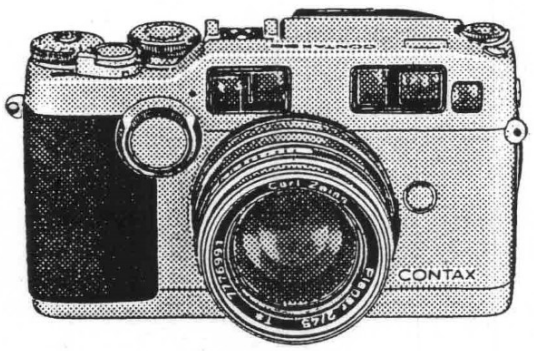
KYOCERA

NO.	419-01-50-RA1AS01

CONTAX G2

Repair Manual



Approved by	Made by
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KYOCERA CORPORATION

No.	419-01-50-RA1AS01

FOREWORD

- This Repair Manual provides technical information concerning the product mechanisms, maintenance and repair of CONTAX G2.

- Major technical changes will be made known through the Technical Bulletins. You are advised to revise this manual according to the content of the Technical Bulletins.
  Information in this manual is subject to change without notice.

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CONTENTS

No.	419-01-50-RA1AS01

A. GENERAL & TECHNICAL INFORMATION

FEATURES

The CONTAX G2 is a higher-order camera that, together with the highly reputed CONTAX G1, constitutes a CONTAX G series.
This AF rangefinder camera displays a higher precision, enhanced durability and easier operation as well as excellent portability and maneuverability.

『 AF 』
- AF system using both active and passive methods ensures fast, highly reliable focusing. An infrared active AF system and an external passive AF system with an extended base length (distance between the two focusing windows) are combined to make use of the excellent characteristics of both AF systems. Thus the resultant AF system establishes higher reliability and faster focusing.

『 AE 』
- Center-weighted average light metering performed by TTL actual exposure metering system. (Automatic switching to external metering when the Hologon T 16mm F8 lens is mounted.)
- The Silicon Photo Diode (SPD) is located in the upper central area of the camera body.
- Simple selection of exposure control means between two modes, namely, Aperture Priority AE and Manual Exposure.

『 Shutter 』
- The high-speed shutter operates at high speeds up to 1/6000 second and synchronizes with flash at a maximum speed of about 1/200 second. The A.B.C. function is incorporated.

『 Viewfinder 』
- The real-image zoom viewfinder is accurate and easy to view.
- Parallax correction is automatically and steplessly adjusted by the mechanism employing a dedicated motor.
- Built-in diopter adjuster permits diopter adjustments in a range from +0.3D to −2D.

『 Drive Mode 』
- Drive modes for S, CL, CH, self-timer and multiple exposure available. "S" represents Single Mode and "CL" Continuous Mode at the rate of 2 frames/sec. In "CH" mode, continuous shooting at a high speed up to about 4 frames/sec is realized.

『 High-performance 4 Motor Mechanism 』
- The camera incorporates a DC coreless motor for winding and rewinding, a large DC coreless motor for shutter charge, a DC motor for lens driving and a pulse motor for parallax correction. Each motor drives an independent mechanism that is electrically controlled by the CPUs,

『 Viewfinder Display 』
- Large LCD viewfinder indicators are incorporated. Photographic information, such as shutter speed, exposure warning, flash ready mark, exposure compensation and AF scale, are arranged in a way easy to see.

『 Body Cover 』
- Titanium is used for the body covering on the six sides, which is ideal to meet all the requirements of light weight, high strength, and shock and corrosion resistance as well as beautiful finish.

『 Camera Body 』
- Precisely processed copper/silumin die-cast alloy chassis is employed.

『 Easy Operation 』
- A large Focus Dial is located on the front of the camera body to ensure easier operation for manual focusing.
- A dedicated Focus Lock Button is provided on the back of the camera body.

『 Custom Function 』
- Custom function permits the photographer to select desired functions.

『 Dedicated Data Back 』
- The multi-functional data back allows recording of photographic data on the film.
- Interval shooting function is provided.

No.	419-01-50-RA1AS01

CONTAX G2 Specifications

Type	: 35mm AF rangefinder camera with focal plane shutter.
Image Size	: 24×36mm
Lens Mount	: CONTAX G mount
Shutter	: Electronically-controlled vertical-travel focal-plane shutter.
Shutter Speed	: 16 secs. to 1/6000 sec. at Auto. Manual mode...4 secs. to 1/4000 sec. B and X (1/200 sec.).
Synchro contact	: Direct X contact (synchronizing speeds 1/200 sec. or slower), provided with synchro terminal.
Self-timer	: Electronic self-timer with a 10 sec. delay, cancellable halfway.
Shutter Release	: Electronic release, provided with an exclusive release socket.
Focusing Adjustment	: Automatic Focus or manual focus using body-mounted focus mode dial
Focusing Method	: Combination reinforced external passive / active baseline type
Light metering range (ISO 100)	: EV3～19 (passive)
Auto Focus Modes	: SAF (single auto focus), CAF(continuous auto focus)
Exposure Control	: (1)Aperture-priority auto exposure (2)Manual exposure (3)TTL auto flash (4)Manual flash
Metering System	: TTL actual exposure metering (center-weighted average light metering) / External metering (automatic switchover with the mounted Hologon).
Metering Range (ISO 100,F2)	: EV1～19 on TTL actual exposure metering, EV3～19 on external metering.
Film Speed Range	: ISO 25～5000 for automatic setting with DX film, ISO 6～6400 for manual setting.
AE Lock	: The shutter speed is stored in memory.
Exposure Compensation	: +2EV～−2EV (can be set in 1/3-EV increments).
A.B.C. Mode	: ±0.5 EV /±1EV exposure compensating values with A.B.C. lever.
Flash Light Control	: TTL direct light control.
Flash Synchronization	: In combination with dedicated flash, the shutter speed is automatically set when the flash is fully charged.
Second Curtain Synchronization	: Possible with CONTAX flash having a second curtain synchronization capability.
Viewfinder	: Real-image zoom viewfinder (with lens coupling in range 28～90mm), 0.57x magnification and 90% field of view (with 45mm lens, at infinity and−1D diopter).
Diopter Adjustment	: Built-in diopter adjuster, correctable range +0.3D～−2D.
Display in Viewfinder	: Picture area frame (automatic parallax adjustment), focusing frame, focus display, shutter speed, exposure mark, exposure compensation, flash mark.
Display Panel	: Shooting distance / film speed, multi-exposure mark, custom function display and battery warning mark.
Film Loading	: Auto loading, automatic film positioning to "01" on counter.
Film Advance	: Automatic winding with built-in motor.

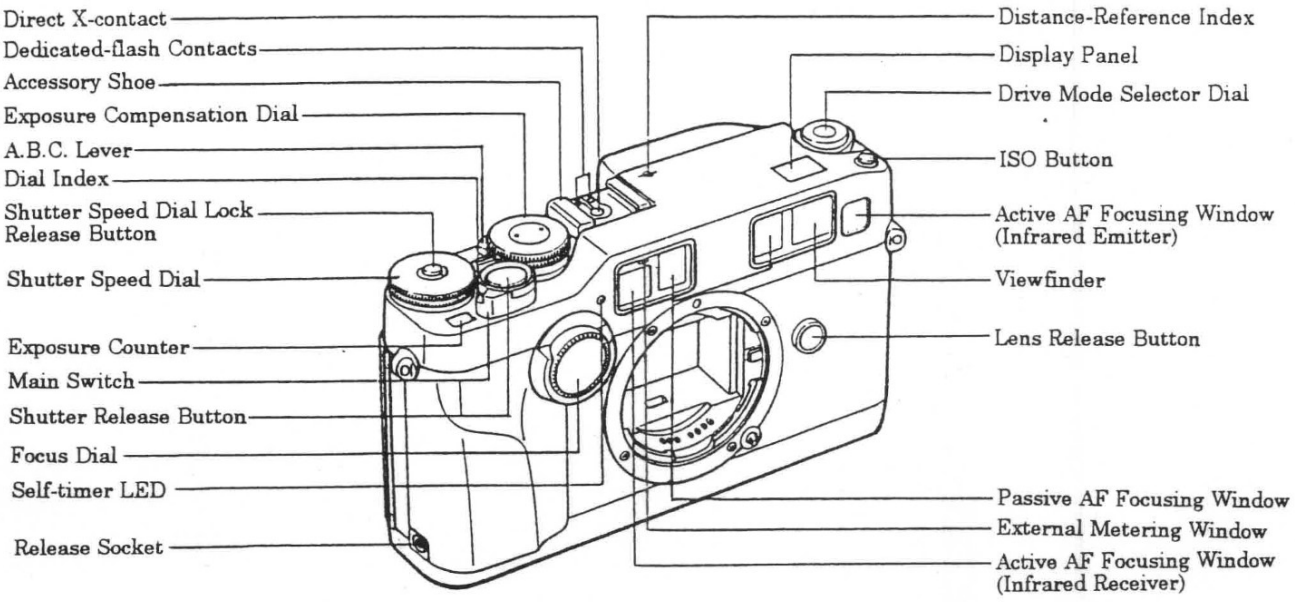
Film Rewinding	: Automatic rewinding with built-in motor, automatic stop / return after rewinding is completed, mid-roll rewinding possible.
Drive Mode	: Single-flame exposure, continuous shooting (CL,CH), self-timer, multiple exposure.
Winding Speed	: Up to about 4 frames / sec. on continuous shooting ("CH" mode) (with new batteries, at ordinary temperature, as tested according to CONTAX testing standard).
Exposure Counter	: Automatic-resetting additive type, A.B.C. display.
Custom Function	: (1)AE lock operation (2)A.B.C. exposure order selection (3)Rewind with tab remaining out or wound in (4)Focus dial operation during manual focus (5)Multiple exposure operation
Camera Back	: Can be opened by camera back opening knob, detachable, provided with film check window.
Power Source	: Two 3V lithium batteries (CR2).
Battery Check	: Automatic check, battery warning mark in display panel.
Battery Capacity	: About 80 rolls of 24-exposure film (with new lithium batteries, at ordinary temperature, as tested according to CONTAX testing standard.)
Dimensions	: 139(W)×80(H)×45(D)mm (5-1/2×3-3/16×1-13/16 in.)
Weight	: 560g (19.76 ozs.) (without batteries)

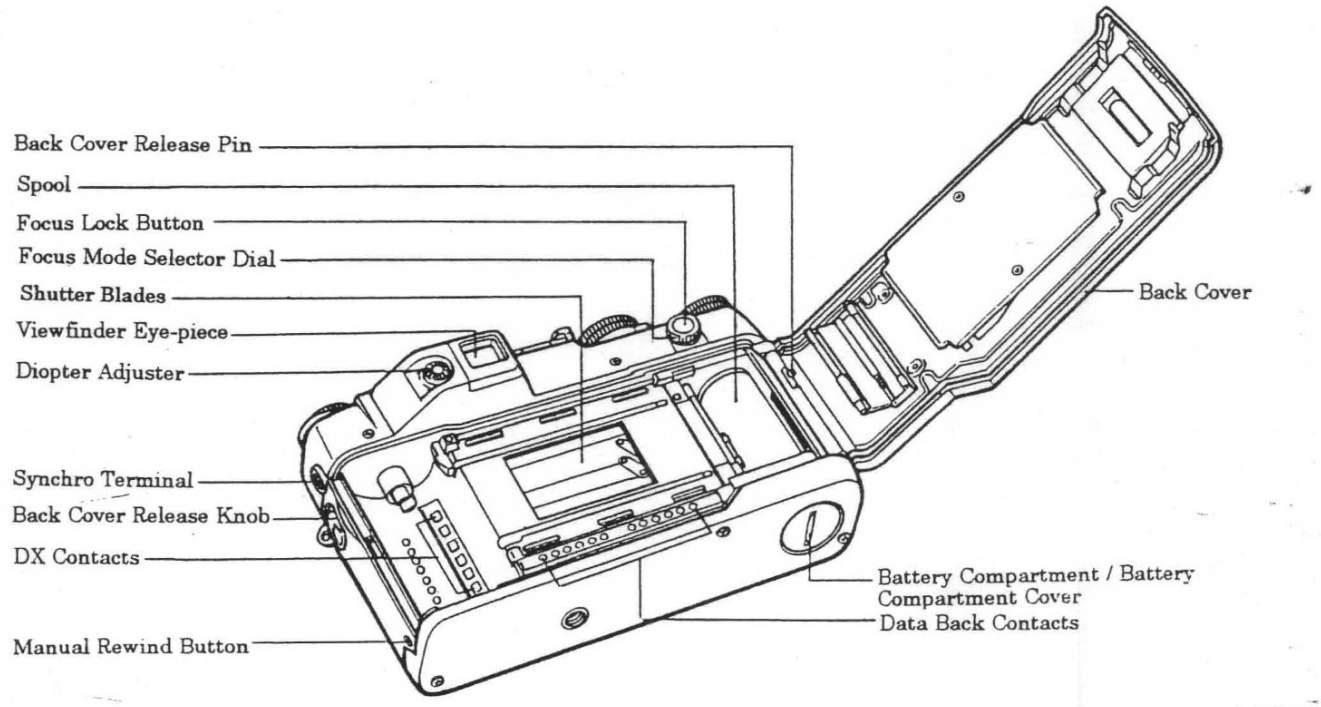
Specification of the CONTAX G2 DATA BACK GD-2 (Optional)

Type	: Muiti-function type, data recording and camera control unit.
Data Printing Position	: Compiled data imprint ··· First two frames of the film; Between-frame imprint ··· In between frames
Confirmation of Data Print	: Compiled imprint; Warning lamp blinks and PRINT mark blinks; Between-frame imprint; PRINT mark blinks
Contents to be printed	: On compiled data printing: Exposure data when shooting (exposure compensation value, shutter speed, Approx. F-value*, exposure mode). Between-frame imprint: (1)Dates (year/month/day, month/day/year, day/month/year) (2)Time (day/hour/minute) (3)Exposure data when shooting (exposure compensation value, shutter speed, approx. F-number *, exposure mode) (4)Counter data (4-digit additive counter + 2-digit film counter) +two characters (5)6-digit fixed numerals + two characters (6)No imprint
Interval Shooting	: Interval time; 2 sec. to 99 hours 59 min. 59 sec.
Frequency of interval	: 1-99 times
Interval Action check	: INT. mark lights
Film Speed	: Automatic setting coupled to ISO setting on the camera.
Auto Calendar	: A.D indication in two digits
Power Source	: Two 3V lithium batteries (CR2025)
Dimensions&Weight	: 139(W)×55(H)×21(D)mm (5-1/2×2-3/16×7／8 in.), 110g (3.88 ozs) (without batteries)

* Approx. F (aperture) value: Calculated as a guide, based on brightness measured using the camera's external metering system.

NAMES OF PARTS





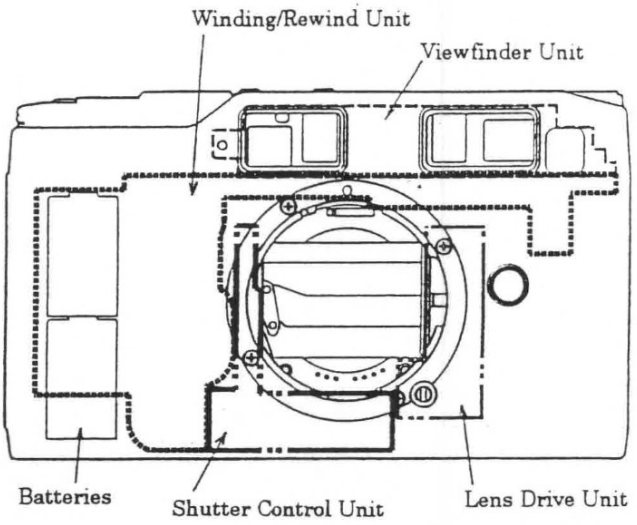
DESCRIPTION OF MECHANISMS

1. Internal Structure

The layout of the units is based on the CONTAX G1 in which the units are effectively arranged to constitute a compact camera. Accordingly, this camera consists of eight major blocks — the camera body, mount base, viewfinder mechanism, shutter charge and shutter control mechanism, lens drive mechanism, film winding and rewinding mechanism, electronic circuits and external covers.

In the upper area, the camera incorporates a viewfinder unit consisting of the variable real-image viewfinder coupled with taking lenses and the active AF circuit. In front of the viewfinder unit, the external passive AF module with an elongated base length is incorporated as a unit. The film winding and rewinding mechanism consists of two units that are located below the viewfinder and in the front left of the camera body. The lens drive unit is located in the lower area of the camera. Thus the units are effectively arranged so that all the functions are displayed efficiently.

(Layout of Units)

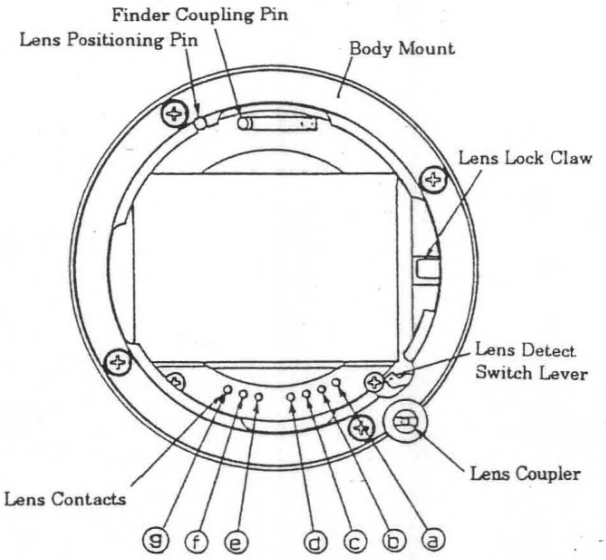


2. Major Mechanisms

(1) Body Mount

The CONTAX G2 employs the lens mount of Spigot bayonet type which is the same as that of the CONTAX G1. Inside the body mount, the Angle-of-view Setting Pin, Lens Signal Pin, Lens Lock Lever and Lens Detect Switch Lever are provided for the communication with the lens. By the operation of the Finder Coupling Pin on the lens-side mount, the Angle-of-view Setting Pin moves to a position corresponding to the focal length of the lens. This pin operates the variable viewfinder so that the viewfinder is adjusted to the angle of view of the interchangeable lens. The Lens Signal Pin communicates the type of the lens, the reference signal for the lens extension and the compensation value for each lens. The Lens Detect Switch Lever, coupled with the Lens Detect Switch, detects the presence or absence of a lens mounted. The Lens Detect Switch is operated only when a lens is mounted.

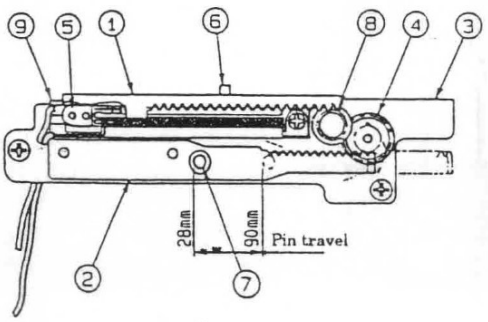
(CONTAX G Mount)



ⓐ Start Position Code Terminal
ⓑ Infinity Position Adjusting Terminal
ⓒ Lens Identification Terminal
ⓓ Not connected
ⓔ Power Supply Terminal (VDD)
ⓕ Not connected
ⓖ GND

(Description of Viewfinder Coupling Mechanism)

The FL Pin, coupled with the rotation of the Spigot Ring, moves right and left. With this movement amplified by the Amplifying Gear Train, the FL Pin moves the F Cam Plate via the FL Cam Shaft. The FL Pin, which is always being pushed toward the 28 mm side, is moved longer by the mounting of a lens whose focal length is longer. When no lens is mounted, the FL Pin is placed at the "28 mm" position. The travel of the FL Cam Plate is converted to a change in resistance as the FL Contact fixed to the FL Cam Plate slides on the FL PC Board.



① FL Cam Plate
② FL Gear Plate
③ FL Base Plate
④ FL Gear (1)
⑤ FL Contact
⑥ FL Cam Shaft
⑦ FL Pin
⑧ FL Gear (2)
⑨ FL PC Board
⑩ FL Contact Base
⑪ FL-SP Plate
⑫ FL Spring

(Viewfinder Coupling Mechanism)

(2) Viewfinder Mechanism

The viewfinder is the same real-image zoom type as is used in the CONTAX G1. It covers focal length ranging from 28 to 90 mm.

The viewfinder mechanism incorporates a viewfinder lens, zoom mechanism, parallax correction system, diopter compensation mechanism, viewfinder display, active AF and external metering system.

The optical system consists of three objective lenses, two condenser lenses, a pentaprism and two eyepiece lenses.

The diopter compensation mechanism permits diopter compensation in the range of +0.3D to –2D by moving one eyepiece lens. In addition, this compensation range is extended to +3D to –5D by the externally mounted Diopter Lens.

The parallax correction mechanism adjusts the framing according to the shooting distance.

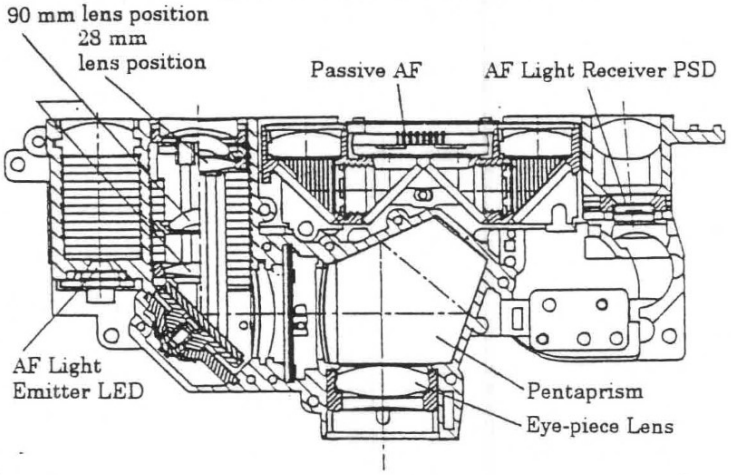
By moving the field-of-view frame, this CONTAX G2 corrects the parallax not only at the left and top of the viewfinder but also at the right and bottom. In this way, the parallax correction mechanism prevents the field of view from lowering at near-distance shooting.

As the drive source, an ultra-small motor with a large torque is employed. The surplus torque stabilizes the rotation of the gears and suppresses the noise.

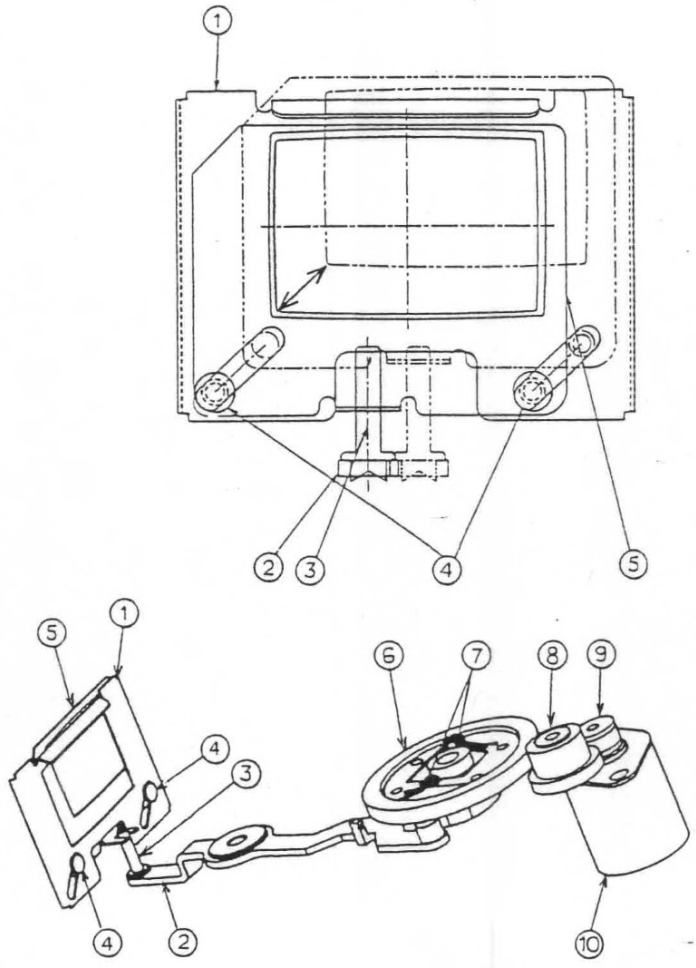
(Operation of Parallax Correction Mechanism)

① The number of pulses to drive the pulse motor for parallax correction is calculated from the taking lens data and shooting distance data. ② The pulse motor starts turning and runs by the number of the calculated driving pulses whose counting is started when the Parallax Correction Contact separates from the Reference Position Detect Code. Consequently, the Parallax Correction Gear Train is driven. ③ The Parallax Correction Lever moves along the profile of the cam on the Parallax Correction Gear (3). ④ The Parallax Correction Lever Pin on the Parallax Correction Lever enters the Viewfinder and moves the Parallax Correction Frame. ⑤ The Parallax Correction Frame is retained on the Parallax Correction Frame Base Plate by engaging the Parallax Correction Frame Shafts with the grooves in the Base Plate. The Parallax Correction Frame moves along the grooves to achieve parallax correction.

(Cross Section of Viewfinder)



(Parallax Mechanism)



① Parallax Correction Base Plate
② Parallax Correction Lever
③ Parallax Correction Lever Pin
④ Parallax Correction Frame Shaft
⑤ Parallax Correction Frame
⑥ Parallax Correction Gear (3)
⑦ Parallax Correction Contacts
⑧ Parallax Correction Gear (2)
⑨ Parallax Correction Gear (1)
⑩ Pulse Motor

(3) Shutter Control Mechanism

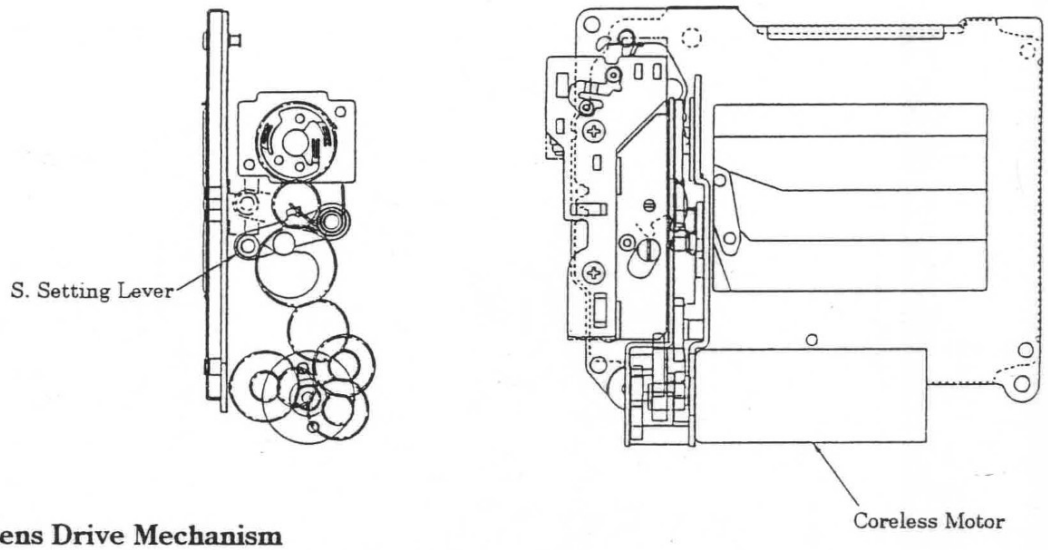
The CONTAX G2 incorporates the electronically controlled vertical travel focal plane shutter that is equivalent to the shutters used in CONTAX SLR cameras.

With this higher-performance camera, the range of shutter speeds is remarkably extended. The shutter speeds in automatic mode are from 16 seconds to 1/6000 second. In manual mode, the shutter allows Bulb exposures and operates correctly at shutter speeds of X (1/200 second) and from 4 seconds to 1/4000 second.

Unlike SLRs, this camera does not have the quick return mirror. In this CONTAX G2, therefore, the light leakage through the shutter onto the film plane is perfectly prevented by closing the first and second curtains when the shutter is charged. This structure does not require any other light-proof curtains.

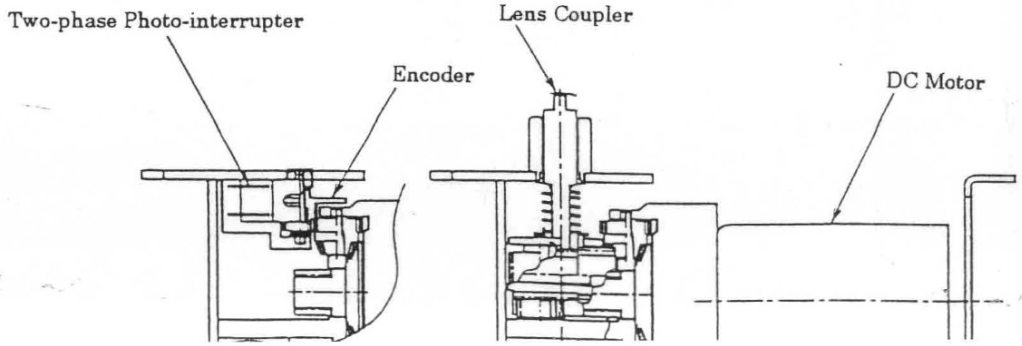
The camera performs direct light metering via a TTL actual exposure metering system that measures the light reflected by the shutter curtain. For this purpose, the central surface of the first curtain of the shutter is coated gray to obtain a uniform light reflected from a limited area.

The shutter charge mechanism is driven by a high-torque coreless motor that displays excellent start and stop characteristics. The rotation of the rotor of the motor is transferred through a gear train to the cam that operates the S. Setting Lever to charge the shutter. At press of the Shutter Release Button, the motor runs to retract the S. Setting Lever and open the second curtain of the shutter. Then the second curtain is held by the Shutter Magnet. Subsequently, the first and second curtains having been held by the Shutter Magnet travel so that the film is exposed.



(4) Lens Drive Mechanism

The lens drive mechanism consists of a DC motor functioning as the drive source, reduction gears, an encoder and coupler that constitute a unit. The gear train reaching the Lens Coupler incorporates a friction mechanism to enhance reliability. The Lens is driven and controlled by the code signal in the Lens Unit and the encoder pulse signal in the Lens Drive Unit. The encoder pulse signal, output through the two-phase type photo-interrupter, judges correctly the Lens Coupler drive direction. In addition, during one revolution of the Lens Coupler, about 323 pulses are output to ensure a highly reliable, high-precision drive of the Lens.



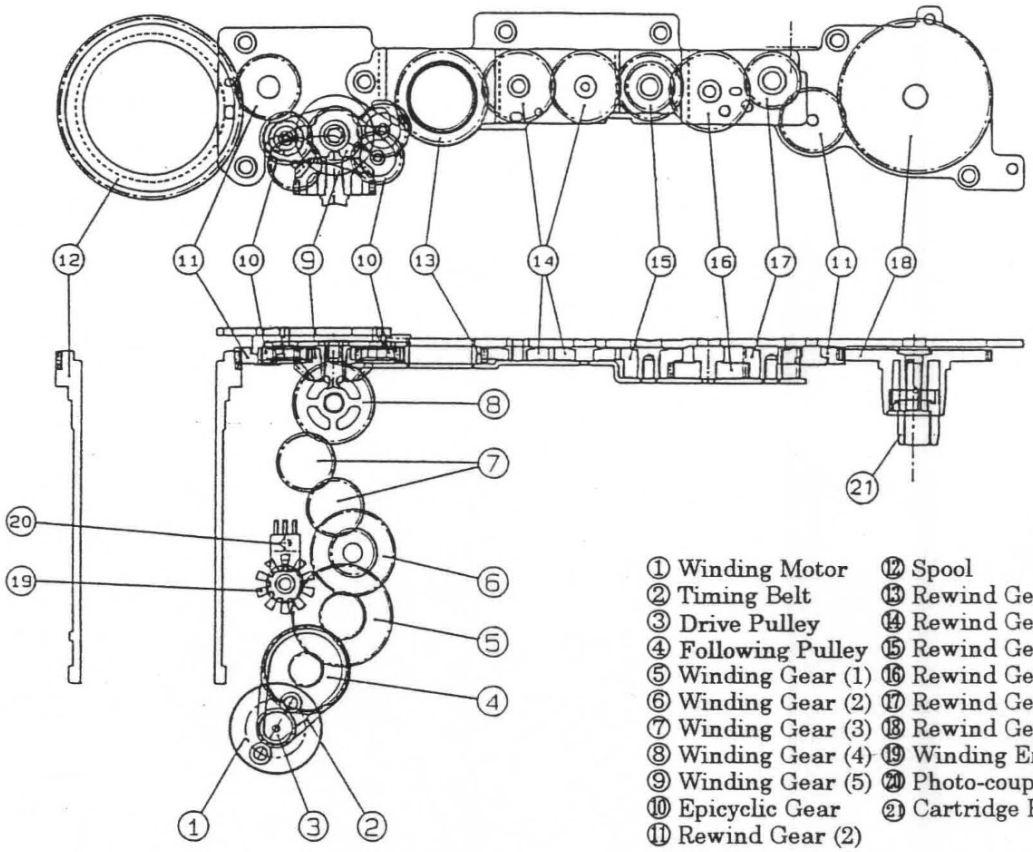
(5) Film Transport Mechanism

The film winding and rewinding mechanism consists of two units. In the forward or reverse run of one motor, the position of the Epicyclic Lever is switched to connect the two units. Consequently, film winding is performed by the Spool and rewinding by the Cartridge Fork.

The high-speed winding and rewinding are realized by use of a high-performance coreless motor. Also use of a timing belt between the motor and the gear train keeps the mechanical operation silent.

To control film travel, the movement of the perforations is directly detected with a reflection type photo-interrupter. Another photo-interrupter is also located in the drive system so that the drive pulse is read in and the film is wound little by little at compiled data imprinting.

(Winding and Rewinding Mechanism)



3. Electronic Circuitry and Its Arrangement

The Circuit Block Diagram on page A-13 shows the constitution of the electronic circuitry.

All the circuits are connected with the two 8-bit microcomputers as the core. One of the two microcomputers are dedicated to auto focusing to ensure high-speed processing in complicated auto focusing control.

The light metering circuit consists of two systems, namely, the TTL light metering circuit and the external light metering circuit, which use dedicated light metering ICs, respectively.

The TTL Light Metering IC, located on the top of the Black Box, detects the light reflected by the shutter curtain. The External Light Metering IC, located at the side of the Light Metering Module, detects the light through the dedicated lens.

The TTL Flash Auto Control Circuit is located at the bottom of the Black Box. It detects the light reflected by the film surface during exposure (TTL actual exposure direct light metering) and controls flash intensity (TTL Flash Auto control).

For information display, there are two external LCDs and one LCD in the Viewfinder. The external LCDs are controlled directly by the Main CPU while the LCD in the Viewfinder is controlled by the Sub CPU.

4. Display

(1) External Display

For external display, in addition to the dials, there are two LCDs, namely, the Film Counter LCD and the Display Panel LCD.

The Exposure Counter LCD displays the exposure count after each winding and counts down during rewinding. Also by blinking the display, the Exposure Counter provides film loading error warning (release locked) and displays the A.B.C. exposure compensation. Moreover, the Exposure Counter displays every second the exposure remaining time during self-timer operation or the time elapsed during Bulb shooting.

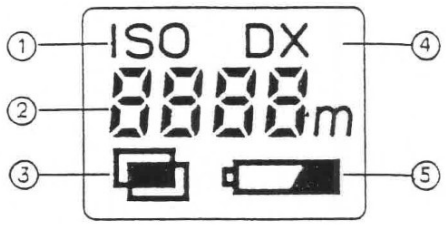
The Display Panel LCD displays film speed/focusing distance, battery warning mark and multiple exposure mode indicator. The numerical display by a 4-digit number indicates selectively the film speed or the focusing distance. It shows the focusing distance usually, but is switched to display the film speed only when the ISO Button is depressed .

In auto focus mode, the display is switched by a halfway depression of the Shutter Release Button to show the measured distance. It also displays the measured distance even during use of the Hologon lens, which does not perform focusing, or use of a mount adapter to facilitate the distance setting of the lens.

In manual focusing, the display shows the distance setting. While looking at this indication, the photographer can operate the Focus Dial to set a distance.

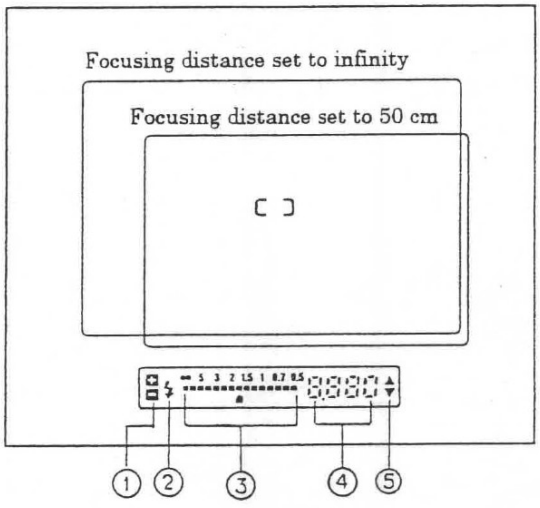
When the multiple exposure mode is set, the Display Panel shows the multiple exposure mode indicator. For multiple exposure, the first exposure is to be performed with the Drive Dial set in the multiple exposure position. The second exposure is to be performed with the Drive Dial set in a position other than the multiple exposure position. At the setting in the multiple exposure position, the multiple exposure mode indicator appears blinking to show that the film will not be wound after shooting. At the setting in a position other than the multiple exposure position, the multiple exposure mode indicator changes from blinking to lighting up to show that the next exposure will overlap the previous one.

(LCD Panel)



① ISO Indicator
② Focusing Distance / Film Speed
③ Multiple Exposure Mode
④ DX Indicator
⑤ Battery Warning Mark

(Viewfinder Display)



① Exposure Compensation Indicator
② Flash Ready Mark
③ Focus Display
④ Shutter Speed / Focusing Distance
⑤ Exposure Mark

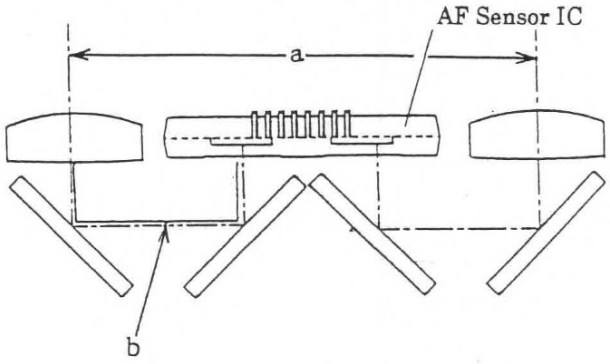
(2) Viewfinder Display

For the viewfinder display, back light by an LED and a penetrating type LCD Panel are used. The LCD in the viewfinder indicates only the information necessary at shooting. That is, it indicates shutter speed, exposure warning, focus display, exposure compensation indicator and flash ready mark. The shutter speed display is switched to the focusing distance display as long as the AF Lock Button is depressed in Manual Focus mode.

In Auto Focus mode, the focus display shows a distance scale ranging from the nearest point to the infinity and a dot indicating the distance measurement result. In Manual Focus mode, the focus display indicates the variance from the true focus point by a bar length. It indicates a dot at the center when the subject is in true focus; the larger the variance, the longer the bar.

5. Auto Focusing

(Passive AF Optical System)



For auto focusing, the CONTAX G2 incorporates the active system (triangle distance measuring system by applying an infrared beam) and external passive distance measuring system (in which focusing is performed by detecting the difference between the images of the subject obtained through the right and left External Metering Windows). The passive system is used to measure such a far distance as the infrared beam does not reach. The active AF system supplements the auto focusing on a low-contrast subject at a relatively near distance where the passive system is not suited.
At a halfway depression of the Shutter Release Button, the G2 first measures roughly the distance to the focus area using the active system. Then the passive system measures precisely the distance to the major point in the focus area to perfect auto focusing.

(1) AF Optical System

To ensure a high AF accuracy, left and right two-surface mirrors are installed and the base length and the focusing lenses are maximized. Thanks to the W-shape of the mirrors, the AF optical system is located properly between the Viewfinder Unit and the Body.
The distance measurement capability is generally proportional to the base length "a" multiplied by the focusing distance "b". The base length is 28.4 mm and the focusing distance 21 mm, and thus $a \times b = 596.4$.

(2) AF Sensor

With the external passive AF system, the image size on the sensor does not change when the focal length of the taking lens changes. Accordingly, at use of a lens with a long focal length, it is necessary to narrow the data area to be used for the calculation of distance measurement. The AF Sensor IC uses 356 line sensor elements to provide an adequate resolution even in the narrow data area. That is, 178 photosensor elements are arranged in each of two rows on the AF Sensor IC.

(3) Calculation and Control

The CONTAX G2 selects a calculation data area according to not only the focal length of the taking lens, as mentioned above, but also according to the camera-to-subject distance.
In the external passive AF system, parallax can occur according to the camera-to-subject distance. It corrects the horizontal parallax by changing the data area for calculation. In selecting a data area, the result of active distance measuring is used and the amount of passive AF operation is reduced to shorten the AF operation time. In this way, auto focusing is correctly achieved by selecting a calculation area for the focal length of the mounted lens and the camera-to-subject distance. Moreover, an early response is ensured by additional use of the active AF system.
Lens drive control is correctly performed by changing the speed reduction timing according to the mounted lens.

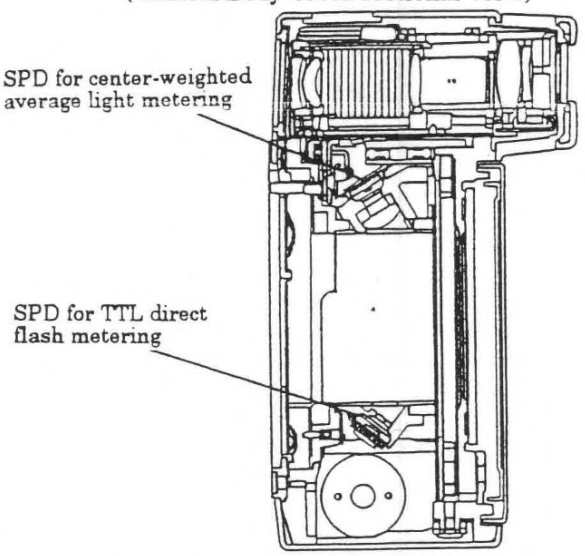
(4) Ease in Operation

The CONTAX G2 is provided with an independent dial for each of drive mode setting, focus mode setting (SAF, CAF, MF) and Focus Dial to facilitate operation.
Focus mode is selected among SAF, CAF and MF by turning the Focus Dial, which is located in a position convenient to operation by the thumb of the right hand. The Focus Lock Button is located at the center of the Focus Mode Selector Dial. The Lens extends at press of the Focus Lock Button, and it is kept in the extended position as long as the Focus Lock Button is held pressed.
The Focus Dial, which sets the shooting distance in Manual Focus (MF) mode, is an electronic dial having no stoppers. The dial is to be operated by looking at the distance setting indicated on the Display Panel. For easy setting, the operation speed is detected so that a large change will appear at a fast operation but a small change will appear at a slow operation. In addition, the custom function can be set in such a way that distance setting is allowed only when the Focus Lock Button is held pressed. Also the set distance is displayed in the viewfinder at press of the Focus Lock Button in MF mode. Set distance can be checked without leaving the eye from the viewfinder.

6. Exposure Control

(1) Exposure Control

(Central Body Cross-sectional View)



The camera incorporates the light metering circuits for TTL light metering and external light metering.
The TTL light metering is an actual exposure light metering in which the light reflected by the first curtain of the shutter is measured through the dedicated lens. The shutter curtain is coated with gray paint only on the central surface to trim the light for center-weighted average metering. The external light metering is performed through a dedicated lens by the Light Metering Circuit located at the side of the focusing windows.
With the Hologon lens mounted, the distance from the end of the rear element to the shutter curtains is too short to allow an accurate metering of the light reflected by the first curtain. In such a case, the external light metering is selected.
The selection is performed according to the lens information output from the circuit inside the lens. Also when a lens permitting the TTL light metering has been mounted, the camera performs external light metering. Then it changes the brightness of the display back light in the viewfinder according to the light metering results.

(2) Exposure Compensation

Aperture Priority Automatic Exposure is selected when the Shutter Speed Dial is set to AUTO.
At automatic exposure, the exposure value is compensated by the setting of the Exposure Compensation Dial. The Exposure Compensation Dial is used only for compensation to facilitate operation. Exposure compensation can be set in the range of ± 2 EV in 1/3 EV increments.
When an exposure compensation has been set, the LCD in the viewfinder displays "+" or "–" to indicate the exposure compensation states. This display is also intended to warn the photographer against his or her forgetting to release the compensation setting after the shooting.
In addition to the compensation by the Exposure Compensation Dial, the A.B.C. function (three-frame continuous automatic exposure compensation) is available. With the A.B.C. setting, three frames can be exposed under automatic compensation; standard exposure → overexposure → underexposure. The order of compensations can be changed by the custom function to "overexposure → standard exposure → underexposure". The A.B.C. function can be used in combination with the Exposure Compensation Dial to set various types of three frame continuous automatic exposure compensation, for example, "standard exposure → underexposure → underexposure". Exposure bracketing can be set in ± 0.5 EV or ± 1.0 EV increments by the A.B.C. Lever located under the Exposure Compensation Dial.
The Main Switch Lever located around the Shutter Release Button functions also as the AE Lock Switch. The shutter speed is locked immediately when the Main Switch Lever is set to "AEL". This continuous AE Lock system keeps the shutter speed locked until the Main Switch position is changed to a position other than "AEL". Since this system locks a shutter speed, exposure value can be compensated during the AE Lock by changing the Aperture Ring position.

(3) TTL Flash Auto Control

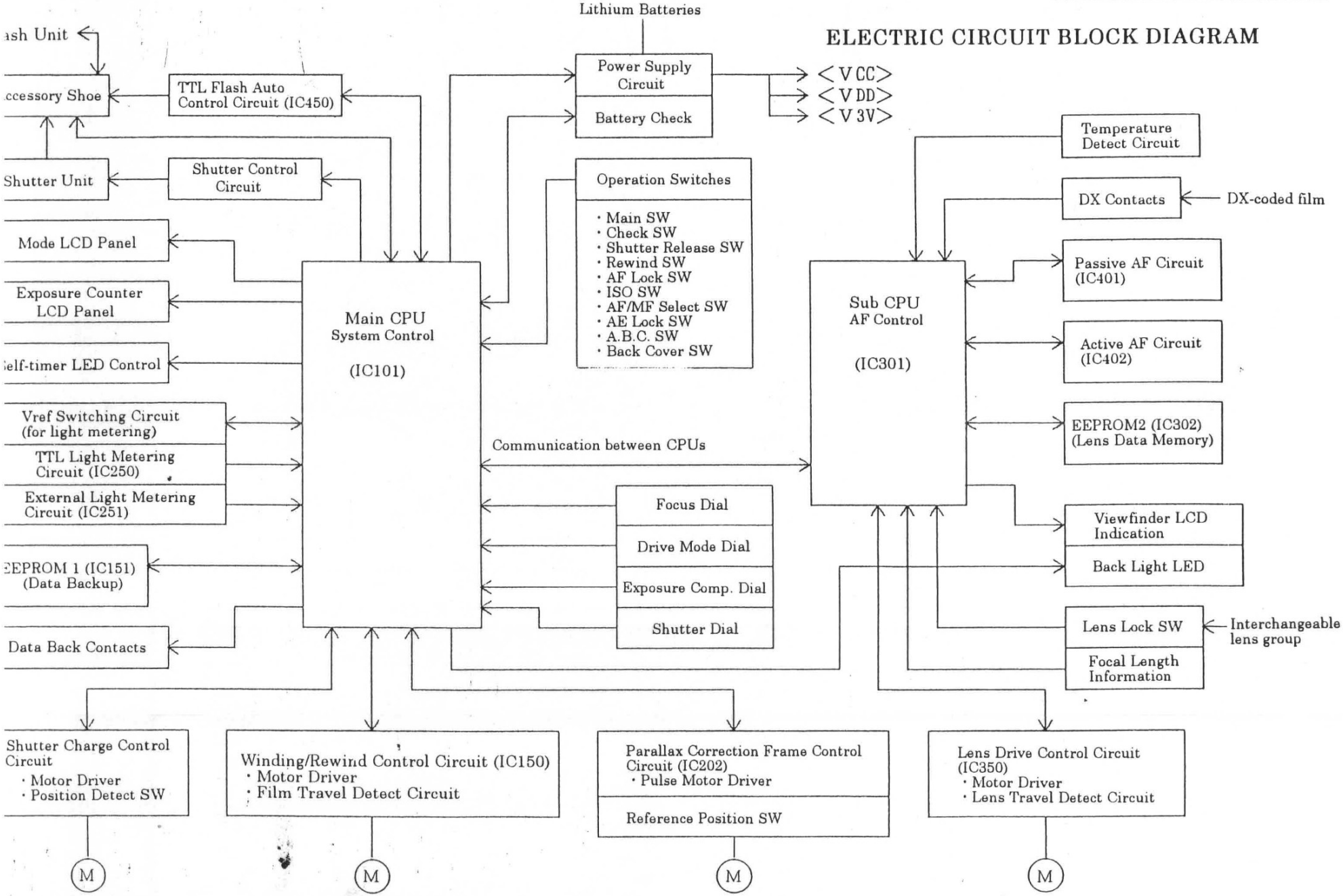
TTL direct flash control is possible with a TLA Flash Unit. This control system measures the light reflected from the film plane during exposure and stops flashing upon detection of an optimum exposure.
Exposure compensation can be set in 1/3 steps by the Exposure Compensation Dial.
The TLA 280, TLA 360 and TLA 480 allow the TTL direct flash control with second curtain synchronization.

7. Data Back GD-2 (Multi-function Type)

The Data Back incorporates a function of recording automatically the photographic information, that is, the compiled data imprinting function.
Two recording functions are available — "compiled data imprinting function" and "between-frame imprinting function". These two functions can be used together. The Data Back, having interval shooting function, enables fixed point shooting and unattended shooting.

No.	419-01-50-RA1AS01

ELECTRIC CIRCUIT BLOCK DIAGRAM



No.	419-01-50-RA1AS01

DESCRIPTION OF ELECTRIC CIRCUIT

1. Power Supply Circuit

[1] Constitution

This circuit outputs each voltage under control of the Main CPU (IC101). It also detects a battery voltage drop and resets the Main CPU (IC101) by hardware.

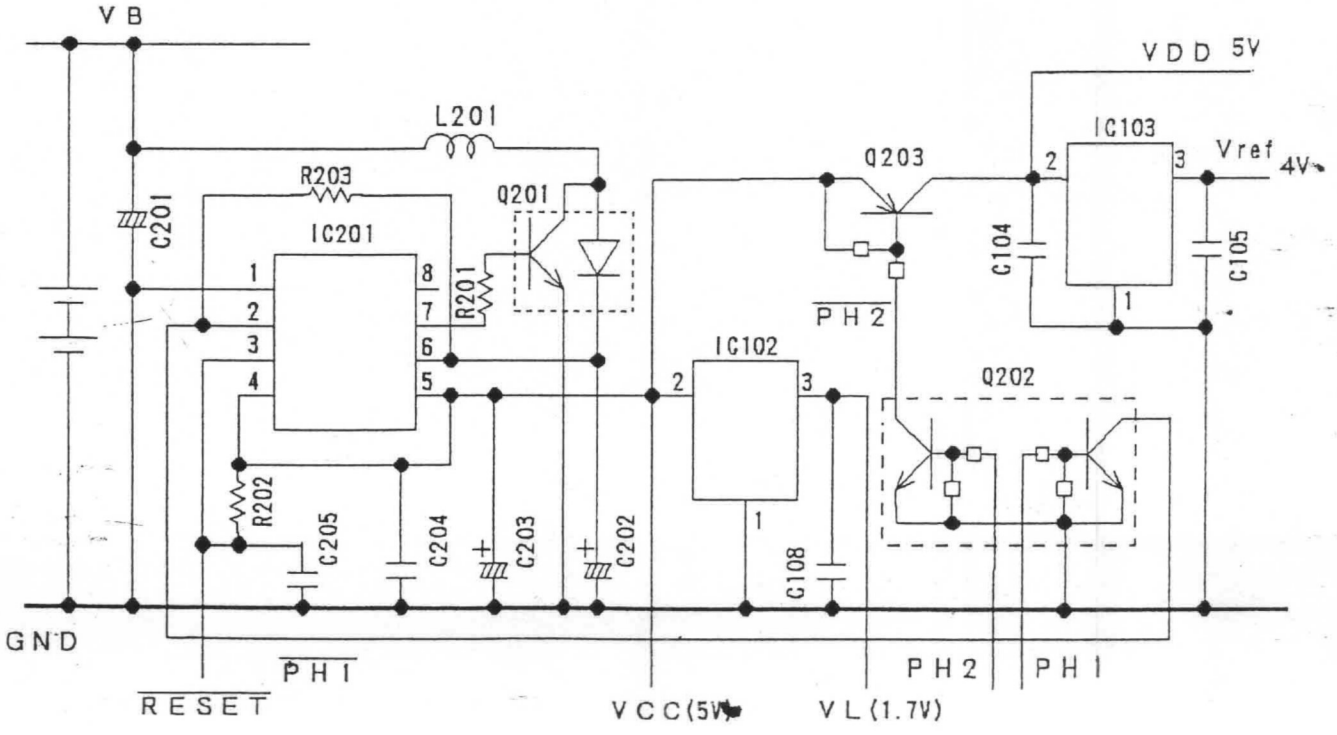
[2] Description of Power Supply Lines

- VCC : Power to CPU
  At start of camera operation, IC101 turns PH1 "L", so that IC201 (DC/DC Converter) becomes active and starts switching boosting. IC201 boosts the voltage at Pin 6 to 5.5 V and outputs 5 V (VCC) at Pin 5 through the internal series regulator.
  In standby mode, IC101 turns PH1 "H", thus stopping the switching operation. Then the camera enters the low power consumption state. In this state, the voltage at the battery is supplied through the coil L201, the Schottky diode in Q201 and the above-mentioned series regulator, so that VCC is almost the same as the battery voltage (VB).

