


作成承認印	配布許可印
	

Speedlight
SB-27

REPAIR MANUAL

修 理 指 針

Nikon | NIKON CORPORATION
Tokyo, Japan

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1. SPECIFICATIONS

1. GN

The zoom description shows the zoom position in horizontality.

Msetting	24mm	28mm	35mm	50mm	At bounce
1/1	25	27	30	34	6
1/2	17.7	19	21.2	24	4.2
1/4	12.5	13.5	15	17	3
1/8	8.8	9.5	10.5	12	2.1
1/16	6.2	6.7	7.4	8.5	1.5
Pre-flash	1.7	1.8	2.0	2.2	————

2. Flash duration

Msetting	Time
1/1	Approx. 1ms
1/2	Approx. 0.9ms
1/4	Approx. 0.4ms
1/8	Approx. 0.2ms
1/16	Approx. 150 μ s
Pre-flash	Approx. 42 μ s

Flash duration: The time till the light volume is reduced to a half of the peak since the flash started. (half-value width)

3. Zoom head position and angle of coverage

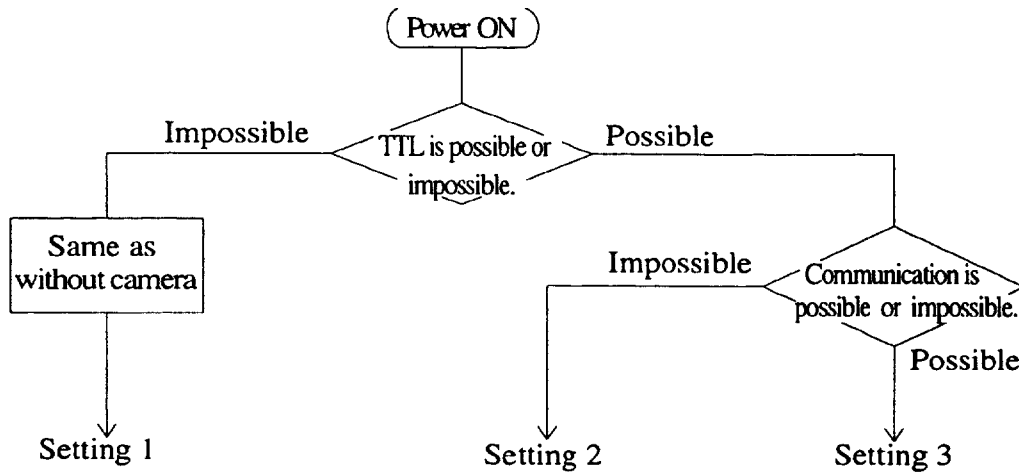
There are four zoom positions. The angle of coverage is changed according to the SB position (horizontal or vertical).

Zoom position	Angle of view in horizontality	Angle of view in verticality	Horizontal	Vertical
24mm	24mm cover	35mm cover	78 °	60 °
28mm	28mm cover	↓	70 °	53 °
35mm	35mm cover	50mm cover	60 °	46 °
50mm	50mm cover	70mm cover	46 °	36 °

Note: The Zoom head does not stop at the 28mm position in verticality. If the zoom is set at 28mm in horizontality and then the SB is set vertically, "50mm" is shown only in the display.

4. Flow, when the power is ON

When the STBY switch is OFF (while the power is ON):



(1) Setting 1

(a) When M is selected: Manual light emitting control

GN—It is set manually (1/1 ~ 1/16) by M button.

F value —It is set manually (F1.4~F64) by F button.

ISO value —It is set manually (ISO3~6400) by M button after A is selected.

ZOOM—It is set manually (24~70mm) by Z button.

(b) When A is selected: External light control

F value —It is set manually (F1.4~F64) by F button.

For example, ISO is 100, it can be selected from F2.8, F4, F5.6 and F8.

ISO value —It is set manually (ISO3~6400) by M button.

ZOOM—It is set manually (24~70mm) by Z button.

The ZOOM value, 24mm and 28mm, can be set only in horizontality and 70mm can be set only in verticality. The ISO value is prepared for display in M mode. The range of setting F value in A mode is determined automatically by the set ISO value.

(2) Setting 2

(a) When M is selected—Same as those of M mode in Setting 1.

(b) When A is selected—TTL Auto (The TTL display only)

Others are the same as those of A mode in Setting 1.

Setting of F value or ISO value is related only to the display of the shooting distance range. It has nothing to do with the real control.

(3) Setting 3

(a) When M is selected:

GN value—It is set manually (1/1 ~ 1/16) by M button.

F value —It is set by communication. It cannot be set by F button.

ZOOM—Automatic zoom is possible.

It is changed by Z button from Auto. →M24mm ·····.

ISO value —It is set by communication. It cannot be set on the SB side.

(b) When A is selected: TTL auto

Display —Shows the top TTL in the combination of SB and the camera at the moment.

"TTL-Multi mark" in the combination of F90 and CPU lens and "TTL-BL mark" in the no-CPU lens are displayed respectively. The change with normal TTL can be done by M button.

ZOOM, ISO and F value —They are set by communication. Only ZOOM can be set manually. Auto. and Manual for ZOOM can be changed by ZOOM button.

5. Flow, when the power is ON

When the STBY switch is ON:

The power is STBY OFF in approx. 80 seconds unless the SB operation is done, even if it is set at A or M position.

- (1) If the switch is at M, other functions except STBY are the same as the above.
- (2) If the switch is at A, the TTL mode is set forcedly. If the SB-27 is mounted on a non TTL impossible camera, it flashes fully. In the case of a TTL possible camera, the operation is the same as above.

6. Display change timing

When the SB is mounted on a TTL possible camera, the change is as follows. If the power of SB is ON and A is selected, the display is changed to TTL whether the power of the camera is ON or OFF. If the power of the camera is ON, the top TTL is displayed. (TTL-MULTI or TTL-BL) If the power switch of the F601 camera is OFF, the display of SB remains A. If the power switch is ON, TTL is displayed though the power hold is Time over. In a F50 camera, the display returns to A mode unless the power of the camera is held. In flash shooting, the display is changed to TTL because the power of camera is held surely.

