

作成承認印

配布許可印



# SB-800

FSA03501

REPAIR MANUAL

**Nikon** | NIKON CORPORATION  
Tokyo, Japan

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## SPECIFICATION

Electronic construction	Automatic Insulated Gate Bipolar Transistor (IGBT) and series circuitry	
Guide number (at 35mm zoom-head position, 20 C/68 F)	38/125 (ISO 100, m/ft), 53/174 (ISO 200, m/ft)	
Flash shooting distance range (TTL auto flash/ Auto Aperture flash/ Non-TTL auto flash)	0.6m to 20m (2 to 66 ft.) (varies depending on the ISO sensitivity, zoom-head position, and lens aperture in use)	
Flash exposure control      * CLS = Creative Lighting System		
Indicator	Available flash mode	Usable camera
<b>TTL</b>	i-TTL mode	Cameras compatible with CLS
<b>TTL</b>	D-TTL mode	Digital SLRs not compatible with CLS
<b>TTL</b>	TTL (film based) mode	Cameras in Groups I to VI (film based cameras)
<b>BL</b> <b>TTL</b>	Balanced Fill-Flash	Cameras compatible with CLS, digital SLRs not compatible with CLS, cameras in Groups I to IV (No o appears with cameras in Groups III to IV)
<b>AA</b>	Auto Aperture flash	Cameras compatible with CLS, digital SLRs not compatible with CLS, cameras in Groups I to II
<b>A</b>	Non-TTL auto flash	No limitation
<b>GN</b>	Distance-priority manual flash	No limitation
<b>M</b>	Manual flash	No limitation
<b>RPT</b>	Repeating flash	No limitation
Other available functions      Test firing, Monitor Preflashes, AF-assist illuminator, and Modeling illuminator		
Creative Lighting System	A variety of flash operations are available with camera's compatible with CLS: i-TTL mode, Advanced Wireless Lighting, FV Lock flash, Flash color information communication, Auto FP High-Speed sync, and Wide-area AF-Assist Illuminator	
Multiple flash operation	Available multiple flash	Usable camera
	Advanced Wireless Lighting	Cameras compatible with CLS
	SU-4 type wireless multiple flash	No limitation
	Multiple flash shooting using cords	No limitation

Group	Camera
CLS compatible	D 2 H
CLS not compatible	D 1 series • D 1 0 0
A	F 5 • F 1 0 0 • F 9 0 series • F 8 0 series • F 7 5 • F 7 0
B	F 4 • F 6 5 • F 8 0 1 series • PRONEA 6 0 0 i
C	F 6 0 1 • F 6 0 1 M
D	F 6 0 • F 5 0 • F 4 0 1 X
E	F 5 0 1 • F 4 0 1 S • F 4 0 1 • F 3 0 1
F	FM 3 A • FA • FE 2 • FG • NIKONOS V • F 3 (A S - 1 7)
G	New FM 2 • FM 1 0 • FE 1 0 • F 3 • F 5 5

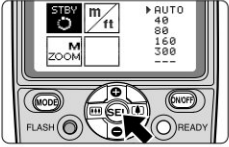
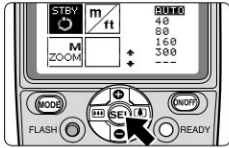


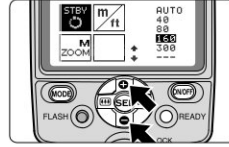


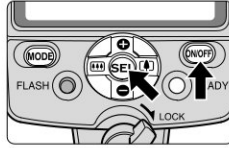














Flash exposure control set on the camera	Slow-sync, Red-eye reduction, Red-eye reduction in slow-sync, Rear-curtain sync flash, Auto FP High-Speed sync, FV Lock flash																																												
Angle of coverage	<div>Variable in 7 steps, plus three steps with wide-flash adapter and Nikon Diffusion Dome</div> <table><tr><th>Zoom-head position</th><th>Angle of coverage</th><th>Vertical</th><th>Horizontal</th></tr><tr><td>14mm *1</td><td>14mm</td><td>110</td><td>120</td></tr><tr><td>14mm *2</td><td>14mm</td><td>110</td><td>120</td></tr><tr><td>17mm *2</td><td>17mm</td><td>100</td><td>110</td></tr><tr><td>24mm</td><td>24mm</td><td>60</td><td>78</td></tr><tr><td>28mm</td><td>28mm</td><td>53</td><td>70</td></tr><tr><td>35mm</td><td>35mm</td><td>45</td><td>60</td></tr><tr><td>50mm</td><td>50mm</td><td>34</td><td>46</td></tr><tr><td>70mm</td><td>70mm</td><td>26</td><td>36</td></tr><tr><td>85mm</td><td>85mm</td><td>23</td><td>31</td></tr><tr><td>105mm</td><td>105mm</td><td>20</td><td>27</td></tr></table> <div>*1 With the Nikon Diffusion Dome attached *2 With the built-in wide-flash adapter set</div>	Zoom-head position	Angle of coverage	Vertical	Horizontal	14mm *1	14mm	110	120	14mm *2	14mm	110	120	17mm *2	17mm	100	110	24mm	24mm	60	78	28mm	28mm	53	70	35mm	35mm	45	60	50mm	50mm	34	46	70mm	70mm	26	36	85mm	85mm	23	31	105mm	105mm	20	27
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35mm	35mm	45	60																																										
50mm	50mm	34	46																																										
70mm	70mm	26	36																																										
85mm	85mm	23	31																																										
105mm	105mm	20	27																																										
Bounce capability	Flash head tilts down to -7° or up to 90° with click-stops at -7°, 0°, 45°, 60°, 75°, 90°; flash head rotates horizontally 180° to the left or 90° to the right with click-stops at 0°, 30°, 60°, 90°, 120°, 150°, 180°																																												
ON/OFF button	Press the <span>ON/OFF</span> button for approx. 0.3 sec. to turn the SB-800 on or off.  Standby function can be set.																																												
Power source/ min. recycling time/no. of flashes (at M1/1 output)	<div>Four AA-type penlight batteries (1.5V or lower) of any of these types: Alkaline-manganese (1.5V), Lithium (1.5V), Nickel (1.5V), NiCd (rechargeable, 1.2V), or Ni-MH (rechargeable, 1.2V)</div> <table><tr><th>Battery type</th><th>Min. recycling time (approx.)*</th><th>Min. number of flashes/ recycling time (approx.)*</th></tr><tr><td>Alkaline-manganese</td><td>6.0 sec.</td><td>130/6-30 sec.</td></tr><tr><td>Lithium</td><td>7.5 sec.</td><td>170/7.5-30 sec.</td></tr><tr><td>Nickel</td><td>6.0 sec.</td><td>140/6-30 sec.</td></tr><tr><td>NiCd (1000mAh) (rechargeable)</td><td>4.0 sec.</td><td>90/4-30 sec.</td></tr><tr><td>Ni-MH (2000mA) (rechargeable)</td><td>4.0 sec.</td><td>150/4-30 sec.</td></tr></table> <div>*With fresh batteries. M1/1 output without use of AF-assist illuminator, zoom operation, and LCD panel illuminator.</div>	Battery type	Min. recycling time (approx.)*	Min. number of flashes/ recycling time (approx.)*	Alkaline-manganese	6.0 sec.	130/6-30 sec.	Lithium	7.5 sec.	170/7.5-30 sec.	Nickel	6.0 sec.	140/6-30 sec.	NiCd (1000mAh) (rechargeable)	4.0 sec.	90/4-30 sec.	Ni-MH (2000mA) (rechargeable)	4.0 sec.	150/4-30 sec.																										
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External power sources (optional)	External power source	Battery type
	DC Unit SD-7	Six C-type alkaline-manganese
	High-Performance Battery Pack SD-8A	Six AA-type alkaline-manganese
	Power Bracket Unit SK-6	Four AA-type alkaline-manganese
Ready-light	Lights up when the SB-800 is recycled and ready to fire. Blinks for 3 sec. when flash fires at its maximum output, indicating light may have been insufficient (in TTL Auto Flash, Auto Aperture B Flash and Non-TTL Auto Flash A operations)	
Flash duration (approx.)	1/1050 sec. at M 1/1 (full) output 1/1100 sec. at M 1/2 output 1/2700 sec. at M 1/4 output 1/5900 sec. at M 1/8 output 1/10900 sec. at M 1/16 output 1/17800 sec. at M 1/32 output 1/32300 sec. at M 1/64 output 1/41600 sec. at M 1/128 output	
Mounting foot lock lever	Provides secure attachment of SB-800 to camera's accessory shoe using locking plate and mount pin to prevent accidental detachment.	
Flash output level compensation	-3.0 to +3.0 EV in increments of 1/3 steps in the TTL auto flash, Auto Aperture flash modes and Distance-priority manual flash	
Custom settings	By pressing the g and ef, c or d buttons, the following custom settings are possible: ISO sensitivity, Wireless flash auto, Sound monitor in the wireless flash mode, Non-TTL auto flash, Standby function, Selecting the distance unit (m, ft.), Canceling power zoom function, Power zoom function using the built-in wide-flash adapter/Nikon Diffusion Dome, LCD panel illuminator, Brightness of the LCD panel, AF-assist illuminator, and canceling flash firing.	
Other functions	Recalling the underexposure value in the TTL auto flash mode, Resetting the settings, Button lock	
Built-in wide-flash adapter	Allows SB-800 to be used with 14mm or 17mm lens	
Dimensions (W x H x D)	Approx. 70.5 x 129.5 x 93.0mm (2.8 x 5.1 x 3.7 in.)	

## Custom settings

### Setting Custom functions

	<p>1. Press the [ SEL ] button for approx. 2 sec. to display the Custom settings mode.</p>
	<p>2. Press the [ + or - ] button and [  or  ] button on the Multi Selector to choose the desired custom functions to be set, then press the [ SEL ] button.</p>
	<p>3. Press the [ + or - ] button to highlight the preferred setting. Press the [  or  ] button to adjust the "LCD panel brightness"</p>
	<p>4. Press the [ SEL ] button for approx. 2 sec. or press the [ ON/OFF ] button to return to the normal setting mode.</p>

Details on Custom settings (RED = default setting)	
	<p><u>ISO sensitivity</u> The available ISO sensitivity range is ISO 3 to 8000. Pressing the [ + / - ] button increases or decrease the value in increments of 1/3 step. Pressing the [ + / - ] button continuously increases or decreases the value quickly.</p> <p>• 100</p>
	<p><u>Wireless flash mode</u> Setting the flash mode in wireless multiple flash photography.</p> <p>• OFF : Canceled</p> <p>• MASTER : Master flash unit in the Advanced Wireless Lighting mode</p> <p>• MASTER (RPT) : Master flash unit in the Advanced Wireless Lighting mode (in Repeating flash)</p> <p>• REMOTE : Remote flash unit in the Advanced Wireless Lighting mode</p> <p>• SU-4 : SU-4 type wireless flash mode</p>
	<p><u>Sound monitor in the wireless flash mode</u> When the SB-800 is used as a wireless remote flash unit, you can activate or cancel the sound monitor function.</p> <p>• ON : Sound on</p> <p>• OFF : Sound off</p>
	<p><u>Non-TTL auto flash mode</u> Setting the Non-TTL auto flash mode.</p> <p>• AA : Auto Aperture flash</p> <p>• A : Non-TTL auto flash</p>
	<p><u>Standby function</u> Adjusting the time before the standby function is activated.</p> <p>• AUTO : With a camera body that is compatible with TTL auto flash , the SB-800 turns off when the camera' s exposure meter turns off.</p> <p>• 40 : 40 sec.</p> <p>• 80 : 80 sec.</p> <p>• 160 : 160 sec.</p> <p>• 300 : 300 sec.</p> <p>• --- : Standby function canceled</p>
	<p><u>Selecting the distance unit of measure</u> Setting the distance unit of measure on the LCD panel to either meters "m" or feet "ft" .</p> <p>• m : meters</p> <p>• ft : feet</p>
	<p><u>Power zoom function</u> Setting to activate or cancel the power zoom function, which adjusts the zoom-head position automatically.</p> <p>• OFF : Activated</p> <p>• ON : Canceled</p>
	<p><u>Power zoom function using the built-in wide-flash adapter/Nikon Diffusion Dome</u> Setting to activate or cancel the power zoom function using the built-in wide-flash adapter/Nikon Diffusion Dome. The same is true when using the built-in wide-flash adapter. When set to ON, the zoom-head position display is framed.</p> <p>• OFF : Canceled</p> <p>• ON : Activated</p>
	<p><u>LCD panel illuminator</u> Setting the LCD panel illuminator to turn on or off.</p> <p>• ON : Turn on</p> <p>• OFF : Turn off</p>
	<p><u>LCD panel brightness</u> Adjusting the brightness of the LCD panel. Available brightness levels are graphically displayed in 9 steps on the LCD panel. Press the # or ▲ button to adjust the brightness.</p>
	<p><u>Wide-Area AF-Assist Illuminator</u> Setting to activate or cancel the Wide-Area AF-Assist Illuminator.</p> <p>• ON : Activated (AF-ILL appears on the LCD panel)</p> <p>• OFF : Canceled (NO AF-ILL appears on the LCD panel)</p>
	<p><u>Canceling flash firing</u> Setting to activate or cancel flash firing of the SB-800. When it is set to OFF, the SB-800 does not fire but the Wide-Area AF-Assist Illuminator still comes on.</p> <p>• ON : Firingactivated</p> <p>• OFF : Firing canceled (AF-ILL ONLY appears on the LCD panel)</p>

## Disassembly

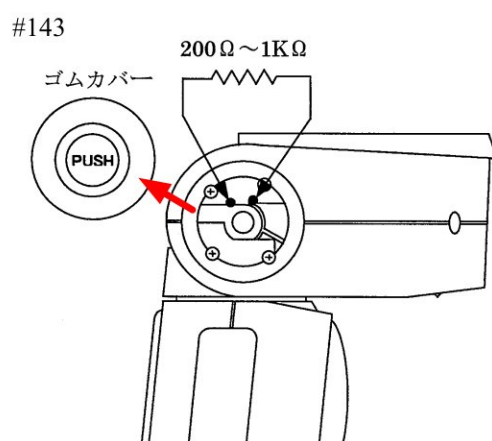
**WARNING**

- Due to an internal high voltage area, be sure to discharge the main condenser before removing covers according to the instructions of the repair manuals.

\*Note: For disassembling/(re)assembling this product, lead-free solder is used except both ends of Xe-tube on Page D8/A3.

**Side Rubber**

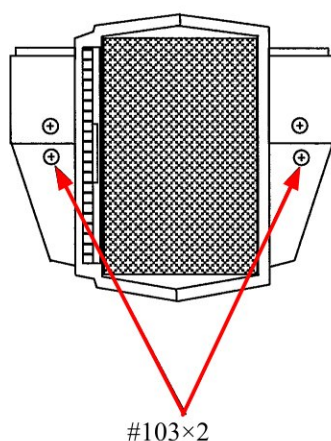
- Remove right-and-left side rubbers.
- Discharge the main condenser at 2 holes under the side rubbers (#143) by using discharging tool.

**Cover (E) unit**

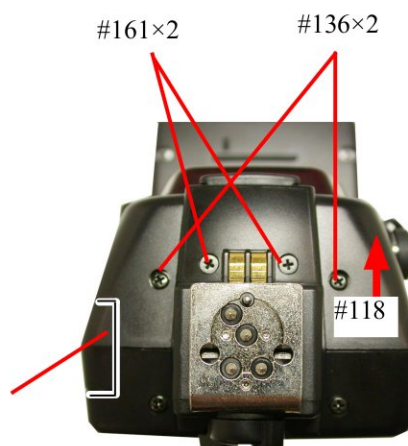
- Take out each screw, and lift the cover (E) unit (#118) up slowly in the direction indicated by the arrow.

\* Note: Be careful not to cut off the inside wires.

- The battery lid comes off.



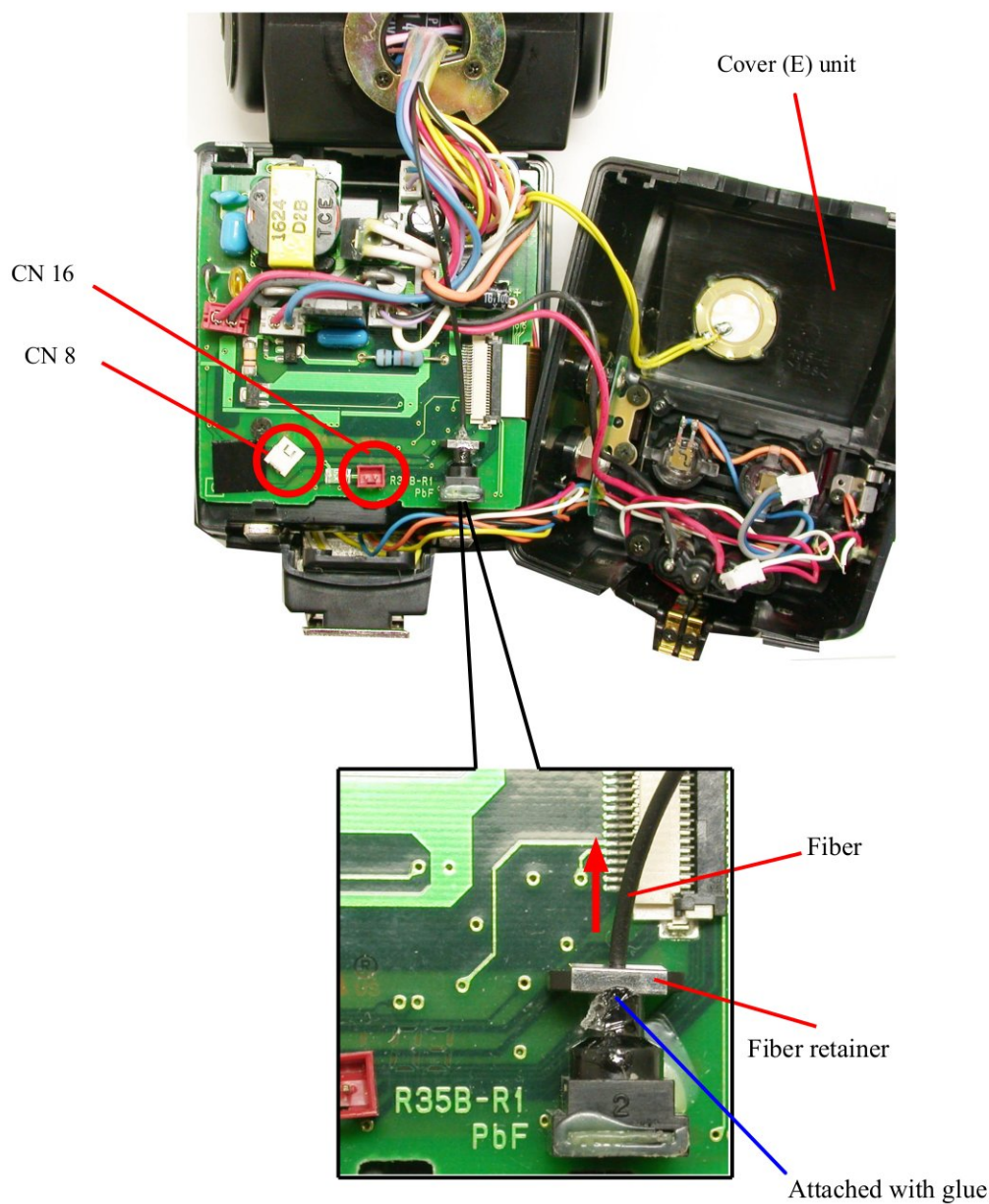
Battery lid





Fiber ①

- Detach the connectors (CN16 and CN8) from the cover (E) unit.