- VDD : Power to peripheral circuits
  After completion of the above-mentioned VCC boosting at start of camera operation, IC101 turns PH2 "L", thus turning ON Q203 to supply 5 V to the VDD line.
  In standby mode, IC101 turns PH2 "H" to turn OFF the VDD line.

- VL : Reference voltage for LCD Drive Circuit
  IC102 (regulated DC voltage IC : 1.7 V) generates this reference voltage at VCC. This voltage is tripled by the boosting circuit in IC101 and used in the LCD Drive Circuit.

- Vref of IC101 : Reference voltage for A/D conversion
  This voltage is used as the reference voltage for the A/D conversion in IC101. IC103 generates this voltage at VDD.
  Since this voltage is 4 V, the Vref for all the A/D conversion in IC101 is only 4 V.



2. Battery Check Circuit

[1] Initial Battery Check

- At reset start
- At power OFF → ON

[2] Mechanical Operation Battery Check (At motor start for each mechanical operation)

- Blank shots advance
- Shutter sequence
  Immediately after shutter sequence start and immediately after winding start (two times in total)
- Mid-roll rewinding

[3] Indications of Battery Warning Mark

LCD			VB
LCD lighting,	(▭) mark off	(normal operation)	4.2 V or higher
LCD lighting,	(▭) mark lighting	(warning)	Approx.4.05V or lower
LCD off,	(▭) mark blinking	(operation prohibited)	Approx.4.2V to 4.05V

[4] Constitution

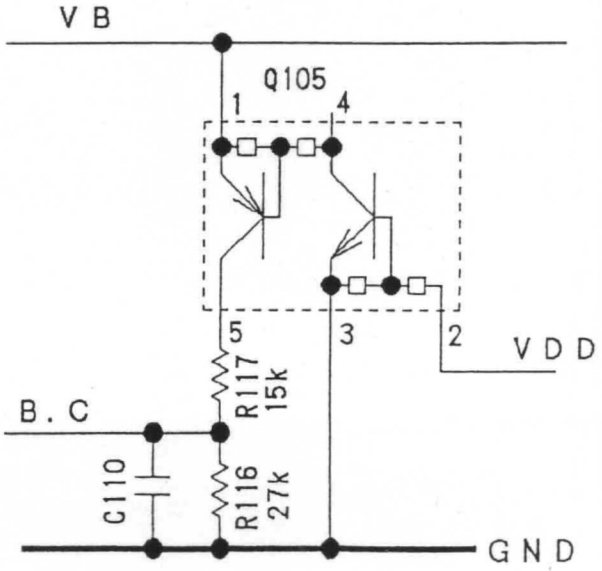
The Battery Check Circuit consists of Q105, R117, R116 and C110.

[5] Functions

VB (battery voltage) divided by R117 and R116 is input directly to IC101, where the voltage is checked. This voltage is stabilized by C110. Also when VDD is OFF, Q105 turns OFF to cut off the current to be consumed by these resistors.
The voltage input to the port for A/D conversion is as follows :

$$V_{IN} = V_B \times 27k / (15k + 27k) = V_B \times 0.643$$

(Reference : The change in A/DBC corresponding to VB 0.1 V is 04H.)



3. Auto Focusing Circuit

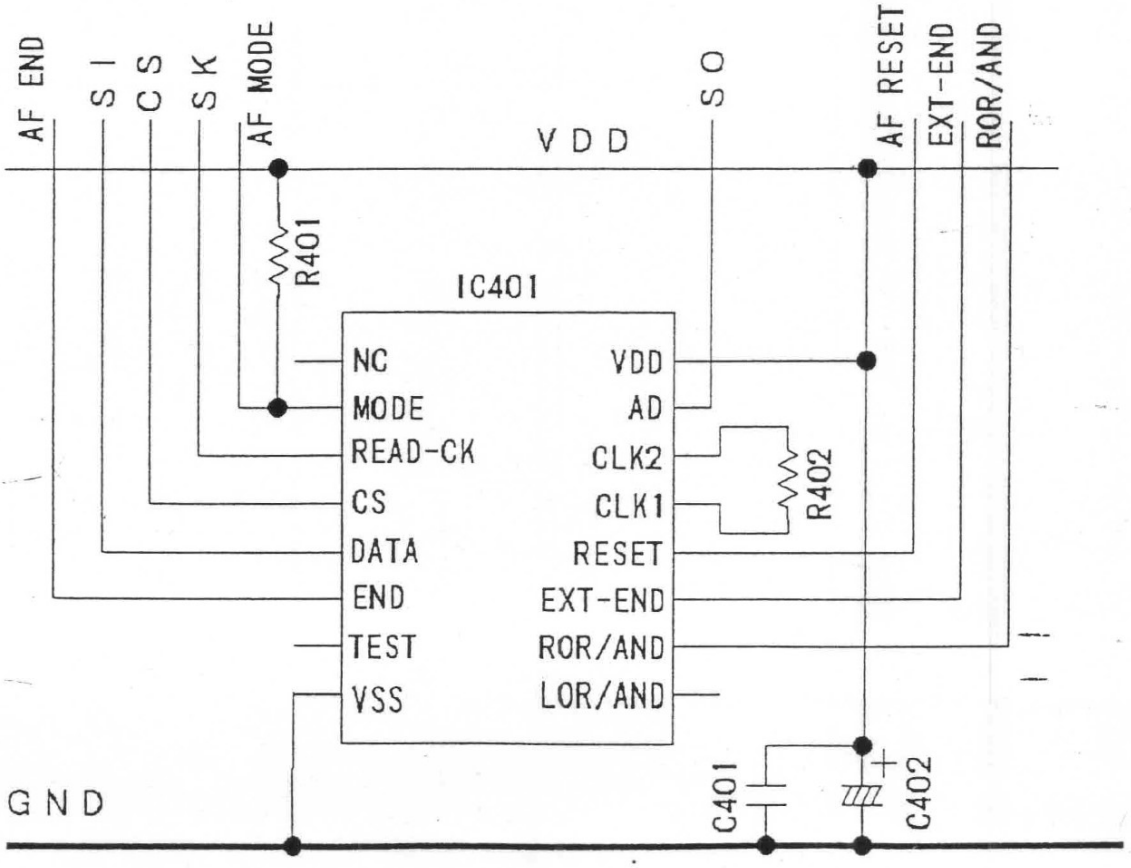
3-1. Passive AF Circuit

[1] Outline

- Auto focusing : external passive system
- After completion of accumulation, this circuit outputs the data read signal by serial communication.

[2] Description of Control Terminals

Terminal Name	Function	I/O	Description of Function
RESET	AF start signal	I	"L": Reset, "H": AF start at rise (accumulation start)
EXT-END	Signal for externally forced stop of accumulation	I	Stops accumulation forcibly when it has not been completed in the time limit.
END	End-of-accumulation signal	O	Outputs "H" upon completion of data accumulation by IC.
READ-CK	Serial clock	I	Clock to be used when IC101 reads AF data from AF IC .
DATA	AF data	O	Outputs AF data to IC101 in synchronization with READ-CK.



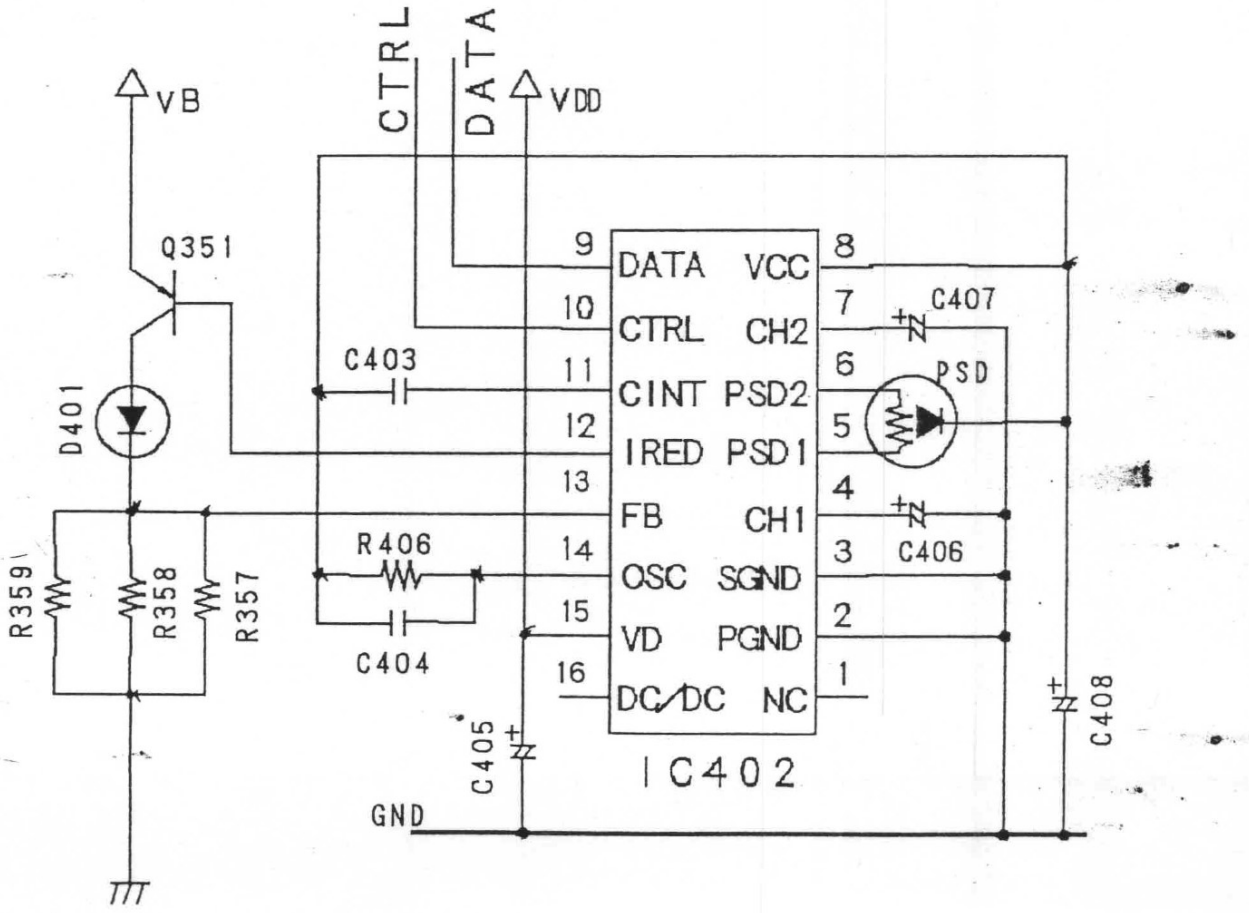
3-2. Active AF Circuit

[1] Outline

- Auto focusing : infrared active system
- The Infrared LED emits an infrared beam (16 times), the PSD receives the reflected beam and this circuit outputs the measured distance data.
- The infrared beam can reach as far as about 3 m, so that this active AF system is used to assist passive AF.

[2] Description of Control Terminals

Terminal Name	Function	I/O	Description of Function
CTRL	AF start signal	I	"L": Reset, "H": AF start at rise. Also inputs data transfer clock after completion of distance measuring.
DATA	AF data output	O	Outputs the digital data of distance measuring result.
IRED	Infrared LED output	O	Controls infrared beam emission of Infrared LED.
FB	IRED current limiting monitor	I	Monitors the current in Infrared LED and feeds back the data.



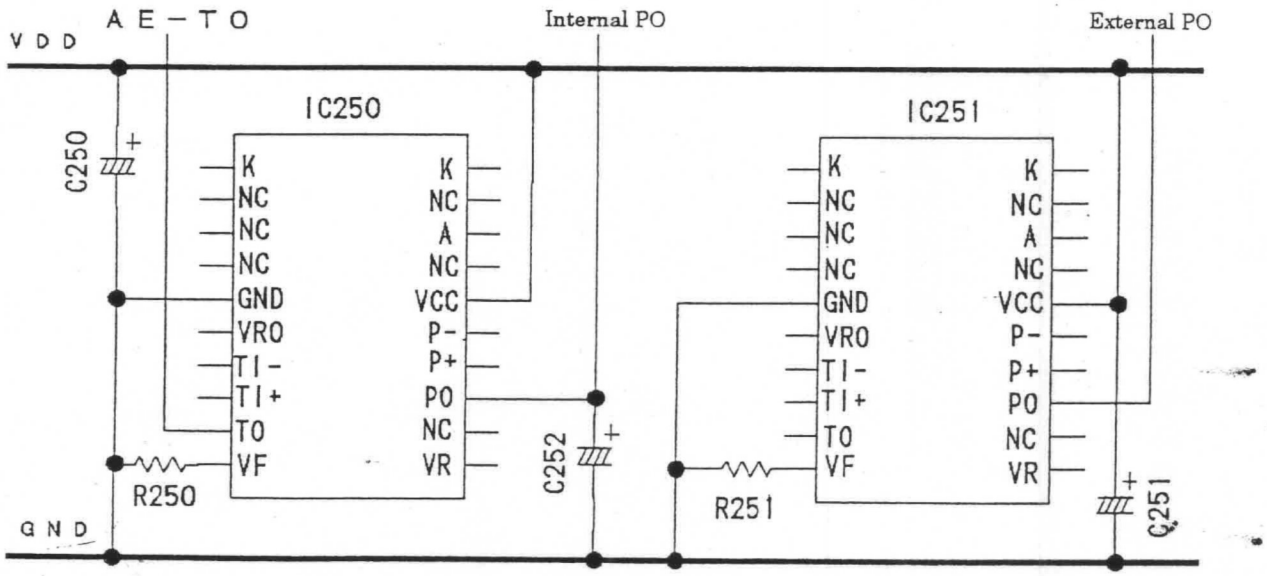
4. Light Metering Circuit

[1] Outline

- Light metering output : This circuit logarithmically compresses the photocurrent of the SPD and convents it to a voltage linear to the EV value. There are internal metering and external metering. (Internal : IC250, External : IC251)
- Temperature dependence : Since light metering output is dependent on temperature, IC101 temperature-compensates the light metering output. For this compensation, IC250 outputs the necessary temperature data as voltage.

[2] Description of Control Terminals (Common to Internal and External)

Terminal Name	Function	Description of Function
PO	Light metering output	Outputs voltage according to brightness.
TO	Temperature sensor output	Outputs voltage linear to temperature. (Only internal : IC250)



5. Drive Circuit

5-1. Winding and Rewinding Circuit

[1] Constitution

This circuit consists of the Drive IC (IC150) and the surrounding capacitors (C150 to C154).
The Drive IC consists of the H Bridge Circuit (comprising MOS transistors) and its predriving circuit.
The surrounding capacitors are used in the charge pump (voltage boosting) circuit for the voltage to drive the gates of the MOS transistors.

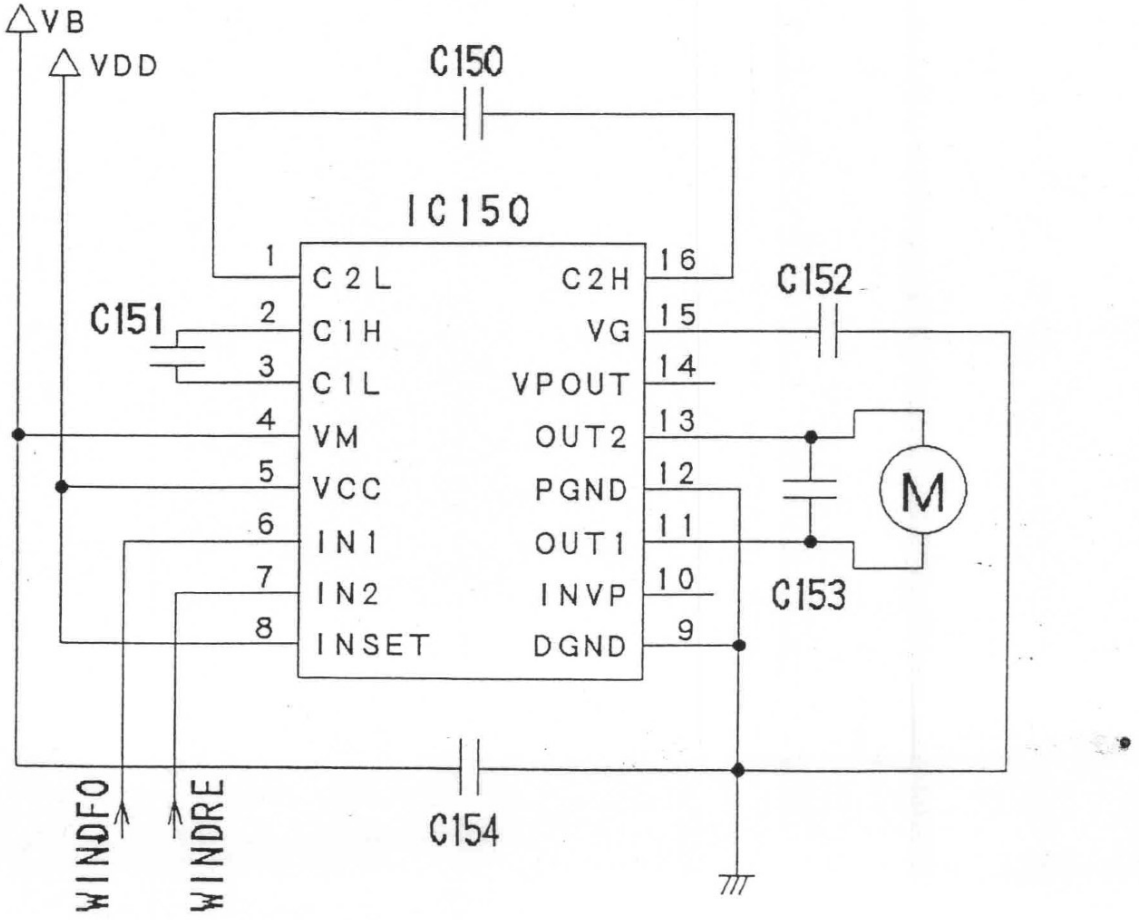
The Drive IC (IC150) is only used to drive the winding and rewinding mechanism. It is controlled by the IC101 (Main CPU).

[2] Functions

The control terminals are controlled by the Main CPU (IC101) as follows :

Pin No.	Terminal Name	Signal Name	Stop	Winding	Rewinding	Brake
62	P00	WINDFO	L	H	L	H
61	P01	WINDRE	L	L	H	H

Winding and Rewinding Drive Circuit Diagram



5-2. AF Motor Drive Circuit (Lens Drive Circuit)

[1] Constitution

This circuit consists of the Drive IC (IC350) and the surrounding capacitors (C350 to C354).
The Drive IC consists of the H Bridge Circuit (comprising MOS transistors) and its predriving circuit.
The surrounding capacitors are used in the charge pump (voltage boosting) circuit for the voltage to drive the gates of the MOS transistors.

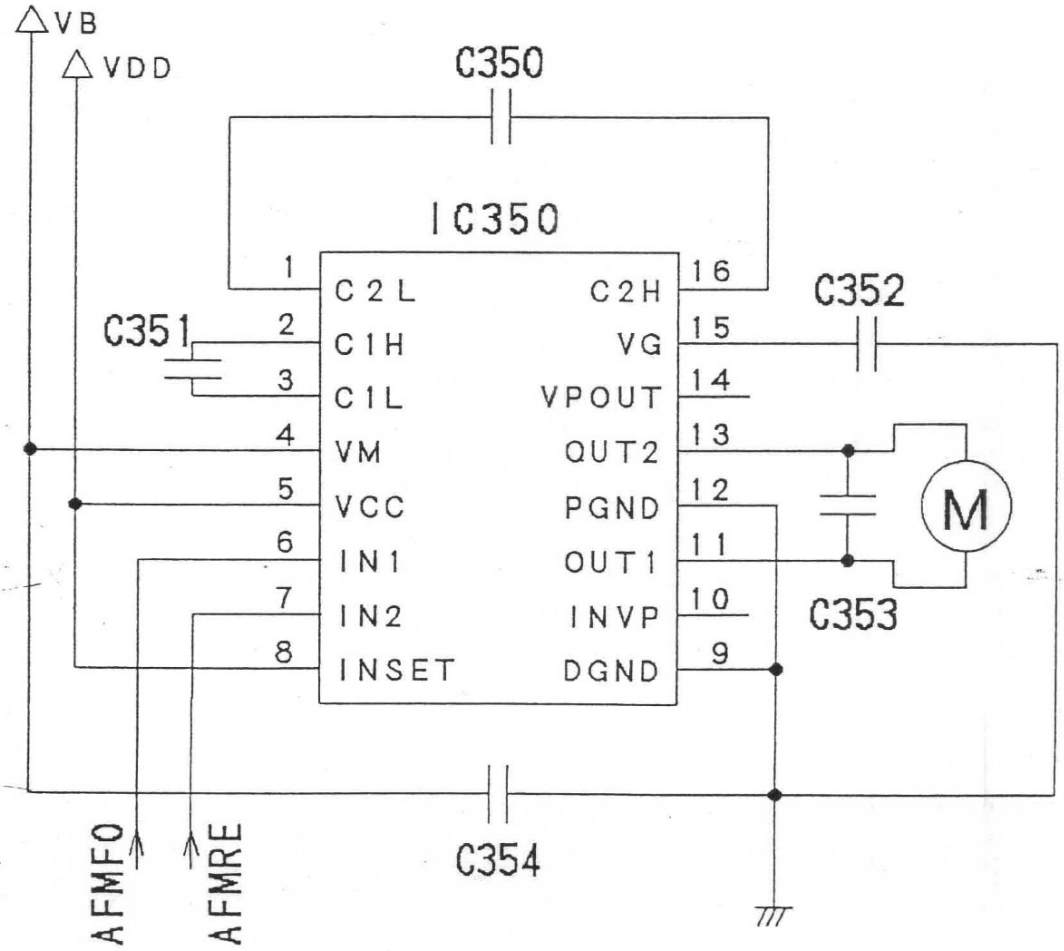
The Drive IC (IC350), which is only used to drive the AF Motor, is controlled by the IC301 (Sub CPU). (Constitution is the same as that of the Winding and Rewinding Circuit.)

[2] Functions

The control terminals are controlled by the Sub CPU (IC301) as follows :

Pin No.	Terminal Name	Signal Name	Stop	→ Near	Near →	Brake
46	P11	AFMFO	L	H	L	H
45	P10	AFMRE	L	L	H	H

AF Motor Drive Circuit Diagram



5-3. Shutter Charge Motor Drive Circuit

[1] Constitution

This circuit consists of the transistor (Q152) for driving, the transistor (Q151) for braking, the transistors (Q153 and Q154) for their predriving, and the resistor (R151).

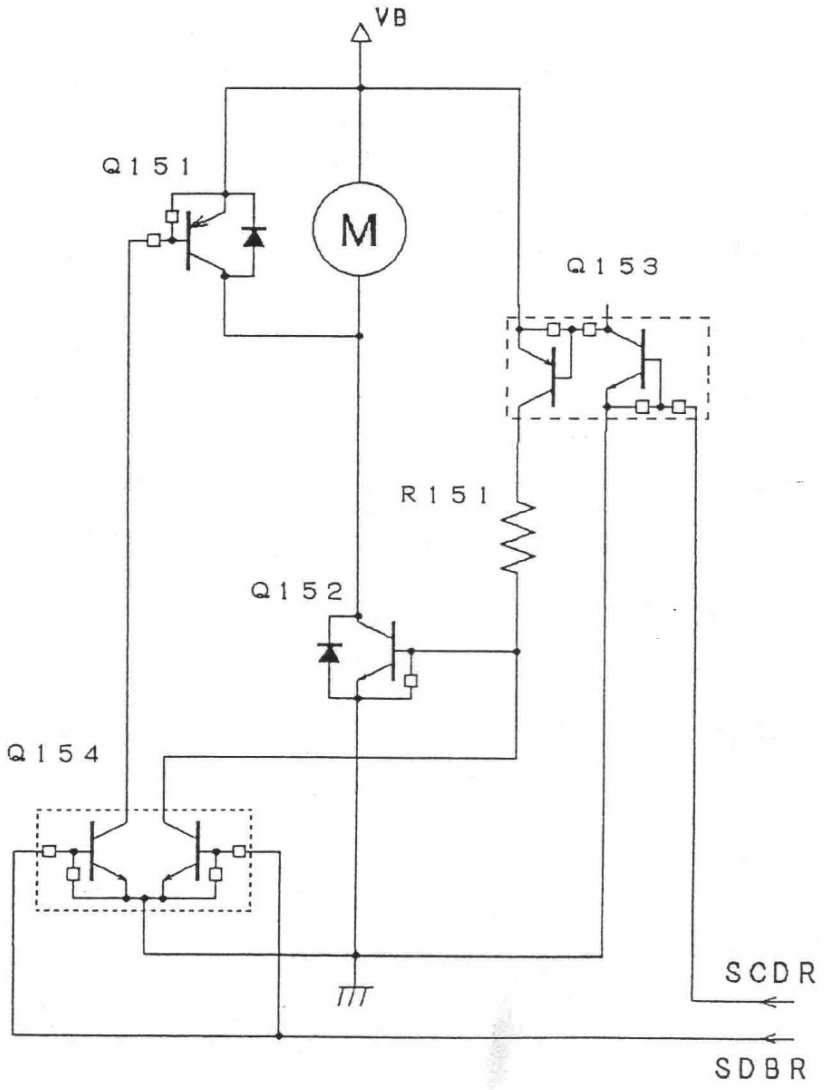
[2] Functions

The control terminals are controlled by the Main CPU (IC101) as follows :

Pin No.	Terminal Name	Signal Name	Stop	Drive	Brake
64	P36	SCDR	L	H	L
63	P37	SCBR	L	L	H

* Shutter charge is controlled by unidirectional turn.

Shutter Charge Motor Drive Circuit Diagram



5-4. Parallax Correction Motor Drive Circuit

[1] Constitution

This circuit consists of the Pulse Motor Drive IC (IC202) and the Regulated DC Voltage Circuit (IC203, Q204, Q205, C206 and R204).

The regulated DC voltage is 3.3 V and a voltage of 2.8 to 3 V is applied across each pair of terminals of the motor.

[2] Functions

When the signal at the ENA terminal of IC202 is set to "H" and simultaneously Q205 is turned ON, the Regulated DC Voltage IC (IC203) operates. Then it supplies a regulated DC voltage to IC202 so that the Pulse Motor is driven by regulated DC voltage.

The control terminals are controlled by the Main CPU (IC101) as shown at table below.

ENA "L" : Standby state Turns OFF the output to the motor.
"H" : Excitation state Turns ON the output to the motor irrespective of stop or drive state.

IN1 : Controls the Drive IC's outputs "OUT1" and "OUT 2" (motor terminals: phase A and phase $\overline{A}$)

IN2 : Controls the Drive IC's outputs "OUT3" and "OUT 4" (motor terminals: phase B and phase $\overline{B}$)

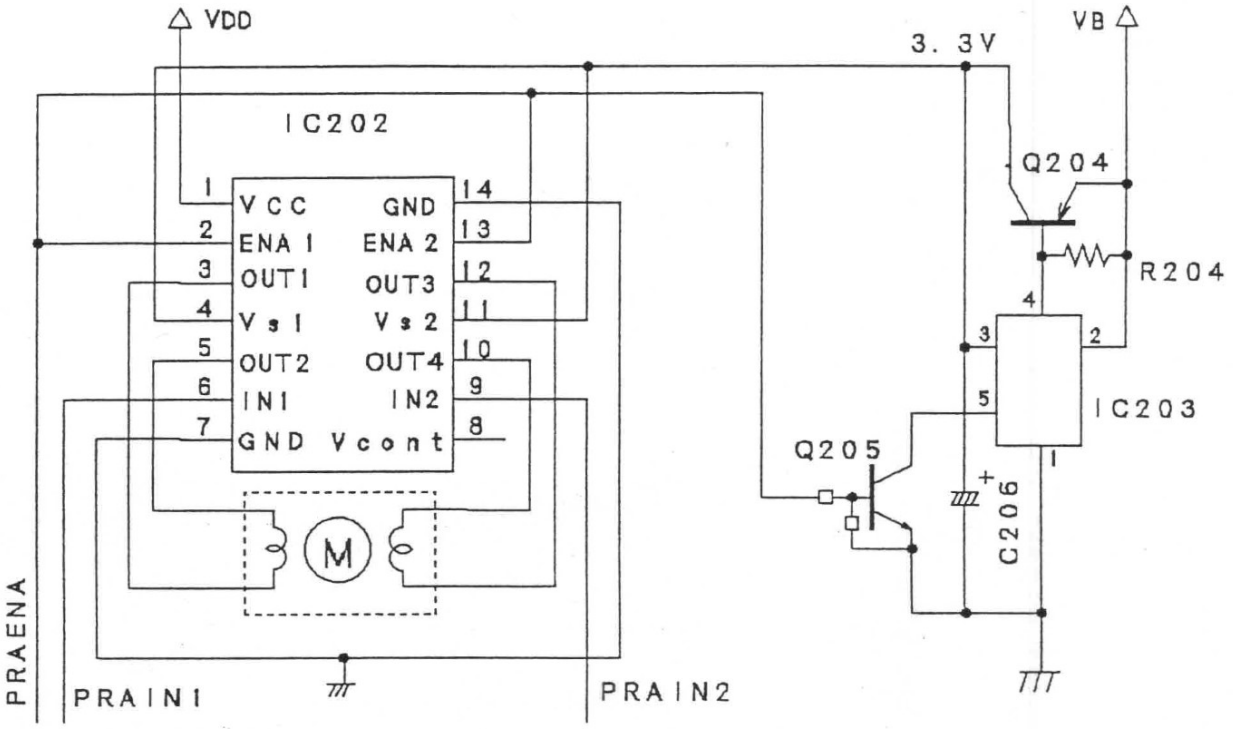
Excitation Pattern	Motor Terminal		$\overline{A}$	A	B	$\overline{B}$	Drive Direction	
	Drive IC Output / Drive IC Input		OUT1	OUT2	OUT3	OUT4	Close up CW	Infinity CCW
	IN1	IN2						
1	L	H	H	L	L	H	↑	↓
2	L	L	H	L	H	L		
3	H	L	L	H	H	L		
4	H	H	L	H	L	H		

The motor does not turn unless the ENA terminal signal is "H".

Drive IC		Main CPU	
Pin No.	Terminal Name	Pin No.	Signal Name
2	ENA1	67	PRAENA
13	ENA2		
6	IN1	66	PRAIN1
9	IN2	65	PRAIN2

No.	419-01-50-RA1AS01

Parallax Correction Drive Circuit Diagram



6. TTL Flash Auto Control Circuit

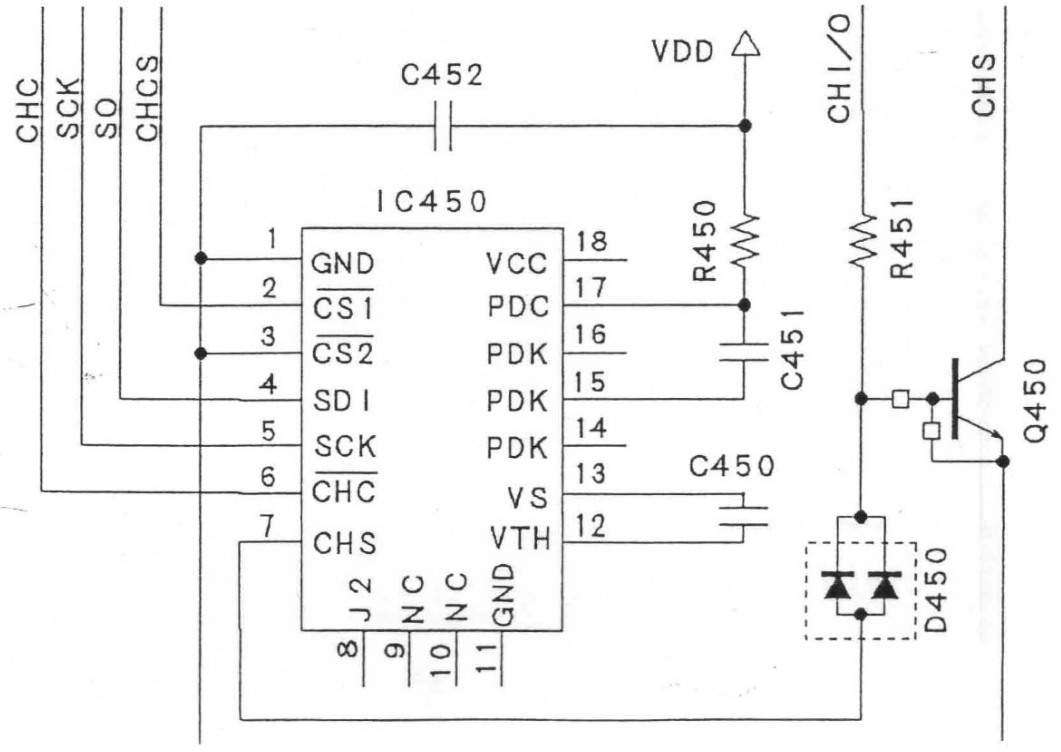
[1] Outline

- TTL Flash Auto Control output : The TTL Flash Auto IC (IC450) starts integration (accumulation of charges in C451) upon receiving the start signal ($\overline{CHC}$: L) from the Main CPU. When the integral voltage has reached the reference voltage (VTH), IC450 outputs the stop signal (CHS = "H"). This CHS signal is output through D450 to the CHI/O terminal. The CPU, upon receiving the inverted CHS signal ($\overline{CHS}$ signal) via Q450, conducts TTL Flash Auto indication.
- Reference voltage : The reference voltage VTH varies with ISO values. Each ISO value is transferred in the form of 5-bit data by serial communication and converted to a voltage in IC450.

[2] Description of Control Terminals

Terminal Name	Function	Description of Function
CHC	Start signal input for TTL Flash Auto control	Conducts TTL Flash Auto operation only during "L".
CHS	Stop signal output for TTL Flash Auto control	Stops flash firing at "H".
CHCS	Chip select input	Selects this IC at "L". (By serial communication)
SCK	Serial clock input	Clock to transfer ISO data by serial communication.
SO	Serial data input	Data line to transfer ISO data by serial communication.

TTL Flash Auto Control Circuit



DESCRIPTION OF FUNCTIONS OF IC TERMINALS

< IC101 > Main CPU

Terminal No.	Port Name	I/O	Signal Name	Functions
1 2	AN7 AN6	I I	AEOUT1 AEOUT2	A/D input Light metering output (Internal) (External)
3	AN5	I	TO	A/D input Light Metering IC temperature output
4	AN4	I	B.C.	A/D input Battery check voltage
5	AN3	I	WPRPLS	A/D input Winding Photo-reflector Perforation waveform
6	AN2	I	S. Speed	A/D input Shutter Dial setting voltage
7	AN1	I	Compens.	A/D input Exposure Compensation Dial setting voltage
8	AN0	I	Drive	A/D input Drive Dial setting voltage
9 10	P57 P56	I	ABC1.0 ABC0.5	A.B.C. Switch, 1.0 A.B.C. Switch, 0.5
11 12	P55 P54	I	CHSW2 CHSW1	Charge Switch 2 Charge Switch 1
13	P53	I	Para. SW	Parallax Switch
14 15	P52 INT3	I I	FD2 FD1	Focus Dial 2 Focus Dial 1
16 17	INT2 P47	I I	MF CAF	AF mode "MF" AF mode "CAF"
18 19 20	SCK TXD RXD	O O I	SCK SO SI	Serial communication Clock output Data output Data input Communicated with : EEPROM1, TTL Flash Auto IC, Adjusting Tool and Data Back
21	INT1	I	Back Cover SW	Back Cover Switch Open : "L", Close : "H"
22	INT0	I	Main SW	Main Switch OFF : "H", ON : "L"
23	P41	O	SELFLED	Self-timer LED Lighting : "H", Going out : "L" Also used as ACK signal for serial communication with Adjusting Tool
24	P40	O	DB DCS	Data Back Chip select signal (Select : "H")
25 26 27 28	P77 P76 P75 P74	I/O I/O I/O I/O	CPU D3 CPU D2 CPU D1 CPU D0	Between-CPU communication signal 3 Between-CPU communication signal 2 Between-CPU communication signal 1 Between-CPU communication signal 0
29 30 31	P73 P72 P71	I I I	DB TMP DB DHS DB LMP	Data Back Temperature detection signal Communication handshake signal Imprinting lamp lighting signal / DCS recognition signal
32	P70	I	WPIPULS	Winding photo-interrupter output signal

Terminal No.	Port Name	I/O	Signal Name	Functions
33	$\overline{\text{RESET}}$	I	$\overline{\text{RESET}}$	CPU reset signal
34 35	XCIN XCOUT			32 kHz oscillator connection
36 37	XIN XOUT			8 MHz oscillator connection
38	VSS			CPU power grounding
39	P27	I	$\overline{\text{CHS}}$	Flash Ready Detect Signal / TTL Flash Auto IC Flash stop signal
40	P26	I	TEST	Transition to test mode Test mode : "L", Normal : "H"
41	P25	I	W-UP	
42	P24	I	AFLOCK	Input to AF Lock Switch
43	P23	I	ISO	Input to ISO Switch
44	P22	I	Rewind	Input to Rewind Switch
45	P21	I	Release	Input to Shutter Release Switch
46	P20	I	Check	Input to Check Switch
47	P17	I	AE-L	Input to AE Lock Switch
48	P16	I	$\overline{\text{A.ACK}}$	Between-CPU communication control signal
49	P15	O	2RESET	CPU2 reset signal
50 51	P14 P13	O O	TIME $\overline{\text{A.RQU}}$	Between-CPU communication control signal
52	P12	O	$\overline{\text{CHC}}$	TTL Flash Auto IC Accumulation control signal
53	P11	O	$\overline{\text{CHCS}}$	TTL Flash Auto IC Chip select signal (Select : "L")
54	P10	O	DBPRN	Data Back Imprinting lamp ON signal
55	P07	O	ROM1CS	EEPROM1 Chip select signal (Select : "H")
56	P06	O	WPLED	Winding photo-reflector & photo-interrupter LED Lighting : "H", Going out : "H"
57 58	P05 P04	O O	$\overline{\text{B.LED2}}$ $\overline{\text{B.LED1}}$	Viewfinder back light LED 2 Viewfinder back light LED 1 Lighting "L", Going out "H"
59 60	P03 P02	O O	$\overline{\text{SMG2}}$ $\overline{\text{SMG1}}$	Control of shutter second curtain magnet Control of shutter first curtain magnet
61 62	P01 P00	O O	WINDRE WINDFO	Winding Motor control / Stop / Forward turn / Reverse turn / Brake WINDFO 0 1 0 1 WINDRE 0 0 1 1 Forward turn: Winding Reverse turn: Rewinding
63 64	P37 P36	O O	SCBR SCDR	Charge Motor control / Stop / Drive / Brake SCDR 0 1 0 SCBK 0 0 1

Terminal No.	Port Name	I/O	Signal Name	Functions
65 66 67	P35 P34 P33	O O O	PRAIN2 PRAIN1 PRAENA	Pulse Motor control for parallax correction
68	P32	O	AX	Hot Shoe AX signal
69	P31	O	PH2	V_{DD} ON : "H", OFF : "L"
70	P30	O	PH1	DC/DC chip select signal (ON : "H")
71 72	SG17 SG16	- -	- -	Not used Not used
73 74 75 76 77	SG15 SG14 SG13 SG12 SG11	O O O O O	SEG15 SEG14 SEG13 SEG12 SEG11	Counter LCD indication
78 79 80 81 82 83 84 85 86 87 88	SG10 SG9 SG8 SG7 SG6 SG5 SG4 SG3 SG2 SG1 SG0	O O O O O O O O O O O	SEG10 SEG9 SEG8 SEG7 SEG6 SEG5 SEG4 SEG3 SEG2 SEG1 SEG0	Main LCD indication
89	VCC		VCC	CPU power input
90	VREF		VREF	Reference voltage input for A/D conversion
91	AVSS		AVSS	CPU analog grounding (0 V)
92	COM3	-	-	Not used
93 94 95	COM2 COM1 COM0	O O O	COM2 COM1 COM0	LCD common output, used by 3-time-division
96 97 98 99 100	VL3 VL2 C2 C1 VL1		VL3 VL2 C2 C1 VL1	LCD power input Applies voltages as $0 \leqq VL1 \leqq VL2 \leqq VL3$ For boosting circuit For boosting circuit Power input

< IC301 > Sub CPU

Terminal No.	Port Name	I/O	Signal Name	Functions
1	AN7	I	TDATA	A/D input Thermistor circuit temperature output voltage
2	AN6	I	∞ Adjusted Value	A/D input Infinity adjustment voltage
3	AN5	I	Model Inf.	A/D input Lens model voltage
4	AN4	I	Focal Length	A/D input Focal length voltage
5	AN3	I	Reference SW	Lens Reference Position Switch
6 7	P62 P61	I/O O	LSDI LSCK	Lens communication data input/output Lens communication data output
8	P60	-	-	Not used
9 10 11 12	P57 P56 P55 P54	I/O I/O I/O I/O	CPU D3 CPU D2 CPU D1 CPU D0	CPU communication signal 3 CPU communication signal 2 CPU communication signal 1 CPU communication signal 0
13	P53	-	-	Not used
14 15 16	P52 INT3 INT3	O I I	$\overline{\text{A.ACK}}$ $\overline{\text{TIMI}}$ $\overline{\text{A.REQ}}$	Between-CPU communication control signals
17	P47	I	$\overline{\text{VDD2PH}}$	VDD2 ON : "L", OFF : "H"
18 19 20	SCK TXD RXD	O O I	SCK S0 S1	Serial communication Clock output Data output Data input Communicated with : EEPROM2, Passive AF IC
21 22	INT1 INT0	I I	AFPULS2 AFPULS1	Lens drive detection pulse 2 Lens drive detection pulse 1
23	P41	O	AFCTRL	Active AF IC CTRL signal
24	P40	I	AFDATA	Active AF IC DATA signal
25	$\overline{\text{RESET}}$	I	$\overline{\text{RESET}}$	CPU reset signal
26	P71	O	Compiled Data Imprint LED	Compiled Data Imprinting LED in Data Back Lighting : "L", Going out : "H"
27	P70	O	AFPILED	AF Photo-interrupter LED Lighting : "L", Going out : "H"
28 29	XIN XOUT			8 MHz oscillator connection
30	VSS			CPU power grounding
31	P27	I	AF ROR	Passive AF IC AF ROR signal
32	P26	I	AF END	Passive AF IC AF END signal

Terminal No.	Port Name	I/O	Signal Name	Functions
33	P25	I	L-LOCKSW	Input to Lens Lock Switch
34 35 36 37 38	P24 P23 P22 P21 P20	I I I I I	DX4 DX3 DX2 DX1 DX0	Cartridge DX detection
39	P17	O	MODE	Passive AF IC MODE signal
40	P16	O	AF RESET	Passive AF IC AF RESET signal
41	P15	O	EXT-END	Passive AF IC EXT. END signal
42	P14	O	AFIC-CS	Passive AF IC Chip select signal (Select : "H")
43	P13	O	ROM2-CS	EEPROM2 Chip select signal (Select : "H")
44	P12	-	-	Not used
45 46	P11 P10	O O	AFMFO AFMRE	AF Motor control / Stop / Forward turn / Reverse turn / Brake AFMFO 0 1 0 1 AFMRE 0 0 1 1
47~54		-	-	Not used
55 56 57 58 59 60 61 62 63 64 65 66 67	SG15 SG14 SG13 SG12 SG11 SG10 SG9 SG8 SG7 SG6 SG5 SG4 SG3	O O O O O O O O O O O O O	SEG15 SEG14 SEG13 SEG12 SEG11 SEG10 SEG9 SEG8 SEG7 SEG6 SEG5 SEG4 SEG3	Viewfinder LCD indication
68 69 70	SG2 SG1 SG0	O O O	SEG2 SEG1 SEG0	Viewfinder LCD indication
71	VCC		VCC	CPU power input
72	VREF		VREF	A/D conversion reference voltage input
73	AVSS		AVSS	CPU analog grounding (0 V)
74	COM3	-	-	Not used
75 76 77	COM2 COM1 COM0	O O O	COM2 COM1 COM0	LCD common output, used by 3-time-division
78 79 80	VL3 VL2 VL1		VL3 VL2 VL1	LCD power input

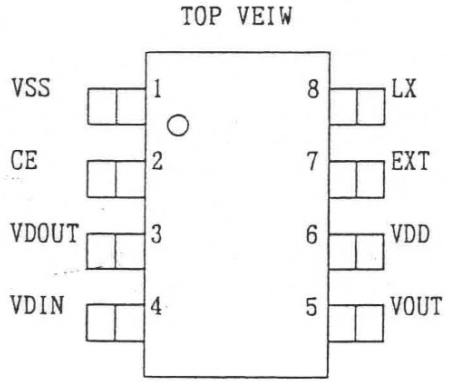
< IC201 > DC/DC Converter

Pin No.	Terminal Name	I/O	Description of Functions
1	VSS	-	Grounding terminal
2	CE	I	Chip enable terminal
3	VDOUT	O	Voltage detector output terminal
4	VDIN	I	Voltage detector input terminal
5	VOUT	O	Regulator output terminal (5.0 V output)
6	VDD	O	Boosted output terminal
7	EXT	O	External transistor drive terminal
8	LX	-	Not used

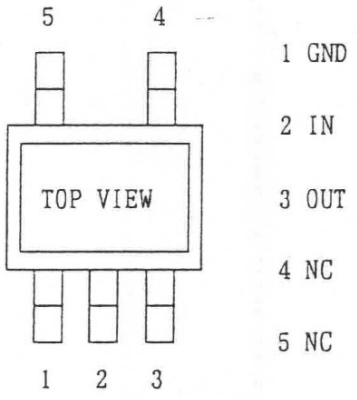
< IC103 > Regulated DC Voltage IC

Pin No.	Terminal Name	I/O	Description of Functions
1	GND	-	Grounding terminal
2	IN	I	Voltage input terminal (VDD input)
3	OUT	O	Voltage output terminal (4 V output : reference voltage for A/D conversion of IC101)
4	NC	-	Not connected
5	NC	-	Not connected

(IC201 DC/DC Converter Pin Arrangement)



(IC103 Regulated DC Voltage IC Pin Arrangement)



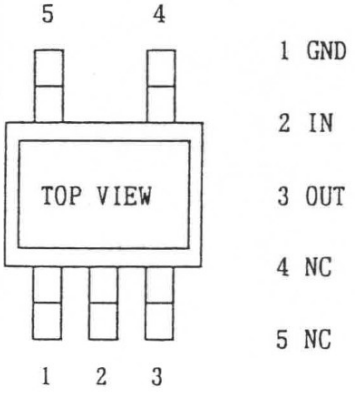
< IC102 > Regulated DC Voltage IC

Pin No.	Terminal Name	I/O	Description of Functions
1	GND	-	Grounding terminal
2	IN	I	Voltage input terminal (VCC input)
3	OUT	O	Voltage output terminal (1.7 V output)
4	NC	-	Not connected
5	NC	-	Not connected

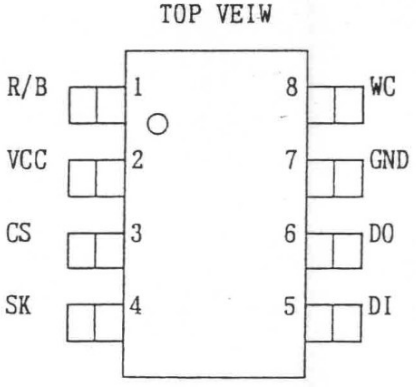
< IC151 > EEPROM1

Pin No.	Terminal Name	I/O	Description of Functions
1	R/B	O	READ, BUSY status signal : Open
2	VCC	-	Circuit power
3	CS	I	Chip select signal input
4	SK	I	Clock input
5	DI	I	Serial data input
6	DO	O	Serial data output
7	GND	-	Power supply grounding
8	WC	I	Write control input : connected to GND

(IC102 Regulated DC Voltage IC Pin Arrangement)



(IC151 EEPROM1 Pin Arrangement)



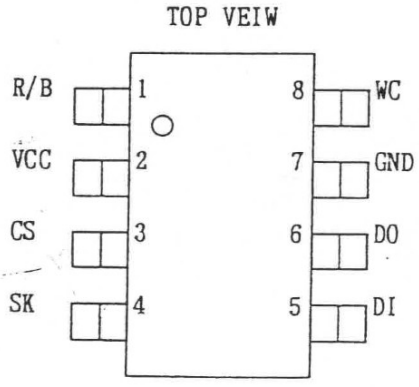
< IC302 > EEPROM2

Pin No.	Terminal Name	I/O	Description of Functions
1	R/B	O	READ, BUSY status signal : Open
2	VCC	-	Circuit power
3	CS	I	Chip select signal input
4	SK	I	Clock input
5	DI	I	Serial data input
6	DO	O	Serial data output
7	GND	-	Power supply grounding
8	WC	I	Write control input : connected to GND

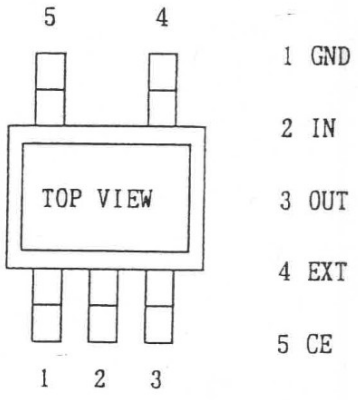
< IC203 > Regulated DC Voltage IC for Parallax Motor

Pin No.	Terminal Name	I/O	Description of Functions
1	GND	-	Power supply terminal (Grounding)
2	IN	I	Input terminal
3	OUT	O	Output terminal
4	EXT	O	External transistor control terminal : for current amplification
5	CE	I	IC operation select terminal "H": OFF state, "L": ON (operation) state

(IC302 EEPROM2 Pin Arrangement)



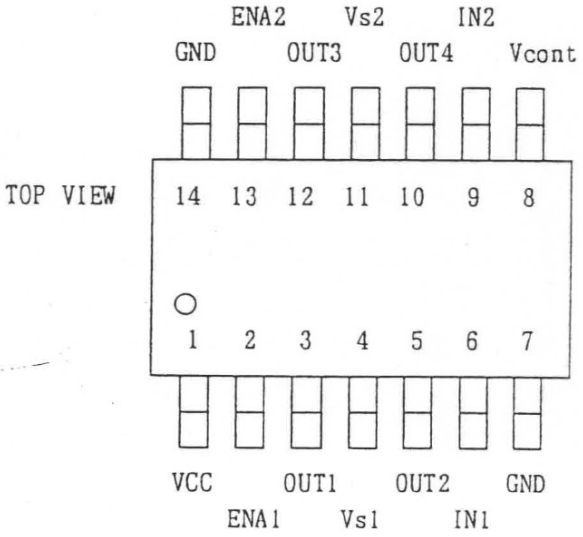
(IC203 Regulated DC Voltage IC Pin Arrangement)



< IC202 > Parallax Motor Drive IC

Pin No.	Terminal Name	I/O	Description of Functions
1	VCC	-	Power to control circuit
2	ENA1	I	IC operation selection terminal 1 "L": standby state, "H": drive (operation) state
3	OUT1	O	Output terminal
4	Vs1	-	Power input terminal for output circuit
5	OUT2	O	Output terminal
6	IN1	I	Input terminal for drive direction selection 1 "L": forward turn, "H": reverse turn
7	GND	-	Circuit grounding
8	Vcont	-	Not connected
9	IN2	I	Input terminal for drive direction selection 2 "L": forward turn, "H": reverse turn
10	OUT4	O	Output terminal
11	Vs2	-	Power input terminal for output circuit
12	OUT3	O	Output terminal
13	ENA2	I	IC operation selection terminal 2 "L": standby state, "H": drive (operation) state
14	GND	-	Circuit grounding

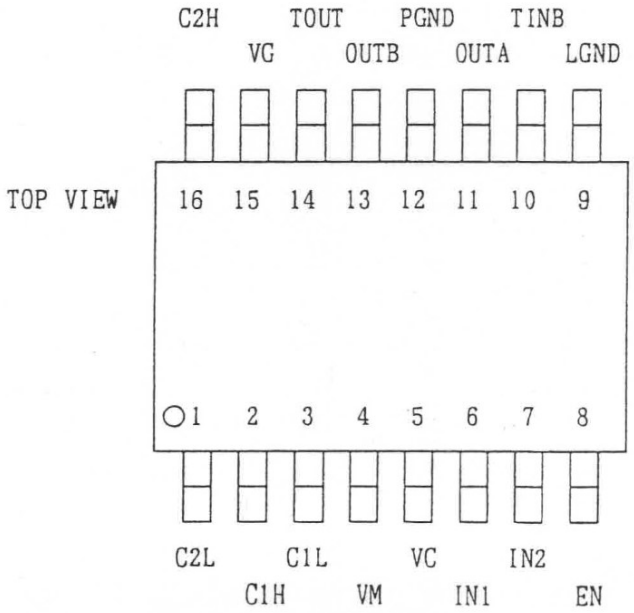
(IC202 Parallax Motor Drive IC Pin Arrangement)



