

C. ADJUSTMENT PROCEDURES, ETC.

C-1. ADJUSTMENTS OF MECHANISMS

C-1-1. Adjustment of Open F. Stop Signal Contact Position

* When the Open F. Stop Signal Base Plate Ass'y has been replaced, adjust the position of the Open F. Stop Signal Contact.

[Tool for Adjustment]

- Planar F1.4/50 MM Lens

[Adjustment Procedure]

- 1) Loosen the Open F. Stop Signal Base Plate Ass'y Setscrews (69103576) × 2.
- 2) Set the Planar F1.4/50 Lens on the body mount.
- 3) Adjust the position of the Open F. Stop Signal P.C. Board so that the Open F. Stop Signal Contact is aligned with the triangle mark on the Open F. Stop Signal P.C. Board.
- 4) Tighten the Open F. Stop Signal Base Plate Ass'y Setscrews.

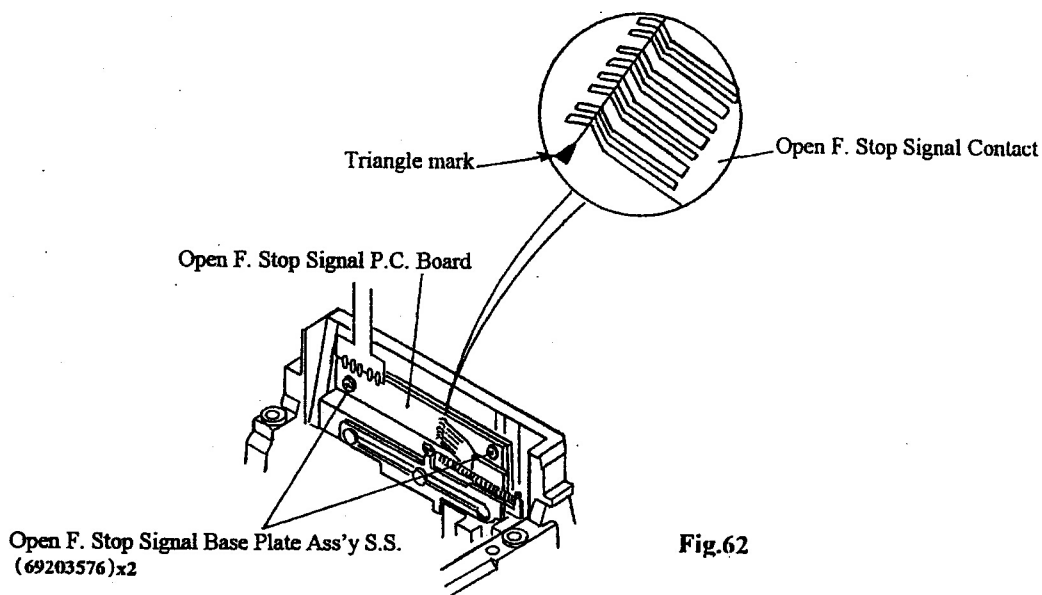


Fig.62

C-1-2. Adjustment of AV Gear (L) Ass'y Position (Aperture Value)

- 1) Position the cut portion of the AV Gear (L) Ass'y (1AWE2600) horizontal.
- 2) Turn the Aperture Coupling Plate of the Aperture Ring Holding Plate Ass'y (1AWB2500) in the aperture opening direction (in the direction of the arrow ①) until it comes in contact with the stopper.
- 3) While maintaining the states obtained at 1) and 2), install the Aperture Ring Holding Plate Ass'y and engage its AV Gear (S) with the AV Gear (L) Ass'y.
- 4) Tighten the Aperture Ring Holding Plate Ass'y Setscrews.
- 5) Turn the Aperture Coupling Plate in the aperture stop-down direction (in the direction of the arrow ②). Then release the Aperture Coupling Plate and make certain that the Aperture Coupling Plate returns smoothly in the aperture opening direction by the force of the AV Spring.
- 6) When the Aperture Coupling Plate has returned in the open F. stop position, make certain that the cut portion of the AV Gear (L) Ass'y is in the horizontal position.

(Right Side View of Mirror Box)

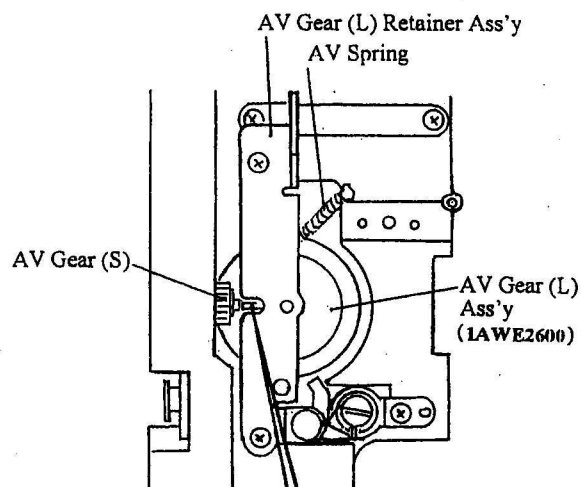


Fig.63

(Front View of Mirror Box)

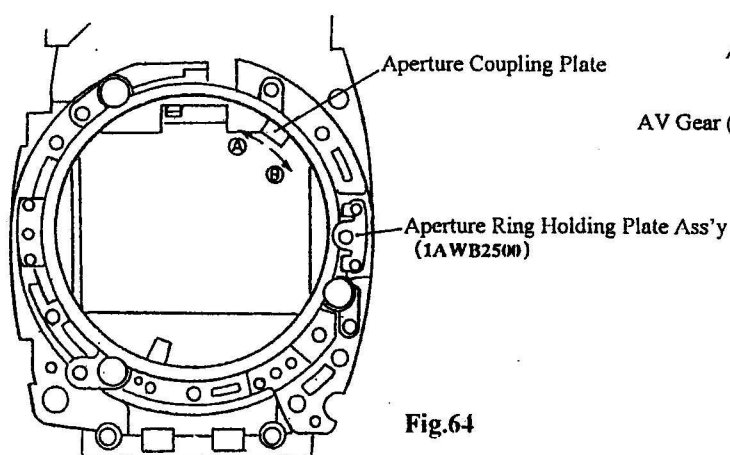
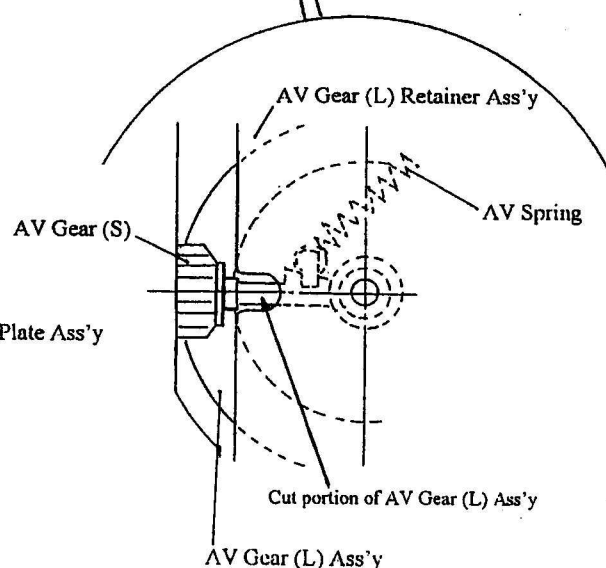


Fig.64



C-1-2. Adjustment of Viewfinder Indication Positions

* Place your eye at the center of the Eye-piece Lens and make adjustment so that all the indications (flash ready indicator, shutter speed, aperture value, metering indicator, manual exposure mark, exposure compensation marks, exposure warning / exposure meter and exposure counter) can be seen without vignetting.

[Tool for Adjustment]

- Regulated DC Power Supply

[Adjustment Procedure]

- 1) Loosen the Finder Indicator Cover Ass'y Setscrews (69203076) $\times 2$.
- 2) Turn ON the switch of the Regulated DC Power Supply.
Then set the voltage of the Regulated DC Power Supply to about 5.0 V.
- 3) Turn OFF the switch of the Regulated DC Power Supply.
- 4) Connect the Pink lead wire of the Finder Indicator Cover Ass'y to the (+) terminal of the Regulated DC Power Supply and the White lead wire to the (-) terminal.
- 5) Turn ON the switch of the Regulated DC Power Supply.
- 6) Look in the viewfinder through the Eye-piece Lens and adjust the position of indications in the viewfinder by moving the Finder Indicator Cover Ass'y.
- 7) Tighten the Finder Indicator Cover Ass'y Setscrews.
- 8) Lock the Finder Indicator Cover Ass'y Setscrews by applying the bond (Cemedine 551) to their heads.