7. Other functions of operating switches

(1) Exposure compensation

a. Conditions —The camera enables TTL and SB communication.

b. Method —Press the F and M buttons simultaneously. the +/- mark and "00" are displayed and they flicker. The display is variable by 0.3Ev in the minus side if pressing M button and in plus side if pressing F button. It can be set in the range of +1 ~ -3Ev. After setting, press the F and M buttons again simultaneously or leave it for 5 seconds, and the display will light up. If "0" is set, the exposure compensation display disappears.

(2) m/ft change in TTL range display

a. Method —Turn on (M or A) the power switch as pressing F button, and the setting will change.

(3) Automatic zoom cancel

a. Conditions —The camera enables communication and auto. zoom is possible.

b. Method —Press ZOOM button and M button for 4 seconds simultaneously. The zoom M mark flickers and the auto. zoom is impossible. Press the both buttons for 4 seconds simultaneously again to reset them.

(4) Broken bounce plate recovery

When the bounce plate is drawn out, the zoom is fixed on the 28mm position to disable the setting by auto. zoom or manual zoom. If the bounce plate is broken, the zoom cannot be executed for normal photographing. There is a recovery function to prevent such inconvenience.

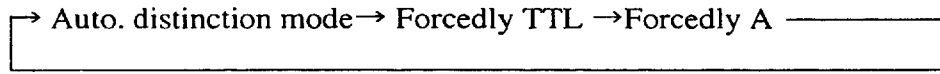
a. Conditions —The bounce is displayed.

b. Method —Press F button and ZOOM button for 4 seconds simultaneously, and the zoom numerical value flickers to enable the manual or auto. zoom. If the repaired bounce plate is set as before, the display will light up to start the normal operation.

(5) Setting of the forcedly TTL or forcedly A mode

This setting is used when light is adjusted externally by the TTL possible camera (compulsory A mode) or when the TTL - multiple flash lights are used for a slave.

- a. Conditions —Stand-by is OFF.
- b. Method —Turn on (M or A) the power switch as pressing the ZOOM switch, and the modes will be changed in the following order.



- c. Display—In the forcedly mode, A or TTL mark (one of the two set at present) flickers.

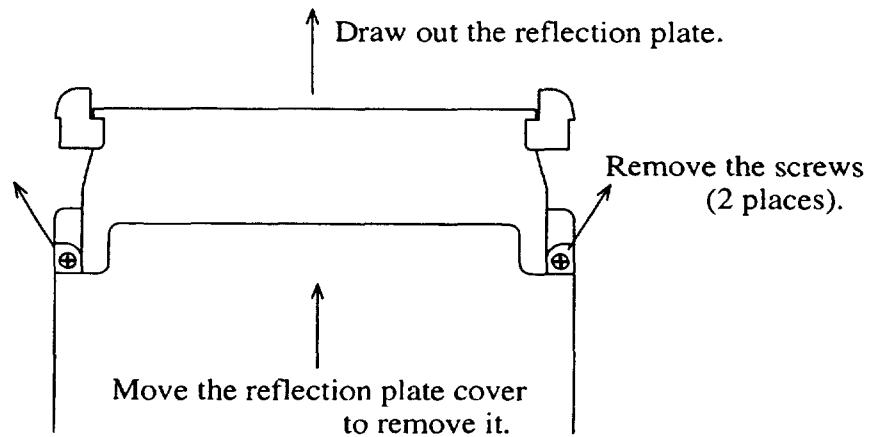
8. Others

Refer to teh instruction manual for the details of the use.

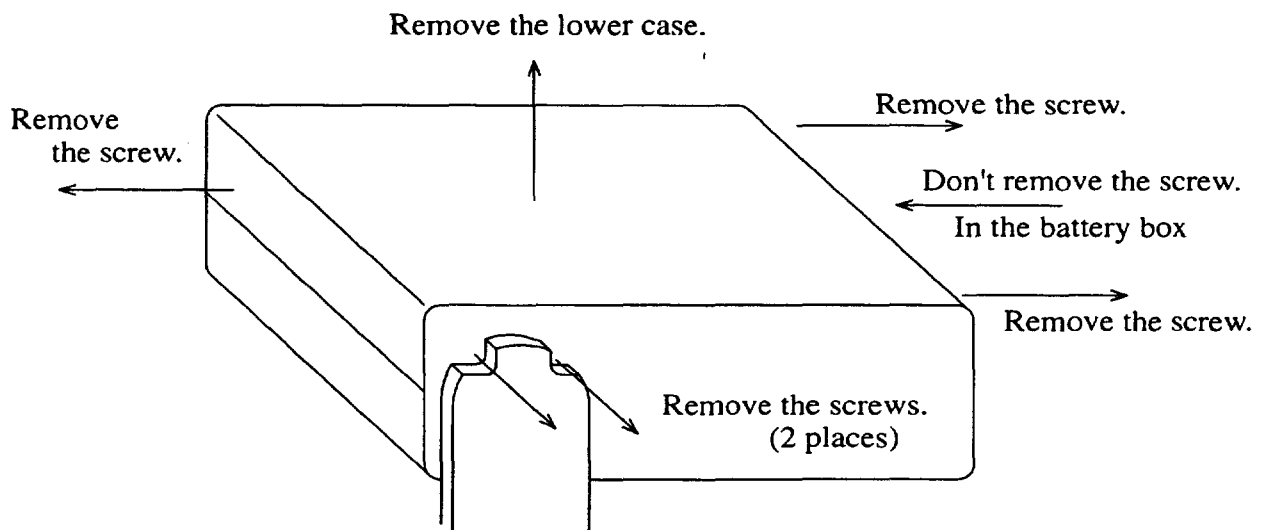
2. DISASSEMBLY

I . Disassembly of main unit

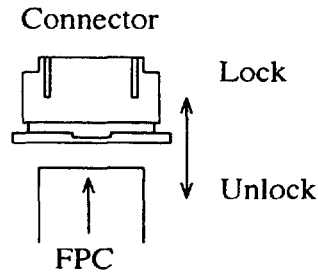
1. Draw out the reflection plate a little and remove the two screws hidden under the plate. Move the reflection plate cover forward, and the plate and its cover are removed. (Be careful about the falling of the reflection plate's extension spring, spring stud or stopper spring.)