< IC150, 350 > WIND/AF Motor Drive IC

Pin No.	Terminal Name	I/O	Description of Functions
1	C2L	-	Motor forward turn : IN1 = "H", IN2 = "L" Motor reverse turn : IN1 = "L", IN2 = "H" Motor brake : IN1 = "H", IN2 = "H" Motor OFF : IN1 = "L", IN2 = "L" Since the WIND Motor and AF Motor use the same type of IC, both of them are driven by the combinations of the signals as shown above. WIND is controlled by the Main CPU (IC101) and AF controlled by the Sub CPU (IC301). WIND Motor control ------ by Main CPU through its two ports P00 : "H"→ WIND forward turn P01 : "H"→ WIND reverse turn P00, P01 : "H"→ WIND brake AF Motor control ------ by Sub CPU through its two ports P10 : "H"→ AF forward turn P11 : "H"→ AF reverse turn P10, P11 : "H"→ AF brake
2	C1H	-	
3	C1L	-	
4	VM	-	
5	VC	-	
6	IN1	I	
7	IN2	I	
8	EN	I	
9	LGND	-	
10	TINB	-	
11	OUTA	O	
12	PGND	-	
13	OUTB	O	
14	TOUT	-	
15	VG	-	
16	C2H	-	

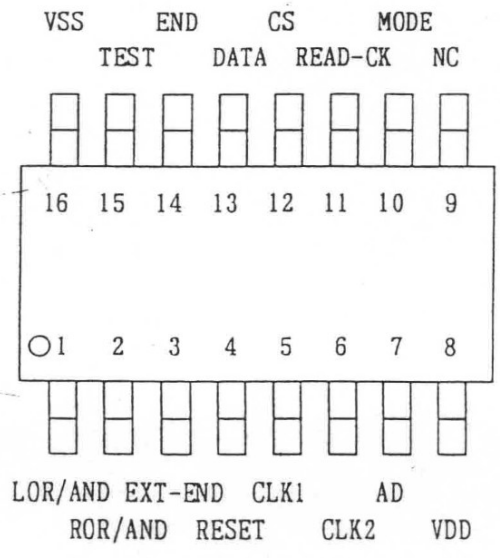
(IC150 WIND Motor Drive IC / IC350 AF Motor Drive IC Pin Arrangement)



< IC401 > Passive AF IC

Pin No.	Terminal Name	I/O	Description of Functions
1	LOR/AND	O	OR/AND output of left sensor array. Not connected
2	ROR/AND	O	OR/AND output of right sensor array
3	EXT-END	I	Input of "L" stops sensor operation forcibly. (Pull-up resistor incorporated)
4	RESET	I	IC reset terminal (reset at "L", pull-up resistor incorporated)
5	CLK1	-	Terminal to mount external resistor for oscillator
6	CLK2	-	Terminal to mount external resistor for oscillator
7	AD	I	Input terminal for the first address of calculation start and sensor data output area (Pull-up resistor incorporated)
8	VDD	-	Power terminal
9	NC	-	Not connected
10	MODE	I	"L": AF mode, "H": sensor mode
11	READ-CK	I	Control signal for address input and data output (Pull-up resistor incorporated)
12	CS	I	Chip select ("L": DATA terminal ---- High impedance "H": DATA terminal ----Data output)
13	DATA	O	Data output terminal
14	END	O	"L" : Sensor operation state, data output state "H" : Address input state
15	TEST	I	Test terminal for use by manufacturer Normal operation at "L" or in "open" state. Not connected
16	VSS	-	Power terminal (Grounding)

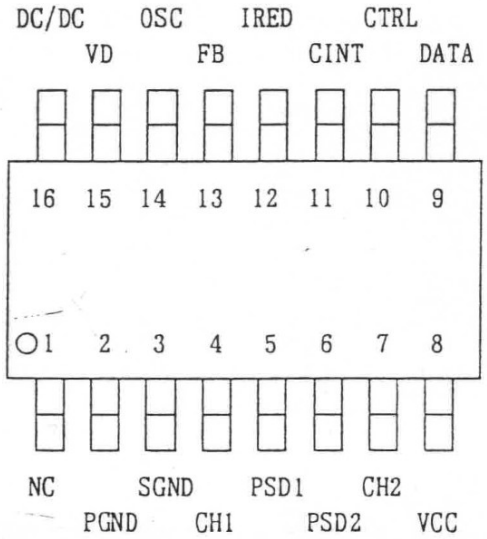
(IC401 Passive AF IC Pin Arrangement)



< IC402 > Active AF IC

Pin No.	Terminal Name	I/O	Description of Functions
1	NC	-	Not connected
2	PGND	-	Power terminal (Power grounding)
3	SGND	-	Power terminal (Signal grounding)
4	CH1	I	Hold capacitor 1 (for external light cancellation)
5	PSD1	I	PSD input 1 (Far distance)
6	PSD2	I	PSD input 2 (Near distance)
7	CH2	I	Hold capacitor 2 (for external light cancellation)
8	VCC	O	Power terminal (Output from internal stabilization power circuit : 4 V)
9	DATA	O	Output terminal for distance measurement data
10	CTRL	I	Control input terminal
11	CINT	O	Integrating capacitor connecting terminal for A/D conversion
12	IRED	O	Output terminal for AF infrared LED drive
13	FB	I	Monitor terminal for IRED current limiting feedback
14	OSC	I	Oscillating CR connecting terminal
15	VD	I	Power terminal
16	DC/DC	-	Transistor terminal for DC/DC (Not connected)

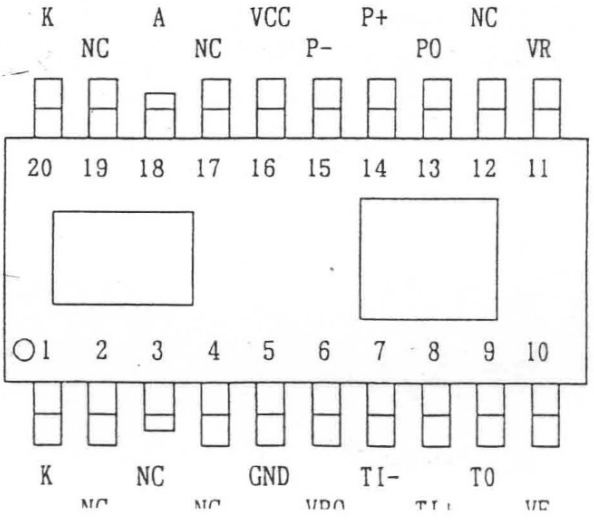
(IC402 Active AF IC Pin Arrangement)



< IC250, 251 > Light Metering IC

Pin No.	Terminal Name	I/O	Description of Functions
1	K	-	Photodiode cathode (Not connected)
2~4	NC	-	Not used
5	GND	-	Power terminal (Signal grounding)
6	VRO	I	Internal reference voltage terminal (Not connected)
7	TI−	I	Inversion input terminal of temperature sensor amplifier (Not connected)
8	TI+	I	Non-inversion input terminal of temperature sensor amplifier (Not connected)
9	TO	O	Output terminal of temperature sensor amplifier
10	VF	I	Light metering output adjustment terminal (Adjustment range: ± 1 EV)
11	VR	O	Output terminal for A/D conversion reference voltage (Not connected)
12	NC	-	Not used
13	PO	O	Light metering value output terminal
14	P+	I	Non-inversion input terminal of light metering amplifier (Not connected)
15	P−	I	Inversion input terminal of light metering amplifier. (Not connected)
16	VCC	-	Power terminal
17	NC	-	Not used
18	A	-	Photodiode anode (Not connected)
19	NC	-	Not used
20	K	-	Photodiode cathode (Not connected)

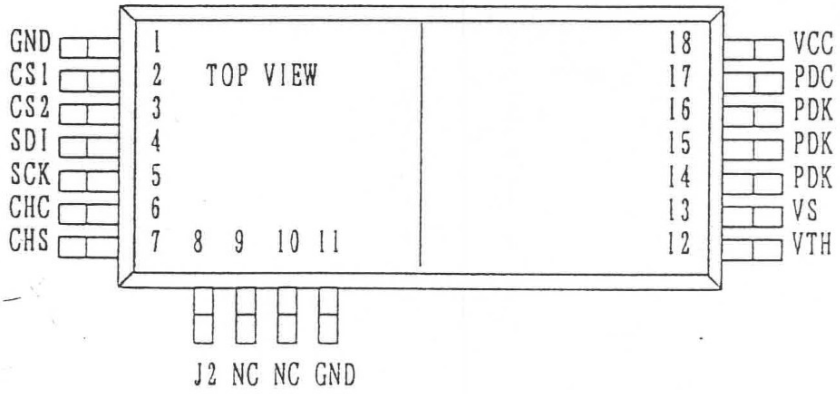
(IC250, 251 Light Metering IC Pin Arrangement)



< IC450 > TTL Flash Auto IC

Pin No.	Terminal Name	I/O	Description of Functions
1	GND	-	Power terminal (Signal grounding)
2	CS1	I	Chip select signal 1 (Selection at "L")
3	CS2	I	Chip select signal 2 (Connected to GND)
4	SDI	I	Input terminal for ISO code serial data
5	SCK	I	Serial clock input terminal
6	CHC	I	Input terminal for TTL Flash Auto control start signal (TTL Flash Auto control operation during "L")
7	CHS	O	Output terminal for TTL Flash Auto control stop signal (Stop at "L" → "H")
8~11	NC	-	Not used
12	VTH	-	Reference voltage for TTL Flash Auto control integration (Varies with ISO)
13	VS	O	Reference voltage output terminal
14	PDK	-	Internal SPD connecting terminal : Cathode
15	PDK	-	Internal SPD connecting terminal : Cathode
16	PDK	-	Internal SPD connecting terminal : Cathode
17	PDC	-	Internal SPD connecting terminal : Anode
18	VCC	-	Power terminal

(IC401 TTL Flash Auto IC Pin Arrangement)



DESCRIPTION OF FUNCTIONS OF ELECTRONIC PARTS

Symbol	Name	Rating	Functions
IC101	Main CPU		Sequence control Display control (Main LCD, Counter LCD, Self-timer LED) Power circuit control Input read in (Switch, Dial information (A/D), etc.) Sensor read in (TTL , external light metering) Peripheral circuit control (Shutter, winding, Viewfinder Parallax Motor, etc.)
IC102	REG-IC		Reference voltage output for LCD power (1.7 V)
IC103	REG-IC		Reference voltage output for A/D conversion during light metering (4 V)
IC150	Motor Drive IC		WIND Motor Drive IC
IC151	EEPROM1		Memory for backup data, counter, states information
IC201	DC/DC Converter		Power supply circuit for system
IC202	Motor Drive IC		Parallax Motor drive IC
IC203	REG-IC		Regulated DC Voltage IC for Parallax Motor drive
IC250	Light Metering IC		Light metering IC (TTL light metering)
IC251	Light Metering IC		Light metering IC (External light metering)
IC301	Sub CPU		AF control (passive, active IC control, calculation, etc.) Lens drive Viewfinder LCD drive
IC302	EEPROM2		Lens data memory
IC350	Motor Drive IC		AF Motor drive IC
IC401	AF IC		Passive auto focusing IC
IC402	AF IC		Active auto focusing IC
IC450	TTL Flash Auto IC		TTL Flash Auto Control IC
Q101	Double PNP Transistor	FMA3A	Predriving of Shutter Drive Circuit
Q102	Double NPN Transistor	IMX17	Shutter drive
Q103	NPN Transistor	DTC114YUA	Driving of Winding Photo-coupler LED
Q104	NPN Transistor	DTC114YUA	Inversion of Accessory Shoe AX signal
Q105	NPN, PNP Transistor	FMC5A	B.C. circuit switching
Q106	NPN Transistor	DTC114YUA	Self-timer LED drive
Q107	Double PNP Transistor	FMA3A	Driving of Back Light LED for Viewfinder LCD
Q151	PNP Power Transistor	2SB1394	Braking of Charge Motor Drive Circuit
Q152	NPN Power Transistor	2SD1999	Driving of Charge Motor Drive Circuit
Q153	NPN, PNP Transistor	FMC5A	Driving of Charge Motor Drive Circuit
Q154	Double NPN Transistor	FC146	Braking of Charge Motor Drive Circuit
Q155	Double NPN Transistor	FMG5A	Data Back interface
Q156	Double NPN Transistor	FMG11A	Data Back interface
Q201	NPN Transistor with Diode	FP301	Coil switching
Q202	Double NPN Transistor	FC146	Inversion of PH control signal
Q203	PNP Transistor	DTA123JUA	VDD power switching
Q204	PNP Power Transistor	2SB1121	Current amplification of Regulated DC Voltage Circuit for Pulse Motor drive
Q205	NPN Transistor	DTC114YUA	Control of Regulated DC Voltage Circuit for Pulse Motor drive
Q301	Double PNP Transistor	FMA3A	VDD2, Driving of compiled data imprinting LED of Data Back
Q302	NPN Transistor	DTC123JUA	Inversion of serial clock signal for Lens

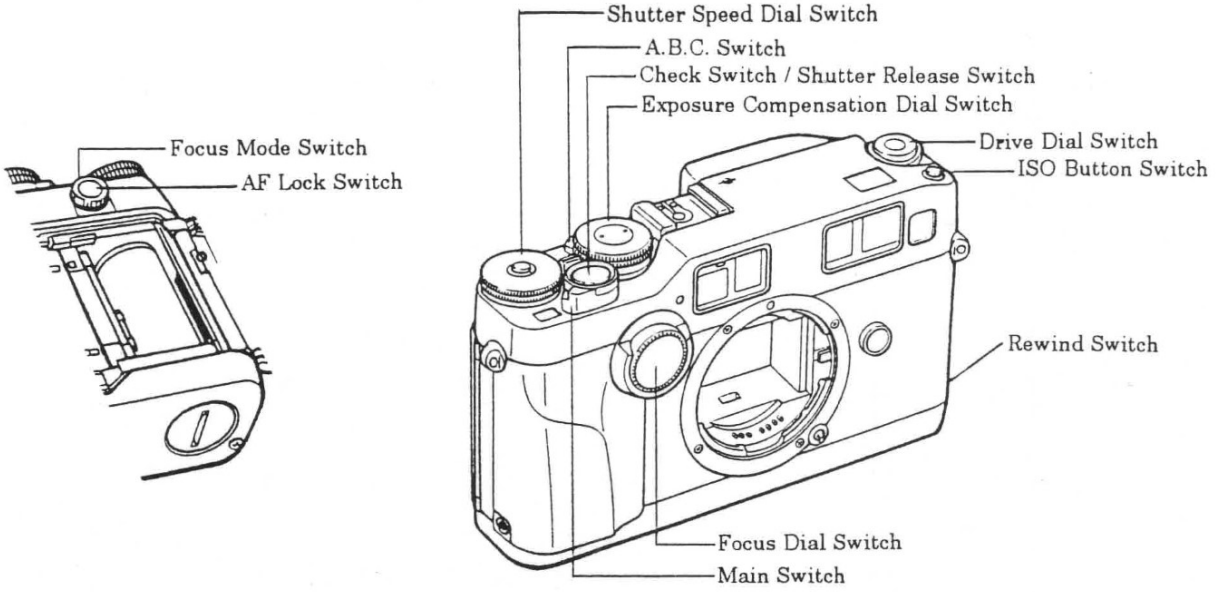
Symbol	Name	Rating	Functions
Q350	Double NPN Transistor	FC104	Waveform shaping of AF photo-coupler signal
Q351	PNP Power Transistor	2SB1121	Driving of light emitter LED for active AF
Q450	NPN Transistor	DTC123JUA	Inversion of Accessory Shoe CH I/O signal
D150	Chip Schottky Diode	RB715F	Interface for Multi-functional Data Back
D250	Self-timer LED	LN1271RAL	Self-timer LED
D251	Viewfinder Back Light LED		Back light LED for viewfinder display
D401	AF Light Emitter LED	L6486	Active AF light emitting
D450	Chip Diode	DCF010	CHS-CH I/O connection of TTL Flash Auto IC
C101	Ceramic Capacitor	22P	Stabilization of sub clock oscillation of Main CPU
C102	Ceramic Capacitor	22P	Stabilization of sub clock oscillation of Main CPU
C103	Ceramic Capacitor	0.47μ	Stabilization of LCD drive power
C104	Ceramic Capacitor	0.1μ	Stabilization of VDD voltage
C105	Ceramic Capacitor	0.01μ	Stabilization of Vref voltage
C106	Ceramic Capacitor	0.47μ	Stabilization of CPU power
C107	Ceramic Capacitor	0.47μ	LCD drive 1/3 bias boosting
C108	Ceramic Capacitor	0.47μ	LCD drive 1/3 bias boosting
C109	Ceramic Capacitor	0.47μ	LCD drive 1/3 bias boosting
C110	Ceramic Capacitor	0.01μ	Stabilization of battery check line
C150	Ceramic Capacitor	0.01μ	Charge pump for Winding Drive IC
C151	Ceramic Capacitor	0.01μ	Charge pump for Winding Drive IC
C152	Ceramic Capacitor	0.01μ	Voltage stabilization of charge pump for Winding Drive IC
C153	Ceramic Capacitor	0.01μ	Protection of Winding Drive Motor
C154	Ceramic Capacitor	1μ	Protection of Winding Drive IC
C201	Tantalum Capacitor	68μ/10V	Stabilization of input voltage for DC/DC Converter
C202	Tantalum Capacitor	22μ/7V	Smoothing capacitor for boosted voltage of DC/DC Converter
C203	Tantalum Capacitor	68μ/10V	VCC voltage stabilization
C204	Ceramic Capacitor	0.1μ	VCC voltage stabilization
C205	Ceramic Capacitor	0.01μ	Stabilization for Vout terminal of DC/DC Converter
C206	Tantalum Capacitor	10μ/4V	Stabilization of regulated DC voltage for Parallax Motor
C250	Tantalum Capacitor	22μ/7V	Light Metering IC power stabilization (internal)
C251	Tantalum Capacitor	6.8μ/7V	Light Metering IC power stabilization (external)
C252	Tantalum Capacitor	6.8μ/7V	Light metering output stabilization (internal)
C301	Ceramic Capacitor	0.1μ	VDD voltage stabilization of Sub CPU
C350	Ceramic Capacitor	0.01μ	Charge pump for AF Drive IC
C351	Ceramic Capacitor	0.01μ	Charge pump for AF Drive IC
C352	Ceramic Capacitor	0.01μ	Voltage stabilization of charge pump for AF Drive IC
C353	Ceramic Capacitor	0.01μ	Protection of AF Drive Motor
C354	Ceramic Capacitor	Iμ	Protection of AF Drive IC
C355	Ceramic Capacitor	3300P	Base voltage stabilization of waveform shaping transistor for AF Photo-coupler
C401	Ceramic Capacitor	0.1μ	AF IC power stabilization (passive)
C402	Tantalum Capacitor	6.8μ/7V	AF IC power stabilization (passive)
C403	Ceramic Capacitor	0.1μ	Integrating capacitor of Active AF IC
C404	Ceramic Capacitor	220P	Oscillating capacitor of Active AF IC
C405	Tantalum Capacitor	68μ/10V	Power voltage stabilization for Active AF IC
C406	Tantalum Capacitor	0.47μ/25V	Memory capacitor of Active AF IC
C407	Tantalum Capacitor	0.47μ/25V	Memory capacitor of Active AF IC

Symbol	Name	Rating		Functions
C408	Tantalum Capacitor	68μ/10V		Stabilization of internal regulated DC voltage of Active AF IC
C450	Ceramic Capacitor	0.01μ		Stabilization of TTL Flash Auto Control VTH
C451	Ceramic Capacitor	39P		TTL Flash Auto control integration
C452	Ceramic Capacitor	0.1μ		Power stabilization for TTL Flash Auto IC
R101	Resistor	10MΩ	1/16W	Feedback resistor of sub oscillator circuit for Main CPU
R102	Resistor	220KΩ	1/16W	Oscillation stabilization for sub oscillator circuit for Main CPU
R103	Resistor	680KΩ	1/16W	Pull-up resistance for shutter speed data input
R104	Resistor	680KΩ	1/16W	Pull-up resistance for exp. compensation data input
R105	Resistor	15KΩ	1/16W	Pull-up resistance for Focus Dial input 2
R106	Resistor	1MΩ	1/16W	Pull-up resistance of Back Cover Switch
R107	Resistor	1MΩ	1/16W	Pull-up resistance of Main Switch
R108	Resistor	1MΩ	1/16W	Pull-up resistance for MF input in AF mode (Power-ON detection)
R109	Resistor	1MΩ	1/16W	Pull-up resistance for Focus Dial input 1 (Power-ON detection)
R110	Resistor	15KΩ	1/16W	Pull-up resistance for Parallax Switch input
R111	Resistor	3.3KΩG	1/16W	Regulated DC voltage setting for Shutter drive
R112	Resistor	3.3KΩG	1/16W	Regulated DC voltage setting for Shutter drive
R113	Resistor	680Ω	1/16W	LED current limiting of Winding Photo-reflector
R114	Resistor	680Ω	1/16W	LED current limiting of Winding Photo-interrupter
R115	Resistor	47KΩ	1/16W	Load resistance for output pulse signal of Winding Photo-reflector
R116	Resistor	1KΩ	1/16W	Static electricity prevention of Accessory Shoe AX terminal
R117	Resistor	15KΩ	1/16W	VB voltage division of Battery Check Circuit
R118	Resistor	27KΩ	1/16W	VB voltage division of Battery Check Circuit
R119	Resistor	330Ω	1/16W	Current limiting of Self-timer LED
R120	Resistor	200Ω	1/16W	Current regulation at low brightness of Viewfinder Back Light LED
R121	Resistor	330Ω	1/16W	Current regulation at high brightness of Viewfinder Back Light LED
R122	Resistor	10KΩ	1/16W	Pull-up resistance for pulse signal of Winding Photo-interrupter
R151	Resistor	100Ω	1/10W	Base current limiting of Charge Motor Drive Circuit transistor
R152	Resistor	1KΩ	1/16W	Data Back interface (Port protection: static electricity, short)
R153	Resistor	1KΩ	1/16W	Data Back interface (Port protection: static electricity, short)
R154	Resistor	1KΩ	1/16W	Data Back interface (Port protection: static electricity, short)
R155	Resistor	1KΩ	1/16W	Data Back interface (Port protection: static electricity, short)
R156	Resistor	1KΩ	1/16W	Data Back interface (Port protection: static electricity, short)
R157	Resistor	100Ω	1/16W	Data Back interface (Port protection: static electricity, short)
R158	Resistor	100Ω	1/16W	Data Back interface (Port protection: static electricity, short)
R159	Resistor	100Ω	1/16W	Data Back interface (Port protection: static electricity, short)
R160	Resistor	100Ω	1/16W	Data Back interface (Port protection: static electricity, short)
R161	Resistor	100Ω	1/16W	Data Back interface (Port protection: static electricity, short)
R162	Resistor	10KΩ	1/16W	Data Back interface
R163	Resistor	10KΩ	1/16W	Data Back interface
R201		150Ω	1/16W	Base current limiting of boosting switching transistor for DC/DC Converter
R202	Resistor	2KΩ	1/16W	Pull-up of RESET terminal of Main CPU
R203	Resistor	15KΩ	1/16W	Pull-up of control terminal of DC/DC Converter

Symbol	Name	Rating		Functions
R204	Resistor	10KΩ	1/16W	Shunt resistance of amplification transistor for Parallax Motor drive
R250	Resistor	100KΩ	1/16W	Adjustment of light metering output level of Light Metering IC (internal)
R251	Resistor	47KΩ	1/16W	Adjustment of light metering output level of Light Metering IC (external)
R301	Resistor	100KΩ	1/16W	LCD drive voltage division for Sub CPU
R302	Resistor	100KΩ	1/16W	LCD drive voltage division for Sub CPU
R303	Resistor	100KΩ	1/16W	LCD drive voltage division for Sub CPU
R304	Resistor	100KΩ	1/16W	Pull-down of RESET terminal of Sub CPU
R306	Resistor	15KΩ	1/16W	Pull-up of Lens Reference Switch input
R307	Resistor	1MΩ	1/16W	Pull-up resistance for Lens Model data input
R308	Resistor	330Ω	1/16W	Current limiting for compiled data imprinting LED of multi-functional Data Back
R309	Resistor	100ΩG	1/16W	Current limiting of lens contact VDD terminal (for protection)
R310	Resistor	15KΩ	1/16W	Pull-up of data input from Active AF IC
R311	Resistor	15KΩ	1/16W	CS terminal pull-up of Lens ROM
R312	Resistor	1MΩ	1/16W	Input pull-up resistance for Lens ∞ adjusted value data
R350	Resistor	5.1KΩ	1/16W	Voltage division of AF photo-coupler output signal waveform
R351	Resistor	2KΩ	1/16W	Voltage division of AF photo-coupler output signal waveform
R352	Resistor	5.1KΩ	1/16W	Voltage division of AF photo-coupler output signal waveform
R353	Resistor	2KΩ	1/16W	Voltage division of AF photo-coupler output signal waveform
R354	Resistor	10KΩ	1/16W	Pull-up resistance of AFPULS2 signal of AF photo-coupler
R355	Resistor	10KΩ	1/16W	Pull-up resistance of AFPULS1 signal of AF photo-coupler
R356	Resistor	330Ω	1/16W	Protective resistance of AF photo-coupler LED
R357	Resistor	0.47Ω	1/4W	Resistance for constant current drive monitor for Active AF Light Emitter LED
R358	Resistor	0.47Ω	1/4W	Resistance for constant current drive monitor for Active AF Light Emitter LED
R359	Resistor	0.47Ω	1/4W	Resistance for constant current drive monitor for Active AF Light Emitter LED
R401	Resistor	10KΩ	1/16W	Pull-up resistance of MODE terminal of Passive AF IC
R402	Resistor	6.8KΩG	1/16W	Passive AF IC oscillation
R403	Resistor	3.3KΩG	1/16W	Temperature detection circuit for AF
R404	Resistor	8.2KΩG	1/16W	Temperature detection circuit for AF
R405	Resistor	20KΩG	1/16W	Temperature detection circuit for AF
R406	Resistor	68KΩG	1/16W	Oscillation resistance for Active AF IC
R450	Resistor	62KΩ	1/16W	Stabilization of TTL Flash Auto control integration circuit
R451	Resistor	1KΩ	1/16W	Static electricity prevention of Accessory Shoe CH I/O terminal
VR1	Trimmer Resistor	CVR32A-102SW2P		Current adjustment of AF Photo-coupler LED
TH1	Chip Thermistor	TCM310D37D		Temperature detection circuit for AF
PSD	PSD	S5642-01		Lighting receiver sensor for Active AF
L201	Coil	LQH4N560K-04		Boosting choke coil
X'tal1	Ceramic Oscillator	FARC4CG8MHz		Main clock of Main CPU (8 MHz)
X'tal2	Crystal Oscillator	DT26S		Sub clock of Main CPU (32 kHz)
X'tal3	Ceramic Oscillator	FARC4CG8MHz		Main clock of Sub CPU (8 MHz)
PC1	Photo-reflector	SG105F		Winding control
PC2	Photo-interrupter	RPI-1133		Winding control at compiled data imprinting by Data Back
PC3	Photo-coupler	GP1S30		Lens drive control
M LCD	Main LCD			LCD for display of mode, etc. (external)
C LCD	Counter LCD			LCD for display of counter (external)
F LCD	Viewfinder LCD			LCD for display in viewfinder

FUNCTIONS OF SWITCHES

<External Operation Switches>



[1] Main Switch

This switch turns ON/OFF the power to the camera and switches AE Lock.

OFF	Main Switch OFF
↓↑	
ON	Main Switch ON
↓↑	
AEL	AE lock (Main Switch ON)

[2] Check Switch

When the Shutter Release Button is depressed halfway, this switch turns OFF→ON ("Hi"→"Low") so that the camera performs light metering, auto focusing, parallax correction drive and lens drive.

[3] Shutter Release Switch

When the Shutter Release Button is depressed all the way, this switch turns OFF→ON ("Hi"→"Low") so that the shutter operates.

[4] Shutter Speed Dial Switch

This switch sets a shutter speed.

AUTO, 1/4000 second to 4 seconds, B, X (18 steps)

[5] Exposure Compensation Dial Switch

This switch sets an exposure compensation.

- 2 to + 2 EV (1/3 EV step) (13 steps)

[6] A.B.C. Switch

0	A.B.C. setting OFF
↓↑	
0.5	Setting of A.B.C. operation of ± 0.5 EV
↓↑	
1	Setting of A.B.C. operation of ± 1.0 EV

[7] ISO Button Switch

When the ISO Button is pressed, this switch turns OFF → ON ("Hi"→"Low"). Upon detecting "Low", the camera enters ISO check mode and the external LCD indicates the current film speed setting.
When the ISO Button is pressed in the ISO check mode for more than 1.2 seconds, the mode changes to ISO setting mode.
In the ISO setting mode, the "ISO" display on the external LCD blinks.
At an operation of a switch other than the ISO Button, the camera leaves the ISO check mode.

[8] Drive Dial Switch

This switch sets a drive mode.
Single (S), continuous (CL, CH), self-timer (ST), multiple exposure (ME)

[9] Focus Dial Switch

This switch sets a focus position (sets a distance) at MF and sets an ISO by manual operation.

- Setting of focus position
  The switch sets a focus position at MF.

  As viewed from the camera front :

  Clockwise ⟷ Counterclockwise

  0.50 m, 0.51 m, ... , 15 m, infinity

- Setting of ISO
  The switch sets an ISO in ISO setting mode.

  As viewed from the camera front :

  Counterclockwise ← 6400, 5000, 4000, ... , 10, 8, 6, DX → Clockwise

[10] AF Lock Switch

When the AF Lock Button is turned OFF → ON ("Hi"→"L"), this switch retains (locks) the distance measurement result. At the same time, this switch activates light metering, parallax correction drive and Lens drive.

[11] Focus Mode Switch

This switch sets a focus mode.

CAF	Continuous AF
↑ ↓	
SAF	Single AF
↑ ↓	
MF	Manual Focus

[12] Rewind Switch

This switch is used to start rewinding the film by pressing the Manual Rewind Button.

- Rewinding starts when the Rewind Switch is turned OFF → ON with the Back Cover closed.
- With the Back Cover open, turn the Rewind Switch OFF → ON and within one second while keeping the Rewind Switch ON, turn ON the Shutter Release Switch and hold it ON. About one second later, the camera will enter manual adjusting mode.

<Internal Mechanical Switches>

[13] Charge Switch

The Charge Switches, incorporated in the S. Charge Base Plate Ass'y, detect the timing of shutter charge control. There are two Charge Switches, namely, Charge Switch 1 and Charge Switch 2.

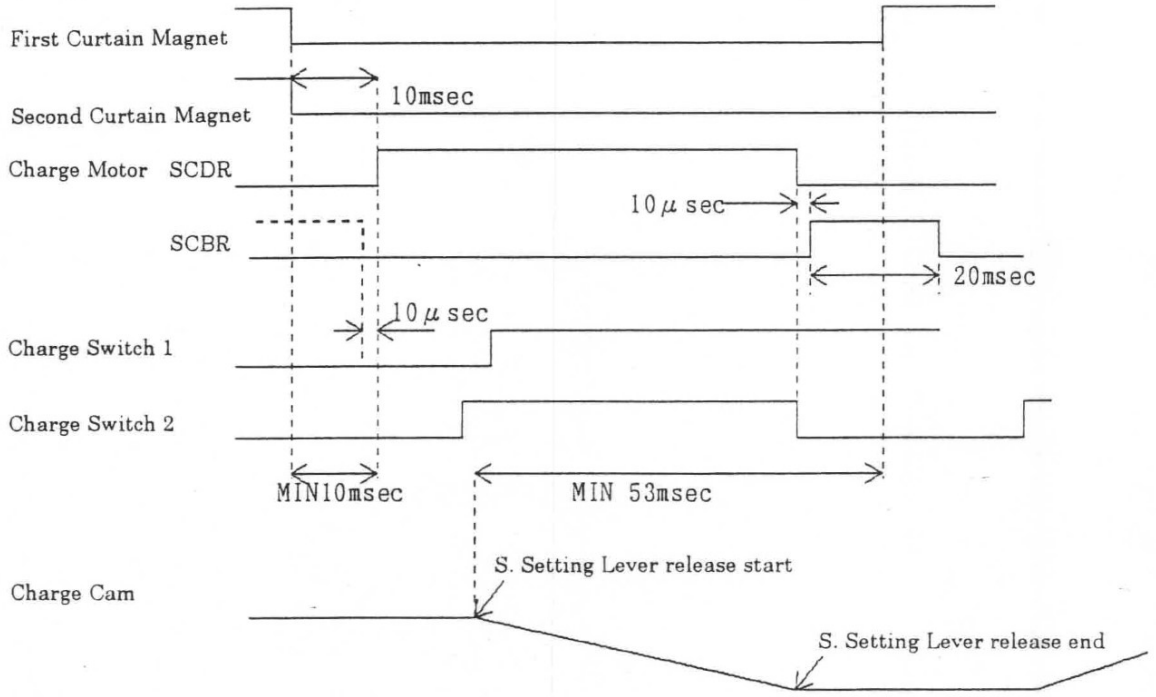
(Relationship between shutter charge release and Charge Switches)

① At "Check Switch ON → Shutter Release Switch ON", the Shutter Magnets are energized so that the First Curtain Magnet and the Second Curtain Magnet hold.

② The Shutter Charge Motor starts turning ten milliseconds after the holding by the First Curtain and Second Curtain Magnets.

③ After this starting (SCDR : "Hi", SCBR : "Low"), the Shutter Charge Motor rotates the S. Cam Gear via the gear train, so that the S. Cam moves the S. Setting Lever. At the same time, the contacts of the Charge Switch 1 and Charge Switch 2 caulked to the S. Gear (7) move round on the S. Control Board until the Charge Switch 2 turns "L"→"Hi" and starts releasing the S. Setting Lever. After that, the Charge Switch 1 turns "L"→"Hi".

④ The Charge Switch 2 turns "Low"→"Hi" (charge release detection) 30 msec after its turning "L"→"Hi". At this point, the Shutter Charge Motor stops (DRIV : "Low", Brake : "Low") and 10 μsec later, short braking occurs (SCDR : "Low", SCBR : "Hi") to complete the releasing of the S. Setting Lever.



(Camera states vs. Charge Switches)

Camera States	Charge Switch 1	Charge Switch 2
Release sequence start : (Charge release drive start)	"Low"	"Low"
↓	↓	↓
S. Setting Lever release start :	"Low" →"Hi"	"Low" →"Hi"
↓	"Hi"	"Hi"
(During S. Setting Lever release)	↓	↓
S. Setting Lever release completion :		
S. Setting Lever release stop : (Charge release drive stop)		"Hi" → "Low"
Completion of S. Setting Lever release drive :	↓	"Low"

(Relationship between shutter charge and Charge Switches)

① The Shutter Charge Motor is released from the brake (SCDR : "Low", SCBR : "Low") 18 msec after the completion of shutter sequence (Second Curtain Magnet OFF)(9 msec after winding drive start).

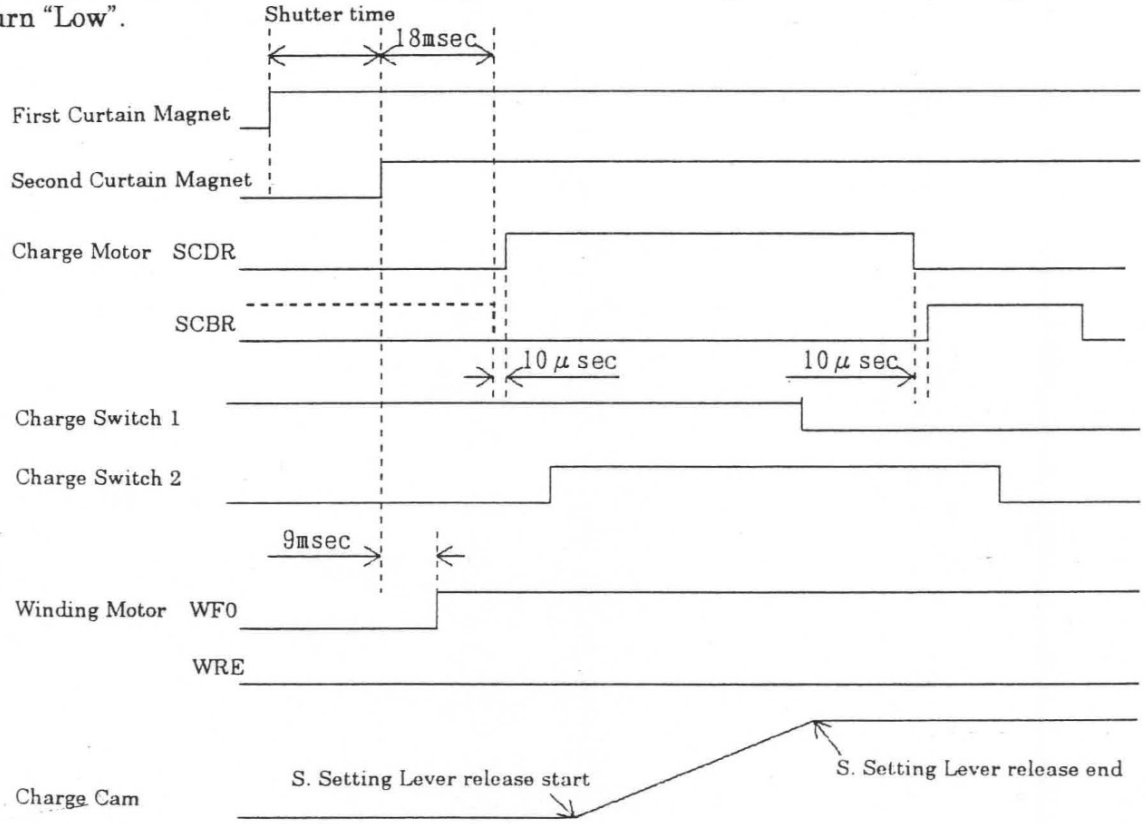
② Charge drive starts (SCDR : "Hi", SCBR: "Low") 10 μsec later. Then the Shutter Charge Motor rotates the S. Cam via the gear train to move the S. Setting Lever. The S. Setting Lever, which is in contact with the Setting Lever of the Shutter Unit, charges the Shutter Unit.

③ As the S. Cam Gear rotates, the contacts of the Charge Switches caulked to the S. Gear (7) move round on the S. Control Board. As a result, the Charge Switch 2 turns "L"→"Hi" and the S. Setting Lever starts setting.

④ After that, the Charge Switch 1 turns "Hi"→"Low" to complete the setting of the Shutter Unit.

⑤ After the completion of the Shutter Unit setting (Charge Switch 1 : "Low", Charge Switch 2 : "Hi"), the Shutter Charge Motor stops (SCDR: "Low", SCBR: "Low") and 10 μsec later, the brake operates (SCDR : "Low", SCBR: "Hi").

⑥ At step ⑤, charge drive is completed when both the Charge Switch 1 and Charge Switch 2 are detected "Low" by the motor overrun.
When the Charge Switch 1 and Charge Switch 2 are not detected to be both "Low" within braking time, the motor is driven by pulse until the Charge Switch 1 and Charge Switch 2 both turn "Low".



(Camera states vs. Charge Switches)

Camera States	Charge Switch 1	Charge Switch 2
Shutter charge drive start :	"Hi"	"Low"
↓	↓	"Low" → "Hi"
S. Setting Lever drive start :		"Hi"
(During shutter charge)		↓
↓	"Hi" → "Low"	
Shutter setting completion :	"Low"	
S. Setting Lever drive stop :	↓	"Hi" → "Low"
Shutter sequence completion :		"Low"
(Shutter charge drive completion)		

[14] Back Cover Switch

This switch detects the opening and closing of the Back Cover.

- The Back Cover Switch turns OFF → ON ("Hi"→"Low") at the "closing → opening" of the Back Cover.
- At the "opening → closing" of the Back Cover, the switch turns ON → OFF ("Low"→"Hi") and starts blank shots advance of the film.

[15] Lens Lock Switch

The switch at the lens mount (Spigot turning) on the Body detects the mounting of a lens on the Body.
Mount a lens on the Body Mount and turn the Mounting Ring of the Lens, and the Lens Lock Switch will turn ON → OFF.

- Lens has been mounted : OFF ("Hi")
- Lens has not been mounted : ON ("Low")

[16] Parallax Correction Detecting Switch

The Parallax Correction Detecting Switch, installed at the bottom of the Finder Unit Ass'y, detects the reference position of the cam by means of the PC board stuck on the Base and the contacts mounted on the Parallax Correction Gear (3). The optical infinity is positioned at eight pulses counted from the "ON → OFF" of this switch. That is, this switch provides the reference point for counting.
The CPU calculates the number of parallax correction pulses based on the AF distance data (Focus Dial position in manual focusing) and the focal length of the mounted lens.
The pulse motor is controlled according to the number of the drive pulses that are determined from the current correction position and the calculated correction value.

<Meaning of parallax correction>

Since the viewfinder optical system in this camera is independent of the exposure optical system, parallax occurs between the viewfinder screen and the exposed screen according to the shooting distance. The camera puts a mask on the viewfinder screen so that the viewfinder screen becomes the same as the exposed screen. This operation is called "parallax correction".
The mask, a mechanical part, is driven by the pulse motor via a cam so that it moves by a required travel.
The mechanism is so designed that the exposed screen agrees with the viewfinder screen at the shooting distance of infinity. Accordingly, the shorter the shooting distance, the larger the parallax.
Also the parallax is larger for the mounted lens with a smaller picture area (with a greater focal length).

[17] DX Switch

① This switch detects the DX code of the film cartridge and automatically sets a film speed according to the DX code.

Setting range: ISO 25 to 5000 in 1/3 SV steps

② Detection timing

100 msec after the detection of "Back Cover open → close"

B. DISASSEMBLY & REASSEMBLY PROCEDURES

NOTES ON REPAIR

a) Never disassemble Viewfinder Ass'y or AF Module Ass'y ; otherwise, auto focusing accuracy can be impaired.
b) Never disassemble the LD Unit Ass'y ; otherwise. the Lens drive accuracy can be impaired.

No.	419-01-50-RA1AS01

B-1. REMOVAL OF EXTERIOR PARTS

[Chart for Removal of Exterior Parts]

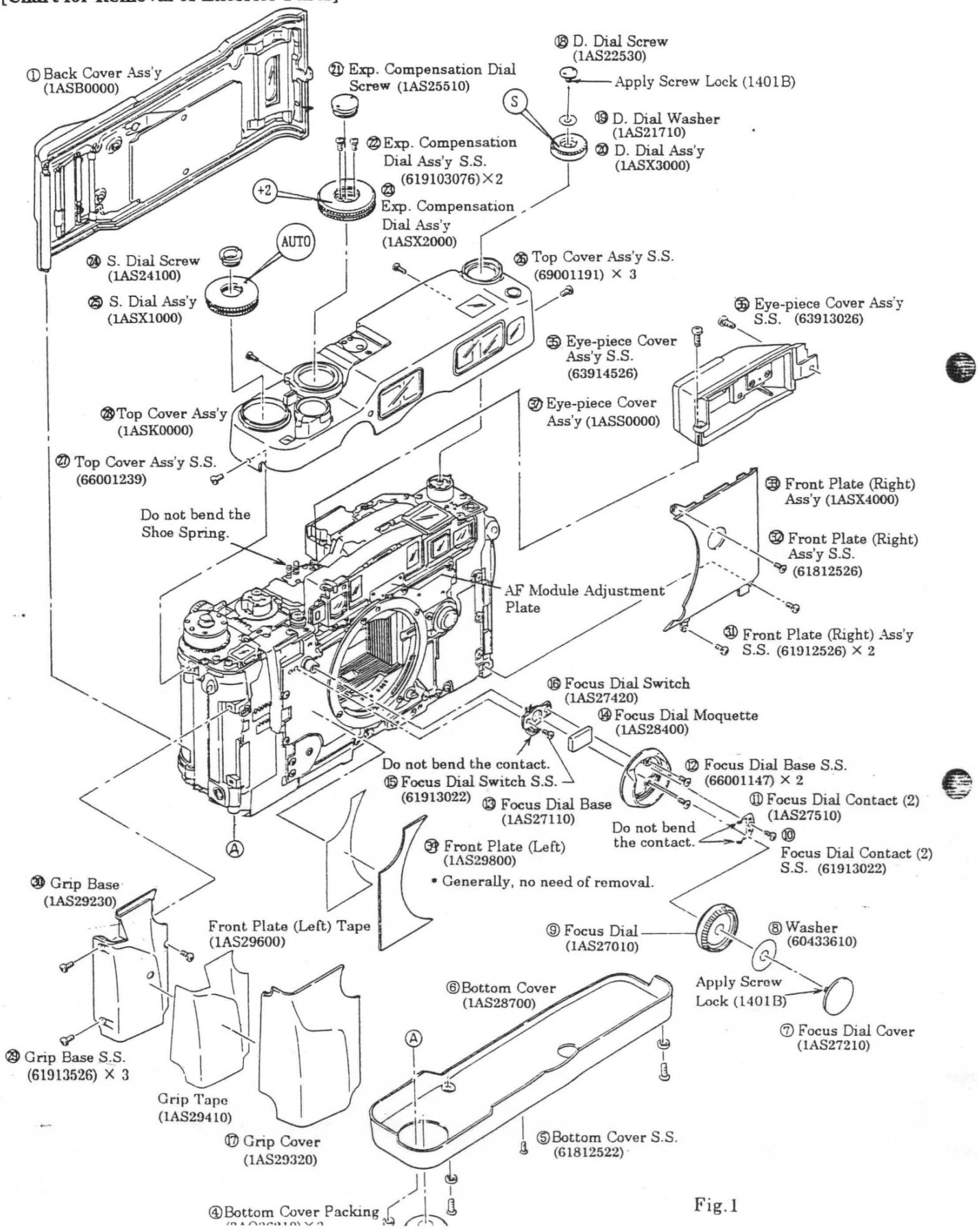


Fig.1

B-1-1. Removal of Exterior Parts

1) Remove exterior parts in the numerical order of ① to ⑭ shown in Fig. 1.
2) Unsolder the 2 soldered joints between the Main FPC and the Focus Dial Switch. (See Fig. 2)
3) Remove exterior parts in the numerical order of ⑰ to shown in Fig. 1.

[Notes on Removal of Exterior Parts]

a) When removing the S. Dial Ass'y (1ASX1000), position the "AUTO" mark of the S. Dial at the Dial Index.
b) **When removing the Exp. Compensation Dial Ass'y (1ASX2000), position the "+2" mark of the Exp. Compensation Dial at the Dial Index.**
Without positioning the "+2" mark correctly, you can not remove the Top Cover Ass'y (1ASK0000). If you try to remove the Top Cover Ass'y forcibly, the ABC Click Plate Ass'y may bend.
c) When removing the D. Dial Ass'y (1ASX3000), position the "S" mark of the D. Dial at the Dial Index.
d) Using a dedicated two-pin provided screwdriver, dividers or tweezers, remove the S. Dial Screw (1AS24100), Exp. Compensation Dial Screw (1AS25510) and D. Dial Screw (1AS22530) with care not to flaw them.
e) Remove the D. Dial Screw carefully, since it is fixed with Screw Lock (THREE BOND 1401B).
f) Use rubber or the like to remove the F. Dial Cover (1AS27210) .
Remove the F. Dial Cover carefully, since it is fixed with Screw Lock (THREE BOND 1401B).
g) The Grip Cover (1AS29320) is fixed to the Grip Base (1AS29230) with the Grip Tape (1AS29410).
h) The Front Plate (Left) (1AS29800) is fixed to the Body with the Front Plate (Left) Tape (1AS29600).

[Notes on Handling of Removed Exterior Parts]

a) Take care not to bend or deform the Main Switch contacts or ABC contacts, which are incorporated in the Top Cover Ass'y (1ASK0000).
b) Take care not to leave your fingerprints on or flaw the window glasses of the Top Cover Ass'y, the lenses of the Viewfinder Ass'y, Counter LCD or Mode LCD.
c) Take care not to bend or deform the Focus Dial Switch (1AS27420) or Focus Dial Contact (2) (1AS27510).

[How to Check Camera Operation with Top Cover Ass'y Removed]

a) To operate the camera with the Top Cover Ass'y removed, cause a short circuit on the pattern of the Main FPC by a bridge with solder as shown in Fig. 2.
b) **Before installing the Top Cover Ass'y, be sure to remove the solder.**

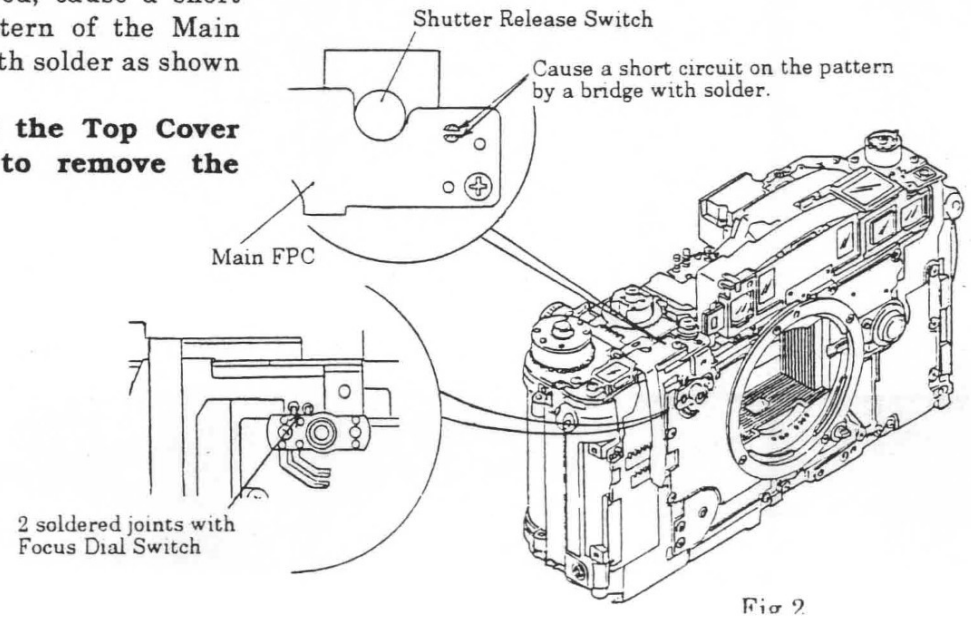


Fig 2

[Notes on Installation of Exterior Parts]

a) When installing the Top Cover Ass'y, take care not to catch the Main FPC, lead wires or AF Module Adjustment Plate.
b) When installing the Bottom Cover, take care not to catch the Main FPC or lead wires between the Bottom Cover and the Body.
c) Once the Grip Cover is peeled off, the adhesive strength of the Grip Tape weakens. Be sure to replace the Grip Tape with a new one.
d) Once the Front Plate (Left) is peeled off, the adhesive strength of the Front Plate (Left) Tape weakens. Be sure to replace the Front Plate (Left) Tape with a new one. And care must be taken to ensure that Front Plate (Left) is not bend.
e) Be sure to apply THREE BOND 1401 to the threaded part of the Focus Dial Cover and D. Dial Screw. And after assembling the Focus Dial and D. Dial, check to make sure that the Focus Dial and D.Dial move evenly and smoothly.

[Installation Procedure for S. Dial, Exposure Compensation Dial and D. Dial]

1) Set the S. Stopper (1AS23710) in the position as shown in Fig. 3.
2) Set the Exp. Compensation Dial Holder Ass'y (1ASR0000) in the position as shown in Fig. 3.
3) Set the D. Dial Base Ass'y (1ASN2000) in the position as shown in Fig. 3.
4) Install the Top Cover Ass'y on the Body and tighten the Top Cover Ass'y Setscrews (66001191) ×3, (66001239).
5) Install the S. Dial Ass'y (1ASX1000) while positioning the "AUTO" mark at the Dial Index, and tighten the S. Dial Screw (1AS24100).
6) Install the Exp. Compensation Dial Ass'y (1ASX2000) while positioning the "+2" mark at the Dial Index, and tighten the Exp. Compensation Dial Ass'y Setscrews (69103076)×2. Then tighten the Exp. Compensation Dial Screw (1AS25510).
7) Install the D. Dial Ass'y (1ASX3000) while positioning the "S" mark at the Dial Index, and install the D. Dial Washer (1AS21700). Then tighten the D. Dial Screw (1AS22520).