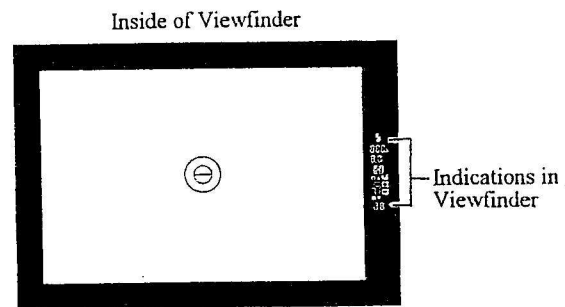


Fig.65

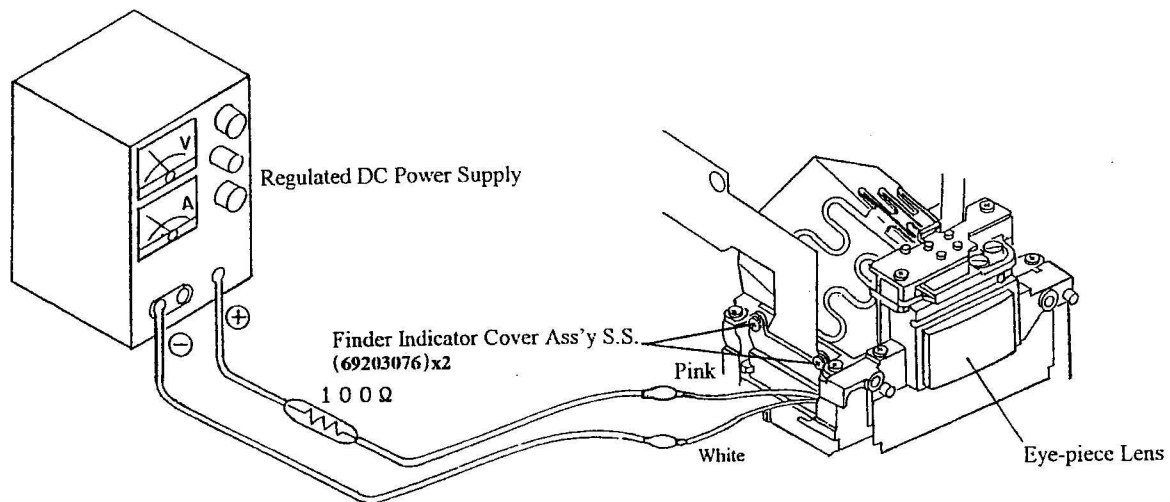


Fig.66

C-1-4. Adjustment of Spot Light Metering Position

- * Adjust the position of the light metering sensor (SPD) to ensure correct spot light metering.
- * Once the Eye-piece Ass'y (1AWF2300) or the Light Metering FPC Ass'y (1AWE2200) has been replaced, be sure to make this adjustment of spot light metering position.

[Tools for Adjustment]

- EF-8000 or EF-5000 multi camera tester
- Planar F 1.4/50 MM Lens
- Black chart (to be prepared)

[Preparation of Chart]

- Prepare a chart of about 40 mm × 90 mm of low-reflectivity black paper.

[Adjustment Procedure]

- 1) Loosen the Accessory Shoe Base Setscrews (69113076) ×2 slightly.
- 2) Install the Top Cover Ass'y temporarily.
- 3) Set the Planar F 1.4/50 MM Lens on the camera.
- 4) Set exposure mode to "AV".
- 5) Set the Metering Mode Select Lever to the spot metering mark "☐".
- 6) Turn ON the Main Switch.
- 7) Fix the black chart vertically to the light source surface of the multi camera tester with Scotch tape.
- 8) Set the brightness of the multi camera tester to "LV 15".

(Preparation of Chart)

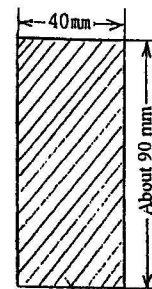


Fig.67

Black paper of low reflectivity

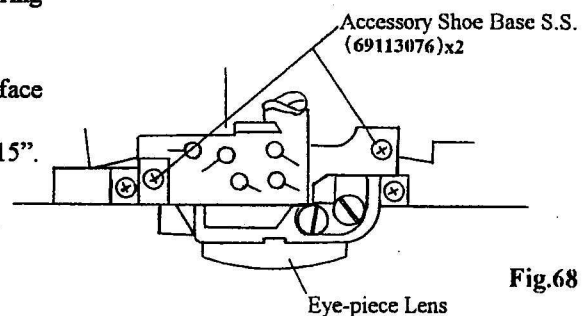
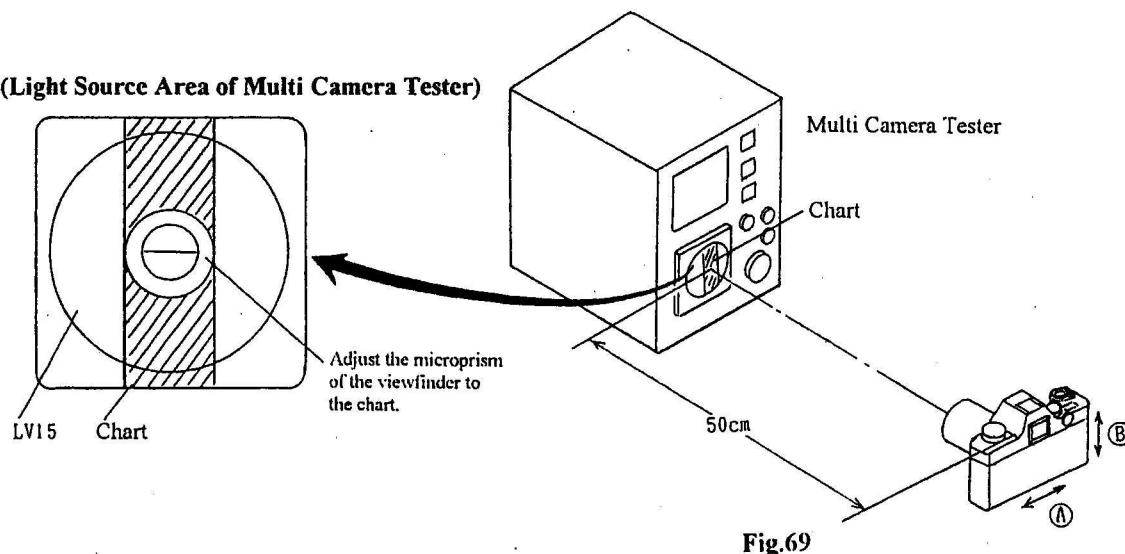


Fig.68

(Top View of Accessory Shoe Base)

(Light Source Area of Multi Camera Tester)



- 9) Set the camera at 50 cm from the black chart.
- 10) Focus the viewfinder by turning the Distance Ring of the Lens. In doing so, adjust the microprism area (about 5 mm in diameter) of the viewfinder to the side lines of the black chart rectangle.
- 11) Look into the viewfinder and swing the camera gently right and left (in the direction of the arrow Ⓐ). (See Fig. 69) Adjust by turning the Adjusting Pin Ⓐ so that the shutter speed indicator shows the slowest speed at swinging.
- * Remove the Top Cover Ass'y for this adjustment.
- 12) Repeat steps 10) and 11).
- 13) Remove the black chart and fix it with the long side of the rectangle in the horizontal position.
- 14) Set the camera at 50 cm from the black chart.
- 15) Focus the viewfinder by turning the Distance Ring of the Lens. In doing so, adjust the microprism area (about 5 mm in diameter) of the viewfinder to the side lines of the black chart rectangle.
- 16) Look into the viewfinder and swing the camera gently up and down (in the direction of the arrow Ⓑ). (See Fig. 69) Adjust by turning the Adjusting Pin Ⓑ so that the shutter speed indicator shows the slowest speed at swinging.
- 17) Repeat steps 15) and 16).
- 18) Tighten the Accessory Shoe Base Setscrews (69113076) × 2.
- 19) Lock the Adjusting Pins by applying the bond (Cemedine 551).

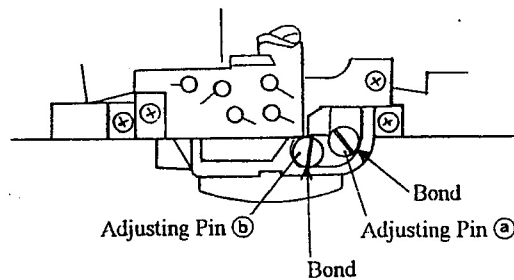


Fig.70

C-1-5. Adjustment of Flange Back Distance

- ① Distance from the Body Mount surface to the film rail surface:

⇒ 45.43 ± 0.02 mm

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

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

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

⇒ 0.20 ± 0.02 mm

C-1-6. Adjustment of Viewfinder Focusing

[Tool for Adjustment]

- Planar F1.4/50 MM Lens

1. Rough Adjustment of Viewfinder Focusing

* For adjustment, replace the washers under the Penta Prism Holder. (See Fig. 26)

- ① If focusing is not achieved even when the focus ring is turned to the infinity position
⇒ The finder back distance is too long, so shorten (lower) the position of the focusing plate.
- ② If focusing occurs before the focus ring is turned to the infinity position
⇒ The finder back distance is too short, so lengthen (raise) the position of the focusing plate.

2. Fine Adjustment of Viewfinder Focusing

- ① Use the Adjusting Pin in the Mirror Box only for a fine adjustment to correct such a small defocus that the Index is found within $\pm 1/4$ of the "∞" mark of the Lens (within 0.1 mm with the standard lens Planar F 1.4/50 mounted).
- ② When the adjustment of viewfinder focusing has been made by use of the Adjusting Pin in the Mirror Box, be sure to operate the shutter several times and make certain that viewfinder focusing is proper.
Upon completion of the adjustment, lock the Adjusting Pin by applying the bond (THREE BOND 1521B).

C-2. 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 only with the camera and measuring instruments, without communication with any special adjusting tools.

