Macro Speedlight SB-21

マクロスピードライト SB-21 (FSA90401)

Controler AS-12

コントローラー AS-12 (FSW52701)

Controler AS-14

コントローラー AS-14 (FSW52801)

REPAIR MANUAL

修 理 指 針

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CONTENTS

1. SPECIFICATIONS ----SB-21A(AS-12 + SB-21) or SB-21B(AS-14 + SB21)

(1) Guide No. (At full output on M mode) Distance: 1m

	Internal Power Source		External Power Source			
			LA-2		LD-2	
	A	B	A	B	A	B
FULL	$13^{+1.9}_{-2.0}$	$15^{+2.2}_{-2.4}$	$15^{+2.3}_{-2.4}$	$18^{+3.4}_{-2.3}$	$15^{+3.5}_{-1.9}$	$18^{+4.2}_{-2.3}$
1/4	$6.5^{+1.2}_{-1.0}$	$6.7^{+1.3}_{-1.0}$	$6.2^{+1.2}_{-1.0}$	$6.4^{+1.2}_{-1.0}$	$6.2^{+1.2}_{-1.0}$	$6.4^{+1.2}_{-1.0}$
1/16	$3.2^{+0.6}_{-0.3}$	$3.3^{+0.7}_{-0.4}$	$2.9^{+0.5}_{-0.5}$	$3.0^{+0.6}_{-0.5}$	$2.9^{+0.5}_{-0.5}$	$3.0^{+0.6}_{-0.5}$

A: When both flash modules fire
B: When only one flash module fires

On instant that the ready-light turns on, the guide number is to be changed by -1EV at full output.
When the flash fires at 1/4 or 1/16 output, guide number is to be within the above standards.

(2) Angle of flash coverage (Distance: 1m)

To cover 35mm lens picture angle
(Vertically 85°, Horizontally 65°)

(3) Number of flashes, Recycling time

Power Source	Number of Flashes	Recycling time
AA alkaline-manganese battery X 4	180 or more	8 sec. or less
AA zinc-carbon battery X 4	40 or more	12.5 sec. or less
AA Ni-Cd battery X 4	50 or more	7 sec. or less
LD-2(AA alkaline-manganese battery X 8)	280 or more	4 sec. or less
LD-2(AA zinc-carbon battery X 8)	80 or more	8 sec. or less
LD-2(AA Ni-Cd battery X 8)	90 or more	3 sec. or less
LA-2(100^{+2}_{-0}V)	---	4 sec. or less

(4) Focus illuminator

The SB-21 is provided with the focus illuminator in order to focus easily. Lighting duration(T) is controlled by the built-in timer.

$$T=65^{+10}_{-25} \text{ sec.}$$

If sync contact is closed while the focus illuminator is lighting, it goes out.
In case that the internal power source is used, only the lower focus illuminator will light up. In case that the external power source is used, both of the upper and the lower will light up.

(5) Condenser adapter SW-8

The SW-8 can be used in order to increase the light exposure on the image surface by 0.5-0.9 step, when the flash-to-subject distance is too short.

(6) Synchronizing range (Use Micro Nikkor 55/2.8 and ISO 100 film.)

Lens Direction \ Aperture / Magnification		2.8	4	5.6	8	11	16	22	32
Normal	1/10		○	○	○	○			
	1/7			○	○	○	○	○	
	1/5				○	○	○	○	○
	1/3				○	○	○	○	○
	1/2					○	○	○	○
	1				○	○	○	○	○
Reverse	2			○	○	○	○	○	
	3		○	○	○	○	○		
	5	○	○	○	○				

(7) Function

a) Ready-light

The ready-lights of the SB-21 and the camera viewfinder light up when the main condenser in the flash or in the external power source is charged. In case of warning, the ready-light blinks even when the main condenser is charged.

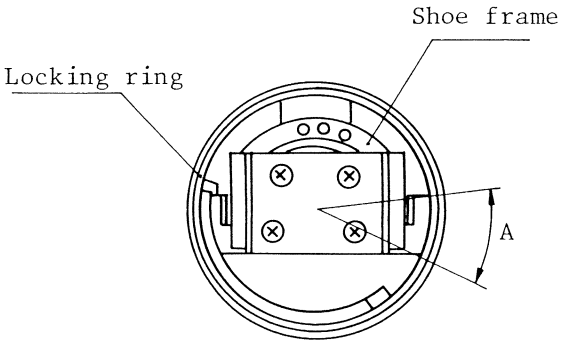
On instant that the power switch is turned on, the shutter speed changeover signal ICRY1 is output. Then, if charging is completed, the charging completion signal ICRY2 is out put.
Standard current value of each signal is as follows;

Signal Power off	Symbol ICRY(off)	Current Value 5μA or less
Shutter speed changeover sig	ICRY1	30 - 60 μA
Charging completion sig	ICRY2	2.3 - 7 mA

b) Incomplete lock warning (before fire)
....only with SB-21A

When the angle A, which is formed by a (end of the locking ring) and the end of the shoe frame, is more than 30°, the ready-lights of the SB-21 and the viewfinder blink at the frequency f(war). Warning should not be output when the locking ring is locked to the camera accessory shoe.
During this warning operation, oscillation is carried intermittently.

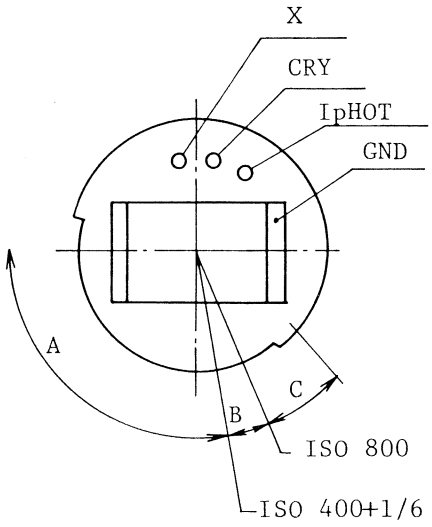
$$f(war)=4^{+4}_{-2}Hz$$



c) Warning before fire on TTL mode

i) SB-21A

When the flash mode switch of the SB-21A is set to TTL, relation between the position of the ISO dial of the F3 and warning is as follows. During this operation, oscillation is carried intermittently.



ISO dial setting	Warning	Position in the above figure
Below ISO 400+1/6		A
ISO 400+1/6 - 800	Unsteady	B
Above ISO 800		C

Both the ready-lights of the SB-21A and the camera viewfinder blink to warn at f(war) (frequency).

ii) SB-21B

If CSTP terminal is turned to low level when the flash mode switch is set to TTL and the current Isp flow into SP terminal and sync contact is open, ICRY1 and ICRY2 are output by turns and the viewfinder ready-light blinks to warn at f(war). Warning is not output when sync contact is closed.

$Isp=70\mu A$

d) Overexposure warning (after fire)

If the light amount (GO) is within the following range or less on TTL mode, the overexposure warning lamp (orange) lights up. Lighting duration should be as follows;
(Both flash modules fire; Distance 1m)

$GO=3.2^{+0.6}_{-0.3}$ (ISO 100, m)

$T1=2^{+2}_{-1}$ (sec.)

e) Underexposure warning (after fire)

If the flash fires at full output on TTL mode, the ready-lights on the controller and in the viewfinder blink at f(war) for T2 sec..

$T2=3^{+1.6}_{-1.4}$ (sec.)

f) Shoe contact

i) SB-21A

The SB-21A can be used with the F3 cameras, and it has following four contacts:

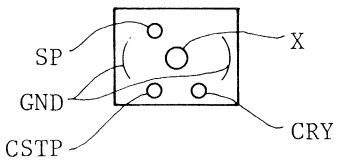
X: Sync contact
CRY: Ready-light signal
IPHOT: Metering current
GND: Ground

Ready light signal (CRY)

When the power switch of the SB-21A is turned on or off, the current indicated in (7)-a) should be output. During warning, ICRY1 and ICRY2 are to be output at f(war) by turns.

ii) SB-21B

The SB-21B can be used with the FG, FE2, FA, F-301 and F-501, and it has following five contacts:



X: Sync contact
SP: Camera distinction signal
CRY: Ready-light signal
CSTP: Stop signal
GND: Ground

Shoe contact (Top view)

Ready-light siganal (CRY)

When the power switch of the SB-21A is turned on or off, the current indicated in (7)-a) should be output. During warning, ICRY1 and ICRY2 are to be output at f(war) by turns.

Camera distinction signal (SP)

While the constant current Isp is flowing to SP terminal, the voltage at SP terminal (Vsp) should be as follows:

Vsp=0.6V or less (Isp=70μA)

When the flash mode switch is set to 'M' or the power switch is turned off and 5V is provided to SP terminal, the current Isp flowing into SP terminal is to be as follows:

Isp=5μA

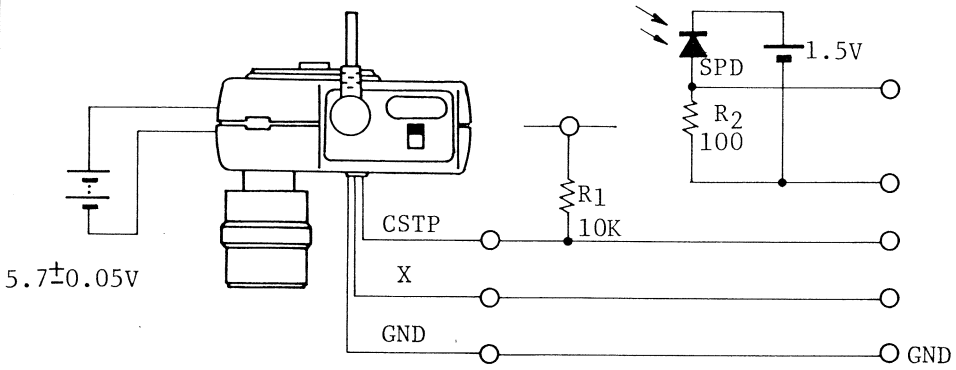
Stop signal (CSTP)

The current ICSTP, which is output when CSTP terminal is turned to low level on TTL mode, is to be as follows:

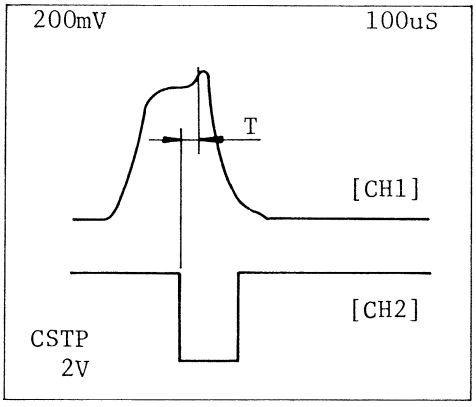
ICSTP=300μA

g) TTL multiple flash terminal (only with SB-21A)

Connect the circuit indicated in Fig.4 to TTL multiple flash terminal and then fire the flash under the following condition.



Inspection circuit for TTL multiple flash terminal

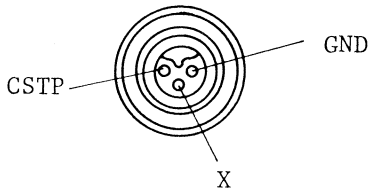


Wave form

-Condition-

Monitor the light amount with the light sensor (SPD) and adjust the resistor R2 so that the maximum voltage at both ends of R2 will be 0.8V.
Set the flash mode switch to TTL and connect the circuit as shown in Fig4.
Pull up CSTP terminal via resistor R1 and connect X terminal to the trigger terminal.
When the wave form shown in Fig.5 is found after flash firing, stop operation are to start within T after start of CH2.

$T=10\mu S$



Front view

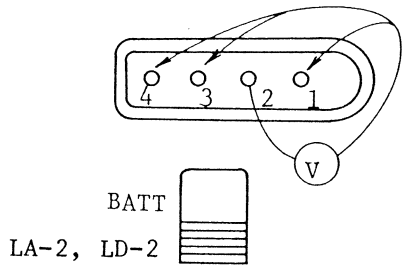
1-1. SAFETY CHECK FOR SB-21

The Nikon AC Unit LA-2 and DC Unit LD-2, originally designed to provide a regulated DC power supply for Medical-Nikkor lenses, can also be used to power the AS-12 and AS-14 Controllers for the Macro Speedlight SB-21. For this purpose, an external power source terminal is provided. If trouble occurs in these units, this may result in an electric shock. Therefore, make sure that the following safety check is performed after completing repairs.

1) Triple safety measures have been provided for the external power source terminal.
   (1) Since the four pins of the external power source terminal are protected by a spring-loaded cover, the four pins are not easy to touch by accident.
   (2) Even when a user touches the pins with his fingers after opening the cover, switch (SW1) prevents the voltage from flowing, as long as the connector is in normal operating order.
   (3) If the metallic parts in switch (SW1) melt or voltage leaks to pin ① of the 330V high voltage circuit, the internal oscillation circuit breaks and reduces the voltage as time elapses.

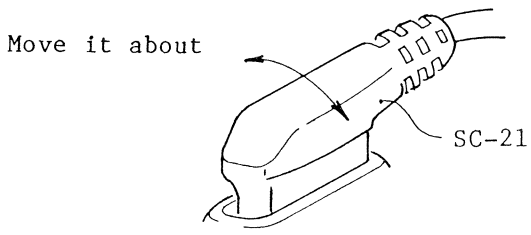
2) Check safety mechanism
   Check (1) : Check operating conditions.
   Check (2)-1 : Make sure that the voltage on your voltmeter indicates under 1V as shown in the figures below.

   (1) 330V voltage supply pin
   (2) 330V GND
   (3) 12V GND
   (4) 12V voltage supply pin



Connect pin ② or ③ to the negative terminal of the voltmeter, then measure the voltage of the other pins. Make sure the voltage is below 1V.

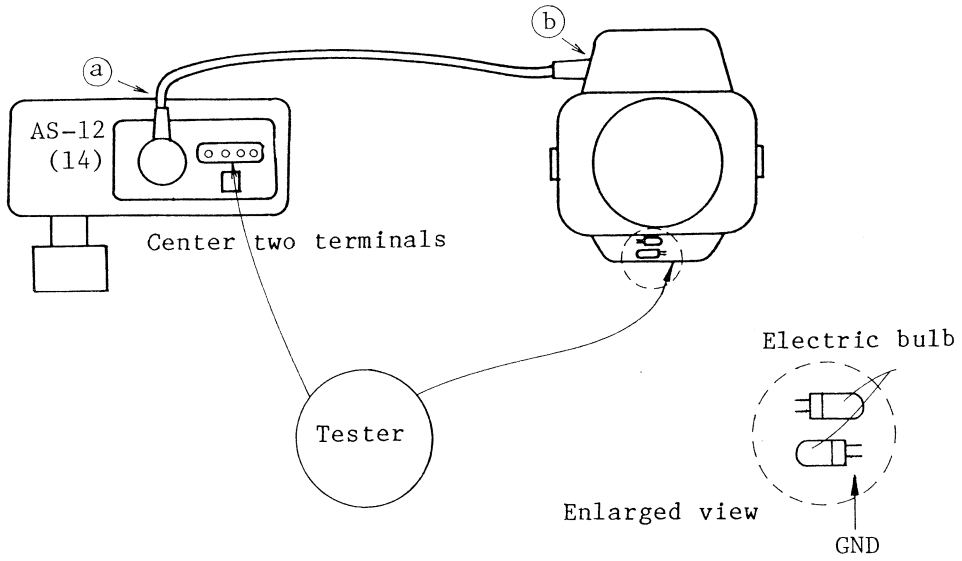
Check (2)-2 : Make sure that no clicking sounds come from switch SW1 when moving it about after connecting the power cord SC-21 into the external power source terminal.



External power source terminal

Check (3) : Check the charging sound after loading batteries into the Controller and turning on its power switch. When turning on the power switch of the LA-2 or LD-2 which is connected to the external power source terminal via the SC-21 power cord, the charging sound should stop. Then when the power switch of the external power source is turned off, the charging sound should begin again.

3) Check the power cord of the SB-21 (check for a break in the GND line).

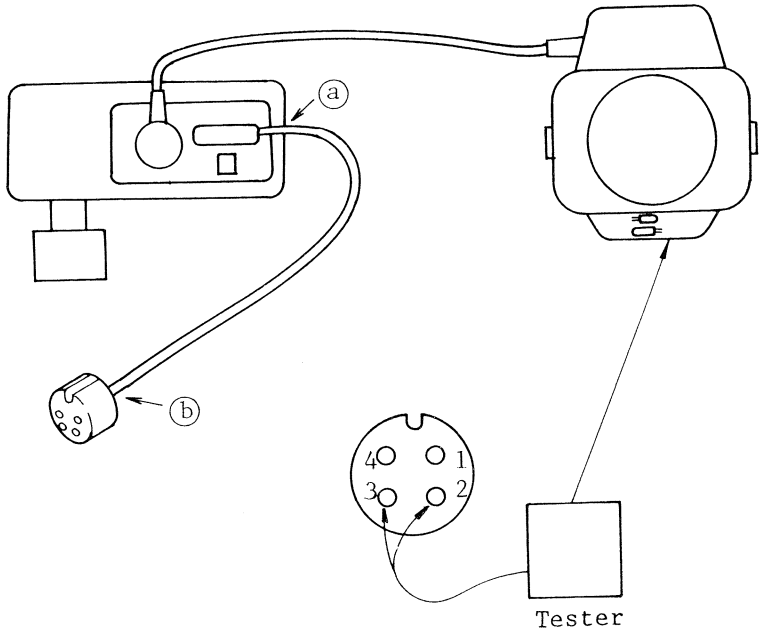


After fastening two portions with aligator clips as shown in the figure, connect to a tester. (Below 1Ω.)
Make sure that the meter needle of the tester does not move when moving portions a and b in any direction. If the needle moves, this indicates a break in the GND line, or poor contact in the bent portion or the connector pins.

4) Check for poor contact in the external power source terminal or in the power cord SC-21 as well as for a break in the GND line. If there is poor contact or breakage, it may give an electric shock when using the LA-2 or in case of the LD-2, it may cause serious damage to the oscillation transistors.

Method of checking the SC-21 GND line

(1) 330V
(2) 330V GND
(3) 12V GND
(4) 12V



Analog tester is recommended and a 500V- insulation resistor tester is also available.

Check as in (3) and confirm that the needle of the tester (analog) does not move.

Trouble in LA-2 or LD-2

(1) In Combination with the LA-2
After receiving a customer claim of electric shock problems when the SB-21 is used with the LA-2, perform repairs by referring to the following Nikon Technical Information for the LA-2 to which no electric shock preventative measures have been applied.

No. A-830020
Short-circuit of transformer #56 with input voltage changeover switch #65

No. A-850023
Breakage of power cord SC-21 or poor contact, or power cord connector causes a weak electrical shock.

(2) In Combination with the LD-2
After receiving a customer claim of oscillation transistor damage to the LD-2 when used with the SB-21, perform repairs by referring to the following Nikon Technical Information for the LD-2 in which the old version of the LD-2 has been incorporated.

No. A-850006
Breakdown of oscillation transistor Q1

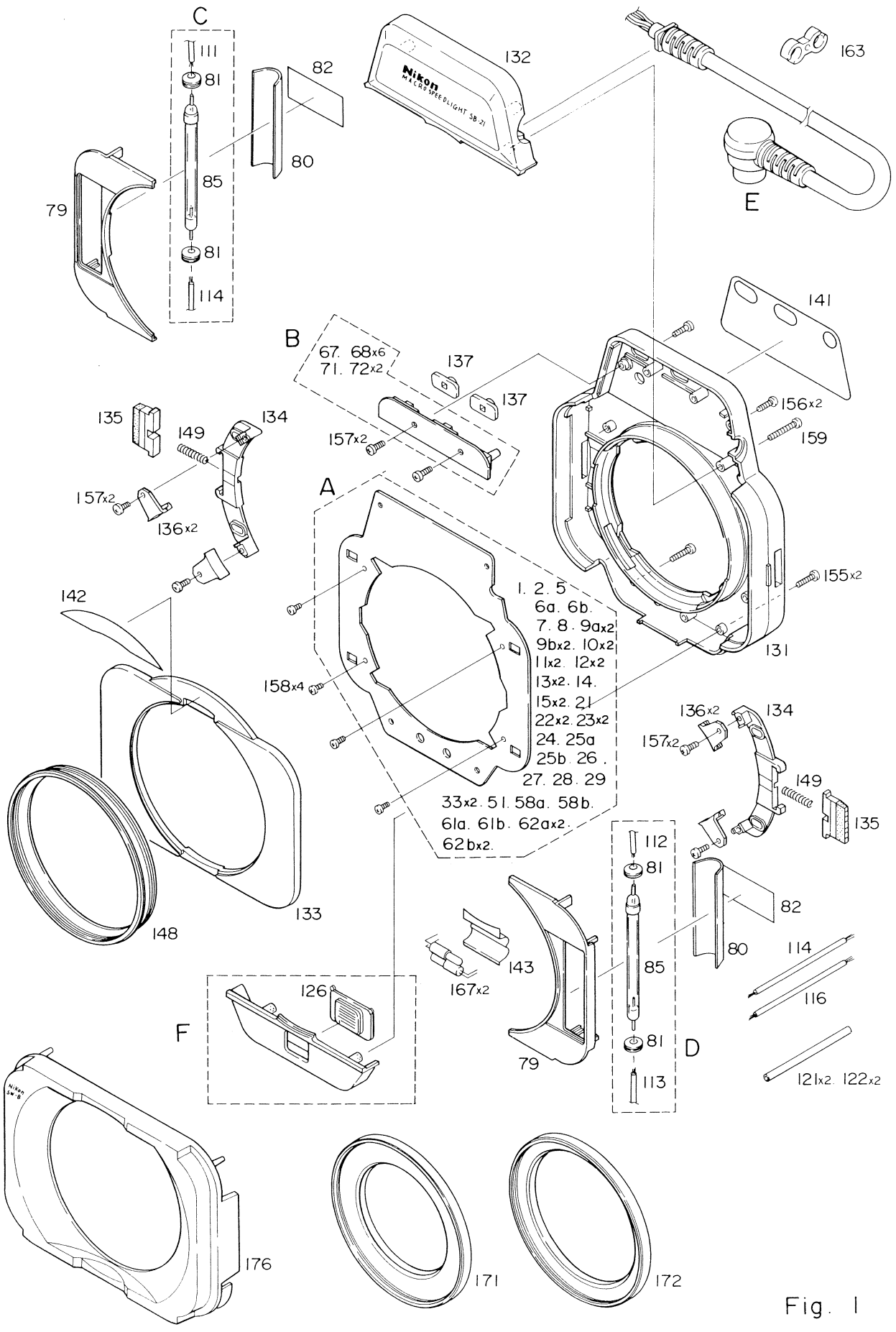

C
111
81
85
81
114
82
80
79
132
Nikon
MACRO FREE FLIGHT SB-21
163
E
141
B
67. 68x6
71. 72x2
137
137
135
149
134
157x2
136x2
156x2
159
A
1. 2. 5
6a. 6b.
7. 8. 9ax2
9bx2. 10x2
11x2. 12x2
13x2. 14.
15x2. 21
22x2. 23x2
24. 25a
25b. 26.
27. 28. 29
33x2. 51. 58a. 58b.
61a. 61b. 62ax2.
62bx2.
158x4
155x2
131
142
148
133
136x2
134
157x2
149
135
112
81
82
80
85
81
113
D
114
116
121x2. 122x2
143
167x2
79
F
126
176
171
172

