

Nikon

SPEEDLIGHT UNIT SB-2, SB-3

**20FA27, 20FA28
(Included 20FA27A)**

REPAIR MANUAL



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Note:- Marks in the Parts List are;

(1) In the "Name and Shape" column

⊕ Cross recessed head screw

Q Flat head screw

R Pan head (or flat fillister head) screw

Example:

⊕ 2R-4(3)
 ├── Shape of screw head
 ├── 3rd class
 ├── Length in mm
 └── Nominal screw size

(2) In the "Term of Sale" column

○ Can be supplied individually

△ Not supplied individually but only as subassembly

○△ Supplied either as part or subassembly

⊠ Delivered as a product from the sales department
(i.e., not supplied as repair part)

× Not considered as repair part

I. SPEEDLIGHT UNIT SB-2 AND SB-3

1. Causes of Failures

(1) Xenon discharge tube #62 does not take fire, and neon pilot lamp #114 also does not light. The following causes are conceivable:

a. When AA type dry cells are used.

- 1) Poor dry cell
 - 2) Incorrect installation of cells, inverted polarity
 - 3) Poor main transistor #105
 - 4) Poor oscillator transformer #116
 - 5) Poor diodes #101 (D_1 and D_2)
 - 6) Poor main capacitor #94
 - 7) Poor switch #63
- Etc.

b. When the AC unit is used

- 1) Poor diode #102 (D_3)
 - 2) Poor main capacitor #94
 - 3) Poor contact of AC socket on the main body with AC unit plug
- Etc.

(2) Xenon discharge tube #62 does not take fire, but neon pilot lamp #114 lights. The following causes are conceivable:

- 1) Poor xenon discharge tube #62
 - 2) Poor trigger coil #111
 - 3) Poor SCR #104 (SCR_2)
 - 4) Poor SCR #103 (SCR_1)
 - 5) Poor SCR #106 (SCR_4)
 - 6) Poor trigger capacitor #97a (C_8)
 - 7) Poor adjustment* of neon pilot lamp #114 (of variable resistor #91a)
 - 8) Poor capacitor #95
 - 9) Poor Zener diode #108
 - 10) Disconnection or short of discharge circuit or trigger circuit
- Etc.

* Lighting voltage ($250V \pm 10V$) of neon pilot lamp #114 can be adjusted by means of variable resistor #91a.

(3) Xenon discharge tube #62 takes fire, but neon pilot lamp #114 does not light. The following causes are conceivable:

- 1) Poor adjustment of neon pilot lamp #114 (of variable resistor #91a)

- 2) Disconnection or short of neon pilot lamp circuit
- 3) Poor neon pilot lamp #114
- Etc.

For the adjustment of lighting voltage of the neon pilot lamp, follow the procedure (2)-* .

- (4) In case the speedlight has not been used for a long period, the neon pilot lamp may take a longer time than the standard to glow. Make measurement of the time, after firing the speedlight several times, using the AC unit or dry cells (i.e. aging of the capacitor).

The following causes are conceivable:

- 1) Poor oscillator transformer #116
- 2) Poor main transistor #105
- 3) Poor main capacitor #94
- 4) Poor adjustment of neon pilot lamp #114
- 5) Poor diodes #101 (D_1 and D_2) and #102 (D_3)
- Etc.

For the adjustment of lighting voltage of the neon pilot lamp, follow the procedure (2)-* .

- (5) The ready-light or eyepiece pilot lamp (SF-1) of the camera does not light correctly. The following causes are conceivable:

- 1) Poor adjustment of variable resistor #91b
- 2) Disconnection or short of neon pilot lamp circuit
- 3) Poor contact on the camera side with the speedlight (only in 20FA27)
- Etc.

Adjusting method of output voltage for the ready-light:

Keeping constant the voltage of the speedlight at $V_m = 245V$,

connect [A]-circuit

with the sync-socket.

Then, adjust variable

resistor #91b so that

V_n is read $62.5 \begin{matrix} +1.5 \\ -1.0 \end{matrix} V$.

Use a digital voltmeter

with an input impedance

of $10M\Omega$.

- (6) The function of the auto-light-control is not correct.

The following causes are conceivable:

- a. If auto-control does not work at all.

- 1) Poor SCR #104 (SCR_2)

- 2) Poor bipolar capacitor #99
- 3) Poor charging resistors #90a and #90b for bipolar capacitor
- 4) Poor diode #102 (D₆) for discharge prevention
- 5) Poor quenching tube #113
- 6) Poor SCR #103 (SCR₃)
- 7) Poor trigger coil #112
- 8) Poor IC #100
- 9) Poor photo-transistor #107
- 10) Poor Zener diode #108
- 11) Poor adjustment of variable resistor #91c
- 12) Disconnection or short of light acceptance and/or discharging circuits
- 13) Dust or the like in the light acceptance window blocks the light passage.
Etc.

b. Shifting of light control value

Set the selector in a position other than "M", measure the light control value. If this does not correspond to the standard value, the following causes are conceivable:

- 1) Mal-adjustment of variable resistor #91c
 - 2) Mal-adjustment (or dropping off) of ND filter #60
 - 3) Dust or the like in the light acceptance window blocks the light passage
 - 4) Poor Zener diode #108
 - 5) Poor photo-transistor #107
 - 6) Poor IC #100
- Etc.

c. When the selector is placed in "M" position, light control takes place. The following causes are conceivable:

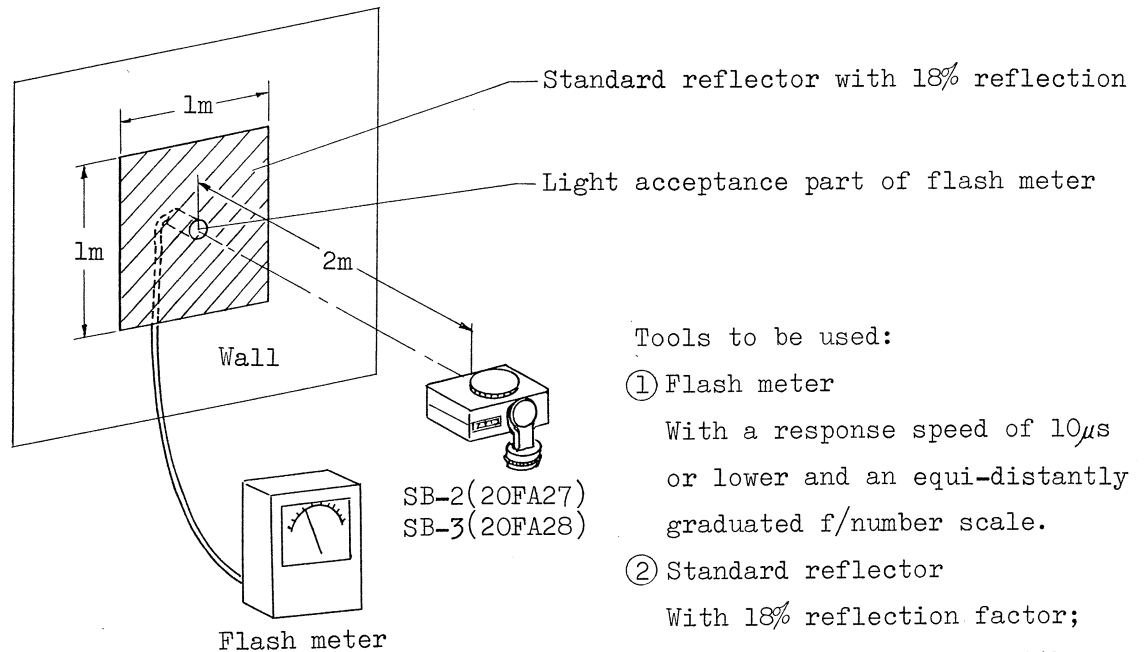
- 1) Insufficient shut out of extraneous light from the light acceptance window
 - 2) Incorrect wiring of lead wires #79—#81
 - 3) Poor photo-transistor #107
 - 4) Poor IC #100
 - 5) Poor Zener diode #108
 - 6) Poor SCR #103 (SCR₃)
- Etc.

Note: The following occurrence is applied only to SPEEDLIGHT SB-3(20FA28).
Xenon discharge tube #62 does not fire, when a sync-cord is used to a camera without hot-shoe.
The following cause is conceivable:

Poor change-over of S_3 (#34 and #25)...(So far as the shoe is made of metal).

If any sync-cord is not inserted, the hot-shoe contact on the speedlight side will not be changed over. As a result, it may sometimes occur that light emits, when the main capacitor is charged, that is, the power switch remains turned on in the case of using dry cells, or the AC unit remains connected, when the speedlight is inserted into a camera provided with a metal shoe and without hot-shoe.

2. Adjusting Method of Light Control Value



Tools to be used:

- ① Flash meter
With a response speed of $10\mu s$ or lower and an equi-distantly graduated f/number scale.
- ② Standard reflector
With 18% reflection factor; size $1m \times 1m$; provided with a hole at the center through

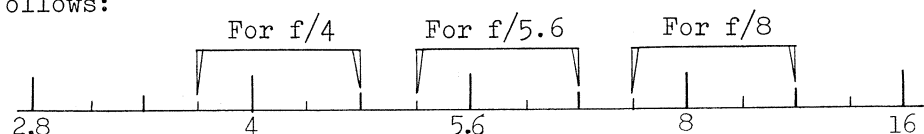
which the light acceptance part of flash meter can be protruded.

