Ref. No. 3701
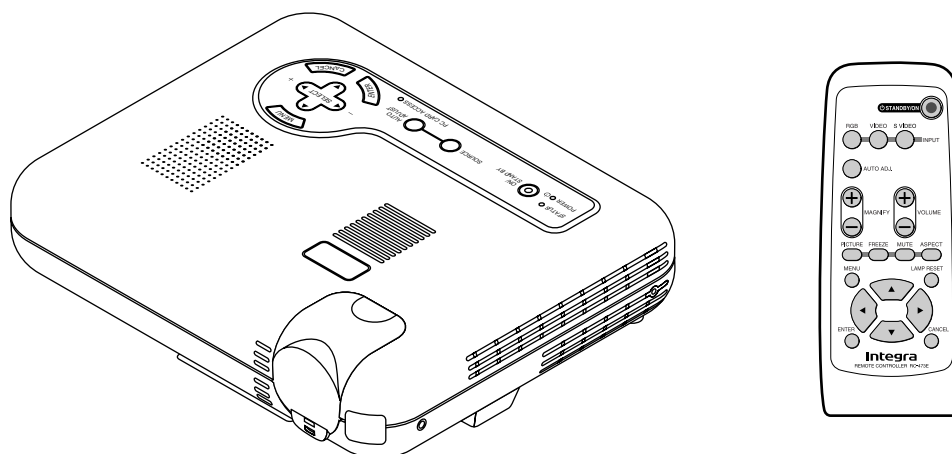
Integra SERVICE MANUAL

Nov, 2001

Digital Light Processing Projector
MODEL DLV-100

UUD	100 - 120 / 200 - 240 V AC, 50 / 60 Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

1. Application

This specification sheet applies for DLV-100.

    Model   <u>DLV-100</u>

    NEC Model code   01152009

2. General

2.1 Operation temperature range

    +5 ~ +35 degree C (Humidity 20-80%RH, not in the dewfall.)

2.2 Storage temperature range

    -10 ~ +50 degree C

2.3 Power source

    100 ~ 120 VAC / 200 ~ 240 VAC +/-10%, 50 / 60 Hz

2.4 Input Current

    2.2/1.1A (MAX.)

2.5 Inspection condition

Inspection shall be done by AC120V / 60 Hz unless no rule is specified.

As for the projection condition, the screen is perpendicularly installed to the set and the projection screen is in WIDE condition of 60 inches. When test, inspector shall be 2 +/- 0.3 m away from the screen.
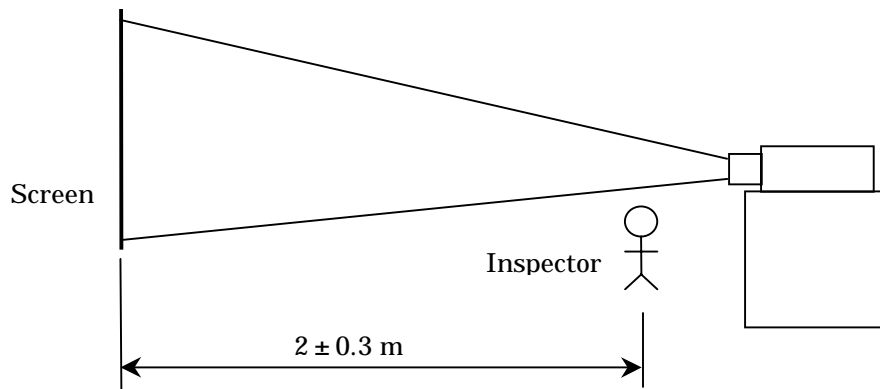

Screen

Inspector

2± 0.3 m

Fig. 1   Condition

3. Main parts specifications

3.1 DMD panel

    Single Chip Digital Micromirror Device(DMD)

    1024 x 768 pixels

3.2 Lens

    Manual zoom and focus

    F-no.=2.61~2.84, f=28.35~34.02mm

3.3 Lamp

    135W DC Lamp

    Average lifetime   1,000H

The definition of average lifetime is the time that light becomes half with the continuous lighting-up.

(Notes)

The lamp bulb can be ruptured, while using a projector.

When the lamp bulb is ruptured, there is a small crack and pieces of glass, which may be scattered in the lamp case.

4. Electric specifications

4.1 Input signal band width

RGB	80MHz
Video	6.5MHz

4.2 Graduation

256 grade full color (16,777,216 color)

4.3 Display resolution

NTSC/PAL/YCbCr	550TV lines
SECAM	300TV lines
RGB	1024dots(H)× 768dots(V)

4.4 Input terminal

RGB	1 input: Mini D-SUB 15pin
	YCbCr:shares with the RGB terminal
VIDEO	1 input: RCA
S-VIDEO	1 input: DIN 4pin
Audio	1 input: Stereo mini jack
PC Control	1 input: DIN 8pin
USB	1 input: Type A
PC Card	1 input: CompactFlash

4.5 PC Card Viewer

This Viewer can display the JPEG/BMP image which is preserved in CompactFlash (CF).
CF correspond to SanDisk CF 128Mbytes media.

4.6 Y/C Separation

NTSC/PAL

4.7 Input signal (RGB)

Horizontal Freq.	15 ~ 100KHz(RGB: 24KHz or over)
Vertical freq.	50 ~ 120Hz
Pixel clock freq.	Less than 100MHz
Capable resolution	UXGA 1600dot(H)× 1200dot(V) Max.
Sync system	Separate Sync/Composite Sync/Sync on G

4.8 Input signal level

RGBHV Input	R,G,B	0.7Vp-p / 75ohm positive
	Y	1.0Vp-p / 75ohm positive
	Cb,Cr(Pb,Pr)	0.7Vp-p / 75ohm
	H/V Sync	4.0Vp-p / TTL posi./nega
	Composite Sync	4.0Vp-p / TTL posi./nega
	Sync on G	0.3Vp-p / 75 ohm negative
VIDEO		1.0Vp-p / 75 ohm
S-VIDEO	Y:	1.0Vp-p / 75 ohm
	C:	0.283Vp-p / 75 ohm
AUDIO		0.5Vrms / 22 K ohm

4.9 Audio output

1W monaural Speaker

4.10 On Screen Display
      1. Pull down menu
         Basic/Custom menu <> Advanced menu
      2. Multilingual menu
         English / French /German / Italian / Japanese / Spanish / Swedish
4.11 Remote
      Palm type remote unit
4.12 Input current
      2.2A 100 ~ 120VAC/1.1A 200 ~ 240VAC
4.13 Plug & Play data
      Tab.1   EDID data

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	38	A3	D3	00	01	00	00	00
10	27	0B	01	02	0E	00	00	78	0A	34	70	95	59	4F	88	26
20	15	4A	53	FF	FF	80	31	59	45	59	61	59	71	59	81	4F
30	81	99	A9	4F	01	01	EA	24	00	60	41	00	28	30	30	60
40	13	00	00	00	00	00	00	1E	F9	15	20	F8	30	58	1F	20
50	20	40	13	00	00	00	00	00	00	1E	00	00	00	FD	00	32
60	78	0F	64	0A	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4F	4E	4B	59	4F	20	44	4C	56	31	30	30	0A	00	E2

4.14 Safety test
  (1)Dielectric strength test
    By the test vessel, under the condition of main power supply ON,
    Apply AC voltage of 1500V(+50/-0) ,at 50Hz or 60Hz for 1.5~2 second between power supply
    circuit part(AC) and exposure metal part.
    No insulation destruction, catching fire, and so on is allowed.
   (2) Insulation resistance test
    Measure insulation resistance between power supply circuit part(AC) and exposure metal
    part (FG) under the condition of main power ON(Stand By mode) by using 500V insulate
    ohmmeter.
    Insulation resistance shall be more than 50M ohm.
  (3)Leakage electric current test
    Measure leakage electric current by the leakage ammeter under the condition of main power
    supply ON (Standby condition). The measurement impedance should be measured by
    the build in resistor of 1.5K　, with the bypass capacitor of 0.15μ F.
    The leakage electric current should be less than 2mA each.

