

B. INSPECTION STANDARDS

CONTENTS

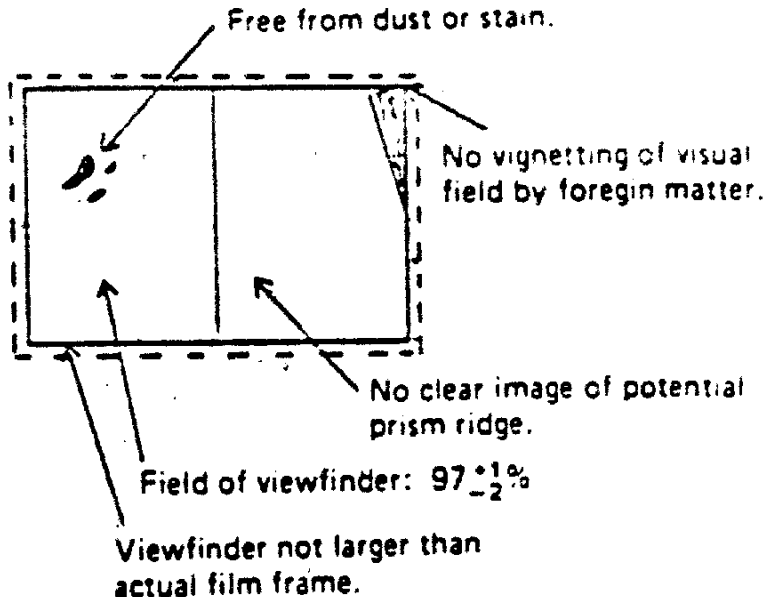
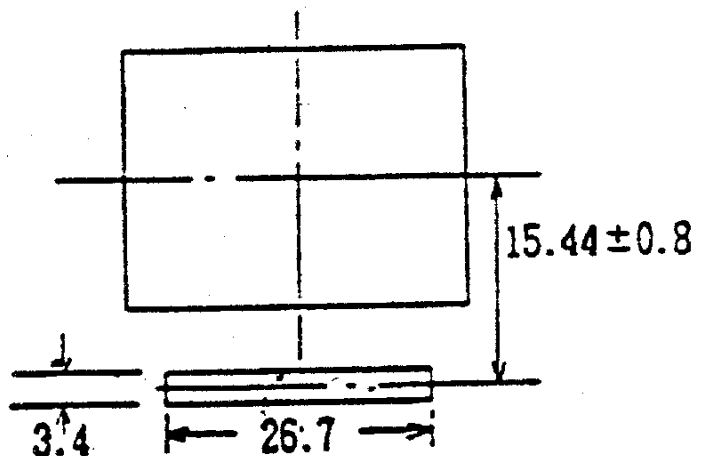
APPEARANCE AND FUNCTIONS

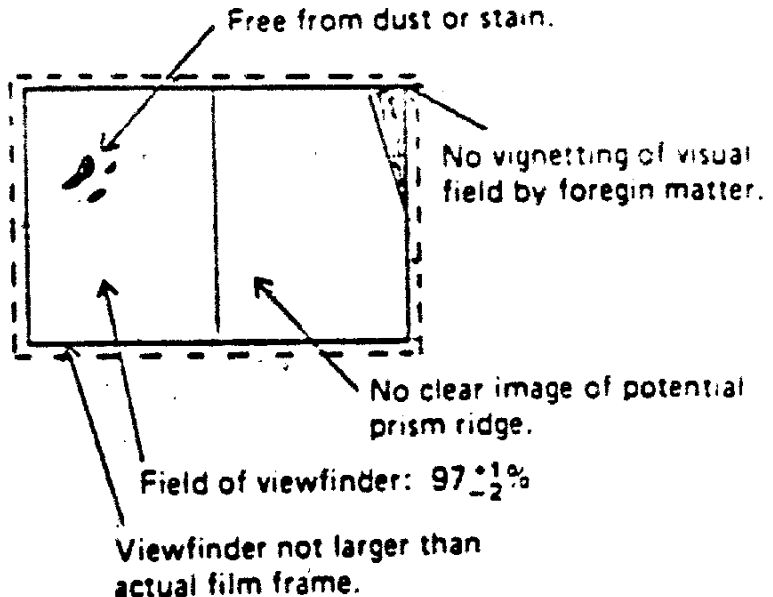
1. Viewfinder	B- 1
2. Indication within viewfinder	B- 1
3. Spot button	B- 2
4. High light button	B- 3
5. Shadow button	B- 3
6. Clear memory lever	B- 4
7. L-pin	B- 4
8. F-key	B- 5
9. R-knob	B- 5
10. Winding lever	B- 6
11. Release button	B- 7
12. Film counter	B- 7
13. Rear cover	B- 8
14. Pressure plate	B- 8
15. Sprocket	B- 8
16. Spool	B- 9
17. Shutter dial	B- 9
18. B lock button	B- 9
19. Rewinding button	B-10
20. Mode selector lever	B-10
21. ASA dial	B-10
22. "±" correction dial	B-10
23. Self lever	B-11
24. Spot down lever	B-11
25. Diaphragm interlock ring	B-12
26. Movable mirror	B-12
27. B mount	B-12
28. Combination with T-series flash (Auto mode)	B-12
29. Combination with T-series flash (Manual mode)	B-13
30. Combination with T-series flash (B. mecha 1/60)	B-13
31. Motor drive	B-13

II. PERFORMANCE

1. Mount back and optical path length	B-14
2. Spacing between tunnels	B-14
3. Position of perforations	B-14
4. Film frame spacing	B-14
5. Vertical deviation of actual screen surface	B-14
6. Accuracy of automatic exposure	B-15
7. Manual time	B-16
8. Exposure indication	B-17
9. Spot characteristic	B-18
10. Time lag	B-18
11. Contact efficiency	B-18
12. Insulation resistance	B-18
13. Indications by B. check lamp, LED and PCV	B-18
14. Release lock voltage	B-18
15. Unlocking	B-18
16. Current consumption	B-18
17. Standby current	B-18

I. APPEARANCE AND FUNCTIONS

Major check point	Item to be checked	Standard and check procedure
1. Viewfinder	1) Visual field	
	2) Diopter adjustable range	+1.0 to 3.0 diop.
	3) Force required to adjust diopter	Force to pull out adjusting knob: $360 \pm 60g$ Force to turn adjusting knob: $65 \pm 25 g\cdot cm$ (at click position) Force to push in adjusting knob: $360 \pm 60g$
2. Indication within viewfinder	1) Exposure indicating position	



2) Diopter adjustable range

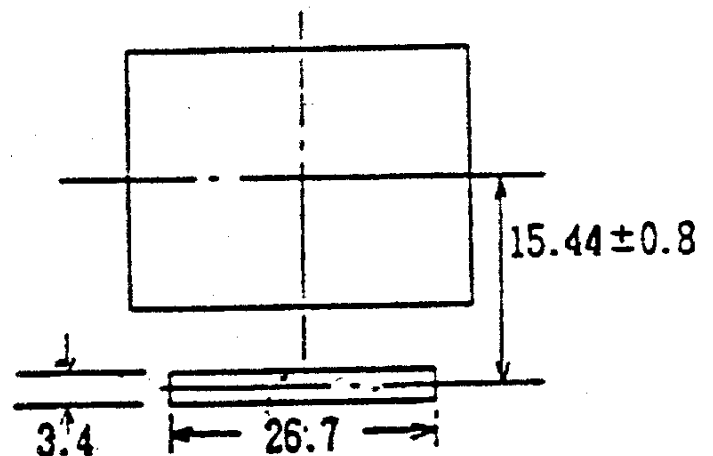
+1.0 to 3.0 diop.

3) Force required to adjust diopter

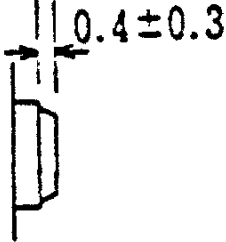
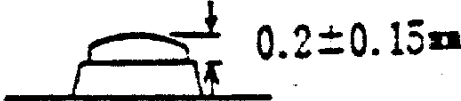
Force to pull out adjusting knob:
 $360 \pm 60g$
 Force to turn adjusting knob:
 $65 \pm 25 g\cdot cm$ (at click position)
 Force to push in adjusting knob:
 $360 \pm 60g$

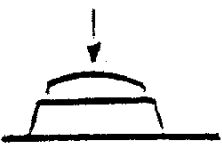
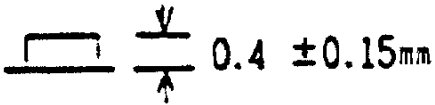
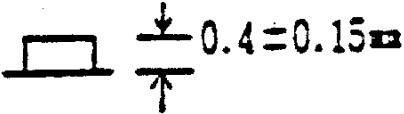
2. Indication within viewfinder



1) Exposure indicating position

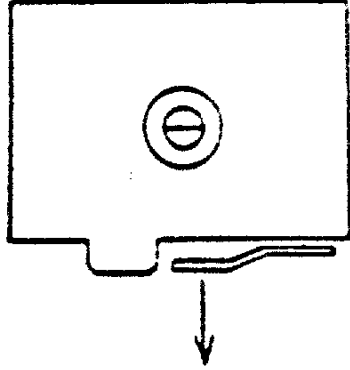
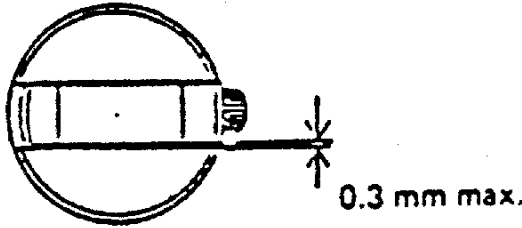
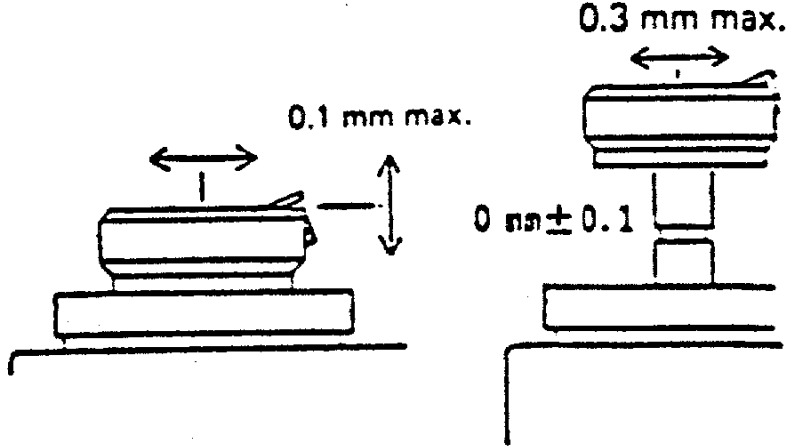
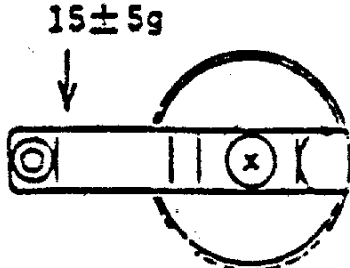


No remarkable inclination or deviation of the indicator mask from the mask surface.
 No remarkable inclination of indicator segment relative to the mask, vignetting or deviation.
 No-uniform thinning or inclination of character in the segment.

Major check point	Item to be checked	Standard and check procedure	
2. Indication within viewfinder	2) Start of indication	Indication must start upon the following operation: Auto → Manual Manual → Auto Flash power lamp ON or OFF by depressing the release button to its first stage. Completion of photographing	
	3) Extinguishment of indication	120 ± 50 sec. (Display time must be updated automatically during operation.) B. mecha. set at 1/60 Battery voltage lower than the locked level	
	4) Clearing of indication	Upon extinguishment of indication, the Spot mode and memory setting must be cleared automatically.	
	5) OVER indication	The OVER lamp must flicker and PCV must sounds when high luminance lasts 1/2000 sec. or longer.	
	6) Indication error	Exposure indication must not be erroneous upon switching between Auto and Manual. 0.5 EV or lower (1 segment) Indication must not be erroneous by tilting the camera in either direction. When the camera is equipped with MS5018 lens, influence due to BV15 must be 0.5 EV or less (for 1 segment) at BV10 forward or BV15 backward.	
	7) Force required to depress illumination button	180 ± 70g 0.4 ± 0.3 at ON position	
	8) Illumination time	10 ± 10 sec. (Illumination is stopped by turning ON the main switch.)	
	3. Spot button	1) Operating reliability	The camera must be set in the Spot mode by manipulating the Spot button during indication within the viewfinder in the Manual, Auto or B. check mode. Position of input button: 0.2 ± 0.5 mm
			

Major check point	Item to be checked	Standard and check procedure
		<p>Indication within viewfinder: SPOT</p> <p>Sound indication: PCV sounds at 2 kHz</p>
	2) Force required to depress spot button	<p>200 ± 50g</p> 
4. High light button	1) Operating reliability	<p>The camera must be set in the Hi light mode by depressing the Hi light button in the Spot mode. The mode must be cancelled by depressing the button once again.</p> <p>Position of input button: 0.4 ± 0.15 mm</p> 
	2) Force required to depress Hi light button	<p>200 ± 50g</p>
5. Shadow button	1) Operating reliability	<p>The camera must be set in the Shadow mode by depressing the Shadow button in the Spot mode. The mode must be cancelled by depressing the button once again.</p> <p>Position of input button: 0.4 ± 0.15 mm</p> 
	2) Force required to depress Shadow button	<p>200 ± 50g</p>

Major check point	Item to be checked	Standard and check procedure
6. Clear memory lever	1) Operating reliability	<p>The camera must be set in the Memo mode by turning the memory level during indication within the viewfinder in the Auto or B. check mode.</p> <p>Indication within viewfinder: Memo</p> <p>Sound indication: PCV sounds at 2 kHz</p> <p>LED indication: The indication memory signal LED must flicker twice at intervals of 2 sec.</p>  <p>The Memo mode must be compatible with the Spot mode and incompatible with the manual mode.</p>
	2) Force required to click in memory	<p>650 ± 150g (must be reset automatically)</p>
	3) Operating reliability (memory hold)	<p>The memory must be held upon releasing the shutter in the Memo mode.</p> <p>Indication within viewfinder: Memo (flickering)</p> 
	4) Reliability of clearing operation	<p>The clear lever must be effective to set the camera in the average mode by cancelling the Spot or Memo mode.</p> <p>Sound indication: PCV sounds at 2 kHz</p>
	5) Force required to click in clear lever	<p>500 ± 100g (must be reset automatically)</p>
7. L-pin	Operating reliability	<p>Upon detaching the lens, the camera must be set in the average direct mode by cancelling the Spot or Memo mode.</p>

Major check point	Item to be checked	Standard and check procedure
8. F-key	1) Locking reliability	The F-key must be capable of locking film without fail (with a click sound).
	2) Force required to remove F-key	100 ± 30g 
9. R-knob	1) Operating reliability	The knob must be pulled out in two stages (with click feeling). When it is pull up further from the 2nd stage and then released, it must be set automatically at the 2nd stage.
	2) Force required to pull out R-knob	400 ± 100g to pull out to the 1 stage 1200 ± 300g to pull out to the 2nd stage
	3) Rattling of R-knob	No vertical rattling 0.1 mm max. in back-force and right-left direction in stored position. 0.3 mm max. at tip of the rewinding knob in pulled-out position. Gap between the knob and crank:
		
	4) Spring force of R-lever	30 to 40g at raising start of the lever tip
	5) Friction	15 ± 5g on the knob (with no film loaded) 

Major check point

Item to be checked

Standard and check procedure

10. Winding lever

1) Operating reliability

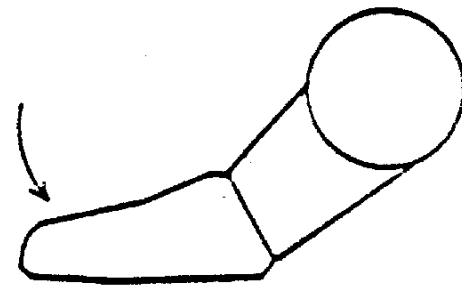
A single stroke of the winding lever must cause film feeding to the next frame and charging of the shutter and mirror without fail.

2) Smoothness of operation

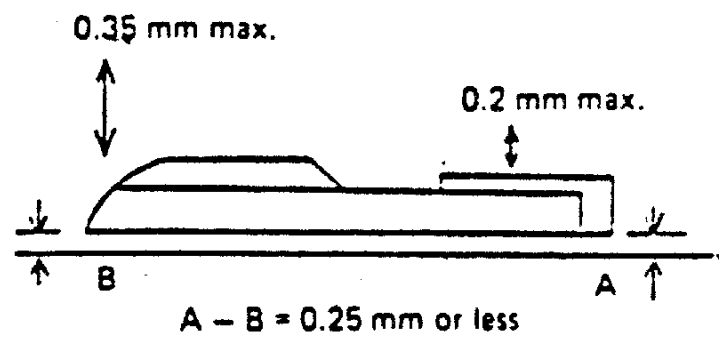
The winding lever must operate smooth with no remarkable seizure, rattling, friction, creak or abnormal noise at the initial stage.

3) Force required for turning

1.3 kg max. as measured at the lever tip with film loaded.



4) Rattling of winding lever



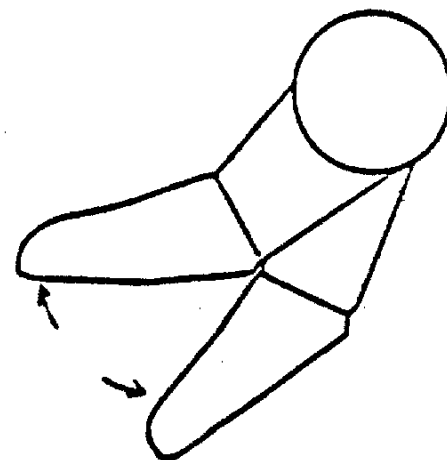
Rattling in back-forth or right-left direction:
0.1 mm max.

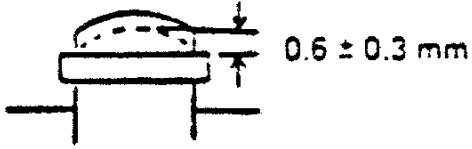
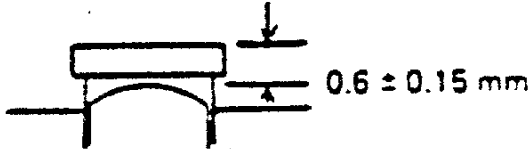
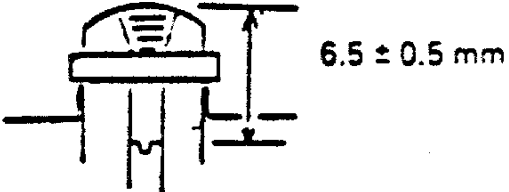
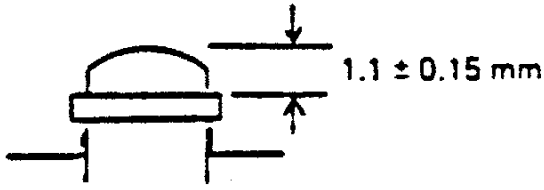
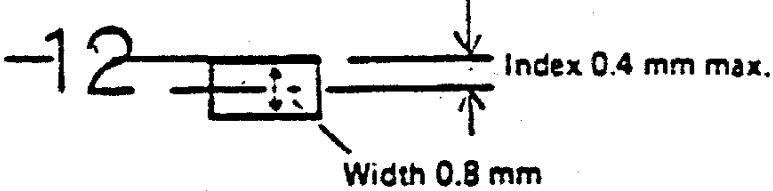
5) Force for spare pull-out

100 ± 50g as measured at lever tip

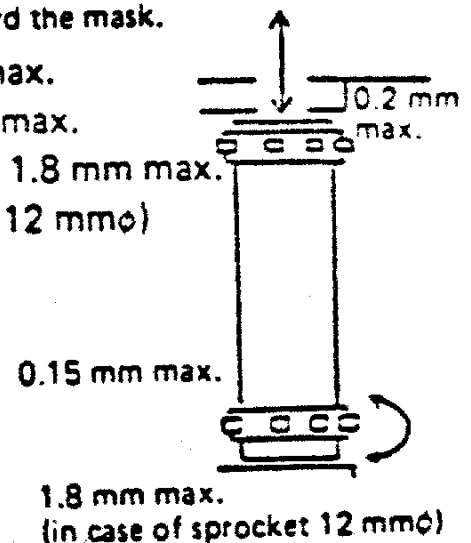
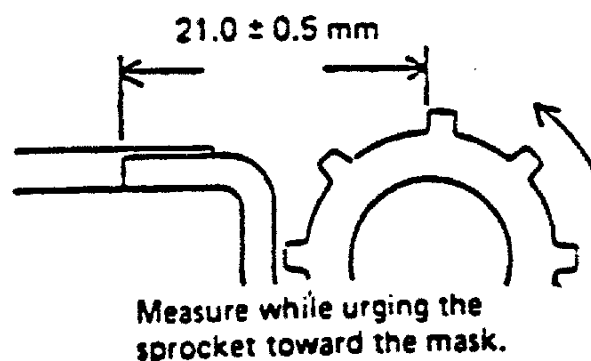
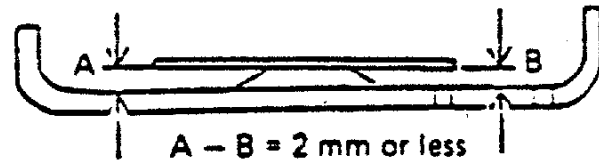
6) Angle for spare pull-out

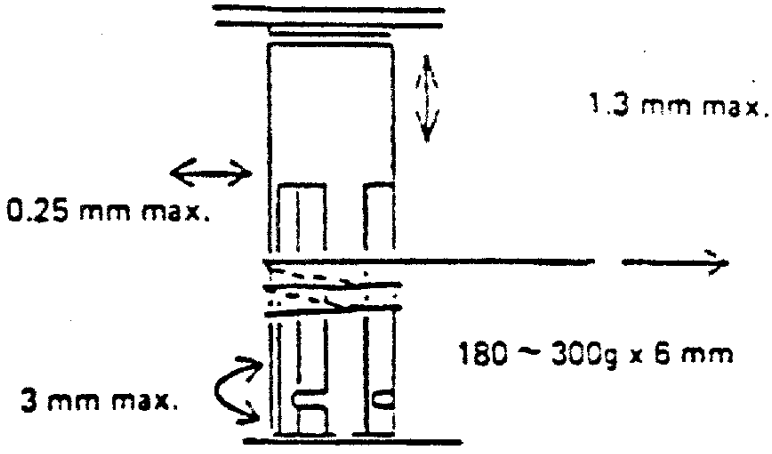
30 ± 5°

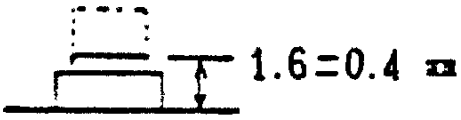
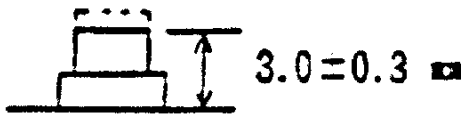
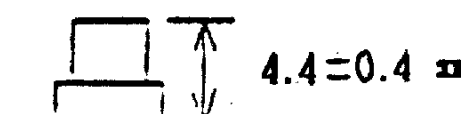


Major check point	Item to be checked	Standard and check procedure
11. Release button	1) ON position of indication switch	The indication switch must be turned ON at a position 0.6 ± 0.3 mm as measured from the top surface of the button seat. 
	2) Releasing position	The shutter must be released when the button is depressed 0.6 ± 0.15 mm as measured from the top surface of the button seat. 
	3) Depth of releasing core	The shutter should be released when the releasing core is set 6.5 ± 0.5 mm as measured from the button top. 
	4) Reset position of switch	The switch must be turned OFF when it is reset to a position 1.1 ± 0.15 mm as measured from the top of the button seat. 
	5) Force required to release shutter	Force to turn ON switch: 50 ± 10 g Force to release shutter: 260 ± 60 g
	6) Rattling of release button	No vertical rattling Tilting: 0.25 max.
12. Film counter	1) Alignment between index and counter character	0.4 mm max. (deviation between center of character height and center of the index) 
	2) Indication of "No. 1"	After closing the rear cover, "No. 1" must be indicated by feeding three film frames.
	3) Operating reliability	The film counter must advance 1 step each time a single frame is fed. The film counter must stop when "E" is indicated. The film counter must return to "S" upon opening the rear cover at any film position.

Major check point	Item to be checked	Standard and check procedure
13. Rear cover	1) Closing reliability	The rear cover must not be opened by depressing any part of it. The rear cover must not be opened by weight of the camera when the R-knob is raised. The rear cover must be opened by pulling the R-knob to the 2nd stage.
	2) Rattling and tilting of rear cover	Back-forth rattling: 0.5 mm max. Tilting: 0.5 mm max.
	3) Rattling of hinge	0.15 mm max.
	4) Gap between rear cover and upper/lower plate	0.9 mm max. with no deviation
	5) Gap around key cover	0.5 mm max.
	6) Force required to close rear cover	1 to 2 kg
14. Pressure plate	1) Force of pressure plate	600 ± 100g on sprocket side 250 ± 50g on patrone side with the rear cover closed
	2) Parallelism of pressure plate	Within 0.2 mm relative to the rear cover when it is closed.
	3) Rattling of pressure plate	0.25 max. in any direction
15. Sprocket	1) Position of tooth	21.0 ± 0.5 mm as measured from the mask to the sprocket tooth.
	2) Rattling of sprocket	Vertical: 0.2 mm max. Radial: 0.15 mm max. Rotating direction: 1.8 mm max. (in case of sprocket 12 mmø)



Major check point	Item to be checked	Standard and check procedure																															
16. Spool	1) Rattling of spool	Vertical: 1.3 mm max. Radial: 0.25 mm max.																															
	2) Force required to turn spool																																
17. Shutter dial	1) Clicking force	Force required to disengage click: 2 ± 0.6 kg-cm Intermediate section: 600 ± 300 g-cm																															
	2) Rattling	0.15 mm max. at position of the index. Thrusting or radial rattling: 0.1 mm max.																															
	3) Indicating deviation	Deviation: Within ± 0.3 mm V1, 2, 4 and 8 within ± 0.3 mm of the character center Plural characters within ± 0.3 mm of the position specified for each character row: <table border="1" data-bbox="1282 1512 1832 1908"> <tr><td>$\frac{1}{5}$</td><td>→</td><td>15</td><td>0.72 mm</td></tr> <tr><td>$\frac{3}{0}$</td><td>→</td><td>30</td><td>0.77 mm</td></tr> <tr><td>$\frac{6}{0}$</td><td>→</td><td>60</td><td>0.72 mm</td></tr> <tr><td>$\frac{12}{5}$</td><td>→</td><td>125</td><td>1.38 mm</td></tr> <tr><td>$\frac{25}{0}$</td><td>→</td><td>250</td><td>1.49 mm</td></tr> <tr><td>$\frac{50}{0}$</td><td>→</td><td>500</td><td>1.49 mm</td></tr> <tr><td>$\frac{100}{0}$</td><td>→</td><td>1000</td><td>1.55 mm</td></tr> <tr><td>$\frac{200}{0}$</td><td>→</td><td>2000</td><td>0.51 mm</td></tr> </table>	$\frac{1}{5}$	→	15	0.72 mm	$\frac{3}{0}$	→	30	0.77 mm	$\frac{6}{0}$	→	60	0.72 mm	$\frac{12}{5}$	→	125	1.38 mm	$\frac{25}{0}$	→	250	1.49 mm	$\frac{50}{0}$	→	500	1.49 mm	$\frac{100}{0}$	→	1000	1.55 mm	$\frac{200}{0}$	→	2000
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18. B lock button	1) Operating reliability	The B lock button must be operated optionally from 1/2000 to 1 sec., and must not turn from 1 sec. to mechanical 1/60. When the B lock button is depressed $0.3_{-0.1}^{+0.2}$ mm, it must release the B lock and turns from 1 sec. to mechanical 1/60.																															
	2) Force required to depress B lock button	120 ± 40 g																															
	3) Release of memory hold condition	The memory hold condition must be cancelled by turning to B mechanical 1/60.																															

Major check point	Item to be checked	Standard and check procedure
19. Rewinding button	1) Operating reliability	<p>The sprocket must turn idly without fail by setting the rewinding button.</p> <p>Depressed position of rewinding button:</p>  <p>Position to actuate clutch (button height):</p> 
	2) Resetting reliability	<p>Upon next depression of the winding button the button must be reset within 3/4 turn of the sprocket and film must be wound without fail.</p> 
	3) Force required to depress rewinding button	450 ± 50g
20. Mode selector lever	1) Operating reliability	Modes must be easily selectable without fail. The keys (Spot, Hi light, Shadow, Clear and Memo) must be effective in the B. check mode.
	2) Clicking force	Auto ↔ Manual 375 ± 80g Auto ↔ B. check 375 ± 80g
	3) Indication of B. check mode	The B. check mode must be indicated by the LED and PCV without fail.
	4) Cancelling of memory hold condition	The memory hold condition must be cancelled by changing the mode.
21. ASA dial	1) Operating reliability	Deviation of the index: Within its width Radial rattling: 0.3 mm max.
	2) Force required to raise ASA dial	450 ± 100g
22. "±" correction dial	1) Correcting reliability	Deviation of the index: Within ±0.2 mm Indication within viewfinder: "+" mark flickers
	2) Clicking force	400 ± 100 g·cm

Major check point

Item to be checked

Standard and check procedure

3) Correctable range

	+2	+1	0	-1	-2
6	/	/			
12	/				
25					
40					
64					
100					
200					
400					
800					
1600					/
3200				/	/

Blank columns indicate correctable ranges.

23. Self lever

- 1) Operating reliability of self-timer
- 2) Time set by self-timer
- 3) Force required to turn lever
- 4) Flickering interval

Upon releasing the shutter, the self-timer must start operating with sound and LED indications without fail.

12 ± 3 sec.

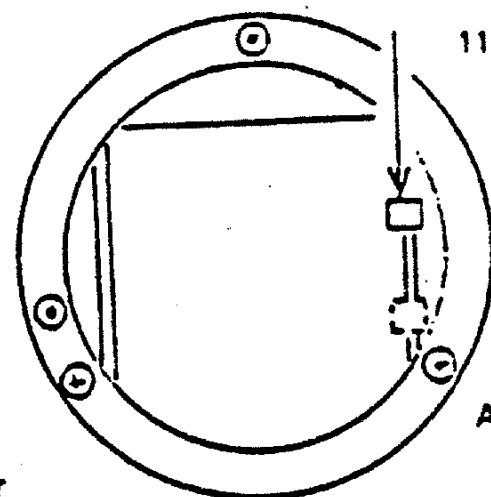
220 ± 80g as measured at the lever tip

LED frequency 2 Hz

PCV frequency 2 Hz, sounding tone at 4 kHz

24. Stop down lever

Force required to turn lever

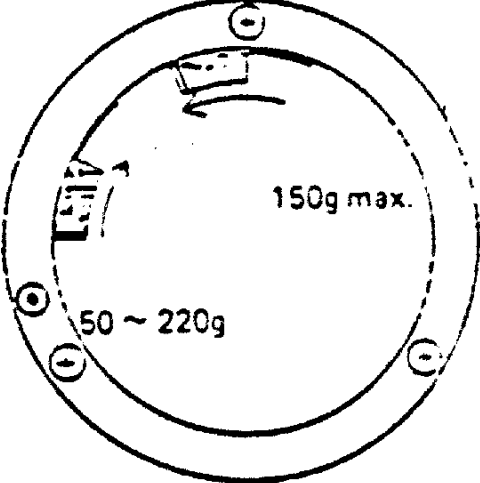


115 ± 20g

左記の力
で絞り込み
レバーが下
に動くこと

At least 50g

Force required to return lever

Major check point	Item to be checked	Standard and check procedure
25. Diaphragm interlock	Force required to turn ring	
26. Movable mirror	1) Smoothness of motion 2) Shutter releasing position	The mirror must move without breathing or abnormal noise. The 1st curtain must be sent out when the mirror tip rises at least 8 mm above the film center.
27. B mount	1) Torque required for mounting and dismounting standard lens 2) Locking reliability	4 to 7 kg·cm The B mount must be locked at its stop position without fail. Deviation of the index due to rotational rattling: Within 0.2 mm
28. Combination with T-series flash (Auto mode)	1) Operating reliability 2) Indicating reliability	When T-series flash is mounted and the switch is turned ON in the Spot or Memo mode, it must be switched to the average direct mode. In the Auto mode, the flash must not glow at bar indication of speed higher than 1/60 sec. The flash must glow at 1/60 sec. or lower speed. TTL auto must be settable in the Auto mode even while the flash is set in the manual or ordinary auto mode. "▷◁" mark must be indicated on both sides of SS 1/60 when the flash switch is turned ON. "↗" mark must be indicated upon completing charging of the flash. "↗" mark must flicker when light intensity becomes adequate after flashing. "UNDER" must flicker when flash intensity is under 0.5 ± 0.3 EV or the strobe does not flash at shutter speed of 1/60. "OVER" must flicker when flash intensity exceeds 1 ± 0.3 EV.

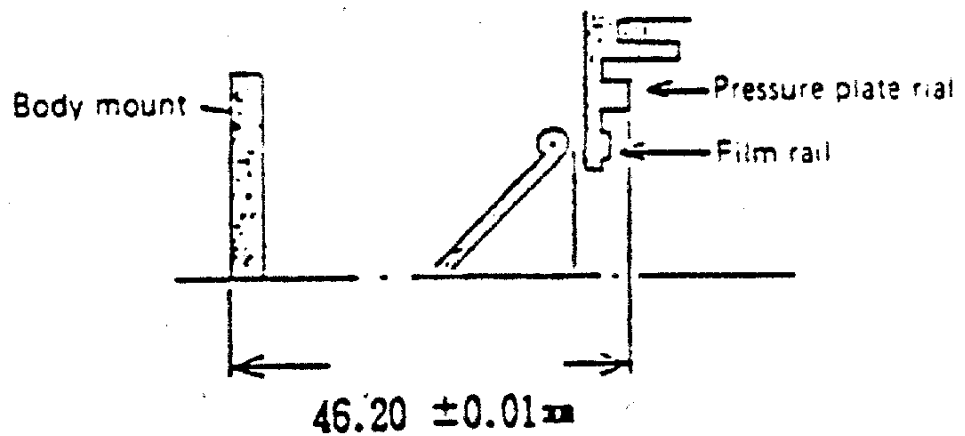
Major check point	Item to be checked	Standard and check procedure
29. Combination with T-series flash (Manual mode)	1) Operating reliability	The strobe must be capable of flashing at all the shutter speeds.
	2) Indicating reliability	" ⚡ " mark must be indicated upon completing charging.
30. Combination with T-series flash (B. mecha 1/60)	1) Operating reliability	The strobe must flash when battery voltage exceeds the lock voltage. The strobe must not flash when battery voltage is lower than lock voltage.
	2) Indicating reliability	" ⚡ " mark must be indicated upon completing charging.
31. Motor drive	1) Operating reliability	Film must be wound without fail when the motor drive and winder are set in position.
	2) Force required to operate releasing plate	$180 \pm 20\text{g}$
	3) Release lock	At least 2.5 mm
	4) Releasing position	$2 \pm 0.4\text{ mm}$
	5) Contact	Insulator position from F plate: $0 \pm 0.05\text{ mm}$ Contact position from F plate: $0.1 \pm 0.2\text{ mm}$
	6) Continuity and insulation resistance	0.2Ω max. in continuous condition Insulation resistance at least $50\text{ M}\Omega$ at 20V (between contact and body)

II. PERFORMANCE

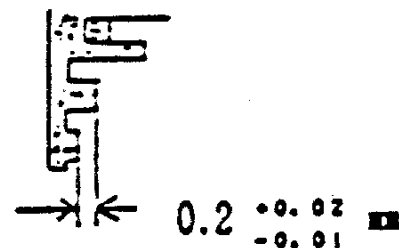
1. Mount back and optical path length

Optical path length of viewfinder
 46.05 ± 0.02 mm

Mount back
 46.20 ± 0.02 mm
 Standard for pressure plate rail

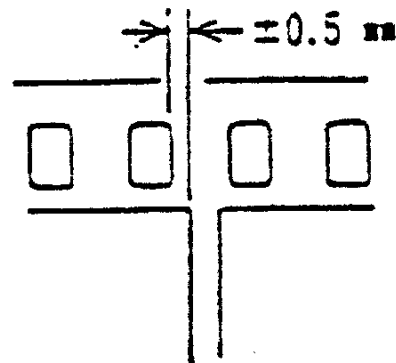


2. Spacing between tunnels



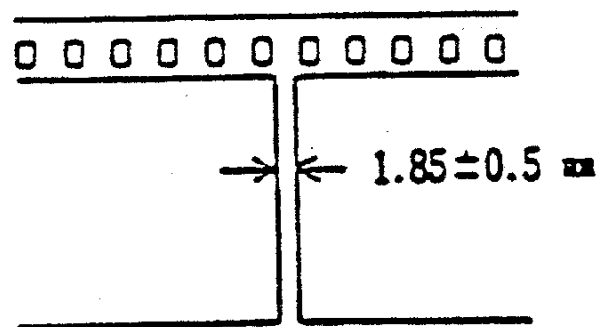
3. Position of perforations

The perforations must not be located within a range of ± 0.5 mm of the center line between succeeding film frames.



4. Film frame spacing

1.85 ± 0.5 mm in normal film winding condition
 At least 0.6 mm in abnormal film winding condition



5. Vertical deviation of actual screen surface

The screen must not overlap with the perforations.

6. A. Accuracy of automatic exposure

F5.6, new battery x 2, K = 1.3

Luminance	Central value	Standard for adjustment	Standard for inspection	ASA
BV15	0	+0.65 ~ -0.15 EV.	-0.7 ~ +0.75 EV	200
BV14	0	0 ± 0.3 EV	0 ± 0.1 EV	100
BV10	0	0 ± 0.05 EV	0 ± 0.3 EV	100
BV7	0	0 ± 0.3 EV	0 ± 0.3 EV	100
BV4	0	0 ± 0.3 EV	0 ± 0.3 EV	100

B. ASA switching accuracy

Standard conditions: F4, BV7, ± correction,
ASA (ISO) 100, SS 1/8

ASA switching	Standard for adjustment	Standard for inspection
6 ~ 12	0 ± 0.4 EV	±0.4 EV
25 ~ 50	0 ± 0.4 EV	±0.3 EV
100	0 ± 0 EV	± 0 EV
200 ~ 400	0 ± 0.3 EV	±0.3 EV
800 ~ 1600	0 ± 0.4 EV	±0.4 EV
3200	0 ± 0.4 EV	±0.7 EV

NOTE: Difference between neighboring ASA levels is 0.6 EV/EV.

C. ± correction accuracy

Standard conditions: F4, BV7, ASA (ISO)
100 ± 0 EV, SS 1/8

± correction value	Standard for adjustment	Standard for inspection
-2 EV	±0.4 EV	±0.4 EV
-1 EV	±0.3 EV	±0.3 EV
±0 EV	±0 EV	±0 EV
+1 EV	±0.3 EV	±0.3 EV
+2 EV	±0.4 EV	±0.4 EV

7. Manual time

Time	Central value	Standard for adjustment	Standard for inspection
1/2000	0.49	0.30 ~ 0.75 ms	0 ± 0.70 ~ +0.62
1/1000	0.98	0.79 ~ 1.20	0 ± 0.3
1/500	1.95	1.59 ~ 2.40	0 ± 0.3
1/250	3.91	3.40 ~ 4.49	0 ± 0.2 EV
1/125	7.82	6.80 ~ 8.97	0 ± 0.2 EV
1/60	15.6	13.6 ~ 17.9	0 ± 0.2 EV
1/30	31.3	27.2 ~ 35.9	0 ± 0.2 EV
1/15	62.5	54.4 ~ 71.8	0 ± 0.2 EV
1/8	125	109 ~ 143	0 ± 0.2 EV
1/4	250	218 ~ 287	0 ± 0.2 EV
1/2	500	435 ~ 574	0 ± 0.2 EV
1/1	1000	871 ~ 1149	0 ± 0.2 EV
Mecha 1/60	15.6	14.6 ~ 19.9	0 ± 0.1 ~ +0.35

Battery voltage: 3.0 ± 0.05V

- Curtain speed: $X10.9_{-0.15}^{+0.1}$ ms (at 20°C)
 (Variation during 25 shutter releasing operations, except the first)
 Difference between the 1st and 2nd curtain speeds: X0.06 ms max.
 (Variation during 25 shutter releasing operations, except the first)
- Disturbance: 0.05
 (Variation during 25 shutter releasing operations, except the first)
- Exposure variation: 0 ± 0.35 EV at shutter speed of 1/1000 to 1/2000 (for B channel)
 0 ± 0.40 EV at shutter speed of 1/500 or lower (for B channel)
- Difference between neighboring shutter speeds:
 1 ± 0.3 EV at shutter speeds of 1/1 to 1/500
 1 ± 0.4 EV at shutter speeds of 1/1000 to 1/2000

8. Exposure indication

A. Indication accuracy (average mode)

Conditions: F4, ISO (ASA) 100,
MS5018 standard lens

Luminance	Indication	Standard
BV16	OVER	
BV14	1/1000	±0.5 EV (in 1 segment)
BV11	1/125	±0.5 EV (in 1 segment)
BV8	1/15	±0.5 EV (in 1 segment)
BV4	IS	±0.5 EV (in 1 segment)

Difference within ±0.5 EV as compared with Spot at BV9 (in 1 segment).

B. ISO switching accuracy

Standard conditions: F4, ISO (ASA) 100, MS5018
standard lens, ISO 100, SS 1/15

ISO	Indication	Standard
3,200	1/500	±0.5 EV (in 1 segment)
1,600	1/250	±0.5 EV (in 1 segment)
800	1/125	±0.5 EV (in 1 segment)
400	1/60	±0.5 EV (in 1 segment)
200	1/30	±0.5 EV (in 1 segment)
100	1/15	±0 EV
50	1/8	±0.5 EV (in 1 segment)
25	1/4	±0.5 EV (in 1 segment)
12	1/2	±0.5 EV (in 1 segment)
6	1/1	±0.5 EV (in 1 segment)

Step between neighboring ISO levels must be at least 2/3 EV per EV (in 2 segments).

C. ± correction accuracy

Standard conditions: F4, BV8, ISO (ASA)
100 ± 0 EV, SS 1/15

Correction value	Indication	Standard
-2 EV	1/60	±0.5 EV (in 1 segment)
-1 EV	1/30	±0.5 EV (in 1 segment)
±0 EV	1/15	±0 EV
+1 EV	1/8	±0.5 EV (in 1 segment)
+2 EV	1/4	±0.5 EV (in 1 segment)

At least 2/3 EV per EV (in 2 segments)

Difference between automatic exposure time and indicated time must be within 1 EV (for typical object).

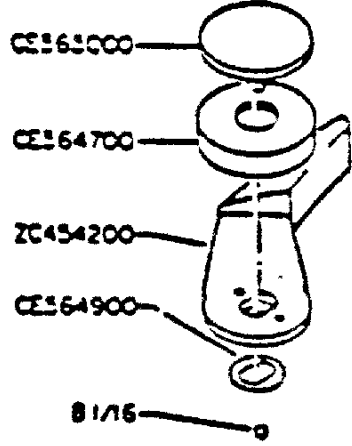
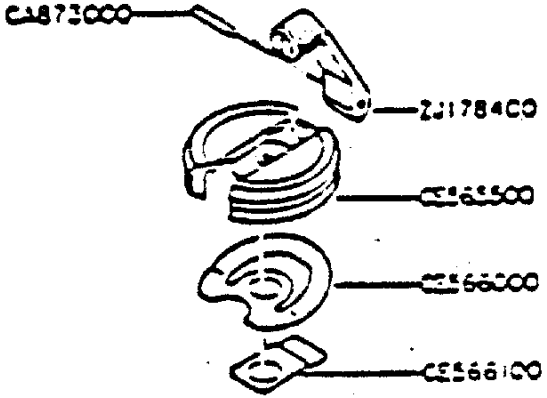
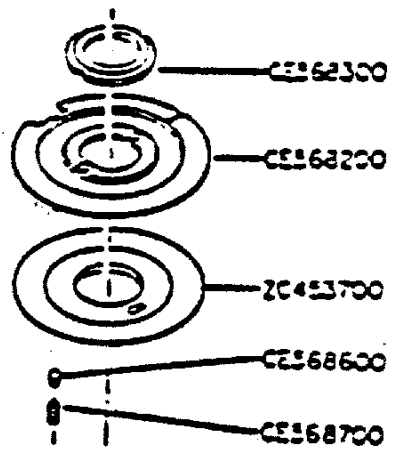
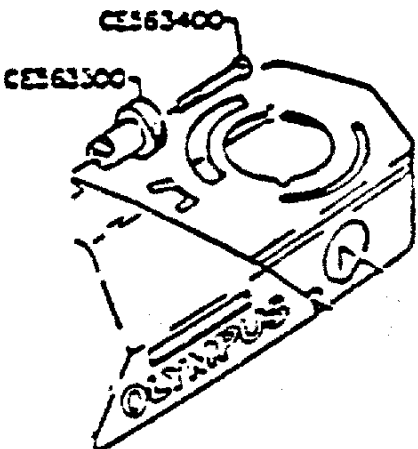
D. Spot indication	Indication of Shadow	The bar must be indicated 2-2/3 EV toward the "+" side from the minimum luminance of spot input value.
	Hi light	The bar must be indicated 2 EV toward the "-" side of the maximum luminance of spot input value.
9. Spot characteristic		The photosensor must exhibit the maximum sensitivity for a light source $\phi 1$ located within the split of screen 1-13.
10. Time lag		0.1 to 0.5 ms
11. Contact efficiency		At least X50% at intervals of 1 ms at a shutter speed of 1/60 sec.
12. Insulation resistance		At least 30Ω at 500V
13. Indications by B. check lamp, LED and PCV		Judging voltage $2.65V \pm 0.05V$ Warning voltage: Lock voltage $0.1 \pm 0.05V$
14. Release lock voltage		$2.65 \pm 0.05V$
15. Unlocking		The lock must be released at a voltage exceeding 2.95V without fail.
16. Current consumption		10 ± 3 mA for illumination within viewfinder 4 ± 1 mA for Memo indication 4 ± 1 mA for color illumination 5 ± 1 mA for self-timer 5 ± 1 mA for B. check Approx. 8 mA during shutter operation
17. Standby current		Approx. $35 \mu A$ as measured with a digital circuit tester.

C. DISASSEMBLING PROCEDURES

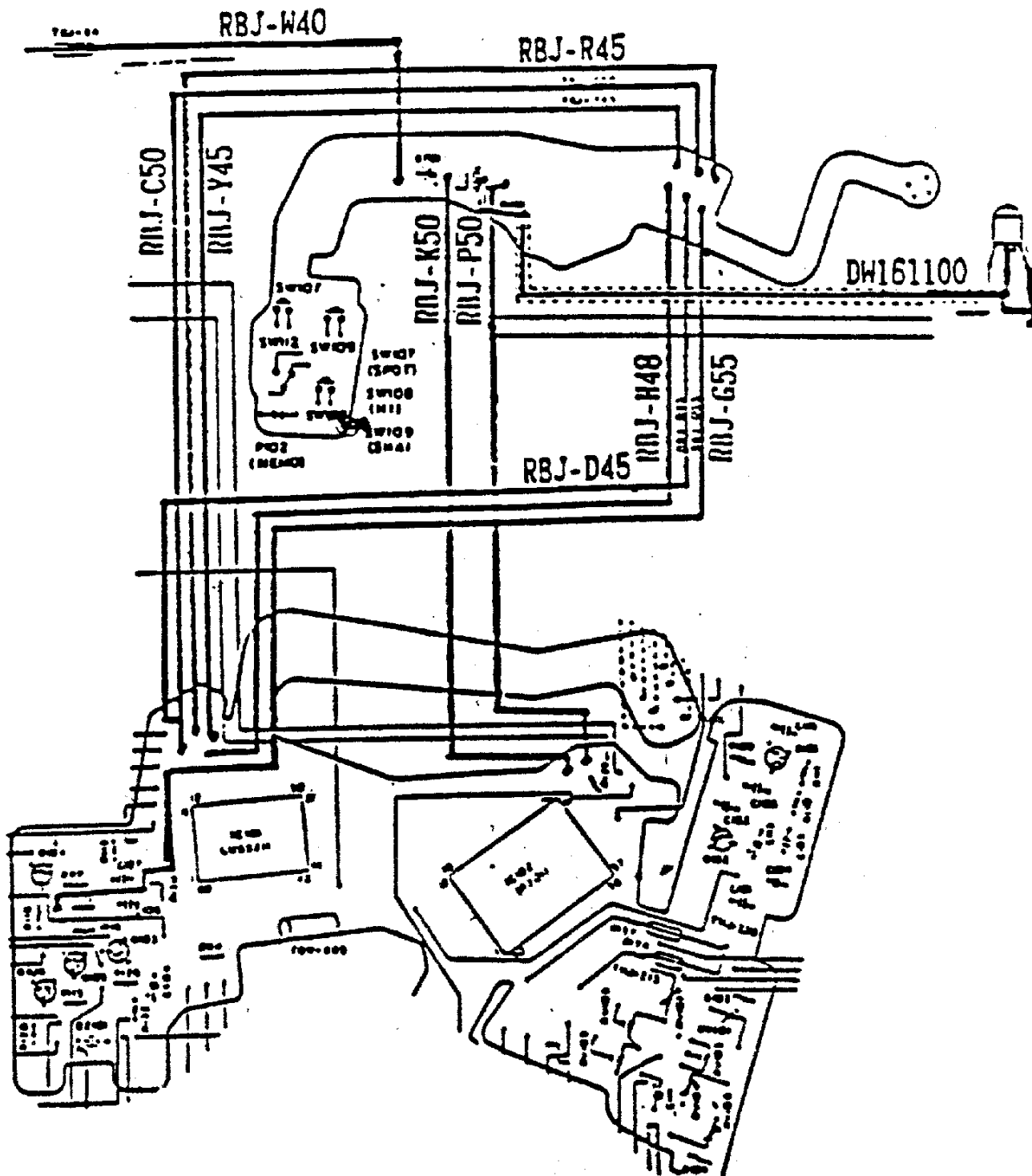
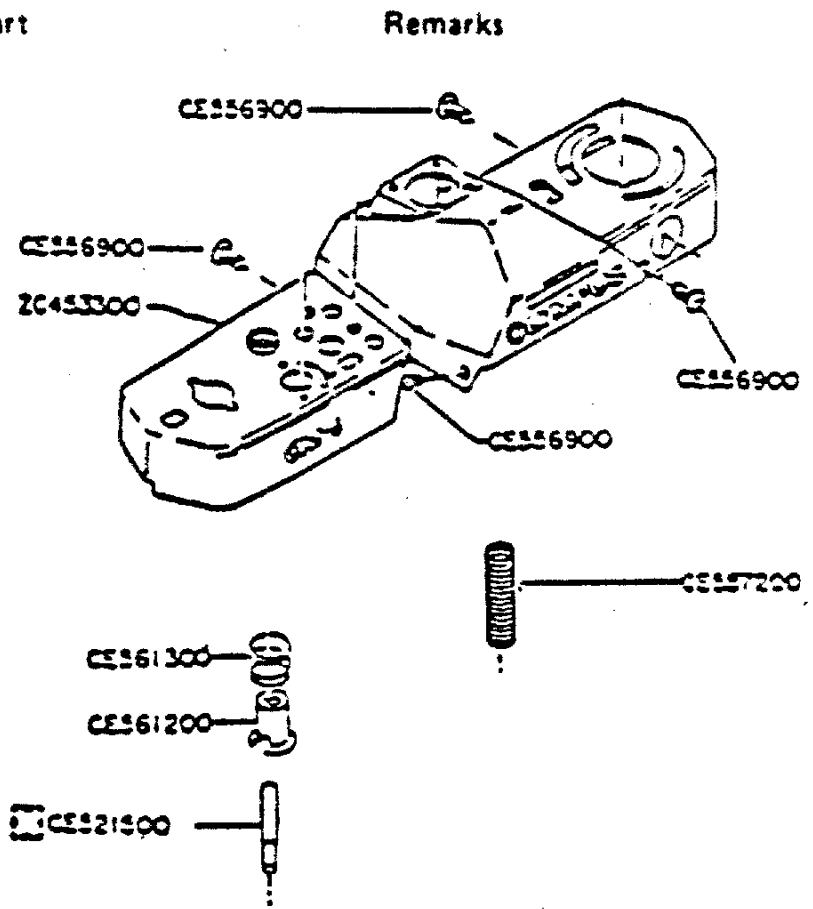
CONTENTS

I.	DETACHMENT OF TOP COVER ASS'Y.....	C- 1
II.	REMOVAL OF TV CIRCUIT BOARD.....	C- 3
III.	DISMOUNTING OF SHUTTER UNIT.....	C- 5
IV.	DISASSEMBLY OF SHUTTER MECHANISM	C- 7
V.	REMOVAL OF MAIN CIRCUIT BOARD.....	C- 8
VI.	DETACHMENT OF SIDE PLATES L AND R	C-10
VII.	DISASSEMBLY OF FILM WIND UNIT.....	C-11

I. DETACHMENT OF TOP COVER ASS'Y

Main part	Part to be removed	Q'ty	Removable part	Remarks
1. Lever	CE565000 Lever screw	1	Lever ZC454200 FW Lever dec. ring CE564700 Lever connector CE564900 B 1/16 (2)	
2. R knob	CE565500 R Knob	1	R Lever ZJ178400 R Lever pin CA873000 R Lever spring CE566000 R Spring holder CE566100	
3. SV dial	CE568300 Cover holder	1	ASA Cover plate CE568200 SV Dial ZC453700 SV Click CE568600 SV Spring CE568700	
4. IS knob	CE563400 IS Screw	1	IS Knob CE563300	

Main part	Part to be removed	Q'ty	Removable part
5. Top cover ass'y	CE556900	4	Top cover ass'y
	U Screw		ZC453300
	RBJ-P50	1	RK Button
	RBJ-K50	1	CE561200
	DW161100	1	RK Spring
	FP Shield 2	1	CE561300
	RBJ-D45	1	P Rod
	RBJ-C50	1	CE521500
	RBJ-R45	1	Key spring
	RBJ-Y45	1	CE557200
	RBJ-H48	1	
	RBJ-G55	1	
	RBJ-W40	1	

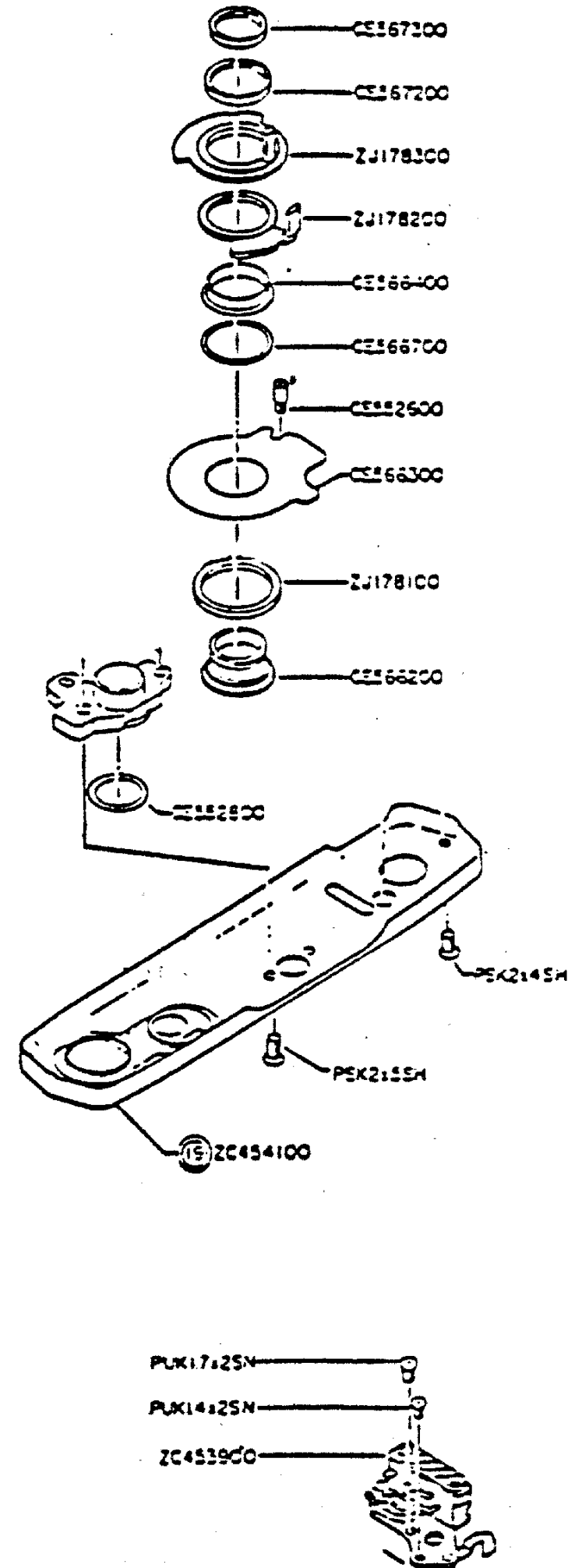


II. REMOVAL OF TV CIRCUIT BOARD

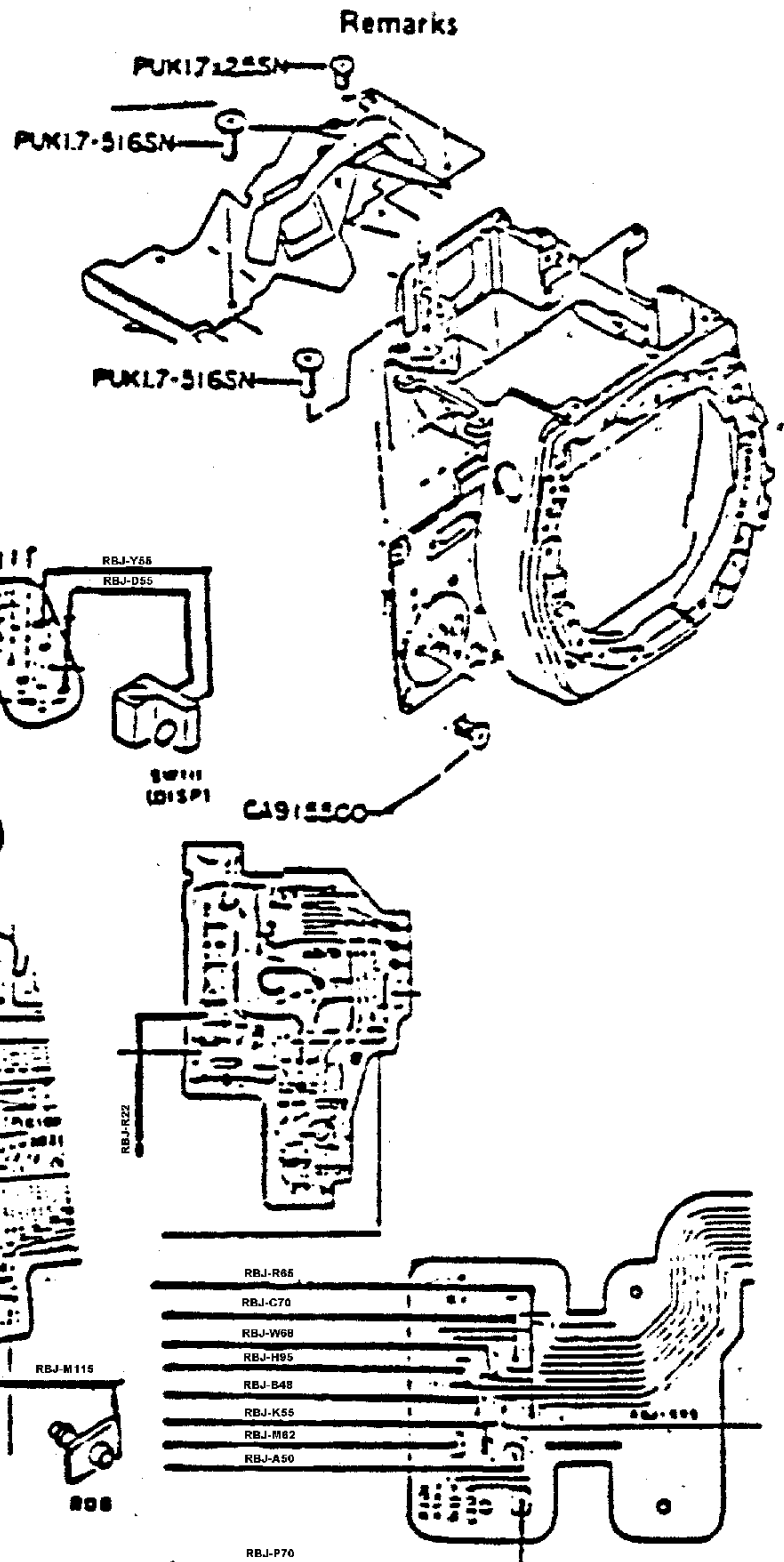
Main part	Part to be removed	Q'ty	Removable part	Remarks
1. SV circuit board	CE567300	1	SV Circuit board	The SV circuit board is removed as a unit consisting of the SV collar and other six parts. (Do not disconnect the lead wires.)
	SV Nut 2		CE566300	
	ZJ178100	1		
	M Switch mecha			
	CE566200	1		
	SV Collar			

2. Bottom plate ass'y	PSK2x4SH	2	Bottom plate ass'y
	PSK2x5SH	2	ZC454100 T Mount seal CE552800

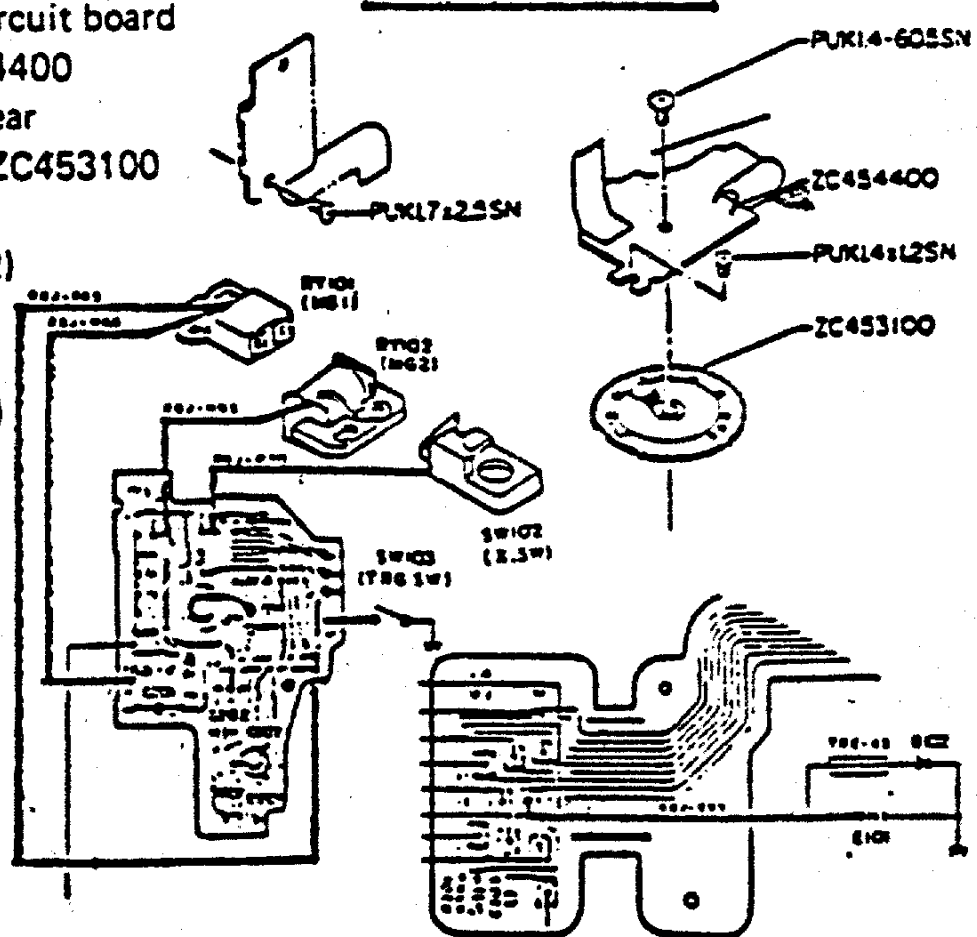
3. SW plate	PUK1.7x2SN	1	SW Plate
	PUK1.4x2SN	1	ZC453900
	RAJ-R36	1	
	RBJ-Y168	1	
	RBJ-G130	1	



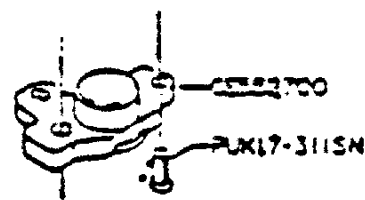
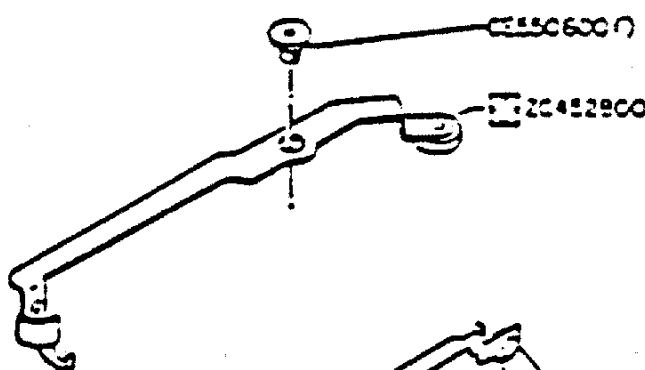
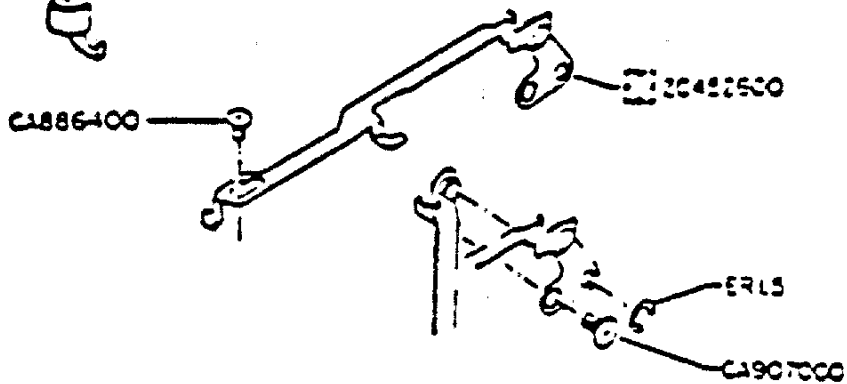
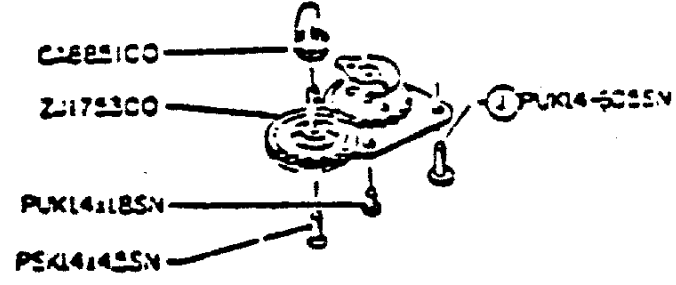
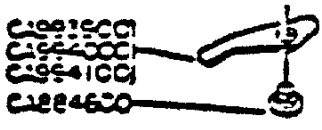
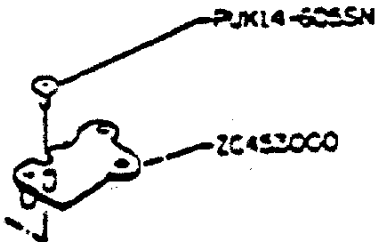
Main part	Part to be removed	Q'ty	Removable part
4. Front casting unit	CA915500	5	Front casting unit
	F Screw		
	PUK1.7-516SN	2	
	PUK1.7x2 5SN	1	
	RBJ-D55	1	SW 111)
	RBJ-Y55	1	
	RBJ-P70	1	
	RBJ-R65	1	
	RBJ-C70	1	
	RBJ-W68	1	TV circuit board)
	RBJ-H95	1	
	RBJ-B48	1	
	RBJ-M62	1	
	RBJ-K55	1	
	RBJ-A50	1	
	RBJ-R22	1	Main circuit board)
	RBJ-M115	1	



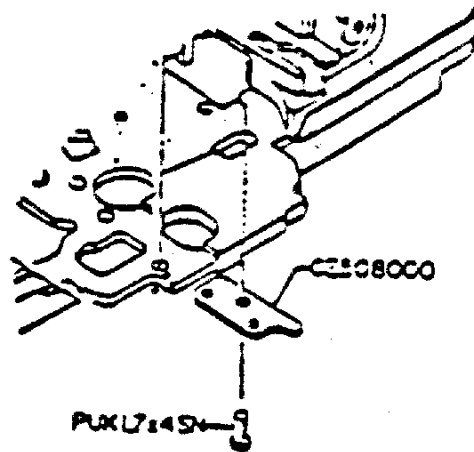
5. TV circuit board	PUK1.4x2.5SN	1	TV Circuit board
	PUK1.4-605SN	1	ZC454400
	PUK1.4x1.2SN	1	TV Gear
	RBJ-B95	1	DC) ZC453100
	RBJ-H95	1	MG2)
	RBJ-P70	1	SW102)
	RBJ-W68	1	MG1)
	RBJ-R65	1	
	TRG, SW	1	Solder)



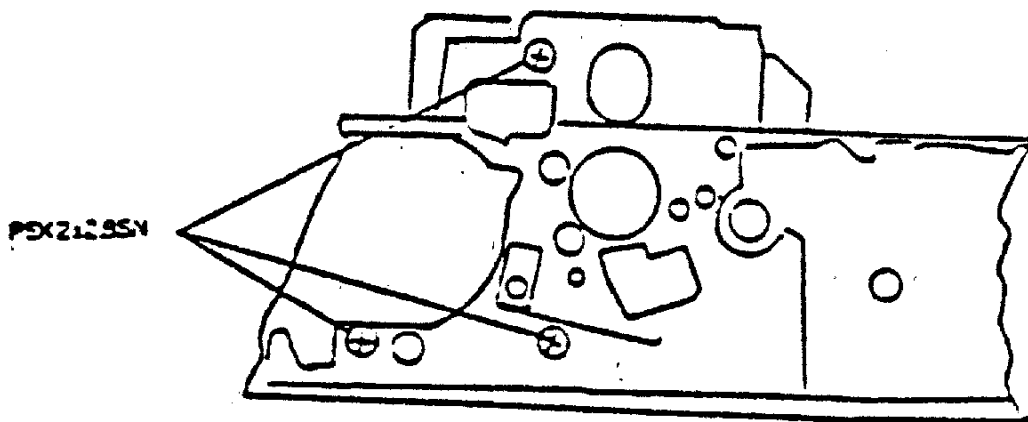
III. DISMOUNTING OF SHUTTER UNIT

Main part	Part to be removed	Q'ty	Removable part	Remarks
1. Tripod mount plate	PUK1.7x311	2	Tripod mount plate CE552700	
2. KM lever	CE550600 M Lever shaft 2	1	KM Lever ZC452800	The M lever shaft 2 has left-hand thread. 
3. KL plate	CA886400 KL Shaft CA907000 C Screw ER1.5 E Washer	1 1 1 1 1	KL Plate ZC452600	
4. No. 4 base plate	PUK1.4-605SN PUK1.4x1.8SN PSK1.4x4.5SN	1 1 1	No. 4 base plate ZJ175300 No. 3 Gear spring CA885100	
5. Spring lever	CA884600 Spring shaft 1	1	S Lever CA993900	
6. TR circuit board	PUK1.4-605SN	1	TR Circuit board ZC453000	

Main part	Part to be removed	Q'ty	Removable part	Remarks
7. S plate	PUK1.4x4SN	1	S Plate CE508000	

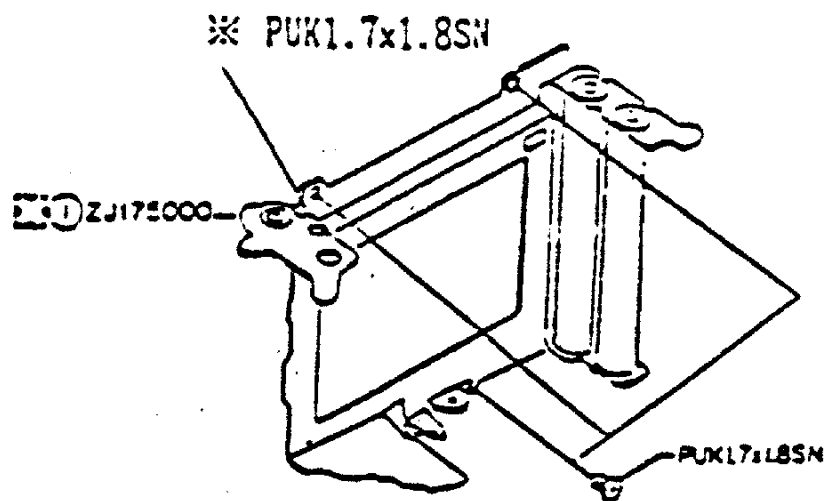


8-1 Shutter unit (lower part)	PSK2x2.8SN	3		
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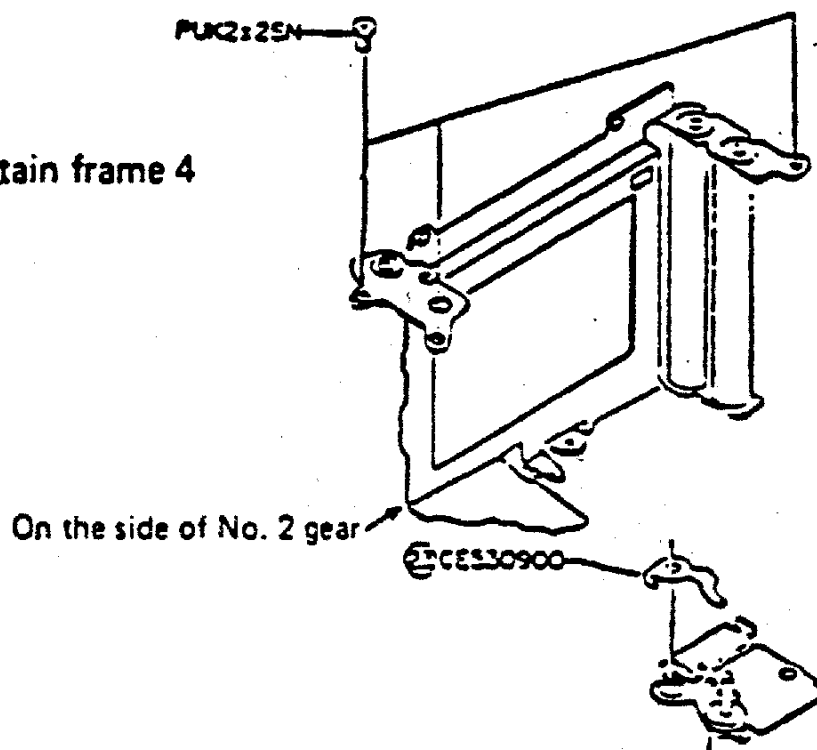
8-2 Shutter unit (mask)	PUK1.7x1.8SN	3		
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*Tentatively tighten Screw PUK1.7x1.8SN to the U Plate R ZJ175000 to prevent it from separating from SC Frame ZJ175500 of the S body



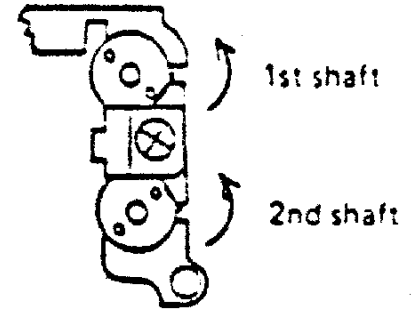
8-3 Shutter unit (upper part)	PUK2x2SN	3	Shutter curtain frame 4 ZC451000	
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*While pushing up the shutter unit on the side of No. 2 Gear ZJ176000, remove the lower part of the curtain cylinder from the shutter curtain frame and then separate the shutter unit by raising it to the top of the shutter curtain frame while swinging leftward, rightward, back and forth.