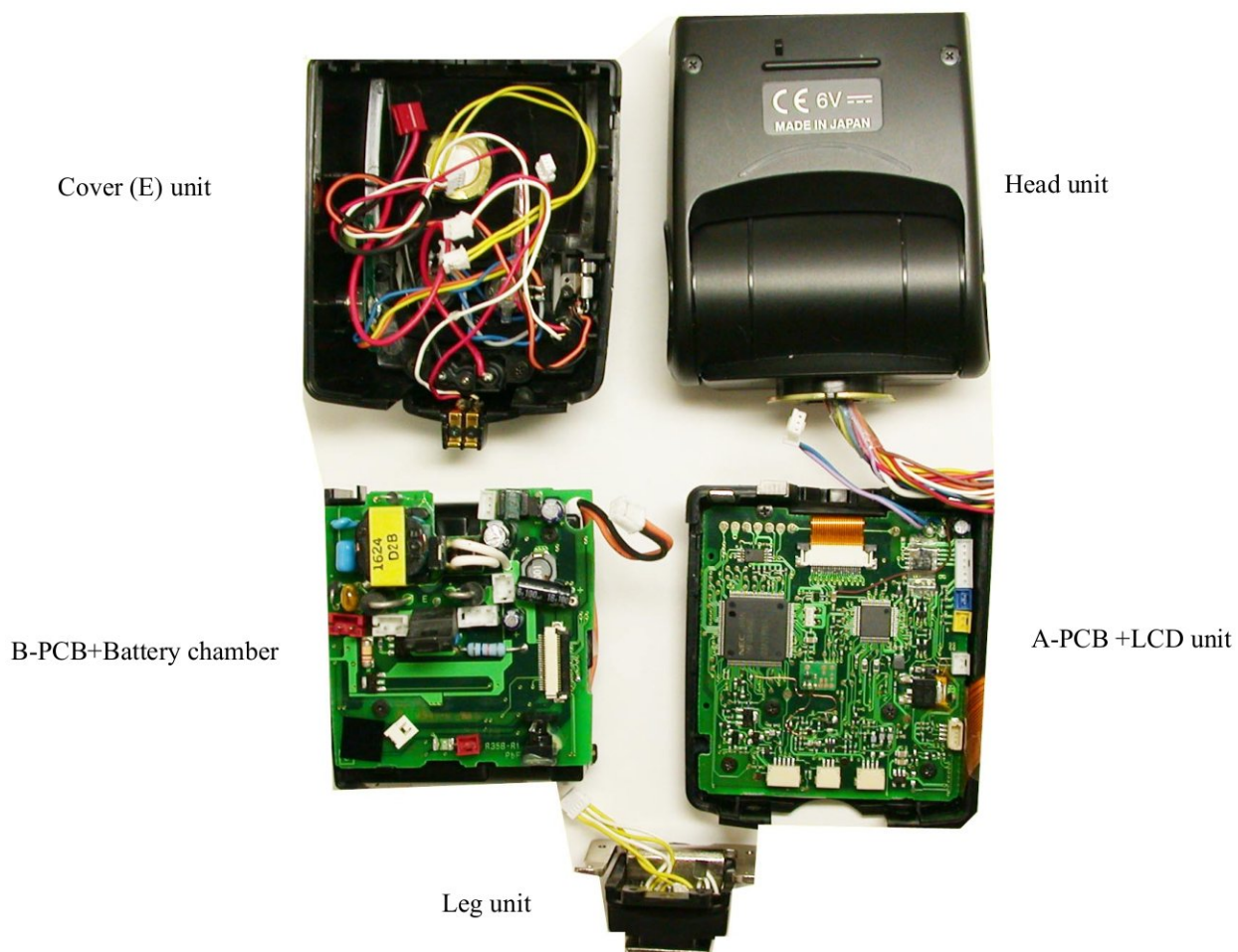
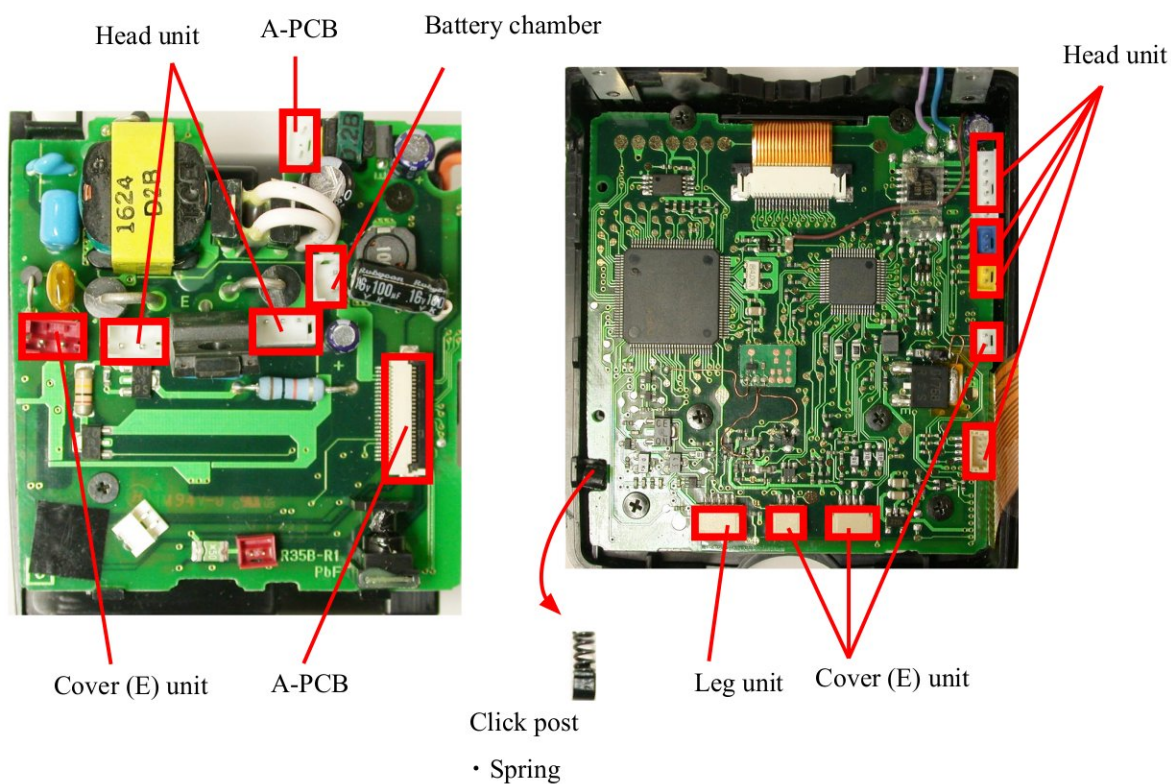


- Detach the fiber retainer.
  - Pull the fiber in the direction indicated by the arrow.
- \* Note: Be careful NOT to bend the fiber when disassembling and (re)assembling.

# Separation into each unit

- By disconnecting each connectors, separate into each unit.

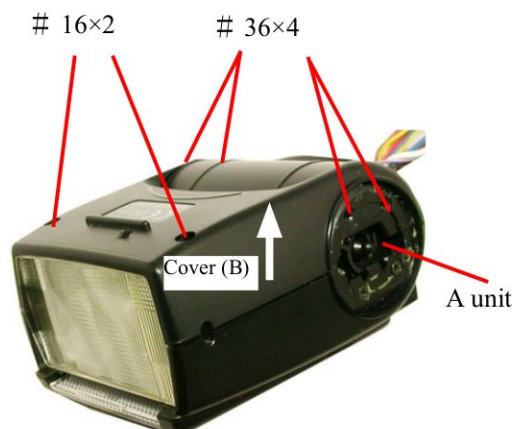
\* **Note:** Be careful NOT to lose the click post and spring.



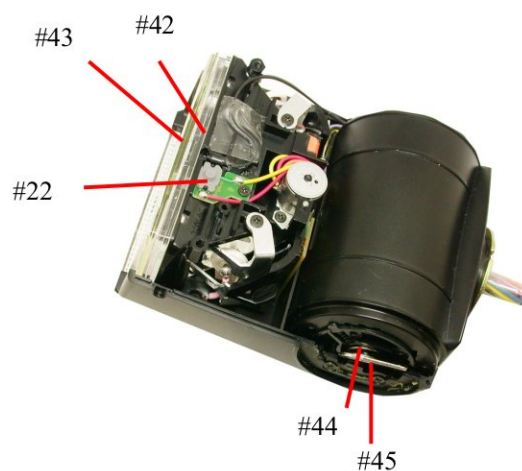
Head unit

- Take out 6 screws and detach the cover (B) in the direction indicated by the arrow.

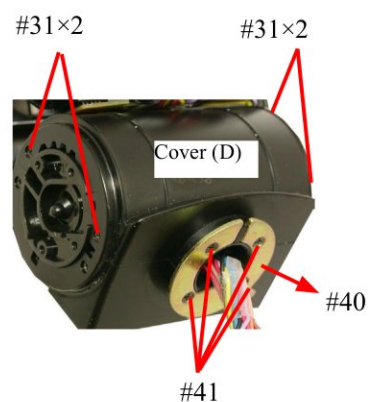
\* **Note:** Be careful of jump out of U/D stopper metals (#45) and the U/D bounce spring (#45) of the A unit.



- Remove the U/D stopper metal (#45) and U/D bounce spring (#44).
- Remove the acrylic panel (#43) and fresnel lens (#42).
- Remove the detection SW (#22).



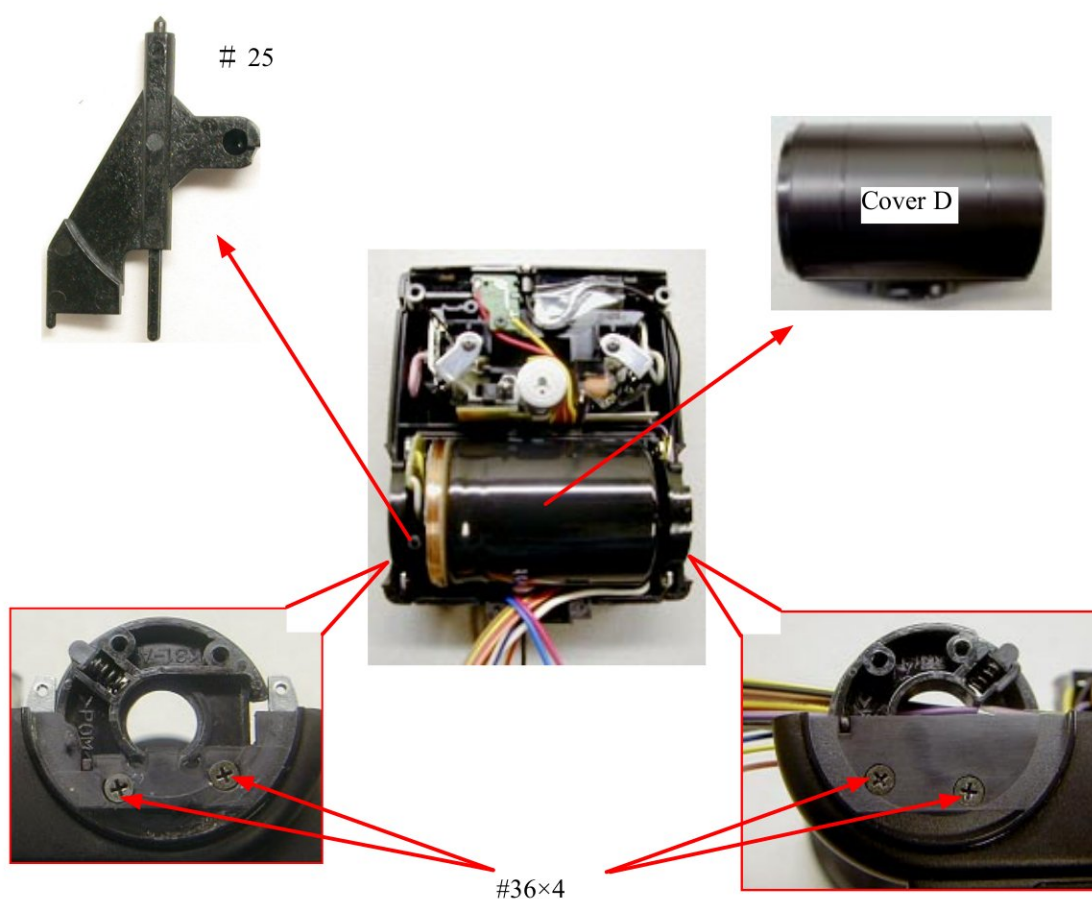
- Take out 4 screws (#31) of the cover (D) unit.
- Take out 4 screws (#41) and remove the turning plate (#40).





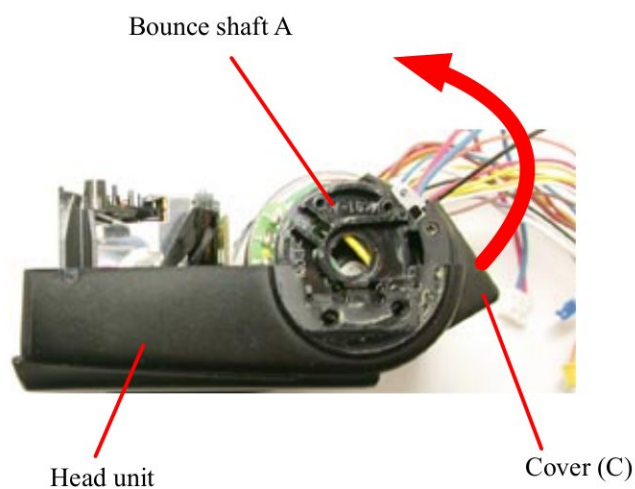
### Cover (D) unit

- Detach the cover (D) unit.
- Detach L/R lock knob (#25).
- Take out 4 screws (#36).

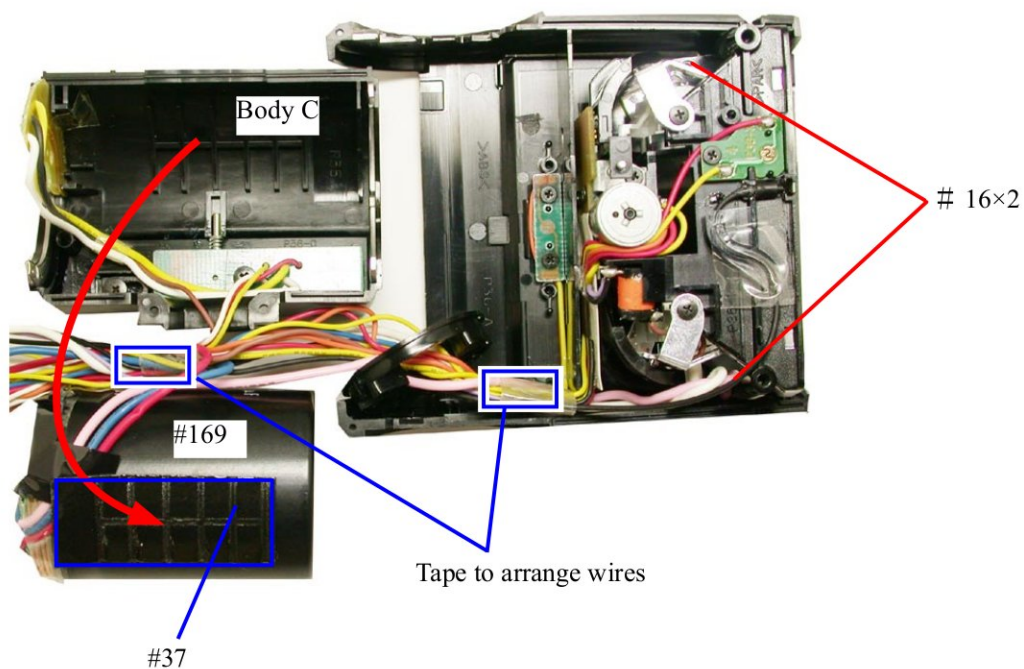


### Cover (C) unit

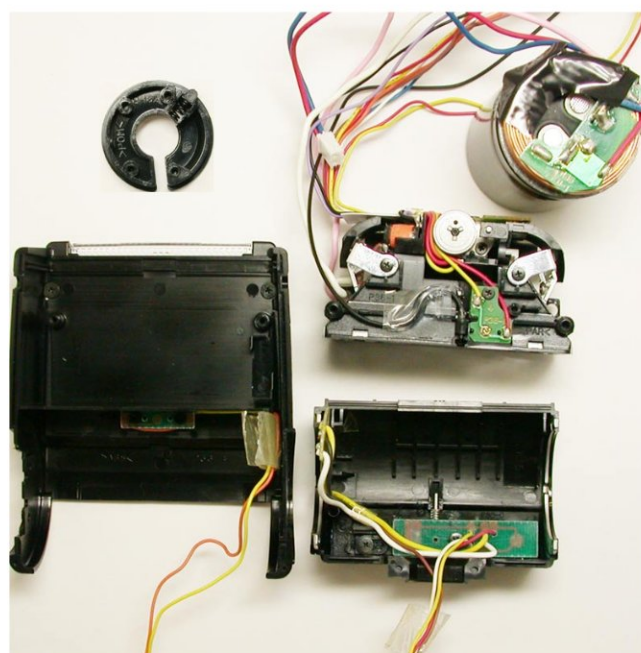
- Detach the cover (C) from the head unit by turning it in the direction indicated by the arrow.
- The bounce shaft A comes off.



- Detach the main condensor (#169) from the cover (C) by pulling it.  
(Both-sided adhesive tape (#37) is attached.)
- Take out 2 screws (#16).

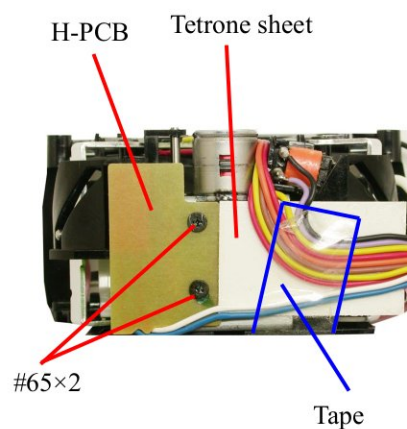


- Remove the tapes that attach the wires at the above 2 parts, then each unit comes off as shown in the right.

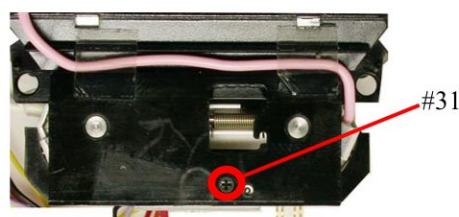


Motor unit

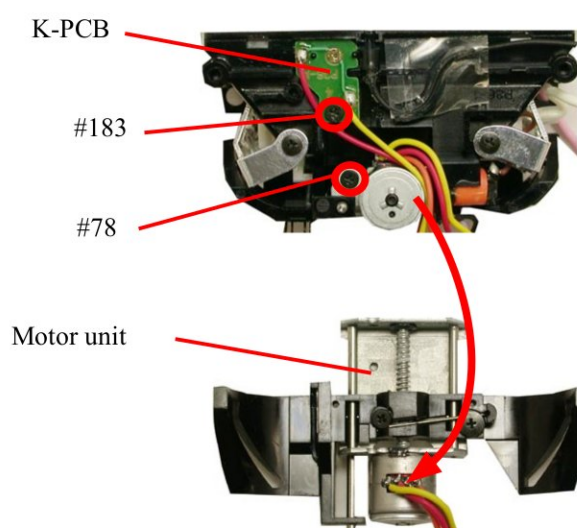
- Remove the tape to release wires that are arranged by the both-sided adhesive tape on the tetrone sheet.
- Take out 2 screws (#65) to detach the H-PCB.



- Take out the screw (#31).



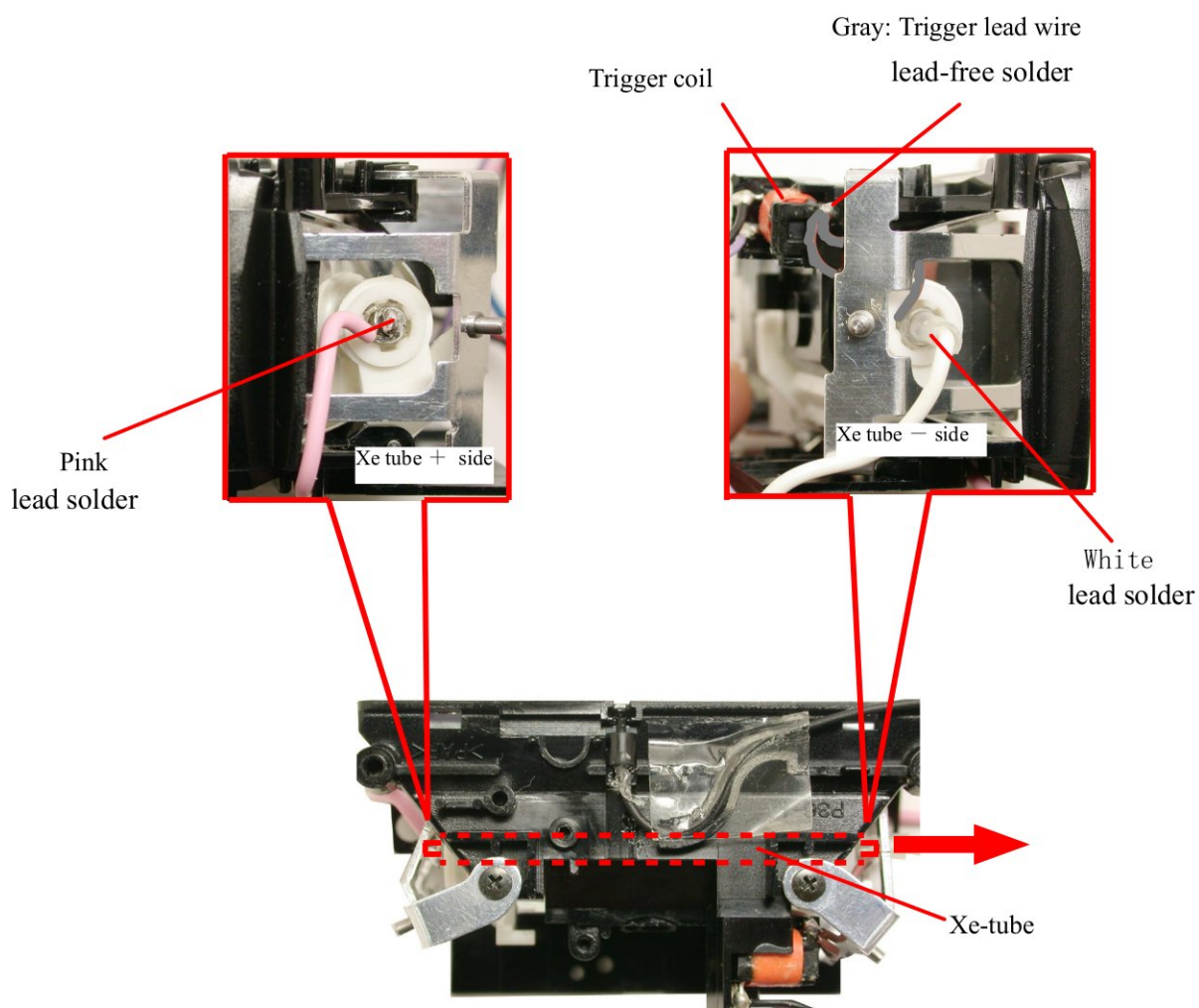
- Take out the screw (#183) to detach the K-PCB.
- Take out the screw (#78) to detach the motor unit.





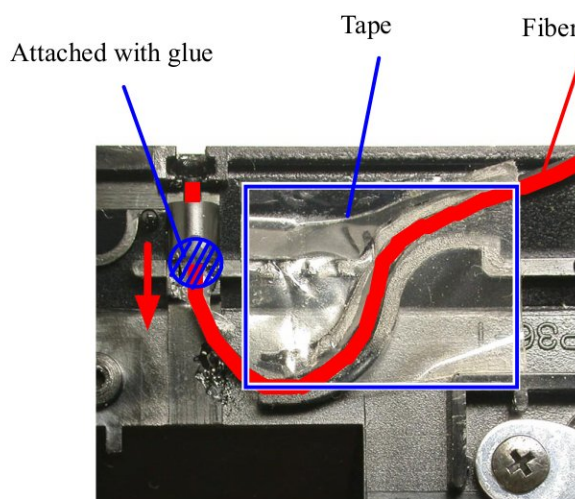
## Xe-tube

- Cut out the heat contraction tube on the + side of Xe-tube with nipper, etc, and remove the solder of the pink wire.
- On the trigger coil side, remove the solder of the trigger lead wire (Gray) that connects the - side of Xe-tube.
- Detach the Xe-tube in the direction indicated by the arrow.
- Cut out the heat contraction tube on the -side of Xe tube with nipper, etc, and remove the solder of the white wire.



## Fiber ②

- Remove the tape.
- Detach the fiber in the direction indicated by the arrow.



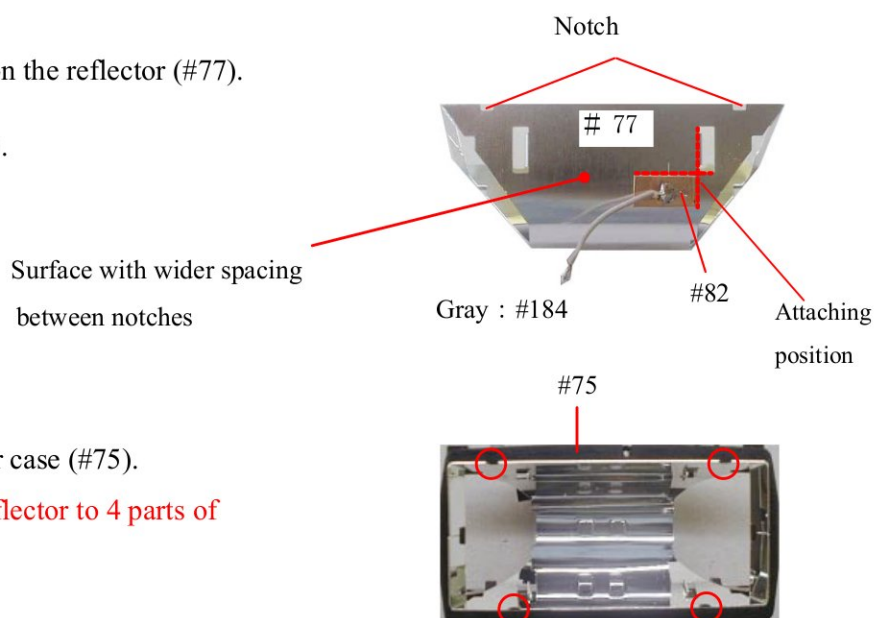
## Assembly

\* Note: For disassembling/(re)assembling this product, lead-free solder is used except for both ends of Xe-tube.

