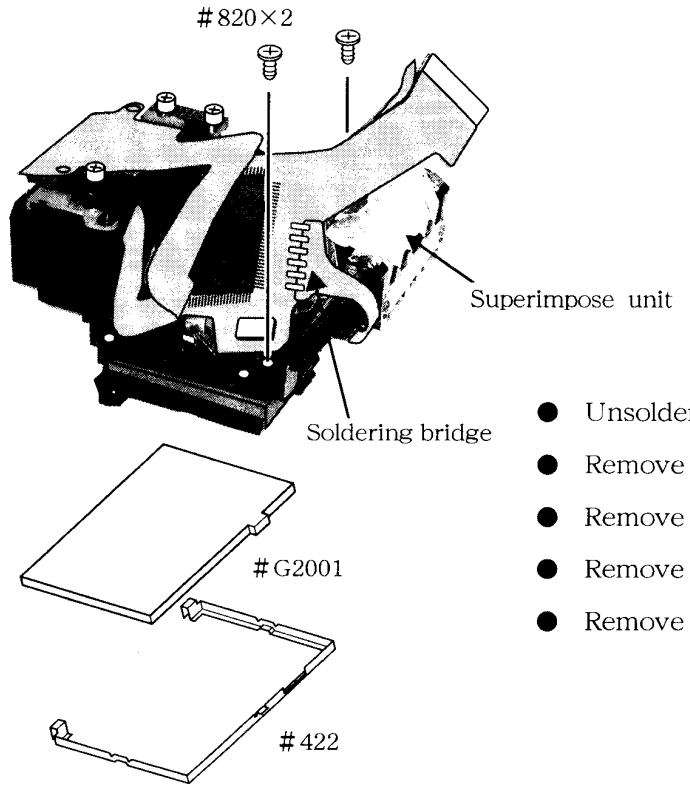
Diopter adjusting mount



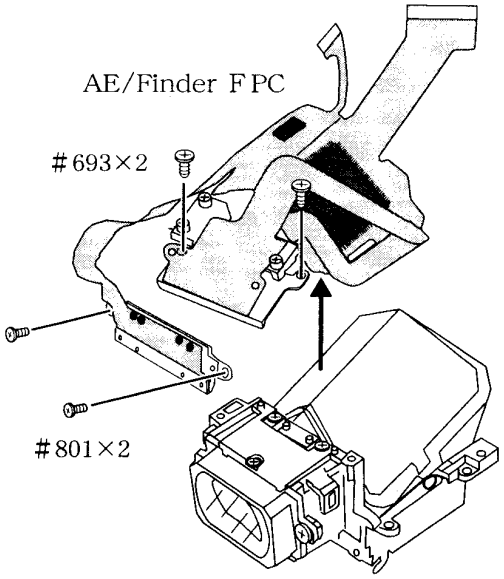
- Remove the screw (#784).
- Remove the diopter adjusting mount (#B73).

Main FPC → Light baffle plate

Prism box



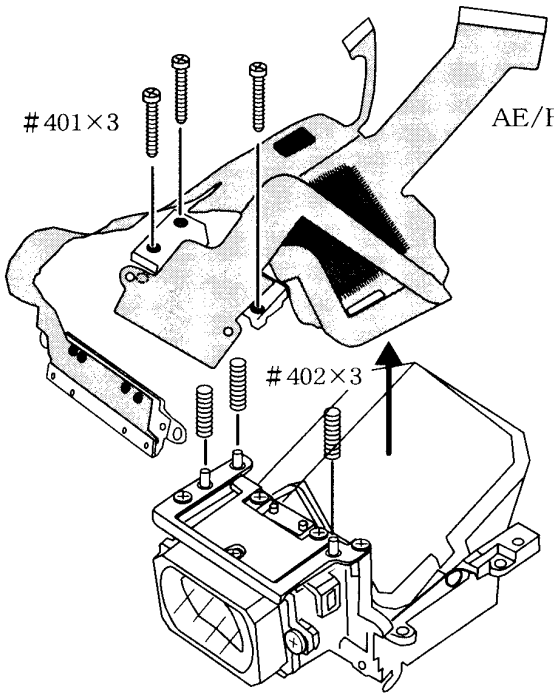
- Unsolder the soldering bridge.
- Remove the two screws (#820).
- Remove the superimpose assembly unit.
- Remove the screen (#G2001).
- Remove the screen frame (#422).



※: **If unnecessary to replace the AE/Finder FPC**

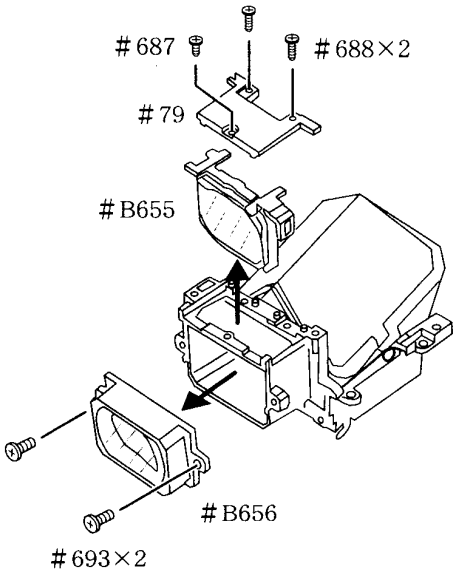
- Remove the two screws (#801).
- Remove the internal LCD unit from the prism box.
- Remove the two screws (#693).
- Remove the AE/Finder FPC.

  The AE/Finder FPC is adhered with the double adhesive tape.

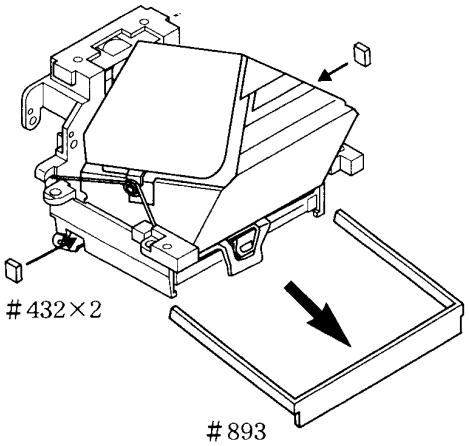


※ When you hope to replace the AE/Finder FPC:

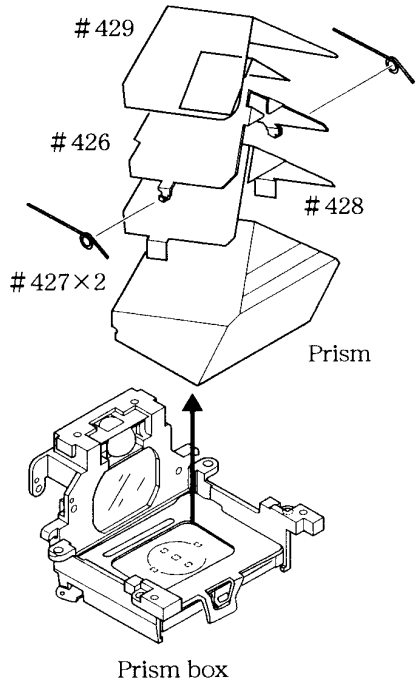
- Remove the three screws (#401).
- The three springs (#402) can be removed.



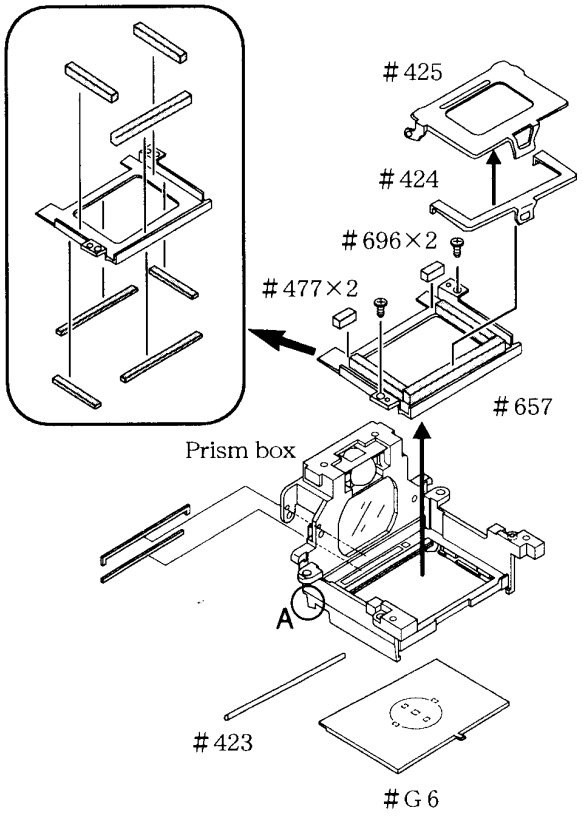
- Remove the two screws (#693).
- Remove the eyepiece lens frame unit (#B656).
- Remove the two screws (#688) and the screw (#687).
- Remove the roof plate (#79) of the eyepiece unit.
- Remove the diopter movable lens (#B655).



- Remove the sponge (#893).
- Remove the two sponges (#432).



- Remove the two pentaprism retainer springs (#427).
- Remove the pentaprism retainer plate (#426) and pentaprism retainer insulating sheet (#429).
- Remove the pentaprism retainer sheet (#428).
- Remove the prism.



- Remove the adhesive, Super X, which is applied to the right and left of the unit "A".
- Remove the screen frame indication shaft (#423).
- Remove the SI indication plate (#G6).
- Remove the finder field frame (#425).
- Remove the superimpose frame (#424).
- Remove the two sponges (#477).
- Remove the two screws (#696).
- Remove the reference frame (#657).

Horizontal AF lever, AF unit → Bayonet mount, apron

Attachable lens switch unit, AF/M switch circuit board → Lens release button unit, lens release base plate

AF driving unit → Preview unit → L I unit

I base plate, L base plate → Other small parts

6. Top cover unit

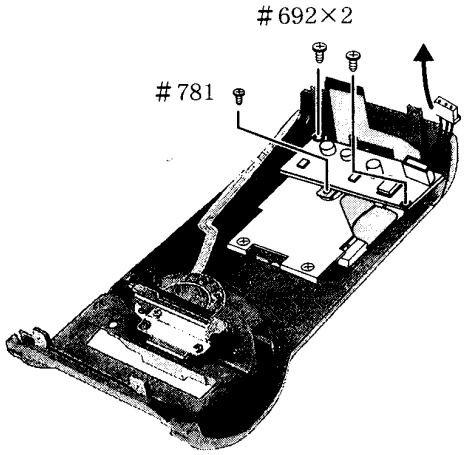
Note:The top cover unit of D1 is not equipped with the eyepiece unit.

Front C/D unit → Release switch unit → Front C/DFPC unit

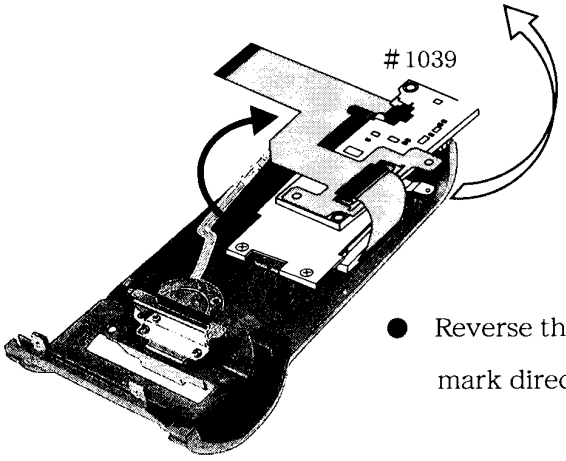
Top cover FPC / film advance mode dial / triple operation buttons → Other small parts

7. Back door unit

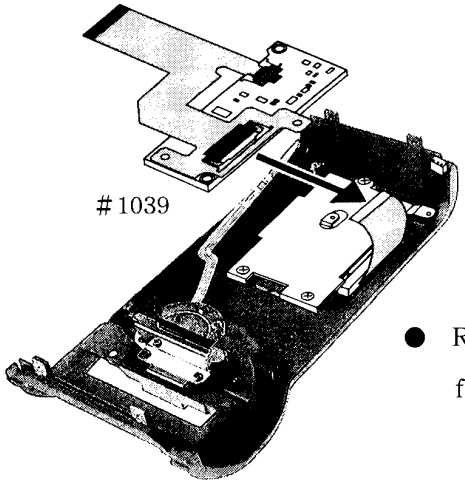
Inverter circuit PCB/Indication LCD relay FPC



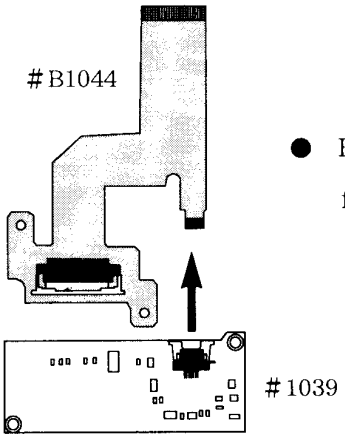
- Remove the lead wire connector of the TFT assembly unit from the connector of the inverter circuit PCB.
- Remove the screw (#781).
- Remove the two screws (#692).



- Reverse the inverter circuit PCB (#1039) in the white arrow mark direction and then turn it in 90° counterclockwise.