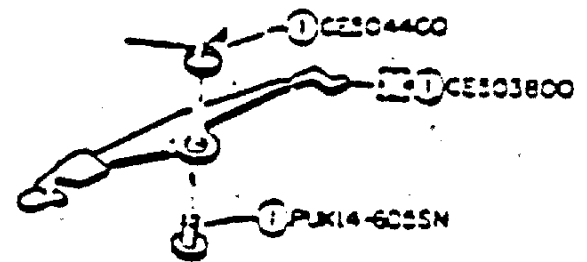


IV. DISASSEMBLY OF SHUTTER MECHANISM

- | Main part | Part to be removed | Q'ty | Removable part |
|--|--------------------|------|----------------|
| 1. Set shutter blind torque at 0.
The 1st shutter blind rotates the 1st shaft about 5.5 turns counterclockwise, whereas the 2nd shutter blind rotates the 2nd shaft about 4 turns counterclockwise. | | | |

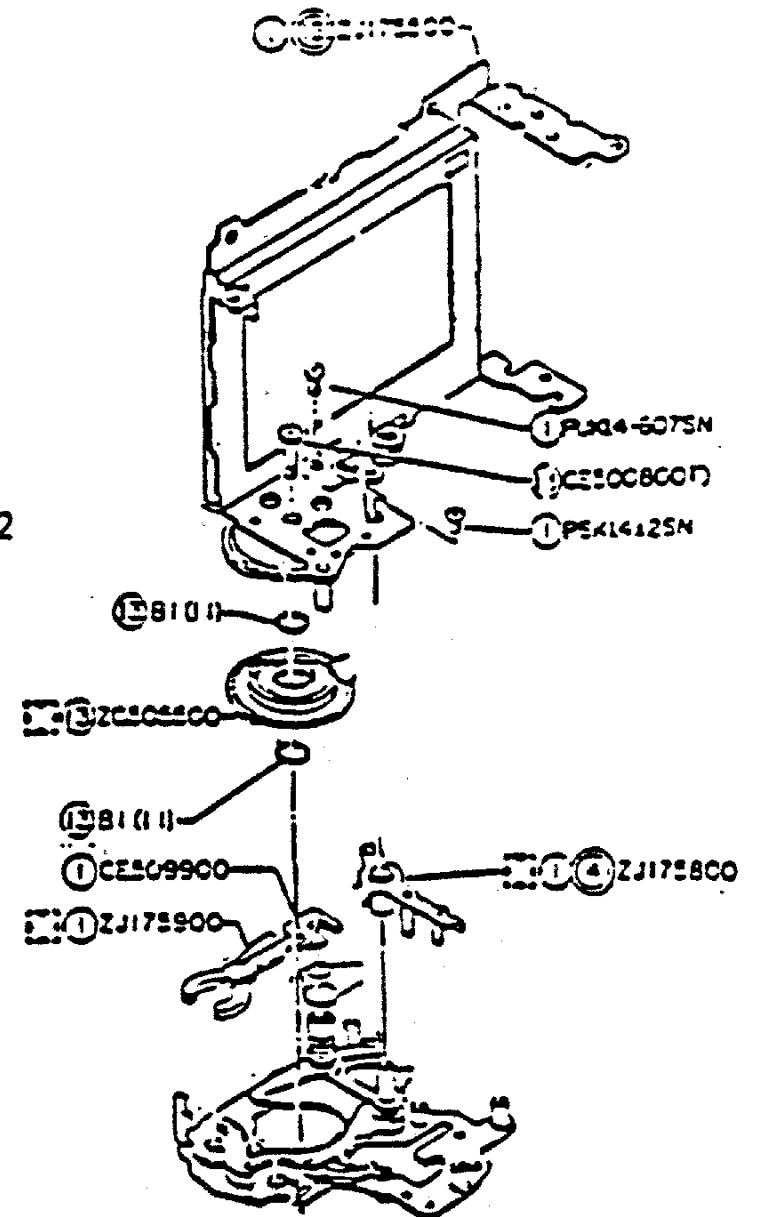


- | | | | |
|--------------|--------------|---|---|
| 2. M lever 2 | PUK1.4-605SN | 1 | M Lever 2
CE503800
M Lever spring
CE504400 |
|--------------|--------------|---|---|



- | | | | |
|---------------|----------------------------|--------|--|
| 3. SC frame 2 | PUK1.4-607SN
PUK1.4x2SN | 1
1 | SC Frame 2
ZJ175500
R Claw
ZJ175800
B Lever
ZJ175900
BB Lever spring 2
CE509900 |
|---------------|----------------------------|--------|--|

*Note that 22 balls B₁ spring out since Gear A ZC505500 is disengaged upon removing Gear Screw CE500800.

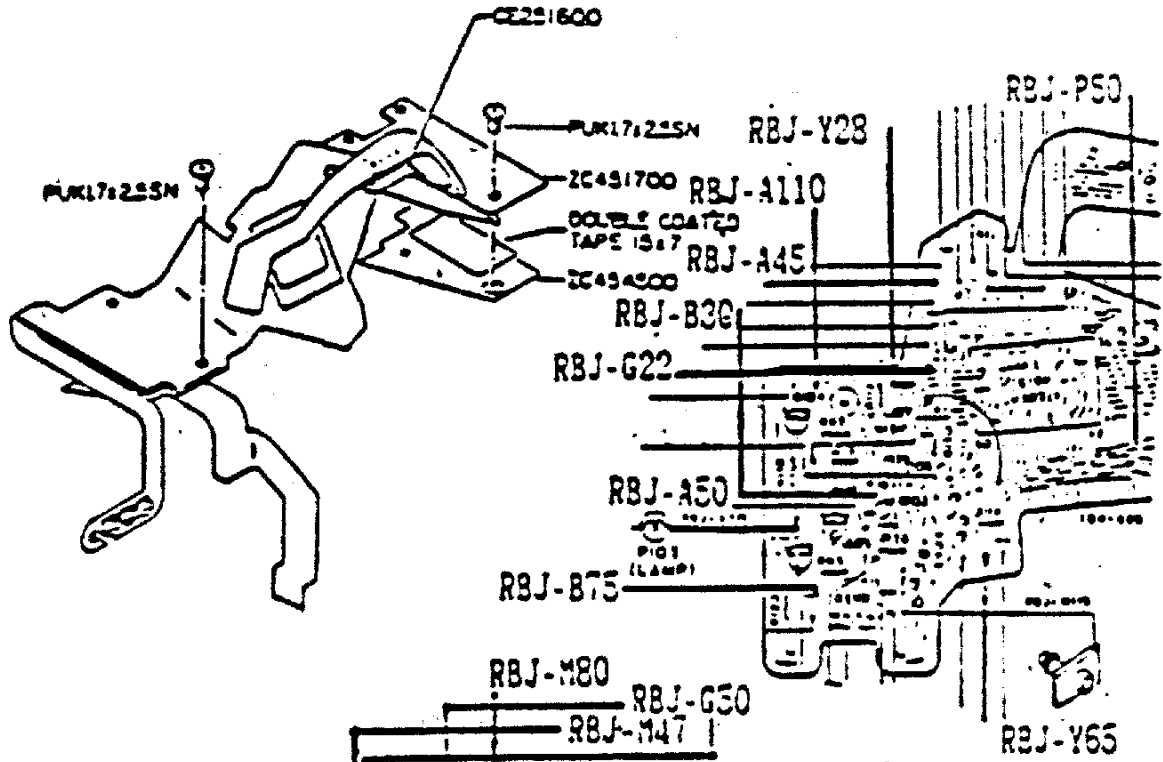


V. REMOVAL OF MAIN CIRCUIT BOARD

Main part	Part to be removed	Q'ty	Removable part	Remarks
Main circuit board	PUK1.7x2.5SN			RS Circuit board ZC454500 and CV Circuit board CE566300 are removed together with the main circuit board.
	RBJ-Y28			

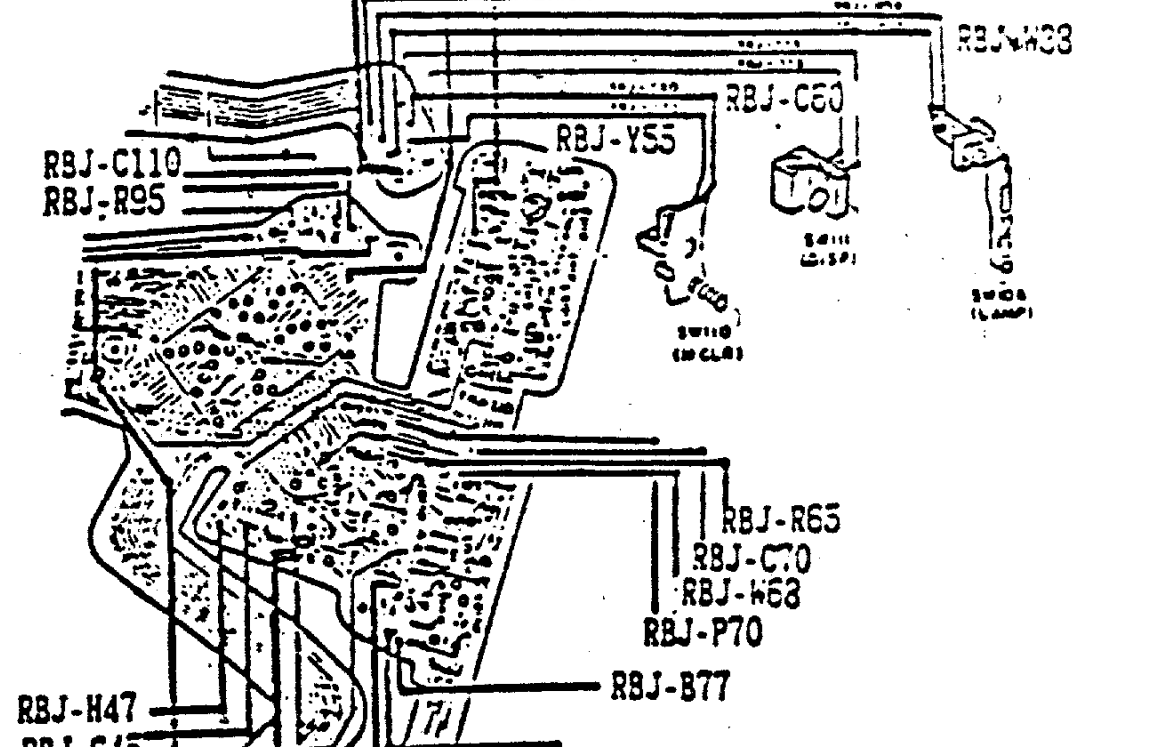
Upper left side

- RBJ-A45
- RBJ-B30
- RBJ-P50
- RBJ-G22
- RBJ-A50
- RBJ-B75
- RBJ-Y65
- RBJ-A110
- RBJ-H47
- RBJ-G45
- RBJ-K55
- RBJ-M62
- RBJ-A50
- RBJ-B48
- RBJ-B77
- RBJ-W68
- RBJ-R65

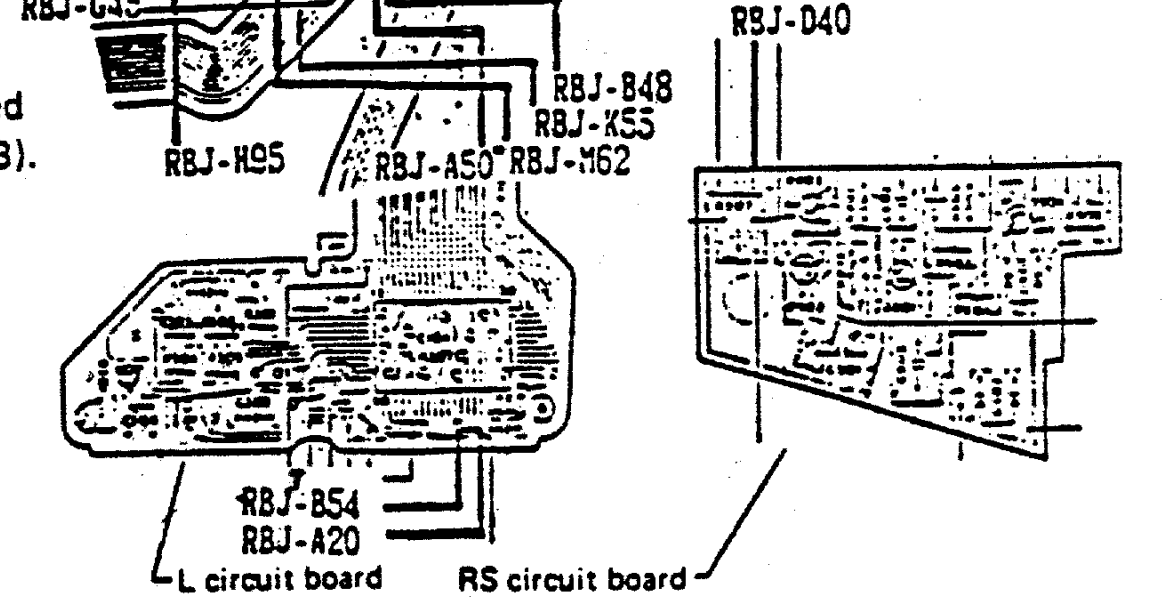


Upper right side

- RBJ-C70
- RBJ-P70
- RBJ-M80
- RBJ-G50
- RBJ-H95
- RBJ-C60
- RBJ-M47
- RBJ-W38
- RBJ-Y55
- RBJ-C110
- RBJ-R95
- RBJ-B54
- RBJ-A20
- RBJ-D40
- RBJ-W115

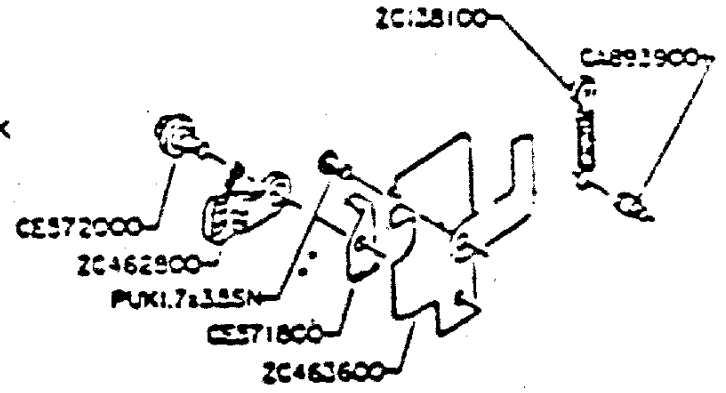


L circuit board
RS circuit board

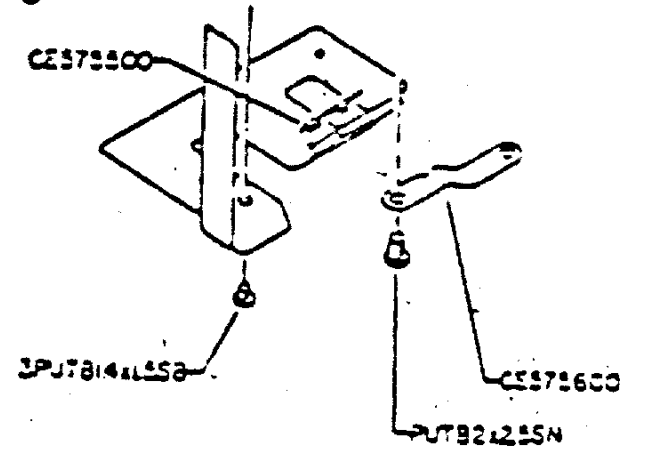
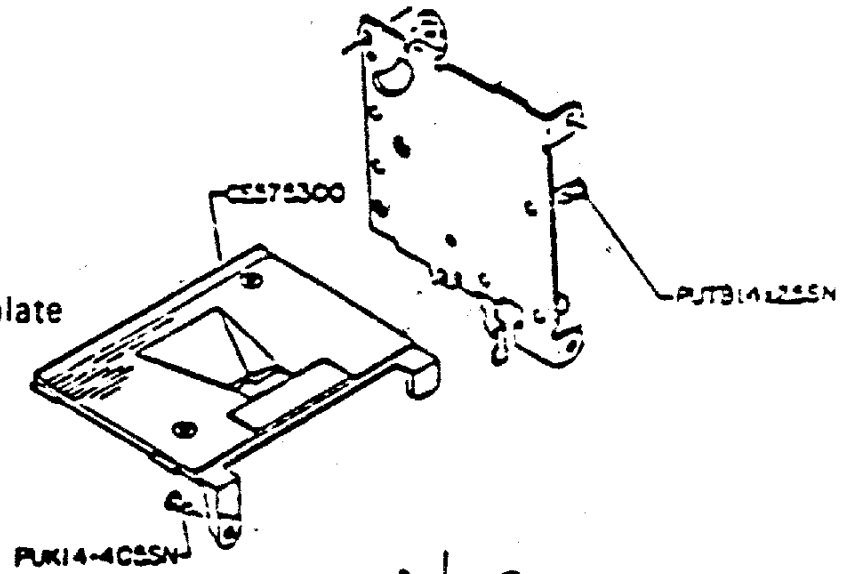


*Wiring is partially different on the circuit boards manufactured before November, 1983 (TNCB).

Main part	Part to be removed	Q'ty	Removable part	Remarks
2. SE circuit board	PUK1.7x3.5SN	1	SE Holder	
	CE572000	1	ZC462800	
	SE Screw		SE Spring hook	
	CA893900	1	CE571800	
	B Spring shaft			



3. L covering plate	PUTB1.4x2.5SN	1	L Stopper	
	PUK1.4-405SN	1	CE575600	
	3PUTB1.4x1.5SB	2	L Covering plate	
	PUTB2x2.5SN	2	CE575300	

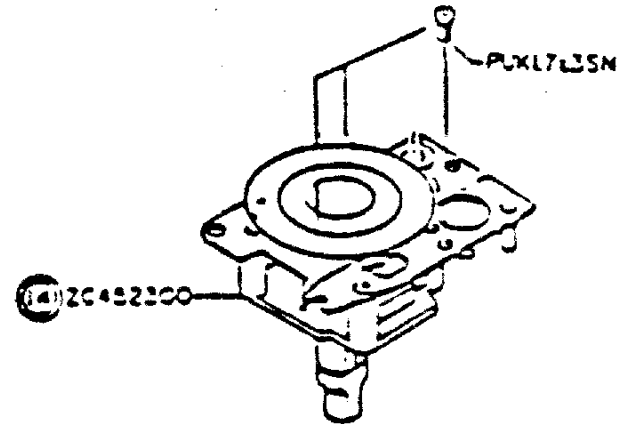


VI. DETACHMENT OF SIDE PLATE L AND R

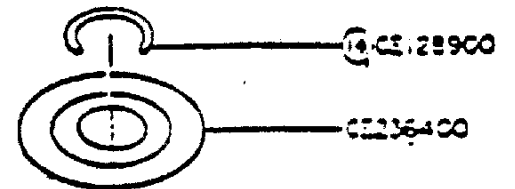
Main part	Part to be removed	Q'ty	Removable part	Remarks
B mount	PUK2x4.5SG PSK1.4x2SN	3 5	B Mount BL Button CE573400 CE571200 S Dial CE572900 Dial gear CE573000 Front cover CE570200 L Pin CE572500 L Pin sprmg CE573500 B2	
2. Side plate L	PUK2x3.5SN PUK2x3SN PUK2x1.8SN CA840400 M Lever screw	1 1 1 1	Side plate L ZJ178900	
3. Side plate R	PUK2x3.5SN PUK2x2.2SN	2 1	Side plate R ZJ178700	

VII. DISASSEMBLY OF FILM WIND UNIT

Main part	Part to be removed	Q'ty	Removable part	Remarks
1. Film wind unit	PUK1.7x3SN	3	FM Mecha ass'y ZC452300	The film wind unit is removed as a whole the camera body.

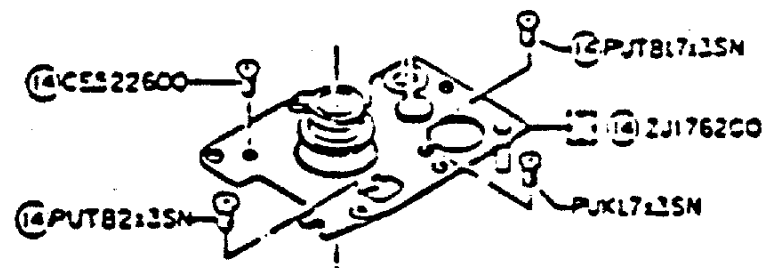


2. FC plate	CE128900 FC Stopper	1	FC plate CE236400	
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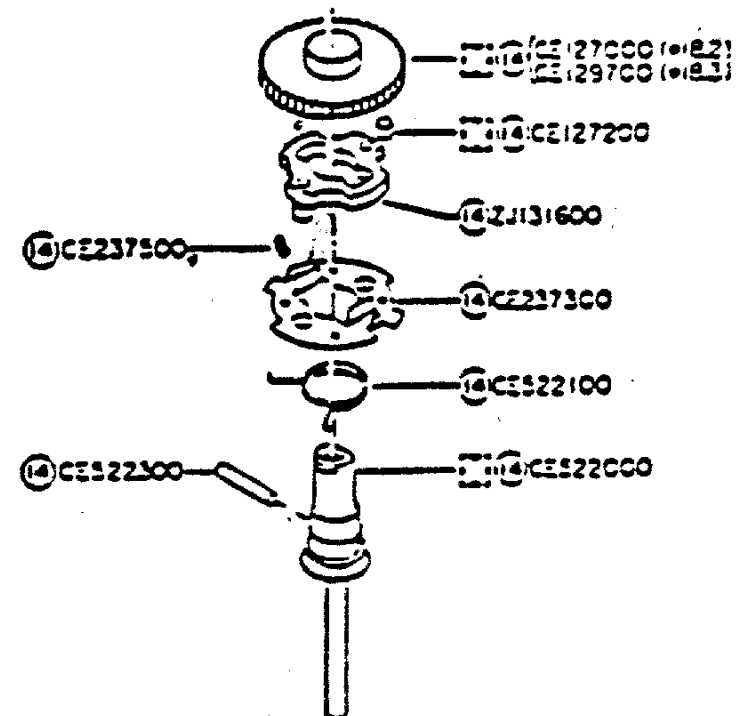


3. U base plate	CE522600 W Screw PUTB2x3SN PUTB1.7x3SN	1 1 1 1	U Base plate ZJ176200	
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Release Lock lever CE520700 and raise the U base plate.



4. P winding shaft	CE522100 Returning spring CE237300 Spring 2	1 1 1	FW Claw ZJ131600 Roller CE127200 R Spring A CE237500 FW Gear 1 CE127000 P-W Pin CE522300	
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D. REASSEMBLING AND ADJUSTING PROCEDURES

CONTENTS

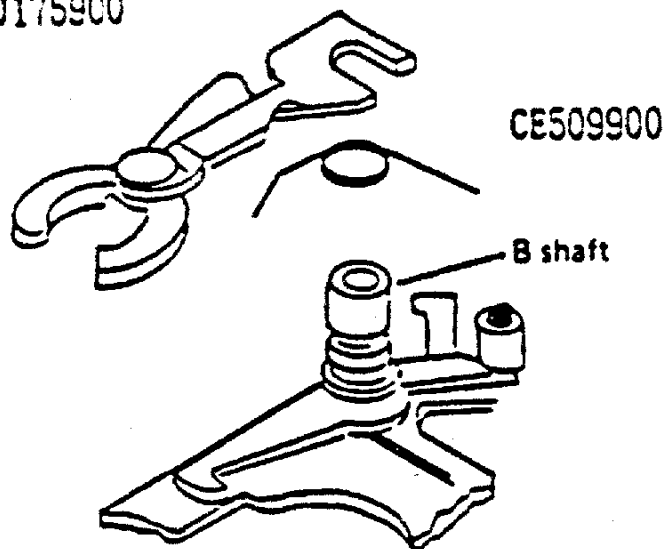
I.	REASSEMBLY AND ADJUSTMENT OF SHUTTER UNIT	D- 1
II.	REASSEMBLY AND ADJUSTMENT OF FILM WIND UNIT	D- 5
III.	REASSEMBLY AND ADJUSTMENT OF FRONT CASTING UNIT	D- 7
	1. Check and Adjustment of Side Plate R	D- 7
	2. Check and Adjustment of Side Plate L	D- 7
	3. Adjustment of Viewfinder Focus Point	D-10
	4. Reassembly and Adjustment of Photosensor Element	D-11
IV.	FORMING OF LEAD WIRES AND CIRCUIT BOARDS	D-12
	1. Forming of Circuit Boards	D-12
	2. Reassembly of Circuit Boards	D-14
	3. Forming of Lead Wires	D-15
V.	REASSEMBLY OF FRONT CASTING UNIT	D-19
VI.	CHECK AND ADJUSTMENT OF EXPOSURE CONTROL CIRCUIT AND INDICATION CIRCUIT	D-20
	1. Adjustment of Main Circuit Board	D-20
	2. TV Adjustment (Manual time)	D-24
	3. EE Adjustment (Direct auto mode)	D-25
	4. Adjustment of Indication (BV)	D-26
	5. Check of Indicator Lamps within Viewfinder	D-27
VII.	REASSEMBLY AND ADJUSTMENT OF INDICATOR ILLUMINATOR	D-28
	1. Reassembly of PL Base Unit	D-28
	2. Reassembly and Adjustment of K Prism	D-29
	3. Reassembly and Adjustment of L Circuit Board, LCD and K Prism	D-30
VIII.	TIMING ADJUSTMENT OF SW BASE PLATE	D-31
IX.	CHECK AND ADJUSTMENT OF SPOT CHARACTERISTIC (POSITION OF SUB MIRROR)	D-33

I. REASSEMBLY AND ADJUSTMENT OF SHUTTER UNIT

1. Reassembly of B Brake Lever

- Fit B Lever spring CE509900 over the B shaft with the bent part of the spring set on the side of Gear AZC505500.
- Fit the U-shaped part of B Brake lever ZJ-175900 into the second highest groove of the B shaft and engage the B lever spring.

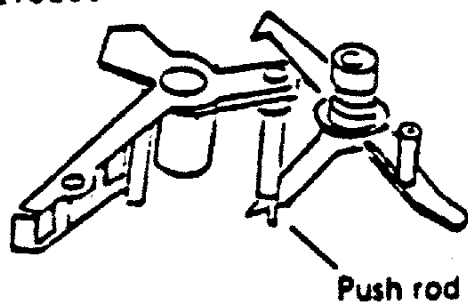
ZJ175900



2. Reassembly of R Claw

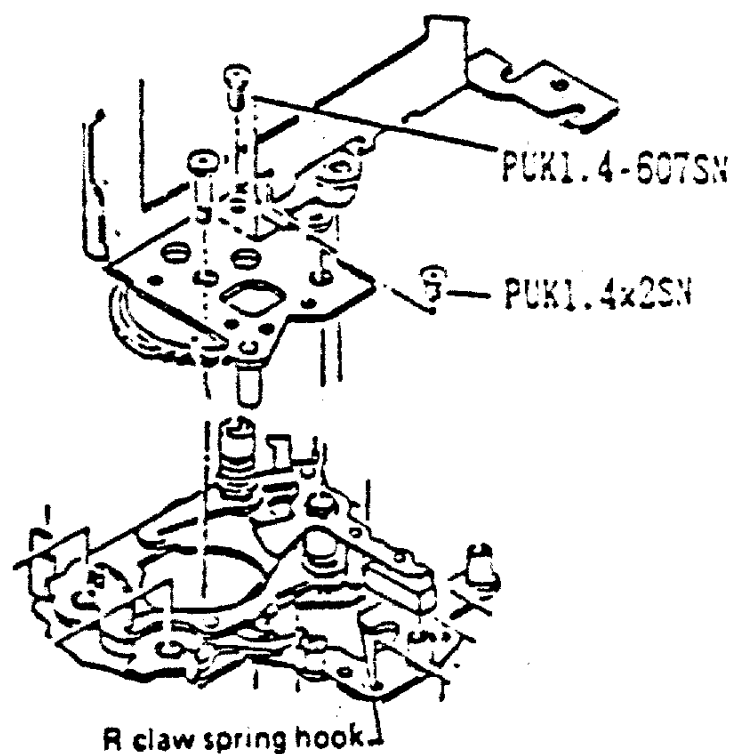
- Fit R Claw ZJ175800 into the R shaft. (The push rod of the R claw should be located as shown on the right side.)

ZJ175800



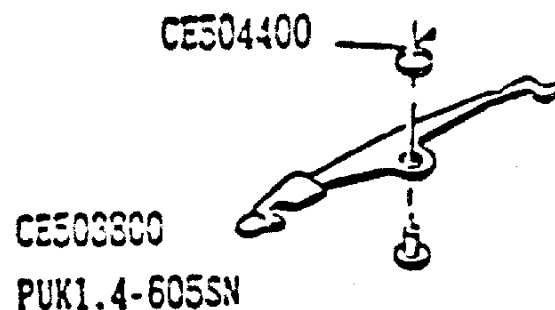
3. Bring Shutter frame ZJ175500 into contact with Shutter base plate ZJ175200.

- Set the shutter frame while taking care not to catch the releasing claw, Hook lever ZJ175400, etc.
- Tighten Screws PUK1.4-607SN and PSK1.4x2SN.
- Engage R Spring XE505000 with the R claw spring hook (groove).



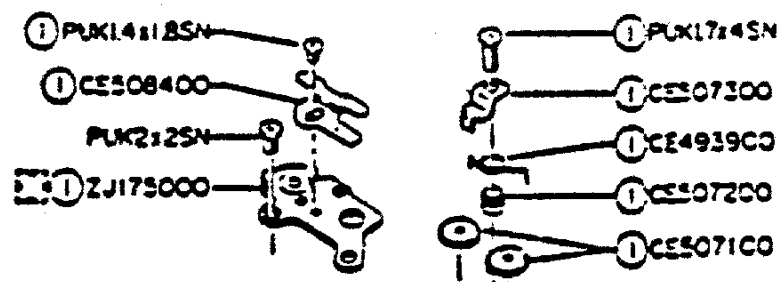
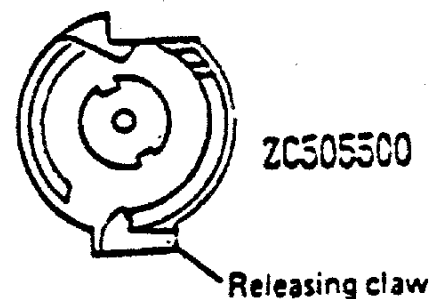
4. Reassembly of M Lever 2 CE503800

- Fit M Lever spring CE504400 over the shaft for M lever 2.
- Fit M Lever 2 CE503800 over the shaft and tighten Screw PUK1.4-605SN.
- Engage the M lever spring.

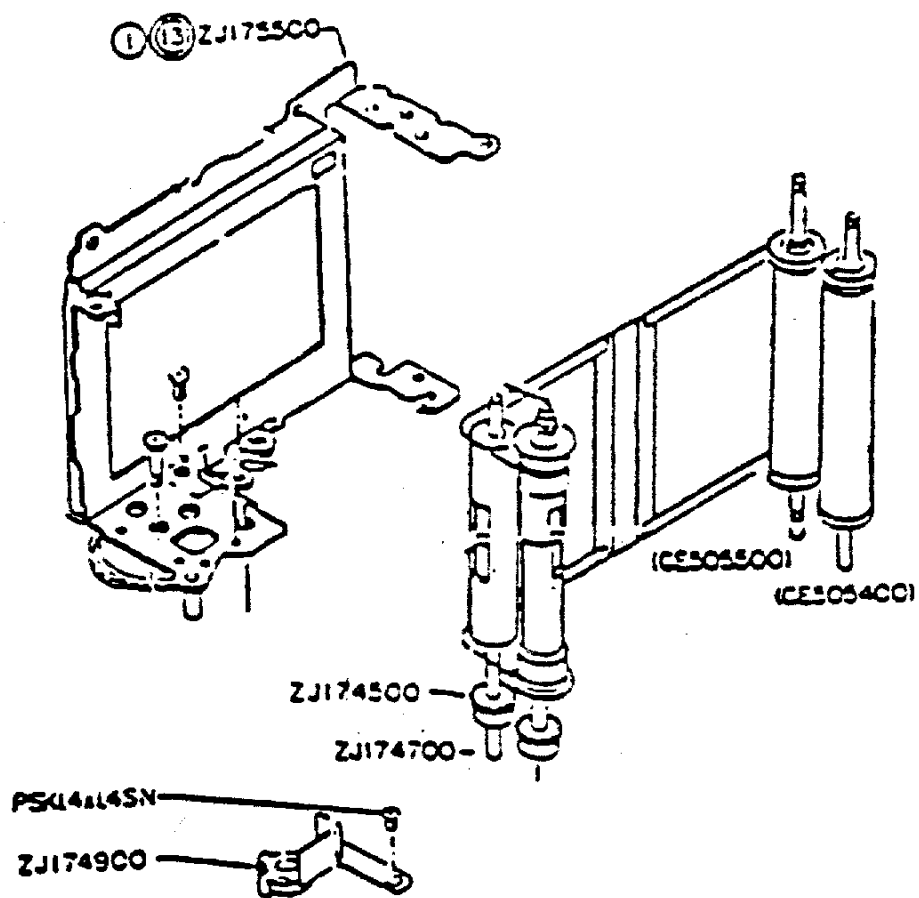


5. Reassembly of B Stopper

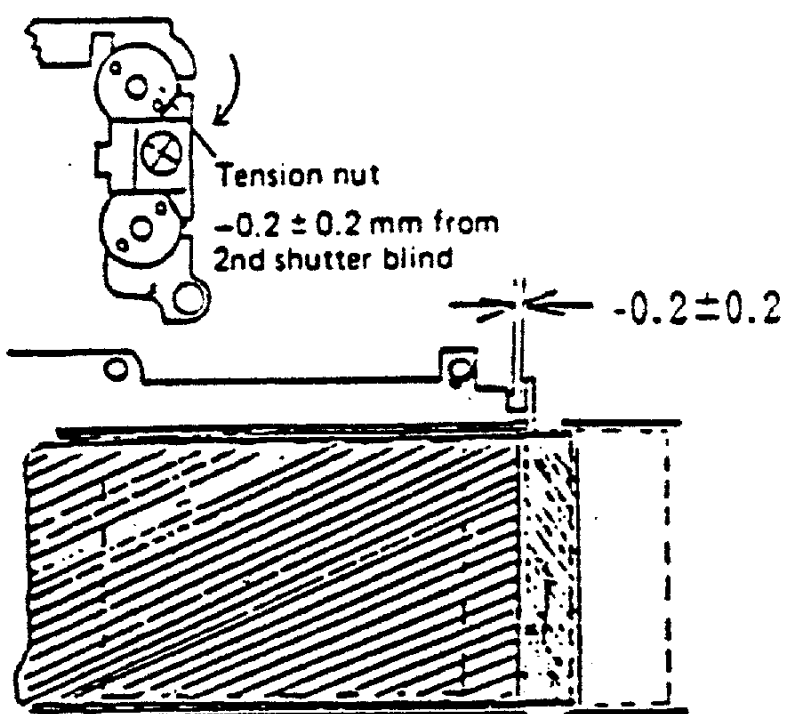
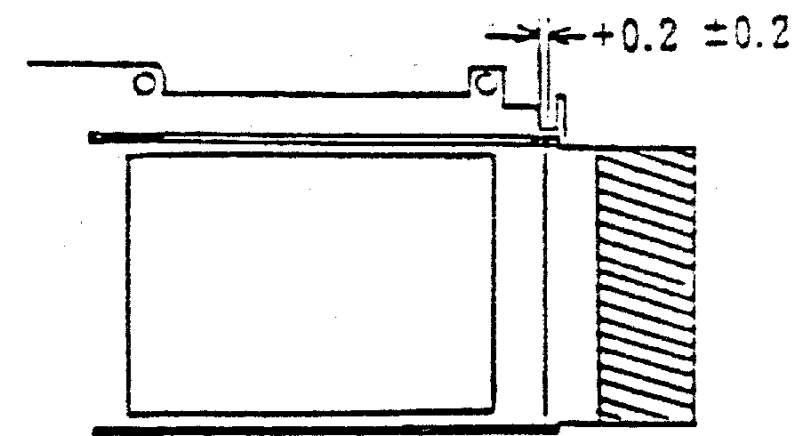
- Turn Gear A ZC505500 until it is engaged with the releasing claw.
- Turn Gear B CE500400 counterclockwise until it is stopped.
- Set B Stopper CE 508300 in position and fix it with Screw PSK1.4x1.4SN.



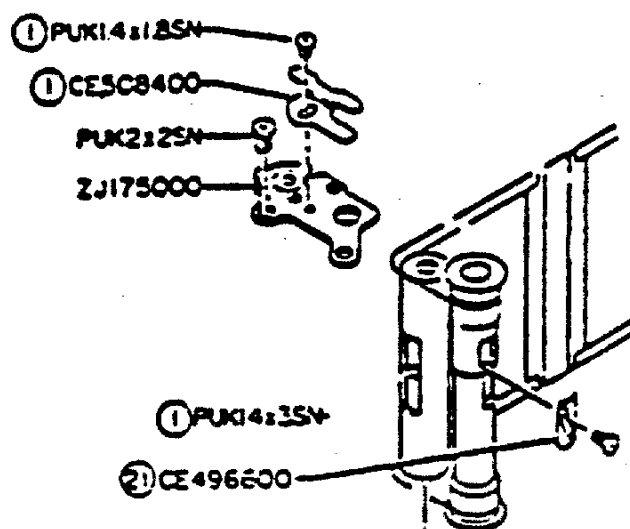
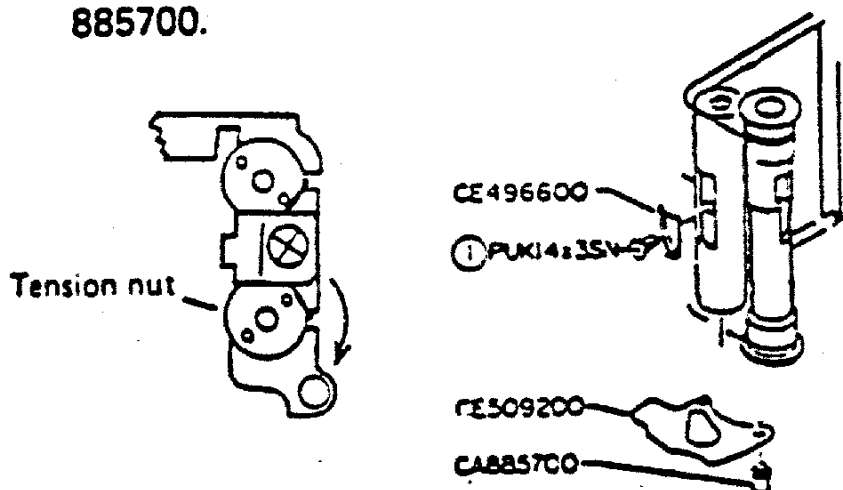
6. Reassembly of 1st and 2nd Shutter Blinds
- Insert Blind shaft C CE505400 and Blind shaft D CE505500 into Shutter frame 2 ZJ175500.
 - Tighten Tension nut CE507100.
 - Fix TN Shaft CE507200, T Stopper CE493900 and TN Lock CE507300 by tightening Screws PUK1.7x4SN.
 - Insert Tube A ZJ174700 and Tube shaft B ZJ174500 into the shutter frame 2.
 - Tentatively fix U plate R ZJ175000.
 - Fix I Plate R ZJ174900 with Screw PSK1.4x4SN.



8. Positioning of 1st Shutter Blind
- Apply torque to the 1st shutter blind (rotate the tension nut about 5.5 turns clockwise).
 - Remove Tube A ZJ174700 from gear A. Wind the 1st shutter blind until its metal fitting is located as shown below. Perform fine adjustment by moving the positioning plate.
 - Fix the U stopper with Screw PUK1.4x1.8SN.

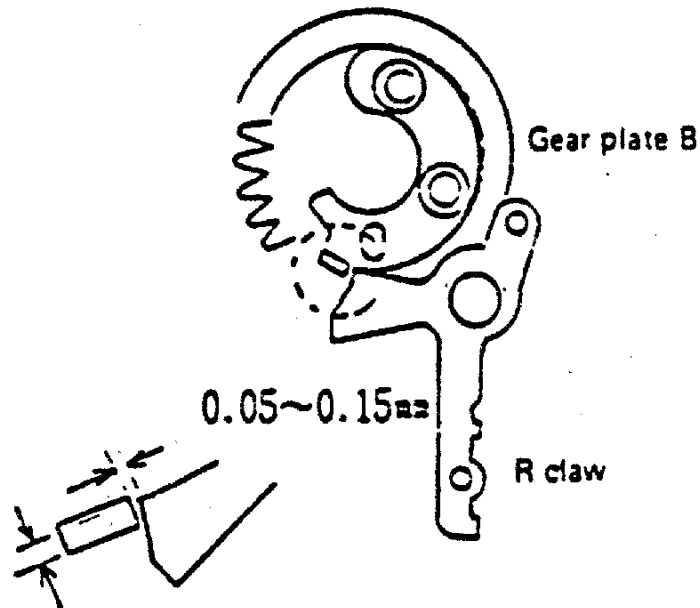


7. Positioning of 2nd Shutter Blind
- Apply torque to the 2nd shutter blind (rotate the tension nut about 4 turns clockwise).
 - Remove the tube shaft B from gear B. Wind the 2nd shutter blind until its metal fitting is located as shown on the right side. Perform fine adjustment by moving Positioning plate CE496600.
 - Fix L Plate CE509200 with B Plate shaft CA885700.



9. Adjustment of Gap between R Claw and Gear Plate B

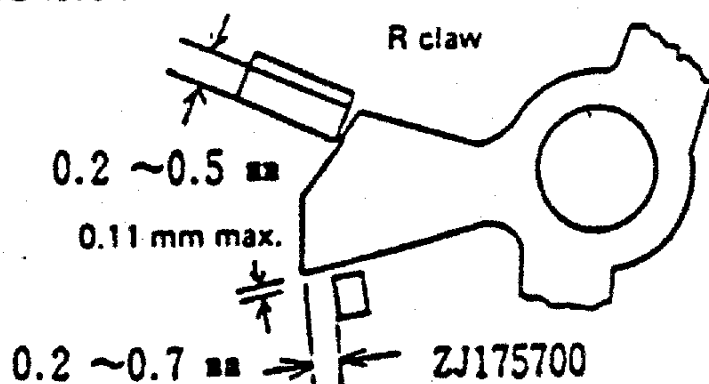
- Charge the shutter. (The releasing claw must be engaged with the second stage of the gear A.)
- Engaging depth of R claw
Bring M Lever spring CE504600 into contact with the magnet and adjust engaging depth of the R claw to 0.3 ~ 0.5 mm by changing position of MG Plate ZJ175600.
- Gap of R claw
Adjust the gap to 0.05 ~ 0.15 mm by changing position of the gear plate B assembled with the gear B.
- The pressure plate must be brought into close contact with the magnet under force applied through the releasing claw by the push rod.



0.3 ~ 0.5 mm

10. Adjustment of Gap between Valve Lever and R Claw

- Charge the shutter by releasing BU Lever ZJ175700.
- The gap between the BU lever and R claw must be 0.1 mm max. The lever must spring into the R claw in this condition.
- When the shutter is kept open, engagement depth between the BU lever and R claw must be 0.2 ~ 0.5 mm.
- If not, adjust engagement depth by bending the BU lever.

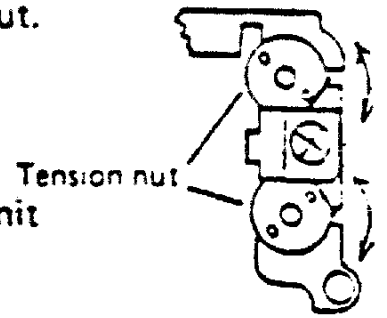


11. Adjustment of Shutter Blind Speed

- Adjust speed of the 1st and 2nd shutter blinds by turning the tension nut.

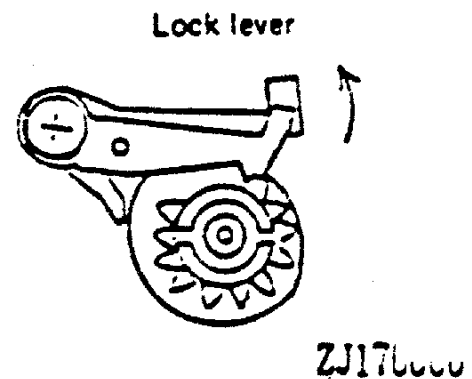
Standard: $10.9^{+0.1}_{-0.15}$ ms

Reassembly of shutter unit



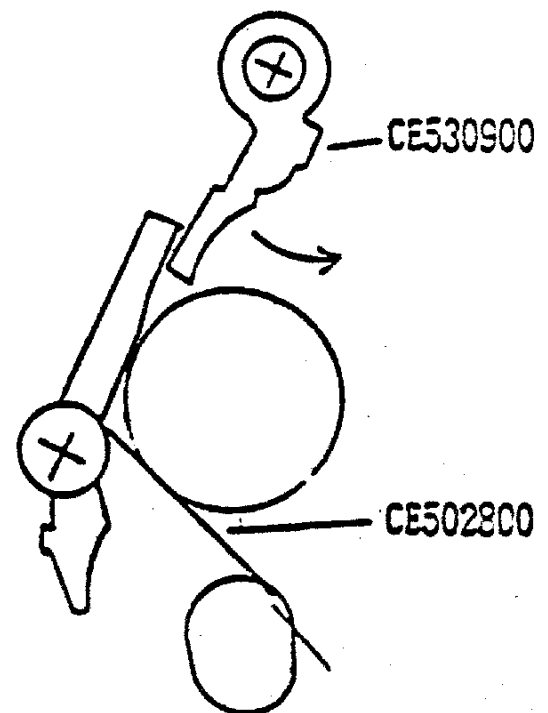
12. Positioning of No. 2 Gear

- Release the lock lever and rotate No. 2 Gear ZJ176000 1/4 turn.



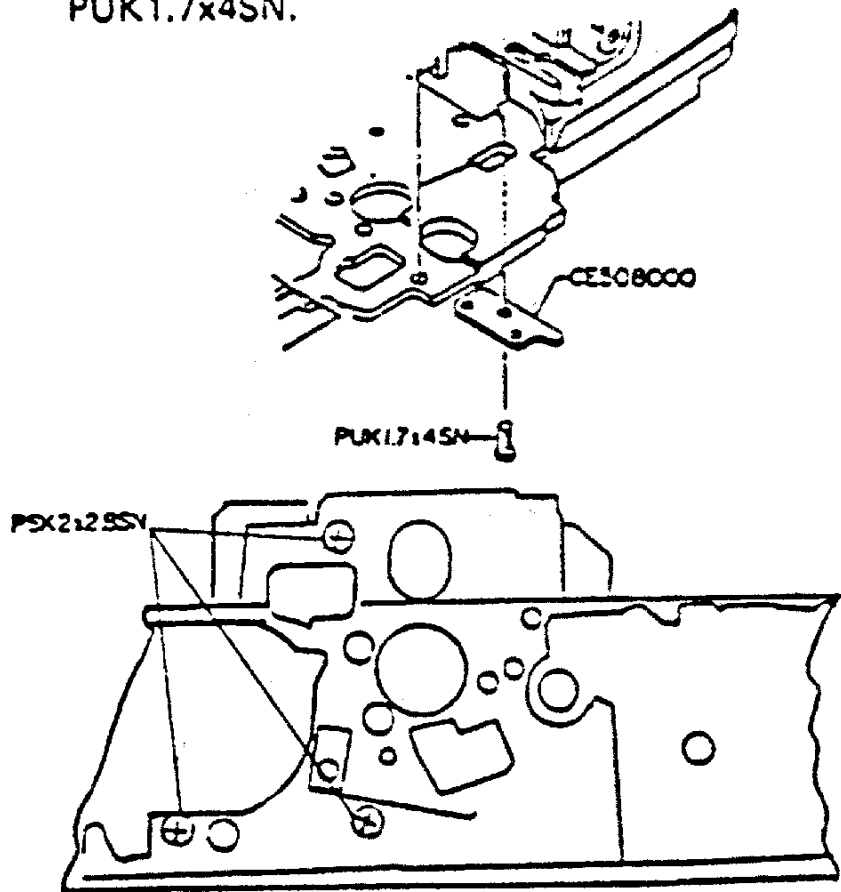
13. Setting of Shutter Unit

- Set the shutter unit into the camera body from above.
- Allow SL Lever CE530900 toward MG1 and reassemble the shutter unit with the camera body.
- Engage Reset spring CE502800 with the camera body.



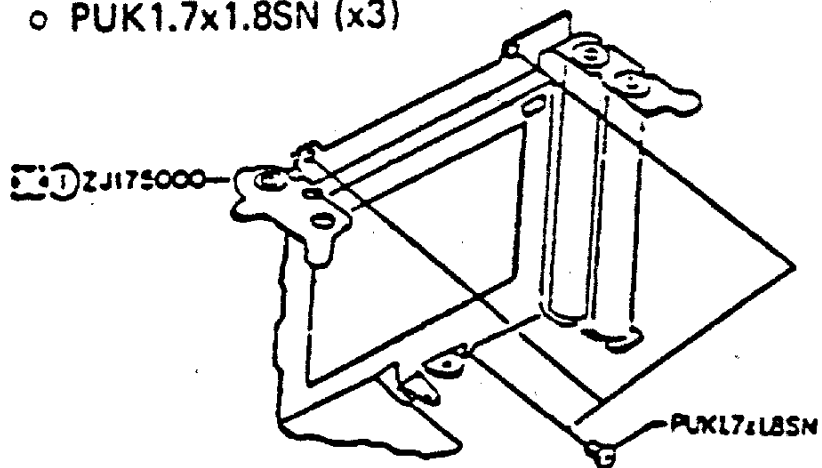
14. Tighten the three screws on the bottom of the camera body:

- PSK2x2.8SN (x3)
- Reassemble S Plate CE508000 with two Screws PUK1.7x4SN.



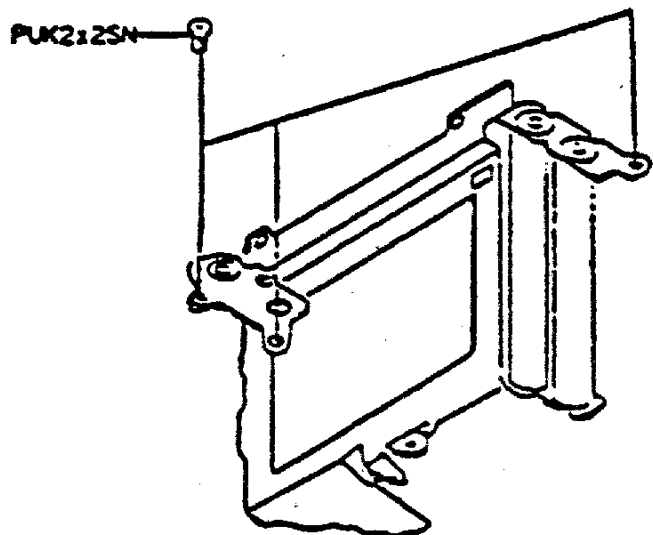
15. Tighten the three screws on the mask of the camera body:

- PUK1.7x1.8SN (x3)



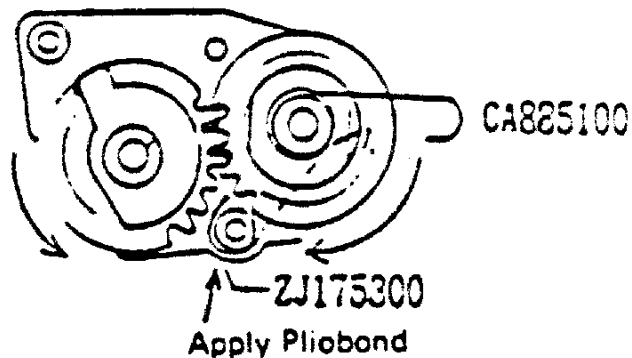
16. Tighten the two screws on the stop of the camera body:

- PUK2x2SN (x3)



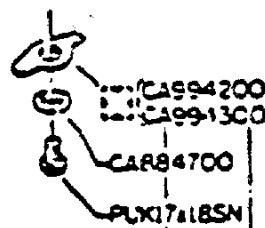
17. Reassembly No. 4 base plate.

- Engage No. 3 Gear spring CA885100 with the No. 4 base plate.
- Reassemble the No. 4 base plate with the shutter unit.



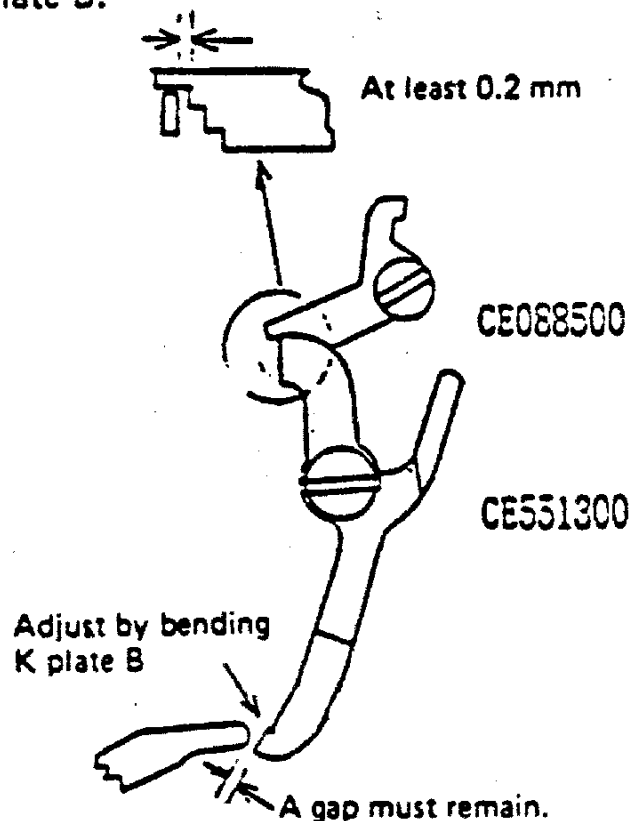
18. Reassemble S lever 2.

- Mount S Lever 2 CA994200 on KS Holder CA884700 and tighten Screw PUK1.7x1.8SN.



19. Gap of K Plate B

- In film winding, K Plate B CE551300 must be placed over the upper stage of K Plate A CE-088500 with a gap of at least 0.2 mm.
- When the gap is narrower than 0.2 mm, adjust it by bending the J plate B. (The K plate A must not penetrate into the K plate B.)
- After completing film winding, a gap must remain between the K plate B and releasing claw.
- If no gap remains, form a gap by bending the K plate B.



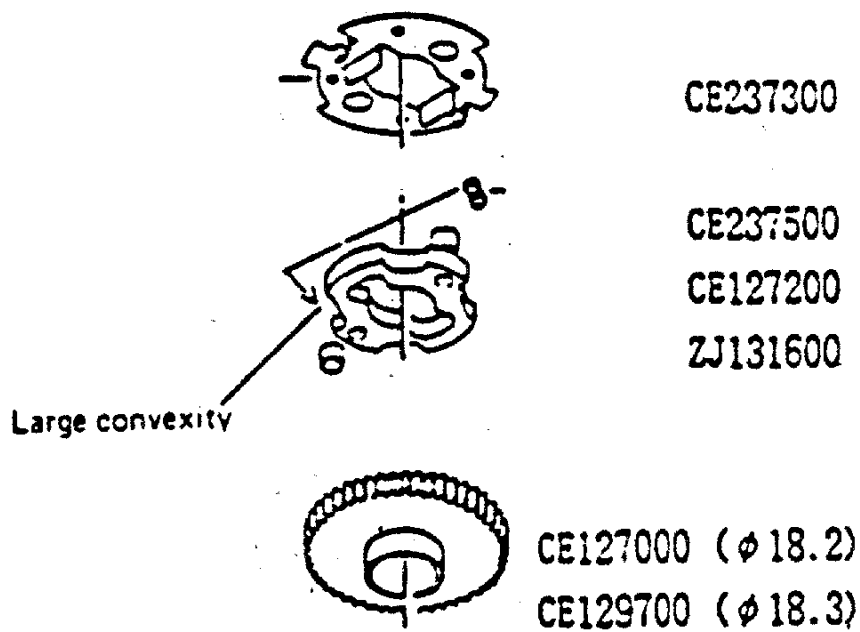
II. REASSEMBLY AND ADJUSTMENT OF FILM WIND UNIT

1. Reassembly of Film Wind Unit

1) Reassembly of FW Gear 1 CE127000 and roller

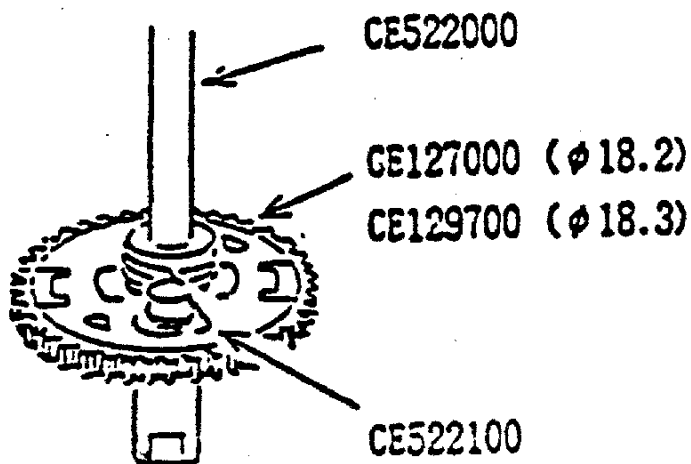
- Set the FW gear 1 inside out and reassemble 1 through 4 in this sequence:

1. FW Claw ZJ131600
2. Roller CE127200
3. R Spring A CE237500
4. Spring 2 CE237300



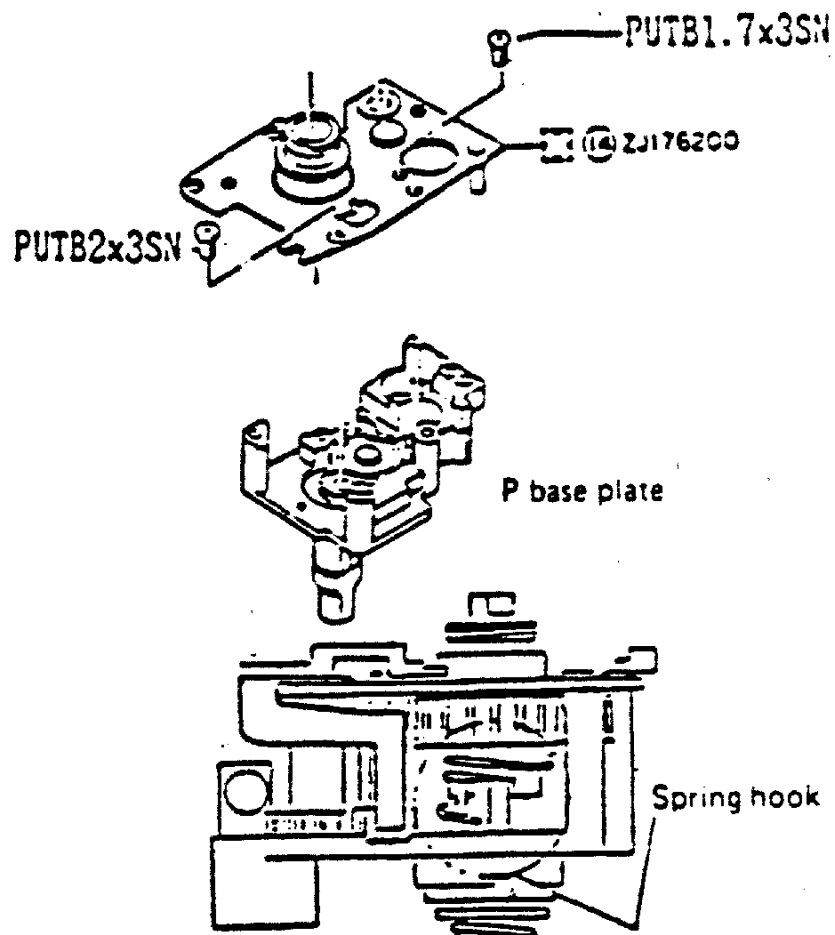
2) Reassembly of FW shaft

- Insert P-FW Pin CE522300 into P-FW Shaft CE522000 until its projection becomes flush.
- Push P-FW Shaft CE522000 into the FW gear unit.
- Engage Returning spring CE522100 as shown on the right side.



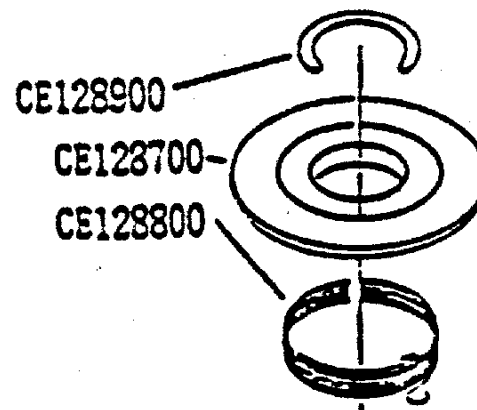
3) Reassembly of FW shaft unit

- Insert the FW shaft unit under the FW unit. (P base plate)
- Engage the returning spring with the convexity of the P base plate and locate the spring hook of the FW claw on the right side of the P base plate.
- Reassemble the U base plate.



4) Reassembly of FC Upper gear CE128700

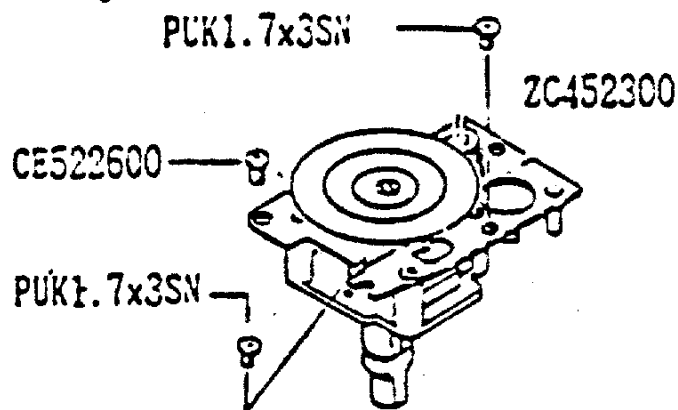
- Engage FC Spring 2 CE128800 with the projection of U base plate. Make FC Stopper CE128900 override the projection and set it in position by applying torque to FC Upper gear CE128700.



5) Reassembly of film wind unit

- Reassemble the film wind unit into the camera body. Tighten two Screws PUK1.7x3SN and Screw CE522600.

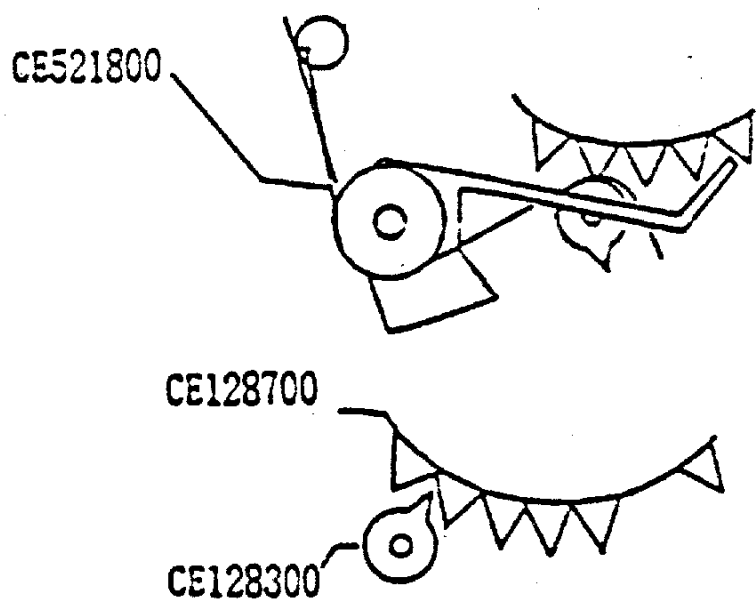
Engage P-FC Spring 2 CE521800 as shown the right side.



2. Adjustment of FC Upper Gear

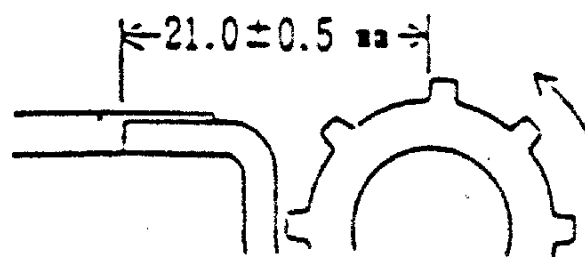
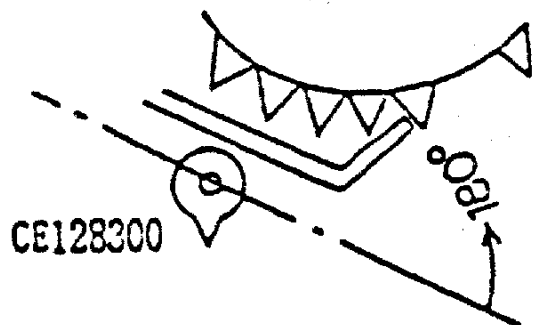
1) Positional check and adjustment of FC lower gear

- At the first film winding, FC Lower gear CE128300 must be engaged with the fourth tooth of FC Upper gear CE128700.

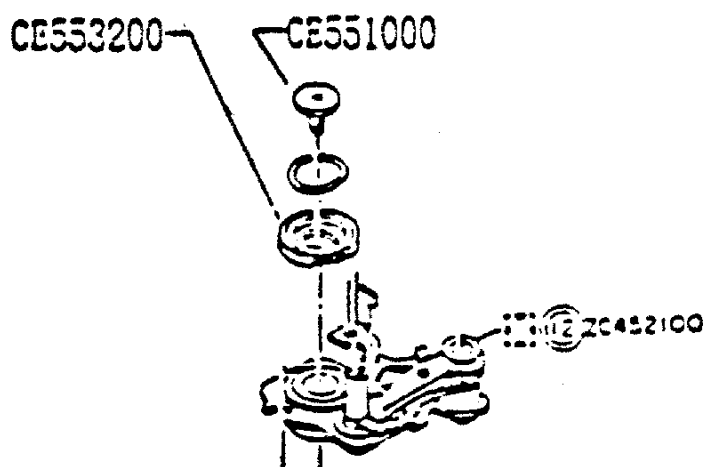


- After completing film winding, the projection of the FC lower gear must not be located within 180° on the side of the FC plate.

Position of the FC lower gear can be adjusted after detaching No. 1 gear.

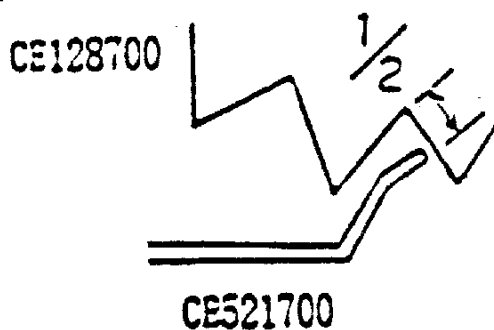


The No. 1 gear is detached for adjustment, check the sprocket for its proper position.

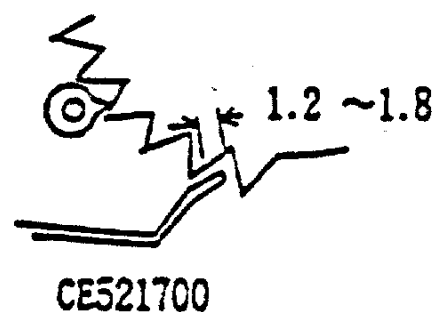


2) Engagement adjustment of P-FC plate

- When engagement depth of P-FC Plate CE521700 is less than 1/2 of the tooth the FC upper gear after completing film winding, adjust the engagement depth by bending the P-FC plate.