4.15 Signal table
    Refer to Tab.2.

5. Optical specifications

5.1 Brightness

Normal : 630 ANSI lumens minimum

High Brightness : 750 ANSI lumens minimum

It contains 5 % of measurement tolerance.

5.2 Contrast ratio

700 : 1 typical

It contains 20 % of measurement tolerance.

5.3 Relative illumination

More than 70%

On the screen which is shown in figure 2, apply following formula with condition of Aj as the illumination of point j.

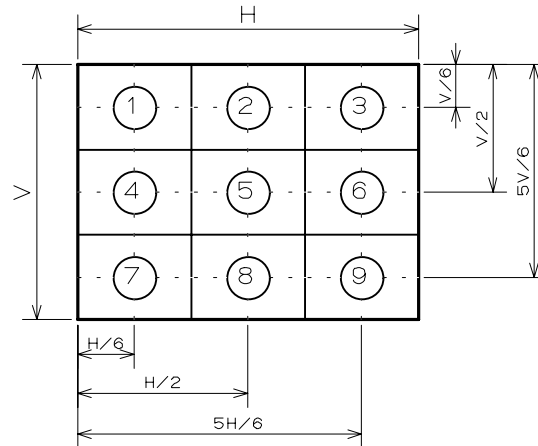Relative illumination = $(A1 + A3 + A7 + A9) / (4 \times A5) \times 100$ [%]

Fig.2　The measurement point

5.4 Chromaticity

x=0.234 – 0.344(0.289 +/- 0.055)

y=0.269 – 0.379(0.324 +/- 0.055)

5.5 Throwing angle

14.3 degree(+/- 5%)

5.6 Projection size

Min. 30 inch / 1.16 m (wide)

Max. 200 inch / 9.67 m (tele)

(For the details, refers to Tab.3.)

5.7 Geometry distortion

Less than 1.11%

5.8 Pixel defects and blemishes

1. No adjacent dark pixels.

2. No bright pixels.

3. No unstable pixels.

4. 5 dark pixels.

5. 7 blemishes

6. No dark blemishes.(Using the blue 180 screen)

7. No bright blemishes.(Using the gray 35 screen)

Note) Blue 180 screen

All areas of the screen are colored a Microsoft paintbrush blue 180(green and red set at 0).

Note) Gray 35 screen

All areas of the screen are colored a Microsoft paintbrush gray 35(green, red, and blue set at 91).

5.9 Stray light

In all the black signals , a thing with no stray light in the inside of the display area.

6. Mechanical specifications

6.1 Dimensions

243 (w) x 196 (D) x 53 (H)

Not including lens, feet and prominence.

6.2 Weight

1.5 Kg / 3.3 Lbs

6.3 Outside figure

Refer to the separate sheet (drawing number 2410447_)

There shall be no scratch and dirt, which becomes a problem for actual use.

6.4 Tilt foot

5 degree adjustable (Front foot)

6.5   Fan noise

39dB (Normal) / 43 dB (High)

The way of measuring and the measurement condition is based on the following.

"Guidelines for LCD Projector Measuring Procedures and Measuring Conditions"

Established in June 1999

Issued by Japan Business Machine Makers Association

Data Projector Committee

URL http://www.jbma.or.jp

6.6 After cooling

90 sec, approx.

7. Safety and EMC regulations

7.1 Safety regulations

UL1950, CSA950

7.2 EMC regulations

FCC Class B

8. Accessories

Power Cable, RGB Signal Cable, Remote Control, Batteries AAx2, Lens Cap, String & Rivet, Soft Carrying Case, Manual, Quick Connect Guide, Warranty Card   (Refer to PA_DLV100.pdf)

9. Packing specifications
9.1 Packing dimensions
366 (W) x 465 (D) x 197 (H)
9.2 Packing weight
5.0 Kg
9.3 Packing method
Refer to Fig.5.

10. Doubtful point
When doubtful point occurred to this specification and when changes will become necessary, ONKYO and NEC Viewtechnology, Ltd. shall discuss each other and shall
issue a revised spec.

Tab.2   Signal table

No.	Signal	Resolution (dots)	H Frequency (KHz)	V Refresh Rate (Hz)	Dot Clock (MHz)
1	NTSC		15.734	60	-
2	PAL		15.625	50	-
3	PAL60		15.734	60	-
4	SECAM		15.625	50	-
5	VESA	640 x 350	37.86	85.08	31.5
6	NEC	640 x 400	24.83	56.43	21.053
7	MAC	640 x 400	35	66	30.24
8	NEC	640 x 400	31.47	70	25.175
9	IBM	640 x 400	31.47	70	25.175
10	VESA	640 x 400	37.86	85.08	31.5
11	VESA	640 x 480	31.47	59.94	25.175
12	IBM	640 x 480	31.47	60	25.175
13	MAC	640 x 480	31.47	60	25.175
14	NEC	640 x 480	31.47	60	25.175
15	MAC	640 x 480	34.97	66.67	31.334
16	MAC 13"	640 x 480	35	66.67	30.24
17	VESA	640 x 480	37.86	72.81	31.5
18	VESA	640 x 480	37.5	75	31.5
19	IBM	640 x 480	39.375	75	31.49
20	VESA	640 x 480	43.269	85.01	36
21	IBM	720 x 350	31.469	70.09	28.322
22	VESA	720 x 400	37.927	85.04	35.5
23	IBM	720 x 350	39.44	87.85	35.5
24	IBM	720 x 400	39.44	87.85	35.5
25	VESA	800 x 600	35.16	56.25	36
26	VESA	800 x 600	37.879	60.32	40
27	VESA	800 x 600	48.077	72.19	50
28	VESA	800 x 600	46.88	75	49.5
29	VESA	800 x 600	53.674	85.06	56.25
30	MAC 16"	832 x 624	49.725	74.55	57.283
31	VESA	1024 x 768	35.5	43 INT	44.9
32	VESA	1024 x 768	48.363	60	65

No.	Signal	Resolution (dots)	H Frequency (KHz)	V Refresh Rate (Hz)	Dot Clock (MHz)
33	VESA	1024 x 768	57.476	70.07	75
34	MAC 19"	1024 x 768	60.241	74.93	80
35	VESA	1024 x 768	60.023	75.03	78.75
36	VESA	1024 x 768	68.677	85	94.5
#37	VESA	1152 x 864	67.5	75	108
#38	MAC 21"	1152 x 870	68.681	75.06	100
#39	SUN	1152 x 900	61.796	65.95	92.94
#40	SGI	1152 x 900	71.736	76.05	105.6
#41	VESA	1280 x 960	60	60	108
#42	VESA	1280 x 960	85.94	85	148.5
#43	VESA	1280 x 1024	63.981	60.02	108
#44	MAC(1280EG)	1280 x 1024	69.87	65.18	118.5
#45	NEC(EWS4800)	1280 x 1024	75.12	71.2	125
#46	VESA	1280 x 1024	79.976	75.03	135
#47	VESA	1280 x 1024	91.146	85.02	157.5
#48	VESA	1600 x 1200	75	60.0	162
#49	VESA	1600 x 1200	81.25	65.0	175.5
#50	VESA	1600 x 1200	87.5	70.0	189
#51	VESA	1600 x 1200	93.75	75.0	202.5
#52	HDTV (1080i)	1920 x 1080	33.75	60 Interlace	74.25
#53	HDTV (720p)	1280 x 720	45	60Progressive	74.25
54	SDTV (480p)	720 x 483	31.47	59.94 Progressive	27
55	DVD YCbCr		15.734	59.94 Interlace	-
56	DVD YCbCr		15.625	50 Interlace	-

Images are compressed by Advanced AccuBlend
Only separate sync is available for UXGA signals.