2. Take the name plate off the foot unit, remove the one screw under the plate and remove the foot cover and the flash switch.
3. Turn the foot unit and remove the two screws from the lower cover. Remove the two screws from the front side of the lower case, open the battery cover and remove the one screw from the back side of the case.



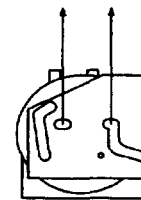
4. Remove the lower case. The battery box is hooked on the upper case. Remove the hooks from all the P.C.B (the connector is used only with the B P.C.B) and remove all the wires from the connectors. Be careful not to drop the fresnel lens of flash head and the red eye lens.
Unlock the FPC connector and then pull out the FPC.



5. Discharge the main condenser. Be careful of the electric shock. Use the white wire (+) and blue wire (-). Remove the main condenser. Be careful not to break the B P.C.B. because the double-faced tape is powerful.

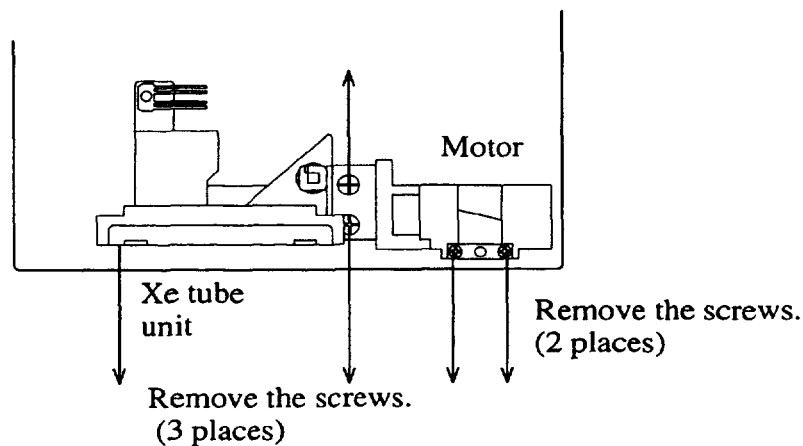
⚠ WARNING	
	<ul style="list-style-type: none"> ● There are high voltage parts inside. Be careful of this electric shock, when you open the cover. ● You must discharge the main condenser according to the instruction of this repair manual after you remove the cover.

Discharge.



Bottom of main condenser

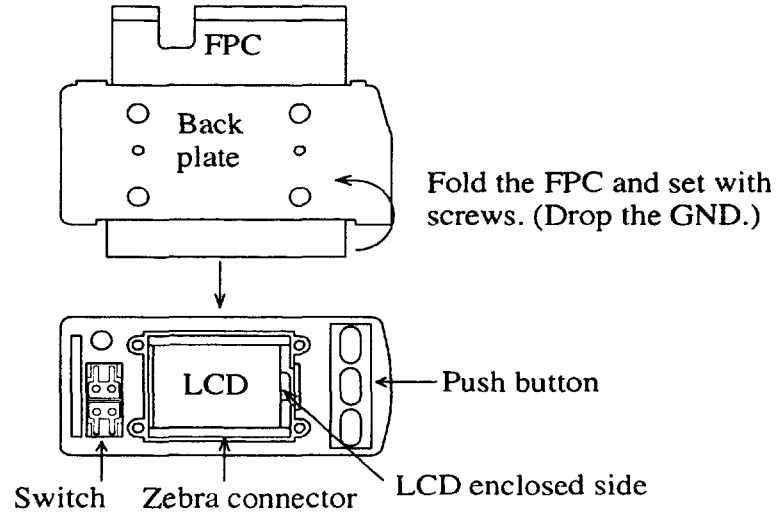
6. Remove the FPC or wires from the connectors on the P.C.B. Turn the foot unit reversely and remove another two screws. The foot unit and LCD unit will be removed.
7. Remove the four screws to remove the B P.C.B. The sensor for A mode is set on the B P.C.B. as one part of the B FPC assembly. The red eye reduction lamp is set beside the motor, and it can be removed easily.
8. The motor assembly can be removed by two screws under the front. The Xe tube unit and the movable cam can be removed by three screws.



II. Disassembly of LCD unit

The LCD unit is regarded as one set. Since the rubber connector or rubber switch can be deteriorated, the disassembly procedure is shown below.

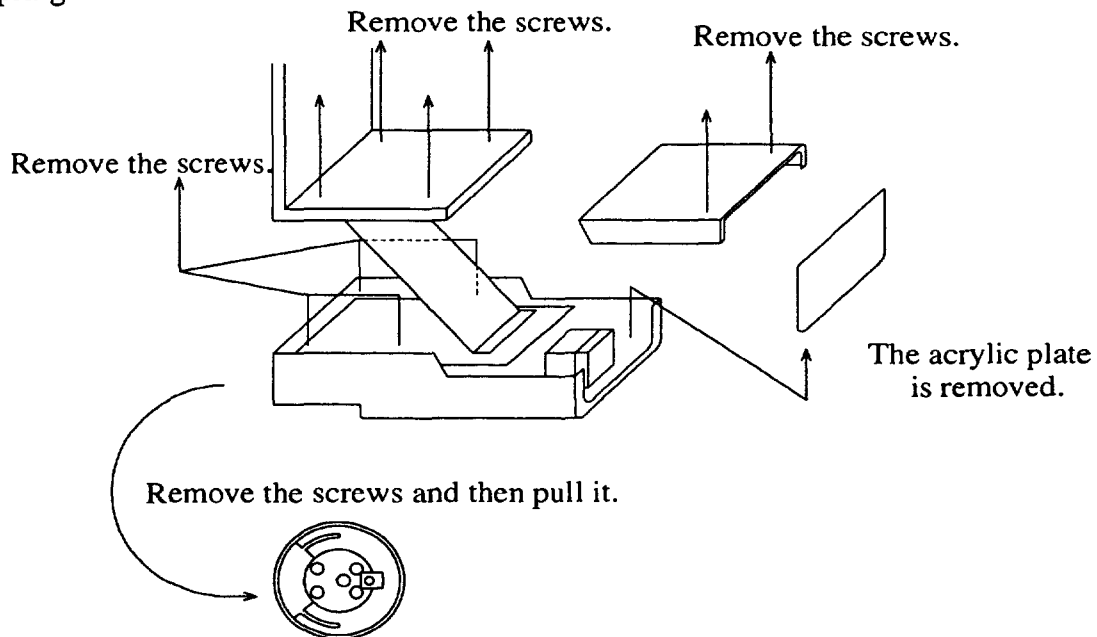
1. Remove the four screws from the back plate.
2. When the back plate and FPC are removed, you will find the rubber connector, LCD, rubber switch and slide switch.