- For assembling work for both ends of Xe-tube on Page A3, use lead solder. For the other all works, use lead-free solder.

### Reflector

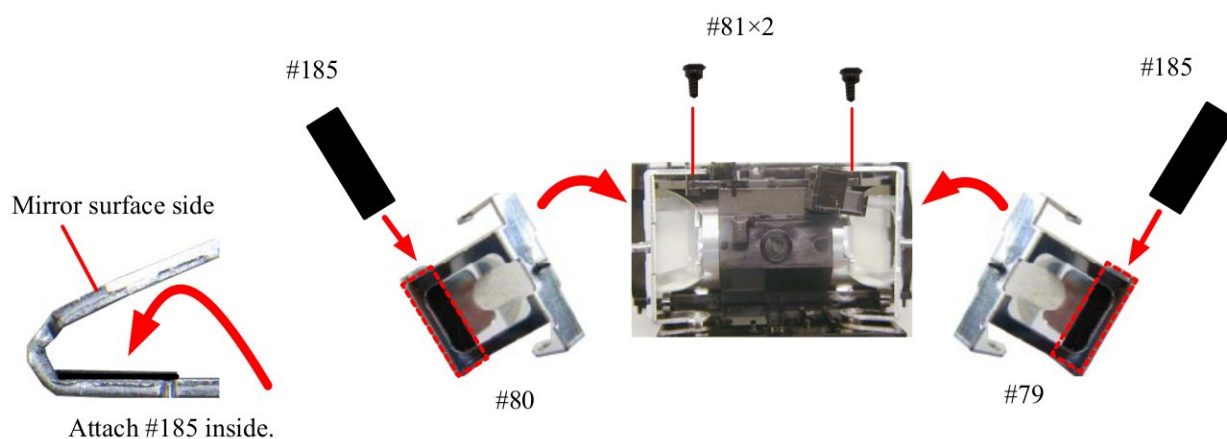
- Attach the conductive tape (#82) on the reflector (#77).
- Solder the trigger lead wire (#184).



- Attach the reflector to the reflector case (#75).
- \* Note: Hook the notches of the reflector to 4 parts of the reflector case.**

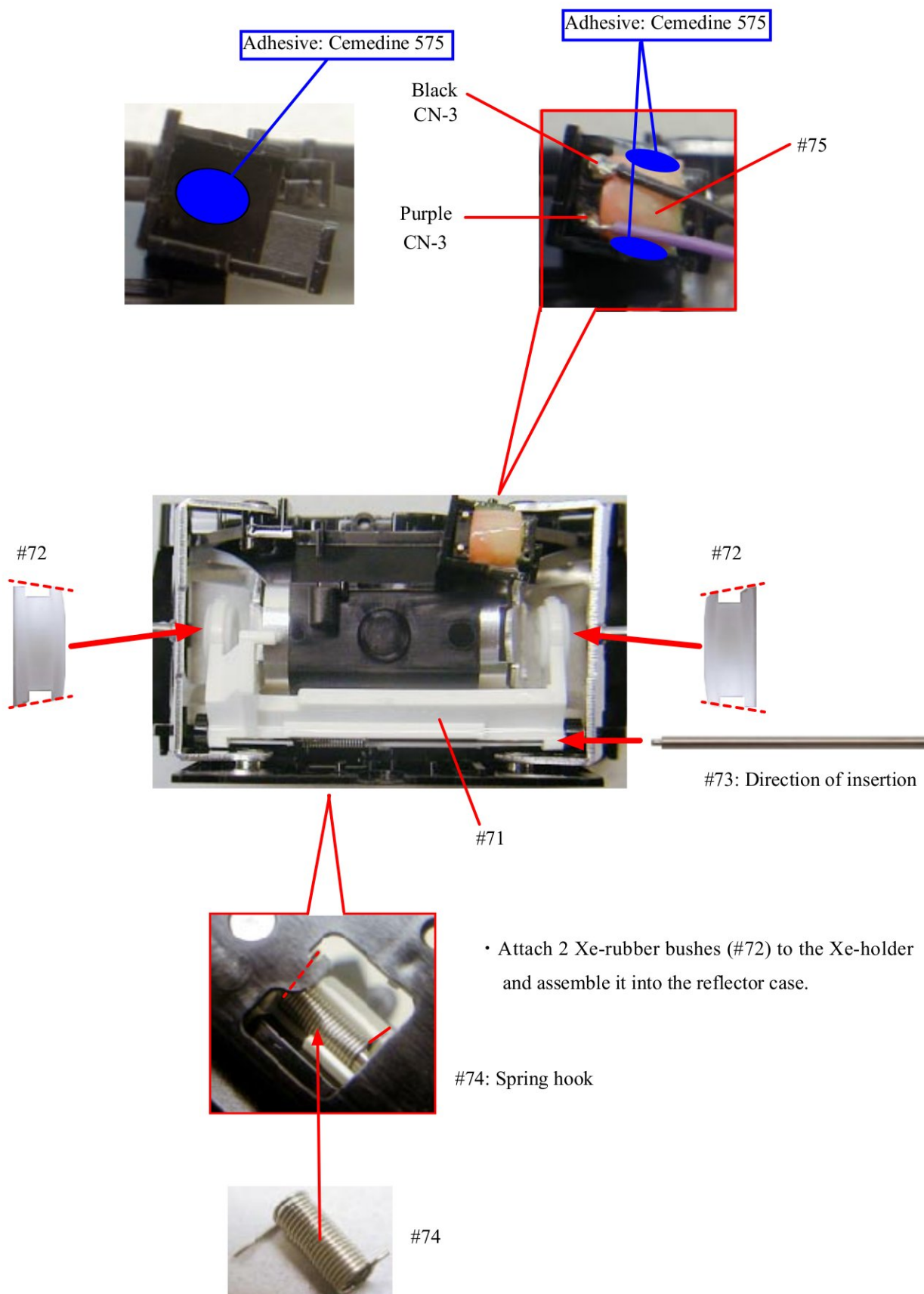
### Reflector side plate

- Attach 2 shade sheets (#185) inside the reflector side plates (#79, #80).
- Attach the reflector side plate to the reflector case.
- Attach 2 screws (#81).



Trigger coil / Xe-holder unit

- Attach the trigger coil (#75) with glue and solder black and purple wires.

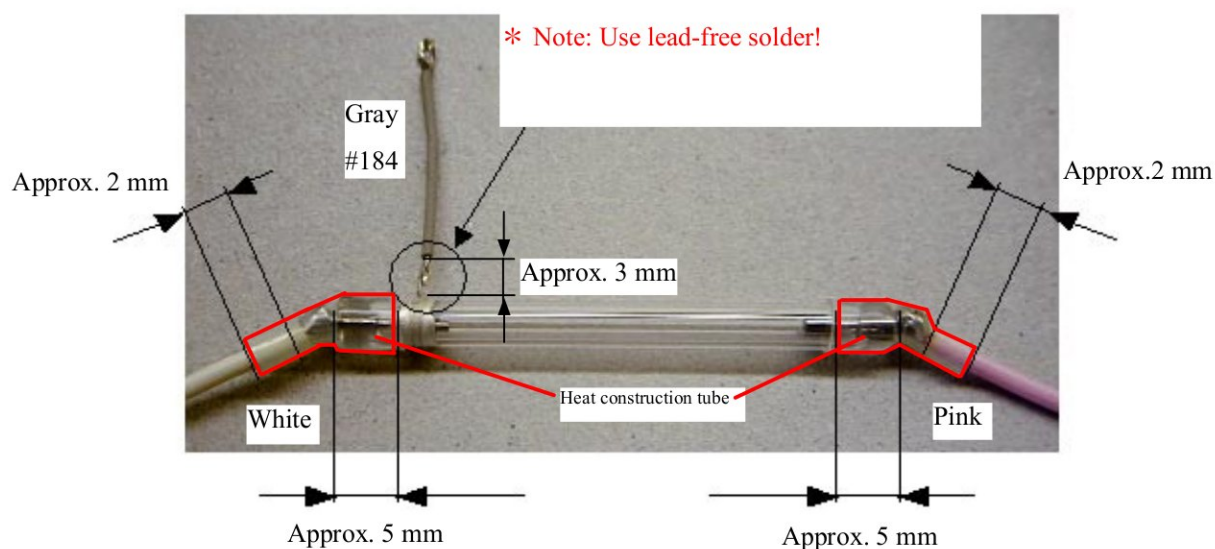




## Xe-tube

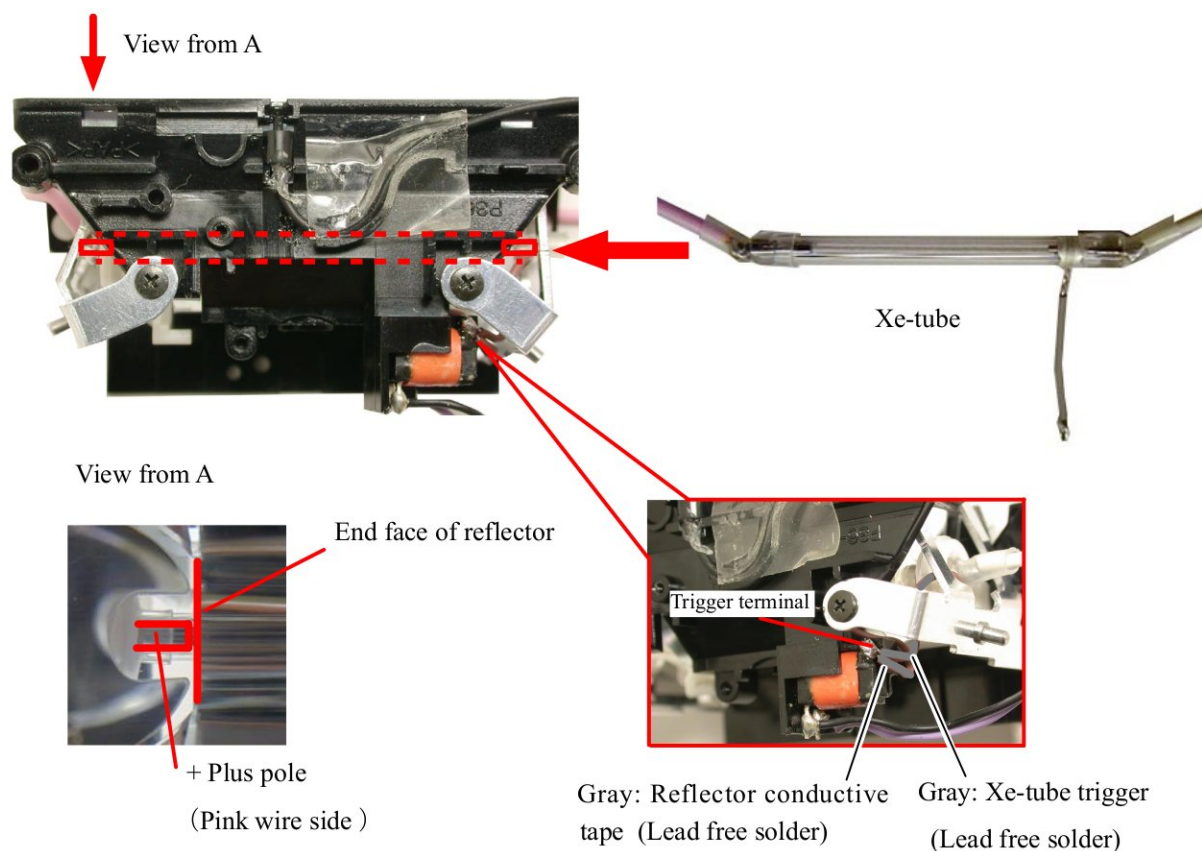
\* Note: Use lead solder for both ends of the Xe-tube. For all the others, use lead-free solder.

- Put the pink and white wires into each 2 heat-constriction tube (#70).
- Solder the pink wire to (+ side) Xe-tube and the white wire to (-side) with lead solder.
- Solder the Gray (trigger) wire #184.
- Heat treat 2 heat-constriction tube (#70) to contract. (Refer to the below for the position.)



### Xe-tube attachment

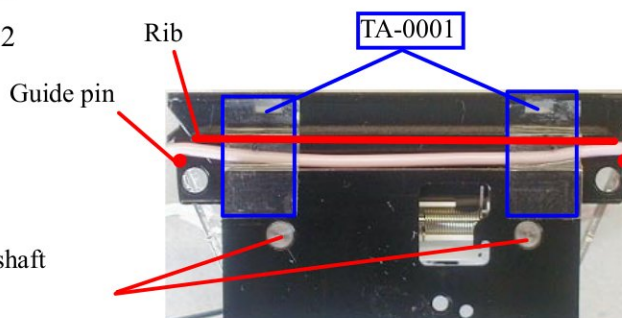
- Insert the Xe-tube into the reflector unit from + side (pink wire) then align the end faces of the plus pole and the reflector viewed from A.
- Solder the 2 Gray wires on the trigger terminal. (Solder 2 wires on the 1 terminal.)



- Slacken the pink wire.



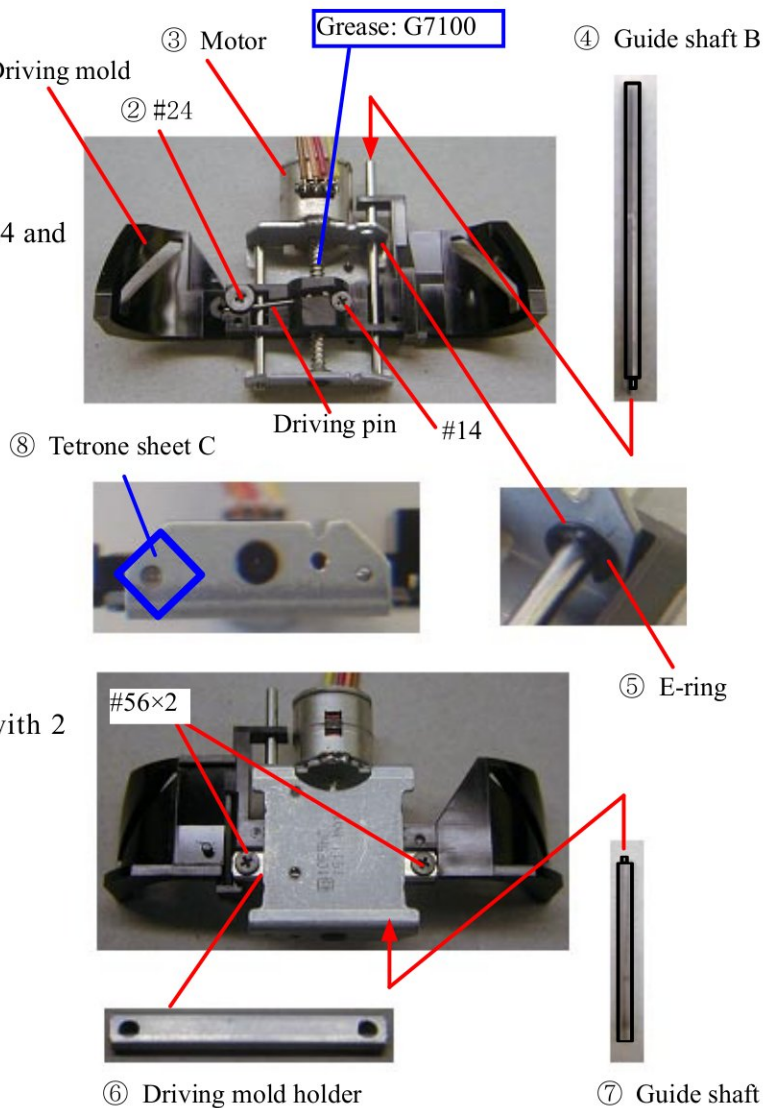
- Place the pink wire between the rib and guide pin for arrangement and fix it with tape at 2 positions.



## Motor unit

### Procedure

- ① Assemble the driving pin, screw (#24 and #14) into the driving mold.
- ② Tighten the screw (#24) slightly, then rotate back about one-third turn counterclockwise.
- ③ Mount the driving mold on the motor.
- ④ Insert the guide shaft B.
- ⑤ Fix the guide shaft B with E-ring.
- ⑥ Attache the driving mold holder with 2 screws (#56).
- ⑦ Insert the guide shaft A.
- ⑧ Attach the tetrone sheet C.

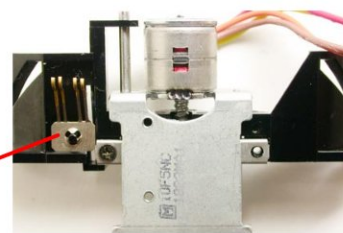




H PCB

- Insert the zoom brush into place.

Zoom brush

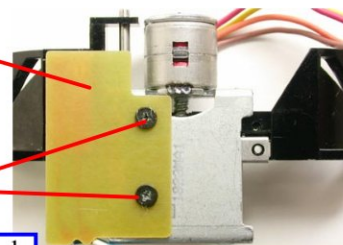


- Attach the H PCB with 2 screws (#65).

H PCB

#65

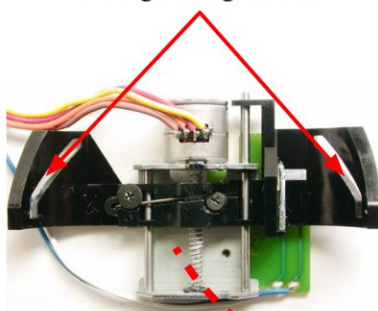
Adhesive:Screw Lock



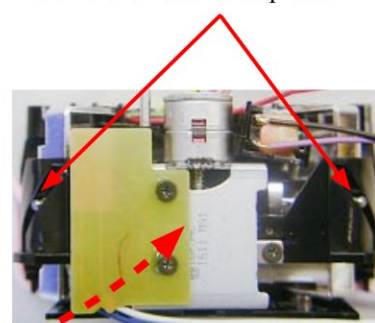
### Motor unit attachment

- Assemble the motor unit into the reflector unit. Check if the pins of the reflector side plate are put in the driving mold grooves A.

Driving mold grooves A



Pins of the reflector side plates.



- Check if the lever of the Xe holder is put in the driving mold groove B.
- Attach the motor unit with screws (#78 and #31).
- Attach the K PCB with screw (#183).

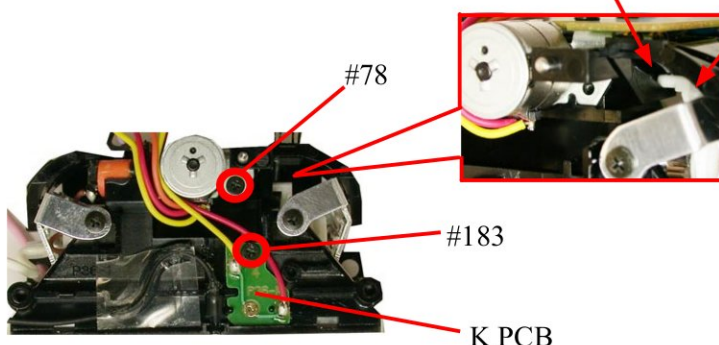
Driving mold groove B

Lever of Xe holder

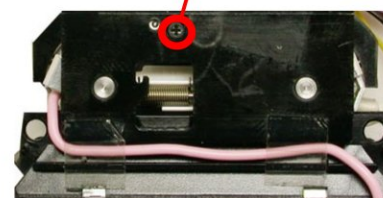
#78

#183

K PCB



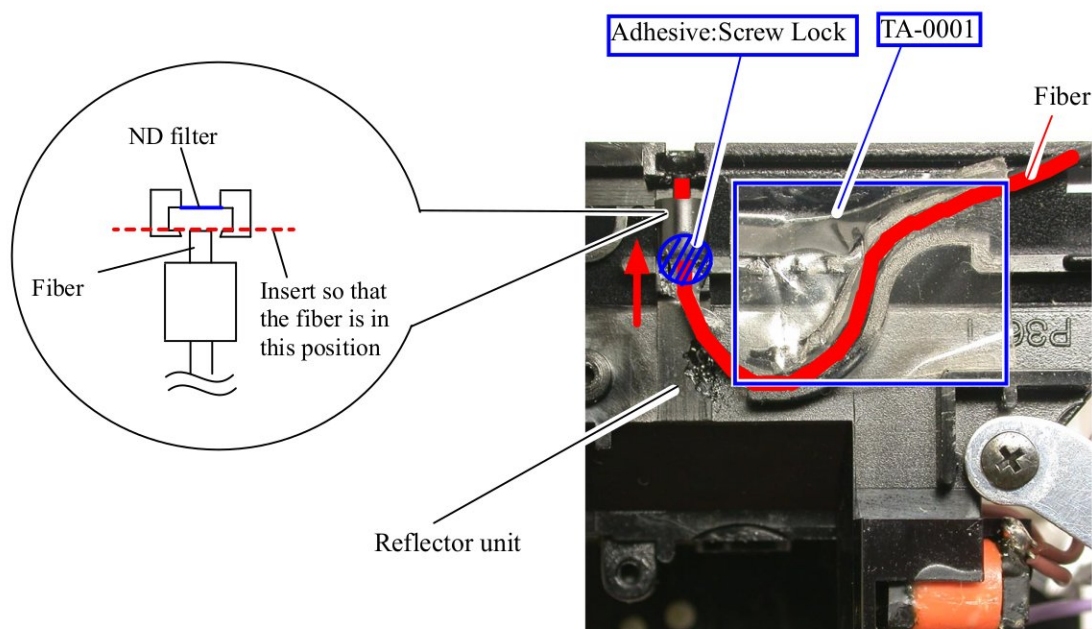
#31



## Fiber ①

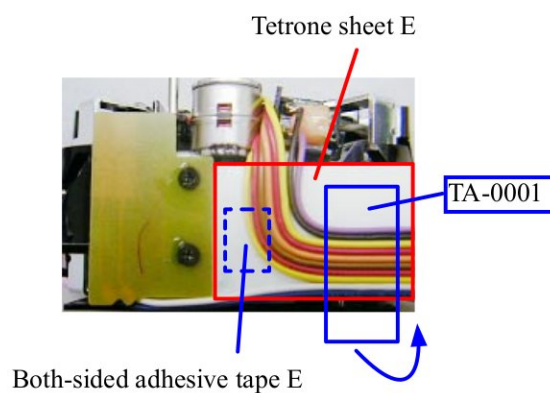
- Insert the fiber into the reflector unit.