Fig. 1

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
1	M基板 Printed circuit M	1	A		△		
2	SPD受 SPD base	1	A	1	○△		5
5	IC M51203TL	1	A	1	○△	U1	5
6a	トランジスタ Transistor UN4111	1	A	1	○△	Q1	5
6b	トランジスタ Transistor 2SA1348	1	A	1	○△		5
7	トランジスタ Transistor 2SC2603F	1	A	1	○△	Q2	5
8	トランジスタ Transistor 2SA1297Y	1	A	1	○△	Q3	5
9a	ダイオード Diode SR1FM8	2	A	1	○△	D1, D11	5
9b	ダイオード Diode S5277G	2	A	1	○△		5
10	発光ダイオード Diode SLR-34UT	2	A	1	○△	D2, D3	5
11	ダイオード Diode 1Z150	2	A	1	○△	D4, D8	5
12	ダイオード Diode RD120EB	2	A	1	○△	D5, D9	5
13	ダイオード Diode CROZAM-8T	2	A	1	○△	D6, D7	5
14	SPD SPDN021D292	1	A	1	○△	D10	5
15	ダイオード Diode 1S1588	2	A	1	○△	D12, D13	5
21	電解コンデンサー Condenser DN1A100KIS	1	A	1	○△	C1	5
22	セラミックコンデンサー Condenser SS45X1E223MY	2	A	1	○△	C2, C4	5
23	積層フィルムコンデンサー Condenser MKH250V 0.068μF	2	A	1	○△	C3, C5	5

部品表 Parts List

FSA90401-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
24	タンタルコンデンサー 10 μF 35V Tantalum condenser	1	A	1	○△	C6	5
25a	電解コンデンサー DSB1V683K1M Condenser	1	A	1	○△	C7	5
25b	電解コンデンサー MDS683FH Condenser	1	A	1	○△	C7	5
26	電解コンデンサー TWSS16V-100μF Condenser	1	A	1	○△	C9	5
27	タンタルコンデンサー DNIC220K1S Tantalum condenser	1	A	1	○△	C10	5
28	タンタルコンデンサー DNIVR68K1S Tantalum condenser	1	A	1	○△	C11	5
29	タンタルコンデンサー DNIVR33K1S Tantalum condenser	1	A	1	○△	C8	5
33	トリガーコイル KP-24A Trigger coil	2	A	1	○△	T1, T2	5
38	固定抵抗器 10KJ Resistor	1	A		△	R1	
39	固定抵抗器 1KJ Resistor	1	A		△	R9	
40	固定抵抗器 47 Ω Resistor	2	A		△	R2, R3	
41	固定抵抗器 10KΩ Resistor	2	A, B		△	R10, R15	
42	固定抵抗器 2.2K Ω Resistor	2	A		△	R4, R8	
43	固定抵抗器 1M Ω Resistor	2	A		△	R6, R7	
44	固定抵抗器 68KΩ Resistor	1	A		△	R12	
45	固定抵抗器 1K Ω Resistor	3	A		△	R5, R16, R19	
46	固定抵抗器 3.9M Ω Resistor	1	A		△	R17	
47	固定抵抗器 470Ω Resistor	1	A		△	R18	

部 品 表 Parts List

FSA90401-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
48	固定抵抗器 Resistor 4.7KΩ	2	A		△	R13, R14	
51	半固定抵抗器 Resistor RVG4L05303VM	1	A	1	○△	VR1	5
52	固定抵抗器 Resistor 1MΩ	1	A		△	R11	
56a	20P ソケット 20P socket SNAP-S1P14120-01-446	1	A	1	○△		5
56b	20P ソケット 20P socket (PM-1)	1	A	1	○△		5
58a	5P ソケット 5P socket 14120-01-446-5P	1	A	1	○△	J1	5
58b	5P ソケット 5P socket (PM-1)	1	A	1	○△		5
61a	3P ソケット 3P socket 14120-01-446-3P	1	A	1	○△	J2	5
61b	3P ソケット 3P socket (PM-1)	1	A	1	○△		5
62a	2P ソケット 2P socket 14120-01-446-2P	2	A	1	○△	J3, J4	5
62b	2P ソケット 2P socket (PM-1)	2	A	1	○△		5
67	スイッチ基板 Switch circuit	1	B	1	○△		5
68	接点ピン Pin	6	B	1	○△		5
71	イルミネータースイッチ Illuminator switch KHH10914	1	B	1	○△	SW1	5
72	切り換えスイッチ Switch SSS313	2	B	1	○△	SW2, SW3	5
79	リフレクター枠 Reflector frame	2		1	○		5
80	リフレクタ Reflector	2		1	○		1
81	Xe ブッシュ Xe bush	2	C, D	1	○△		5

部 品 表 Parts List

FSA90401-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
82	マイラーテープ(透明) 14x30 Tape	2		1	○		5
85	Xe ランプ HYC-4596-S1 Xenon lamp	2	C, D		△		
101	8P プラグ 8P plug	1	E		△		
102	コネクターピン Connector pin	8	E		△		
103	6芯コード Cord	1	E		△		
104	Si tube φ1.5x50 Tube	1	E		△		
105	スミチューブ F φ6x10 Tube	1	E		△		
111	Lead wire (red) PVC20/0.12x125	1	C	1	○△	W1	5
112	Lead wire (red) PVC20/0.12x150	1	D	1	○△	W2	5
113	Lead wire (purple) PVC20/0.12x60	1	D	1	○△	W3	5
114	Lead wire (orange) PVC20/0.12x45	2	C	1	○△	W4, W5	5
116	Lead wire (blue) PVC13/0.08x55	1		1	○	W6	5
121	Si チューブ φ1.0x35x0.4 Tube	2		1	○	PT2, PT3	5
122	Si チューブ φ1.0x12x0.4 Tube	2		1	○	PT4, PT5	5
125	ケース U2 Flash head (lower)	1	F		△		
126	ランプカバー Lamp cover	1	F	1	○△		1
131	本体 Main body	1		1	○		1
132	銘板 Name plate	1		1	○		1

部品表 Parts List

FSA90401-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
133	拡散板 Diffuser	1		1	○		1
134	レバー Lever	2		1	○		5
135	レバーツマミ Lever setting knob	2		1	○		5
136	フック Hook	4		1	○		5
137	スイッチツマミ Switch setting knob	2		1	○		5
141	操作パネル Operation panel	1		1	○		1
142	反射シール Reflector seal	1		1	○		5
143	反射板 Reflector plate	1		1	○		5
148	リング Ring	1		1	○		5
149	レバーバネ Lever spring	2		1	○		5
155	Screw M2x8	2		1	○		5
156	Screw M2x6	2		1	○		5
157	Screw M2x5	6		1	○		5
158	Screw M1.7x4	4		1	○		5
159	Screw M2x14	1		1	○		5
163	コード押さえ Holder	1		1	○		5
167	イルミネーター Lamp	2		1	○	TL1, TL2	5
171	52mmリング 52mm ring	1		1	○		1

部品表 Parts List

FSA90401-R. 3200. A

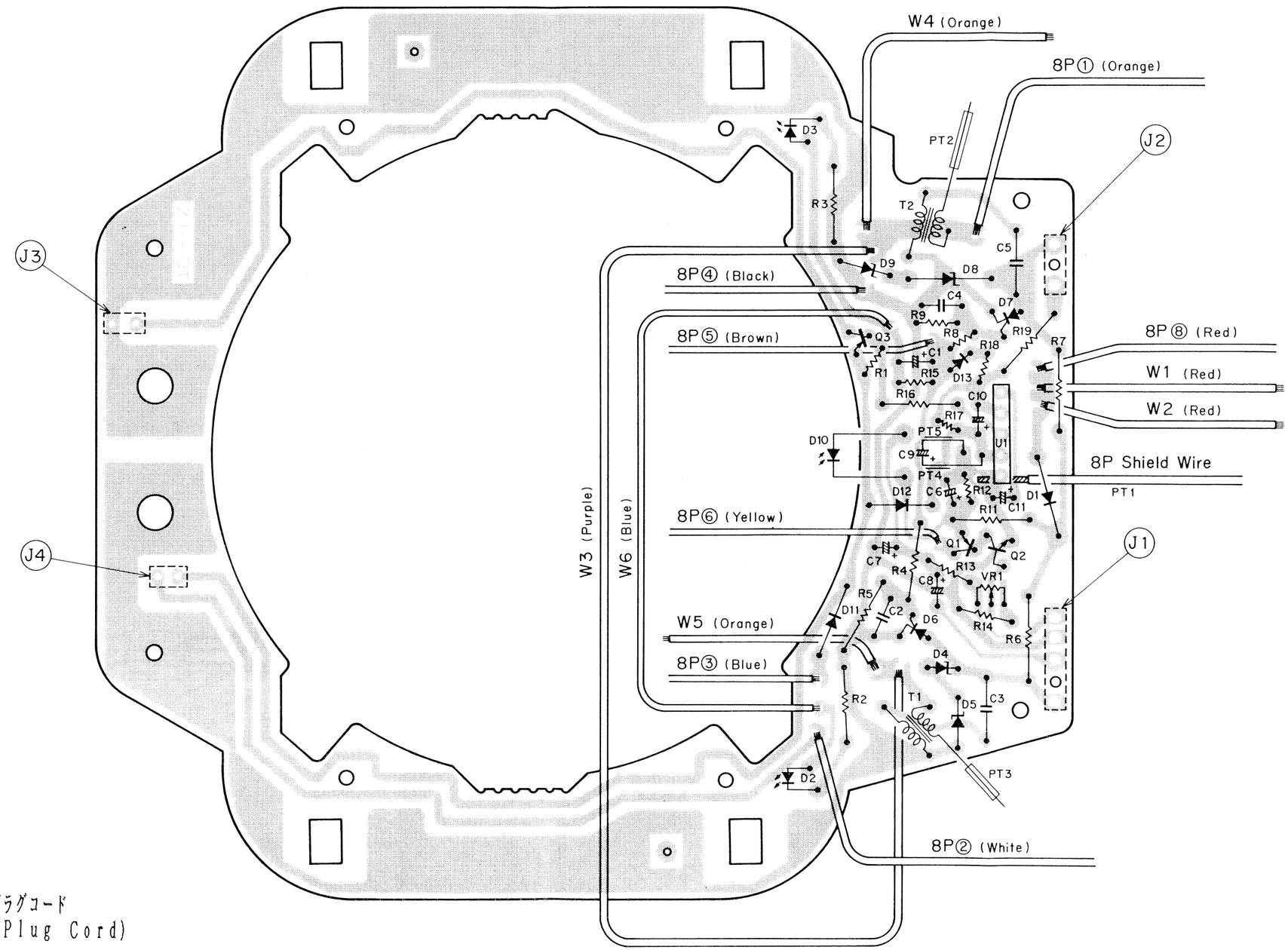
部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
172	62mmリング 62mm ring	1		1	○		1
176	集光板 SW-8 Converging plate	1		1	○		5

部 組 品 表　Subassembly List

FSA90401-R. 3200. 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.	備　考 Remarks	要求単位 Q'ty per order
A	M基板 M unit	1	1, 2, 5, 6a(6b), 7, 8 9ax2, (9bx2), 10x2,11x2 12x2, 13x2, 14 15x2, 21 22x2, 23x2,24, 25a(25b) 26, 27,28, 29, 33x2, 38 39, 40x2, 41x2, 42x2 43x2, 44, 45x3, 46. 47 48x2, 51, 52,56a(56b) 58a(58b) 61a(61b), 62ax2(62bx2)	1		1
B	スイッチ基板 Switch unit	1	67, 68x6, 71, 72x2, 41x2	1		1
C	Xeランプ組品 Xenon lamp	1	81, 85, 111, 114	1		1
D	Xeランプ組品 Xenon lamp	1	81, 85, 112, 113	1		1
E	8Pプラグコード 8P plug cord	1	101, 102x8, 103, 104 105	1		1
F	ケース U2 Case	1	125, 126	1		1

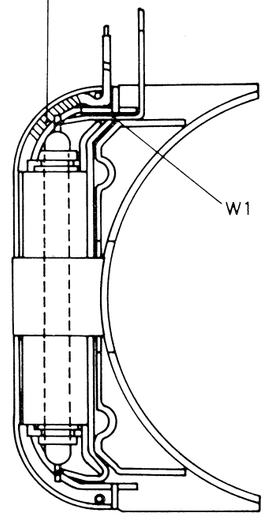
FSA90401-R.3200.A



8P：8Pプラグコード
(8P Plug Cord)

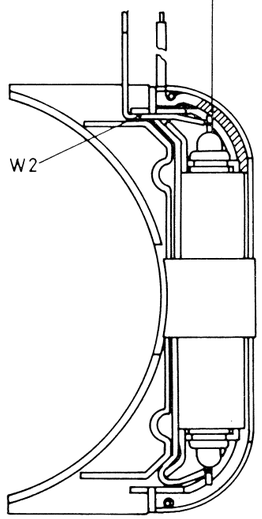
発光部左
Flash head (left)

接着剤で固定のことセメダイン#575
Apply adhesive #575

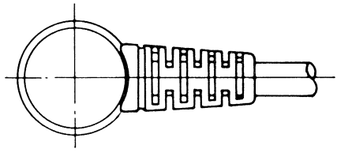


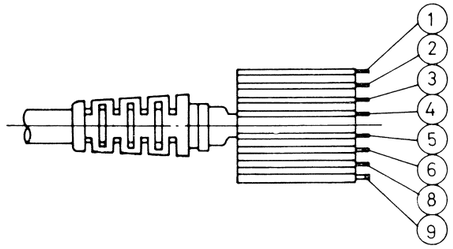
発光部右
Flash head (right)

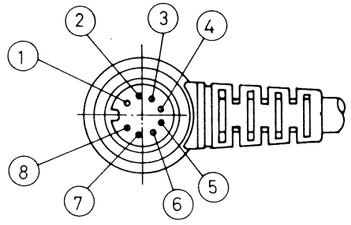
接着剤で固定のことセメダイン#575
Apply adhesive #575



8ピンプラグコード
8 Pin plug cord







Pin No.	Lead wire No.	Color	Mark
①	①	Orange	Xe
②	②	White	12V
③	③	Blue	6V
④	④	Black	⊖
⑤	⑤	Brown	TG
⑥	⑥	Yellow	MSTP
⑧	⑧	Red	330V
	⑨		

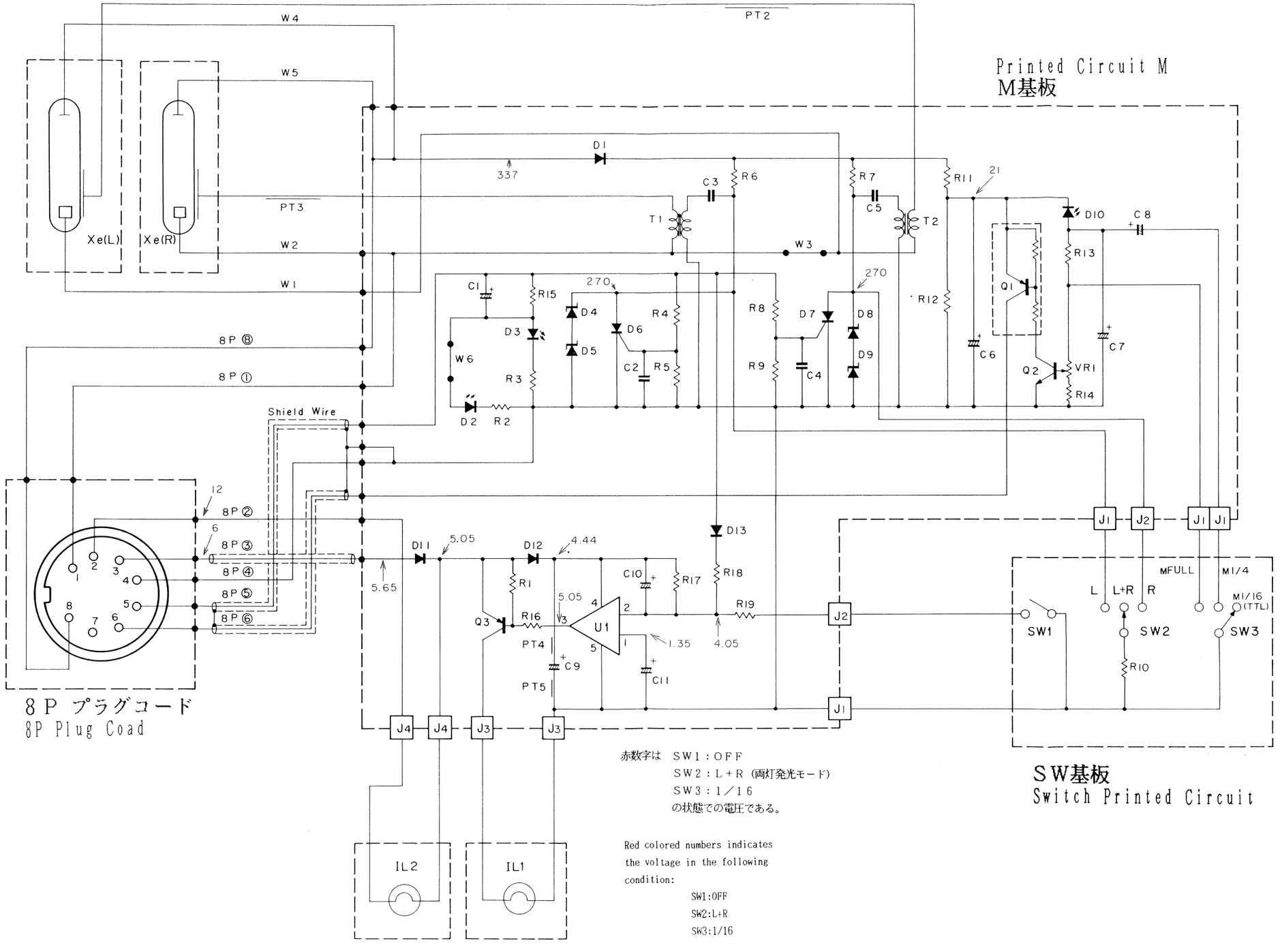
5. 電子部品対照表
(Circuitry Parts Reference Table)

回路番号 Circuit No.	部品番号 Part No.	備考 Remarks	回路番号 Circuit No.	部品番号 Part No.	備考 Remarks
R1	38	10K Ω	C11	28	35V, 0.68 μF
R2	40	47Ω			
R3	40	47Ω	D1	9a, 9b	SR1FM-8 or S5277G
R4	42	2.2KΩ	D2	10	SLR-34UT
R5	45	1KΩ	D3	10	SLR-34UT
R6	43	1MΩ	D4	11	1Z150
R7	43	1MΩ	D5	12	RD120EB
R8	42	2.2KΩ	D6	13	CROZAM-8T
R9	39	1KΩ	D7	13	CROZAM-8T
R10	41	10K Ω	D8	11	1Z150
R11	52	1MΩ	D9	12	RD120EB
R12	44	68K Ω	D10	14	SPDN021D292
R13	48	4.7KΩ	D11	9a, 9b	SR1FM-8 or S5277G
R14	48	4.7KΩ	D12	15	1S1588
R15	41	10K Ω	D13	15	1S1588
R16	45	1KΩ			
R17	46	3.9MΩ			
R18	47	470 Ω	Q1	6a, 6b	UN4111 or 2SA1348
R19	45	1KΩ	Q2	7	2SC2603F
			Q3	8	2SA1297Y
VR1	51	RVG4L05303VM (30KΩ)			
			U1	5	M51203TL
C1	21	10V, 10 μF	T1	33	KP-24A
C2	22	25V, 0.022μF	T2	33	KP-24A
C3	23	250V, 0.068 μF			
C4	22	25V, 0.022μF			
C5	23	250V, 0.068 μF	SW1	71	KHH10914
C6	24	35V, 10 μF	SW2	72	SSS313
C7	25a, 25b	35V, 0.068μF	SW3	72	SSS313
C8	29	35V, 0.33 μF			
C9	26	16V, 100μF			
C10	27	16V, 22 μF			

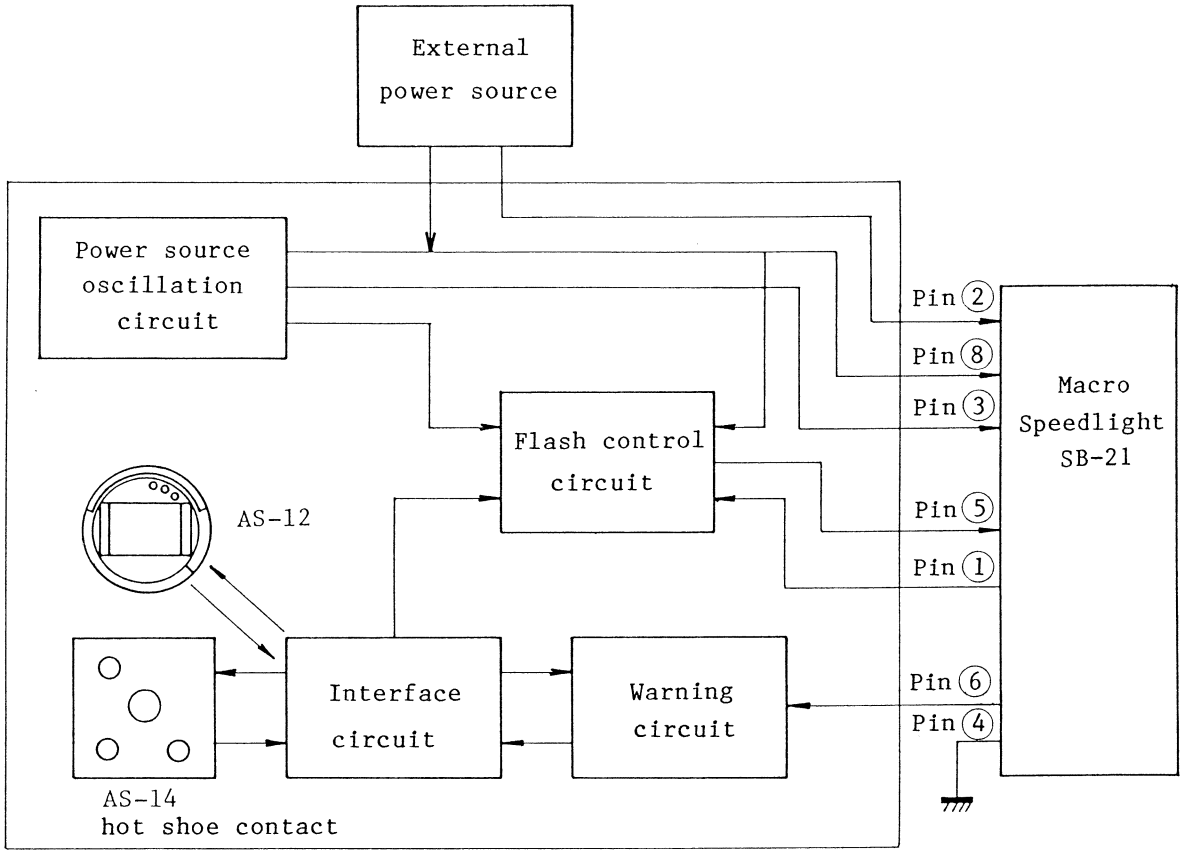
電子部品対照表

(Circuitry Parts Reference Table)