C-2-1. Explanation of Manual Adjusting Mode

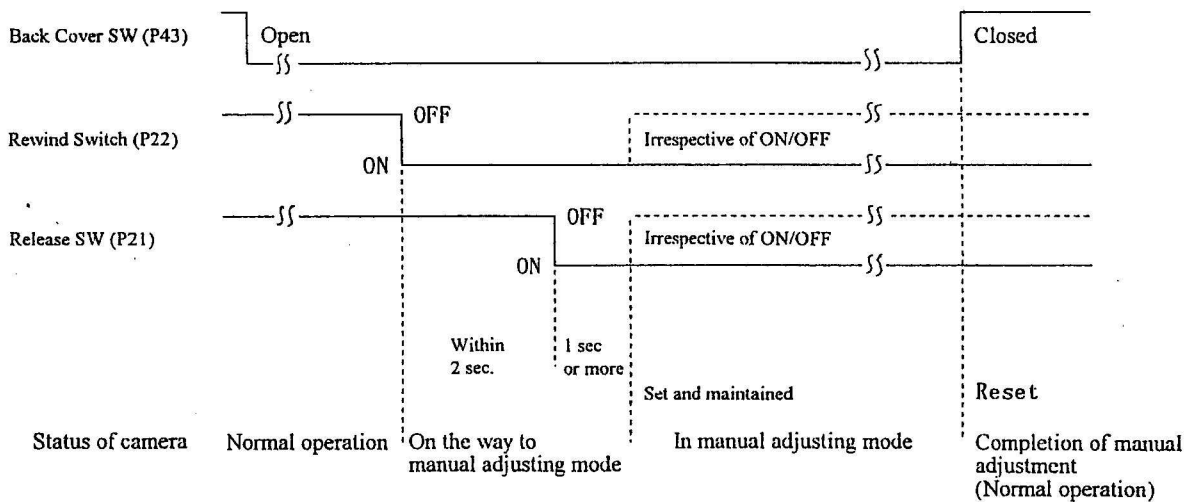
1. Transition from Normal Mode to Manual Adjusting Mode

With the Main Switch turned ON and the Back Cover open, turn ON the Rewind Switch by pressing the Shutter Release Button and at the same time (within two seconds), turn ON the Release Switch by pressing the Shutter Release Button and keep the two switches ON for more than one second. Then the manual adjusting mode will appear.

Once the manual adjusting mode has appeared, the manual adjusting mode is set and maintained irrespective of the positions of the Rewind Switch and Release Switch.

The Release Switch is used at data write, operation selection and item change.

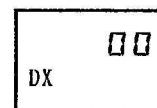
Upon successful setting of the manual adjusting mode, the display indicates the adjustment item No. 1 in each mode. (Modes and adjustment item Nos. are described later.)



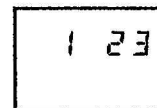
< Procedure for Setting of Manual Adjusting Mode >

- 1) Turn ON the Main Switch.
- ↓
- 2) Open the Back Cover.
- ↓
- 3) Press the Rewind Button. (Rewind Switch turns ON.)
- ↓ Within 2 seconds while pressing the Rewind Button
- 4) Press the Shutter Release Button. (Release Switch turns ON.)
- ↓ After passage of more than one second
- 5) The Display Panel indicates a manual adjusting mode display.

Normal Mode



Manual Adjusting Mode Display



2. Completion of Manual Adjusting Mode

By one of the following operations, the transition from the manual adjusting mode to the normal mode occurs. However, the data is not stored in memory.

- Detection of the turning OFF of the Main Switch
- Detection of the closing of the Back Cover
- Unloading and loading of the batteries

After this transition, the indications, mode and data will be the same as those restored by the reset operation.

3. Items in Manual Adjusting Mode and Their Description

In the manual adjusting mode, select an item by a combination of the setting position of the ABC Lever, the setting position of the Metering Mode Select Lever and the operation of the UP/DOWN Button.

(1) Selection of Adjusting Mode

Select an Adjusting Mode by a combination of the setting positions of the ABC Lever and Metering Mode Select Lever. Table 1 below shows the relationship between the setting positions of the ABC Lever and Metering Mode Select Lever and the Adjusting Mode Codes (A, B, C, D, E, F and G) :

Table 1 Setting Positions of ABC Lever and Metering Mode Select Lever and Adjusting Mode Codes

		Setting Position of ABC Lever		
		0	± 0.5	± 1.0
Setting position of Metering Mode Select Lever	Spot metering	A	D	G
	Average metering	B	E	
	Evaluative metering	C	F	

A, B, C, D : Indication of adjusted value

E : Indication of A/D value

F : Indication of backup data

G : Indication by semiautomatic adjustment

(2) Items in Adjusting Modes and Their Description

Table 2. Adjustment Items in Manual Adjusting Mode and Description of Adjustments (Part 1)

Item No. (Hex.)	Description	Item No. (Hex.)	Description
A - 0	Writing in EEPROM	B - 0	Writing in EEPROM
A - 1	Adjusted value for TTL Flash Auto control	B - 1	Adjusted value 1 for shutter resistance
A - 2	Adjusted value for shutter time	B - 2	Adjusted value 2 for shutter resistance
A - 3	Adjusted value for shutter delay	B - 3	Adjusted value 3 for shutter resistance
A - 4	Adjusted value 2 for winding brake by reverse run (for stop)	B - 4	Adjusted value 1 for exp. compensation resistance
A - 5	Adjusted value 1 for charge (brake delay)	B - 5	Adjusted value 2 for exp. compensation resistance
A - 6	Adjusted value 2 for charge (brake time)	B - 6	Adjusted value 3 for exp. compensation resistance
A - 7	Battery adjustment 1 (without load B2)	B - 7	Adjusted value 1 for aperture resistance
A - 8	Battery adjustment 2 (with load B2)	B - 8	Adjusted value 2 for aperture resistance
A - 9	Battery adjustment 3 (without load B1 - B2)	B - 9	Adjusted value 3 for aperture resistance
A - A	Battery adjustment 4 (with load B1 - B2)	B - A	Adjusted value for light metering distribution open F2.8 (pattern A)
A - b	Adjusted value for output level at shutter closing	B - b	Adjusted value for light metering distribution open F3.5 (pattern A)
A - c	Adjusted value for unexposure error count	B - c	Adjusted value for light metering distribution open F4.0 (pattern A)
A - d	Aperture delay pulse 1	B - d	Adjusted value for light metering distribution open F5.6 (pattern A)
A - E	Aperture delay pulse 2	B - E	Adjusted value for temperature sensor
A - F	Aperture delay pulse 3	B - F	Adjusted value for light metering temperature

Table 3. Adjustment Items in Manual Adjusting Mode and Description of Adjustments (Part 2)

Item No. (Hex.)	Description	Item No. (Hex.)	Description
C - 0	Writing in EEPROM	D - 0	Writing in EEPROM
C - 1	Adjusted value for imprinting time	D - 1	Snow mountain compensation judgment brightness
C - 2	Exposure adjustment shift value	D - 2	Adjusted value for light metering distribution open F2.4 (pattern D, E)
C - 3	Average light metering shift value	D - 3	Adjusted value for light metering distribution open F3.5 (pattern D, E)
C - 4	Spot light metering shift value	D - 4	Adjusted value for light metering distribution open F4.0 (pattern D, E)
C - 5	Adjusted value 1 for SPD A	D - 5	Adjusted value for light metering distribution open F5.6 (pattern D, E)
C - 6	Adjusted value 2 for SPD A	D - 6	Exposure shift value for service station
C - 7	Adjusted value 1 for SPD B	D - 7	Adjusted value for exposure detection
C - 8	Adjusted value 2 for SPD B	D - 8	Adjusted value 1 for winding brake by reverse run (for slow down)
C - 9	Adjusted value 1 for SPD C	D - 9	Adjusted value for winding pulse drive time
C - A	Adjusted value 2 for SPD C	D - A	Not used
C - b	Adjusted value 1 for SPD D	D - b	
C - c	Adjusted value 2 for SPD D	D - c	
C - d	Adjusted value 1 for SPD E	D - d	
C - E	Adjusted value 2 for SPD E	D - E	
C - F	Evaluative metering judgment brightness	D - F	
E - 0	Writing in EEPROM		
E - 1	A/D indication of battery check (without load)		
E - 2	A/D indication of shutter (unexposure detection)		
E - 3	A/D indication of winding perforation		
E - 4	A/D indication of aperture resistance		
E - 5	A/D indication of Mode Dial		
E - 6	A/D indication of Shutter Dial		
E - 7	A/D indication of Exp. Compensation Dial		
E - 8	A/D indication of temperature		
E - 9	A/D indication of light metering terminal (VR2)		
E - A	A/D indication of SPD A		
E - b	A/D indication of SPD B		
E - c	A/D indication of SPD C		
E - d	A/D indication of SPD D		
E - E	A/D indication of SPD E		
E - F	Not used		

Table 4. Adjustment Items in Manual Adjusting Mode and Description of Adjustments (Part 3)

Item No. (Hex.)	Description	Range of Adjusted (Displayed) Value
F - 0	Writing in EEPROM	00 (blinking at writing of adjusted value)
F - 1	Shots counter L	00 ~ FF (0 ~ 255 shots)
F - 2	Shots counter M	00 ~ 03 (0 ~ 1,023 shots)
F - 3	Shots counter H	00 ~ 99 (0 ~ 101,376 shots) (decimal notation)
F - 4	ISO setting value	00 ~ 1F (ISO 6 ~ ISO 6400)
F - 5	Error code	00 ~ 06
F - 6	Film threshold level L	
F - 7	Film threshold level H	
F - 8	Unexposure error counter	00 ~ (decimal notation)
F - 9	SHCOUT at unexposure error	
F - A	Status information L	
F - b	Status information H	
F - c	Contents of option setting	
F - d	Adjusted value for charge release brake time	
F - E	CPU version	ROM version (Superior-order : CPU1 ; Inferior-order : CPU2)
F - F	Erase of all data in EEPROM	00 (blinking during all data erasure)

Table 5. Adjustment Items in Manual Adjusting Mode and Description of Adjustments (Part 4)

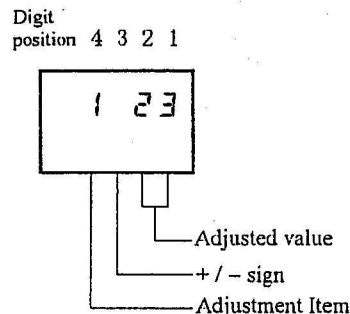
Item No. (Hex.)	Description	Displayed
G - 0	Writing in EEPROM	00 (blinking at writing of adjusted value)
G - 1	Semiautomatic adjustment of shutter resistance	See "Semiautomatic Adjustment Mode"
G - 2	Semiautomatic adjustment of exp. compensation resistance	See "Semiautomatic Adjustment Mode"
G - 3	Semiautomatic adjustment of aperture resistance	See "Semiautomatic Adjustment Mode"
G - 4	Semiautomatic adjustment of unexposure detect level	See "Semiautomatic Adjustment Mode"
G - 5	Whole LCD lighting	00 (whole lighting or 00 indication occurs alternately at each Release SW "ON")
G - 6 G - 7 G - 8 G - 9 G - A G - b G - c G - d G - E	Not used	00
G - F		0, 1 (0 or 1 is displayed alternately at each Release SW "ON") (Writing is not allowed at G - 0)

4. Display, Change and Storage of Adjusted Value

(1) Display of Adjusted Value

Adjusted values are generally displayed by hexadecimal notations but some adjusted values are decimal notations depending on adjustment items.