III. Disassembly of the foot unit

The foot unit should be regarded as one set basically, but the lock pins and the acrylic plate of the focusing light may sometimes be replaced.

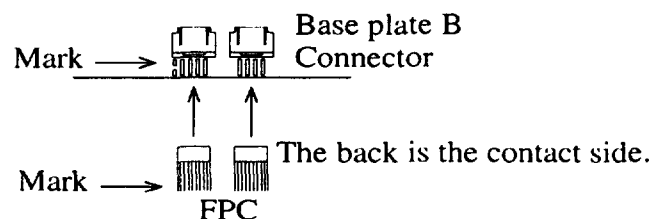
1. Remove the two screws from the top of the focusing light and remove the cover. Then the red acrylic plate is removed.
2. Remove the four screws from the top of the foot unit. In the unit, remove the four screws from the electric P.C.B.
3. Pull the lock dial downward to remove it. Be careful about the falling of the contact or spring.



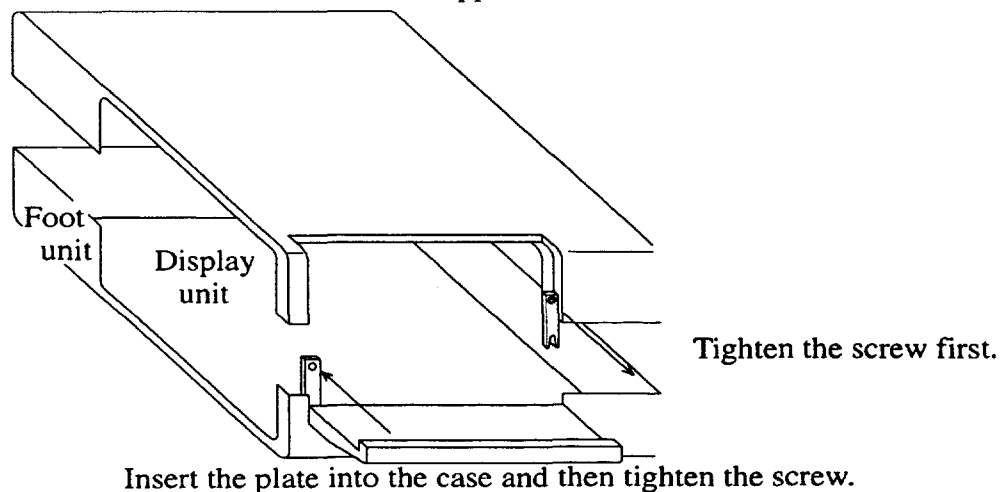
3. ASSEMBLY

The assembly is basically the opposite of the disassembly. Only the cautions are shown below.

1. Assembly of the Xe tube unit — Check if the unit can move smoothly. For example, check if the boss of the Xe tube unit is fit to the cam groove or if the set screw of the cam is tightened too much to cause the dull movement.
2. Motor wire arrangement — There is a thick white line on the B P.C.B. Arrange the wire along the line and retain it with a tape.
3. Setting of the B P.C.B — This setting is easy if connecting the wire or FPC to the connectors beforehand. Connect the FPC from the foot unit not to be kinked when turning the unit. The FPC from the foot unit is classified to the four-terminal (2 pcs.) and two-terminal (1 pc.). The four-terminal FPC should be connected to the connectors with the marks of four-terminal and four-terminal-and-half on the B P.C.B. One FPC has normal patterns and the other has two projections on the fourth pattern. The FPC with projection pattern should be connected with the four-terminal-and-half. The contact side must be against the P.C.B surface when installing the FPC.



4. Battery box assembly — Connect the wire before installing the assembly. The connectors are used to connect to the B P.C.B. Loosen the wire upward because the Xe tube unit is movable. Arrange the red eye reduction lamp wire not to hinder the movement of the light emitting unit.
5. The main condenser attaching position — There is the projection in front of the upper case to position the main condenser. Set the condenser toward the projection. Attach it after installing the battery box.
6. Installation of the red eye lens and the fresnel lens — The protruded side is its outside in both of the lenses. The red eye lens' round side is the lower case side and the fresnel lens curved side is the lower case side.
7. Battery chamber lid retaining plate — Put the back plate into the upper case first and then set it with a screw when the lower case has been inserted. Set the front plate on the lower case with a screw first and then insert it into the upper case.



II . LCD assembly

1. The notched side of the LCD frame on the display plate is the LCD's enclosed side.
2. Back plate direction – Set the back plate so that its notched part may be on the F button side of the display plate. Be careful about the direction.

III. Foot unit assembly

The focusing light position has already been adjusted. Don't remove the foot unit if possible. If the unit has been removed, set it to the camera after assembling it. Make sure that the irradiation position of the focusing light is in the AF zone.

4. ADJUSTMENT

Four trimmer resistors should be adjusted. Adjust them with an adjusting screwdriver through the hole under the blind plate of the upper case. Their names, CS, TM, A and M, are shown on the upper case. Adjust them after disassembly even if the P.C.B are not replaced because the M and monitor flash sensors are set on the P.C.B and the receiving light value changes with every disassembly. Turn on the bounce switch at adjustment. You can attach a tape or put a weight. If attaching a tape, take it off after adjustment.