回路番号 Circuit No.	部品番号 Part No.	備考 Remarks	回路番号 Circuit No.	部品番号 Part No.	備考 Remarks
J1	58a	14120-01-446-5P			
J2	61a	14120-01-446-3P			
J3	62a	14120-01-446-2P			
J4	62a	14120-01-446-2P			
Xe1	85	HYC-4596-S1			
Xe2	85	HYC-4596-S1			
PT2	121	φ1.0x35x0.4			
PT3	121	φ1.0x35x0.4			
PT4	122	φ1.0x12x0.4			
PT5	122	φ1.0x12x0.4			
IL1	167	6V 0.2A			
IL2	167	6V 0.2A			

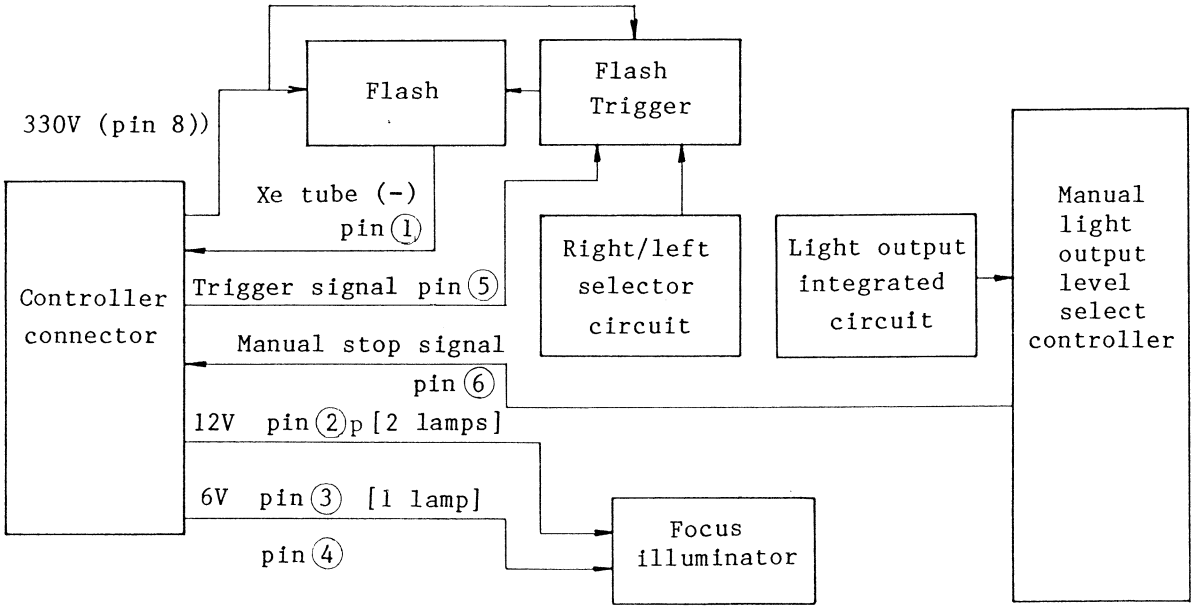

Printed Circuit M
M基板
W4
W5
PT2
PT3
W2
W1
Xe(L)
Xe(R)
D1
337
C3
R6
T1
R7
C5
T2
R11
21
D10
C8
R13
Q1
R12
C6
C7
Q2
VR1
R14
W3
270
C1
R15
D4
D3
D6
D5
R4
R8
D7
D8
D9
R9
C4
W6
R3
C2
R5
D2
R2
8P ⑧
8P ①
Shield Wire
12
8P ②
6
8P ③
8P ④
8P ⑤
8P ⑥
1
2
3
4
5
6
7
8
D11
5.05
D12
4.44
5.65
D13
R18
R17
C10
R1
R16
Q3
U1
PT4
C9
PT5
C11
R19
1.35
4.05
J4
J3
J2
J1
IL2
IL1
8P プラグコード
8P Plug Coad
赤数字は　SW1：OFF
SW2：L＋R（両灯発光モード）
SW3：1／16
の状態での電圧である。
Red colored numbers indicates
the voltage in the following
condition:
SW1:OFF
SW2:L+R
SW3:1/16
MFULL
M1/4
M1/16
(TTL)
L
L+R
R
SW1
SW2
SW3
R10
SW基板
Switch Printed Circuit

CIRCUITRY OUTLINE



AS-12 or AS-14

Block diagram of SB-21A, SB-21B



SB-21

Through the power switch, current from the internal battery source (four AA-penlight batteries) flows into the oscillation circuit to increase voltage, and charges the main condensor C4 (C4) to approx. 330V.

Flash control circuit

The flash control circuit controls the flash beginning and ending timing of the Xe tube. When the shutter is released, the sync contact is closed and a trigger signal is transmitted to the Controller (AS-12 or AS-14) via the sync hot shoe contact (X pin). The trigger signal is transmitted from X pin --> (L2) --> D12 (D12) --> R28 (R27) --> Pin ⑦ of IC --> Pin ⑧ of IC --> C15 (C13) --> Pin ㉗ of IC. The one-shot circuit, which consists of Pin ㉗ and ㉘ of U1 (MB4411A), generates the start pulse (approx. 30ms). The start pulse is output from Pin ⑱ of U1, transmitted to SB-21 through Pin ⑤ of the Controller connector, turning on the SCR (D7) via Pin ⑱ --> R44(R42) --> Q13 (Q9) --> R35 (R41) --> Q15 (Q6) --> R13 (R13) --> C11 (C11) --> D7 (D7). The trigger start pulse is transmitted to the SB-21 via Q15 (Q6) and Pin ⑤ of the Controller connector, turning on the SCR via R4 (SB-21) and R8 (flashing two lights) --> D6 (SB-21) and D7 (flashing two lights), then turns on the trigger circuit of T1 (SB-21), C3, R6 and T2 (SB-21), C5, and R7, and the flash starts firing by applying a high voltage (thousands of volts) to the trigger electrode of the Xe tube. Firing current flows through the above mentioned SCR (D7) of the Controller.

Stop signal

(1) TTL mode

a) SB-21A

Metering current flows into the circuit from IP line of the hot shoe contact, transmitted via L2 --> Q9 --> Pin ㉕ of the IC, and integration of the light quantity is performed at Pin ㉔. And when receiving a fixed quantity of light, the stop signal is output from Pin ⑯ of U1 and is transmitted to the gate of commutating thyristor of D5 via Pin ⑯ --> R23 --> D16 --> R9 --> D5, and the flash stops firing.

b) SB-21B

The stop signal from the CSTP line of the hot shoe contact is transmitted via L4 --> R26 --> Pin ⑥ of the IC. A stop signal is output from Pin ⑯ of U1, transmitted to the gate of commutating thyristor of D5 via R34 --> D18 --> R9 --> D5, and the flash stops firing.

(2) M mode

Monitoring light output from the Xe1 and Xe2 tubes through the built-in light sensor D10, integration of the amount of light is performed in the integration circuit (R11, R12, C6, Q1, Q2, VR1, R14, R13, D10, C7, C8, S3). When receiving a fixed quantity of light (at 1/4, 1/16 light output only), the Q1 transistor turns on and an electric charge of C6 is transmitted to the gate of commutating thyristor of D5 via Q1 --> Pin ⑥ of the Controller connector --> R36 (R45) of the Controller --> R37 (R44) --> D16 (D18) --> R9 (R9) --> D5 (D5), and the flash stops firing. When in the full output

mode, Q1 does not turn on and no stop signal is output, because the base of Q2 is connected to the GND at the SW3 of the SB-21.

Interface circuit
This executes communication of every signal between the camera and the SB-21, in addition to signal communication in the TTL mode. Signals treated in the interace circuit are as follows: viewfinder ready-light, automatic changeover to proper shutter speed for synchronization, sync contact signal, and other warning signals.

Warning controller
When using TTL flash control:
a) Indicates warnings (SB-21A) for incomplete shoe locking, out of TTL range, or over/underexposure.
b) Indicates warnings (SB-21B) for camera/speedlight mismatch, out of TTL range, or over/underexposure.
These warnings are indicated in the viewfinder ready-light or in the Controller ready-light, or both.

Focus illuminator
As the SW1 of the SB-21 closes, a small light used for focusing lights up, and turns off automatically within a constant period of time (65 + 10, -25 seconds). But the lamp will go out when the sync contact is closed during the time the focus illuminator lights up.

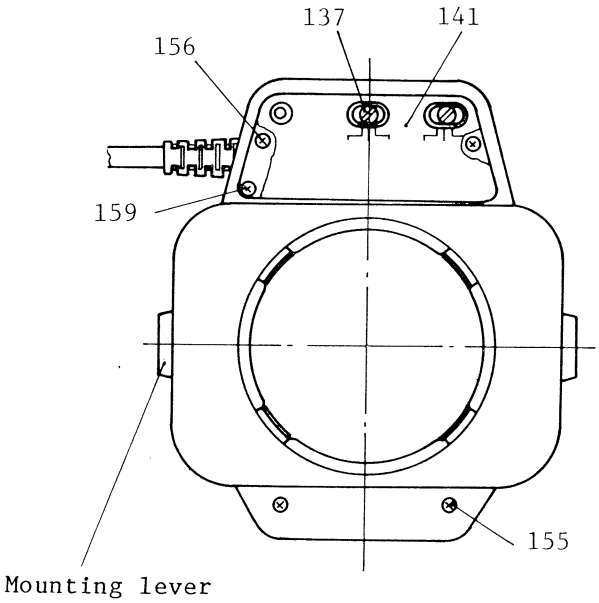
Light quantity integration circuit
This works both as a light quantity integration for outputting a stop signal in the manual mode and as an overexposure warning signal when using TTL flash control.

8. DISASSEMBLY PROCEDURE

Discharge the condenser as described below before disassembling the SB-21.

(1) Remove the 8-pin connector from the Controller, set the flash module selector (137) on L( ) and R( ) positions for ten or more seconds.
(2) Remove the operation panel (141), and unfasten two screws (156) and one screw (159).
(3) Unfasten two screws (155) as indicated in the figure.
(4) Remove the ring (148) on the rear of the unit.
(5) Now the diffusor (133) and name plate (132) can be removed.
(6) While lifting up the flash head, remove four screws (158) and two screws (157), and then baseplate M can be removed.

* During disassembly, the use of mounting levers facilitates the removal operation.



9. ADJUSTMENT PROCEDURE

SB-21
(Adjustement of VR1)
Purpose: Adjust manual light output level
Adjustment procedure:

After setting the power switch of the standard Controller to "M" and the flash module selector to the 2-light position, set the light output selector of the SB-21 to 1/16 (TTL). Place a flash meter at the distance of 1m and use a regulated power source (5.7V, 2A). Adjust the VR1 so that the guide number is within the range of 3.2 +0.6, -0.3 when fired. Make sure the flash guide number is within the range of 6.5 +1.2, -1.0 after setting the light output selector to the 1/4 position.

* The adjustment of VR1 can be carried out after removing the operation panel (141).

10. TROUBLESHOOTING

(Troubleshooting when using the internal power source is described below. Troubleshooting in combination with an external power source is discussed on page 35.)

* Be sure to repair both the SB-21 and AS-12 (or AS-14) together, when received from a customer. As for LA-2 and LD-2, repair should be made, including its power cord (SC-21).

CONTENTS

10. Faulty warning after shooting.
    10-1. Ready-light on the flash fails to stop blinking and oscillation fails to start.
    10-2. Warning duration is too short.
    10-3. Blinking frequency is incorrect.
    10-4. Warning is output after shooting in the M mode.
    10-5. Warning is output in the TTL mode, even if controlled at the correct TTL light level.
    10-6. Warning is not output, even if the flash fires at full output in the TTL mode.

11. When the power is turned on, the shutter speed does not automatically change to the flash synchronization speed.

12. Overexposure warning failure.
    12-1. Every time the flash is fired, the overexposure warning lights up (in the TTL mode).
    12-2. Every time the flash is fired, the overexposure warning fails to light up (in the TTL mode).
    12-3. Overexposure warning lights up in the M mode.
    12-4. Illumination duration is too long or too short.

13. When the power is turned on, the illuminator of the SB-21 lights up.

14. Failure of illuminator.
    14-1. Illuminator fails to light up.
    14-2. Once the illuminator lights up, it will not go out until the flash fires again.
    14-3. Illuminator lights up only while holding the switch.

15. Flash module cannot be selected.

16. TTL multiple flash failure (SB-21A only).
    16-1. All slave flashes fire at full output.
    16-2. Slave flash only fails to fire.

17. Diffusor of the SB-21 is deformed.

When using external power source LD-2 or LA-2

1. Normal condition.
2. The SB-21 does not fire even when an external power source is connected. (However, it works normally when not using an external power source.)
3. Oscillation does not stop even when an external power source is connected (with batteries loaded in the Controller).
4. The SB-21 does not work when an external power source is connected and the batteries in the Controller are removed.
5. Both illuminators do not light up. (One illuminator only lights up when batteries are loaded in the Controller.)

Notes on Troubleshooting

* Circuit voltage and part numbers in troubleshooting are indicated in the circuit diagram.
* The voltage or current value when a DC regulated power supply (5.7V) is used as a power source is indicated in troubleshooting or the circuit diagram.
* For instance, "Failure of Q1" means either that the transistor itself is faulty or poor soldering of transistors, or failure of soldering patterns, is present.
* Symbols appearing in this manual are for the SB-21A, while those in parenthesis are for the SB-21B. Parts symbols for the SB-21 are expressed as Rx or Cx. The same symbols are used in common for both SB-21A and SB-21B when no parenthesis are used.

When using batteries in the Controller.

1. Normal condition.
   The following phenomena are not problems:
   When the shutter dial of the FG, FE2, FA or Nikonos V is set to B, M90 or M250 and the flash mode selector of the SB-21 is set in TTL mode, the flash fires at full output. In these cases, the viewfinder ready-light always blinks.

2. Oscillation fails to start when the power switch is turned on.
   2-1. Illuminator lights up.
   (1) Failure of C1, Q1, C2, Q2, R1, R2, T1, or C3.
   (2) Failure of Pin(15) or (19) of U1(MB4411A), or failure of C21(C18), or R22(R21).
   (3) Failure of Q3 or R5.
   (4) It is hazardous if the voltage of pin ① of an external power source terminal exceeds 10V. Due to a leakage of printed circuit K on which an external power source terminal is mounted, oscillation fails to start. (Q3 safety circuit is being activated.)

   2-2. Illuminator fails to light up. (Also refer to 2-1.)
   (1) Battery polarity is reversed.
   (2) Battery contact springs are stained. (When corroded, replace the spring.)
   (3) Failure of the power switch.

3. Ready-light fails to light up.
   3-1. Both Controller and viewfinder ready-lights fail to light up (but oscillation sound is normal).
   (1) Failure of D1, L1, D2, or C4.
   (2) Failure of switch SW1.
   (3) Failure of R11, R7, R8, or Ne.
   (4) Failure of Ne lamp or pin ⑪ of U1, pin ⑫ (ready-light of the Controller), or pin ⑬ (camera viewfinder ready-light).

   3-2. Only the Controller ready-light fails to light up.
   (1) Failure of U1 (pin ⑫).
   (2) Failure of C23(C22), D14(D15), or R31(R33).

3-3. Only the viewfinder ready-light fails to light up.
(1) Failure of R29, R30 (R30, R31).
(2) Failure of shoe CRY terminal.
(3) Failure of L5, C30 (SB-21B only).
(4) Failure of Pin ⑬ of U1.

4. Flash fails to fire when shutter is released. Ready-light on flash blinks for 3 seconds after shutter is released in the TTL mode.
(1) Failure of pin ⑱ of U1.
(2) Failure of R44(R42), D22(D23), R45(R43), C29(C27), Q13(Q9), R35(R41), R34(R47), or Q15(Q6).
(3) Failure of R13, C11, R14, C9, or D7.
(4) Failure of R4, R5, C2, D6, R8, R9, C4, D7, D4, D5, D8, D9, R6, C3, T1, R7, C5, or T2 of SB-21.
(5) Failure of Xe1 or Xe2 of SB-21.
(6) Breakage of W1 or W2 of SB-21.
(7) Breakage of pins ①,④,⑤ lines of connector cord or the 8-pin connector.

5. Flash fires at full output in any flash mode.
(1) Failure of pin ⑯ of U1.
(2) Failure of R23(R34) or D16(D18).
(3) Failure of D4, R9, R10, C5, D5, C8, C7, R11, or R15.
(4) Sync contact of the camera may cause chattering when the closing shutter curtain closes. This can be found when the shutter speed is longer than one second, the flash will fire twice: once when the opening shutter curtain opens and again when the closing shutter curtain closes.

6. Flash output is insufficient in any flash mode.
(1) Failure of U1.
(2) Short circuit between the gate of D5 and other lands.
(3) Short circuit between pin ⑥ of U1 and GND.
(4) Failure of D4.

7. Faulty flash output in the TTL mode only.
7-1. Flash fires at full output in the TTL mode.
(1) Breakage of shoe contact IP line, or failure of L2, Q9, Q8, Q10, C18, R20, or U1. (Short circuit bewteen pin ㉒ and GND, or breakage of R21.) (SB-21A only.)
(2) Breakage of shoe contact CSTP line, or failure of R26, L4, C29, or U1. (Short circuit between pin ㉒ and GND, or breakage of R21.) (SB-21B only.)

7-2. Flash output is insufficient in the TTL mode.
(1) Refer to 6 ("Flash output is insufficient in any flash mode").

8. Faulty flash output in the M mode only.
8-1. Flash fires at full output in any light output setting.
(1) Breakage of lead wires (pin ⑤ line) in power cord connected to SB-21 or poor contact of pin ⑤ of 8-pin connector.
(2) Failure of R36(R45), Q4(Q10), R37(R44), or D16(D18).
(3) Failure of R11, R12, Q1, C6, Q2, R14, VR1, R13, D10, or C7 and C8 (SB-21).

8-2. Flash output is insufficient in any light output setting.
(1) Failure of C7, or C8 (SB-21).
(2) Poor adjustment of VR1 (SB-21).
(3) Failure of D10 (SB-21).

9. Faulty warning before shooting.

9-1. Viewfinder ready-light blinks in the TTL mode even though the settings on the camera are correct (at ISO 100).
(1) Failure of brush switch on the shoe connecting the emitter of Q6 and GND or failure of Q5, Q6, or U1 (SB-21A only).
(2) Failure of R25, C20, L3, or C28, or failure of shoe contact SP line (SB-21B only).
(3) Short circuit between R26, L4, C29, or pins ⑥ or ⑩ of U1 and GND (SB-21B only).

9-2. Warning fails to be given when exceeding the usable film speed range.
(1) Failure of switch connected between emitter of Q6 and GND or failure of U1 (SB-21A only).
(2) Breakage of shoe contact of CSTP line or failure of U1 (SB-21B only).
(3) Breakage of shoe contact of CRY line.

9-3. Warning fails to be given when shoe locking is incomplete (SB-21A only).
(1) Failure of brush switch connected between base of Q5 and GND.
(2) Failure of R27, Q5, or U1.

9-4. Blinking frequency is incorrect.
(1) Failure of C22(C21) or U1.
(2) Poor adjustment of VR3, failure of VR4 (ISO resistor), or failure of R46 or R25 (AS-12 only).

9-5. Warning is given in the M mode or shoe locking warning is not given for the AS-12.
(1) Failure of power switch or failure of brush switch connecting emitters of Q5 and Q6 with GND (SB-21A only).
(2) Failure of power switch, breakage of shoe contact SP line, or short circuit between CSTP line and GND (SB-21B only). Or short circit between pin⑩ of U1 and GND.

9-6. Camera/speedlight mismatch warning is given, even when TTL camera (FG, FA, FB2, F-301, F-501) is used (SB-21B only).
(1) Breakage of shoe contact SP line.

9-7. No (or intermittent) warning is given in the TTL mode even when the AS-14 is mounted on a non-TTL camera.
(1) Poor contact between GND spring of flash shoe and camera hot shoe, or breakage of lead wire W11.

10. Faulty warning after shooting.

10-1. Ready-light on flash fails to stop blinking and oscillation fails to start.
(1) Failure of pin ㉘ of U1 or pin ⑲ of U1.

10-2. Warning duration is too short.
(1) Failure of R22(R21) (low resistance).
(2) Failure of C21 (C18).
(3) Short circuit between pin ⑲ of U1 and other lands.

10-3. Blinking frequency is incorrect.
(1) Refer to 9-4.

10-4. Warning is output after shooting in the M mode.
(1) Failure of power switch.
(2) Failure of U1.

10-5. Warning is output in the TTL mode even if controlled at the correct TTL light level.
(1) Failure of C16(C14) or R19(R19).
(2) Poor soldering of C17(C15).
(3) Failure of U1.
(4) Too much chattering at sync contact in the camera.

10-6. Warning is not output even if flash fires at full output in the TTL mode.
(1) Short circuit between C20(C17) and Vcc, or between C21(C18) and other lands.
(2) Failure of U1.

11. When the power is turned on, the shutter speed does not automatically change to the flash synchronization speed.
(1) Failure of R4, D3, or R3.
(2) Failure of R29, or R30 (R30 or R31). (Viewfinder ready-light fails to light up.)
(3) Failure of L5 or C30 (SB-21B only). (Viewfinder ready-light fails to light up.)
(4) Failure of shoe contact or CRY line.

12. Overexposure warning failure.
12-1. Every time the flash is fired, the overexposure warning lights up (in the TTL mode).
(1) Failure of Q1, Q2, C7, D10, R13, VR1, R14, C6, R11, or R12 (SB-21).
(2) Failure of R36(R45) or D23(D24).
(3) Breakage of lead wires of Pin ⑥ line in power cord of SB-21.
(4) Failure of Q12, Q11, D15, or D23 (Q7, Q8, D18, or D24).