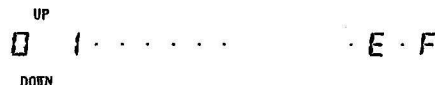
- ① 4th digit : Indicates the adjustment item number.
The hexadecimal numbers of 0 to F represent 16 adjustment items.
* Initial display : " 1 "
- ② 3rd digit : [Hexadecimal notation] Always blank.
[Decimal notation] Indicates the plus or minus sign of the number indicated at the 1st and 2nd digit positions.
However, the plus is represented by a blank and the minus is represented by "-".
* Initial display : " " (blank)
- ③ 1st and 2nd digits: Indicate the adjusted value of the selected adjustment item.
[Hexadecimal notation] Indicate 00 ~ FF. Initial display : 00
[Decimal notation] Adjusted values including the sign described at ② above are represented in the range of -99 to +99. Initial display : 00
- ④ Adjustment items for which the adjusted value is displayed by decimal notation.
- F - 3 (Shots counter : superior-order), F - 4 (Unexposure error counter)



(2) Change of Adjustment Item and Adjusted Value

(2) - 1. Change of Adjustment Item

Pressing the UP Button to turn ON the UP Switch will increment the adjustment item number and pressing the DOWN Button to turn ON the DOWN Switch will decrement the adjustment item number. One press of the UP or DOWN Button will change the adjustment item one time. The display will not change even by pressing the DOWN Button at " 0 " or UP Button at " F ".



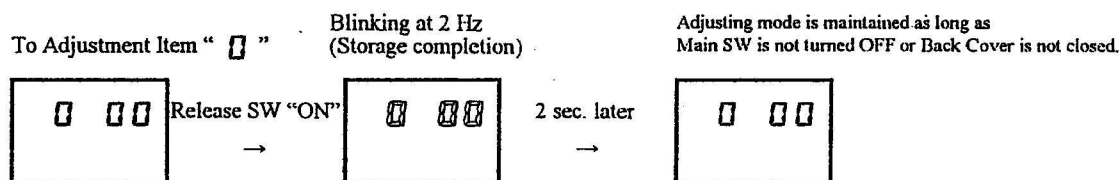
(2) - 2. Change of Adjusted Value

Change the adjusted value of the adjustment item selected in (2)-1. The adjusted value obtained by the previous adjustment is displayed first. Then adjust the displayed value (initial value is " 00 "). To change the adjusted value, set the Main Switch in the "AEL" position and press the UP or DOWN Button. Pressing the UP Button to turn ON the UP Switch will increment the adjusted value and pressing the DOWN Button to turn ON the DOWN Switch will decrement the adjusted value.

One press of the UP or DOWN Button will change the adjusted value one time. The upper and lower limits of adjusted values vary with the adjustment item. Keeping the UP or DOWN Button pressed (for more than 1.2 seconds) will change the value as rapidly as at eight times a second.

(3) Storage

Return the adjustment item display to " 0 " and turn ON the Release Switch, and the adjusted values for all the adjustment items will be written in EEPROM whether some or no adjusted values have been changed. Item " 0 " means memory mode, where the adjusted value indicating area of the display always shows " 00 ". After turning ON the Release Switch, the display blinks at 2 Hz for 2 seconds.



C-2-2. Adjustment Procedure

1. Semiautomatic Adjustment Mode (Adjustment Item G - 1 ~ 4)

* Use this mode to adjust the relationship between the setting positions of Dials and A/D converted values.

(1) Semiautomatic Adjustment of Shutter Resistance (Adjustment Item G - 1)

* Make this adjustment to set the adjusted values 1, 2 and 3 for the shutter resistance.

* Perform the operations 1) to 5) described below, and the camera will automatically calculate and write the adjusted values for the shutter resistance reference value and shutter resistance inclination. (There is no need of returning the adjustment item to 0.)

< Adjustment Procedure >

1) Set the manual adjusting mode.

2) Set the ABC Lever to "± 1.0" and set the adjustment item to G - 1. In the initial state, the 7-segment display will indicate 1 4.

3) Set the Shutter Dial in the "4s" position and turn ON the Release Switch.

The voltage from the shutter resistor is A/D converted and the adjusted value 1 for the shutter resistance will be obtained.

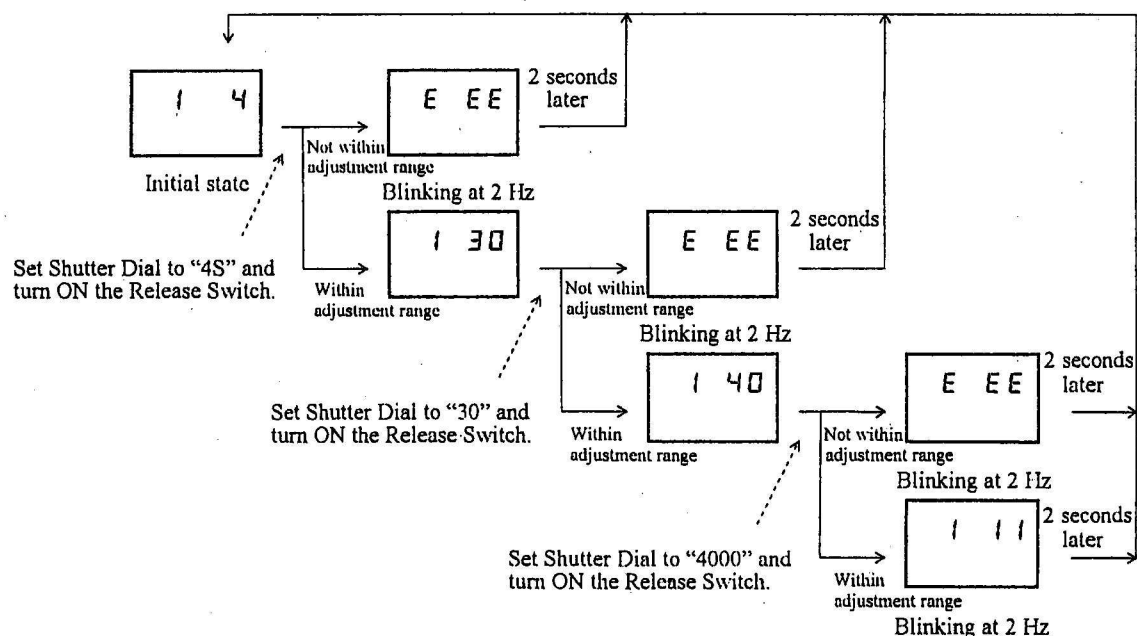
When the adjusted value 1 for the shutter resistance is within the adjustment range, the display will change to 1 30. If the adjusted value is not within the adjustment range, the display will indicate E E E, blinking at 2 Hz, for two seconds and then return to the initial state.

4) With the display indicating 1 30, set the Shutter Dial in the "30" position and turn ON the Release Switch. The voltage from the shutter resistor will be A/D converted and the adjusted value 2 for the shutter resistance will be obtained.

When the adjusted value 2 for the shutter resistance is within the adjustment range, the display will change to 1 40. If the adjusted value is not within the adjustment range, the display will indicate E E E, blinking at 2 Hz, for two seconds and then return to the initial state.

5) With the display indicating 1 40, set the Shutter Dial in the "4000" position and turn ON the Release Switch. The voltage from the shutter resistor will be A/D converted and the adjusted value 3 for the shutter resistance will be obtained.

When the adjusted value 3 for the shutter resistance is within the adjustment range, the adjusted values 1, 2 and 3 for the shutter resistance will automatically be written in EEPROM. The display will indicate 1 1 1, blinking at 2 Hz, for two seconds to show the execution of writing and then return to the initial state. If the adjusted value is not within the adjustment range, the display will indicate E E E, blinking at 2 Hz, for two seconds and then return to the initial state.