\* Note: Be careful NOT to bend the fiber while assembling work.

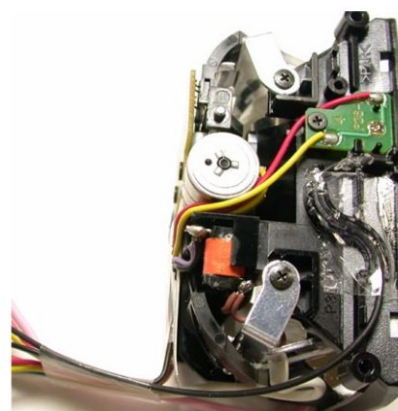
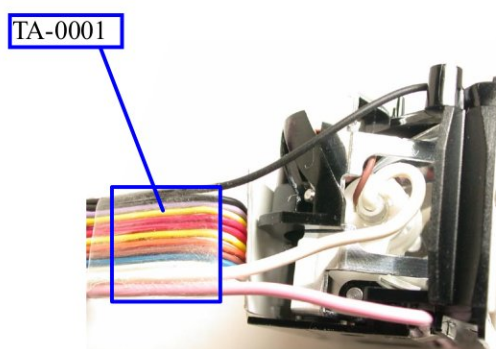


## Wiring

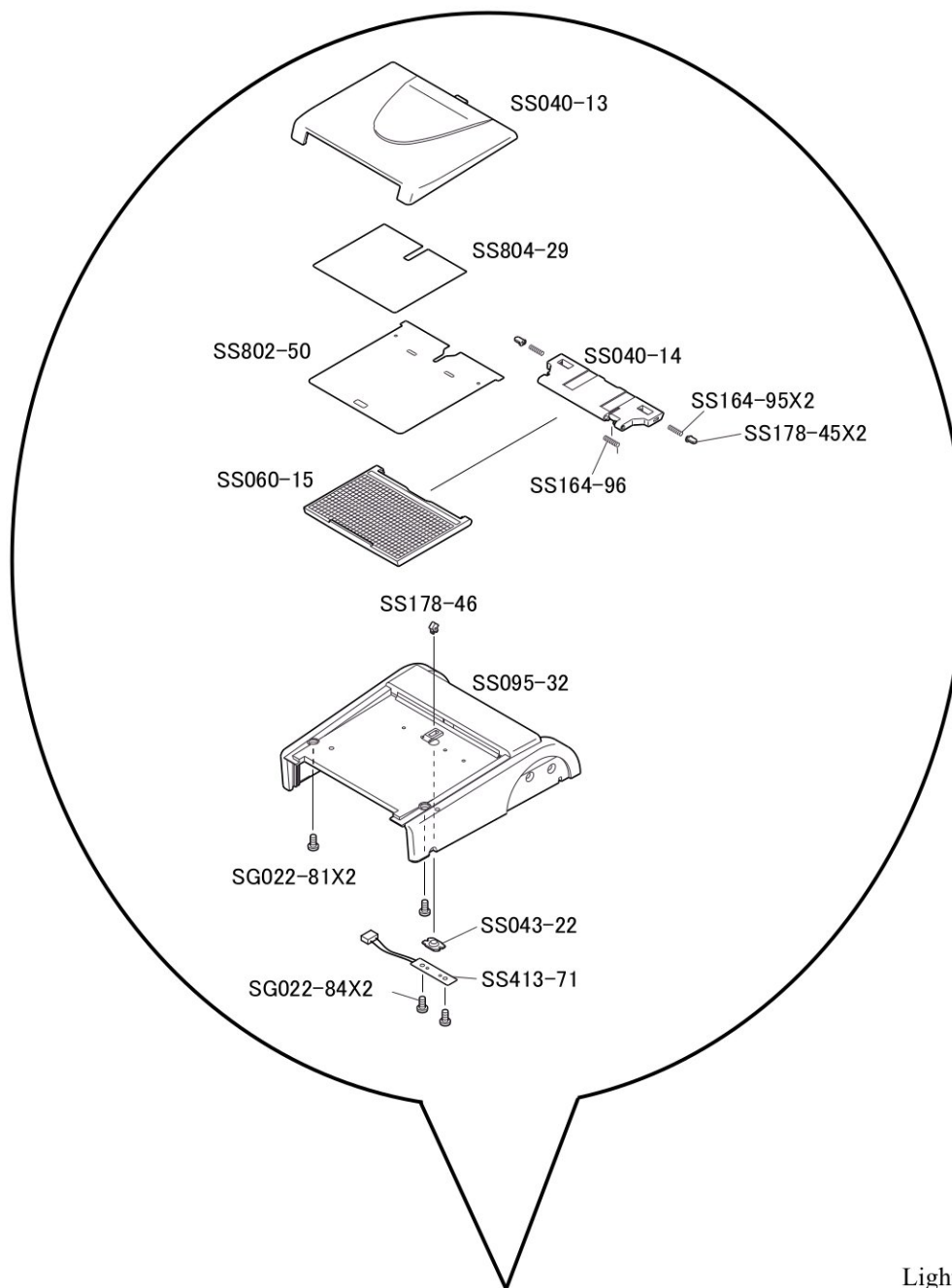
- Attach the tetrone sheet E with the both-sided adhesive tape E.
- Arrange wires by using the adhesive face of the tetrone sheet.
- Attach the tape (TA-0001) on the arranged wires.



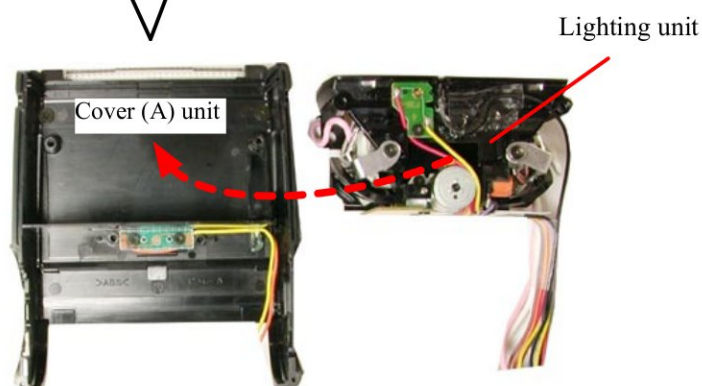
- Bundle all wires together on the tape.  
Be careful so that the wires are NOT piled up as far as possible.



## Cover (A) unit



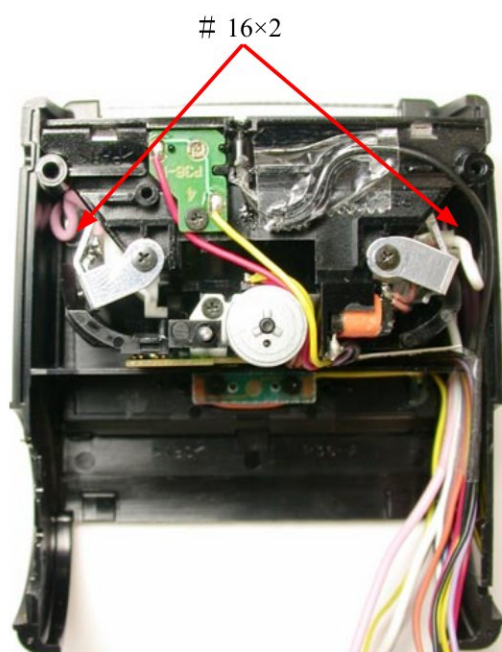
- Assemble the lighting unit into the cover (A) unit.





### Head unit

- Put the wire between ribs.
- Attach 2 screws (#16).



Rib

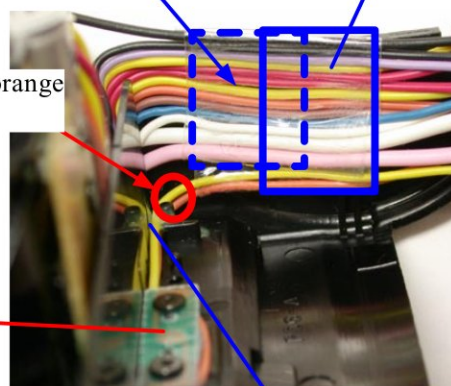


Taped on Page A6

TA-0001

Yellow/orange wires

E PCB

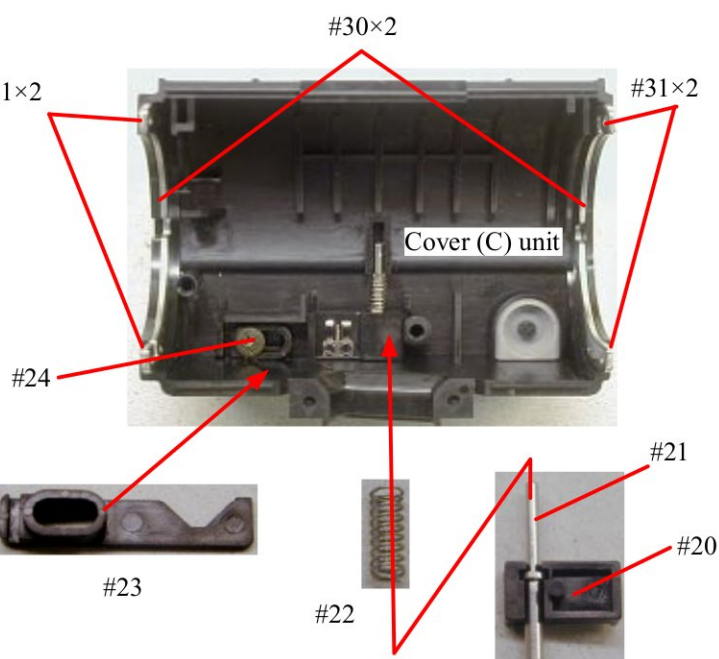


- Bundle the yellow and orange wires of E PCB together with tape (TA-0001).

Adhesive: Cemedine 575

### Cover (C) unit

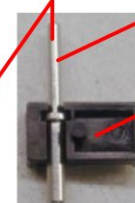
- Assemble the 2 head stopper metals (#30) #31x2 into the cover (C) unit, and attach 4 screws (#31).
- Assemble the lever (#23) into the cover (C) unit by attaching the screw (#24).
- Assemble the pin (#21) into #20, then pass them through the spring (#22) to assemble into the cover (C) unit.



#23



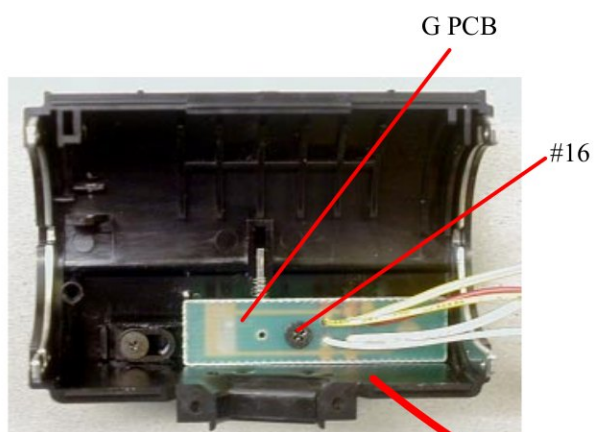
#22



#21

#20

- Attach the G PCB with the screw (#16).

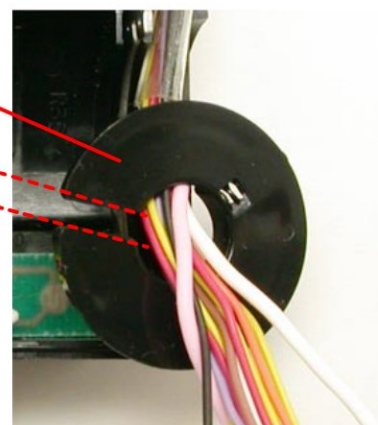


- Assemble the cover (C) unit into the head unit.

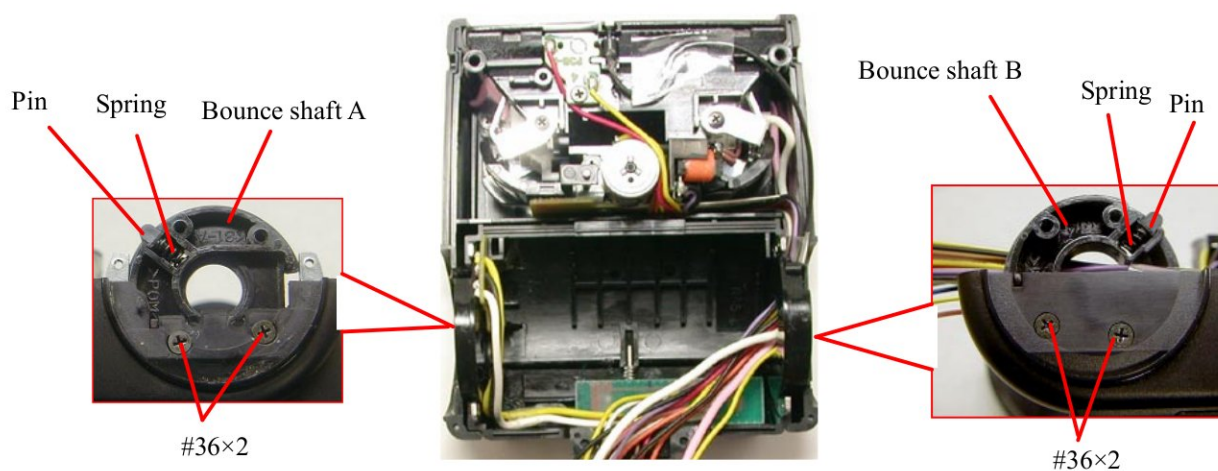
- Pass the wires of the head unit through the clearance of the bounce shaft B.

Bounce shaft B

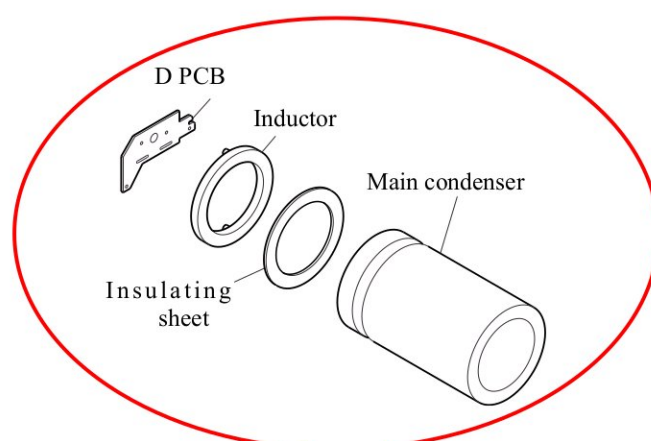
Clearance



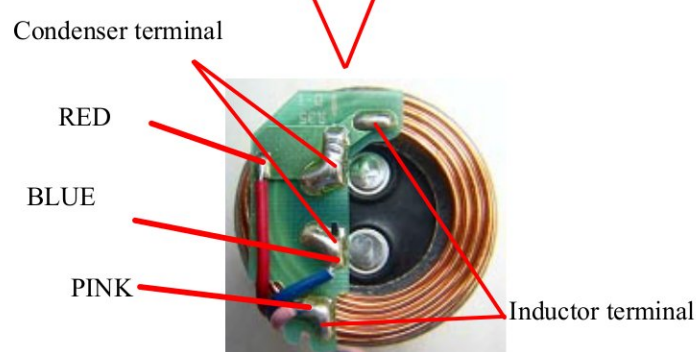
- Assemble the L/R bounce shaft into the head unit and attach 4 screws (#36).
- Attach the spring and pin to the L/R bounce shafts.



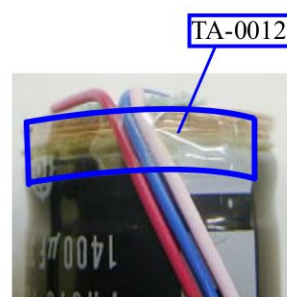
## Main C



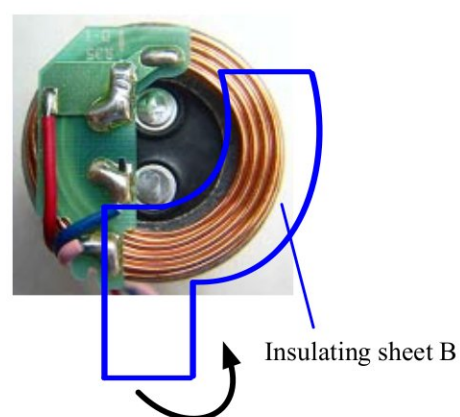
- Solder each part.



- Bundle 3 wires together with tape(TA-0012).



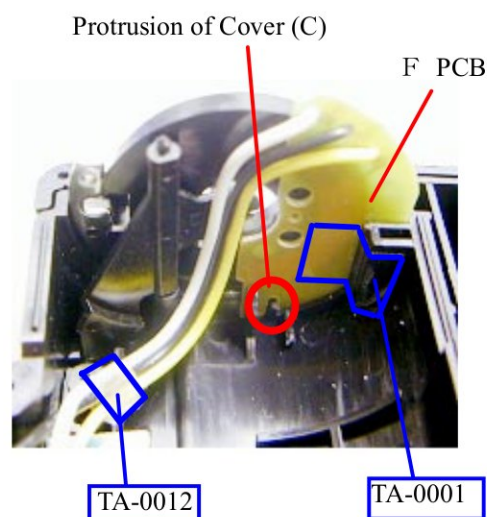
- Attach the insulating sheet B.



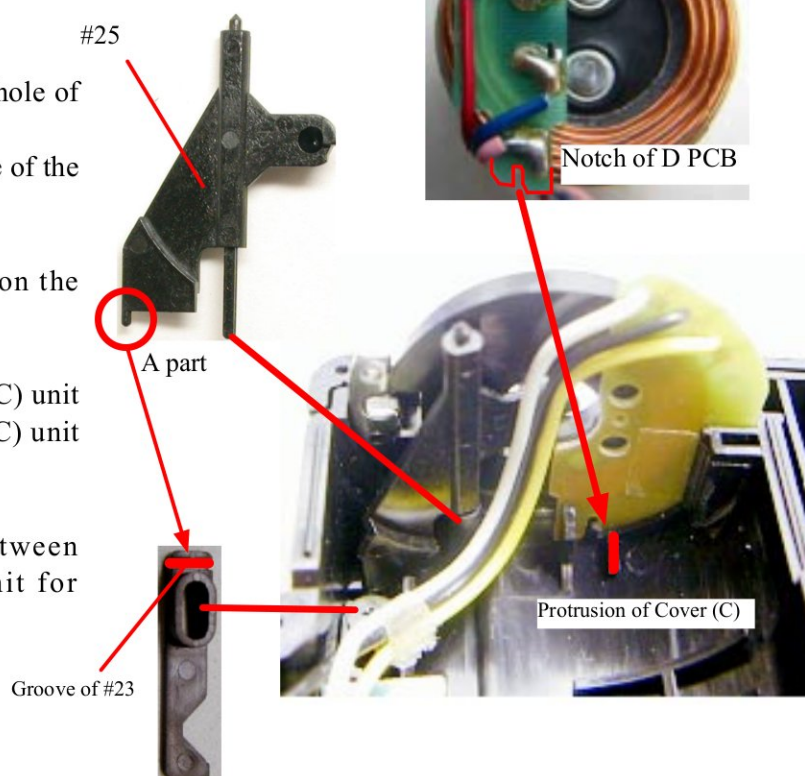


## F PCB

- Assemble the F PCB by fitting it into the protrusion of the cover (C).
- Fix the F PCB with tape(TA-0001).
- Bundle white, black and yellow wires together with tape(TA-0012).

Assemble the Main (C)

- Enter the L/R lock knob (#25) into the hole of the cover (C) unit.  
Check if the A part is put into the groove of the L/R lock lever (#23).
- Attach the both-sided adhesive tape on the cover (C). (Fig. A)
- Assemble the main (C) into the cover (C) unit by fitting the protrusion of the cover (C) unit into the notch of the D PCB.
- Put each wire into the clearance between the main (C) and the cover (C) unit for arrangement. (Fig.B)



Both-sided adhesive tape

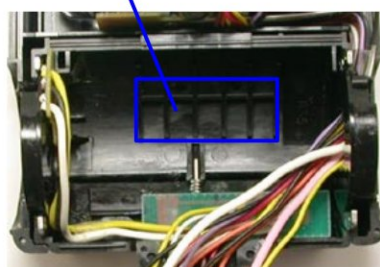


Fig. A

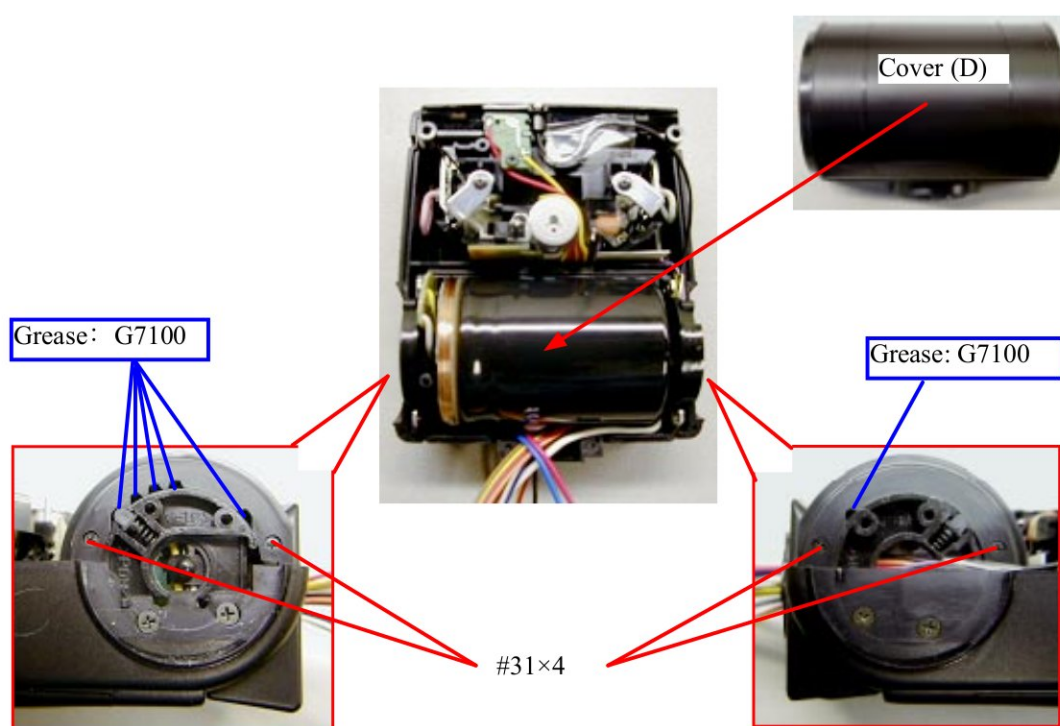


Fig. B

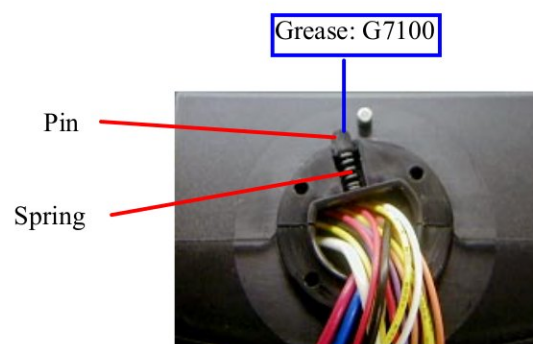
## Cover (D) unit

- Attach the cover (D) to the head unit with 4 screws (#31).