Adjusting procedures:

Adjustment (measurement) is to be made with the speedlight placed about 2m apart from the reflecting surface.

- ① If each light control value is displaced differently, replace ND filter #60, so that it is displaced equi-distantly about one step and, then, make adjustment of ②.
- ② If each light control value is displaced equi-distantly (about one step), turn the semi-fixed resistor #91c until the specified control value is obtained.

The standard values of light control at ASA 100 are to be as follows:



Note: For adjusting the light control value, use at all times a standard reflector with 18% reflection. If a reflector with over 18% reflection is used, pictures actually taken will be underexposed. If a reflector with under 18% reflection is used, pictures actually taken will be overexposed.

3. Disassembly

- (1) Remove rubber plug #68 from the bottom of the lower case #1.
Unscrew three tapping screws #69 (not the screw #72).
- (2) Then, unscrew the screw #72 from the side of the upper case #2.
Remove the case #2 to check the interior.

Caution: Since a high voltage current may remain in the main capacitor #94 or bipolar capacitor #99, it is recommended first to connect the plus(+) and minus(-) terminal of xenon discharge tube #62 with a resistor of several kΩ (2W) for discharging, and, then, to connect both leads of bipolar capacitor #99 with the same resistor as above for discharging.

4. Binding Agents

For SB-2 (20FA27)

To be use for	Item No. of binding agent
#9, #10	#616
#24	"
#54	#501
#55	"
#56	"
#57	"
#65	"
#31	#350
#44	"
#107	#634
#118	#201
#119	"

For SB-3 (20FA28)

To be use for	Item No. of binding agent
#9, #10	#616
#54	#501
#55	"
#56	"
#57	"
#65	"
#107	#634
#28	#350
#29	"
#118	#201
#119	"

5. Illustrations

Outer Views

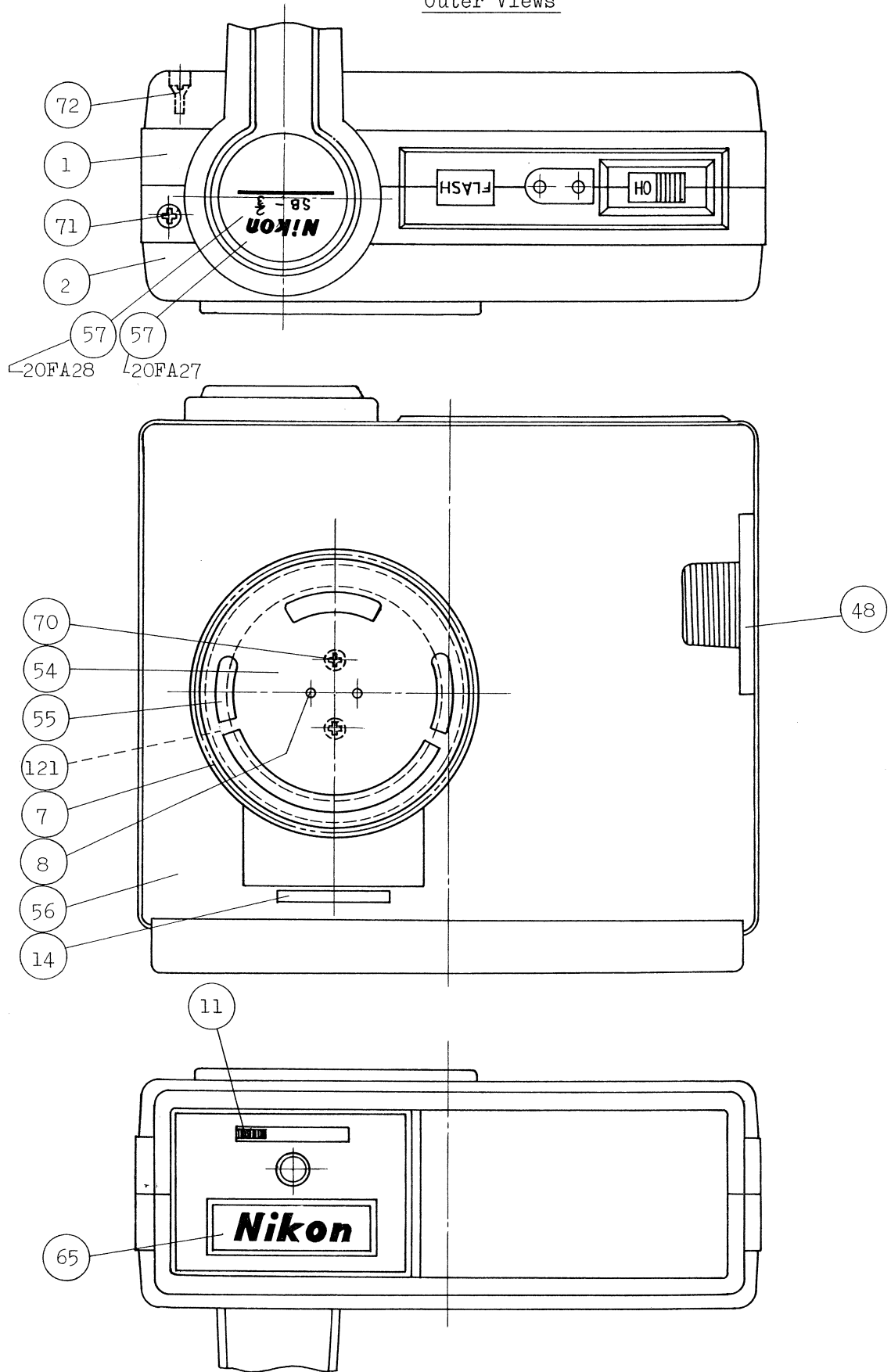


Fig. 1

Sectional Views

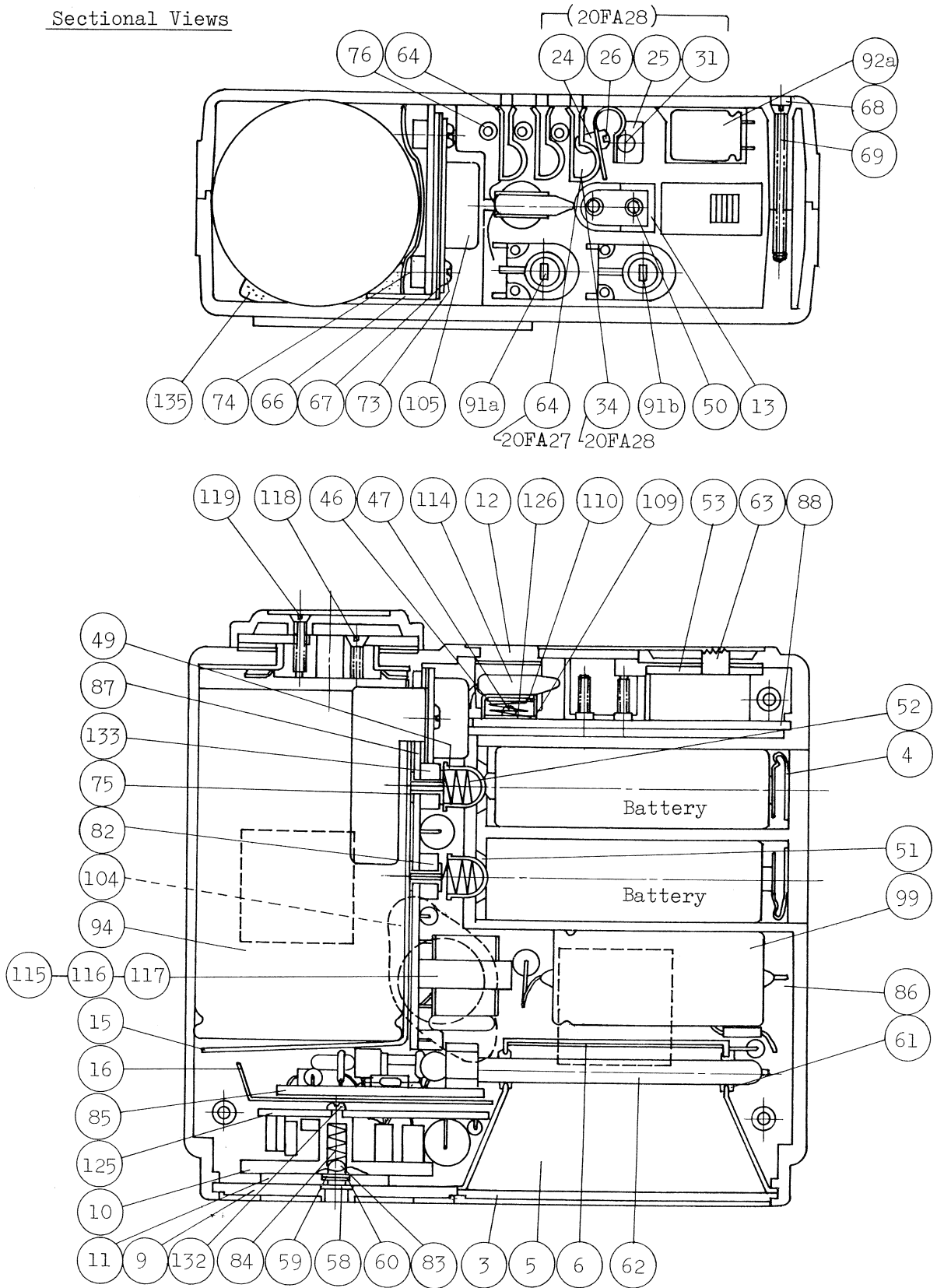
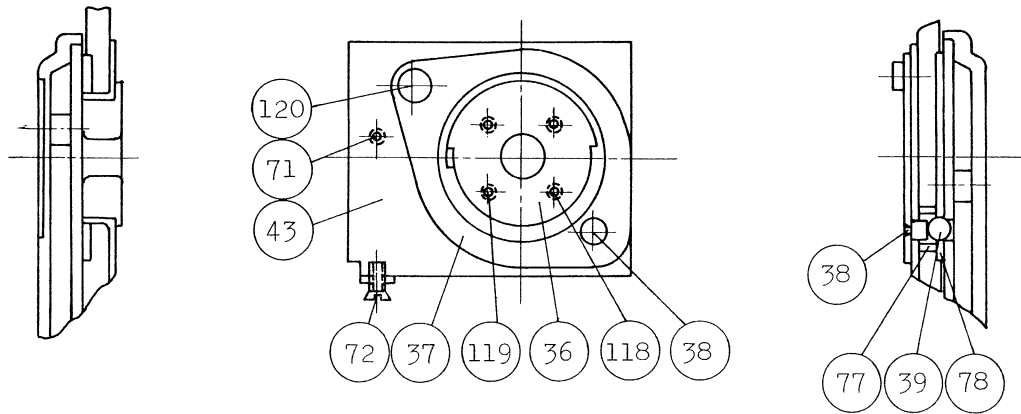
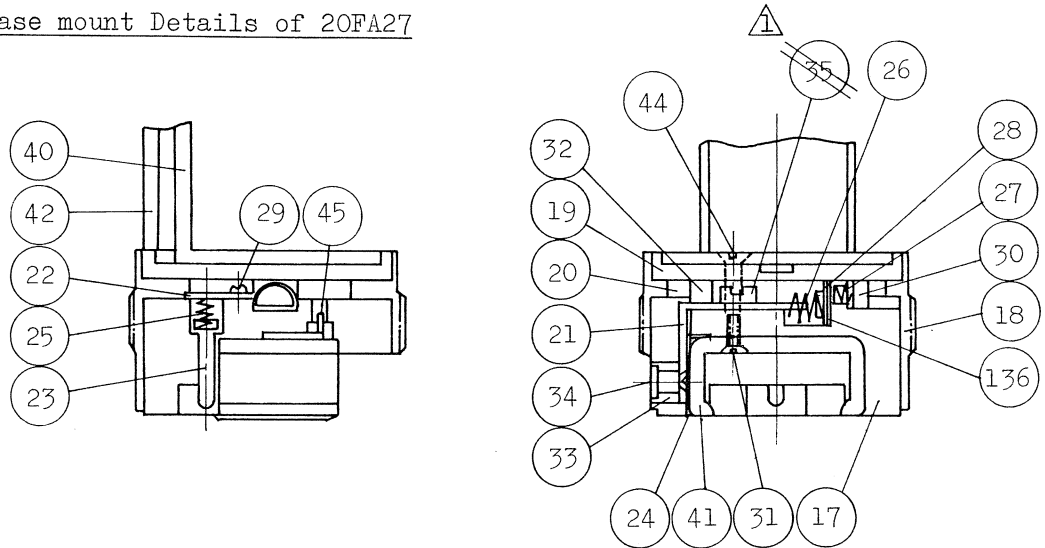