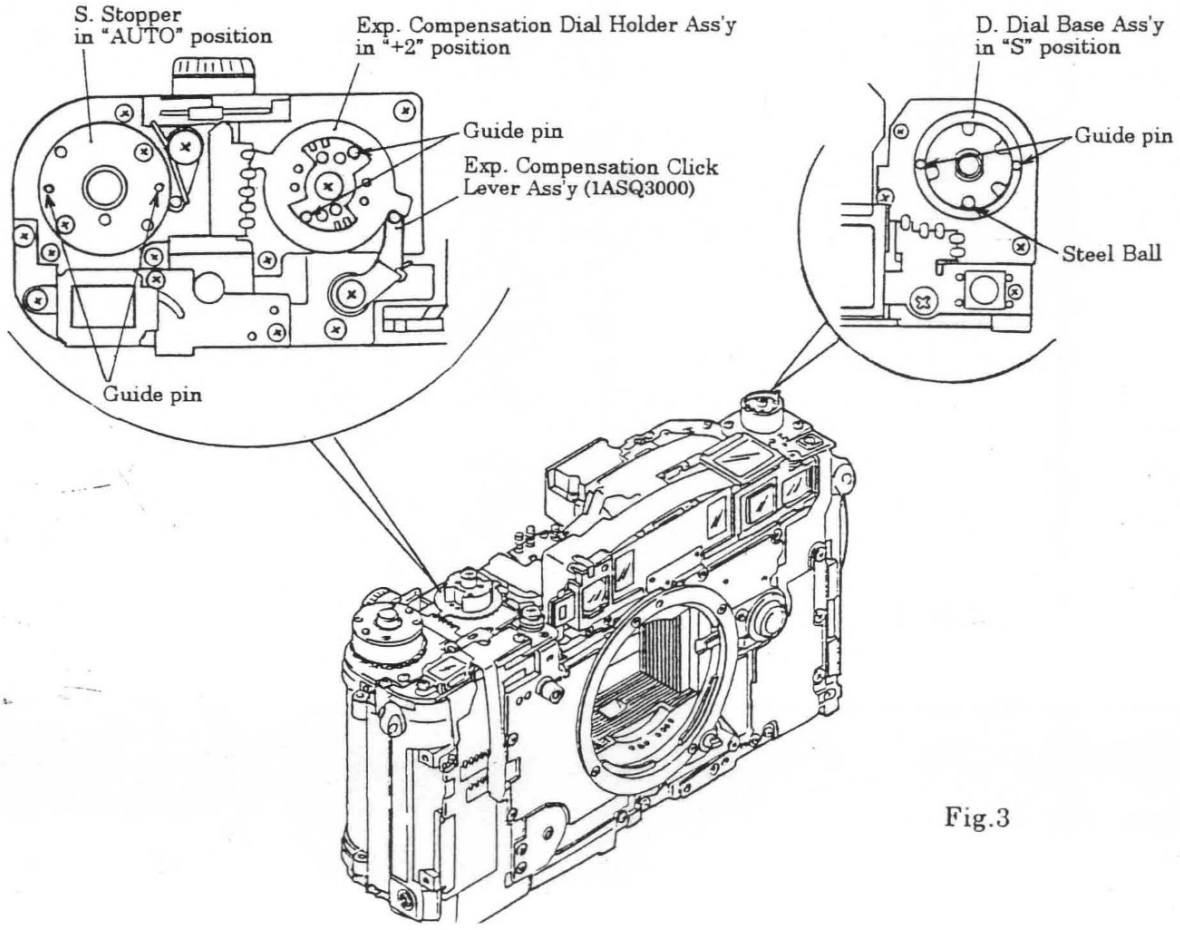


Fig.3

No.	419-01-50-RA1AS01

B-2. REMOVAL OF MAIN FPC ASS'Y

[Chart for Removal of Main FPC Ass'y]

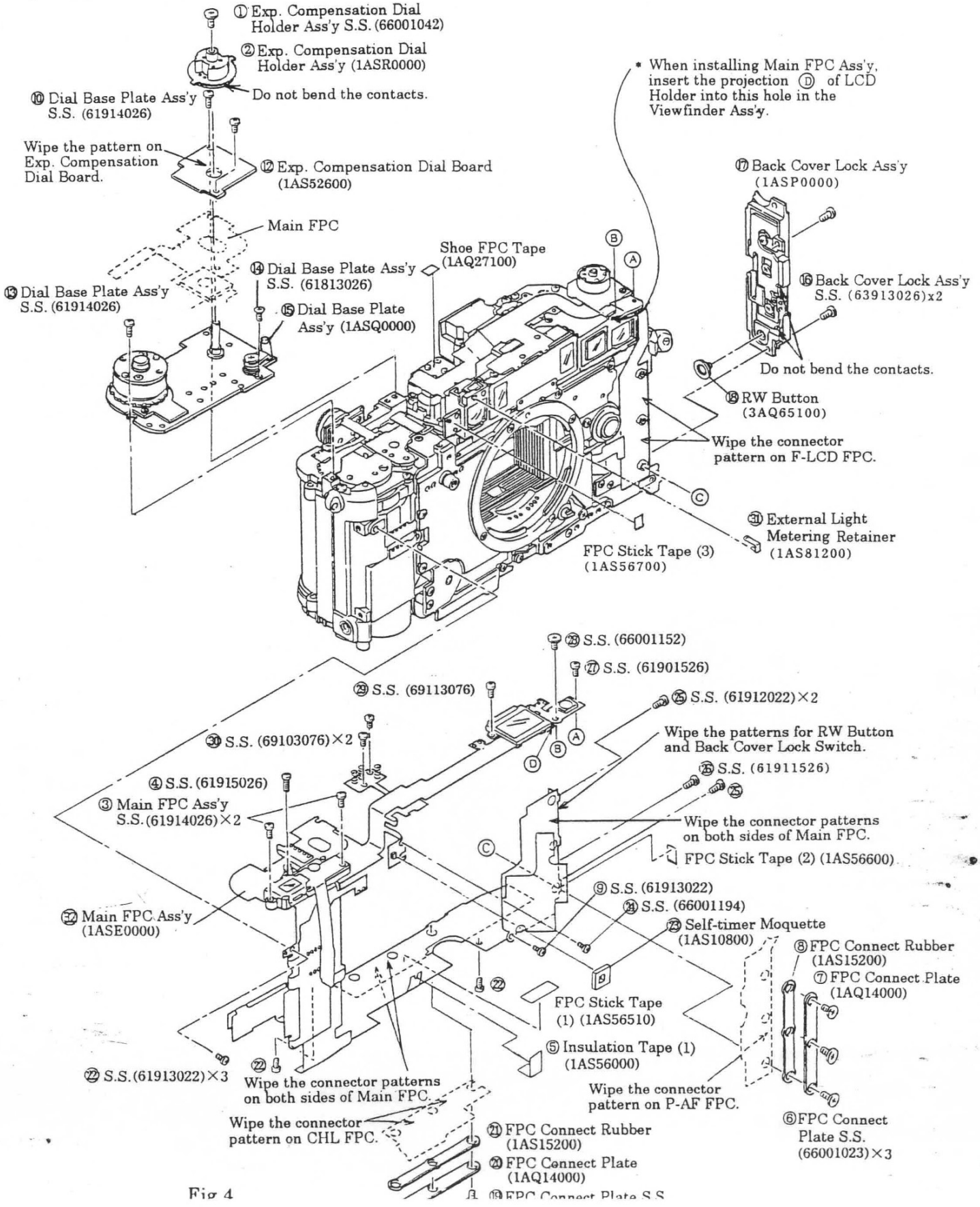


Fig 4

B-2-1. Removal of Main FPC Ass'y

1) Remove parts in the numerical order of ① to ⑨ shown in Fig. 4.
2) Unsolder the soldered joints and lead wires on the Main FPC Ass'y. (See Fig. 5)
   (Top of Body)
   - Unsolder the Brown lead wire (from Shutter Unit) and the Brown lead wire (from Synchro Terminal).
   - Unsolder the Blue and Pink lead wires (from Viewfinder Display Illuminator).
   - Unsolder the 5 soldered joints between the Drive Dial Board and the Main FPC.
   - Unsolder the 5 soldered joints between the Exp. Compensation Dial Board and the Main FPC.
   - Unsolder the 3 soldered joints between the Shutter Dial Board and the Main FPC.

   (Front Right of Body)
   - Unsolder the Orange and Green lead wires (from AF Light Emitter Board).
   - Unsolder the Yellow and Blue lead wires (from LD Motor).

   (Front Left of Body)
   - Unsolder the Black lead wire (from Shutter Unit).
   - Unsolder the Orange and Purple lead wires (from Shutter Unit).
   - Unsolder the 5 soldered joints between the S. Control FPC and the Main FPC.
   - Unsolder the 5 soldered joints between the WPI FPC and the Main FPC.

   (Lower Front of Body)
   - Unsolder the 1 soldered joint between the Lens Convertible SW Wire and the Main FPC.

   (Bottom of Body)
   - Unsolder the Red and Black lead wires (from S. Control Motor).
   - Unsolder the Red and Black lead wires (from Winding Motor).
   - Unsolder the Green lead wire (from Release Socket).

3) Remove parts in the numerical order of ⑩ to ⑮ shown in Fig. 4.
4) Unsolder the soldered joints and lead wires on the Main FPC Ass'y. (See Fig. 5)
   (Top Left of Body)
   - Unsolder the 4 soldered joints between the AF Change FPC and the Main FPC.
   - Unsolder the 3 soldered joints between the WPR FPC and the Main FPC.
   - Unsolder the 4 soldered joints between the AE FPC and the Main FPC.
   - Unsolder the 4 soldered joints between the PM FPC and the Main FPC.
   - Unsolder the 1 soldered joint between the Battery Contact (+) and the Main FPC.
   - Unsolder the Orange and Black lead wires (from Parallax Correction Board).

5) Remove parts in the numerical order of ⑯ to ㉜ shown in Fig. 4.

[Notes on Removal and Handling of Parts]

a) Remove the Main FPC Ass'y carefully, since it is fixed with the FPC Stick Tape (1) (1AS56510), FPC Stick Tape (2) (1AS56600), FPC Stick Tape (3) (1AS56700) and Shoe FPC Tape (1AQ27100).
b) Do not touch the two connect patterns of the Main FPC Ass'y, the pattern of the RW Button or the pattern of the Back Cover Lock Switch directly with a bare hand.
   Before installing the Main FPC Ass'y, wipe the two connect patterns of the Main FPC, the pattern of the RW Button and the pattern of the Back Cover Lock Switch with lens cleaning paper with ether alcohol.
c) Take care not to bend or deform the contacts of the Exp. Compensation Dial Holder Ass'y (1ASR0000) or Back Cover Lock Ass'y (1ASP0000).
   Before installation, wipe each contact with lens cleaning paper with ether alcohol.
d) After soldering the Main FPC and Exp. Compensation Dial Board, wipe the pattern of the Exp. Compensation Dial Board with lens cleaning paper with ether alcohol.

No.	419-01-50-RA1AS01

[Chart for Unsoldering of Soldered Joints and Removal of Lead Wires on Main FPC Ass'y]

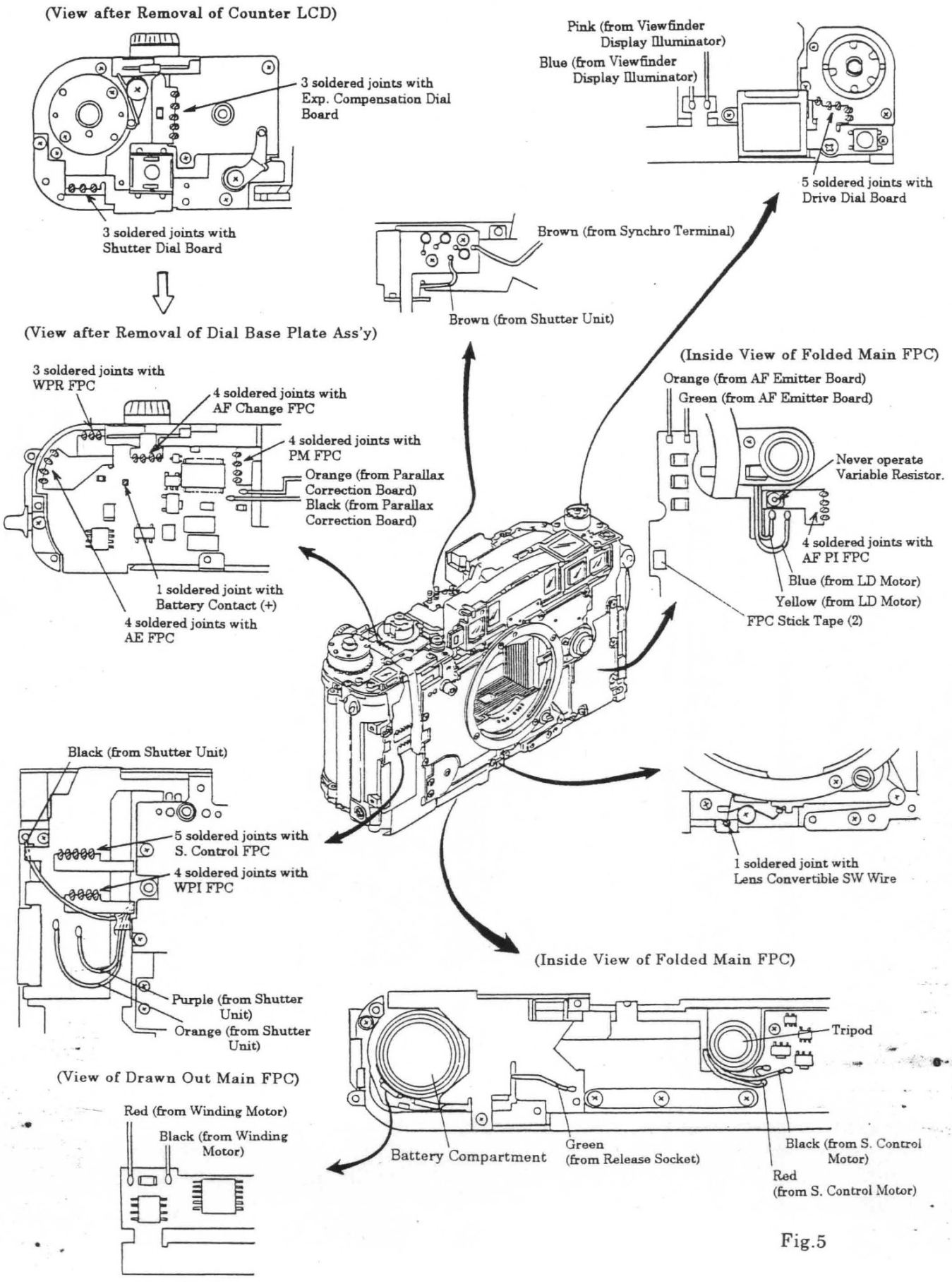


Fig.5

B-3. REMOVAL OF AF MODULE ASS'Y AND VIEWFINDER ASS'Y

[Chart for Removal of AF Module Ass'y and Viewfinder Ass'y]

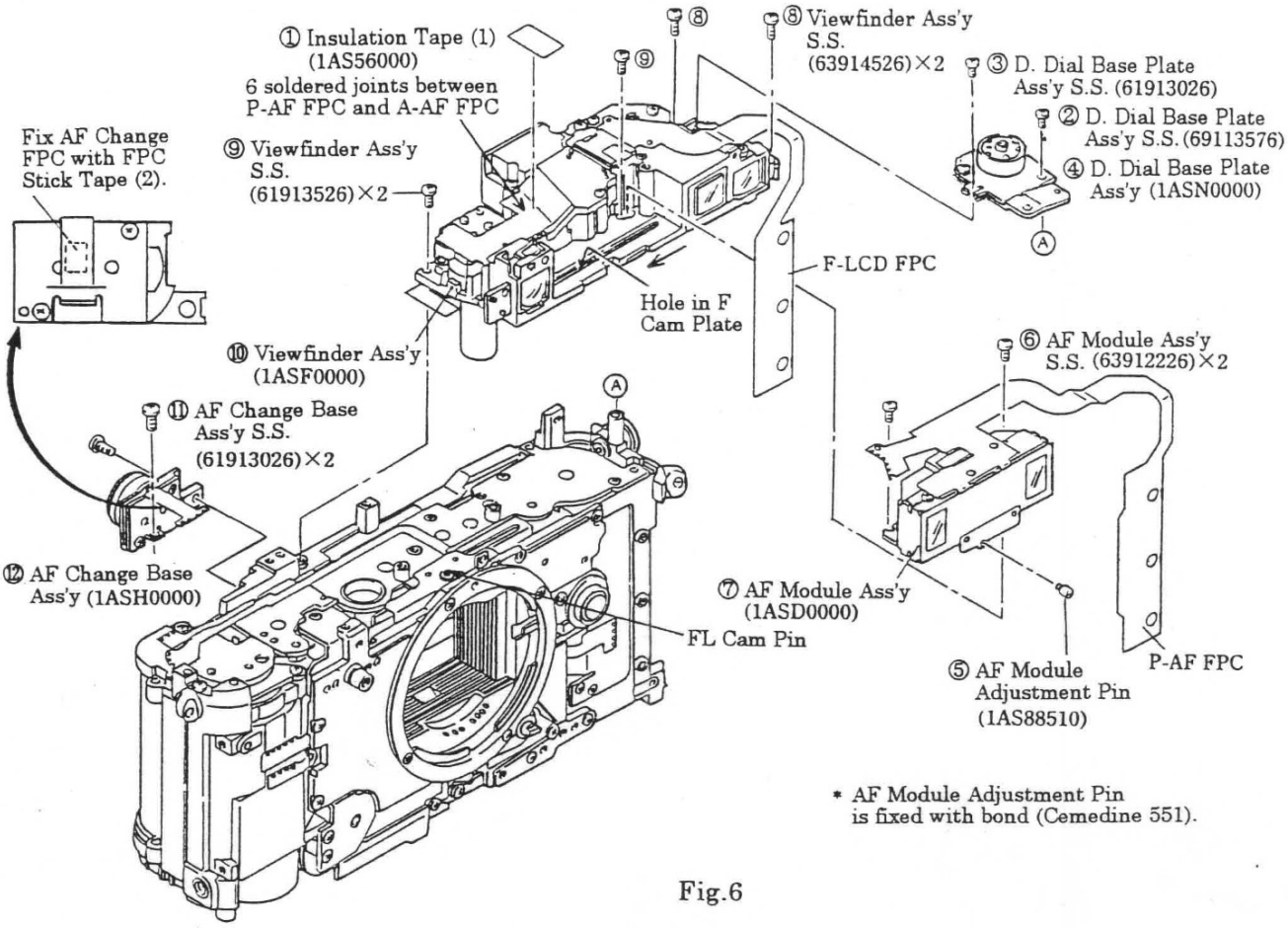


Fig.6

B-3-1. Removal of AF Module Ass'y and Viewfinder Ass'y

(See Fig. 6)

1) Peel off ① Insulation Tape (1AS56000).
2) Unsolder the 6 soldered joints between the A-AF FPC and the P-AF FPC.
3) Remove parts in the numerical order of ② to ⑫ shown in Fig. 6.

[Notes on Handling of AF Module Ass'y and Viewfinder Ass'y]

a) Never disassemble the AF Module Ass'y or Viewfinder Ass'y.
b) Do not touch the FPC of the F. LCD or the connect patterns of the P-FPC directly with a bare hand.
   Before installing the AF Module Ass'y and Viewfinder Ass'y, wipe the connect patterns with lens cleaning paper with ether alcohol.
c) Once the AF Module Ass'y and Viewfinder Ass'y are removed, make checking and adjustment of parallax.
d) Take care not to leave your fingerprints on or flaw the glasses or lenses of the AF Module Ass'y or Viewfinder Ass'y.

[Notes on Installation of Viewfinder Ass'y]

a) While pushing the F Cam Plate fully in the direction of the arrow (toward WIDE side) as shown in Fig. 6, install the Viewfinder Ass'y on the Body so that the FL Cam Pin enters the hole in the F Cam Plate.

B-4. REMOVAL OF MOUNT BASE ASS'Y AND WINDING & REWIND MECHANISM ASS'Y

[Chart for Removal of Mount Base Ass'y and Winding & Rewind Mechanism Ass'y]

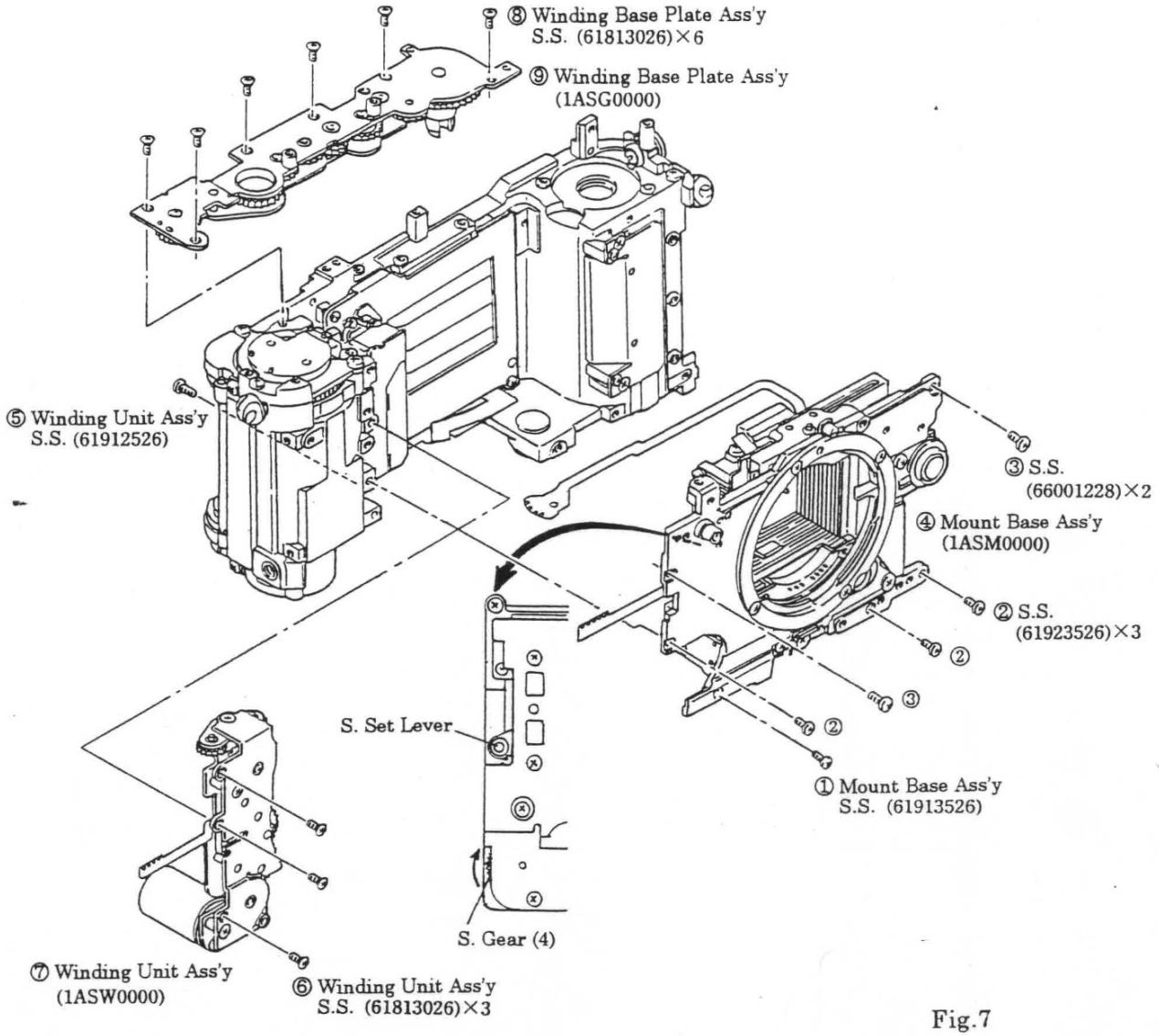


Fig.7

B-4-1. Removal of Mount Base Ass'y and Winding & Rewind Mechanism Ass'y

1) Remove parts in the numerical order of ① to ⑨ shown in Fig. 7.

[Notes on Installation of Mount Base Ass'y and Winding & Rewind Mechanism Ass'y]

a) Before installing the Winding Base Plate Ass'y (1ASG0000), Winding Unit Ass'y (1ASW0000) and Mount Base Ass'y (1ASM0000), dress the lead wires and FPCs as shown in Fig. 8.
At Installation, take care not to catch any lead wires or FPC between the Body and the Ass'y.

b) Make certain that the S. Set Lever of the S. Set Base Plate Ass'y is in the lower position, and then install the Mount Base Ass'y in the Body. (See Fig. 7)
If the S. Set Lever has not been set in the lower position, turn the S. Gear (4) (white gear) clockwise (in the direction of the arrow) to set the S. Set Lever Ass'y in the lower position.

c) Tighten the Mount Base Ass'y Setscrews in the order of ① to ⑥ as shown in Fig. 9.

[Check of Dressing of Lead Wires and FPCs]

* Chart for dressing of lead wires of Shutter Unit

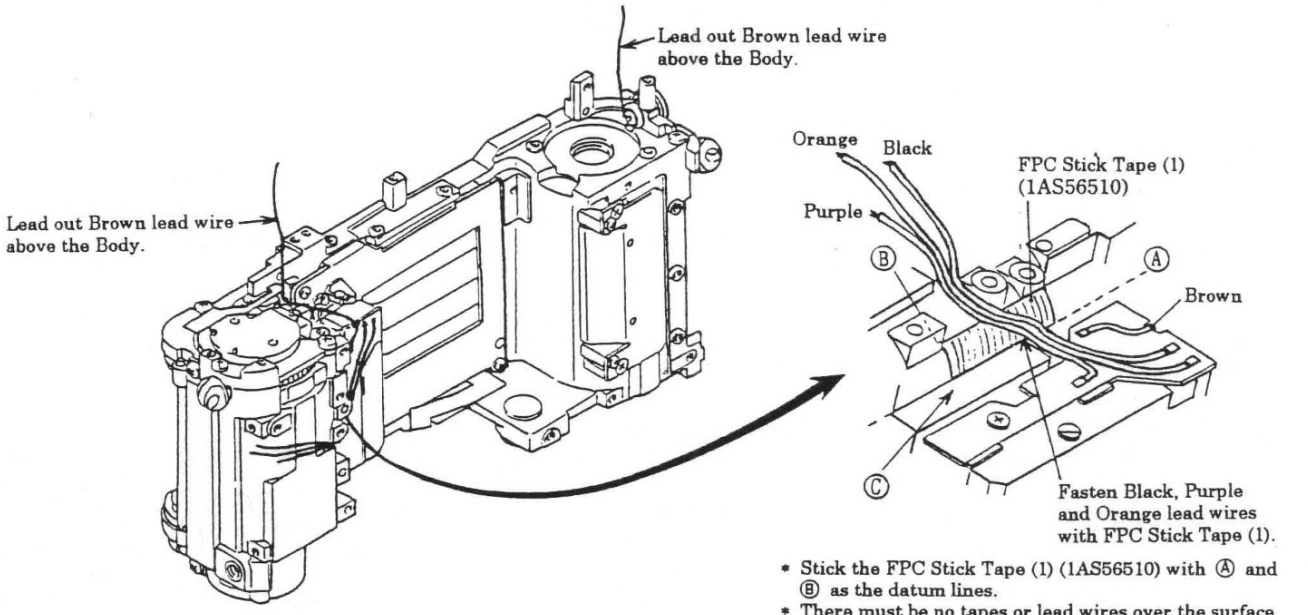


Fig.8

* Stick the FPC Stick Tape (1) (1AS56510) with Ⓐ and Ⓑ as the datum lines.
* There must be no tapes or lead wires over the surface Ⓒ of the Body.
* After installing Mount Base Ass'y, make certain that the WPI FPC is positioned over the lead wires.

* After installing the Mount Base Ass'y in the Body, make certain that the lead wires and FPCs are dressed as shown in Fig. 9.

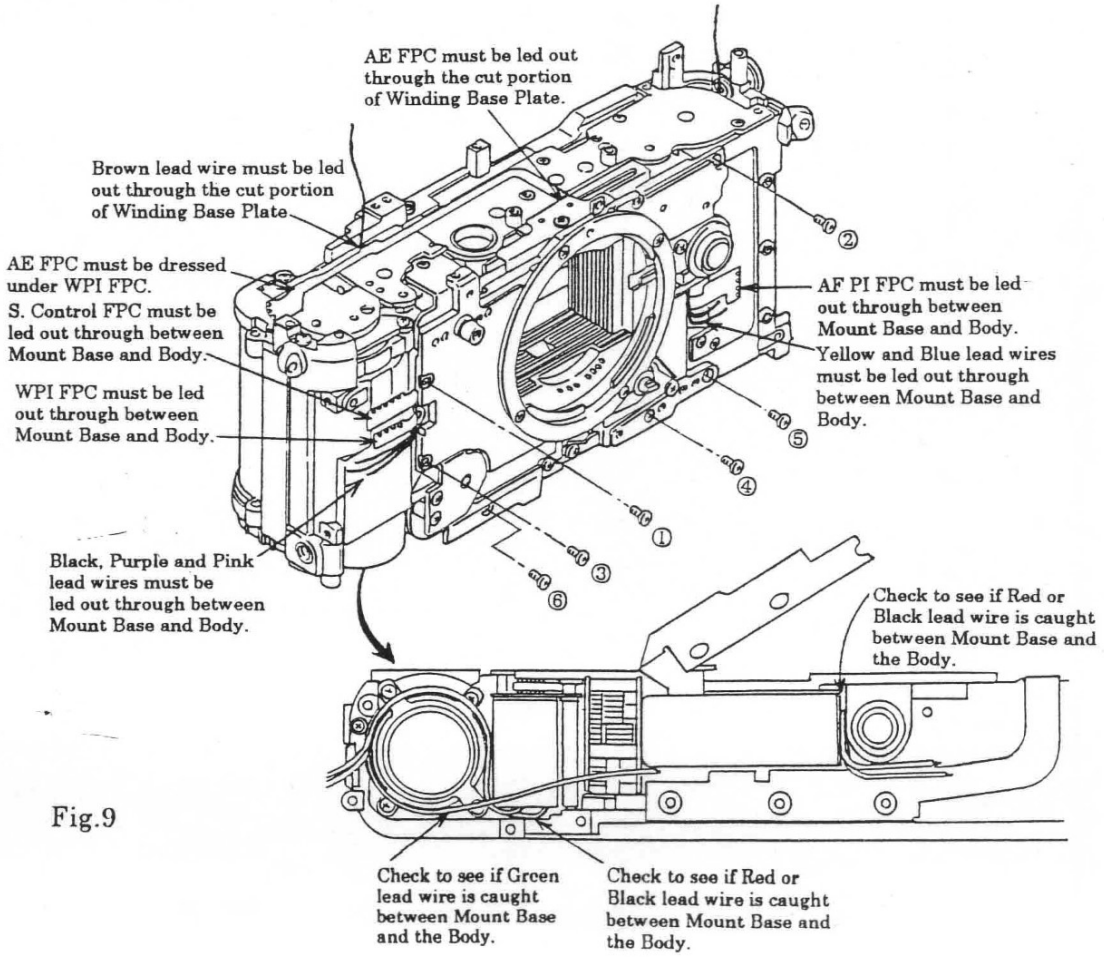


Fig.9

B-5. REMOVAL OF SHUTTER UNIT

B-5-1. Removal of Shutter Unit

1) Remove the Shutter Unit Setscrews (61924022), (61924026)×2 and take off the Shutter Unit (1AS35010).

Notes :

- The blades of the Shutter Unit are made with precision. Never touch the blades directly with a bare hand nor push with any tool or flaw them.
- Never clean the front gray blades with ether alcohol or the like.
- When the Shutter Unit has been replaced, stick the Shutter Tape (1) (1AS36200), Shutter Tape (2) (1AS36300) and Shutter Light Shield Sheet (1AS35100).
- After installing the Shutter Unit, fasten the lead wires of the Shutter Unit with the FPC Stick Tape (1) as shown in Fig. 8.

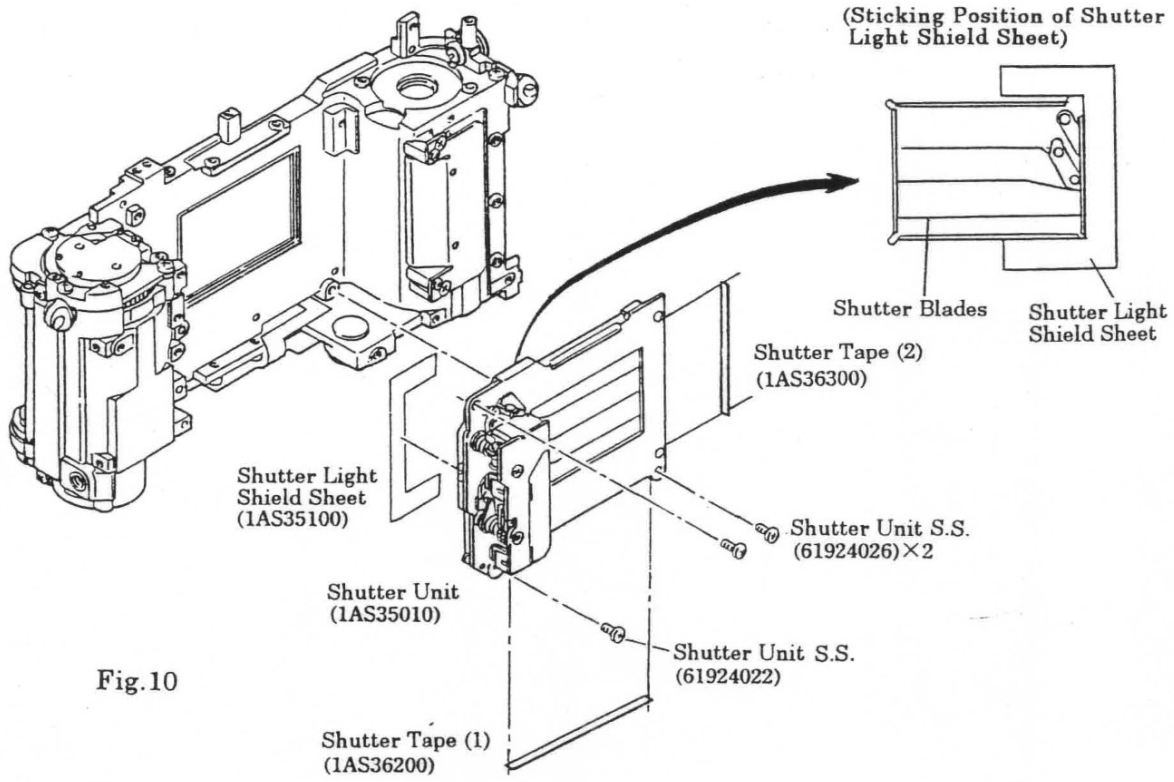


Fig.10

[Layout of Lead Wires of Shutter Unit]

① Orange lead wire (Shutter Magnet 2)
② Black lead wire (Grounding)
③ Purple lead wire (Shutter Magnet 1)
④ Brown lead wire (X)

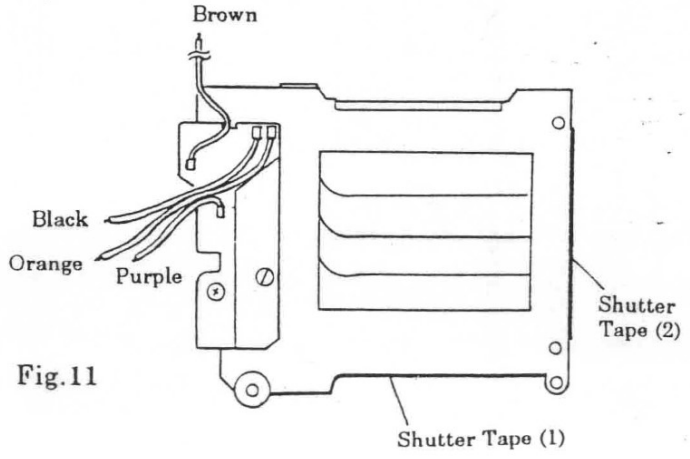
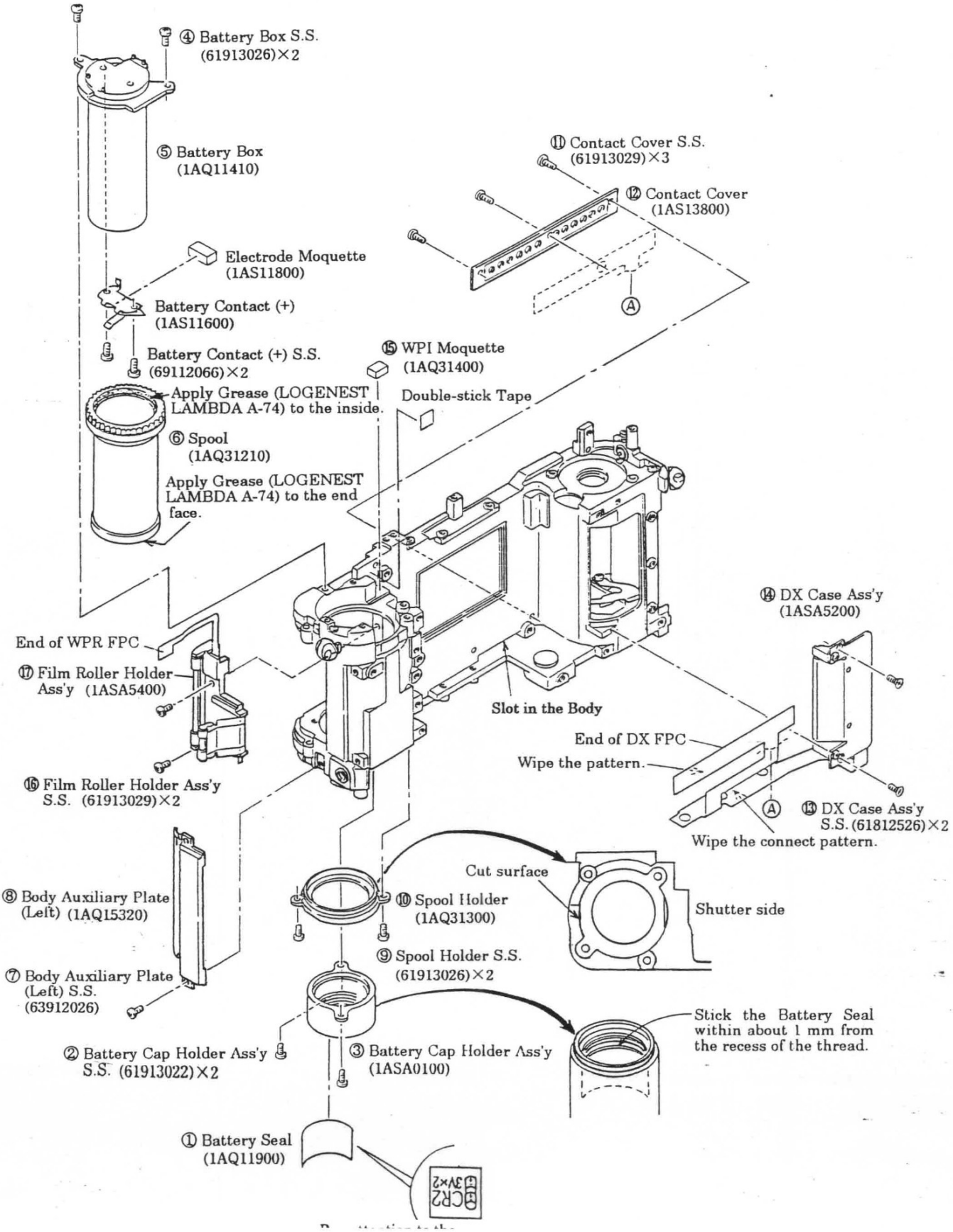


Fig.11

B-6. REMOVAL OF OTHER PARTS

[Chart for Removal of Other Parts]



B-6-1. Removal of Other Parts

1) Remove parts in the numerical order of ① to ⑰ shown in Fig. 12.

[Notes on Removal of Parts]

a) Remove the Film Roller Holder Ass'y (1ASA5400) carefully, since its WPR FPC is fixed to the Body with double-stick tape.
b) Do not touch the connect pattern on the DX FPC of the DX Case Ass'y (1ASA5200) directly with a bare hand.

[How to Install DX Case Ass'y]

(See Fig. 12)

1) Install the DX Case Ass'y while passing the end of the DX FPC through the slot in the Body.
2) Tighten the DX Case Ass'y Setscrews (61812526) × 2.
3) Wipe the pattern on the DX FPC with lens cleaning paper with ether alcohol.
4) Install the Contact Cover (1AS13800) and tighten the Contact Cover Setscrews (61913029) × 3.
5) Put the holes in the DX FPC onto the three projections at the Body bottom. Then wipe the connect patterns with lens cleaning paper with ether alcohol.

[How to Install Film Roller Holder Ass'y]

(See Fig. 13)

1) Install the Film Roller Holder Ass'y while passing the end of the WPR FPC through the slot in the Body.
2) Tighten the Film Roller Holder Ass'y Setscrews (61913029) × 2.
3) Stick the double-stick tape (5 × 5 mm) to the Body.
4) Attach the WPR FPC to the double-stick tape.
5) Stick the WPI Moquette (1AQ13400).

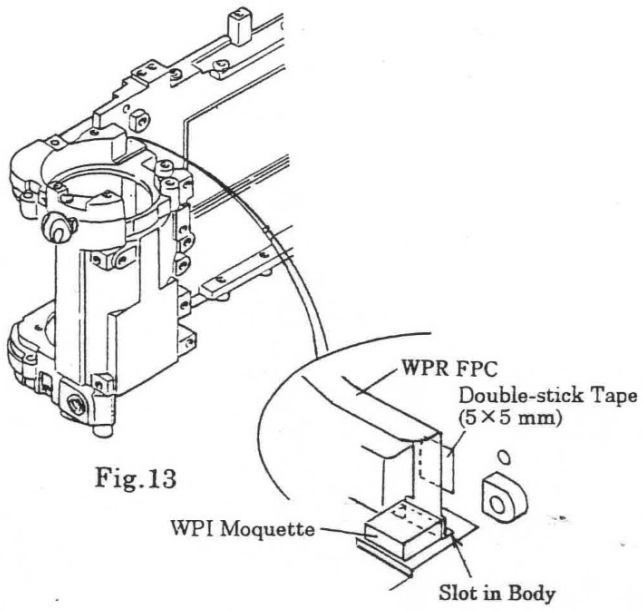


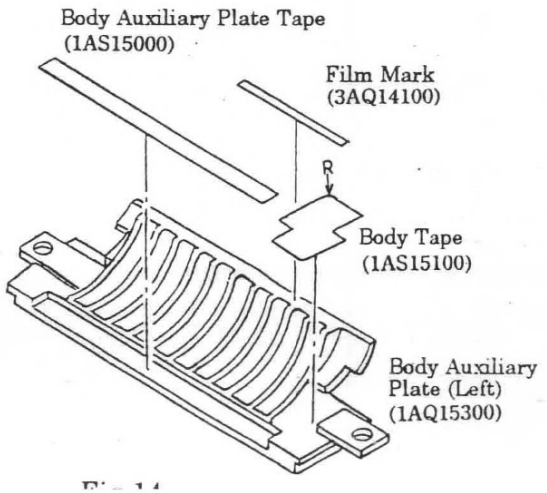
Fig.13

[Notes on Installation of Parts]

a) Install the Spool Holder (1AQ31300) on the Body in the direction as shown in Fig. 12.
b) Before installing the Spool (1AQ31200) on the Body, apply the Grease (LOGENEST LAMBDA A-74) to the inside and end face of the Spool.
c) Stick the Battery Seal (1AQ11900) as shown in Fig. 12.

[Notes on Replacement of Parts]

a) When the Body Auxiliary Plate (Left) (1AQ15300) has been replaced, stick the Film Mark (3AQ14100), Body Auxiliary Plate Tape (1AS15000) and Body Tape (1AS15100) on the Body Auxiliary Plate (Left).
b) When the Battery Box (1AQ11400) has been replaced, stick the Electrode Moquette (1AS11800) on the Battery Contact (+) (1AS11600). Then install the Battery Contact (+) in the Battery Box and tighten the Battery Contact (+) Setscrews (69112066) × 2. (See Fig. 12)



B-7. DISASSEMBLY AND REASSEMBLY OF ASS'Y PARTS

B-7-1. Disassembly of Mount Base Ass'y

[Chart for Disassembly of Mount Base Ass'y]

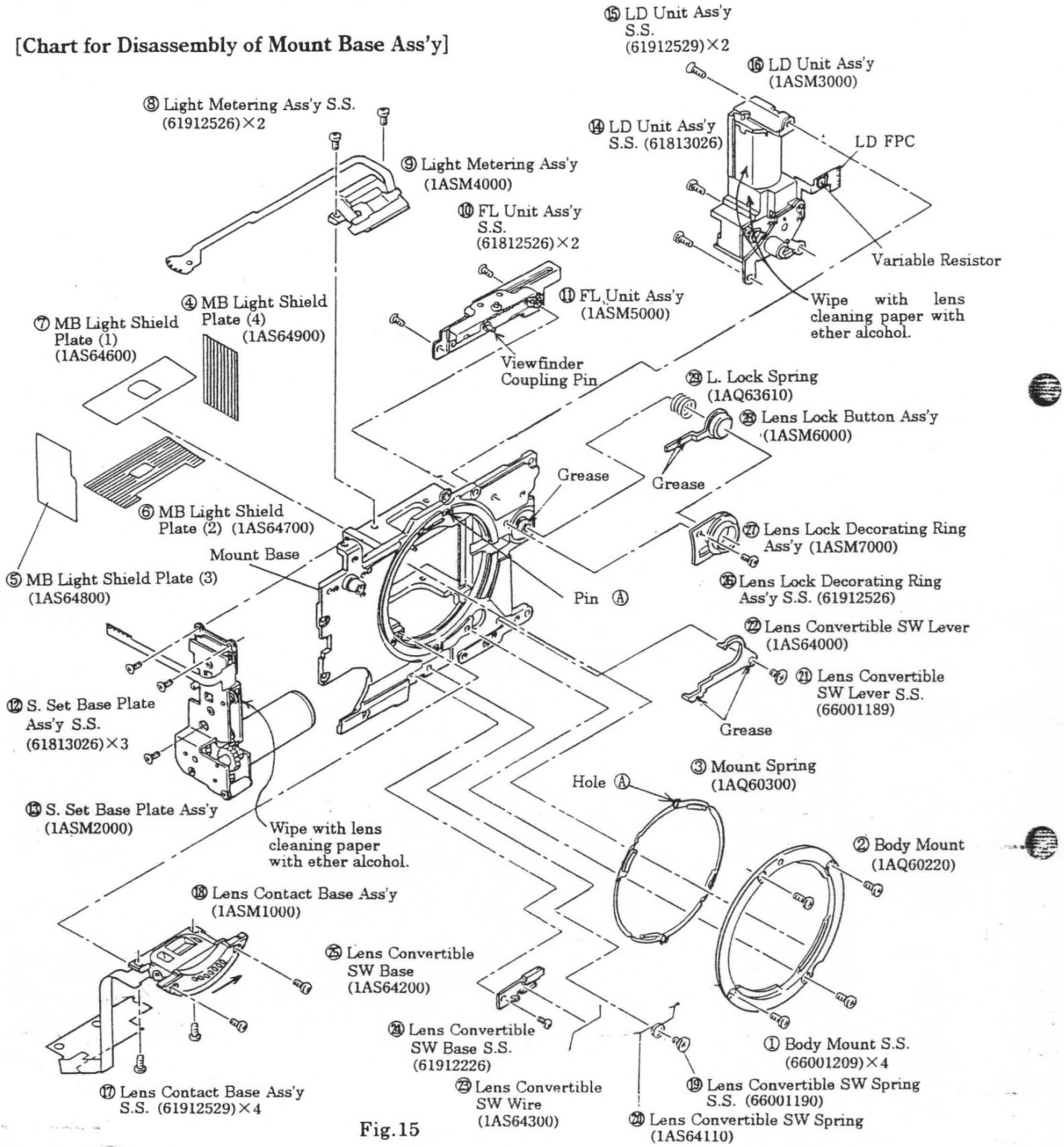


Fig.15

[Disassembly Procedure]

1) Remove parts in the numerical order of ① to ⑨ shown in Fig. 15.
2) Unsolder the Pink and Blue lead wires (from FL Board) on the S. Control FPC. (See Fig. 16)
3) Remove parts in the numerical order of ⑩ to ㉙ shown in Fig. 15.

Notes :

- Take due care, since the Body Mount Setscrews (66001209) × 2 are locked with the bond (Loctite #262).
- Do not use any of the MB Light Shield Plate (1) (1AS64600), MB Light Shield Plate (2) (1AS64700), MB Light Shield Plate (3) (1AS64800) and MB Light Shield Plate (4) (1AS64900) that have been peeled off once, since thire adhesive strength is weak.
- Be sure to apply Grease (LOGENEST LAMBDA A-74) to the specified positions. (See Fig. 15)
- Take care not to flaw the exterior surface on the front of the Mount Base.

(Back View of Mount Base)

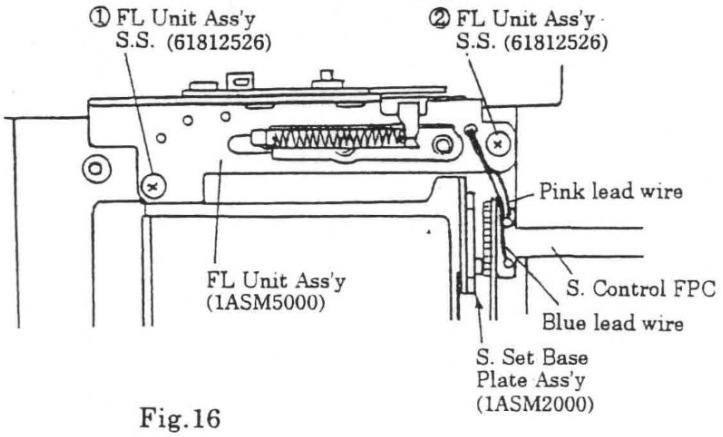


Fig.16

[Installation Procedure for FL Unit Ass'y]

1) Apply Grease (LOGENEST LAMBDA A-74) to the slide surface of the FL Unit Ass'y on the back of the Mount Base. (See Fig. 17)
2) Install the FL Unit Ass'y (1ASM5000) while inserting its Viewfinder Coupling Pin into the oval hole in the Mount Base.
3) Tighten the FL Unit Ass'y Setscrews (61812526)×2 in the numerical order as shown in Fig. 16.
4) Move the Viewfinder Coupling Pin projecting through the oval hole in the front of the Mount Base and make certain that it operates smoothly without being caught. In doing so, take care not to flaw the exterior surface on the front of the Mount Base.

(Greasing Points)

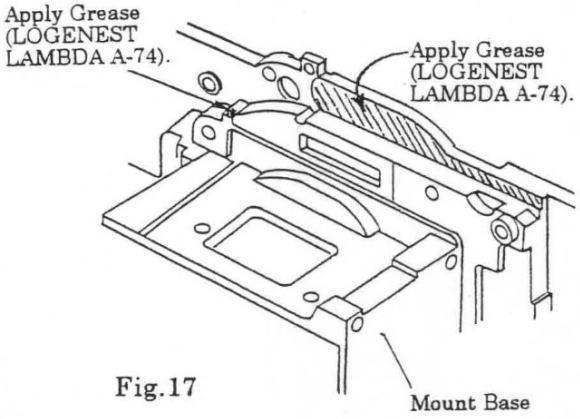


Fig.17

[Notes on Installation of Parts]

a) When installing the Lens Contact Base Ass'y (1ASM1000), push it in the direction of the arrow as shown in Fig. 15 and tighten the Lens Contact Base Ass'y Setscrews (61912529)×4.
b) **Never disassemble the LD Unit Ass'y (1ASM3000). Also never change the setting of the Variable Resistor mounted on the LD FPC.**
c) Using lens cleaning paper with ether alcohol, wipe the Mount Base-inside-surfaces of the LD Unit Ass'y and S. Set Base Plate Ass'y (1ASM2000).

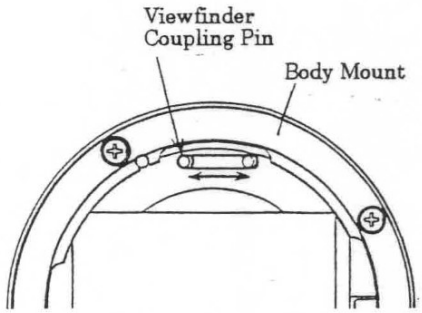


Fig.18

d) Attach the MB Light Shield Plates (1), (2), (3) and (4) with the front surface of the Mount Base as the datum line.
Stick the MB Light Shield Plates so that they do not float or are not dislocated.
e) After installing the Lens Convertible SW Lever (1AS64000) and Lens Lock Button Ass'y (1ASM6000), make certain that they operate smoothly.
f) When installing the Mount Spring (1AQ60300), fit the hole Ⓐ in the Mount Spring onto the pin Ⓐ of the Mount Base.