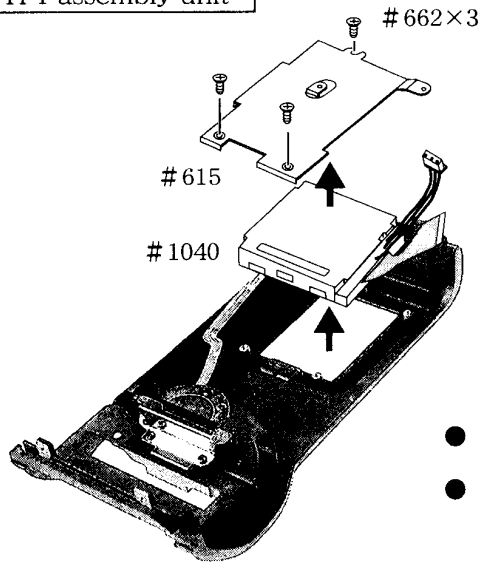


- Remove the connector of the inverter circuit PCB (#1039) from the FPC of the TFT assembly unit.



- Remove the connector of the inverter circuit PCB (#1039) from the FPC of the TFT assembly unit.

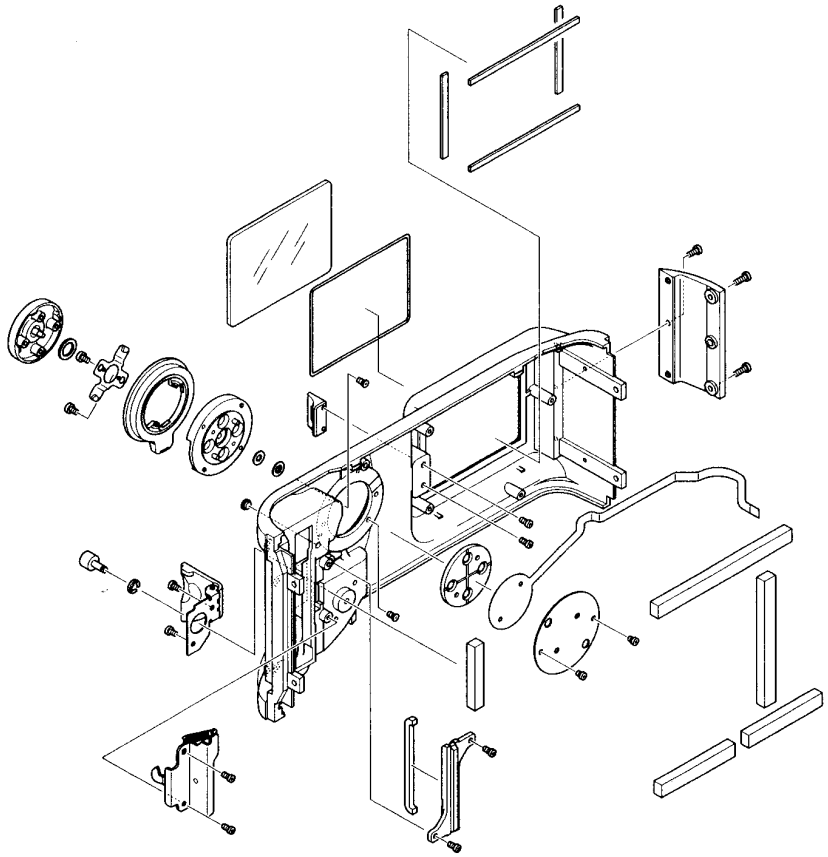
TFT assembly unit



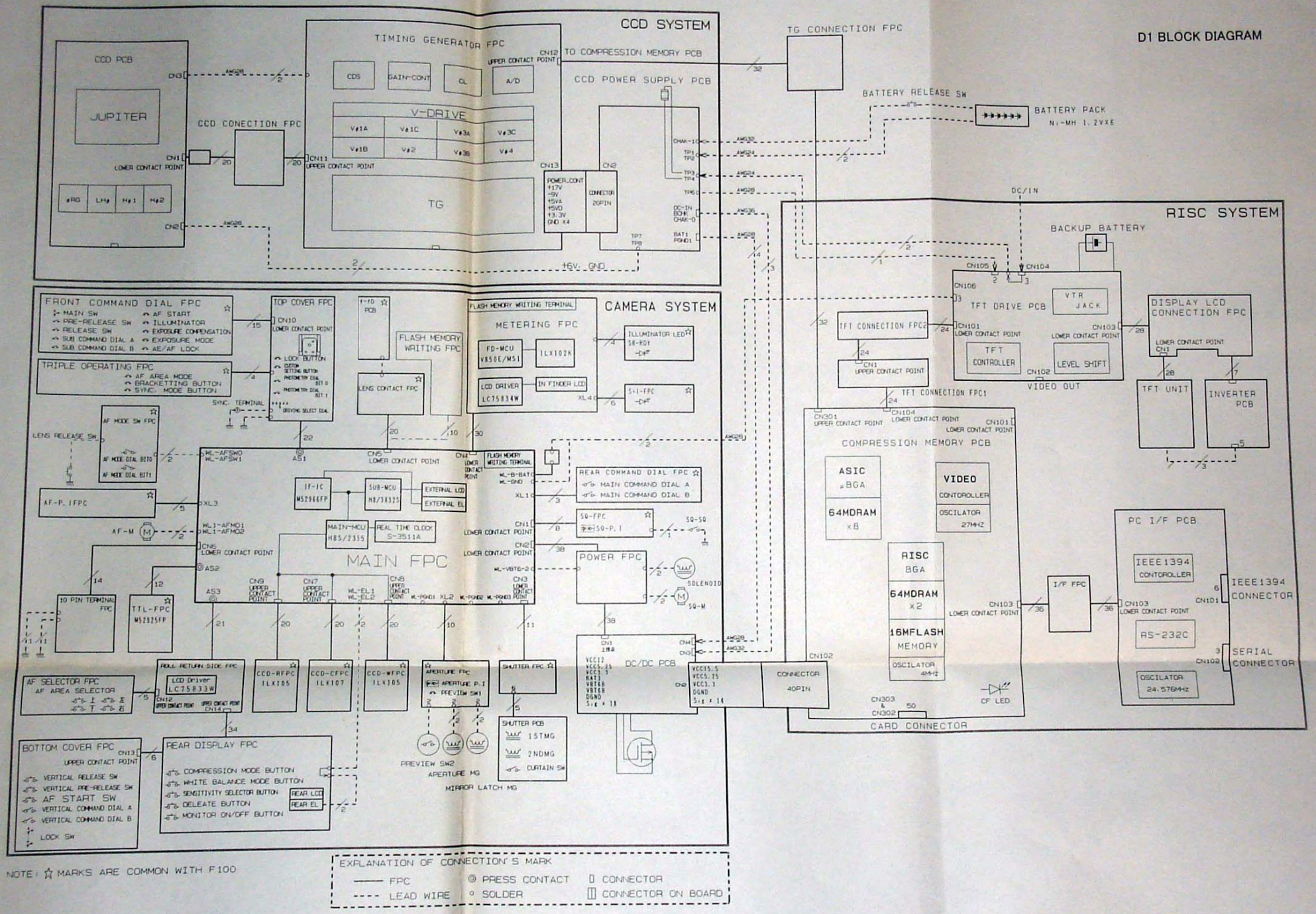
- Remove the three screws (#662).
- Remove the TFT assembly unit (#1040) and TFT retainer (#615).