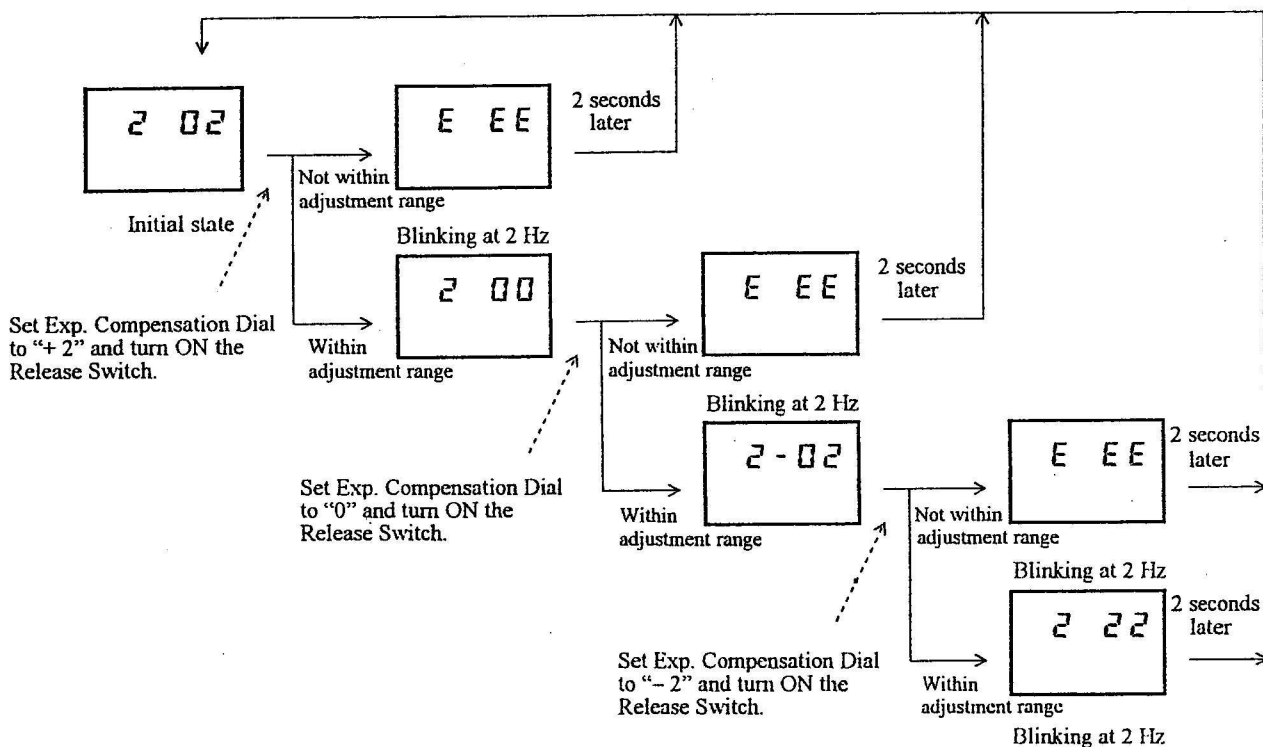


(2) Semiautomatic Adjustment of Exposure Compensation Resistance (Adjustment Item $G - \bar{2}$)

- * Make this adjustment to set the adjusted values 1, 2 and 3 for the exposure compensation resistance.
- * Perform the operations 1) to 4) described below, and the camera will automatically calculate and write the adjusted values for the exposure compensation resistance reference value and exposure compensation resistance inclination. (There is no need of returning the adjustment item to $\bar{0}$.)

< Adjustment Procedure >

- 1) In the manual adjusting mode, set the adjustment item to $G - \bar{2}$ by pressing the UP Button. In the initial state, the 7-segment display will indicate $\bar{2} \bar{0} \bar{2}$.
- 2) Set the Exposure Compensation Dial in the "+ 2" position and turn ON the Release Switch.
The voltage from the exposure compensation resistor is A/D converted and the adjusted value 1 for the exposure compensation resistance will be obtained.
When the adjusted value 1 for the exposure compensation resistance is within the adjustment range, the display will change to $\bar{2} \bar{0} \bar{0}$. If the adjusted value is not within the adjustment range, the display will indicate $E \ E \ E$, blinking at 2 Hz, for two seconds and then return to the initial state.
- 3) With the display indicating $\bar{2} \bar{0} \bar{0}$, set the Exposure Compensation Dial in the "0" position and turn ON the Release Switch. The voltage from the exposure compensation resistor will be A/D converted and the adjusted value 2 for the exposure compensation resistance will be obtained.
When the adjusted value 2 for the exposure compensation resistance is within the adjustment range, the display will change to $\bar{2} - \bar{0} \bar{2}$. If the adjusted value is not within the adjustment range, the display will indicate $E \ E \ E$, blinking at 2 Hz, for two seconds and then return to the initial state.
- 4) With the display indicating $\bar{2} - \bar{0} \bar{2}$, set the Exposure Compensation Dial in the "- 2" position and turn ON the Release Switch. The voltage from the exposure compensation resistor will be A/D converted and the adjusted value 3 for the exposure compensation resistance will be obtained.
When the adjusted value 3 for the exposure compensation resistance is within the adjustment range, the adjusted values 1, 2 and 3 for the exposure compensation resistance will automatically be written in EEPROM. The display will indicate $\bar{2} \bar{2} \bar{2}$, blinking at 2 Hz, for two seconds to show the execution of writing and then return to the initial state. If the adjusted value is not within the adjustment range, the display will indicate $E \ E \ E$, blinking at 2 Hz, for two seconds and then return to the initial state.

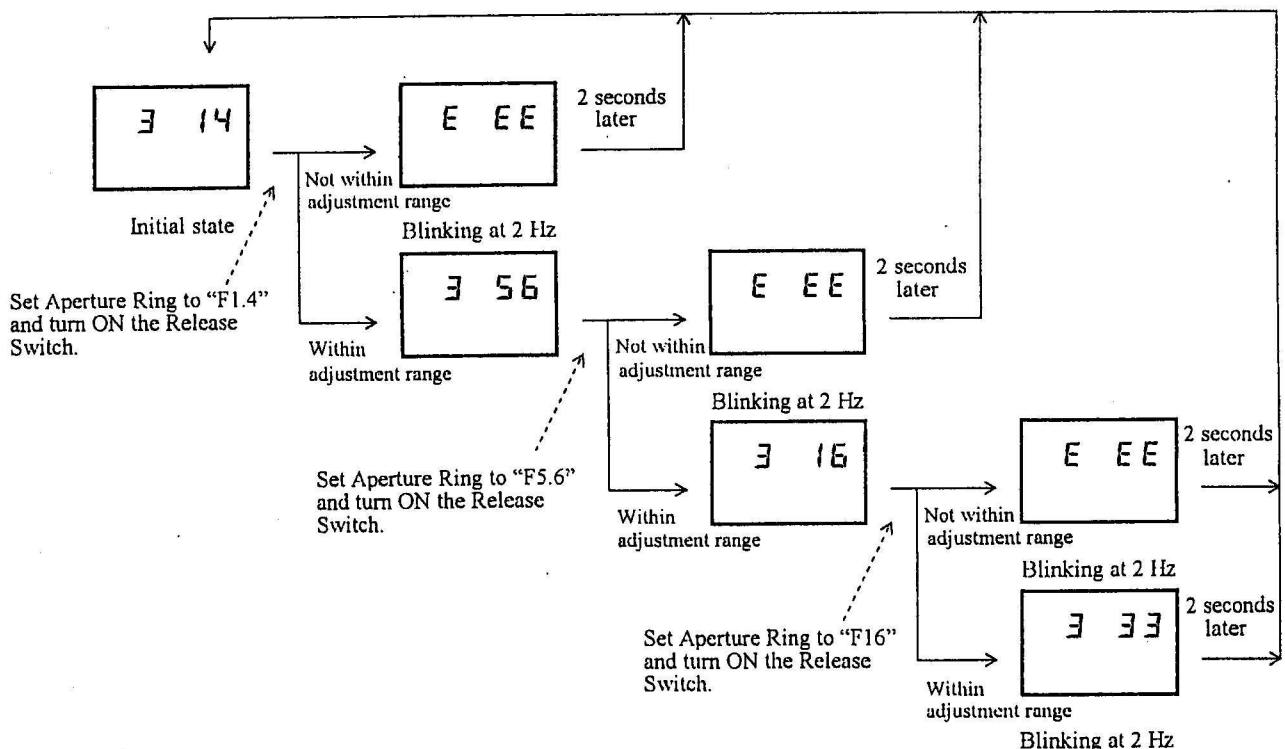


(3) Semiautomatic Adjustment of Aperture Resistance (Adjustment Item G - 3)

- * Make this adjustment to set the adjusted values 1, 2 and 3 for the exposure aperture resistance.
- * Perform the operations 1) to 5) described below, and the camera will automatically calculate and write the adjusted values for the aperture resistance reference value and aperture resistance inclination. (There is no need of returning the adjustment item to 0.)
- * With the Planar 50 mm/F1.4 MM lens mounted, perform the following operations :

< Adjustment Procedure >

- 1) Set the Lens (Planar 50 mm/F1.4) on the camera.
- 2) In the manual adjusting mode, set the adjustment item to G - 3 by pressing the UP Button. In the initial state, the 7-segment display will indicate 3 14.
- 3) Set the Aperture Ring in the "F1.4" position and turn ON the Release Switch.
The voltage from the aperture resistor is A/D converted and the adjusted value 1 for the aperture resistance will be obtained.
When the adjusted value 1 for the aperture resistance is within the adjustment range, the display will change to 3 56. If the adjusted value is not within the adjustment range, the display will indicate E E E, blinking at 2 Hz, for two seconds and then return to the initial state.
- 4) With the display indicating 3 56, set the Aperture Ring in the "F5.6" position and turn ON the Release Switch. The voltage from the aperture resistor will be A/D converted and the adjusted value 2 for the aperture resistance will be obtained.
When the adjusted value 2 for the aperture resistance is within the adjustment range, the display will change to 3 16. If the adjusted value is not within the adjustment range, the display will indicate E E E, blinking at 2 Hz, for two seconds and then return to the initial state.
- 5) With the display indicating 3 16, set the Aperture Ring in the "F16" position and turn ON the Release Switch. The voltage from the aperture resistor will be A/D converted and the adjusted value 3 for the aperture resistance will be obtained.
When the adjusted value 3 for the aperture resistance is within the adjustment range, the adjusted values 1, 2 and 3 for the aperture resistance will automatically be written in EEPROM. The display will indicate 3 3 3, blinking at 2 Hz, for two seconds to show the execution of writing and then return to the initial state. If the adjusted value is not within the adjustment range, the display will indicate E E E, blinking at 2 Hz, for two seconds and then return to the initial state.