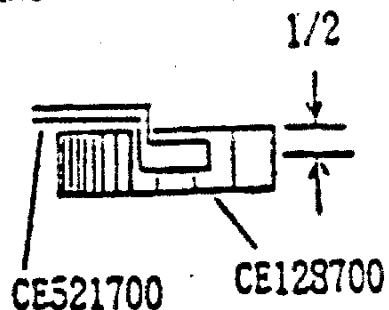


- The FC upper gear must have a feeding margin of 1.2 ~ 1.8 teeth. Adjust so as to obtain such a margin by bending the FC base plate.

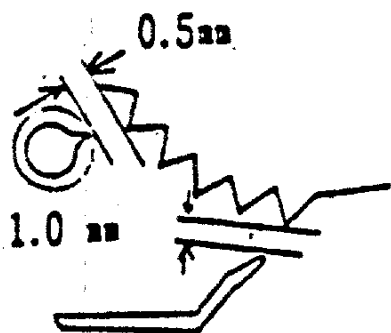


- The P-FC base plate must have an engagement depth of at least 1/2 tooth thickness of the FC upper gear.

If the engagement depth is shallow, adjust by bending the P-FC base plate.



- The gap between the P-FC base plate and FC upper gear must be at least 1.0 mm along the whole circumference of the FC upper gear when the rear cover is opened gently. Gap around the lower gear must be at least 0.5 mm.



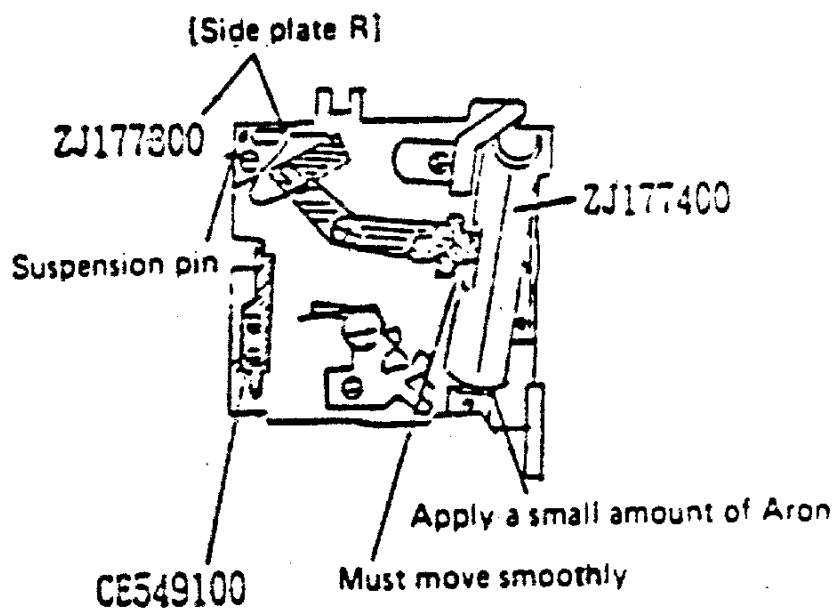
- Bond FC Plate CE236400 to FC upper gear. All the characters must be located within the range of the index. When the rear cover is opened, character "S" must be aligned with the index.



III. REASSEMBLY AND ADJUSTMENT OF FRONT CASTING UNIT

1. Check and Adjustment of Side Plate R

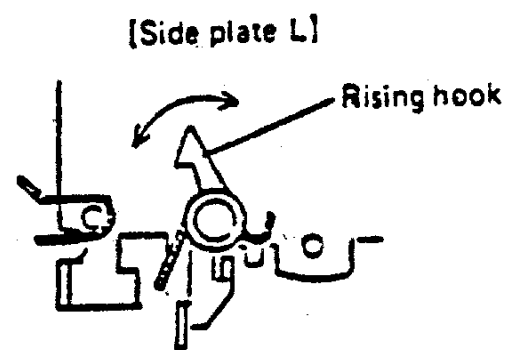
- The air damper (Pipe ZJ177400) must drop smoothly with no seizure or rattling.
- Side plate R ZJ178700 must be perpendicular to the suspension plate and in close contact with A Cam ZJ177300.
- Fix P Lever CE541900 around the center of the adjusting hole.



2. Check and Adjustment of Side Plate L

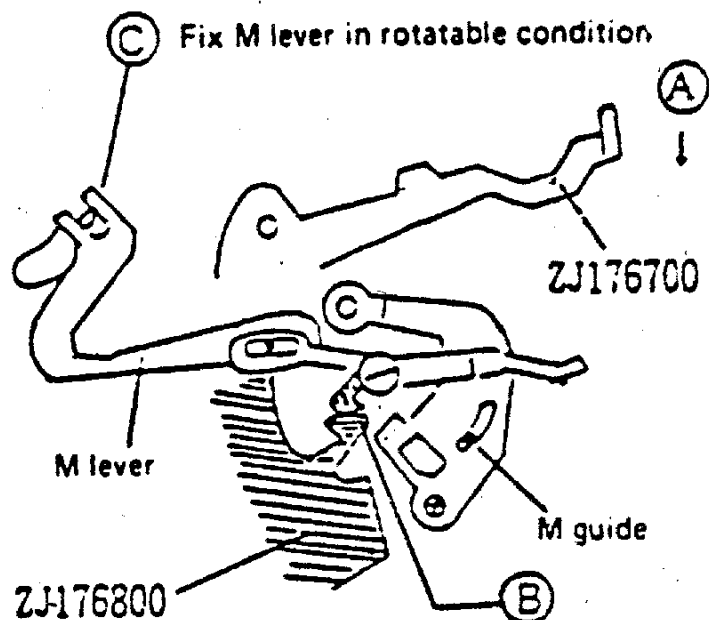
1) Operational check of rising hook

- The rising hook must move by its own weight.
- It must not be caught even when it is moves fully in the direction indicated by arrow.



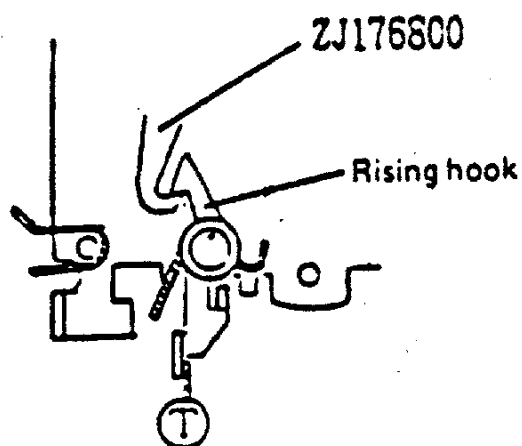
2) Engagement check of rising hook

- By turning M Charging lever ZJ176700 a little in the A↓ direction, set the engaging parts of the rising hook and F Lever ZJ176800 at position (B). Fix M Lever ZJ176900 at position (C). Return the M charging lever gently and make sure that the rising hook is engaged.



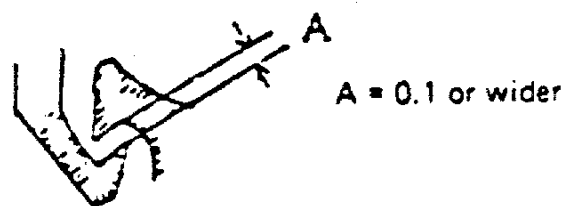
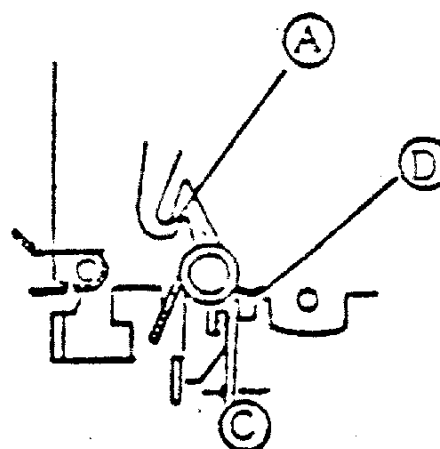
3) Force required to disengage rising hook

- With the M charging lever set in position, the rising hook must be capable of being disengaged by a force of 25 ~ 40g.



4) Engagement check of rising hook

- When requirement C = 0 ~ 0.2 is not satisfied, adjust by bending part D.
- When the rising hook is swung, the F lever must be engaged at least 2/3 of thickness of the rising hook.
- When the M charging lever is not set in position, the rising hook must be engaged in the condition shown on the right side.

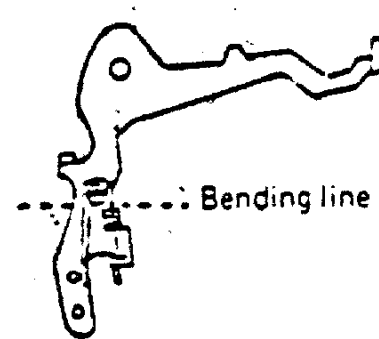
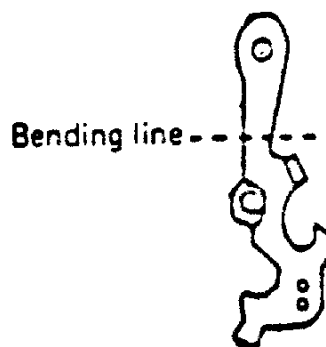


5) Operational check of F lever and M charging lever

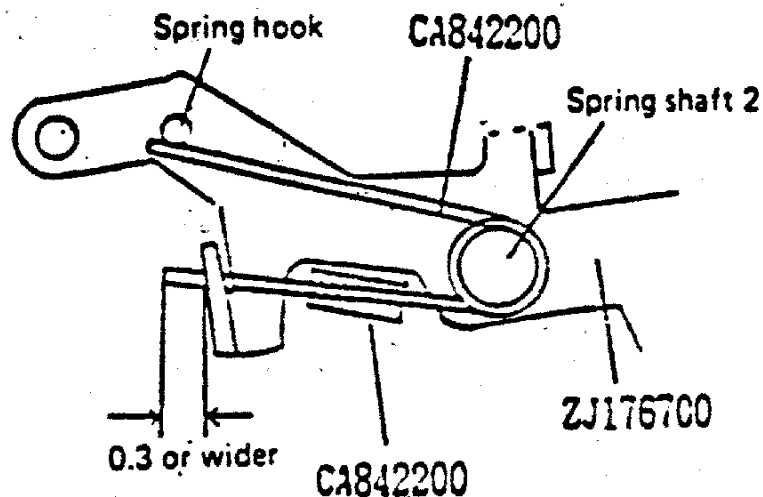
- For adjusting rattling, bend M charging lever ZJ176700 and F Lever ZJ176800.

ZJ176800

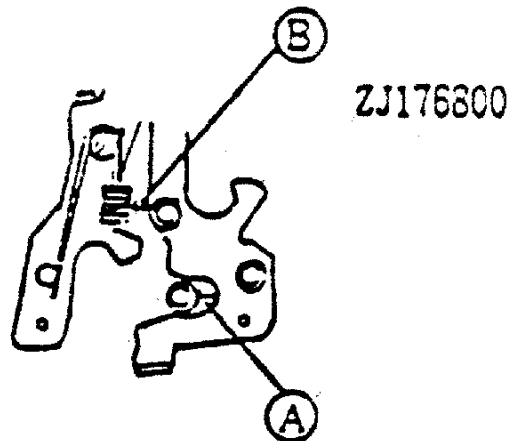
ZJ176700



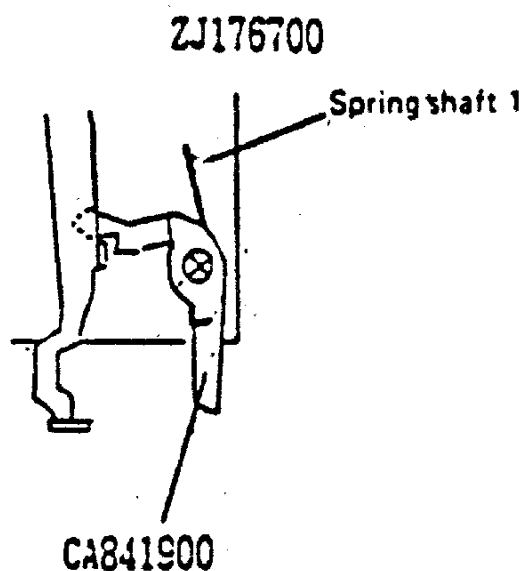
- The stopper spring must project at least 0.3 mm from the rectangular hole of the M charging lever
- Tube 2 CA842200 must be ride over the M charging lever.
- The stopper spring must be operative within the rectangular hole of the M charging lever.



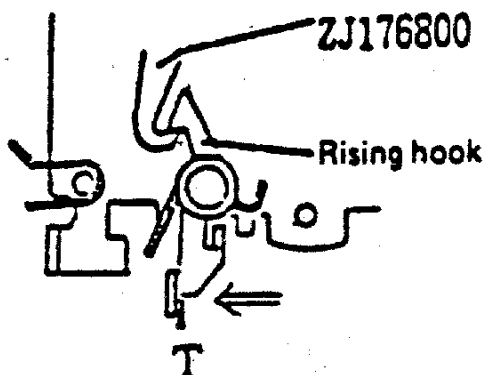
- 6) Stop position of F lever
- The F lever must be brought into contact first with the runner ring (part A) and then the stopper spring (part B).



- 7) Operational check of D hook
- D Hook CA841900 must operate by its own weight (12 ~ 18g).
 - The D hook must operate before it is located 2.0 mm from the spring shaft 1.



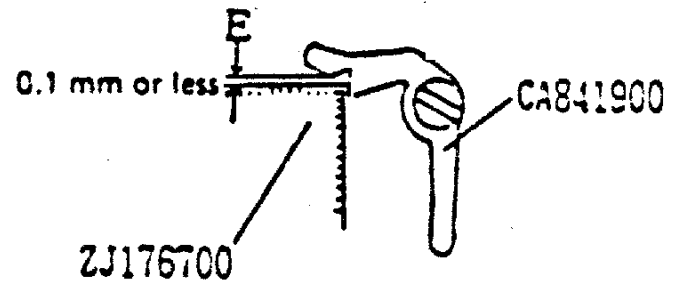
- 8) Force required to disengage D hook
- In a condition where M Charging lever ZJ176700 set in position and the rising hook is disengaged, the D hook must be disengaged by a force of 30 ~ 100g.



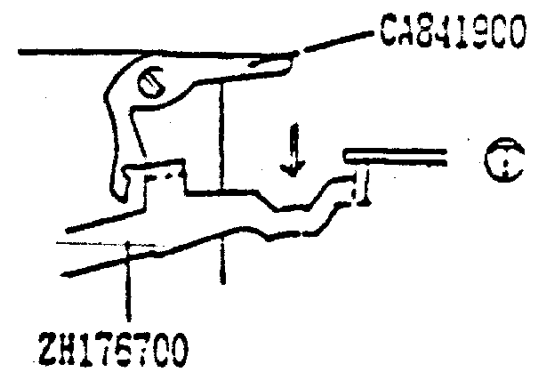
- 9) Engagement check of D hook
- When the M charging lever is set in position, the D hook must be engaged 0.1 mm or less with the lever.

Engagement of D hook

When the D hook is engaged, it must not be disengaged by raising the M charging lever until it is flexed.



- 10) Force required to set M charging lever
- When the F lever is engaged with the rising hook, the D hook must be engaged with the M charging lever by a force of $460 \pm 30g$.

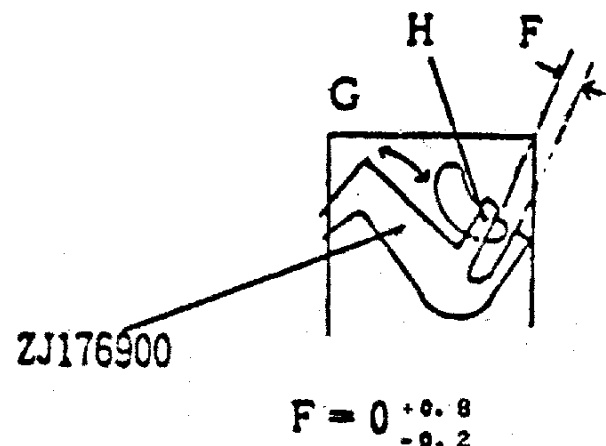


- 11) Operational and positional checks of M lever

- Position of M lever

When M Charging lever ZJ176700 is set in position and the rising hook is engaged, M Lever ZJ176900 must be positioned as shown below.

- The M lever must run smoothly.



$$F = 0 \begin{matrix} +0.8 \\ -0.2 \end{matrix}$$

3. Adjustment of Viewfinder Focus Point

1) Correction of ununiform focusing

Detach the screen and set the jig mirror in position.

Attach the front casting unit to the ununiform focusing correcting device.

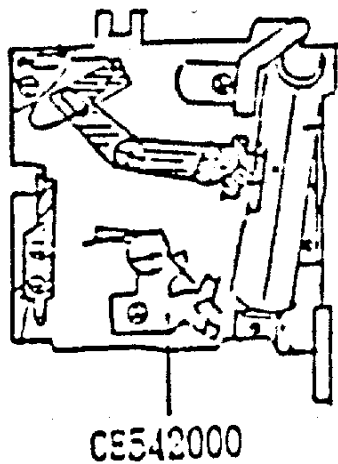
o Correction in Y direction

Correct ununiform focusing in the Y direction by slightly moving 45 P Plate CE-542000 on the mirror stopper.

Standard: $1 \pm 5'$

Difference produced by setting M charging lever: Within $4'$

Use jig mirror [Side plate R]

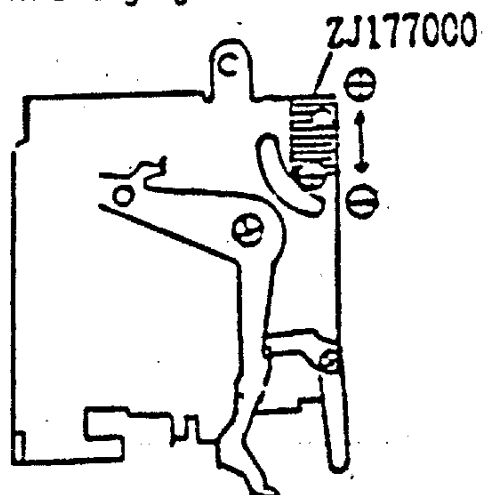


Correction in X direction

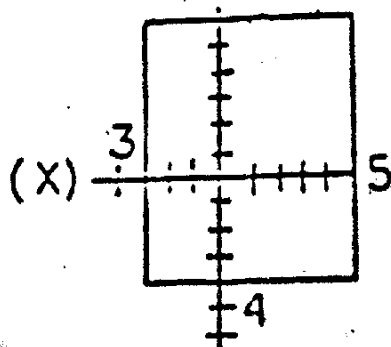
Correct ununiform focusing in the X direction by slightly moving M Pin ZJ177000 on the mirror mount.

Standard: $1 \pm 4'$

Difference produced by setting M charging lever: Within $4'$



(y)



2) Positional adjustment of Fresnel lens (adjustment of F focus point)

Detach the screen and set the jig mirror in position.

Attach the front casting unit to the photoelectric collimator.

o Turn the dial scale of the collimator and read peak position (focus point) of the pointer.

o Select the ring washer corresponding to the read value. (0.03 ~ 0.35 mm of 33 types in 1/100 mm steps)

o Remove the pentagonal prism and set the selected ring washer.

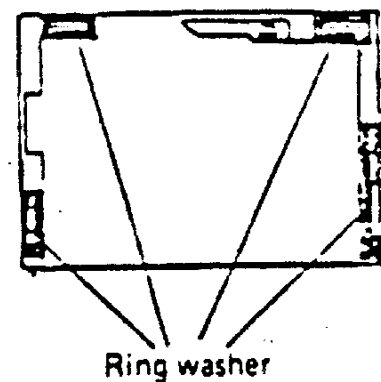
(Apply a small amount of Pliobond.)

o Set the pentagonal prism in position and read the focus point once again.

Standard: $4600_{-0.04}^{+0}$ mm

o In the standard is not satisfied, replace the ring washer with another.

o The M charging lever should be set for adjustment of the focus point.



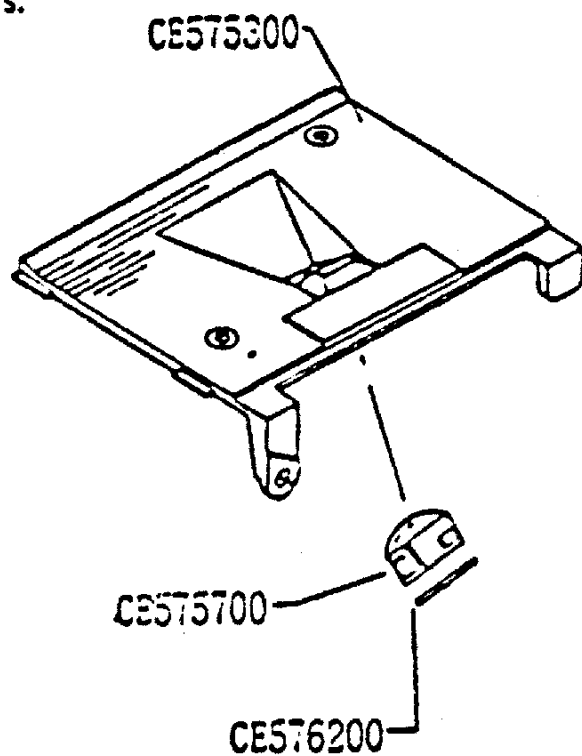
4. Reassembly and Adjustment of Photosensor Element

1) Reassembly of M lens

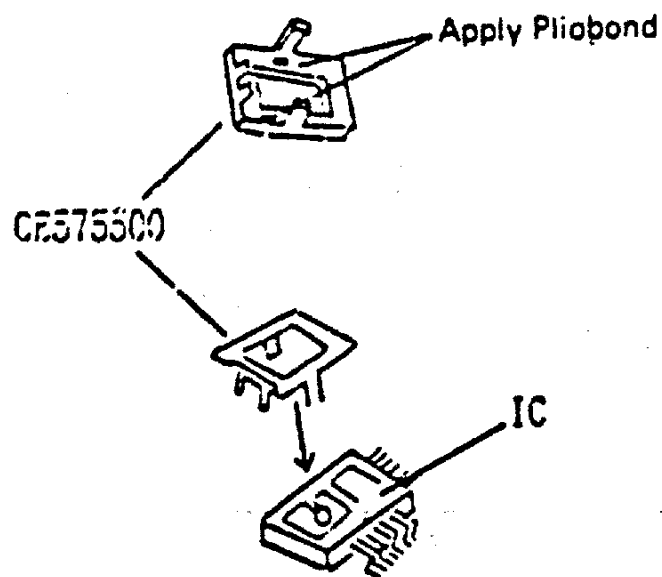
- Push M Lens CE575700 into L Covering plate CE575300.

The M lens should be set in such a direction that the lens stopper is in parallel with the vertical surface of the covering plate on the side of the lens.

- Mount M Lens cover CE576200 on the M lens.



- Apply a small amount of Pliobond to L Plate CE575500 and fit it into the LC. Take care not to deviate the L plate and not allow Pliobond to extrude outside.



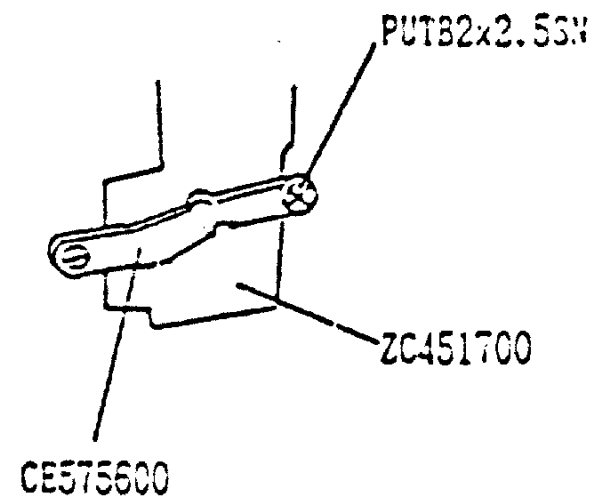
2) Reassembly of main circuit board

- Fit Main circuit board ZC451700 in position with its SBC matched with the L covering plate and lens cover.

Take care not to deviate the main circuit board.

- Bring the convexity of L Stopper CE575600 into contact with Main circuit board ZC451700 and fix it by tightening Screw PUTB2x2.5SW.

The L stopper should be set in such a direction that the convexity is located at the center of the main circuit board.

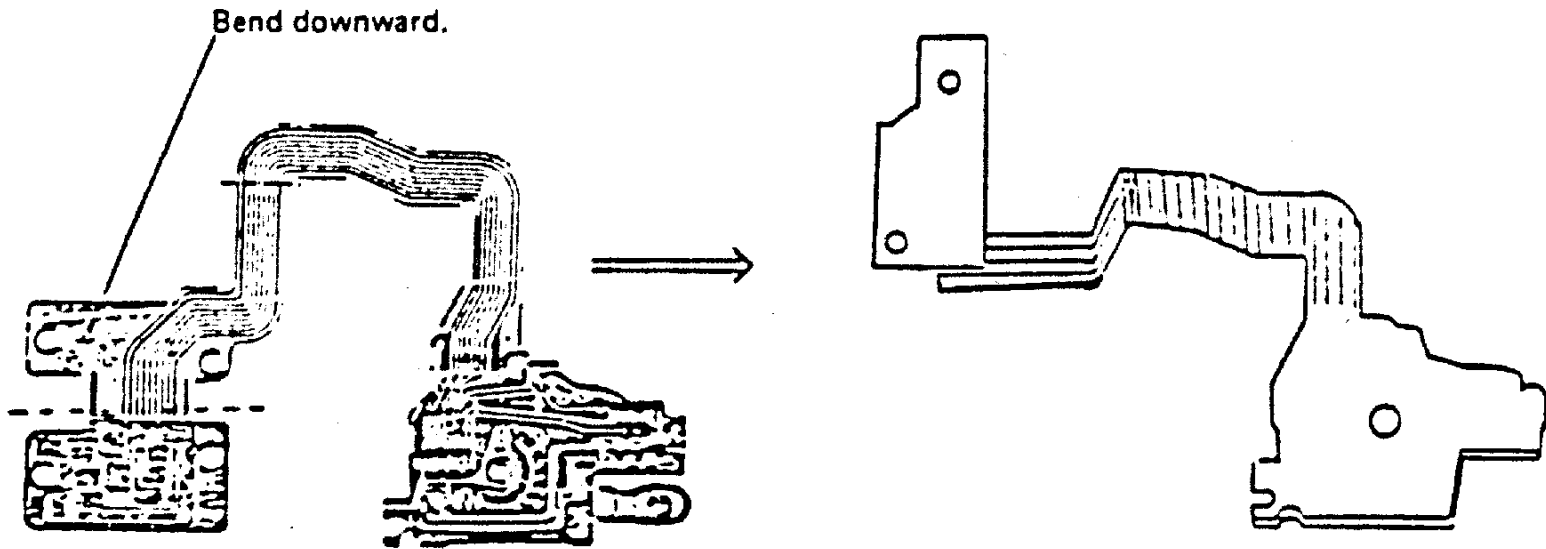


IV. FORMING OF LEAD WIRES AND CIRCUIT BOARD

1. Forming of Circuit Boards

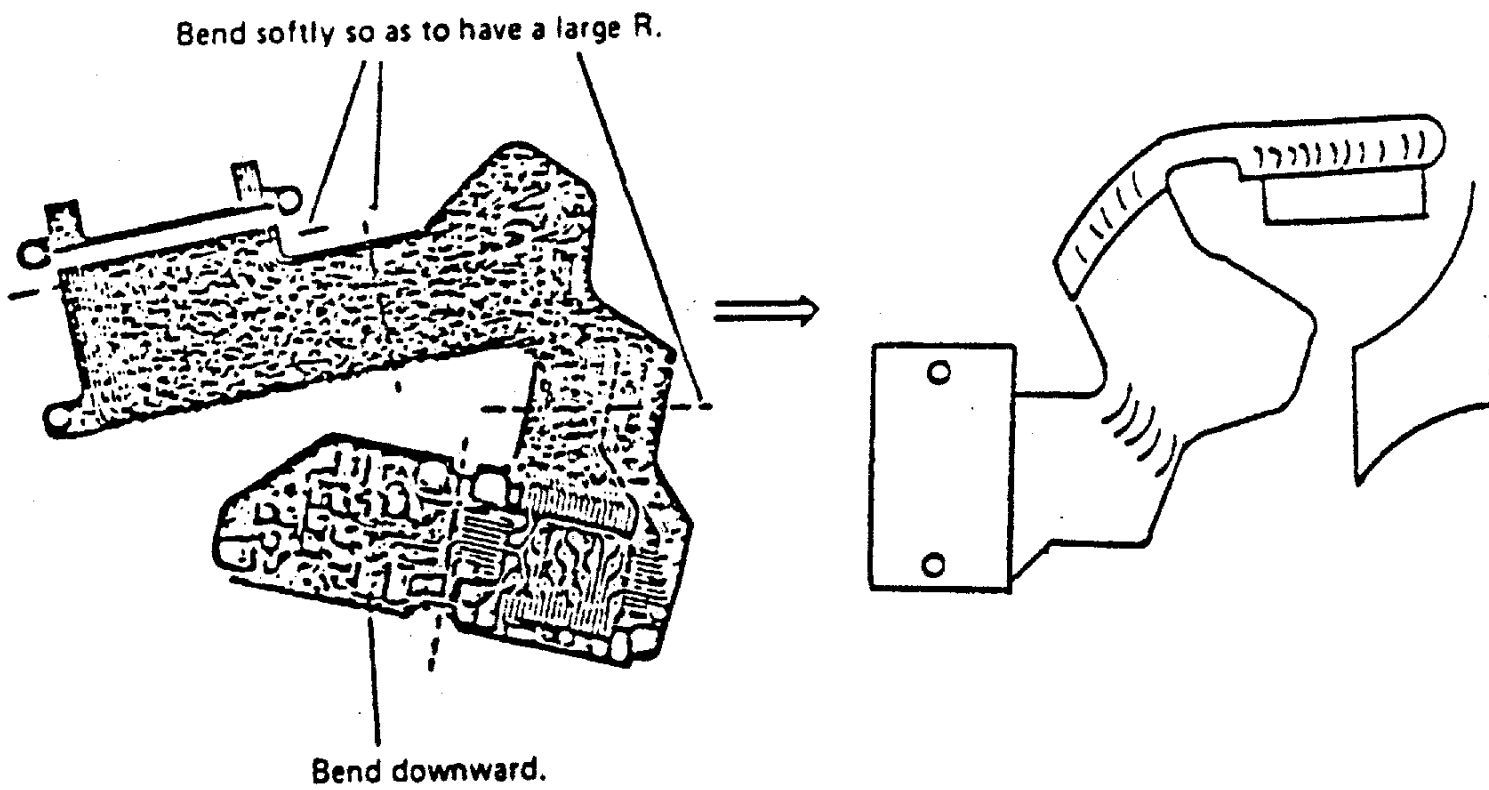
1) TV circuit board

Bend the flexible part as shown below:

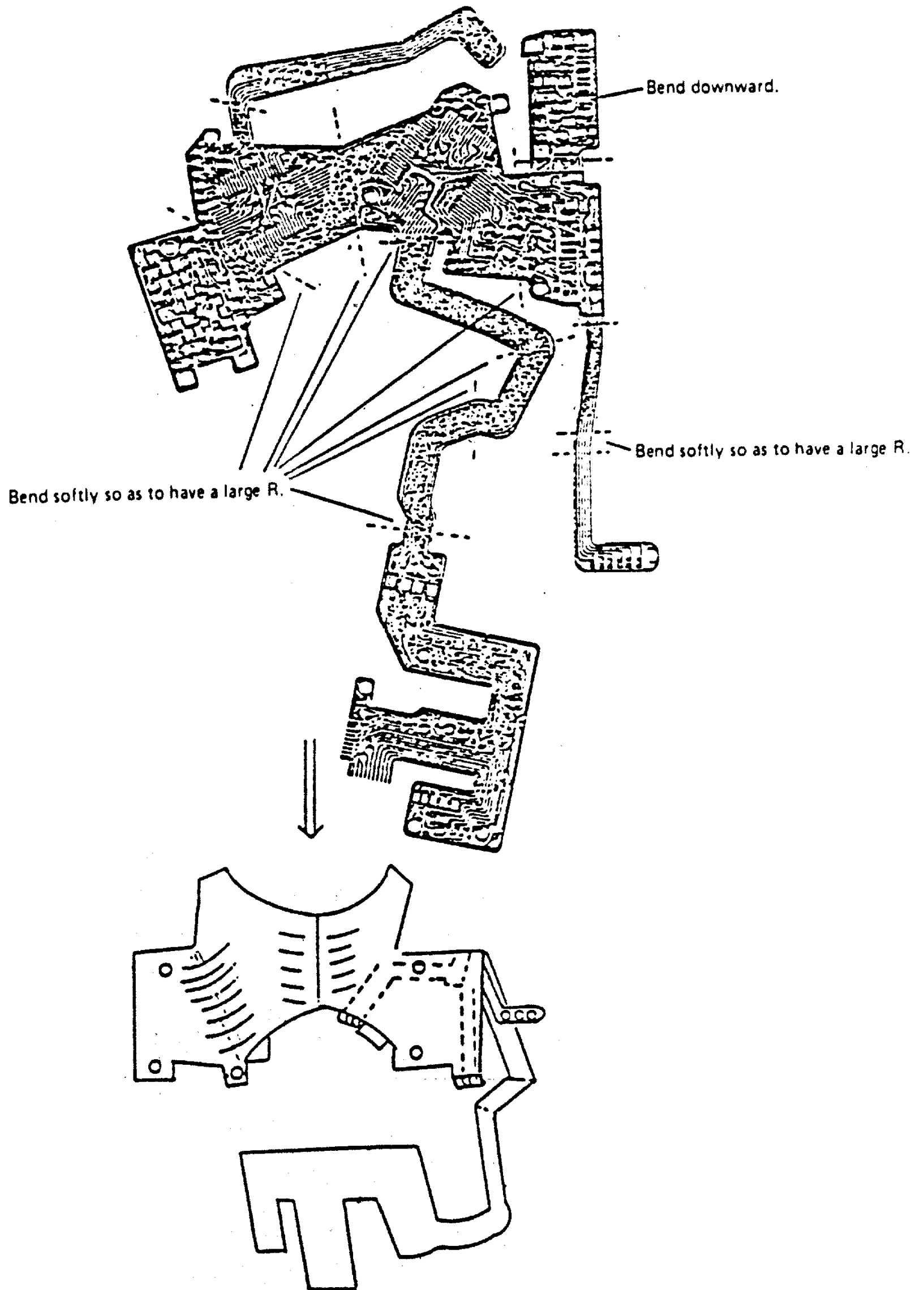


2) L circuit board

Bend the right side of IC104 as shown on
the right side.



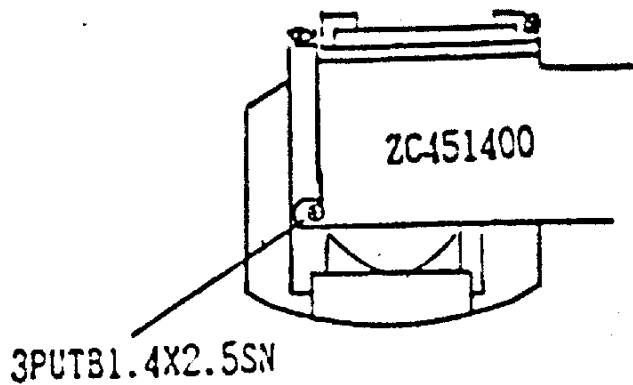
- 3) Main circuit board
Bend as shown below:



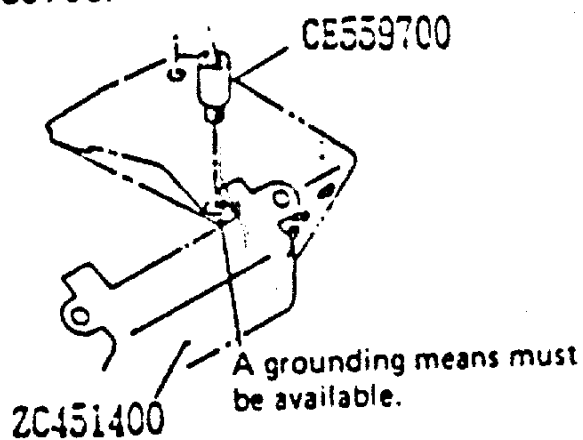
2. Reassembly of Circuit Boards

1) Reassembly of L circuit board

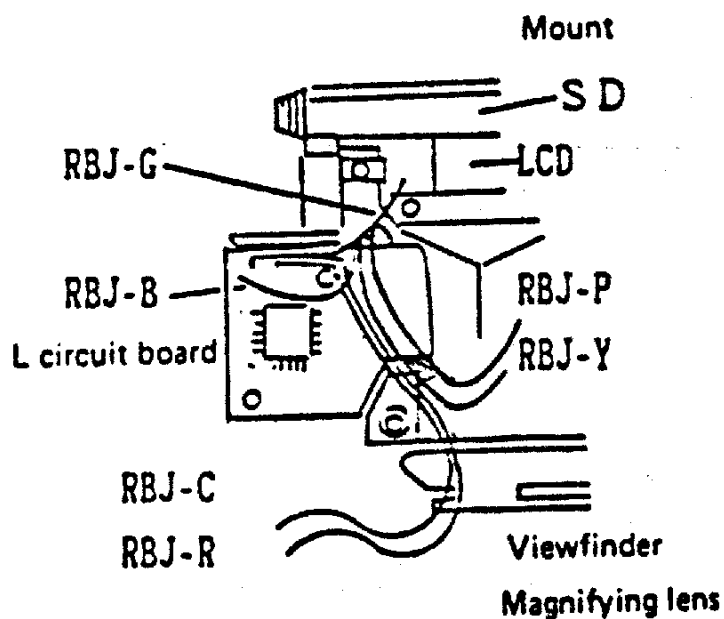
- a. Form the L circuit board correctly.
- b. Fix L Circuit board ZC451400 to PL Holder CE547100 of the prism with Screw 3PUTB1.4x2.5SN.



- c. Set Penta prism ZC451200 in position.
- d. Fix one side of the L circuit board to the front casting unit with ML Shaft CE559700.

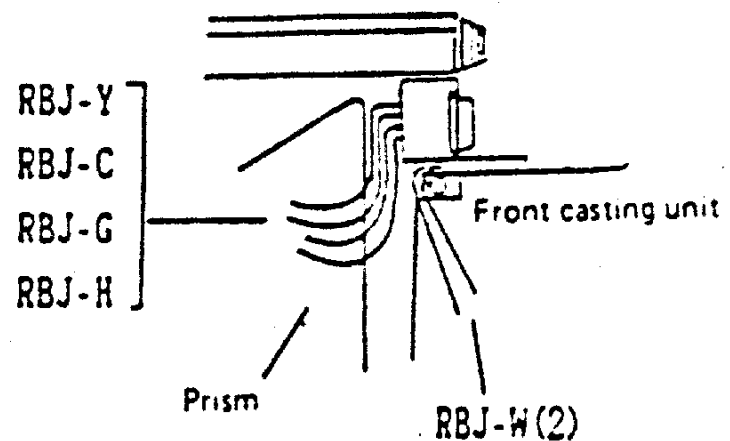


- e. Arrangement of lead wires
 L circuit board: RBJ-G, RBJ-R, RBJ-C
 AV circuit board: RBJ-Y
 FX contact: RBJ-P
 Main switch: RBJ-B
 L circuit boards (M, C): RBJ-Y, RBJ-C
 AV circuit board: RBJ-G, RBJ-H
 Lamp switch: RBJ-W (x2)

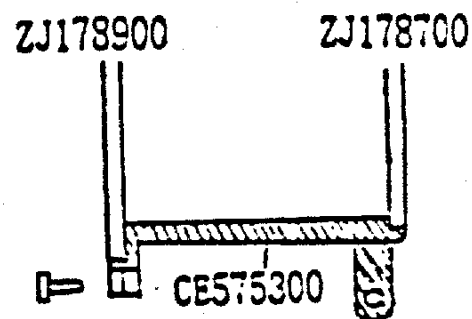


2) Reassembly of main circuit board

- a. Attach the photosensor element of Main circuit board AC451700 to L Covering plate ZC450600.
- b. Remove B Spring shaft CA893900 while taking care not to detach the string from the roller.
- c. Pass the main circuit board under B Spring ZC138100 and set the L covering plate on the front casting unit.
- d. Set B Spring shaft CA892900 in position.

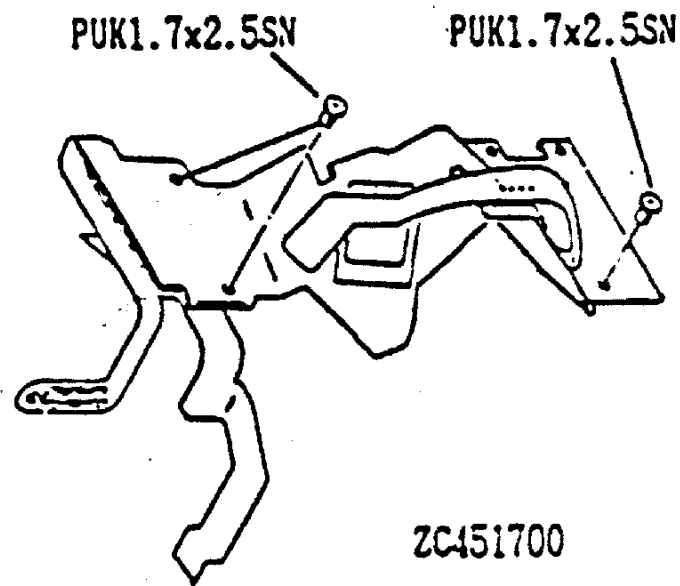


- e. Attach L Covering plate CE575300 to the front casting plate.
 - o Make sure that the front casting plate and covering plate are properly grounded by using a circuit tester.

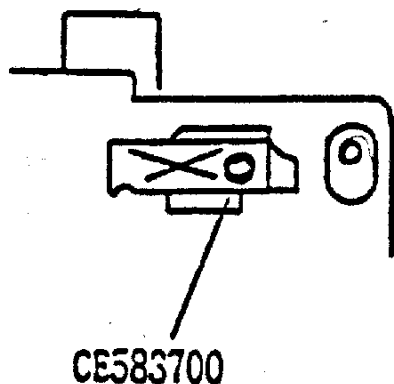


- f. Form Main circuit board ZC451700 correctly.
- g. Fix the main circuit board to the front casting unit with three Screws PUK1.7x5SN.
 - o Do not clamp the IC, three serial variable resistors and four serial variable resistors.
 - o The flexible board should be folded at one point only.
 - o The main circuit board should must be grounded through a screw.

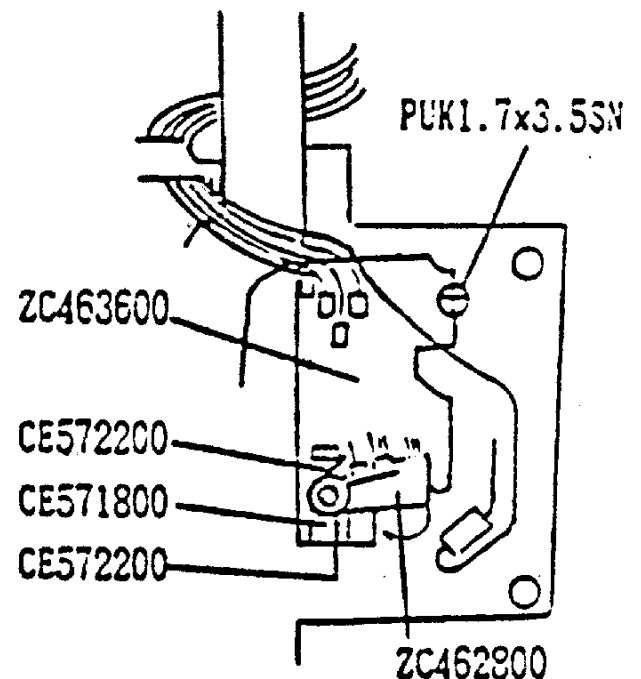
- h. Mount HNW CE583700 on the front casting unit.
- Mount the flexible board with the variable resistors aligned with the NW holes.
 - After the variable resistors are mounted, they must be arranged horizontally without inclination as seen from the front side.



- 3) Reassembly of SE circuit board
- a. Mount SE Circuit board ZC463600 and clamp it with Screw PUK1.7x3.5SN.
 - The SE circuit board must be connected to the camera body for grounding.
 - b. Pass the four lead wires of the SE circuit board and RBM-B of the LED between the front casting unit and flexible board.
 - c. Set SE Holder ZC462800 in position.
 - Clicking touch must be felt from SE Lever CE571500 when it is operated.
 - The SE contact must be brought into secure contact with no floating.



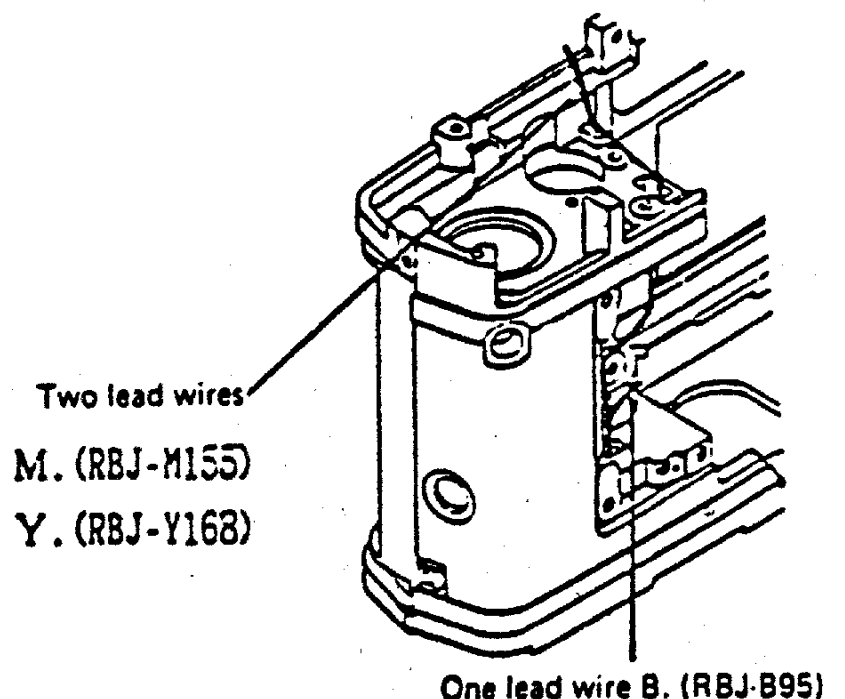
- 4) Reassembly of thyristor and front casting unit lead wires
 - a. Fix F Covering plate CE571400 with Screw PUK1.7x2.5SN.
 - Reassemble while urging the front covering plate toward the prism.
 - b. Cut off the feet from Thyristor DS-114400 and bond it to the magnifying lens attaching part of the viewfinder with Pliobond. The feet should be 3 ± 0.5 mm long.
 - c. Set the tube in parallel with the IC between the IC and viewfinder magnifying lens.
 - d. Solder each lead wire.



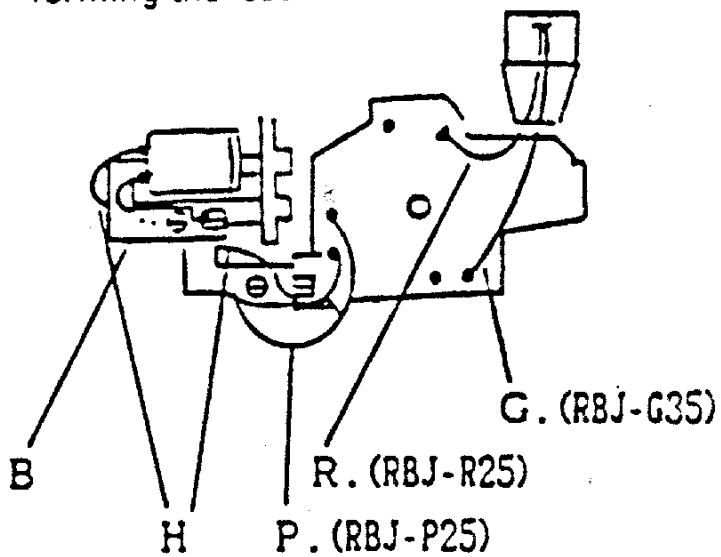
3. Forming of Lead Wires

- 1) Forming D contact cord of power cord

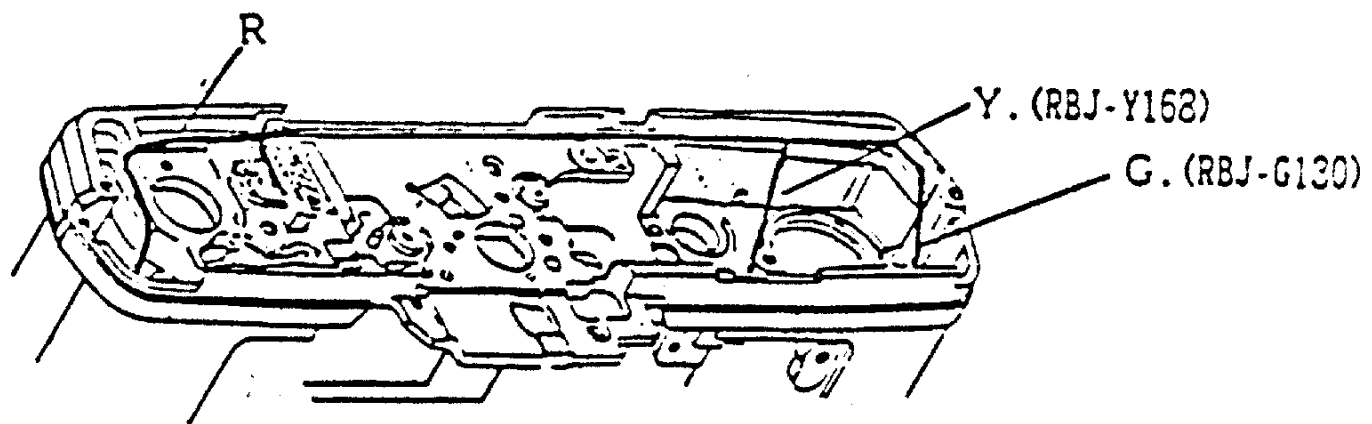
Bond lead wire (M) of D Contact CE-108000 and lead wire (Y) of RK Switch CE520800 under the release spring.



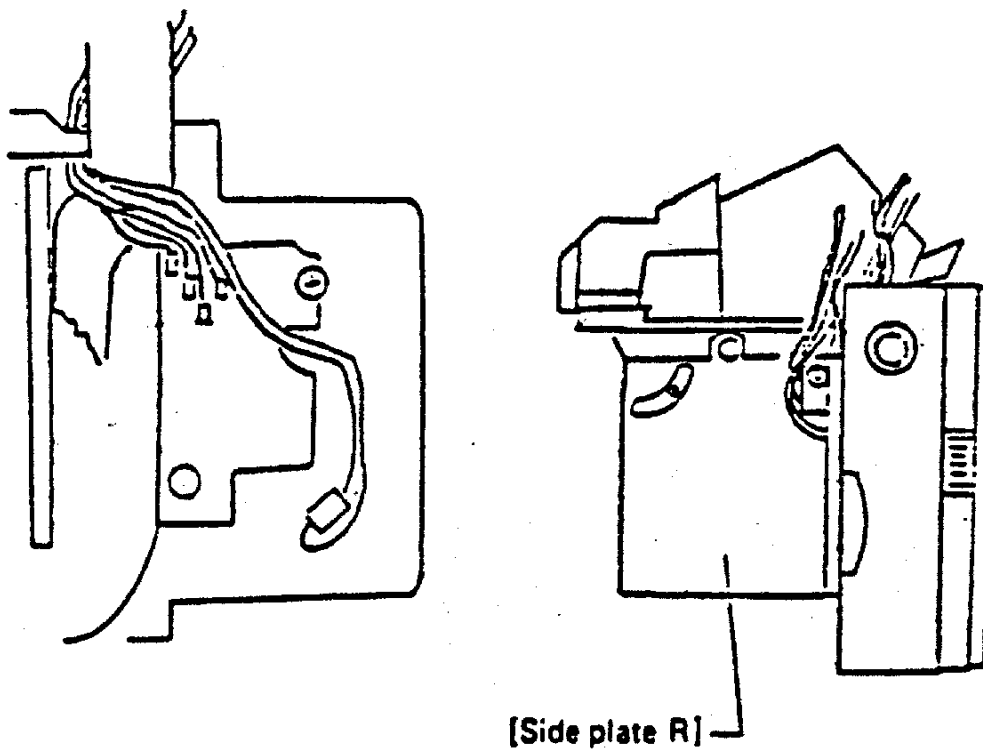
- 2) Forming lead wires of TV circuit board
Do not hold the IC or electric element for forming the lead wires.



- 3) Forming lead wires of SW base plate

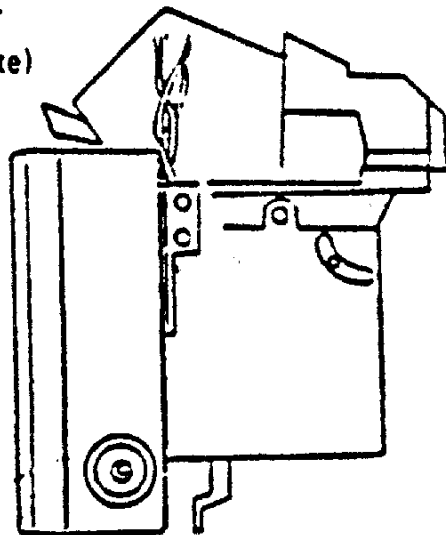


- 4) Forming lead wires or side plates
a. Form the lead wires of side plate R as shown below.
Bring all the lead wires of side plate R toward the port and pass them beside the B spring plate.



- b. Form the lead wires of side plate L as shown below.

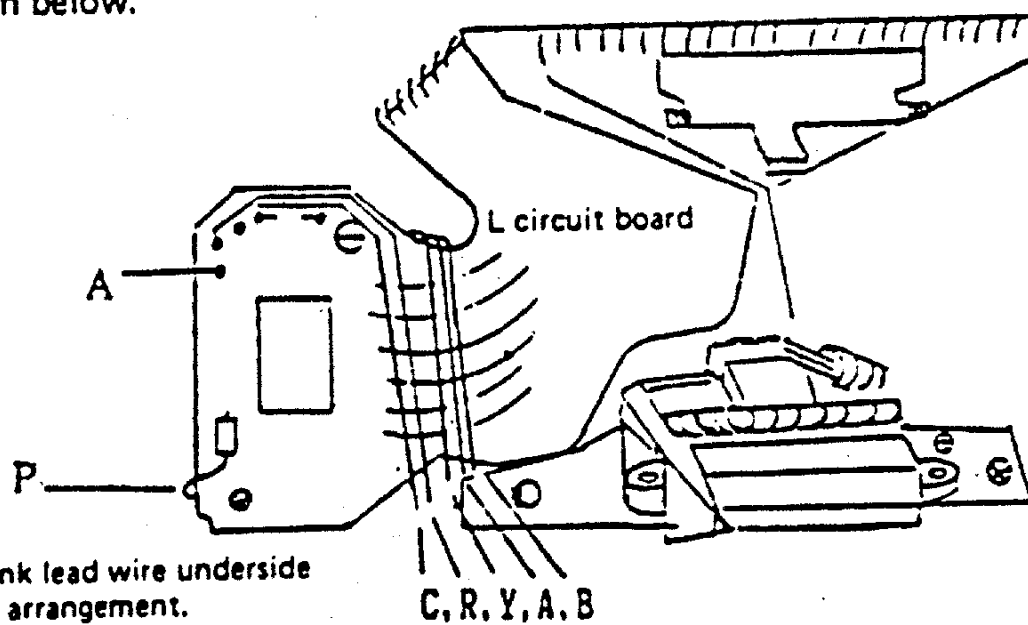
Shielded wire (white)



Orange (synchronous cord)

[Side plate L]

- 5) Forming lead wires of penta prism unit
 a. Form the lead wires of L circuit board as shown below.

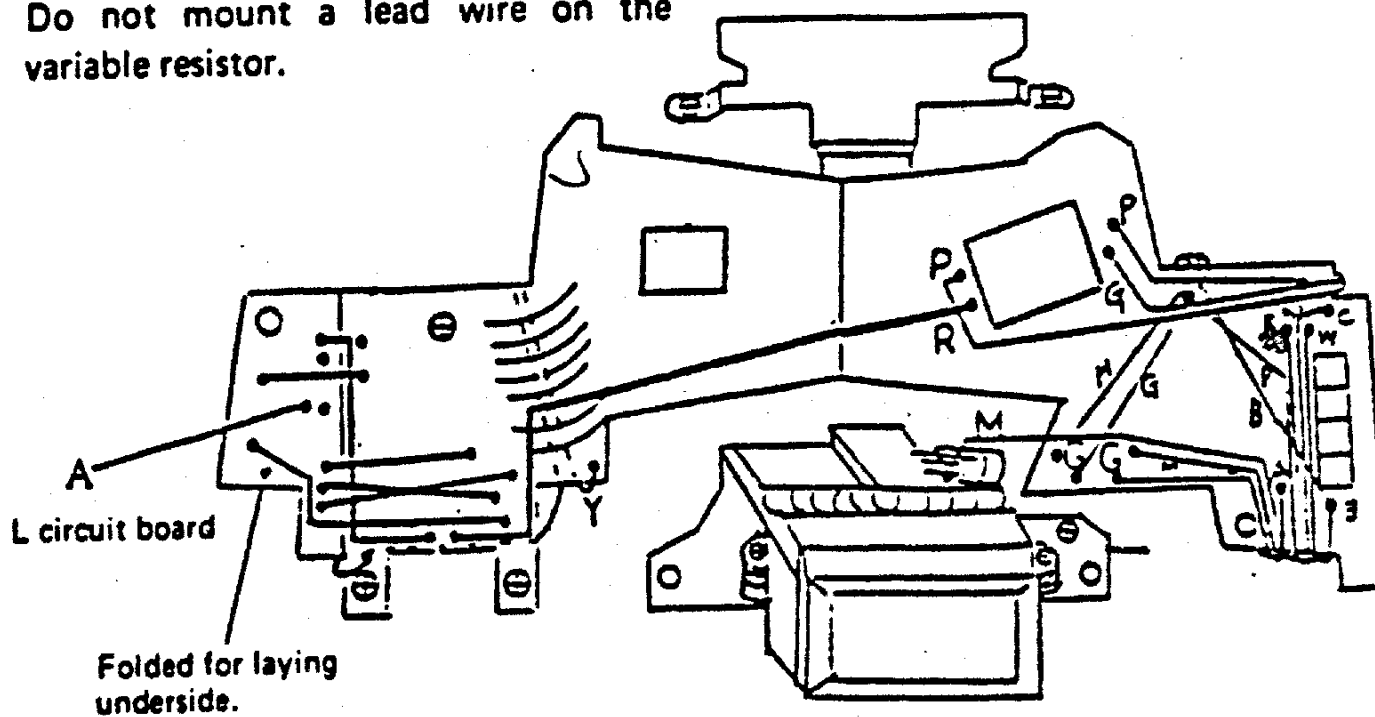


Lay the pink lead wire underside for proper arrangement.

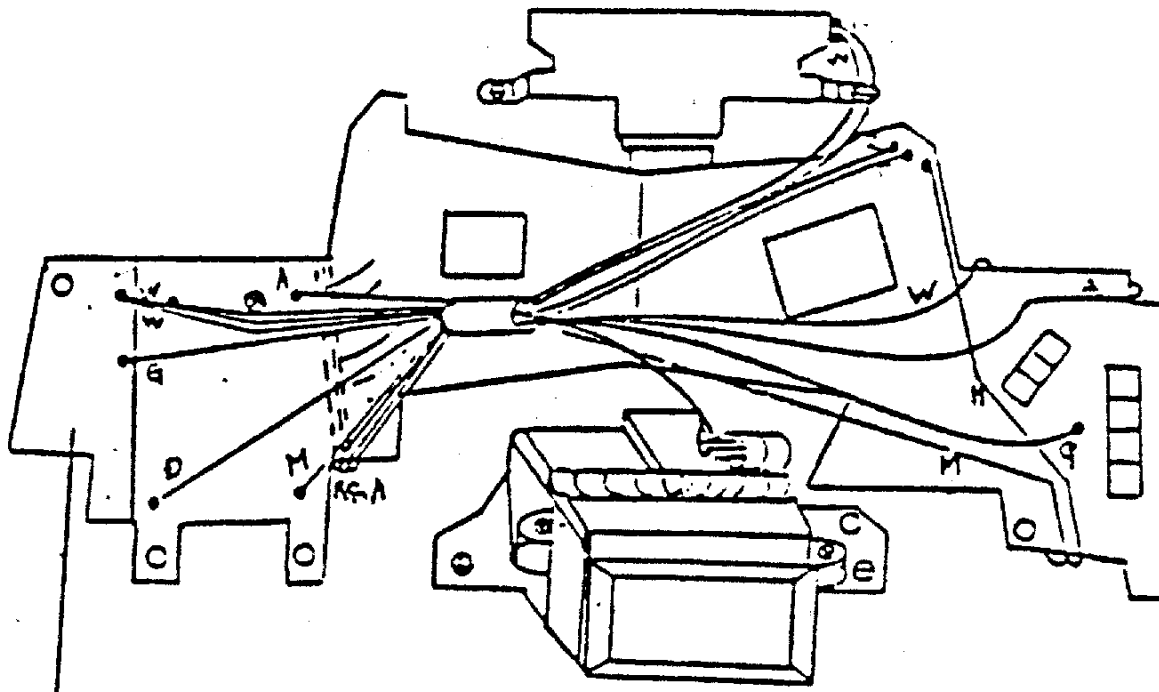
- b. Forming lead wires of main circuit board

- o Forming lead wires between circuit boards

Do not mount a lead wire on the variable resistor.

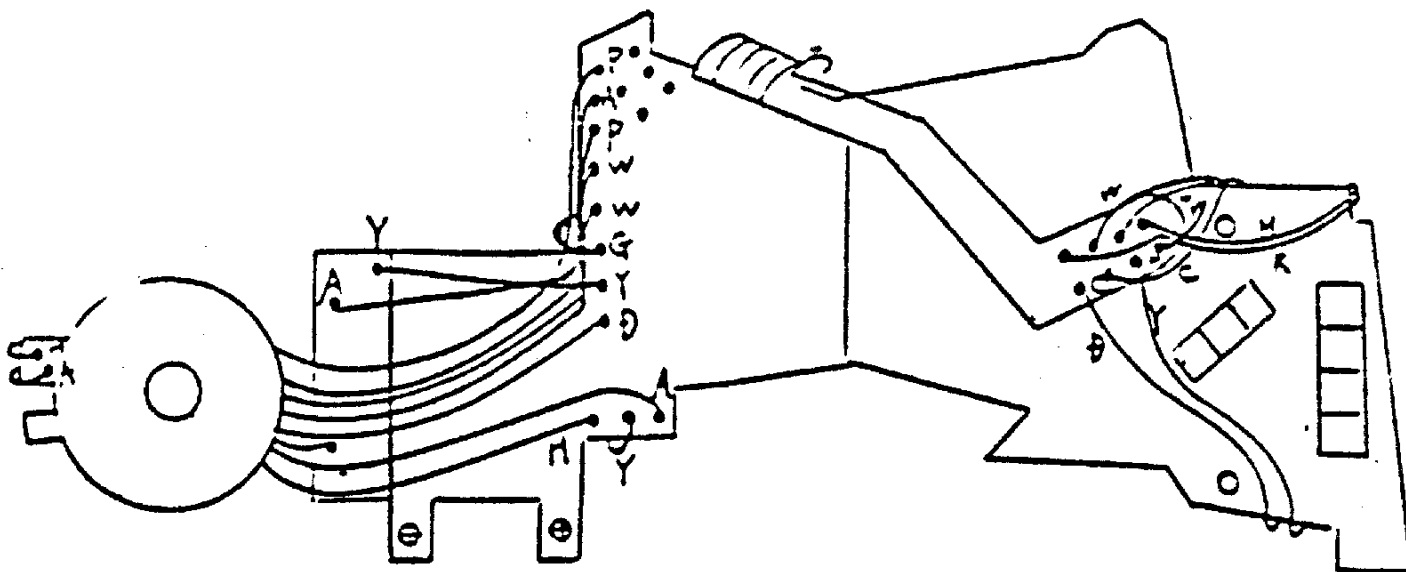


- o Forming lead wires banded with tube



Folded for laying underside.

- o Forming lead wires for mode and key inputs

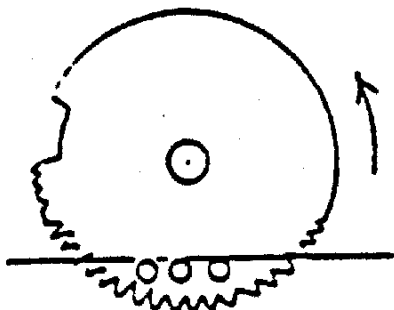


V. REASSEMBLY OF FRONT CASTING UNIT

1. Positioning of TV Gear

- Turn ZC451300 counterclockwise to position the mechanism at 1/60.

2. Set the shutter dial at 1/60.

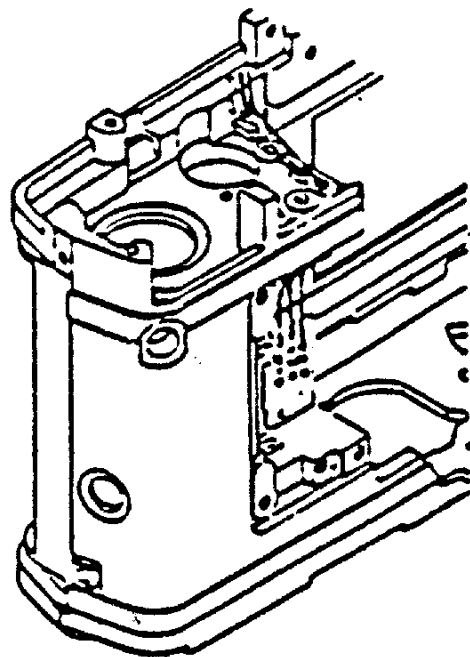


These three holes are visible when the mechanism is set at 1/60.

Do not turn the TV gear in the opposite direction.

3. Arrange the nine lead wires from the TV circuit board, one lead wire from the D contact and two lead wires from the display switch on the rear of the camera body.

Forming lead wires leading from the TV circuit board



4. Set the front casting unit into the camera body.

- Pass S Release ZJ128400 of side plate L into the notch hole formed in the camera body.
- Take care not to catch each lead wire.
- Take care to properly position M Lever 2 CE503800 and M Charging lever ZJ176700.
- Take care to properly position KM Lever ZC452800 and M charging lever.
- The camera body and front casting unit must be free from rattling.

- Moltplane must not be extruded on the upper or lower sides.
- Take care not to catch the main circuit board between parts.

- While locating the front casting plate at the lower right side as seen from the front side, fix it with five F Screws CA915500.

The F screws should be tightened in the following sequence:

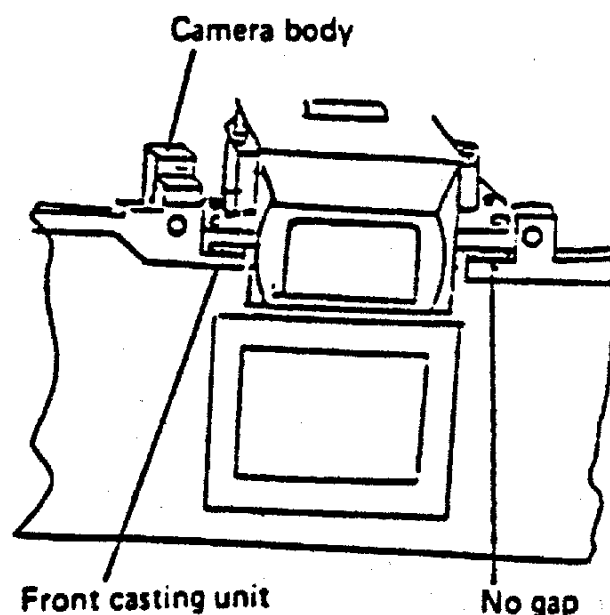
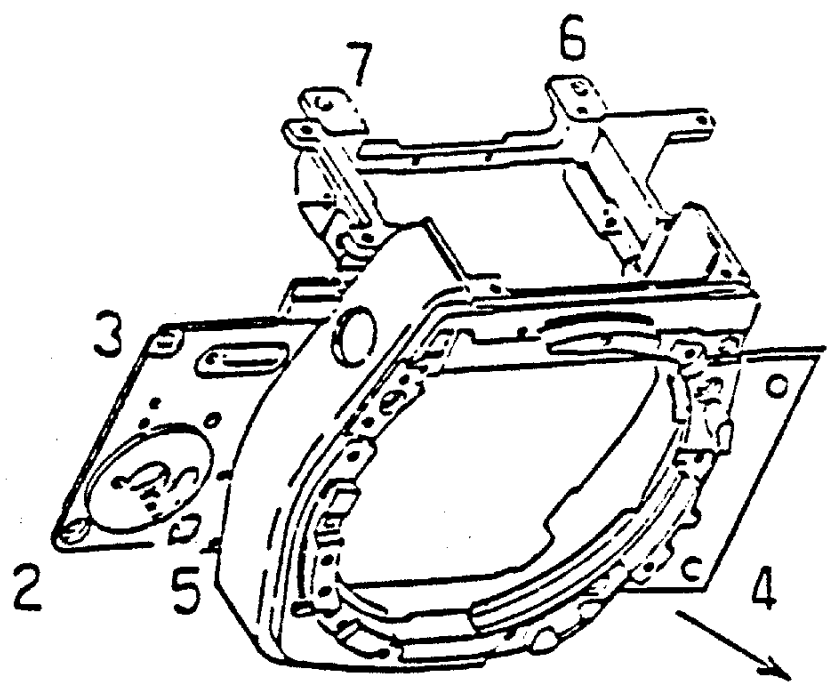
Tighten the F screws in the diagonal sequence. Tighten the selftimer lever screw before and after tightening the F screws.

- No (vertical) gap should remain between Screw PUK1.7-516 and the eyepiece of the front casting unit.

Use ring washer when the gap is wider than 0.2 mm.

When a ring washer is already used, do not place another on under the ring washer.