\* **Note: Do NOT pinch wires.**

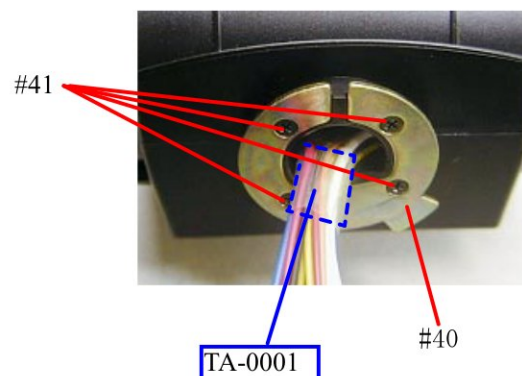


- Attach the spring and pin.



- Attach the turning plate (#40) with 4 screws (#41).

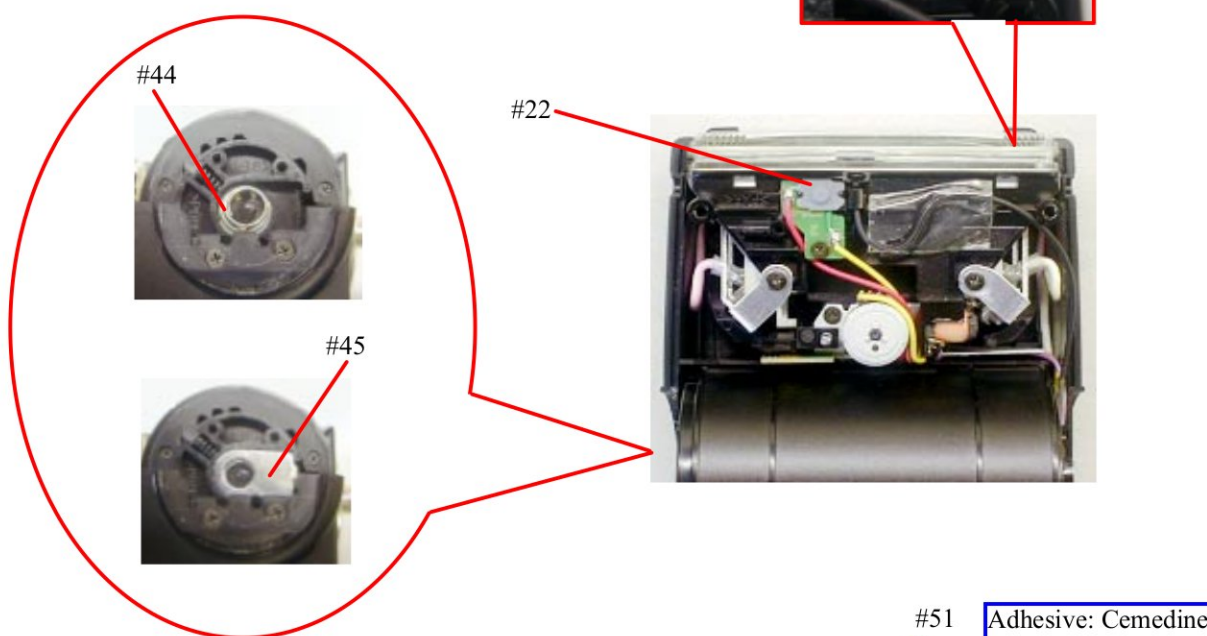
- Bundle wires with tape(TA-0001).



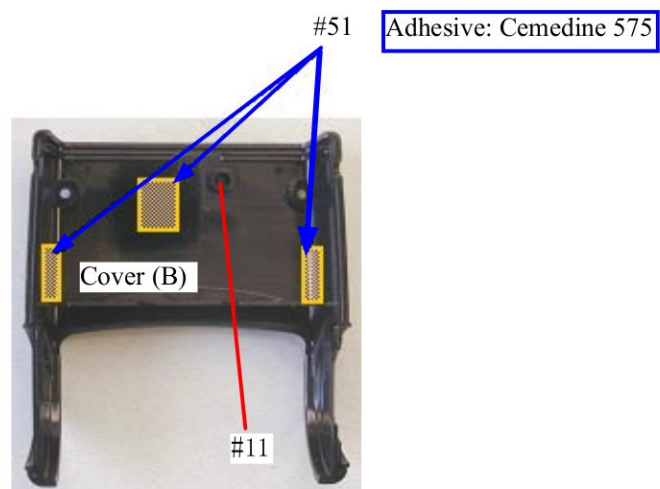


Cover (B) unit

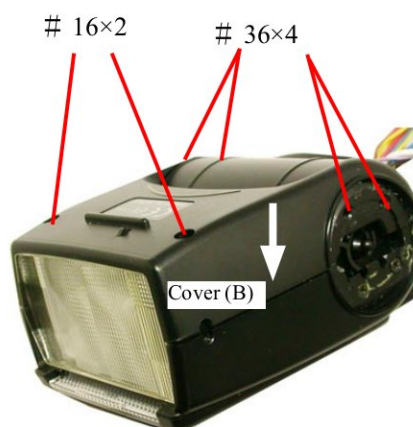
- Put the acrylic panel (#43) and fresnel lens (#42).
- Attach the detection SW (#22).
- Assemble the U/D bounce spring (#44) and U/D stopper metal (#45).



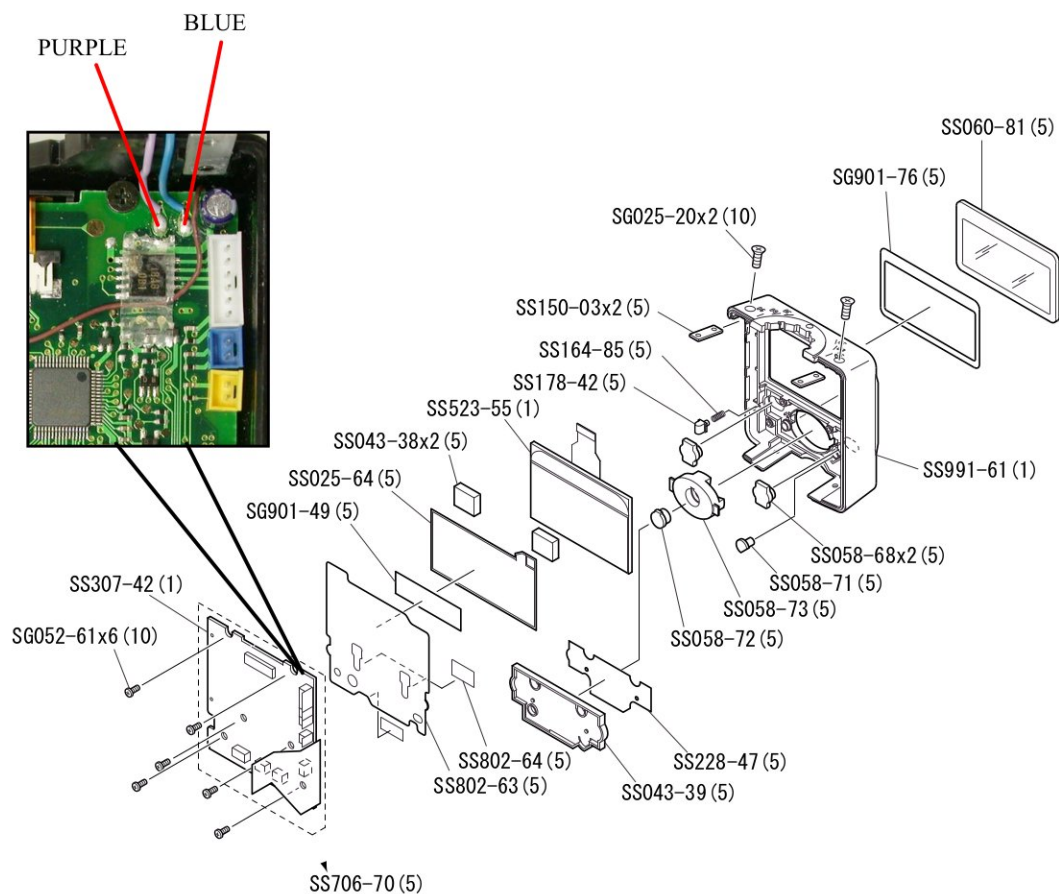
- Insert the switch (#11) into the cover (B) unit.  
Attach 3 water absorbent sheets (#51).



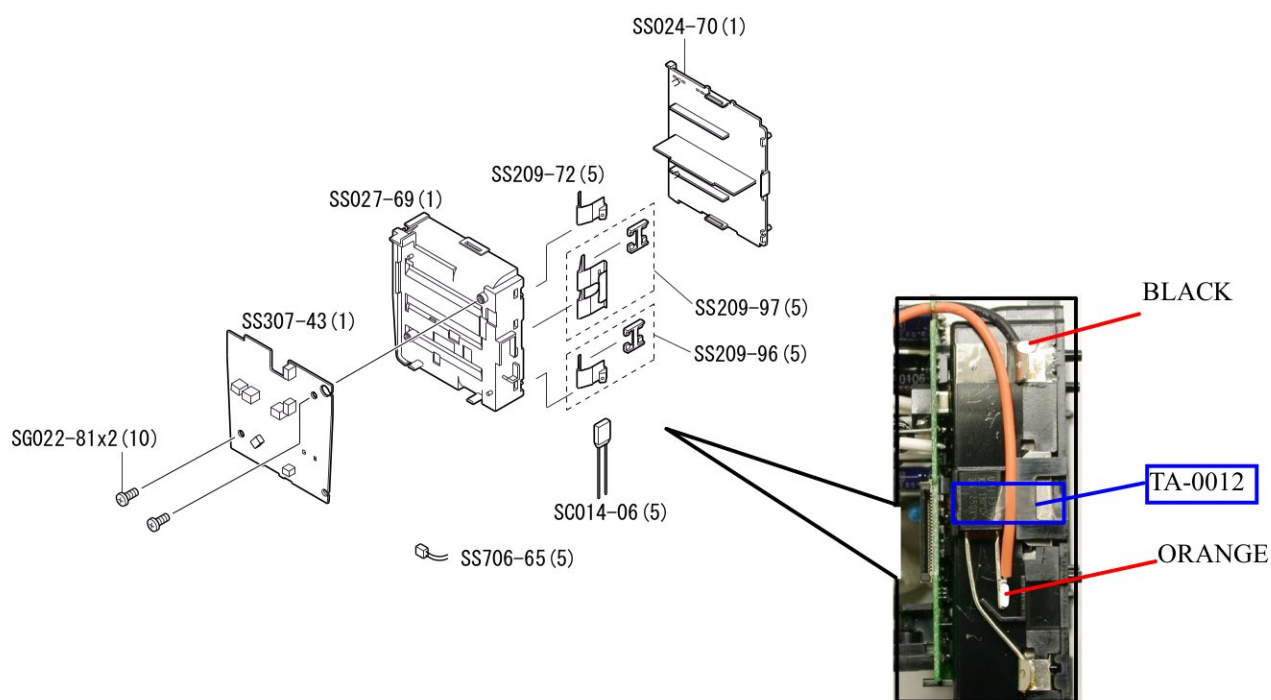
- Attach the cover (B) unit with 2 screws (#16) and 4 screws (#36).



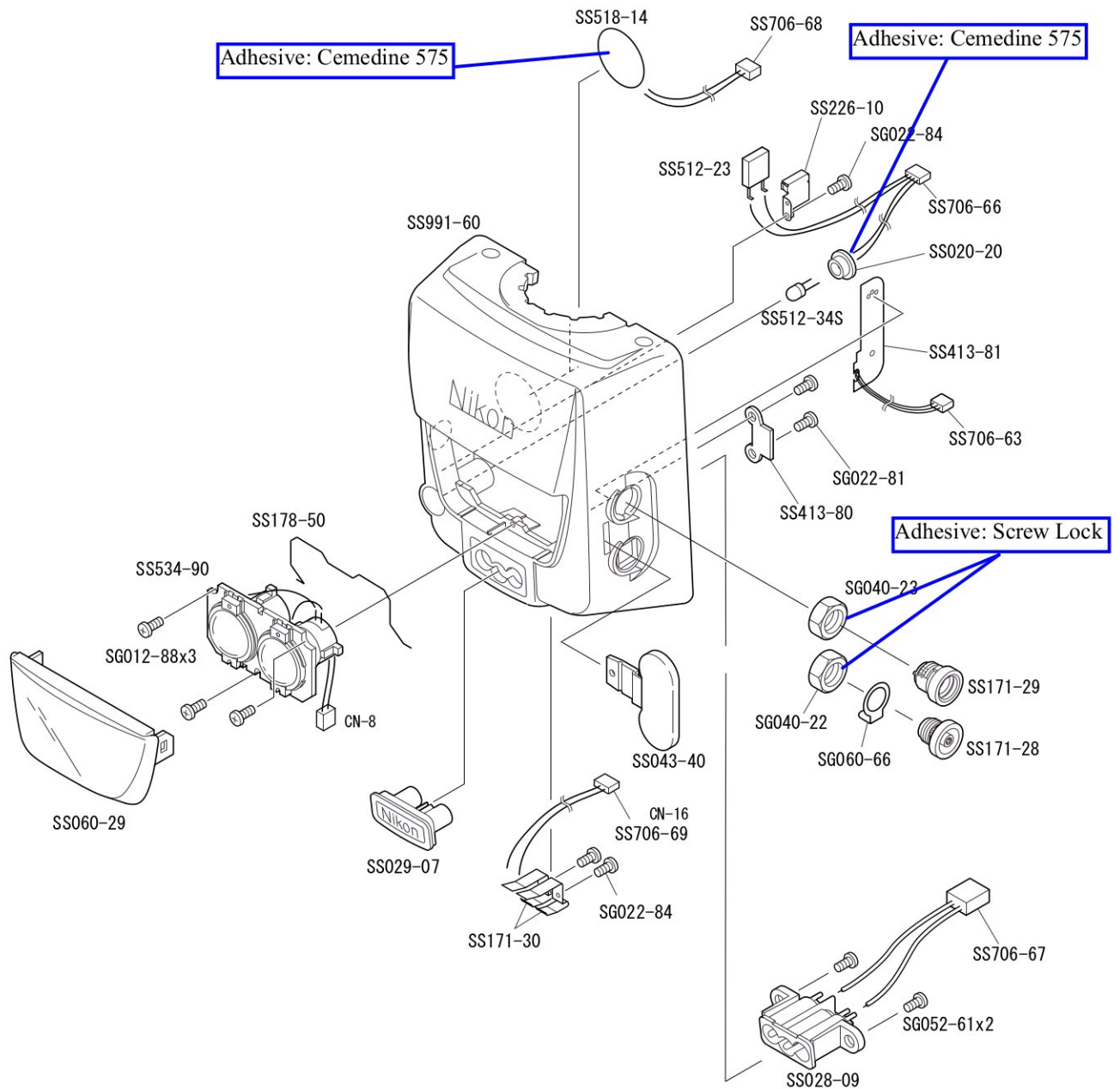
## A PCB + LCD unit



## B PCB + Battery chamber unit



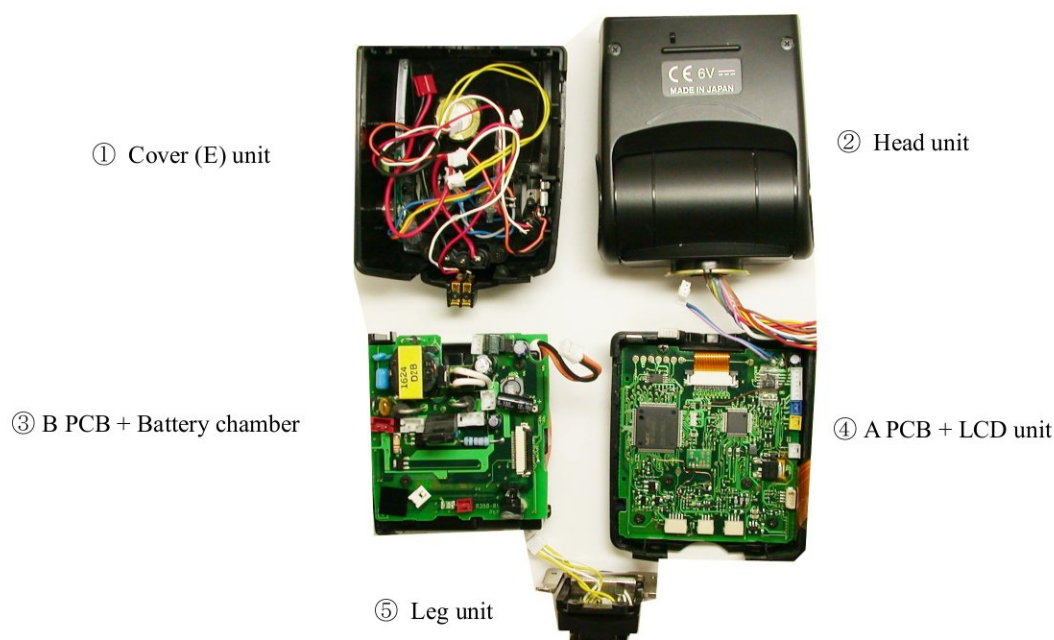
## Cover (E) unit





## Connectors

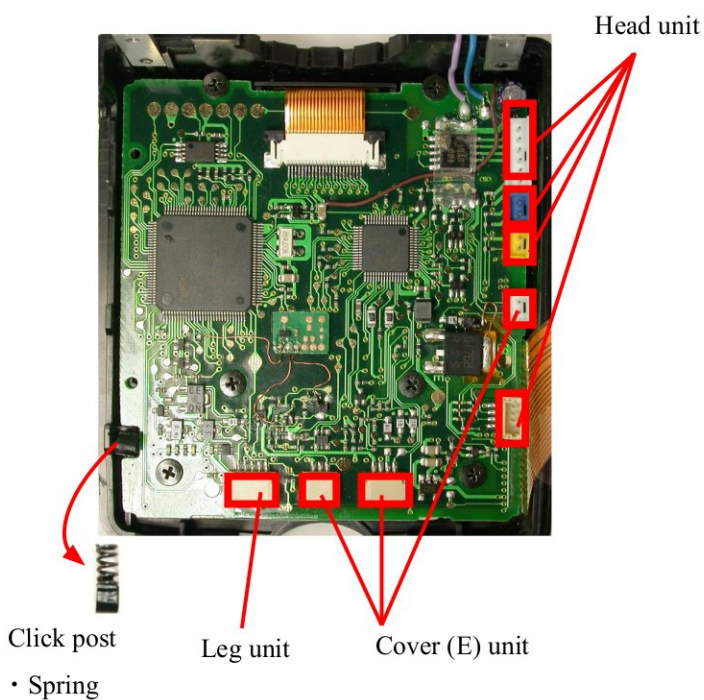
- Refer to next page for the details on how to connect connectors.



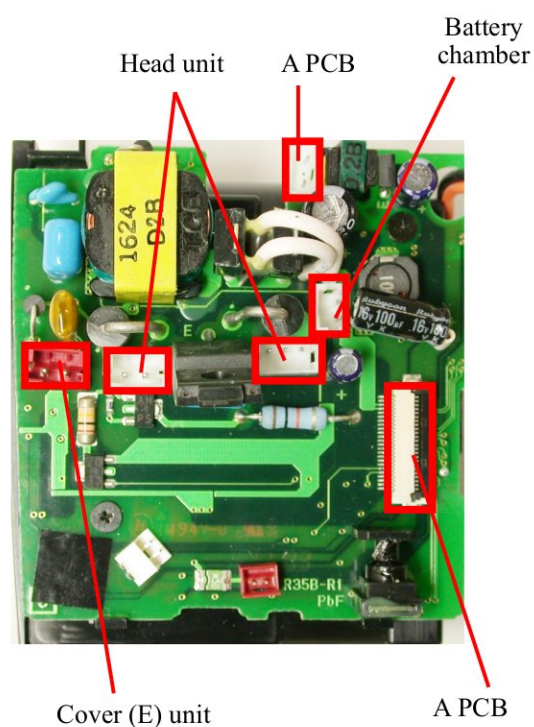
- Connect the connectors on the A PCB.
- Assemble the leg unit into the ④ (A PCB + LCD unit).
- Assemble the ③ (B PCB + Battery chamber) into the ④ (A PCB + LCD unit).
- Assemble the connectors on the B PCB.

\* **Note:** Do NOT forget to attach the below click post and spring!