Back door body

Other small parts



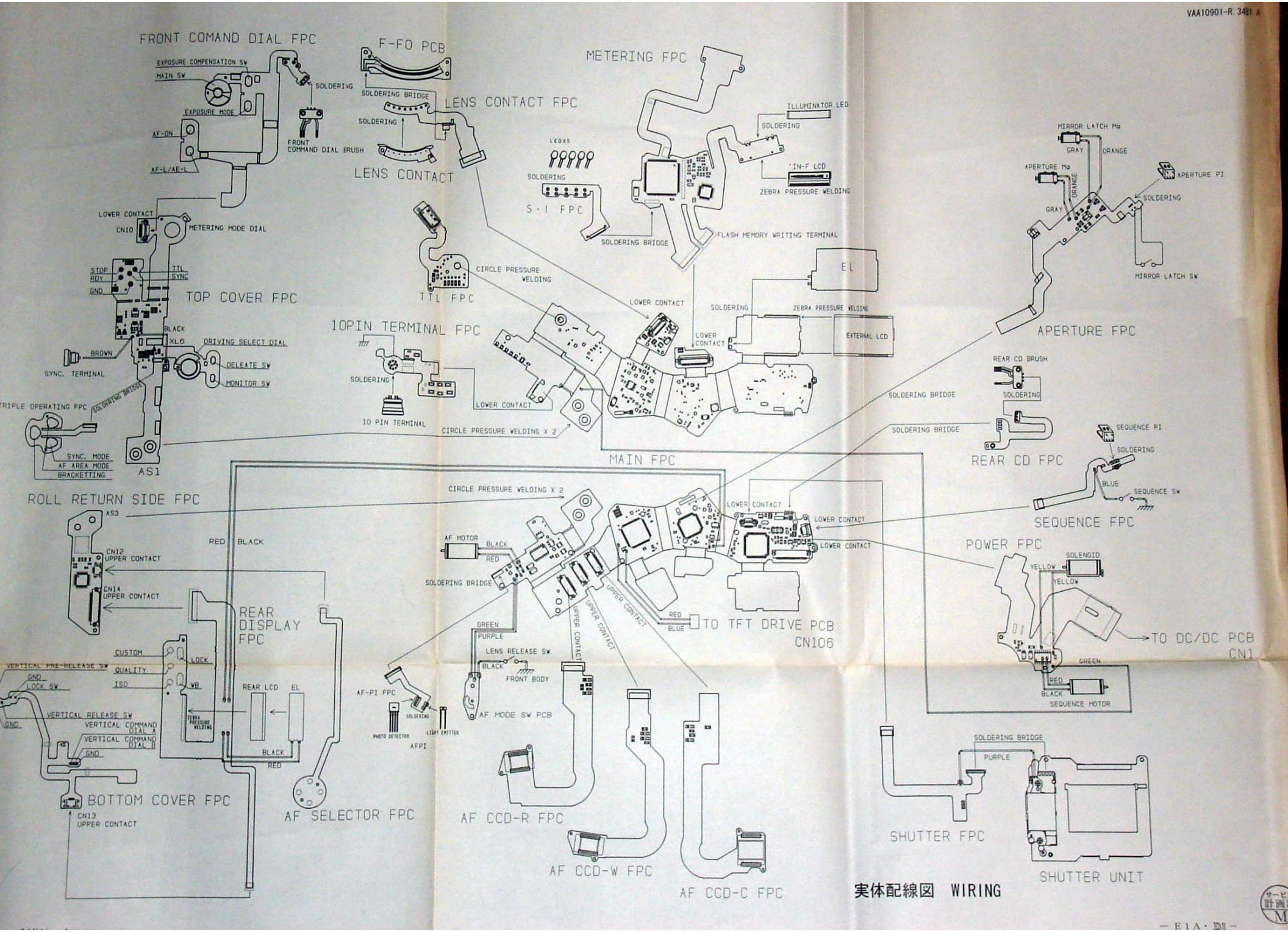
D1 BLOCK DIAGRAM



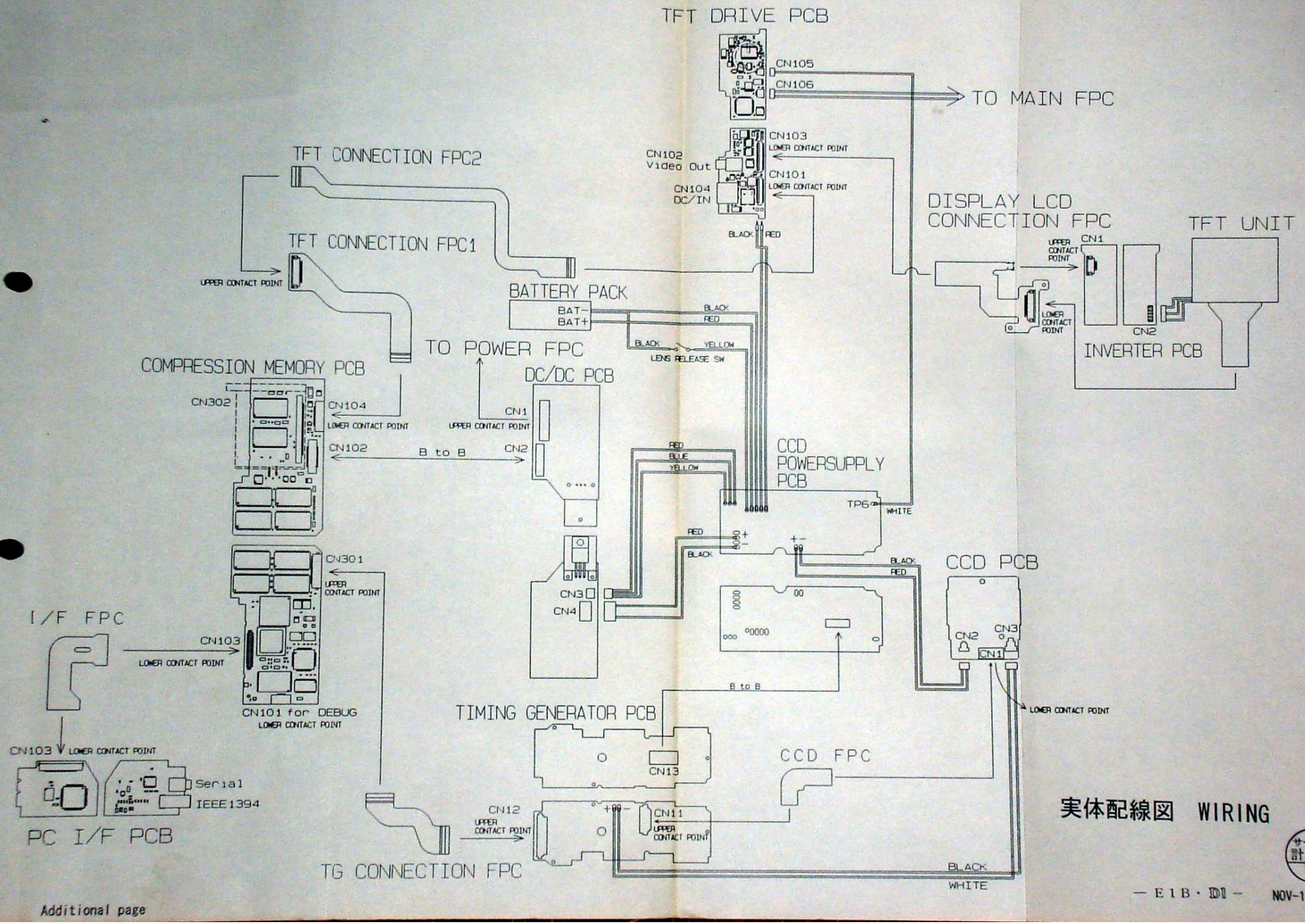
NOTE : ☆ MARKS ARE COMMON WITH F100

EXPLANATION OF CONNECTION'S MARK

—— FPC	◎ PRESS CONTACT	▯ CONNECTOR
---- LEAD WIRE	○ SOLDER	▯ CONNECTOR ON BOARD



実体配線図　WIRING

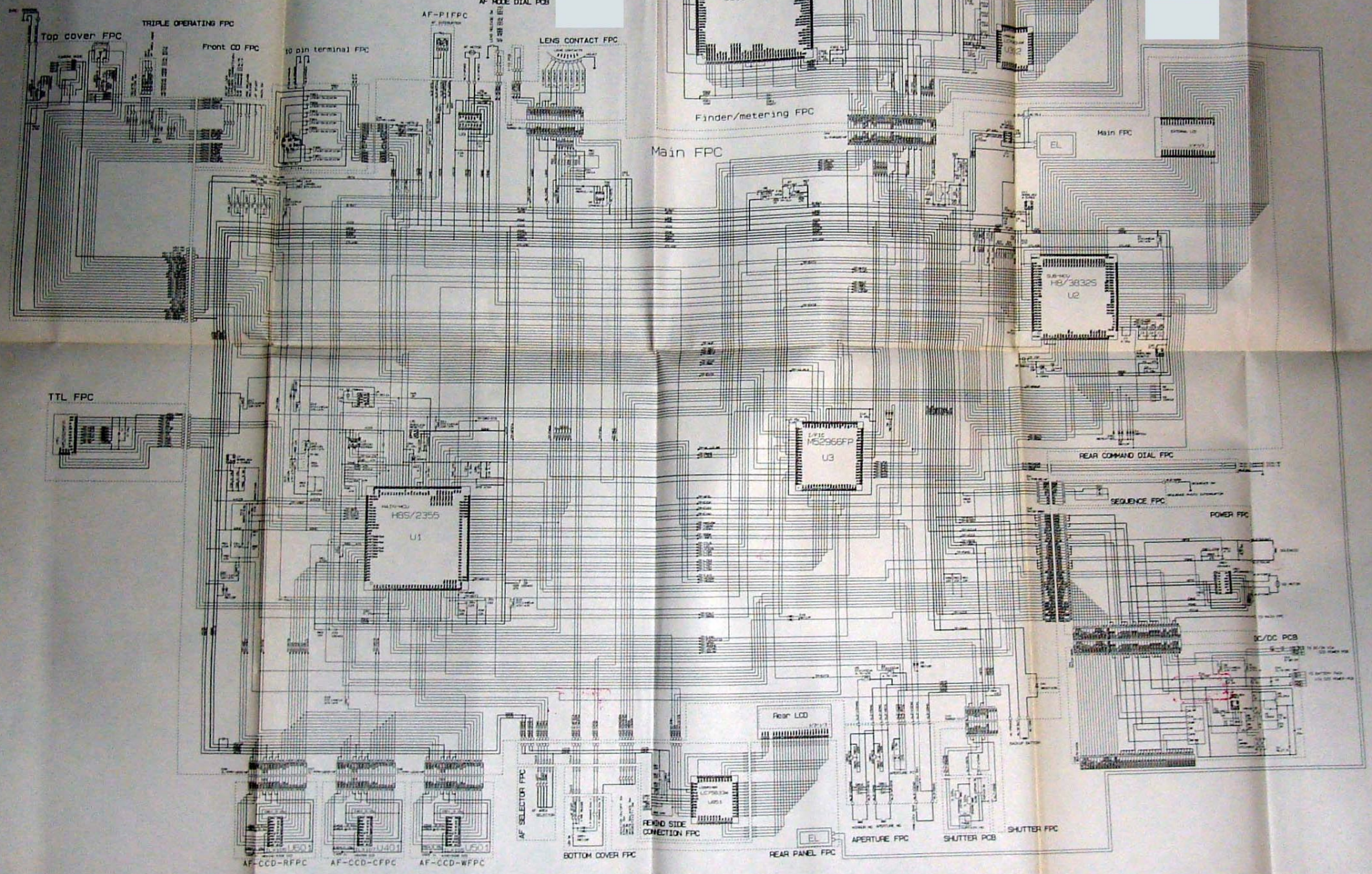


実体配線図 WIRING

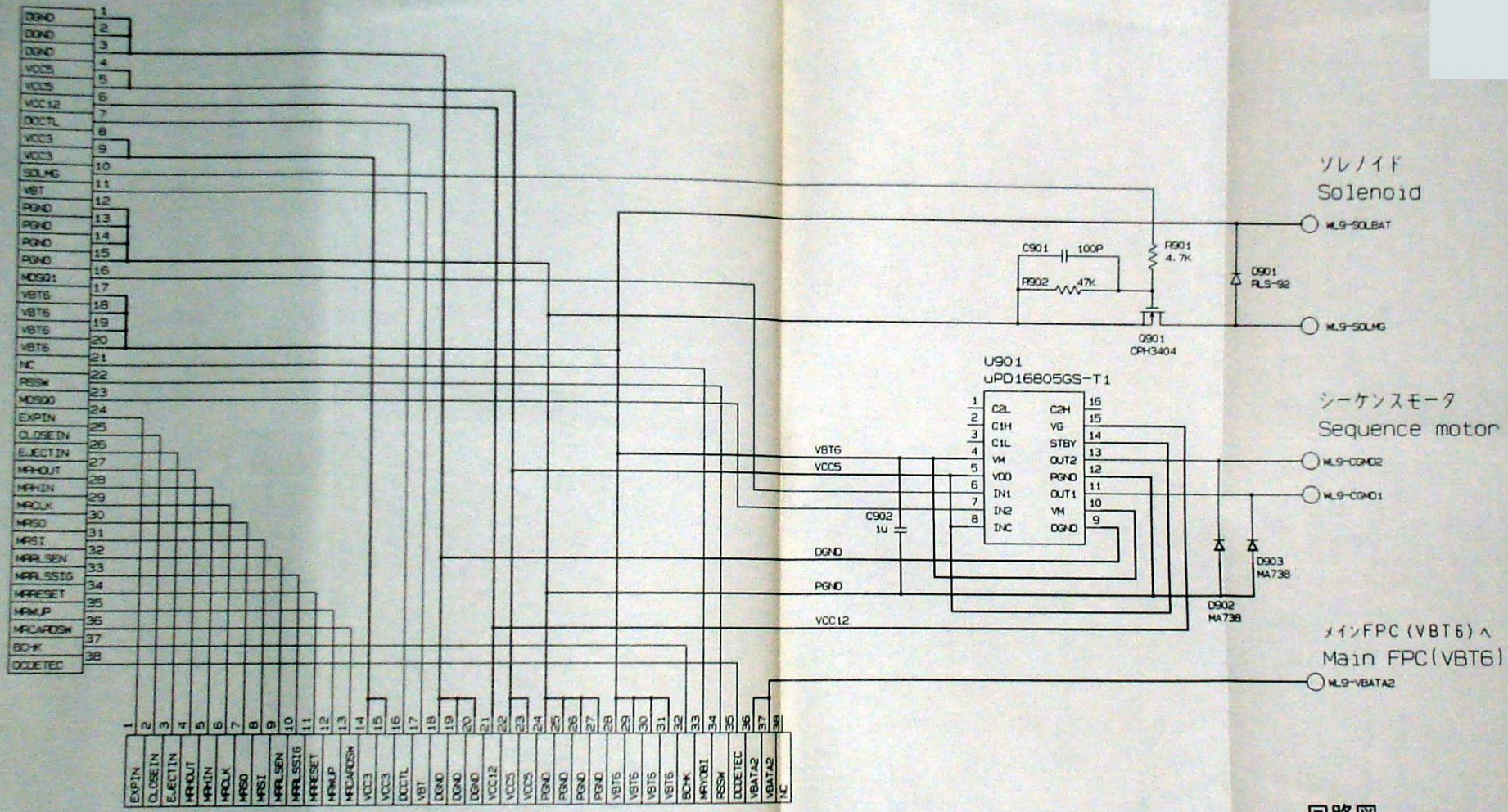
サービス計画課 M

Additional page