Tab.3   Projection size and throwing angle

Screen Size						Wide			Tele		
						Projection Distance		Screen bottom	Projection Distance		Screen bottom
		H	E	D	g	C	α	B	C	α	B
Diagonal (inch) (mm)		Width （mm） a/5*4	Height （mm） a/5*3	Half height （mm） E/2	Projector base to lens center （mm）	Distance （mm）	Degree tan^{-1}(D+B/ C)	Height of Screen Bottom （mm）	Distance （mm）	Degree tan^{-1}(D+B/ C)	Height of Screen Bottom （mm）
30	762	610	457	229	38	1158	14.7	77	1411	12.2	78
40	1016	813	610	305		1560	14.6	103	1897	12.1	104
60	1524	1219	914	457		2363	14.4	154	2869	12	155
80	2032	1626	1219	610		3167	14.4	206	3841	12	207
100	2540	2032	1524	762		3971	14.3	257	4813	12	259
120	3048	2438	1829	914		4775	14.3	309	5785	11.9	311
150	3810	3048	2286	1143		5981	14.3	386	7243	11.9	389
180	4572	3658	2743	1372		7186.	14.3	463	8701	11.9	466
200	5080	4064	3048	1524		7990	14.3	515	9673	11.9	518

(Note)
The value in the table is a design value including +/- 5 % tolerance
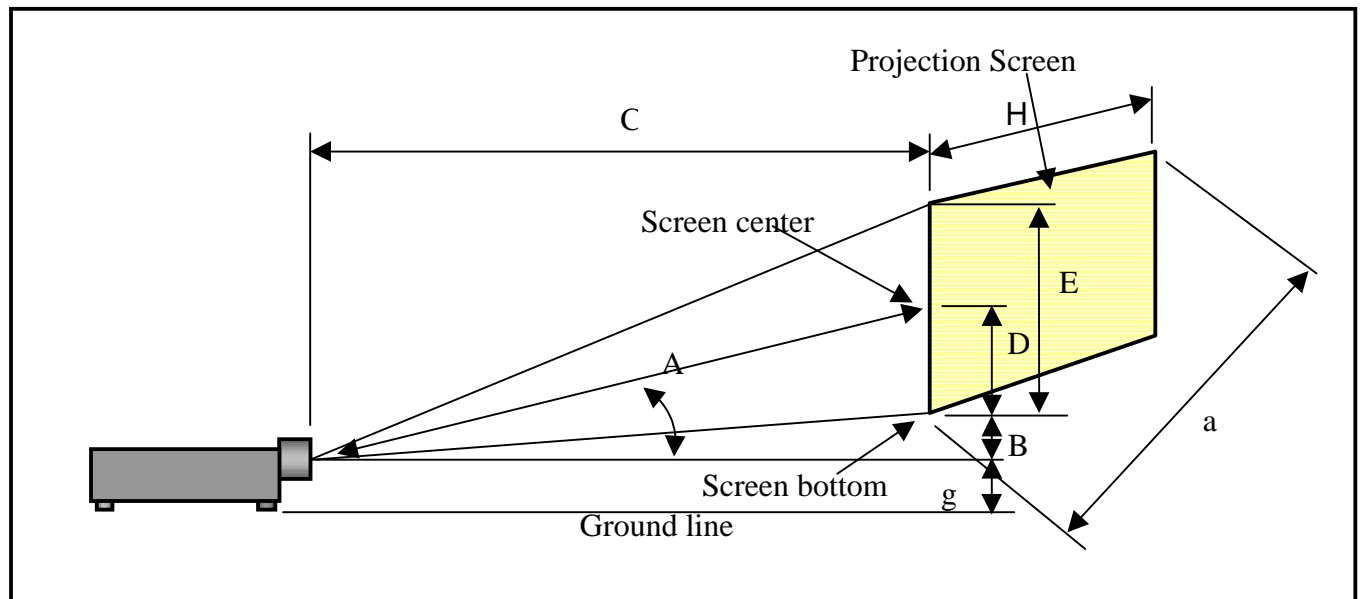
Fig.4   Projection figure

_____SAFETY PRECAUTIONS

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol warns the user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any part inside of this unit.

This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included.
Therefore, it should be read carefully in order to avoid any problems.

ATTENTION

RISQUE D'ELECTROCUTION
NE PAS OUVRIR

MISE EN GARDE: AFIN DE REDUIRE LES RISQUES D' ELECTROCUTION, NE PAS DEPOSER LE COUVERCLE, IL N'Y A AUCUNE PIECE UTILISABLE A L'INTERIEUR DE CET APPAREIL. NE CONFIER LES TRAVAUX D'ENTRETIEN QU'A UN PERSONNEL QUALIFIE.

Ce symbole a pour but de prévenir l' utilisateur de la présence d' une tension dangereuse, non isolée se trouvant à l' intérieur de l' appareil. Elle est d' une intensité suffisante pour constituer un risque d' électrocution. Eviter le contact avec les pièces à l' intérieur de cet appareil.

Ce symbole a pour but de prévenir l' utilisateur de la présence d' importantes instructions concernant l' entretien et le fonctionnement de cet appareil. Par conséquent, elles doivent être lues attentivement afin d' éviter des problèmes.

SAFETY PRECAUTIONS

During servicing carefully observe the following.

1. OBSERVE ALL PRECAUTIONS

Items and locations that require special care during serv-icing, such as the cabinet, chassis, and parts are labelled with individual safety instructions. Carefully comply with these instructions and all precautions in the instruction manual.

2. BE CAREFUL OF ELECTRIC SHOCK

The chassis carries an AC voltage. If you touch the chassis while it is still alive, you will get a severe shock. If you think the chassis is alive, use an isolating transformer or gloves, or pull out the plug before replacing any parts.

3. USE SPECIFIED PARTS

The components have been chosen for minimum flammability and for specific levels of resistance value and withstand voltage. Replacement parts must match these original specifications. Parts whose specifications are particularly vital to safe use and maintenance of the set are marked ⚠ on the circuit diagrams and parts list. Substitution of these parts can be dangerous for you and the customer, so use only specified parts.

4. REMOUNT ALL PARTS AND RECONNECT ALL WIRES AS ORIGINALLY INSTALLED

For safety, insulating tape and tubes are used throughout, but some lift-off parts on the printed wiring board require special attention.
All wires are positioned away from high-temperature and high-voltage parts, and, if removed for servicing, they must be retuned precisely to their original positions.

5. LAMP

Be very careful of the lamp because it generates high heat while it is used at high voltage. When replacing the bulb, make sure it is cool enough.

6. LENS

Do not look into the lens during projection. This important to avoid damage to the eyes.

7. SERVICING

At the time of repair or inspection services, use an earth band (wrist band), without fail.

8. RUN A COMPLETE SAFETY CHECK AT THE COMPLETION OF SERVICING

After completion of servicing, confirm that all screws, parts, and wiring, removed or disconnected for servicing, have been returned to their original positions. Also examine if the serviced sections and peripheral areas have suffered from any deterioration as a result of servicing. In addition, check insulation between external metallic parts and blades of wall-outlet plugs. This examination is indispensable in confirming complete establishment of safety.

(Insulation check)
Pull out a plug from a wall outlet to disconnect the connection cable. Then turn on the POWER switch. Use a 500V megger (Note 2) and confirm that the insulation resistance is 1MΩ or more between each terminal of the plug and exposed external metal (Note 1). If the measured value is below the specified level, then it is necessary to inspect and fix the set.

(Note 1)
Exposed external metal....RGB input terminals, control terminals, etc.
(Note 2)
If a 500V megger is not available for an unavoidable reason, then use a circuit tester or the like for inspection.

TROUBLESHOOTING _____

1. Operation check

A certain degree of diagnosis can be carried out by examining the equipment operation in the state of ordinary usage.

Prior to the removal of the top cover, check the points shown below.

• Is the POWER indicator lit in orange when in standby?

　　　　　　　No ⟶
- The POWER cord is not correctly inserted.
- A connector (POPA, POPB, POSW) is pulled out.
- The POWER unit is defective.
- The MAIN PWB, SUB PWB, or the membrane switch is defective.

　Yes

• Is the POWER indicator lit in green when POWER is ON?

　　　　　　　No ⟶
- The lamp's life has expired. (The STATUS indicator is lit.)
- The connector (POSW) is pulled out.
- The optical engine is defective.

　Yes

• Is the STATUS indicator flashing?