Fig. 2

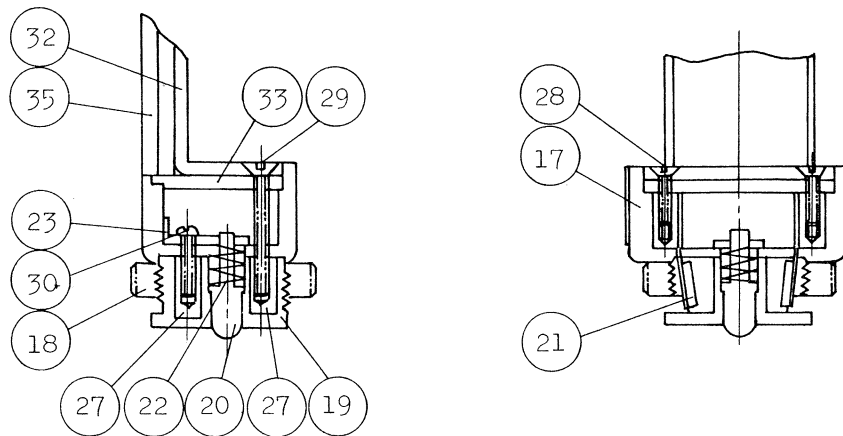
Tilting Axle Details



Base mount Details of 20FA27



Base mount Details of 20FA28



Circuit Diagram of 20FA27

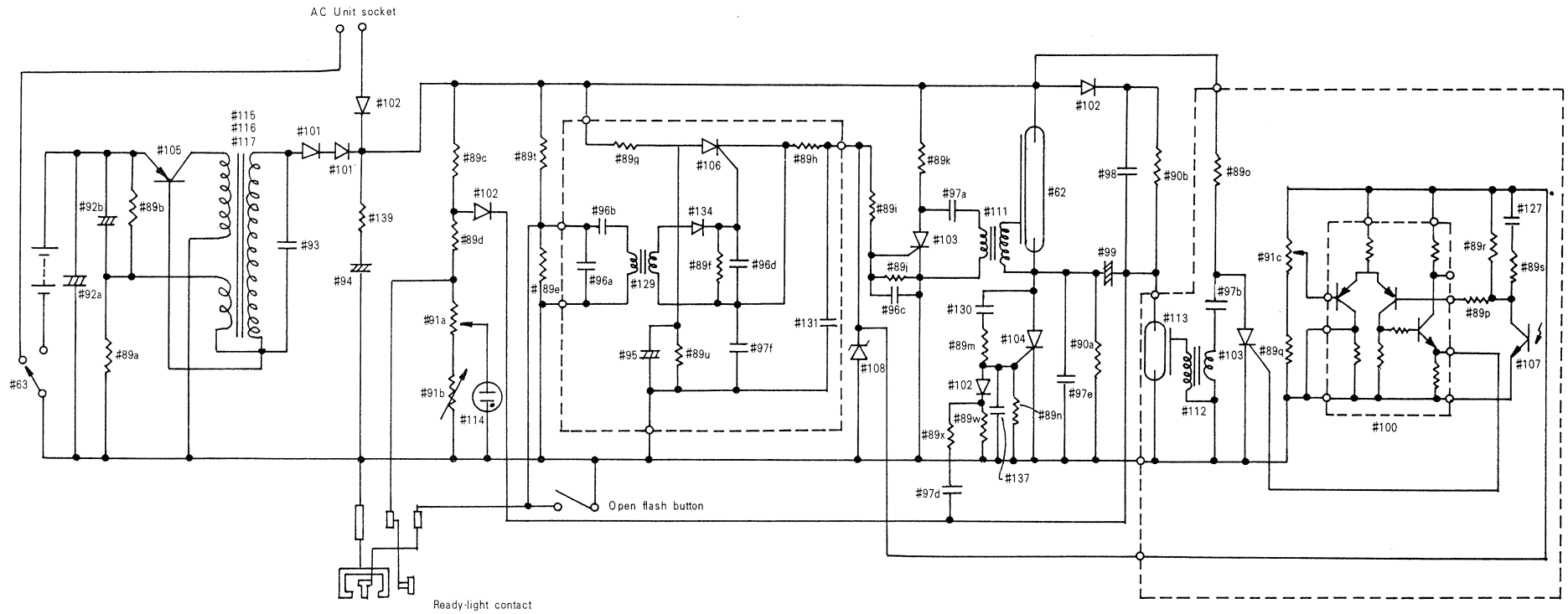


Fig. 4

Fig. 4

Circuit Diagram of 20FA28