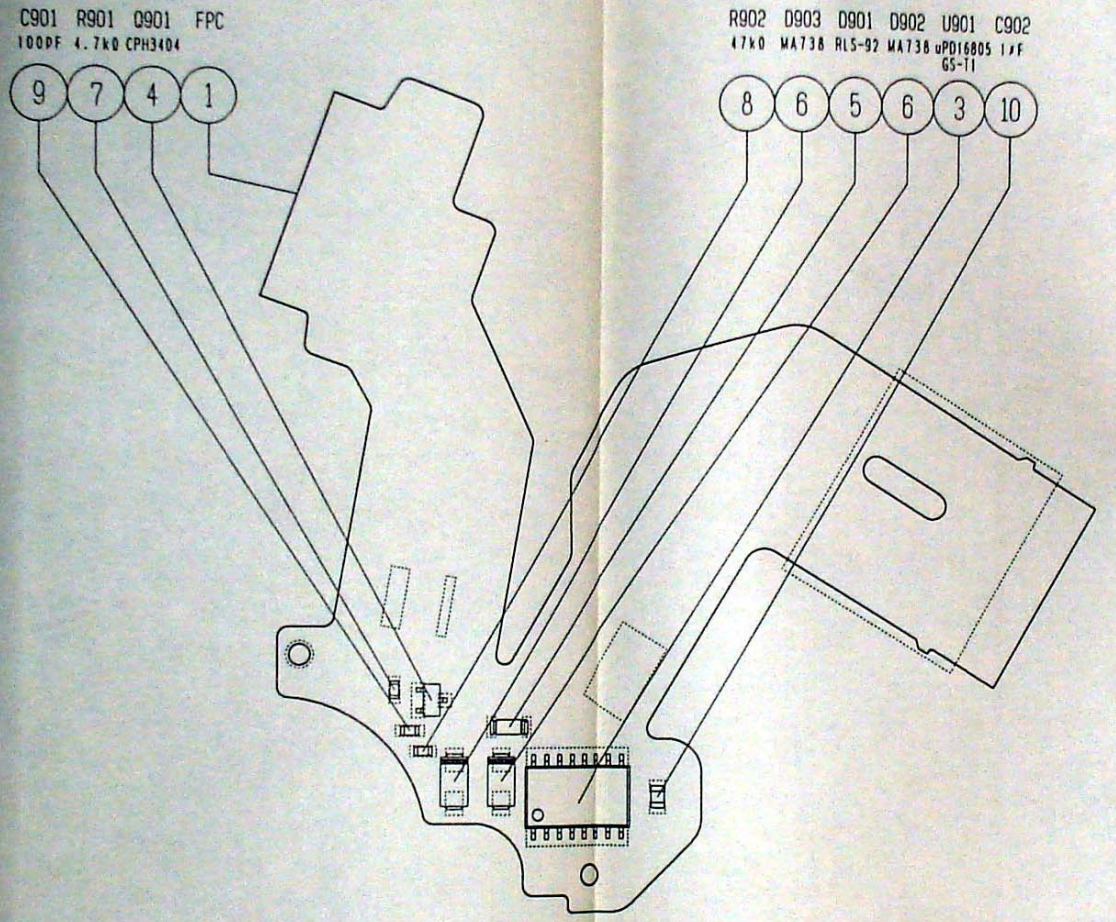
CAMERA SYSTEM CIRCUIT DIAGRAM



パワーFPC
POWER FPC

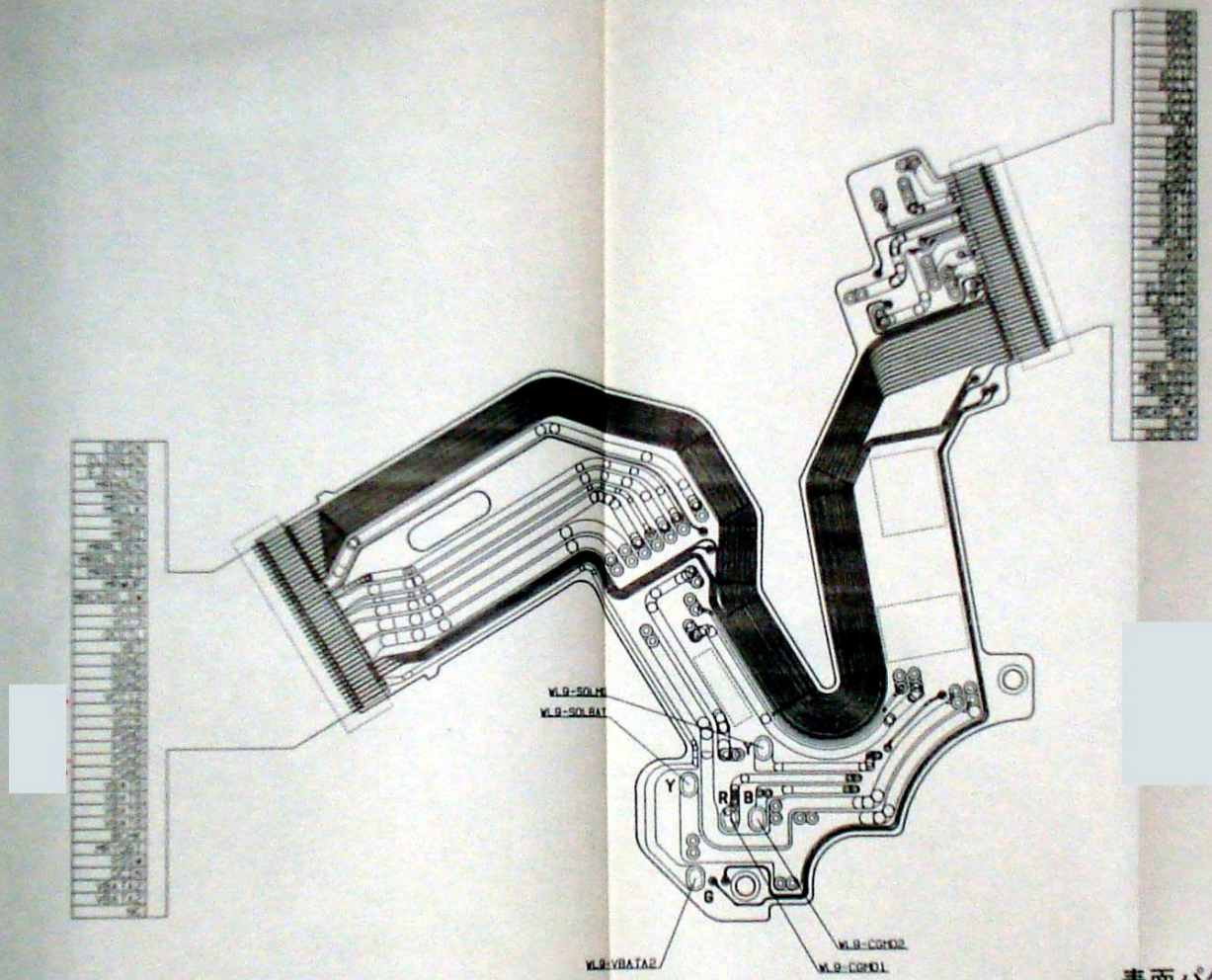


回路図
Circuit diagram

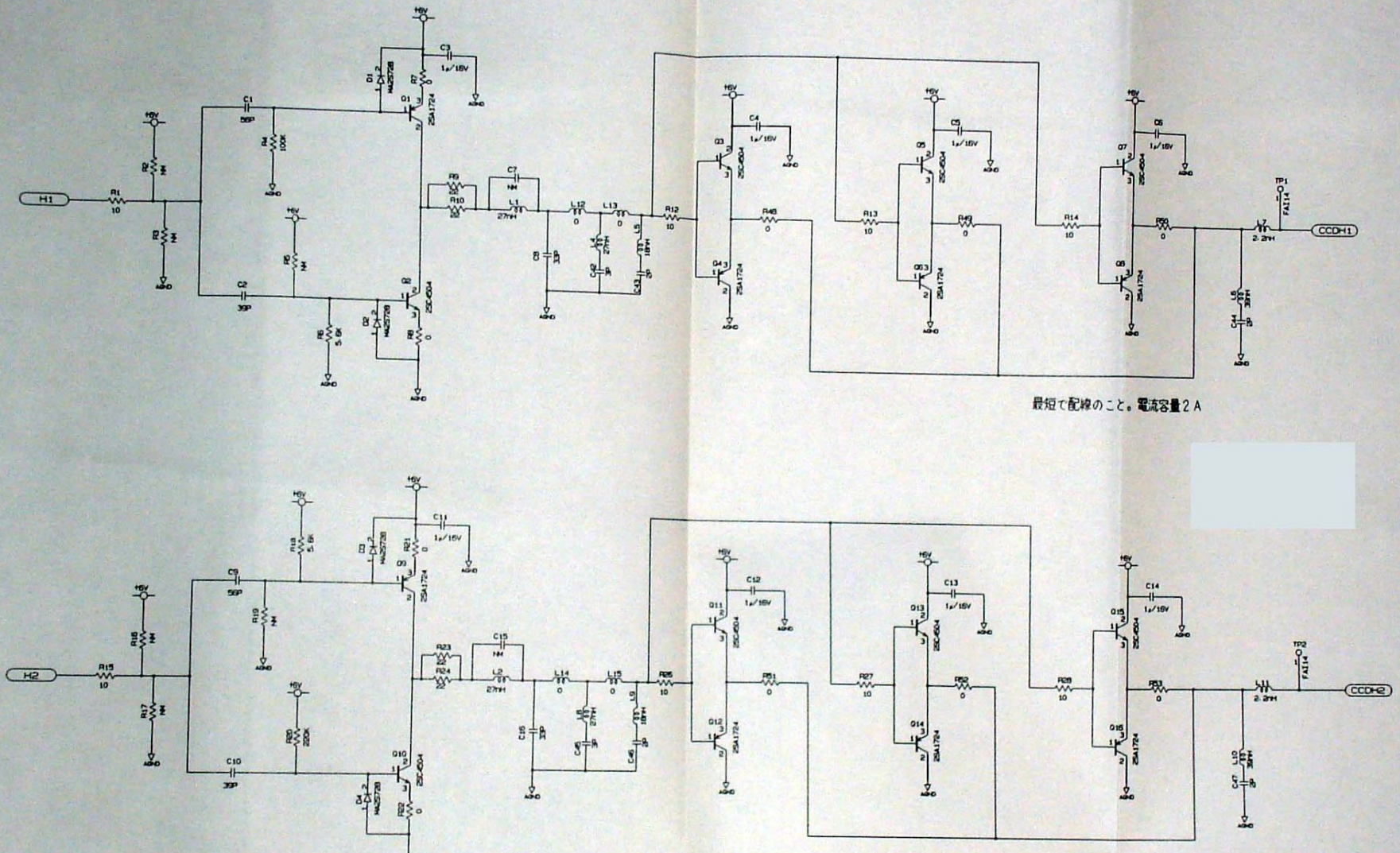


表面部品実装図
Surface parts mount figure

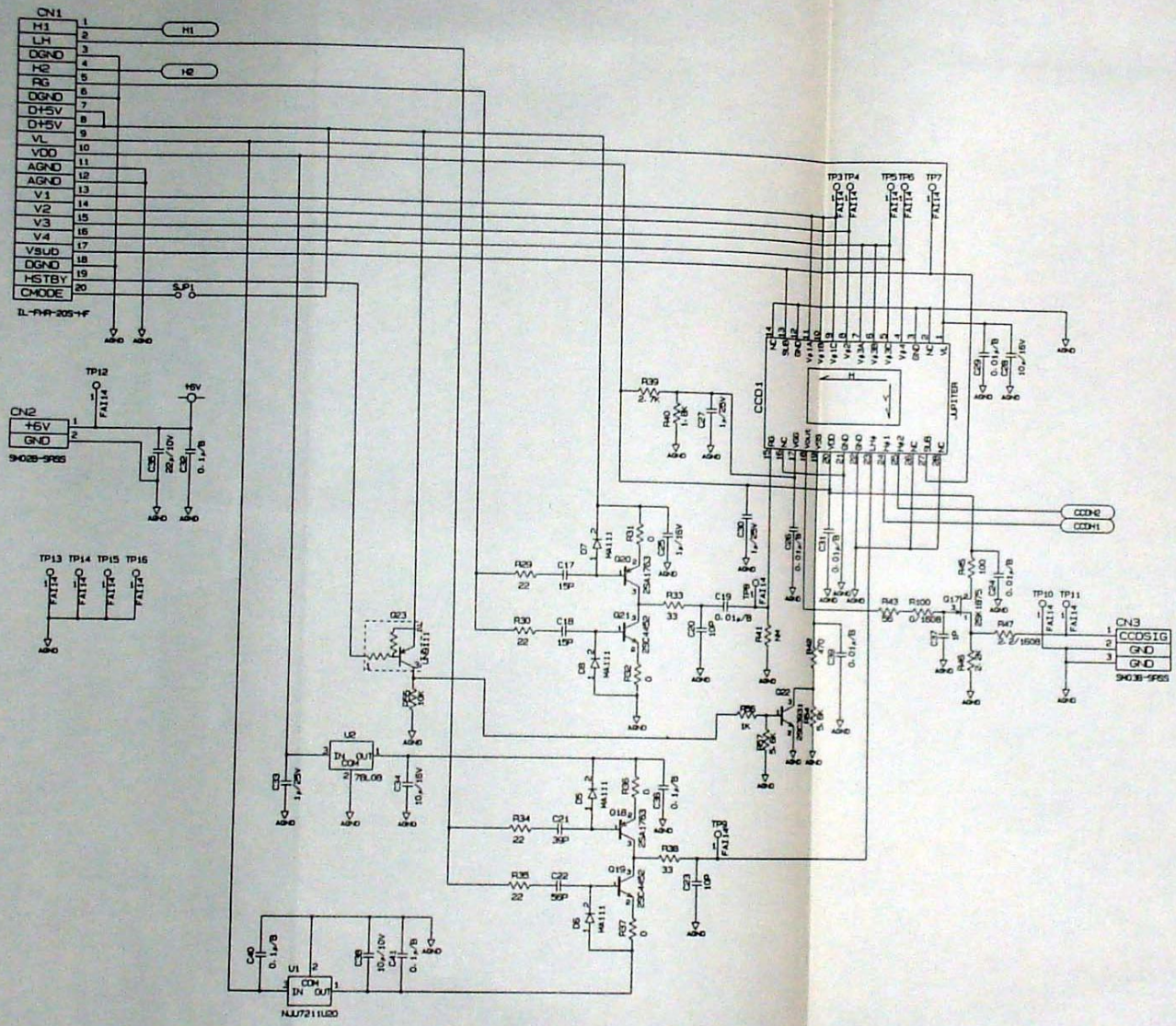
パワーFPC
POWER FPC



表面パターン図
Surface pattern figure

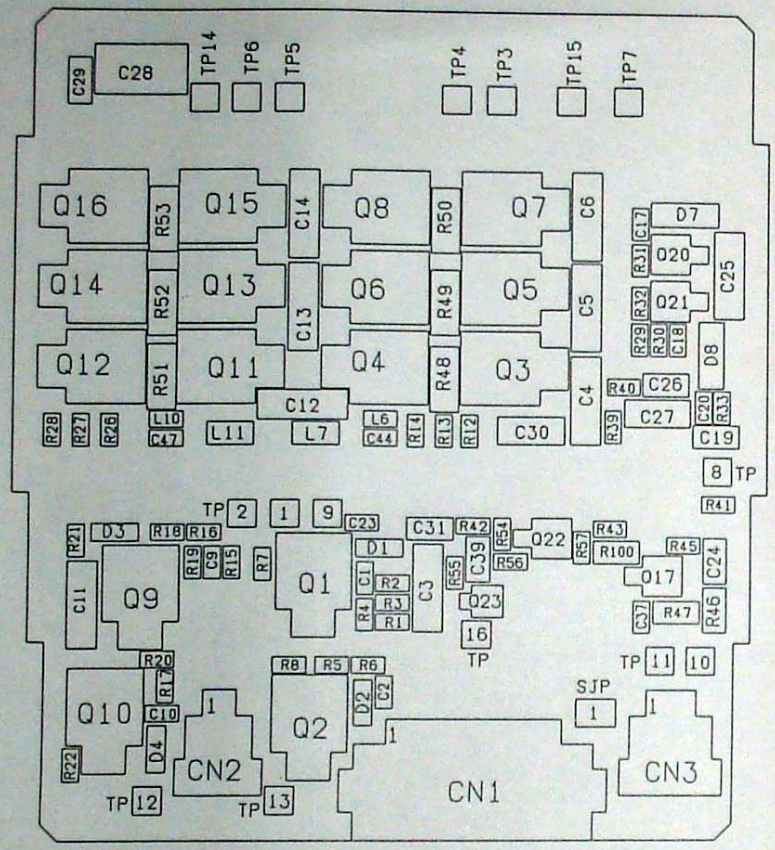


回路図(1)
Circuit diagram (1)



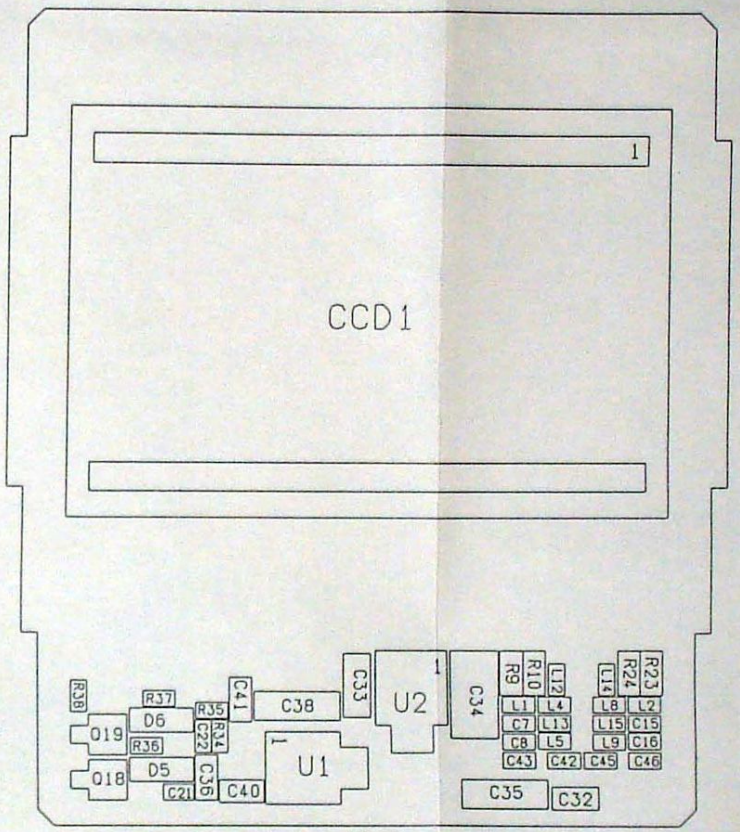
回路図(2)
Circuit diagram (2)