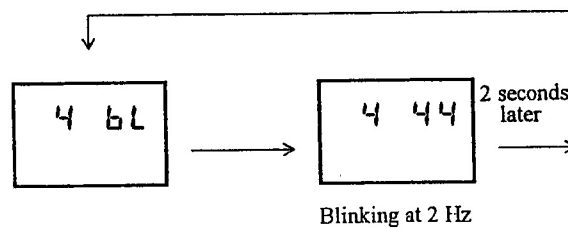


(4) Semiautomatic Adjustment of Unexposure Detection Level (Adjustment Item G - 4)

* Adjusted value for output level at shutter closing

< Adjustment Procedure >

- 1) In the manual adjusting mode, set the adjustment item to G - 4 by pressing the UP Button. In the initial state, the 7-segment display will indicate 4 bL.
- 2) Under these conditions, turn ON the Release Switch. The outputs from the photo-reflector for unexposure detection before the first curtain travel and before the second curtain travel are A/D converted. Then from the A/D converted values, the adjusted value for output level at shutter closing is obtained and written in EEPROM. The display will indicate 4 44, blinking at 2 Hz, for two seconds to show the execution of writing and then return to the initial state.



2. Exposure Adjustments

- * In manual adjustments, the adjustment items $A-1 \sim A-3$, $A-4 \sim A-6$, $C-2 \sim C-5$ relate to exposure adjustments. When any of these adjustment items has been selected, turning ON the Release Switch will start a shutter release sequence. This sequence, however, is different from the shutter release sequence in the normal mode in that the battery check is not performed. Therefore, special attention must be paid to the power supply.
- * The exposure adjustments include the adjustments of the adjusted values 1 and 2 for SPDs A to E and the adjustment of the average metering shift value. Before making these adjustments, be sure to make the shutter time adjustment.
The exposure adjustments must be made in the order of (1) to (4) below. If they are performed in a wrong order, the adjustments can not be achieved correctly.
- * The adjusted values can be written in EEPROM one by one by storage operation after each adjusted value change or all together after the adjustment of aperture delay pulse 3 at (3). The adjusted value for TTL Flash Auto control at (4) must be stored after each change of the adjusted value, since the adjustment is made only with the Back Cover closed.

< Operations before Adjustments >

- ① Make certain that the values for the adjustment items $C-2 \sim 4$ and $D-5$ are both "0". If they are not "0", change them to "0".
- ② Write the changed adjusted values in EEPROM.

(1) Adjusted Value for Shutter Time (Adjustment Item $A-2$)

< Tools for Adjustment >

- AE camera tester (EF8000, EF5000)

< Adjustment Procedure >

- 1) Set the manual adjusting mode.
- 2) Set the Metering Mode Select Lever in the spot metering position and set the ABC Lever in the "0" position.
- 3) Set adjustment item $A-2$ (shutter time adjustment) by pressing the UP Button.
- 4) With the Back Cover open, set the camera on the AE camera tester.
- 5) Set the Exposure Mode Select Lever to "M" (Manual) and the Shutter Dial to "2000".
- 6) Turn ON the Release Switch to execute shutter release sequence. At this time, check the time T_m displayed on the AE camera tester.
If the time T_m displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.

When T_m is slow : Decrement the adjusted value by pressing the DOWN Button.

When T_m is fast : Increment the adjusted value by pressing the UP Button.

Standard range : - 64 to 64

Allowable range at 1/2000 : ± 0.3 EV

- 7) Set the Shutter Dial to "4000" and execute shutter release sequence. Then make certain that the value is within the allowable range.

Allowable range at 1/4000 : ± 0.6 EV

- 8) Set the Main Switch in the "ON" position and set adjustment item $A-3$ by pressing the DOWN Button.
- 9) Write the adjusted value in EEPROM by turning ON the Release Switch.

Table 6. Allowable Range of Manual Exposure Time

Shutter Speed	+	Reference Value	-
X	8.37	7.81	7.29
1"	1035	1000	966
1/2	517.6	500	483.0
1/4	258.8	250	241.5
1/8	134.0	125	116.6
1/15	66.99	62.50	58.32
1/30	33.55	31.30	29.20
1/60	16.75	15.63	14.58
1/125	8.37	7.81	7.29
1/250	4.81	3.91	3.17
1/500	2.40	1.95	1.58
1/1000	1.21	0.98	0.80
1/2000	0.644	0.49	0.370
1/4000	0.383	0.244	0.156

(Unit : ms)

*** Curtain Travel Speed**

- The travel speeds of the first curtain and second curtain are both such that each curtain takes about 4.8 ms to travel the vertical length of 24 mm (sensing point of spot light source tester : 21 mm).
- 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.

(2) SPD Adjustments

* Mount the Planar 50 mm/F1.4 MM Lens on the camera and with the Back Cover open, set the camera on the AE camera tester. In this state, make the adjustments (2) - 1 to (2) - 10 below.

Table 7. Relationship between Adjusted Values for SPDs and Adjustment Item Nos.

	SPD A	SPD B	SPD C	SPD D	SPD E
Adjusted value 1	C - 5	C - 7	C - 9	C - b	C - d
Adjusted value 2	C - 5	C - 8	C - A	C - c	C - E

Table 8. Allowable Range of Light Exposure Values

Brightness (LV)	Allowable Range
LV 9	- 0.5 ~ +0.5 EV
LV 15	- 0.5 ~ +0.5 EV

K value : 1.04 ; ISO 100

< Tools for Adjustments >

- AE camera tester (EF-8000, EF-5000)
- Planar 50 mm/F1.4 MM Lens

(2)-1. Adjusted Value 1 for SPD A (Adjustment Item C - 5)**< Adjustment Procedure >**

- 1) Set the manual adjusting mode.
- 2) Mount the Lens (Planar 50 mm/F1.4) on the camera.
- 3) Set the Metering Mode Select Lever in the evaluative metering position and set the ABC Lever in the "0" position.
- 4) Set adjustment item C - 5.
- 5) Set the Exposure Mode Select Lever to "AV", the aperture to F5.6 and the brightness of the AE camera tester to LV 9.
- 6) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance Δ EV displayed on the AE camera tester.

If the light exposure variance Δ EV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.

When Δ EV is over : Decrement the adjusted value by pressing the DOWN Button.

When Δ EV is under : Increment the adjusted value by pressing the UP Button.

- 7) Set the Main Switch in the "ON" position and set adjustment item C - 5 by pressing the DOWN Button.
- 8) Write the adjusted value in EEPROM by turning ON the Release Switch.

(2)-2. Adjusted Value 2 for SPD A (Adjustment Item C - 5)

- 1) Set the Main Switch in the "ON" position.
 - 2) Set adjustment item C - 5.
 - 3) Set the brightness of the AE camera tester to LV 15.
 - 4) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance Δ EV displayed on the AE camera tester.
- If the light exposure variance Δ EV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.
- 5) Set the Main Switch in the "ON" position and set adjustment item C - 5 by pressing the DOWN Button.
 - 6) Write the adjusted value in EEPROM by turning ON the Release Switch.

(2)-3. Adjusted Value 1 for SPD B (Adjustment Item C - 7)

- 1) Set the Main Switch in the "ON" position.
- 2) Set adjustment item C - 7.
- 3) Set the brightness of the AE camera tester to LV 9.
- 4) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance ΔEV displayed on the AE camera tester.
If the light exposure variance ΔEV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.
- 5) Set the Main Switch in the "ON" position and set adjustment item C - 7 by pressing the DOWN Button.
- 6) Write the adjusted value in EEPROM by turning ON the Release Switch.

(2)-4. Adjusted Value 2 for SPD B (Adjustment Item C - 8)

- 1) Set the Main Switch in the "ON" position.
- 2) Set adjustment item C - 8.
- 3) Set the brightness of the AE camera tester to LV 15.
- 4) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance ΔEV displayed on the AE camera tester.
If the light exposure variance ΔEV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.
- 5) Set the Main Switch in the "ON" position and set adjustment item C - 8 by pressing the DOWN Button.
- 6) Write the adjusted value in EEPROM by turning ON the Release Switch.

(2)-5. Adjusted Value 1 for SPD C (Adjustment Item C - 9)

- 1) Set the Main Switch in the "ON" position.
- 2) Set adjustment item C - 9.
- 3) Set the brightness of the AE camera tester to LV 9.
- 4) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance ΔEV displayed on the AE camera tester.
If the light exposure variance ΔEV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.
- 5) Set the Main Switch in the "ON" position and set adjustment item C - 9 by pressing the DOWN Button.
- 6) Write the adjusted value in EEPROM by turning ON the Release Switch.