1. CS adjustment — This is the γ adjustment for M and A mode. The CS has already been adjusted on the B P.C.B basically. Measure the voltage of TL117-TL118 (test land numbers) and set it to $35\text{mV} \pm 1\text{mV}$. The TL117 and TL118 are the front two of the holes beside the CS. The front one is TL117 and TL117 has higher voltage.

2. M adjustment — The M mode level is adjusted. Set the SB-27 as follows and measure GN.

- ① M setting: 1/4 light output
- ② Zoom position: 35mm in horizontality
- ③ Measuring distance: 2m
- ④ Standard GN: $14.7 < 15 < 15.3$

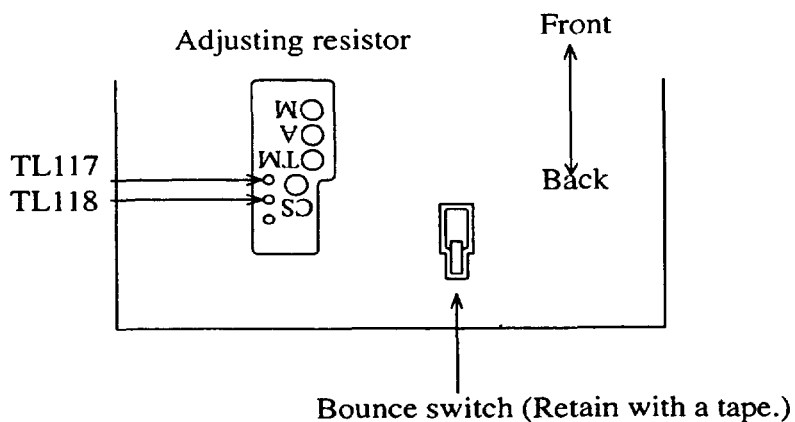
Adjust the M semifixed resistor to be within the above standard.

3. A adjustment — The external light adjusting level is adjusted. Measure GN in the following setting.

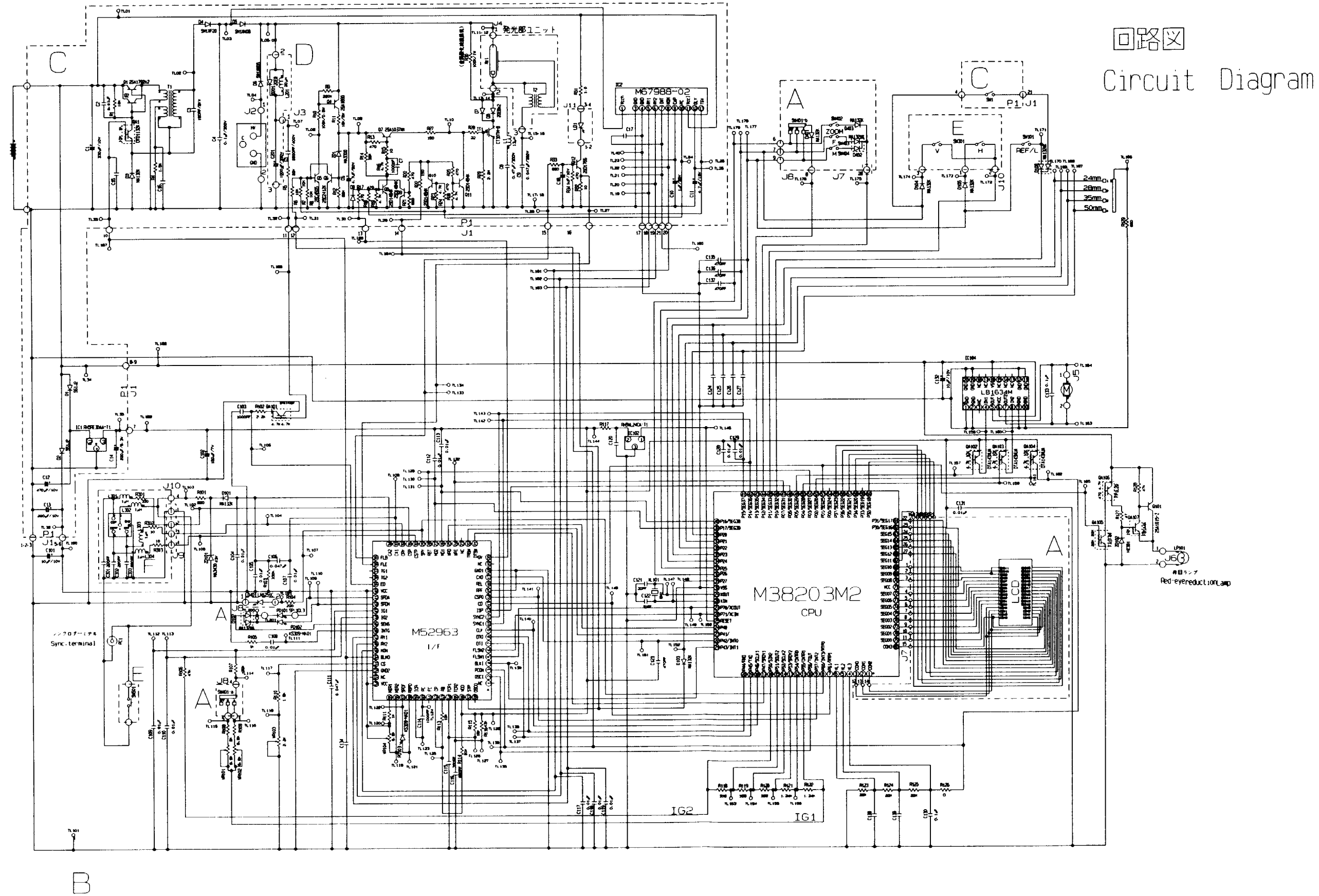
- ① A setting: F4 ISO100
- ② Zoom position: 35mm in horizontality
- ③ Measuring distance: 2m
- ④ Standard GN: $7.9 < 8 < 8.1$

4. TM adjustment — The light volume emitted from the 3DTTL monitor is adjusted. Any special tool is not used. Refer to the adjustment of SB-26 mentioned in TECHNICAL INFORMATION (SB-950009).