12-2. Every time the flash is fired, the overexposure warning fails to light up (in the TTL mode).
(1) Failure of Q8(Q5), D18(D22), C26(C25), C27(C24), Q12(Q8), Q11(Q7), R42(R39), R43(R40), D19(D17), R40(R37).
(2) Breakage of W20(W25). (Flash fires at full output.)

12-3. Overexposure warning lights up in the M mode.
(1) Failure of power switch.
(2) Poor soldering of D24(D21).

12-4. Illumination duration is too long or too short.
(1) Failure of C27(C24). (Capacity is incorrect.)

13. When the power is turned on, the illuminator of the SB-21 lights up.
(1) Failure of Q3 or U1 (SB-21). (Small, lower lamp only lights up.)
(2) Short circuit between pin ② of 8-pin connector and GND (SB-21). (Upper illuminator only lights up.)
(3) Failure of Q4, R17, or D10.

14. Failure of illuminator.
14-1. Illuminator fails to light up.
(1) Breakage of filament of illuminator 1 or illuminator 2 (SB-21). (Usually it is illuminator1.)
(2) Failure of Q3, R16, R1, U1, R19, R17, C10, or switch SW1.

14-2. Once the illuminator lights up, it will not go out until the flash fires again.
(1) Poor soldering of R17 (SB-21).

14-3. Illuminator lights up only while holding the switch.
(1) Poor soldering of C10 (SB-21).

15. Flash module cannot be selected.
(1) Failure of SW2 (SB-21).
(2) Failure of R10 (SB-21).

16. TTL multiple flash failure (SB-21A only).
16-1. All slave flashes fire at full output.
(1) Failure of slave flashes.
(2) Breakage of TTL cord SC-18 (SC-19) connecting the controller with slave flashes.
(3) Breakage of W29 or W31.
(4) Failure of C24 or Q7. (This may result in an insufficient amount of light for all slave flashes.)

16-2. Slave flash only fails to fire.
(1) Refer to (1) and (2) of 16-1.
(2) Breakage of W29 or W30.

17. Diffusor of SB-21 is deformed.
(1) Replace the lamp cover. Advise customers that the small lamp should not be used for a long period of time. (It is recommended to turn off the lamp for one minute, after each 5-minute period of continuous use.)

When using an external power source

1. Normal condition. (The following phenomena are not problems.)
   (1) When the external power source is on and internal power source is off, both small lamps light up for a specified period of time by a timer after the focus illuminator button is pressed. However, the lamps do not go out even if the shutter is released.

   (2) When the external power source is off, and the power switch of the Controller is on, or vice versa, the warning after shooting is given without firing, when the shutter is released in the TTL mode.

   (3) When the external power source is off, and the internal power source is on, the ready-light goes out but oscillation does not stop.

   (4) When turning off the external power source while both external and internal power sources are on, only one small lamp lights up. And when the external power source is turned on again, the lamp goes out. Then if you turn on the external power source once again, only one lamp lights up again.

   (5) When using the LD-2, without an internal power source, the warning after shooting may not work properly in the TTL mode. (The warning lamp becomes dark.)

2. The SB-21 does not fire even when the external power source is connected. (However, it works normally when not using an external power source).
   (1) Failure of switch SW1. (If the switching over sound is heard when moving the connector of the SC-21, the screw fastening the switch is loose.)
   (2) Failure of external power source or breakage of SC-21.

3. Oscillation does not stop even when an external power source is connected (with batteries loaded in the Controller).
   (1) Failure of Q1, Q3, R5, or R6.
   (2) Refer to (2) of 2.

4. The SB-21 does not work when an external power source is connected and the batteries in the Controller are removed.
   (1) Breakage of W2.
   (2) Failure of Q4, R17, or D10.
   (3) Failure of D8.

5. Both illuminators do not light up. (One illuminator only lights up when batteries are loaded in the Controller.).
   (1) Failure of illuminator 2 (SB-21).

Note: After completing repairs, make sure that no foreign matter, such as dust, is left inside the unit or that the GND lead wire is not broken. Also, check for breakage or poor contact in the GND lead wire of the power cord.

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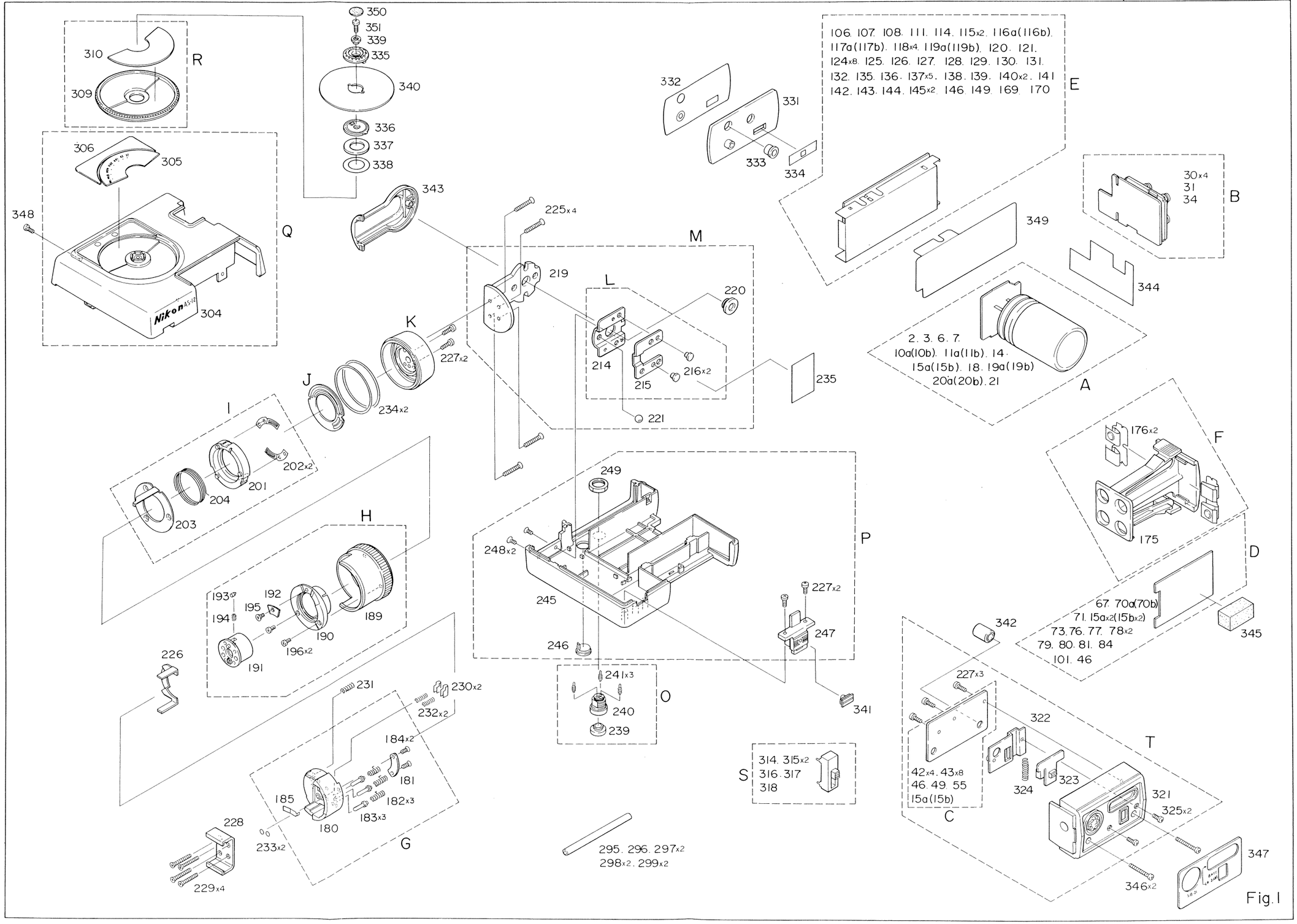
Controler AS-12

コントローラー AS-12


R
310
309
Q
306
305
348
304
Nikon AS-12
350
351
339
335
340
336
337
338
343
M
225x4
219
K
227x2
J
234x2
I
202x2
201
204
203
H
193
194
195
192
190
189
191
196x2
226
231
230x2
232x2
184x2
181
185
182x3
183x3
180
233x2
228
229x4
G
L
220
214
216x2
215
221
235
P
249
248x2
245
246
227x2
247
341
O
241x3
240
239
S
314. 315x2
316. 317
318
295. 296. 297x2
298x2. 299x2
332
331
333
334
E
106. 107. 108. 111. 114. 115x2. 116a(116b).
117a(117b). 118x4. 119a(119b). 120. 121.
124x8. 125. 126. 127. 128. 129. 130. 131.
132. 135. 136. 137x5. 138. 139. 140x2. 141
142. 143. 144. 145x2. 146. 149. 169. 170
349
344
30x4
31
34
B
2. 3. 6. 7.
10a(10b). 11a(11b). 14.
15a(15b). 18. 19a(19b)
20a(20b). 21
A
176x2
F
175
D
67. 70a(70b)
71. 15ax2(15bx2)
73. 76. 77. 78x2
79. 80. 81. 84
101. 46
345
342
227x3
322
T
42x4. 43x8
46. 49. 55
15a(15b)
C
324
323
321
325x2
347
346x2
Fig. I

2 部品表 Parts List (AS－12) FSW52701-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
1	L基板 Printed circuit L	1	A		△		
2	Lボビン Bobbin L	1	A	1	○△		5
3	絶縁板B Insulator B	1	A	1	○△		5
6	インダクター Inductor	1	A	1	○△	L	5
7	トリガーコイル Trigger coil EE-13	1	A	1	○△	T1	5
10a	トランジスタ Transistor 2SA1348	1	A, D	1	○△	Q1	5
10b	トランジスタ Transistor UK4110	1	A, D	1	○△	Q1	5
11a	トランジスタ Transistor 2SA1357Y	1	A	1	○△	Q2	5
11b	トランジスタ Transistor 2SA1120Y	1	A	1	○△	Q2	5
14	ダイオード Diode ESIF	1	A	1	○△	D1	5
15a	ダイオード Diode SR1FM-8	4	A, C	1	○△	D2, 6, 8, 25	5
15b	ダイオード Diode S5277G	4	A, C	1	○△	D2, 6, 8, 25	5
18	電解コンデンサ Condenser ECE TWMS6.3V47 μF	1	A	1	○△	C1	5
19a	セラミックコンデンサ Condenser DSSC70SJY5R223M	1	A	1	○△	C2	5
19b	セラミックコンデンサ Condenser AMZ223K	1	A	1	○△	C2	5
20a	セラミックコンデンサ Condenser HS80SJYB101K	1	A	1	○△	C3	5
20b	セラミックコンデンサ Condenser DE0405B101K2KV	1	A	1	○△	C3	5
21	電解コンデンサ Condenser ECF330V650μF	1	A	1	○△	C4	5

部品表 Parts List

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部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
24	固定抵抗器 15Ω Resistor	1	A		△	R1	
25	固定抵抗器 6.8KΩ Resistor	1	A		△	R2	
29	B基板 Printed circuit B	1	B		△		
30	BATバネ Spring	4	B	1	○△		5
31	BATバネ受け BAT spring retainer	1	B	1	○△		5
34	ダイオード MZ-310B Diode	1	B	1	○△	D3	5
37	固定抵抗器 1MΩ Resistor	1	B		△	R4	
38	固定抵抗器 200KΩ Resistor	1	B		△	R3	
41	K基板 Printed circuit M	1	C		△		
42	電源ピン Pin	4	C	1	○△		5
43	接点板 Contact plate	8	C	1	○△		5
46	トランジスタ 2SC2603F Transistor	2	C, D	1	○△	Q3, Q17	5
49	スイッチ SH-1 Switch	1	C	1	○△	SW1	5
55	フィルムコンデンサ WMTB-2A-225K Condenser	1	C	1	○△	C7	5
58	固定抵抗器 680KΩ Resistor	1	C		△	R5	
59	固定抵抗器 15K Ω Resistor	1	C		△	R6	
64	M基板 Printed circuit M	1	D		△		
67	ネオンランプ NL-8SD Ne lamp	1	D	1	○△	Ne	5

部 品 表 Parts List

FSW52701-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
70a	ダイオード Diode 1S1588	1	D	1	○△	D4	5
70b	ダイオード Diode DS442	1	D	1	○△	D4	5
71	ダイオード Diode CR3CM-8	1	D	1	○△	D5	5
73	ダイオード Diode CR3JM-8	1	D	1	○△	D7	5
76	セラミックコンデンサ Condenser DN1V010KIS	1	D	1	○△	C30	5
77	セラミックコンデンサ Condenser MKH250V 0.01μF	1	D	1	○△	C5	5
78	セラミックコンデンサ Condenser MKH250V 0.047 μF	2	D	1	○△	C9, C10	5
79	フィルムコンデンサ Condenser WMTB-2A-225K	1	D	1	○△	C8	5
80	セラミックコンデンサ Condenser SC45F1H103Z	1	D	1	○△	C11	5
81	フィルムコンデンサ Condenser B32520-A3 473K	1	D	1	○△	C6	5
84	半固定抵抗器 Variable resistor EVNB1A00B55	1	D	1	○△	VR1	5
87	固定抵抗器（マンガニン線） Resistor φ0.6x41	1	D		△	R16	
88	固定抵抗器 Resistor 1.2MΩ	1	D		△	R7	
89	固定抵抗器 Resistor 330KΩ	1	D		△	R8	
90	固定抵抗器 Resistor 330 Ω	1	D		△	R9	
91	固定抵抗器 Resistor 680 Ω	1	D		△	R10	
92	固定抵抗器 Resistor 22K ΩJ	1	D		△	R11	
93	固定抵抗器 Resistor 1KΩ	2	D		△	R12, R13	

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
94	固定抵抗器 Resistor 22Ω	1	D		△	R14	
95	固定抵抗器 Resistor 15K ΩJ	1	D		△	R15	
96	固定抵抗器 Resistor 220 Ω	1	D		△	R48	
97	固定抵抗器 Resistor 47Ω	1	D		△	R49	
98	固定抵抗器 Resistor 10K Ω	1	D		△	R50	
101	トランジスタ Transistor UN4214	1	D	1	○△	Q16	5
106	C基板 Printed circuit C	1	E	1	△		
107	OPバネ Spring	1	E	1	○△		5
108	シールドケース Shield case	1	E	1	○△		5
111	IC MB4411A	1	E	1	○△	U1	5
114	トランジスタ Transistor 2SD999-T1	1	E	1	○△	Q4	5
115	トランジスタ Transistor 2SC1623T1BL6	2	E	1	○△	Q5, Q13	5
116a	トランジスタ Transistor DTC144WKT96	1	E	1	○△	Q6	5
116b	トランジスタ Transistor DTC144wk	1	E	1	○△	Q6	5
117a	トランジスタ Transistor DTC143XKT96	1	E	1	○△	Q7	5
117b	トランジスタ Transistor DTC143XK	1	E	1	○△	Q7	5
118	トランジスタ Transistor UN2211TX	4	E	1	○△	Q8, Q10, Q12, Q14	5
119a	トランジスタ Transistor 2SC3064FDP6B	1	E	1	○△	Q9	5

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
119b	トランジスタ Transistor 2SC3064GDP6B	1	E	1	○△	Q9	5
120	トランジスタ Transistor 2SA812T1B	1	E	1	○△	Q11	5
121	トランジスタ Transistor 2SB798-J1	1	E	1	○△	Q15	5
124	ダイオード Diode MA151KTX	8	E	1	○△	D9, D11, D17, D18, D20 D21, D23, D24	5
125	ダイオード Diode MA3056-TX	1	E	1	○△	D10	5
126	ダイオード Diode MA292TW	1	E	1	○△	D12	5
127	ダイオード Diode MA3091-MTX	1	E	1	○△	D13	5
128	ダイオード Diode SLP135	1	E	1	○△	D14	5
129	ダイオード Diode MA151WATX	1	E	1	○△	D15	5
130	ダイオード Diode MA151WKTX	1	E	1	○△	D16	5
131	ダイオード Diode SLP435B	1	E	1	○△	D19	5
132	ダイオード Diode MA152KTX	1	E	1	○△	D22	5
135	電解コンデンサ Condenser ECETTMS6.3V 470 μF	1	E	1	○△	C12	5
136	セラミックコンデンサ Ceramic condenser GR42-6SL680K50PT	1	E	1	○△	C13	5
137	セラミックコンデンサ Condenser GR42-6B103K50PT	5	E	1	○△	C14, C15, C17, C19, C29	5
138	タンタルコンデンサ Condenser TESVA1V334M1-8R	1	E	1	○△	C16	5
139	セラミックコンデンサ Condenser GR42-6SL472J50PT	1	E	1	○△	C18	5
140	セラミックコンデンサ Condenser GR42-6B102K50PT	2	E	1	○△	C20, C23	5

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
141	タンタルコンデンサ Condenser DN1A3R3K1S	1	E	1	○△	C21	5
142	タンタルコンデンサ Condenser TESVA0G335M1-8R	1	E	1	○△	C22	5
143	セラミックコンデンサ Condenser GR42-6B472K50PT	1	E	1	○△	C24	5
144	タンタルコンデンサ Condenser DN1A4R7K1S	1	E	1	○△	C27	5
145	セラミックコンデンサ Condenser GR42-6B473K50PT	2	E	1	○△	C25, C26	5
146	セラミックコンデンサ Condenser GR42-6SL101K50PT	1	E	1	○△	C28	5
149	コイル Coil 1R0K	1	E	1	○△	L2	5
152	固定抵抗器 Resistor 102J16	6	E		△	R17, R20, R28, R32, R35 R37	
153	固定抵抗器 Resistor 105J16	1	E		△	R18	
154	固定抵抗器 Resistor 104J16	2	E		△	R19, R38	
155	固定抵抗器 Resistor 103J16	1	E		△	R21	
156	固定抵抗器 Resistor 684J16	1	E		△	R22	
157	固定抵抗器 Resistor 101J16	1	E		△	R23	
158	固定抵抗器 Resistor 333J16	2	E		△	R24, R46	
159	固定抵抗器 Resistor 223J16	3	E		△	R25, R27, R33	
160	固定抵抗器 Resistor 681J16	1	E		△	R26	
162	固定抵抗器 Resistor 30J16	2	E		△	R29, R30	
163	固定抵抗器 Resistor 331J16	2	E		△	R31, R40	

部 品 表 Parts List

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部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
164	固定抵抗器 222J16 Resistor	6	E		△	R34, R36, R39, R43, R44 R45	
165	固定抵抗器 224J16 Resistor	2	E		△	R41, R42	
166	固定抵抗器 475K16 Resistor	1	E		△	R47	
169	半固定抵抗器 4.7K Varuiable resistor	1	E	1	○△	VR2	5
170	半固定抵抗器 2.2K Varuiable resistor	1	E	1	○△	VR3	5
175	BATカートリッジ Battery clip	1	F	1	○△		5
176	BATバネ BAT spring	2	F	1	○△		5
180	足 枠 Base	1	G	1	○△		5
181	バネ押さえ Spring holder	1	G	1	○△		5
182	接点バネ Spring	3	G	1	○△		5
183	接点ピン Contact pin	3	G	1	○△		5
184	Screw M1.7x4	2	G	1	○△		5
185	足接片 Foot contact blade	1	G	1	○△		5
189	外リングN Outer ring N	1	H	1	○△		5
190	カムリングN Cam ring N	1	H	1	○△		5
191	取りつけ軸N Base N	1	H	1	○△		5
192	接片N Contact blade N	1	H	1	○△		5
193	コ ロ Roller	1	H	1	○△		5

部品表 Parts List

FSW52701-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
194	クリックSW Click SW	1	H	1	○△		5
195	Screw M1.7x3	1	H	1	○△		5
196	Screw M1.7x2.5	2	H	1	○△		5
201	連動リング Coupling ring	1	I	1	○△		5
202	摺動SP Sleeve spring	2	I	1	○△		5
203	連動爪 Coupling claw	1	I	1	○△		5
204	戻しバネ Spring	1	I	1	○△		5
207	VR基板 Printed circut VR	1	G	1	○△		5
210	基板台 Base mount	1	K	1	○△		5
214	足取りつけ板 Foot cover plate	1	L	1	○△		5
215	足板バネ Foot spring	1	L	1	○△		5
216	薄平リベット Rievet	2	L	1	○△		5
219	足 板 B Foot plate B	1	M	1	○△		5
220	足止め軸 Axle	1	M	1	○△		5
221	スチールボール φ4 Steel ball	1	M	1	○△		5
225	Screw M2x12	4	N	1	○△		5
226	押さえ金 Retainer	1	N	1	○△		5
227	Screw M2x6	7	N, P, T	1	○△		5

部品表 Parts List

FSW52701-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
228	足 Mounting foot	1	N	1	○△		5
229	Screw M2x14	4	N	1	○△		5
230	接点N Contact N	2	N	1	○△		5
231	戻しバネ Spring	1	N	1	○△		5
232	接点バネN Contact spring	2	N	1	○△		5
233	絶縁板 Insulator	1	N	1	○△		5
234	Washer t=0.2	2	N	1	○△		10
235	GCテープ Tape 19x28	1	N	1	△		
239	ソケット口金 Socket	1	0	1	○△		5
240	3Pソケット 3Psocket	1	0	1	○△		5
241	ソケット接点ピン Pin socket	3	0	1	○△		5
245	ケースL Flash head (lower)	1	P	1	○△		1
246	化粧板C Cover plate C	1	P	1	○△		5
247	SPDケース SPD case	1	P	1	○△		1
248	Screw M2x3	2	P	1	○△		5
249	M7ナット Nut	1	P	1	○△		5
255	Lead wire (orange) l=60	1			×	W-00800R	
256	Lead wire (blue) l=270	1			×	W-0080BE	

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
257	Lead wire (red) l=140	1			×	W-0120RE	
258	Lead wire (grey) l=95	1			×	W-0120GY	
259	Lead wire (grey) l=60	1			×	W-0080GY	
260	Lead wire (white) l=170	1			×	W-0080WH	
261	Lead wire (black)	1			×	W-0120BK	
262	Lead wire (grey) l=130	1			×	W-0080GY	
263	Lead wire (red) l=100	1			×	W-0080RE	
264	Lead wire (brown) l=210	1			×	W-0080BN	
265	Lead wire (green) l=200	1			×	W-0080GN	
266	Lead wire (brown) l=85	1			×	W-0080BN	
267	Lead wire (black) l=230	1			×	W-0080BK	
268	Lead wire (red) l=85	1			×	W-0080RE	
269	Lead wire (black) l=85	1			×	W-0080BK	
270	Lead wire (black) l=140	1			×	W-0120BK	
271	Lead wire (red) l=35	1			×	W-0120RE	
272	Lead wire (green) l=185	1			×	W-0120GN	
273	Lead wire (brown) l=125	1			×	W-0120BN	
274	Lead wire (purple) l=185	1			×	W-0080PU	