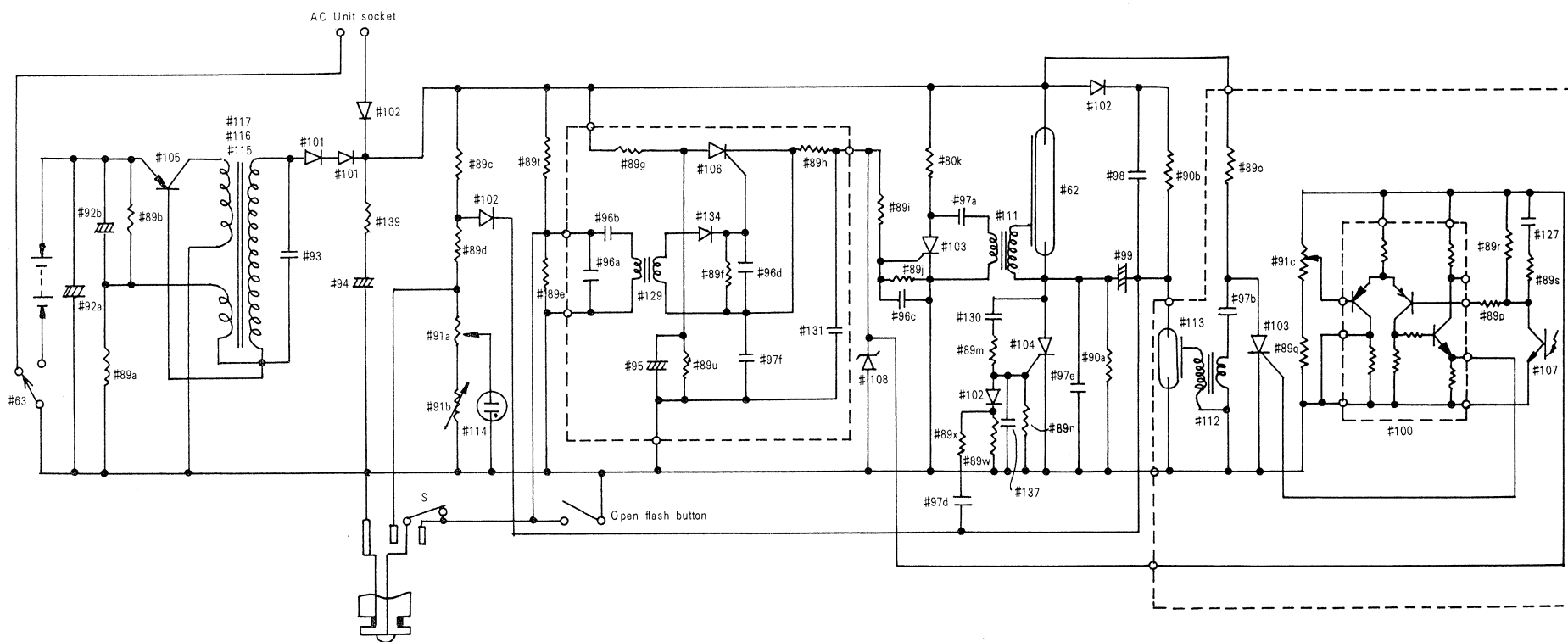


Fig. 5

Fig. 5

Printed Circuit (#87)

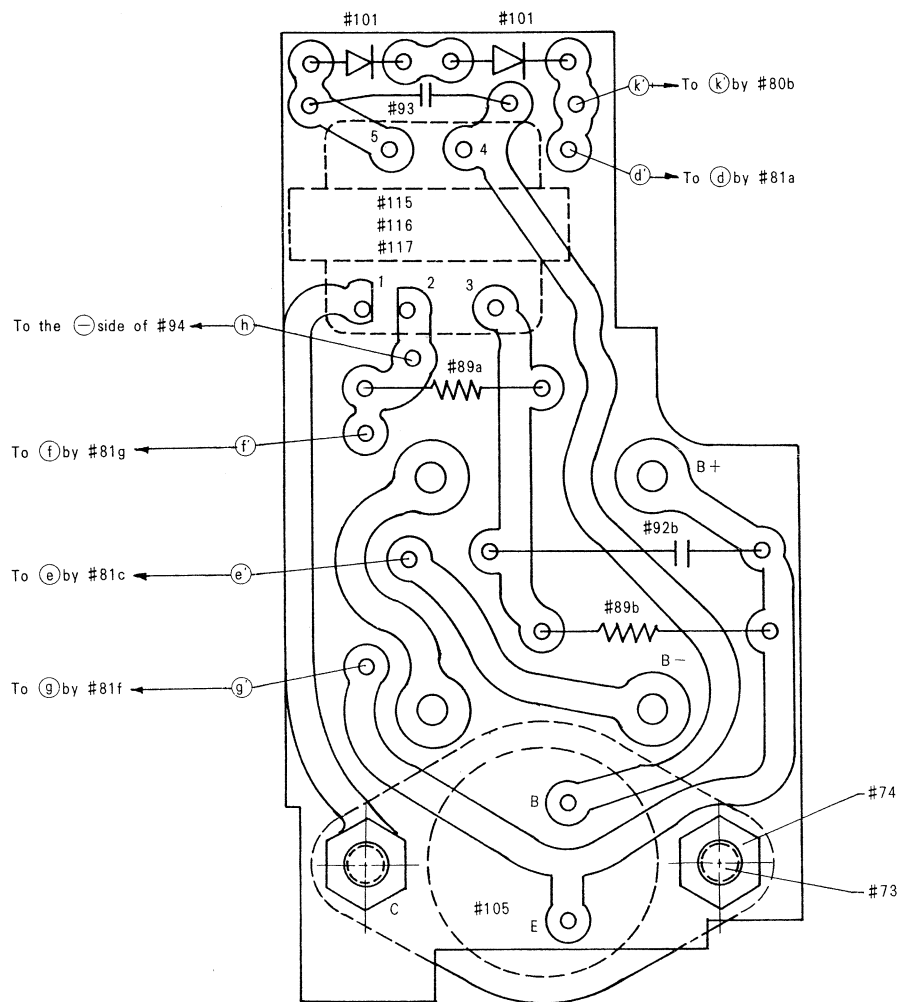


Fig. 6

Printed Circuit (#88)

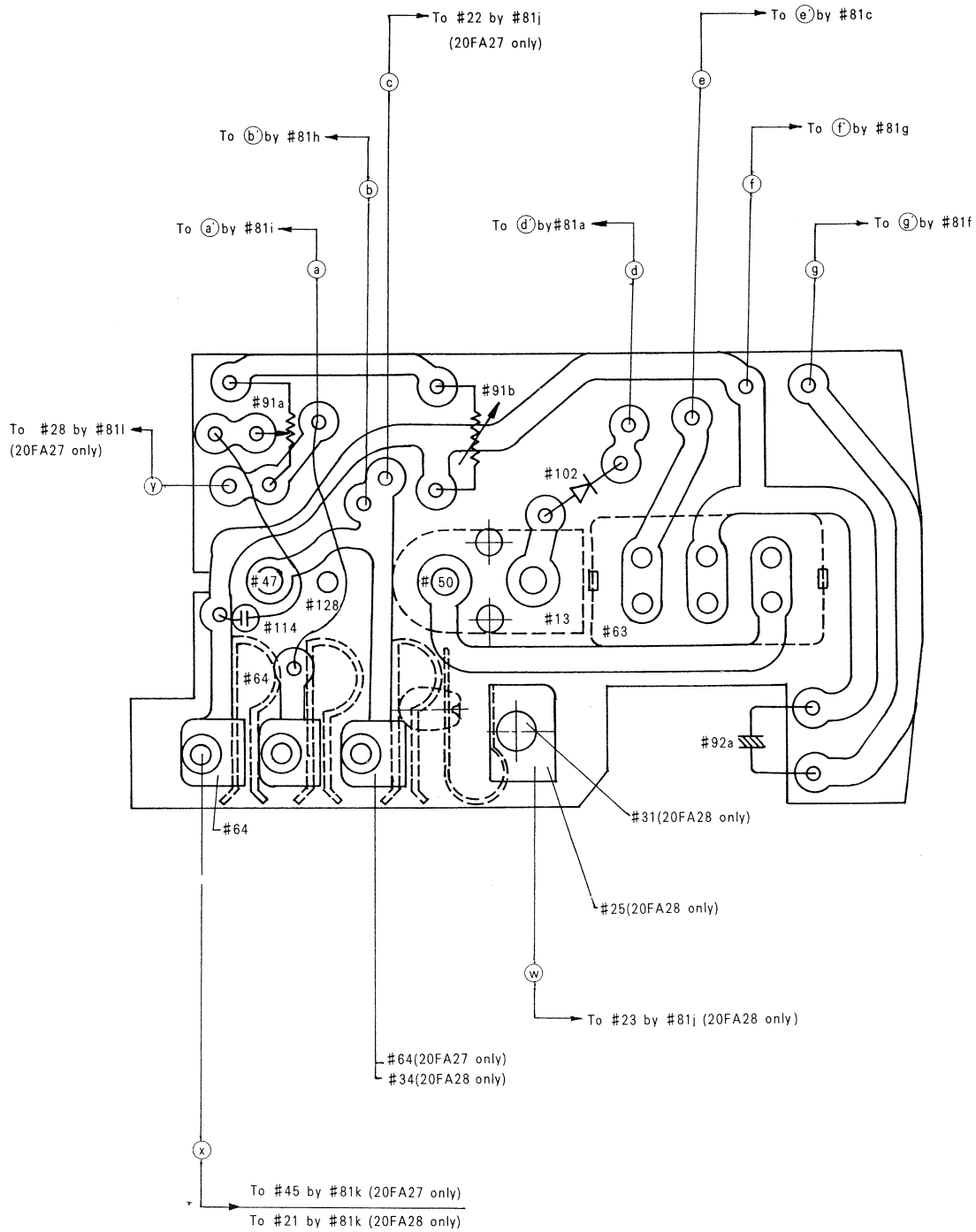
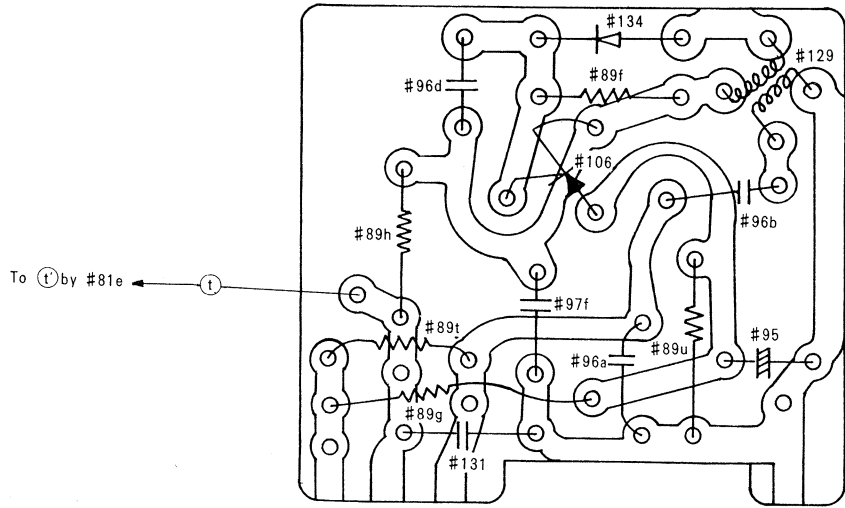