CCD基板
CCD PCB



表面部品実装図

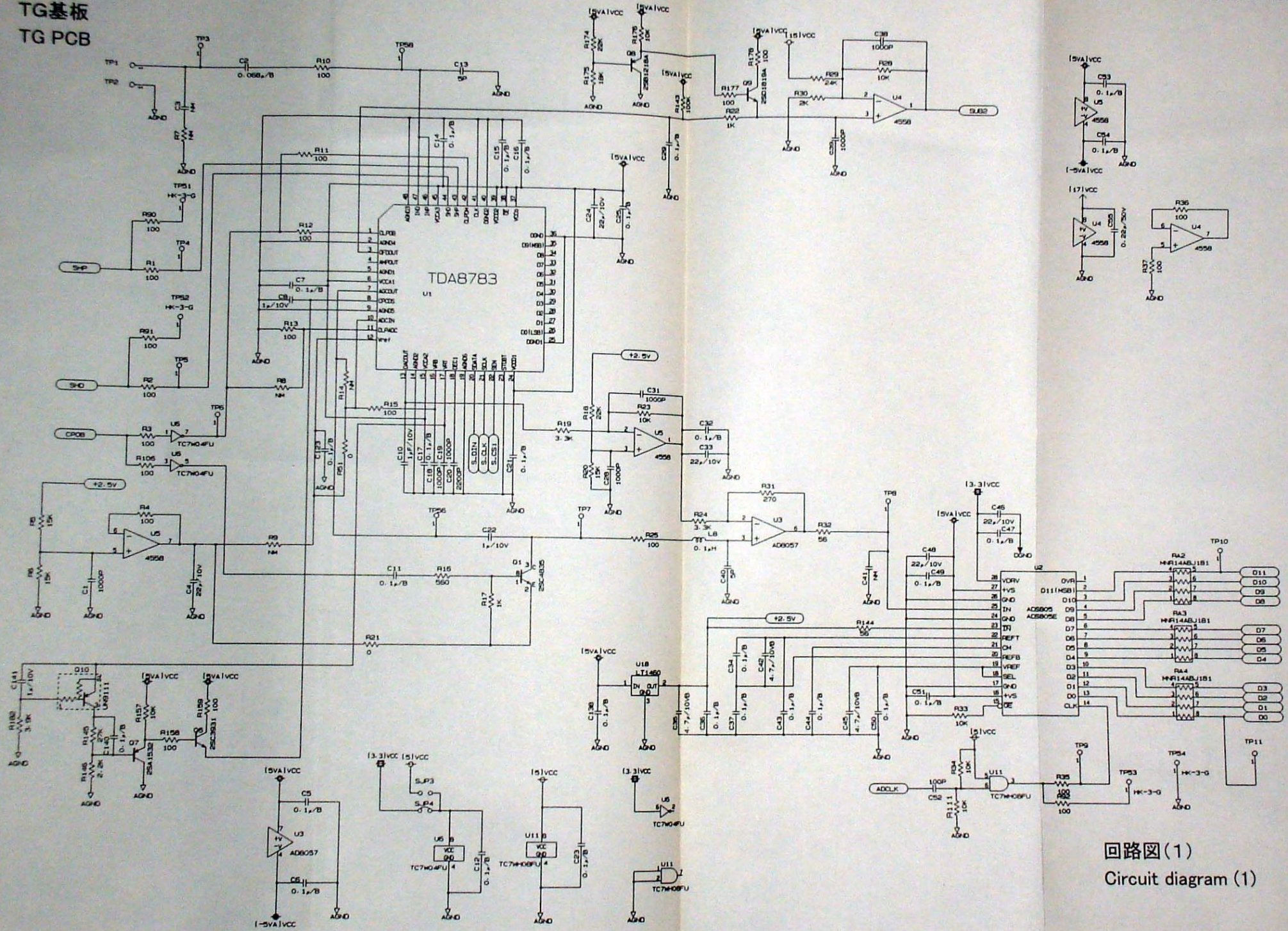
Surface parts mount figure



裏面部品実装図

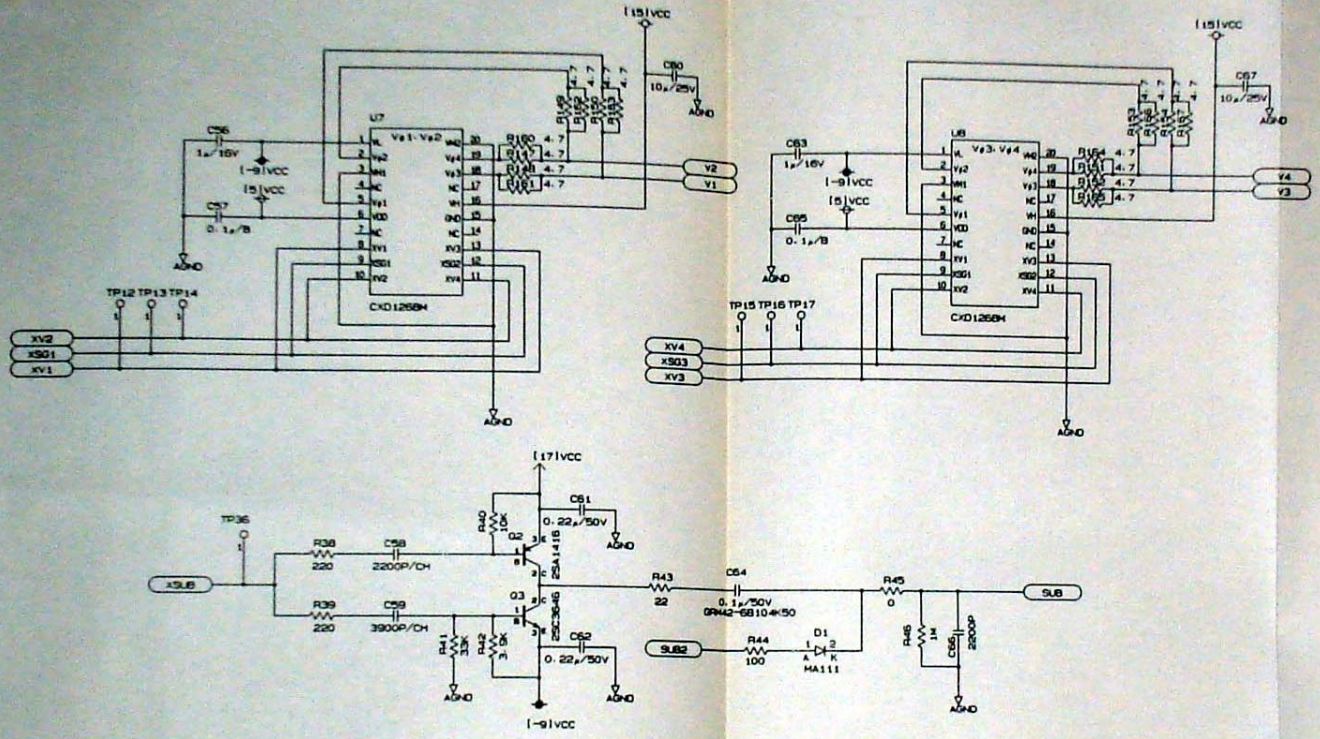
Reverse parts mount figure

TG基板
TG PCB



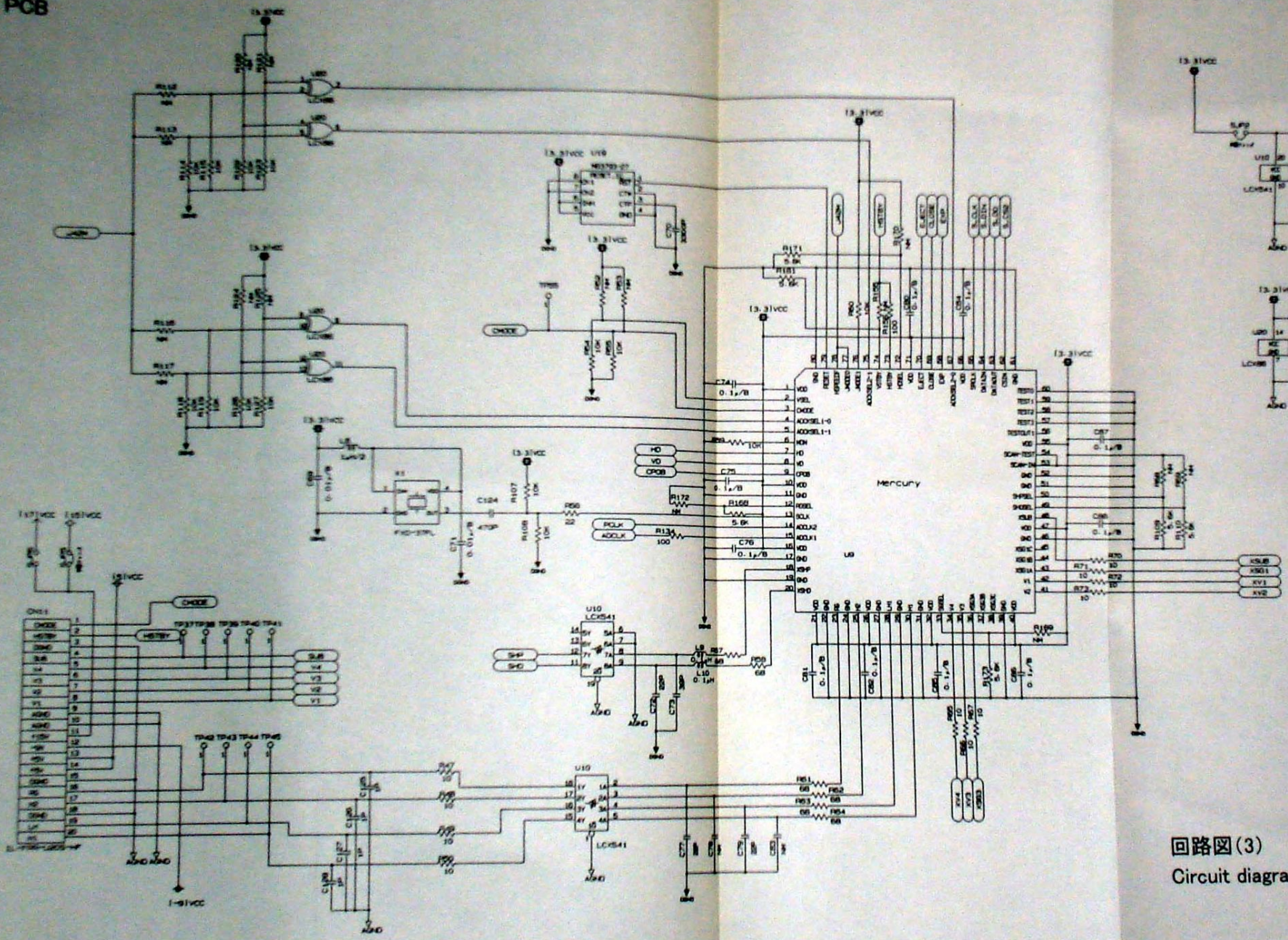
回路図(1)
Circuit diagram (1)

基板
PCB



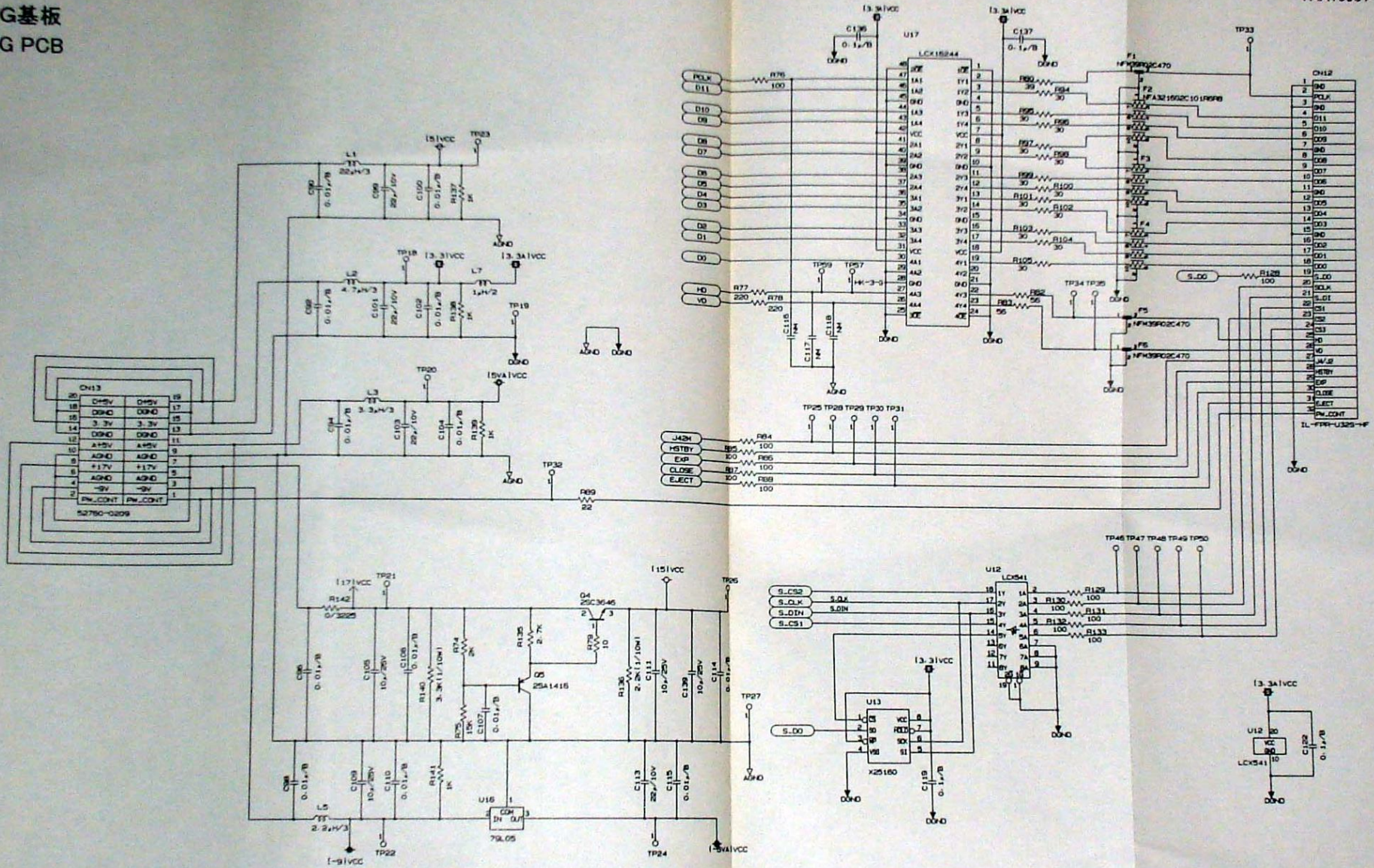
回路図(2)
Circuit diagram (2)