部 品 表 Parts List

FSW52701-R. 3200. A

部品番号 Part No	名 称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備 考 Remarks	要求単位 Q'ty per order
275	Lead wire (white) l=115	1			×	W-0120WH	
276	Lead wire (gray) l=180	1			×	W-0080GY	
277	Lead wire (black) l=160	1			×	W-0080BK	
278	Lead wire (orange) l=130	1			×	W-0080OR	
279	Lead wire (white) l=150	1			×	W-0080WH	
280	Lead wire (yellow) l=170	1			×	W-0080YE	
281	Lead wire (purple) l=155	1			×	W-0080PU	
282	Lead wire (blue) l=195	1			×	W-0080BE	
283	Lead wire (gray) l=40	1			×	W-0080GY	
284	Lead wire (yellow) l=55	1			×	W-0080YE	
285	Lead wire (black) l=50	1			×	W-0080BK	
286	Lead wire (green) l=150	1			×	W-0080GN	
287	Lead wire (brown) l=180	1			×	W-0080BN	
288	Lead wire (black) l=70	1			×	W-0080BK	
289	Lead wire (orange) l=135	1			×	W-0080OR	
290	Lead wire (yellow) l=225	1			×	W-0080YE	
295	ビニールチューブ Tube φ15x30	1			○	PT1	5
296	Si チューブ Tube φ1x35	1			○		5

部品表 Parts List

FSW5270I-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
297	ビニールチューブ φ5x5 Tube	2		1	○	PT3, PT4	5
298	Iチューブ φ1x10x0.3 Tube	2		1	○	PT5, PT6	5
299	Iチューブ φ1x14 Tube	2		1	○	PT7, PT8	5
304	ケースU Flash head (upper)	1	Q	1	○△		5
305	A銘板 Name plate A	1	Q	1	○△		5
306	B銘板 Name plate B	1	Q	1	○△		5
309	GN枠 GN dial frame	1	R	1	○△		5
310	F銘板 Name plate F	1	R	1	○△		5
314	ツマミC Setting knob C	1	S	1	○△		5
315	SW接点バネ Switch contact spring	2	S	1	○△		5
316	SWフレームB SW frme B	1	S	1	○△		5
317	SWクリックバネB SW click spring B	1	S	1	○△		5
318	ステンボール φ2 Stn ball	1	S	1	○△		5
321	カバーパネル Cover diffuser	1	T	1	○△		5
322	押さえ板 Holder plate	1	T	1	○△		5
323	スライドツマミ Slide setting knob	1	T	1	○△		5
324	スライドバネ Slide spring	1	T	1	○△		5
325	Screw M2x4	2	T	1	○△		5

部品表 Parts List

FSW52701-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
331	リアパネル Rear diffuser	1		1	○		5
332	リア銘板 Rear name plate	1		1	○		5
333	ＯＰ釦 Open flash button	1		1	○		5
334	メクラ銘板 Cover plate	1		1	○		5
335	切り換えツマミ Auto mode selector	1		1	○		5
336	固定板 Washer	1		1	○		5
337	Washer M t=2	1		1	○		5
338	Washer A t=0.188	1		1	○		5
339	軸 Axle	1		1	○		5
340	ＧＮ板 GN dial	1		1	○		5
341	化粧板 Cover plate A	1		1	○		5
342	スペーサー Spacer	1		1	○		5
343	足カバー Mounting foot cover	1		1	○		1
344	絶縁板Ｄ Insulator D	1		1	○		5
345	モルトプレン 10x20x10 Sponge strip	1		1	○		5
346	Screw M2x18	2		1	○		5
347	パネル銘板 Cover name plate	1		1	○		5
348	Screw M2x3	1		1	○		5

部 品 表 Parts List

RSW52701−R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
349	絶縁板TC Insulator TC	1		1	○		5
350	化粧板 Cover plate	1		1	○		5
351	Screw M2x7	1		1	○		5

部組品表 Subassembly List

FSW52701-R. 3200. 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.	備考 Remarks	要求単位 Q'ty per order
A	Lプリント基板 Unit, PCB(L)	1	1, 2, 3, 6, 7, 10a(10b) 11a(11b), 14, 15a(15b) 18, 19a(19b), 20a(20b) 21, 24, 25	1		1
B	BAT基板部 Battery contact	1	29, 30x4, 31, 34, 37, 38	1		5
C	Kプリント基板 Unit, PCB(K)	1	41, 42x4, 43x8, 46, 49 15a(15b), 55, 58, 59	1		1
D	Mプリント基板 Unit, PCB(M)	1	64, 67, 70a(70b), 71 15ax2(15bx2), 73, 76, 77 78x2, 79, 80, 81, 84, 87 88, 89, 90, 91, 92, 93x2 94, 95, 96, 97, 98, 101 46	1		1
E	Cプリント基板 Unit, PCB(C)	1	106, 107, 108, 111, 114 115x2, 116a(116b) 117a(117b), 118, 119a(119b), 120, 121 124x8, 125, 126, 127, 128, 129, 130, 131, 132 135, 136, 137x5, 138 139, 140x2, 141, 142, 143, 144, 145x2, 146 149, 152x6, 153, 154x2 155, 156, 157, 158x2 160, 159x3, 162x2 163x2, 164x6, 165x2, 166 169, 170	1		1
F	BATカートリッジ部 Battery clip	1	175, 176x2	1		5
G	足枠部 Unit base	1	180, 181, 182x3, 183x3 184x2, 185	1		1
H	外リング部 Outer ring	1	189, 190, 191, 192, 193 194, 195, 196x2	1		1
I	連動リング部 Coupling ring	1	201, 202x2, 203, 204	1		1
J	VR基板 VR unit	1	207	1		5
K	基板台 Base unit	1	210	1		5
L	足取りつけ板部 Foot plate	1	214, 215, 216x2	1		1
M	足板部 Foot plate	1	219, 220, 221	1		1
N	連動足部 Foot interlock unit	1	225x4, 226, 227x2, 228 229x4, 230x2, 231, 232x2 233, 234x2, 235	1		1

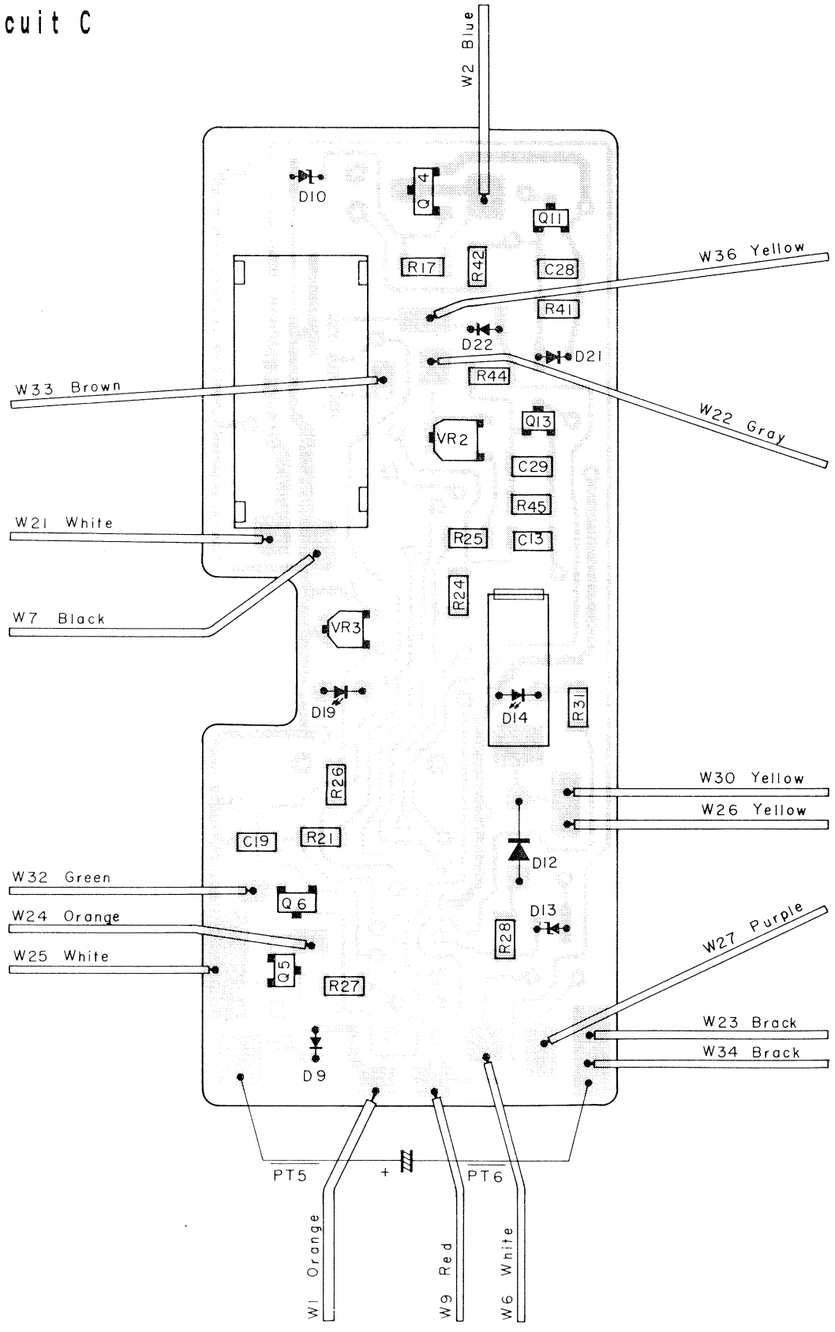
部組品表 Subassembly List

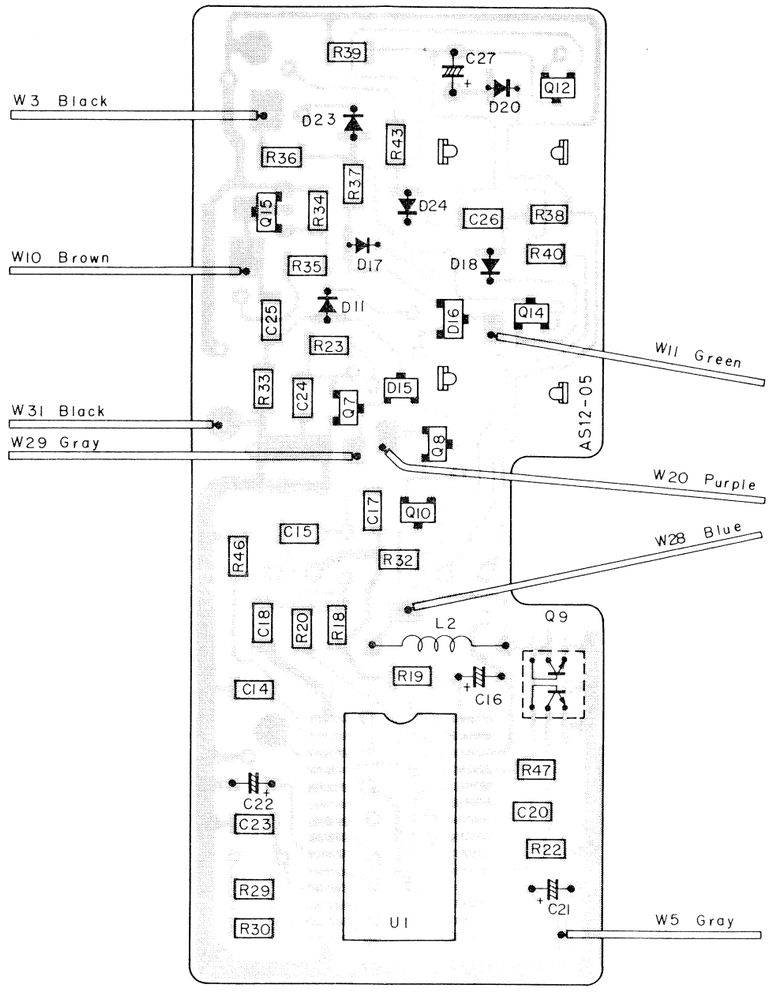
FSW52701−R. 3200. A

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.	備考 Remarks	要求単位 Q'ty per order
O	3Pソケット部 3P socket	1	239, 240, 241x3	1		5
P	ケースL L case	1	245, 246, 247, 248x2 249, 227x2	1		1
Q	ケースU U case	1	304, 305, 306	1		1
R	GN枠部 GN dial frame	1	309, 310	1		5
S	ツマミB部 Setting knob	1	314, 315x2, 316, 317 318	1		5
T	カバーパネル Cover diffuser	1	321, 322, 323, 324 325x2, 227X3	1		1