Fig. 7

Printed Circuit (#85)



Printed Circuit (#125)

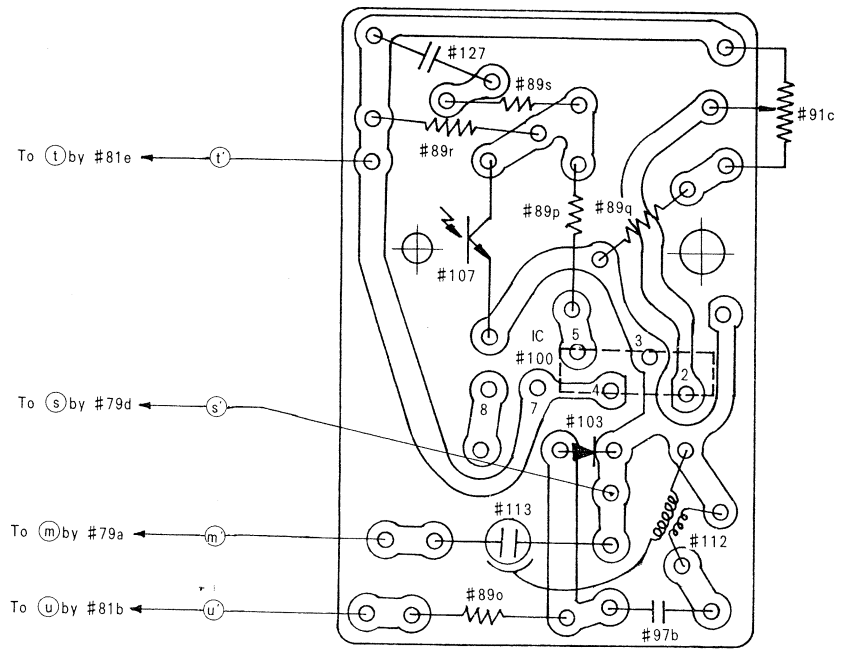


Fig. 8

Printed Circuit (#86)

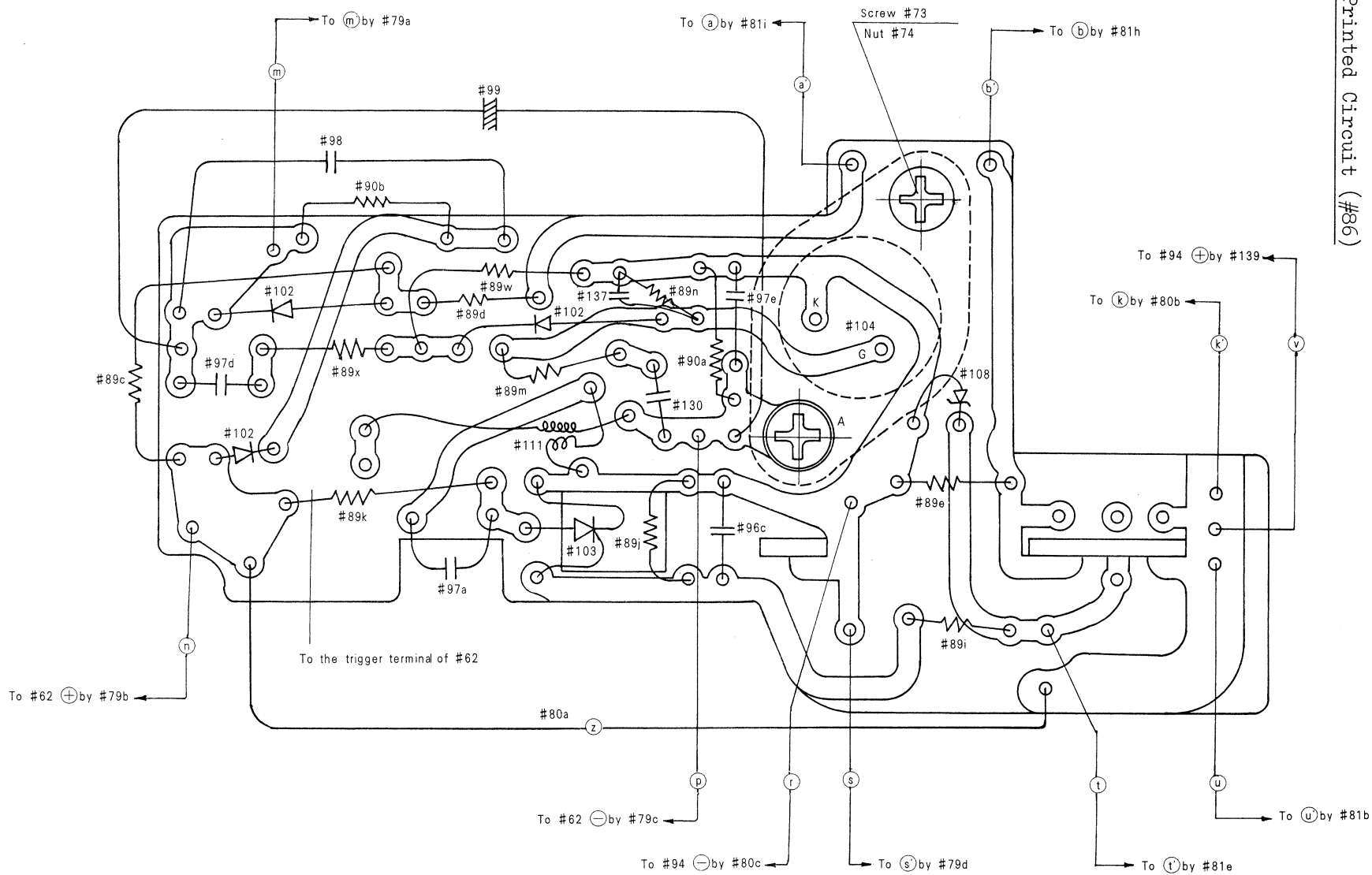
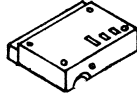
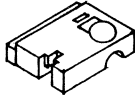



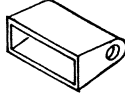








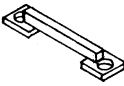
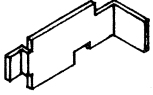







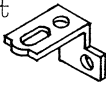
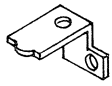

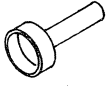



















Fig. 9

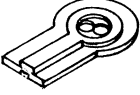





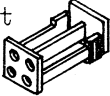








6. Parts List






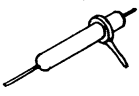
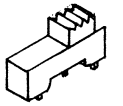
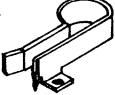

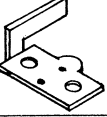
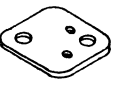




20FA27,28 - R.1070.A
















Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27- 20FA28- 1	Lower case 	1	B1	1	△	
" 2	Upper case 	1	B2	1	△	
" 3	Diffuser 	1		2	○	
" 4	Battery contact spring 	2	E	2	△	
" 4-1	" 	2	E	2	△	Revised -3 × $\frac{1401}{3000}$
" 5	Reflector 	1	A	2	△	
" 6	Plate reflector 	1	A	2	△	
" 7	Calculator dial A 	1	B2	1	○△	
" 8	Calculator dial B 	1	B2	1	○△	
" 9	Front panel 	1	D	2	△	
" 10	Photo-transistor holder 	1	D	2	△	
" 11	Light-control selector 	1	D	1, 2	△	
" 12	Open flash button 	1		2	○	
" 13	AC power socket 	1	C4	2, 7	△	
" 14	Light-control selector window 	1	B2	1	○△	















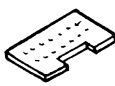
Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27- 20FA28- 15	Insulator A 	1		2	○	
" 16	Insulator B 	1		2	○	
20FA27- 17	Mount base 	1	G	3	○△	
" 17-1	" 	1	G	3	○△	Revised -3 x $\frac{1401}{3000}$
" 18	Shoe guard ring 	1	G	3	○△	
" 19	Guard ring holder 	1	G	3	○△	
" 19-1	"  boss	1	G	3	○△	Revised -3 x $\frac{1401}{3000}$
" 20	Mount base cam 	1	G	3	○△	
" 21	Ready-light contact slider 	1	G, G1	3	△	Revised -3 x $\frac{1401}{3000}$
" 21-1	" 	1	G, G1	3	△	
" 22	Contact pin guide 	1	G	3	○△	Use the wire #81j
" 23	Sync contact pin 	1	G	3	○△	
" 24	Mount base insulator 	1	G	3	○△	
" 25	Contact pin spring 	1	G	3	○△	
" 26	Ready-light spring 	1	G	3	○△	