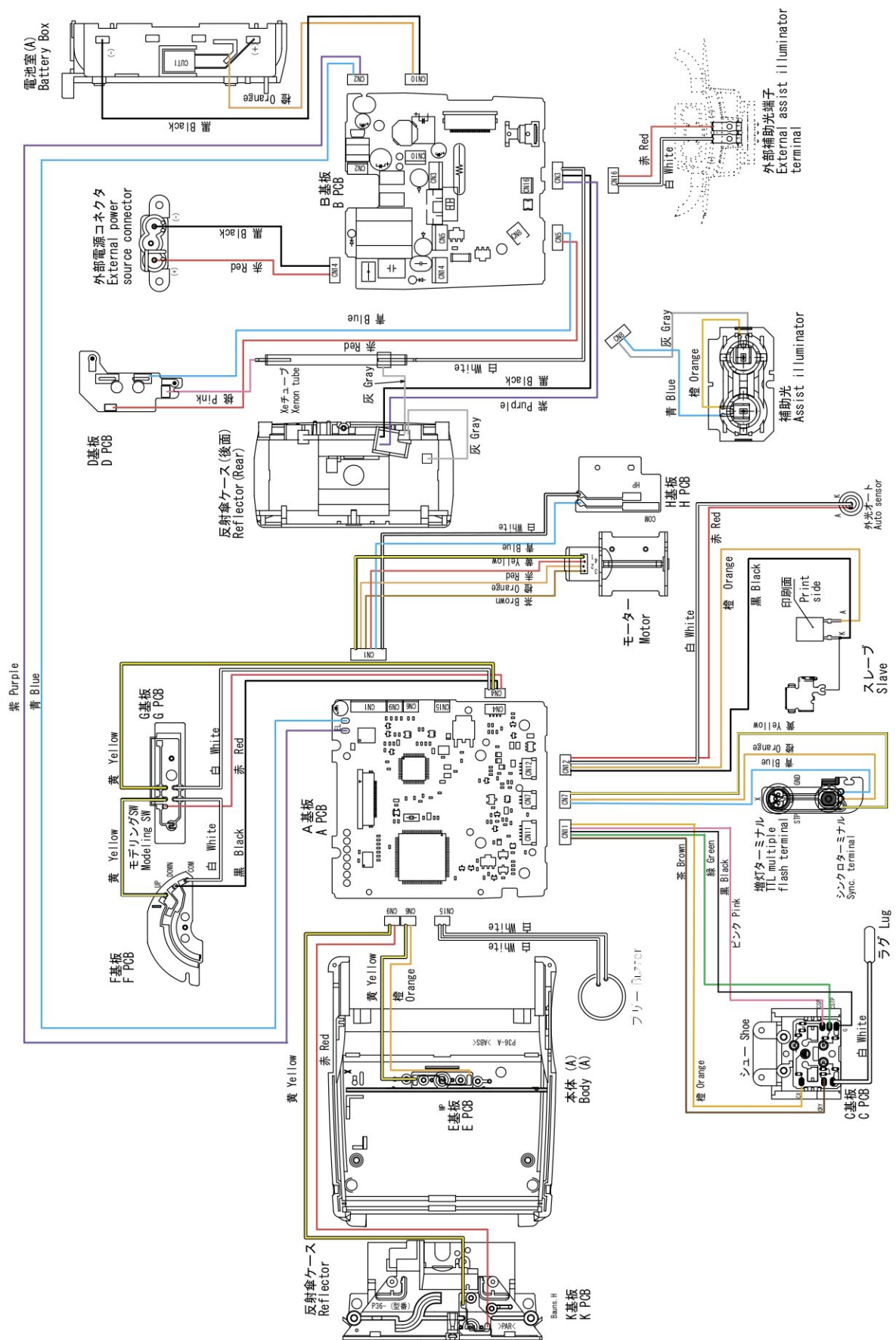
### Connectors on the A PCB



### Connectors on the A PCB



## Connectors

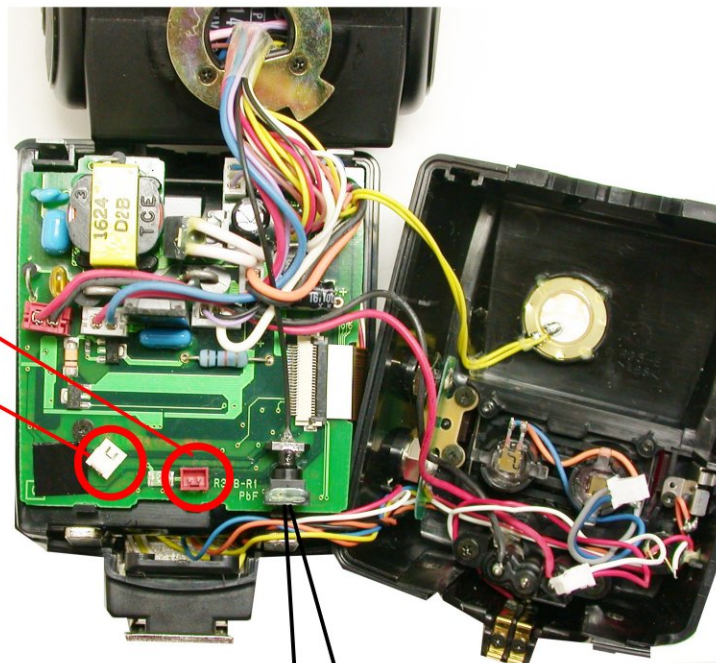


## Fiber ②

- Connect the connectors (CN16 and CN8) of the cover (E) unit.

CN 16

CN 8



- Insert the fiber until it stops to reach the photo diode.

\* Note: Do NOT bend the fiber.

- Hold down the fiber with the fiber retainer plate.

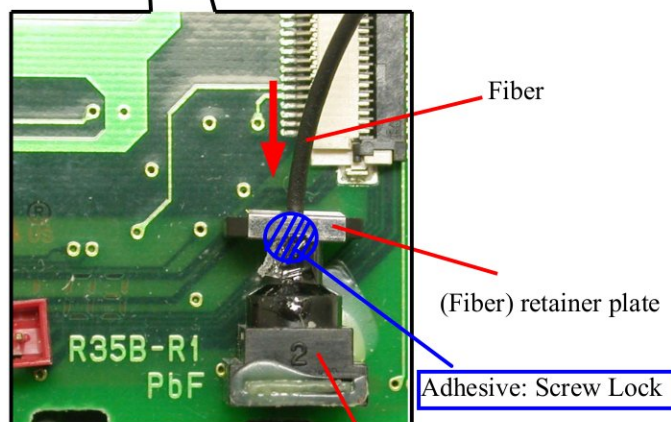


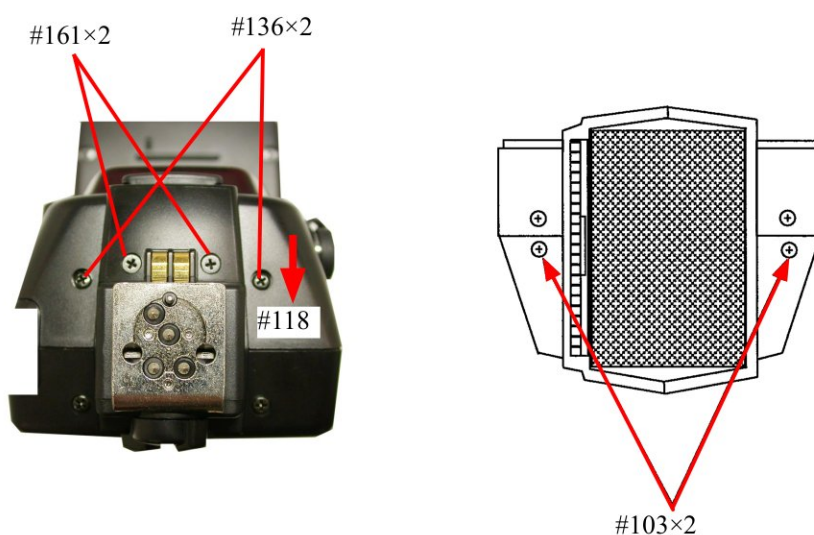
Photo diode



Assemble the Cover (E)

- Assemble the cover (E) (#118) and attach 2 screws (#161), 2 screws (#136) and 2 screws (#103).

\* Note: Do NOT pinch the inside wires.



\*Note: If the flash need to be adjusted, follow the page A20 before attaching bellow parts (Battery lib and side rubber).

Battery lib

- Put the battery lid in position.



Side Rubber

- Attach the side rubbers (#143 and # 144).



# Adjustment

Necessary equipment:

1. Adjustment software (J18355) \*Refer to Page A25 of Repair Manual for the details.
2. Personal computer \*Refer to Page A25 of Repair Manual for the details.
3. NEW high-speed communication tool (J15405)
4. Flash meter
5. Stabilized power supply (possible to output 0-6V, 3A)
6. Neutral test card (J18069)
7. Chart of inspecting focusing light (Copy and use the Page A27 of the Repair Manual.)

Adjustment items:

1. Writing of EEPROM initial value
2. Inspection & adjustment of power voltage of the main condenser
3. Adjustment of zoom home position
4. Inspection & adjustment of light volume
  - Inspection & adjustment of manual light volume
  - Inspection & adjustment of auto light volume
  - Inspection & adjustment of monitor flash volume
  - Inspection & adjustment of D-TTL flash
  - Inspection & adjustment of FP flash
  - Inspection & adjustment of wireless flash
5. Inspection of the number of times for flashing
6. Inspection & adjustment of focusing light

\* The inspection (& adjustment) of all the Item 1-5 is made electrically by using PC, so be sure to follow the instruction of the adjustment software.

Regarding 6."Focusing light adjustment", be sure to follow the instruction of Page A26.

- ※ In case the PCB (A) is replaced, be sure to make adjustments of 1 - 4.
- ※ In case the PCB (B) is replaced, be sure to make adjustments of 2 and 4.
- ※ In case the head unit of lighting unit is disassembled or a part of the head is replaced, be sure to make adjustments of 3 and 4.



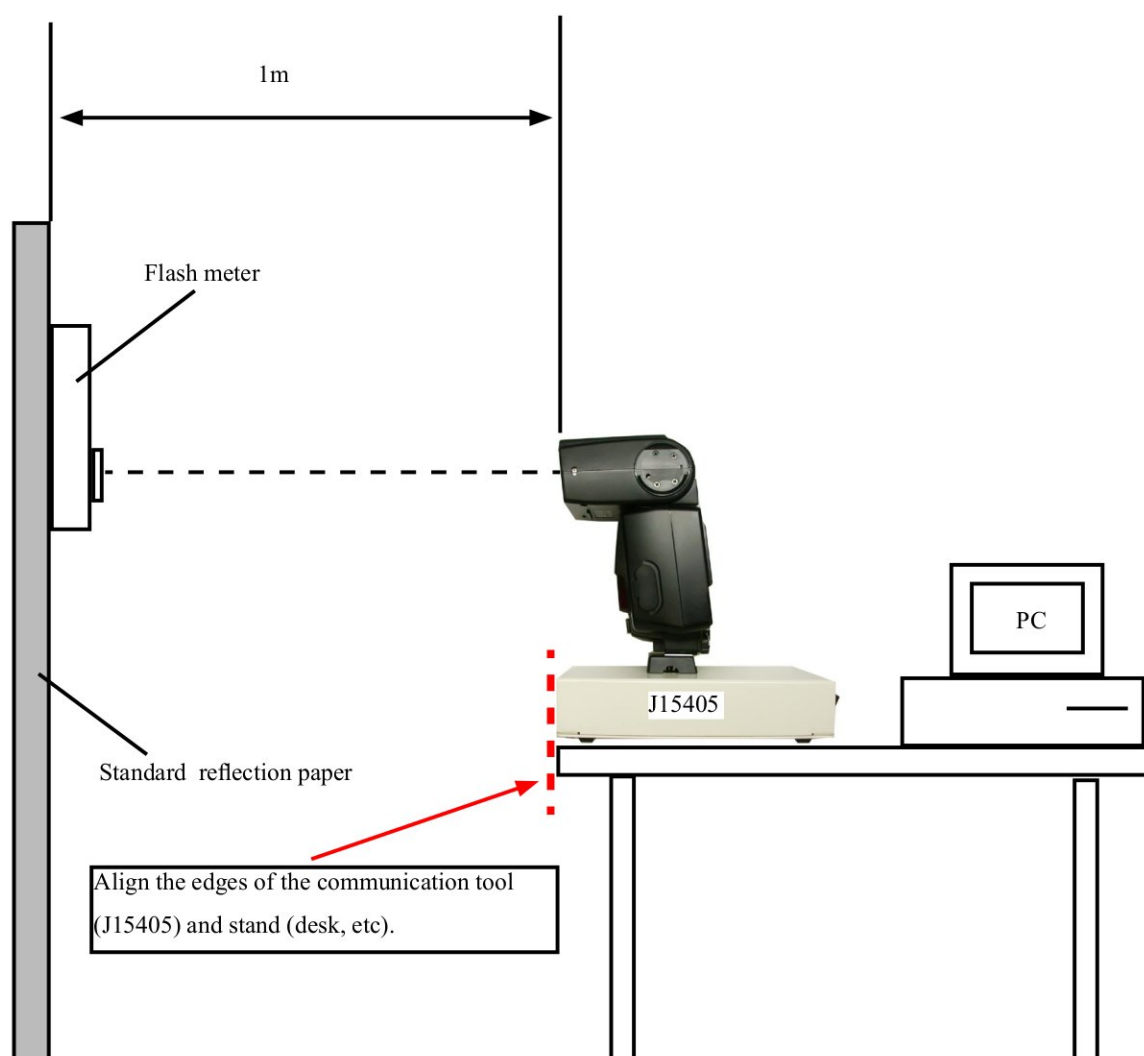
## Points to notice for Inspection & Adjustment of Flash

When the adjustment item 4. (Inspection & adjustment of flash) is made, be careful of the following:

\*Be sure to make the adjustment in a dark place (e.g. photo darkroom, etc) without influence of outside light.

\*If there is some reflector (e.g. desk, etc) in front of SB, it may affect the accuracy.

Therefore, be sure to align both the edges of the communication tool (J15405) and stand (desk, etc) as shown below.

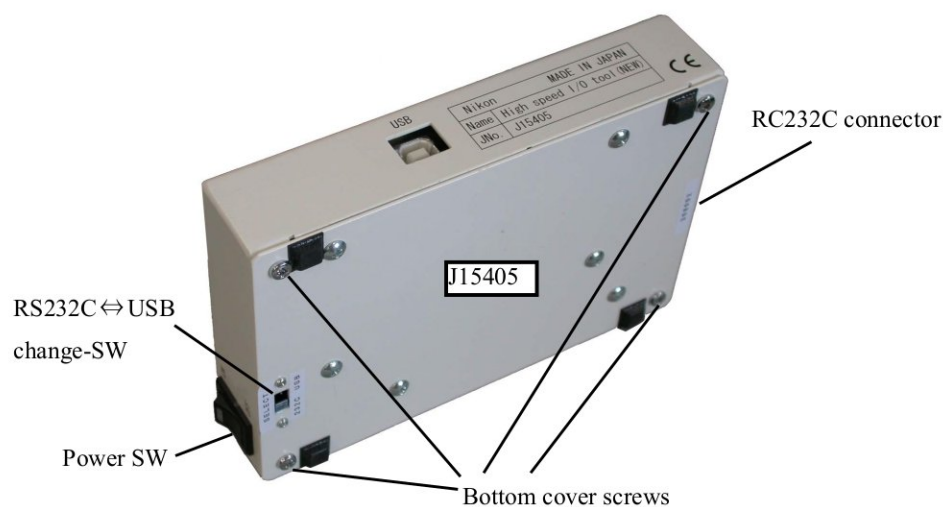


## How to connect PC and SB-800 when adjustments are made

### \* Serial communications

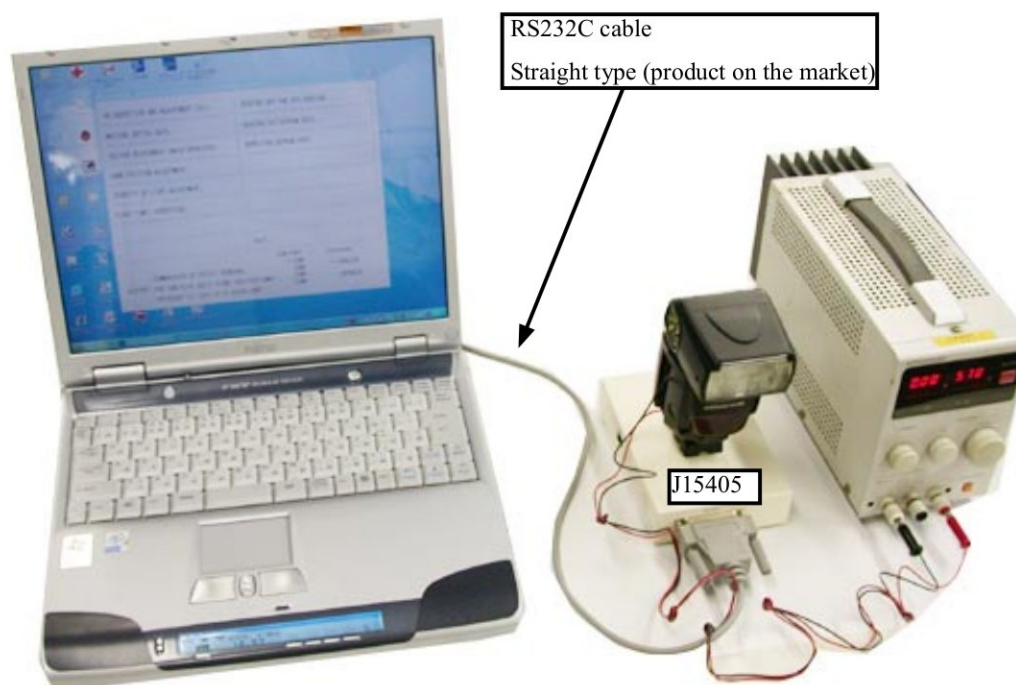
#### 1. Setup of the NEW high-speed communication tool (J15405)

- Set "RS232C  $\leftrightarrow$  USB change-SW" to "RS232C".
- Remove 4 screws of the bottom-cover and insert 4 LR6-alkaline dry batteries.



#### 2. Connection

- Connect the serial port of PC and NEW high-speed communication tool (J15405) via RS232C cable (product on the market).
- Put SB-800 on NEW high-speed communication tool (J15405).
- Supply power for SB-800. (Stabilized power supply = 5.7V)



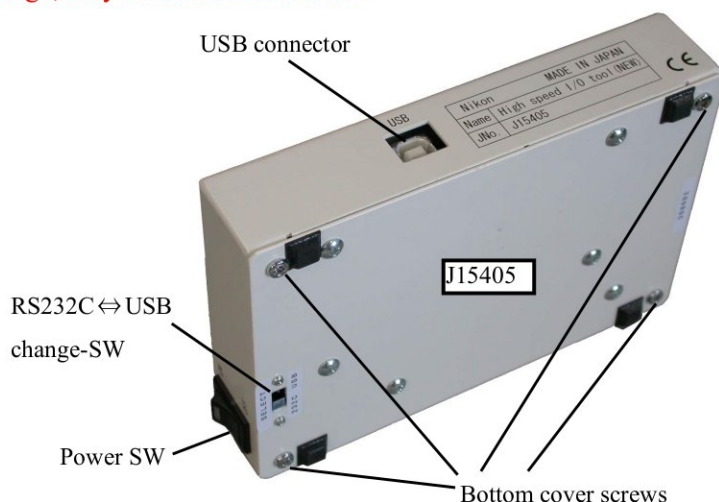
### \* USB communications

#### 1. Setup of NEW communication tool (J15405)

- Set "RS232C ⇔ USB change-SW" to "USB".
- In case 4 LR6-alkaline dry batteries are inserted in the tool, remove 4 screws of the bottom-cover to take out the batteries.

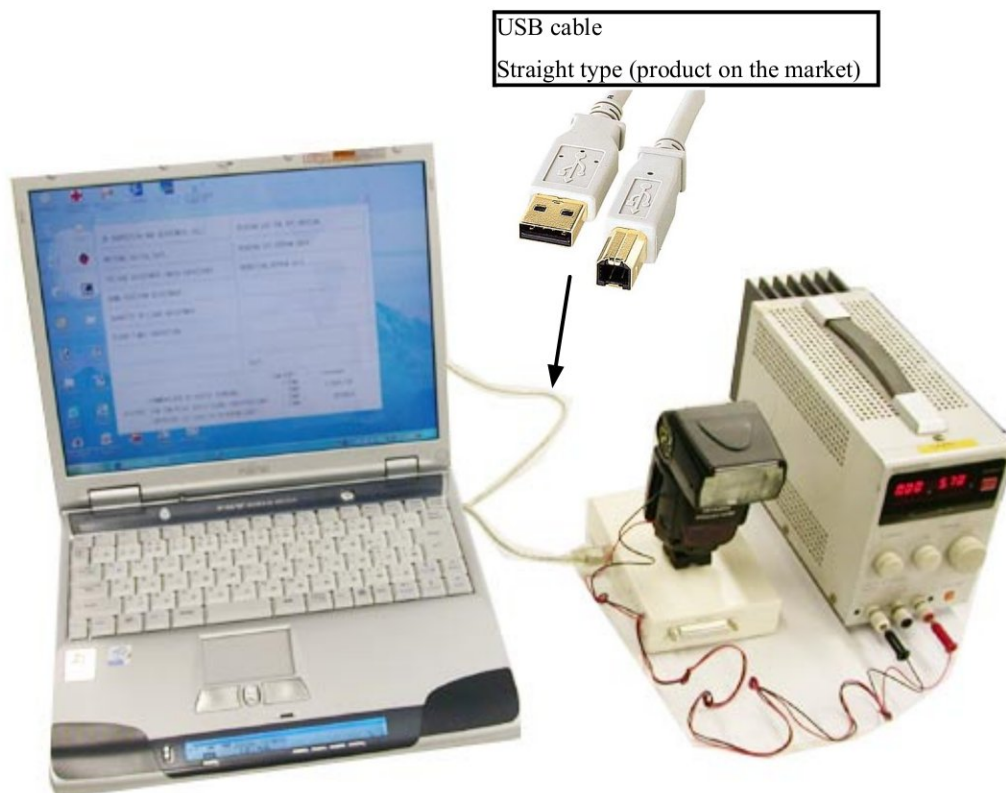
**Note:** For USB communications, batteries are NOT necessary because power is provided by PC.

Although there is no operational problem with batteries being inserted, in order to prevent liquid leakage, they should be taken out.



#### 2. Connection

- Connect the USB port of PC and NEW high-speed communication tool (J15405) via USB cable (product on the market).
- Put SB-800 on NEW high-speed communication tool (J15405).
- Supply power for SB-800. (Stabilized power supply = 5.7V)



**Note:** For USB communications, "Set the USB driver" as described on the next page.

### 3. Setup of USB driver

Install a decompression tool on PC beforehand to decompress ZIP files.

- ① Via website (of the below address) for FTDI on the Internet, download a decompress file to PC that includes virtual COM port driver.  
"http://www.ftdichip.com/Files/P8002104.ZIP"
- ② Decompress the downloaded file. (Refer to the instruction manual of the decompression file for how to use.)  
Move the decompressed file to any appropriate folder for driver.
- ③ Turn the power of NEW high-speed communication tool (J15405) to ON.
- ④ Connect the USB wire.
- ⑤ When the wire is connected, it is necessary to choose the place of the USB driver. Therefore, designate the folder of the above driver.  
Depending OS, it is necessary to designate INF file instead of folder.  
In this case, install all the 3 drivers of INF file of the following:  
ftdibus.inf 、 FTDIPORT.INF 、 FTSERMOU.INF
- ⑥ Click "Start", " Control Panel", "System", and "Device manager", to start the device manager. Then indicate by type.  
Depending on OS, the start-up method is different.
- ⑦ Indicate the detailed items of "universal serial bass controller" of the device manager, then confirm that "USB High Speed Serial Converter" is indicated.
- ⑧ Indicate the detailed items of the port of the device manager, then confirm that "USB Serial Port (Com 1-4)" is indicated.  
The designated COM (the above COM1-4) number of this item is used when the communication port of the adjustment software is actually designated.
- ⑨ Close the device manager. Start the adjustment software to check if communications are made or not.  
(Note that it is impossible to change the port other than COM1-COM4 by the adjustment software.)

If it is desired to uninstall this USB driver, perform "Ftdiunin.exe" in the driver's folder.



## Inspection & adjustment software ( J18355 )

<Operating environment> The following operating environment is required for installing this program on PC.

PC : IBM PC/AT compatible

OS : Windows XP Home Edition, Windows 2000, Windows Millennium Edition (Me),  
Windows 98 Second Edition (SE)

CPU : 80486 100MHz Pentium 1.2GHz

RAM (memory) : 32MB or more, HD 6MB-or-more free disk space is required when installing

Monitor resolution : 800×600 pixels or more

Interface : RS232C or USB

As long as the above hardware requirements are met, any PC such as desktop or laptop, etc is available.