C基板

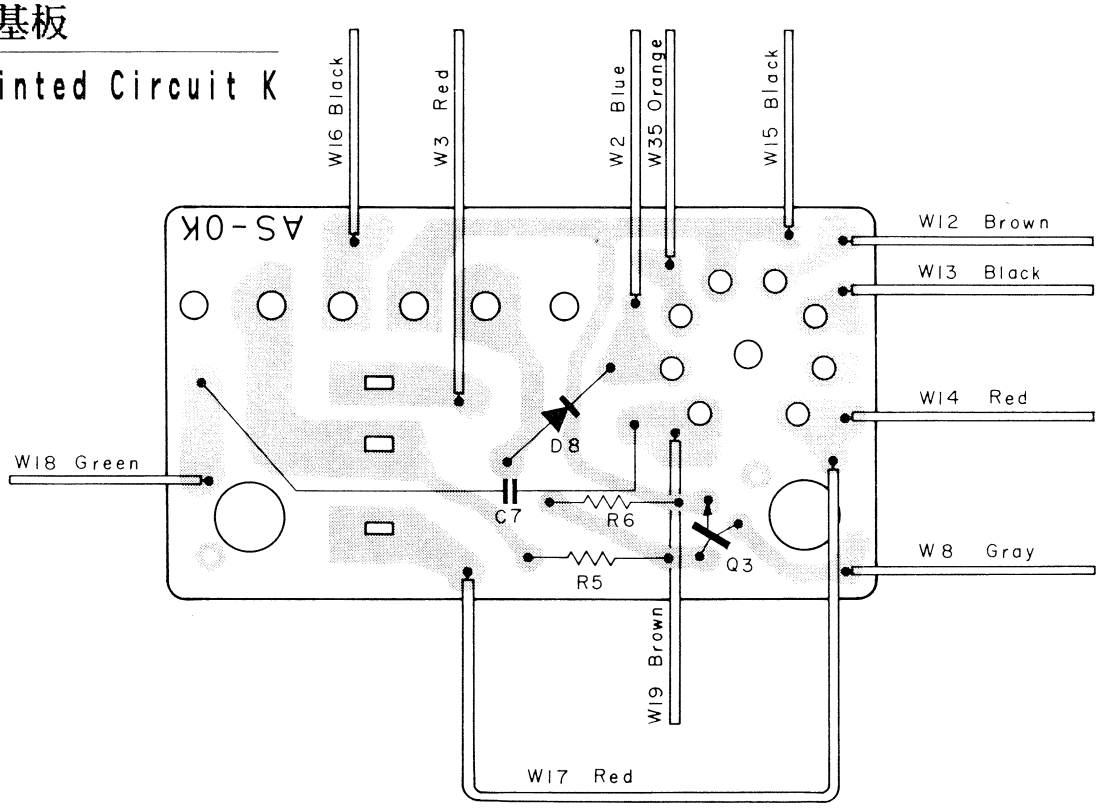
Printed Circuit C





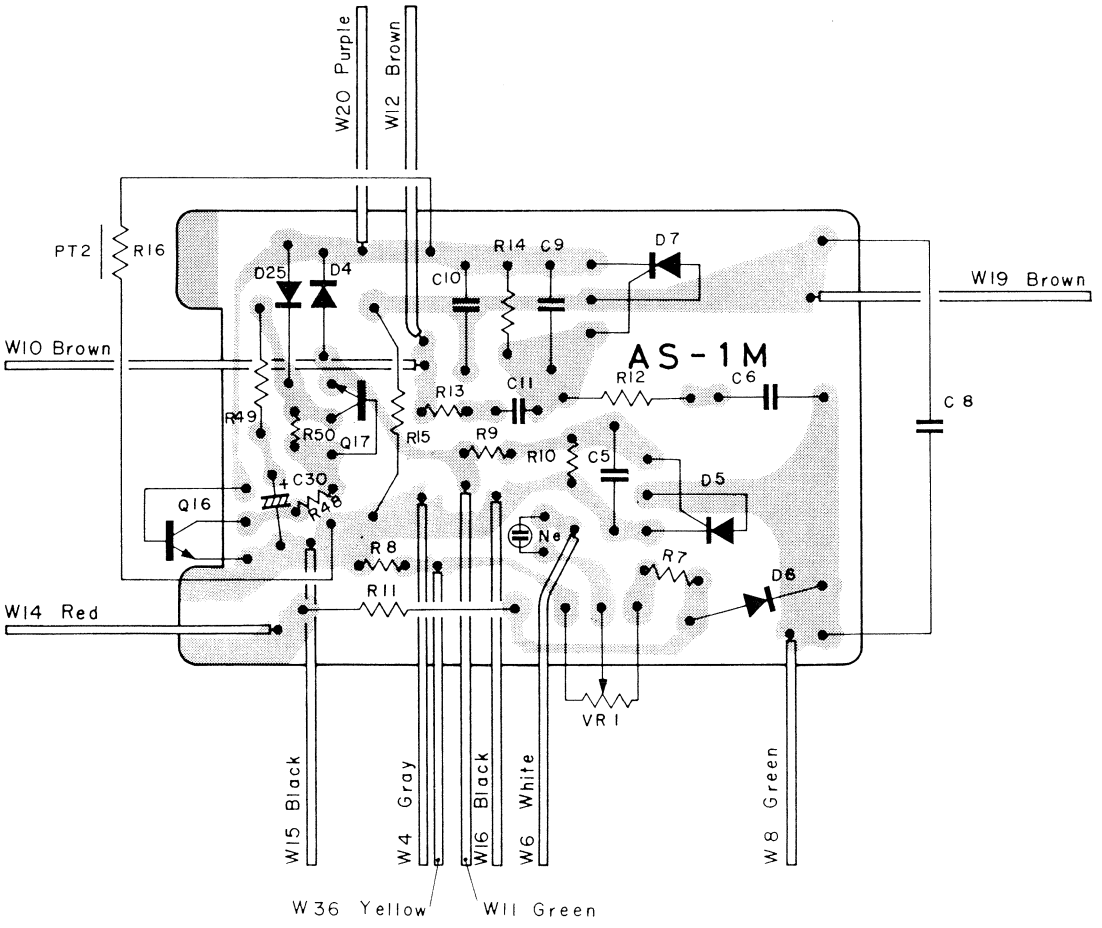
K基板

Printed Circuit K



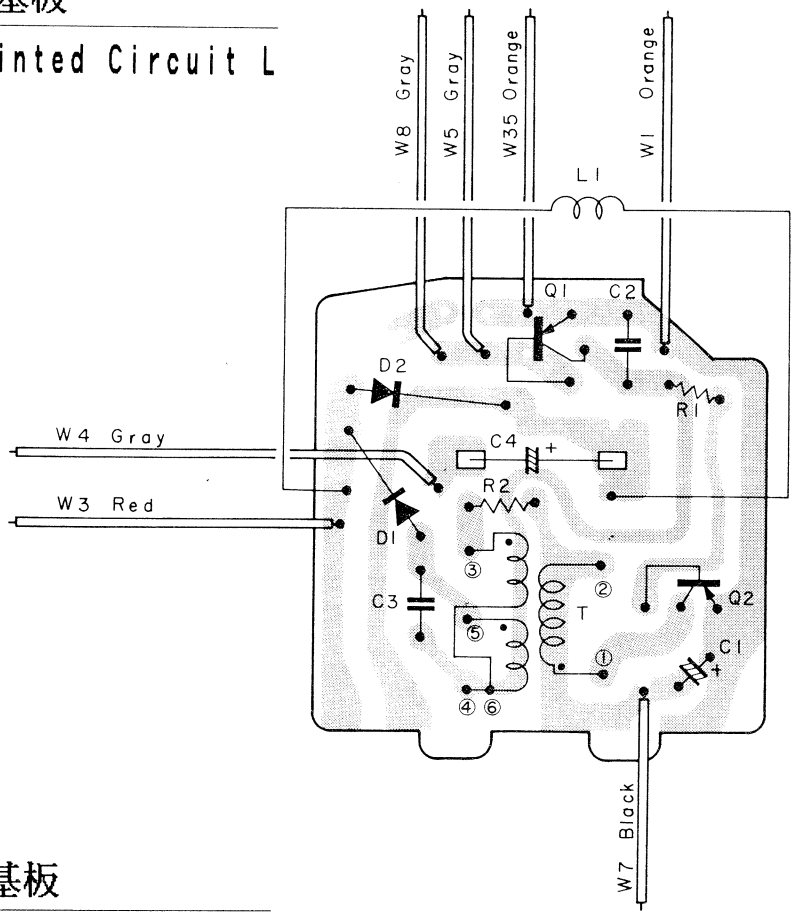
M基板

Printed Circuit M



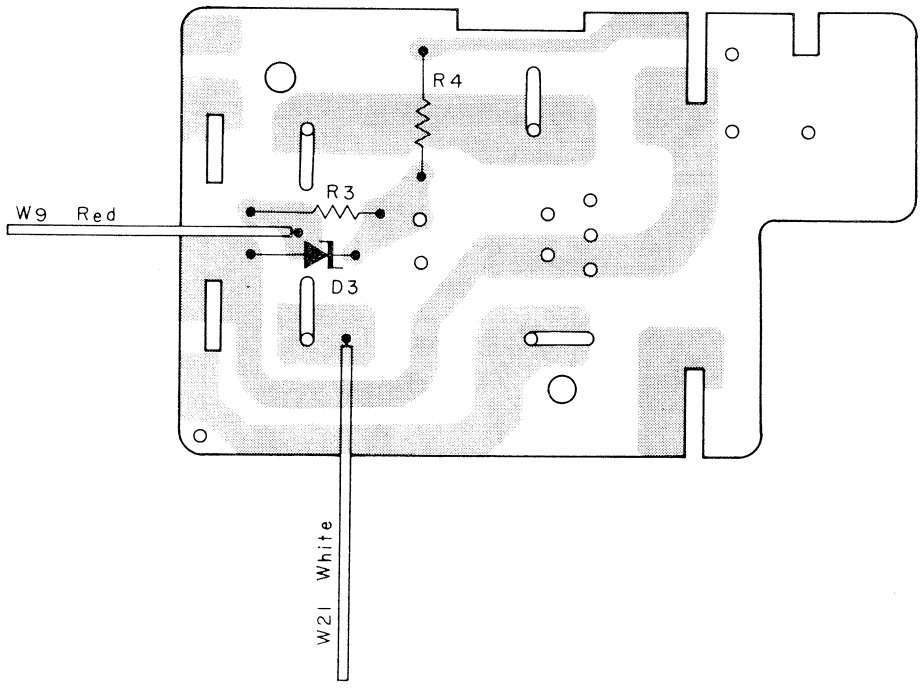
L基板

Printed Circuit L

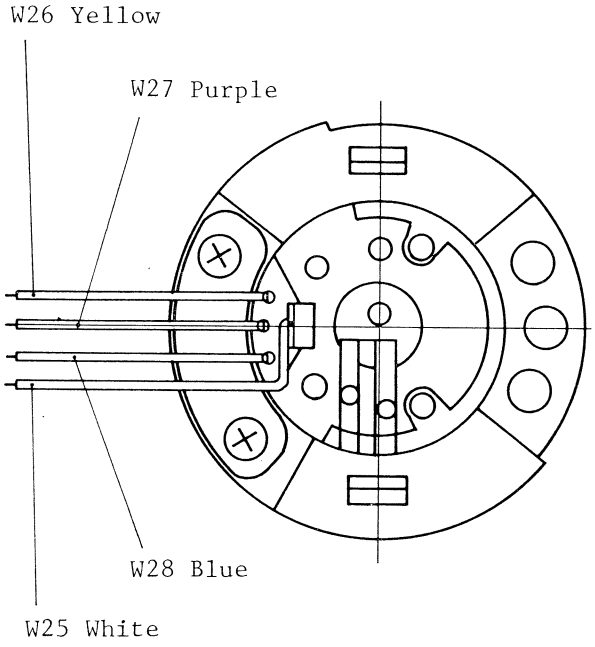


B基板

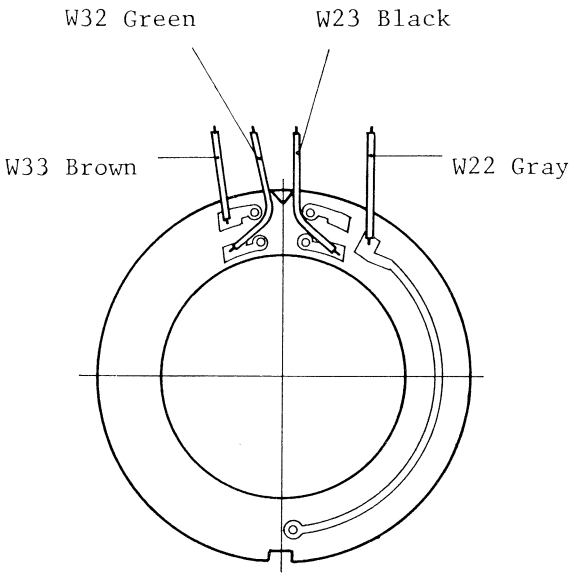
Printed Circuit B



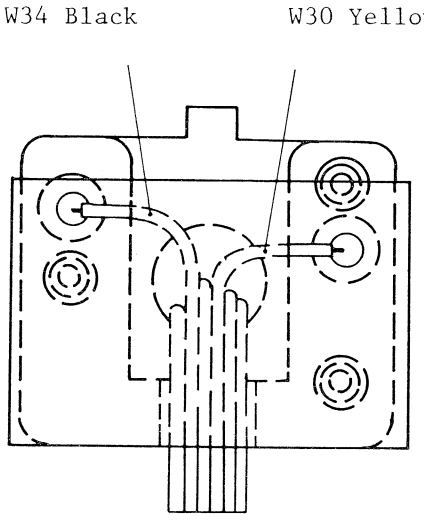
脚枠部
Unit Base



ＶＲ基板
VR unit



連動脚部
Coupling Foot



電子部品対照表

(Circuitry Parts Reference Table)

回路番号 Circuit No.	部品番号 Part No.	備考 Remarks	回路番号 Circuit No.	部品番号 Part No.	備考 Remarks
R1	24	15Ω	R35	152	1KΩ
R2	25	6.8KΩ	R36	164	2.2KΩ
R3	38	200KΩ	R37	152	1KΩ
R4	37	1MΩ	R38	154	100KΩ
R5	58	680KΩ	R39	164	2.2KΩ
R6	59	15K Ω	R40	163	330 Ω
R7	88	1.2MΩ	R41	165	220KΩ
R8	89	330KΩ	R42	165	220KΩ
R9	90	330 Ω	R43	164	2.2KΩ
R10	91	680 Ω	R44	164	2.2KΩ
R11	92	22K Ω	R45	164	2.2KΩ
R12	93	1KΩ	R46	158	33K Ω
R13	93	1KΩ	R47	166	4.7MΩ
R14	94	22Ω	R48	96	220 Ω
R15	95	15K Ω	R49	97	47Ω
R16	87	ﾏﾝｶﾞﾆﾝ 線 φ0.6x41 Manganin wire	R50	98	10K Ω
R17	152	1KΩ	C1	18	6.3V, 4.7 μF
R18	153	1MΩ	C2	19a, 19b	50V, 0.022μF
R19	154	100KΩ	C3	20a, 20b	2000V, 100PF
R20	152	1KΩ	C4	21	330V, 650 μF
R21	155	10K Ω	C5	77	250V, 0.01μF
R22	156	680KΩ	C6	81	250V, 0.047 μF
R23	157	100 Ω	C7	55	100V, 2.2 μF
R24	158	33K Ω	C8	79	100V, 2.2 μF
R25	159	22K Ω	C9	78	250V, 0.047 μF
R26	160	680 Ω	C10	78	250V, 0.047 μF
R27	159	22K Ω	C11	80	50V, 0.01 μF
R28	152	1KΩ	C12	135	6.3V, 470 μF
R29	162	300 Ω	C13	136	50V, 68PF
R30	162	300 Ω	C14	137	50V, 0.01 μF
R31	163	330 Ω	C15	137	50V, 0.01 μF
R32	152	1KΩ	C16	138	35V, 0.33 μF
R33	159	22K Ω	C17	137	50V, 0.01 μF
R34	164	2.2KΩ	C18	139	50V, 0.0047 μF

電子部品対照表
(Circuitry Parts Reference Table)

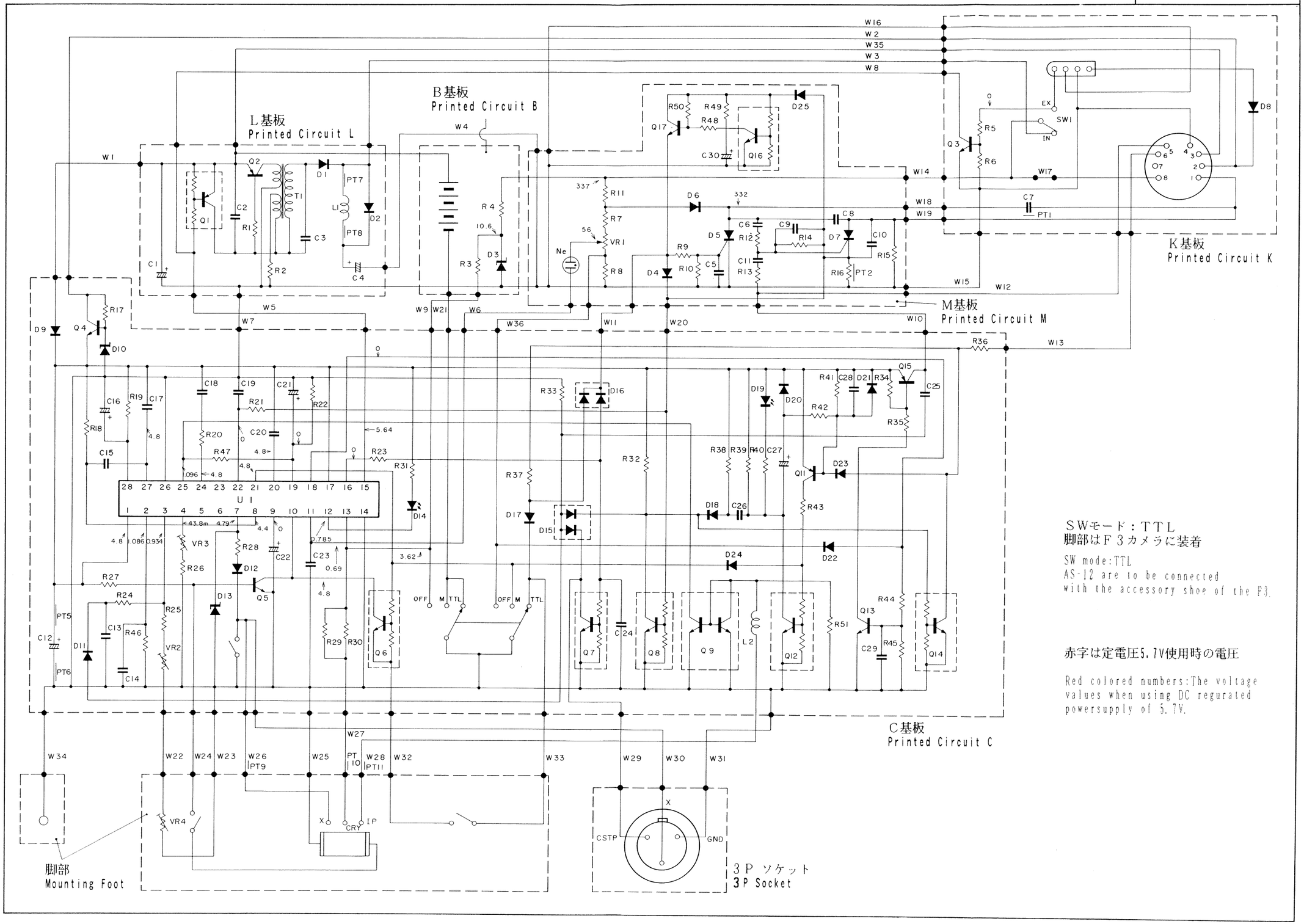
回路番号 Circuit No.	部品番号 Part No.	備考 Remarks	回路番号 Circuit No.	部品番号 Part No.	備考 Remarks
C19	137	50V, 0.01 μF	D1	14	ESIF
C20	140	50V, 1000PF	D2	15a, 15b	SR1FM-8 or S5277G
C21	141	10V, 3.3μF	D3	34	MZ-310B
C22	142	4V, 3.3 μF	D4	70a, 70b	1S1588 or DS442
C23	140	50V, 1000PF	D5	71	CR3CM-8
C24	143	50V, 0.0047 μF	D6	15a, 15b	SR1FM-8 or S5277G
C25	145	50V, 0.047μF	D7	73	CR3JM-8
C26	145	50V, 0.047μF	D8	15a, 15b	SR1FM-8 or S5277G
C27	144	10V, 4.7μF	D9	124	MA151K
C28	146	50V, 100PF	D10	125	MA3056
C29	137	50V, 0.01 μF	D11	124	MA151K
C30	76	35V, 1μF	D12	126	MA292
			D13	127	MA3091-M
			D14	128	SLP135B
Q1	10a, 10b	2SA1348 or UN4110	D15	129	MA151WA
Q2	11a, 11b	2SA1357Y or 2SA1120Y	D16	130	MA151WK
Q3	46	2SC2603F	D17	124	MA151K
Q4	114	2SD999	D18	124	MA151K
Q5	115	2SC1623	D19	131	SLP435B
Q6	116a	DTC144WKT96 or	D20	124	MA151K
	116b	DTC144WK	D21	124	MA151K
Q7	117a	DTC143XKT96 or	D22	132	MA152K
	117b	DTC143XK	D23	124	MA151K
Q8	118	UN2211	D24	124	MA151K
Q9	119a	2SC3064FDP6B or	D25	15a, 15b	SR1FM-8 or S5277G
	119b	2SC3064GDP6B			
Q10	118	UN2211			
Q11	120	2SA812	L	6	インダクター
Q12	118	UN2211	L2	149	SP0305IROK
Q13	115	2SC1623			
Q14	118	UN2211	SW1	49	SH-1
Q15	121	2SB798			
Q16	101	UN4214			
Q17	46	2SC2603F	U1	111	MB4411A

電子部品対照表

(Circuitry Parts Reference Table)

回路番号 Circuit No.	部品番号 Part No.	備　考 Remarks	回路番号 Circuit No.	部品番号 Part No.	備　考 Remarks
PT1	295	φ15x30			
PT2	296	φ1x35			
PT3	297	φ5x5			
PT4	297	φ5x5			
PT5	298	φ1x10x0.3			
PT6	298	φ1x10x0.3			
PT7	299	φ1x14			
PT8	299	φ1x14			
VR1	84	EVNB1A00B55(500KΩ)			
VR2	169	H042CAX-4.7K			
VR3	170	H042CAX-2.2K			
Ne	67	NL-8SD			
T1	7	EE-13			

FSW52701-R.3200.A



SWモード：TTL
脚部はF3カメラに装着

SW mode:TTL
AS-12 are to be connected
with the accessory shoe of the F3.

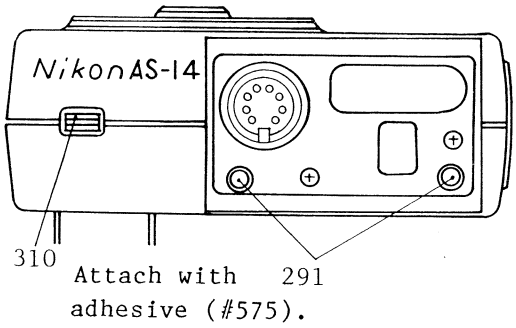
赤字は定電圧5.7V使用時の電圧

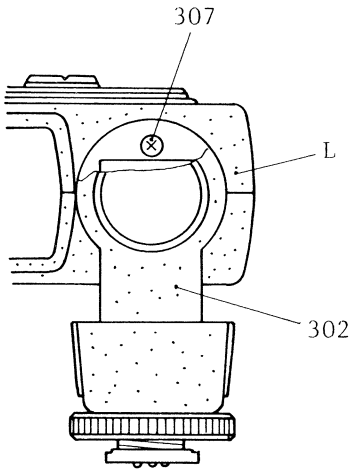
Red colored numbers:The voltage values when using DC regurated powersupply of 5.7V.

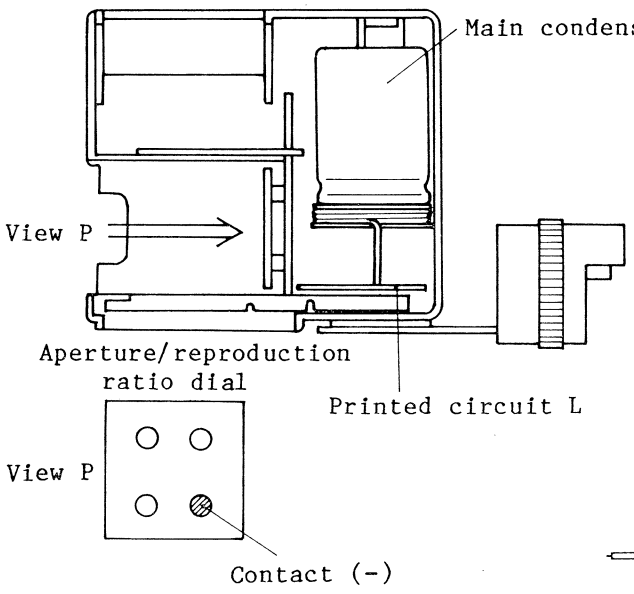
6. DISASSEMBLY PROCEDURE (AS-12, AS-14)

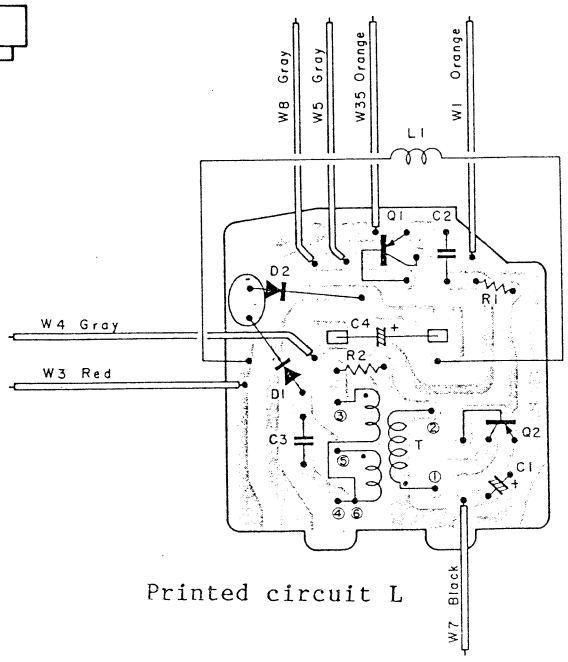
* When disassembling the above two units, refer to the AS-14 for part numbers, athough the procedure is the same for both.

(1) Disassemble the battery chamber.
(2) Remove the front name plate (309).
(3) Remove the two screws (291) on the operation panel.
(4) Remove the cover plate A (310).
(5) Remove the foot cover (302) and screw (307).
(6) Disassemble the case U (L).
(7) Discharge the condenser.
Set the power switch to either the M or TTL mode. The condenser will not discharge while the switch is off. Then connect the battery contact (-) and the pin of the diode (encircled part) on printed circuit L with the discharge resistor (200-1kΩ, 5W or more) and wait more than 10 seconds.









Printed circuit L

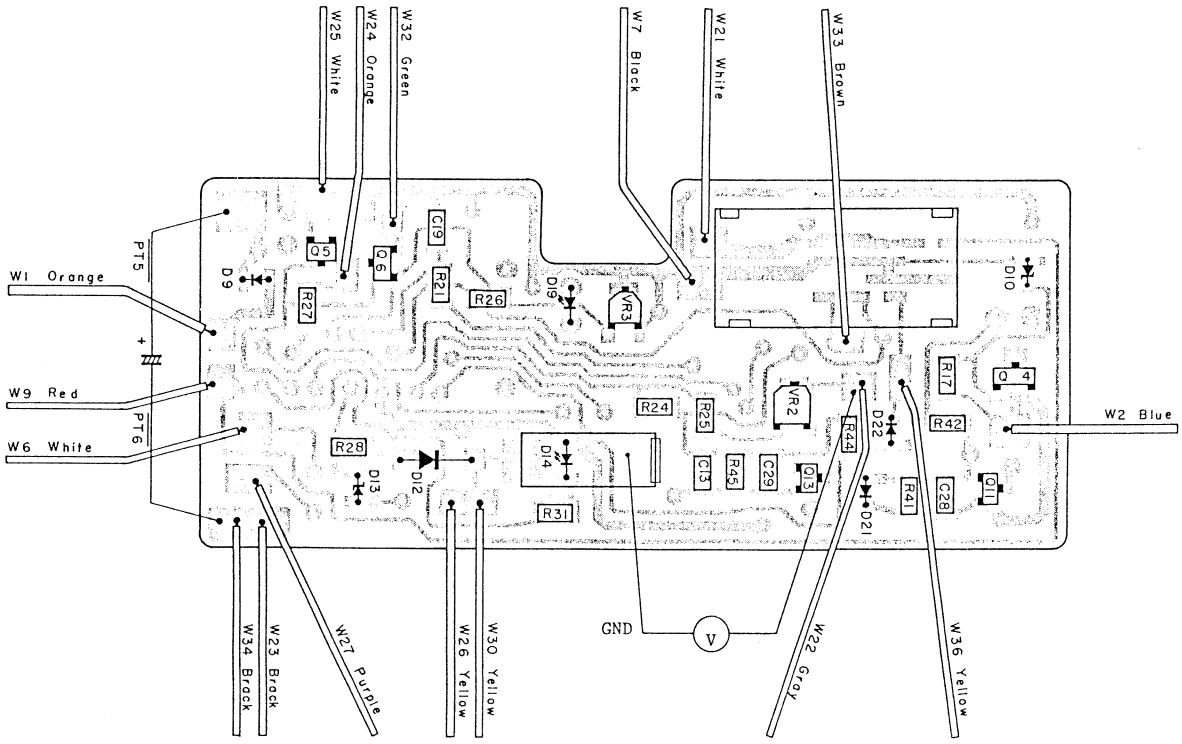
7. ADJUSTMENT PROCEDURE

AS-12
(Adjustment of VR1)
Purpose: Regulation of the voltage required to activate the ready-light.
Adjustment procedure:

Using a DC regulated power supply as an internal power supply, adjust VR1 so that the Ne lamp light up when the voltage of the main condenser C4 reaches 260V ± 1V. The Ne lamp will remain lit even when the voltage is reduced. Accordingly, when you readjust VR1, reduce the voltage sufficiently. It is recommended to increase the voltage of the power supply gradually and remember do not set the voltage at 5.7V immediately.

(Adjustment of VR3) [Adjust VR3 first, then VR2]
Purpose: Gamma adjustment (constant current adjustment).
Adjustment procedure:

While measuring the voltage between the GND spring of the open flash button and the soldered land of lead wire W22 (gray) connected to the shoe, adjust the VR3 so that the difference in voltage between ISO 25 and 200 on the voltmeter is 144 +2, -1 mV.



Adjustment of VR3

(Adjustment of VR2)
Purpose: Adjustment of light output level of TTL. (Adjustment can be performed by disassembling the rear display panel (347).)
Adjustment procedure:
Load Fuji Super HR-100 or Kodachrome 64 into a standard camera and set the film speed at ISO 100. Attach the SB-21 to the front of the 50mm f/1.4 standard lens, insert an aperture plate of f/5.6, and place the camera 0.8m in front of a standard reflector board (with luminance coefficient: 0.08) . Adjust VR2 so that flash meter value is $\pm$ 0.2EV at the f/5.6 standard, while providing 5.7V from a regulated power source.

AS-14
(Adjustment of VR1)
Adjust in the same manner as the AS-12.