Setting direction of front casting unit and screw tightening sequence

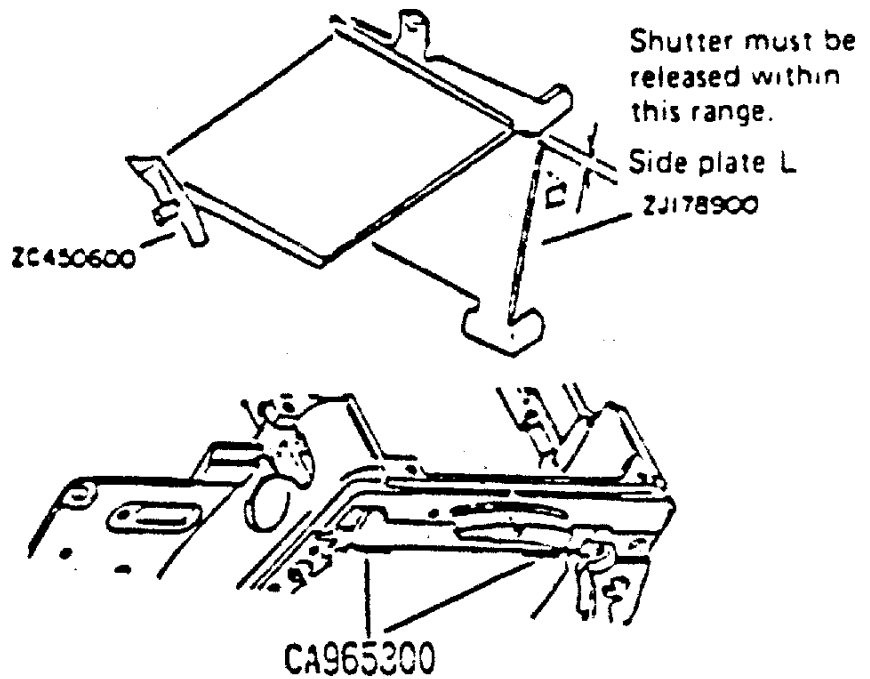


5. Checks and confirmations after fixing the front casting unit

- Gap between the front casting unit and camera body frame;
 - Back-forth: 0.3 mm max.
 - Vertical: 0.2 mm max.
- Engagement between TV Gear ZC451300 and Dial gear CE537300;
 - Engagement depth: At least equal to thickness of the TV gear
- Gap between M Lever 2 CE503800 and D Hook CA841900
 - 0.05 ~ 0.5 mm with the shutter released and mirror set at the DOWN position;
 - Vertical engagement: At least equal to thickness

○ mzmzmz

- Overcharging (charging after the D hook springs in) of the M charging lever: 0.6 ~ 1.2 mm.
- Overcharging of K Plate A, CE088500: At least 0.2 mm with no overriding of K plate B.
- Shutter releasing position
 - The shutter should be released while the lower end of the M frame is located within the range of the groove formed in the side plate L. (Check in B mode.)
- Stop position of mirror at its ascending time
 - The mirror should be stopped when M Frame ZC450600 is brought into contact with Damper CA965300.
- The shutter must be locked at a position other than 1/60 with the battery removed.



VI. CHECK AND ADJUSTMENT OF EXPOSURE CONTROL CIRCUIT AND INDICATION CIRCUIT

After the main circuit has been replaced with a new one, the following adjustments are necessary:

- (1) SVCV matching adjustment
- (2) TV adjustment: Regeneration EE adjustment (at manual 1/8 sec.)
Treg. adjustment (at manual 1/2000 sec.)
- (3) EE adjustment: Direct EE adjustment
- (4) Indication adjustment: BV adjustment Auto (average auto mode)
Spot adjustment

Adjustments (2) through (4) mentioned above must be performed at repair time even when the main circuit board is not replaced with a new one.

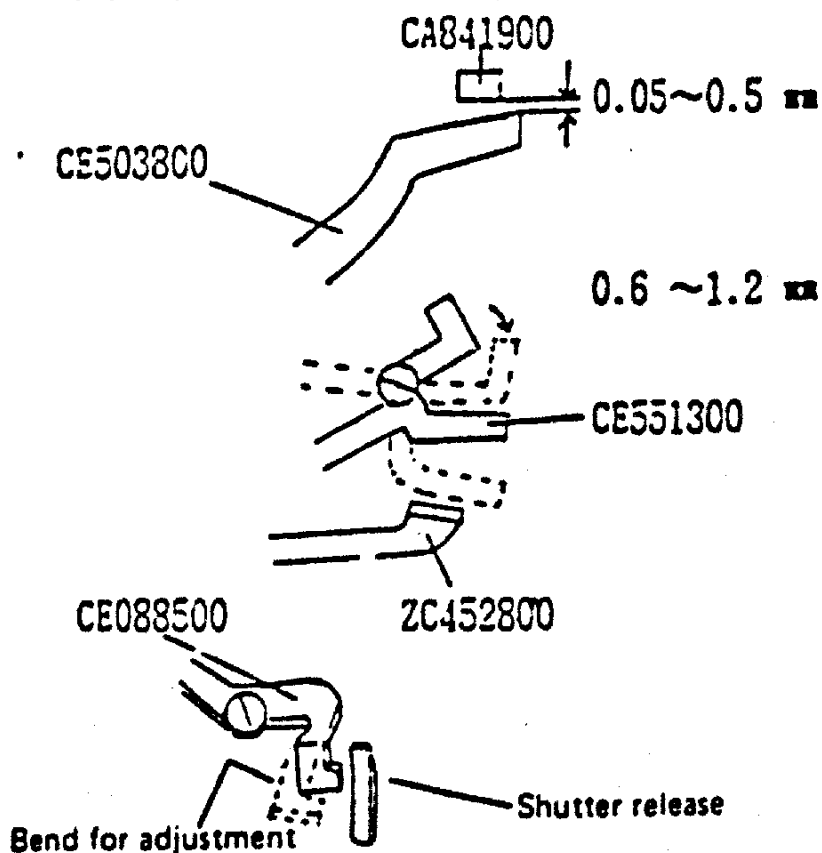
All the other items have been already been adjusted properly.

1. Adjustment of Main Circuit Board

The main circuit board requires the following adjustments for SVCV matching:

- 1) I ref. adjustment
- 2) AV/TV adjustment
- 3) DAC adjustment
- 4) CV indication adjustment

These adjustments must be performed in the sequence listed above. When I ref. for example, is adjusted, all the subsequent adjustments must be performed once again. Further, it is necessary to check and adjust TV and EE indication.



Preparation for adjustments

(1) Required equipment

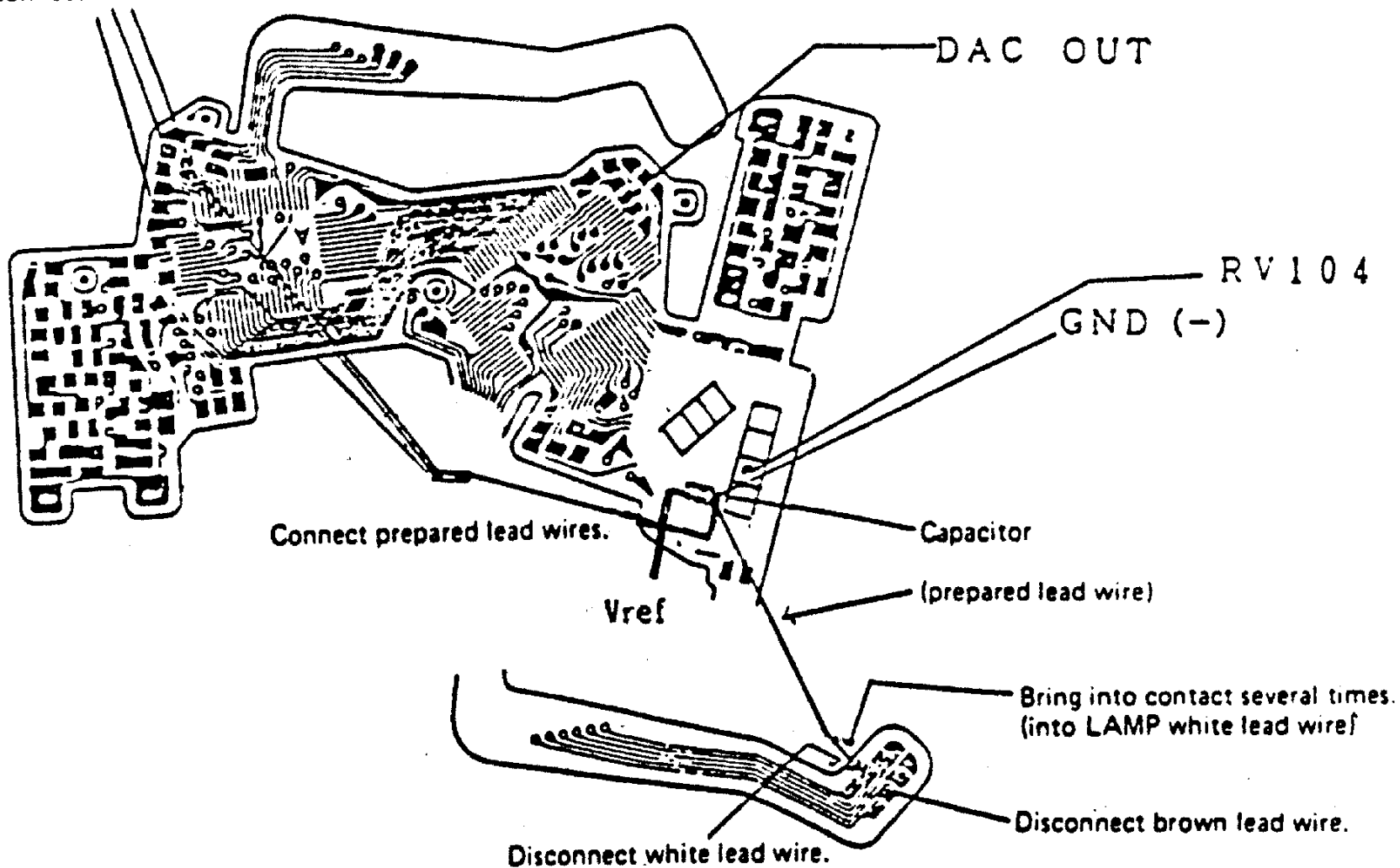
- a. Lens (MS5018)
- b. Six lead wires (about 10 cm long)
- c. Digital voltmeter
- d. Thermometer
- e. VR adjusting wrench

(2) Preparatory works

- a. Detach the upper plate.
- b. Disconnect the three lead wires from the circuit boards:
W (white), MANU P (pink) and SHAD, MEMO brown lead wires from BC, SELF and LAMP circuit boards.

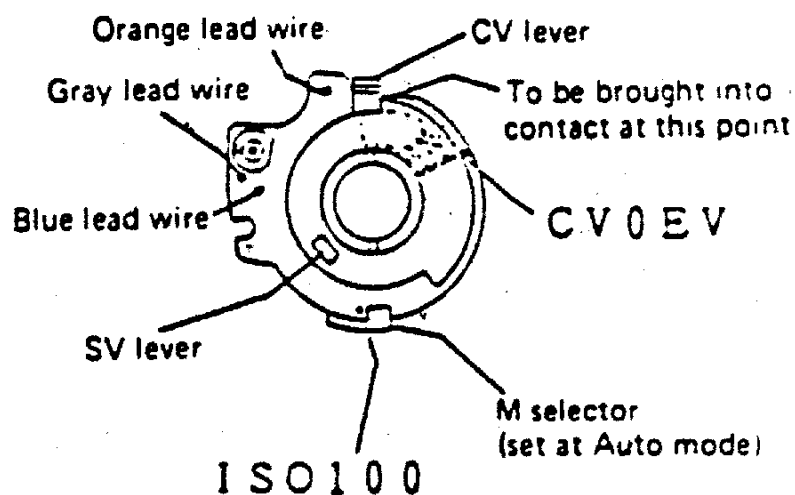
- c. Disconnect the two lead wires from the circuit board:
W (white) and SPOT, MCLR brown lead wires from the LAMP circuit board.
- d. In place of the lead wires disconnected at step (b) above, solder three of the prepared lead wires and connect their other ends to GND (-).
- e. Solder two of the prepared lead wires to Vref and DAC OUT.
- f. Connect the prepared lead wire to GND.

Disconnect three lead wires.



(3) Procedure to start check program

- a. Mode: Auto or Manual (do not select the self mode)
- b. SD: B, mechanism at position other than 1/60
- c. Lens: Set. F No. optional
- d. Bring the GND (-) lead wire into contact with LAMP terminal (from which the white lead wire was disconnected) several times. Now, the program is started.



1) I ref. adjustment

o Standard values

(Variable depending on temperature. ISO3200)

(A) Voltage across gray and orange wires

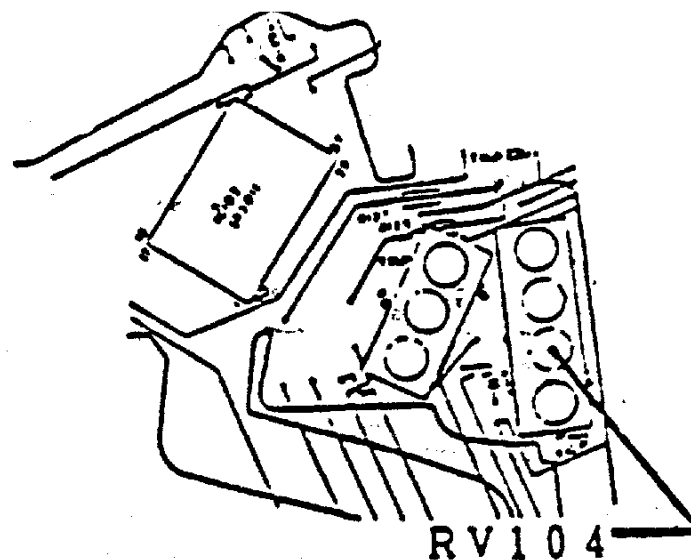
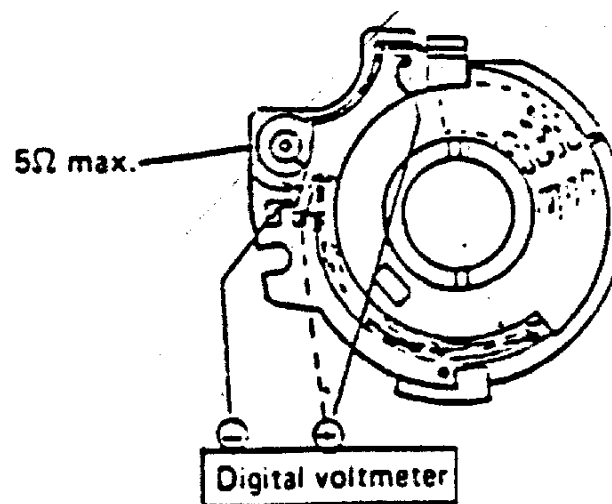
20° C	—	35.4 mV ± 0.3 mV
22° C	—	35.7 mV ± 0.3 mV
24° C	—	35.9 mV ± 0.3 mV
26° C	—	36.2 mV ± 0.3 mV
28° C	—	36.4 mV ± 0.3 mV
30° C	—	36.7 mV ± 0.3 mV

(B) Voltage across gray and blue wires

20° C	—	198 mV ± 10 mV
22° C	—	199 mV ± 10 mV
24° C	—	200 mV ± 10 mV
26° C	—	202 mV ± 10 mV
28° C	—	203 mV ± 10 mV
30° C	—	204 mV ± 10 mV

o Measuring procedures

- a. CV: 0 EV
- b. ISO: 3200
- c. Self the ± correcting resistor below 5Ω.
- d. Measure temperature at the side.
- e. Measure voltage across gray and orange lead wires.
- f. Then, check voltage across gray and blue lead wires.
- g. Check whether or not the voltage is at the standard value corresponding to the temperature measured at the site. It must be within the standard range.



o Adjusting procedure

If the standard is not satisfied, adjust voltage by turning RV104.

2) AV/TV adjustment

o Standard values

(Variable depending on temperature.)

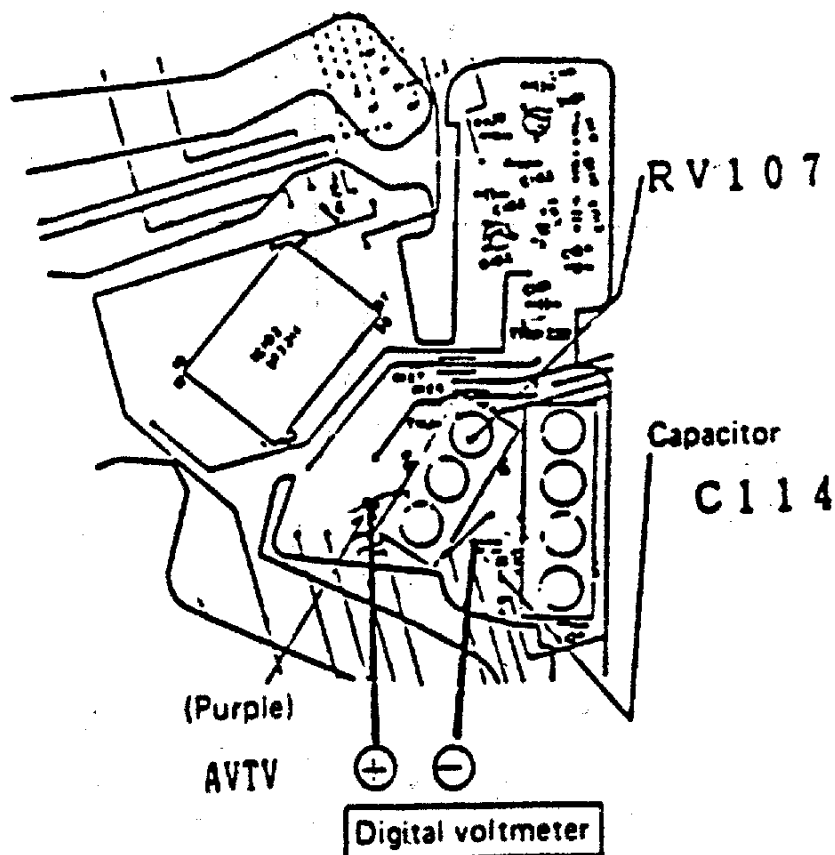
- 20°C – 205 mV ± 0.5 mV
- 22°C – 206 mV ± 0.5 mV
- 24°C – 207 mV ± 0.5 mV
- 26°C – 209 mV ± 0.5 mV
- 28°C – 210 mV ± 0.5 mV
- 30°C – 211 mV ± 0.5 mV

o Measuring procedures

- a. CV: 0 EV
- b. ISO: 3200
- c. Set the ± correcting resistor below 5Ω.
- d. Measure temperature at the site.
- e. Measure voltage across Vref-AV/TV.
(Connect the positive and negative terminals of the digital voltmeter to the AV/TV terminal and Vref lead wire respectively.)
- f. Check whether or not the voltage is at the level corresponding to the temperature at the site. It must be within the standard range.

o Adjusting procedure

If the standard is not satisfied, adjust by turning VR107.



3) DAC adjustment

o Standard values

(Variable depending on temperature)

- 20°C – 197 mV ± 0.5 mV
- 22°C – 199 mV ± 0.5 mV
- 24°C – 200 mV ± 0.5 mV
- 26°C – 202 mV ± 0.5 mV
- 28°C – 203 mV ± 0.5 mV
- 30°C – 204 mV ± 0.5 mV

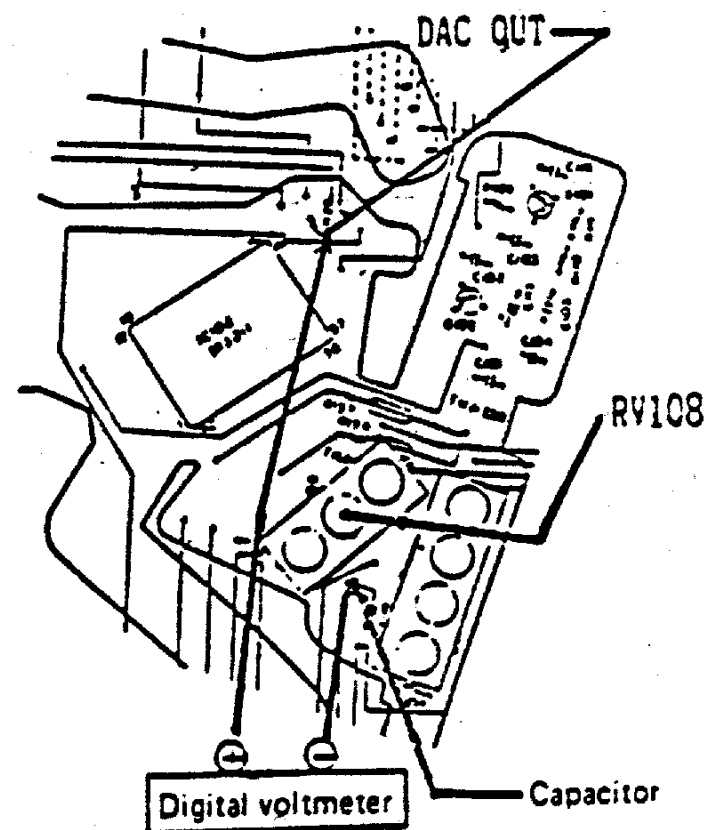
o Measuring procedures

- a. CV: 0 EV
- b. ISO: 3200
- c. Set the ± correcting resistor below 5Ω.
- d. Measure temperature at the site.
- e. Measure voltage across Vref – DAC OUT.
(Connect the "+" and "-" terminals of the digital voltmeter to the Vref and DAC OUT lead wires by using crimping connectors.)

Check whether or not the voltage is at the standard level corresponding to the temperature at the site. It must be within the standard range.

o Adjusting procedure

If the standard is not satisfied, adjust by turning RV108.



4) Adjustment of CV indication

o Standard value

The CV lamp must light at the first right and left (+ and -) click ($\pm 1/3$ EV).

o Adjusting procedures

- a. Disconnect the six lead wires used for the measurement.
- b. Solder the other six lead wires (disconnected for the measurement) in their initial conditions.
- c. Mount the CV adjusting jig in position.
- d. Set the camera in the BC mode. Stop the PCV.
- e. Observe the indication within the viewfinder.
- f. Confirmation of \pm indication

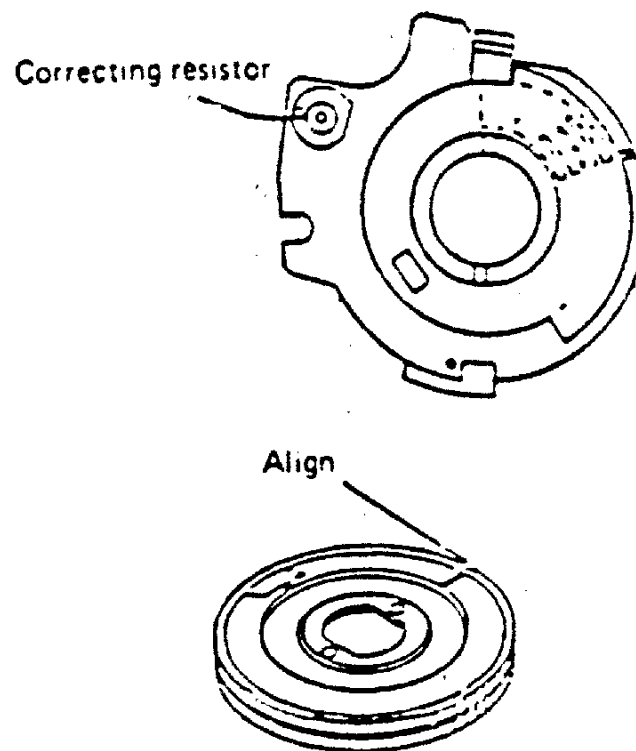
Set the LV adjusting CV click at the left side position and turn the \pm correcting resistor above the SV until the \pm indicator is extinguished.

Make sure that the \pm indicator is extinguished. Set the CV click at the right side position. The \pm indicator should normally be extinguished.

If it stays lit, turn the \pm correcting resistors until the \pm indicator is extinguished with the CV click set at the right side position. Then, set it at the left side position and make sure that the \pm indicator is kept extinguished.

Adjust the \pm correcting resistors until the \pm indicator is extinguished between the right and left positions of the \pm click.

- g. After the \pm resistors have been adjusted properly; adjust the CV click until the index on the CV dial is set horizontally.
- h. Make sure that the \pm indicator is lit by turning the CV dial $\pm 1/3$ EV.



2. TV Adjustment (Manual time)

o Standard value

1) Power supply voltage: $3.0 \pm 0.05V$

2) Check points

a. SP 1/8: 117 ± 0 ms

b. SP 1/2000: $0.49^{+0.315}_{-0.037}$ ms

c. Check each manual time to make sure that it is within the standard range.

o Measuring procedures

1) Power supply voltage: $3.0 \pm 0.05V$

2) Camera

a. Dismount the lens.

b. Mode: Manual

c. Check point on low speed side: 1/8

d. Check point at high speed side: 1/2000.

3) Shutter tester

Set at EXP.

4) Set the camera on the shutter tester.

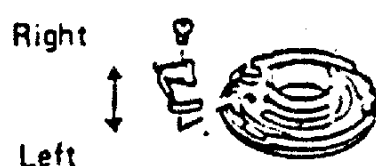
Wind the film and release the shutter several times.

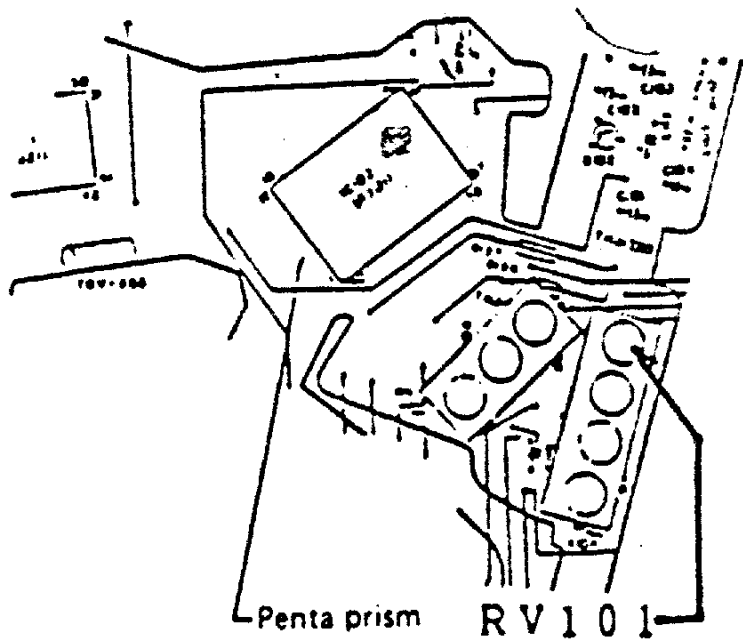
Check 1/8 sec. to confirm that it is within the standard range.

Then, check 1/2000 sec. to confirm that it is within the standard range.

Finally, check each time to confirm that it is within the standard range.

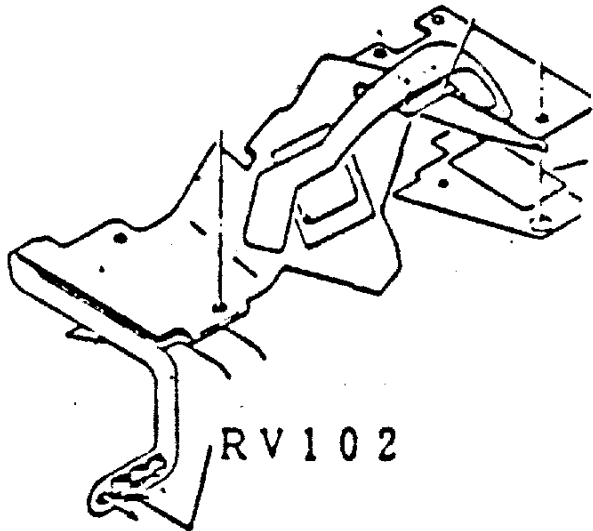
CV click CE567800





○ Adjusting procedures

- 1) Adjustment of 1/8 sec.
Detach the upper plate and turn RV101.
- 2) Adjustment of 1/2000 sec.
Detach the upper right part of the front right light wave and turn RV102.



3. EE Adjustment (Direct auto mode)

○ Measuring jig

- 1) Jig lens

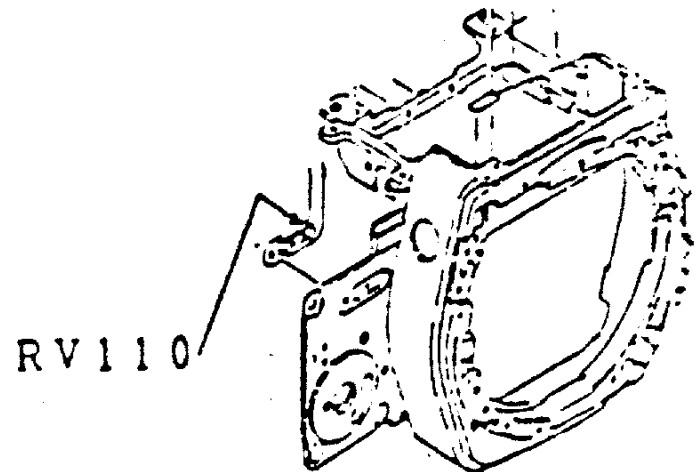
○ Standard values

- 1) 0 ± 0.05 EV, at BV10, F5.6, ISO 100
- 2) Check of ISO conversion
 ± 0.4 EV relative to ISO 100 standard at BV7, F5.6, ISO 3200.
- 3) 0 ± 0.3 EV at BV10, F5.6, ISO 3200

○ Measuring procedures

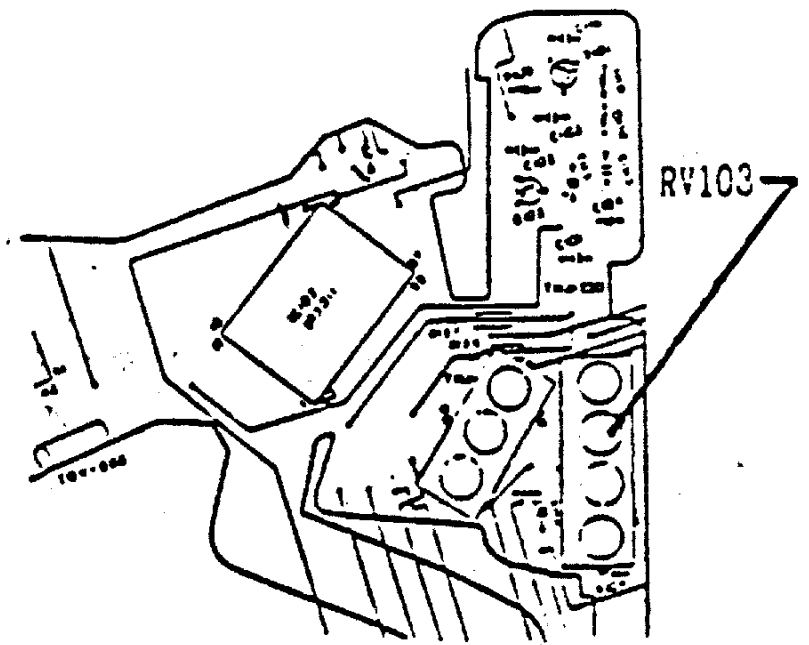
- 1) Power supply voltage: 3.0 ± 0.05 EV
- 2) Camera
 - a. Mode: Direct auto
 - b. ISO: (1) 100, (2) 3200
 - c. CV: 0
 - d. AV: F5.6

- 3) EE tester
 - a. BV: 10
 - b. K value: 1.3
 - c. ISO: 100
- 4) Set the camera on the EE tester.
Wind the film and release the shutter several times.
Check EE to confirm that it is within the standard range.
First, check at ISO 100.
Then, check at ISO 3200.
Finally check at ISO 3200.



○ Adjusting procedures

- 1) Adjustment at ISO 100
Detach the upper right side part of the front right light wave and turn RV110.
- 2) Adjustment at ISO 3200
Perform fine adjustment by turning RV103.



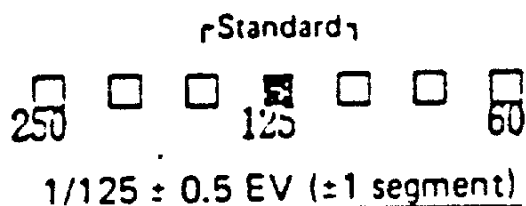
4. Adjustment of Indication (BV)

1) Auto Adjustment (average auto mode)

- Measuring jigs
 - a. Luminance box
 - b. Lens (MS5018)
 - c. VR adjusting wrench

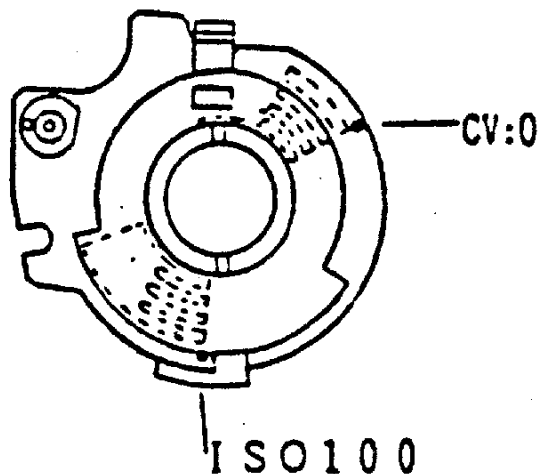
○ Standard value

The bar should be indicated at 1/125 at BV11, F4, ISO 100.



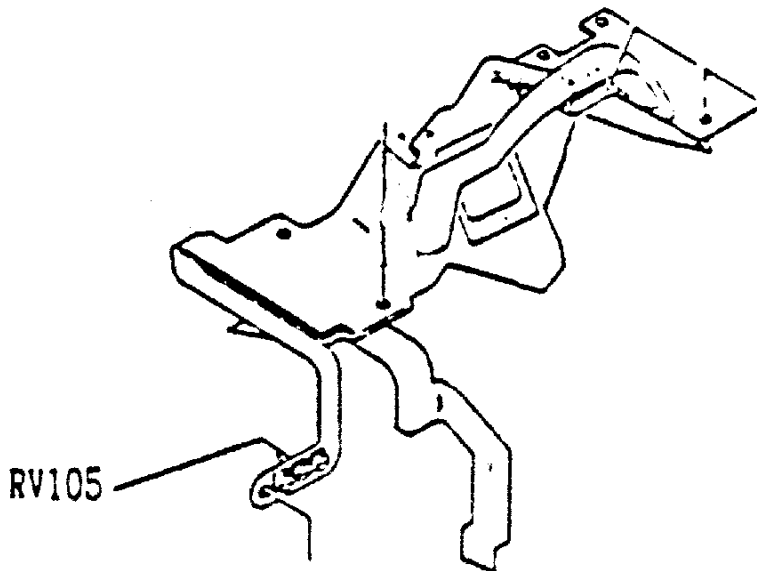
○ Measuring procedures

- a. Power supply voltage: $3.0 \pm 0.05V$
- b. Camera
 - (1) Mode: Direct auto
 - (2) ISO: 100
 - (3) CV: 0
 - (4) AV: F4 (jig lens)
- c. Luminance box
 - (1) BV: 11
 - (2) K value: 1.3
- d. Set the camera in the luminance box.
Set the camera in the direct auto mode (SW ON) and observe through the viewfinder.
The bar must be indicated within the standard range.
- e. Check BV16 (OVER), 14, 11, 8 and 4 to confirm that they are indicated within the standard ranges.



○ Adjusting procedure

Detach the upper left side part of the front right light wave and turn RV105.

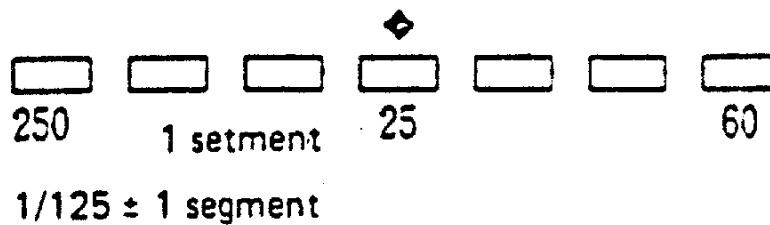


2) Spot adjustment

- Measuring jigs
 - a. Luminance box
 - b. Lens (MS-5018)
 - c. VR adjusting wrench

○ Standard values

- a. The dot must be indicated at 1/125 at BV11, F4, ISO 100.



- b. Step formed by switching: $\pm 0.5 EV$

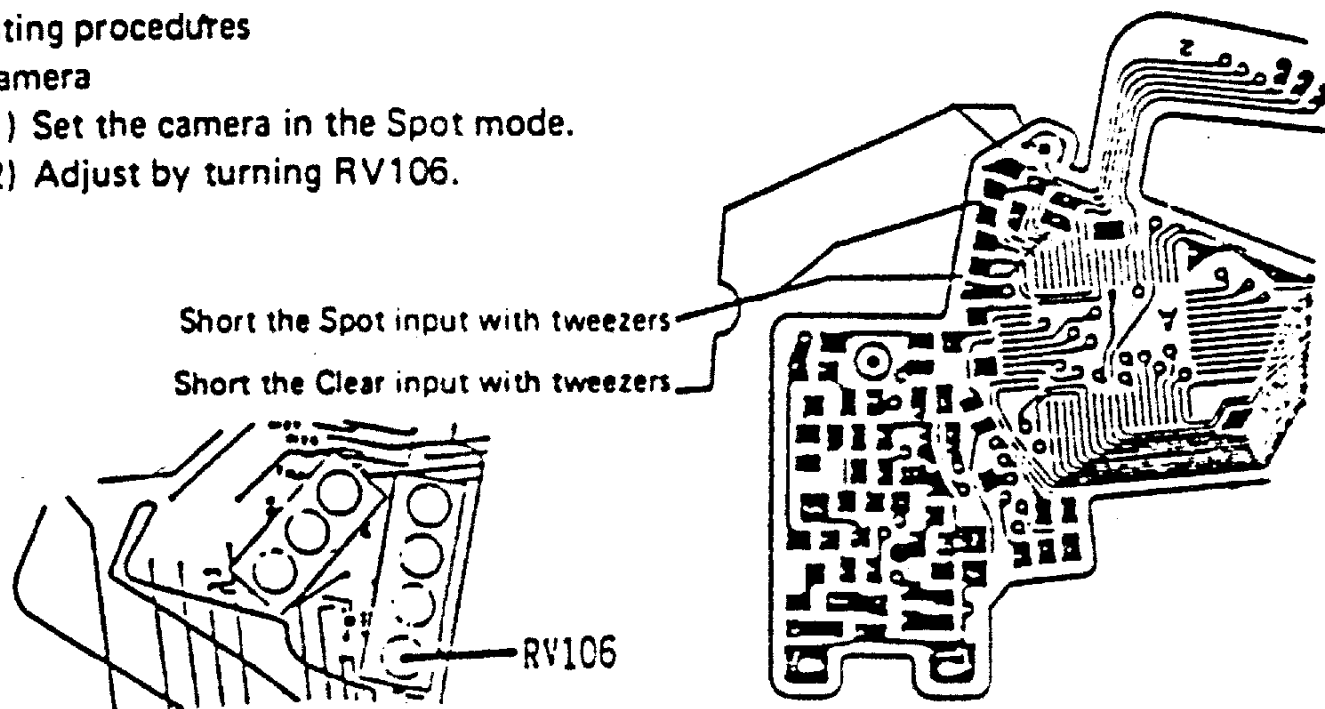
○ Measuring procedures (spot characteristic must be within the standard range)

- a. Power supply voltage: $3.0 \pm 0.05V$
- b. Camera
 - (1) Mode: Direct auto
 - (2) ISO: 100
 - (3) CV: 0
 - (4) AV: F4
- c. Luminance box
 - (1) BV: 11
 - (2) K value: 1.3
- d. Set the camera in the luminance box.
 - (1) Depress the Spot button
 - (2) The dot must indicate 1/125 within the standard range.
 - (3) Check also at BV16, 14, 8 and 4 to confirm that the indications are within the standard ranges.

○ Adjusting procedures

a. Camera

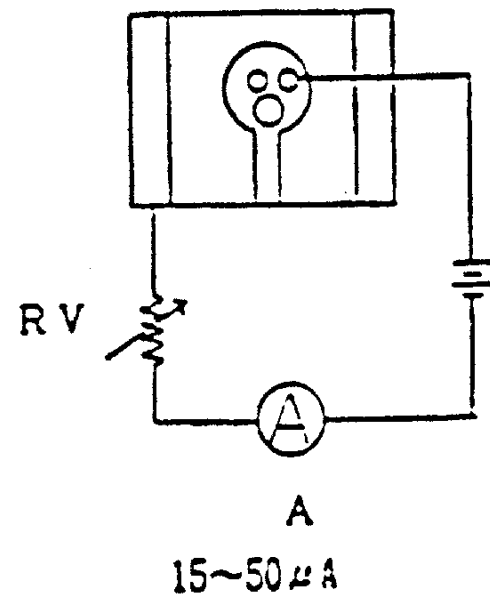
- (1) Set the camera in the Spot mode.
- (2) Adjust by turning RV106.



5. Check of Indicator Lamps within Viewfinder

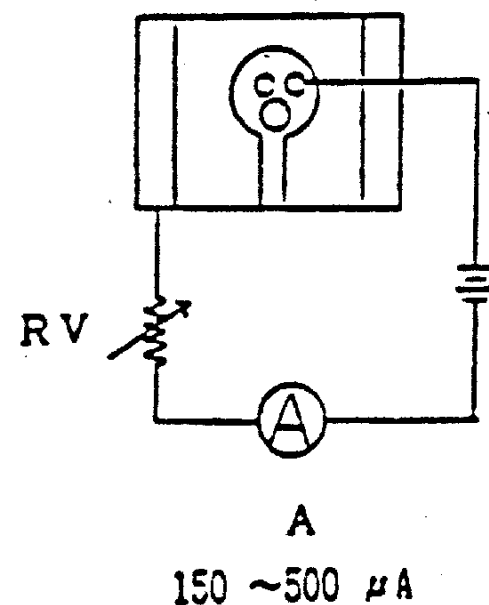
1) Check of F time switching

- Form a circuit as shown on the right side. Adjust current by turning the variable resistor.
- When current of $15 \sim 50 \mu\text{A}$ is flowed, time must be switched to auto strobe time of $1/60$ sec. (SP should be set at about 1 sec. to facilitate the check.)
- When current of $15 \sim 50 \mu\text{A}$ is flowed, mark "||60||" must be indicated as a sign of auto strobe time of $1/60$ (F time).



2) Check of strobe charging indication

- Form a circuit as shown on the upper right side. At a current level of $150 \sim 500 \mu\text{A}$, mark "||" must be indicated on the indicator LED within the viewfinder.



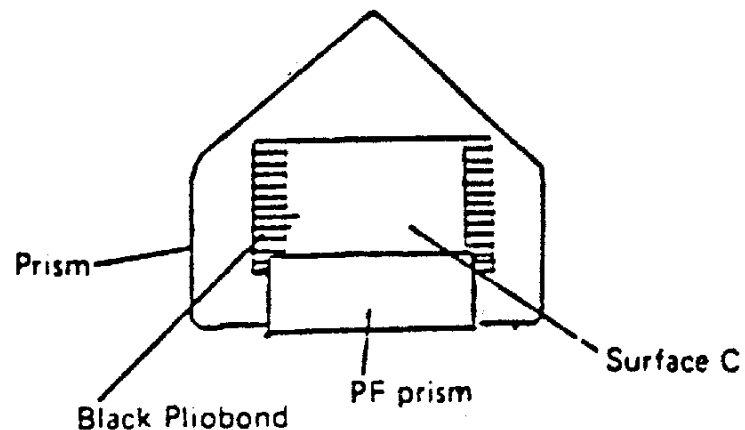
3) Check of strobe UNDER and OVER indications

- Check of UNDER indication
After attaching T20, T32 or T54 to the camera and turning ON the switch, release the shutter before the charging lamp comes on.
The UNDER lamp must flicker.
- Check of OVER indication
 - a. Prepare a piece of white film (having reflectance of 95%) and set it in the camera.
 - b. Attach T20, T32 or T45 and turn ON the switch. Release the shutter after the charging lamp comes on.
The OVER lamp must flicker.

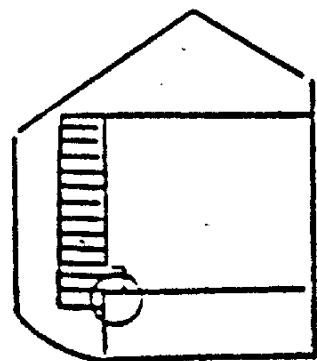
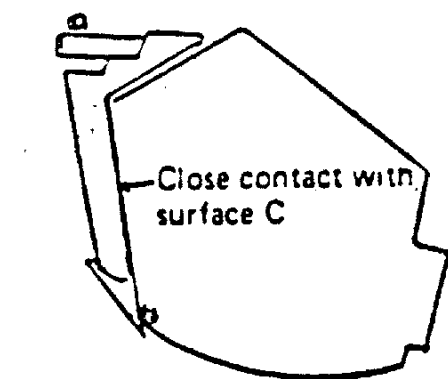
VII. REASSEMBLY AND ADJUSTMENT OF INDICATOR ILLUMINATOR

1. Reassembly of PL Base Unit

- 1) Apply black Pliobond to the mounting surface (surface of prism C) for PL Holder 1 CE547100.



- 2) Mount and bond the PL holder 1 onto the black Pliobond.
 - o It must be brought into close contact with the surface C.
 - o Both the sides of the PF prism must be in contact with the bonded surface of the PL holder.



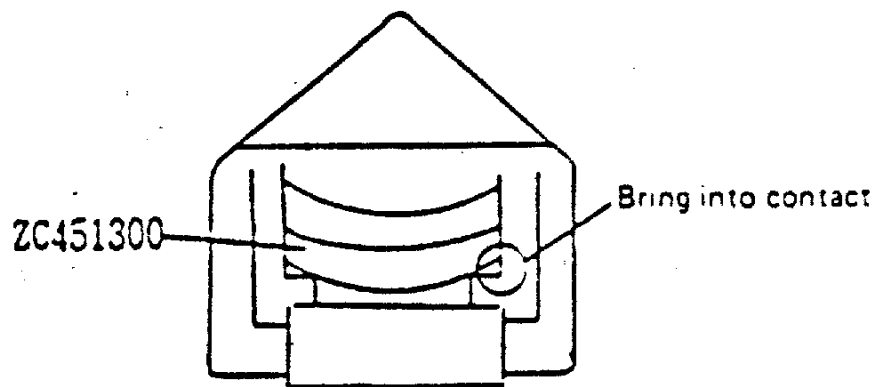
Bring into contact with PL prism.

3) Bonding relay lens

- o Apply black Pliobond to surface C of the prism to which Relay lens ZC451300 is to be bonded.
- o Mount and bond the relay lens to the black Pliobond.

The relay must be brought into close contact with the surface C.

Bring the relay lens contact with the surface of the PL holder 1 as shown on the right side.

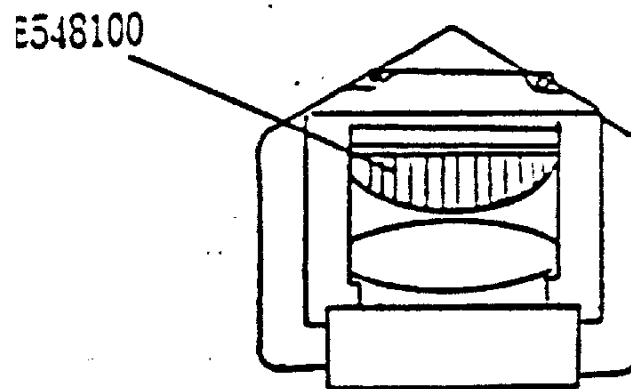


4) Bonding of P light proof

- o Bond P Light proof CE598100 to the relay lens.

The P light proof must be brought into close contact with surface C.

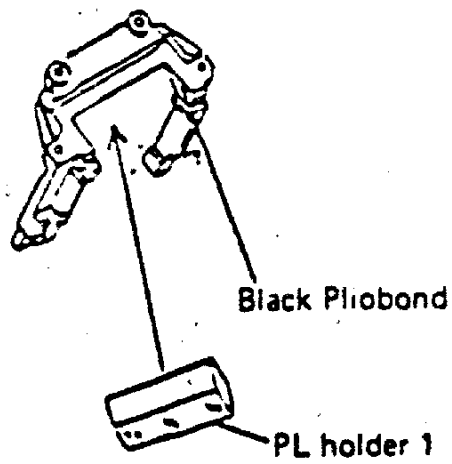
It must not eclipse the light beam between the HL prism and relay lens.



5) Bonding of HF prism

- o Apply a small amount of black Pliobond to both the sides of the top of the PL holder 1.
- o Direct the coated surface of HF Prism LC420500 deeper downward and bond the prism to the PL holder 1.

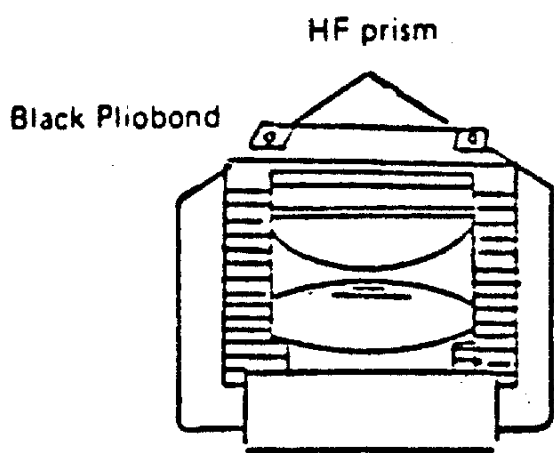
Bring the bottom transparent surface into contact with the PL holder 1 and bond the prism in such a position that the top transparent surface is set horizontally.



6) Bonding of PL light proof (1)

- Apply black Pliobond to two spots on the PL holder 1 and a spot on the relay lens.
- Bond PL Light proof CE542800 between the bottom surface of the HF prism and top surface of the PF prism.

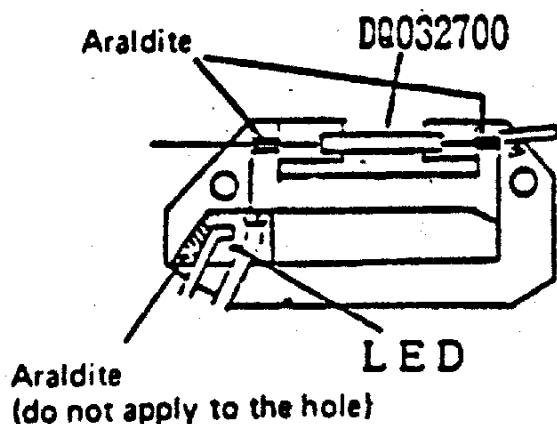
mzmzmz



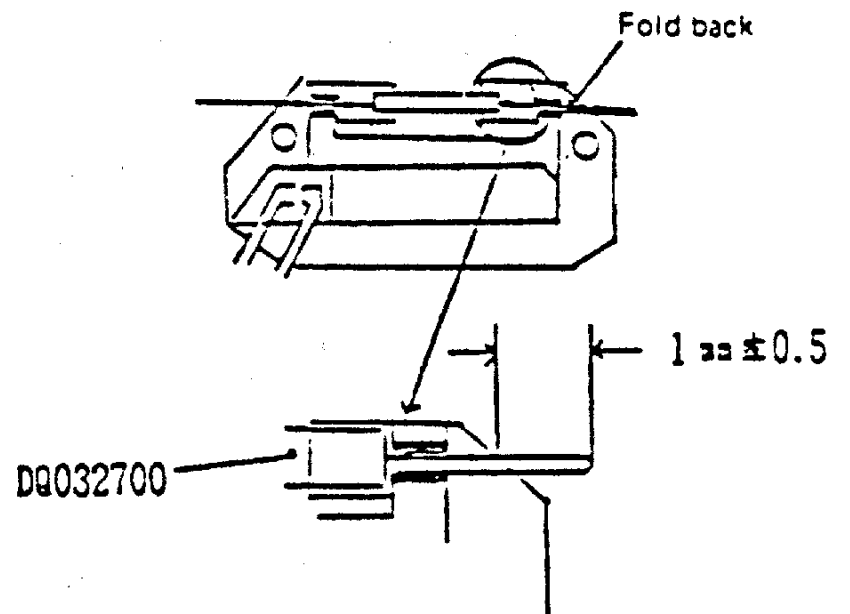
Reassembly and Adjustment of K Prism

1) Reassembly of lamp

- Set Lamp DQ032700 in the lamp setting groove of K Prism ZC451500 and fit the lamp lead wires into the right and left grooves.
- After the lamp has been set in position, fix it by applying Araldite at two spots on its right and left sides.



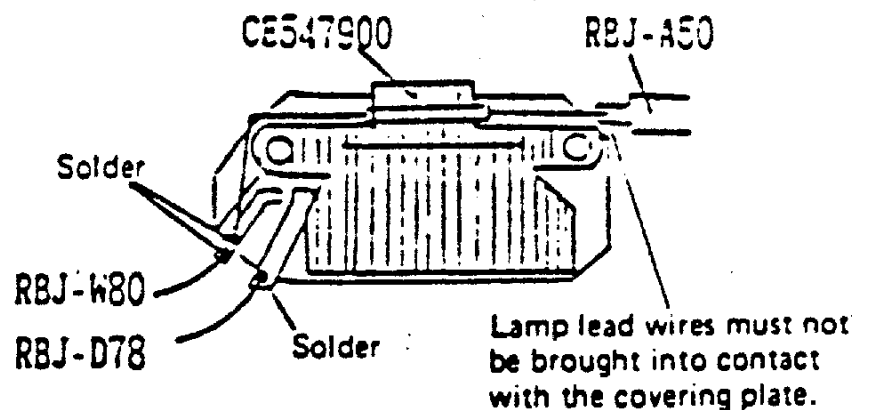
- Since the lamp feet are weak, fold back the soldered part of RBJ-A as shown below.



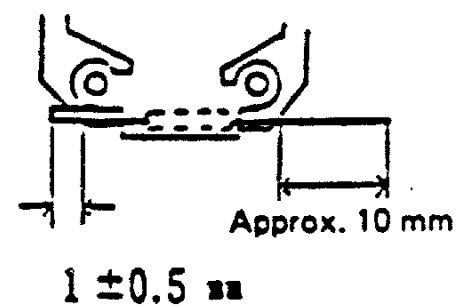
2) Reassembly of covering plate

- Fit Covering plate CE547900 over the K prism.
- Solder RBJ-D78, RBJ-A50 and lamp lead wires at the positions shown below.

• The soldering works must be done quickly. Note that Araldite and K prism are easily affected by heat.

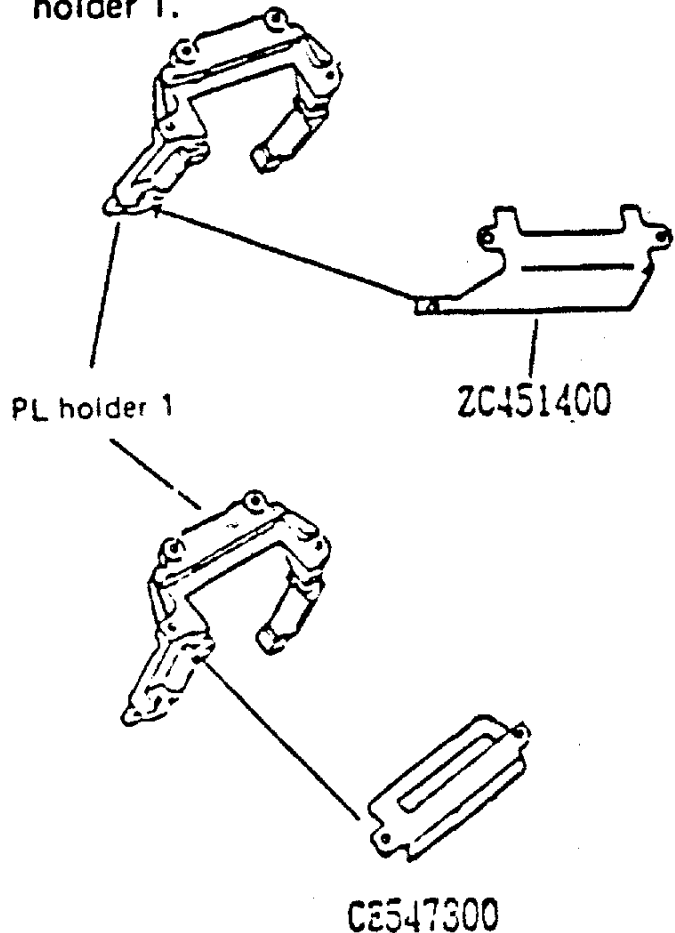


- The lamp lead wires should have the length shown below.

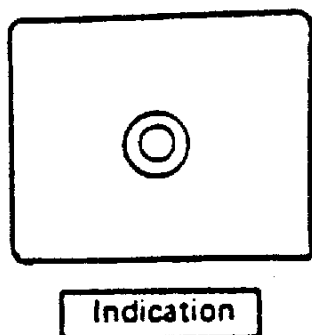


3. Reassembly and Adjustment of L Circuit Board, LCD and K Prism

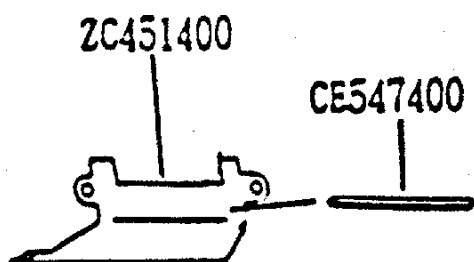
- 1) Fix L Circuit board ZC451400 to the PL holder 1 with Screw 3PUTB1.4x2.5SN.
- 2) Mount PL Plate CE547300 on the PL holder 1.



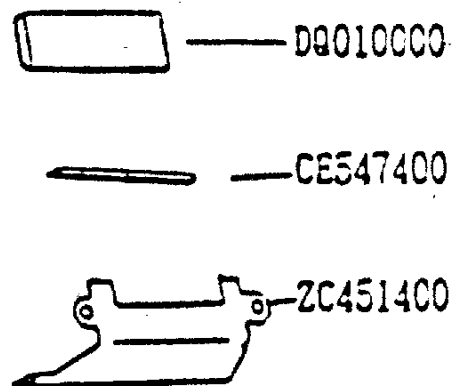
- o The indication must be visible on the lower surface of the mask free from vignetting or inclination. The indicator lamp must not be remarkably injured or inclined.



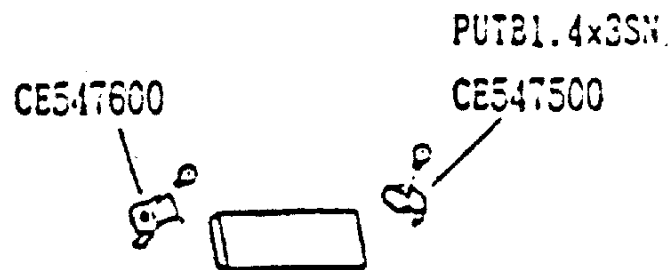
- 3) Mount Rubber connector CE457400 on the contact of L circuit board.
 - o The rubber connector must not deviate from the pattern LCD on the L circuit board.



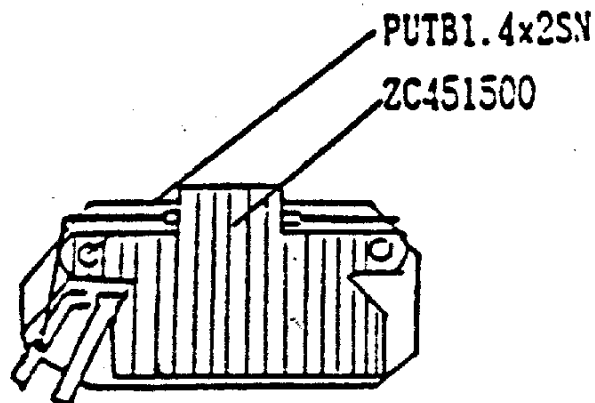
- 4) Mount LCD DD010000 on the rubber connector.
 - o The liquid crystal cell surface (coated surface) should be set upside with the glass surface kept underside.



- 5) Mount L Stopper L CE547500 and L Stopper CE547600 on both the sides of LCD DD010000. Fix the stoppers with two Screws PUTB1.4x3SN.
 - o The stoppers must be fixed so as not to incline the indicator lamp.



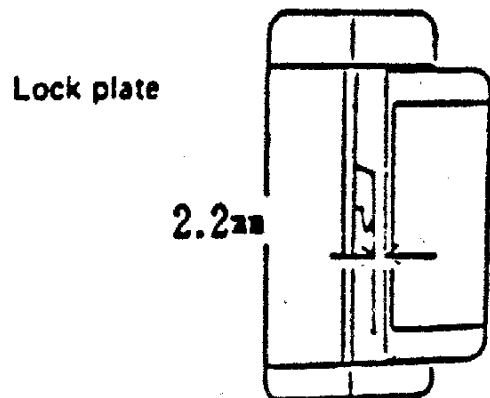
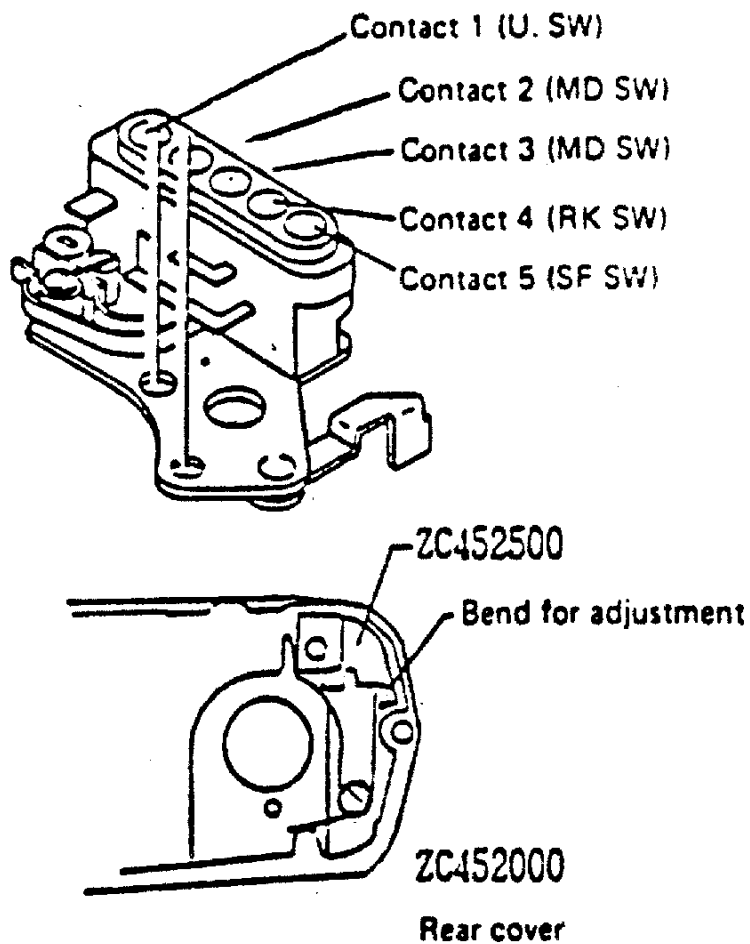
- 6) Place K Prism ZC451500 on the LCD and fix it by tightening Screw PUTB1.4x2SN.
 - o The LED lead wire must be set above.
- 7) After reassembling the indicator lamp in ignited condition, make sure that all the LCDs can be lit, and position them correctly. Finally fix them by tightening the two setscrews (PUTB1.4x3SN) on the L stoppers L and R.



VIII. TIMING ADJUSTMENT OF SW BASE PLATE

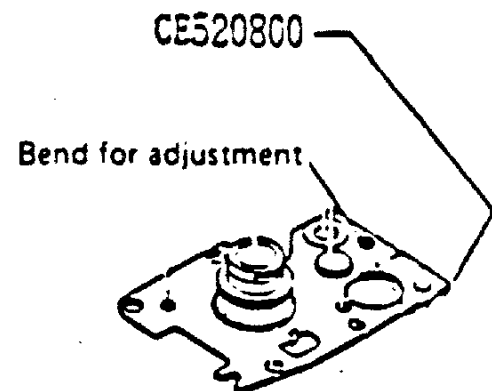
1. Adjustment of U Switch (Contact 1)

- 1) The gap between the tips of Lock plate ZC452000 and SW Plate ZC452500.
- 2) Gap between rear cover and lock plate
The U switch must not be turned OFF when the gap is 2.2 mm or wider.
- 3) When the rear cover is opened, contact 1 must be shorted to the body.
- 4) When the rear cover is closed, contact 1 must be disconnected from the body.
- 5) For the timing, bend the tip of SW Plate ZC452500.



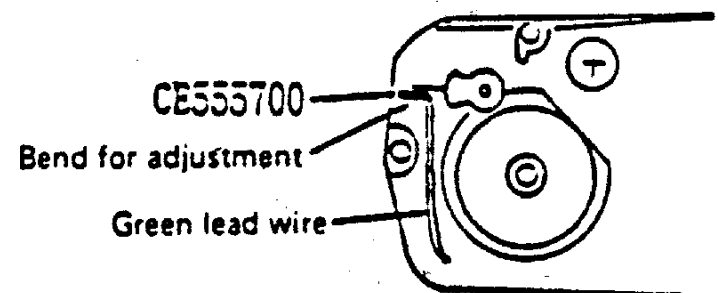
2. Adjustment of RK Switch (Contact 4)

- 1) When RK Button CE561200 is set, contact 4 is shorted to the body.
- 2) When the RK button is released, contact 4 must be disconnected from the body.
- 3) For adjustment, bend Lock spring CE520800.
- 4) Make sure that the switch can be normally turned ON and OFF by loading and unloading a tentative film twice.



3. Adjustmnt of SF Switch (Contact 5)

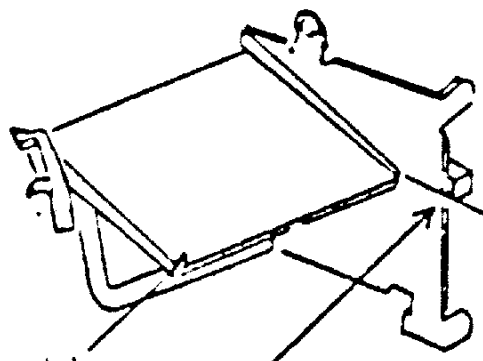
- 1) When the film is loaded contact 5 must be shorted to the body.
- 2) When the film is unloaded, contact 5 must be disconnected from the body.
- 3) For adjusting the SF switch, bend SF Plate CE555700.



4. Adjustment of MD Switch

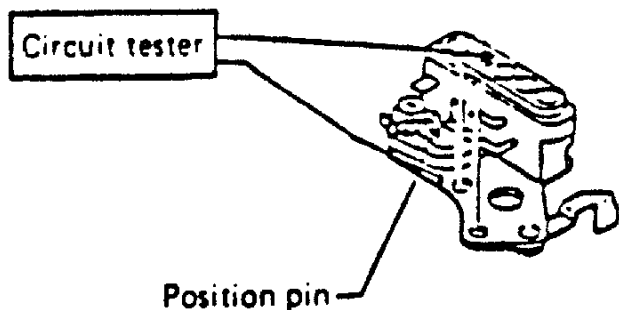
1) Adjustment of brake timing (contact 2)

- a. Wind the film.
- b. While holding the lower end of the mirror with a finger, release the shutter.
- c. Gradually raise the mirror.
- d. When the top surface of the mirror reaches the lower end of the diaphragm lever, contact 2 must be shorted to the body.
- e. For adjusting the brake timing, move the positioning pin (without tube).



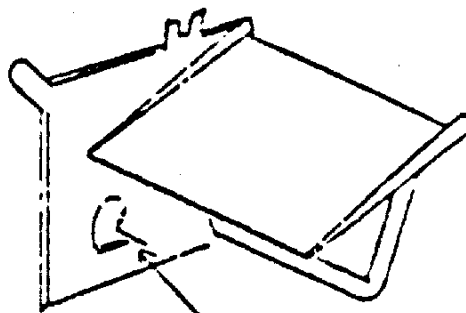
Gradually raise while holding with a finger.

Contact 2 is shorted to body at this position.

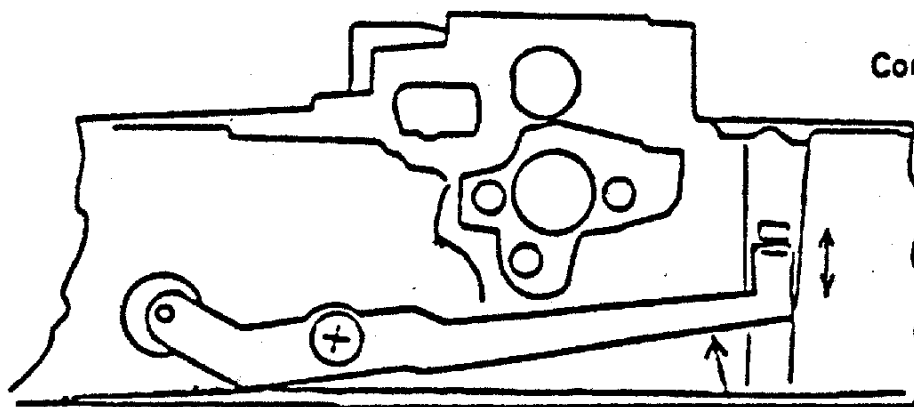
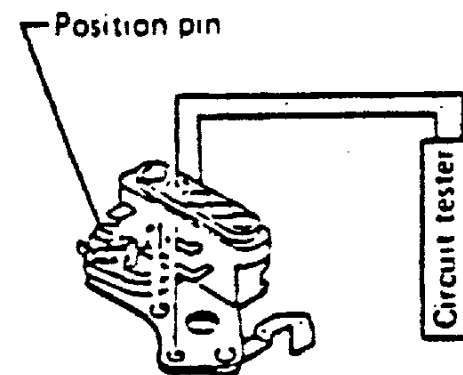


2) Adjustment of winding timing (contact 3)

- a. Wind the film.
- b. mzmzmz
- c. Release the shutter.
- d. Lower the KM lever gradually while holding it with a finger.
- e. When the mirror is lowered until it is brought into contact with P Plate CE-542000 (for 45° positioning), contact 2 must be continuous to contact 3.
- f. For adjusting the winding timing, move the positioning pin (with tube).
- g. Contacts 1 and 2 must not be shorted simultaneously.



Contact 2 is continuous to contact 3 at this position.

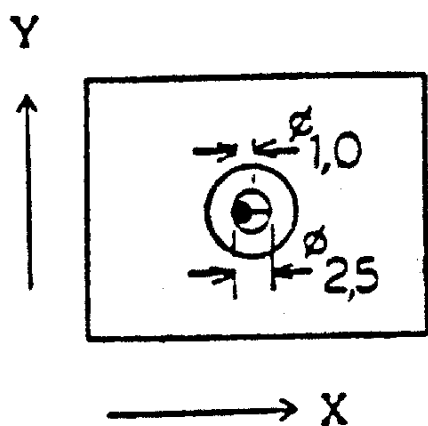
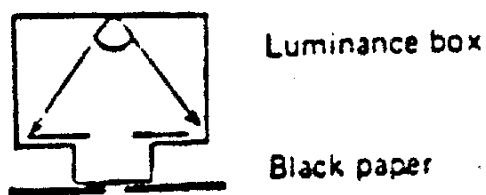


Contact 1 Contact 2

指で押さえながら下げて来る

IX. CHECK AND ADJUSTMENT OF SPOT CHARACTERISTIC (POSITION OF SUB MIRROR)

1. Checking Procedures of Spot Characteristic
 - Attach lens MS5018 to the camera and set it on the tripod.
 - Place a piece of black paper (30 cm x 30 cm having a hole about $\phi 10$) in the luminance box light source.
Use BV12 ~ 15 as the light source (surroundings should be kept dark).
 - Bring the camera into focus on the light source. Move the camera to and from the luminance box until the image of the light source has a size of $\phi 1$ on the screen.
($\phi 1$: Approximate diameter of split part)
 - Set the camera in the Spot mode and locate the light source image $\phi 1$ within the split part. While observing the indication within the viewfinder and inclining the camera in the X and Y directions, check whether or not the photosensor element exhibits the maximum sensitivity.

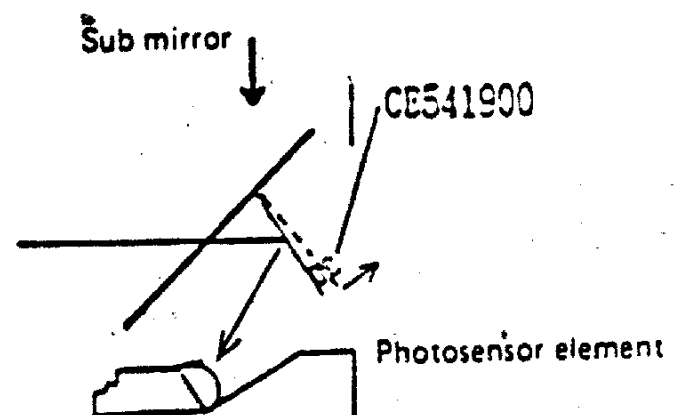
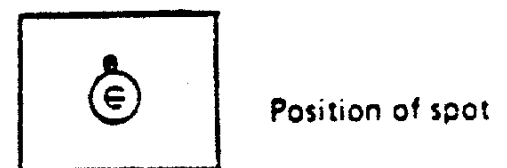
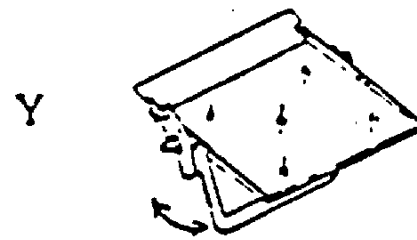


2. Adjustment of Spot Position
When position of the spot is deviated, correct it by varying the stop position of the sub mirror.