(2)-6. Adjusted Value 2 for SPD C (Adjustment Item C - 10)

- 1) Set the Main Switch in the "ON" position.
- 2) Set adjustment item C - 10.
- 3) Set the brightness of the AE camera tester to LV 15.
- 4) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance ΔEV displayed on the AE camera tester.
If the light exposure variance ΔEV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.
- 5) Set the Main Switch in the "ON" position and set adjustment item C - 10 by pressing the DOWN Button.
- 6) Write the adjusted value in EEPROM by turning ON the Release Switch.

(2)-7. Adjusted Value 1 for SPD D (Adjustment Item C - b)

- 1) Set the Main Switch in the "ON" position.
- 2) Set adjustment item C - b.
- 3) Set the brightness of the AE camera tester to LV 9.
- 4) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance ΔEV displayed on the AE camera tester.
If the light exposure variance ΔEV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.
- 5) Set the Main Switch in the "ON" position and set adjustment item C - \square by pressing the DOWN Button.
- 6) Write the adjusted value in EEPROM by turning ON the Release Switch.

(2)-8. Adjusted Value 2 for SPD D (Adjustment Item C - c)

- 1) Set the Main Switch in the "ON" position.
- 2) Set adjustment item C - c.
- 3) Set the brightness of the AE camera tester to LV 15.
- 4) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance ΔEV displayed on the AE camera tester.
If the light exposure variance ΔEV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.
- 5) Set the Main Switch in the "ON" position and set adjustment item C - \square by pressing the DOWN Button.
- 6) Write the adjusted value in EEPROM by turning ON the Release Switch.

(2)-9. Adjusted Value 1 for SPD E (Adjustment Item C - d)

- 1) Set the Main Switch in the "ON" position.
- 2) Set adjustment item C - d.
- 3) Set the brightness of the AE camera tester to LV 9.
- 4) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance ΔEV displayed on the AE camera tester.
If the light exposure variance ΔEV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.
- 5) Set the Main Switch in the "ON" position and set adjustment item C - \square by pressing the DOWN Button.
- 6) Write the adjusted value in EEPROM by turning ON the Release Switch.

(2)-10. Adjusted Value 2 for SPD E (Adjustment Item C - E)

- 1) Set the Main Switch in the "ON" position.
- 2) Set adjustment item C - E.
- 3) Set the brightness of the AE camera tester to LV 15.
- 4) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance ΔEV displayed on the AE camera tester.
If the light exposure variance ΔEV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.
- 5) Set the Main Switch in the "ON" position and set adjustment item C - \square by pressing the DOWN Button.
- 6) Write the adjusted value in EEPROM by turning ON the Release Switch.

(3) Adjustments of Aperture Delay Pulse

< Tools for Adjustment >

- AE camera tester (EF-8000, EF-5000)
- Planar 50 mm/F1.4 MM Lens

(3)-1. Aperture Delay Pulse 1 (Adjustment Item A – Δ)

< Adjustment Procedure >

- 1) Set the manual adjusting mode.
- 2) Mount the Lens (Planar 50 mm/F1.4) on the camera.
- 3) Set the Metering Mode Select Lever in the spot metering position and set the ABC Lever in the “0” position.
- 4) Set adjustment item A – Δ .
- 5) Set the Exposure Mode Select Lever to “TV”, the Shutter Dial to “125” and the aperture to the minimum aperture (F16). (The light metering system is set to center-weighted average metering.)
- 6) Set the brightness of the AE camera tester to LV 9.
- 7) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance Δ EV displayed on the AE camera tester.

If the light exposure variance Δ EV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the “AEL” position and make adjustment by pressing the UP or DOWN Button so that the variance is nearly 0 EV.

When Δ EV is over : Decrement the adjusted value by pressing the DOWN Button.

When Δ EV is under : Increment the adjusted value by pressing the UP Button.

Standard range : – 12 to 12

- 8) Set the Main Switch in the “ON” position and set adjustment item A – \square by pressing the DOWN Button.
- 9) Write the adjusted value in EEPROM by turning ON the Release Switch.

(3)-2. Aperture Delay Pulse 2 (Adjustment Item A – E)

- 1) Set the Main Switch in the “ON” position.
- 2) Set adjustment item A – E.
- 3) Set the brightness of the AE camera tester to LV 12.
- 4) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance Δ EV displayed on the AE camera tester.
If the light exposure variance Δ EV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the “AEL” position and make adjustment by pressing the UP or DOWN Button so that the variance is nearly 0 EV.
- 5) Set the Main Switch in the “ON” position and set adjustment item A – \square by pressing the DOWN Button.
- 6) Write the adjusted value in EEPROM by turning ON the Release Switch.

(3)-3. Aperture Delay Pulse 3 (Adjustment Item A – F)

- 1) Set the Main Switch in the “ON” position.
- 2) Set adjustment item A – F.
- 3) Set the brightness of the AE camera tester to LV 15.
- 4) Turn ON the Release Switch to execute shutter release sequence. At this time, check the light exposure variance Δ EV displayed on the AE camera tester.
If the light exposure variance Δ EV displayed on the AE camera tester is not within the standard range relative to the reference value, set the Main Switch in the “AEL” position and make adjustment by pressing the UP or DOWN Button so that the variance is nearly 0 EV.
- 5) Set the Main Switch in the “ON” position and set adjustment item A – \square by pressing the DOWN Button.
- 6) Write the adjusted value in EEPROM by turning ON the Release Switch.

(4) Adjustment of TTL Flash Auto Control Value (Adjustment Item A — f)

- * Make the adjustment of TTL direct flash metering for use of a Flash Unit of the TLA system.
- * Set the Lens and Flash Unit on the camera, measure the TTL Flash Auto control value ΔEV with a flash meter and change the adjusted value to optimize the TTL Flash Auto control value.
- * 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 >

- Flash meter
- Planar 50 mm/F1.4 MM Lens
- Flash unit of TLA system
- Tripod
- Standard reflector paper (gray chart with a reflectivity of 18 %)

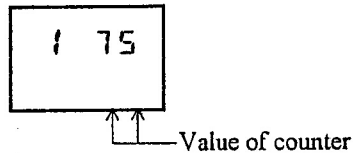
< Adjustment Procedure >

- 1) Load the film (Ektachrome 64) in the camera.
- 2) Mount the lens (Planar 50 mm/F1.4) and a flash unit (flash unit of TLA system) on the camera.
- 3) Mount the camera on the tripod.
- 4) Fix the standard reflector paper and set the flash meter.
- 5) Place the tripod at 2 m from the standard reflector paper.
- 6) Set the aperture for the lens to F 4.0.
- 7) Set the Exposure Mode Select Lever of the camera to "AV" and the ISO film speed to "ISO 100".
- 8) Turn ON the Release Switch to execute shutter release sequence and fire the flash. Then measure the deviation of the TTL Flash Auto control value ΔEV with the flash meter.
- 9) Set the manual adjusting mode.
- 10) Set adjustment item A — f and change the adjusted value.
If the TTL Flash Auto control value ΔEV displayed on the flash meter is not within the standard range relative to the reference value, set the Main Switch in the "AEL" position and make adjustment by pressing the UP or DOWN Button.
- 11) Set the Main Switch in the "ON" position and set adjustment item A — □ by pressing the DOWN Button.
- 12) Write the adjusted value in EEPROM by turning ON the Release Switch.
- 13) Repeat the steps 8) to 12) above until the TTL Flash Auto control value ΔEV becomes within the range of $\pm 0.5 EV$.

3. About Other Adjusted Values

(1) Shots Counter (Adjustment Item F - 1 ~ 3)

- * Check the total number of shots. Every time the shutter operates, the camera adds one to the value of the shots counter in EEPROM. In these items, the value of the counter is indicated at the 2nd and 1st digit positions of the 7-segment display.



At F - 1, the displayed value is incremented every shutter operation. The value is displayed by one of the decimal numbers ranging from 00 to FF.

At F - 2, the displayed value is incremented every carry at F - 1. The value is displayed by one of the decimal numbers ranging from 00 to 03.

At F - 3, the displayed value is incremented every carry at F - 2. The value is displayed by one of the decimal numbers ranging from 00 to 99.

Since the value at F - 3 is incremented every 1024 shots, the display can be used as a counter that shows a multiple of about 1000 shots.

The values of the shots counters can be changed and written by the same procedure as in the adjusted value setting mode. If the Shutter Unit has been replaced with a new one by servicing, write 00 in the shots counters F - 1 ~ 3. If the EEPROM is replaced with a new one without replacing the Shutter Unit, read out the shots count from the old EEPROM and write it in the new EEPROM.

(2) Battery Adjustments 1, 2, 3 and 4 (Adjustment Item A - 7, 8, 9, A)

- * Since all battery adjustments have been finished at the factory, there is no need of performing any battery adjustments on the service side.
Do not change the adjusted values.
- * The Main FPC Ass'y which is supplied as a service part has already been adjusted.

(3) About the Other Adjusted Values

- * Never change any of the other adjusted values.

C-3. OTHERS

C-3-1. Synchro Contact

① Delay time of X-contact

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

A range : 0.2 ~ 1.0 ms

C range : 1.7 ms or more

② Contact efficiency of X-contact

The contact efficiency must be 60% or above at shutter speed of 1/125 sec. (X) or less.