　　　　　　　Yes ⟶
- The lamp fails to light. (Flash in a 12-second cycle. ON for 6 seconds and OFF for 6 seconds)
- The lamp is broken. (Flash in a 12-second cycle. ON for 6 seconds and OFF for 6 seconds)
- Connector (PODB or DC) is pulled out. (Flash in a 12-second cycle. ON for 6 seconds and OFF for 6 seconds)
- Connector (POFA or POFB) is pulled out. (Flash in an 8-second cycle. ON for 4 seconds and OFF for 4 seconds)
- The fan stops due to failure or intrusion of foreign substance. (Flash in an 8-second cycle. ON for 4 seconds and OFF for 4 seconds)
- Deviation from the range of normal operating ambient temperature conditions. (Flash in a 4-second cycle. ON for 2 seconds and OFF for 2 seconds)
- The connector (POLA) is pulled out. (Flash in a 4-second cycle. ON for 2 seconds and OFF for 2 seconds)
- The lamp house is dislodged. (Flash in a 1-second cycle. ON for 0.5 seconds and OFF for 0.5 seconds)
- The connector (POLB) is pulled out. (Flash in a 1-second cycle. ON for 0.5 seconds and OFF for 0.5 seconds)
- The POWER unit or peripheral circuits of the CPU are defective.

　No

• Is the STATUS indicator lit?

　　　　　　　Yes ⟶
- Lamp timer has reached 1000 hours.

　No

• CPU's peripheral circuit malfunction. Breakage of programs and data.

2. MAIN PWB, SUB PWB (PWC-4448A)

• Are the following voltage inputs available at POPA (connection between POWER unit and POPA)?

Pin No.		Related circuits
1	+12V	AUDIO circuit
2	GND	GND
3	+5V	RGB, VIDEO signal processing system
4	+5V	RGB, VIDEO signal processing system
5	GND	GND
6	GND	GND
7	+5V	CPU, FLASHROM, DRAM, G/A
8	+5V	CPU, FLASHROM, DRAM, G/A
9	GND	GND
10	GND	GND
11	—	

No → Connections of the POPA connector are defective. The POWER unit is defective.

Yes

• Are the following voltage inputs available at POPB (connection between POWER unit and POPB)?

Pin No.		Related circuits
1	+12V	Fan and formatter board
2	GND	FANGND
3	+3.3V	Formatter board
4	+3.3V	Formatter board
5	+3.3V	Formatter board
6	GND	GND
7	GND	GND
8	GND	GND

No → Connections of the POPB connector are defective. The POWER unit is defective.

Yes

• Are the following signal outputs available at PODA (connection between Optical Engine unit and PODA)?

Pin No.	
6, 8, 10, 12, 14, 16, 18	+3.3V
61, 63, 65	+12V
67, 69, 71	+5V
92	Horizontal sync signal (TTL)
31	Vertical sync signal (TTL)
33	Enable signal (TTL)
35	Clock sync signal (TTL)
37, 39, 41, 43, 96, 98, 100, 102	B-ch signal (TTL)
45, 47, 49, 51, 104, 106, 108, 110	R-ch signal (TTL)
53, 55, 57, 59, 114, 116, 118, 120	G-ch signal (TTL)

No → Connections of the PODA connector are defective. The MAIN or SUB PWB is defective.

Yes

• Optical engine unit out of order
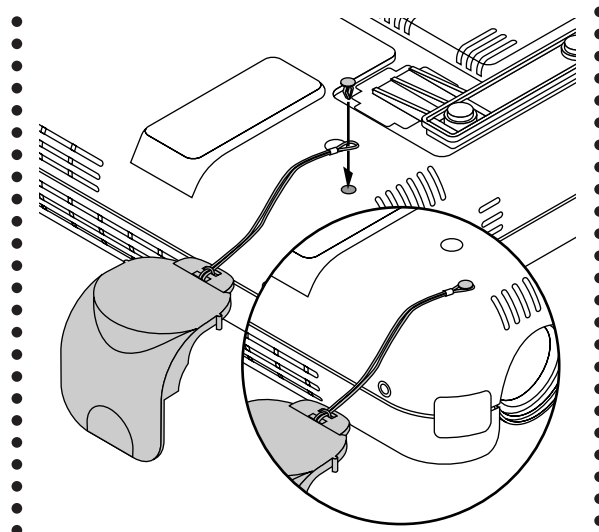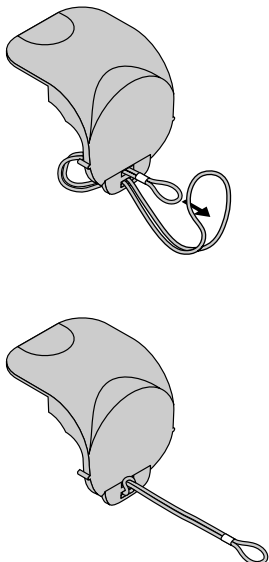
• Miscellaneous. Problem in the MAIN and SUB PWBs.
  Poor contact in the connector (POMA1–POMA2, POMB1–POMB2) between MAIN PWB and SUB PWB.
  Inadequate soldering or cracks in PWB.

Getting to Know Your Projector DLV-100

Front/ Side Features

Controls

Ventilation (inlet)

Adjustable Tilt Foot

Adjustable Tilt Foot Button

Zoom Ring

Focus Ring

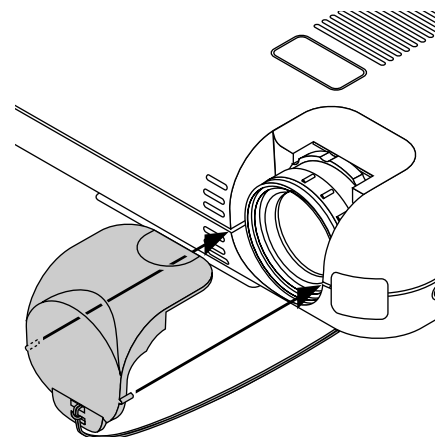Remote Sensor
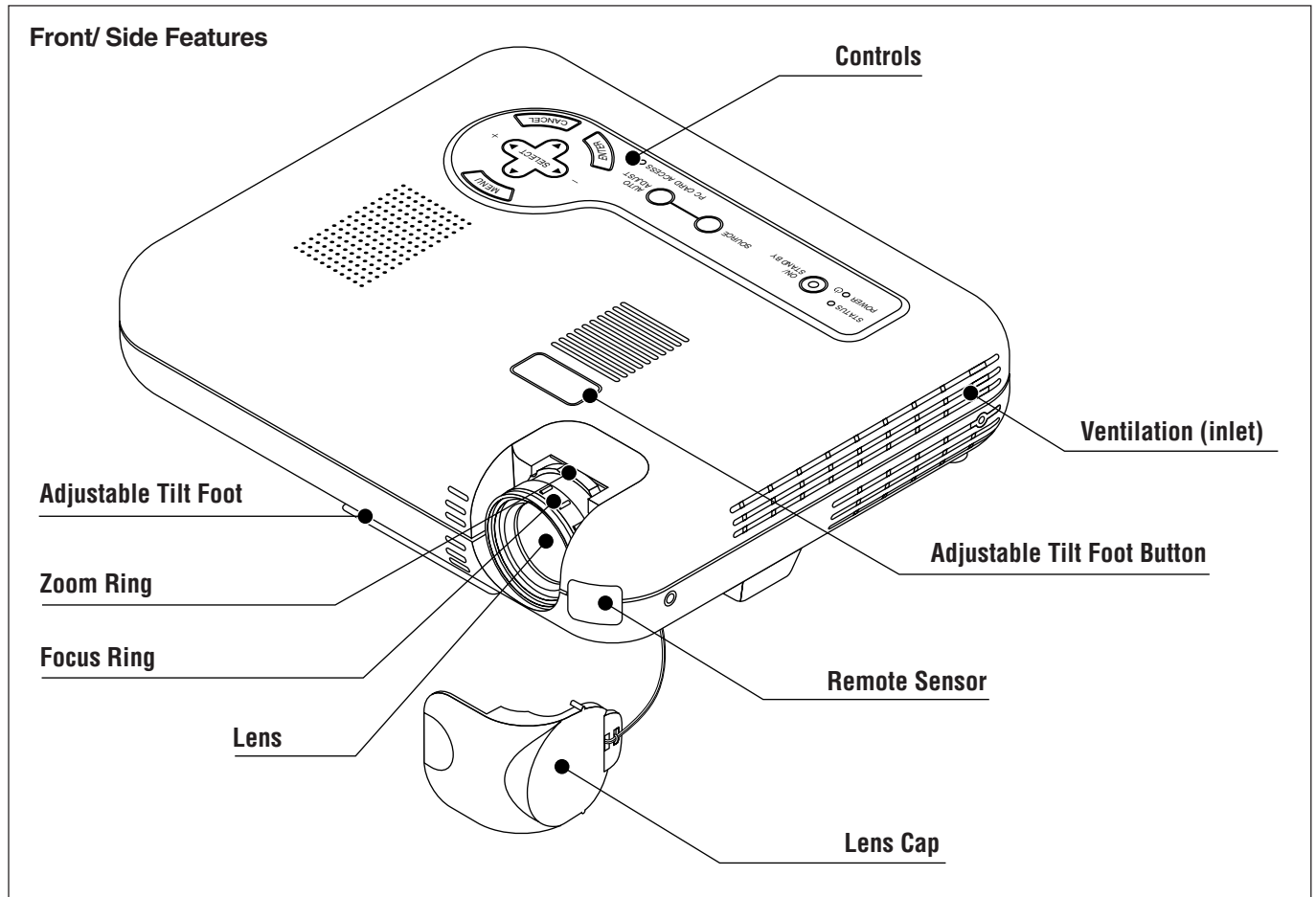
Lens