TG基板
TG PCB



回路図(3)
Circuit diagram (3)

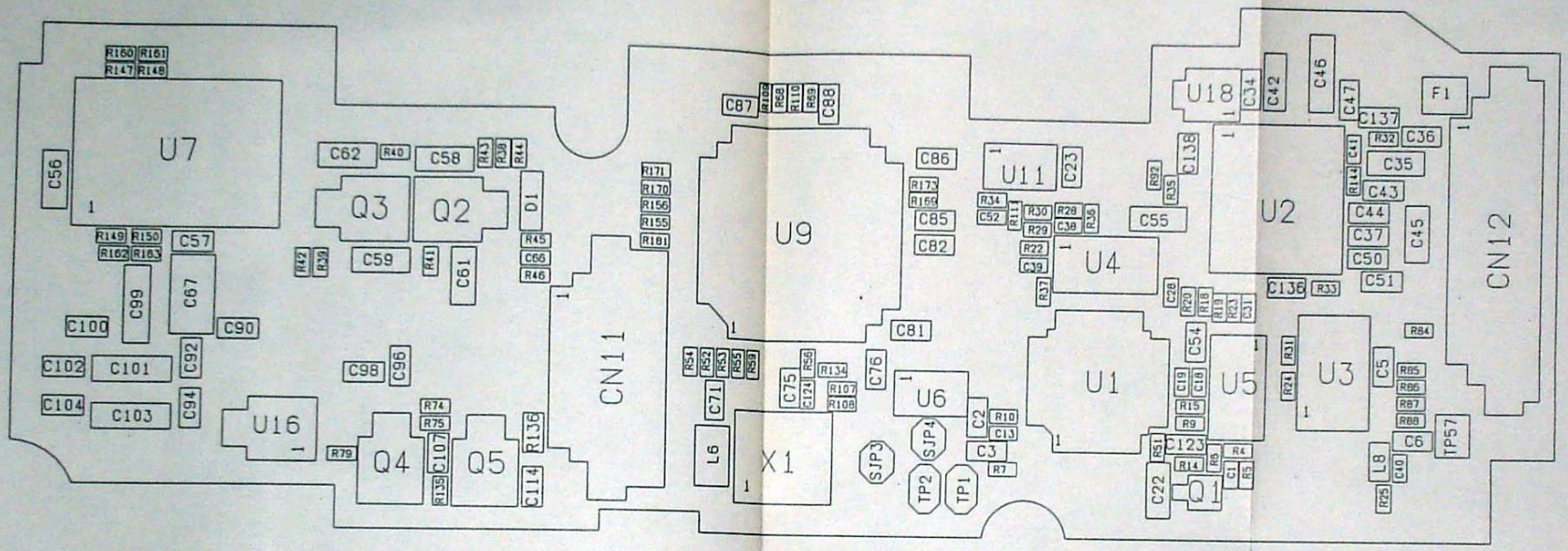
TG基板
TG PCB



回路図(4)
Circuit diagram (4)