- Positioning in Y direction
With the shutter kept open, vary stop position of the sub mirror by bending P Lever. CE-541900.
When the stop position is remarkably deviated, separate the front casting unit and varying the position of the P lever.

Example: When position of the spot is deviated upward on the screen, shift stop position of the sub mirror toward the mask (to prolong the optical path length).

- Positioning in X direction
The sub mirror is calked to Main mirror ZC-450600 and cannot be adjusted independently. Therefore, it should be readjusted taking optical path length of the viewfinder into consideration.



3. Wiring of Old and New M and L Circuit Boards
M Circuit board ZC451700 and L Circuit board ZC451400 have patterns different from those on the M and L circuit boards currently used. When a circuit board is replaced with the new one, it is therefore necessary to add and remove wires and external attachment parts.

1) Adoption of new circuit board

Camera manufactured in November, 1983 adopted the new M circuit board in combination with the old L circuit board.

Subsequently, the new L circuit board was adopted in combination with the new M circuit board.

- 2) Combinations of the circuit boards
- a. Old M circuit board and old L circuit board
 - b. Old M circuit board and new L circuit board
 - c. New M circuit board and old L circuit board
 - d. New M circuit board and new L circuit board

These combinations are interchangeable when parts are added and removed.

3) Modifications

M circuit board:

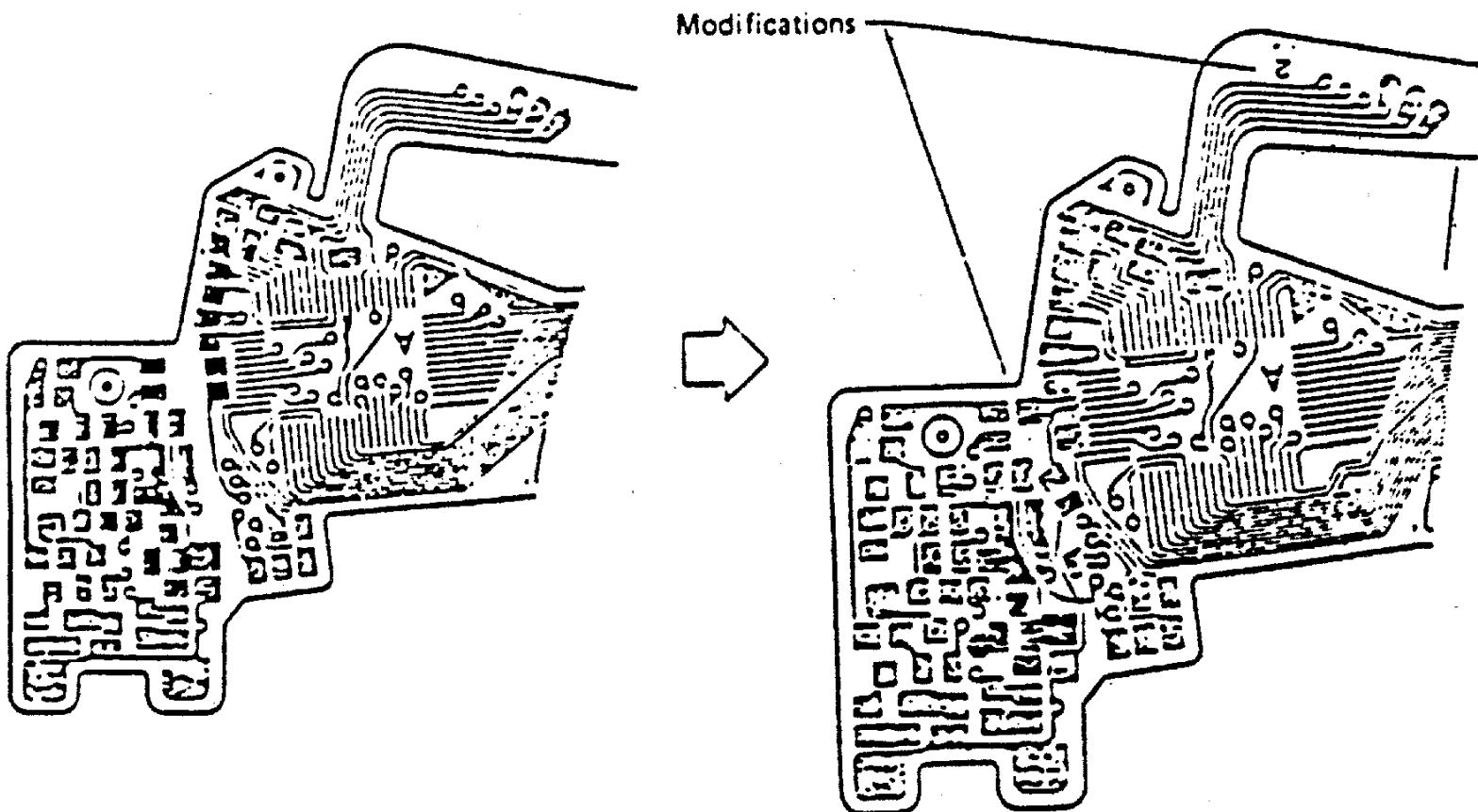
R129, R130 and R132 used as external parts of the old circuit board were modified into patterns on the new circuit board.

L circuit board:

R306 and R307 used as external parts of the old circuit board were modified into patterns on the new circuit board.

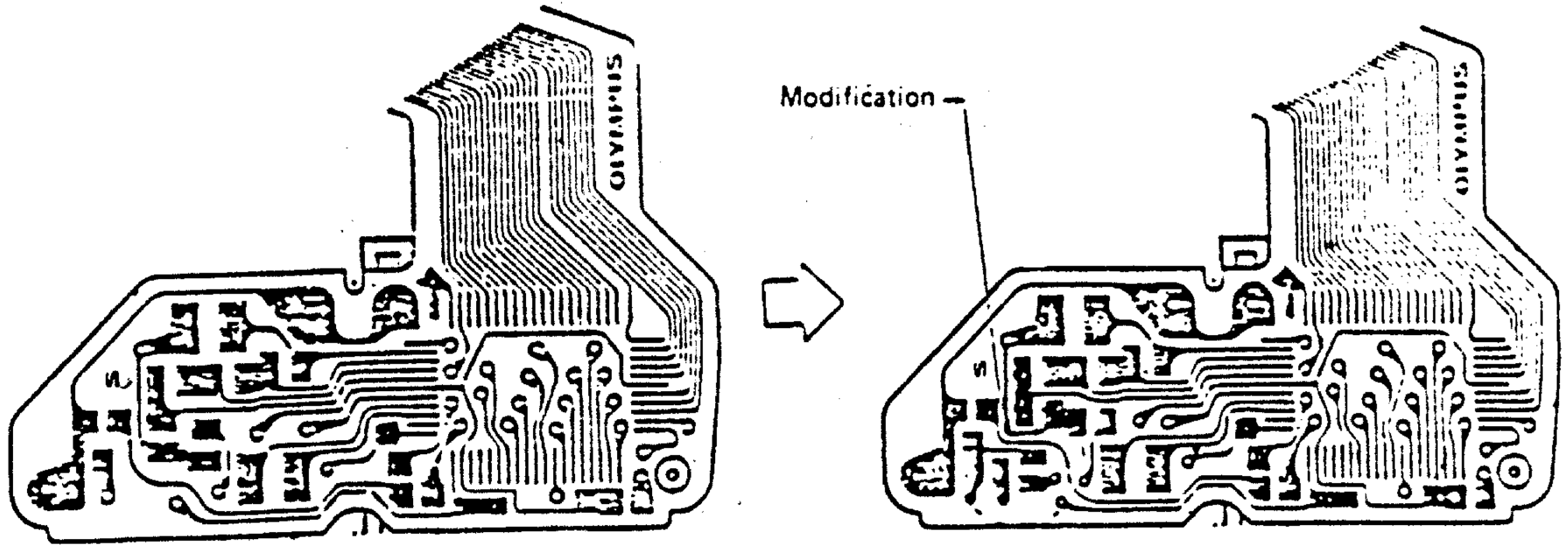
M circuit board (old)

M circuit board (new)



L circuit board (old)

L circuit board (new)

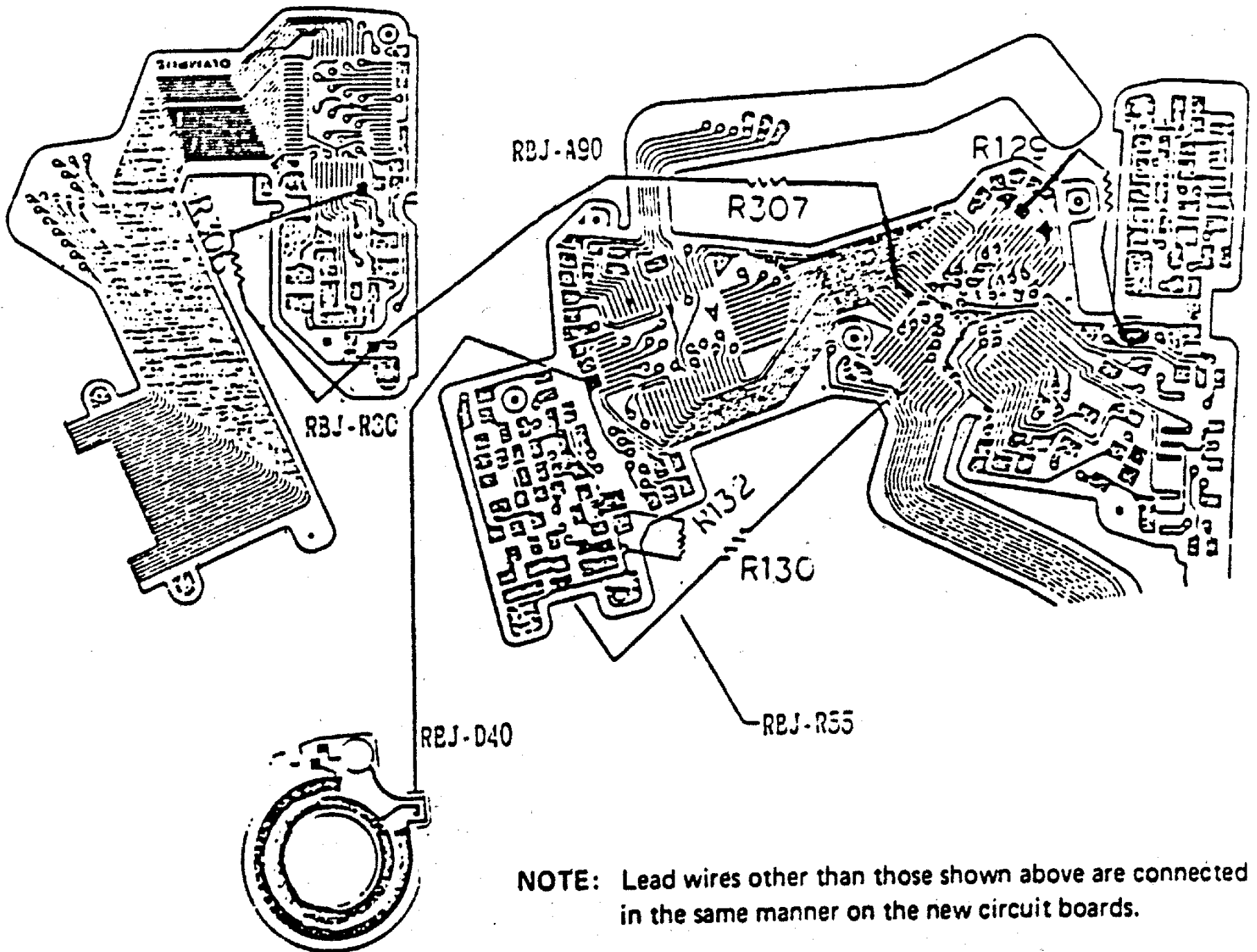


4) Wiring and connection of resistors

1. Combination of old M circuit board and old L circuit board

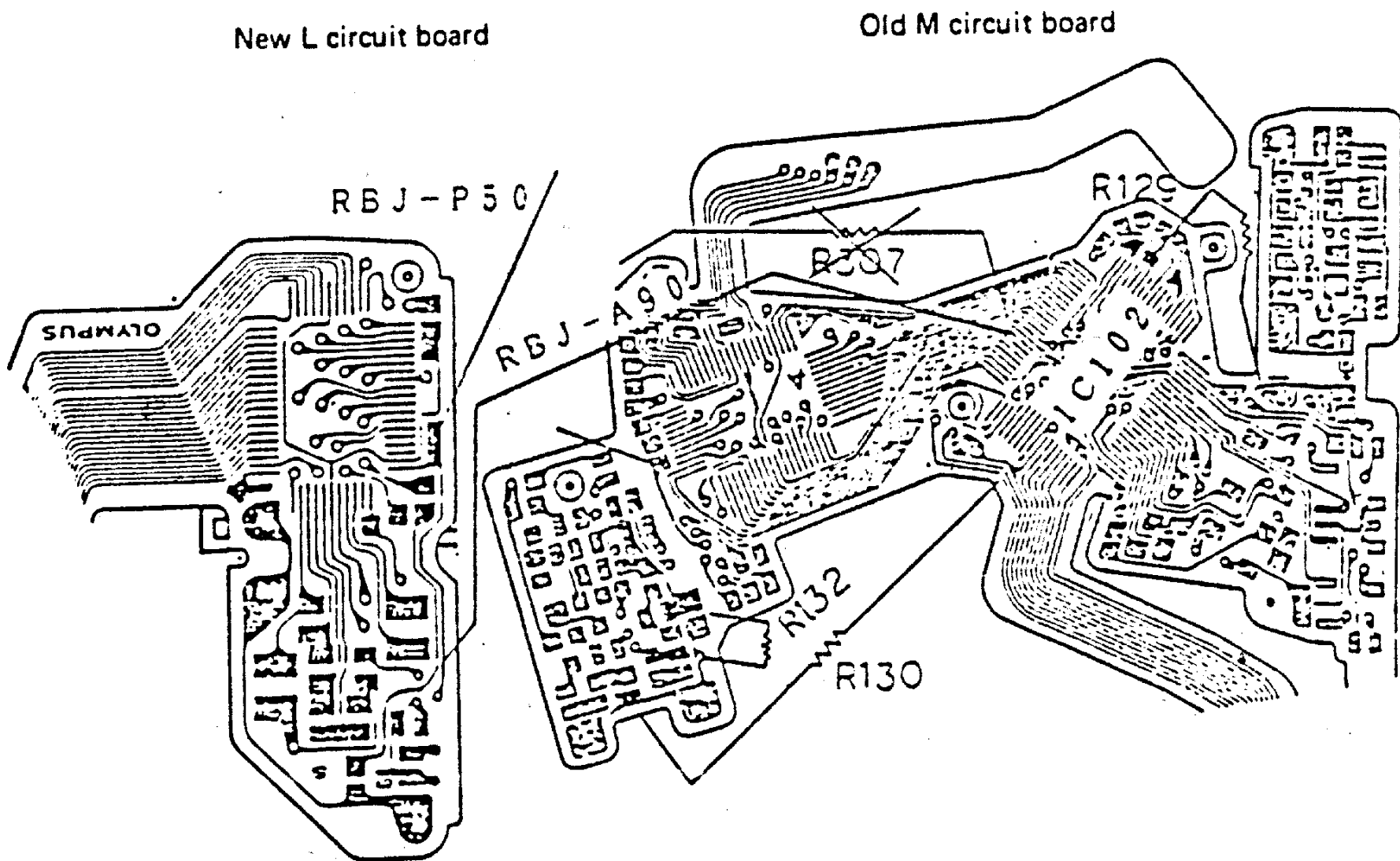
Old L circuit board

Old M circuit board



NOTE: Lead wires other than those shown above are connected in the same manner on the new circuit boards.

2. Combination of old M circuit board and new L circuit board
 - o Disconnect RBJ-P50 and R307.
 - o Solder RBJ-A90 or G90 to terminal No. 26 of IC102 (bipolar) and solder the other end to R307 rand on the L circuit board.

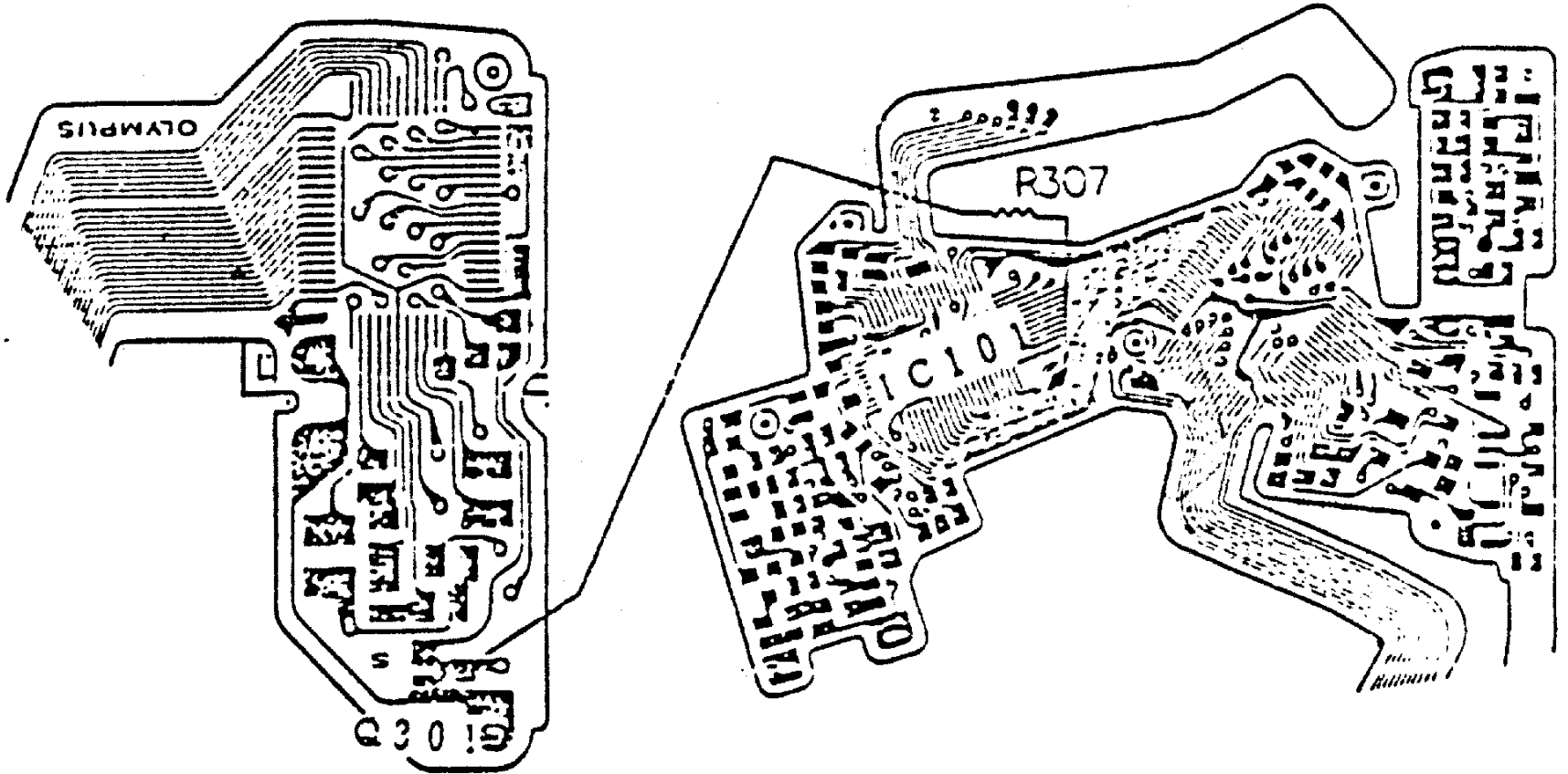


3. Combination of new M circuit board and new L circuit board
 - o Refer to the wiring diagram contained in manual No. A-4.

4. Combination of new M circuit board and old L circuit board
 - c Solder R307 (330 k Ω) chip resistor to terminal No. 52 of IC101 (CPU). Solder one end of RBJ-G75 to R307 and the other end to collector of Q301.

Old L circuit board

New M circuit board



NOTE: Connections of the lead wires other than those shown above remain unchanged.

E. REPAIRING PROCEDURES

CONTENTS

I.	SYMBOLS FOR ELECTRIC CIRCUIT AND REMARKS	E- 1
II.	CHECK POINTS OF CIRCUIT BOARD	E- 3
	1. M Circuit Board	E- 3
	2. RS Circuit Board	E- 5
	3. L Circuit Board	E- 5
	4. CE Circuit Board	E- 5
	5. TV Circuit Board	E- 6
	6. (M Circuit Board) Head Amplifier unit	E- 6
	7. Layout of Electric Parts	E- 7
III.	INPUT AND OUTPUT VOLTAGES OF ELECTRIC CIRCUIT	E-10
	1 Power Supply Circuits	E-10
	1-1 Mode Switching Circuit	E-10
	1-2 Bipolar Power Supply	E-13
	1-3 LCD D Power Supply	E-15
	2. Oscillator Circuit	E-17
	3. LCD D Circuit	E-18
	4. LCD	E-23
	5. Reference Voltage and Current Circuits	E-24
	6. CV & SV Circuit: EE Adjusting Circuit	E-25
	7. TV & AV Circuit	E-27
	8. BV Level Converter Circuit	E-29
	9. Head Amplifier	E-30
	10. DAC Circuit	E-33
	11. Reset Circuit and Flash Misjudgement Preventive Circuit	E-36
	12. MG1 Drive Circuit	E-39
	13. Trigger Drive Circuit	E-40
	14. Head Amplifier (Exposure)	E-41
	15. MG2 Drive Circuit: High-Speed Limiter	E-42
	16. Regeneration Time Circuit	E-43
	17. Trigger Data Latch Circuit	E-44
	18. MG1 Charging Circuit	E-45
	19. Flash Control Circuit	E-46
	20. Light Control Circuit	E-47

21. Flashing Circuit	E- 48
22. Over/Under Exposure Circuit	E- 50
23. B.C. Circuit	E- 51
24. Self-Timer Circuit	E- 53
IV. TROUBLESHOOTING OF ELECTRIC SYSTEM	E- 55
1. Diagnosis Flow Chart	E- 55
2. Troubleshooting Flow Charts	E- 56
2-1 Electric System Inoperative	E- 56
2-2 LCD Indication Abnormal	E- 58
2-3 Shutter Locked	E- 72
2-4 Shutter Left Open	E- 78
2-5 Shutter Speed Too High	E- 80
2-6 Flash Circuit Defective	E- 82
2-7 Auto EE Adjustment Abnormal	E- 85
2-8 Regeneration Time Abnormal	E- 86
2-9 Malfunction of B.C. System	E- 87
2-10 Self-Timer Inoperative	E- 87
2-11 LED Abnormal	E- 88
2-12 PCV Defective	E- 91
2-13 Reset Function Abnormal	E- 92
2-14 Reference Voltage Vref Abnormal	E- 93
2-15 DAC Adjusting Circuit Defective	E- 94
2-16 ± Correction Adjustment Abnormal	E- 94
3. Troubleshooting: Check Procedures	E- 95
3-1 Electric System Dead	E- 95
3-2 LCD Indication Abnormal	E-104
(1) No Item Displayed	E-104
(2) All Items Indicated	E-120
(3) Indication Unreliable	E-121
(4) Some Items Not Indicated	E-126
(5) Bar Indication Not Provided	E-135
(6) Bar Indication Always OVER ^{OVER}	E-139
(7) Bar Indication Unchanged with Data Input	E-142
(8) Bar Indication Flickers	E-148
(9) Head Amplifier or Related Part Defective	E-151

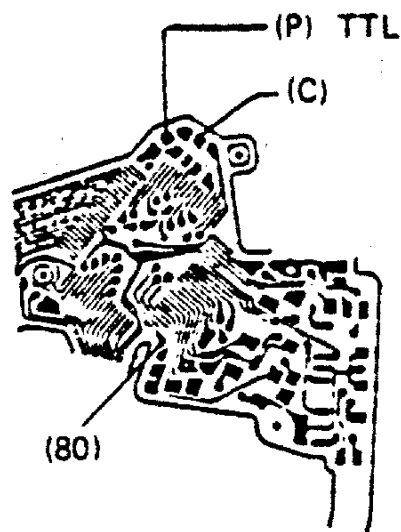
3-3	Shutter Locked	E-162
	(1) Diagnosis with Synchroscope	E-162
	(2) Shutter Locked in AUTO and MANUAL Modes	E-167
	(3) Shutter Locked in AUTO Mode	E-174
	(4) Shutter Locked in MANUAL Mode	E-174
3-4	Shutter Left Open	E-175
	(1) Shutter Left Open in AUTO and MANUAL Modes	E-175
	(2) Shutter Left Open in AUTO Mode	E-178
	(3) Shutter Left Open in MANUAL Mode	E-178
3-5	Shutter Speed Too High	E-179
	(1) Shutter Speed Too High in AUTO and MANUAL Modes	E-179
	(2) Shutter Speed Too High in AUTO Mode	E-183
	(3) Shutter Speed Too High in MANUAL Mode	E-185
3-6	Flash Circuit Defective	E-186
3-7	EE Adjustment Abnormal	E-193
3-8	Regeneration Time Abnormal	E-194
3-9	Malfunction of B.C. System	E-195
3-10	Malfunction of Self-Timer	E-196
3-11	LED Not Light	E-197
3-12	PCV Defective	E-199
3-13	Reset Circuit Defective	E-200
3-14	Reference Voltage Vref Abnormal	E-201
3-15	DAC Adjusting Circuit Defective	E-202
3-16	Misadjustment of +— Compensation	E-203

I. SYMBOLS FOR ELECTRIC CIRCUIT AND REMARKS

1. Symbols for Lead Wires and Leg No. of IC

- (1) (P) and (C) shown on the right side represent colors of lead wires.
- (2) GND represents ground.
- (3) (80) represents leg No. of IC.

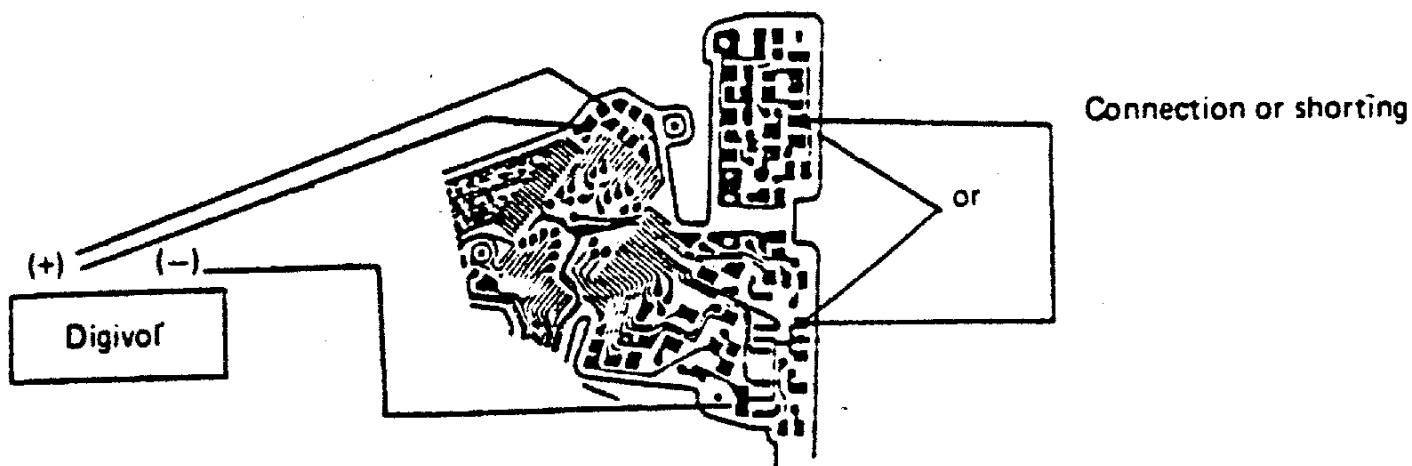
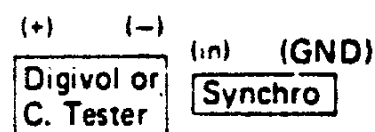
Symbol	Color of lead wire	Symbol	Color of lead wire
A	Blue	K	Light green
B	Black	M	Purple
C	Brown	P	Pink
D	Orange	R	Red
G	Green	W	White
H	Gray	Y	Yellow



(P) and (C) represent colors of lead wires

2. Symbols for Measuring Instruments

- (1) A digital voltmeter is expressed as "Digivol".
- (2) A DC range is represented by DC or DC.
- (3) A resistance range is expressed as Ω or Ω .
- (4) A synchroscope is expressed as "Synchro".
- (5) "+", "-", input and GND terminals of a measuring instrument are expressed as respectively.
- (6) Connections and shorting are illustrated as shown below.



- (7) The two wires leading from the (+) side of the measuring instrument are not connected to the same point. With the (-) side fixed, bring the (+) side tester rod into contact with the patterns indicated by the two lines respectively and read measured values on the patterns respectively. For simplicity of illustration, only one measuring instrument is traced.

3. Indications of Voltage and Resistance Values

- (1) Voltage and resistance are indicated in approximate values.
- (2) H and L generally represent 3 V and 0 V. However, this does not apply to transistors. Since 0.6 V is sufficient between base and emitter, L may represent 2.4 V at a location where a transistor is used.
- (3) Signal between CPU and Bipolar IC generally represent H = 0.5V and L = 0V except POWER, HA and HB signals.

- (3) A digital voltmeter or synchroscope should in principle be used for measuring voltages.
 - A circuit tester often reads lower voltages.
 - When a circuit tester reads a voltage remarkably different from a reference voltage, it should be checked with a digital voltmeter or synchroscope.
- (4) Do not flow a high current to an IC for continuity check with a circuit tester.

4. Check Sequence

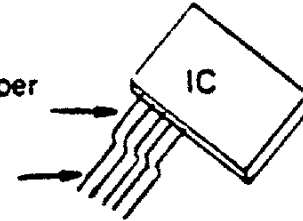
Checks for troubleshooting should in principle be carried out in the sequence given in the manual. However check of IC legs are tedious and may be carried out last.

5. Procedures to Check IC Legs

- (1) Check tips of IC legs by using a thin needle-like rod of a circuit tester.
- (2) Remove Araldite from the IC leg carefully.

Do not touch the legs at the upper stage.

Remove Araldite from the top sides of the legs at the lower stage.



6. Troubleshooting (Electric System)

- (1) Checks for troubleshooting should in principle be carried out in the sequence given in this manual.
- (2) Troubleshooting of the electric system is carried out on a premise that the mechanical system is normal. Be sure to confirm beforehand that the mechanical system is normal.
- (3) Troubleshooting is carried out on a premise that the lead wires are connected correctly. Confirm beforehand that the lead wires are connected correctly.
- (4) When troubles occurs simultaneously at two or more locations, troubleshooting becomes a time-consuming task. Carry out troubleshooting patiently.
- (5) A trouble may be traced to a cause which is not mentioned in this manual. In such a case, add the symptom and cause in this manual for later reference.

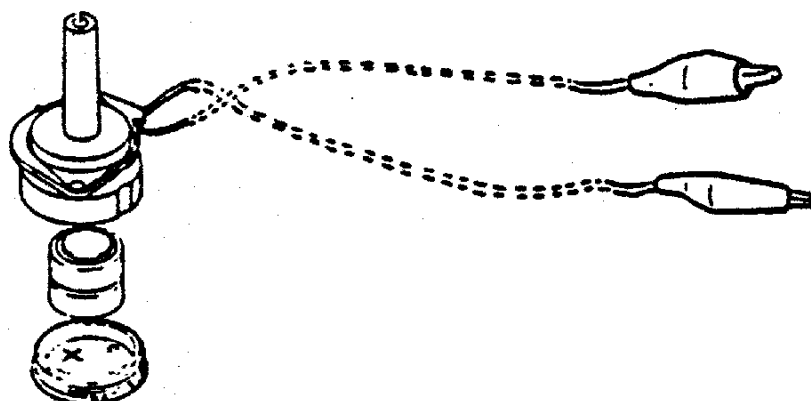
7. Remarks on Troubleshooting

- (1) Troubles frequently traced to defective soldering of IC legs and other parts.
- (2) The servicing personnel should check especially for breakage of patterns as well as connection between front and rear circuit boards.
- (3) Lead wires may be broken or shorted when they are caught between the top plate and front plate.
- (4) In attaching the top plate, take care not to crush the lead wires.

8. Others

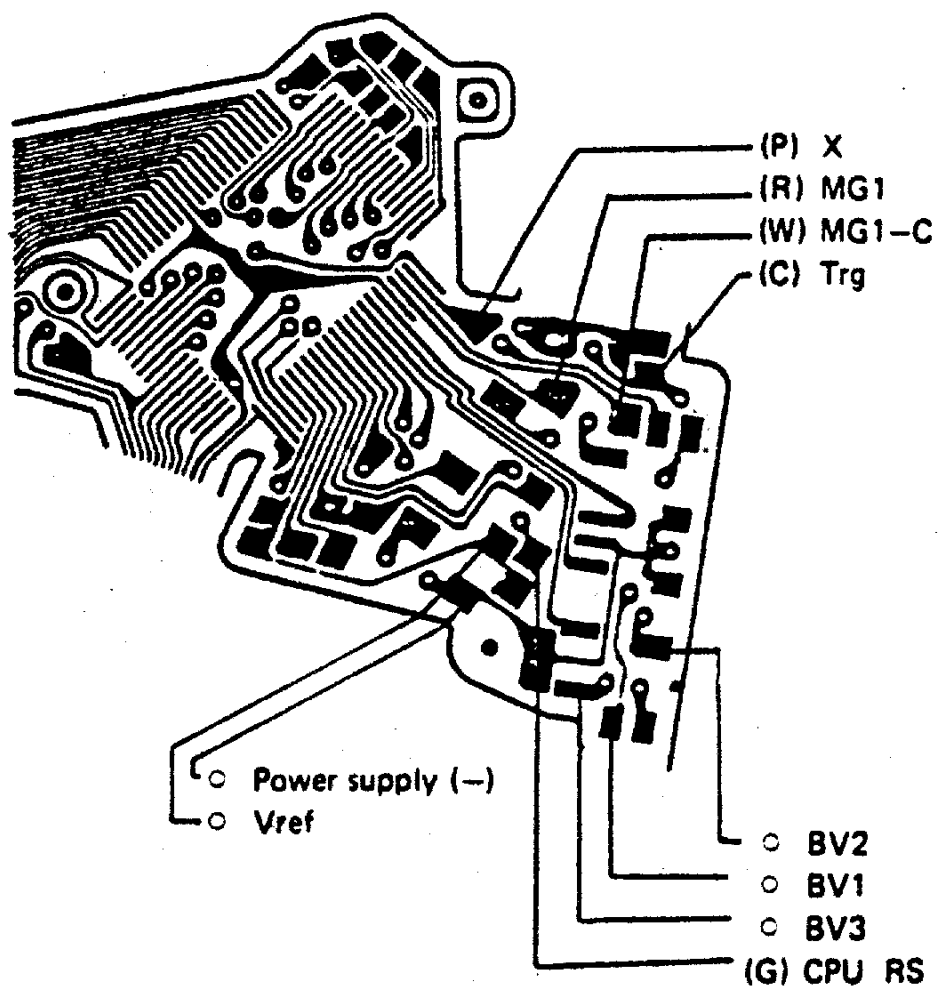
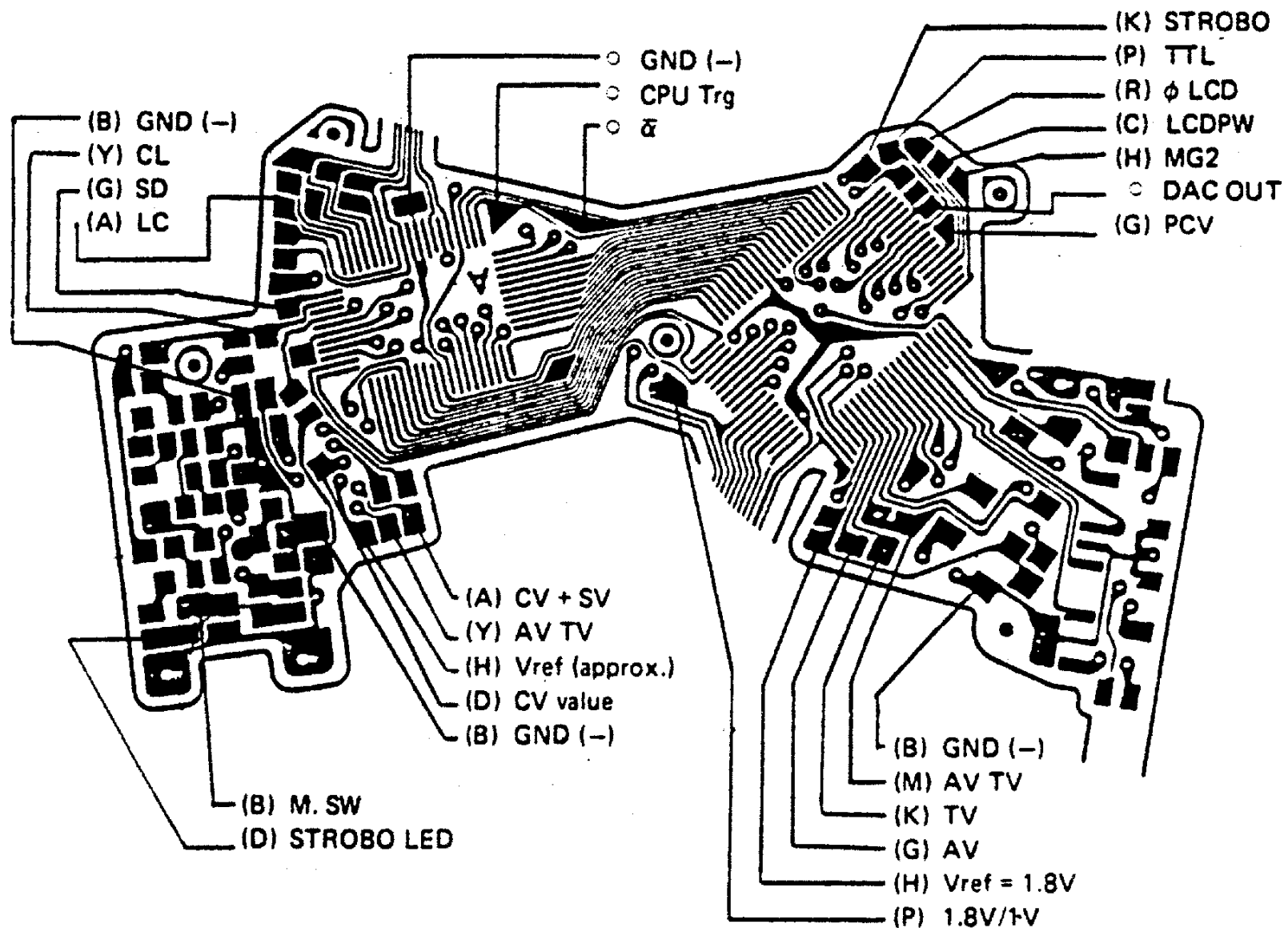
- (1) "IC defective" means defect of IC proper.
- (2) "IC leg defective" and "resistor defective" include defective soldering.
- (3) "Lead wire broken" and "resistor broken" include defective soldering.
- (4) "C902 (-)" and "C101 (+)" represent the (-) side of C902 and (+) side of C101 respectively.

Prepare a jig battery by utilizing Battery case (ZJ144700 or ZJ155200) and Battery case lid (CE215700) of OM-10. Solder red and black lead wires of suitable length to the positive and negative terminals of the battery case, and solder alligator clips to the other ends of the lead wires.

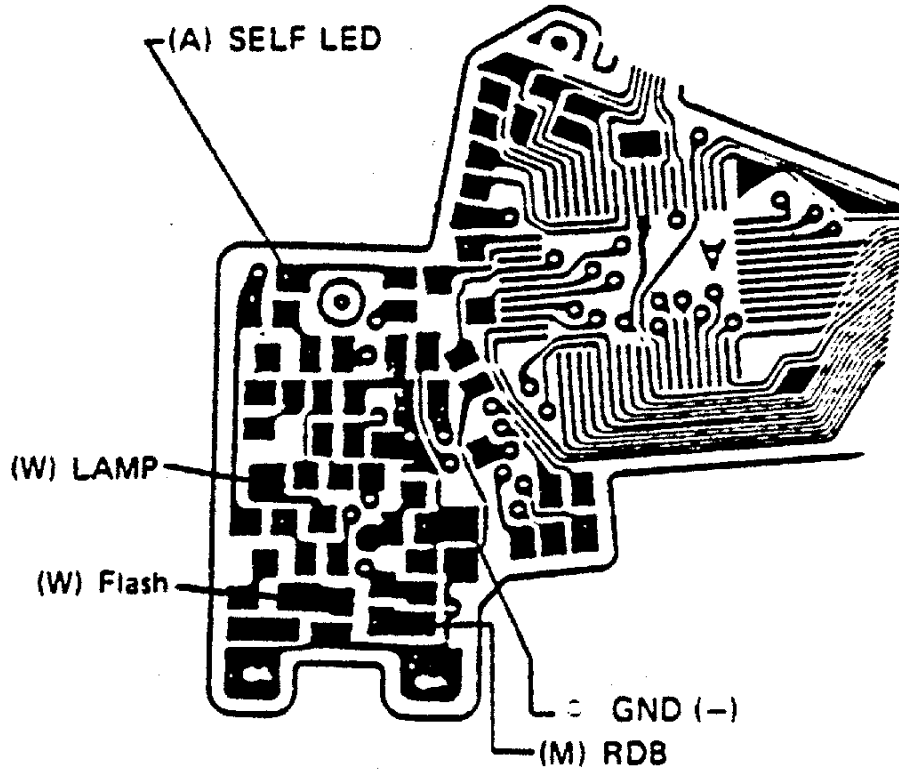
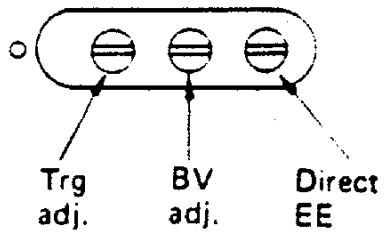


II. CHECK POINTS OF CIRCUIT BOARDS

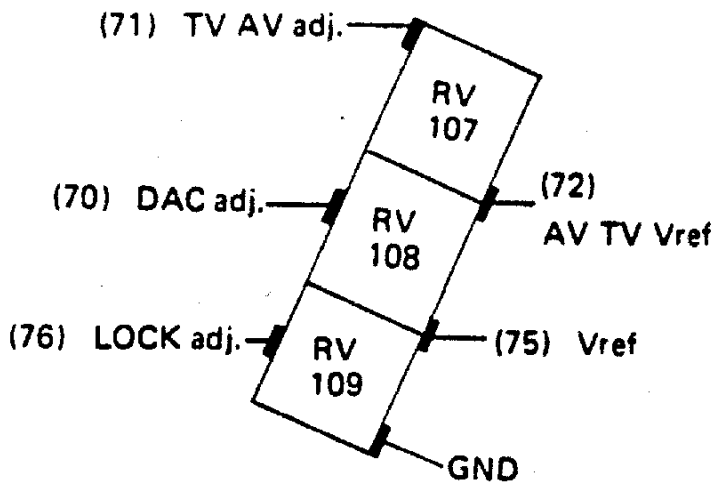
1. M Circuit Board



Front Plate Unit

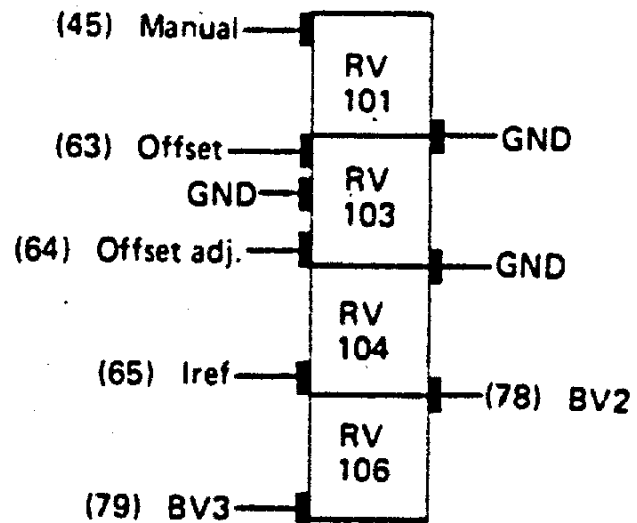


Triple Resistors



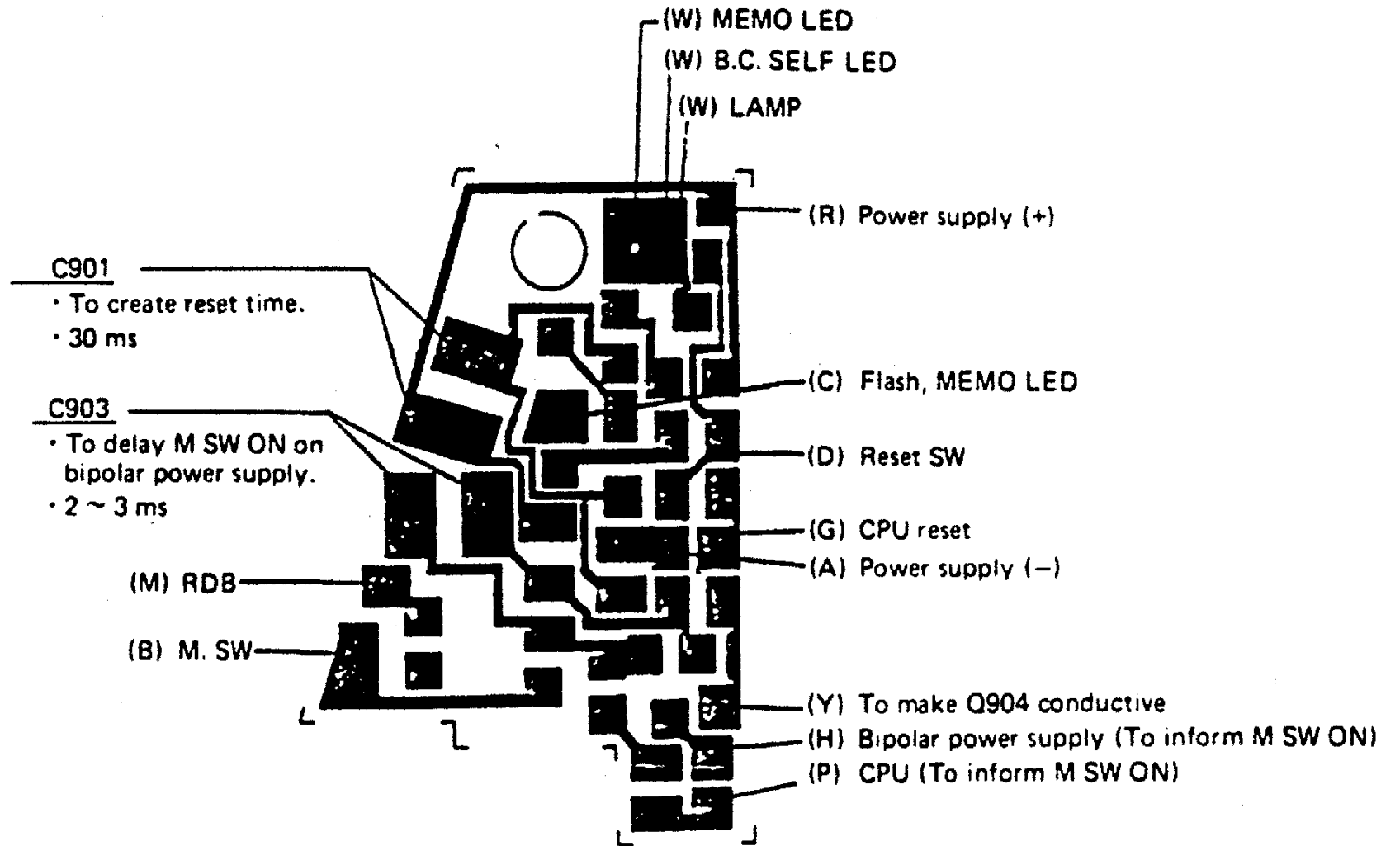
- RV107: TV AV adj.
- RV108: DAC adj.
- RV109: LOCK adj.

Quartette Resistors

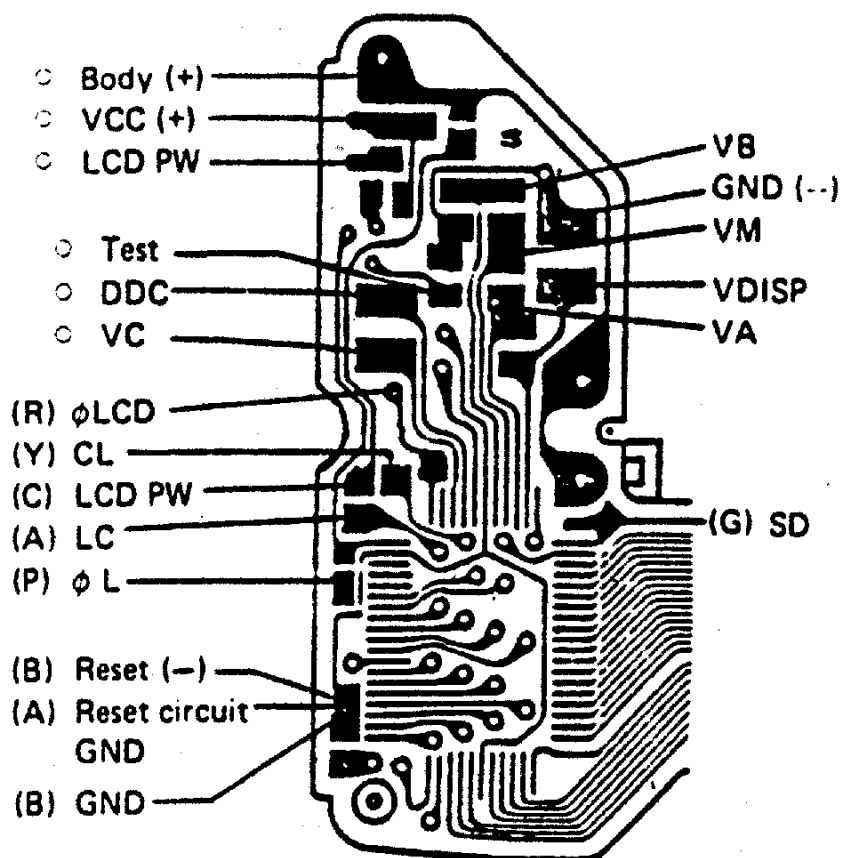


- RV101: Manual adj. (1/8 sec)
- RV103: Main comparator offset adj.
- RV104: Iref adj.
- RV106: BV spot adj.