Lens Cap

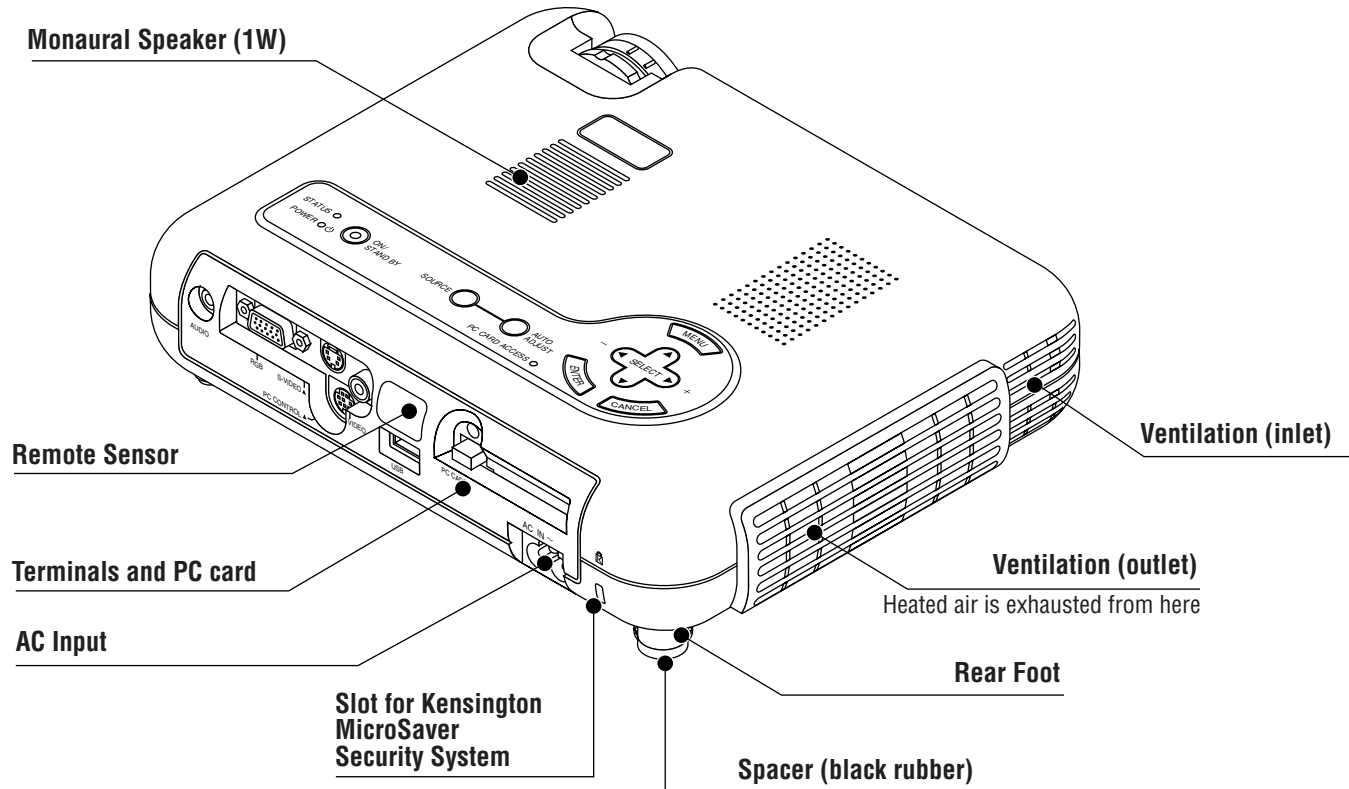### Attaching the lens cap to the lens hood with the supplied string and rivet

1. Thread the string through the hole on the lens cap and then tie a knot in the string.
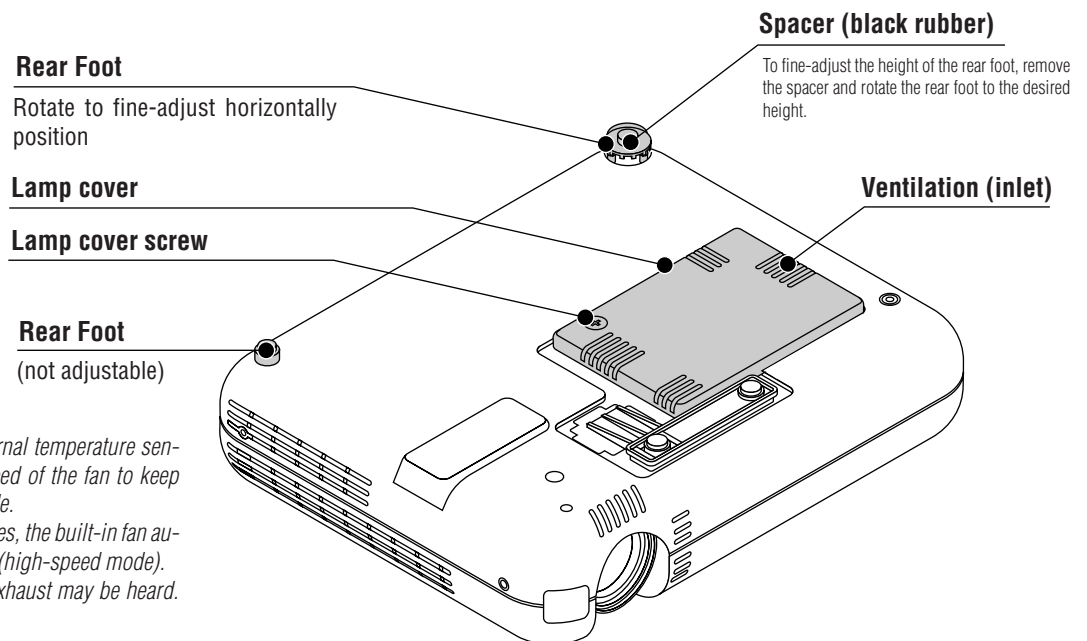2. Use the rivet to attach the string to the bottom of the lens hood.