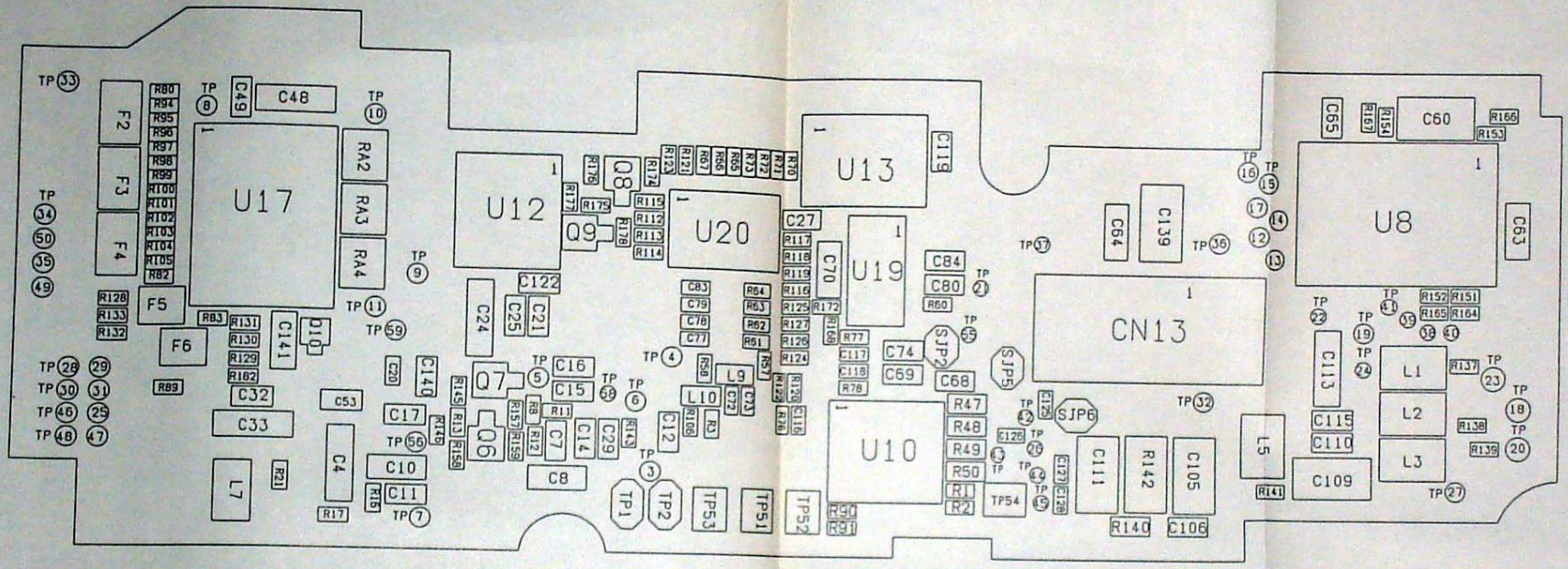
TG基板
TG PCB

VAA10901-R.3481.A



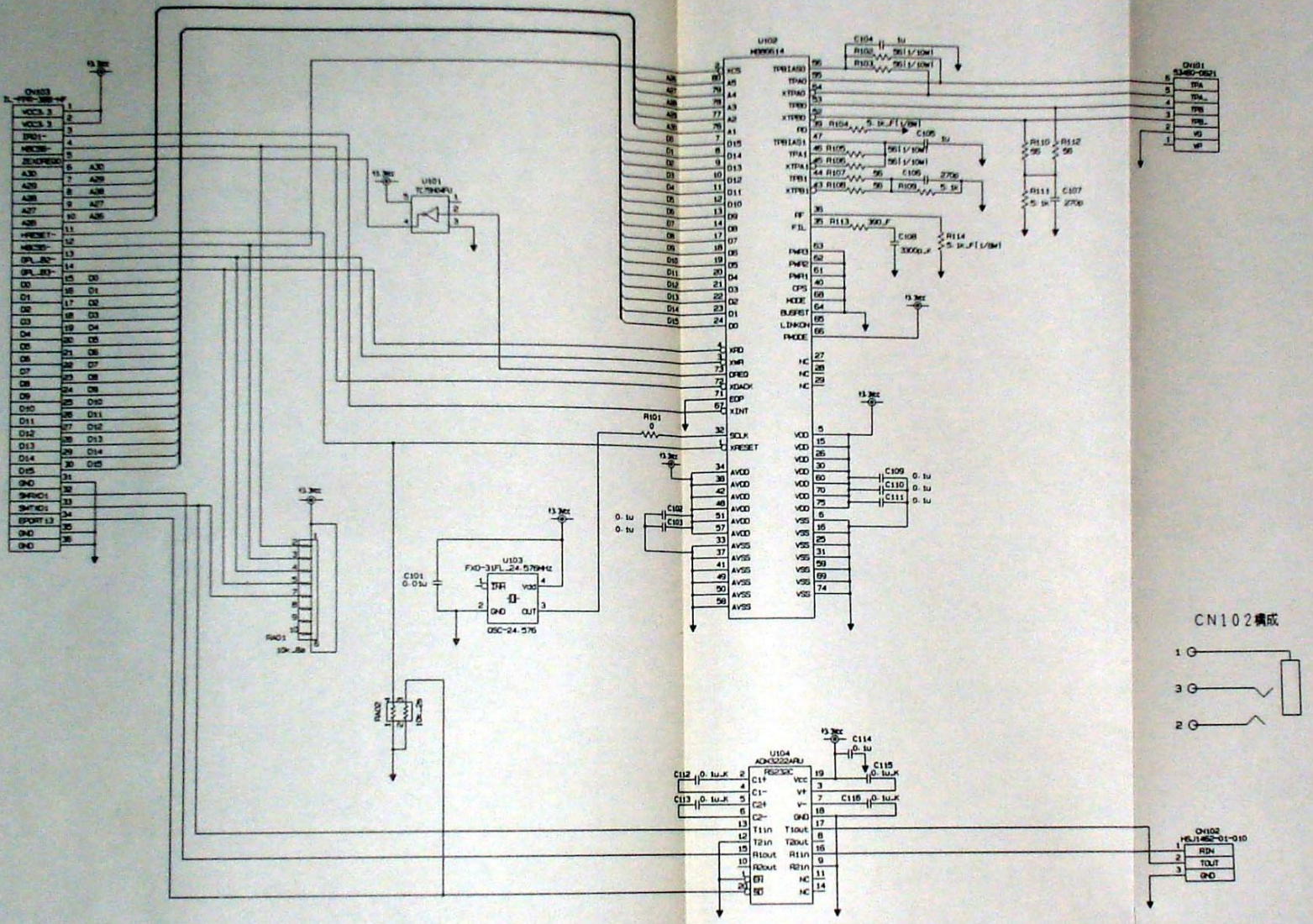
表面部品実装図
Surface parts mount figure

TG基板
TG PCB



裏面部品実装図
Reverse parts mount figure

PC I/F基板
PC I/F PCB

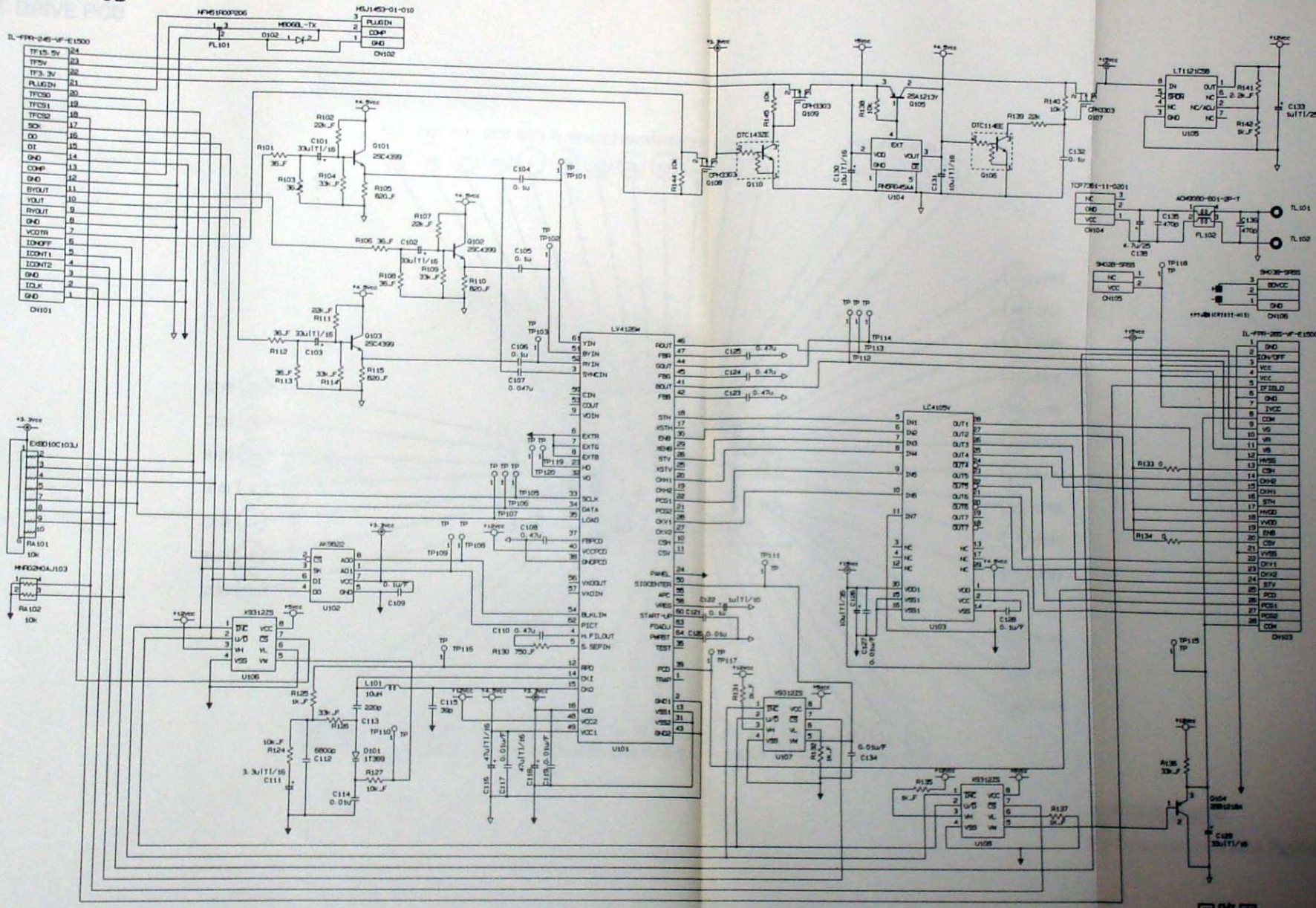


CN102構成

回路図
Circuit diagram

TFTドライブ基板
TFT DRIVE PCB

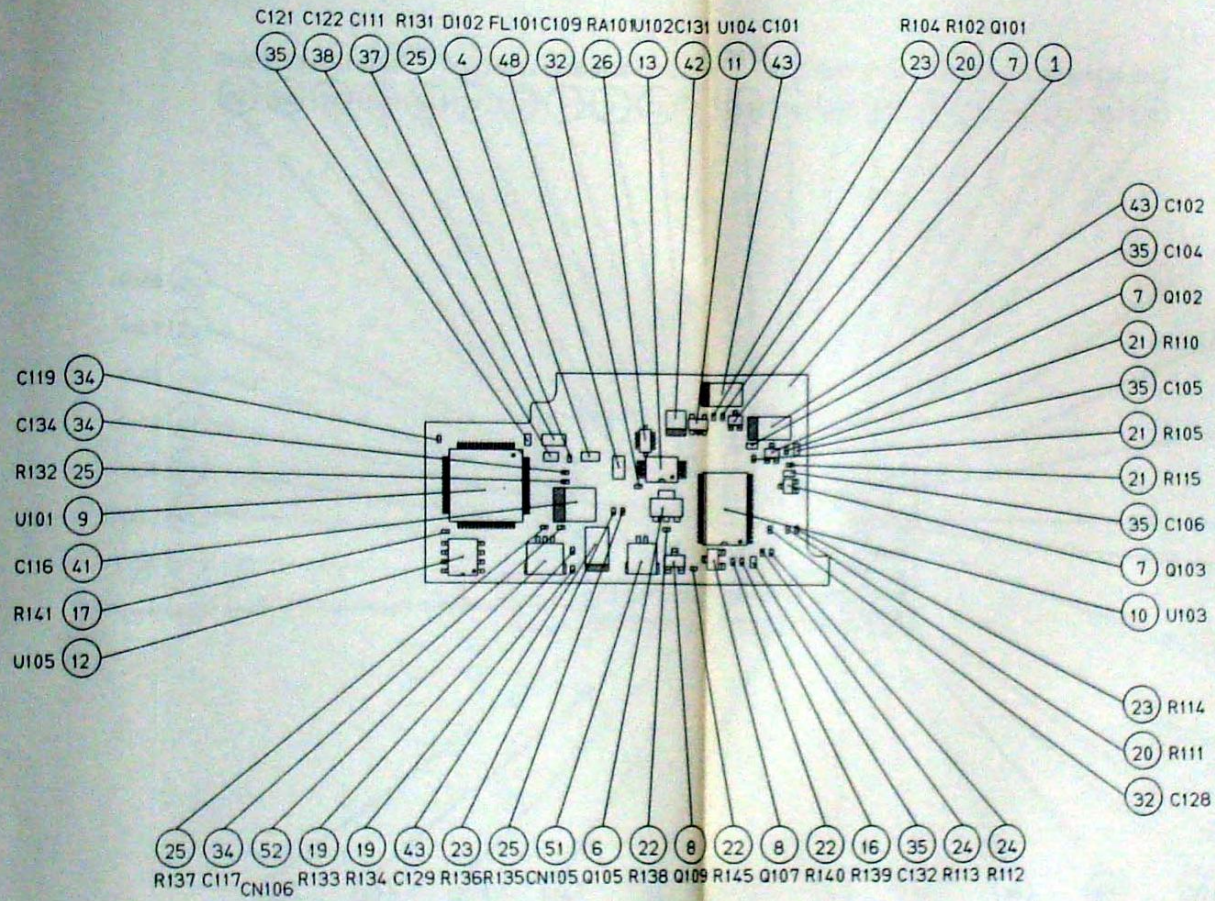
VAA10901-R.3481.A



注1) TL101, TL102は半田付け用ランド
TP101~TP120はチェック用ランド
R116, R117, R118, R119, R120, R121, R122, R123, R128, R129, R143, TP104, C137は欠番