B-7-2. Disassembly of Winding Unit Ass'y

[Chart for Disassembly of Winding Unit Ass'y]

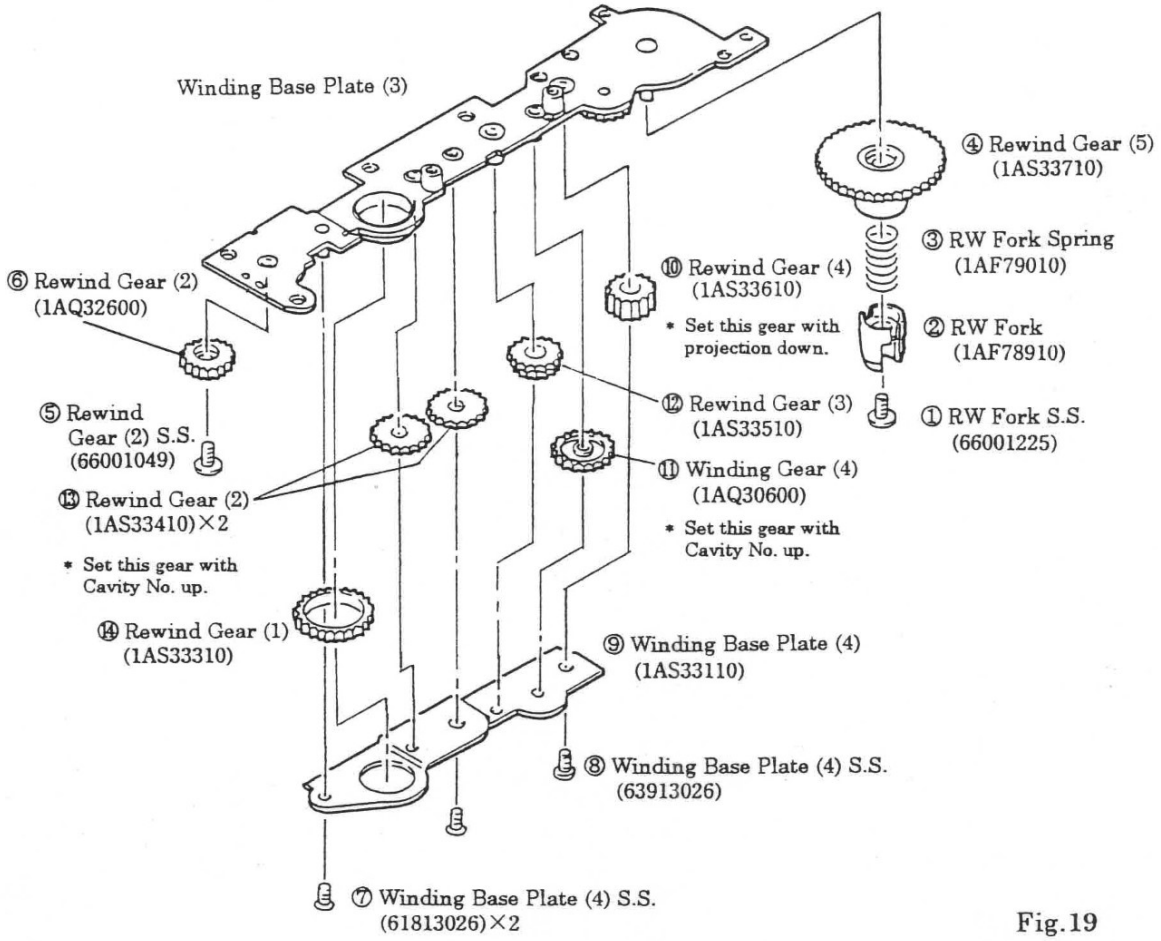


Fig.19

[Disassembly Procedure]

1) Remove parts in the numerical order of ① to ⑭ shown in Fig. 19.

Notes :

- Take care not to flaw gears.
- Take care when installing the gears whose top and bottom are identified.
- Apply Grease (LOGENEST LAMBDA A-74) as shown in Fig. 20.
- After installing the Winding Base Plate Ass'y, turn the Winding Gear (5) (1AS33710) with your hand and make certain that each gear turns smoothly without being caught.
- Push the RW Fork (1AF78910) and make certain that the RW Fork returns to the original position.

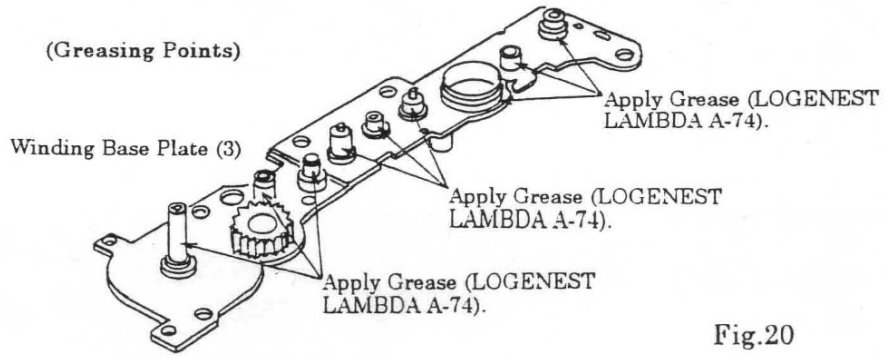


Fig.20

B-7-3. Disassembly of Winding Base Plate Ass'y

[Chart for Disassembly of Winding Base Plate Ass'y]

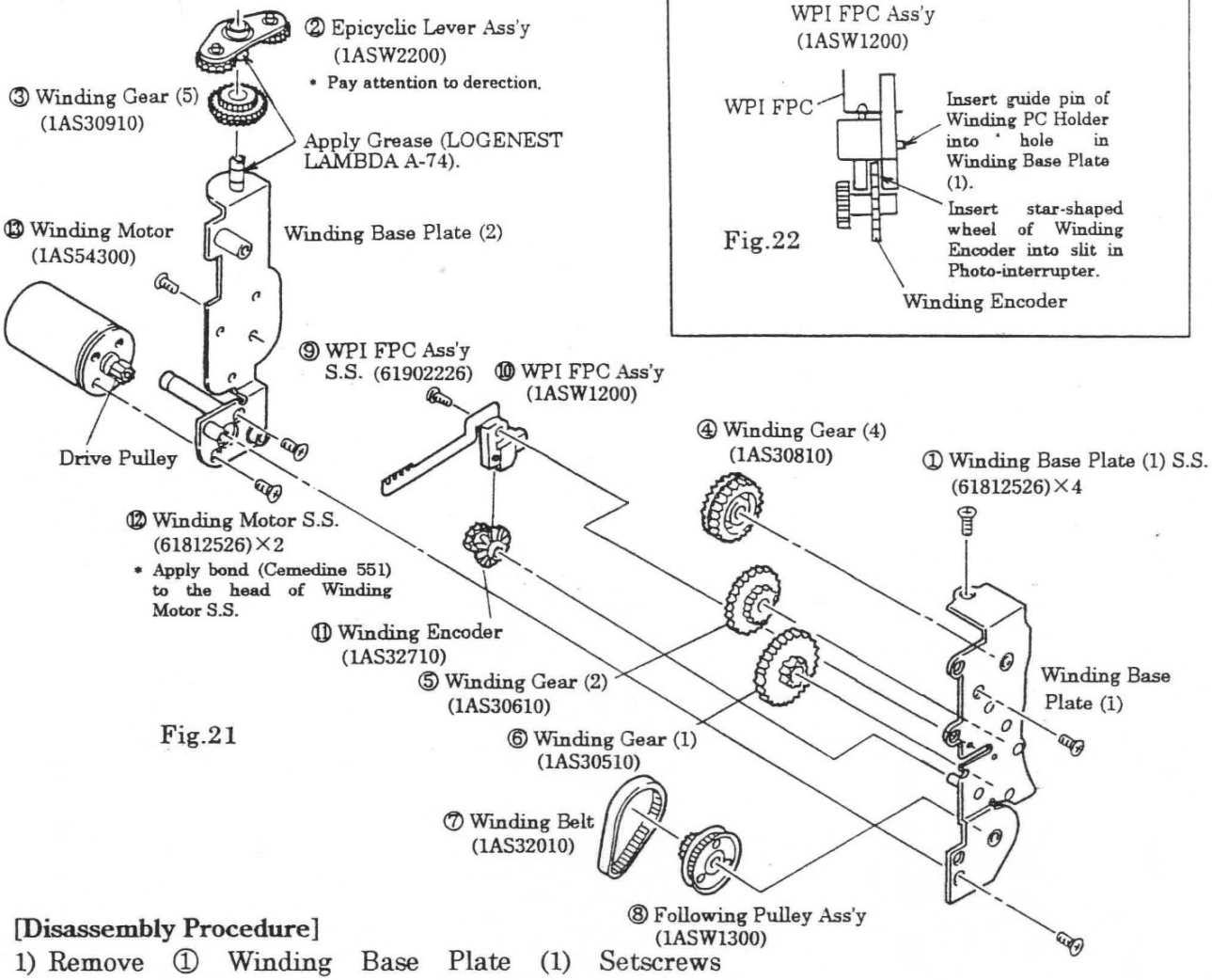


Fig.21

Fig.22

[Disassembly Procedure]

1) Remove ① Winding Base Plate (1) Setscrews (61812526)×4 and separate the Winding Base Plate (1) and Winding Base Plate (2) from each other.
2) Remove parts in the numerical order of ② to ⑬ shown in Fig. 21.

Notes :

- Take care not to flaw gears.
- Apply Grease (LOGENEST LAMBDA A-74) as shown in Figs. 21 and 23.
- Do not clean the Winding Belt (1AS32010) with any solvent.
- Set the Winding Belt (1AS32010) on the Following Pulley Ass'y (1ASW1300) and Drive Pulley of Winding Motor.
- Install the WPI FPC Ass'y (1ASW1200) on the Winding Base Plate (1) so that the star-shaped wheel of the Winding Encoder (1AS32710) enters the slit in the Photo-interrupter. Also install the WPI FPC Ass'y so that the two guide pins of the Winding PC Holder enter the holes in the Winding Base Plate (1). Then tighten the WPI FPC Ass'y Setscrews (61902226). (See Fig. 22)
- When installing the Epicyclic Lever Ass'y (1ASW2200), pay attention to its direction.

(Greasing Points)

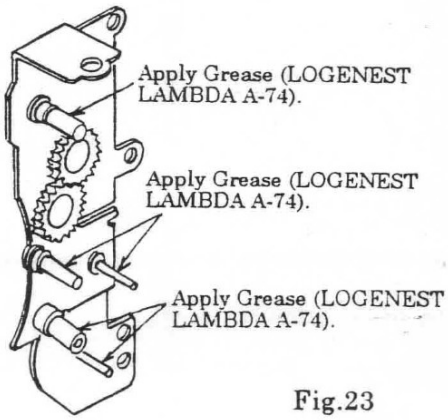


Fig.23

B-7-4. Disassembly of S. Set Base Plate Ass'y

[Chart for Disassembly of S. Set Base Plate Ass'y]

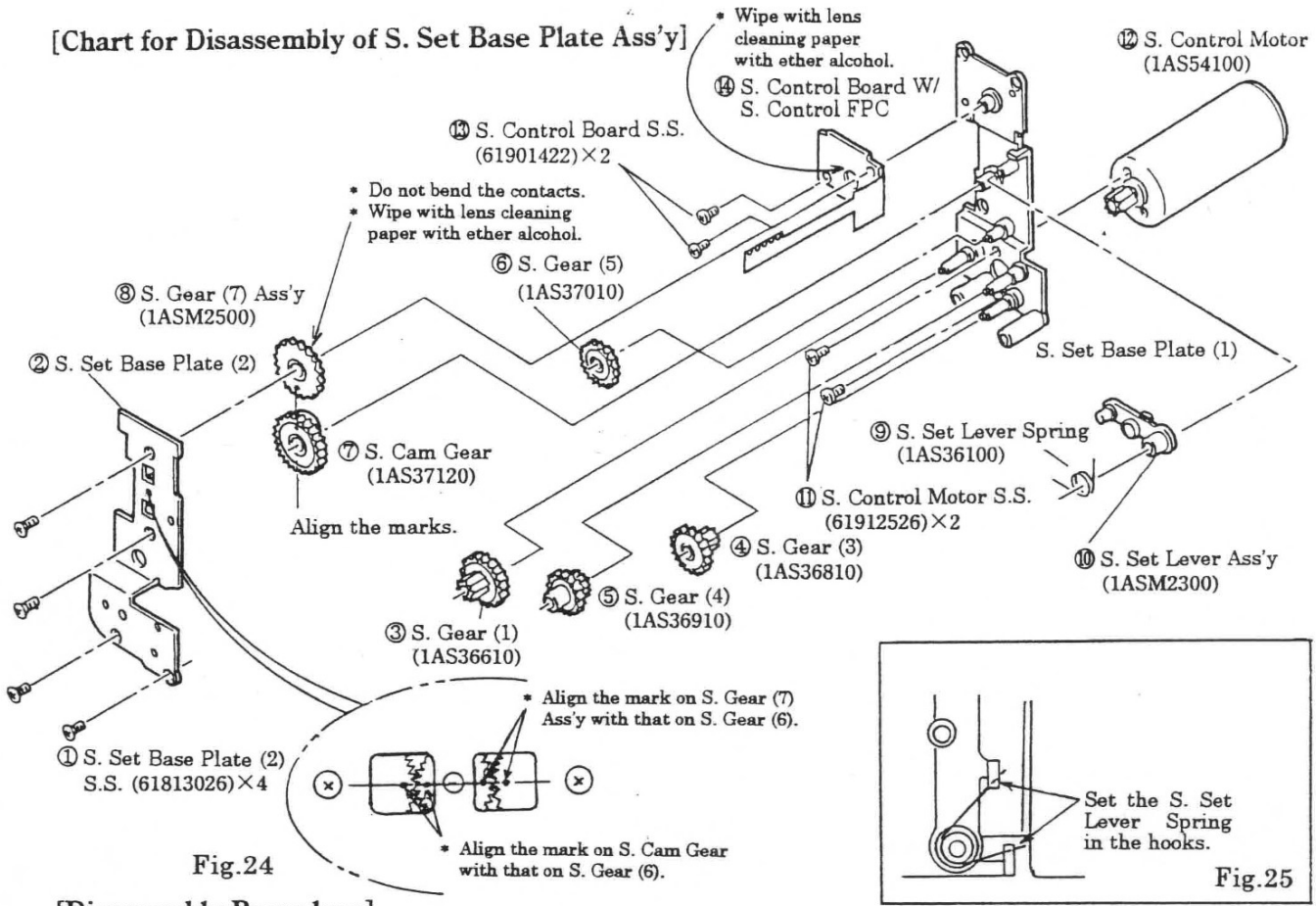


Fig.24

Fig.25

[Disassembly Procedure]

1) Remove parts in the numerical order of ① to ⑭ shown in Fig. 24.

Notes :

- Take care not to flaw gears.
- Apply Grease (LOGENEST LAMBDA A-74) as shown in Fig. 27.
- As shown in Fig. 25, set the S. Set Lever Spring (1AS36100) in the hook of the S. Set Lever and the hook of the S. Set Base Plate (1).
- Wipe the pattern of the S. Control Board (1AS52100) with lens cleaning paper with ether alcohol.
- Take care not to bend the contacts of the S. Gear (7) Ass'y (1ASM2500). Also wipe the contacts with lens cleaning paper with ether alcohol.
- Install the S. Gear (7) Ass'y (1ASM2500) and S. Cam Gear (1AS37120) so that their positioning marks are aligned. Also install the S. Set Base Plate (2) so that the positioning mark on the S. Gear (6) of the S. Set Base Plate (2) is aligned with the positioning marks on the S. Gear (7) Ass'y and S. Cam Gear. (See Fig. 24)
- Solder the S. Control FPC (1AS51300) perpendicularly to the S. Control Board (1AS52100). (See Fig. 26)

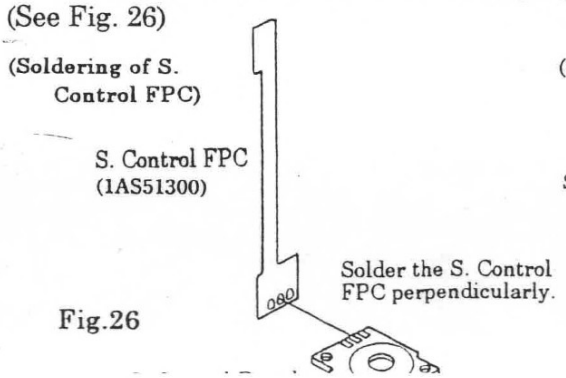
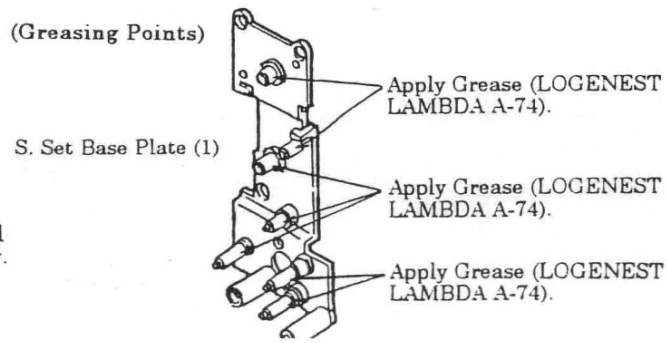


Fig.26



B-7-5. Disassembly of Dial Base Plate Ass'y

[Chart for Disassembly of Dial Base Plate Ass'y]

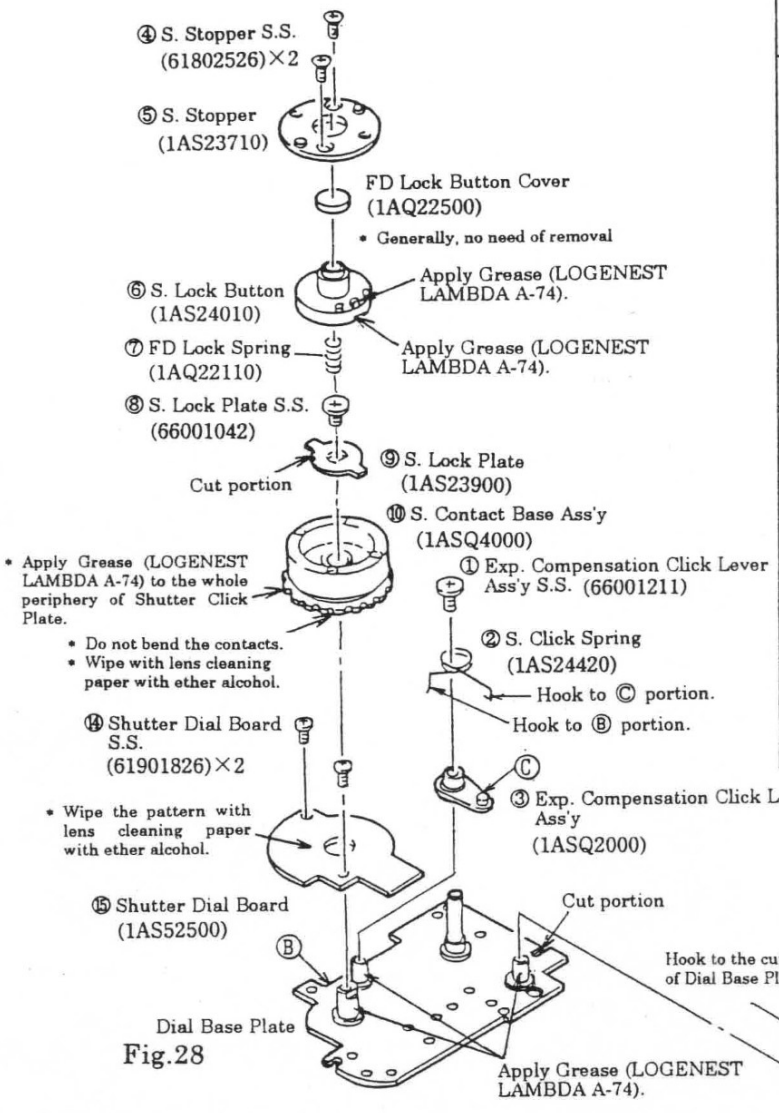


Fig.28

(How to set SH Click Lever Spring)

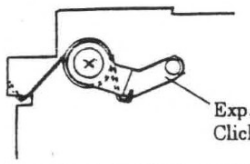


Fig.29

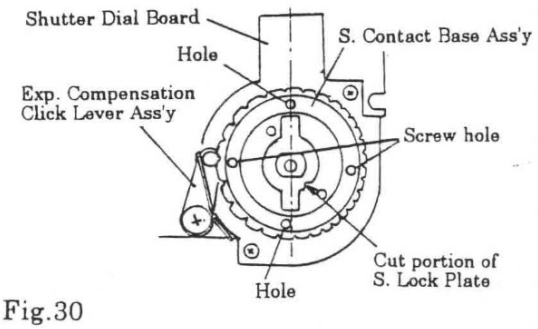


Fig.30

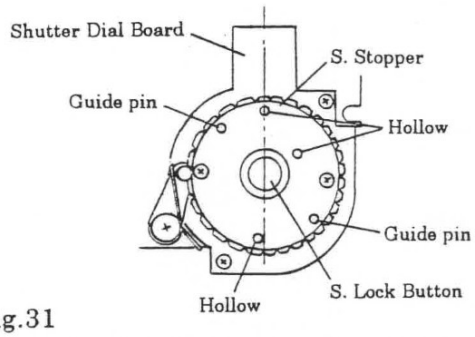


Fig.31

[Disassembly Procedure]

1) Remove parts in the numerical order of ① to ⑮ shown in Fig. 28.

Notes :

- Apply Grease (LOGENEST LAMBDA A-74) to the whole periphery of the Click Plate of the S. Contact Base Ass'y. Take care not to apply grease to the contacts.
- Take care not to bend the contacts of the S. Contact Base Ass'y. Also wipe the contacts with lens cleaning paper with ether alcohol and install the S. Contact Base Ass'y in the position as shown in Fig. 30.
- Wipe the pattern of the Shutter Dial Board (1AS52500) with lens cleaning paper with ether alcohol.
- As shown in Fig. 29, hook the SH Click Lever Spring (1AQ24110) to the cut portion of the Dial Base Plate and Ⓐ portion of the Exp. Compensation Click Lever Ass'y (1ASQ3000).
- Install the S. Lock Plate (1AS23900) with its cut portion positioned as shown in Fig. 30 (with the dull corner side up).
- As shown in Fig. 30, hook the S. Click Spring (1AS24400) to Ⓑ portion of the Dial Base Plate and Ⓒ portion of the Exp. Compensation Click Lever Ass'y (1ASQ2000).
- Install the S. Stopper (1AS23700) as shown in Fig. 31.
- Generally, there is no need of removing the FD Lock Button Cover (1AQ25500). The FD Lock Button Cover is fixed to the S. Lock Button (1AS23700) with the bond (Cemedine 551).

B-7-6. Disassembly of D. Dial Base Plate Ass'y

[Chart for Disassembly of D. Dial Base Plate Ass'y]

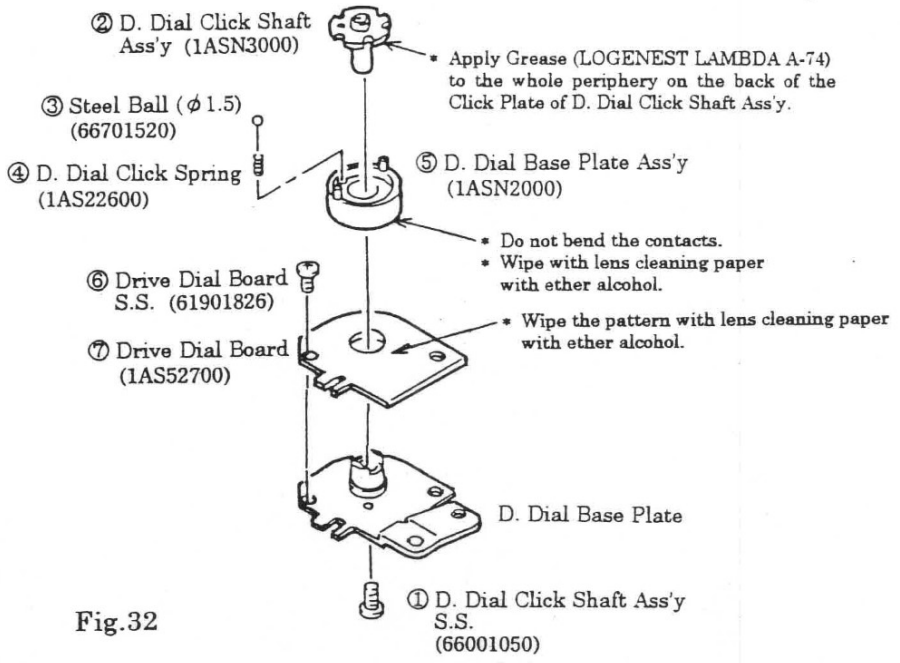


Fig.32

[Disassembly Procedure]

1) Remove parts in the numerical order of ① to ⑦ shown in Fig. 32.

Notes :

- Take care not to bend the contacts of the D. Dial Base Plate Ass'y (1ASN2000). Also wipe the contacts with lens cleaning paper with ether alcohol.
- Wipe the pattern of the Drive Dial Board (1AS52700) with lens cleaning paper with ether alcohol.
- During repair, take care not to lose the Steel Ball (ϕ 1.5) (66701520) or D. Dial Click Spring (1AS22600).
- Apply Grease (LOGENEST LAMBDA A-74) to the whole periphery on the back of the Click Plate of D. Dial Click Shaft Ass'y (1ASN3000).

B-7-7. How to Attach Window Glasses of Top Cover Ass'y

1) Apply the bond (epoxy resin) to the F. Window Frame (1AS20720) and attach the F. Window (1AS20600) and AF Projection Window (1AS21200) there.
2) Set the F. Window Mask (1AS20800) on the F. Window Frame and fix it with the bond (THREE BOND #1541).
3) Apply the bond (epoxy resin) to the AF Window Frame (1AS21030) and attach the AF. Window (1AS20900) there.
4) Set the AF Window Mask (1AS21100) and fix it with the bond (THREE BOND #1541).
5) Set the Main LCD Window (1AS21500) in the Top Cover and apply the bond (epoxy resin).
6) Set the Counter Window (3BK32210) in the Top Cover and apply the bond (epoxy resin).
7) Set the F. Window Frame W/ F. Window and AF Projection Window in the Top Cover and apply the bond (epoxy resin).
8) Set the AF Window Frame W/ AF Window in the Top Cover and set the ST-LED Window (1AQ21000). Then apply the bond (epoxy resin).

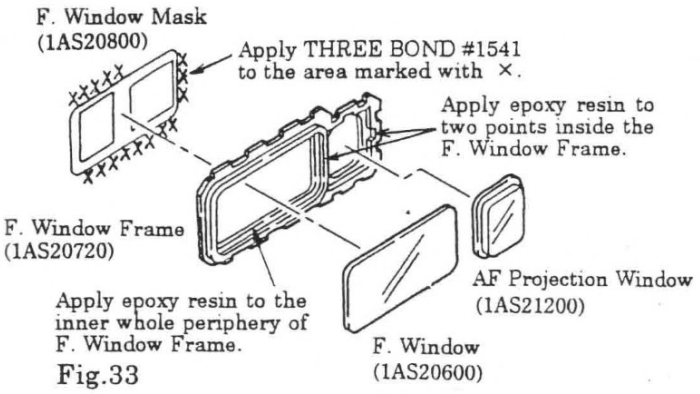


Fig.33

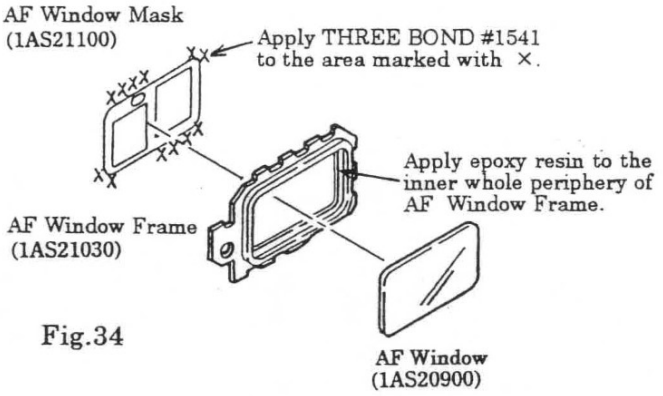


Fig.34

Notes :

- The window glasses of the Top Cover Ass'y are fixed with UV bond (ultraviolet bond). The UV bond will not be supplied to the service side. Use the epoxy resin bond instead of the UV bond at repair.
- Epoxy resin bond hardens slowly. Be sure to wait until the bond hardens completely and then install the Top Cover Ass'y on the Body. (Wait for 24 hours.)
- To remove the UV bond, heat the bond with a dryer for a while and scrape off the UV bond with an NT cutter. In doing so, take care that other window glasses will not be affected by overheating with the dryer.
- Take care not to deposit bond too high.
- Take care that bond does not come out around. Also take care not to soil the window glasses with bond.
- All the window glasses must be in close contact with the Top Cover.

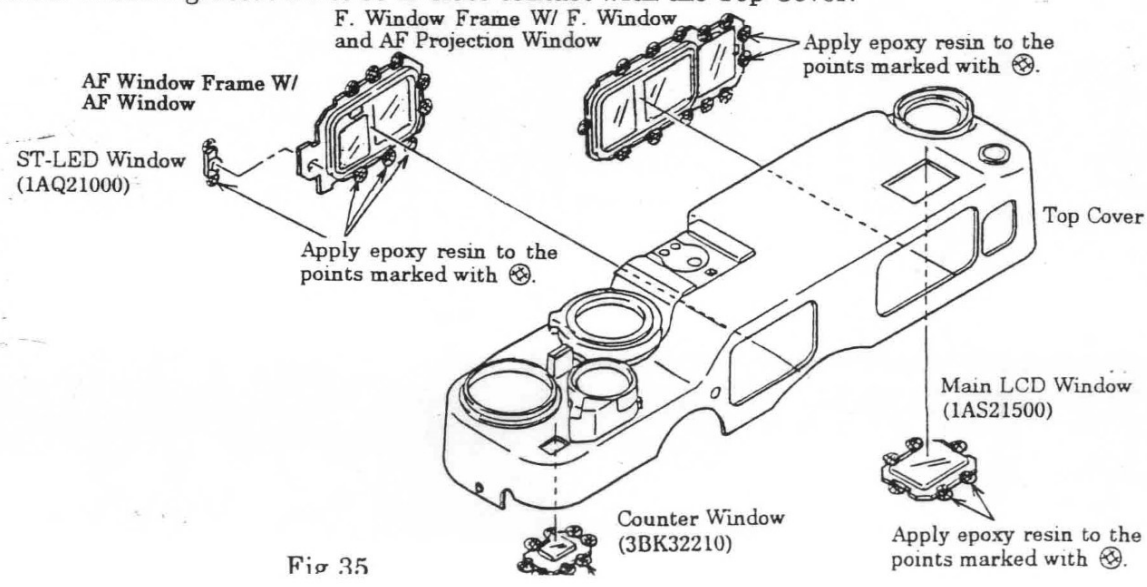


Fig.35

B-8. DRESSING OF LEAD WIRES

B-8-1. Dressing of Lead Wires

1) Dress the lead wires as shown in Figs. 36 to 38.

[Chart for Dressing of Lead Wires on Top of Body]

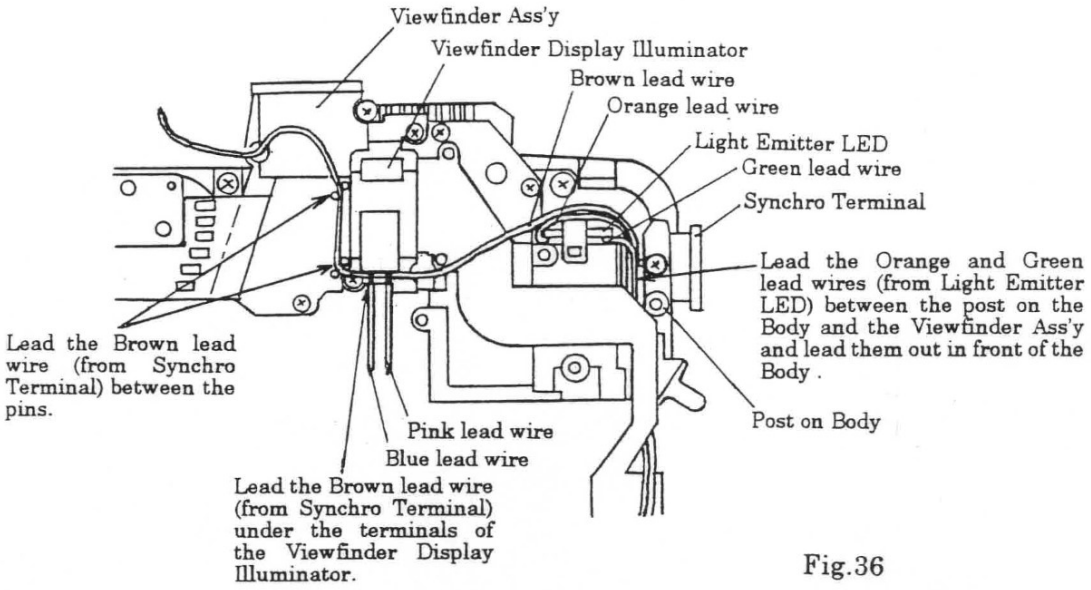


Fig.36

[Chart for Dressing of Lead Wires on Bottom of Body]

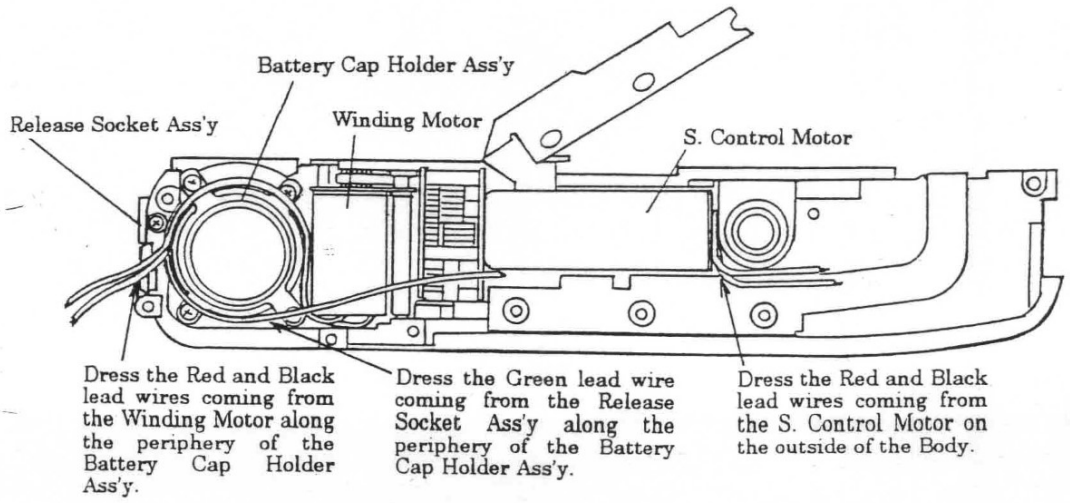


Fig.37

[Chart for Dressing of Lead Wires after Installation of Main FPC Ass'y]

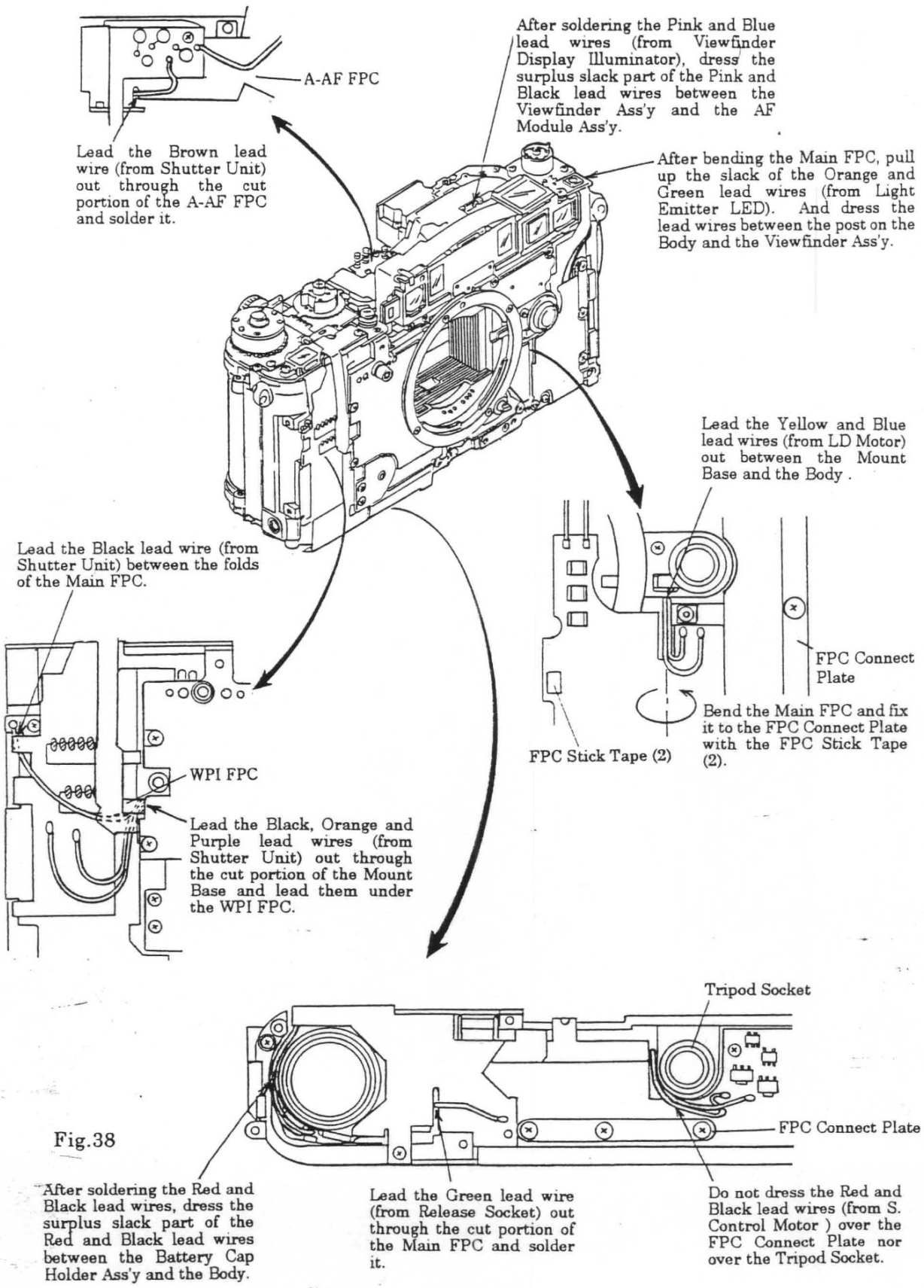


Fig.38

B-9. DISASSEMBLY OF BACK COVER ASS'Y

B-9-1. Disassembly of Back Cover Ass'y

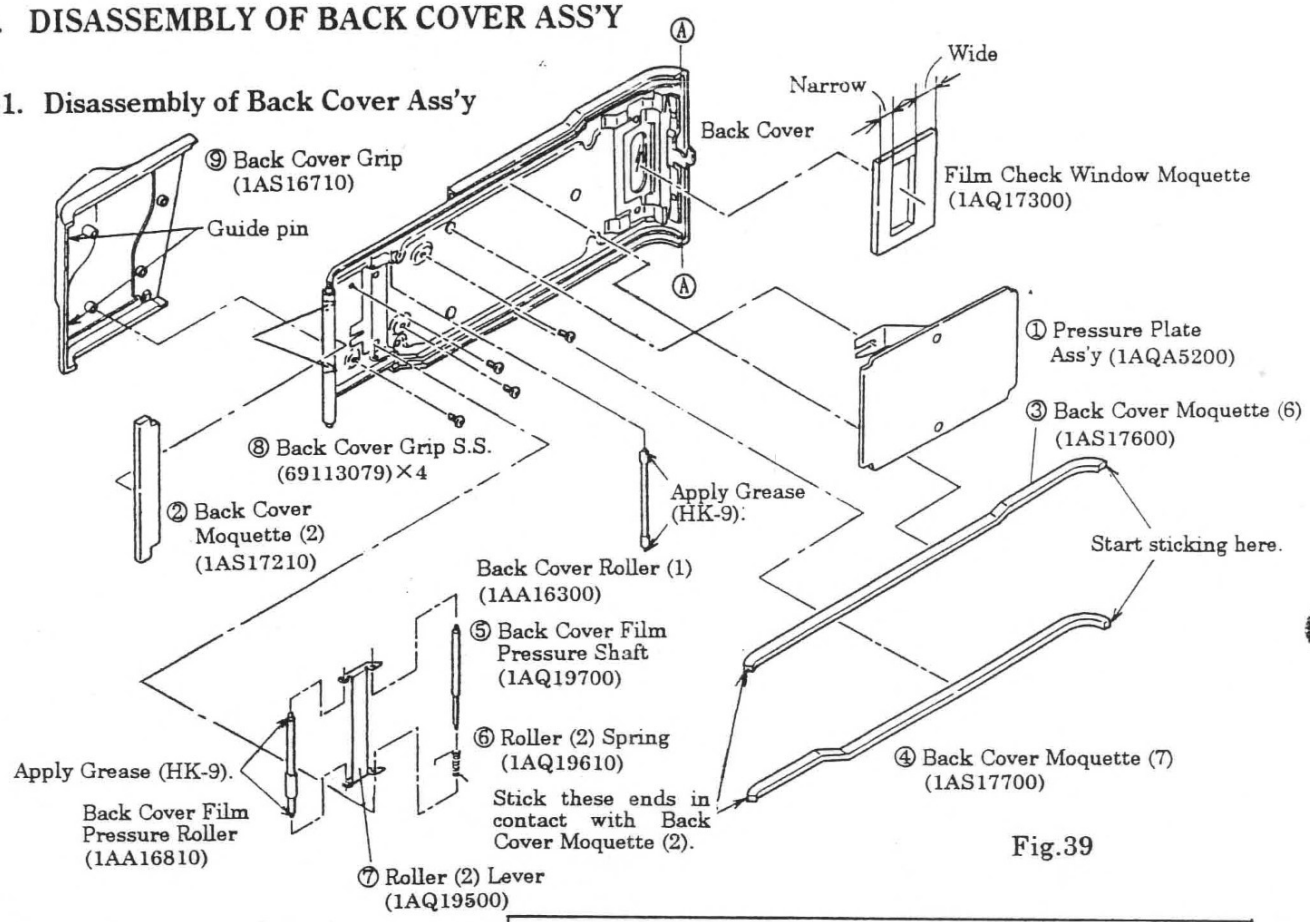


Fig.39

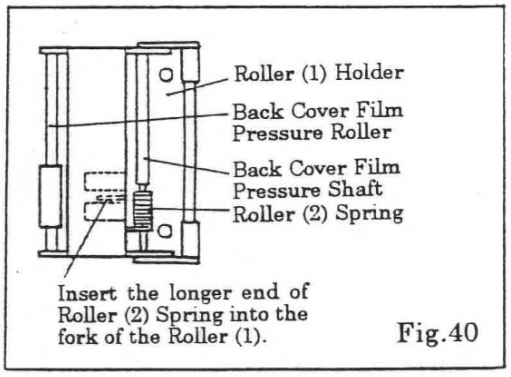


Fig.40

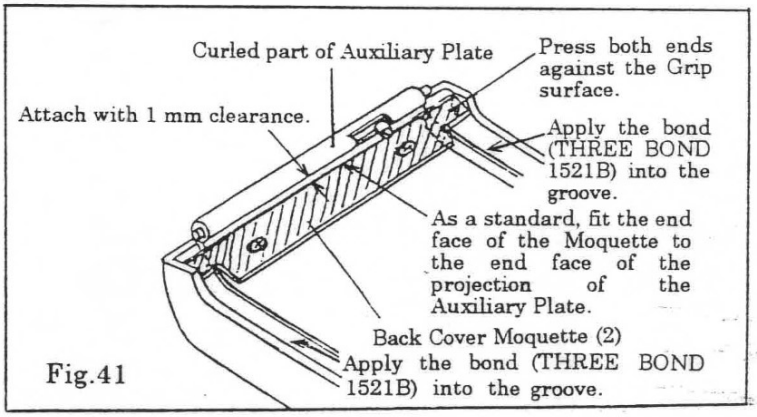


Fig.41

[Disassembly Procedure]

1) Remove parts in the numerical order of ① to ⑨ shown in Fig. 39.

[Notes on Reassembly of Back Cover Ass'y]

a) Insert the two guide pins of the Back Cover Grip (1AS16710) into the two holes in the Back Cover.
b) Apply Grease (HK-9) to both ends of each of the Back Cover Film Pressure Roller (1AA16810) and Back Cover Roller (1) (1AA16300).
c) Insert the longer end of the Roller (2) Spring (1AQ19610) into the fork of the Roller (1) Holder. (See Fig. 40)
d) Stick the Film Check Window Moquette (1AQ17300) in the position as shown in Fig. 36.
e) Stick the Back Cover Moquette (2) (1AS17210) in a manner as shown in Fig. 41.
f) Apply the bond (THREE BOND 1521B) into the groove in the Back Cover. Immediately after applying the bond, attach the Back Cover Moquette (7) (1AS17700) and Back Cover Moquette (6) (1AS17600), starting at Ⓐ end of the Back Cover. Ensure that the other ends of the Back Cover Moquette (7) and Back Cover Moquette (6) are in contact with the Back Cover Moquette (2).
g) Do not use the Moquette that has been peeled off once.

B-10. DISASSEMBLY OF DATA BACK ASS'Y

B-10-1. Disassembly of Data Back Ass'y

[Chart for Disassembly of Data Back Ass'y]

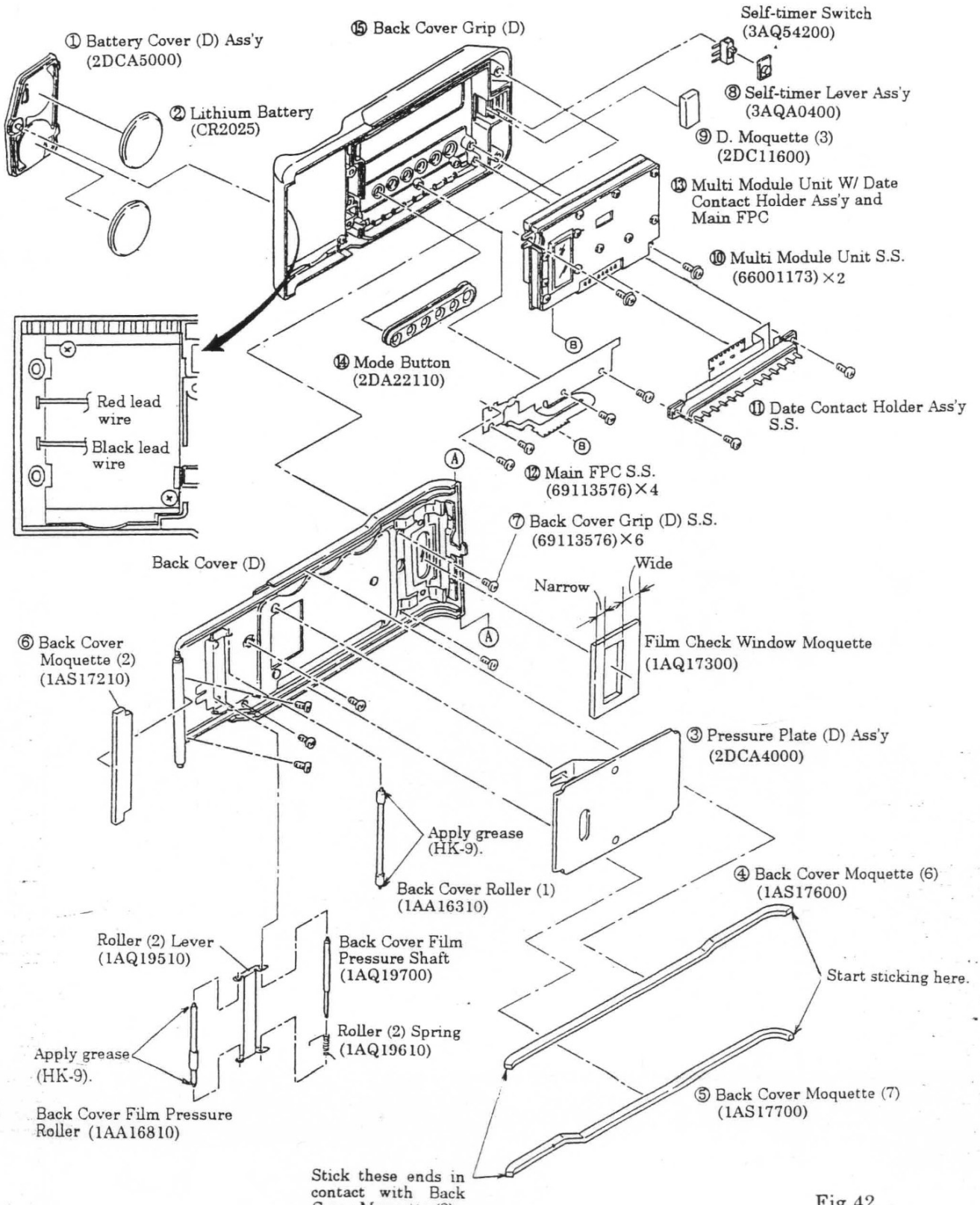


Fig.42

[Disassembly Procedure]

1) Remove parts in the numerical order of ① to ⑨ shown in Fig. 42.
2) Unsolder the Red and Black lead wires of the Battery Contact.
3) Remove parts in the numerical order of ⑩ to ⑮ shown in Fig. 42.

[Notes on Reassembly of Battery Cover (D) Ass'y]

a) Apply Grease (HK-9) to both ends of each of the Back Cover Film Pressure Roller (1AA16810) and Back Cover Roller (1) (1AA16300). (See Fig. 42)
b) Insert the longer end of the Roller (2) Spring (1AQ19610) into the fork of the Roller (1) Holder. (See Fig. 43).
c) Apply the bond (THREE BOND 1521B) into the groove in the Back Cover (D). Apply the bond evenly. (See Fig. 44)
   Immediately after applying the bond, attach the Back Cover Moquette (7) (1AS17700) and Back Cover Moquette (6) (1AS17600), starting at Ⓐ end of the Back Cover (D). Ensure that the other ends of the Back Cover Moquette (7) and Back Cover Moquette (6) are in contact with the Back Cover Moquette (2). (See Fig. 42)
d) Stick the Film Check Window Moquette (1AQ1 7300) in the position as shown in Fig. 42.
e) Once the Multi Module Unit is removed, make the adjustment of compiled data imprint position.
f) Do not use the Moquette that has been peeled off once.

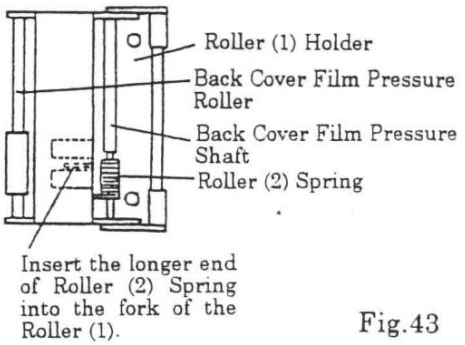


Fig.43

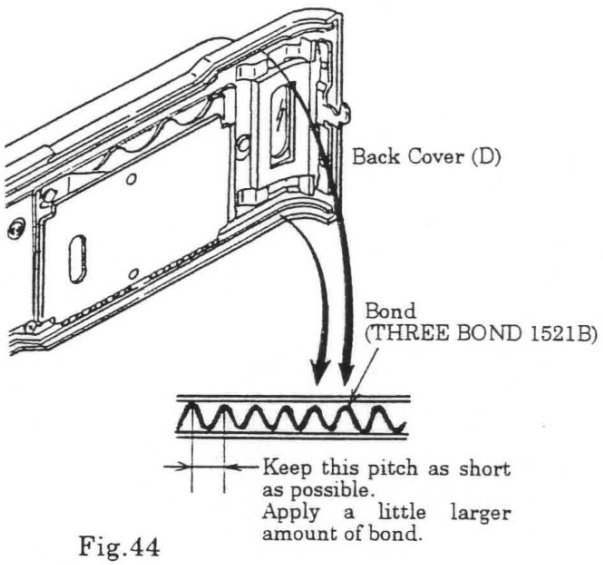


Fig.44

[Reassembly of Back Cover Grip (D)]

1) Apply the bond (Cemedine 551) to the Back Cover Grip (D) and attach the Mode Button Cover MG (2DA22500)×2.
2) Set the M. Indication Window (2DA22600) and from inside the Back Cover Grip (D), apply the bond (Cemedine 551) to the peripheral side face of the M. Indication Window.
   Note :
   - Take care that the bond (Cemedine 551) does not come out around.

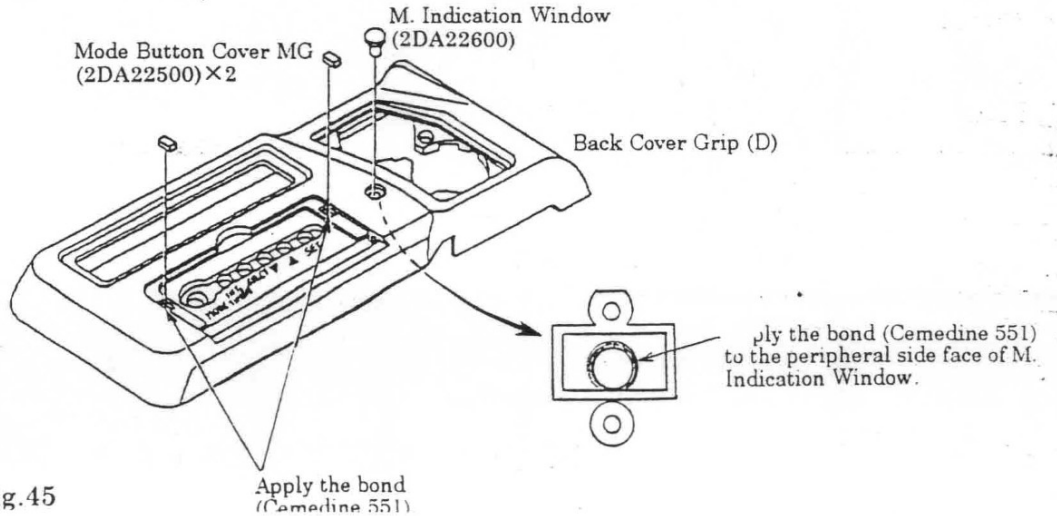


Fig.45

3) Set the Back Cover Cap (2DA21810) and apply the bond (Cemedine 551).
4) Set the Battery Cap Screw Socket (2DB11200) and apply the bond (Cemedine 551) to the periphery of the Battery Cap Screw Socket. Then attach the D. Rubber (2) (2DC10400).
5) Stick the D. Moquette (1) (2DC11100).
6) Install the Battery Cap Holder Ass'y (2DCA2400) and tighten the Battery Cap Holder Ass'y Setscrews (69113576)×2.
7) Stick the Body Moquettes (1AS10700)×2.