Attaching the lens cap

Rear/ Side Features

Monaural Speaker (1W)

STATUS
POWER
ON/STAND BY
SOURCE
PC CARD ACCESS
AUTO ADJUST
MENU
ENTER
SELECT
CANCEL

AUDIO
RGB   S-VIDEO
PC CONTROL
VIDEO
USB   PC CARD
AC IN

Remote Sensor

Terminals and PC card

AC Input

Slot for Kensington MicroSaver Security System

Ventilation (inlet)

Ventilation (outlet)
Heated air is exhausted from here

Rear Foot

Spacer (black rubber)

Bottom

Spacer (black rubber)
To fine-adjust the height of the rear foot, remove the spacer and rotate the rear foot to the desired height.

Rear Foot
Rotate to fine-adjust horizontally position

Lamp cover

Lamp cover screw

Ventilation (inlet)

Rear Foot
(not adjustable)

NOTE: The projector has an internal temperature sensor. The sensor controls the speed of the fan to keep constant temperature in the inside.
When the internal temperature rises, the built-in fan automatically runs at a high speed (high-speed mode). During this time, the sound of exhaust may be heard. This is not a malfunction.

Top Features
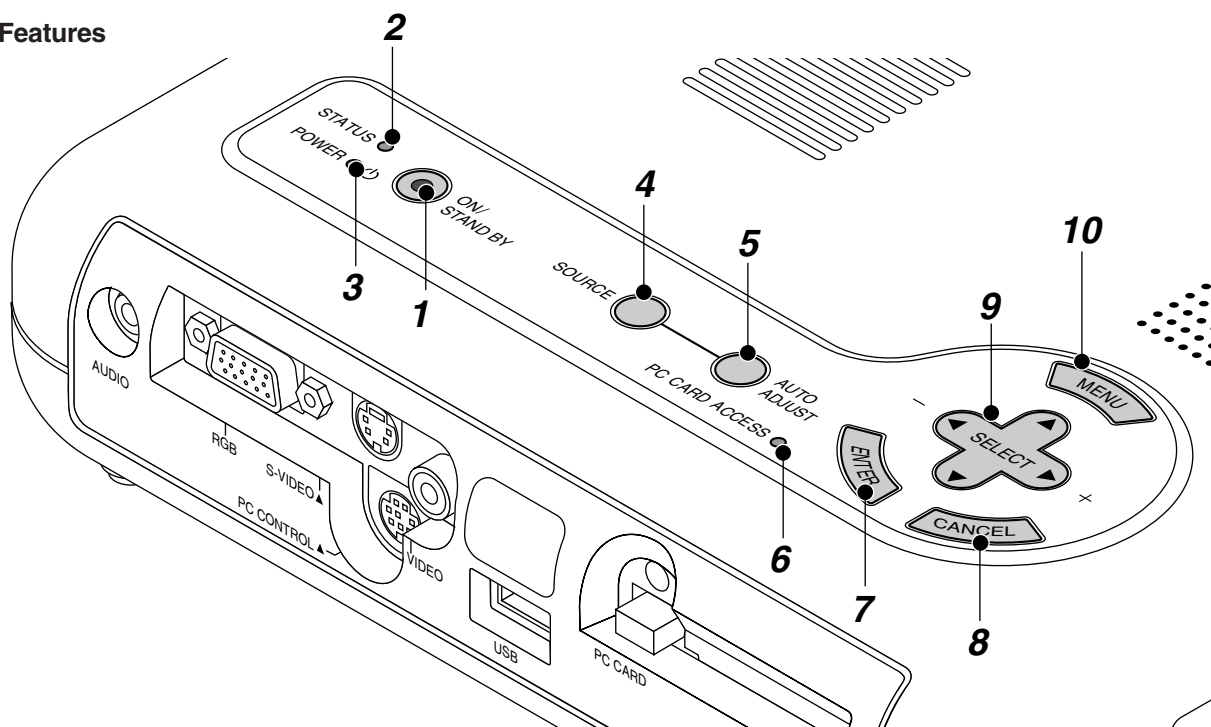
1. Power Button (ON / STAND BY)
Use this button to turn the power on and off when the power is supplied and the projector is in standby mode.

2. Status Indicator
When this is lit red continually, it's warning you that the projection lamp has exceeded 1500 hours (1000 hours in High-Bright mode) of service. After this light appears, it is advisable to replace the projection lamp as soon as possible. (See page 44). In addition the message **"The lamp has reached the end of its usable life. Please replace the lamp!!."** appears continually until the lamp is replaced. If this light blinks red rapidly, it indicates that the lamp cover is not attached properly or the projector is overheated.
See the Power/Status Light Messages on page 45 for more details.

3. Power Indicator (⏻)
When this indicator is green, the projector is on; when the indicator is orange, it is in standby mode.

4. Source Button
Use this button to select a video source such as a PC, VCR, DVD player or PC Card Viewer (CompactFlash card).
Each time this button is pressed, the input source will change as follows:

→ RGB → Video → S-Video → PC Card Viewer ─┐

If no input signal is present, the input will be skipped.

5. Auto Adjust Button (RGB only)
Use this button to adjust Position-H/V and Pixel Clock/Phase for an optimal picture. Some signals may not be displayed correctly or take time to switch between sources.

6. PC Card Access Indicator
Lights while accessing a CompactFlash memory card.

7. Enter Button
Executes your menu selection and activates items selected from the menu.

8. Cancel Button
Press this button to exit "Menus". Press this button to return the adjustments to the last condition while you are in the adjustment or setting menu.

9. Select (▲▼◄►) / Volume (+) (–) Buttons
▲▼: Use these buttons to select the menu of the item you wish to adjust.
When no menus appear, these buttons work as a volume control.
◄►: Use these buttons to change the level of a selected menu item.
A press of the ► button executes the selection.
When the menus or the Viewer tool bar is not displayed, these buttons can be used to select a slide, or to move the cursor in Folder List or Slide List.
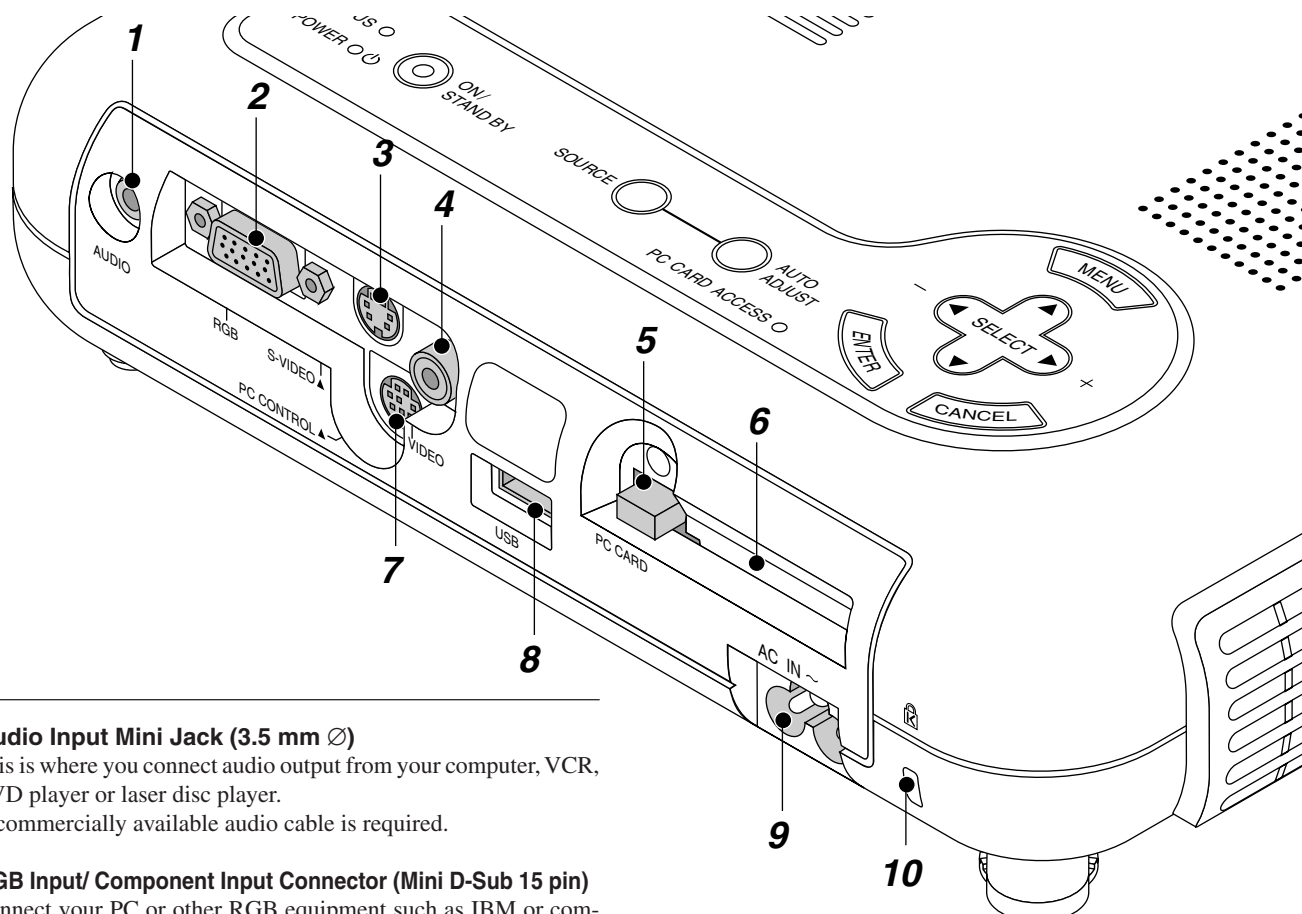When the magnifying glass is displayed, these ▲▼◄► buttons move the magnifying glass.