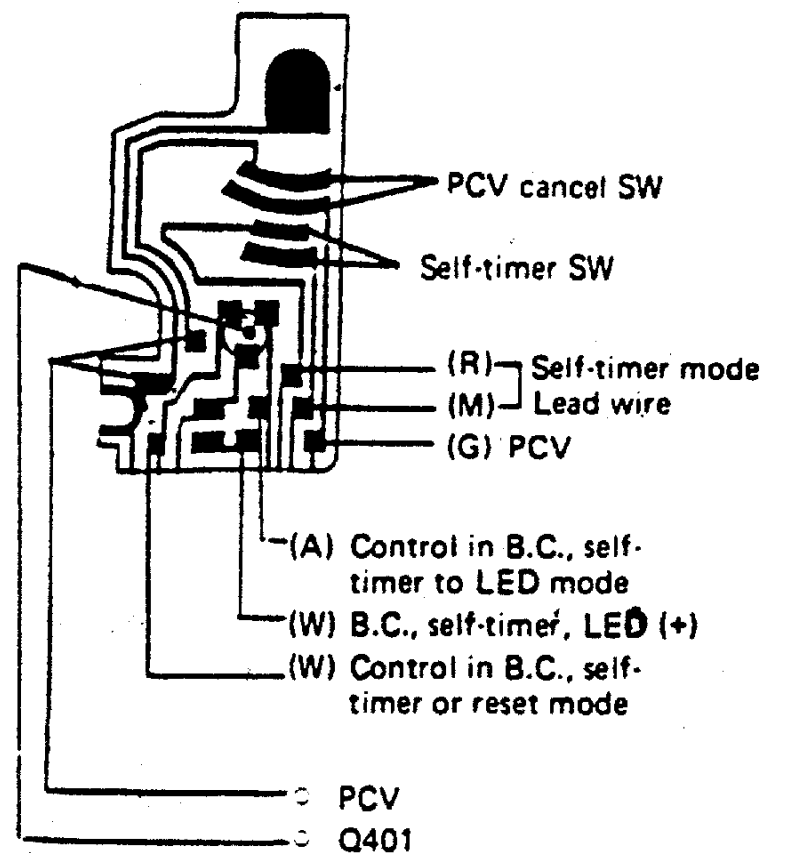
2. RS Circuit Board



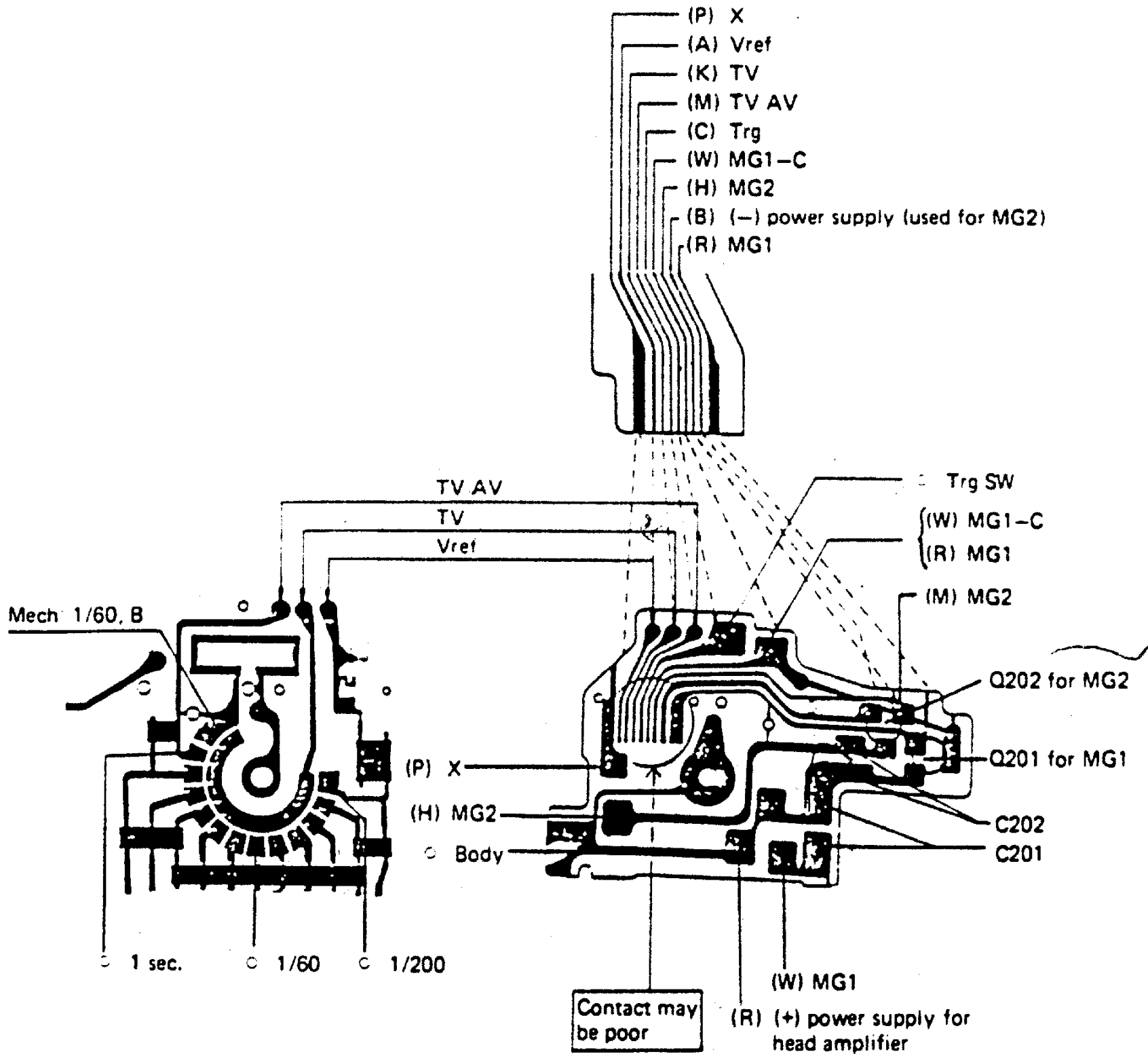
3. L Circuit Board



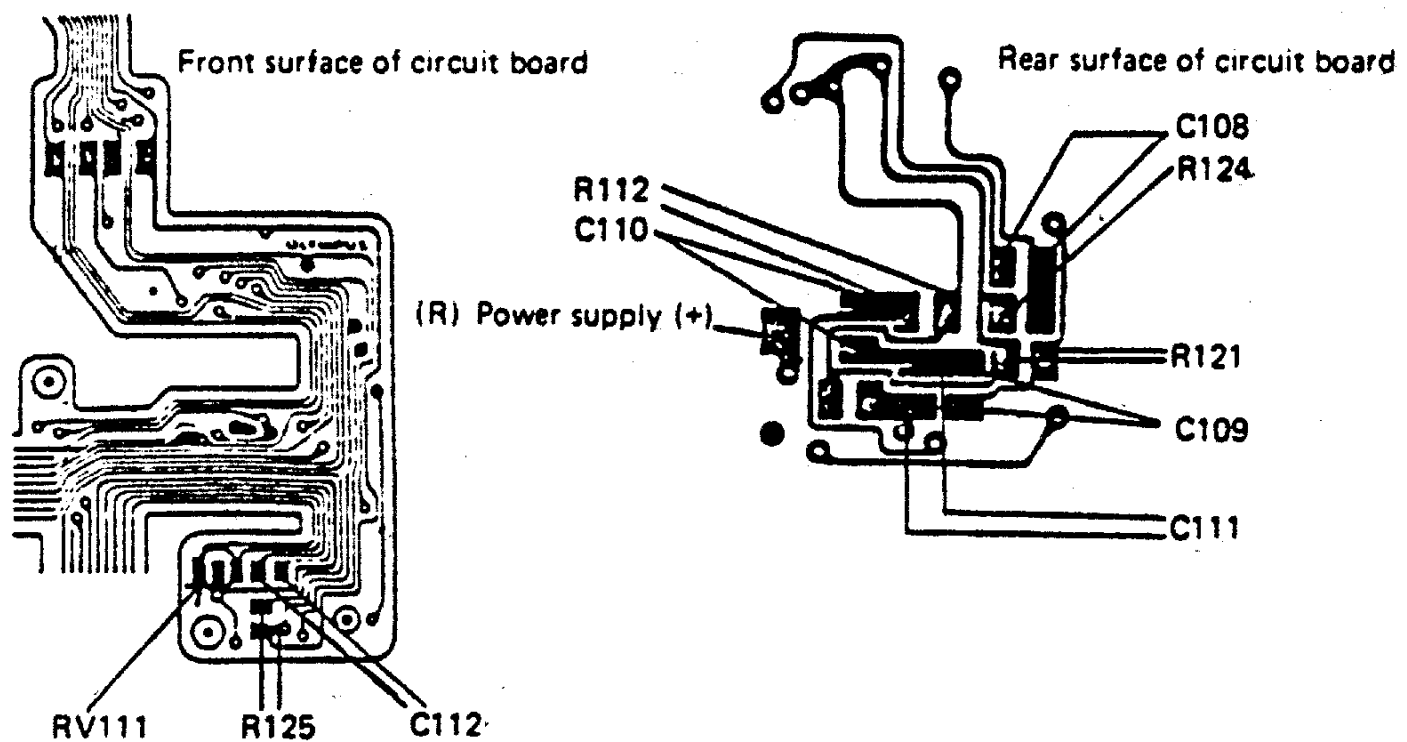
4. CE Circuit Board



5. TV Circuit Board

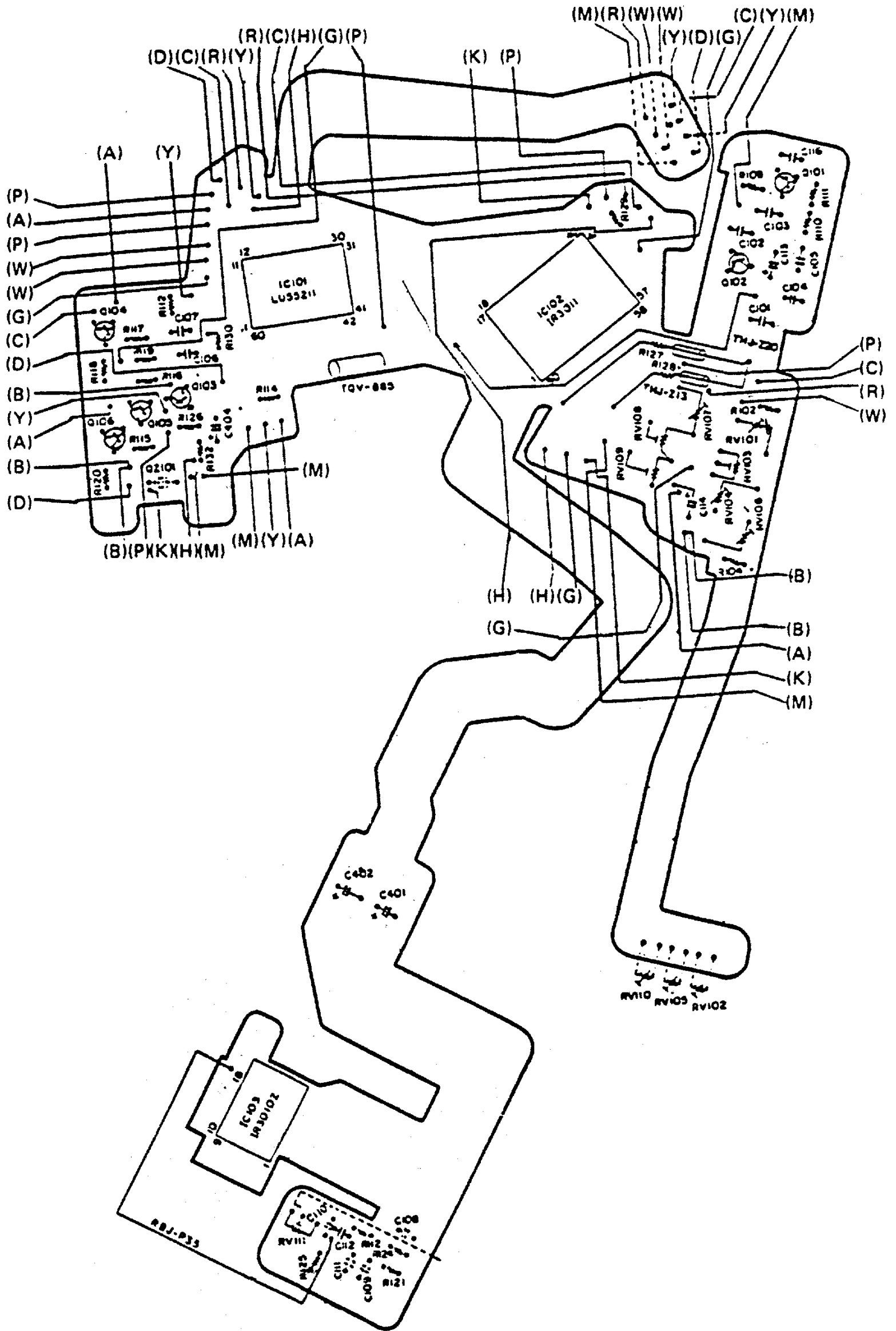


6. (M Circuit Board) Head Amplifier Unit

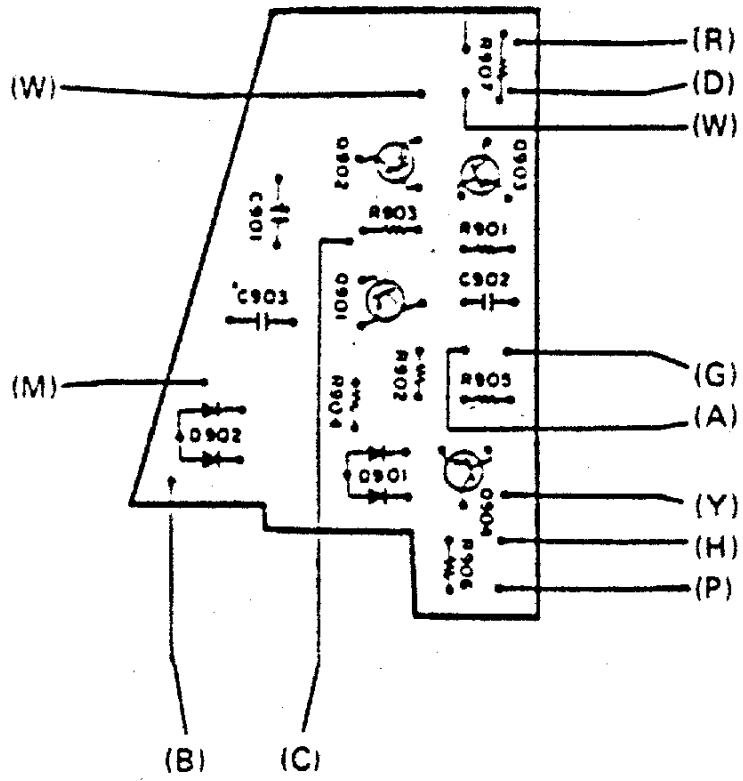


7. Layout of Electric Parts

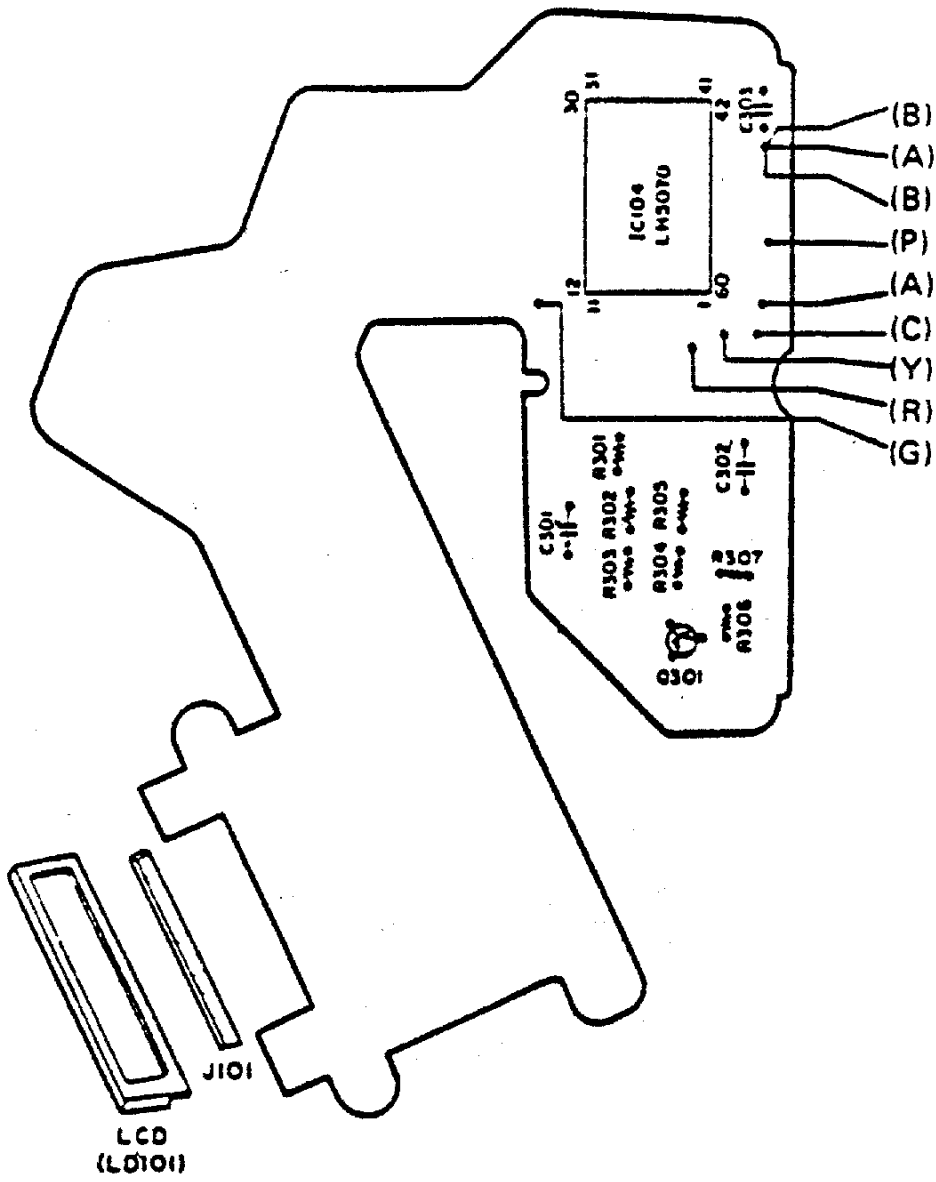
(1) M circuit board



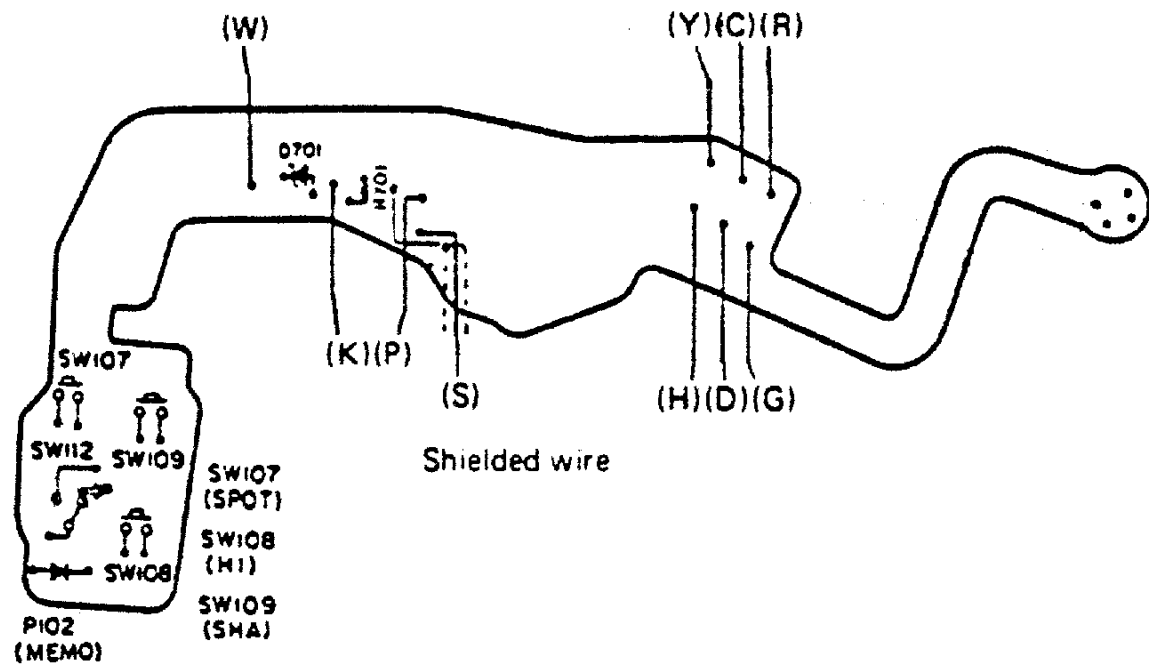
(2) RS circuit board



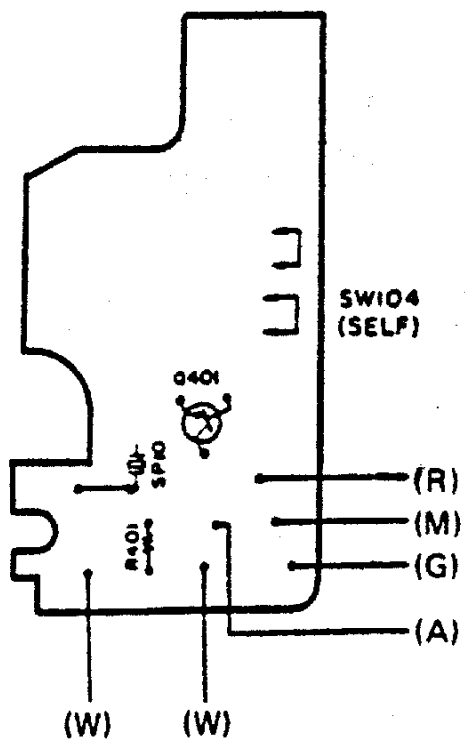
(3) L circuit board



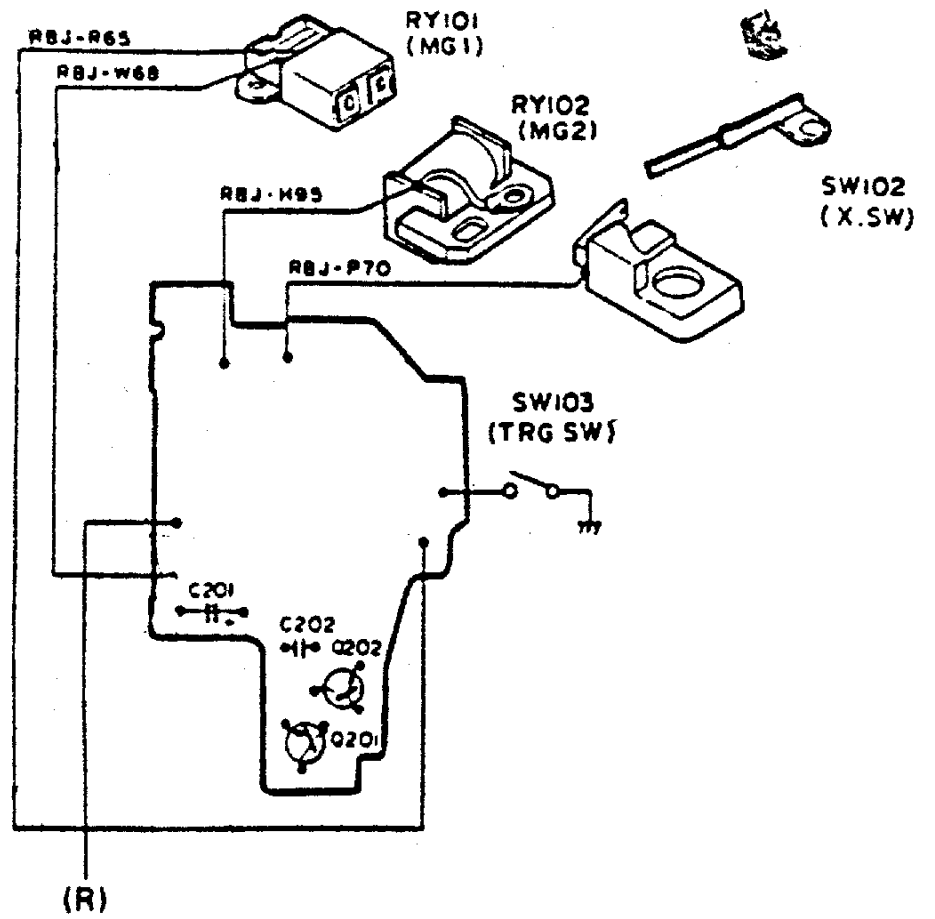
(4) U circuit board



(5) SE circuit board



(6) TV circuit board

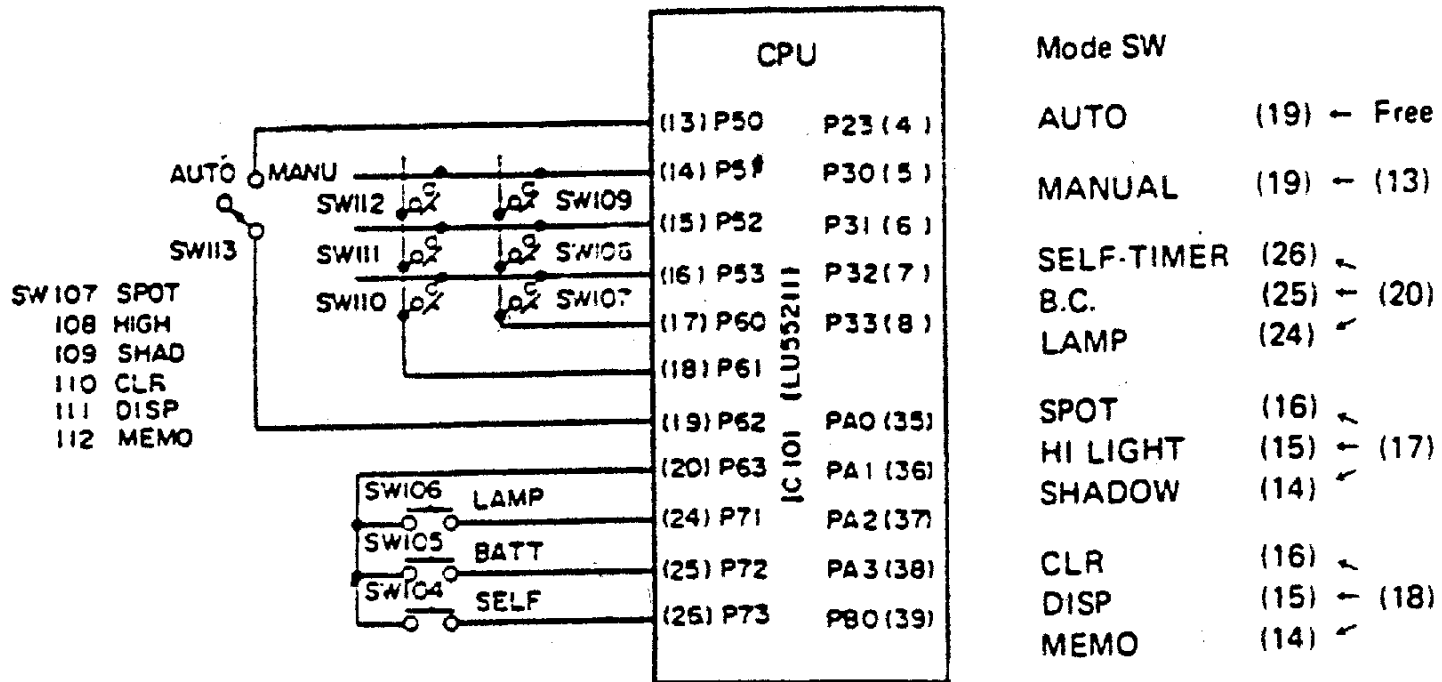


III. INPUT AND OUTPUT VOLTAGES OF ELECTRIC CIRCUITS

1. Power Supply Circuit

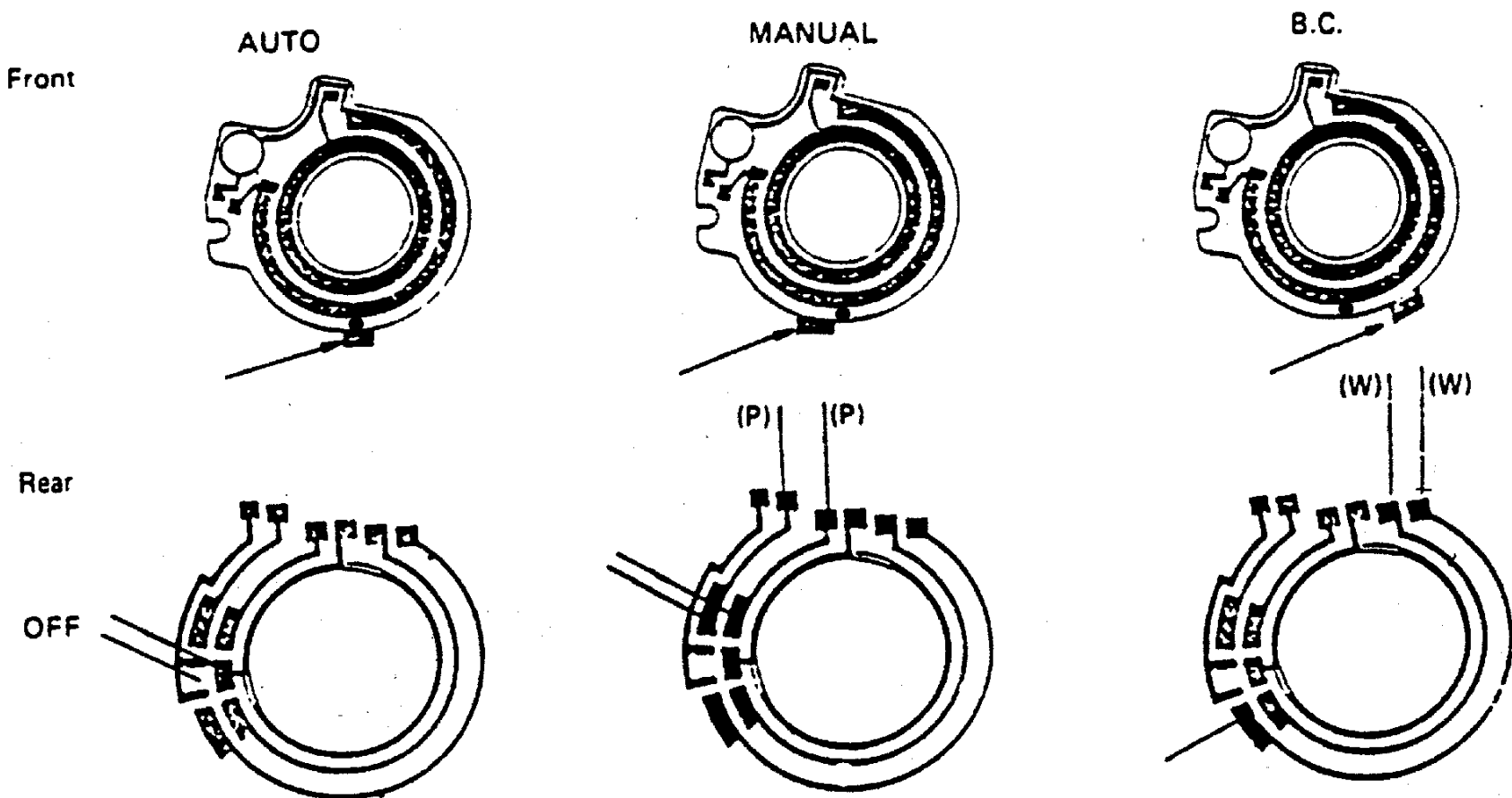
1-1. Mode switch circuit

(1) Circuit diagram



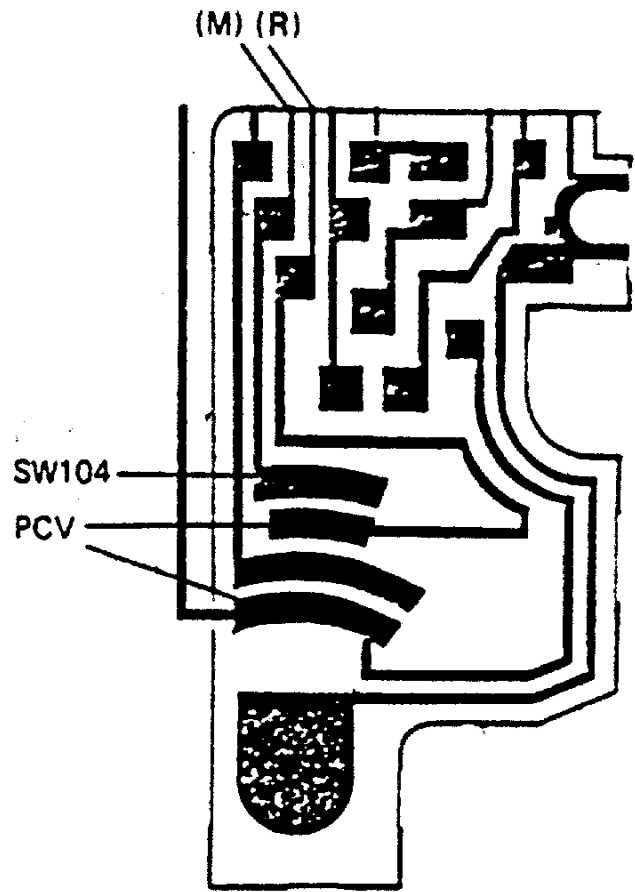
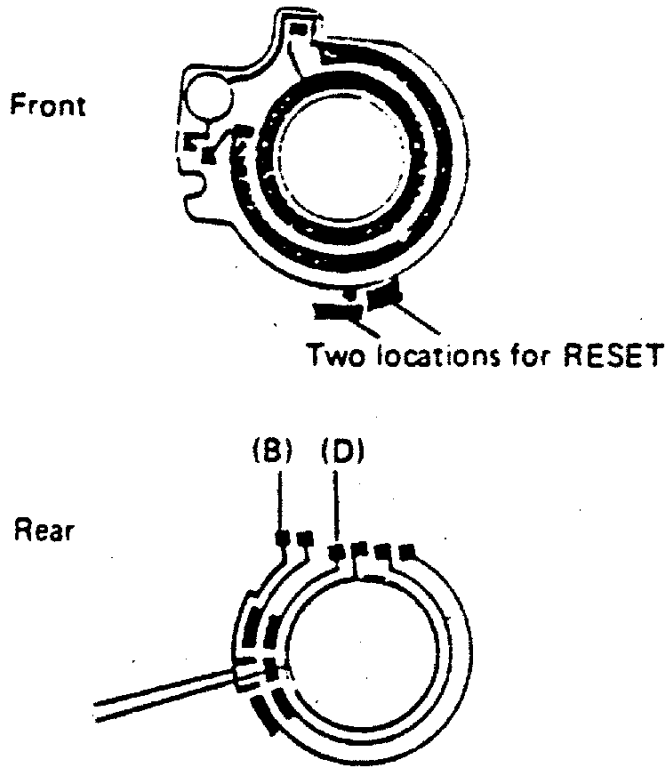
(2) Mode selection

- After detaching the top cover, set ZJ178200 (M selector switch) at the position shown below:



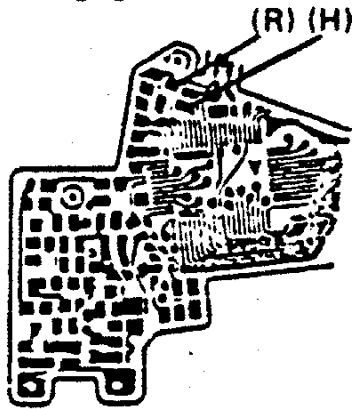
RESET (for reference)

SELF

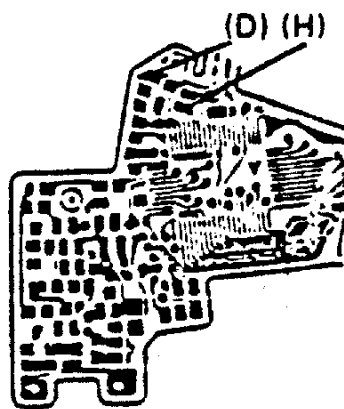


- After detaching the top cover, the camera can be set in each mode by shorting the point indicated below with tweezers.

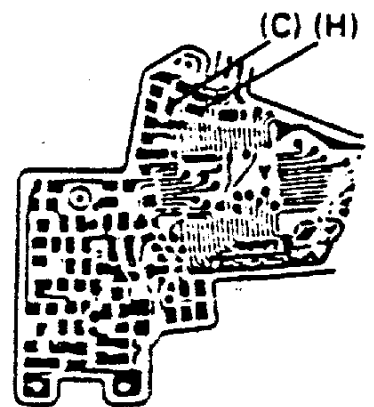
SPOT



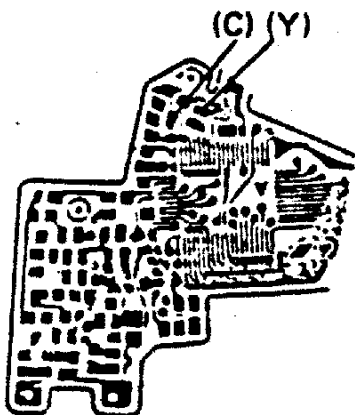
HI LIGHT



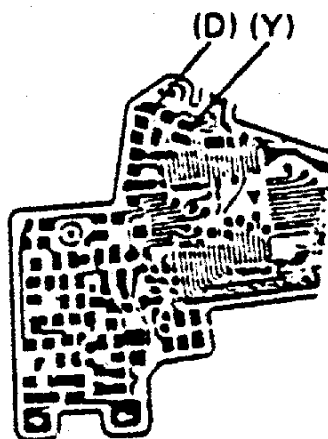
SHADOW



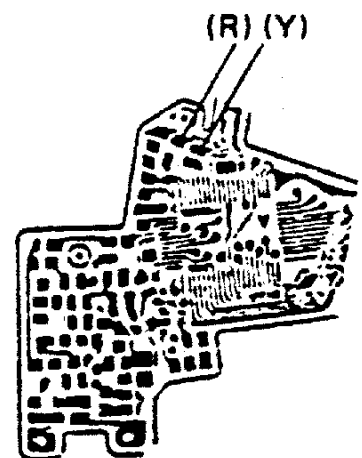
MEMO

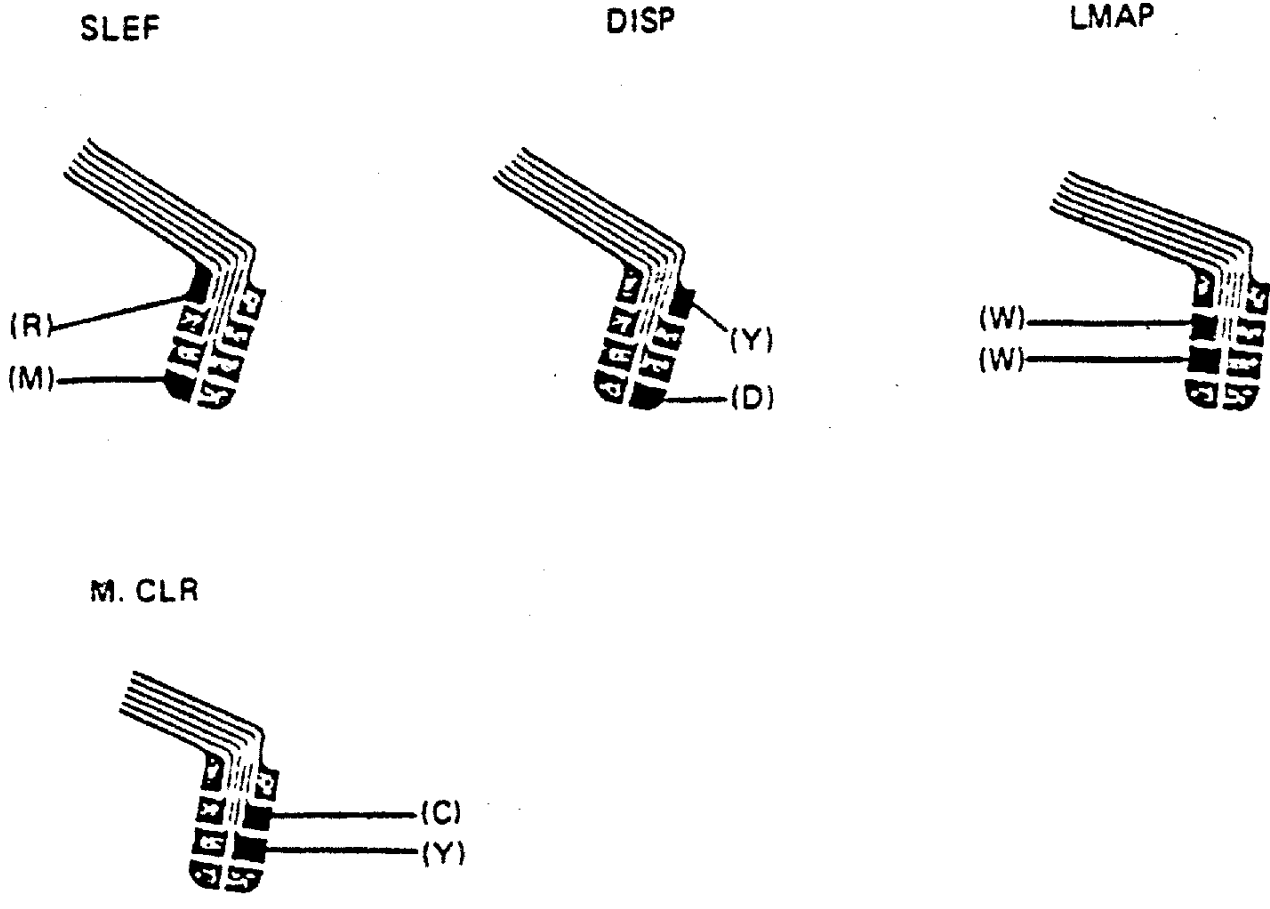


DISP



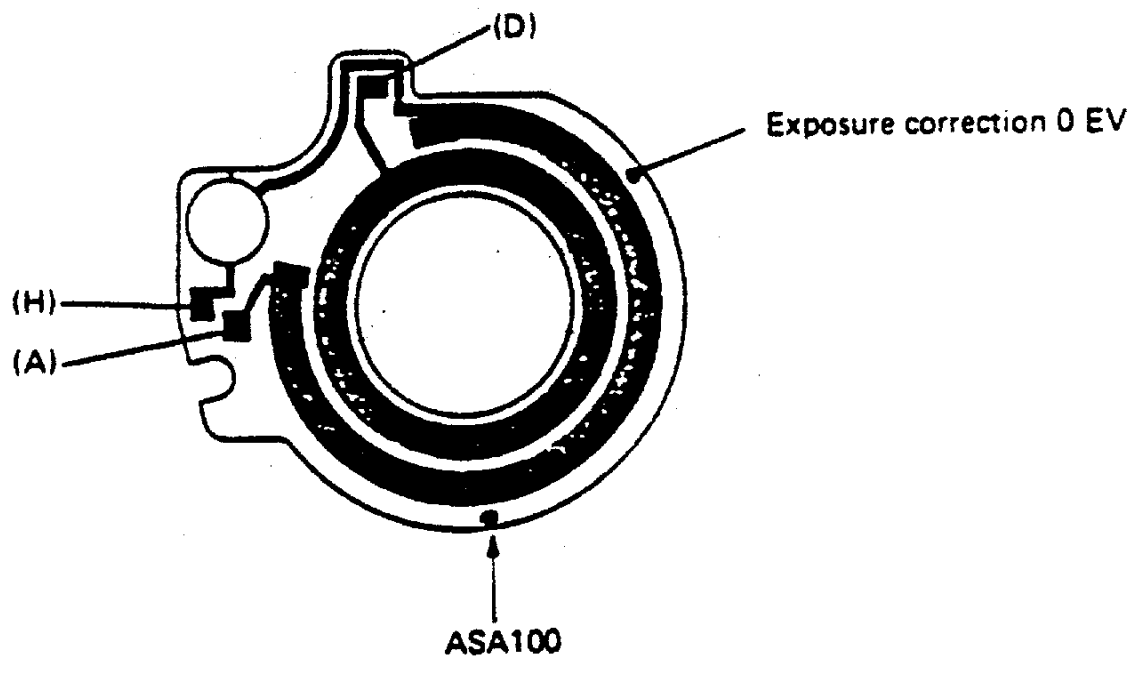
CLR





(3) Position for correcting ASA exposure

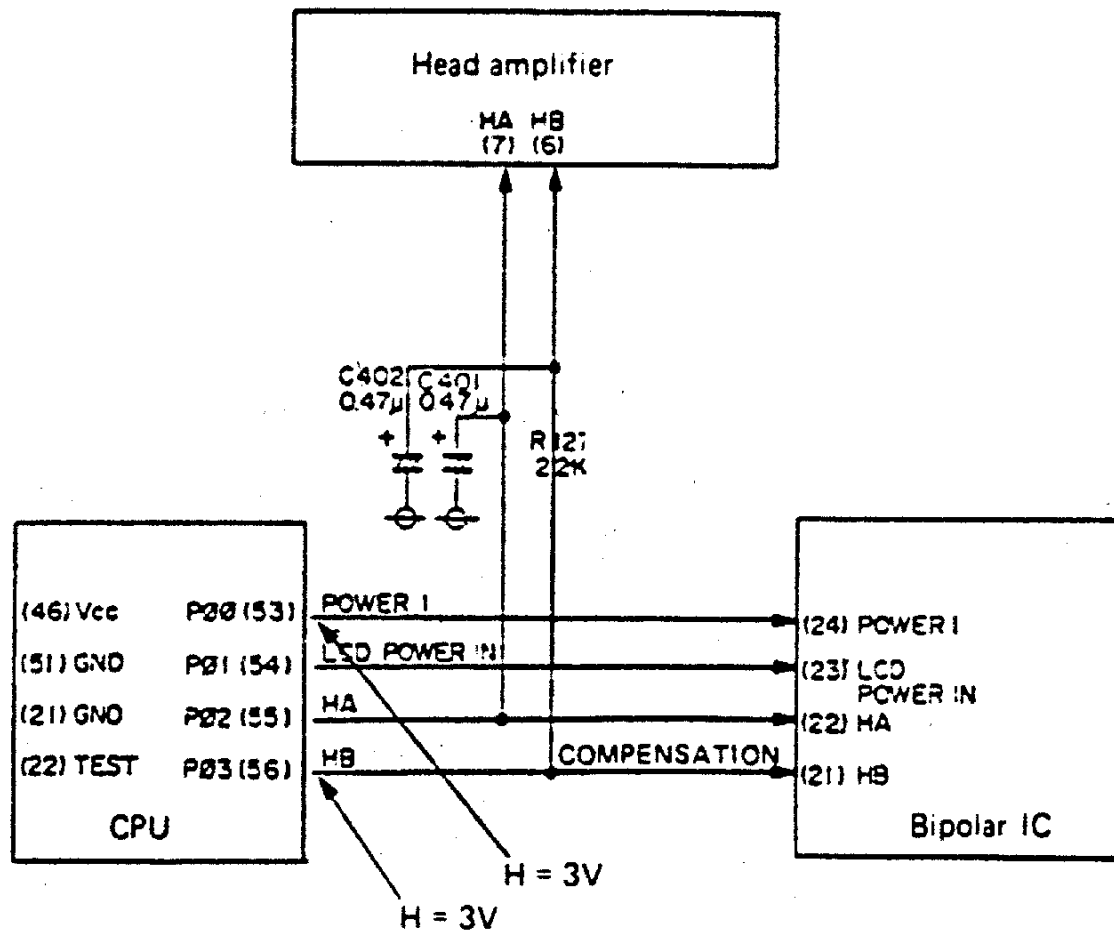
- The SV lever contact and CV lever contact are brought into contact at the points shown below:



1-2. Bipolar Power Supply

- The POWER HB signal is necessary to operate the bipolar power supply.
- Preparations
 1. Measuring instrument a. Digivol or circuit tester
 2. Mode a. B.C., AUTO or MANUAL
 - Attach the lens to the camera.
 - Light the LED in the viewfinder.

(1) Circuit diagram



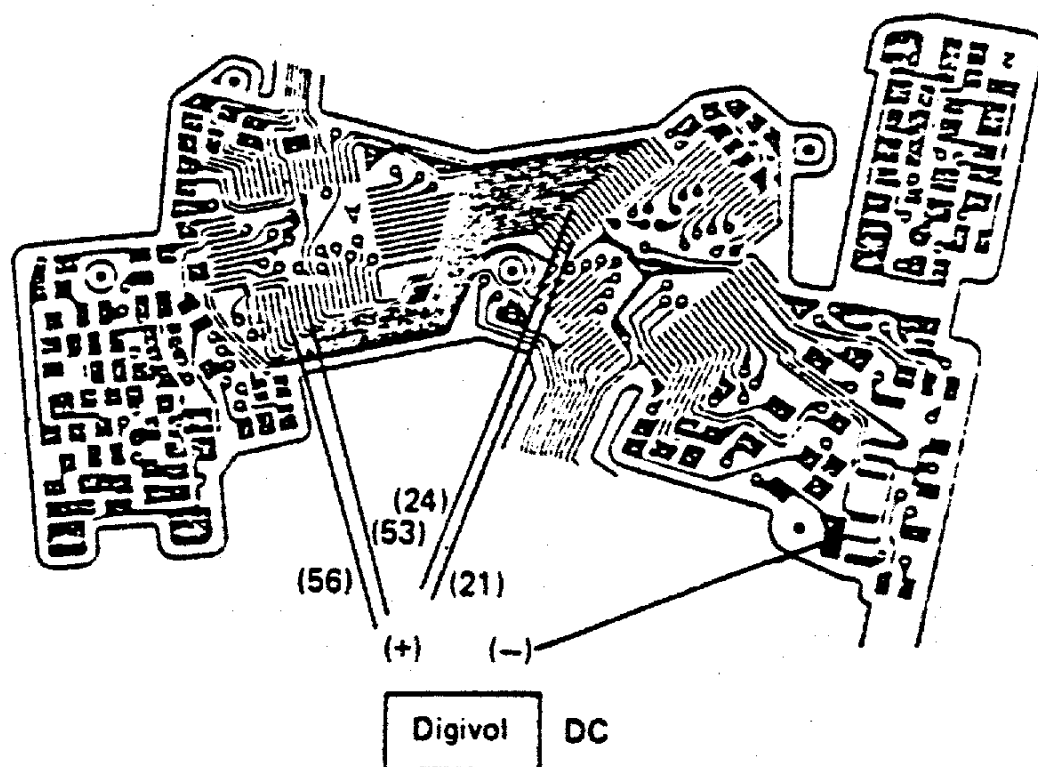
(2) Wiring diagram

1. Turn ON the mode selector switch.
POWER 3V
2. HB signal output (CPU pin No. 56)

During indication in viewfinder		3V
During exposure	AUTO	0V
	MANUAL	3V
	SPOT	3V

CPU	
Pin No. 53	3V
Pin No. 56	3V

Bipolar	
Pin No. 21	3V
Pin No. 24	3V



(3) Simple procedures to check POWER and HB signals

Check of POWER signal

The POWER signal is provided when:

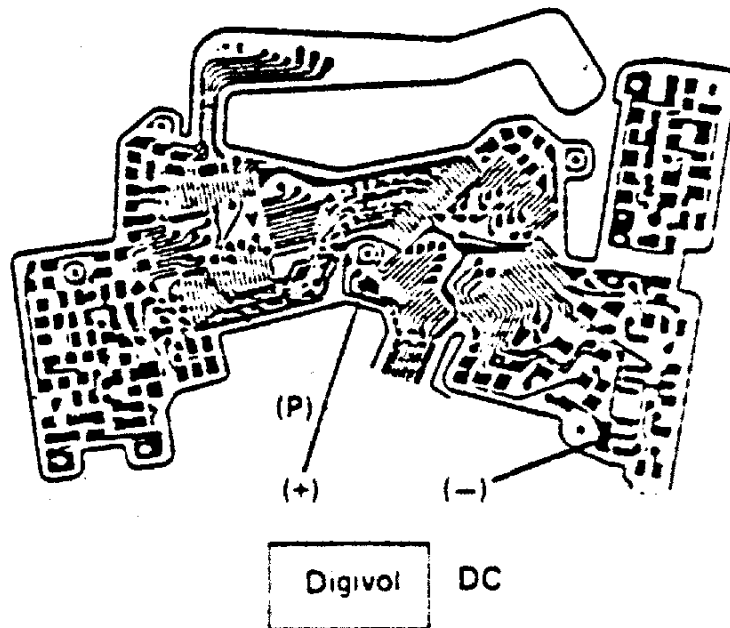
- a. The shutter operates.
- b. The LCD lights in the viewfinder.
- c. The battery check system operates.
- d. The self-timer LED lights.
- e. The PCV sounds.

2. Check of HB signal

- Measure a voltage of 1.8/1 V.

During indication	1.8V
During exposure	1.0V

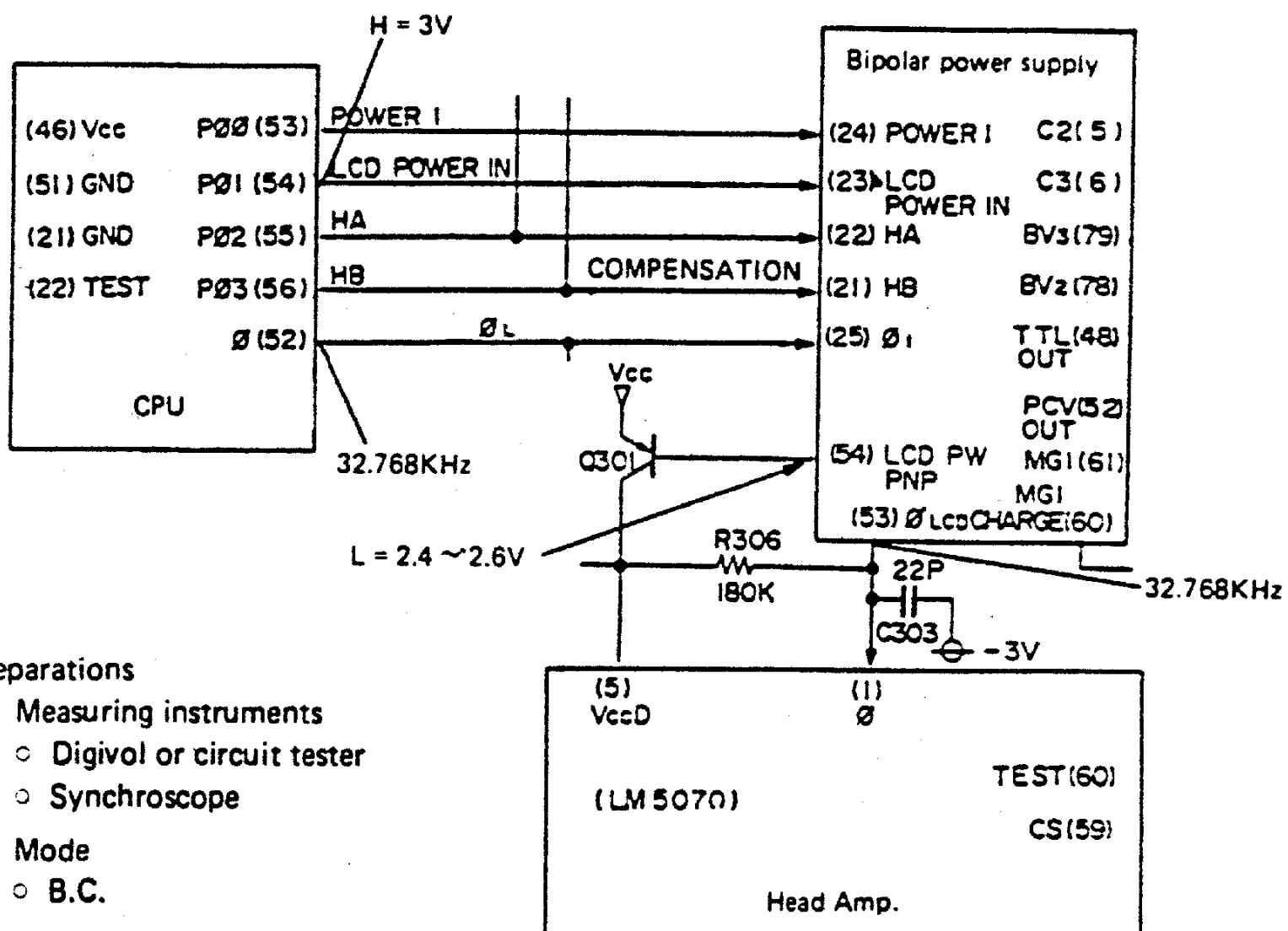
Simple HB signal check



1.3. LCD·D Power Supply

- The LCD D power supply requires four types of signals: Power, HB, LCD power and ϕ . No indication is provided in the viewfinder unless these signals are not provided.

(1) Circuit diagram



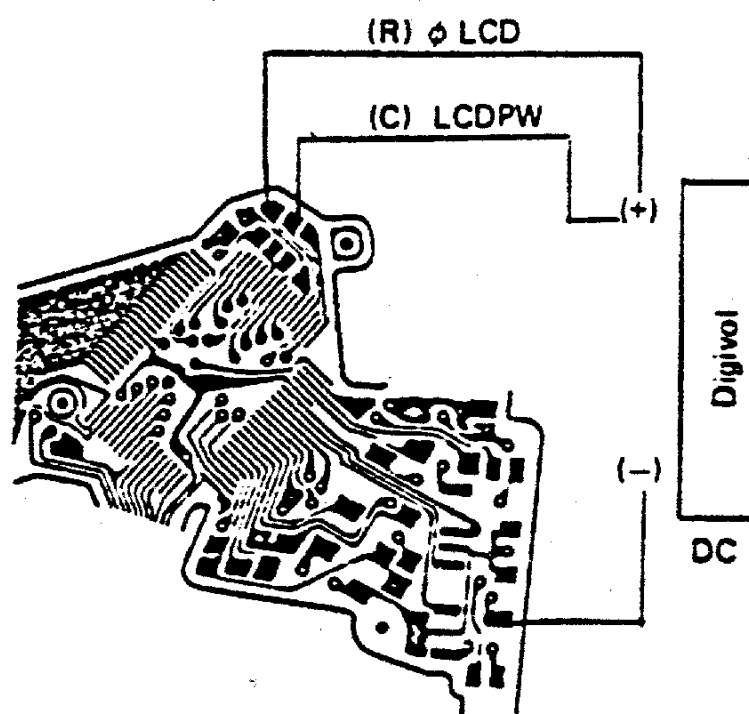
- Preparations
 1. Measuring instruments
 - Digivol or circuit tester
 - Synchroscope
 2. Mode
 - B.C.
 3. Others
 - Attach the lens to the camera.
 - Light the LED in the viewfinder.

(2) Wiring diagram

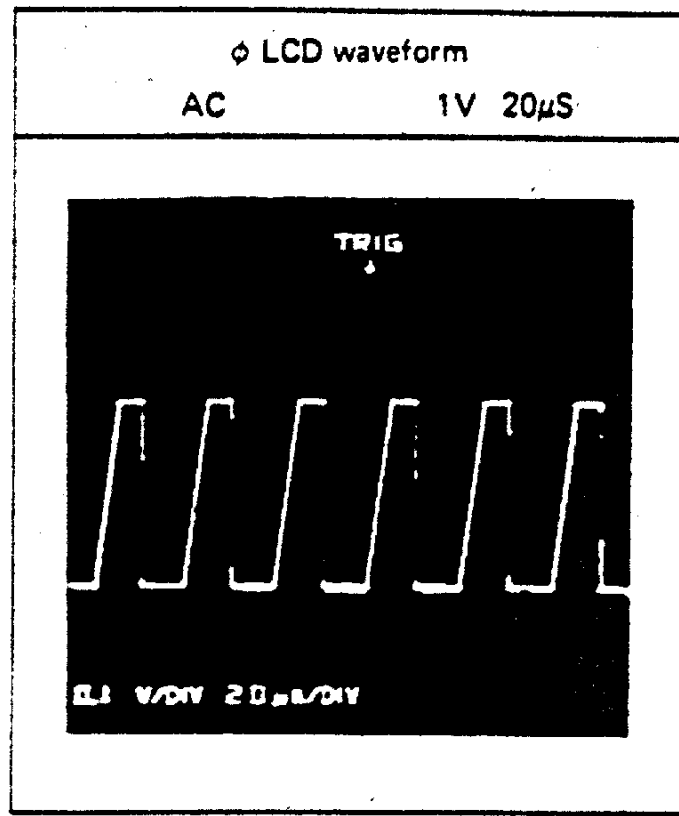
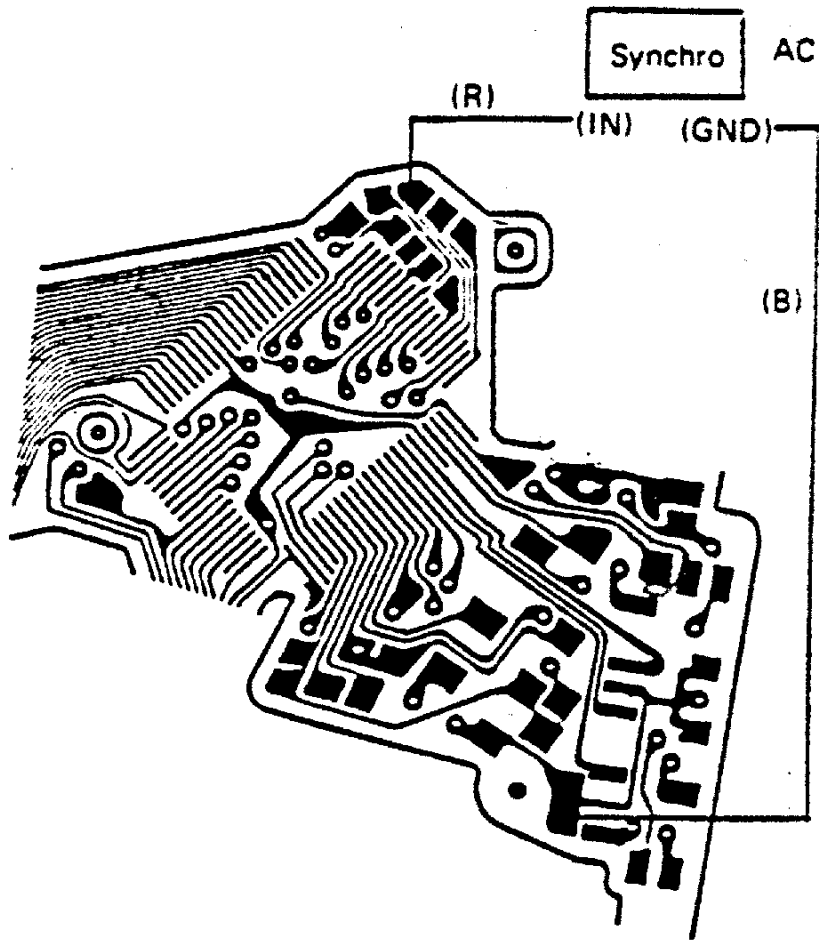
- Voltages during indication

	Leg No.	Voltage (V)
LCDPW	54	2.4 ~ 2.6
ϕ LCD	53	1.0 ~ 2.0

- When no output voltage is provided:
 1. LCD PW
Check LCDPW from the CPU.
 2. ϕ LCD
Check ϕ from the CPU.



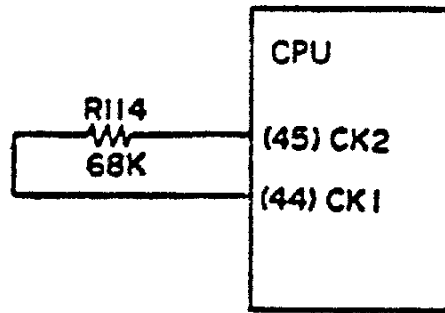
(3) Waveform of ϕ LCD



2. Oscillator Circuit

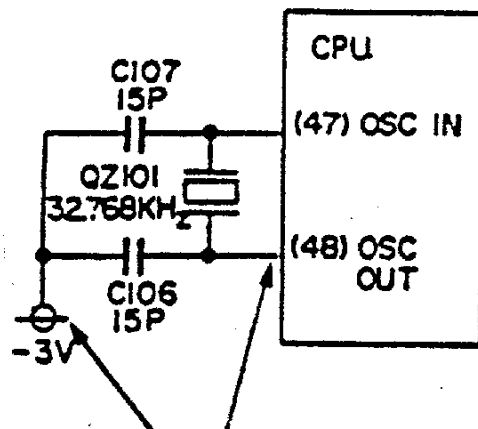
(1) Circuit diagram

A: CPU system clock pulse



- The CPU cannot operate when the signal is not oscillated.

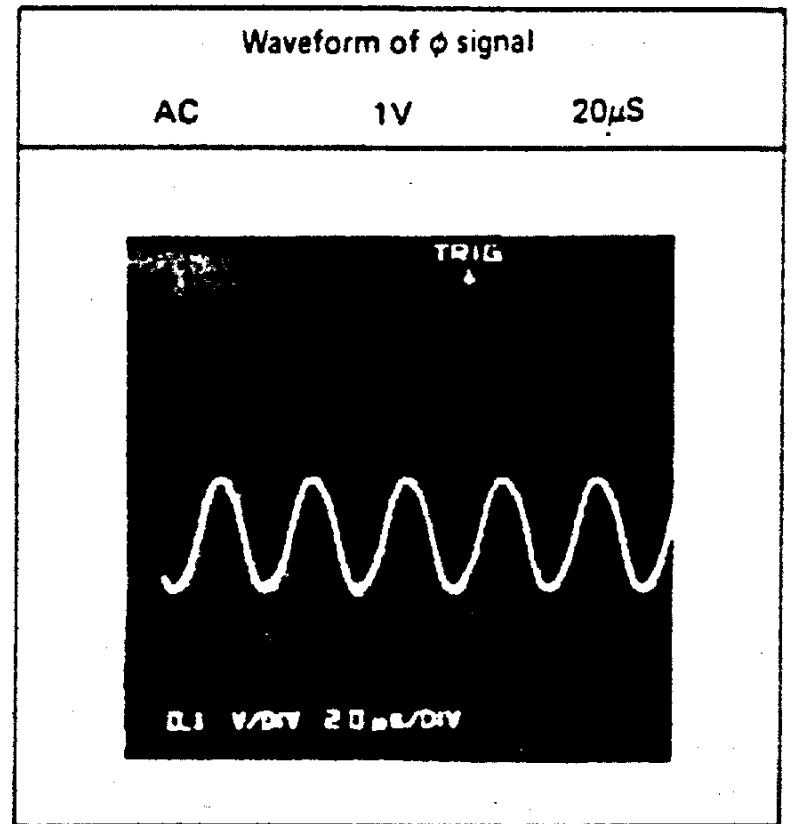
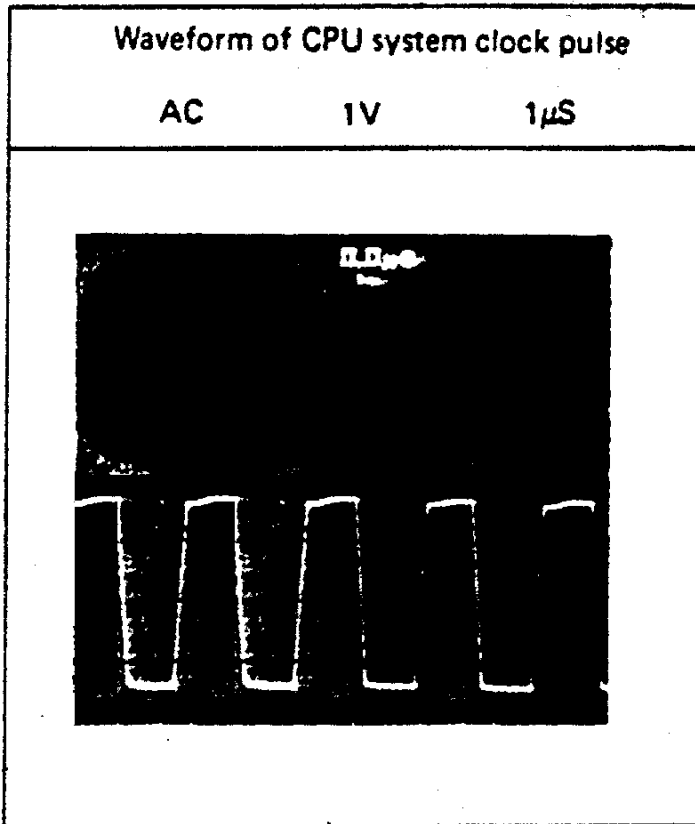
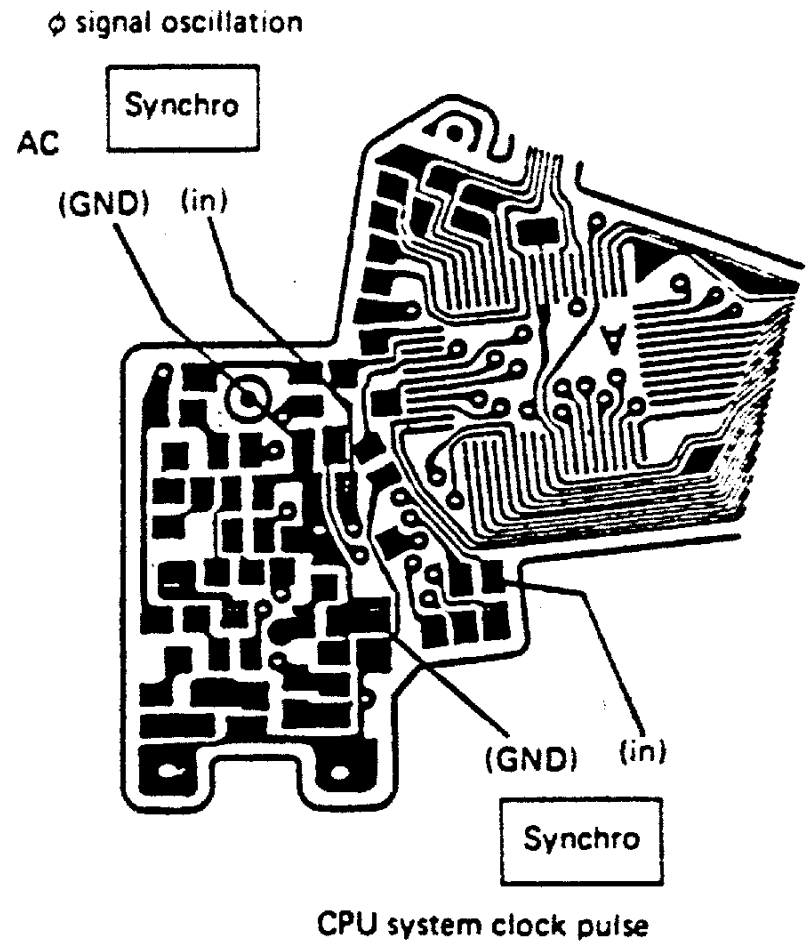
B: ϕ signal oscillation



- The PCV cannot sound and the LCD cannot light when the signal is not oscillated.

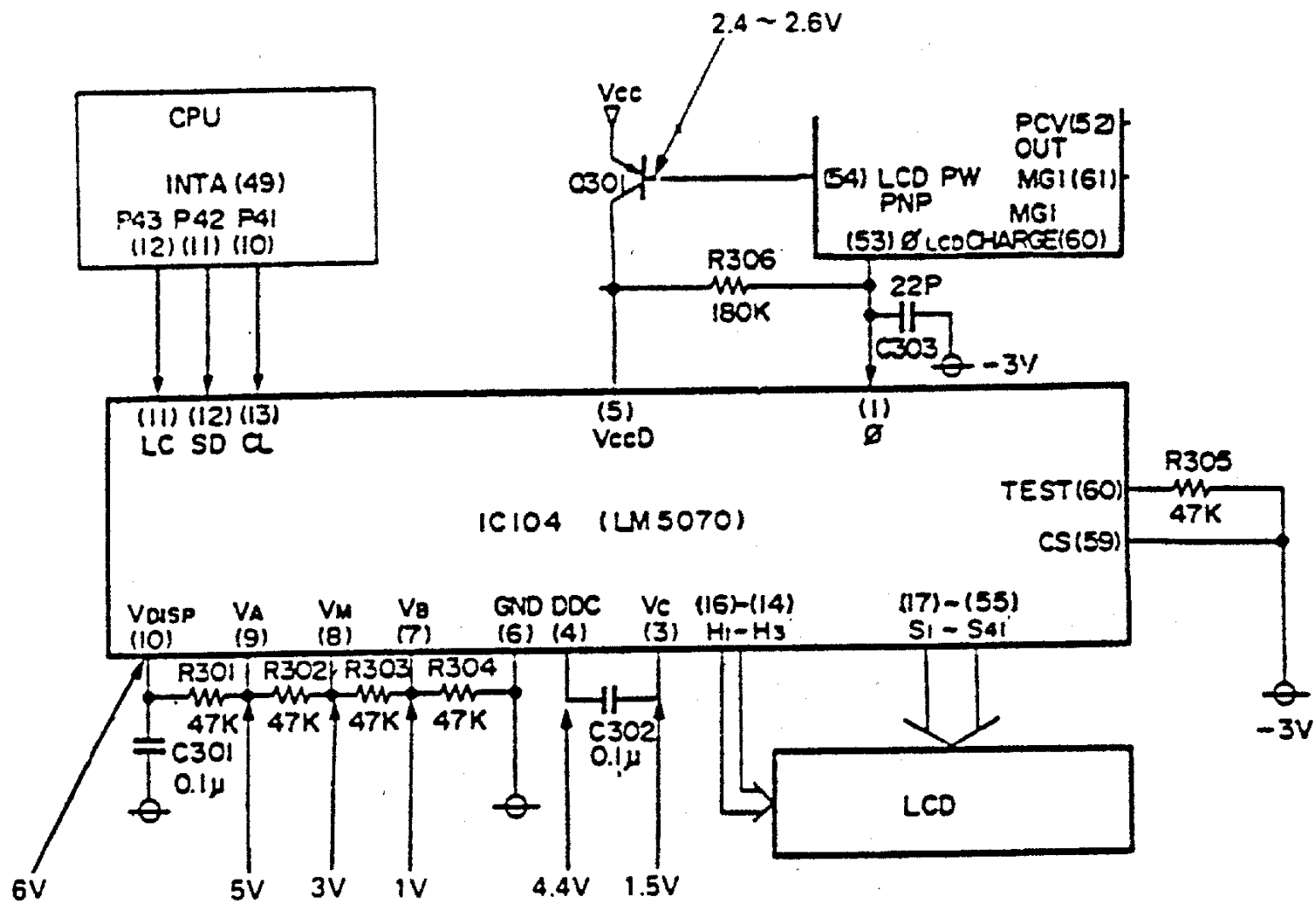
(2) Wiring diagram

- Mode: B.C.
- Attach the lens in position.
- Light the LCD in the viewfinder.



3. LCD D Circuit

(1) Circuit diagram



• Preparations

1. Measuring instruments

- Digivol or circuit tester
- Synchroscope

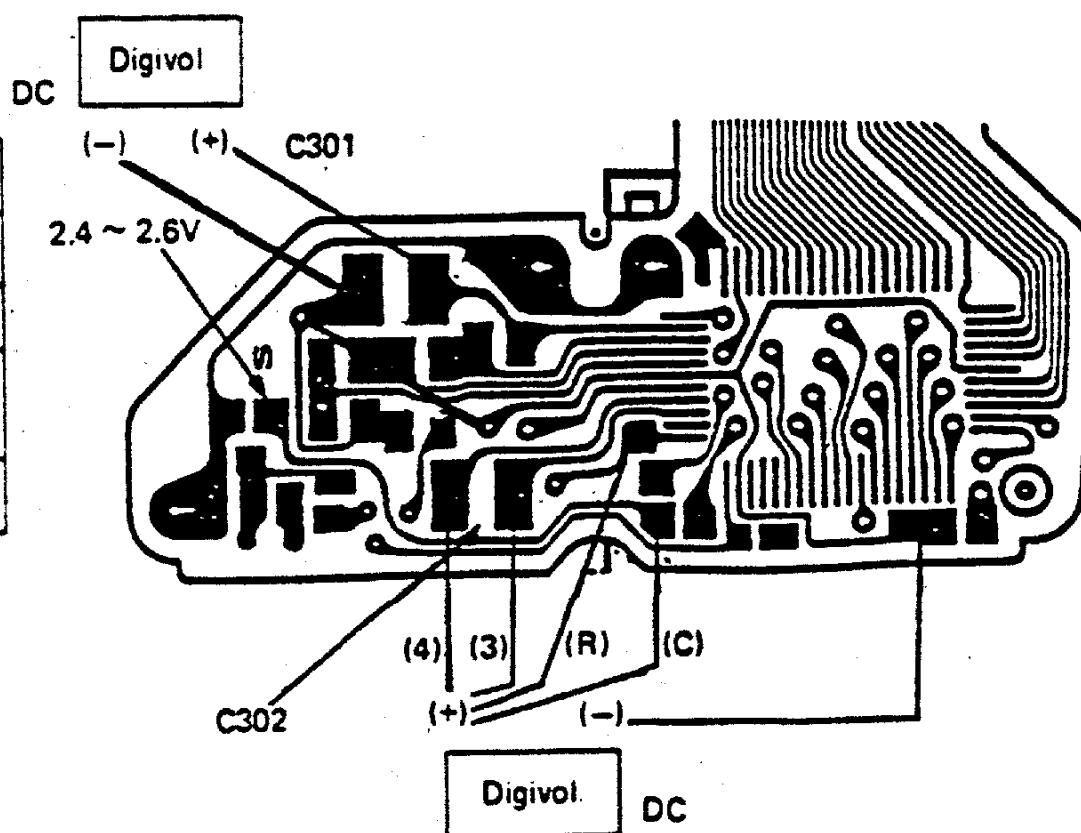
2. Mode: B.C., AUTO or MANUAL

- Attach the lens in position.
- Light the LCD in the viewfinder.

(2) Wiring diagram

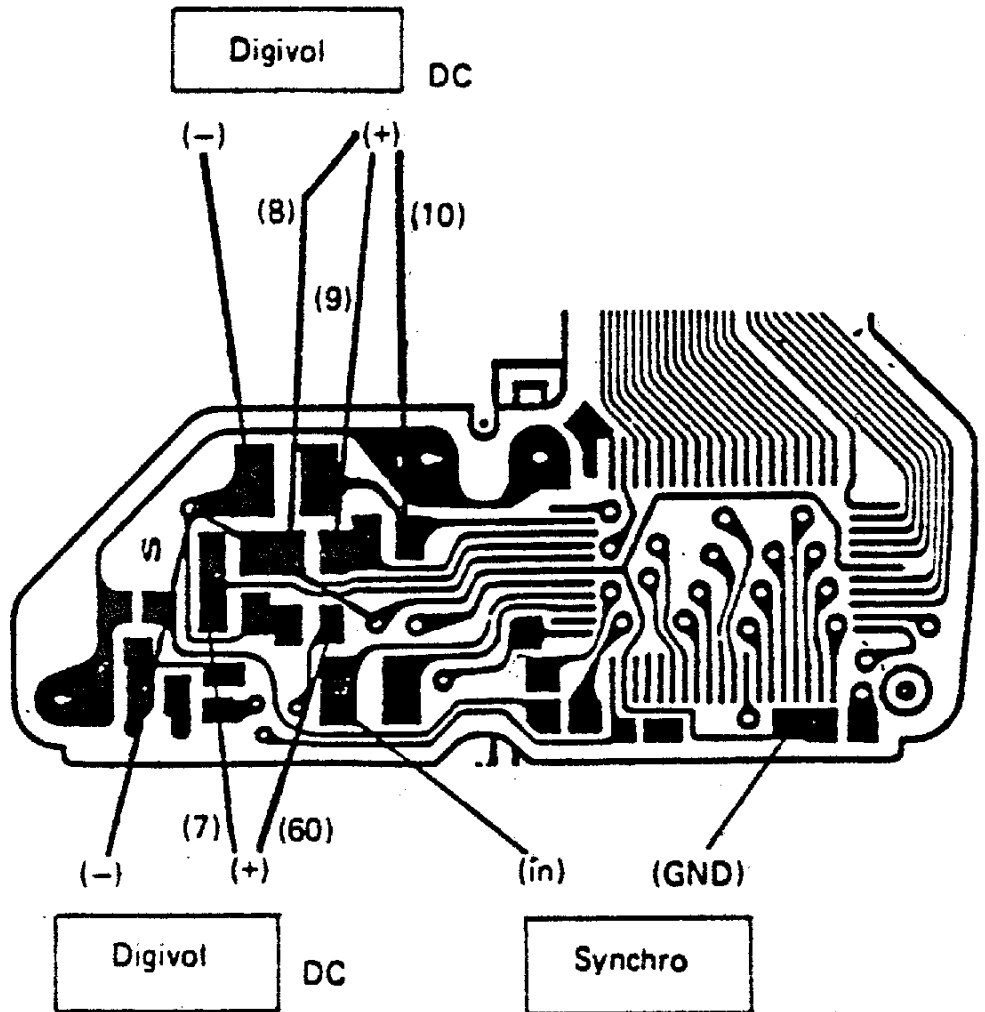
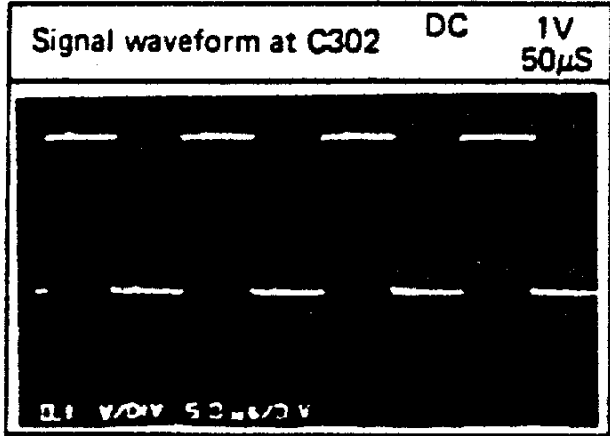
• Voltages at check points

	Check point	Voltage
LCD PW	(C)	2.4 ~ 2.6V
φ LCD	(R)	1.0 ~ 2.0V
C302	Pin No. 3	1.5V
C302	Pin No. 4	4.4V
C301	Pin No. 10	6.0V



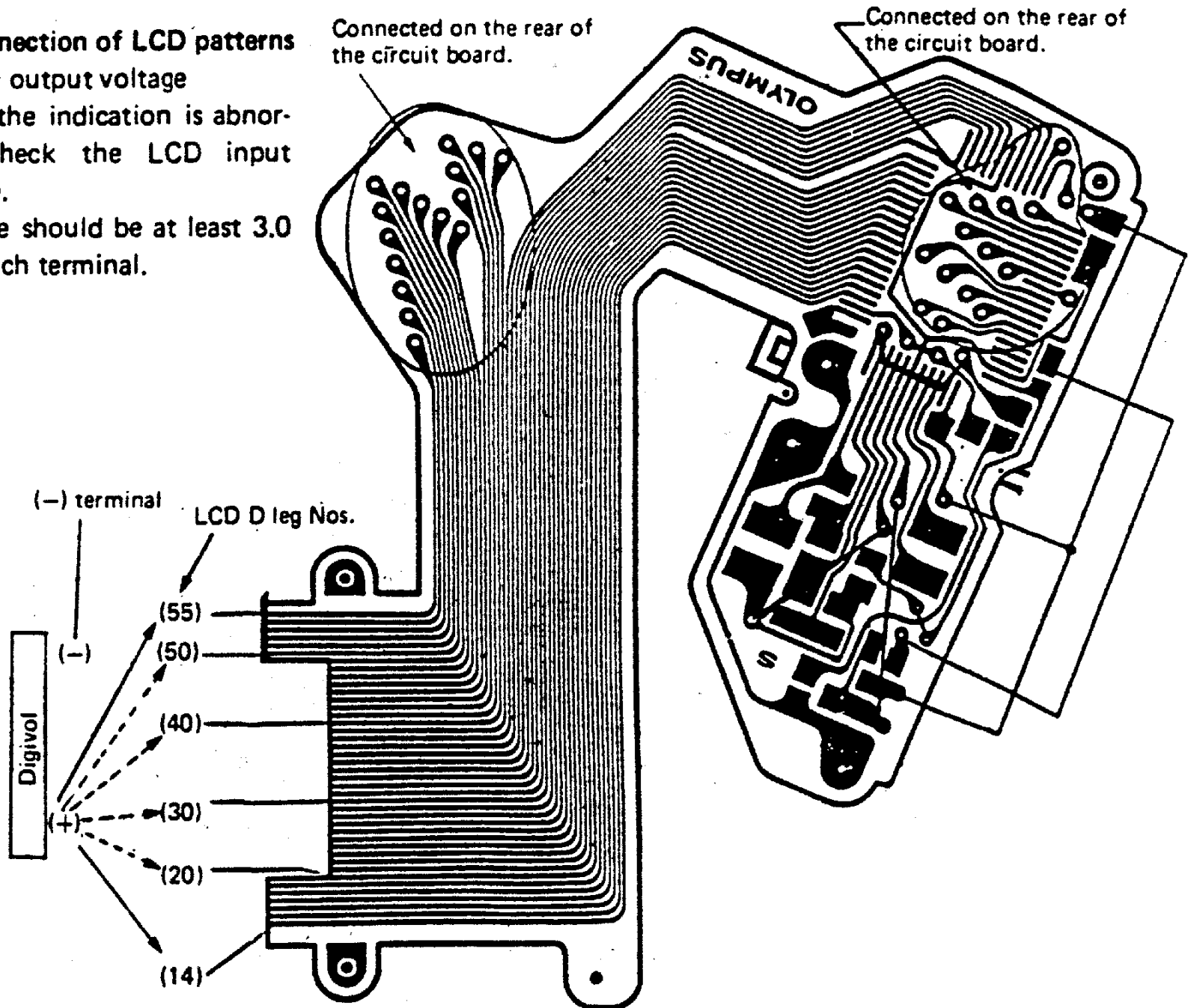
• Voltages at check points

	Leg No.	Voltage
R301	10	6V
R302	9	5V
R303	8	3V
R304	6	1V
R305	60	0V



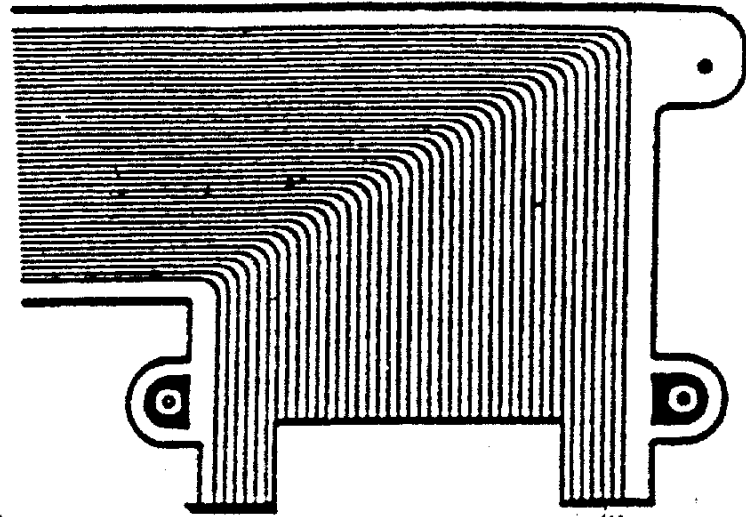
(3) Connection of LCD patterns

- LCD D output voltage
- When the indication is abnormal, check the LCD input voltage. Voltage should be at least 3.0 V at each terminal.



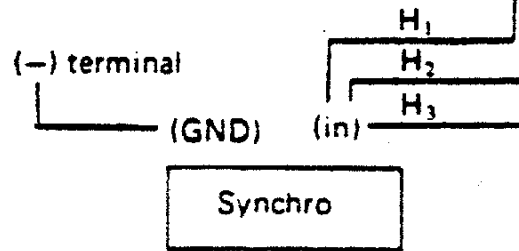
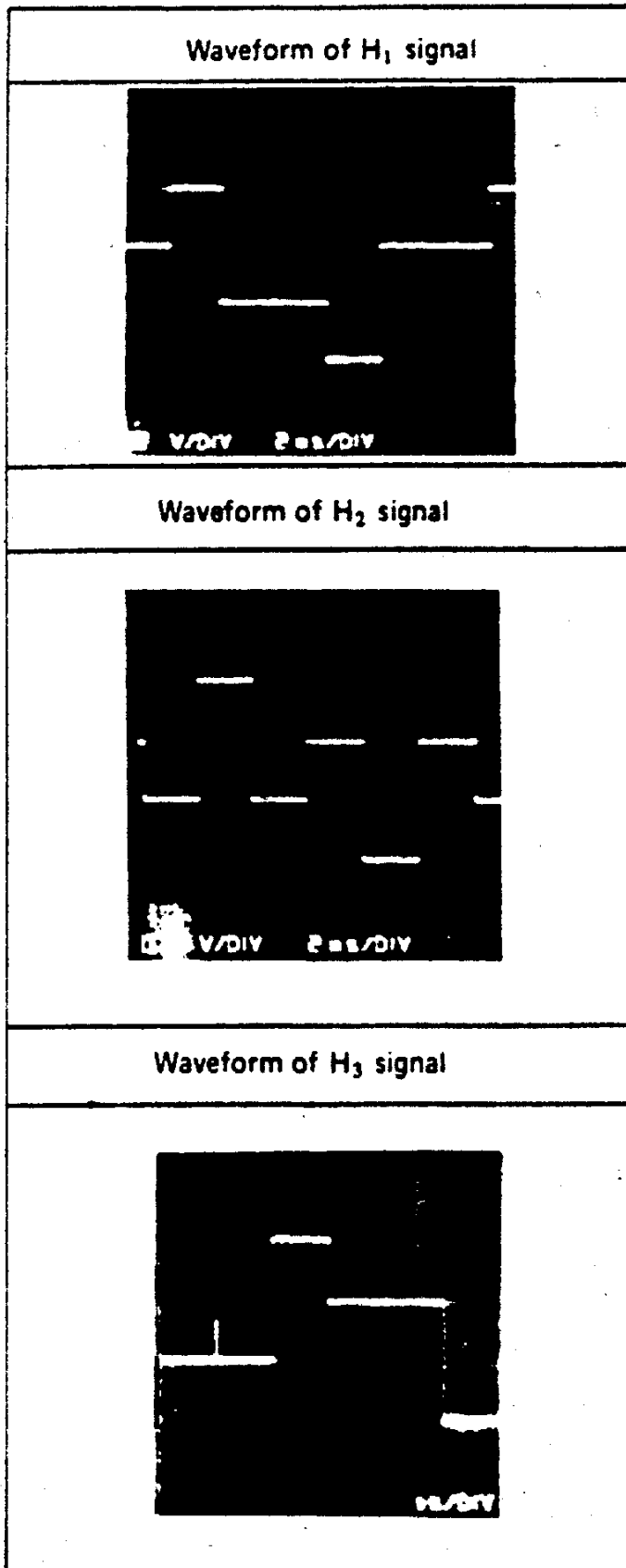
(4) Waveform of LCD D output

- The signals for the characters and symbols desired for indications can be checked by measuring composite voltage of the back plate signal and segment signal.
- The characters and symbols can be normally indicated when the composite signal is 4 V or higher



[Back plate signal]

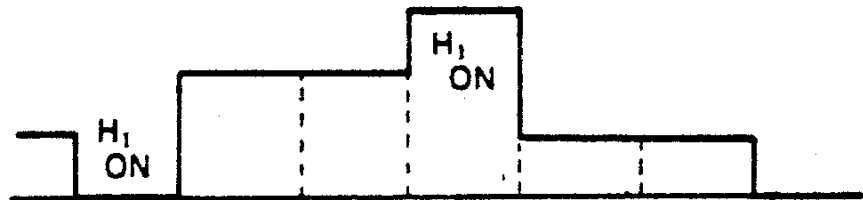
AC 2V
2ms



[Segment signal]

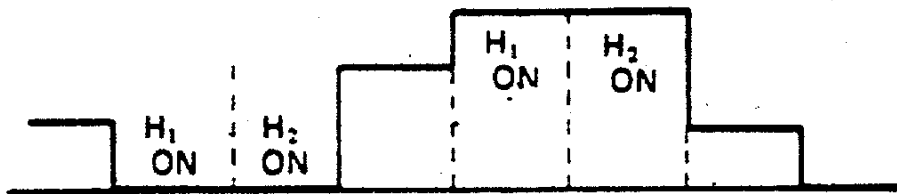
For indicating H₁

- Numeral and symbol only are indicated.
- Bar or dot is not indicated.