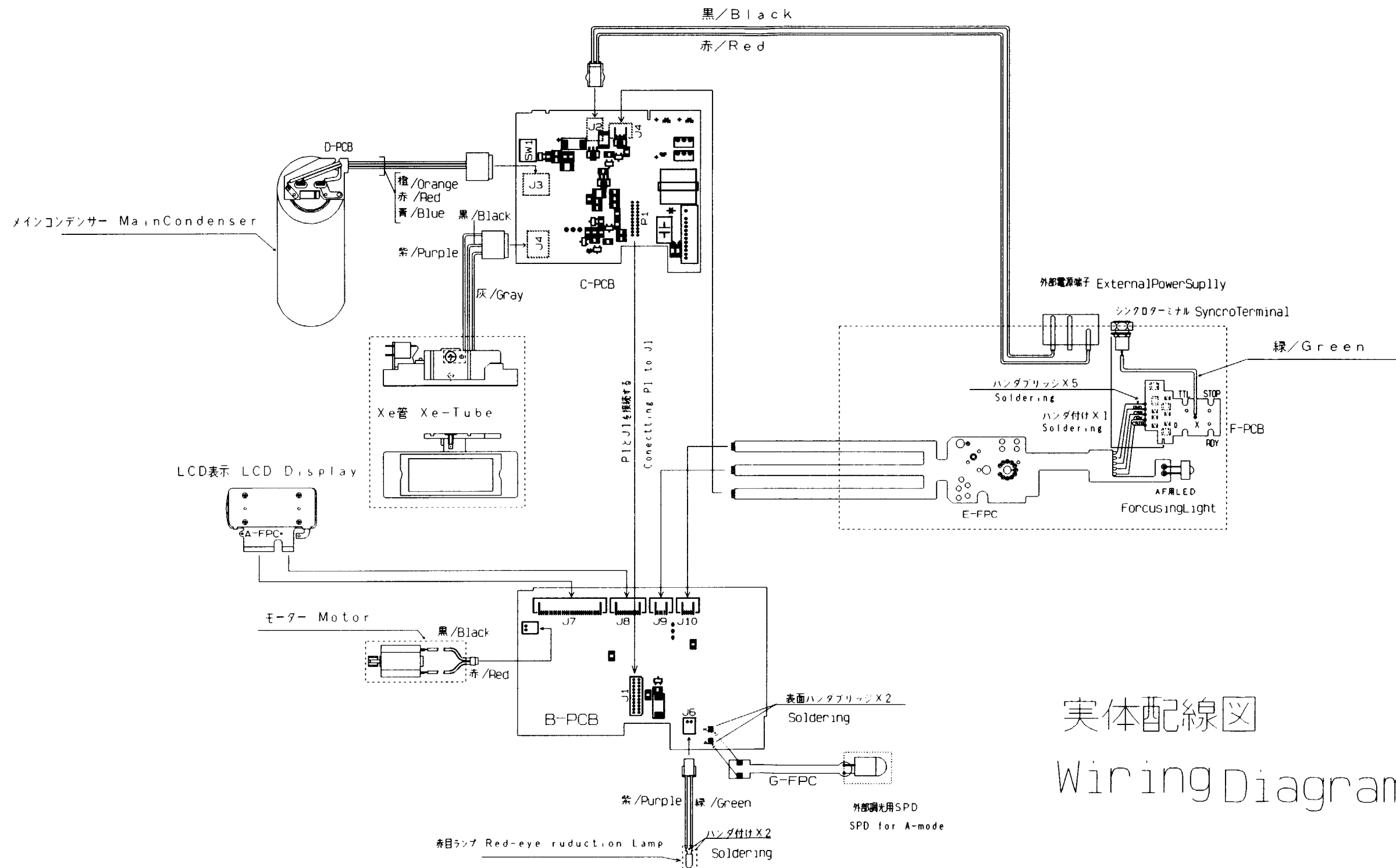
- ① Prepare the adjusted SB-25 and F90.
- ② Prepare the SPD tool to measure the flash duration of SB-25 FP flash.
- ③ Using a proper D lens (nearly standard), put the standard reflection plate (at approx. 1m distance) so that the SB-25 monitor may flash three times.
- ④ Observe the flash waveform on the oscilloscope. Record the peak value of the SB-25 monitor flash.
- ⑤ Replace the SB-25 with the SB-27 in the samp position and adjust the TM trimmer resistor so that the peak value may be the same as the SB-25. The value should be 90 ~ 110% of the SB-25.