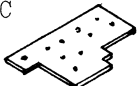
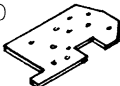



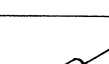
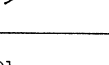
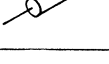




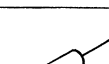
Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27- 27	Roller spring 	1	G	3	○△	
" 28	Spring retainer 	1	G	3	○△	Use the wire #811
" 29	Tapping screw ⊕ 2R-4(3) 	1	G	3	○△	
" 30	Roller 	1	G	3	○△	
" 31	Screw ⊕ 2Q-5 	4	G	3	○△	
" 32	Contact slider pin 	1	G, G1	3	△	
" 33	Contact point guard 	1	G, G1	3	△	
" 34	Ready-light contact point 	1	G, G1	3, 4	△	
" 35	(Discontinuation)					-3 × $\frac{1401}{3000}$
20FA27- 20FA28- 36	Tilting axle 	1		3	○	
" 37	Click spring 	1	F	3	△	
" 38	Click pin 	1	F	3	△	
" 39	Click ball 	1		3	○	
20FA27- 40	Leg plate 	1	G	3	○△	
" 41	Shoe 	1	G	3	○△	


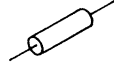
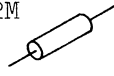
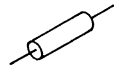
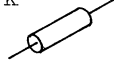
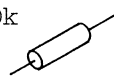
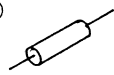
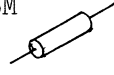






Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27-42	Leg cover 	1		3	○	
20FA27-43 20FA28-	Leg base 	1	F	3	△	
20FA27-44	Screw ⊕ 2Q-8(3) 	4	G	3	○△	
" 45	Leg lug plate 	1	G	3	○△	Use the wire #81k
20FA27-46 20FA28-	Open-flash spring 	1	C4	2	△	
" 47	Open-flash contact A 	1	C4	2, 7	△	
" 48	Battery compartment 	1	E	1	△	
" 49	Battery contact 	4		2	○	
" 50	AC socket pin 	2	C4	2, 7	△	
" 51	Battery contact retainer 	1		2	○	
" 52	Battery contact spring 	4	C3	2	○△	
" 53	Switch ON-OFF plate 	1		2	○	
" 54	Calculator plate A 	1	B2	1	○△	
" 55	Calculator plate B 	1	B2	1	○△	
" 56	Calculator index plate 	1	B2	1	○△	















Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27-57	Name plate 	1		1	○	
20FA27-20FA28-58	ND filter cover A 	1	D	2	△	
" 59	ND filter cover B 	2	D	2	△	
" 60	ND filter (A,B,C) 	3	D	2	△	
" 61	Discharge tube bush 	2		2	○	
" 62	Discharge tube 	1		2, 4 5	○	
" 63	Sliding switch 	1	C4	2, 4 5, 7	○△	
" 64	Sync socket spring 	3	C4	2, 7	△	
" 65	Nikon name plate 	1		1	○	
" 66	Radiator 	1	C3	2	○△	
" 67	Transistor insulator 	1	C3	2	○△	
" 68	Rubber plug 	4		2	○	
" 69	Tapping screw ⊕ 2Q-25(3) 	3		2	○	
" 70	Tapping screw ⊕ 2Q-6(3) 	2	B2	1	○△	
" 71	Screw ⊕ 2Q-5(3) 	1		1, 3	○	



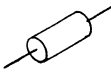
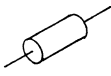
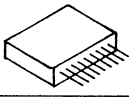

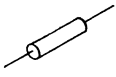








Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27- 20FA28- 72	Screw ⊕ 2Q-5(3) 	1		1, 3	○	
" 73	Screw ⊕ 3×0.5R-5 	4	C2 × 2 C3 × 2	2, 6 9	○△	
" 74	Nut 3×0.5N-2.4 	4	C2 × 2 C3 × 2	2, 6 9	○△	
" 75	Eyelet 2φ-6 	4	C3	2	△	
" 76	Eyelet 2φ-4 	3	C4	2	△	
" 77	Lower case insert 	1	B1	3	△	
" 78	Wave washer 	1		3	○	
" 79a	Lead wire (0.08/40) (red)-110mm 	1			○	
" 79b	" (red)-70mm 	1			○	
" 79c	" (white)-65mm 	1			○	
" 79d	" (white)-50mm 	1			○	
" 80a	Lead wire (0.18/20) (red)-80mm 	1	C2	9	○△	
" 80b	" (red)-55mm 	1 2			○	Changed one to #139 -2 × $\frac{501}{3000}$
" 80c	" (white)-70mm 	1			○	
" 81a	" (red)-125mm 	1			○	


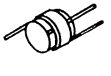
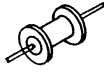



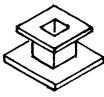





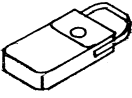

Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27- 20FA28- 81b	Lead wire (0.08/20) (red)-95mm 	1			○	
" 81c	" (white)-80mm 	1			○	
" 81d	" (white)-70mm 	1			○	
" 81e	" (white)-65mm 	1			○	
" 81f	" (yellow)-85mm 	1			○	
" 81g	" (blue)-95mm 	1			○	
" 81h	" (brown)-110mm 	1			○	
" 81i	" (orange)-95mm 	1			○	
20FA27- 81j	" (red)-135mm 	1	G		○△	
" 81k	" (white)-135mm 	1	G		○△	
" 81l	" (yellow)-150mm 	1	G		○△	
20FA27- 20FA28- 82	Contact spring spacer A 	2	C3	2	△	
" 83	Click ball 	1	D	2	△	
" 84	Click spring 	1	D	2	△	
" 85	Printed circuit A 	1	C1, C2	2, 8	△	


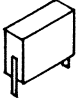
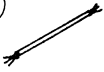





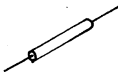
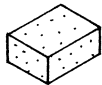
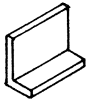


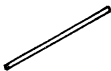
Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27- 20FA28- 86	Printed circuit B 	1	C2	2, 9	△	
" 87	Printed circuit C 	1	C3	2, 6	△	
" 88	Printed circuit D 	1	C4	2, 7	△	
" 89a	Fixed resistor 1/4W 2.2k 	1	C3	4, 5, 6	○△	
" 89b	" 1/4W 470 	1	C3	4, 5, 6	○△	
" 89c	" 1/4W 1M 	1	C2	4, 5, 9	○△	
" 89d	" 1/4W 1M 	1	C2	4, 5, 9	○△	
" 89e	" 1/4W 330k 	1	C2	4, 5, 9	○△	
" 89f	" 1/4W 1k 	1	C1, C2	4, 5, 8	○△	
" 89g	" 1/4W 1M 	1	C1, C2	4, 5, 8	○△	
" 89h	" 1/4W 470 	1	C1, C2	4, 5, 8	○△	
" 89i	" 1/4W 10k 	1	C2	4, 5, 9	○△	
" 89j	" 1/4W 1k 	1	C2	4, 5, 9	○△	
" 89k	" 1/4W 2.2M 	1	C2	4, 5, 9	○△	
" 89l						Blank
















Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27- 20FA28- 89m	Fixed resistor 1/4W 10 	1	C2	4, 5, 9	○△	
" 89n	" 1/4W 470 	1	C2	4, 5, 9	○△	
" 89o	" 1/4W 2.2M 	1	C5	4, 5, 8	○△	
" 89p	" 1/4W 1k 	1	C5	4, 5, 8	○△	
" 89q	" 1/4W 4.7k 	1	C5	4, 5, 8	○△	
" 89r	" 1/4W 100k 	1	C5	4, 5, 8	○△	
" 89s	" 1/4W 150 	1	C5	4, 5, 8	○△	
" 89t	" 1/4W 3.3M 	1	C1, C2	4, 5, 8	○△	
" 89u	" 1/4W 150k 	1	C1, C2	4, 5, 8	○△	
" 89v						Blank
" 89w	Fixed resistor 1/4W 4.7k 	1	C2	4, 5, 9	○△	
" 89x	" 1/4W 1k 	1	C2	4, 5, 9	○△	
" 90a	" 1/2W 15k 	1	C2	4, 5, 9	○△	
" 90b	" 1/2W 15k 	1	C2	4, 5, 9	○△	
" 91a	Semi-fixed resistor 500k 	1	C4	2, 4 5, 7	○△	


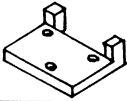
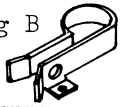
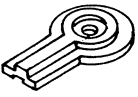



Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27- 20FA28- 91b	Semi-fixed resistor 1M 	1	C4	2, 4 5, 7	○△	
" 91c	Semi-fixed resistor 10k 	1	C5	4, 5, 8	○△	
" 92a	Electrolytic capacitor 6V 220 μ F 	1	C4	2, 4 5, 7	○△	
" 92b	" 6V 33 μ F 	1	C3	4, 5, 6	○△	
" 93	Ceramic capacitor 2kV 33pF 	1	C3	4, 5, 6	○△	
" 94	Main capacitor 340WV 850 μ F 	1		2, 4, 5	○	
" 95	Electrolytic capacitor 50WV 3.3 μ F 	1	C1, C2	4, 5, 8	○△	
" 96a	Ceramic capacitor 50V 0.005 μ F 	1	C1, C2	4, 5, 8	○△	
" 96b	" 50V 0.005 μ F 	1	C1, C2	4, 5, 8	○△	
" 96c	" 50V 0.1 μ F 	1	C2	4, 5, 9	○△	
" 96d	" 50V 0.005 μ F 	1	C1, C2	4, 5, 8	○△	
" 97a	Metallized capacitor -A 250WV 0.0047 μ F 	1	C2	4, 5, 9	○△	
" 97b	" -B 250WV 0.0047 μ F 	1	C5	4, 5, 8	○△	
" 97c						Blank
" 97d	Metallized capacitor -C 250WV 0.068 μ F 0.047μF 	1	C2	4, 5, 9	○△	$-2 \times \frac{501}{3000}$

Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27- 20FA28- 97e	Metallized capacitor -D 250WV 0.047 μ F 	1	C2	4, 5, 9	○△	
" 97f	" -E 250WV 0.047 μ F 	1	C1, C2	4, 5, 8	○△	
" 98	Capacitor 250WV 4.7 μ F 	1	C2	4, 5, 9	○△	
" 99	Bipolar capacitor 	1	C2	2, 4 5, 9	○△	
" 100	IC 	1	C5	4, 5, 8	○△	
" 101	Diode A 	2	C3	4, 5, 6	○△	
" 102	Diode B 	4	C2 \times 3 C4 \times 1	4, 5 7, 9	○△	
" 103	SCR ₁ 	2	C2, C5	4, 5 7, 9	○△	
" 104	SCR ₂ 	1	C2	2, 4 5, 9	○△	
" 105	Main transistor 	1	C3	2, 4 5, 6	○△	
" 106	SCR ₃ 	1	C1, C2	4, 5, 8	○△	
" 107	Photo-transistor 	1	D	4, 5, 8	△	
" 108	Zener diode (12V) 	1	C2	4, 5, 9	○△	
" 109	Neon lamp holder 	1	C4	2	△	
" 110	Open flash contact B 	1	C4	2	△	

Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27- 20FA28- 111	Trigger coil-1 	1	C2	4, 5, 9	○△	
" 112	Trigger coil-2 	1	C5	4, 5, 8	○△	
" 113	Quenching tube 	1	C5	4, 5, 8	○△	
" 114	Neon pilot lamp 	1	C4	2, 4 5, 7	○△	
" 115	Oscillator core 	1	C6, C3	2, 4 5, 6	△	
" 116	Oscillator coil 	1	C6, C3	2, 4 5, 6	△	
" 117	Coil bobbin 	1	C6, C3	2, 4 5, 6	△	
" 118	Screw ⊕ 2Q-6(3) 	2		2, 3	○	
" 119	Screw ⊕ 2Q-10(3) 	2		2, 3	○	
" 120	Rivet 	1	F	3	△	
" 121	Spring washer 	1	B2	1	○△	
20FA27- 122	Mount insert 	4	G		×	
" 123	(Discontinuation)					$-3 \times \frac{1401}{3000}$
20FA27- 20FA28- 124	Carring case 	1			□	
" 125	Printed circuit E 	1	C5	2, 8	△	

Part No. 部品番号	Name and Shape 名称および形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27- 20FA28- 126	Spring retainer 	1	C4	2	△	
" 127	Metallized capacitor-F 100V 0.12 μ F 	1	C5	4, 5, 8	○△	
" 128	Lead wire (0.08/13) (blue)-20mm 	1	C4	7	○△	
" 129	Pulse transformer 	1	C1, C2	4, 5, 8	○△	
" 130	Ceramic capacitor 500V 0.002 μ F 	1	C2	4, 5, 9	○△	
" 131	Ceramic capacitor 25V 0.01 μ F 	1	C1, C2	4, 5, 8	○△	
" 132	Tapping screw ⊕ 2.6R-6(3) 	1		2	○	
" 133	Contact spring spacer 	2	C3	2	△	
" 134	Silicon diode 50V 0.1A 	1	C1, C2	4, 5, 8	○△	
" 135	Sponge pad 	3	B2	2	○△	
20FA27- 136	Insulator, for #28 	1	G		○△	
20FA27- 20FA28- 137	Ceramic capacitor 25V 0.1 μ F 	1	C2	4, 5, 9	○△	Added $-2 \times \frac{501}{3000}$
" 138	Silicone tube 	1			○	Added $-2 \times \frac{501}{3000}$
" 139	Manganic wire 	1		4, 5, 9	○	Added $-2 \times \frac{501}{3000}$

Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA28-17	Mount base 	1	G	3	○△	
" 18	Shoe lock nut 	1	G	3	○△	
" 19	Shoe 	1	G	3	○△	
" 20	Hot-shoe contact (+) 	1	G	3	○△	
" 21	Hot-shoe contact(-) 	1	G	3	○△	
" 22	Contact spring 	1	G	3	○△	
" 23	Contact retainer 	1	G	3	○△	Use the wire #81j
" 24	Sync change-over button 	1	C4	2	△	
" 25	Change-over spring 	1	C4	2, 7	△	
" 26	Screw ⊕ 2R-2.5(3) 	1	C4	2	△	
" 27	Mount base insert 	4		3	×	
" 28	Screw ⊕ 2Q-8(3) 	2	G	3	○△	Use the wire #81k
" 29	Screw ⊕ 2Q-18(3) 	1	G	3	○△	
" 30	Screw ⊕ 2R-8(3) 	1	G	3	○△	
" 31	Rivet 	1	C4	2	△	

Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA28- 32	Leg plate 	1	G	3	○△	
" 33	Mount base cover 	1	G	3	○△	
" 34	Sync socket spring B 	1	C4	2, 7	△	
" 35	Leg cover 	1		3	○	
" 40 41 42						Blank
" 44 45						Blank
" 57	Name plate 	1		1	○	
" 81j	Lead wire (0.08/20) (red)-145mm 	1	G		○△	
" 81k	Lead wire (0.08/20) (white)-120mm 	1	G		○△	
" 81l						Blank
" 122 123						Blank
" 136						Blank

7. Subassembly List

20FA27,28 - R.1070.A

No. of Subassembly 部組品番号	Name 名 称	Pcs. per Unit 1台分個数	No. of Constituent parts 構成部品番号	Reference Fig. No. 参照図番	Remarks 備 考
A	Reflector	1	5, 6	2	
B1	Lower case	1	1, 77	1	
B2	Upper case	1	2, 7, 8, 14, 54, 55, 56 70x2, 121, 135x2	1	
C1	Printed circuit A	1	85, 89f, 89g, 89h, 89t, 89u 95, 96a, 96b, 96d, 97f, 106 129, 131, 134	4, 5 8	
C2	Printed circuit B	1	73x2, 74x2, 80a, 86, 89c 89d, 89e, 89i, 89j, 89k 89m, 89n, 89w, 89x, 90a 90b, 96c, 97a, 97d, 97e, 98 99, 102x3, 103, 104, 108 111, 130, 137, C1	2, 6	
C3	Printed circuit C	1	52, 66, 67, 73x2, 74x2 75x4, 82x2, 87, 89a, 89b 92b, 93, 101x2, 105, 115 116, 117, 133x2	2	
20FA27- C4	Printed circuit D for SB-2 only	1	13, 46, 47, 50x2, 63, 64x3 76x3, 88, 91a, 91b, 92a 102, 109, 110, 114, 126, 128	2, 7	
20FA28- C4	Printed circuit D for SB-3 only	1	13, 24, 25, 26, 31, 34, 46 47, 50x2, 63, 64x2, 76x3 88, 91a, 91b, 92a, 102, 109 110, 114, 126, 128	2, 7	
C5	Printed circuit E	1	89o, 89p, 89q, 89r, 89s 91c, 97b, 100, 103, 112 113, 125, 127	4, 5 8	
C6	Oscillator	1	115, 116, 117	2, 4 5, 8	
D	Light control selector	1	9, 10, 11, 58, 59, 60, 83 84, 107		
E	Battery compartment	1	4-1, 48	1, 2	
F	Leg base	1	37, 38, 43, 120	3	
G1	Ready-light contact	1	21-1, 32, 33, 34	3	
20FA27- G	Mount for SB-2 only	1	17-1, 18, 19-1, 20, 21, 22 23, 24, 25, 26, 27, 28, 29 30, 31x4, 32, 33, 34, 40 41, 44x4, 45, 81j, 81k, 81l 122x4, 136	3	
20FA28- G	Mount for SB-3 only	1	17, 18, 19, 20, 21, 22, 23 28x2, 29, 30, 32, 33, 81j, 81k	3	

II. AC UNIT SA-2

1. Causes of Failures

If the neon pilot lamp on the main body, connected with the AC unit to the main body, does not light. The following causes are conceivable:

- 1) Poor transformer #24
 - 2) Disconnection of thermo-fuse #22
 - 3) Poor diode #21
 - 4) Incorrect setting of input voltage selector
 - 5) Poor inside wiring
- Etc.

2. Disassembly

- 1) Remove four rubber pads #10. Unscrew four screws #17.
- 2) Peel off name plate #12. Unscrew two screws #18. The case (upper) can be removed and the interior observed.
- 3) Furthermore, remove four rubber feet #9. Unscrew four screws #17. The inside can be taken out.