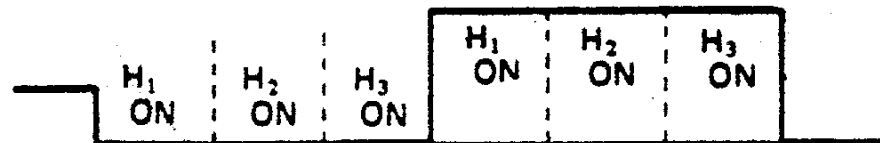
For indicating H₁ and H₂

- Bar is also indicated.



For indicating H₁, H₂ and H₃

- All types of signals are indicated.

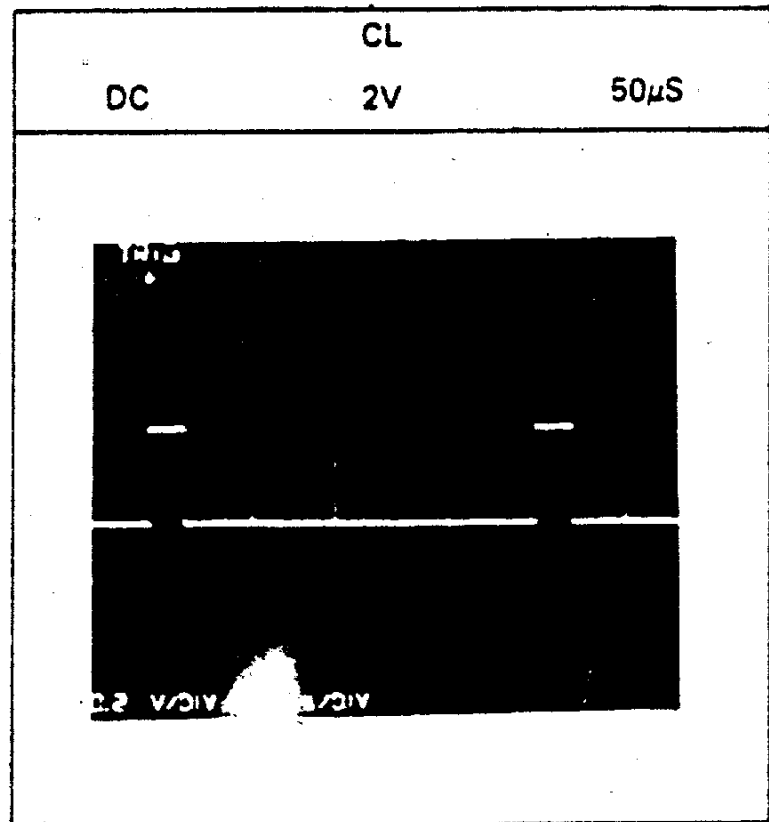
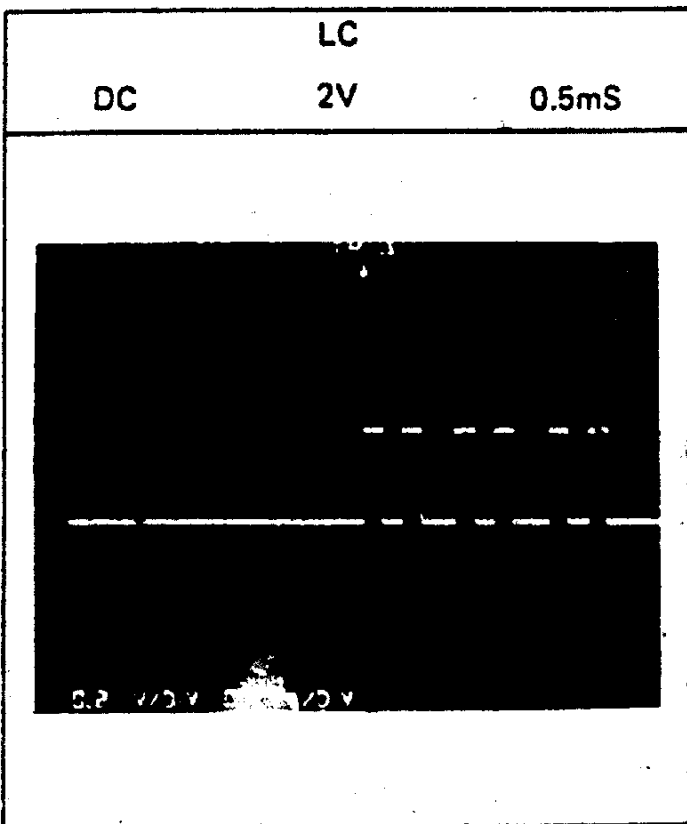
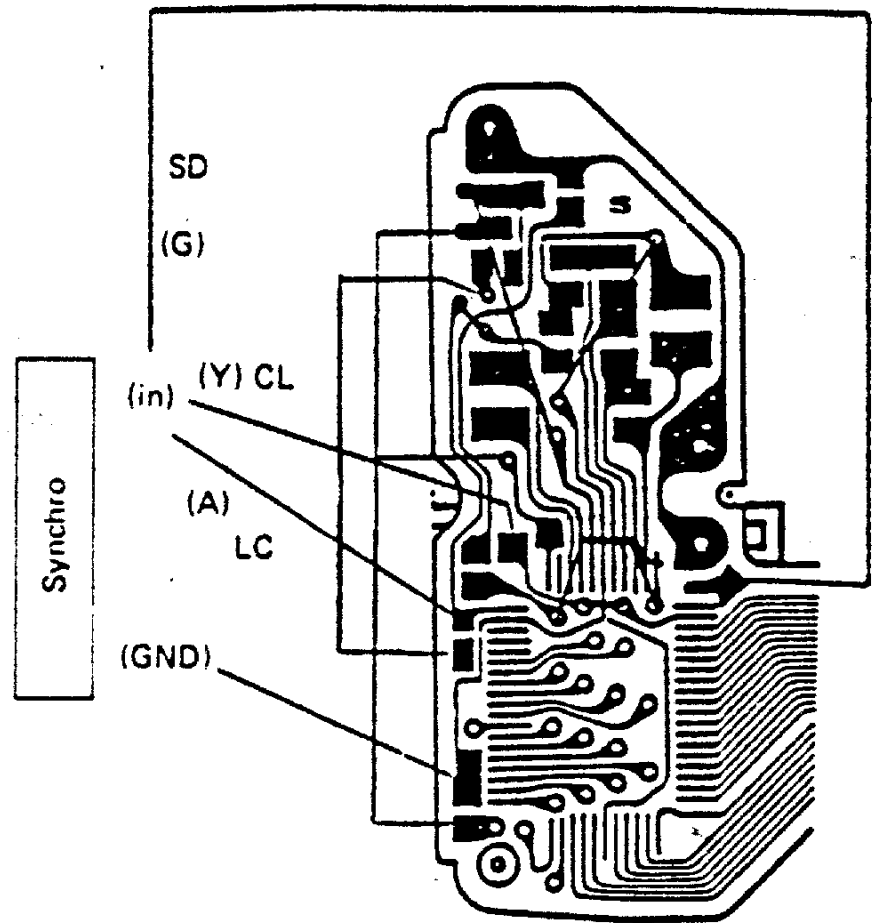
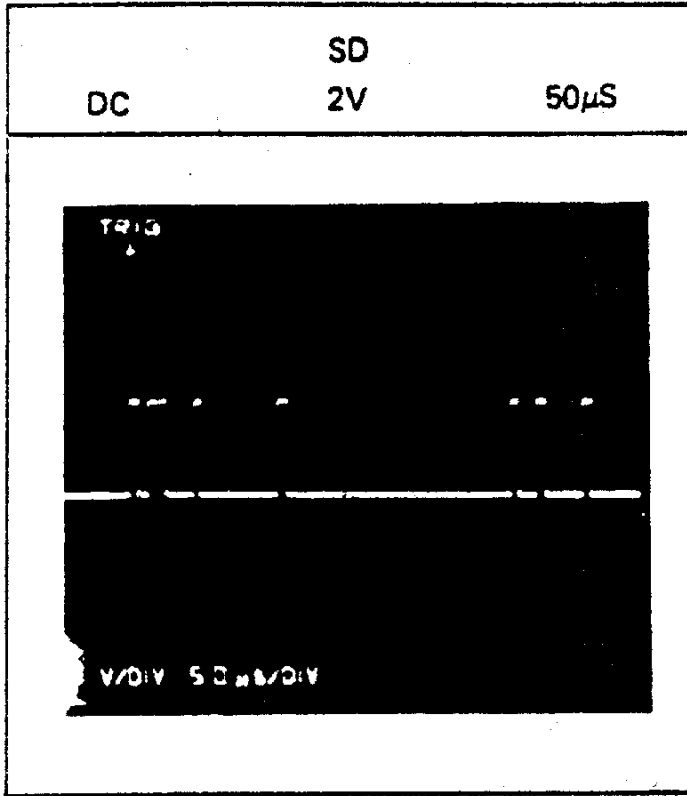


For indicating no signal



(5) Signal output from CPU

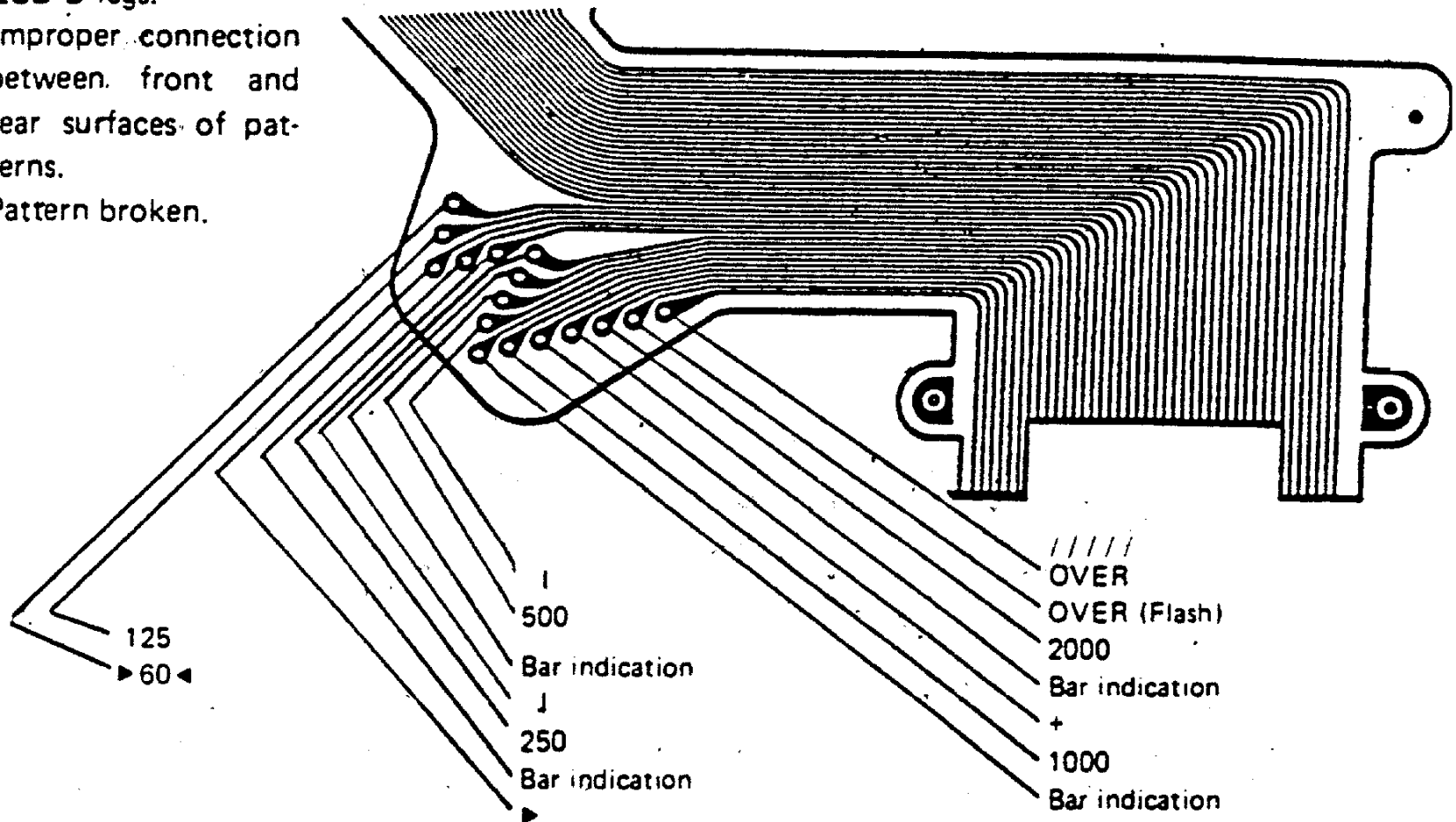
- Check waveform of signal from the CPU on a synchroscope.



(6) Check of indicated symbols and characters for lack

• Cause

1. Defective soldering of LCD D legs.
2. Improper connection between front and rear surfaces of patterns.
3. Pattern broken.



4. When the symbols and characters shown in the drawing are erased, check the patterns for connections on the front and rear surfaces.

(5) Indications of LCD·D IC leg Nos.

[Segment]

Leg No.	17				18			20	
Indication	MEMO	+	-	⚡	SPOT	HI LIGHT	SHADOW	UNDER	

Leg No.	19	22	25	28	31	34	38	41	44	47	50	53	54
Indication	1	2	4	8	15	30	60	125	250	500	1000	2000	OVER

Leg No.	26	29	32	37	39	42	45	48	51	55	40
Indication	-			◀		▶			+	////// OVER	▶ 60 ◀

[Back plate]

H1	16	1	2	4	8	15	30	60	125	250	500	1000	200
		////// OVER			OVER MEMO			+-	▶	◀	UNDER	SPOT	

H2	15	SHADOW	⚡	■ ■ ■	■ ■ ■	(Bar indication)						
----	----	--------	---	-------	-------	-------	------------------	--	--	--	--	--	--

H3	14	+-	HI LIGHT	◆ ◆ ◆	◆ ◆ ◆	(Dot indication)						
----	----	----	----------	-------	-------	-------	------------------	--	--	--	--	--	--

4. LCD (Liquid Crystal Display)

(1) Functions of LCD

- The LCD indicates data required for operating the camera.
- The LCD is controlled by the CPU and LCD D.

(2) Procedures to check LCD

- Simple procedures
Apply the positive voltage to pin No. 60 of LCD-D IC.
The LCD is normal when all the items are indicated.
If all the items are not indicated, the LCD or LCD D is defective.

(3) Handling of LCD

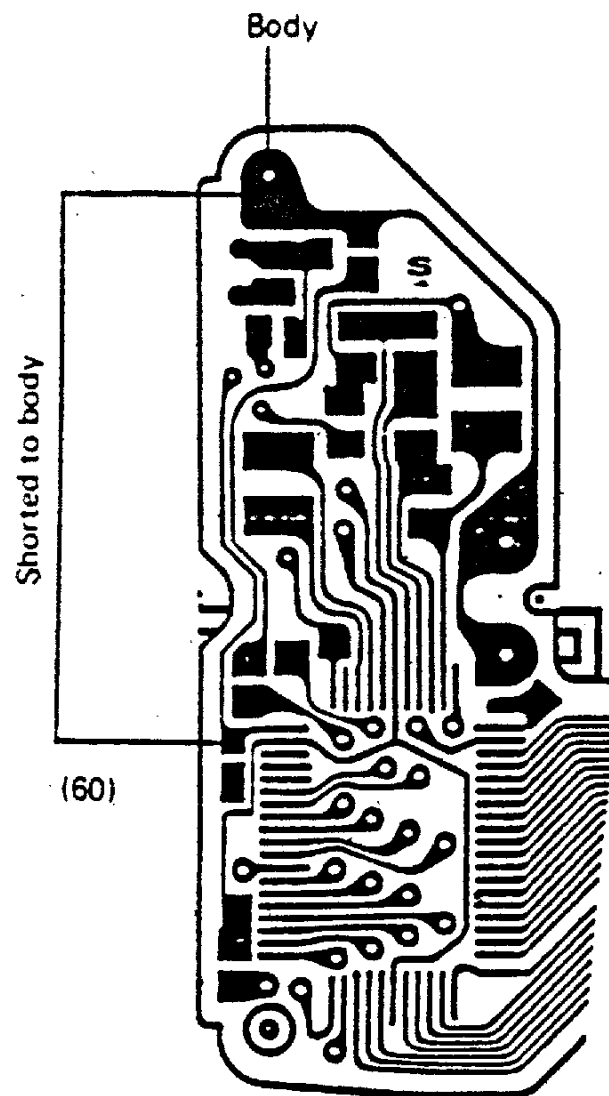
1. Do not mark fingerprints on the LCD.
2. Do not wipe the LCD with a piece of dry cloth.
3. Do not use chemical for cleaning.
4. For cleaning the LCD, wash it with water while brushing it with feathers of wild duck.

(4) When indications are unreliable

- Displace the LCD in the right-left direction.
- Unreliable (unstable) indication is a sign of defective indication circuit (LCD-D or LCD).

• Preparations

1. Mode: AUTO or MANUAL
2. Light the LCD indicator.

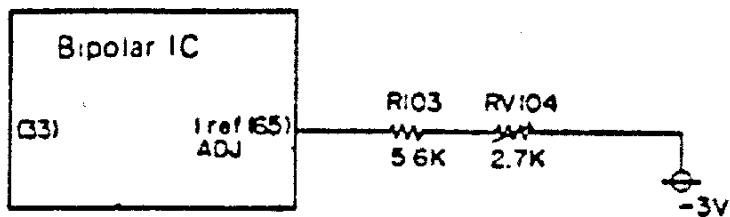


5. Reference Voltage and Current Circuits

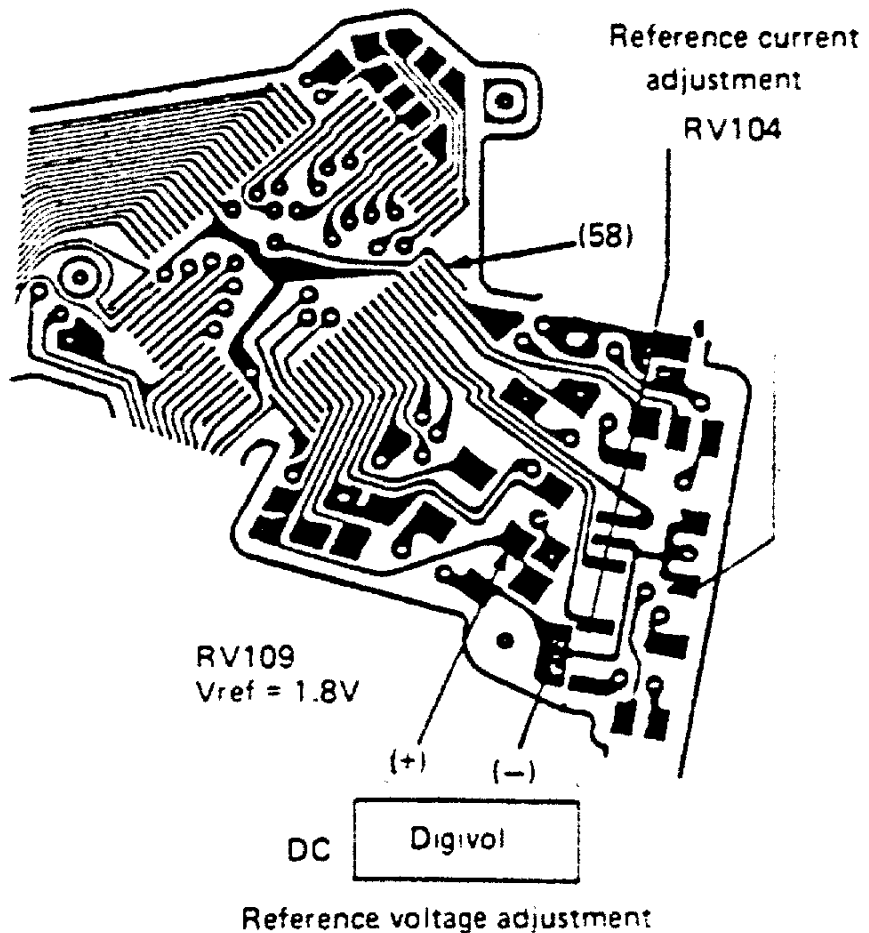
(2) Wiring diagram

(1) Circuit Diagram

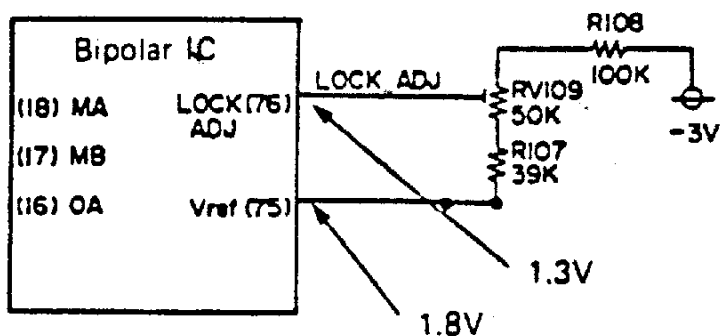
A. (DATA) Reference current circuit



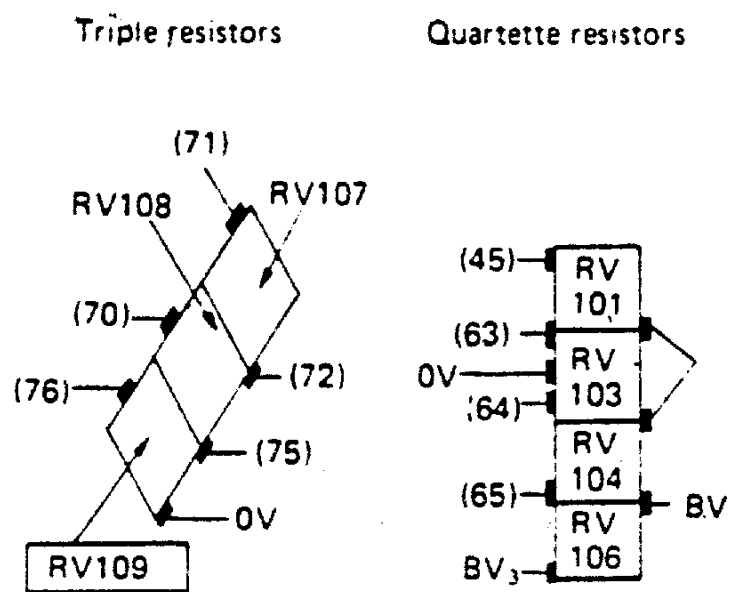
- This is a kind of temperature compensator circuit. When the reference current is deviated, all the circuits cannot operate accurately.
- Adjust the reference current circuit so as to obtain ASA voltage of 18 mV per EV.
- Refer to "Iref adjustment" in "D, REASSEMBLY AND ADJUSTMENT"



B. Reference voltage circuit



- Adjust RV109 until Vref (75) is set at 1.8V (1.8 V \pm 50 mV).
- This serves also as B.C. adjustment. Deviation of the reference voltage causes deviation of the B.C. voltage.
- All the circuit cannot operate normally when Vref deviates from 1.8 V.

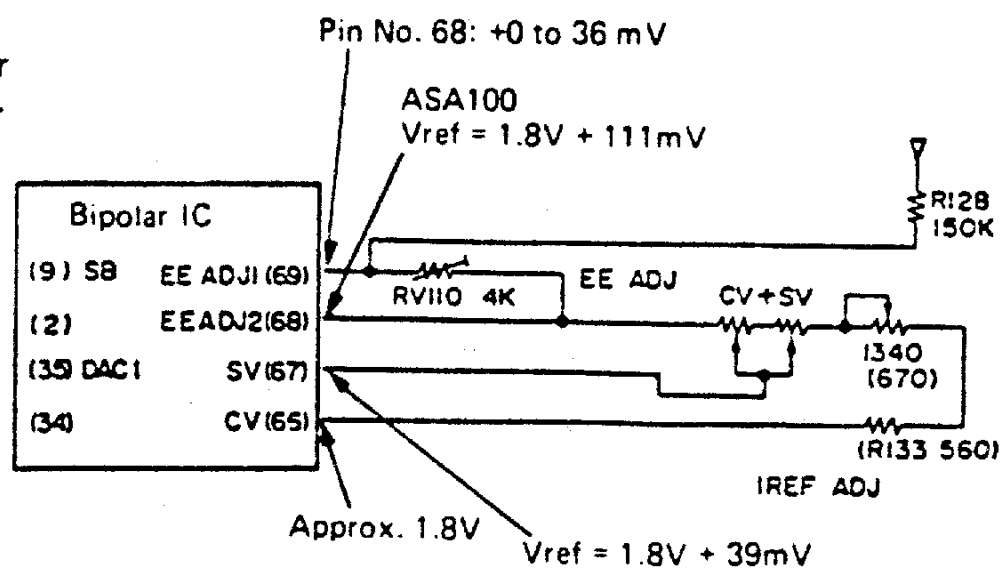


6. CV & SV Circuit: EE Adjusting Circuit

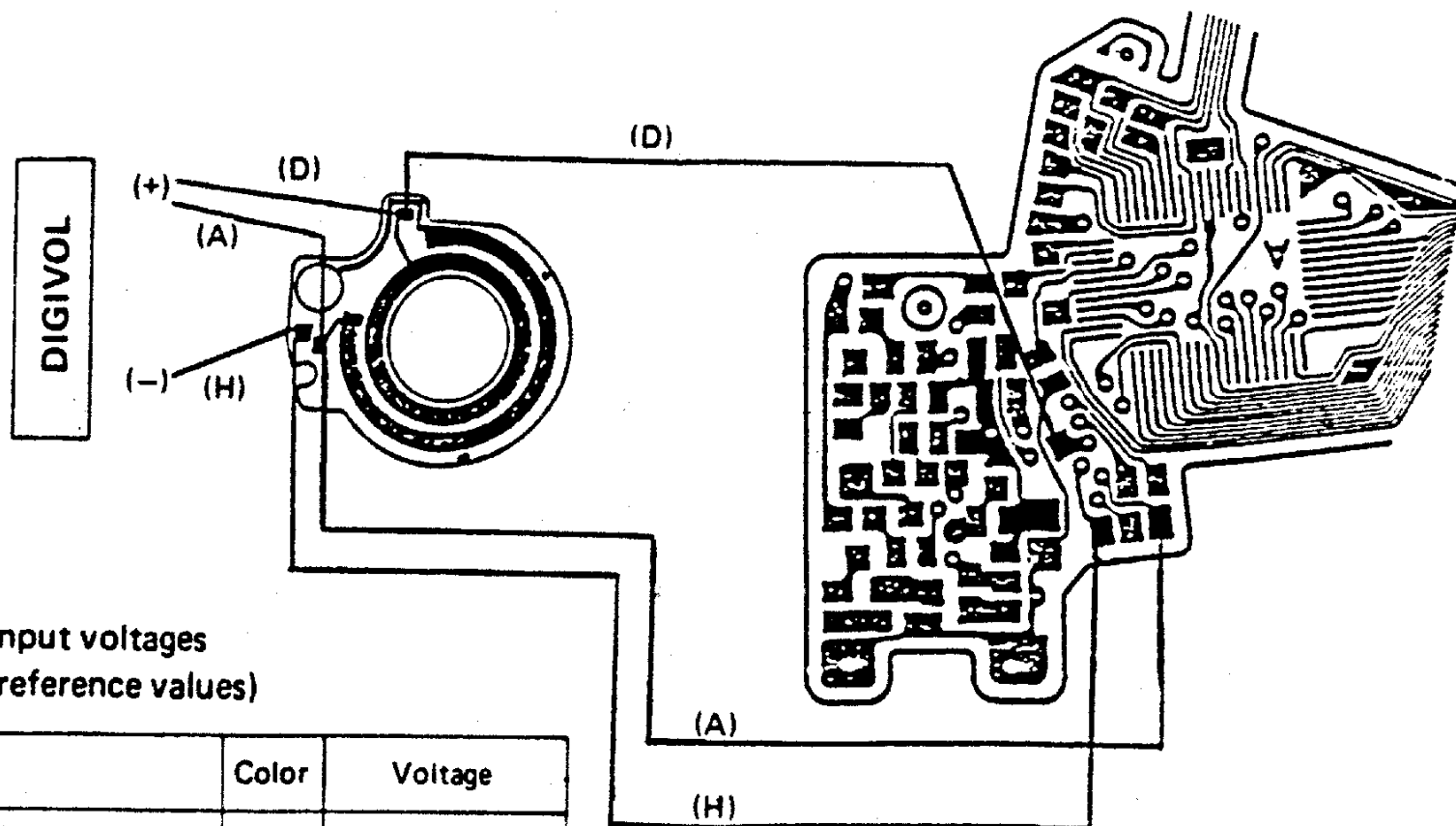
- This is a circuit for ASA level, exposure compensation and inputting data.
- When this circuit becomes defective, indications and exposure time become abnormal (the bar indication is not shifted by changing ASA level).
- Preparations
 1. Measuring instrument: Digivol or circuit tester
 2. Mode: AUTO or MANUAL, B.C.
 - Light the LCD indicator.
 - Attach the lens in position.

(1) Circuit diagram

- ASA resistors
 - High ASA level – High resistor
 - Low ASA level – Low resistor



(2) Wiring diagram



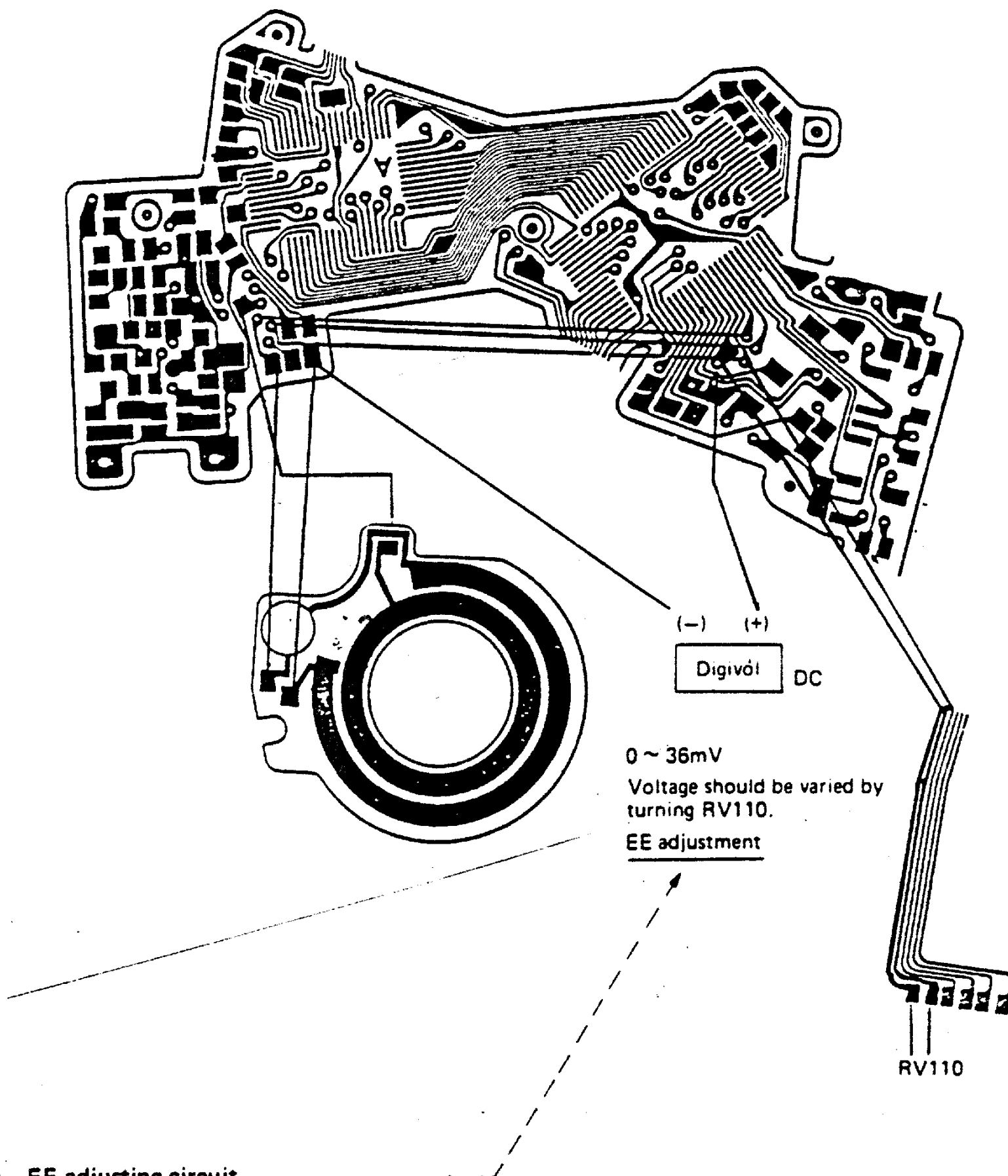
- Input voltages (reference values)

	Color	Voltage
CV: (Reference voltage)	H	1.8V
SV: CV output	D	1.8V + 39mV
Pin No. 68: CV + SV output	A	1.8V + 111mV

(ASA100)

- For details, refer to "Iref Adjustment" in "D, REASSEMBLY AND ADJUSTMENT."

(3) Pattern connections between front and rear surfaces



(4) EE adjusting circuit

- Take care not to short RV110 to the body.
- Voltage on pin No. 69 should be within a range of 0 to 36 mV taking that on pin No. 68 (blue LW) as standard.

7. TV & AV Circuit

- This is a circuit for adjusting F stop value, shutter time and inputting data.
- When this circuit is defective, shutter time becomes abnormal and the indication within the viewfinder is not changed by manipulating the diaphragm or shutter dial.
- Preparations
 1. Measuring instrument: Digivol or circuit tester
 2. Mode: B.C. or MANUAL
 - Attach MS5014 Lens in position.
 - Light the LCD in the viewfinder.

(1) Circuit diagram

1. AV: F stop value

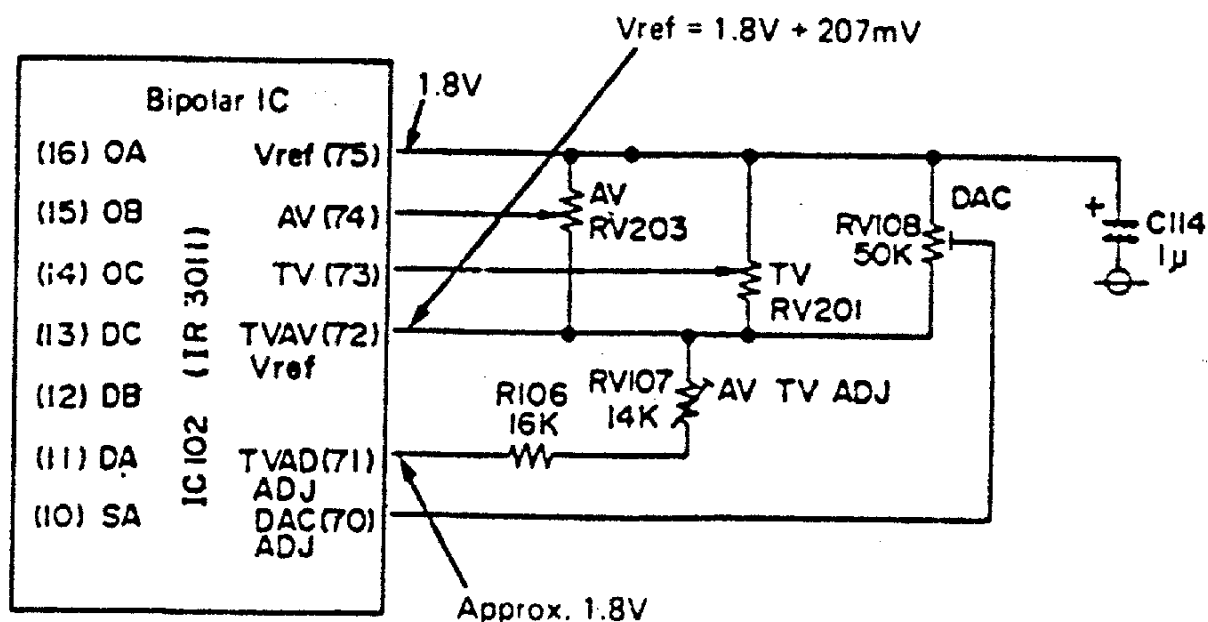
- Varied by manipulating the diaphragm.
- 144 mV with the lens kept open (F1.4).
- Reduced in 18 mV steps by manipulating the diaphragm ring.

2. TV: Shutter time

- $V_{ref} = +207 \text{ mV}$ at 1 sec.
- Reduced in 18 mV steps.

3. BULB

The BULB mode is set up when the TV voltage exceeds $V_{ref} + 225 \text{ mV}$.

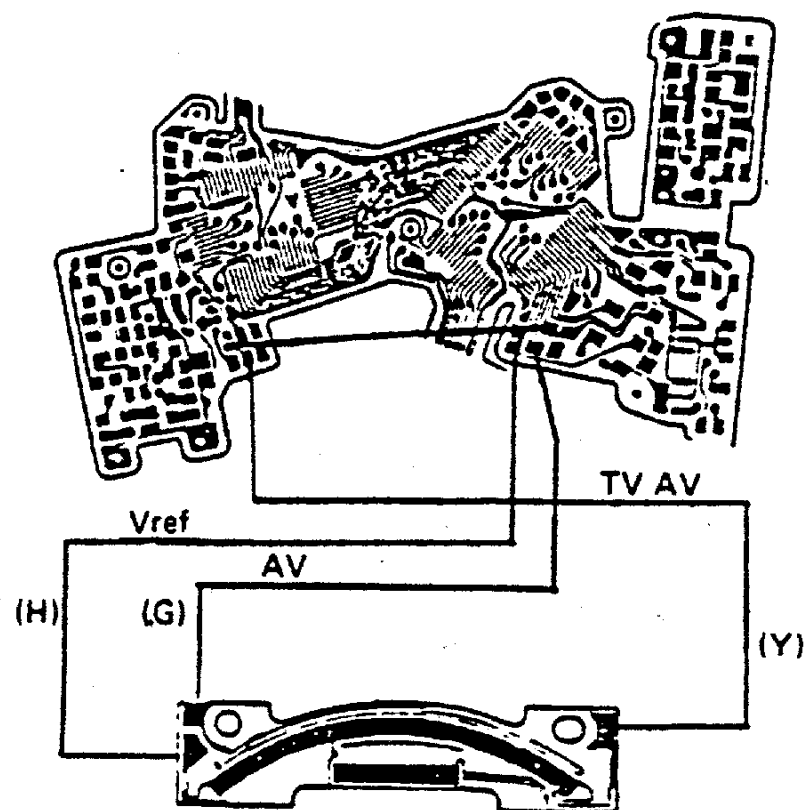


(2) Wiring diagram

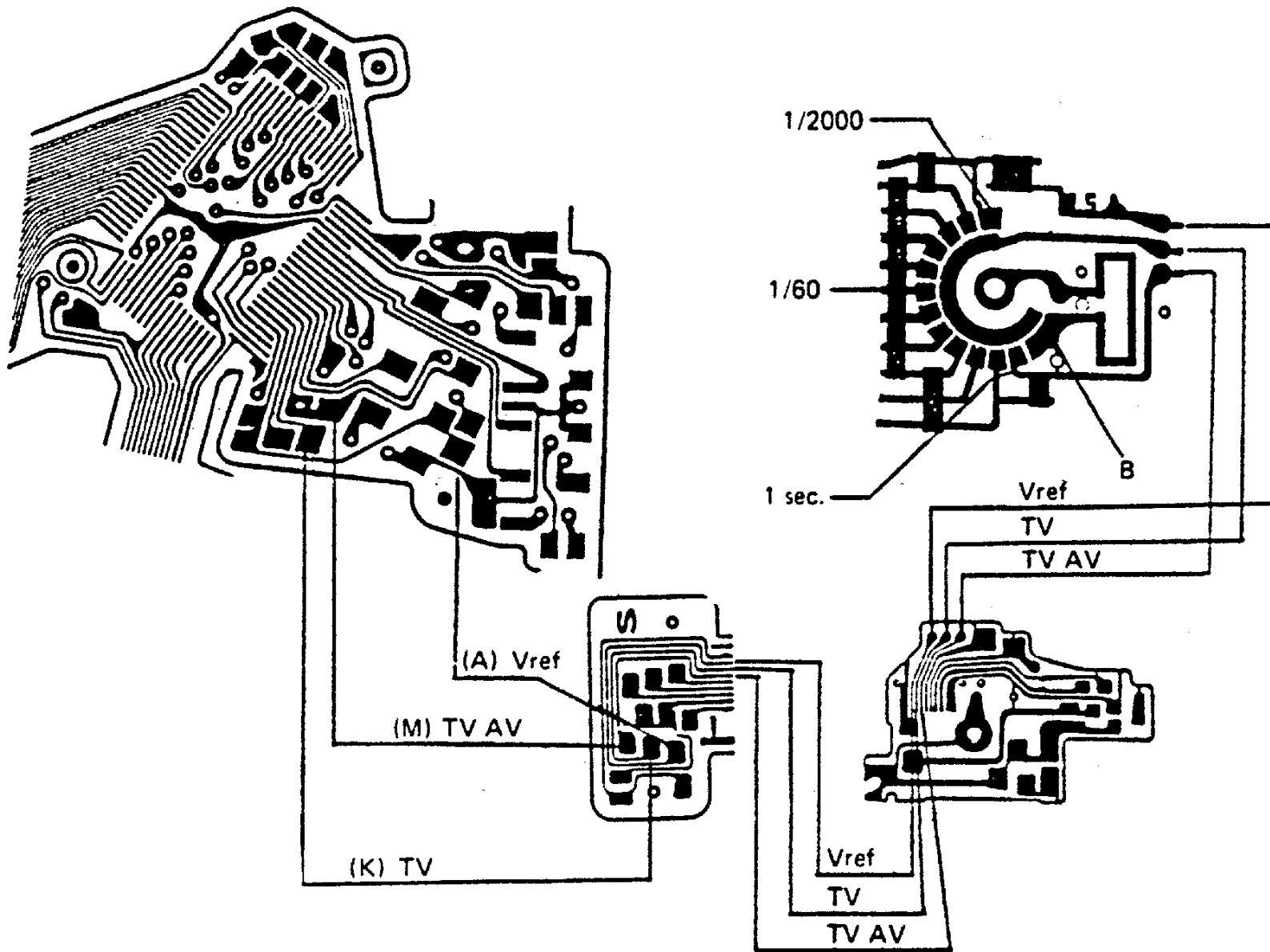
A. AV circuit

- Input voltage

	Color	Voltage
Vref	H	1.8V
TV AV	Y	$1.8V + 207mV$
AV	G	Depending on AV



B. TV circuit



• Input voltage

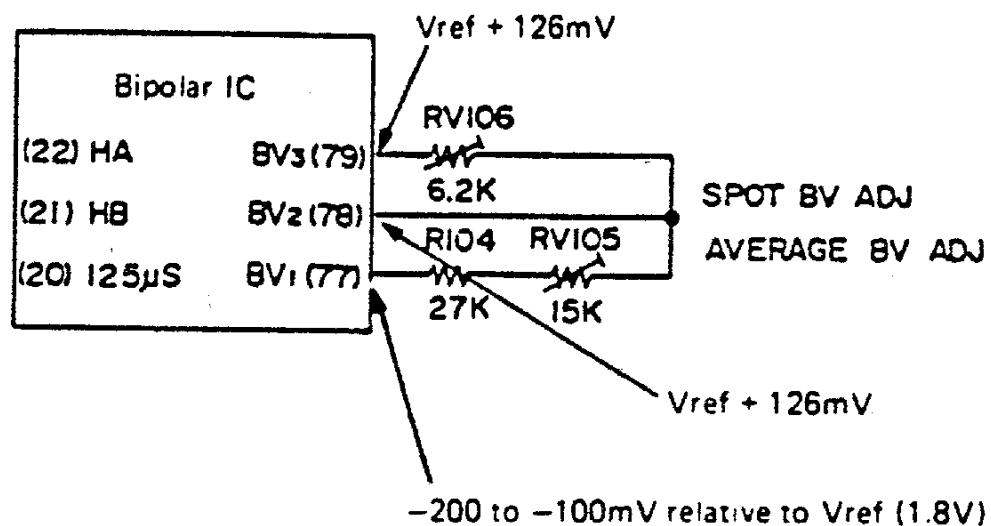
	Color	Voltage
Vref	A	1.8V
TV AV	M	1.8V + 207mV
TV	K	<ul style="list-style-type: none"> ○ Variable depending on shutter time ○ Maximum voltage of 207mV at 1 sec. ○ Minimum voltage of 9mV at 1/2000 (1.8V taken as standard)

8. BV Level Converter Circuit

- This circuit is used for inputting BV voltage at the indicated level to shift BV level.
- When this circuit becomes defective, the bar indication is fixed on the low luminance side.
- Preparations
 1. Measuring instruments:
 - Digivol or circuit tester
 - Synchroscope
 2. Mode: B.C., AUTO or MANUAL
 - Light the LCD in the viewfinder.
 - Attach the lens in position.

(1) Circuit diagram

- Use a synchroscope for measuring voltage.
- Note that a digital voltmeter provides unstable readings.



(2) Wiring diagram

- Voltages
 - Each voltage should be measured relative to Vref.
 - Each voltage should be measured at BV11 and F5.6.

1. BV1

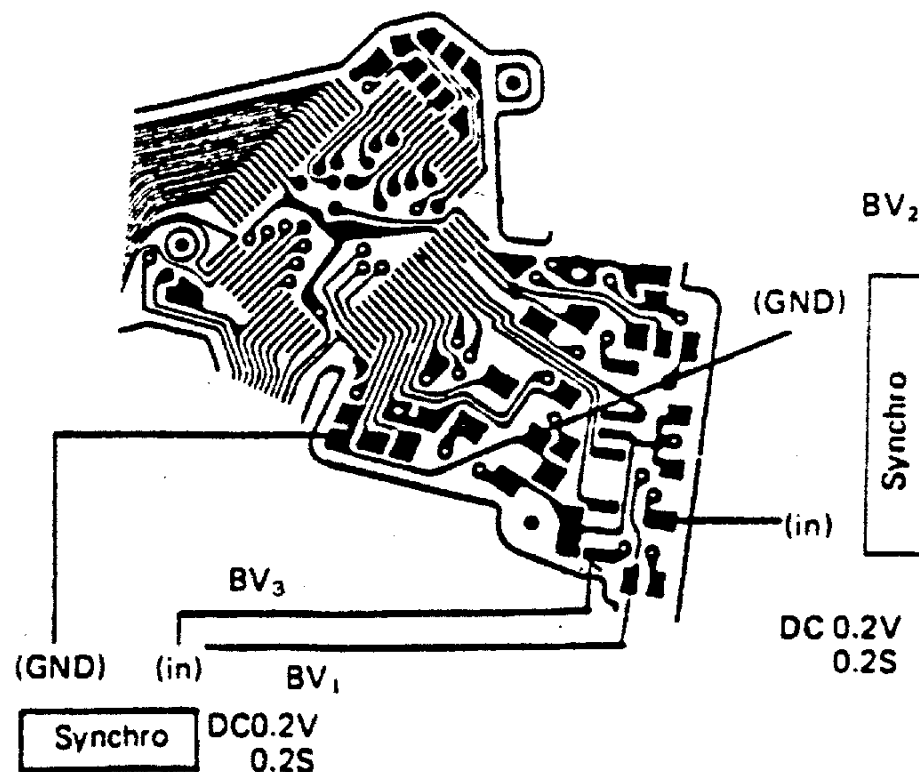
Average BV:	$-170 \pm 25 \text{ mV}$
SPOT BV:	$-150 \pm 25 \text{ mV}$

2. BV2

+126 mV

3. BV3

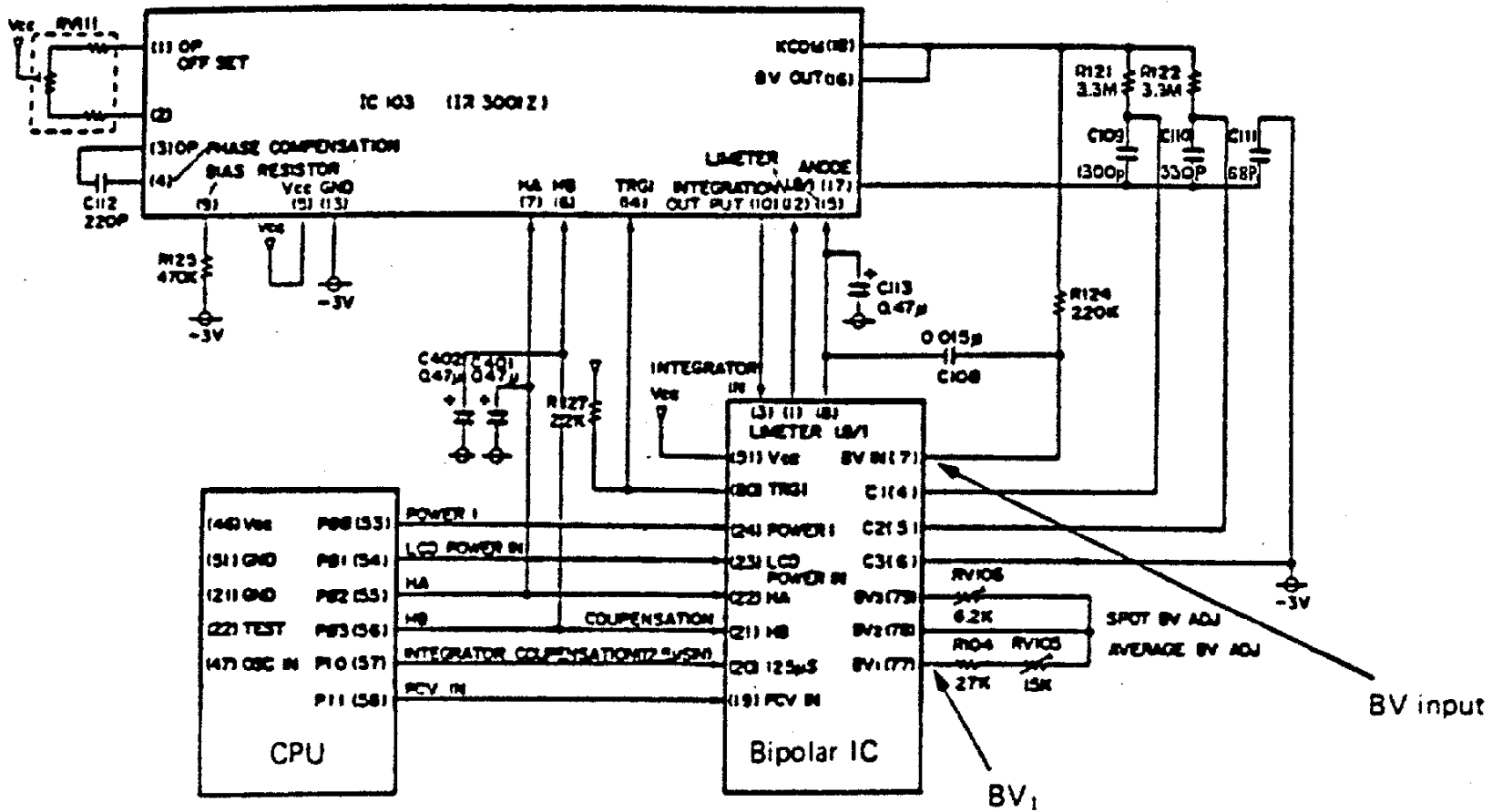
+126 mV



9. Head Amplifier

- The head amplifier should be checked during indication and during exposure respectively.

(1) Circuit diagram



• Voltages

A: During indication

- Reference voltage during indication: $1.8V \pm 50mV$

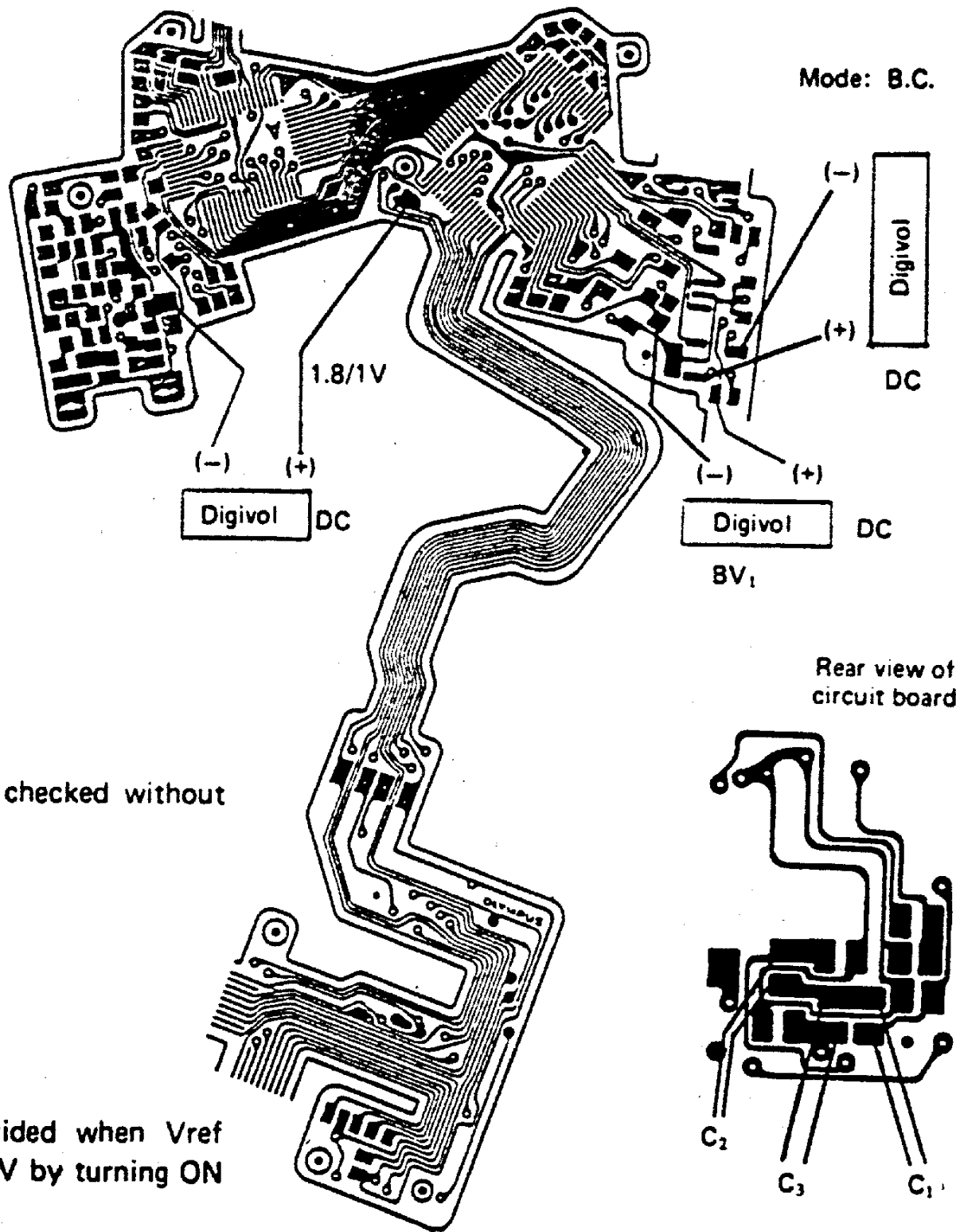
	HA	HB	1.8/1V	Bias voltage	BV	BV ₁
IC leg No.	7	6	12	9	18	Bipolar IC (77)
Voltage	3V	3V	1.8V	0V	-200 ~ -100mV	-200 ~ -100mV

B: During exposure (AUTO)

- Reference voltage during exposure: $1V \pm 0.1V$

	HA	HB	1.8/1V	Bias voltage	Trg	Integral	ANODE
IC leg No.	7	6	12	9	14	10	17
Voltage	3V	0V	1V	-	-	1.0 ~ 1.6V	-

(2) Wiring diagram



A. Vref 1.8/1 V only can be checked without detaching the front plate:

- Vref 1.8/1V
 - 1.8 V during indication
 - 1 V during exposure

B. Indirect checks

1. HB voltage

- The HB voltage is provided when Vref changes from 1.8 V to 1 V by turning ON of the main switch.

2. HA voltage

- The HA voltage is provided when the voltage applied across both ends of BV3 changes from 0 V to 25 mV by switching from AVERAGE to SPOT.

- Mode: B.C.

3. BV output voltage

- The BV output of the head amplifier can be judged by measuring voltage at BV1.
- The BV output of the head amplifier is nearly the same as the output voltage of BV1.

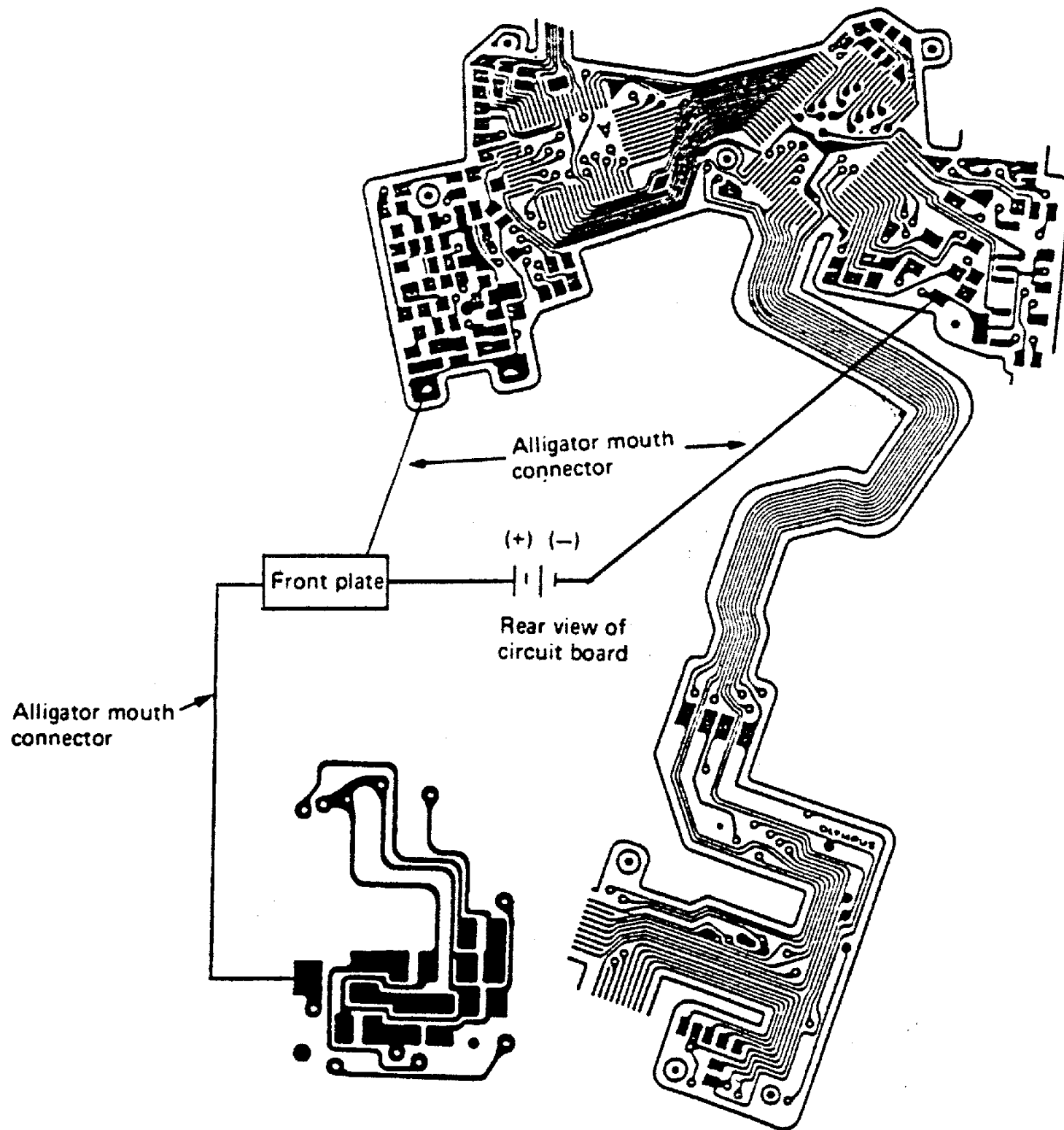
C. The other items should be checked after removing Araldite from the IC legs.

The front plate should be detached for the checks.

D. C₁, C₂ and C₃ are variable depending on ASA level.

Classification	ASA	Integrating capacitor
High ASA	320 ~ 3200	C ₃
Medium ASA	40 ~ 250	C ₂ + C ₃
Low ASA	6 ~ 32	C ₁ + C ₂ + C ₃

(3) Procedures to obtain indication after detaching the front plate from the camera body

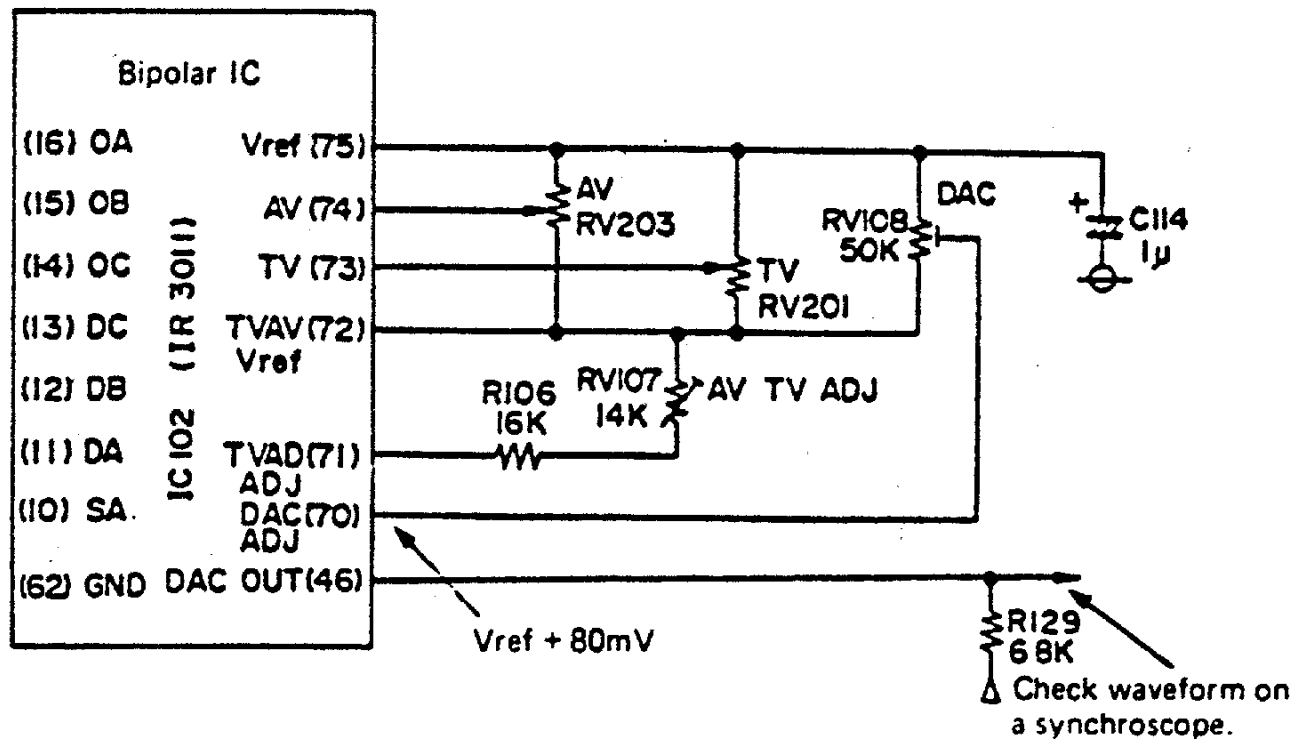


- After detaching the front plate
 1. Use a jig battery.
 2. Apply a positive voltage to the M circuit board.
Connect the camera body to the M circuit board using alligator mouth connectors.
 3. Apply a positive voltage to the head amplifier.
Connect the camera body to the M circuit board using alligator mouth connectors.
 4. Apply a negative voltage to the M circuit board.

10. DAC Circuit

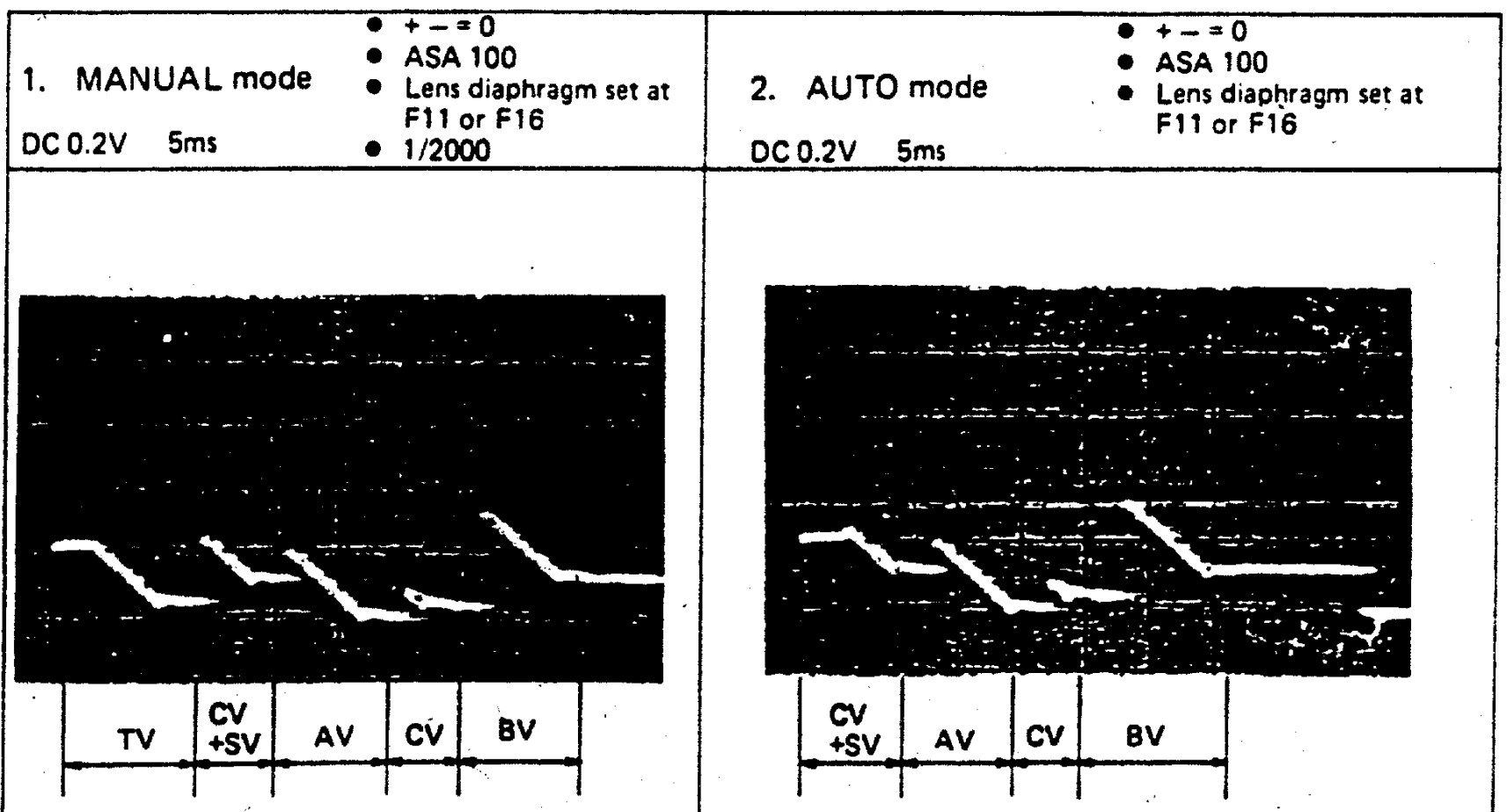
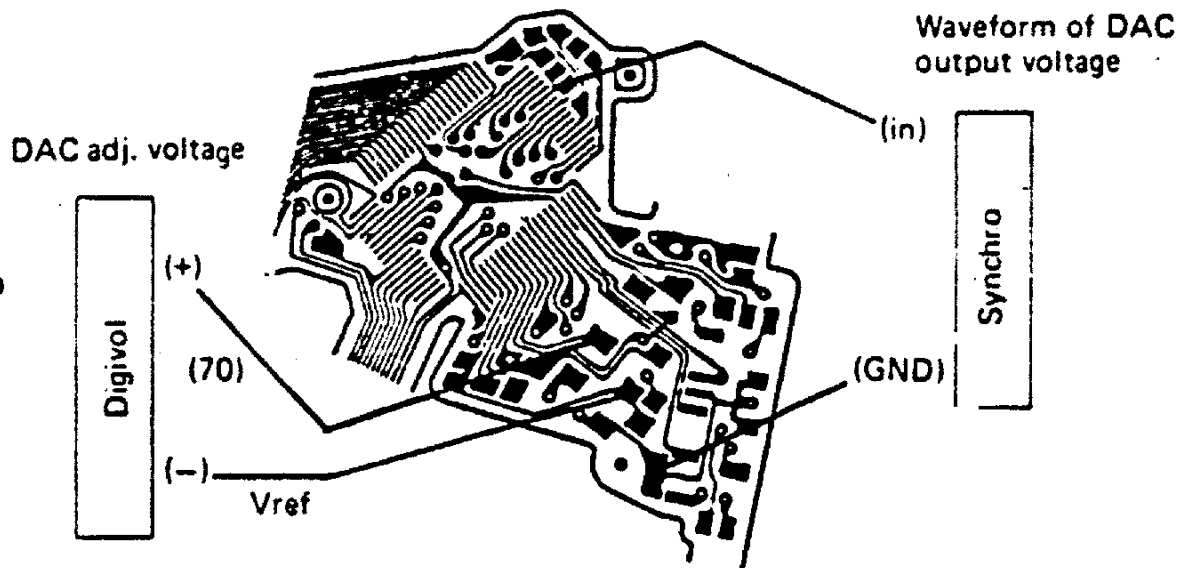
(1) Circuit diagram

- For voltages, refer to "DAC Adjustment" in "D. REASSEMBLY AND ADJUSTMENT"
- The DAC voltage is 18 mV per EV.



(2) Wiring diagram

- DAC output voltage
- TV: Shutter speed
- SV: ASA sensitivity
- AV: F stop value
- CV: Exposure correction
- BV: Luminance of object to be photographed



3. Variation depending on shutter time

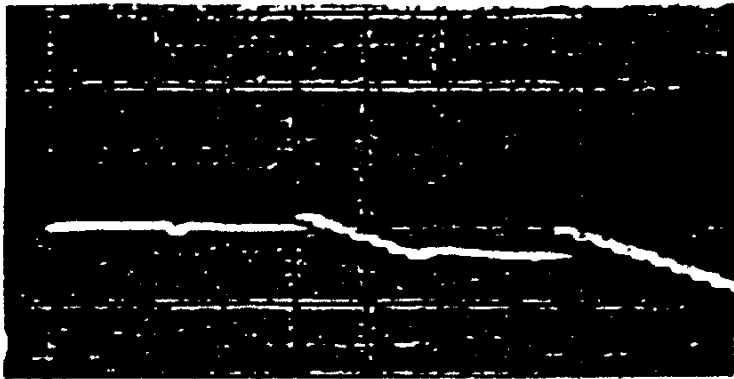
- MANUAL mode
- ASA 100
- +- = 0

4. Variation depending on exposure correction

- AUTO mode
- ASA 100
- Lens diaphragm set at F11 or F16

(1) 1 sec.