Note :

- Take care that the bond (Cemedine 551) does not come out around.

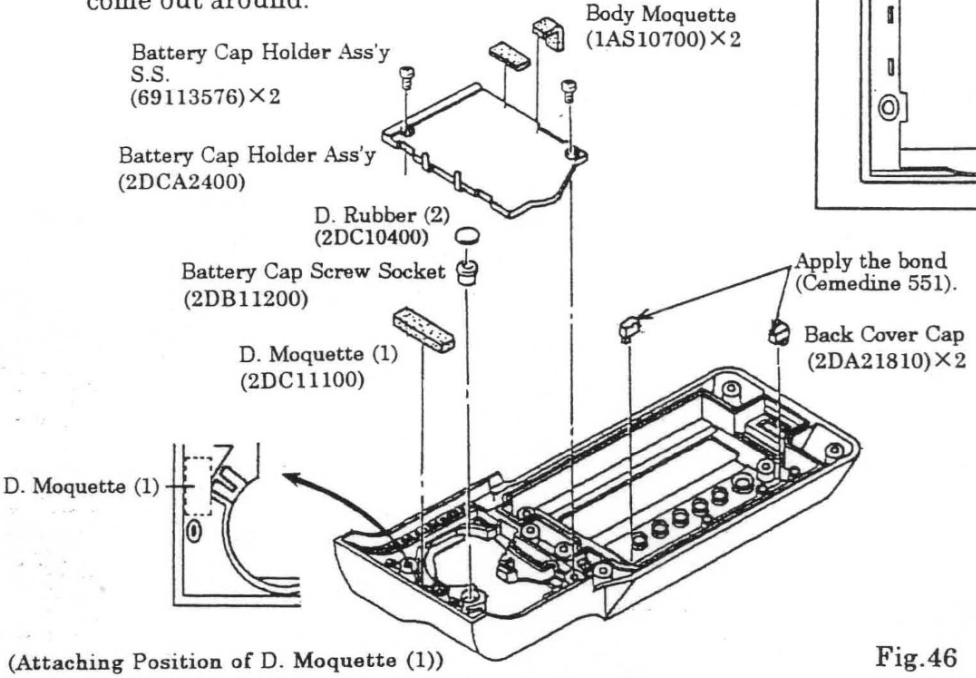


Fig.46

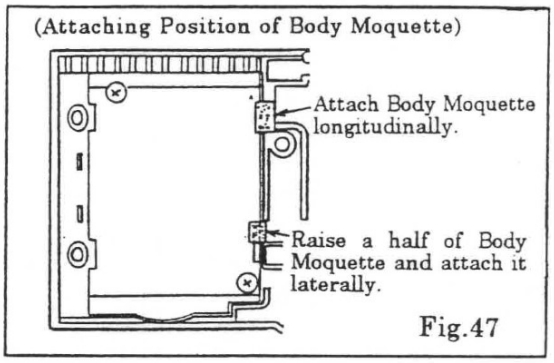


Fig.47

8) Stick the Panel Tape (1) (2DA23600)×2.
9) Set the Mode Button Cover Spring (2DA22400) and Mode Button Cover Shafts (2DA22300)×2 in the Mode Button Cover (2DC11020) and install it on the Back Cover Grip (D).

Notes :

- Make certain that the necks of the Mode Button Cover Shafts are positioned as shown in Fig. 49.
- Stick the Back Cover Panel (2DA22000) after installing all the other parts of the Back Cover (D).

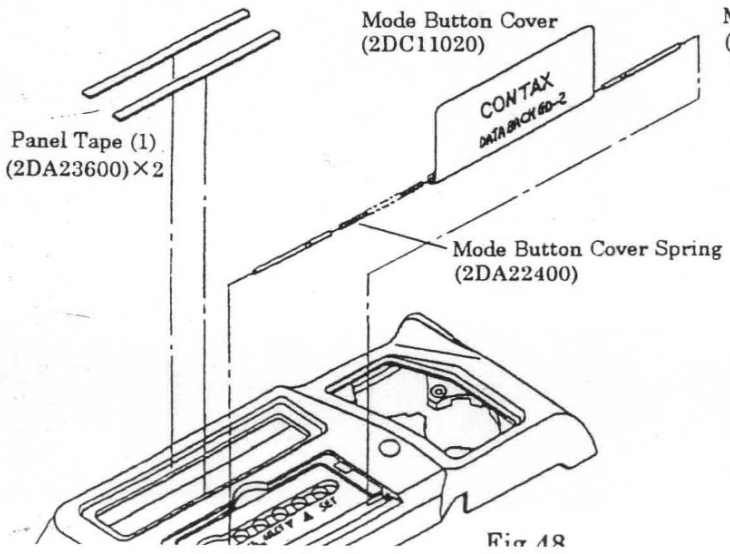


Fig.48

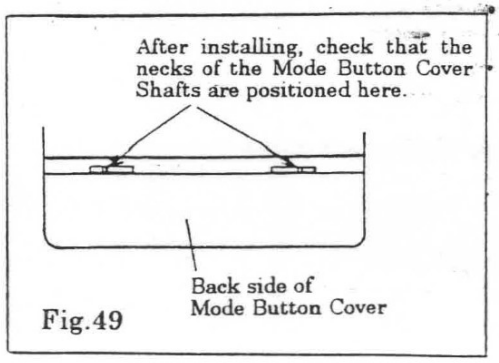


Fig.49

[Reassembly of Multi Module Unit]

1) Stick the Module Insulation Sheet (2DC10900) on the Multi Module Unit (2DA24000).
2) Stick the D. Moquettes (5) (2DC12700) × 2 and D. Moquettes (6) (2DC12800) × 2.
3) Solder the Mode FPC (2DC12400) to the Multi Module Unit at six points.

   Note :

   - Do not solder the first to third soldering lands from the left on the Multi Module Unit, since they are free lands.
4) Solder the Body Connect FPC of the Date Contact Holder Ass'y (2DCA2200) to the Multi Module Unit at 11 points.
5) Solder the Green lead wire coming from the Date Contact Holder Ass'y to the land on the Mode FPC.

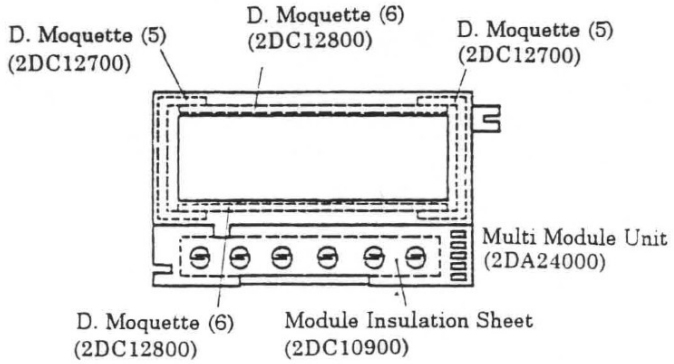


Fig.50

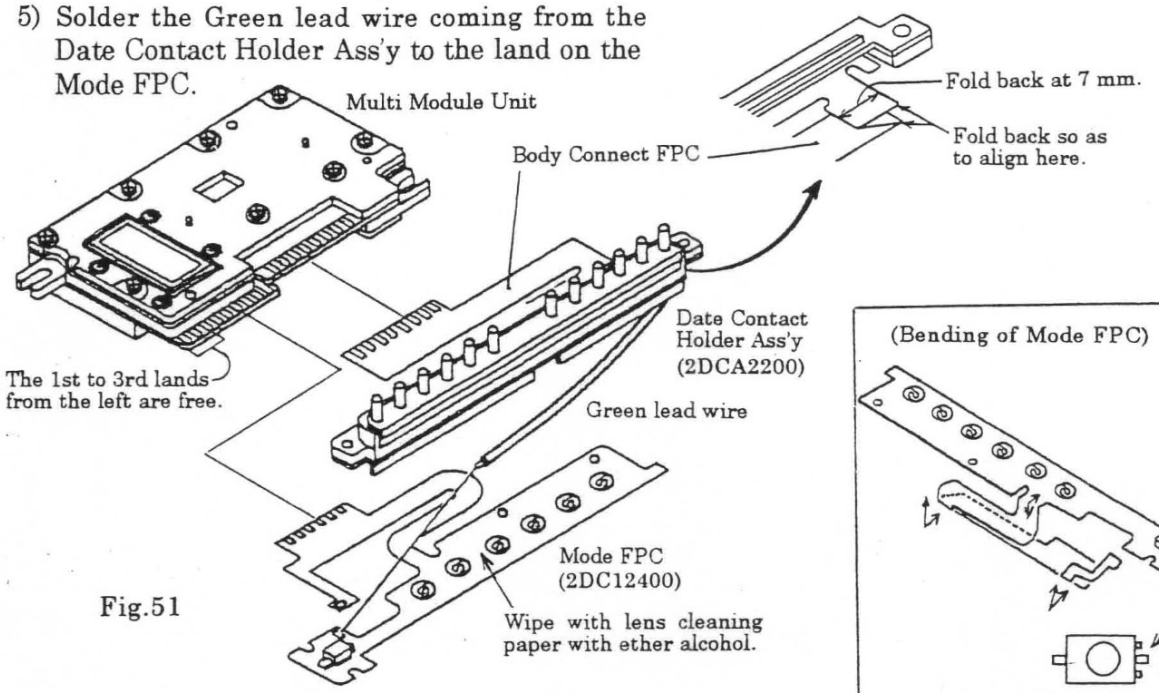


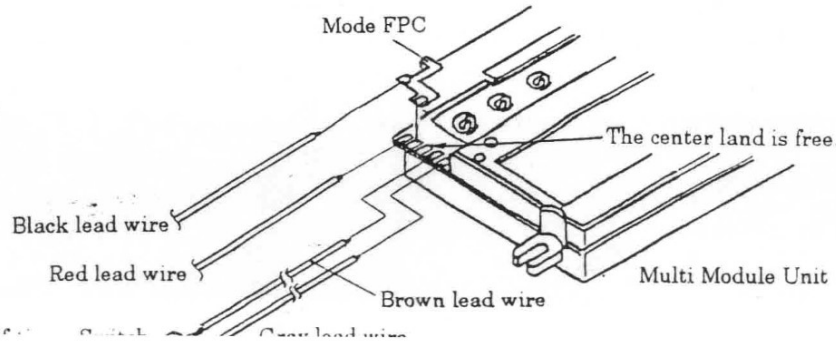
Fig.51

Fig.52

6) Solder the Black lead wire to the land on the Mode FPC.
7) Solder the Mode FPC to the Multi Module Unit at one point.
8) Solder the Red lead wire to the land on the Mode FPC.
9) Solder the Brown and Gray lead wires coming from the Self-timer Switch (3AQ54200) to the Multi Module Unit at one point.

   Note :

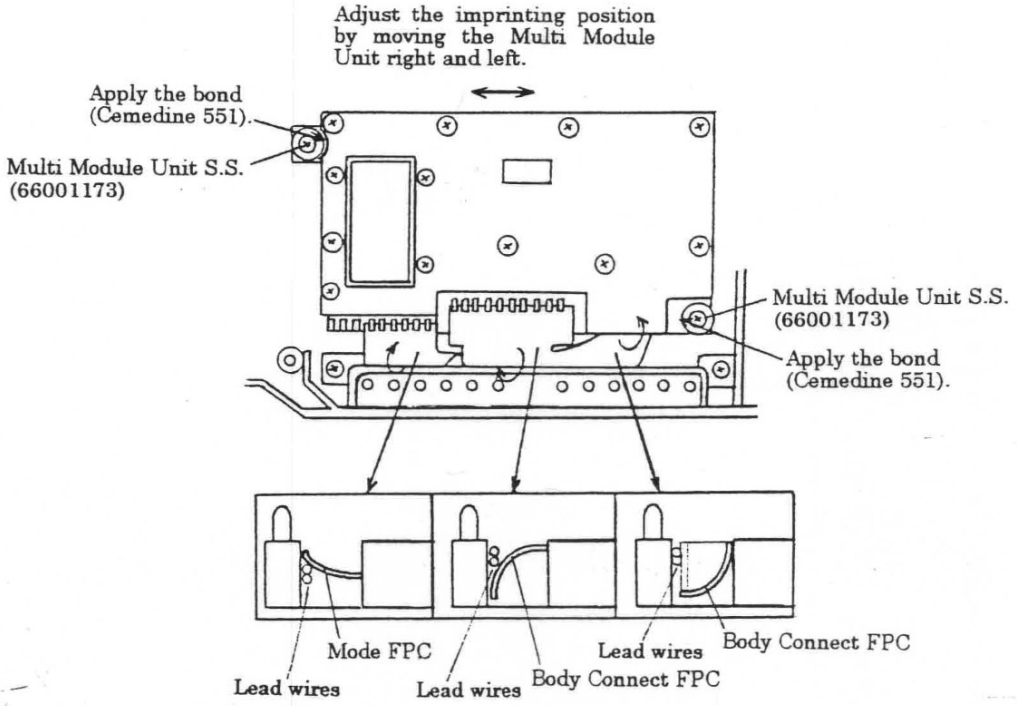
   - Do not solder the center soldering land on the Multi Module Unit, since it is a free land.



[Installation of Multi Module Unit on Back Cover Grip (D)]

(See Fig. 42)

1) Set the Mode Button (2DA22110) in the Back Cover Grip (D).
2) Wipe the pattern of the Mode FPC with lens cleaning paper with ether alcohol. (See Fig. 51)
   Install the Mode FPC and tighten the Mode FPC Setscrews (69113576)×4.
3) Install the Date Contact Holder Ass'y and tighten the Date Contact Holder Ass'y Setscrews (69115076)×2.
4) Dress the Mode FPC and Body Connect FPC as shown in Fig. 54.
5) Install the Multi Module Unit and tighten the Multi Module Unit Setscrews (66001173)×2 temporarily.
6) Using the positioning jig, adjust the imprinting position and then tighten up the Multi Module Unit Setscrews.
   Apply the bond (Cemedine 551) to the heads of the Multi Module Unit Setscrews.
7) Solder the Red and Brown lead wires to the Battery Contact in the Back Cover Grip (D).
   Note :
   - Take care not to cross the Red and Brown lead wires.
8) Install the Self-timer Switch and Self-timer Lever Ass'y (3AQA0400) and stick the D. Moquette (2) (2DC11600) between the Self-timer Lever Ass'y and the Multi Module Unit.
   Note :
   - Install the Self-timer Lever Ass'y so that its red mark is positioned up.



(Dressing of Mode FPC and Body Connect FPC)

Fig.54

No.	419-01-50-RA1AS01

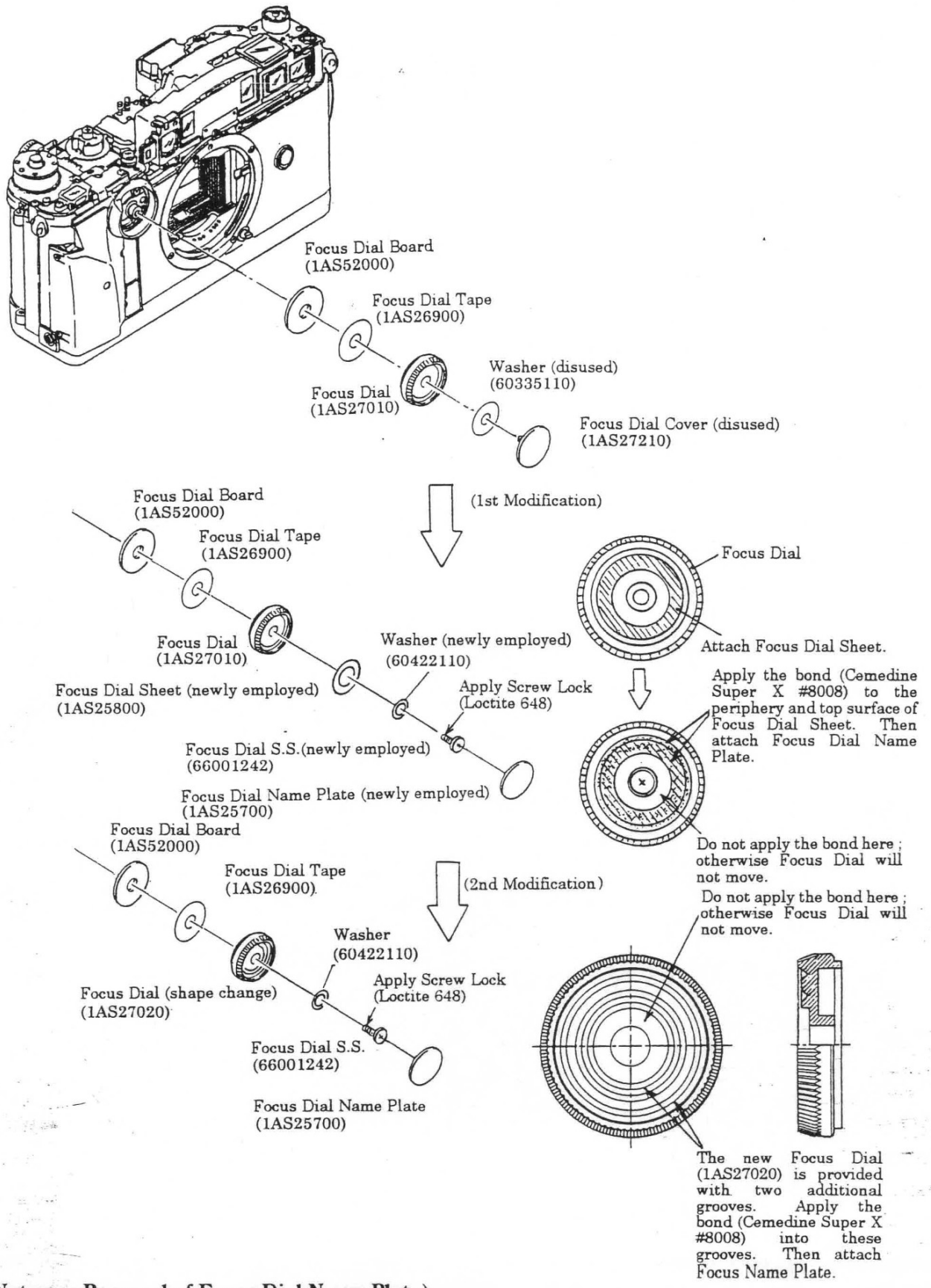
■ PARTS MODIFICATION LIST

[1] Modification of Focus Dial

In the course of production, parts related to the Focus Dial were modified to prevent the Focus Dial from coming off by accident and also to improve work efficiency.
Since there is no interchangeability, pay attention to the following points at replacement :

1st Modification	2nd Modification
Disused  Focus Dial Cover (1AS27210)	Shape change  Focus Dial (1AS27020)
Disused  Washer (60335110)	Disused  Focus Dial Sheet (1AS25800)
Newly employed  Focus Dial Name Plate (1AS25700)	
Newly employed  Focus Dial Sheet (1AS25800)	
Newly employed  Focus Dial S.S. (66001242)	
Newly employed  Washer (60422110)	

No.	419-01-50-RA1AS01



(Notes on Removal of Focus Dial Name Plate)

- The Focus Dial Name Plate (1AS25700) is fixed to the Focus Dial with the bond (Cemedine Super X #8008). Therefore, to remove the Focus Dial Name Plate, make a hole in an area of about ϕ 4 mm from the center, using a screwdriver or the like, and pry it.
- Do not use a holed Focus Dial Name Plate.

[2] Modification of Grip Tape

To improve work efficiency, use of one piece of Grip Tape (1AS29410) has been changed to use of two pieces of tape, namely, Grip Tape (1AS29430) and Grip Auxiliary Tape (1AS29900).

* The old Grip Tape (1AS29410) will not be supplied. Give an order for the Grip Tape (1AS29430) and Grip Auxiliary Tape (1AS29900).

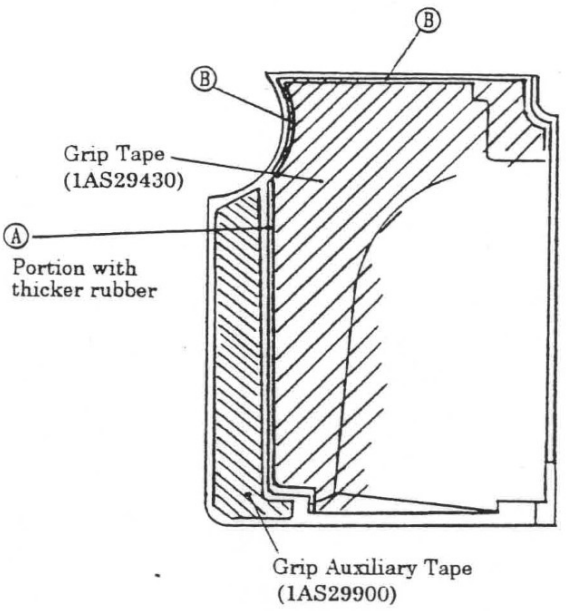
Old Grip Tape (1AS29410) → Grip Tape (1AS29430)

Old Grip Tape (1AS29410) → Grip Auxiliary Tape (1AS29900)

Notes :

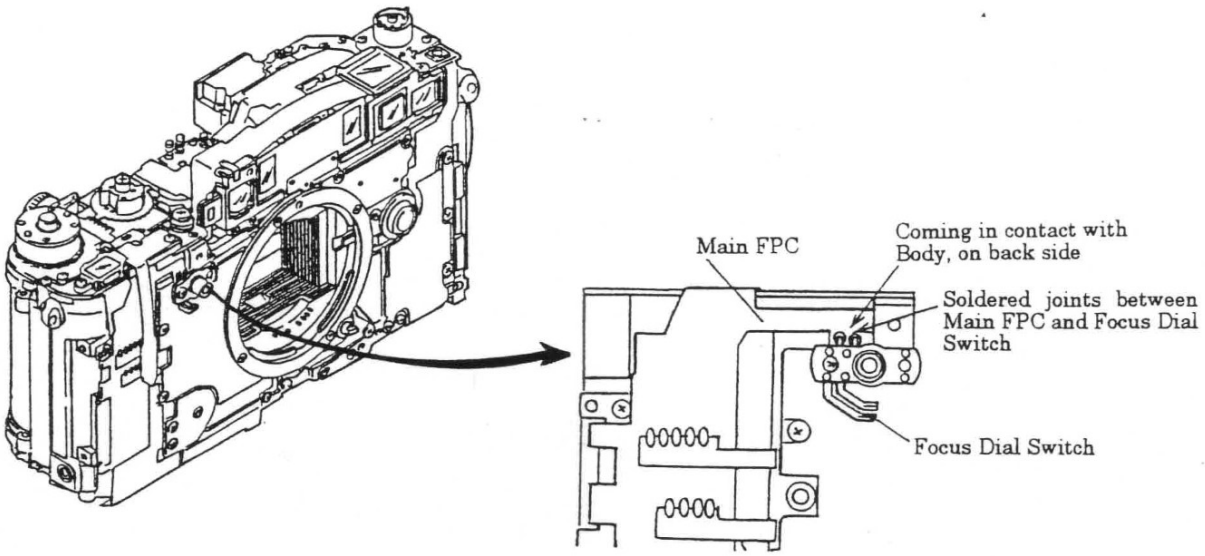
- Attach the Grip Tape (1AS29430) and Grip Auxiliary Tape (1AS29900) so that they do not protrude from the periphery of the Grip Cover (1AS29320).
- Attach the Grip Tape with the straight and round edges of Ⓐ and Ⓑ as the datum lines.
- Stick the Grip Tape and Grip Auxiliary Tape so that they do not float.

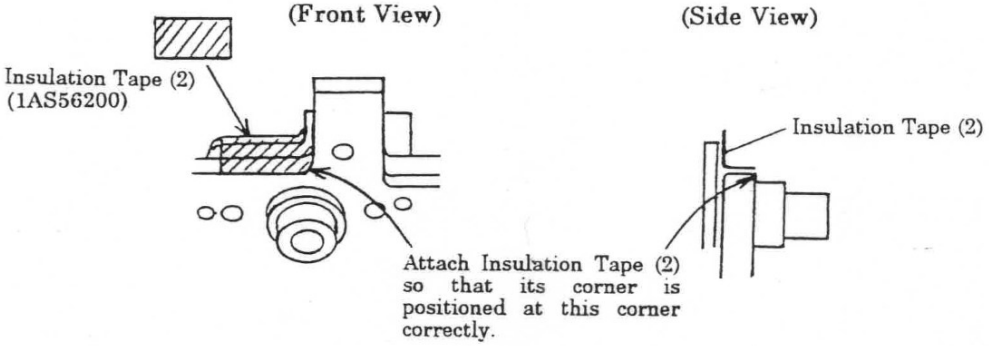
(Inside View of Grip Cover)



[3] Addition of Insulation Tape (2)

There was a possibility of the soldered joints between the Main FPC and the Focus Dial Switch coming in contact with the Body and causing a malfunction of the Focus Dial. To prevent such a trouble, the Insulation Tape (2) (1AS56200) has been added as shown below.





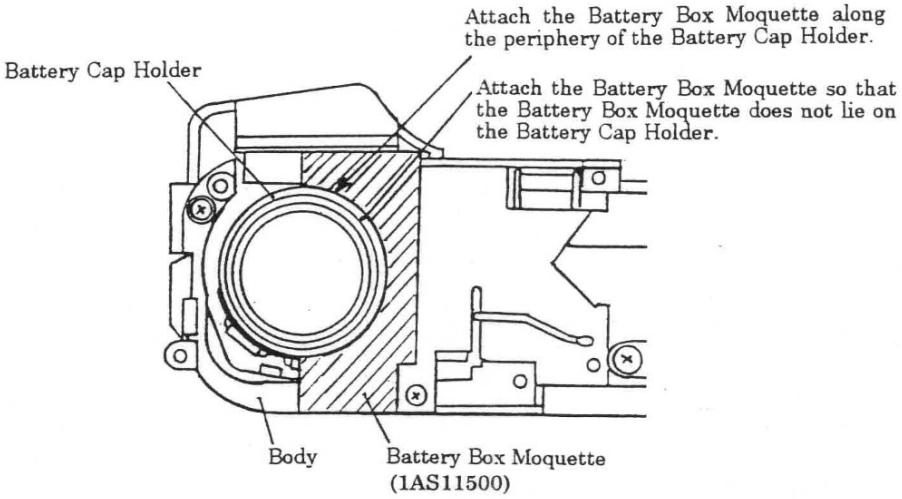
No.	419-01-50-RA1AS01

[4] Addition of Battery Box Moquette

There was a case where light leaked through the joint between the Bottom Cover and the Battery Cap Holder. To prevent this trouble, the Battery Box Moquette (1AS11500) has been added.

Notes :

- Attach the Battery Box Moquette along the periphery of the Battery Cap Holder.
- Attach the Battery Box Moquette so that the Battery Box Moquette does not lie on the Battery Cap Holder.

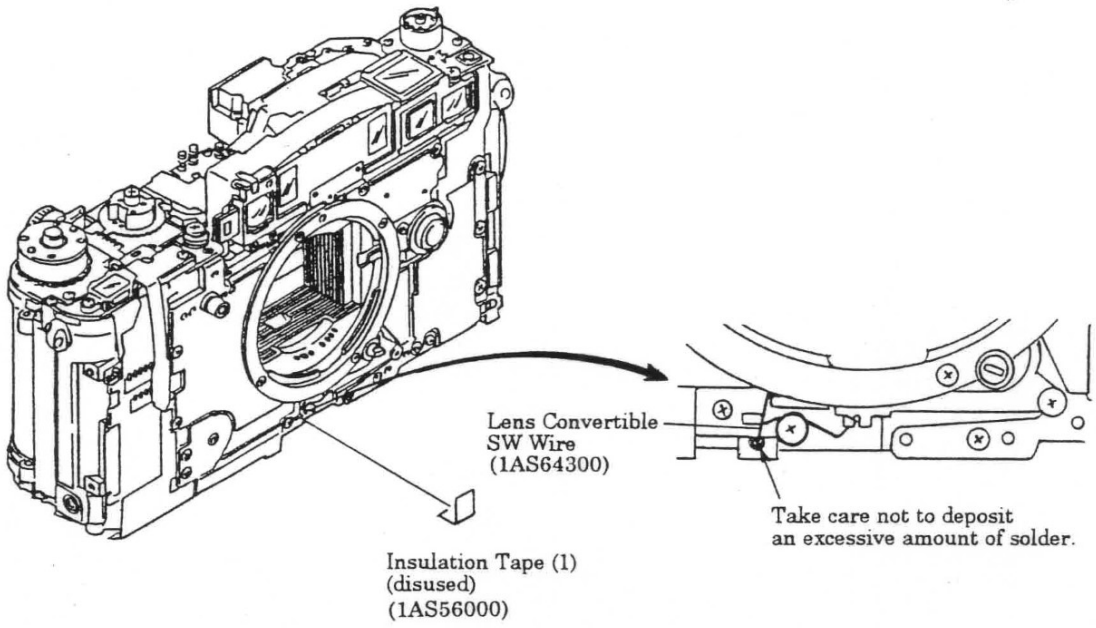


[5] Disuse of Insulation Tape (1)

For the purpose of cost reduction, the Insulation Tape (1) (1AS56000) was disused.

Note :

- When soldering the Lens Convertible SW Wire (1AS64300) to the Main FPC, take care not to deposit an excessive amount of solder.



[6] Change of Part Numbers in Assembling Chart

The following part numbers have been changed to maintain the specified performance of the camera. Please correct the Assembling Chart.

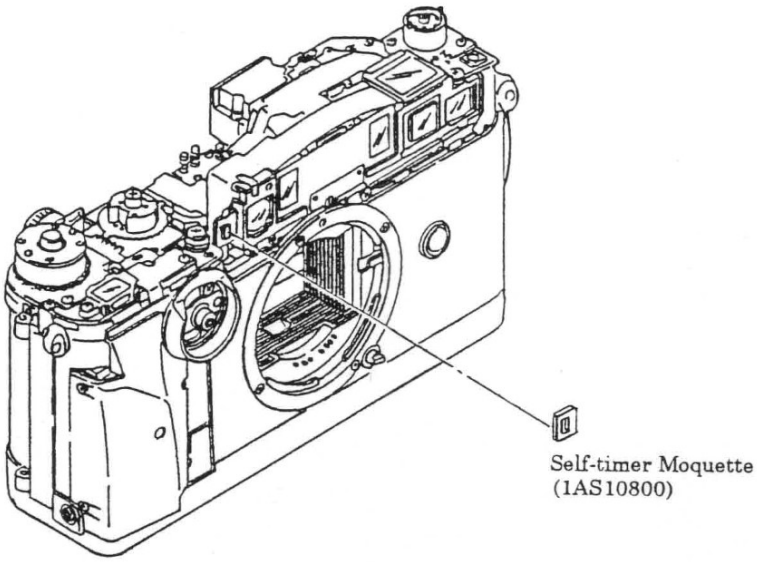
Part Name	Part Number	New Part Number	Page of Chart	Item No. in Chart
D. DIAL SCREW	1AS22520	1AS22530	1	6
BACK COVER LOCK ASS'Y S.S	63913026	61913026	2	47
MAIN FPC ASS'Y S.S	66001142	66001152	2	49
MAIN FPC ASS'Y S.S	61913022	66001081	2	63
RW FORK S.S (*1)	66001275	66001233	3	4
WINDING BASE PLATE ASS'Y	1ASG0000	1ASC0100	3	17
FILM CHECK WINDOW MOQUETTE	1AQ17300	1AS17800	6	39
BACK COVER GRIP S.S	69113079	69113076	6	47
BACK COVER ROLLER (1)	1AA16310	1AS16000	6	48
D. MOQUETTE (3)	2DC11600	2DC11620	7	8
FILM CHECK WINDOW MOQUETTE	1AQ17300	1AS17800	7	36

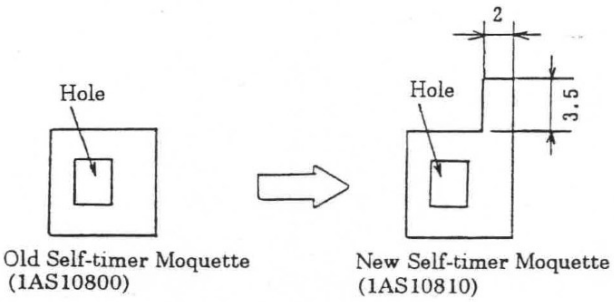
*1 : Loctite has been applied to the thread of the RW Fork Setscrew (66001233). Once the RW Fork Setscrew is removed, replace it with a new one.

No.	419-01-50-RA1AS01

[7] Modification of Shape of Self-timer Moquette

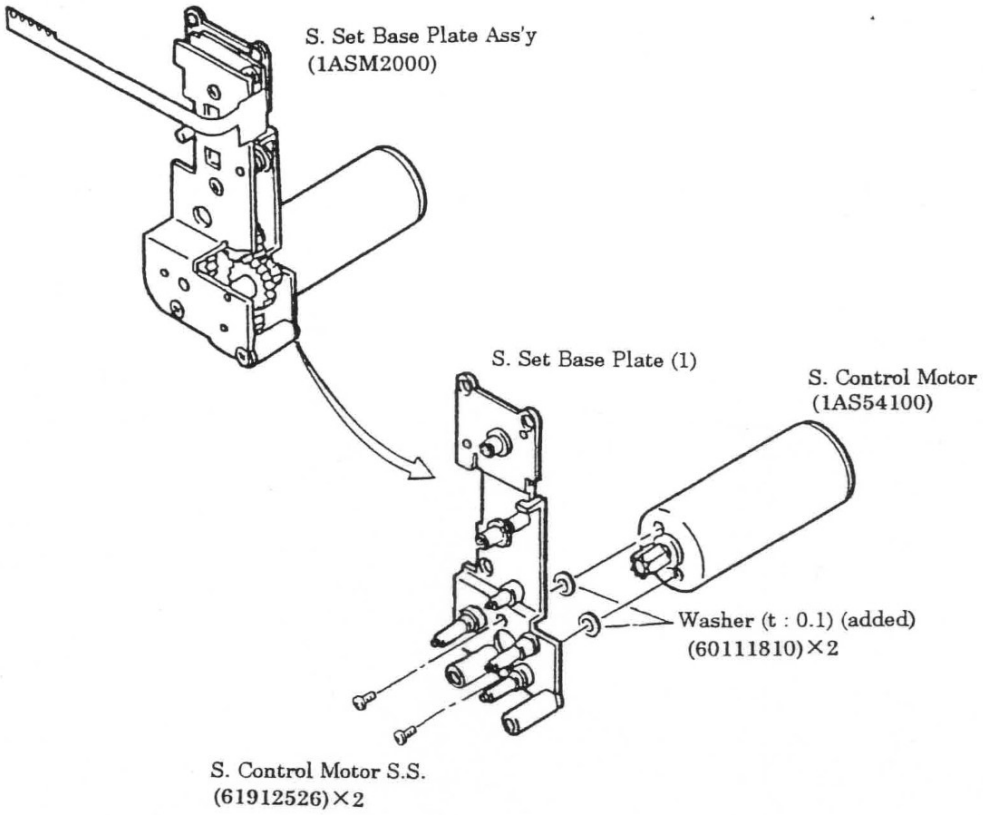
For easier assembly work and to prevent shading in the Self-timer Window, the shape of the Self-timer Moquette and its material were changed.





[8] Prevention of Inclination of S. Control Motor

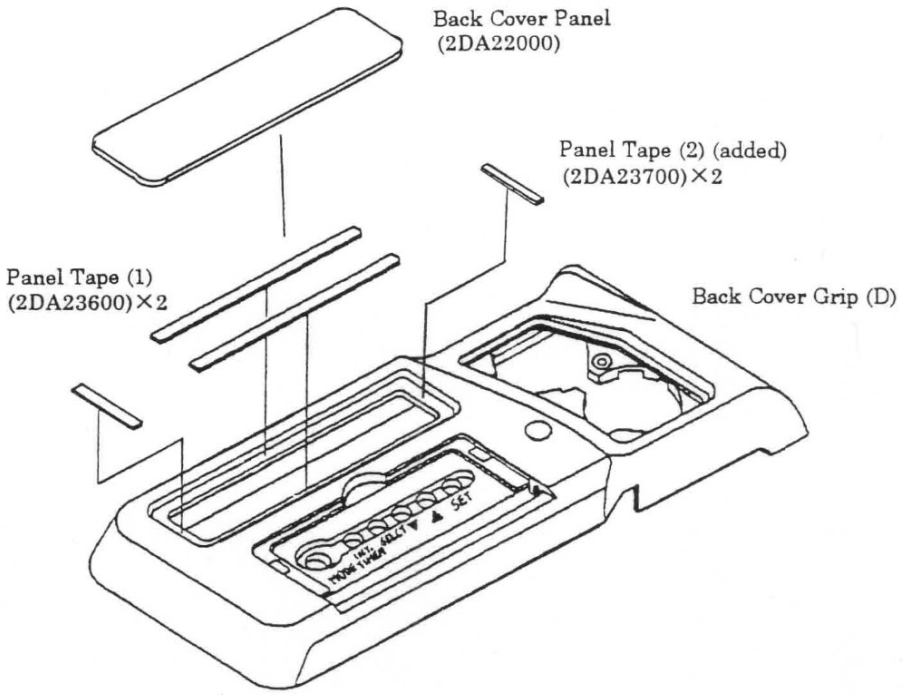
To prevent the inclination of the S. Control Motor, round flat washers (66111810)×2 (t : 0.1) were added at the screw holes between the S. Set Base Plate (1) and the S. Control Motor (1AS54100).



No.	419-01-50-RA1AS01

[9] Addition of Panel Tape (2)

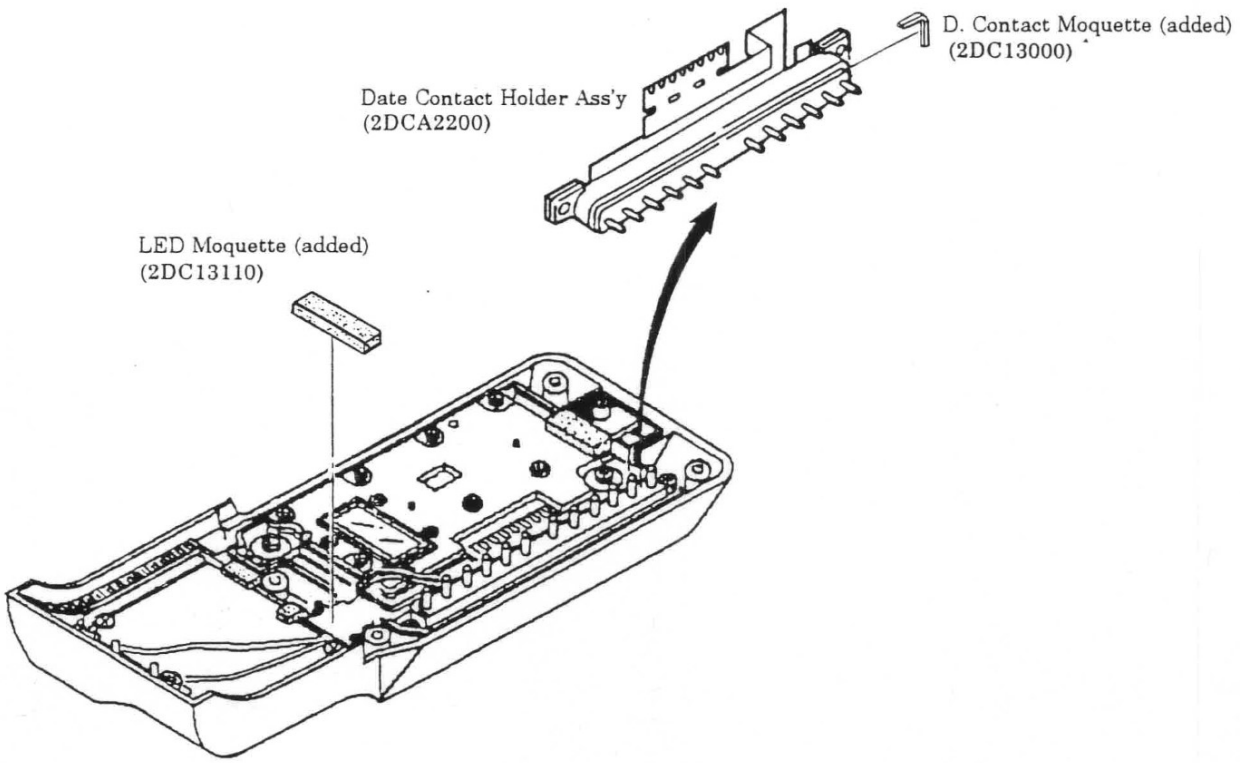
There was a possibility of dust or dirt entering the inside of the Back Cover Panel of the Data Back Ass'y. To prevent such a trouble, the Panel Tape (2) (2DA23700)×2 have been added as a part for fixing the Back Cover Panel (2DA22000).



No.	419-01-50-RA1AS01

[10] Addition of D. Contact Moquette and LED Moquette

To prevent light leakage into the Data Back Ass'y, the D. Contact Moquette (2DC13000) and LED Moquette (2DC13110) have been added.



C. ADJUSTMENT PROCEDURES, ETC.

C-1. ADJUSTMENT OF FLANGE BACK DISTANCE

C-1-1. Adjustment of Flange Back Distance

Install the Inspecting Jig on the Body Mount and measure the rail height.
① Distance from the Body Mount surface to the film rail surface:

28.95 ± 0.02 mm

For the adjustment, insert appropriate washers between the Body Mount and the Mount Base.

Adjusting washers : t 0.05 (12866600), t 0.02 mm (12866700)

② Level difference between the film rail surface and the pressure plate rail surface:

0.2 ± 0.02 mm

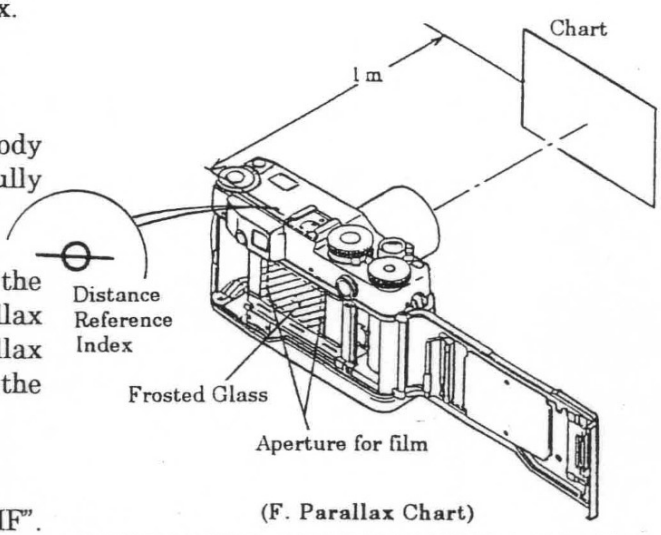
C-2. CHECK AND ADJUSTMENT OF VIEWFINDER PARALLAX

C-2-1. Check of Viewfinder Parallax

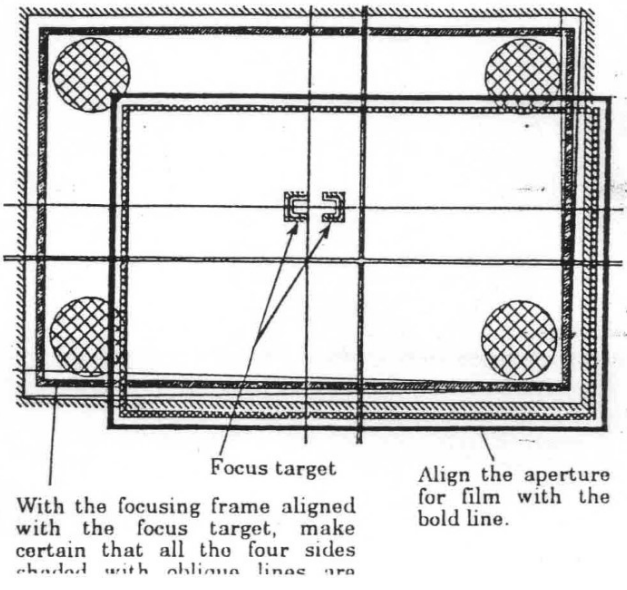
Note:

- Once the Viewfinder Ass'y (1ASF0000) has been removed, check the viewfinder parallax.

1) Fix the F. Parallax Chart on a wall.
2) Fix the frosted glass to the film rail surface.
3) Set the lens "Sonnar 90 mm, F 2.8" on the Body Mount and set the aperture for the lens to "fully open" (F 2.8).
4) Mount the camera on the tripod.
5) Set the tripod so that the optical axis of the camera is perpendicular to the F. Parallax Chart and the distance from the F. Parallax Chart to the Distance Reference Index of the camera is 1 m.
6) Set the Shutter Dial of the camera to "B".
7) Turn ON the Main Switch.
8) Set the Focus Mode Selector Dial to "MF". Then turn the Focus Dial so that the Main LCD shows a distance of "1 m".
9) Open the shutter by pressing the Shutter Release Button. In this state, while looking at the frosted glass, align the aperture for the film with the black bold line of the F. Parallax Chart.
10) Release the Shutter Release Button.
11) Turn the Focus Dial so that the Main LCD shows a distance of "InF" (∞).
12) Look in the viewfinder and align the focusing frame at the center of the viewfinder with the focus target of the F. Parallax Chart. And make certain that all the four sides shaded with oblique lines are seen within the field-of-view frame.



(F. Parallax Chart)



C-2-2. Adjustment of Viewfinder Parallax

Notes :

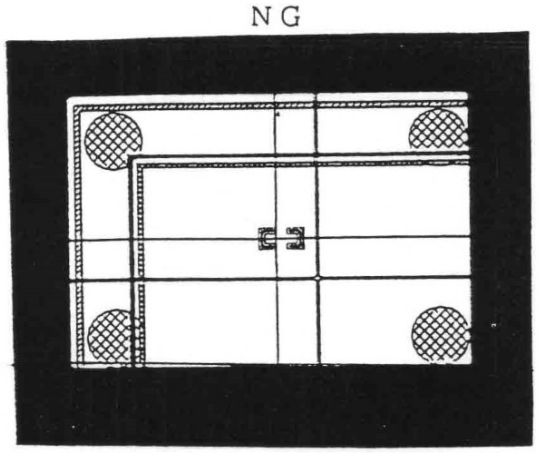
- If the result of the check at C-2-1 is not acceptable, adjust the viewfinder parallax.
- When the Viewfinder Ass'y (1ASF0000) has been replaced, adjust the viewfinder parallax.
- Make this adjustment with the Top Cover Ass'y removed.
- In adjusting the viewfinder parallax, there may be a case where the focus target is seen at an upper or lower position or the right or left shoulder of the field-of-view frame is seen higher than the other shoulder. In such a case, make the adjustment of C-2-3 and then make the adjustment of C-2-2 again.

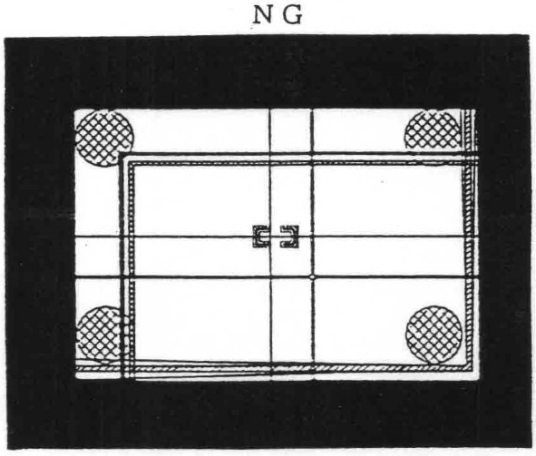
1) Fix the F. Parallax Chart on a wall.
2) Cause a short circuit by a bridge with solder on the pattern of the Main FPC. (See Fig. 2)
3) Fix the frosted glass to the film rail surface.
4) Set the lens "Sonnar 90 mm, F 2.8" on the Body Mount and set the aperture for the lens to "fully open" (F 2.8).
5) Mount the camera on the tripod.
6) Set the tripod so that the optical axis of the camera is perpendicular to the F. Parallax Chart and the distance from the F. Parallax Chart to the Distance Reference Index of the camera is 1 m.
7) Set the Shutter Dial of the camera to "B".
8) Set the Focus Mode Selector Dial to "MF". Then turn the Focus Dial so that the Main LCD shows a distance of "1 m".
9) Open the shutter by pressing the Shutter Release Switch. In this state, while looking at the frosted glass, align the aperture for the film with the black bold line of the F. Parallax Chart.
10) Release the Shutter Release Switch.
11) Turn the Focus Dial so that the Main LCD shows a distance of "InF" (∞).
12) Look in the viewfinder and align the focusing frame at the center of the viewfinder with the focus target of the F. Parallax Chart. And by moving the Mirror Adjustment Plate, make adjustment so that all the four sides shaded with oblique lines are seen within the field-of-view frame and also seen perpendicular and in parallel.
13) Fix the Mirror Adjustment Plate by applying the bond (Cemedine 551).

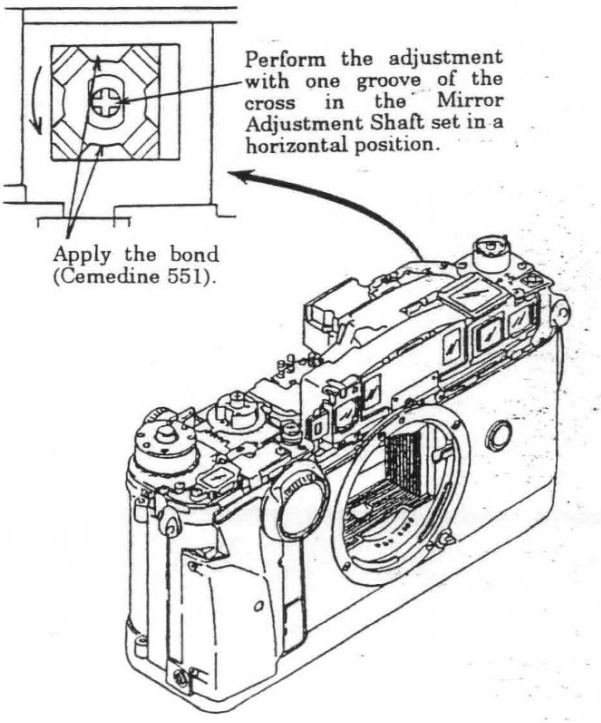
    Note :

    - Perform the adjustment with one groove of the cross in the Mirror Adjustment Shaft set in a horizontal position. Especially, never perform the adjustment with the cross turned counterclockwise (in the direction of the arrow).

14) Remove the bridge with solder on the pattern of the Main FPC. (See Fig. 2)







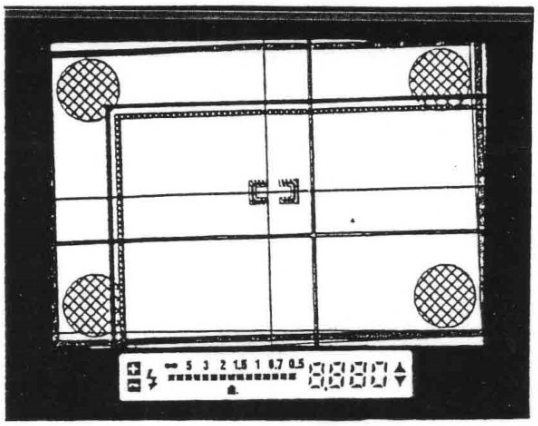
C-2-3. Level Adjustment of Viewfinder Parallax

1) Follow steps 1) to 10) of C-2-2.
2) Look in the viewfinder and make the adjustment by inserting a washer under one of the Viewfinder Ass'y Setscrews depending on the following problem ① or ②: (See the figure below)
   ① When the field-of-view frame is in a horizontal position, the focusing frame at the center of the viewfinder is positioned above the focus target of the F. Parallax Chart. Or when the focusing frame is aligned with the focus target, the right shoulder of the field-of-view frame is seen higher than the left shoulder.
   ——→ Make the adjustment by inserting the Washer Ⓐ under the Viewfinder Ass'y Setscrew beside the Viewfinder Mirror.
   ② When the field-of-view frame is in a horizontal position, the focusing frame at the center of the viewfinder is positioned below the focus target of the F. Parallax Chart. Or when the focusing frame is aligned with the focus target, the left shoulder of the field-of-view frame is seen higher than the right shoulder.
   ——→ Make the adjustment by inserting the Washer Ⓑ under the Viewfinder Ass'y Setscrew beside the Light Emitter Lens.

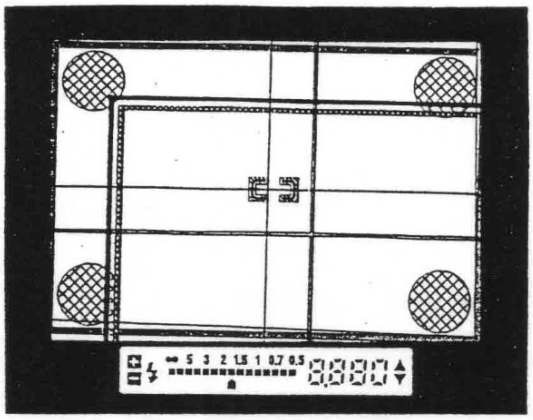
   Notes :
   - Make the adjustment by selecting an appropriate one among the three washers listed below.
   - Do not use any washer exceeding 0.3 mm in thickness.