NO	Port	Terminal Name	NO	Port	Terminal Name
1	COM2	LCD COM2	41	P15	M52963 SYNC2
2	COM1	LCD COM1	42	P14	M52963 SYNC1
3	COM0	LCD COM0	43	P13	SW Matrix output1
4	VL3	LCD Refernce Voltege3	44	P12	SW Matrix output2
5	VL2	LCD Refernce Voltage2	45	P11	SW Matrix output3
6	VL1	LCD Refernce Voltage1	46	P10	SW Matrix output4
7	P61/RTP1	M52963 CD	47	P07	M52963 WR1
8	P60/INT3	M52963 SRY Ready	48	P06	M52963 ISP
9	P57/INT2	M52963 CSP0 SP-signal	49	P05	Motor Drive Signal1
10	P56/TOUT	M52963 OCSI 31.25KHz	50	P04	Motor Drive Signal2
11	P55	Gain control signal1	51	P03	M52963 RST
12	P54	Gain control signal2	52	P02	M52963 PCON
13	P53	Gain control signal3	53	P01	M52963 REL
14	P52	Gain control signal4	54	P00	N C
15	P51	Gain contorol signal5	55	P37	LCD SEG23
16	P50	Gain control signal6	56	P36	LCD SEG22
17	P47	M52963 DTSW	57	P35	LCD SEG21
18	P46	M52963 CLK	58	P34	LCD SEG20
19	P45/TXD	M52963 DT1	59	P33	LCD SEG19
20	P44/RXD	M52963 DTO	60	P32	LCD SEG18
21	P43/INT1	M52963 BLK1	61	P31	LCD SEG17
22	P42/INT0	M52963 CX0	62	P30	LCD SEG16
23	P41/ ϕ	M52963 TRSW	63	SEG15	LCD SEG15
24	P40	M52963 WRO	64	SEG14	LCD SEG14
25	RESET	Reset in	65	SEG13	LCD SEG13
26	P71	M52963 FLSW2	66	SEG12	LCD SEG12
27	P70	M52963 FLSW1	67	SEG11	LCD SEG11
28	XIN	Osclator	68	SEG10	LCD SEG10
29	XOUT	Osclator	69	SEG9	LCD SEG9
30	Vss	GND	70	SEG8	LCD SEG8
31	P27	M52963 STP	71	Vcc	Vdd
32	P26	SW Matrix input(OFF)	72	SEG7	LCD SEG7
33	P25	SW Matrix input(MANU)	73	SEG6	LCD SEG6
34	P24	SW Matrix input(TTL)	74	SEG5	LCD SEG5
35	P23	Zoom position A (24mm)	75	SEG4	LCD SEG4
36	P22	Zoom position B (28mm)	76	SEG3	LCD SEG3
37	P21	Zoom position C (35mm)	77	SEG2	LCD SEG2
38	P20	Zoom position D (50mm)	78	SEG1	LCD SEG1
39	P17	M52963 MD2	79	SEG0	LCD SEG0
40	P16	M52963 MD1	80	COM3	LCD COM3