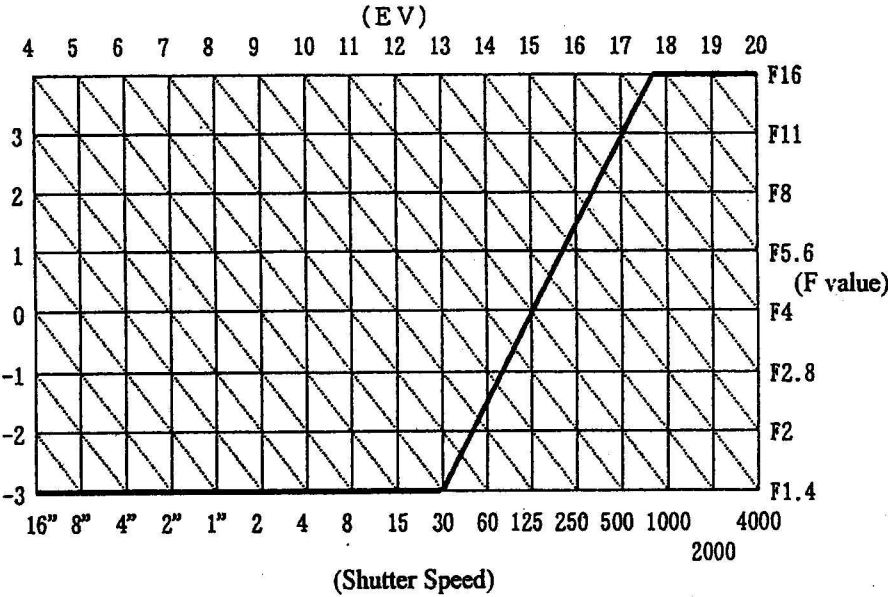
* Use a contact efficiency meter at 1 ms.

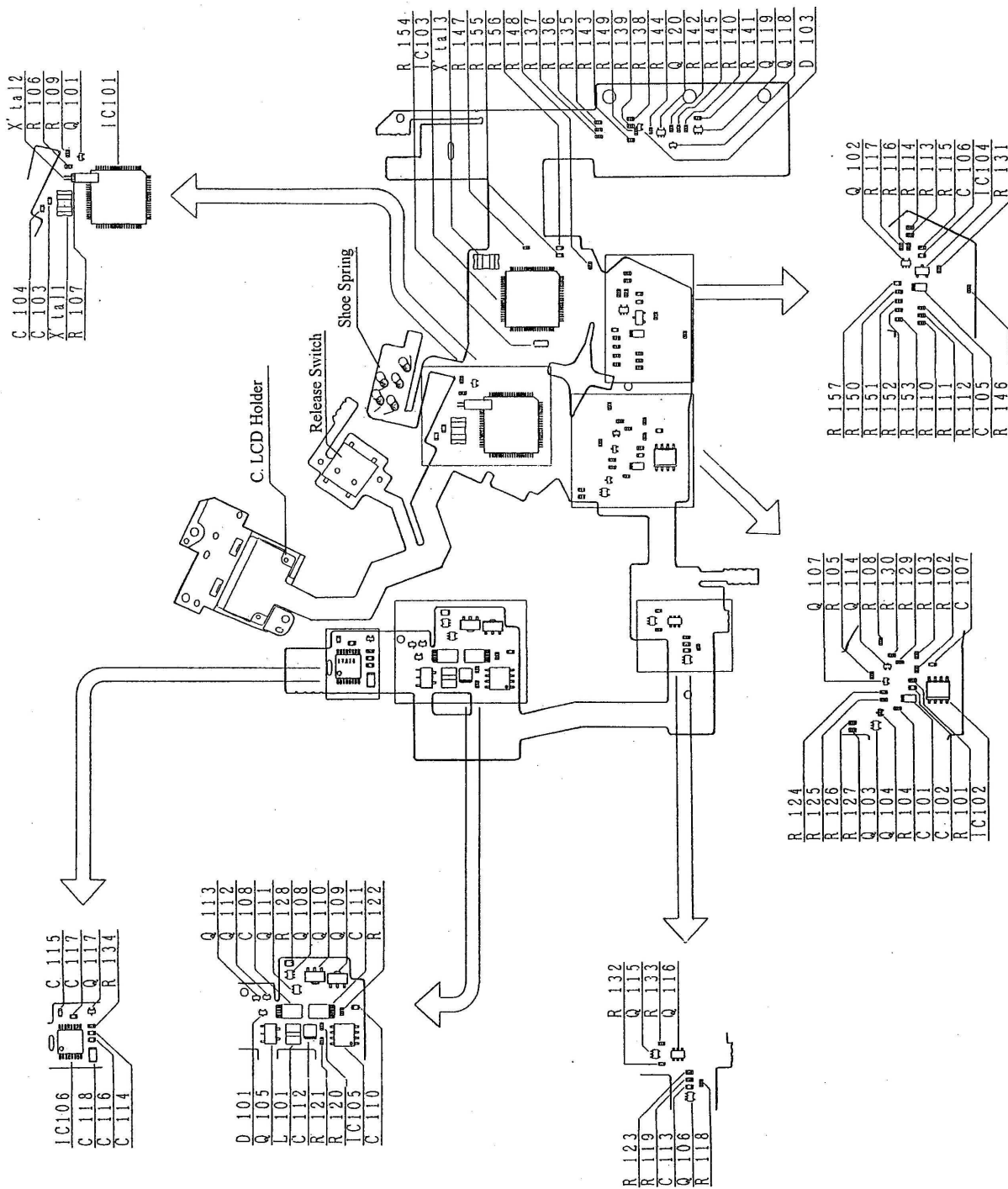
C-3-2. Current Consumption

Main Switch OFF (standby current)	25 μ A or below	
Main Switch ON		
LCD ON (Power ON)	100 mA or below	
LCD OFF	25 μ A or below	
Winding operation	800 mA or below	(Check with film loaded)
Winding stop current	2000 mA or below	(Check with film loaded)
Rewinding operation	500 mA or below	(Check with film loaded)
Release (shutter operation, single frame)	600 mA or below	(Check with film loaded)

C-3-3. Program Control Chart

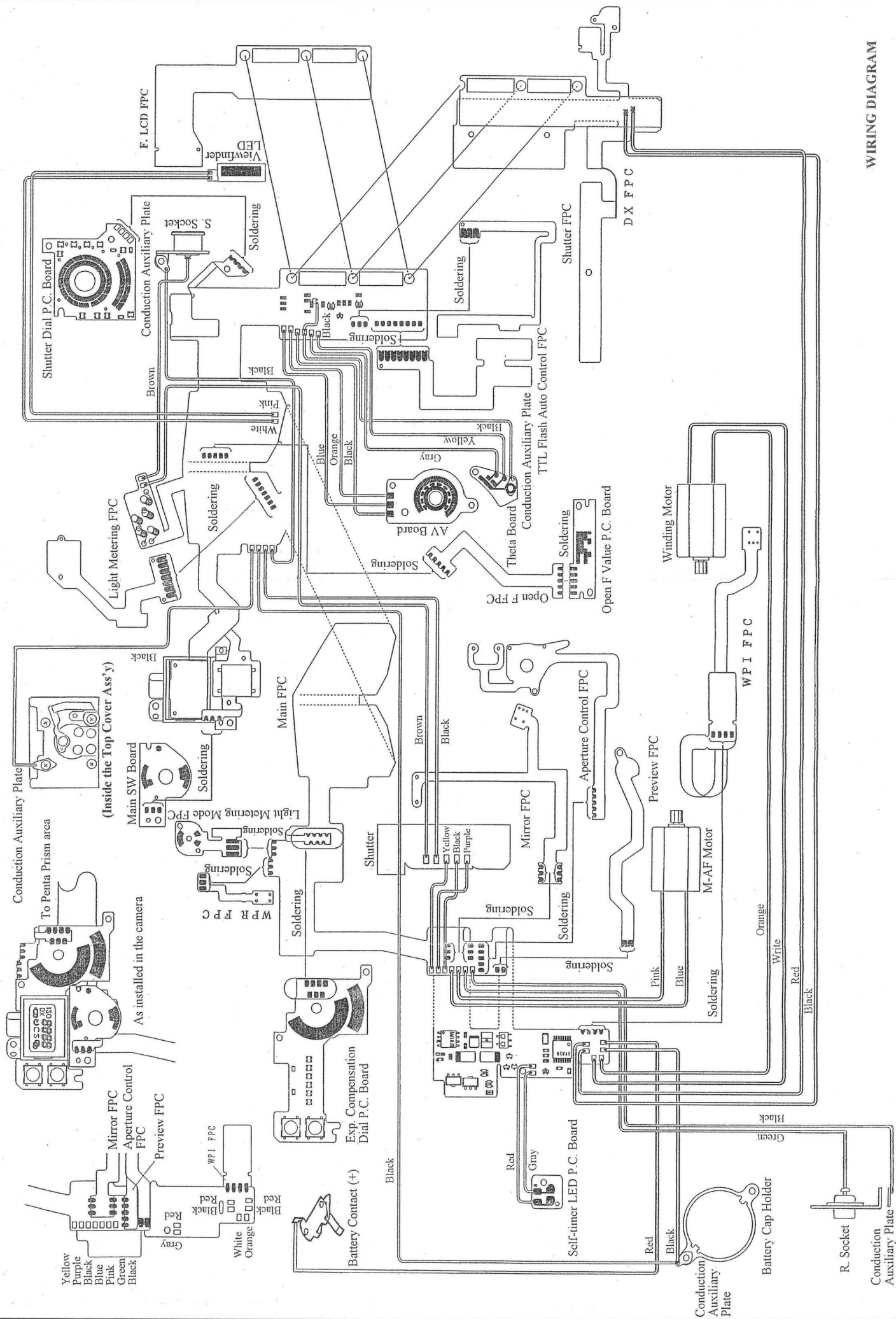
(At use of F1.4 lens, ISO 100)





ELECTRIC ELEMENTS LOCATING DIAGRAM ON MAIN FPC ASS'Y





WIRING DIAGRAM