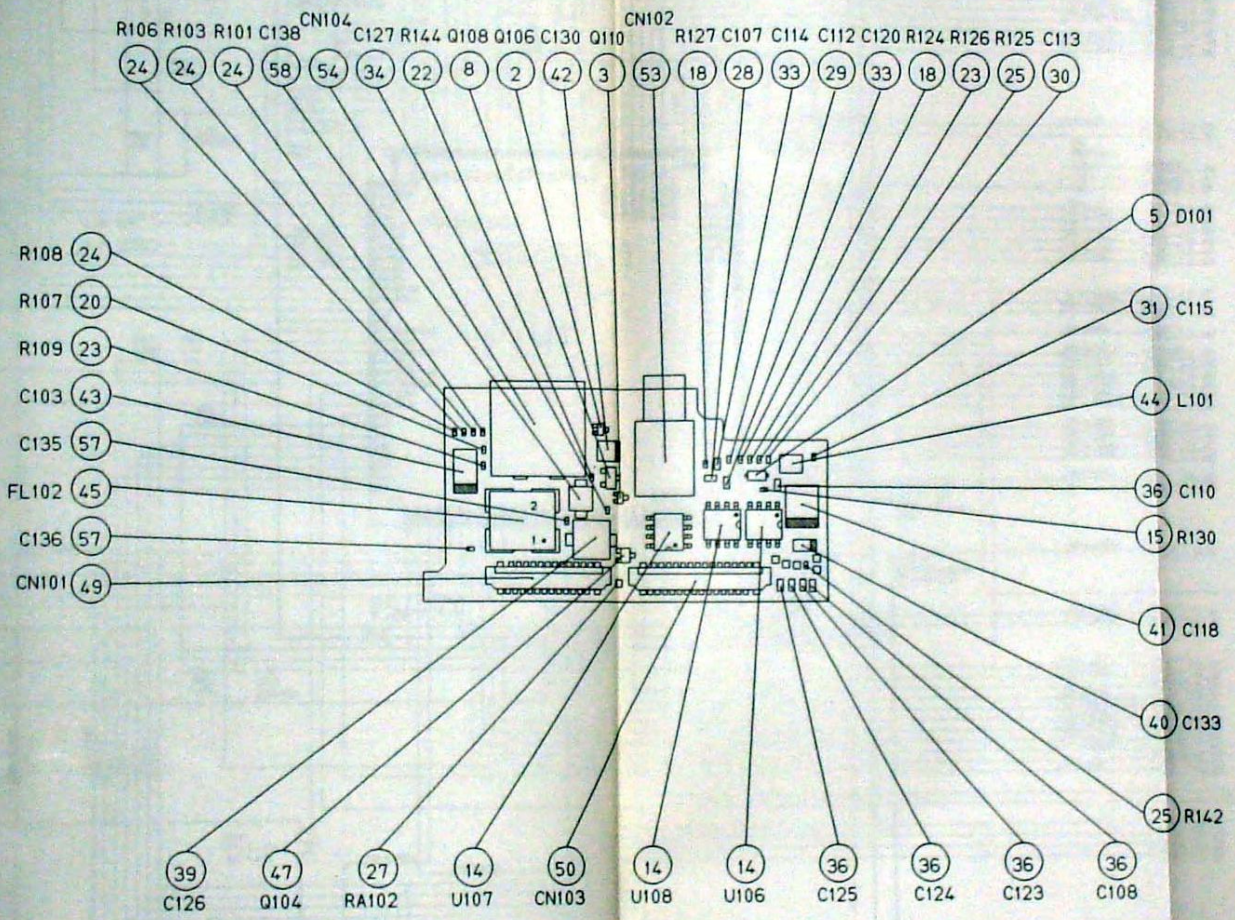
回路図
Circuit diagram

TFTドライブ基板
TFT DRIVE PCB



表面部品実装図
Surface parts mount figure

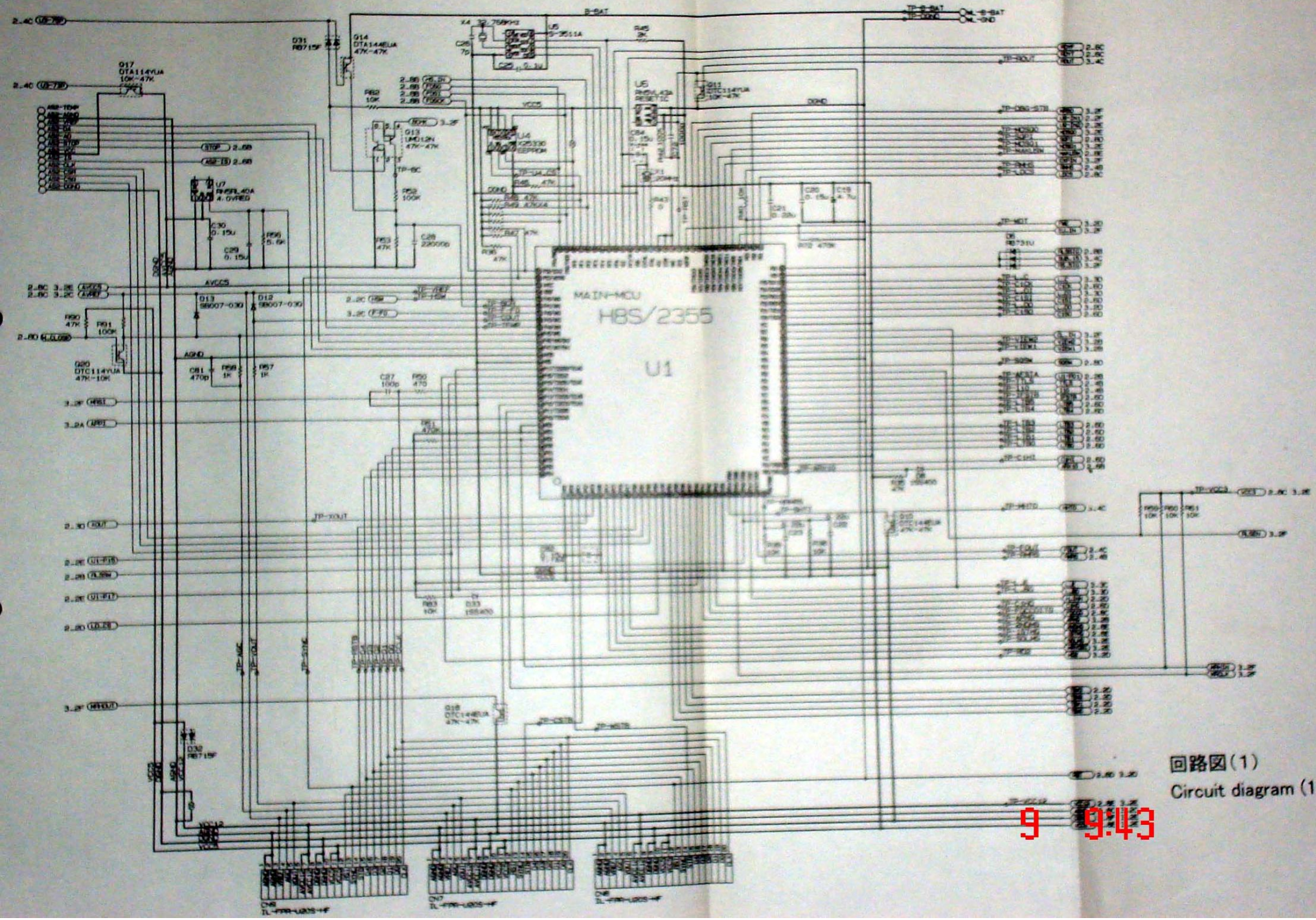
TFTドライブ基板
TFT DRIVE PCB



裏面部品実装図
Reverse parts mount figure

メインFPC
MAIN FPC

VAA10901-R.3481.A

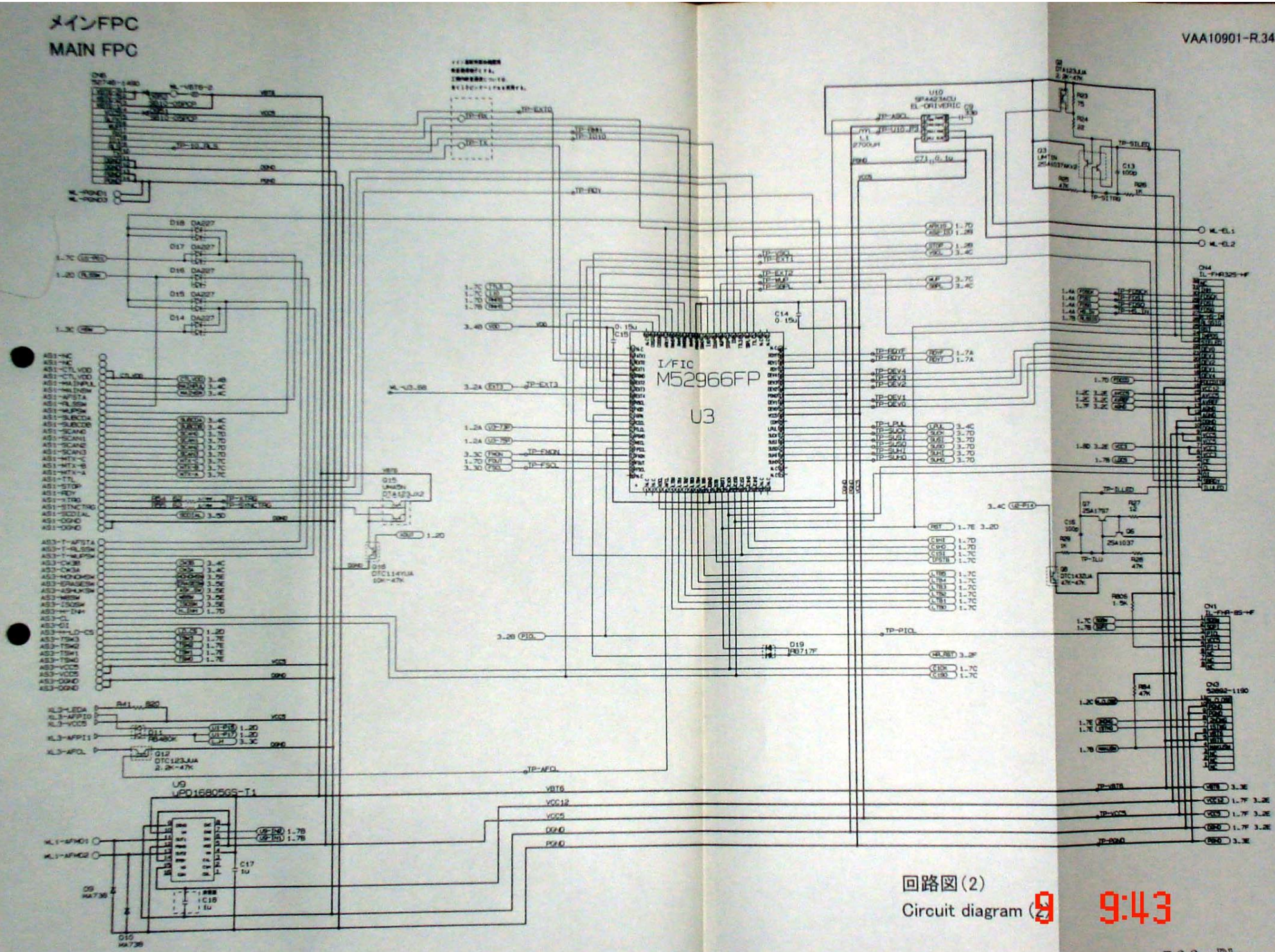


回路図(1)
Circuit diagram (1)

9 9:43

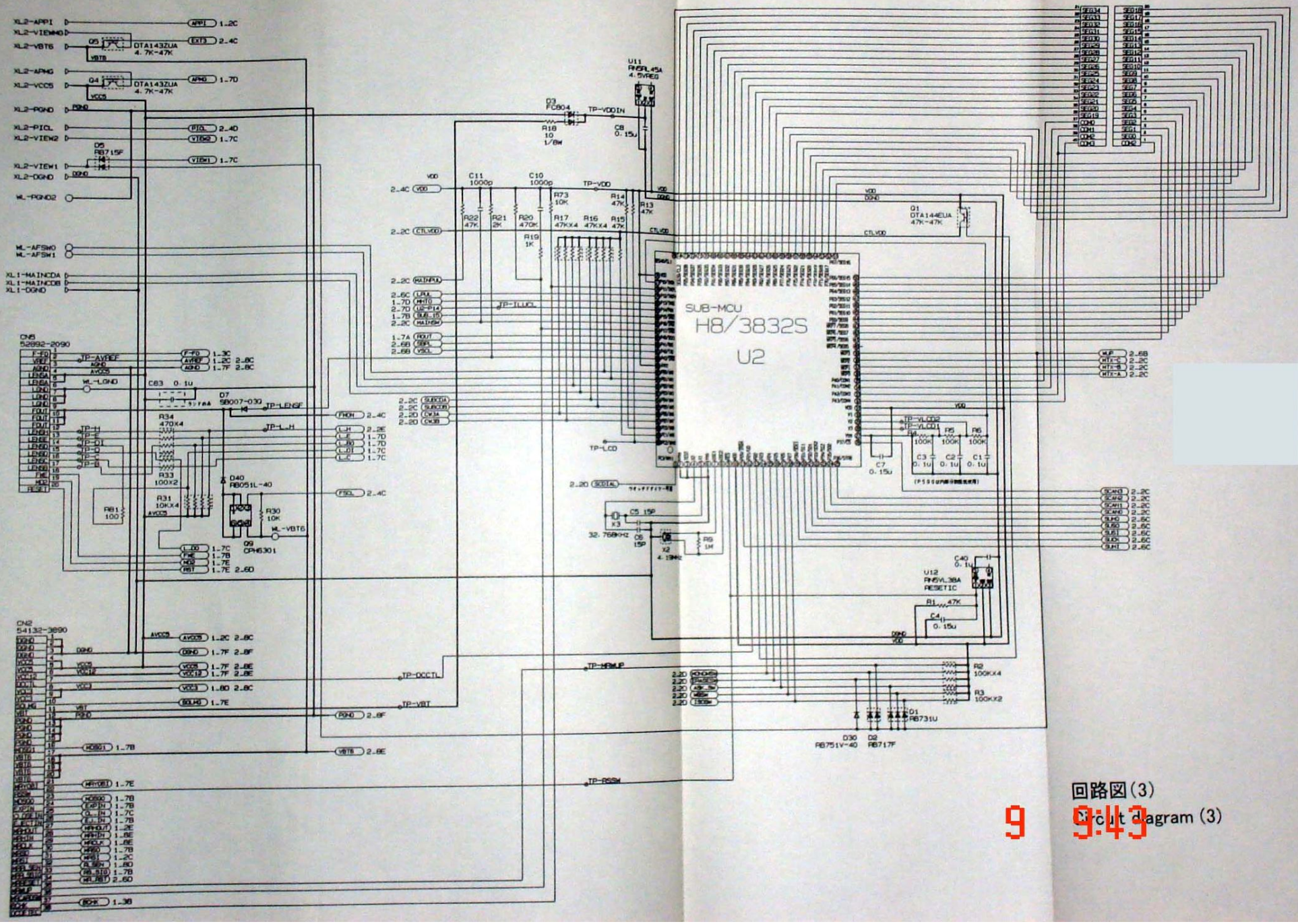
メインFPC
MAIN FPC

VAA10901-R.3481.A



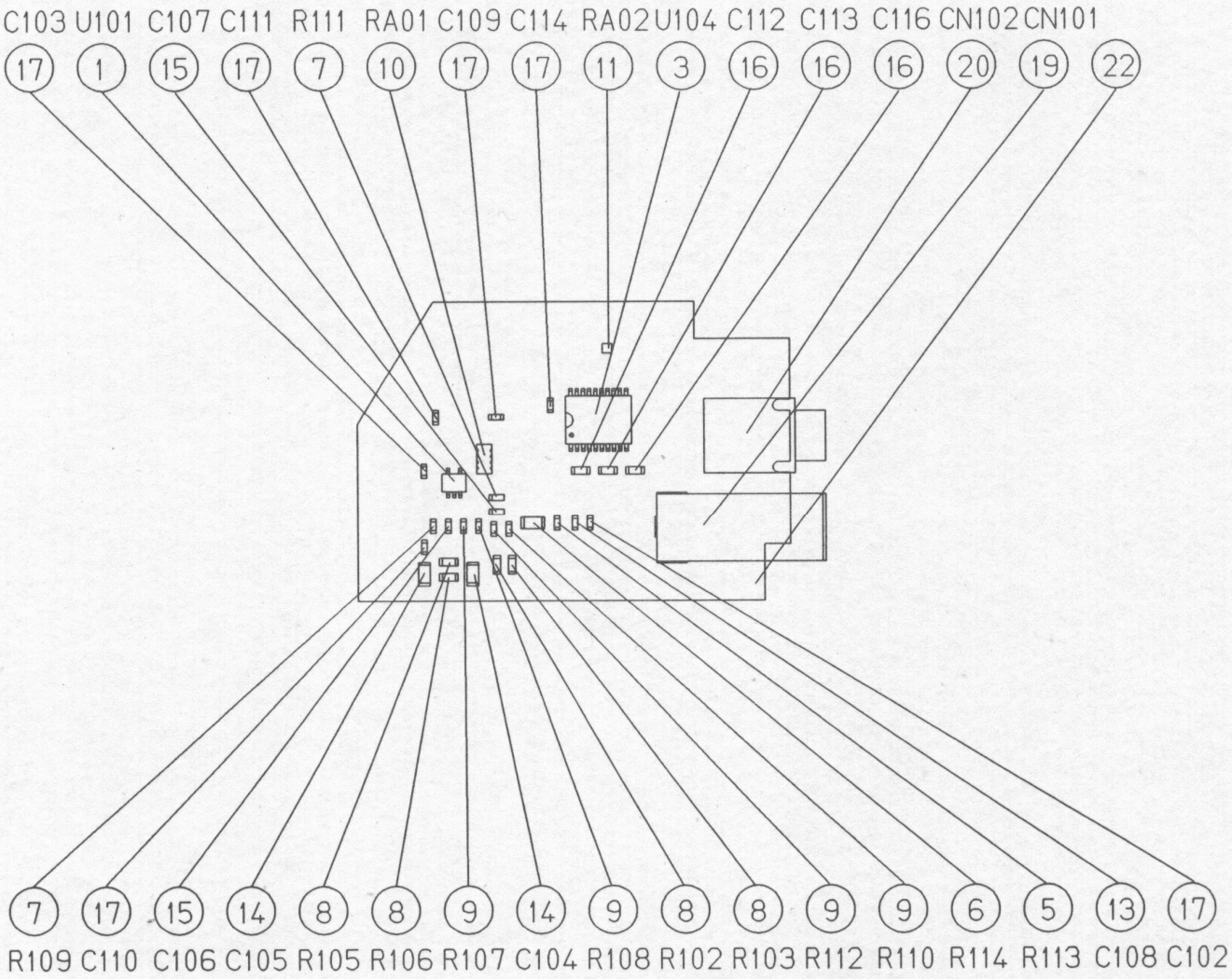
回路図(2)
Circuit diagram (2)

メインFPC
MAIN FPC



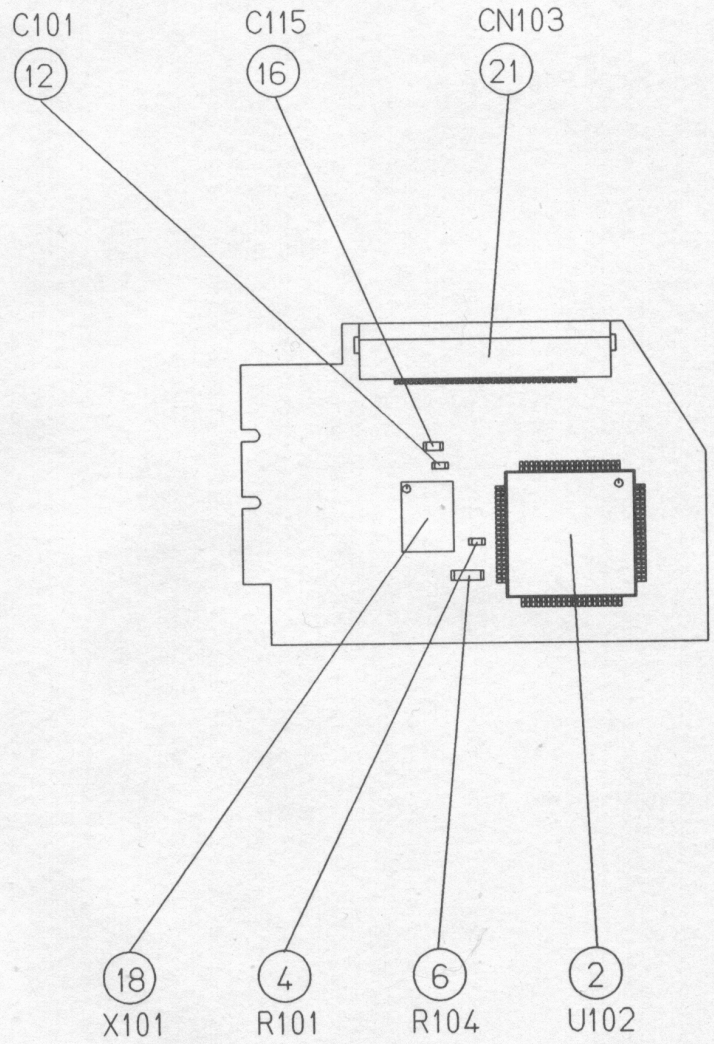
回路図(3)
Circuit diagram (3)

PC I／F基板
PC I/F PCB



表面部品実装図
Surface parts mount figure

PC I／F基板
PC I/F PCB



裏面部品実装図
Reverse parts mount figure