回路図
Circuit Diagram



実体配線図
Wiring Diagram

作成承認印

配布許可印



Speedlight

SB-27

PARTS LIST

修理部品表

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展開図 Exploded Drawings

SB-27 FSA02701-R.3385.A

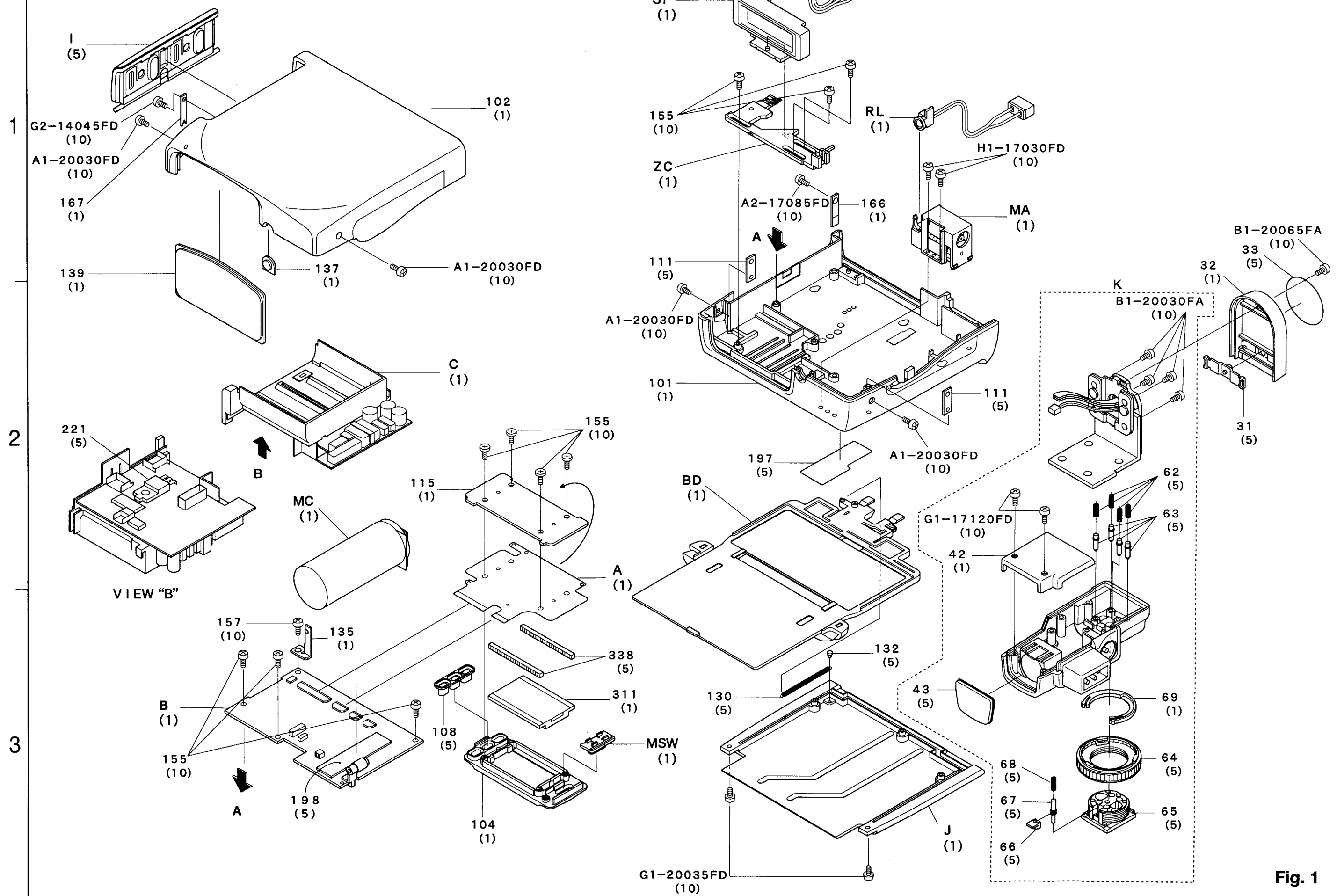


Fig. 1

部品表 Parts List

FSA02701-R. 3385. A

部品番号 Part No.	補助番号 Ckt No.	名称 Name	1台分 個数 Pcs. Per Unit	部組品番号 Assembly	参照 図番 Fig. No.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
31 (FSA02701-31)		発光釦 Flash button	1		D 2	○		5
32 (FSA02701-32)		金具カバー Mounting foot cover	1		D 2	○		1
33 (FSA02701-33)		銘板 Name plate	1		D 2	○		5
42 (FSA02701-42)		脚部蓋 Foot cap	1	K	D 2	○△		1
43 (FSA02701-43)		AF窓 AF Window	1	K	C 3	○△		5
62 (FSA02701-62)		接点バネ Contact spring	4	K	D 2	○△		5
63 (FSA02701-63)		接点ピン Contact pin	4	K	D 2	○△		5
64 (FSA02701-64)		ロックナット Rock nut	1	K	D 3	○△		5
65 (FSA02701-65)		フット Mounting foot	1	K	D 3	○△		5
66 (FSA02701-66)		ロックモールド Rock mold	1	K	D 3	○△		5
67 (FSA02701-67)		ロックピン Rock pin	1	K	D 3	○△		5
68 (FSA02701-68)		ロックバネ Rock spring	1	K	D 3	○△		5
69 (FSA02701-69)		円周カム Circumference cam	1	K	D 3	○△		1
101 (FSA02701-101)		上ケース Case (upper)	1		C 2	○		1
102 (FSA02701-102)		下ケース Case (lower)	1		A 1	○		1

部品表 Parts List

FSA02701-R. 3385. A

部品番号 Part No.	補助番号 Ckt No.	名 称 Name	1台分 個 数 Pcs. Per Unit	部組品番号 Assembly	参照 図番 Fig. No.	販売区分 Term of Delivery	備 考 Remarks	要求単位 Q'ty per order
104 (FSA02701-104)		表示パネル Pilot panel	1		B 3	○		1
108 (FSA02701-108)		3 連釘 Rubber switch	1		B 3	○		5
111 (FSA02701-111)		連結板(I) Coupling plate (I)	2		C 2	○		5
115 (FSA02701-115)		裏打ち板 Suppolting plate	1		B 2	○		1
130 (FSA02701-130)		引張バネ Spring	1		C 3	○		5
132 (FSA02701-132)		バネ掛け軸 Spring hook shaft	1		C 3	○		5
135 (FSA02701-135)		連結板(L) Coupling plate (L)	1		A 3	○		1
137 (FSA02701-137)		赤目レンズ Lens, prevent red eye	1		A 1	○		1
139 (FSA02701-139)		フレネルレンズ Fresnel lens	1		A 1	○		1
155 (FSA02701-155)		タップタイトネジ 頭Φ4 Tap/Tight screw M1. 7X3. 5	15		A3 B2 C1	○		10
157 (FSA02701-157)		タップタイトネジ 頭Φ4 Tap/Tight screw M1. 7X5. 5	1		A 3	○		10
166 (FSA02701-166)		電池蓋押さえ板A Battery cap retaining plate A	1		C 1	○		1
167 (FSA02701-167)		電池蓋押さえ板B Battery cap retaining plate B	1		A 1	○		1
197 (FSA02701-197)		目隠しシール Protecting cover	1		C 2	○		5
198 (FSA02701-198)		テープ Tape	1	B	A 3	○△		5

部品表 Parts List

FSA02701-R. 3385. A

部品番号 Part No.	補助番号 Ckt No.	名 称 Name	1台分 個 数 Pcs. Per Unit	部組品番号 Assembly	参照 図番 Fig. No.	販売区分 Term of Delivery	備 考 Remarks	要求単位 Q'ty per order
221 (FSA02701-221)		I G B T IGBT CT30TM-8	1	C	A 2	○△		5
311 (FSA02701-311)		表示LCD Pilot LCD LCD9549RS	1		B 3	○		1
338 (FSA02701-338)		ゼブラ Rubber connector	2		B 3	○		5

部品表 Parts List

FSA02701-R. 3385. A

部品番号 Part No.	補助番号 Ckt No.	名称 Name	1台分 個数 Pcs. Per Unit	部組品番号 Assembly	参照 図番 Fig. No.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
* A1-20030FD		Screw	4		A1 C2	○		10
A2-17085FD		Screw	1		C 1	○		10
* B1-20030FA		Screw	4		D 2	○		10
B1-20065FA		Screw	1		D 2	○		10
G1-17120FD		Screw	2	K	D 2	○△		10
* G1-20035FD		Screw	2		C 3	○		10
G2-14045FD		Screw	1		A 1	○		10
* H1-17030FD		Screw	2		C 1	○		10

部組品表 Assembly List

FSA02701-R. 3385. A

部組番号 Part No.	名称 Name	1台分 個数 Pcs. Per Unit	構成部品番号 Constituent Parts	参照 図番 Fig. No.	備考 Remarks	要求単位 Qty per order
A (FSA02701-A)	FPC部組 FPC Unit	1		B 3		1
B (FSA02701-B)	B基板部組 Printed circuit B unit	1		A 3		1
C (FSA02701-C)	電池ケース部組 Printed circuit C unit	1	battery chamber unit	A 2		1
I (FSA02701-I)	電池蓋部組 Battery chamber lid unit	1		A 1		5
J (FSA02701-J)	反射板カバー部組 Reflection plate cover unit	1		C 3		1
K (FSA02701-K)	脚部組 Foot unit	1		D 3		1
BD (FSA02701-BD)	反射板部組 Reflection plate unit	1		C 2		1
MA (FSA02701-MA)	モーターケース部組 Motor cover unit	1		C 1		1
MC (FSA02701-MC)	メインコンデンサー Main condenser	1		A 2		1
RL (FSA02701-RL)	赤目ランプ部組 Lamp, prevent red eye unit	1		C 1		1
SF (FSA02701-SF)	発光部部組 Reflector unit	1		C 1		1
ZC (FSA02701-ZC)	板カム部組 Plate cam unit	1		C 1		1
MSW (FSA02701-MSW)	メインSW部組 Main switch unit	1		B 3		1