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Controler AS-14

コントローラー AS-14

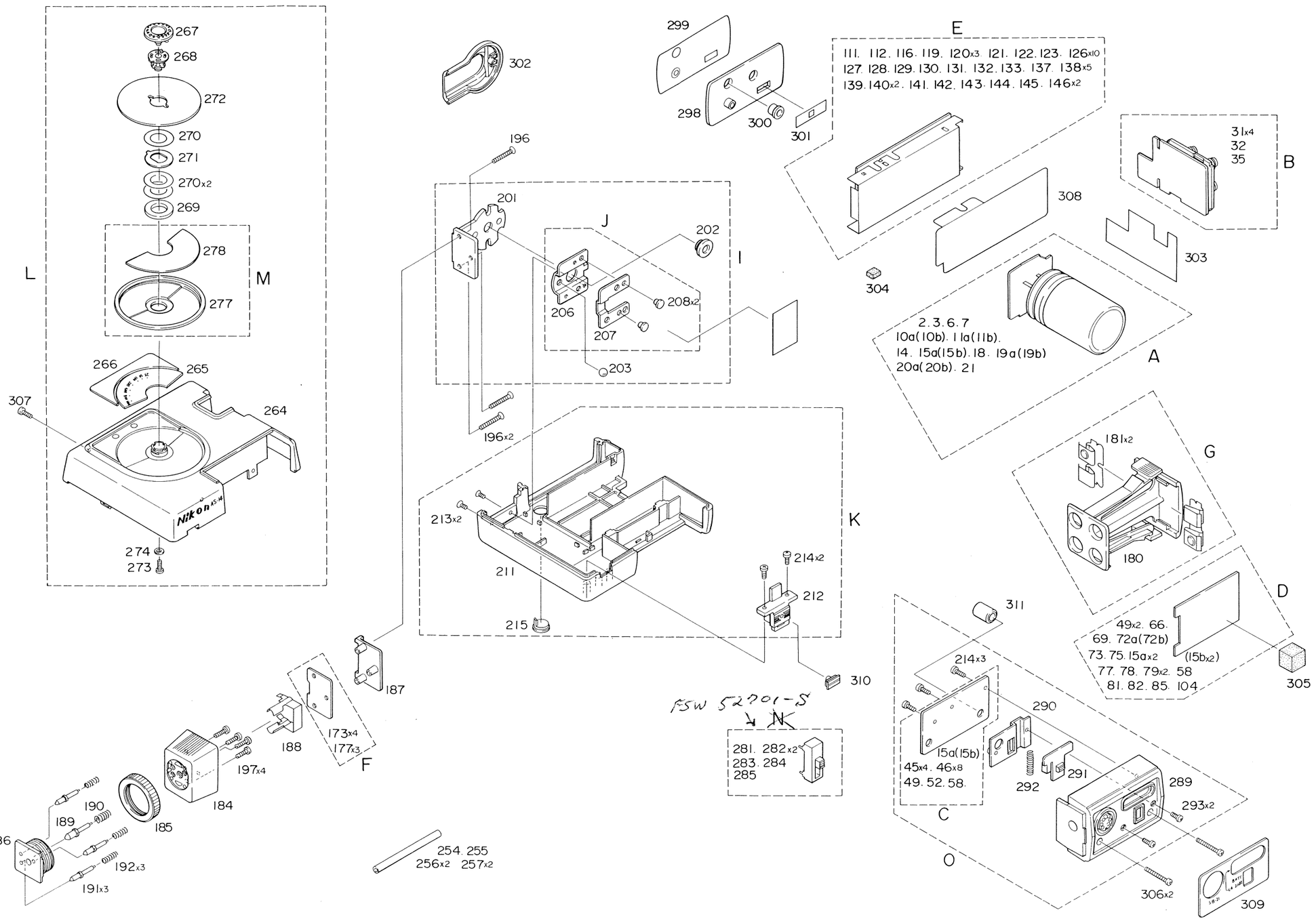
L
M
267
268
272
270
271
270x2
269
278
277
266
265
307
264
Nikon
274
273
302
299
298
300
301
E
111. 112. 116. 119. 120x3. 121. 122. 123. 126x10
127. 128. 129. 130. 131. 132. 133. 137. 138x5
139. 140x2. 141. 142. 143. 144. 145. 146x2
308
31x4
32
35
B
303
304
2.3.6.7
10a(10b). 11a(11b).
14. 15a(15b). 18. 19a(19b)
20a(20b). 21
A
196
201
J
202
I
206
208x2
207
203
196x2
181x2
G
180
213x2
K
211
214x2
212
215
310
311
214x3
290
D
49x2. 66.
69. 72a(72b)
73. 75. 15ax2
(15bx2)
77. 78. 79x2. 58
81. 82. 85. 104
305
15a(15b)
45x4. 46x8
49. 52. 58.
C
292
291
289
293x2
O
306x2
309
FSW 52701-S
N
281. 282x2
283. 284
285
187
173x4
177x3
F
188
197x4
184
190
189
185
186
192x3
191x3
254. 255
256x2 257x2

Fig. 1

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
1	L基板 Printed circuit L	1	A		△		
2	Lボビン Bobin L	1	A	1	○△		5
3	絶縁板B Insulator B	1	A	1	○△		5
6	インダクター Indactor	1	A	1	○△	L	5
7	発振トランス EE-13 Trance	1	A	1	○△	T1	5
10a	トランジスタ 2SA1348 Transistor	1	A	1	○△	Q1	5
10b	トランジスタ UN4111 Transistor	1	A	1	○△	Q1	5
11a	トランジスタ 2SA1357Y Transistor	1	A	1	○△	Q2	5
11b	トランジスタ 2SA1120Y Transistor	1	A	1	○△	Q2	5
14	ダイオード ES1F Diode	1	A	1	○△	D1	5
15a	ダイオード SR1FM-8 Diode	4	A, C, D	1	○△	D2, D6, D8, D26	5
15b	ダイオード S5277G Diode	4	A, C, D	1	○△	D2, D6, D8, D26	5
18	電解コンデンサー ECETWMS6.3V 47 μF Condenser	1	A	1	○△	C1	5
19a	セラミックコンデンサー DSSC70SJY5R223M Condenser	1	A	1	○△	C2	5
19b	セラミックコンデンサー AMZ223K Condenser	1	A	1	○△	C2	5
20a	セラミックコンデンサー HS80SJYB101K Condenser	1	A	1	○△	C3	5
20b	セラミックコンデンサー DE0405B101K24V Condenser	1	A	1	○△	C3	5
21	電解コンデンサー ECE330V650 μF Condenser	1	A	1	○△	C4	5

部品表 Parts List

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部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
24	固定抵抗器 15 Ω Resistor	1	A		△	R1	
25	固定抵抗器 6.8K Ω Resistor	1	A		△	R2	
30	B基板 Printed circuit B	1	B		△		
31	BATバネ Spring	4	B	1	○△		5
32	BATバネ受け Spring holder	1	B	1	○△		5
35	ダイオード MZ-310B Diode	1	B	1	○△	D3	5
38	固定抵抗器 1M Ω Resistor	1	B		△	R4	
39	固定抵抗器 200K Ω Resistor	1	B		△	R3	
44	K基板 Printed circuit K	1	C		△		
45	電源ピン Pin	4	C	1	○△		5
46	接点板 Contact plate	8	C	1	○△		5
49	トランジスタ 2SC2603F Transistor	2	C, D	1	○△	Q3, Q12	5
52	スイッチ SH-1 Switch	1	C	1	○△	SW1	5
58	フィルムコンデンサ WMTB-2A-225K Condensor	2	C, D	1	○△	C7, C8	5
61	固定抵抗器 680K Ω Resistor	1	C		△	R5	
62	固定抵抗器 15MΩ Resistor	1	C		△	R6	
66	M基板 Printed circuit M	1	D		△		
69	ネオンランプ NL-8SD Lamp	1	D	1	○△	Ne	5

部品表 Parts List

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部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
72a	ダイオード Diode 1S1588	1	D	1	○△	D4	5
72b	ダイオード Diode DS442	1	D	1	○△	D4	5
73	SCR CR3CM-8	1	D	1	○△	D5	5
75	SCR CR3JM-8	1	D	1	○△	D7	5
77	セラミックコンデンサ Condenser DN1V010KIS	1	D	1	○△	C31	5
78	セラミックコンデンサ Condenser MKH250V 0.01 μF	1	D	1	○△	C5	5
79	セラミックコンデンサ Condenser MKH250V 0.047μF	2	D	1	○△	C9, C10	5
81	セラミックコンデンサ Condenser SC45F1H103Z	1	D	1	○△	C11	5
82	フィルムコンデンサ Condenser B32520-A3 473K	1	D	1	○△	C6	5
85	半固定抵抗器 Variable resistor EVNB1AA00B55	1	D	1	○△	VR1	5
88	固定抵抗器 (マンガニン 線) Resistor φ0.6x41	1	D		△	R16	
89	固定抵抗器 Resistor 1.2M Ω	1	D		△	R7	
90	固定抵抗器 Resistor 330K Ω	1	D		△	R8	
91	固定抵抗器 Resistor 330Ω	1	D		△	R9	
92	固定抵抗器 Resistor 680Ω	1	D		△	R10	
93	固定抵抗器 Resistor 22KΩJ	1	D		△	R11	
94	固定抵抗器 Resistor 1K Ω	2	D		△	R12, R13	
95	固定抵抗器 Resistor 22 Ω	1	D		△	R14	

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
96	固定抵抗器 15KΩJ Resistor	1	D		△	R15	
97	固定抵抗器 220Ω Resistor	1	D		△	R48	
98	固定抵抗器 47 Ω Resistor	1	D		△	R49	
99	固定抵抗器 10KΩ Resistor	1	D		△	R50	
104	トランジスタ UN4214 Transistor	1	D	1	○△	Q11	5
110	C基板 Printed circuit C	1	E		△		
111	OPバネ OP spring	1	E	1	○△		5
112	シールドケース Shield case	1	E	1	○△		1
116	IC MB4411A	1	E	1	○△	U1	5
119	トランジスタ 2SD999-T1 Transistor	1	E	1	○△	Q4	5
120	トランジスタ UN2211TX Transistor	3	E	1	○△	Q5, Q8, Q10	5
121	トランジスタ 2SB798-T1 Transistor	1	E	1	○△	Q6	5
122	トランジスタ 2SA812-T1B Transistor	1	E	1	○△	Q7	5
123	トランジスタ 2SC1623-T1BL6 Transistor	1	E	1	○△	Q9	5
126	ダイオード MA151KTX Diode	10	E	1	○△	D9, D11, D14, D16, D19 D20,D21, D22, D24, D25	5
127	ダイオード MA3056-TX Diode	1	E	1	○△	D10	5
128	ダイオード MA292TW Diode	1	E	1	○△	D12	5
129	ダイオード MA3091-M TX Diode	1	E	1	○△	D13	5

部 品 表　Parts List

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部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
130	ダイオード Diode SLP135B	1	E	1	○△	D15	5
131	ダイオード Diode SLP435B	1	E	1	○△	D17	5
132	ダイオード Diode MA151WKTX	1	E	1	○△	D18	5
133	ダイオード Diode MA152KTX	1	E	1	○△	D23	5
137	電解コンデンサ Condenser ECETTMS6.3V470μF	1	E	1	○△	C12	5
138	セラミックコンデンサ Condenser GR42-6B103K50PT	5	E	1	○△	C13, C15, C16, C20, C27	5
139	電解コンデンサ Condenser TESVA1V334M1-8R	1	E	1	○△	C14	5
140	セラミックコンデンサ Condenser GR42-6B102K50PT	2	E	1	○△	C17, C22	5
141	タンタルコンデンサ Condenser DN1A3R3K IS	1	E	1	○△	C18	5
142	セラミックコンデンサ Condenser GR42-6B332K50PT	1	E	1	○△	C19	5
143	タンタルコンデンサ Condenser TESVA0G335M1-8R	1	E	1	○△	C21	5
144	タンタルコンデンサ Condenser DN1A4R7KIS	1	E	1	○△	C24	5
145	セラミックコンデンサ Condenser GR42-6SL101K50PT	1	E	1	○△	C26	5
146	セラミックコンデンサ Condenser GR42-6B473K50PT	2	E	1	○△	C23, C25	5
150	固定抵抗器 Resistor 102J16	5	E		△	R17, R27, R41, R44, R46	
151	固定抵抗器 Resistor 105J16	1	E		△	R18	
152	固定抵抗器 Resistor 104J16	2	E		△	R19, R35	
153	固定抵抗器 Resistor 103J16	2	E		△	R20, R22	

部品表 Parts List

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部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
154	固定抵抗器 684J16 Resistor	1	E		△	R21	
155	固定抵抗器 153J16 Resistor	1	E		△	R23	
156	固定抵抗器 152J16 Resistor	2	E		△	R24, R25	
157	固定抵抗器 471J16 Resistor	1	E		△	R26	
158	固定抵抗器 474J16 Resistor	2	E		△	R28, R29	
159	固定抵抗器 301J16 Resistor	2	E		△	R30, R31	
160	固定抵抗器 223J16 Resistor	1	E		△	R32	
161	固定抵抗器 331J16 Resistor	2	E		△	R33, R37	
162	固定抵抗器 101J16 Resistor	1	E		△	R34	
163	固定抵抗器 222J16 Resistor	6	E		△	R36, R40, R42, R43, R45 R47	
164	固定抵抗器 224J16 Resistor	2	E		△	R38, R39	
170	I基板 Printed circuit I	1	F		△		
173	コイル SP03051ROK-2 Coil	4	F	1	○△	L2～L5	5
177	セラミックコンデンサ GR42-6SL221K50PT Condenser	3	F	1	○△	C28 ～C30	5
180	BATカートリッジ BAT cartridge	1	G	1	○△		5
181	BATバネ BAT spring	2	G	1	○△		5
184	足 箱 Attaching foot case	1	H	1	○△		5
185	締めつけナット Nut	1	H	1	○△		5

部品表 Parts List

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部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
186	足台 Mounting foot base	1	H	1	○△		5
187	足蓋 Foot cover	1	H	1	○△		5
188	足バネ Foot spring	1	H	1	○△		5
189	接点ピンA Pin A	1	H	1	○△		5
190	接点バネA Spring A	1	H	1	○△		5
191	接点ピンB Pin B	3	H	1	○△		5
192	接点バネB Spring B	3	H	1	○△		5
196	Screw OF3-M2x14	3	H	1	○△		5
197	Screw OP1-M2x7	4	H	1	○△		5
201	足板 Upper foot plate	1	I	1	○△		5
202	足止め軸 Foot lock axle	1	I	1	○△		5
203	スチールボール φ4 Steel ball	1	I	1	○△		5
206	足取りつけ板 Foot cover plate	1	G	1	○△		5
207	足板バネ Foot spring	1	G	1	○△		5
208	薄平リベット φ2.6x3 Rivet	2	G	1	○△		5
211	ケースL Flash head (lower)	1	K	1	○△		1
212	SPDケース Case, SPD	1	K	1	○△		1
213	Screw OP3-M2x4	2	K	1	○△		5

部品表 Parts List

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部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
214	Screw OP3-M2x6	5	K, O	1	○△		5
215	化粧板B Decorative plate	1	K	1	○△		5
220	Lead wire (orange) PVC13/0.08x110	1			×	W1 W-0080OR	
221	Lead wire (blue) PVC13/0.08x225	1			×	W2 W-0080BK	
222	Lead wire (red) PVC12/0.12x140	1			×	W3 W-0120RE	
223	Lead wire (gray) PVC12/0.12x95	1			×	W4 W-0120GY	
224	Lead wire (gray) PVC13/0.08x60	1			×	W5 W-0080GY	
225	Lead wire (white) PVC13/0.08x170	1			×	W6 W-0080WH	
226	Lead wire (black) PVC12/0.12x120	1			×	W7 W-0120BK	
227	Lead wire (gray) PVC13/0.08x130	1			×	W8 W-0080GY	
228	Lead wire (red) PVC13/0.08x100	1			×	W9 W-0080RE	
229	Lead wire (black) PVC13/0.08x115	1			×	W10 W-0080BK	
230	Lead wire (black) PVC13/0.08x30	1			×	W11 W-0080BK	
231	Lead wire (yellow) PVC13/0.08x30	1			×	W12 W-0080YE	
232	Lead wire (yellow) PVC13/0.08x100	1			×	W13 W-0080YE	
233	Lead wire (blue) PVC13/0.08x30	1			×	W14 W-0080BE	
234	Lead wire (blue) PVC13/0/08x85	1			×	W15 W-0080BE	
235	Lead wire (white) PVC13/0.08x90	1			×	W16 W-0080WH	

部 品 表 Parts List

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部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
236	Lead wire (white) PVC13/0.08x25	1			×	W17 W-0080WH	
237	Lead wire (purple) PVC13/0.08x85	1			×	W18 W-0080PU	
238	Lead wire (purple) PVC13/0.08x25	1			×	W19 W-0080PU	
239	Lead wire (white) PVC12/0.12x115	1			×	W20 W-0120WH	
240	Lead wire (brown) PVC13/0.08x195	1			×	W21 W-0080BN	
241	Lead wire (green) PVC13/0.08x235	1			×	W22 W-0080GN	
242	Lead wire (brown) PVC13/0.08x85	1			×	W23 W-0080BN	
243	Lead wire (black) PVC13/0.08x240	1			×	W24 W-0080BK	
244	Lead wire (purple) PVC13/0.08x175	1			×	W25 W-0080PU	
245	Lead wire (green) PVC12/0.12x185	1			×	W26 W-0120GN	
246	Lead wire (brown) PVC12/0.12x125	1			×	W27 W-0120BN	
247	Lead wire (red) PVC12/0.12x35	1			×	W28 W-0120RE	
248	Lead wire (black) PVC13/0.08x85	1			×	W29 W-0080BK	
249	Lead wire (black) PVC12/0.12x140	1			×	W30 W-0120BK	
250	Lead wire (orange) PVC13/0.08x135	1			×	W31 W-0080OR	
251	Lead wire (red) PVC13/0.08x85	1			×	W32 W-0080RE	
254	ビニールチューブ φ15x30 Tube	1		1	○	PT1	5
255	Siチューブ φ1x35 Si tube	1		1	○	PT2	5

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
256	ビニールチューブ φ5x5 Tube	2		1	○	PT3, PT4	5
257	Iチューブ φ1x14 I tube	2		1	○	PT5, PT6	5
258	Lead wire (black) PVC13/0.08x45	1			×	W33 W-0080BK	
259	Lead wire (yellow) PVC13/0.08x230	1			×	W34 W-0080YE	
264	ケースU Flash head (upper)	1	L	1	○△		1
265	A銘板 Name plate A	1	L	1	○△		5
266	B銘板 Name plate B	1	L	1	○△		5
267	A切り換えツマミ Setting knob A	1	L	1	○△		5
268	GNクリック軸 GN click shaft	1	L	1	○△		5
269	Mワッシャー t=2 Washer M	1	L	1	○△		5
270	ワッシャーA t=0.188 Washer A	3	L	1	○△		5
271	ワッシャーB t=0.3 Washer B	1	L	1	○△		5
272	GN板 Gn plate	1	L	1	○△		5
273	Screw TP-M2x5	1	L	1	○△		5
274	Screw 2X4.3X0.3	1	L	1	○△		5
277	GN枠 Gn frame	1	M	1	○△		5
278	F銘板 Name plate F	1	M	1	○△		5
281	ツマミC Setting knob C	1	N	1	○△		5

部品表 Parts List

FSW52801-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
282	スイッチ接点バネ Switch contact spring	2	N	1	○△		5
283	SWフレームB SW frame B	1	N	1	○△		5
284	SWクリックバネ SW click spring	1	N	1	○△		5
285	ステンボール Stainless steel ball	1	N	1	○△		5
289	カバーパネル Cover panel	1	0	1	○△		5
290	押さえ板 Presser plate	1	0	1	○△		5
291	スライドツマミ Slide knob	1	0	1	○△		5
292	スライドバネ Plate spring	1	0	1	○△		5
293	Screw OP3-Mx4	2	0	1	○△		5
298	リアパネル Rear panel	1		1	○		5
299	リア銘板 Rear name plate	1		1	○		5
300	OPボタン OP button	1		1	○		5
301	メクラ銘板 Cover plate	1		1	○		5
302	足カバー Foot cover	1		1	○		1
303	絶縁板D Shield sheet D	1		1	○		5
304	モルトプレン 5x5x3 Sponge	1		1	○		5
305	モルトプレン 10X10X10 Sponge	1		1	○		5
306	Screw OP3-M2x18	2		1	○		5

部品表 Parts List

FSW52801-R. 3200. A

部品番号 Part No	名称 Name	1台分個数 Pcs. Per Unit	部組品番号 Assembly	参照図番 Fig.	販売区分 Term of Delivery	備考 Remarks	要求単位 Q'ty per order
307	Screw OP1-M2x4	1		1	○		5
308	絶縁板TC Shield sheet TC	1		1	○		5
309	パネル銘板 Front name plate	1		1	○		5
310	化粧板A Cover plate A	1		1	○		5
311	スペーサー Spacer	1		1	○		5