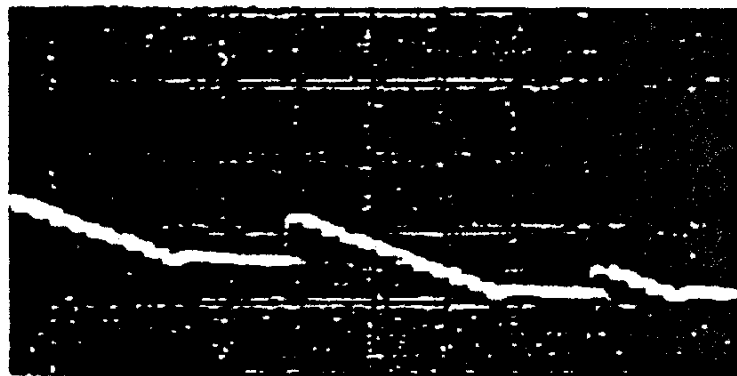
- DC 0.2V
- 2ms



1 sec.

(1) (+ -) Minus side

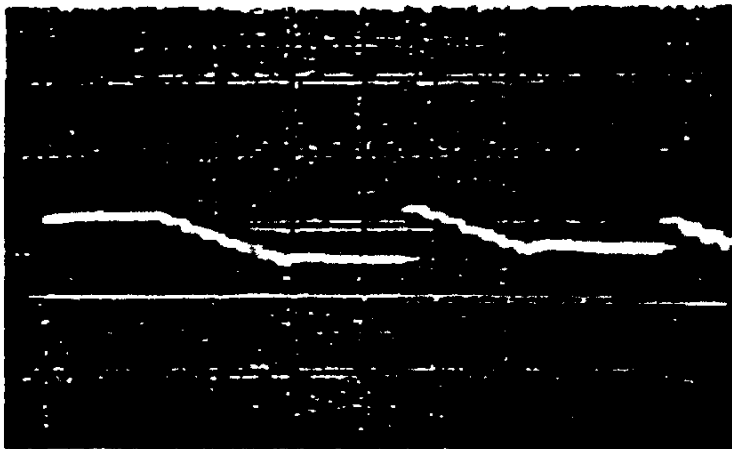
- DC 0.2V
- 2ms



-2EV

(2) 1/60 sec.

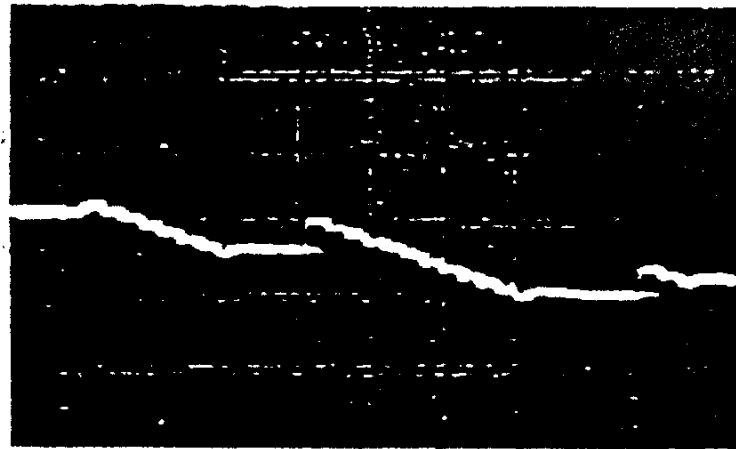
- DC 0.2V
- 2ms



1/60

(2) (+ -) 0

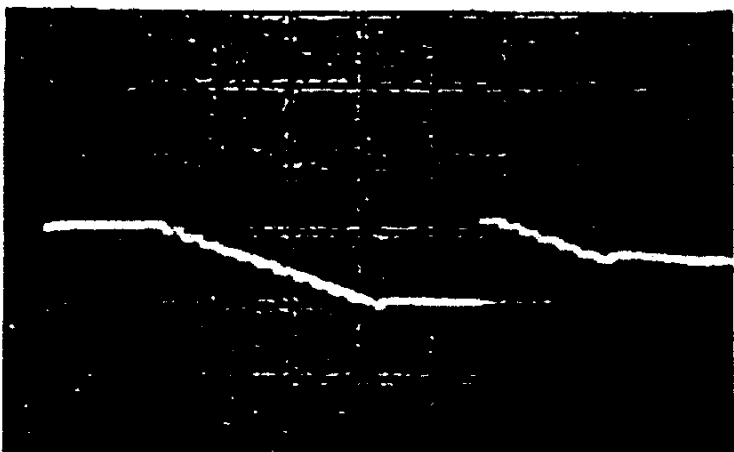
- DC 0.2V
- 2ms.



0EV

(3) 1/2000 sec.

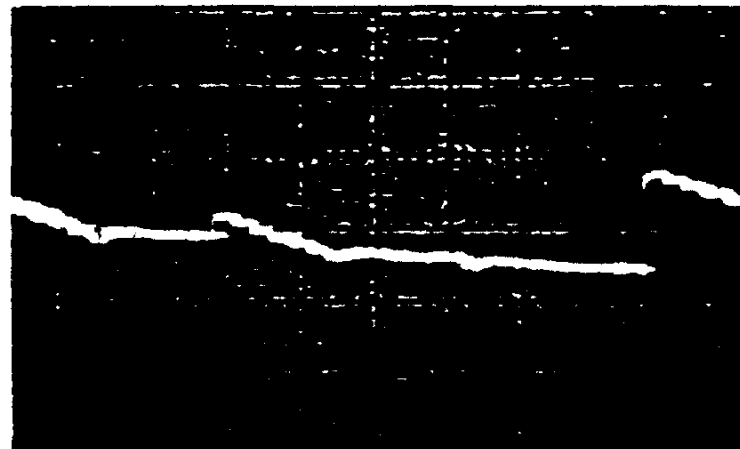
- DC 0.2V
- 2ms



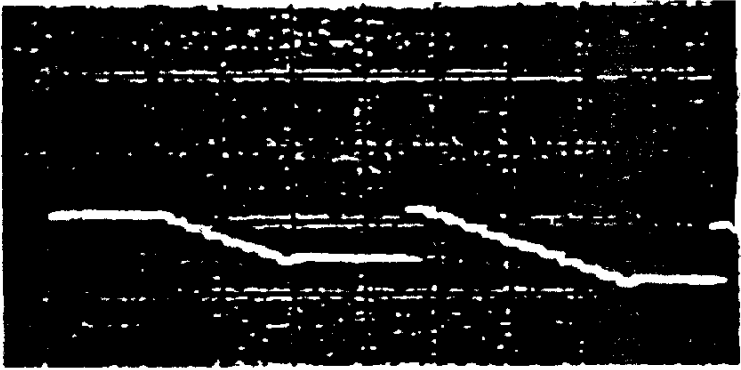
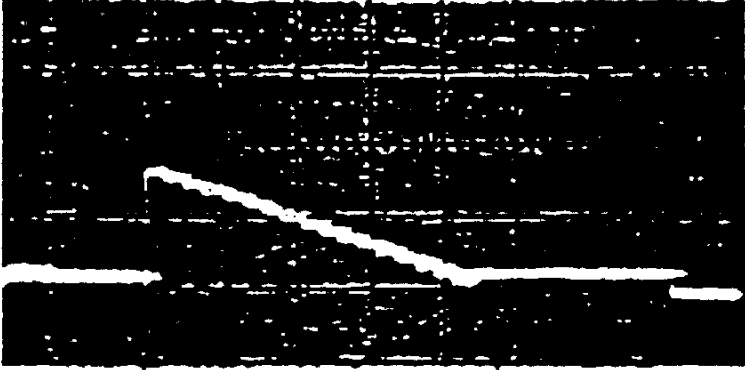
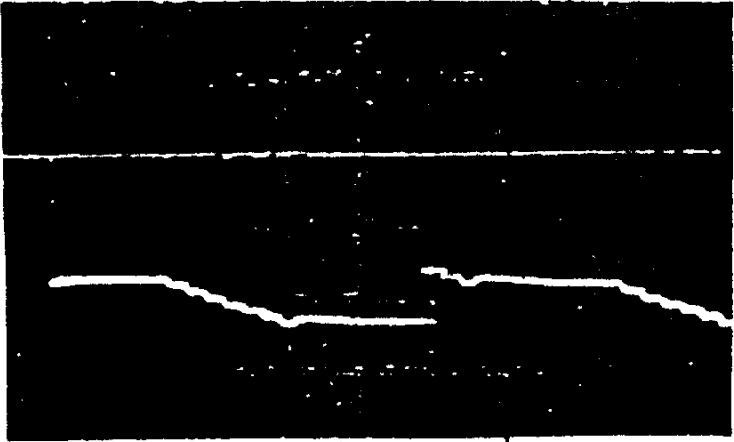
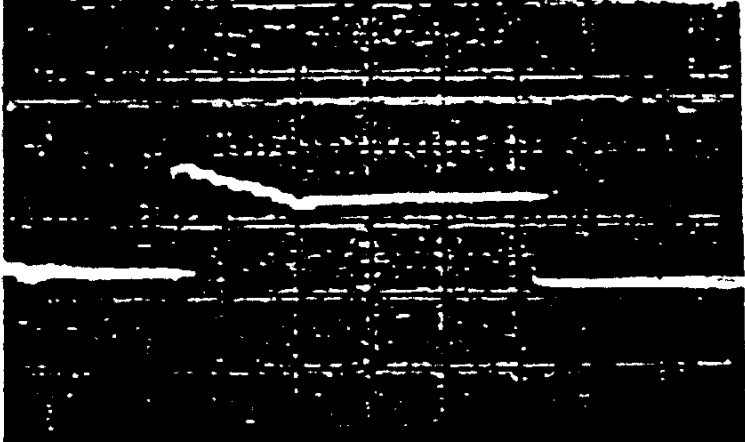
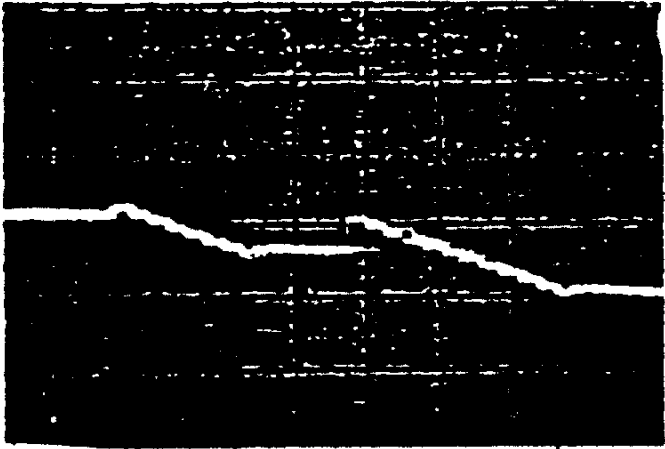
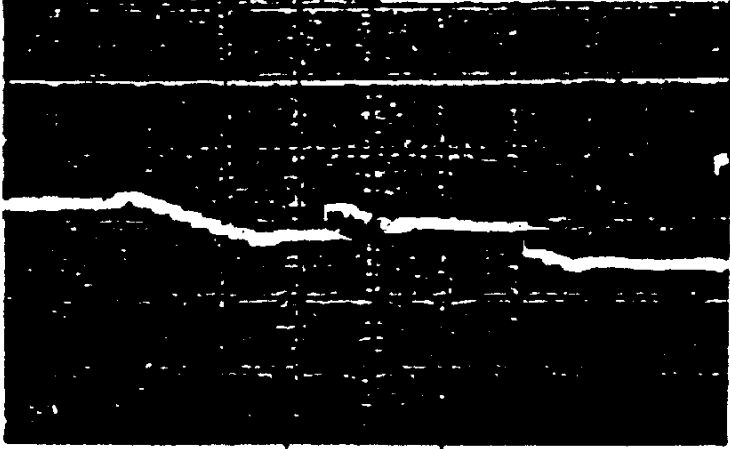
1/2000

(3) (+ -) Plus side

- DC 0.2V
- 2ms

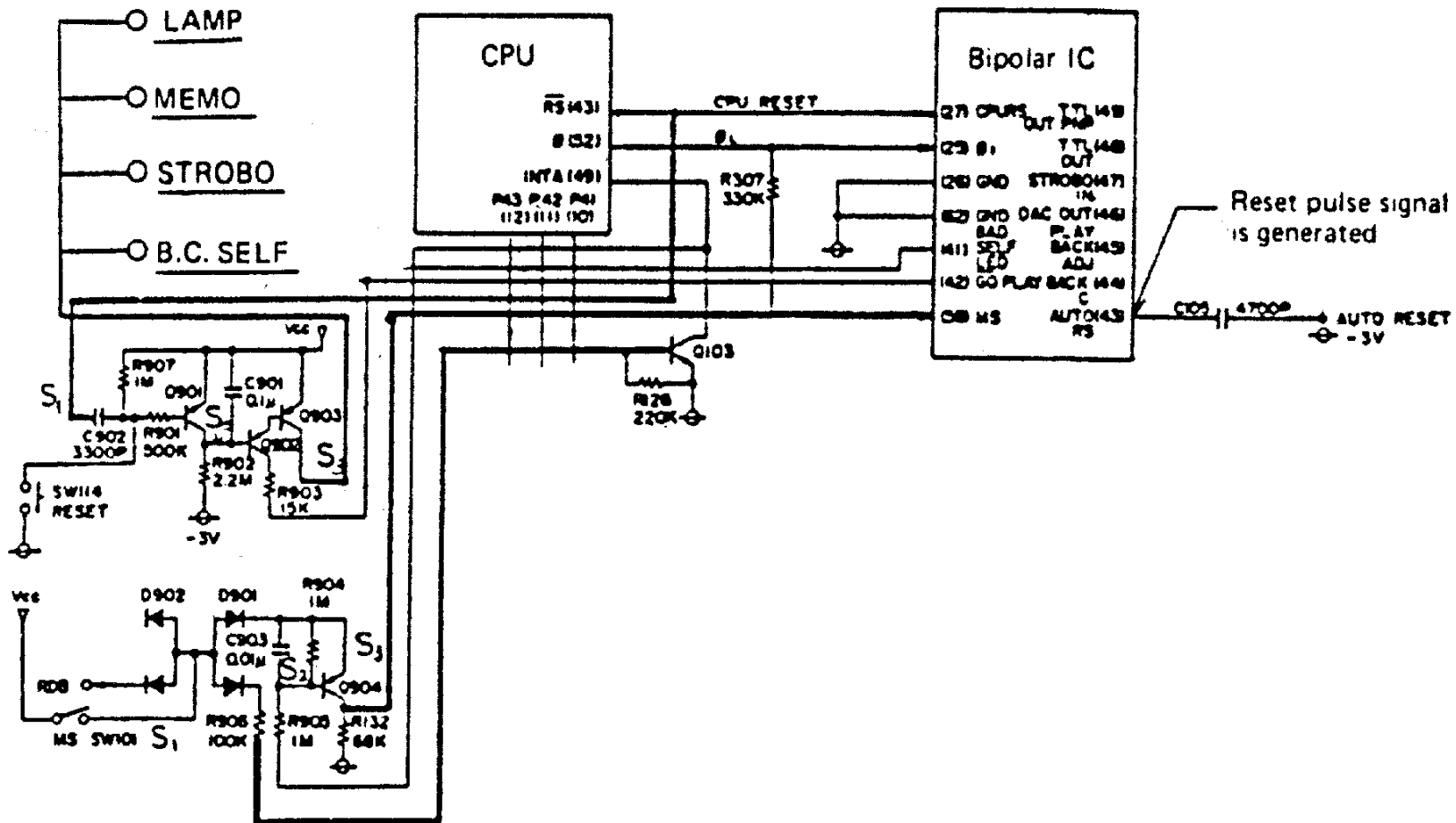


+2EV

<p>5. Variation depending on ASA level</p> <ul style="list-style-type: none"> ● MANUAL mode ● + - = 0 ● 1/60 	<p>6. Variation depending on lumfnance</p> <ul style="list-style-type: none"> ● AUTO mode ● ASA 100 ● + - = 0
<p>(1) Low ASA</p> <ul style="list-style-type: none"> ● DC 0.2V ● 2ms  <p style="text-align: center;">ASA 6 ~ 12</p>	<p>(1). Low lumfnance</p> <ul style="list-style-type: none"> ● DC 0.2V ● 2ms  <p style="text-align: center;">BV</p>
<p>(2) High ASA</p> <ul style="list-style-type: none"> ● DC 0.2V ● 2ms  <p style="text-align: center;">ASA 3200</p>	<p>(2) High lumfnance</p> <ul style="list-style-type: none"> ● DC 0.2V ● 2ms  <p style="text-align: center;">BV</p>
<p>7. Variation depending on stop value</p> <ul style="list-style-type: none"> ● AUTO mode ● ASA 100 ● (+ -) 0 ● DC 0.2mV ● 2ms 	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> (1) Stop-down condition </p>  <p style="text-align: center;">AV F11 or F16</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> (2) Open condition </p>  <p style="text-align: center;">AV F1.4</p>

11. Reset Circuit and Flash Misjudgement Preventive Circuit

(1) Circuit diagram

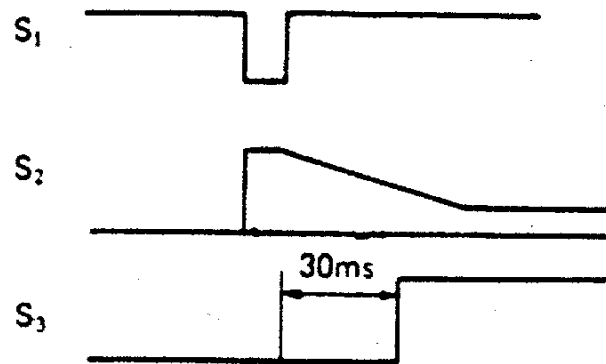


A. Reset circuit

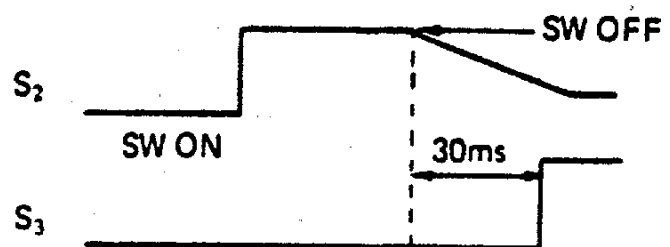
- The reset circuit forcibly extinguishes the LED, etc. sequentially for about 30 ms after the shutter is locked till power supply voltage is restored to the required level to turn it ON.
C105 is charged when battery voltage becomes lower than 2.65 V and discharges when voltage is restored to 2.91 V. Accordingly, the pulse signal is generated and inputted into C902 in the reset circuit to extinguish the LED, etc.
- Check waveform of the voltage on a synchroscope.

Time Chart

(Auto reset)

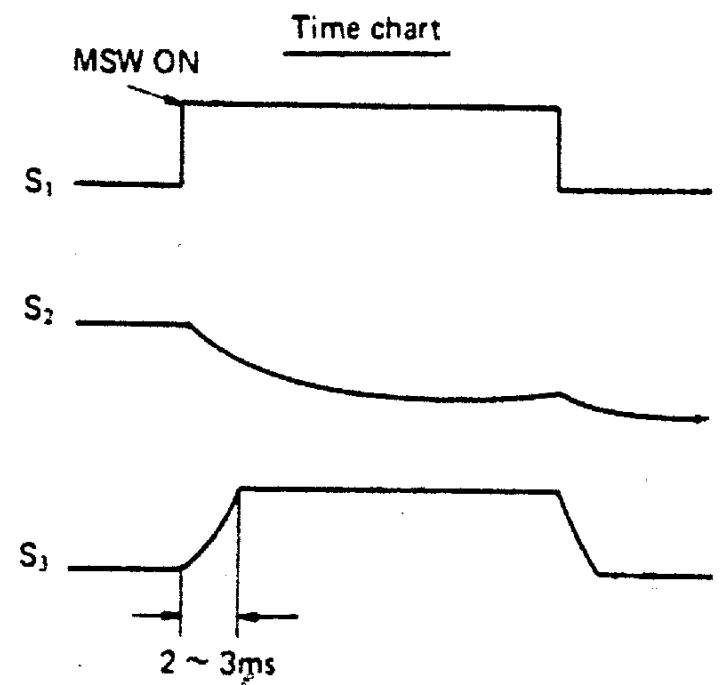


(Reset upon changing mode)



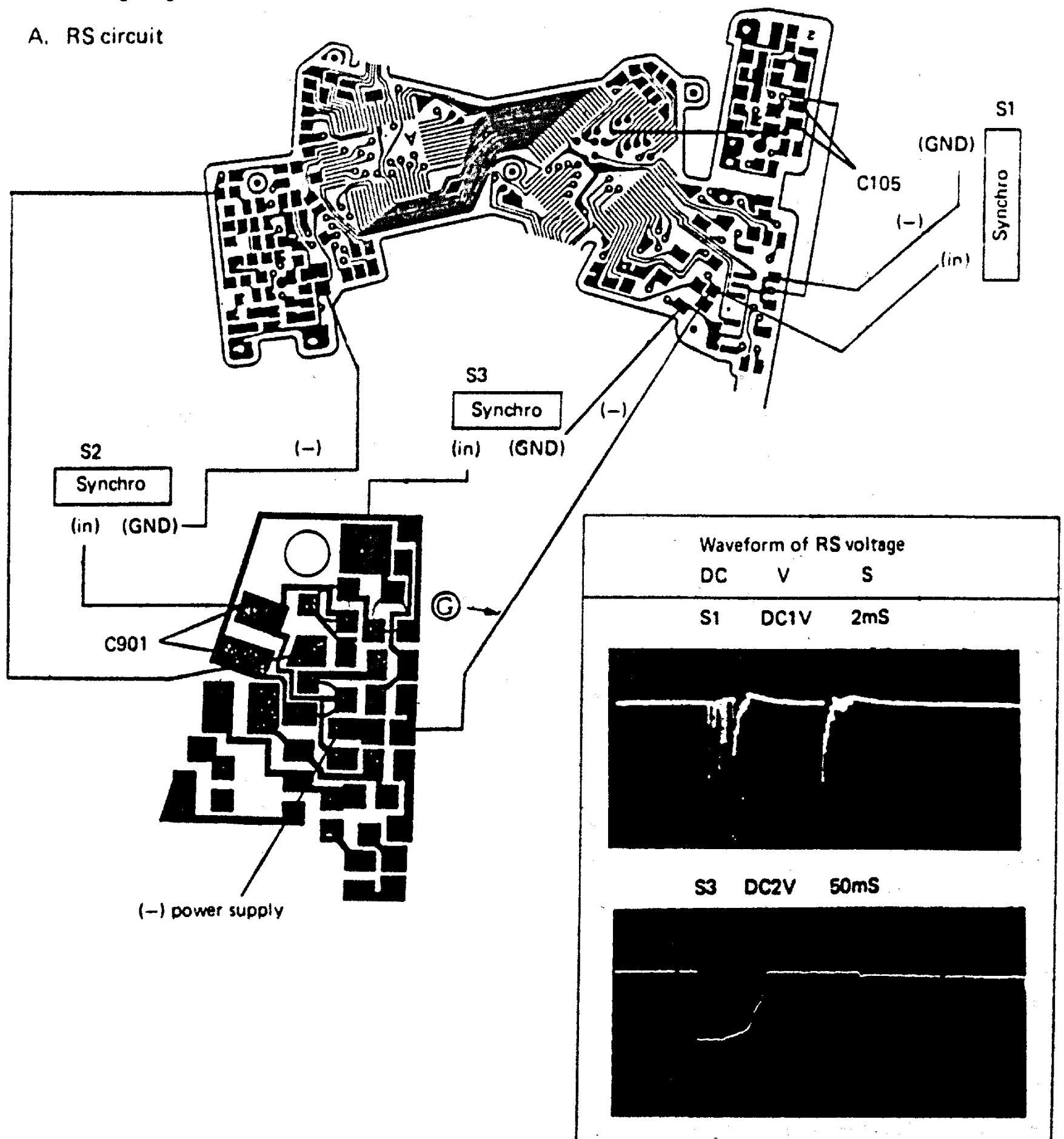
B. Flash misjudgement preventive circuit

- This circuit prevents the strobe from being flashed erroneously by misjudgement of shutter speed of 1/125 for 1/60.
- The circuit operates when the main switch is turned ON.
- Check voltages with a synchroscope:

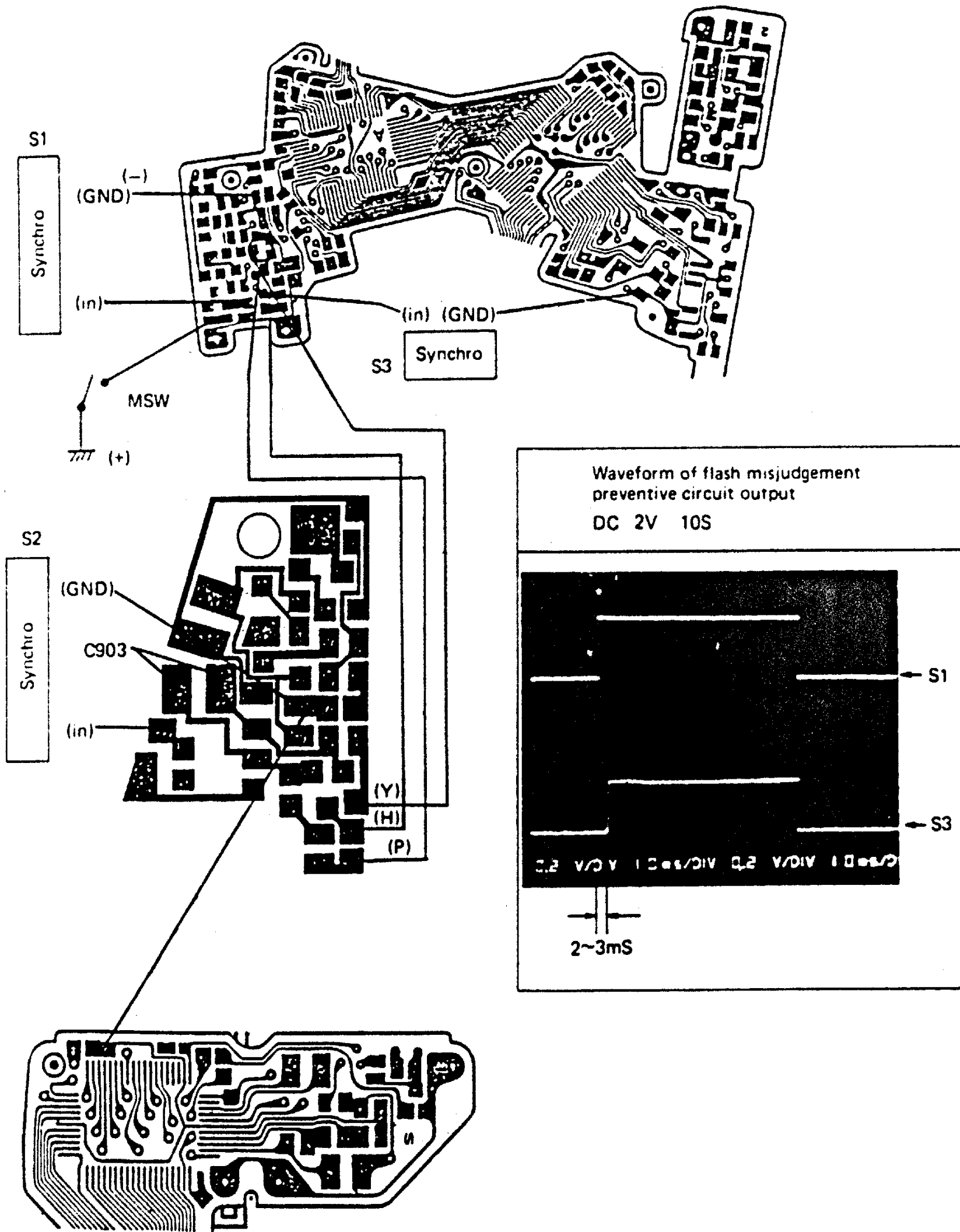


(2) Wiring diagram

A. RS circuit



B. Flash misjudgement preventive circuit



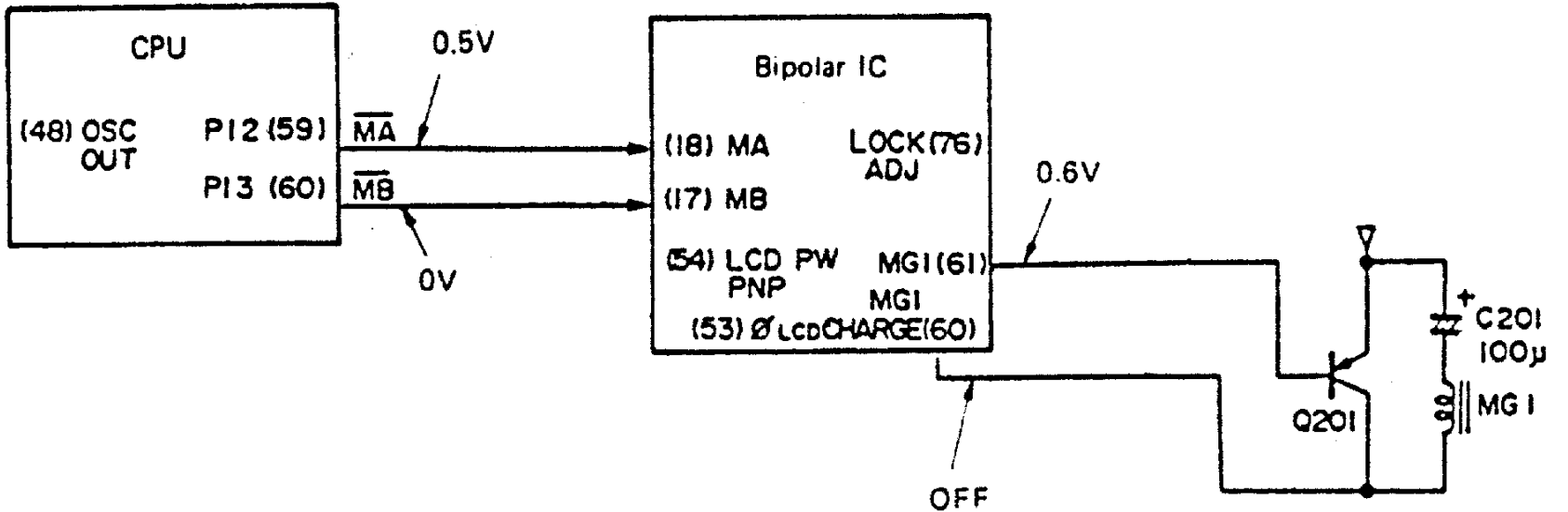
12. MG1 Drive Circuit

(1) Circuit diagram

- When the main switch is turned ON, the MA and MB signals are provided, and MG1 is driven.

• Preparations

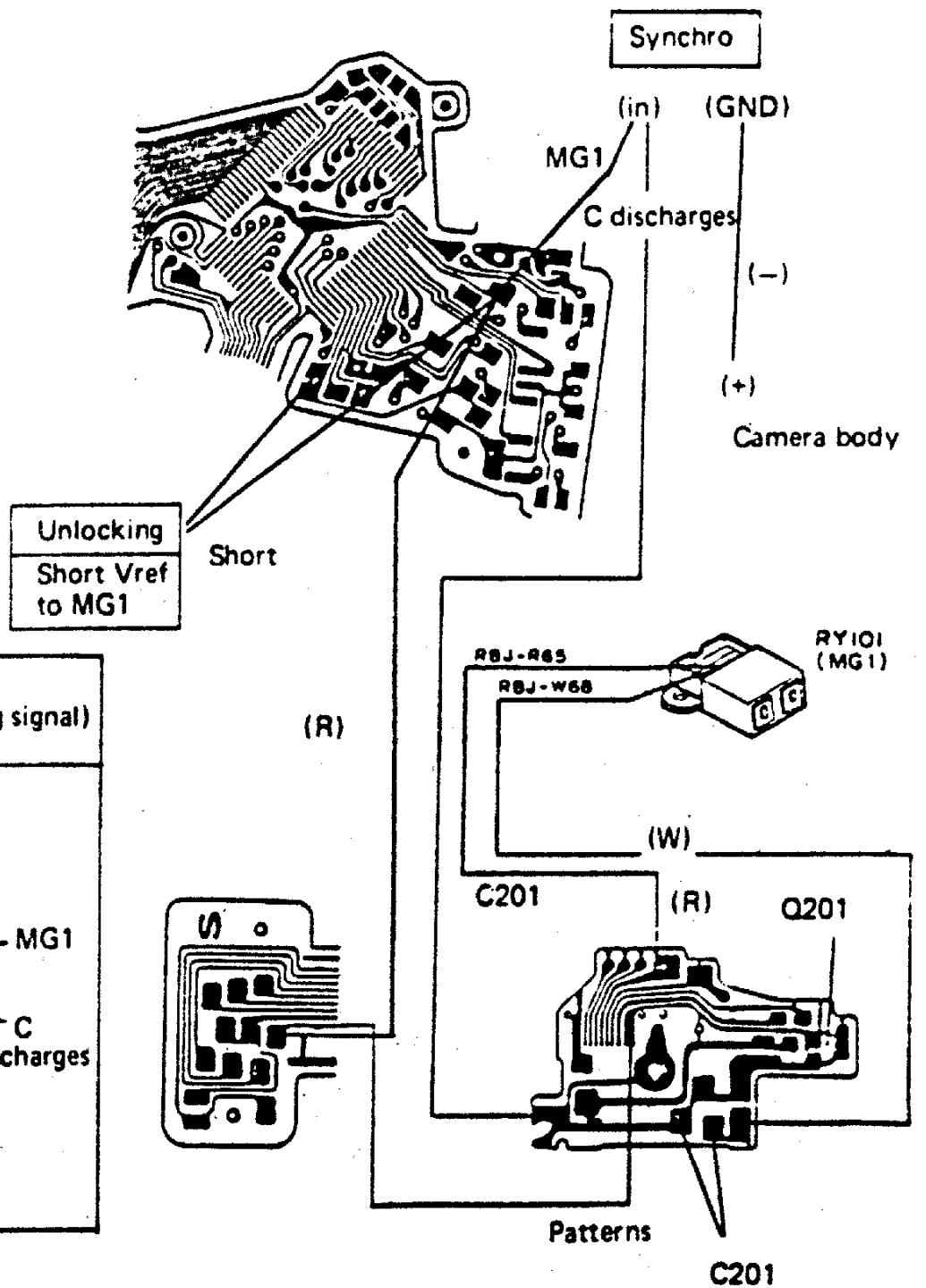
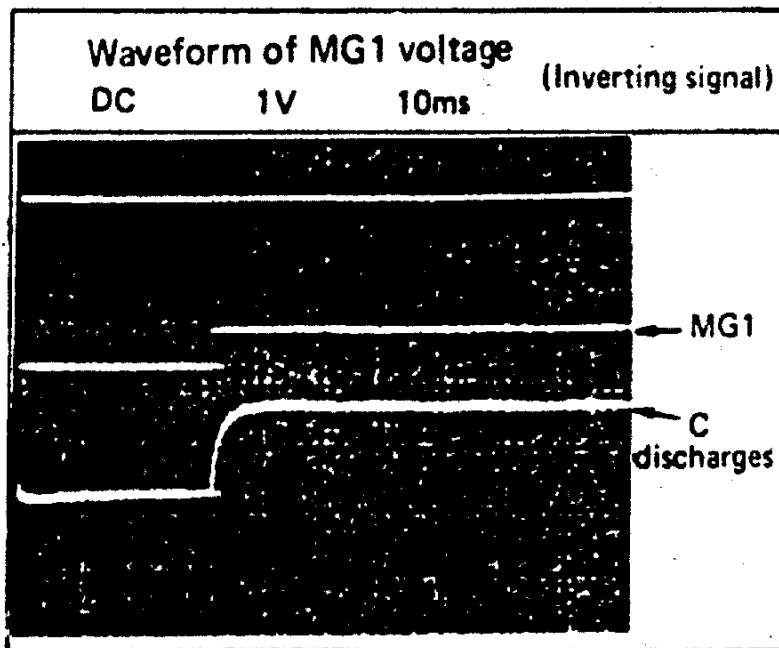
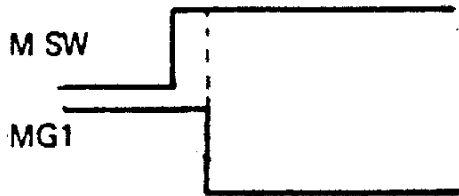
1. Measuring instrument: Synchroscope
2. Mode: AUTO or MANUAL
3. Checks upon releasing the shutter



(2) Wiring diagram.

- Measure voltages with a synchroscope.
- Set the camera in the AUTO or MANUAL mode.

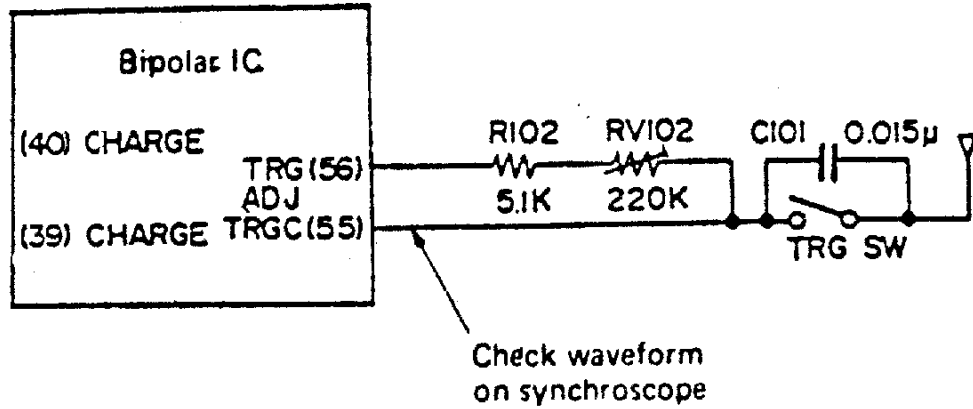
Time Chart



13. Trigger Drive Circuit

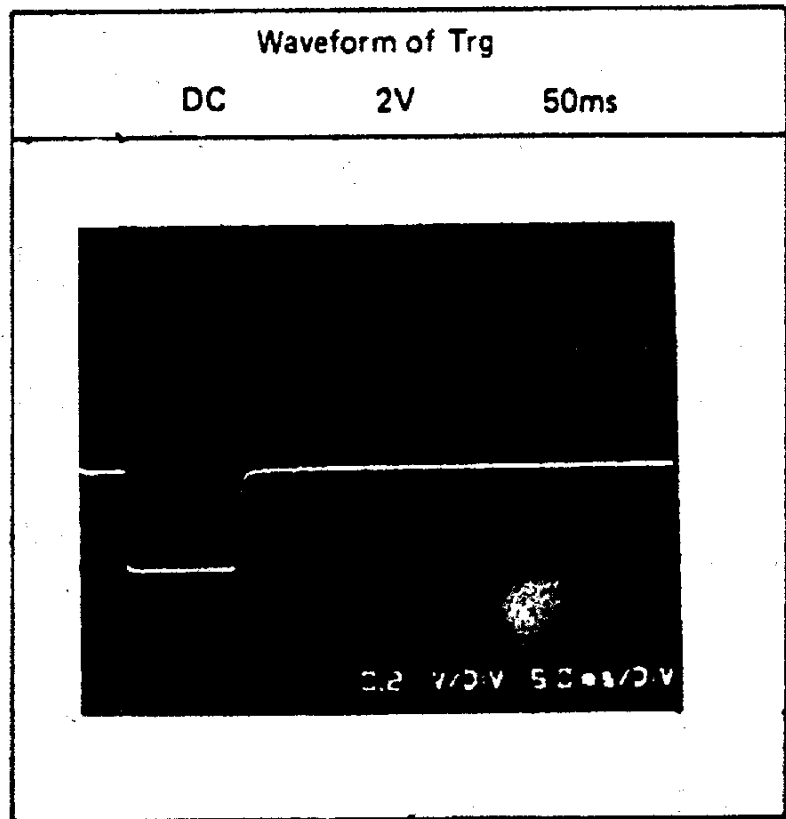
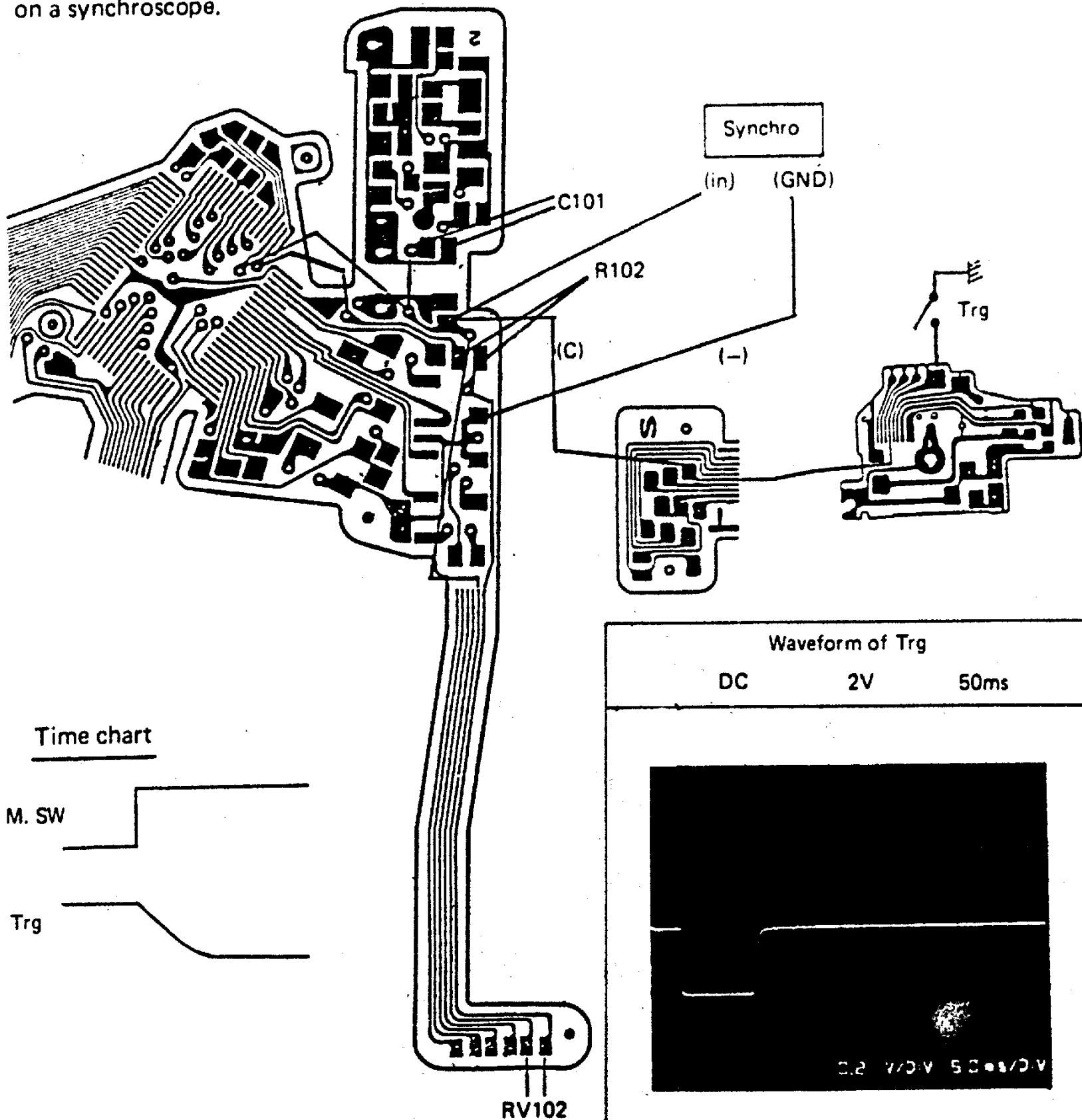
(1) Circuit diagram

- Preparations
 1. Measuring instrument: Synchroscope
 2. Mode: AUTO or MANUAL
 3. Measure voltages upon releasing the shutter.



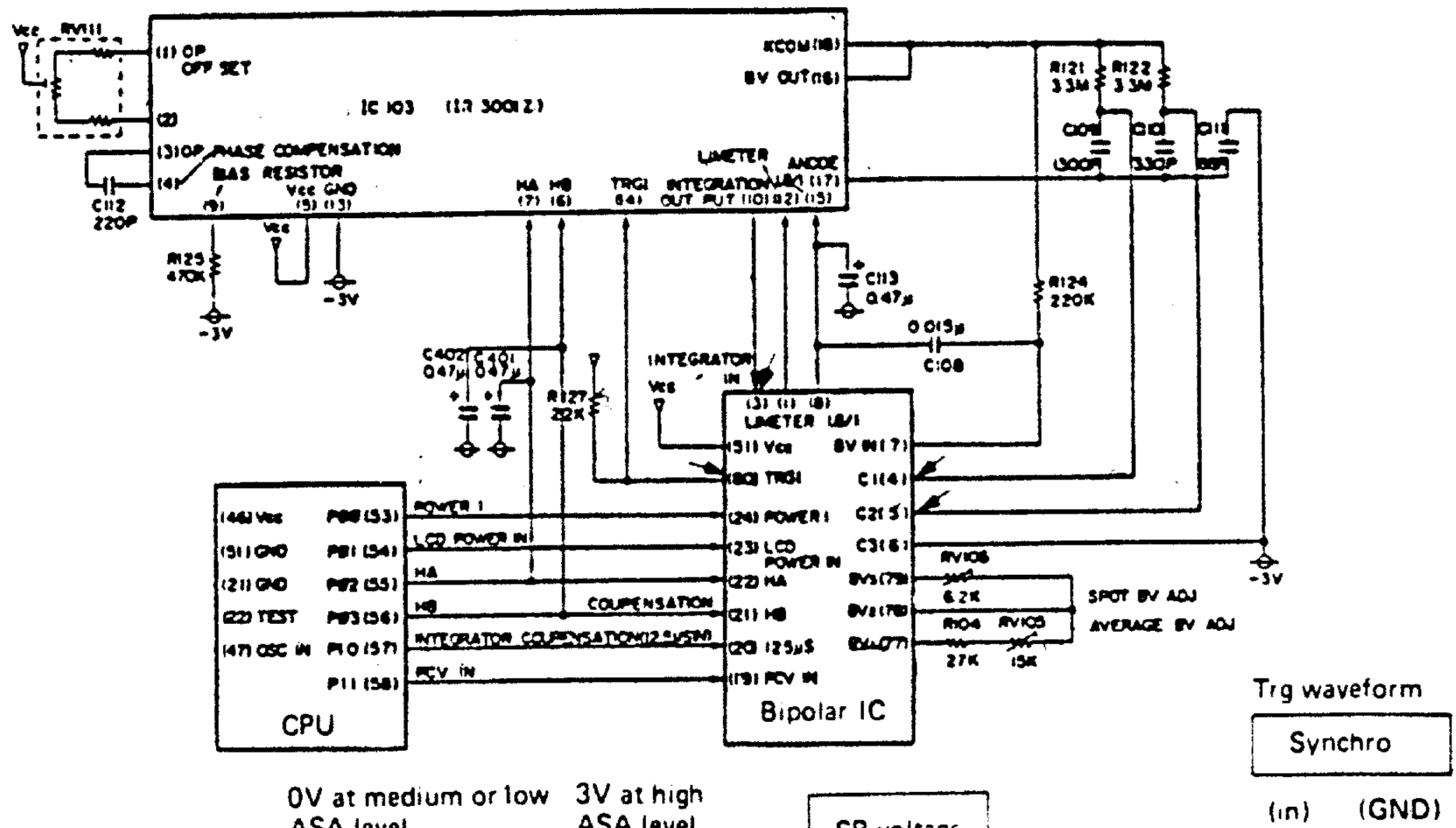
(2) Wiring diagram

- Check voltage waveforms on a synchroscope.



14. Head Amplifier (Exposure)

(1) Circuit diagram

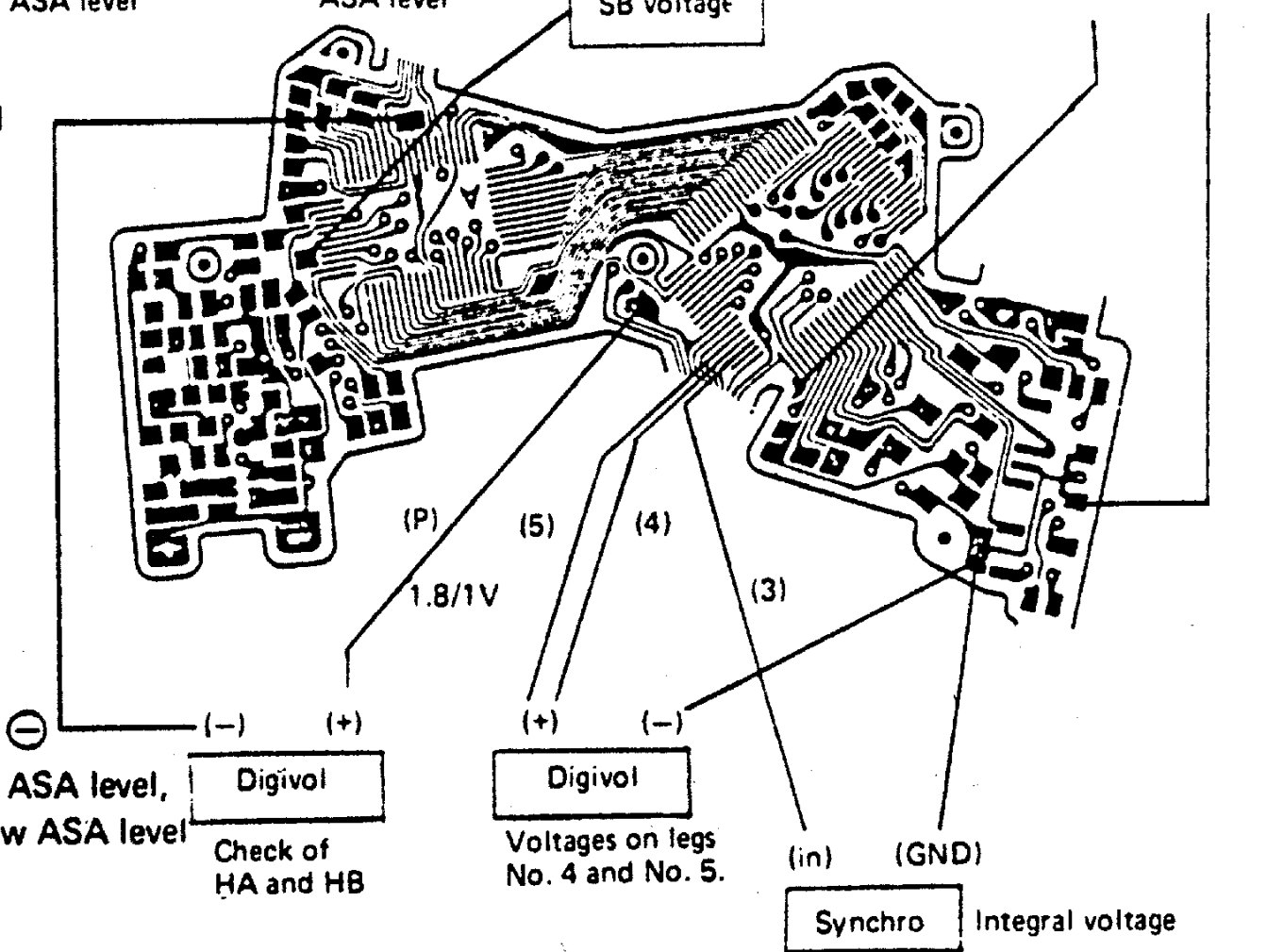


(2) Wiring diagram

- Switching of Vref 1.8/1 V when the main switch is turned ON.
- Switching of C value
 - AUTO mode
 - Main switch ON
 - Voltage on legs Nos 4 and 5.

ASA	4	5
High	OFF	OFF
Medium	OFF	0
Low	0	0

(Unit: V)

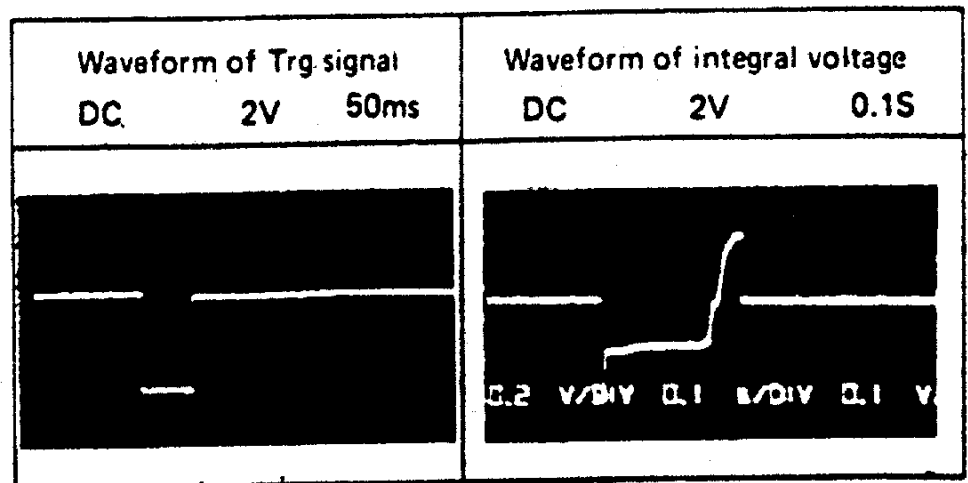


3. Integral voltage

- AUTO mode
- On pin No. 3 of the bipolar IC
- Check waveform with a synchroscope.

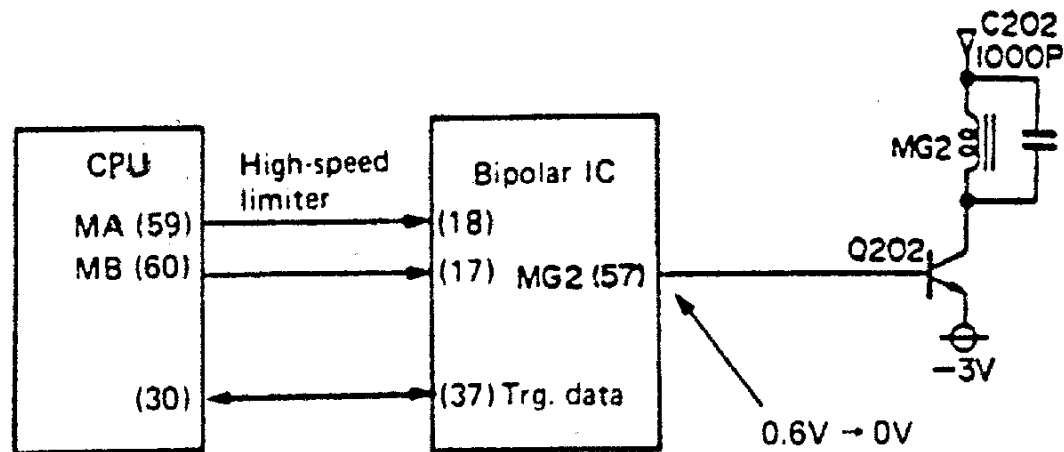
4. Trg signal

- AUTO mode
- On pin No. 80 of the bipolar IC
- Check waveform with a synchroscope.
- Check waveform at R127.

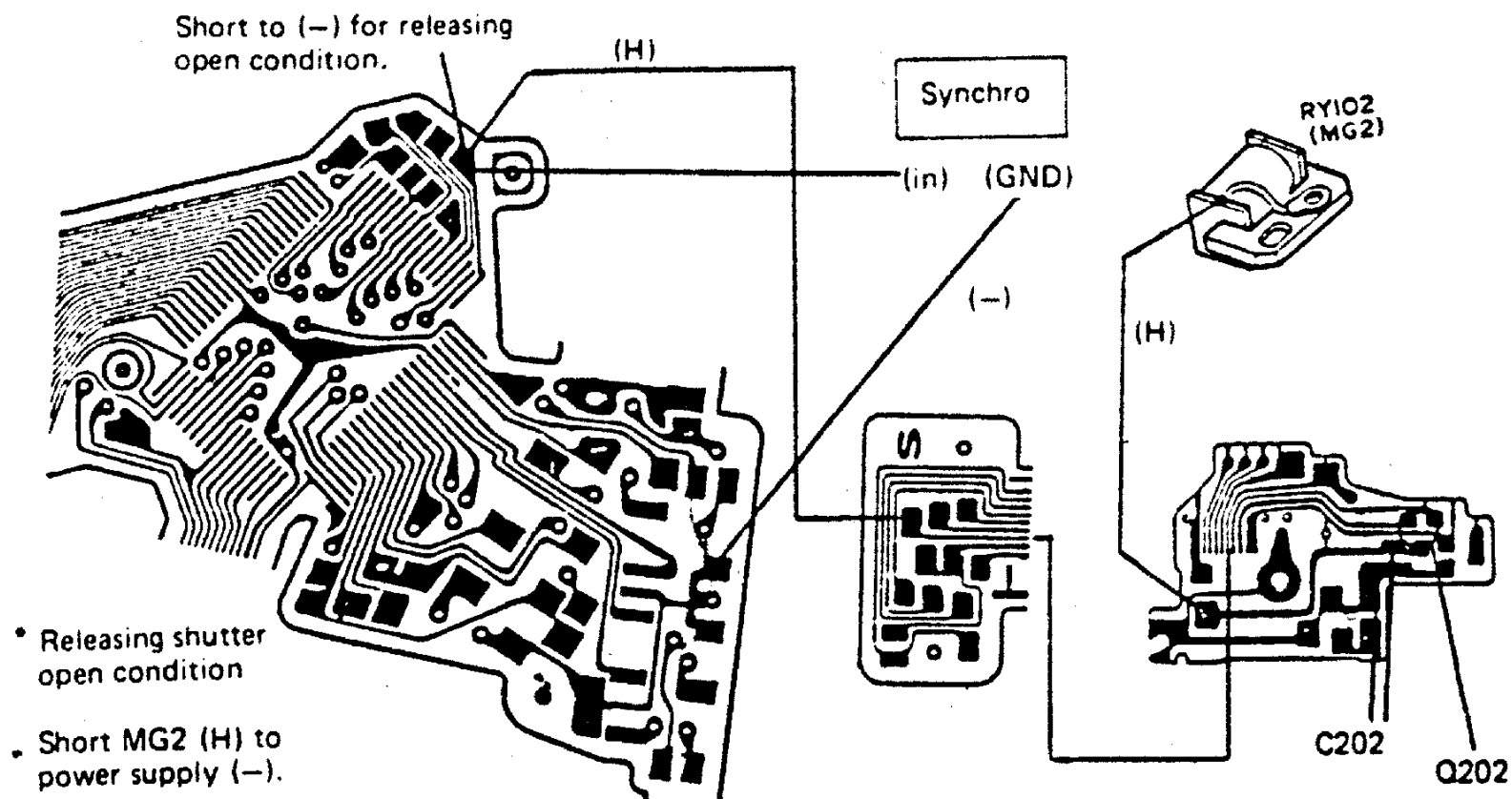


15. MG2 Drive Circuit: High-Speed Limiter

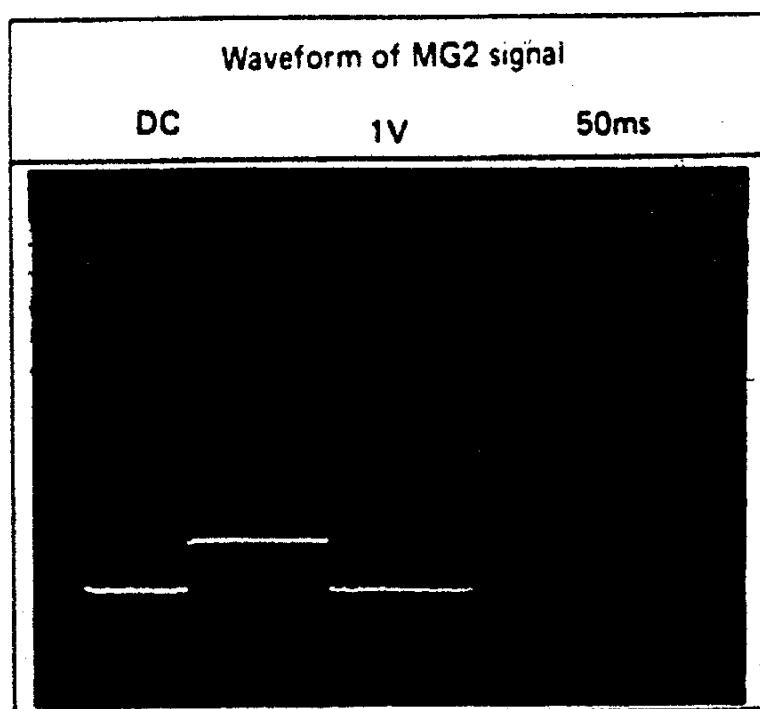
(1) Circuit diagram



(2) Stereoscopic view



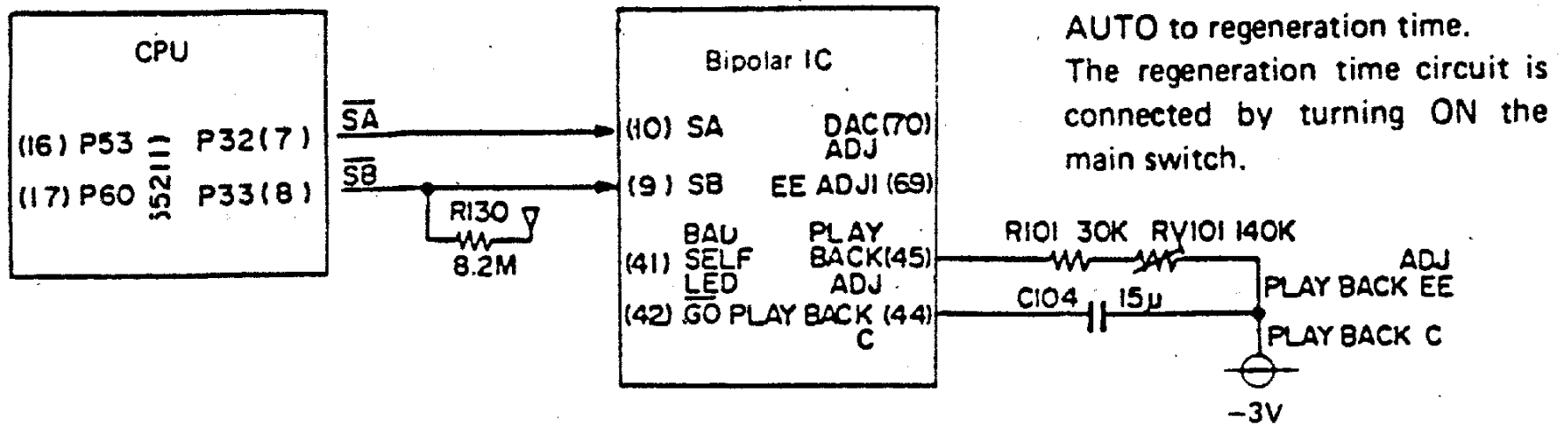
- Upon completing integration, the comparator is inverted in the bipolar IC to deenergize MG2.
- MG2 is deenergized by reducing voltage on pin No. 57 of the bipolar IC from 0.6 V to 0 V.
- High-speed limiter
 - When shutter speed is higher than 1/2000 in the AUTO mode, the CPU provides MA and MB (L and H) signals to forcibly deenergize MG2.
 - Malfunction of the high-speed limiter is caused by poor contact between the CPU and bipolar IC (or defect of the IC proper).



16. Regeneration Time Circuit

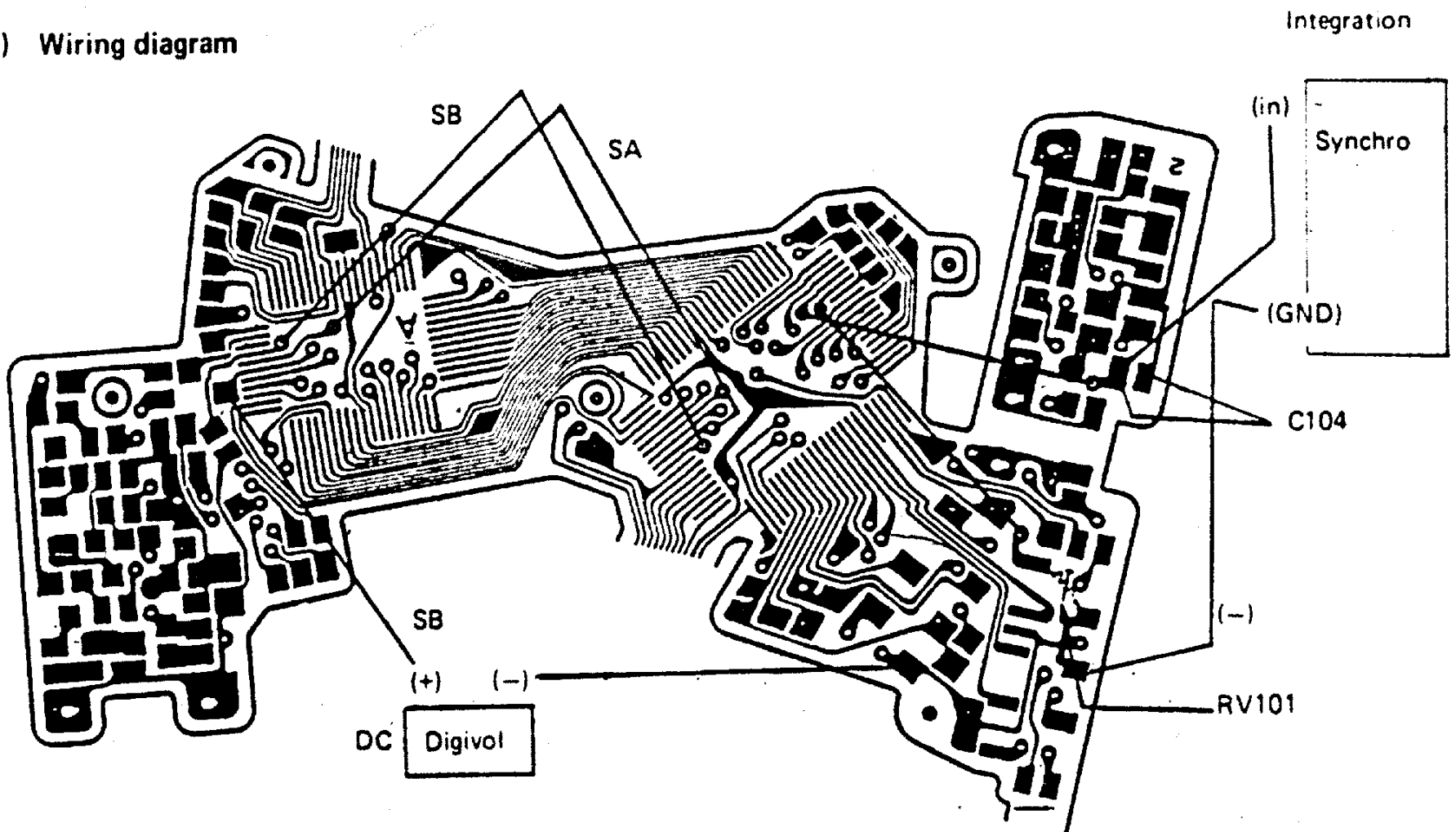
- The regeneration time means MANUAL, SPOT (AUTO or MANUAL) and MEMO time.

(1) Circuit diagram



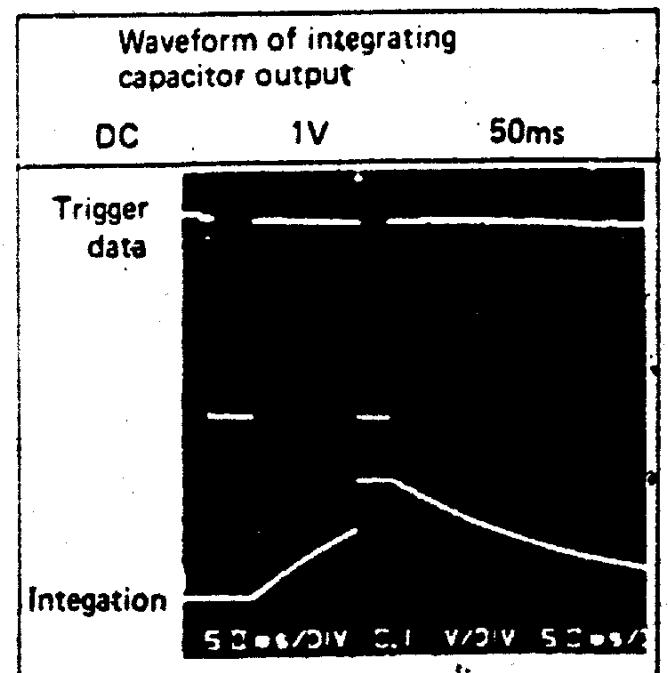
- The regeneration time circuit switches the comparator from AUTO to regeneration time. The regeneration time circuit is connected by turning ON the main switch.

(2) Wiring diagram



• Voltages

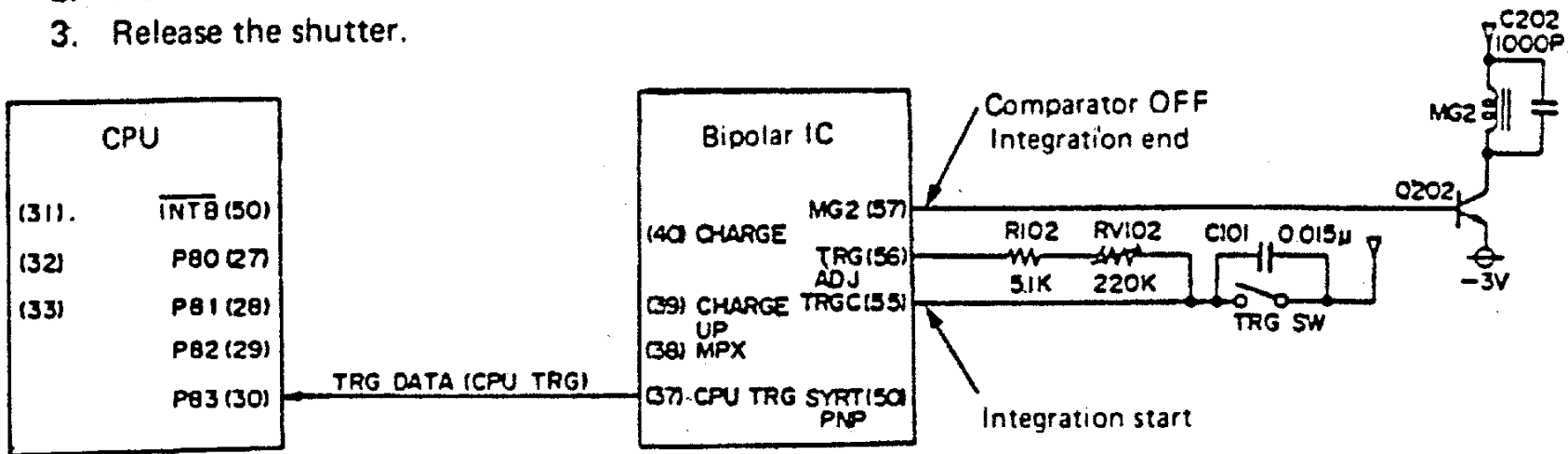
1. For regeneration time
SA 0.5V, SB 0.5V
Measure SB on the (-) terminal of R130.
SA should be checked after removing Araldite from the IC legs.
2. Measure voltage across both ends of RV101.
DC 0.12 V
3. Integrating capacitor voltage
 - Check voltage waveform with a synchroscope.
 - The comparator is inverted when the voltage reaches 1 V.



17. Trigger Data Latch Circuit

(1) Circuit diagram

- Checking procedures
 1. Measuring instruments: Digivol
Synchroscope
 2. Mode: AUTO or MANUAL
 3. Release the shutter.



(2) Wiring diagram

- The CPU judges start and end of the integration from the trigger data signals.
- Integration start: Trg OFF
- Integration end: Comparator OFF