10. Menu Button
Displays the menu.

Terminal Panel Features

1. Audio Input Mini Jack (3.5 mm ∅)
This is where you connect audio output from your computer, VCR, DVD player or laser disc player.
A commercially available audio cable is required.

2. RGB Input/ Component Input Connector (Mini D-Sub 15 pin)
Connect your PC or other RGB equipment such as IBM or compatible computers. Use the supplied RGB cable to connect to a PC. Or connect a Macintosh computer here using the supplied RGB cable. This also serves as a component input connector that allows you to connect a component video output of component equipment such as a DVD player.

3. S-Video Input (Mini DIN 4 Pin)
Here is where you connect the S-Video input from an external source like a VCR.
NOTE: S-Video provides more vivid color and higher resolution than the traditional composite video format.

4. Video Input (RCA)
Connect a VCR, DVD player, laser disc player, or document camera here to project video.

5. PC Card Eject Button
Press to eject a CompactFlash memory card.

6. PC Card Slot
Insert a CompactFlash memory card here.

7. PC Control Port (Mini DIN 8 Pin)
Use this port to connect your PC to control your projector via a serial cable. This enables you to use your PC and serial communication protocol to control the projector.

If you are writing your own program, typical PC control codes are on the back cover page.
A cap is put on the port at the factory. Remove the cap when using the port.

8. USB Terminal
Connect a commercially available mouse that supports USB. You can operate the menu or PC Card Viewer with the USB mouse via this terminal.
Note that this terminal is not used with a computer and that there may be some brands of USB mouse that the projector does not support.

9. AC Input
Connect the supplied power cable's three-pin plug here. When you plug the other end into an active wall outlet, the POWER indicator turns orange and the projector is in standby mode.

10. Built-in Security Slot (🔒)
This security slot supports the MicroSaver® Security System.
MicroSaver® is a registered trademark of Kensington Microware Inc.
The logo is trademarked and owned by Kensington Microware Inc.

Remote Control Features

1. Infrared Transmitter
Direct the remote control toward the remote sensor on the projector cabinet.

2. Standby/On Button
If the main power is applied, you can use this button to turn your projector on or put it in standby.

3. S-Video Button
Press this button to select an S-Video source from a VCR.

4. Video Button
Press this button to select an NTSC, PAL, SECAM or NTSC4.43 compatible video source from a VCR, DVD player, laser disc player or document camera.

5. RGB Button
Press this button to select a video source from computer or component equipment connected to your RGB port.

6. Auto Adjust Button
Use this button to adjust an RGB source for an optimal picture. Some signals may not be displayed correctly or take time to switch between sources.

7. Magnify ⊕ ⊖ Buttons
Use this button to adjust the image size up to 400%.
To change the position of the magnified screen, press one of the ▲▼◄► buttons to recall the magnifying glass, then use the ▲▼◄ ► buttons to move the screen.

8. Volume ⊕ ⊖ Buttons
Press ⊕ button to increase the volume and ⊖ button to decrease it.

9. ASPECT Button
Press this button to select the screen size.

10. Mute Button
This button turns off an image and sound for a short period of time. Press again to restore the image and sound.
NOTE: When the menu is displayed, a press of this button mutes an image and sound without turning off the menu.

11. PICTURE Button
Press this button to recall and display the screen-related menu.

12. Freeze Button
This button will freeze a picture. Press again to resume motion.

13. Menu Button
Displays the menu for various settings and adjustments.

14. LAMP RESET Button
If the lamp has been turned on for more than 1,600 hours (Normal mode), the power to the unit will be cut off and no messages will be displayed. Press and hold down this button for 10 seconds or more while the unit is in stand-by mode to clear the lamp available time and the lamp usage time.

Supplied Remote Control
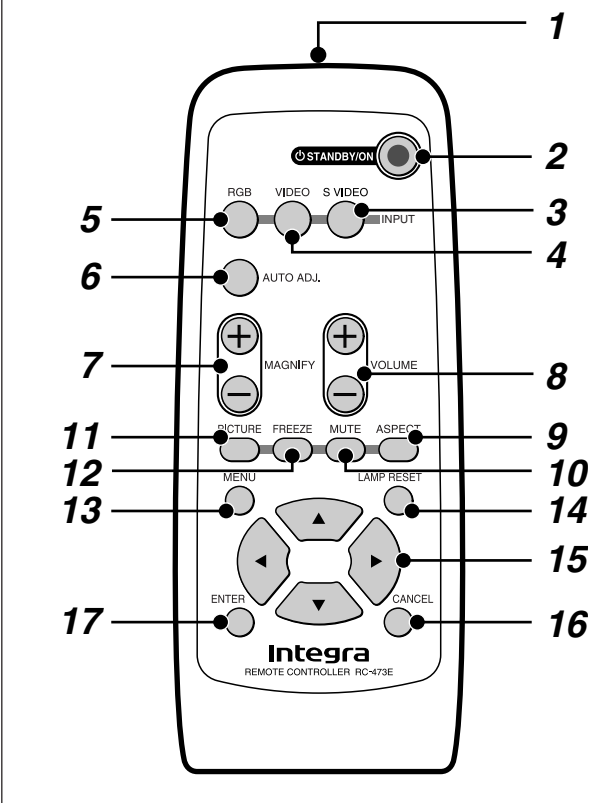
15. ▲▼◄► (Select) Buttons
▲,▼: Use these buttons to select the menu of the item you wish to adjust.
◄,►: Use these buttons to change the level of a selected menu item.
A press of the ► button executes the selection.
When the magnifying glass is displayed, these ▲▼◄ ► buttons move the magnifying glass.

16. Cancel Button
Press this button to exit "Menus". Press this button to return to the previous menu without storing the current settings or adjustments when you are in the submenu or adjustment screen.

17. Enter Button
Press this button to execute the selected item. When this is pressed, the adjustments and settings are saved, and the display is returned to the menu.

DISASSEMBLY

• **In regard to the part name and the part number of each symbol, please refer to the parts table.**

BLOCK DIAGRAMS

PS UNIT

15V
380V
12V
5V
3.3V

BALLAST PS UNIT

77V

LAMP UINT

MAIN PWB

VIDEO

S-VIDEO

VIDEO/S-VIDEO

SECAM DETECT

PAL/SECAM

VIDEO/Comp

VIDEO On/Off
SAA7113

VIDEO DECODER

Y
U/V
LLC
HREF/VIDEOVD

Standard Cell
ENDEAVOR

R
G
B

FORMATTER PWB

RGB Component

RGB/YCbCr

G

RGB/YCbCr LEV CONV

AUTO PICTURE

CXA3506R

A/D CONVERTER (SONY)

RGB or YUV

HD
VD

PnP

M52347FP

G

SYNC PROCESSOR

RGBHD/RGBVD

CLAMP
ADCLP

RGB/VIDEO
SYNC_SEL

ADCLP

COLOR WHEEL UNIT

Vol

AUDIO

Audio AMP

SYNC

Hstate/Vstate/Hpol/Vpol

CLAMP SW

RGBHD
HREF

HSYNC SW

ADCLK

FAN CONTROL

0.5W Speaker

SCL / SDA

READCLK

Addr & Data BUS

FAN   FAN

Compact Flash CARD

G/A BRACE

VCO

DINAMIC RAM

USB

USB CONT.