<Notice on start-up>

When starting this program, close all other applications.

If some other applications are running, this program may not be activated.

<Procedure for installation>

The file (PSB800.EXE) of this program is provided via FD or e-mail.

Because this is the self-extracting file, decompress the file before installing, following the next procedure.

1. Create a folder for installation under a name you like and PC drive. (e.g.) C:\SB800
2. Copy the file (PSB800.EXE) in the created folder.
3. Double-click on the pasted file to display the following screen.

Press the OK button, then decompression starts.

4. When the decompression of file is finished, the file (SB800.EXE) is created.
5. The installation is completed.

<Start-up of Program>

1. Double-click the file (SB800.EXE), then the Inspection & Adjustment program for SB800 starts.
2. To display in ENGLISH, select the radio button "ENGLISH" in "LANGUAGE" in the lower right-hand corner of the screen .
3. When the "HISTORY" button at the lower-left is pressed, the program version will be displayed.
4. Select each item button according to operation.

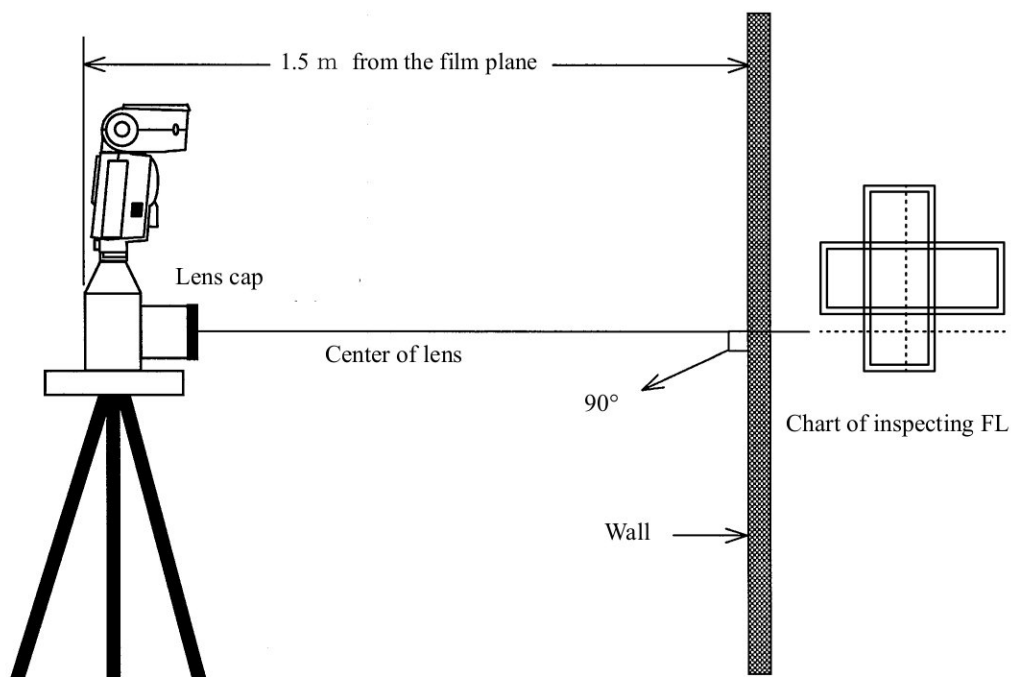
Follow the instructions on the next screen that will be shown after pressing the item button.

5. To finish the program, press the "Close (×)" button in the right-hand corner of the screen or "QUIT".

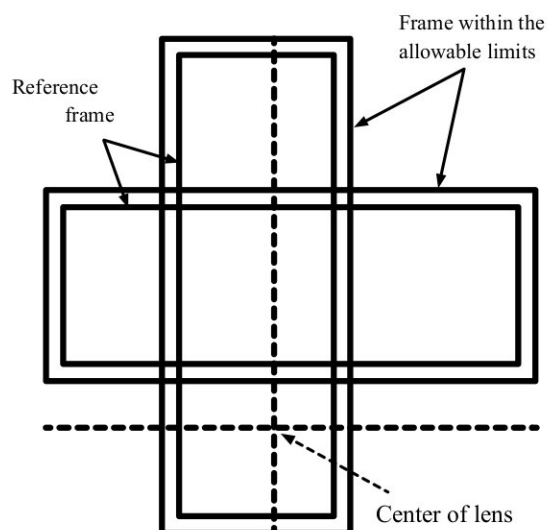
## Inspection &amp; adjustment of Focusing light

## Preparations

1. Camera (F5)
2. AF lens (of any type) with lens cap
3. Tripod
4. Chart of inspecting FL (Copy Page A27 of the Repair Manual for use.)

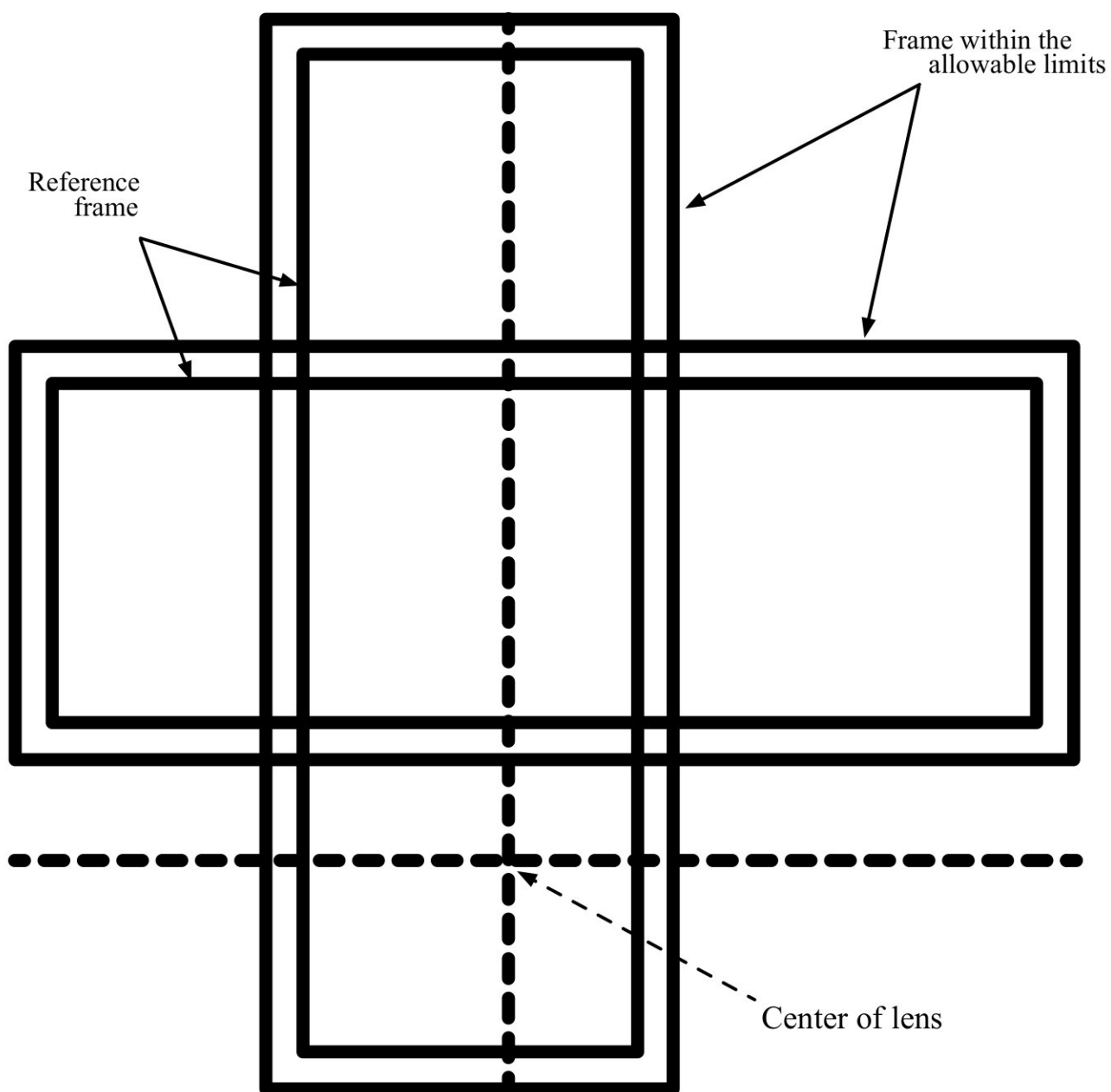
Procedure

- ① Arrange the equipment and materials as shown in the above, and set the AF mode of camera to S.
- ② In case NO AF-ILL is indicated on LCD of SB-800, have AF-ILL displayed by the custom setting.
- ③ Detach the FL cover (SS060-29) of SB-800, and press the release button halfway to lighten AF-Assist illuminator.
- ④ Adjust by using 3 screws (SG012-88) so that the light projected on the inspection chart covers the reference frames completely and fits within the allowable limits of the frame.
- ⑤ After the adjustment, attach 3 screws (SG012-88) with Screw Lock. Attach The FL cover(SS060-29).



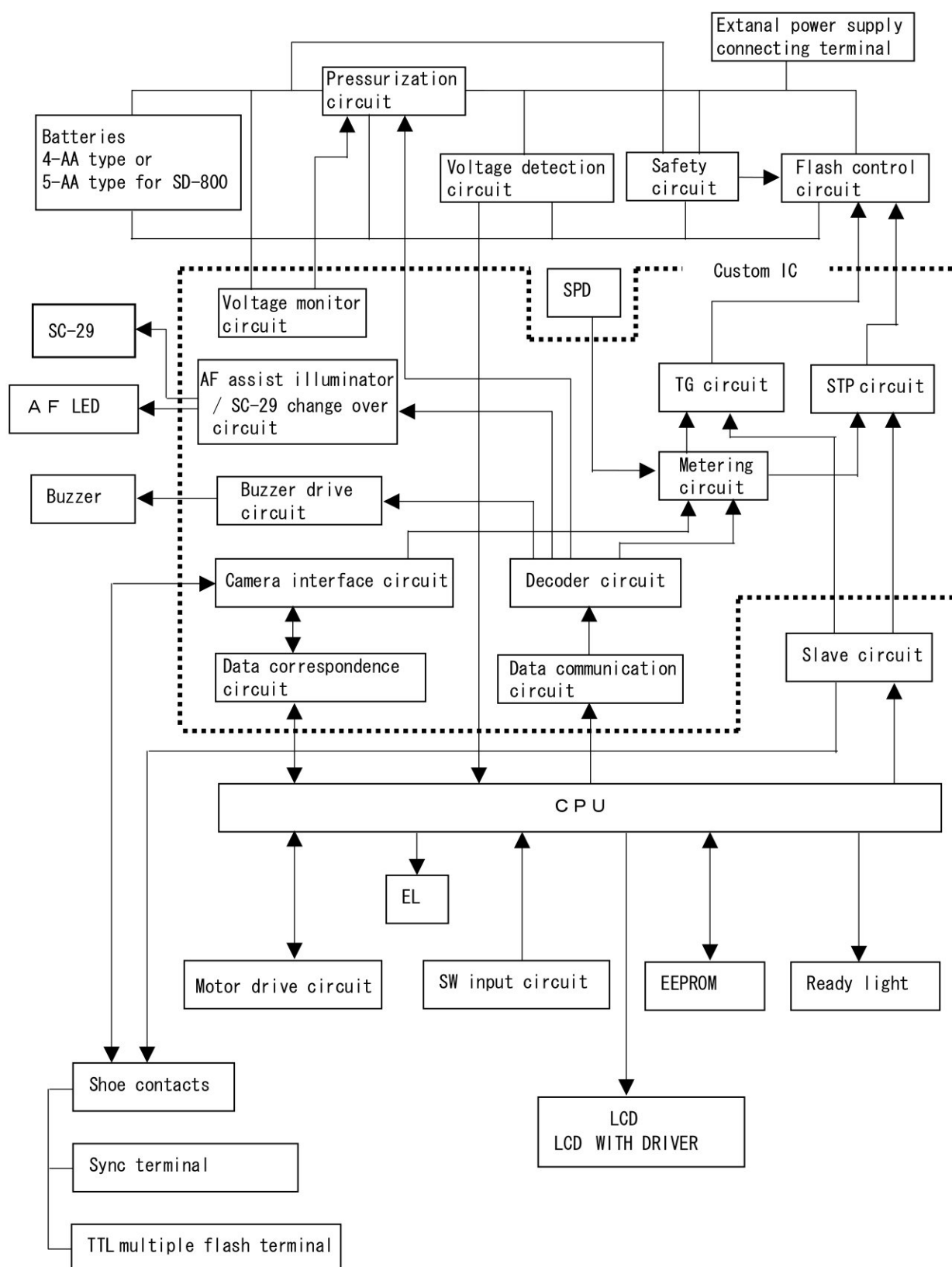
## Chart of inspecting FL for SB-800

\* Attention: Be sure to magnify this  
from A4 to A3-size before use.



## MECHANISM - ELECTRICAL

## Block diagram





## Circuitry

- **Mechanism:**

SB-800 consists of the Custom IC, 8-bit CPU, EEPROM and other peripheral circuitry as shown on Page E1.

- **Battery:**

4 size-AA batteries can be inserted internally in SB-800. Available types are alkaline manganese battery, NiCd battery, nickel-hydrogen battery, lithium battery, nickel manganese battery. Manganese battery could be used, but the recycle time gets extremely long so it is virtually unavailable. If prepackaged additional battery pack (SD-800) is attached, the recycle time can be shortened. In this case, the same type of batteries as that of internal batteries should be used.

- **Pressurization circuit:**

This increases the voltage of internal batteries, and charges the main condenser up to the given voltage (330V).

- **Voltage detection circuit:**

This outputs the voltage of lighting ready-light and the voltage of stopping pressurization to the A/D input terminal of CPU.

- **Safety circuit:**

This always monitors the voltage of charging the main condenser when batteries are inserted, irrespective of power-supply of SB-800. In case the voltage reached the given voltage (350V), the light is forced to be emitted in order to prevent damages to the main condenser.

- **Flash control circuit:**

This starts light-emitting of flash-tube based on the flash-start signal (TG circuit) output by the Custom IC, and stops light-emitting based on the flash-stop signal (STP circuit). The flash-signal output by the safety circuit is irrelevant to the status of the power switch.

- **External power-supply connecting terminal:**

This charges directly the main condenser (not illustrated) that accumulates flash energy of SB-800. This can be connected to external power-supplies which are separately sold: SD-6, SD-7, SD-8A, Power bracket SK-6, SK-6A.

- **Custom IC:**

This consists of the data communication circuit, decoder circuit, camera interface, voltage monitoring circuit, metering circuit, TG circuit, STP circuit, AF assist illuminator circuit, data communication circuit, and buzzer drive circuit.

**• Data communication circuit:**

This connects the CPU by 5-bit signal wires and STB terminal, totalling 6 signal wires. The moment the signal of STB terminal turns OFF, this sets the address for the Custom IC, and the moment the STB terminal turns ON, this writes the data in the Custom IC or reads the data that is set in the Custom IC.

**• Decoder circuit:**

This decodes the address and data that were received at the data communication circuit, and performs various settings for internal each block.

**• Camera interface circuit:**

This makes electrical connections with camera through shoe. This sends/receives data to/from camera based on the signals from CPU. This also controls input/output signals to each terminal of shoe contacts.

**• Voltage monitor circuit:**

This monitors the battery voltage in real time, and when the power voltage falls below a given voltage, it stops the operations of the pressurization circuit temporarily.

**• Metering circuit:**

This decides flash output based on the number of times, calculated by decreasing the preset constant electric current, each time the electric charge, of which the light volume is integrated by the photo cell in the integral condensr of the integration circuit, exceeds the threshold voltage.

**• TG circuit:**

This outputs the flash-start signals based on the flash-start command signals from the metering circuit, decoder circuit, camera interface, and external slave circuit.

**• STP circuit:**

This outputs the flash-stop signals based on the flash-stop command signals from the metering circuit, decoder circuit, camera interface, and external slave circuit.

**• AF assist illuminator circuit:**

This turns the illuminator on according to either the data received by the data communication from CPU or the lighting signal from the CRY terminal. The illuminator turns off according to the CPU command. In addition, there is a terminal prepared for SC-29 with the AF assist illuminator function. When SC-29 is attached, the built-in detection circuit automatically lights up the AF assist illuminator of SC-29, while the AF assist illuminator of SB does NOT light up.

**• Data correspondence circuit:**

This is the control circuit for sending/receiving signals from camera to communicate data via camera interface. The CPU performs various settings or controls based on this data.

- **Buzzer drive circuit:**

This is the control circuit for sounding an external buzzer. The buzzer tone, pattern, etc are controlled by the CPU.

- **CPU:**

This controls, etc the following: data correspondence control with camera via the custom IC; data communication control for setting data to the custom IC; reading of switches; power-supply control; AF assist illuminator control; LCD indications; motor drive circuit; voltage detection of the main condenser; turning ready-light to ON/OFF; EEPROM control; turning EL to ON/OFF; slave circuit control, etc.

- **Ready light:**

This lights up by the CPU when the voltage reaches the ready-light illumination. The CPU judges the charging voltage by A/D conversion of the voltage output from the voltage detection circuit. At the same time, signals to illuminate the ready-light in the camera finder are sent to the custom IC via 5-bit data communications.

- **Slave circuit:**

This performs real-time controls by detecting flash-start of other speedlights, outputting flash-start signal to TG circuit, detecting flash-stop of the speedlights, and outputting flash-stop signal.

- **EEPROM:**

This memorizes information such as status set by the switch input circuit, information necessary for the metering circuit, set value of the timer circuit, etc.

- **LCD:**

This indicates the flash control mode, TTL exposure compensation value, TTL underexposure ratio, zoom value, manual flash output, etc. This adopts the dot matrix type (132 X 64 dots) of STN type, and the LCD driver is mounted on the LCD glass.

- **EL:**

This is the back light to illuminate the LCD. This is automatically turned ON when the switch is operated, then after a certain time passed, automatically turned OFF.

- **Motor drive circuit:**

This sets the illumination angle of the flash unit. The flash unit is set in position under command of the CPU.

- **Switch input circuit:**

This detects ON/OFF of the push switch on the backside of SB-800 and the mechanically required bounce position, the status of the wide panel setting, etc.

- **Shoe contacts:**

This has 5 contacts (CX, CRY, CSTP, CSP, GND) and connects electrically to camera. This is also the signal contacts to communicate data with camera.

- **Synchro terminal:**

This is connected in parallel with the shoe contacts, and receives the flash-start signal by connecting the synchro wire SC-11, SC-15, etc.

- **TTL multiple-flash terminal:**

This is connected in parallel with the shoe contacts, and receives the flash-start and flash-stop signals by connecting the TTL wire SC-18 and SC-19.

- **AF LED:**

This is the LED that lights based on the output from the AF assist illuminator circuit. This emits a specified vertical striped pattern to the object, and assists the AF distance measurement.

- **Buzzer:**

This is the piezoelectric buzzer that sounds by the output from the buzzer drive circuit. This sounds by the output by the buzzer drive circuit and the sounding tone and pattern are based on the CPU command.

- **SPD:**

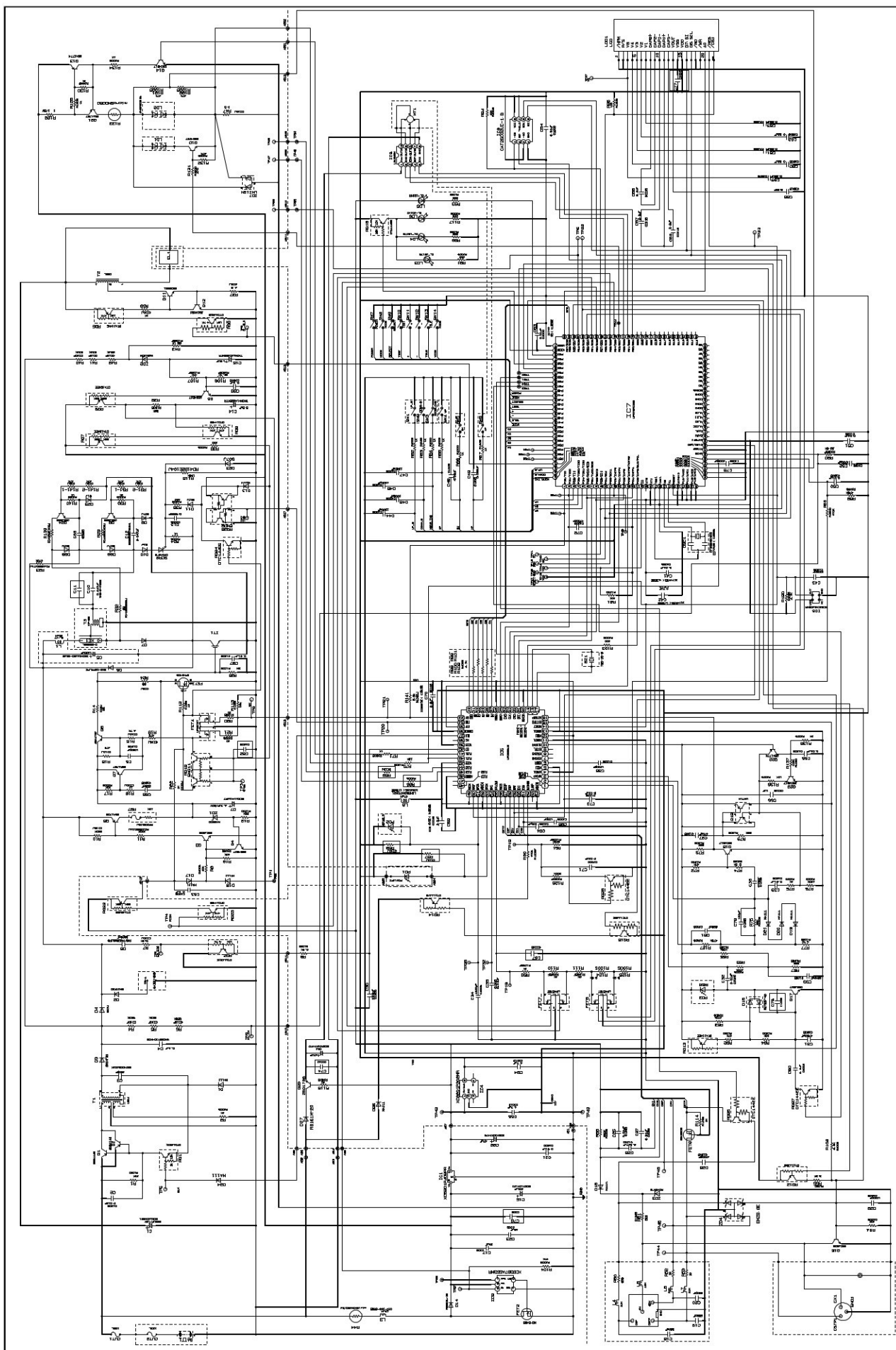
This is the sensor to control the pre-flash output, manual flash output, and external flash output by monitoring the light volume via connection to the metering circuit.