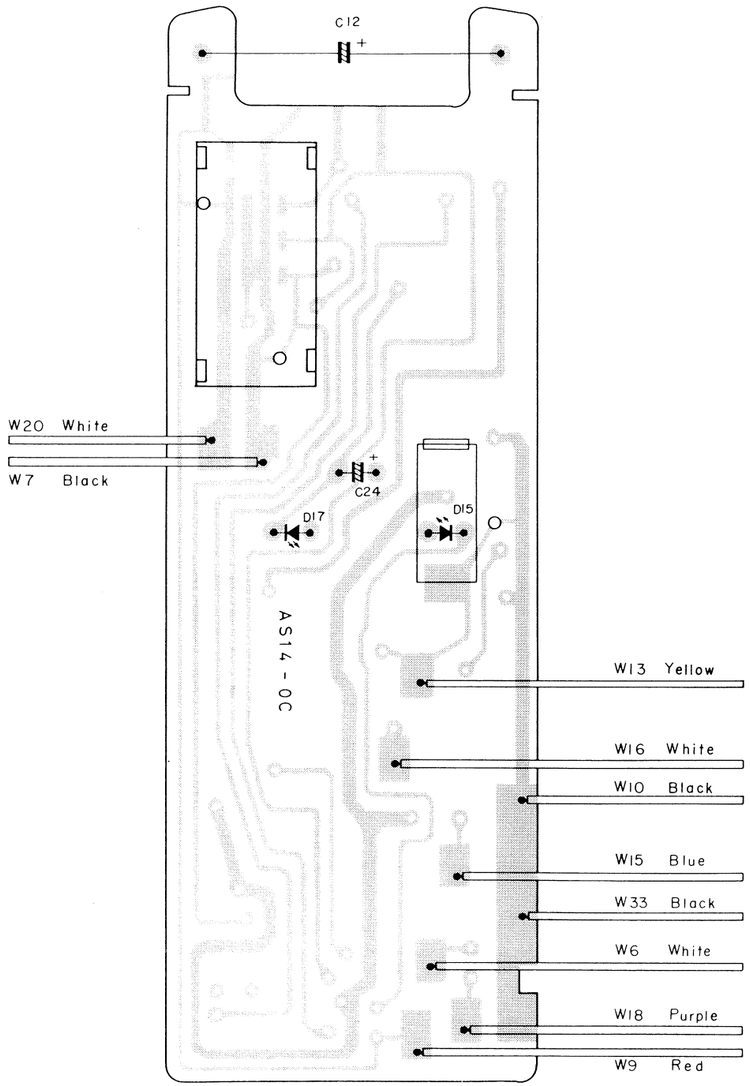
部組品表 Subassembly List

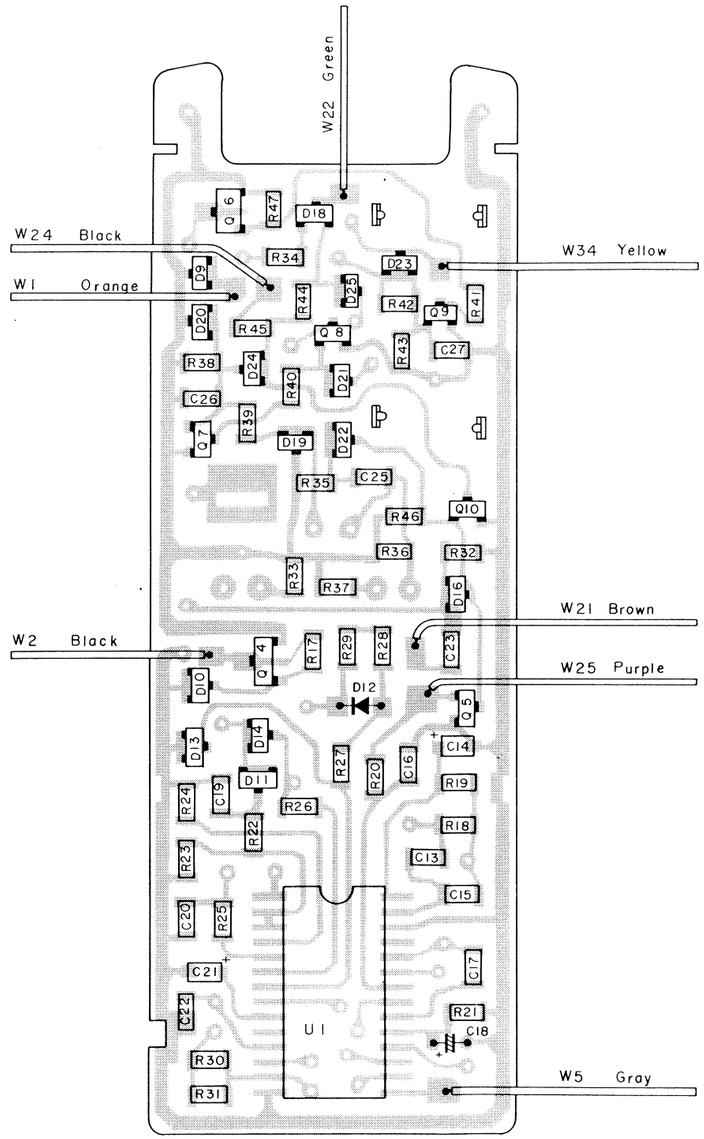
FSW52801-R. 3200. A

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.	備考 Remarks	要求単位 Q'ty per order
A	L基板 L unit	1	1, 2, 3, 6, 7, 10a(10b) 11a(11b), 14, 15a(15b) 18, 19a(19b), 20a(20b) 21, 24, 25	1		1
B	B基板 B unit	1	30, 31X4, 32, 35, 38, 39	1		1
C	K基板 C unit	1	44, 45x4, 46x8, 49, 52 15a(15b), 58, 61, 62	1		1
D	M基板 M unit	1	66, 69, 72a(72b), 73 15ax2(15bx2), 77, 78 79x2, 58, 81, 82, 85, 88 89, 90, 91, 92, 96, 94x2 95, 93, 97, 98, 99, 104 49	1		1
E	E基板 E unit	1	110, 111, 112, 116, 119 120x3, 121, 122, 123, 126x10, 127, 128, 129, 130, 131, 132, 133, 137 138x5, 139, 140x2, 141 142, 143, 144, 145, 146x2, 150x5, 151, 152x2 153x2, 154, 155, 156x2 157, 158x2, 159x2, 160 161x2, 162, 163x6, 164x2	1		1
F	F基板 F unit	1	170, 173x4, 177x3	1		5
G	BATカートリッジ Battery cartridge	1	180, 181x2	1		5
H	足 Foot base unit	1	184, 185, 186, 187, 189 188, 190, 191x3, 192x3 196x3, 197x4	1		1
I	足 板 Foot plate unit	1	201, 202, 203	1		1
J	足取りつけ板 Foot cover plate unit	1	206, 207, 208x2	1		1
K	ケースL Case L	1	211, 212, 213x2, 214x2 215	1		1
L	ケースU Case U	1	264, 265, 266, 267, 268 269, 270x3, 271, 272 273, 274	1		1
M	GN枠 GN frame	1	277, 278	1		5
N	ツマミB Setting knob B	1	281, 282X2, 283, 284 285	1		5
O	カバーパネル Cover panel	1	289, 290, 291, 292 293x2, 214x3	1		1

C基板

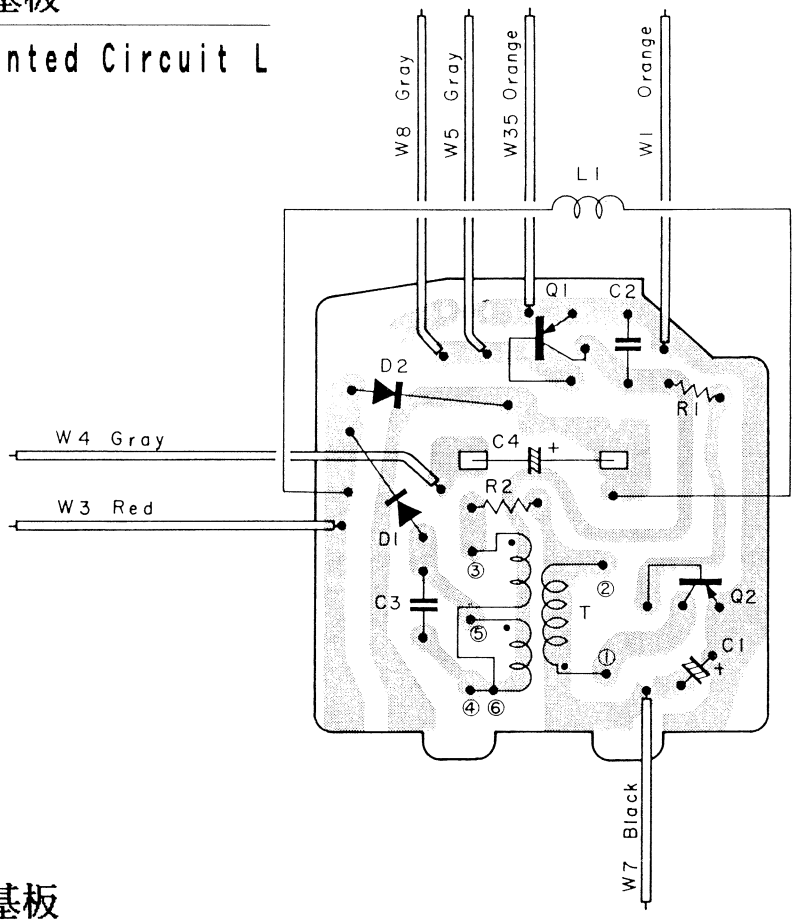
Printed Circuit C





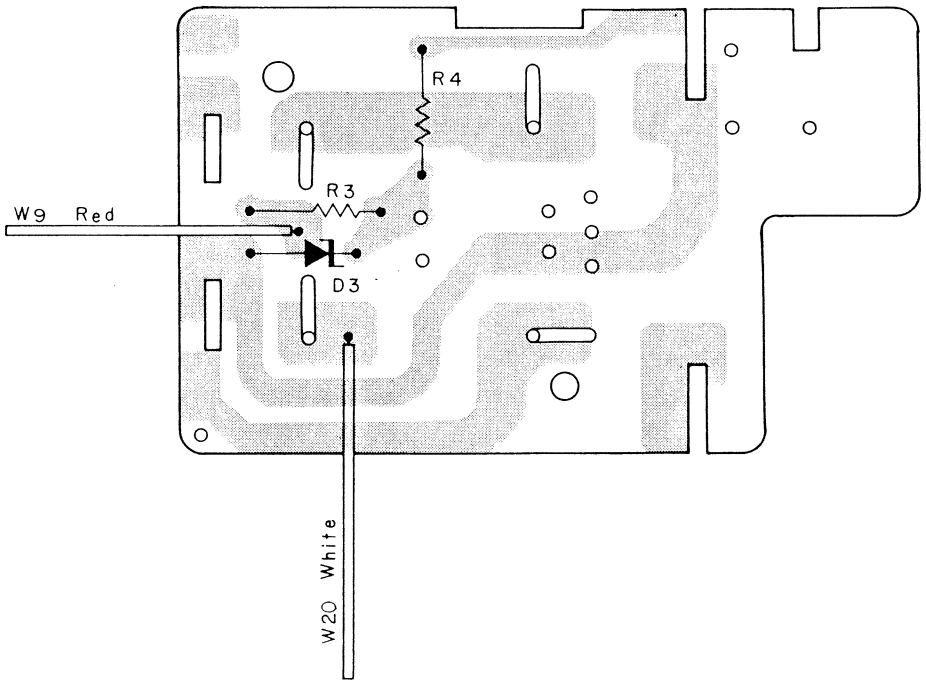
L基板

Printed Circuit L



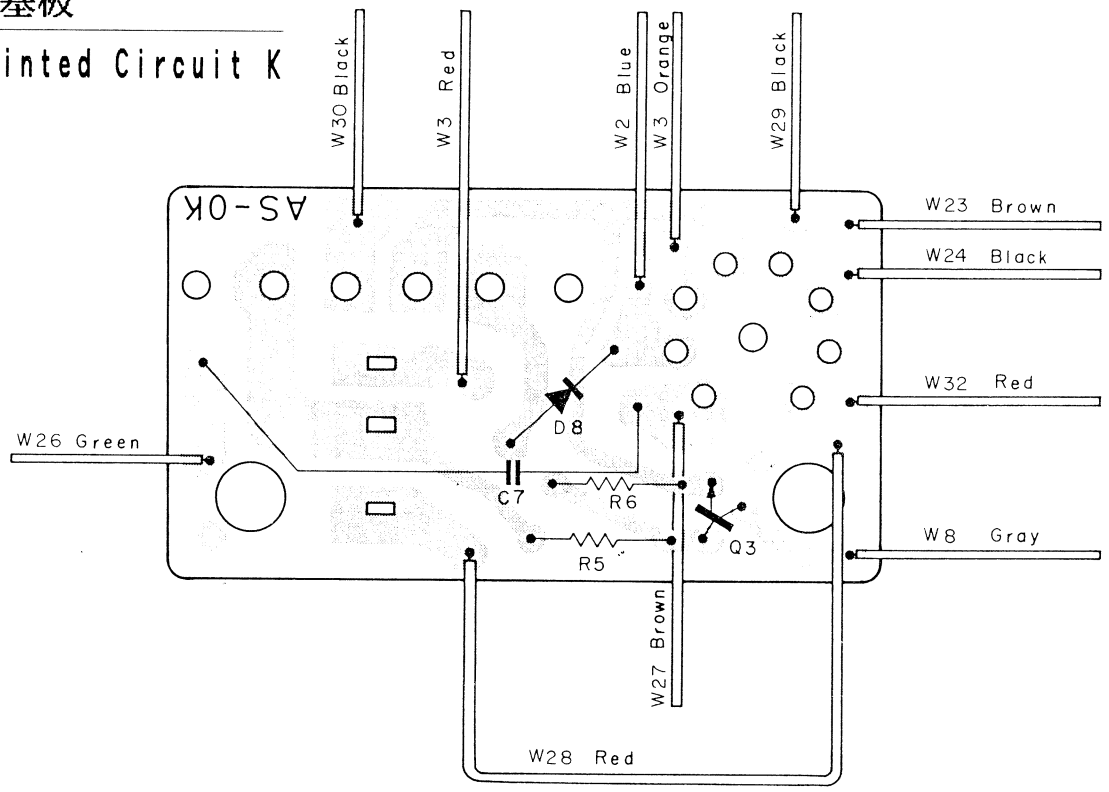
B基板

Printed Circuit B



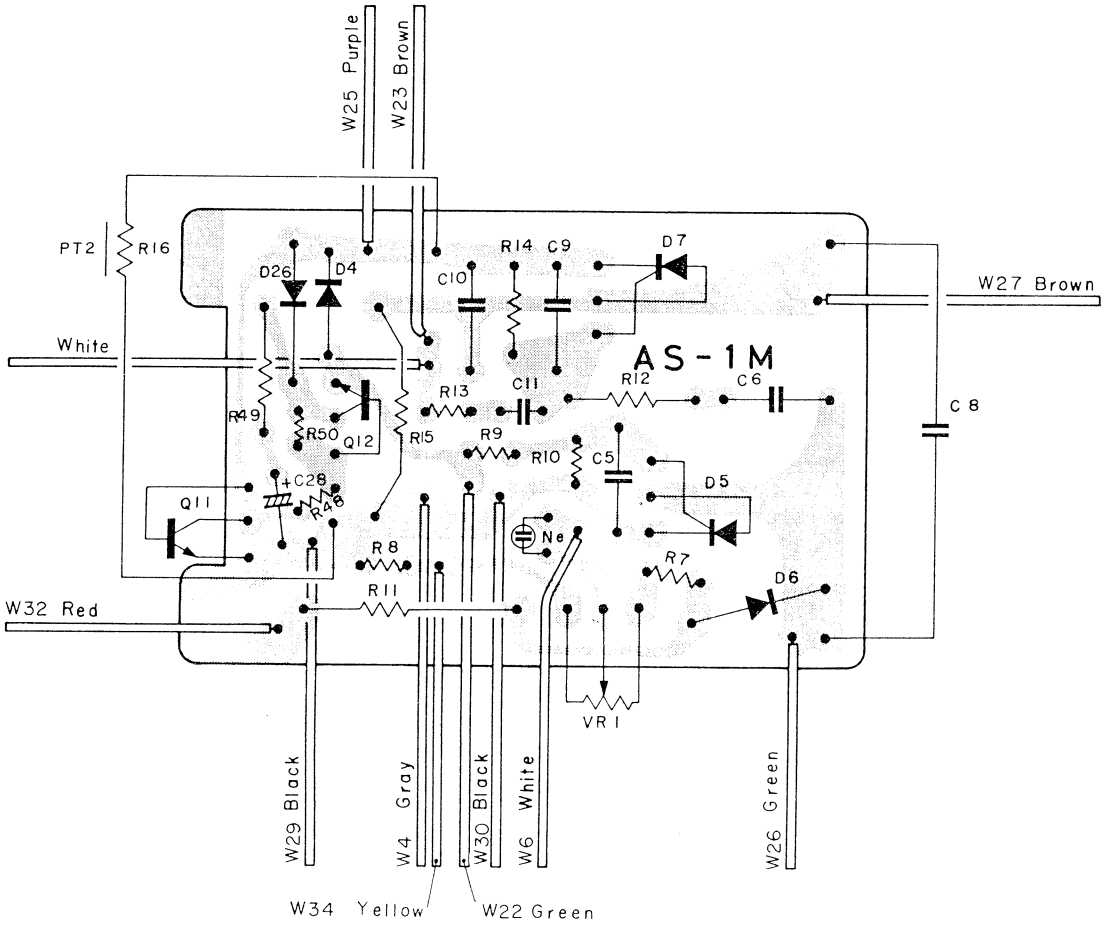
K基板

Printed Circuit K



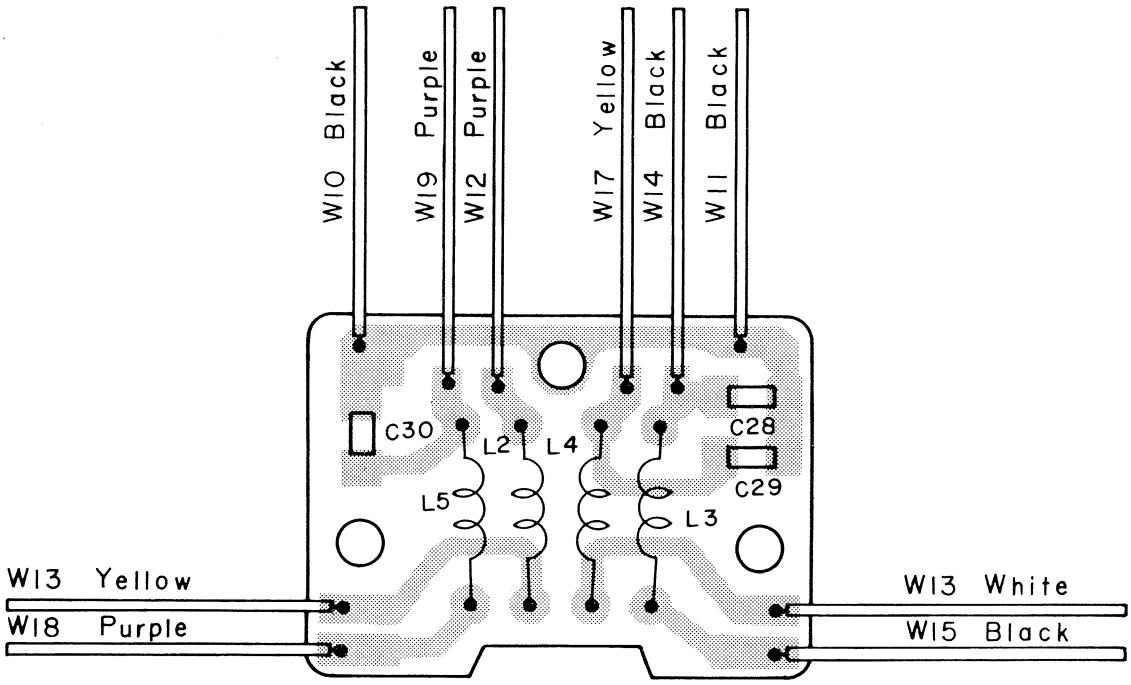
M基板

Printed Circuit M



I基板

Printed Circuit I



電子部品対照表

(Circuitry Parts Reference Table)

回路番号 Circuit No.	部品番号 Part No.	備考 Remarks	回路番号 Circuit No.	部品番号 Part No.	備考 Remarks
R1	24	15Ω	R35	152	100KΩ
R2	25	6.8KΩ	R36	163	2.2KΩ
R3	39	200KΩ	R37	161	330 Ω
R4	38	1MΩ	R38	164	220KΩ
R5	61	680KΩ	R39	164	220KΩ
R6	62	15M Ω	R40	163	2.2KΩ
R7	89	1.2MΩ	R41	150	1KΩ
R8	90	330KΩ	R42	163	2.2KΩ
R9	91	330KΩ	R43	163	2.2KΩ
R10	92	680KΩ	R44	150	1KΩ
R11	93	22K Ω	R45	163	2.2KΩ
R12	94	1KΩ	R46	150	1KΩ
R13	94	1KΩ	R47	163	2.2KΩ
R14	95	22Ω	R48	97	220 Ω
R15	96	15K Ω	R49	98	47Ω
R16	88	ﾏﾝｶﾞﾆﾝ 線 φ0.6x41 Manganin wire	R50	99	10K Ω
R17	150	1KΩ	C1	18	6.3V, 47μF
R18	151	1MΩ	C2	19a, 19b	50V, 0.022μF
R19	152	100KΩ	C3	20a, 20b	2000V, 100PF
R20	153	10K Ω	C4	21	330V, 650 μF
R21	154	680KΩ	C5	78	250V, 0.01μF
R22	153	10K Ω	C6	82	250V, 0.047 μF
R23	155	15K Ω	C7	58	100V, 2.2 μF
R24	156	1.5KΩ	C8	58	100V, 2.2 μF
R25	156	1.5KΩ	C9	79	250V, 0.047 μF
R26	157	470 Ω	C10	79	250V, 0.047 μF
R27	150	1KΩ	C11	81	50V, 0.01 μF
R28	158	470KΩ	C12	137	6.3V, 470 μF
R29	158	470KΩ	C13	138	50V, 0.01 μF
R30	159	300 Ω	C14	139	35V, 0.33 μF
R31	159	300 Ω	C15	138	50V, 0.01 μF
R32	160	220KΩ	C16	138	50V, 0.01 μF
R33	161	330 Ω	C17	140	50V, 1000 PF
R34	162	100 Ω	C18	141	10V, 3.3μF

電子部品対照表
(Circuitry Parts Reference Table)

回路番号 Circuit No.	部品番号 Part No.	備考 Remarks	回路番号 Circuit No.	部品番号 Part No.	備考 Remarks
C19	142	50V, 0.0033 μF	D8	15a, 15b	SR1FM-8 or S5277G
C20	138	50V, 0.01 μF	D9	126	MA151K
C21	143	4V, 3.3 μF	D10	127	MA3056
C22	140	50V, 1000PF	D11	126	MA151K
C23	146	50V, 0.047μF	D12	128	MA292
C24	144	10V, 4.7μF	D13	129	MA3091-M
C25	146	50V, 0.047μF	D14	126	MA151K
C26	145	50V, 100PF	D15	130	SLP135B
C27	138	50V, 0.01 μF	D16	126	MA151K
C28	177	50V, 220PF	D17	131	SLP435B
C29	177	50V, 220PF	D18	132	MA151WK
C30	177	50V, 220PF	D19	126	MA151K
C31	77	35V, 1μF	D20	126	MA151K
			D21	126	MA151K
Q1	10a, 10b	2SA1348 or UN4111	D22	126	MA151K
Q2	11a, 11b	2SA1357Y or 2SA1120Y	D23	133	MA152K
Q3	49	2SC2603F	D24	126	MA151K
Q4	119	2SD999	D25	126	MA151K
Q5	120	UN2111	D26	15a, 15b	SR1FM-8 or S5277G
Q6	121	2SB798			
Q7	122	2SA812			
Q8	120	UN2111	L	6	ｲﾝﾀﾞｸﾀｰ Indactor
Q9	123	2SC1623	L2	173	SP0305IROK-2
Q10	120	UN2111	L3	173	SP0305IROK-2
Q11	104	UN4214	L4	173	SP0305IROK-2
Q12	49	2SC2603F	L5	173	SP0305IROK-2
			U1	116	MB4411A
D1	14	ESIF			
D2	15a, 15b	SR1FM-8 or S5277G	SW1	52	SH-1
D3	35	MZ-310B			
D4	72a, 72b	1S1588 or DS442			
D5	73	CR3CM-8			
D6	15a, 15b	SR1FM-8 or S5277G			
D7	75	CR3JM-8			

電子部品対照表
(Circuitry Parts Reference Table)

回路番号 Circuit No.	部品番号 Part No.	備考 Remarks	回路番号 Circuit No.	部品番号 Part No.	備考 Remarks
PT1	254	φ15x30			
PT2	255	φ7x35			
PT3	256	φ5x5			
PT4	256	φ5x5			
PT5	257	φ1x14			
PT6	257	φ1x14			
VR1	85	EVNB1AA00B55 (500K Ω)			
Ne	69	NL-8SD			
T1	7	EE-13			

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