3. Binding Agents

To be use for	Item No. of binding agent
#9	#921
#12	#501
#17	#201
#18	"
#19	"

4. Assemble Views

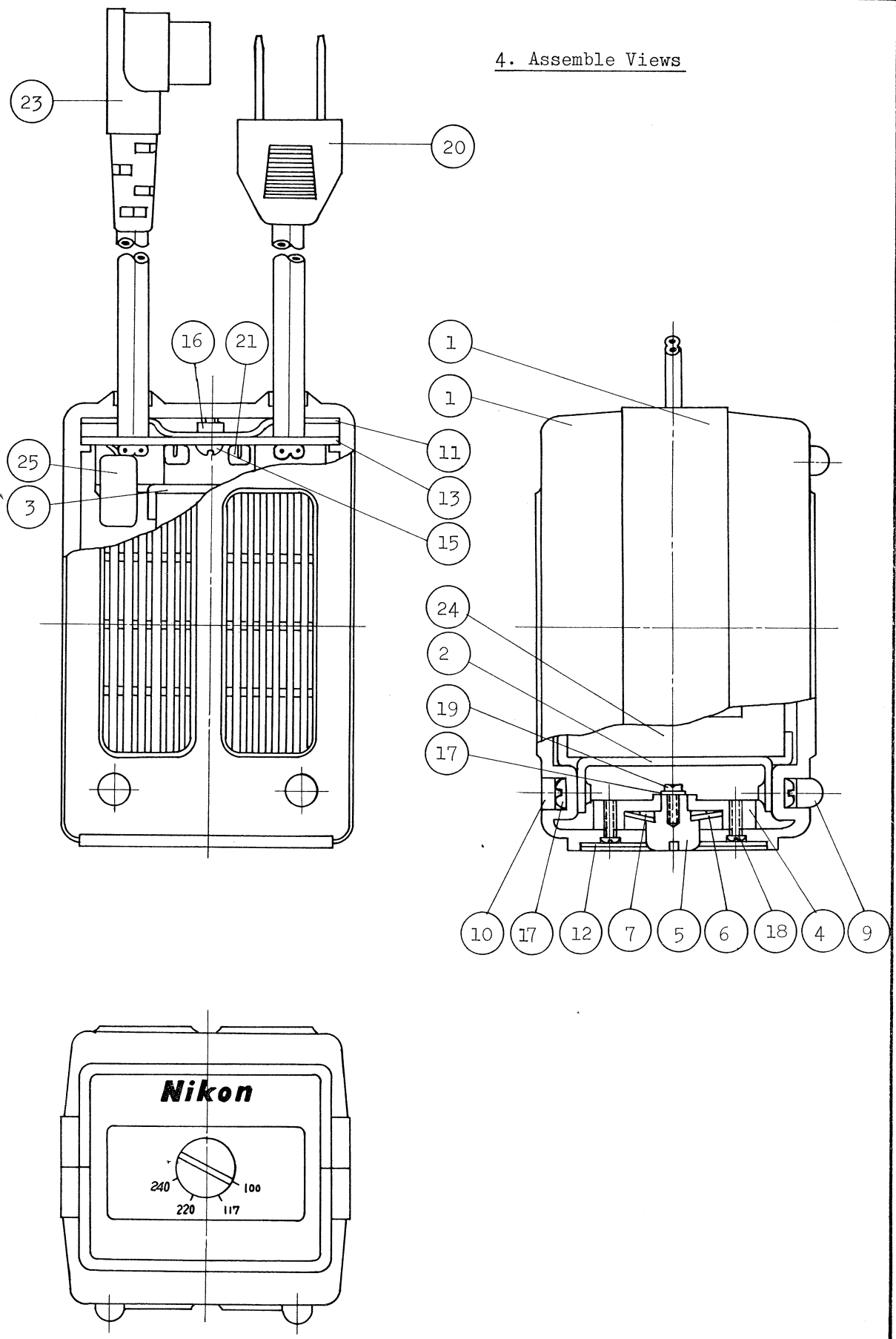


Fig. 10

5. Printed Circuit

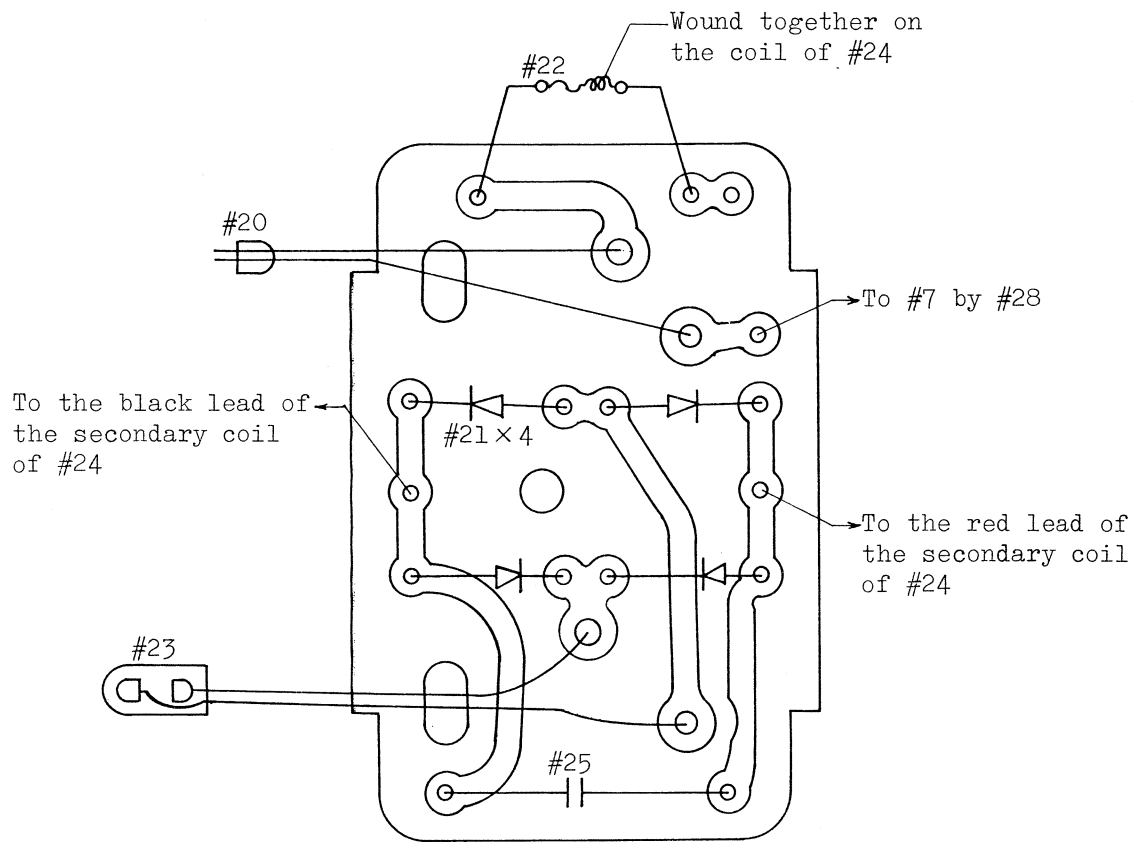










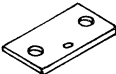
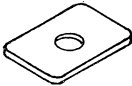
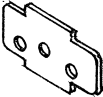

















Fig. 11

6. Parts List

20FA27A - R.1070.A

Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27A- 1	Case mold 	2		10	○	
" 2	Frame A 	1		10	○	
" 3	Frame B 	1		10	○	
" 4	Switch base 	1	A	10	△	
" 5	Switch knob 	1		10	○	
" 6	Switch spring 	1		10	○	
" 7	Lug 	1		10	○	
" 8	Eyelet lug 	4	A		△	
" 9	Case foot (rubber) 	4		10	○	
" 10	Rubber pad 	4		10	○	
" 11	Cord clip 	1		10	○	
" 12	Name plate 	1		10	○	
" 13	Printed circuit 	1	B	10, 11	△	
" 14	Eyelet 	3	B		△	
" 15	Screw ⊕ 3×0.5R-5 	1		10	○	

Part No. 部品番号	Name and Shape 名称 および 形状	Pcs. per Unit 1台分個数	Reference Subassembly No. 参照部組品番号	Reference Fig. No. 参照図番	Term of Sale 販売区分	Remarks 備考
20FA27A-16	Nut 3×0.5N-2.4 	1		10	○	
" 17	Screw ⊕ 3×0.5R-6 	8		10	○	
" 18	Screw ⊕ 2Q-8(3) 	2		10	○	
" 19	Screw ⊕ 2R-5(3) 	1		10	○	
" 20	AC plug & cord 	1		10, 11	○	
" 21	Diode 	4	B	10, 11	○△	
" 22	Thermo-fuse 	1	B	11	○△	
" 23	Output cord 	1		10, 11	○	
" 24	Transformer 	1		10	○	
" 25	Metallized capacitor 1000V 0.022μF 	1		10, 11	○	
" 26	Switch spacer 	1		10	○	
" 27	Switch washer 	1		10	○	
" 28	Lead wire (0.08/20) (yellow)-110mm 	1			○	

7. Subassembly List

20FA27A - R.1070.A

No. of Subassembly 部組品番号	Name 名称	Pcs. per Unit 1台分個数	No. of Constituent parts 構成部品番号	Reference Fig. No. 参照図番	Remarks 備考
20FA27A-A	Switch	1	4, 8×4	10	
B	Printed circuit	1	13, 14×3, 21, 22	10,11	