- **External AF assist illuminator contacts:**

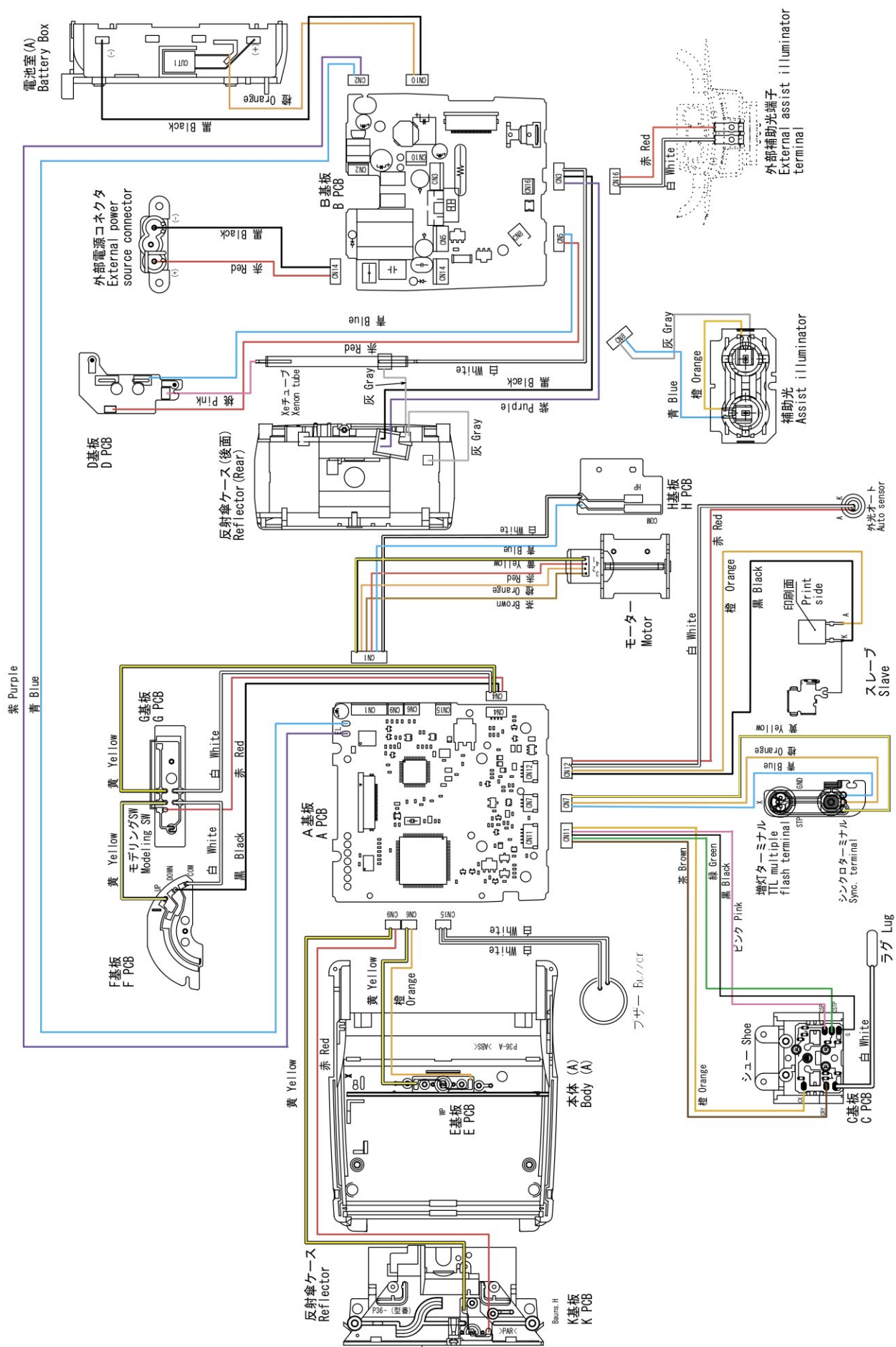
When the TTL Remote Cord SC-29 with the AF assist illuminator function is attached, SB-800 automatically lights up the AF assist illuminator of SC-29 based on the AF light signal from the camera, instead of lighting the AF assist illuminator of SB-800.



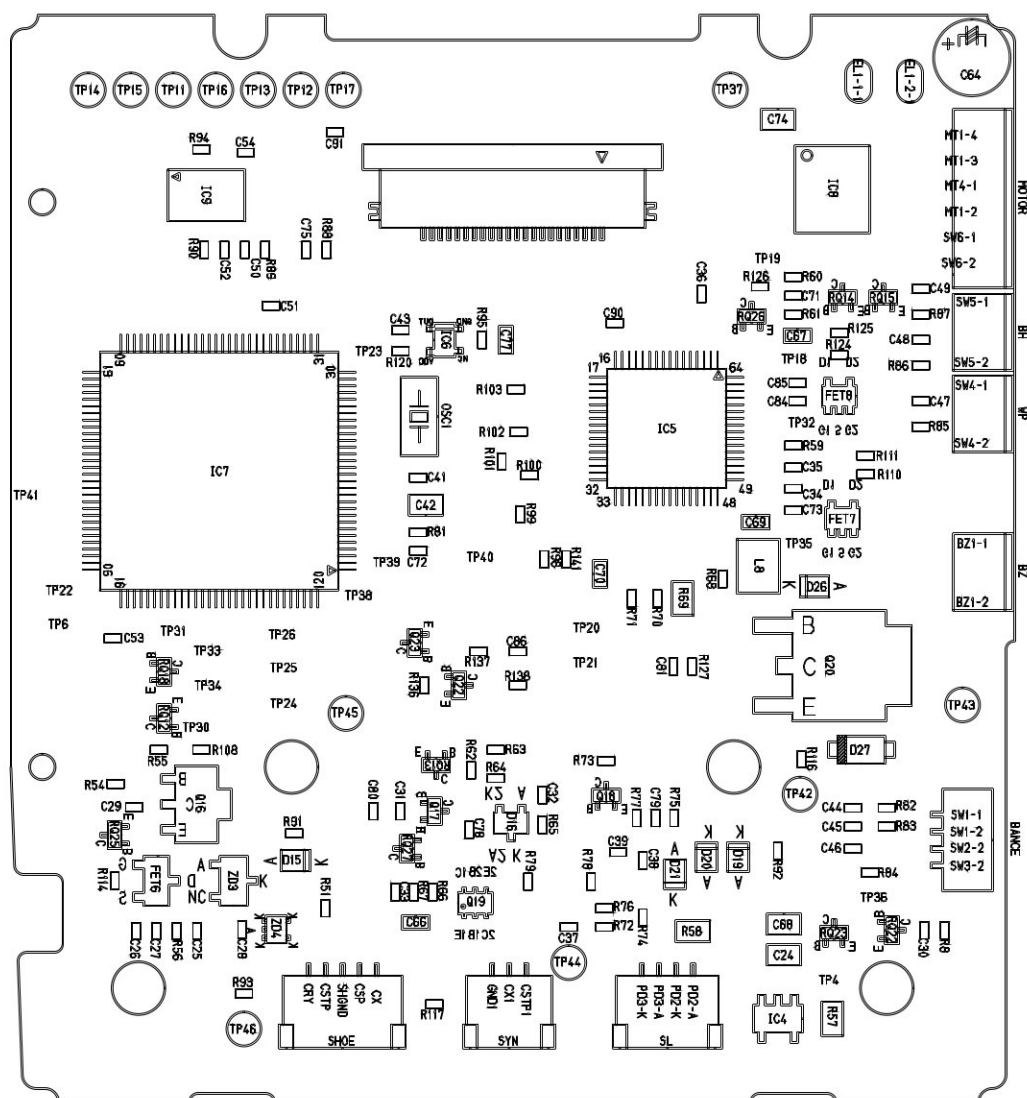
## 回路図・CIRCUIT DIAGRAM



實體配線図 WIRING

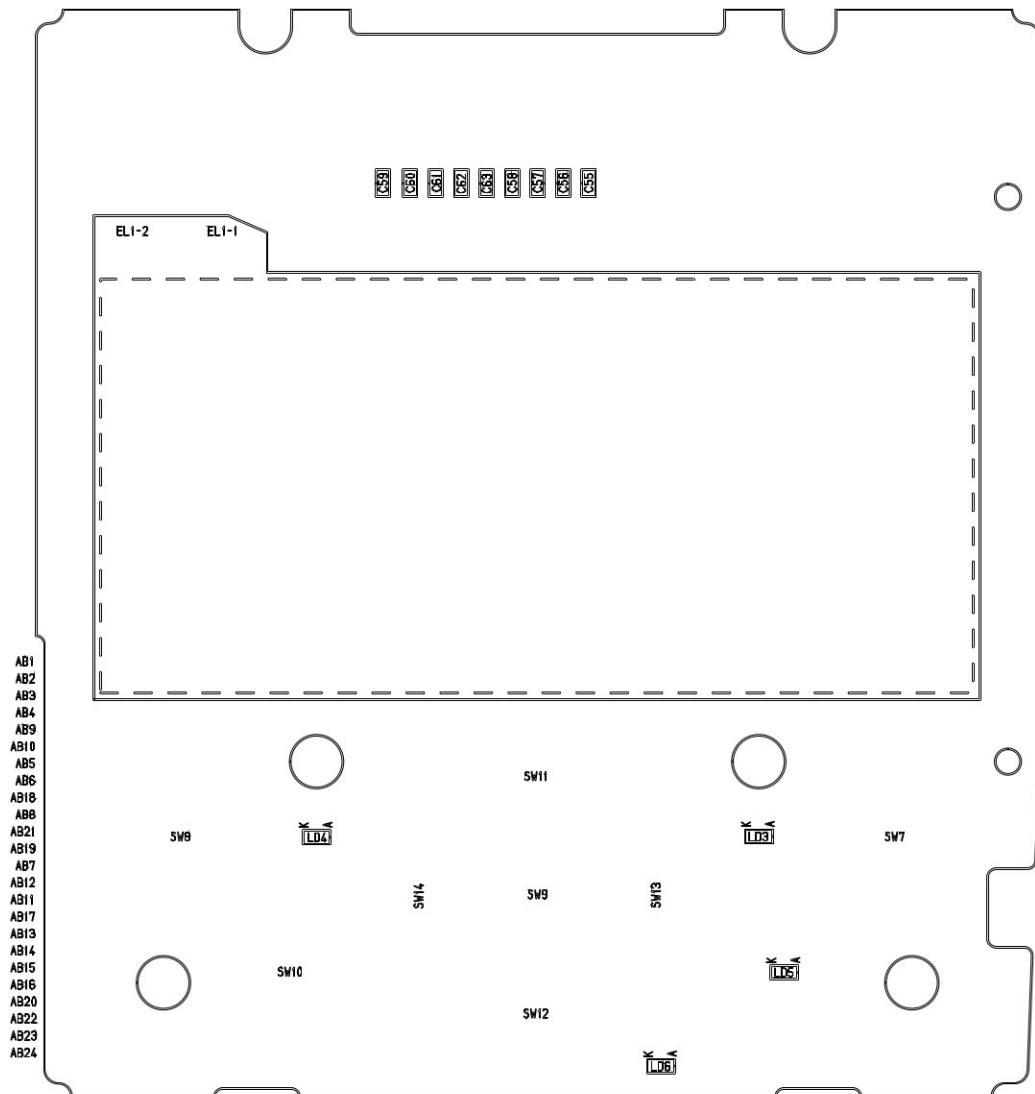


- A 基板 (1)
- A PCB (1)



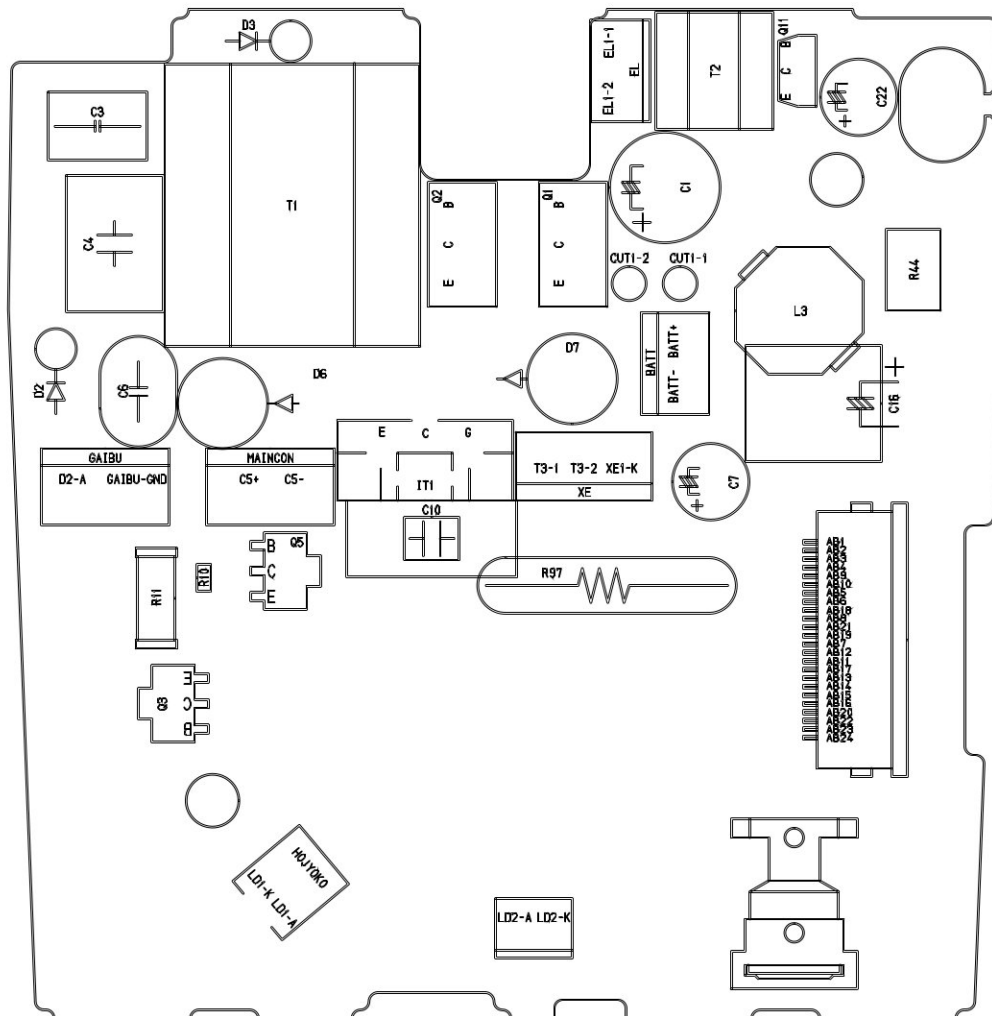
A 基板 (2)

A PCB (2)



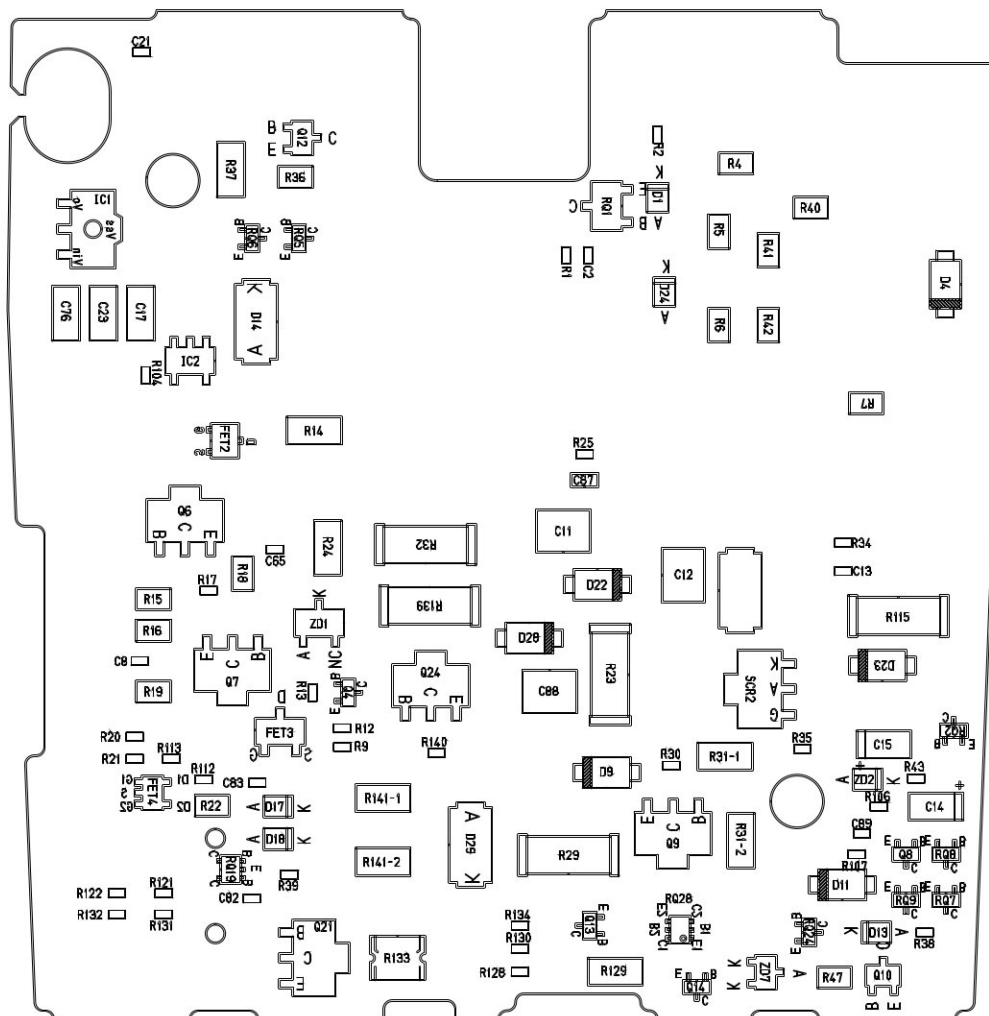


- B 基板 (1)
- B PCB (1)

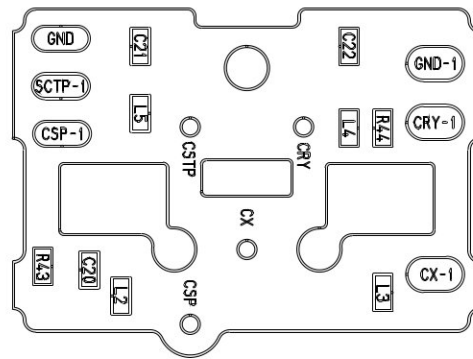


B 基板 (2)

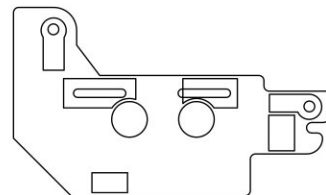
B PCB (2)



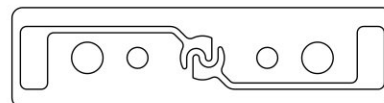
C 基板  
C PCB



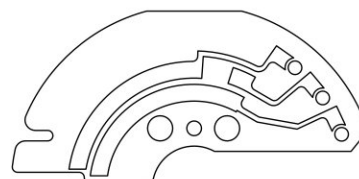
D 基板  
D PCB



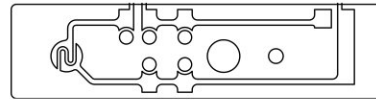
E 基板  
E PCB



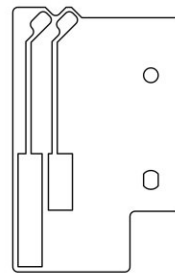
F 基板  
F PCB



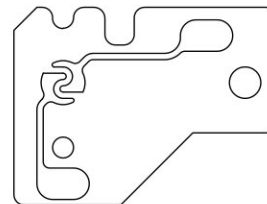
G 基板  
G P C B



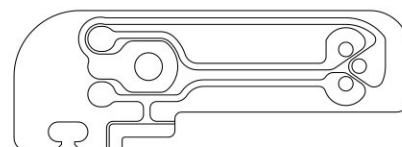
H 基板  
H P C B



K 基板  
K P C B



ターミナル 基板  
Terminal P C B





## EEPROM DATA

## SB-800

ADDRESS	DATA	ADDRESS	DATA
0 ~ 127	制御用データ Control data	219	F P 発光 FP-flash
128 ~ 129	チェックサム Check sum	220 ~ 221	制御用データ Control data
130 ~ 148	制御用データ Control data	222	ワイヤレスパルス Wireless pulse
149 ~ 151	メインコンデンサ Main condenser	223 ~ 226	制御用データ Control data
152 ~ 153	制御用データ Control data	227	D - T T L D-TTL
154 ~ 155	マニュアルフル発光 Manual full flash	228 ~ 230	プリ発光とモニター発光 Pre-flash and Monitor flash
156 ~ 176	制御用データ Control data	231 ~ 232	制御用データ Control data
177	ズーム基準位置 Zoom reference position	233	モニター発光 Monitor flash
178 ~ 199	制御用データ Control data	234 ~ 235	A A 発光 AA out put
200 ~ 205	オート光量 Auto out put	236 ~ 238	制御用データ Control data
206 ~ 208	制御用データ Control data	239	D - T T L D-TTL
209 ~ 210	マニュアル光量 Manual out put	240	制御用データ Control data
211	制御用データ Control data	241 ~ 243	F P 発光 FP-flash
212	プリ発光 Pre-flash	244 ~ 255	制御用データ Control data
213 ~ 218	制御用データ Control data		

## 工 具 ・ TOOLS

★ : 新規設定工具 ・ NEW TOOL

工具番号 Tool No.	名 称 Name of tool	備 考 Others
★ J15405 	新高速通信工具 New high speed I/O tool	
★ J18355 	点検、調整ソフト Inspection and adjustment software	IBM 3.5 inches
J18069 	標準反射板 Standard reflection paper	
	AF 補助光用チャート Chart for AF Assist light	修理指針 A 22 ページ使用 Use the page A 22 of the Repair Manual
	パーソナルコンピュータ Personal computer	汎用品 RJ is Not available
	RS 232C ケーブル RS 232C cable	汎用品 RJ is Not available
	安定化電源 (6.0V 3A) Power supply (6.0V 3A)	汎用品 RJ is Not available
	デジタルマルチメータ Digital meter	汎用品 RJ is Not available
	フラッシュメータ Flash meter	汎用品 RJ is Not available

## その他・Others

工具番号 Tool No.	名 称 Name of tool	備 考 Others
EBB0061 	グリース G7100 Grease G7100	NET = 100g
TA-0001 	テープ W= 10mm	
TA-0012 	テープ W= 6mm	
EDB0011 	ネジロック (赤) Screw Lock (RED)	
J67017 	セメダイン 575 CEMEDINE 575	