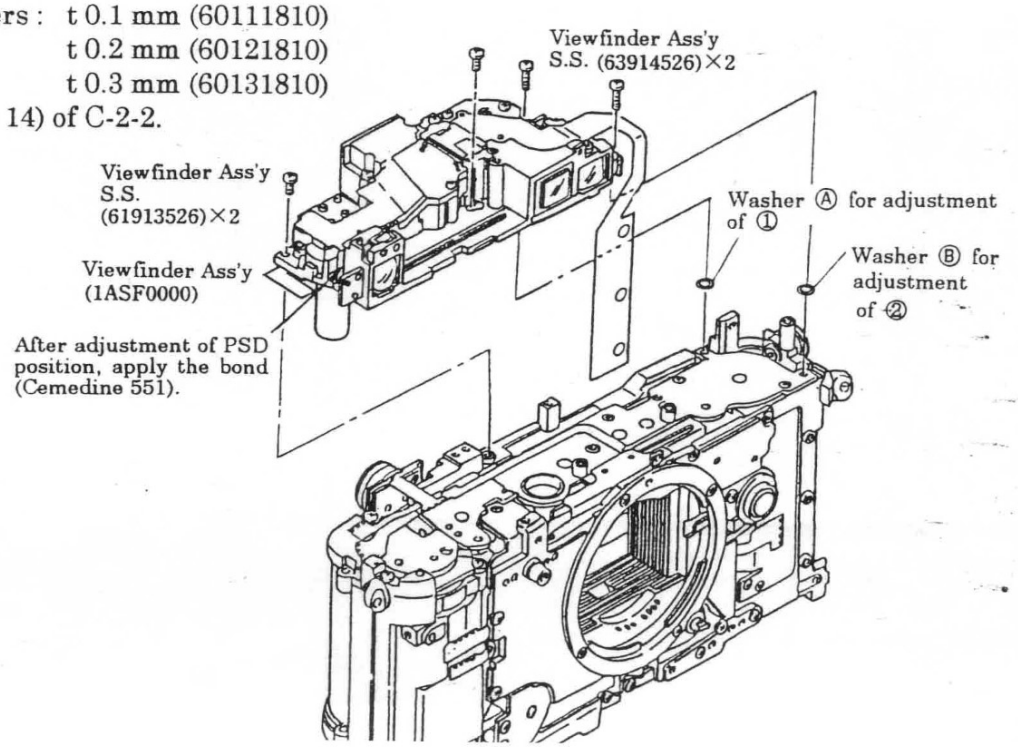
   Adjusting washers : t 0.1 mm (60111810)
   t 0.2 mm (60121810)
   t 0.3 mm (60131810)
3) Follow steps 11) to 14) of C-2-2.

①Focusing frame above target or right shoulder higher



② Focusing frame below target or left shoulder higher





C-3. ADJUSTMENT OF PSD POSITION

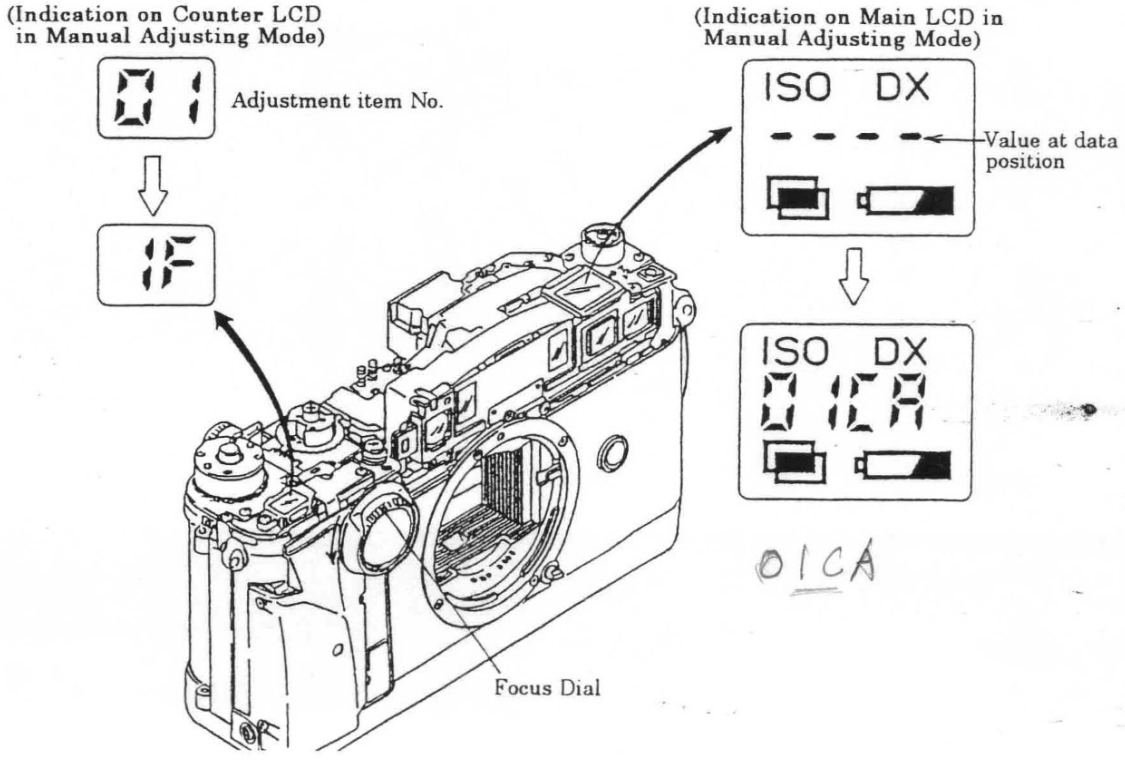
C-3-1. Adjustment of PSD Position (Adjustment of Active AF Position)

Notes :

- When the Viewfinder Ass'y (1ASF0000) has been replaced, make the adjustment of PSD position.
- Make this adjustment with the Focus Dial installed.
- Make this adjustment with the Top Cover Ass'y removed.

1) Fix the standard reflector paper (gray chart with a reflectivity of 18 %) on a wall.
2) Cause a short circuit by a bridge with solder on the pattern of the Main FPC. (See Fig. 2)
3) Set the camera in the manual adjusting mode. (See page C-8)
   ① Open the Back Cover.
   ② Press the Manual Rewind Button and within two seconds while keeping it pressed, press the Shutter Release Switch and hold it down for more than one second. (Press the Shutter Release Switch all the way.)

   At the setting of the manual adjusting mode, all the indications will light up on the Main LCD and "01" will blink on the Exposure Counter LCD.
4) Mount the camera on the tripod.
5) Set the tripod so that the optical axis of the camera is perpendicular to the standard reflector paper and the distance from the standard reflector paper to the Distance Reference Index of the camera is 1 m.
6) Turn the Focus Dial of the Camera Body counterclockwise (in the direction of the arrow) so that the indication on the Exposure Counter LCD changes as "01"→"1F".
7) By changing the PSD position, make the adjustment so that the value at the data position on the Main LCD will be within the following range :
   "1C0" ..... "1C8" "1C9" "1CA" "1CB" "1CC" ..... "1D4" When Viewfinder Replaced
   (Central value)
8) Fix the PSD by applying the bond (Cemedine 551). (See page C-4)
9) Remove the bridge with solder on the pattern of the Main FPC. (See Fig. 2)



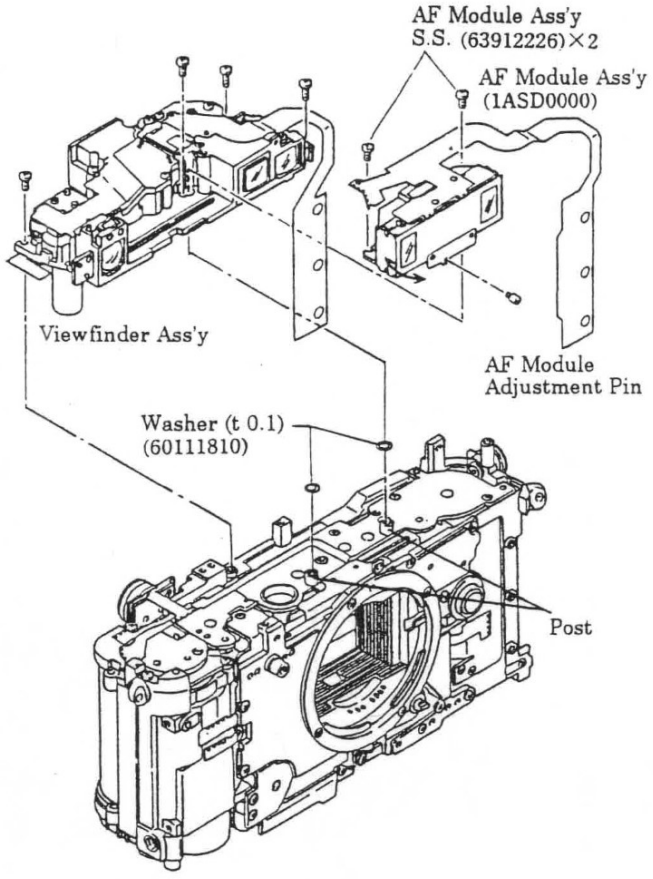
C-4. ADJUSTMENT OF PASSIVE AF PARALLAX

C-4-1. Adjustment of Passive AF Parallax (Adjustment of AF Module Ass'y Position)

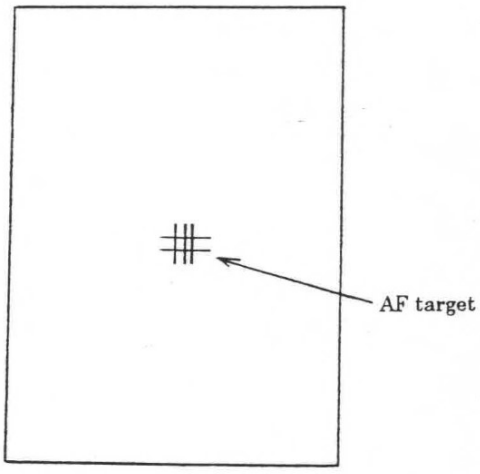
Notes :

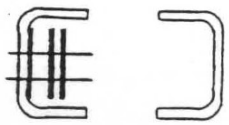
- Make this adjustment to prevent the misalignment between the focusing frame in the viewfinder and the zone subjected to auto focusing by the AF Module.
- Make this adjustment when the AF Module Ass'y or Viewfinder Ass'y has been removed or replaced.
- Check the adjustment result by installing the Top Cover Ass'y temporarily.
- Two washers (t 0.1)(60111810) are fixed to the AF Module Ass'y mounting posts with the bond (Cemedine 551) as a temporary measure to adjust the vertical position of the AF Module Ass'y. Take care not to lose the washers.

1) Fix the F. AF Parallax Chart on a wall.
2) Set the lens "Planar 45 mm, F 2" on the Body Mount.
3) Mount the camera on the tripod.
4) Set the tripod so that the optical axis of the camera is perpendicular to the F. AF Parallax Chart and the distance from the F. AF Parallax Chart to the Distance Reference Index of the camera is 1 m.
5) Set the Focus Mode Selector Dial to "MF" (manual focusing).
6) Turn ON the Main Switch.
   (Adjustment of Lateral Position)
7) Look in the viewfinder and direct the camera so that the left outside line of the AF target at the center of the F. AF Parallax Chart is aligned with the left end of the focusing frame.
   Then make certain that the focus display in the viewfinder is not showing "AF impossible" indicator.
8) Look in the viewfinder and direct the camera so that the right outside line of the AF target at the center of the F. AF Parallax Chart is aligned with the right end of the focusing frame.
   Then make certain that the focus display in the viewfinder is not showing "AF impossible" indicator.
9) If the focus display is showing "AF impossible" indicator at 7) or 8), remove the Top Cover Ass'y and loosen the AF Module Ass'y Setscrews (63912226)×2. And make the adjustment by moving the left side of the AF Module Ass'y (1ASD0000) so that "AF impossible" indication will not appear under the above-mentioned conditions.
10) Tighten the AF Module Ass'y Setscrews.

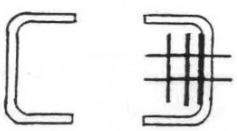


(F. AF Parallax Chart)





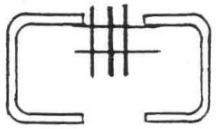
Adjust so that "AF impossible" indication will not appear when the left outside line of the AF target is aligned with the left end of the focusing frame.



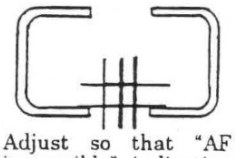
Adjust so that "AF impossible" indication will not appear when the right outside line of the AF target is aligned with the right end of the focusing frame.

(Adjustment of Vertical Position)

11) Look in the viewfinder and direct the camera so that the upper horizontal line of the AF target at the center of the F. AF Parallax Chart is in contact with the top end of the focusing frame.
Then make certain that the focus display in the viewfinder is not showing "AF impossible" indicator.
12) Look in the viewfinder and direct the camera so that the lower horizontal line of the AF target at the center of the F. AF Parallax Chart is in contact with the bottom end of the focusing frame.
Then make certain that the focus display in the viewfinder is not showing "AF impossible" indicator.
13) If the focus display is showing "AF impossible" indicator at 11) or 12), remove the Top Cover Ass'y. And make the adjustment by turning the AF Module Adjustment Pin so that "AF impossible" indication will not appear under the above-mentioned conditions.
14) Fix the AF Module Ass'y Setscrews and AF Module Adjustment Pin by applying the bond (Cemedine 551).

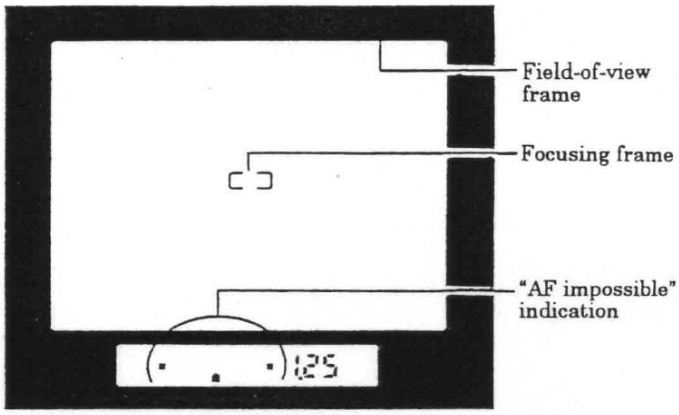


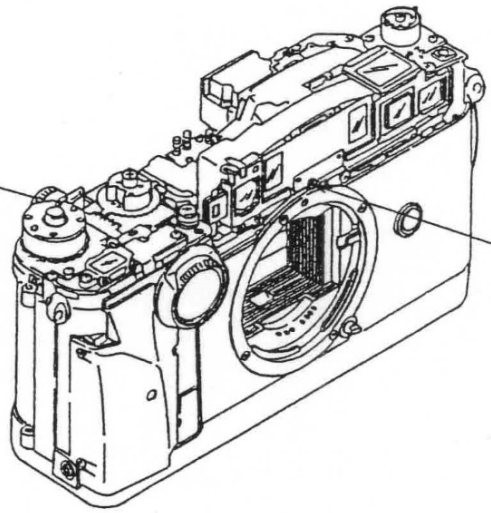
Adjust so that "AF impossible" indication will not appear when the upper horizontal line of the AF target is in the uppermost position within the focusing frame.



Adjust so that "AF impossible" indication will not appear when the lower horizontal line of the AF target is in the lowermost position within the focusing frame.

(Viewfinder Display)

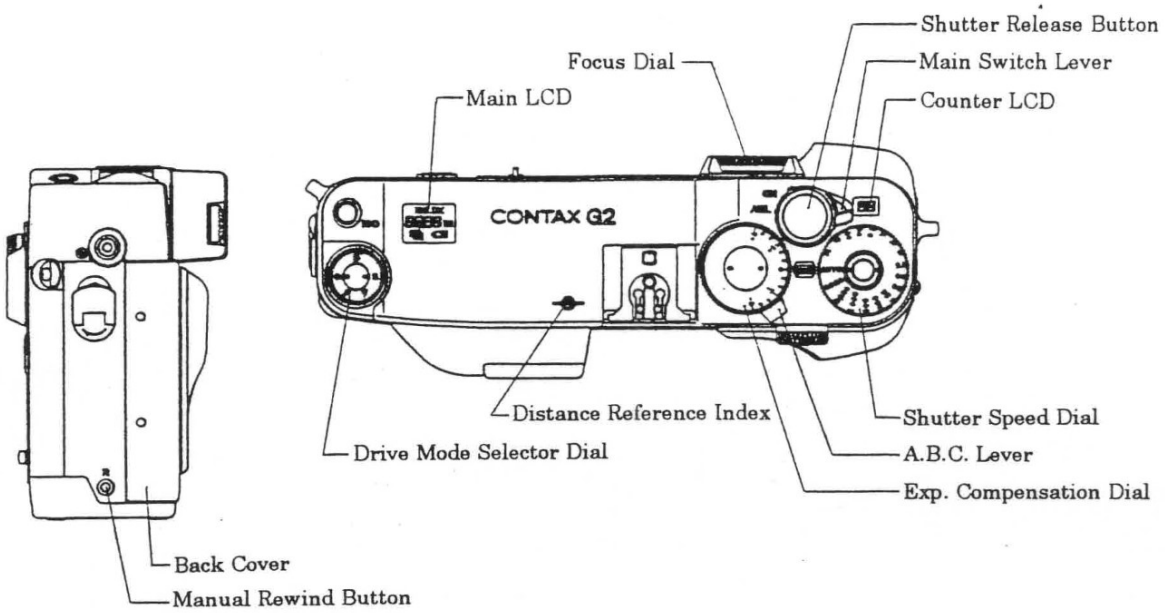




C-5. ADJUSTMENTS OF COMPENSATION VALUES (MANUAL ADJUSTMENTS)

* This camera permits the adjustments of compensation values (adjusted values) by its manual operation only. Therefore, adjustments can be made without communication with any special adjusting tools.

C-5-1. Manual Adjustments and Data Change



<Outline of Manual Adjusting Mode>

The following functions are available in manual adjusting mode:

- Checking and change of memory data (adjusted values) of camera
- Display of data necessary for adjustment of light metering values, distance measuring values and voltage values for the dial resistor
- Checking of shots count

There are three modes for manual adjustments.
Adjusting Mode Ⅰ, Ⅱ or Ⅲ is selected according to the setting position of the A.B.C. Lever.

- ABC / OFF = **Adjusting Mode Ⅰ : Main adjusted values**
- ABC / ± 0.5 = Adjusting Mode Ⅱ : Particular data of lens
- ABC / ±1.0 = **Adjusting Mode Ⅲ : Fixed data and adjusted values (partially the same as Adjusting Mode Ⅰ)**

* In addition to data change, Adjusting Mode Ⅰ allows operations necessary for adjustments.
* In Adjusting Mode Ⅰ, release operation, display of a light metering value, display of a distance measuring value and voltage display of a dial setting position are available.
* Adjusting Modes Ⅱ and Ⅲ allow only the operations for data display and data change. Make all the necessary adjustments in Adjusting Mode Ⅰ.

Note :

- Never change the data displayed in Adjusting Mode Ⅱ.

<Operation Switches for Manual Adjustments>

- Main Switch
  OFF: Completion of manual adjustment. Same as Main Switch OFF in normal operation.
  ON : Mode for display and selection of an adjusted value and adjustment item No.
  AEL: Adjusted value change mode.

- A.B.C. Lever
  Use this lever to select an adjusting mode for manual adjustments.
  ABC / OFF = Adjusting Mode Ⅰ : Main adjusted values
  ABC / ± 0.5 = Adjusting Mode Ⅱ : Particular data of lens
  ABC / ±1.0 = Adjusting Mode Ⅲ : Fixed data and adjusted values

- Back Cover
  In combination with the Manual Rewind Button, Drive Mode Selector Dial and Shutter Release Button, use the Back Cover to set manual adjusting mode.
  Also at the "open → close" of the Back Cover, will complete to manual adjusting mode and returns to the normal operation mode.

- Manual Rewind Button
  In combination with the Back Cover, Drive Mode Selector Dial and Shutter Release Button, use the Manual Rewind Button to set manual adjusting mode.

- Drive Mode Selector Dial
  In combination with the Back Cover, Manual Rewind Button and Shutter Release Button, use the Drive Mode Selector Dial to set manual adjusting mode.

- Shutter Release Button
  In combination with the Back Cover and Manual Rewind Button, use the Shutter Release Button to set manual adjusting mode.
  Also use this button to store data in Adjusting Mode Ⅰ, Ⅱ or Ⅲ and to select a lens model in Adjusting Mode Ⅱ.

- Focus Dial
  Use the Focus Dial to change the adjusted value or adjustment item depending on the Main Switch position.
  This switch allows change of the adjustment item with the Main Switch is in the ON position.
  This switch allows change of the adjusted value with the Main Switch is in the AEL position.

* Clockwise turn as viewed from front will decrease the displayed value.
* Counterclockwise turn as viewed from front will increase the displayed value.

<Display of Adjusting Mode>

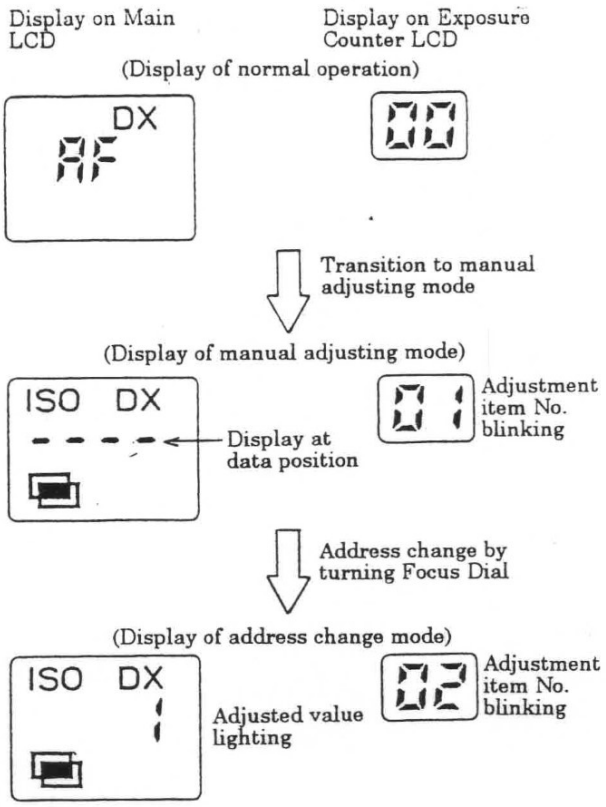
··The Main LCD and Exposure Counter LCD are used.

- Main LCD
  When the camera enters manual adjusting mode, all the characters on the Main LCD light up.
  A selected adjusted value is displayed at the indicator that displays a film speed or focusing distance in the normal operation. (See page C-10)

- Exposure Counter LCD
  This LCD displays the adjustment item No.
  The blinking value is to be changed by means of the Focus Dial. (See page C-10)

<How to Change Adjusted Value>

Change the data by the following procedure :
1. Set the manual adjusting mode.
2. Select an adjustment item for an adjusted value to be changed.
3. Change the adjusted value.
4. Store the adjusted value.
5. Complete manual adjusting mode.



1. How to Set Manual Adjusting Mode

Use the following operation switches to set manual adjusting mode :
Main Switch, Back Cover, Manual Rewind Button, Drive Mode Selector Dial, Shutter Release Button

1) Set the Main Switch to "ON".
   Note :
   - Even when the Main Switch is in the "AEL" position, you can set a manual adjusting mode. However, it is the data change mode. Be sure to set the Main Switch in the "ON" position beforehand when selecting a data item.
2) Set the Drive Mode Selector Dial to "S", "CL", "CH" or the self-timer mark.
   Note :
   - You can not set manual adjusting mode if the Drive Mode Selector Dial is in the position of multiple exposure mark (▣).
3) Open the Back Cover.
4) Press the Manual Rewind Button and within 2 seconds while keeping it pressed, press the Shutter Release Button all the way and hold it down for more than one second.
   At transition to manual adjusting mode, all the displays on the Main LCD light up.
   After setting of manual adjusting mode, release the Manual Rewind Button and Shutter Release Button.
   After that, the camera will be kept in manual adjusting mode unless the Main Switch is turned OFF or the Back Cover is closed.
   In this state, the "auto power OFF" function does not work.

2. Selection of Adjustment Item for Adjusted Value to be Changed (Address Change)

Use the following operation switches to select an adjustment item :
A.B.C. Lever, Focus Dial

1) Select Adjusting Mode Ⅰ by setting the A.B.C. Lever in the "ABC/OFF" position.
   The display on the Exposure Counter LCD blinks, displaying "01".
   The data display on the Main LCD becomes "– – – –".
   The number displayed on the Exposure Counter LCD represents the adjustment item No. The number at the data display position on the Main LCD represents the current adjusted value. The relationship between the adjustment item Nos. and the adjustment items is shown in the attached Data Ⅰ.
2) Select an adjustment item No. by turning the Focus Dial. When the adjustment item No. changes, the data on the Main LCD also changes to an adjusted value corresponding to the adjustment item.
   Reference :
   - The blinking display can be changed by turning the Focus Dial.
     In the case above, the adjustment item No. can be changed, since the counter display is blinking.

3. Change of Adjusted Value (Data Change)

Use the following switches to change an adjusted value :
Main Switch, Focus Dial

1) Set the adjusted value change mode by setting the Main Switch to "AEL".
   The counter changes from blinking to lighting up and the data display on the Main LCD changes from lighting up to blinking.
2) Change the data by turning the Focus Dial.
   Reference :
   - When an item for camera operation has been selected, the displayed data is not an adjusted value and thus it does not change.
3) Restore the mode for changing the adjustment item No. by changing the setting of the Main Switch as "AEL" → "ON".
   Note :
   - In this stage, the changed data is not stored in memory. Therefore, the changed data will be deleted if the Main Switch is turned OFF at this point.

4. Storage of Adjusted Value (Writing in EEPROM)

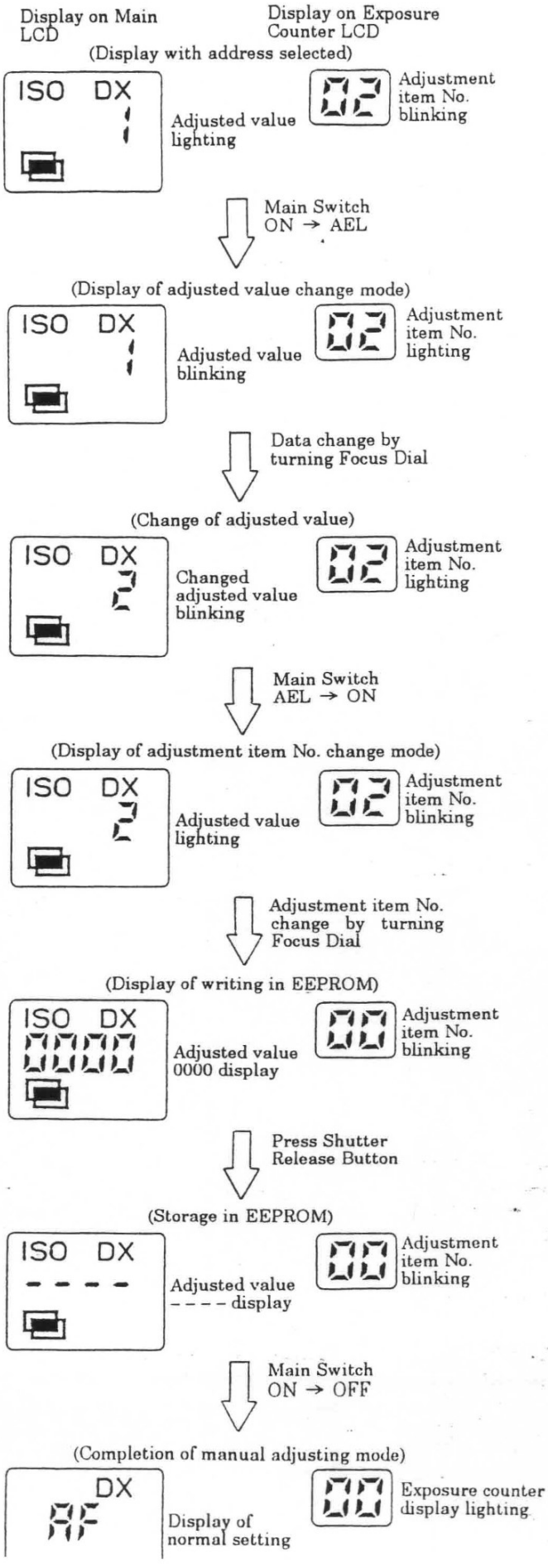
Use the following switches to store an adjusted value :
Focus Dial, Shutter Release Button

1) Set the adjustment item No. to "00" by turning the Focus Dial. "00" selects data storage operation.
   Note :
   - Take care, since the adjusted value can change if the operation of 3-3) has not been performed.

2) Store the data in memory by pressing the Shutter Release Button.
   Upon completion of data storage, the data display on the Main LCD changes to "- - - -".

5. Completion of Manual Adjusting Mode

Turn OFF the Main Switch or close the Back Cover to complete manual adjusting mode.



[CONTENTS OF ADJUSTMENT ITEMS]

Table of Adjusting Mode I Items [A.B.C. Switch : 0]

Item No. (Hex.)	Adjustment Name	Data Display External LCD	Main-ON State	Main-AEL State	Release Switch OFF→ON	Remarks
00	Storage of adjusted value	0000	Item change by Focus Dial		Write in ROM	
01	Free	- - - -	Item change by Focus Dial		No change	
02	Shutter time adjustment	Dec.	Item change by Focus-Dial	Data change by Focus-Dial	Normal shutter operation	
03	TTL Flash Auto adjustment	Dec.				Lv 8
04	TTL light exposure adjustment 1	Dec.				Lv 15
05	TTL light exposure adjustment 2	Dec.				Lv 8
06	External light exposure adjustment 1	Dec.				Lv 15
07	External light exposure adjustment 2	Dec.				
08	Shots counter (Inferior-order 4 digits)	Dec.				
09	Shots counter (Position of 10000)	Dec.				
0A	Error code	Hex.				
0B	Status information (Inferior-order byte)	Hex.				
0C	Status information (Superior-order byte)	Hex.				
0D	CPU version	Hex.				CPU1:CPU2
11	Shutter Dial A/D display	Dec.	Item change by Focus Dial		Ignored	Result display (continuous)
12	Compensation Dial A/D display	Dec.				
13	Drive Dial A/D display	Dec.				
14	Battery Check A/D display (with load)	Dec.				
15	Battery Check A/D display (without load)	Dec.				
16	Light metering value display (LVX) TTL	Dec.				
17	Light metering value display (LVX) External	Dec.				
18	Light metering value code (bv) TTL	Dec.				
19	Light metering value code (bv) External	Dec.				
1A	Display of AF phase difference data	Hex.				
1B	Display of lens model A/D	Dec.				
1C	Display of lens model No.	Dec.				
1D	Light metering temperature A/D display	Dec.				(Adjusted value 1 taken into account)
1E	AF temperature A/D display	Dec.				
1F	Active AF result display	Hex.				
20	Focal length A/D display	Dec.				
21	Back Cover ignor FG during adjustment	BIN	By Focus Dial Item change	Data change	Ignored	
6F	EEPROM1, All clear (00)	- - - -	Item change by Focus Dial		2SEC ON→Clear	All data

→ When a value expressed by a decimal notation(specified as "Dec." above) is a negative number, the sign "–" is displayed at the position of thousands (7-segment display at the left end).

Table of Adjusting Mode II Items (Main Items) [A.B.C. Switch : ±0.5]

Note: Do not change data.

Main Item No.	Name	EEPROM Address (Hex.)	Remarks
01	Bank 1	00 ~ 18	Not used
02	Bank 2	19 ~ 31	Hologon (16 mm, F 8.0)
03	Bank 3	32 ~ 4A	Not used
04	Bank 4	4B ~ 63	Not used
05	Bank 5	64 ~ 7C	Biogon (28 mm, F 2.8)
06	Bank 6	7D ~ 95	~~Not used~~ 35mm F2.0
07	Bank 7	96 ~ AE	Planar (45 mm, F 2.0)
08	Bank 8	AF ~ C7	Not used
09	Bank 9	C8 ~ E0	Sonnar (90 mm, F 2.8)
10	Bank 10	E1 ~ F9	C/Y Adapter
11	Bank 11	FA ~ FF	History

Table of Sub Items of Main Item Nos. 01 to 10]

Note: Do not change data.

Sub Item No.	Name	Symbol
00	Writing	
01	Information on light metering, auto focusing and AF drive	AESO, AES1, LM, AF, RLK, TLA
02	Light metering exposure compensation	AEj
03	Focal length of lens (inferior-order 8/10 bits)	Lf_L
04	Focal length of lens (superior-order 2/10 bits)	Lf_H
05	GI value (1)	GI1_L
06		GI1_H
07	GI value (2)	GI2_L
08		GI2_H
09	GI value (3)	GI3_L
10		GI3_H
11	GI value (4)	GI4_L
12		GI4_H
13	Temperature compensation coefficient for GI value	GIt
14	Focus limit	LMT
15	Backlash compensation (forward run side)	LB1
16	Backlash compensation (reverse run side)	LB2
17	Not used	-
18	Not used	-
19	Infinity adjustment resolution	IFr
20	Infinity position compensation	IFo
21	Nearest distance data	NL
22	Load coefficient	GD
23	Maximum number of stop-down steps	FRG
24	Open F value	FNO
25	Compensation value for lens TTL Flash Auto	STB
26	Value for return to initial position	PIP
27	Focus display resolution	FD (deflection per bar)
28	In-focus width	JFW
29	Adjusted value for spot light metering	AEsj
30	Adjusted value for braking timing	LBRKPL
31	Adjusted value for reset drive braking	
32	Not used (Spare)	
↓	↓	
48	Not used (Spare)	
49	00 (Confirmation code)	
50	01 (Confirmation code)	

No.	419-01-50-RA1AS01

Table of adjustment Mode Ⅲ Items [A.B.C. Switch : ±1.0]

Item No.	Data Stored in EEPROM	Remarks
00	Writing of adjusted value	
01	Shutter time adjustment	
02	TTL Flash Auto adjustment	Adjustment of TTL Flash Auto control time
03	TTL light exposure adjustment 1	Lv 8
04	TTL light exposure adjustment 2	Lv 15
05	External light exposure adjustment 1	Lv 8
06	External light exposure adjustment 2	Lv 15
07	Temperature adjustment 1	Temp. at adjust.: Output difference from standard IC
08	Temperature adjustment 2	Temp. output value at adjust. (Difference from 25°C)
09	AF temperature adjustment	Adjusted value for shift of temperature sensor for AF
10	Auto focusing parallax adjustment	
11	AF adjusted value 1	Difference of 0.5 m image interval from designed value
12	AF adjusted value 2	Difference of 1.0 m image interval from designed value
13	AF adjusted value 3	Difference of ~~2.0 m~~ image interval from designed value
14	AF adjusted value 4	Difference of 2.95m image interval from designed value
15	Adjusted value for contrast judgment 1	
16	Adjusted value for contrast judgment 2	
17	Adjusted value for contrast judgment 3	
18	Adjusted value for contrast judgment 4	
19	Adjusted value for AF distance measuring 1	For active AF (0.5 m)
20	Adjusted value for AF distance measuring 2	For active AF (1.0 m)
21	Adjusted value for AF distance measuring 3	For active AF (~~2.00 m~~)
22	Adjusted value for AF distance measuring 4	For active AF (2.95 m)
23	Battery adjusted value 1	Adjusted value of B2 level without load
24	Battery adjusted value 2	Adjusted value of B2 level with load
25	Battery adjusted value 3	Adjusted value of DB2 (B1-B2) without load
26	Battery adjusted value 4	Adjusted value of DB2 (B1-B2) with load
27	Battery adjusted value 5	Adjusted value of DB2 (B0-B1) without load
28	Battery adjusted value 6	Adjusted value of DB2 (B0-B1) with load
29	Shutter Dial adjusted value 1	[B] (Designed value : 1Ah)
30	Shutter Dial adjusted value 2	[1/30] (Designed value : 82h)
31	Shutter Dial adjusted value 3	[1/4000] (Designed value : DDh)
32	Not used	
33	Exp. Compensation Dial adjusted value 1	[+2] (Designed value : 20h)
34	Exp. Compensation Dial adjusted value 2	[0] (Designed value : 80h)
35	Exp. Compensation Dial adjusted value 3	[–2] (Designed value : E0h)
36	Not used	
37	Adjusted value of focal length resistance 1	28 mm side
38	Adjusted value of focal length resistance 2	60 mm side
39	Adjusted value of focal length resistance 3	90 mm side
40	Shutter delay adjusted value	Difference of delay in shutter first curtain magnet OFF from designed value
41	Lens drive adjusted value 1	Backlash value (forward run → reverse run)
42	Lens drive adjusted value 2	Backlash value (reverse run → forward run)
43	Charge adjusted value 1	Braking delay time
44	Charge adjusted value 2	Braking time
45	Parallax adjusted value	Number of pulses
46	Flange back adjusted value	1 LSB : 2^{-10} mm
47	Winding adjusted value 1	
48	Winding adjusted value 2	At AE lock
49	Adjusted value for AF temperature compensation coefficient	
50	Not used	
51	Not used	
52	Not used	
53	Auto adjustment internal data 1	Data controlled by Auto Adjusting Tool
54	Auto adjustment internal data 2	Data controlled by Auto Adjusting Tool
55	Auto adjustment internal data 3	Data controlled by Auto Adjusting Tool
56	Auto adjustment internal data 4	Data controlled by Auto Adjusting Tool
57	Auto adjustment internal data 5	Data controlled by Auto Adjusting Tool
58	Auto adjustment internal data 6	Data controlled by Auto Adjusting Tool
59	Auto adjustment internal data 7	Data controlled by Auto Adjusting Tool
60	Auto adjustment internal data 8	Data controlled by Auto Adjusting Tool
61	Auto adjustment internal data 9	Data controlled by Auto Adjusting Tool
62	Auto adjustment internal data 10	Data controlled by Auto Adjusting Tool
63	Not used	
64	Not used	

C-5-2. Dial A/D Adjustment

* There are four dials, namely, the Shutter Speed Dial, Exposure Compensation Dial, Focus Dial and Drive Mode Selector Dial. When a dial is set to the index, the indication of the dial may be different from the display on the camera side. In such a case, the dial adjustment is required. Of the four dials, the Shutter Speed Dial and Exposure Compensation Dial require this adjustment.
* In the dial adjustment, the read out A/D values are all displayed by decimal notation. Based on the displayed value, calculate an adjusted value (displayed by a decimal notation), convert it to a hexadecimal number and write the hexadecimal notation in the relevant position as the final adjusted value.

1. Shutter Speed Dial A/D Adjustment

* The indications of the Shutter Speed Dial are "AUTO, 4000, 2000, ... , B, X". Among them, make adjustments for the indications "4000", "30" and "B". Make the adjustments as follows:

1) Set manual adjusting mode.
2) Set the A.B.C. Lever to "OFF" (Adjusting Mode Ⅰ).
3) Set adjustment item No. 11 (Shutter Speed Dial A/D value : decimal notation) by turning the Focus Dial.
4) Turn the Shutter Speed Dial and set it to "4000". At this time, note down the current A/D value for "4000".
5) Turn the Shutter Speed Dial and set it to "30". At this time, note down the current A/D value for "30".
6) Turn the Shutter Speed Dial and set it to "X". At this time, note down the current A/D value for "X".
7) The adjusted value (decimal notation) is obtained by subtracting the designed value from each A/D value.

Adjusted value for "B" position = A/D value for "B" position – Designed value (26(D))
Adjusted value for "30" position = A/D value for "30" position – Designed value (130(D))
Adjusted value for "4000" position = A/D value for "4000" position – Designed value (221(D))

Shutter Speed Dial Position	Designed Value (D)	Adjustment Item No. for Writing
B	26	Adjusting Mode Ⅲ No. 29
30	130	Adjusting Mode Ⅲ No. 30
4000	221	Adjusting Mode Ⅲ No. 31

8) Convert the obtained results expressed by decimal notation to hexadecimal notation, using the convention table.
9) Change the setting position of the A.B.C. Lever to "± 1.0" (Adjusting Mode Ⅲ).
10) Set adjustment item No. 29 (Shutter Speed Dial adjustment 1) by turning the Focus Dial.
11) Change the setting position of the Main Switch as "ON" → "AEL".
By turning the Focus Dial, change the adjusted value for "B" position to the value (hexadecimal notation) obtained at 7).
12) Change the setting position of the Main Switch as "AEL" → "ON".
Set adjustment item No. 30 (Shutter Speed Dial adjustment 2) by turning the Focus Dial.
13) Change the setting position of the Main Switch as "ON" → "AEL".
By turning the Focus Dial, change the adjusted value for "30" position to the value (hexadecimal notation) obtained at 7).
14) Change the setting position of the Main Switch as "AEL" → "ON".
Set adjustment item No. 31 (Shutter Speed Dial adjustment 3) by turning the Focus Dial.
15) Change the setting position of the Main Switch as "ON" → "AEL".
By turning the Focus Dial, change the adjusted value for "4000" position to the value (hexadecimal notation) obtained at 7).

16) Change the setting position of the Main Switch as "AEL" → "ON".
Set adjustment item No. 00 by turning the Focus Dial.
17) Write the adjusted values in EEPROM by pressing the Shutter Release Button.

2. Exposure Compensation Dial A/D Adjustment

* The indications of the Exposure Compensation Dial are "+2, ..., 0, ... , –2". Among them, make adjustments for the indications "+2", "0" and "–2". Make the adjustments as follows:

1) Set adjustment item No. 12 (Exposure Compensation Dial A/D value : decimal notation) by turning the Focus Dial at A.B.C. Lever to "OFF " (Adjusting Mode I) position.
2) Turn the Exposure Compensation Dial and set it to "+2". At this time, note down the current A/D value for "+2".
3) Turn the Exposure Compensation Dial and set it to "0". At this time, note down the current A/D value for "0".
4) Turn the Exposure Compensation Dial and set it to "–2". At this time, note down the current A/D value for "–2".
5) The adjusted value (decimal notation) is obtained by subtracting the designed value from each A/D value.

Adjusted value for "+2" position = A/D value for "+2" position – Designed value (32(D))
Adjusted value for "0" position = A/D value for "0" position – Designed value (128(D))
Adjusted value for "–2" position = A/D value for "–2" position – Designed value (224(D))

Exposure Compensation Dial Position	Designed Value (D)	Adjustment Item No. for Writing
+2	32	Adjusting Mode III No. 33
0	128	Adjusting Mode III No. 34
–2	224	Adjusting Mode III No. 35

6) Convert the obtained results expressed by decimal notation to hexadecimal notation, using the convention table.
7) Change the setting position of the A.B.C. Lever to "± 1.0" (Adjusting Mode III).
8) Set adjustment item No. 33 (Exposure Compensation Dial adjustment 1) by turning the Focus Dial.
9) Change the setting position of the Main Switch as "ON" → "AEL".
By turning the Focus Dial, change the adjusted value for "+2" position to the value (hexadecimal notation) obtained at 5).
10) Change the setting position of the Main Switch as "AEL" → "ON".
Set adjustment item No. 34 (Exposure Compensation Dial adjustment 2) by turning the Focus Dial.
11) Change the setting position of the Main Switch as "ON" → "AEL".
By turning the Focus Dial, change the adjusted value for "0" position to the value (hexadecimal notation) obtained at 5).
12) Change the setting position of the Main Switch as "AEL" → "ON".
Set adjustment item No. 35 (Exposure Compensation Dial adjustment 3) by turning the Focus Dial.
13) Change the setting position of the Main Switch as "ON" → "AEL".
By turning the Focus Dial, change the adjusted value for "–2" position to the value (hexadecimal notation) obtained at 5).
14) Change the setting position of the Main Switch as "AEL" → "ON".
Set adjustment item No. 00 by turning the Focus Dial.
15) Write the adjusted values in EEPROM by pressing the Shutter Release Button.

C-5-3. Shutter Time Adjustment

* Adjust the shutter time on the high speed (1/4000) side.
* Make this adjustment before the light exposure (light metering) adjustment.
* Measure the shutter time using the shutter tester. Then determine the new adjusted value based on the previously set adjusted value and the difference calculated from the measured value. Adjusted values are displayed by decimal numbers.
* Even without quitting item No. 02 in Adjustment Mode Ⅰ, the camera operates normally (at the set shutter time) if the shutter is released.

<Tools for Adjustment>

- Shutter tester (EF-5000, EF-8000)

1) Set manual adjusting mode.
2) Set the A.B.C. Lever to "OFF" (Adjusting Mode Ⅰ).
3) Set adjustment item No. 02 (shutter time adjustment) by turning the Focus Dial.
4) Set the camera on the shutter tester.
5) Set the Shutter Speed Dial of the camera to "1/4000".
6) Press the Shutter Release Button so that the camera will execute release sequence. At this time, by operating the Main Switch and Focus Dial, change the adjusted value for the time Tm displayed on the shutter tester.
   (1) Change the setting position of the Main Switch as "ON" → "AEL".
   (2) Change the adjusted value by turning the Focus Dial. (Change of 4 μs for an adjusted value of 1)
   Tm : slow → Turn the Focus Dial in the direction of "near distance".
   Tm : fast → Turn the Focus Dial in the direction of "∞".
   (3) Return the setting position of the Main Switch as "AEL" → "ON".

   Repeat these steps of shutter release and change of the adjusted value until Tm becomes about 244 μs.
7) After that, set adjustment item No. 00 by turning the Focus Dial.
8) Write the adjusted values in EEPROM by pressing the Shutter Release Button.

(Allowable Range of Manual Shutter Speed)

* The shutter speed of 1/6000 is available in AUTO mode.

Shutter Speed	Upper Limit ms	Reference Center Value ms	Lower Limit ms	Tolerance
1	1035	1000.00	966	±0.05EV
1/2	517.6	500.00	483.0	±0.05EV
1/4	258.3	250.00	241.5	±0.05EV
1/8	134.0	125.00	116.6	±0.10EV
1/15	66.99	62.50	58.32	±0.10EV
1/30	33.55	31.30	29.20	±0.10EV
1/60	16.75	15.63	14.58	±0.10EV
1/125	8.37	7.81	7.29	±0.10EV
1/250	4.81	3.91	3.17	±0.30EV
1/500	2.40	1.95	1.58	±0.30EV
1/1000	1.21	0.98	0.80	±0.30EV
1/2000	0.647	0.49	0.371	±0.40EV
1/4000	0.370	0.244	0.161	±0.60EV
*1/6000	0.274	0.163	0.097	±0.75EV

C-5-4. Light Exposure Adjustments

* Before making the light exposure adjustments, be sure to make the shutter time adjustment.
* As the light exposure adjustment, make the adjustments of the adjusted values 1 and 2 for TTL light metering and external light metering (as a rule, make the reference adjustment at LV 15 and the inclination adjustment at LV 8).
* Measure the light exposure using the AE tester. Then determine the new adjusted value based on the deviation in the measured value and the previously set adjusted value. Adjusted values are displayed by decimal notation. Write the new adjusted value of a decimal notation in EEPROM.
* Set adjustment item No. 04 or 05 in Adjusting Mode Ⅰ. In this state, release the shutter, and the camera will operate normally (perform auto exposure control).

<Tools for Adjustment>

- AE tester (EF-5000, EF-8000)
- Lens : Planar 45 mm, f 2

1. TTL Light Metering Adjustments

(1) TTL light exposure adjustment 1 (Adjustment item No. 04)

1) Mount the lens (Planar 45 mm, f 2) on the camera and set the aperture for the lens to F 5.6.
2) Set the Shutter Speed Dial of the camera to "AUTO" and the ISO film speed to "ISO 100".
3) Set manual adjusting mode.
4) Set the A.B.C. Lever to "OFF" (Adjusting Mode Ⅰ).
5) Set adjustment item No. 04 (TTL light exposure adjustment 1) by turning the Focus Dial.
6) Set the camera on the AE tester.
7) Set the brightness of the AE tester to "LV 8" (K value : 1.3).
8) Press the Shutter Release Button so that the camera will execute release sequence. At this time, by operating the Main Switch and Focus Dial, change the adjusted value based on the deviation △EV in light exposure displayed on the AE tester.
   (1) Change the setting position of the Main Switch as "ON" → "AEL".
   (2) Change the adjusted value by turning the Focus Dial.
   △EV : plus → Turn the Focus Dial in the direction of "near distance".
   △EV : minus → Turn the Focus Dial in the direction of "∞".
   (3) Return the setting position of the Main Switch as "AEL" → "ON".
   Repeat these steps of shutter release and change of the adjusted value until △EV becomes about 0 EV.
9) After that, set adjustment item No. 00 by turning the Focus Dial.
10) Write the adjusted value in EEPROM by pressing the Shutter Release Button.

(2) TTL light exposure adjustment 2 (Adjustment item No. 05)

11) Set adjustment item No. 05 (TTL light exposure adjustment 2) by turning the Focus Dial.
12) Set the brightness of the AE tester to "LV 15" (K value : 1.3).
13) Press the Shutter Release Button so that the camera will execute release sequence. At this time, by operating the Main Switch and Focus Dial, change the adjusted value based on the deviation △EV in light exposure displayed on the AE tester.
   (1) Change the setting position of the Main Switch as "ON" → "AEL".
   (2) Change the adjusted value by turning the Focus Dial.
   △EV : plus → Turn the Focus Dial in the direction of "near distance".
   △EV : minus → Turn the Focus Dial in the direction of "∞".
   (3) Return the setting position of the Main Switch as "AEL" → "ON".
   Repeat these steps of shutter release and change of the adjusted value until △EV becomes about 0 EV.
14) After that, set adjustment item No. 00 by turning the Focus Dial.
15) Write the adjusted value in EEPROM by pressing the Shutter Release Button.

2. External Light Metering Adjustments

* Set adjustment item No. 06 or 07 in Adjusting Mode Ⅰ. In this state, release the shutter, and the camera will operate normally (perform auto exposure control).

<Tools for Adjustment>

- AE tester (EF-5000, EF-8000)
- Lens : Hologon 16 mm, f 8

(1) External light exposure adjustment 1 (Adjustment item No. 06)

1) Mount the lens (Hologon 16 mm, f 8) on the camera.
2) Set the Shutter Speed Dial of the camera to "AUTO" and the ISO film speed to "ISO 100".
3) Set manual adjusting mode.
4) Set the A.B.C. Lever to "OFF" (Adjusting Mode Ⅰ).
5) Set adjustment item No. 06 (external light exposure adjustment 1) by turning the Focus Dial.
6) Set the camera on the AE tester.
7) Set the brightness of the AE tester to "LV 8" (K value : 1.3).
8) Press the Shutter Release Button so that the camera will execute release sequence. At this time, by operating the Main Switch and Focus Dial, change the adjusted value based on the deviation △EV in light exposure displayed on the AE tester.
   (1) Change the setting position of the Main Switch as "ON" → "AEL".
   (2) Change the setting position of the adjusted value by turning the Focus Dial.
   △EV : plus → Turn the Focus Dial in the direction of "near distance".
   △EV : minus → Turn the Focus Dial in the direction of "∞".
   (3) Return the Main Switch as "AEL" → "ON".

   Repeat these steps of shutter release and change of the adjusted value until △EV becomes about 0 EV.
9) After that, set adjustment item No. 00 by turning the Focus Dial.
10) Write the adjusted value in EEPROM by pressing the Shutter Release Button.

(2) External light exposure adjustment 2 (Adjustment item No. 07)

11) Set adjustment item No. 07 (external light exposure adjustment 2) by turning the Focus Dial.
12) Set the brightness of the AE tester to "LV 15" (K value : 1.3).
13) Press the Shutter Release Button so that the camera will execute release sequence. At this time, by operating the Main Switch and Focus Dial, change the adjusted value based on the deviation △EV in light exposure displayed on the AE tester.
   (1) Change the setting position of the Main Switch as "ON" → "AEL".
   (2) Change the adjusted value by turning the Focus Dial.
   △EV : plus → Turn the Focus Dial in the direction of "near distance".
   △EV : minus → Turn the Focus Dial in the direction of "∞".
   (3) Return the setting position of the Main Switch as "AEL" → "ON".

   Repeat these steps of shutter release and change of the adjusted value until △EV becomes about 0 EV.
14) After that, set adjustment item No. 00 by turning the Focus Dial.
15) Write the adjusted value in EEPROM by pressing the Shutter Release Button.

(Allowable Range of Light Exposure)

Brightness (LV)	Allowable Range
9 (8)	–0.5 ~ +0.5 EV
12	–0.5 ~ +0.5 EV
15	–0.5 ~ +0.5 EV

C-5-5. TTL Flash Auto Adjustment

* Adjust the TTL Flash Auto control value for use with the TLA Flash Unit.
* Mount the specified lens and flash unit on the camera, measure ΔEV with a flash meter and calculate the adjusted value for TTL Flash Auto control. Adjusted values are calculated by decimal notation. Write the new adjusted value of a decimal number in EEPROM.
* When measuring the TTL Flash Auto control value, use a standard reflector paper (gray chart with a reflectivity of 18 %) as the subject and prevent the entrance of external light.

<Tools for Adjustment>
- Lens : (Planar 45 mm, f 2).
- Flash unit: Flash unit of TLA system
- Flash meter
- Tripod

<Adjustment Procedure>

1) Load the film (Ektachrome 64) in the camera.
2) Mount the lens (Planar 45 mm, f 2) and a flash unit (flash unit of TLA system) on the camera.
3) Mount the camera on the tripod.
4) Set the flash meter and place the tripod at 2 m from the flash meter.
5) Set the aperture for the lens to F 4.0.
6) Set the Shutter Speed Dial of the camera to "AUTO" and the ISO film speed to "ISO 100".
7) Fire the flash by operating the shutter and measure △EV. Using this value, calculate the adjusted value for TTL Flash Auto control from the following formula :

   Adjusted value for TTL Flash Auto control = △EV ÷ (–0.33 EV)

   * Round fractions to the nearest whole number.

8) Add the previously input adjusted value for TTL Flash Auto control to the value obtained at 7). The resultant value is the adjusted value. This value must be within the following range. If the value is not within this range, there may be some trouble elsewhere.

   $-3 \leqq$ Adjusted value for TTL Flash Auto control $\leqq +3$

9) Set manual adjusting mode.
10) Set the A.B.C. Lever in the "OFF" position (Adjusting Mode Ⅰ).
11) Set adjustment item No. 03 (TTL Flash Auto adjustment) by turning the Focus Dial.
12) Change the setting position of the Main Switch as "ON" → "AEL".
13) By turning the Focus Dial, change the adjusted value for TTL Flash Auto control to the value obtained at 8). (Displayed by a decimal number)
14) Change the setting position of the Main Switch as "AEL" → "ON".
15) Set adjustment item No. 00 by turning the Focus Dial.
16) Write the adjusted value in EEPROM by pressing the Shutter Release Button.
17) Complete manual adjusting mode by turning OFF the Main Switch or closing the Back Cover.
18) Repeat the steps above until △EV becomes within the range of ± 0.5 EV.

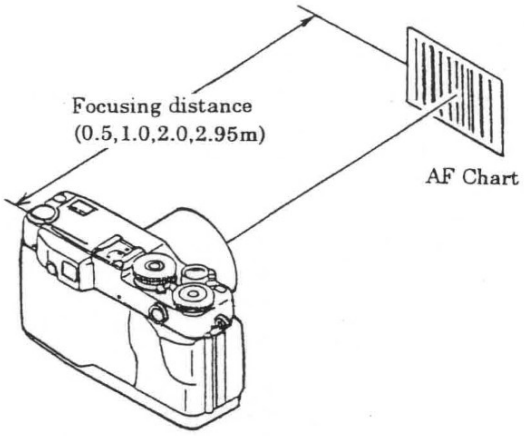
C-5-6. AF Adjustments (Passive AF & Active AF)

* In the stage where the camera has not been adjusted, there is a difference between the distance metering result of the camera and the actual distance. Therefore, make the AF adjustment in order that the distance metering result becomes equal to the actual distance. For this adjustment, there are four adjusted values for the distances 0.50 m, 1.00 m, 2.00 m and 2.95m. Make the adjustment by the procedure described below.
* The data read out by the procedure below are expressed by hexadecimal notation. To obtaine an adjusted value, convert the hexadecimal notation to a decimal notation. After obtaining an adjusted value in decimal, convert it to a hexadecimal notation. Then write the hexadecimal notation at the adjustment item.

<Tools for Adjustment>

- AF chart
- Tripod

1. Passive AF Adjustment



1) Fix the AF chart on a wall.
2) Set manual adjusting mode.
3) Set the A.B.C. Lever to "OFF" (Adjusting Mode Ⅰ).
4) Set adjustment item No. 1A (display of AF phase difference data : hexadecimal notation) by turning the Focus Dial.
5) Mount the camera on the tripod.
6) Set the tripod so that the optical axis of the camera is perpendicular to the AF Chart and the distance from the AF Chart to the Distance Reference Index of the camera is 0.50 m.
   The 4-digit data (hexadecimal notation) displayed on the Main LCD is the current measured distance data.
7) By changing the position of the camera, record the measured distance data for 1.00 m, 2.00 m and 2.95 m the same way.
8) For each measured distance data, convert the hexadecimal notation to a decimal notation. The conversion procedure is as follows :
   (1) Separate the 4-digit data (hexadecimal notation) into four 1-digit numbers.

   Example : If the data for 0.50 m is 54AF (H)

①	②	③	④
5	4	A	F

   (2) For each 1-digit number, convert the hexadecimal notation to a decimal notation. (Use the Conversion Table)

   ① 5(H) → 5
   ② 4(H) → 4
   ③ A(H) → 10
   ④ F(H) → 15

   (3) Perform the following calculation :
   (By this calculation, the hexadecimal notation is converted to a decimal notation.)

   ①×4096 + ②×256 + ③×16 + ④
   5×4096 + 4 ×256 + 10×16 + 15 = 21679 This value represents the measured value for 0.50 m.

9) Calculate the adjusted values.
   (1) Based on the obtained data, calculate the adjusted values from the following formulas:

   Adjusted value for "0.50 m" = (Measured value for "0.50 m") – 21623
   Adjusted value for "1.00 m" = (Measured value for "1.00 m") – 29422
   Adjusted value for "2.00 m" = (Measured value for "2.00 m") – 33186
   Adjusted value for "2.95 m" = (Measured value for "2.95 m") – 34380

If the absolute value of a result value is not smaller than 2033, which is the adjustable limit, the adjustment is impossible. That is, the adjustment is possible when the result values are within the following range :

$-2033 <$ Result value < 2033

If the adjustment is impossible, the AF Module must be replaced with a new one. The result values are the adjusted values (decimal notation).

$21679 - 21623 = 56$ ---------- Let this value be X.

(2) When the value of "X" obtained at (1) is a positive number, let it be "Y" as it is. If the value of "X" is a negative number, let "Y" be the result of the following calculation.

$4096 + X$

Example : If "X" is 56 As it is → 56 ------- Let this value be "Y".
If "X" is – 56 4096 – 56 = 4040 ------- Let this value be "Y".

10) Convert the decimal notation for each adjusted value to a hexadecimal notation.
(1) Divide the value of "Y" obtained at (2) of 9) by 256. $56 \div 256 = 0.21875$
(2) For the integral part of the value obtained above, convert the decimal notation to a hexadecimal notation using the Conversion Table.

0 → 0 (H) ------- Let this value be "Z".

(3) Perform the following calculation :

$Y - Z \times 256$
$56 - 0 \times 256 = 56$ ------- Let this value be "W".

(4) Divide the value of "W" obtained at (3) by 16. $56 \div 16 = 3.5$
(5) For the integral part of the value obtained above, convert the decimal notation to a hexadecimal notation using the Conversion Table.

3 → 3 (H) ------- Let this value be "V".

(6) From the values obtained above, the adjusted value is obtained as the 2-digit number consisting of the value of "W" as the superior-order digit and the value of "V" as the inferior-order digit.

Z	V				
0	3	→	0	3	This value is the final adjusted value (hexadecimal notation).

11) Write the adjusted values (hexadecimal) obtained for the respective distances at the following adjustment item Nos.:

AF Adjustment Distance	Adjustment Item No. for Writing
0.50 m	Adjusting Mode Ⅲ No. 11
1.00 m	Adjusting Mode Ⅲ No. 12
2.00 m	Adjusting Mode Ⅲ No. 13
2.95 m	Adjusting Mode Ⅲ No. 14

12) Change the setting position of the A. B. C Lever to "±1.0" (Adjusting Mode Ⅲ).
13) Set adjustment item No.11 (AF adjusted value 1) by turning the Focus Dial.
14) Change the setting position of the Main Switch as "ON" → "AEL".
By turning the Focus Dial and change the adjusted value for "0.50m" adjustment distance to value (hexadecimal notation) obtained at 10).
15) Repeat, change the setting for each AF adjustment item No.12, No.13 and No.14 (AF adjusted value 2 to 4), and then change for each the adjusted value for "1.00m", "2.00m" and "2.95m" adjustment distance to value (hexadecimal notation) obtained at 10) the same way as at 13) and 14).
16) After changing the all adjusted values, return the setting position of the Main Switch as "AEL" → "ON", and set adjustment item No. 00 by turning the Focus Dial.
17) Write the adjusted value in EEPROM by pressing the Shutter Release Button.
18) Turn OFF the Main Switch or close the Back Cover to complete manual adjusting mode.

2. Active AF Adjustment

* Basically, the active AF adjustment is the same as the passive AF adjustment.

1) Set manual adjusting mode.
2) Set the A.B.C. Lever to "OFF" (Adjusting Mode Ⅰ).
3) Set adjustment item No. 1F (active AF result display : hexadecimal notation) by turning the Focus Dial.
4) Mount the camera on the tripod.
5) Set the tripod so that the optical axis of the camera is perpendicular to the AF Chart and the distance from the AF Chart to the Distance Reference Index of the camera is 0.50 m.
   The 4-digit data (hexadecimal notation) displayed on the Main LCD is the current measured distance data.
6) By changing the position of the camera, record the measured distance data for 1.00 m, 2.00 m and 2.95 m the same way.
7) For each measured distance data, convert the hexadecimal notation to a decimal notation. The conversion procedure is as follows :

   (1) Separate the 4-digit data (hexadecimal notation) into four 1-digit numbers.

   Example : If the data for 0.50 m is 031B (H)

①	②	③	④
0	3	1	B

   (2) For each 1-digit number, convert the hexadecimal notation to a decimal notation. (Use the Conversion Table)

   ① 0 (H) → 0
   ② 3 (H) → 3
   ③ 1 (H) → 1
   ④ B (H) → 11

   (3) Perform the following calculation :
   (By this calculation, the hexadecimal notation is converted to the decimal notation.)

   ①×4096 + ②×256 + ③×16 + ④
   0×4096 + 3 ×256 + 1×16 + 11 = 795 This value represents the measured value for 0.50 m.

8) Calculate the adjusted values.
   (1) Based on the obtained data, calculate the adjusted values from the following formulas:

   Adjusted value for "0.50 m" = 736 – (Measured value for "0.50 m")
   Adjusted value for "1.00 m" = 458 – (Measured value for "1.00 m")
   Adjusted value for "2.00 m" = 368 – (Measured value for "2.00 m")
   Adjusted value for "2.95 m" = 281 – (Measured value for "2.95 m")

   The result values are the adjusted values (decimal notation).

   736 – 1947 = – 59 ---------- Let this value be X.

   (2) When the value of "X" obtained at (1) is a positive number, let it be "Y" as it is. If the value of "X" is a negative number, let "Y" be the result of the following calculation.

   4096 + X

   Example : If "X" is – 59 4096 – 59 = 4037 ------- Let this value be "Y".
   If "X" is 59 As it is → 59 ------- Let this value be "Y".

9) Convert the decimal notation for each adjusted value to a hexadecimal notation.

(1) Divide the value of "Y" obtained at (2) of 8) by 256. $4037 \div 256 = 15.76\cdots$
(2) For the integral part of the value obtained above, convert the decimal notation to the hexadecimal notation using the Conversion Table.

15 → F (H) ------- Let this value be "Z".

(3) Perform the following calculation :

$Y - Z \times 256$
$4037 - 15 \times 256 = 197$ ------- Let this value be "W".

(4) Divide the value of "W" obtained at (3) by 16. $197 \div 16 = 12.31\cdots$
(5) For the integral part of the value obtained above, convert the decimal notation to the hexadecimal notation using the Conversion Table.

12 → C (H) ------- Let this value be "V".

(6) From the values obtained above, the adjusted value is obtained as the 2-digit number consisting of the value of "W" as the superior-order digit and the value of "V" as the inferior-order digit.

Z	V				
F	C	→	F	C	This value is the final adjusted value (hexadecimal notation).

10) Write the adjusted values (hexadecimal) obtained for the respective distances at the following adjustment item Nos. :

AF Adjustment Distance	Adjustment Item No. for Writing
0.50 m	Adjusting Mode Ⅲ No. 19
1.00 m	Adjusting Mode Ⅲ No. 20
2.00 m	Adjusting Mode Ⅲ No. 21
2.95 m	Adjusting Mode Ⅲ No. 22

11) Change the setting position of the A. B. C Lever to "±1.0" (Adjusting Mode Ⅲ).
12) Set adjustment item No.19 (Adjusted value for AF distance measuring 1) by turning the Focus Dial.
13) Change the setting position of the Main Switch as "ON" → "AEL".
By turning the Focus Dial and change the adjusted value for "0.50m" adjustment distance to value (hexadecimal notation) obtained at 9).
14) Repeat, change the setting for each AF adjustment item No.20, No.21 and No.22 (Adjusted value for AF distance measuring 2 to 4), and then change for each the adjusted value for "1.00m", "2.00m" and "2.95m" adjustment distance to value (hexadecimal notation) obtained at 9) the same way as at 13) and 14).
15) After changing the all adjusted values, return the setting position of the Main Switch as "AEL" → "ON", and set adjustment item No. 00 by turning the Focus Dial.
16) Write the adjusted value in EEPROM by pressing the Shutter Release Button.
17) Turn OFF the Main Switch or close the Back Cover to complete manual adjusting mode.

C-5-7. Battery Check Voltage Adjustment

* Supply specified voltages from the Regulated DC Power Supply and check the voltage check A/D values in manual adjusting mode. Calculate the adjusted values from these A/D values and s tore them in memory as the adjusted values for battery check .
* When the Main FPC Ass'y has been replaced, make the Battery Check Voltage Adjustment.

1) Set the Regulated DC Power Supply to 6 V and set the dummy batteries in the battery chamber of the camera.
2) Set manual adjusting mode.
3) Set the A.B.C. Lever to "OFF" (Adjusting Mode Ⅰ).
4) Set adjustment item No. 14 (Battery Check A/D display with load : decimal notation) by turning the Focus Dial.
5) Lower the setting voltage of the Regulated DC Power Supply to 4.1 V. At this point, record the voltage data.
6) Calculate the adjusted values from the following formula:

Adjusted value for B2 level with load (decimal)= (Data obtained at 5)) – 143
Adjusted value for B2 level without load (decimal) = (Adjusted value for B2 level with load) + 12

7) For obtained values, convert the decimal notation to a hexadecimal notation, using the Conversion Table.
8) Return the voltage of the Regulated DC Power Supply to 6 V.
9) Write the adjusted values (hexadecimal) obtained by 7) at the following adjustment item Nos. :

Adjusted value for B2 level without load (hexadecimal notation) at adjustment item No. 23
Adjusted value for B2 level with load (hexadecimal notation) at adjustment item No. 24

10) Change the setting position of the A. B. C Lever to"±1.0" (Adjusting Mode Ⅲ).
11) Set adjustment item No.23 (Adjusted value for B2 level without load) by turning the Focus Dial.
12) Change the setting position of the Main Switch as "ON" → "AEL".
By turning the Focus Dial and change the adjusted value for B2 level without load (hexadecimal notation) obtained at 7).
13) Change the setting position of the Main Switch as "AEL" → "ON", and set adjustment item No.24 (Adjusted value for B2 level with load) by turning the Focus Dial.
And then change the setting position of the Main Switch as "AEL" → "ON".
By turning the Focus Dial and change the adjusted value for B2 level with load (hexadecimal notation) obtained at 7).
14) After changing the all adjusted values, return the setting position of the Main Switch as "AEL" → "ON", and set adjustment item No. 00 by turning the Focus Dial.
15) Write the adjusted value in EEPROM by pressing the Shutter Release Button.
16) Turn OFF the Main Switch or close the Back Cover to complete manual adjusting mode.

C-5-8. Checking of Shots Count

1) Set manual adjusting mode.
2) Set the A.B.C. Lever to "OFF" (Adjusting Mode Ⅰ).
3) Turn the Focus Dial and note down the data (on the Main LCD) corresponding to the adjustment item Nos. 08 and 09 (value on the Exposure Counter) when the value on the Exposure Counter is blinking.

Shots count = (Data at 09) (Data at 08)

[Example]

Value on Exposure Counter LCD	Value on Main LCD
08	4401
09	02

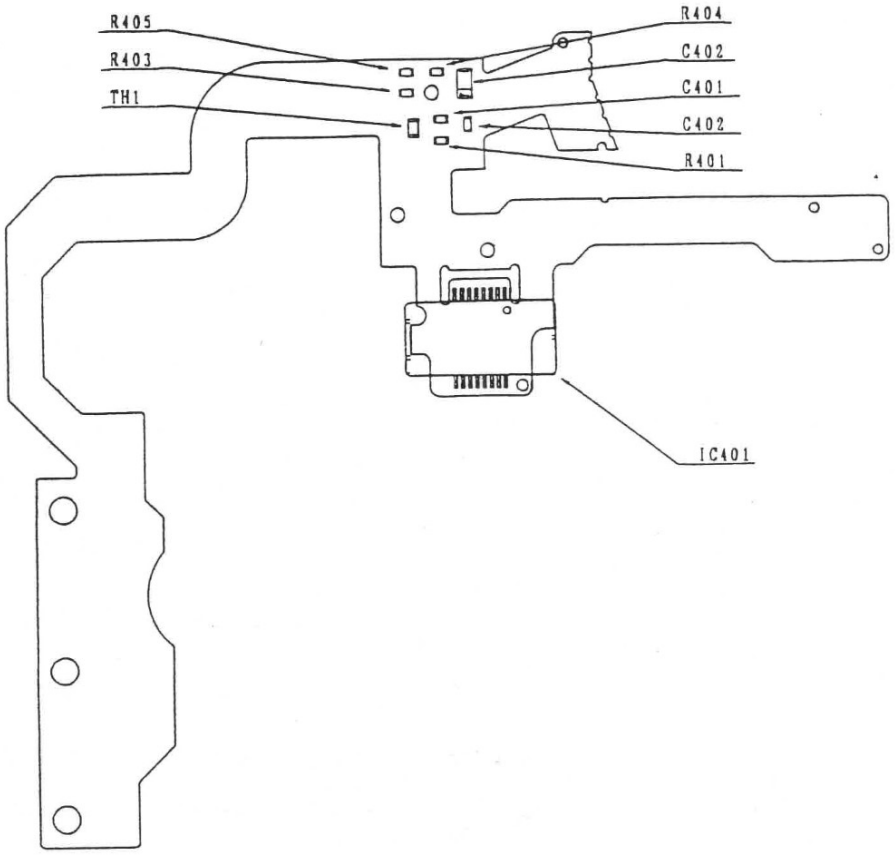
If the displayed values are as above, then
Number of Shots = 24401 (decimal notation)

4) Turn OFF the Main Switch or close the Back Cover to complete manual adjusting mode.

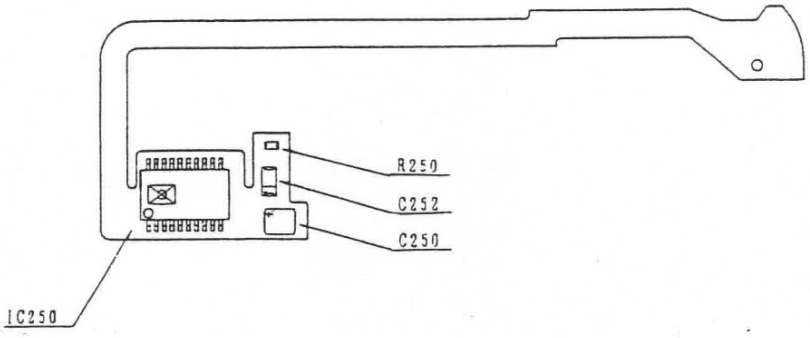
Conversion Table for Decimal Notation & Hexadecimal Notation (+)

Decimal	Hexadecimal	Decimal	Hexadecimal	Decimal	Hexadecimal	Decimal	Hexadecimal
0	0	64	40	128	80	192	C0
1	1	65	41	129	81	193	C1
2	2	66	42	130	82	194	C2
3	3	67	43	131	83	195	C3
4	4	68	44	132	84	196	C4
5	5	69	45	133	85	197	C5
6	6	70	46	134	86	198	C6
7	7	71	47	135	87	199	C7
8	8	72	48	136	88	200	C8
9	9	73	49	137	89	201	C9
10	A	74	4A	138	8A	202	CA
11	B	75	4B	139	8B	203	CB
12	C	76	4C	140	8C	204	CC
13	D	77	4D	141	8D	205	CD
14	E	78	4E	142	8E	206	CE
15	F	79	4F	143	8F	207	CF
16	10	80	50	144	90	208	D0
17	11	81	51	145	91	209	D1
18	12	82	52	146	92	210	D2
19	13	83	53	147	93	211	D3
20	14	84	54	148	94	212	D4
21	15	85	55	149	95	213	D5
22	16	86	56	150	96	214	D6
23	17	87	57	151	97	215	D7
24	18	88	58	152	98	216	D8
25	19	89	59	153	99	217	D9
26	1A	90	5A	154	9A	218	DA
27	1B	91	5B	155	9B	219	DB
28	1C	92	5C	156	9C	220	DC
29	1D	93	5D	157	9D	221	DD
30	1E	94	5E	158	9E	222	DE
31	1F	95	5F	159	9F	223	DF
32	20	96	60	160	A0	224	E0
33	21	97	61	161	A1	225	E1
34	22	98	62	162	A2	226	E2
35	23	99	63	163	A3	227	E3
36	24	100	64	164	A4	228	E4
37	25	101	65	165	A5	229	E5
38	26	102	66	166	A6	230	E6
39	27	103	67	167	A7	231	E7
40	28	104	68	168	A8	232	E8
41	29	105	69	169	A9	233	E9
42	2A	106	6A	170	AA	234	EA
43	2B	107	6B	171	AB	235	EB
44	2C	108	6C	172	AC	236	EC
45	2D	109	6D	173	AD	237	ED
46	2E	110	6E	174	AE	238	EE
47	2F	111	6F	175	AF	239	EF
48	30	112	70	176	B0	240	F0
49	31	113	71	177	B1	241	F1
50	32	114	72	178	B2	242	F2
51	33	115	73	179	B3	243	F3
52	34	116	74	180	B4	244	F4
53	35	117	75	181	B5	245	F5
54	36	118	76	182	B6	246	F6
55	37	119	77	183	B7	247	F7
56	38	120	78	184	B8	248	F8
57	39	121	79	185	B9	249	F9
58	3A	122	7A	186	BA	250	FA
59	3B	123	7B	187	BB	251	FB
60	3C	124	7C	188	BC	252	FC
61	3D	125	7D	189	BD	253	FD
62	3E	126	7E	190	BE	254	FE
63	3F	127	7F	191	BF	255	FF

Electric Parts on P-AF FPC



Electric Parts on AE FPC



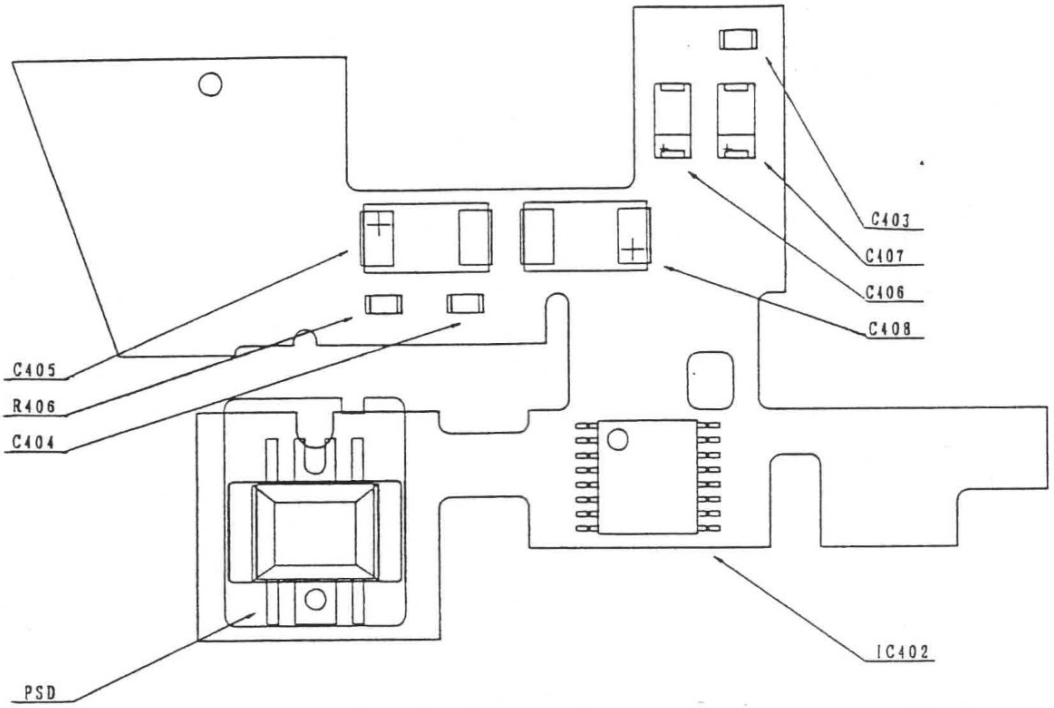
No.	419-01-50-RA1AS01

Conversion Table for Decimal Notation & Hexadecimal Notation (+/–)

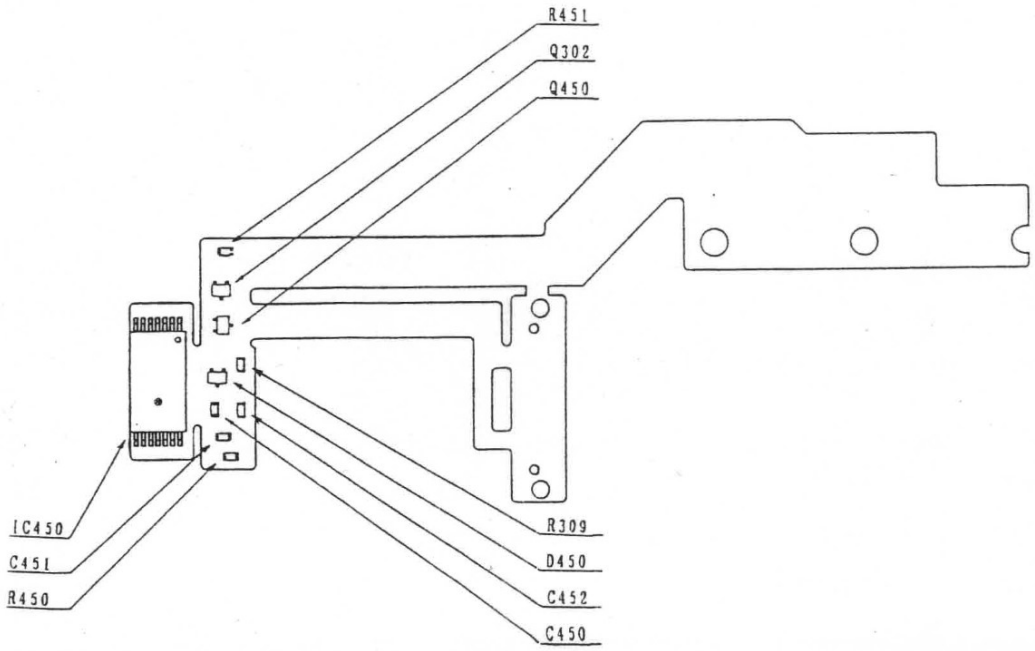
Decimal	Hexadecimal	Decimal	Hexadecimal	Decimal	Hexadecimal	Decimal	Hexadecimal
0	0	64	40	-1	FF	-65	BF
1	1	65	41	-2	FE	-66	BE
2	2	66	42	-3	FD	-67	BD
3	3	67	43	-4	FC	-68	BC
4	4	68	44	-5	FB	-69	BB
5	5	69	45	-6	FA	-70	BA
6	6	70	46	-7	F9	-71	B9
7	7	71	47	-8	F8	-72	B8
8	8	72	48	-9	F7	-73	B7
9	9	73	49	-10	F6	-74	B6
10	A	74	4A	-11	F5	-75	B5
11	B	75	4B	-12	F4	-76	B4
12	C	76	4C	-13	F3	-77	B3
13	D	77	4D	-14	F2	-78	B2
14	E	78	4E	-15	F1	-79	B1
15	F	79	4F	-16	F0	-80	B0
16	10	80	50	-17	EF	-81	AF
17	11	81	51	-18	EE	-82	AE
18	12	82	52	-19	ED	-83	AD
19	13	83	53	-20	EC	-84	AC
20	14	84	54	-21	EB	-85	AB
21	15	85	55	-22	EA	-86	AA
22	16	86	56	-23	E9	-87	A9
23	17	87	57	-24	E8	-88	A8
24	18	88	58	-25	E7	-89	A7
25	19	89	59	-26	E6	-90	A6
26	1A	90	5A	-27	E5	-91	A5
27	1B	91	5B	-28	E4	-92	A4
28	1C	92	5C	-29	E3	-93	A3
29	1D	93	5D	-30	E2	-94	A2
30	1E	94	5E	-31	E1	-95	A1
31	1F	95	5F	-32	E0	-96	A0
32	20	96	60	-33	DF	-97	9F
33	21	97	61	-34	DE	-98	9E
34	22	98	62	-35	DD	-99	9D
35	23	99	63	-36	DC	-100	9C
36	24	100	64	-37	DB	-101	9B
37	25	101	65	-38	DA	-102	9A
38	26	102	66	-39	D9	-103	99
39	27	103	67	-40	D8	-104	98
40	28	104	68	-41	D7	-105	97
41	29	105	69	-42	D6	-106	96
42	2A	106	6A	-43	D5	-107	95
43	2B	107	6B	-44	D4	-108	94
44	2C	108	6C	-45	D3	-109	93
45	2D	109	6D	-46	D2	-110	92
46	2E	110	6E	-47	D1	-111	91
47	2F	111	6F	-48	D0	-112	90
48	30	112	70	-49	CF	-113	8F
49	31	113	71	-50	CE	-114	8E
50	32	114	72	-51	CD	-115	8D
51	33	115	73	-52	CC	-116	8C
52	34	116	74	-53	CB	-117	8B
53	35	117	75	-54	CA	-118	8A
54	36	118	76	-55	C9	-119	89
55	37	119	77	-56	C8	-120	88
56	38	120	78	-57	C7	-121	87
57	39	121	79	-58	C6	-122	86
58	3A	122	7A	-59	C5	-123	85
59	3B	123	7B	-60	C4	-124	84
60	3C	124	7C	-61	C3	-125	83
61	3D	125	7D	-62	C2	-126	82
62	3E	126	7E	-63	C1	-127	81
63	3F	127	7F	-64	C0	-128	80

[ELECTRIC ELEMENTS LOCATING DIAGRAM]

Electric Parts on A-AF FPC



Electric Parts on CHL FPC



C-6. OTHERS

C-6-1. Curtain Travel Speed

* The curtain travel speed can not be adjusted. Therefore, replace the Shutter Unit with a new one if the travel speed of each curtain is significantly different from the specified value.
* The travel speeds of the first curtain and second curtain are both such that each curtain takes about 4.1 ms to travel the vertical length of 24 mm (sensing point of Shutter Tester : 21 mm).

C-6-2. Synchro Contact

① Delay time of X-contact

Sensing point of Shutter Tester: 21 mm
Measure at shutter time "X".

A range: 0.8 ms

② Contact efficiency of X-contact

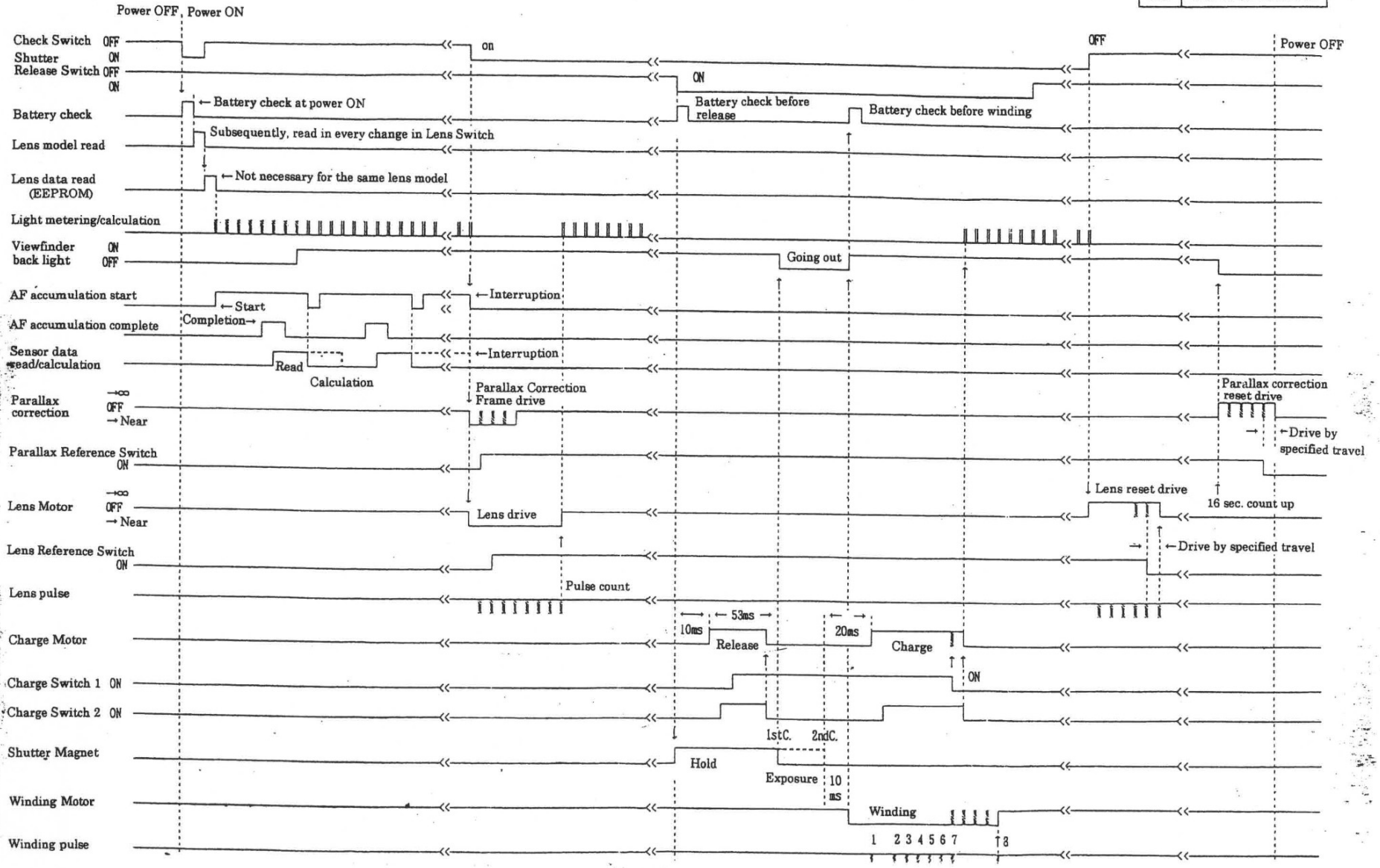
The contact efficiency must be 60% or above at shutter speed of 1/200 sec. (X) or less.
(Use a contact efficiency meter at 1 ms.)

C-6-3. Current Consumption

Main Switch OFF (standby current)	20 μA or below
Main Switch ON	
LCD ON (Power ON)	100 mA or below
LCD OFF	20 μA or below
Blank shots advance	400 mA or below
Winding operation	500 mA or below
Winding stop current	1800 mA or below
Rewinding operation	400 mA or below
Release (shutter operation, single)	400 mA or below

TIMING CHART (OVERALL) SAF/DRIVE S

No.	419-01-50-RA1AS01



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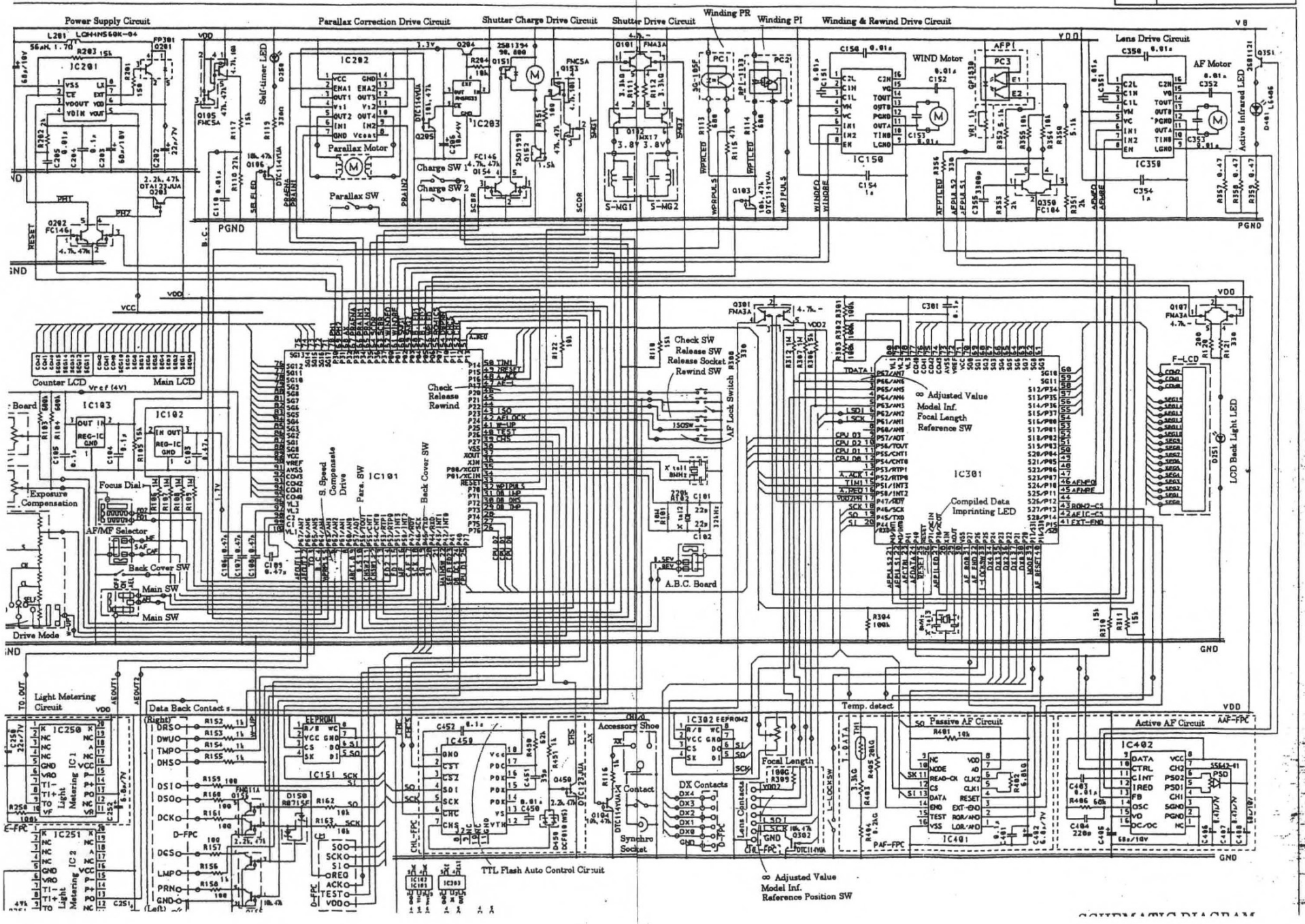
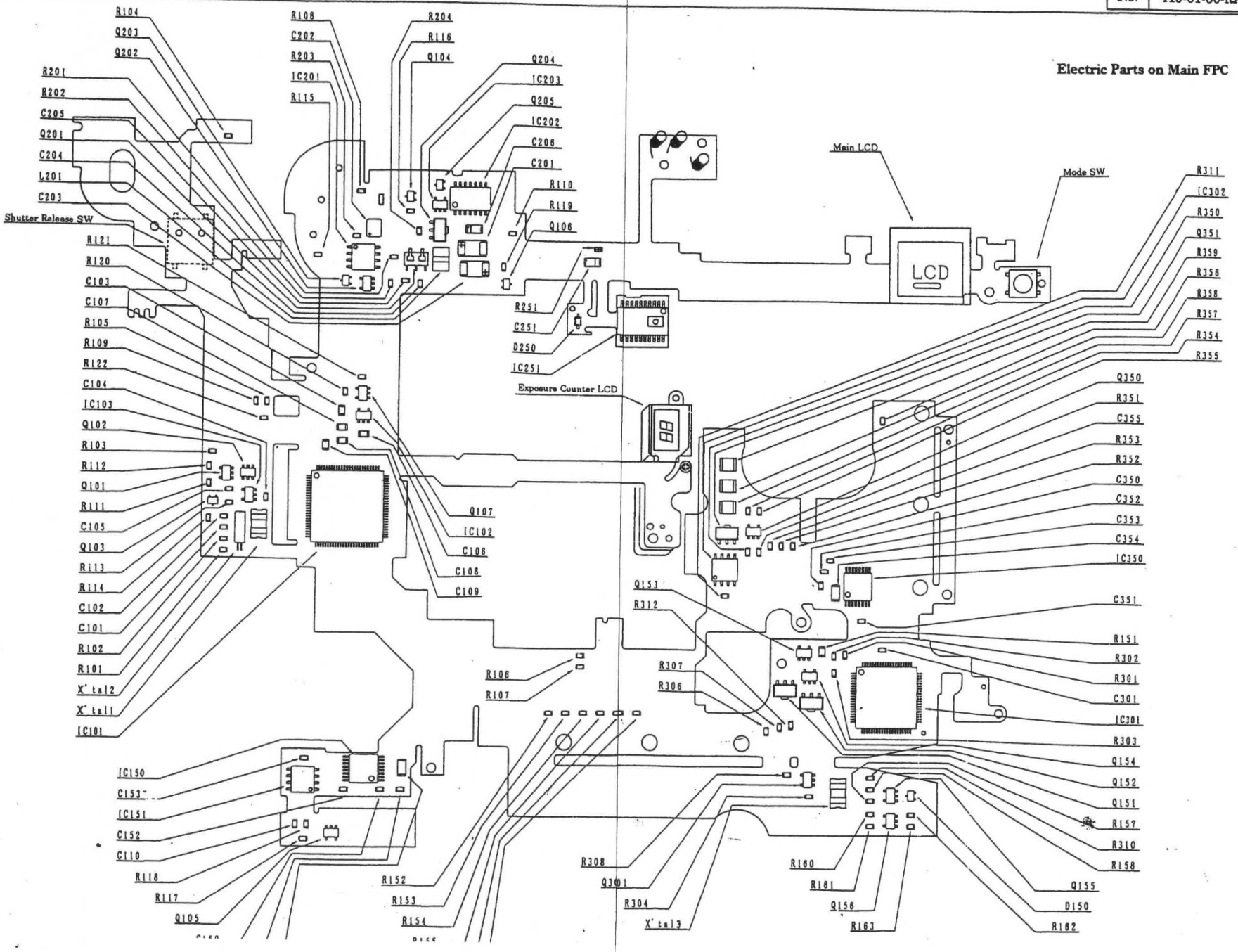
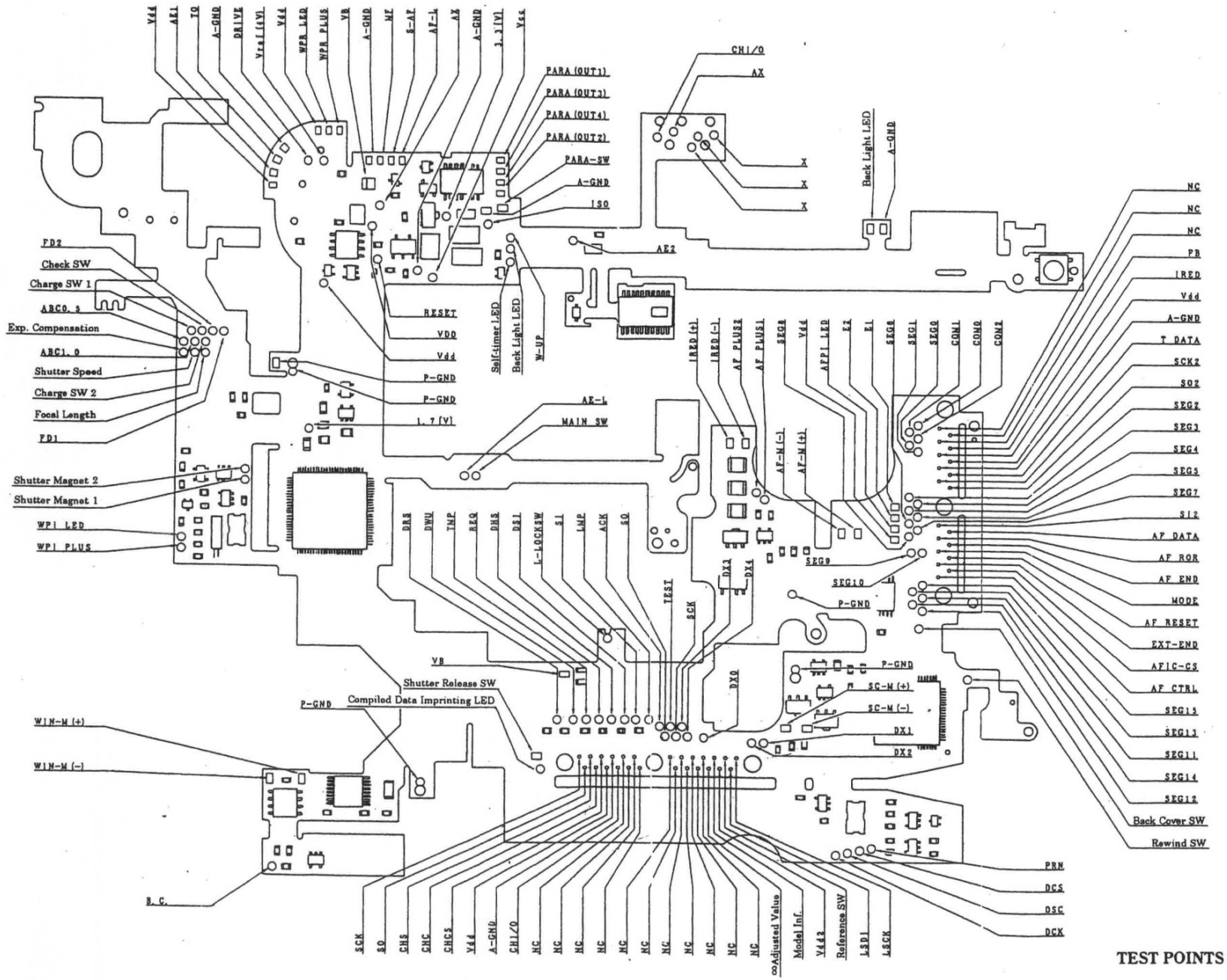
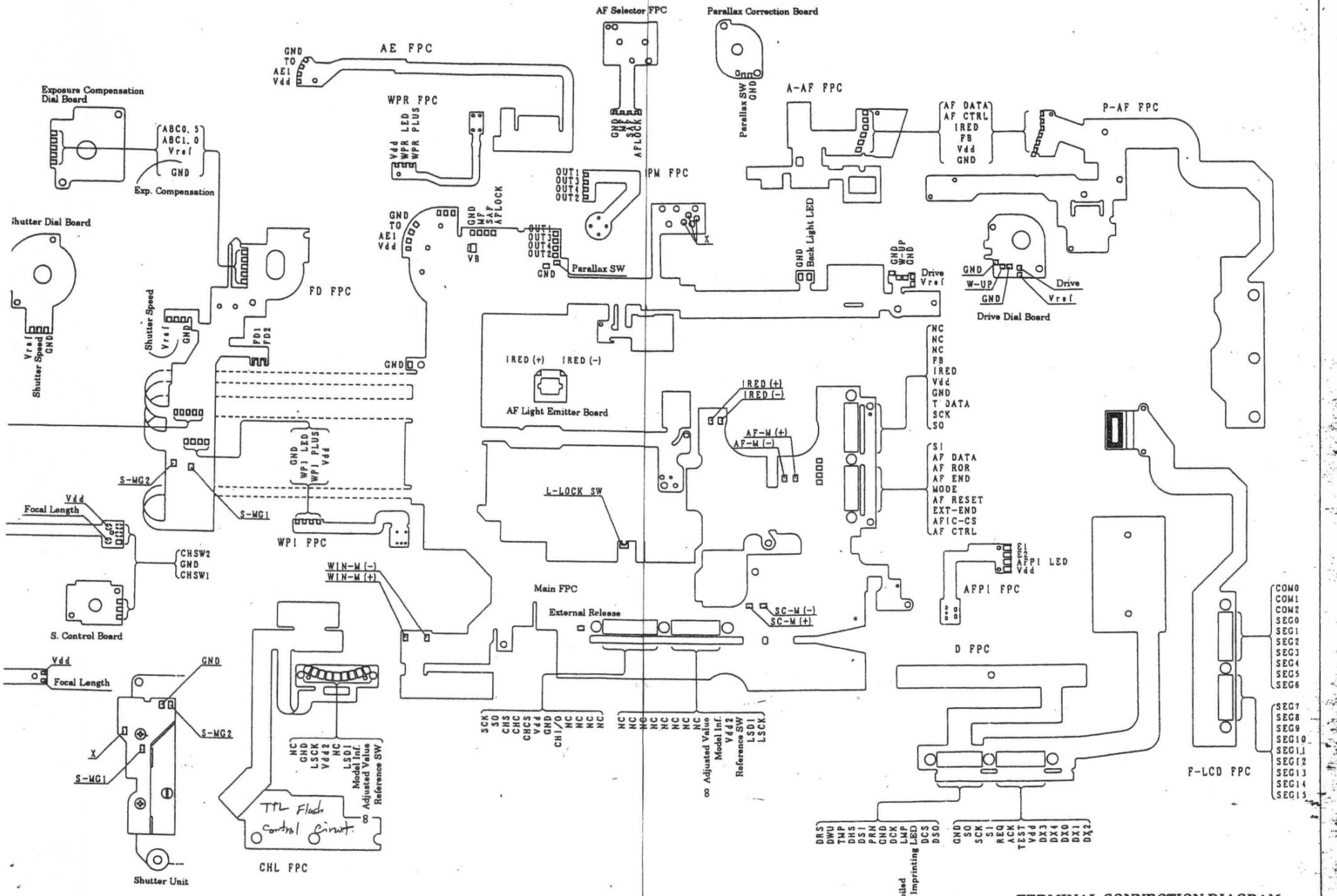


Electric Parts on Main FPC

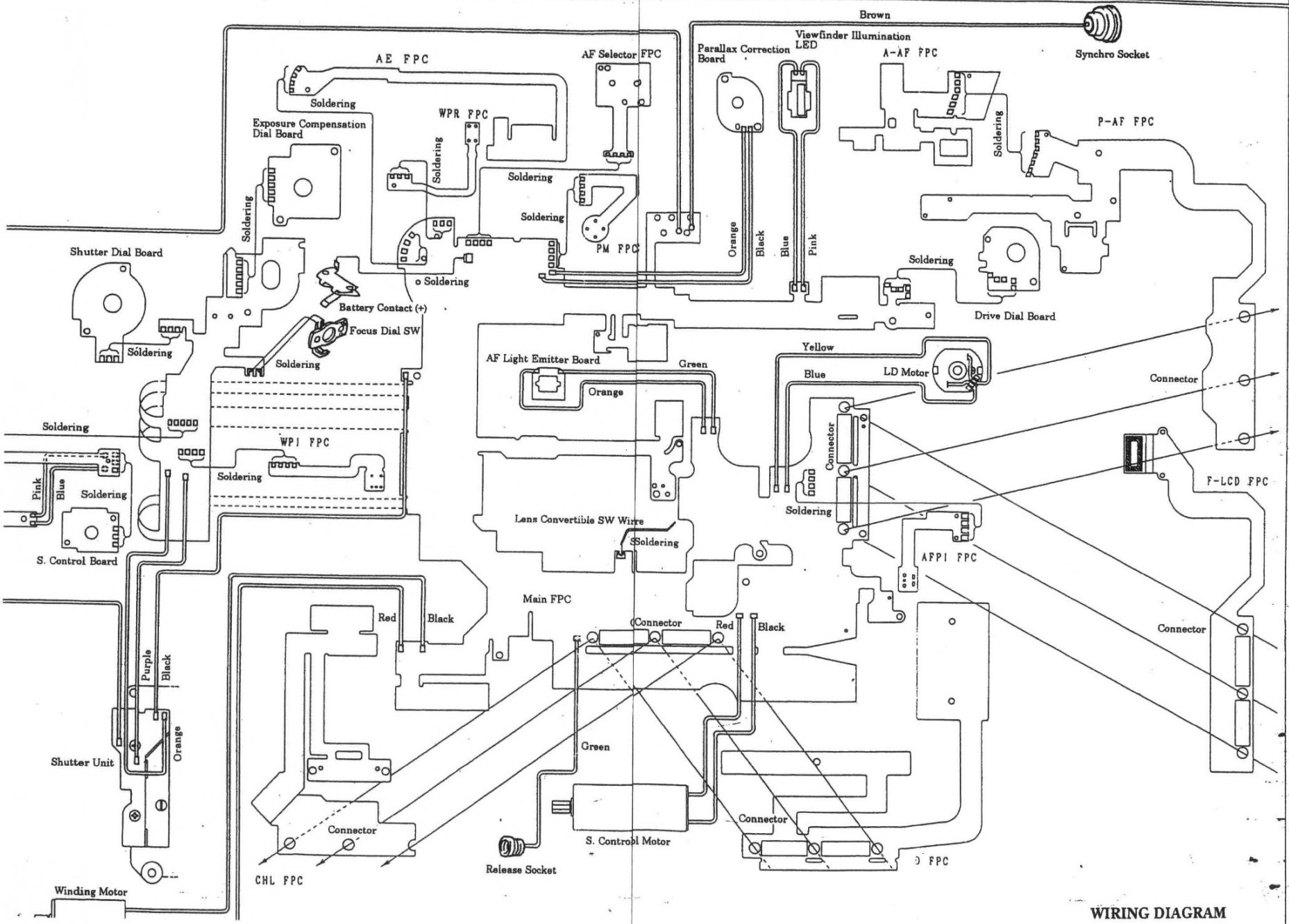




TEST POINTS ON MAIN FPC



TERMINAL CONNECTION DIAGRAM



WIRING DIAGRAM