SL11H

G/A ASSIST

CPU

V831

uPD705101

FLASH ROM

IR_SENSOR

KEY

ADM3202

DRIVER

Rxd / Txd

CPU PWB

KEY PWB

PC-Control

INPUT SIGNAL BLOCK

MAIN PWB 1/5
PWC-4448A

MAIN PWB 2/5
PWC-4448A

INPUT SIGNAL BLOCK

IC7014
LM78M05CDT

IC7003
TK11233BU

IC7002
TK11233BU

IC7023
SN74AHC2G157H

IC7022
SN74AHC2G157H

LPF

IC7001
CXA3506R

A/D CONVERTER

I2C ADDRESS 9AH

M1.000623
P1.000605
S2.000512
E2.000224
E1.000121

MODEL
CR-5000

PWB
MAIN

PWB No.
PWC-4448A
721444A

MAIN PWB 3/5

PWC-4448A

SYNC PROCESSOR

M1.000712
P1.000605
S2.000512
E2.000224
E1.000121

DRWN
ENG.
CHKD.
APP.
MODEL CR-5000
PWB MAIN
PWB No. PWC-4448A
7214448

SYNC. SELECT

SDRAM CLOCK

MAIN PWB 4/5
PWC-4448A

IC8011
74F157

IC8005
PQ20WZ1U

IC7013
LA7311

SECAM
DETECT

IC7012
MM1112XF
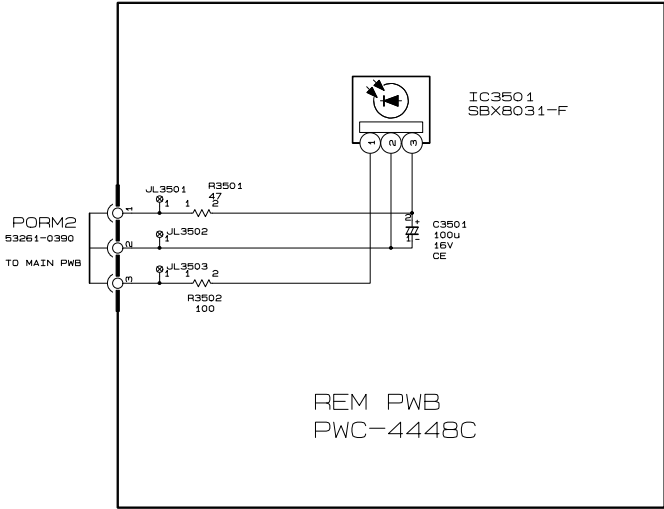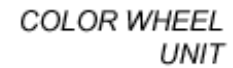
IC8001
JD1000031B
ENDEAVOR

READ CLOCK

IC7011
SAA7113

VIDEO
DECODER

VIDEO DECODER

M1.000623
P1.000605
S2.000512
S2.000224
E1.000121

DRWN.
ENG.
CHKD.
APP.
CR-5000
MODEL
PWB
MAIN
PWB No.
PWC-4448A
721444B 7

PLL & ENDEAVOR BLOCK

MAIN PWB 5/5

PWC-4448A

FORMATTER I/F

CPU BLOCK

SUB PWB 2/4
PWC-4448B

DLV-100

SUB PWB 3/4
PWC-4448B

G/A BLOCK

BRACE

SLAA07AF2N

IC9002

USB(LS)

SL11HT

IC9003

IC9006
LM3525-H

D_CARD[0-15]
A_CARD[1-11]

USBD[0-7]

POPC
FCN568

SUB PWB 4/4
PWC-4448B

CARD,USB I/F BLOCK

M1.000711
P1.000605
S2.000512
E2.000224
E1.000204
DRWN
ENG.
CHKD.
APP.
MODEL
PWB SUB
PWB No. PWC-4448B
721444B

IC3501
SBX8031-F

JL3501   R3501
1   1   47

PORM2
53261-0390

TO MAIN PWB

JL3502

C3501
100u
16V
CE

JL3503

R3502
100

REM PWB
PWC-4448C

M1.000623
P1.000605
S2.000512
E2.000224
E1.000121

DRWN

ENG.

CHKD.

APP.
CR-5000

MODEL

PWB
MAIN

PWB No.
PWC-4448C

7214448

CONNECTION DIAGRAMS

**REM PWB
(PWC 4448C)**

P0RM2

BIMETAL
SENSOR

LAMP
SW

**BALLAST POWER
SUPPLY UNIT**

**POWER SUPPLY
UNIT**

120P

3P

2P

2P

4P

3P

8P

11P

**FORMATTER
PWB**

8P

11P

P0DA

P0RM1

P0LA

P0LB

P0DB

P0DC

P0PB

P0PA

4P

P0FA

P0FB

P0MA1

P0MB1

P0SP

P0SW

**MAIN PWB
(PWC 4448A)**

3P

3P

100P

100P

2P

18P

DMD FAN

LAMP FAN

SW／LED

Membrane UNIT

100P

100P

**SUB PWB
(PWC 4448B)**

P0MA2

P0MB2

50P

P0PC

P0US

4P

COLOR WHEEL
UNIT

REPLACEMENT PART LIST

C-No	Description	Part No
PWB ASSYS		
E08	MAIN PWB ASSY	81E94FA1
E07	SUB PWB ASSY	81E94FB1
E03	REM PWB ASSY	81E94FC1
ELECTRICAL PARTS & MISCELLANOUS PARTS		
4	POWER SUPPLY(BALLAST)	3N100131
5	POWER SUPPLY(DC)	3N100002
E05	FAN (LAMP)	3N170021
E06	FAN (PSU)	3N170022
SW5501	POWER SWITCH LM3525MX-H	3N7J0001
	SPEAKER 20*35MM 8H 1W	6N300004
	CN3P(RM)105W,1685-26	7NW3W005
	CN8P(PB)175W,1685-26	7NW8W001
	CN11P(PA)65W,1685-26	7NWAW001
M37	ZOOM LENS(01 DLP)	12JS2691
M24	BOTTOM COVER BK ASSY	24PS2901
	COVER(LENS Z)	24F35271
M47	FILTER(F)	24F32641
	CAP(PC CONTROL)	24F32691
M03	PANEL(FAN B)	24F34621
M09	HOLDER(BALLAST B)	24F34641
21	HOLDER(FAN 20)	24F34651
M48	LENS CAP ZK	24F35641
	TERMINAL PANEL B ASSY	24FT8071
	FILTER(B)	24F32651
M04	TERMINAL PANEL B	24F35331
	COVER(VIEWER B)	24F35341
	SPRING(VIEWER)	24H35091
	BRACKET(I/O)	24H37602
	BRACKET(I/O)	24H37611
	BRACKET(TOP)	24H39781
M15	PLATE(I/O B)	24H41781
M16	SHEET,INSULATOR(TOP)	24J16122
M17	SHEET,INSULATOR(CPU-PWB)	24J16133
M46	SHEET,INSULATOR(POWER)	24J16143
	SPACER(7*7*3.5)	24J16401
	SPACER(210*10*5)	24J16411
	SPACER(70*10*5)	24J16421
	SPACER(50*10*5)	24J16431
	SPACER(REAR FOOT)	24J16451
	SHEET(LENS CAP Z)	24J18241
41	CUSHION(T1*5*28)	24J19401
	CAUTION LABEL(SERVICE U)	24L45241
	CAUTION LABEL(SERVICE J)	24L45251
	NAME PLATE	24L47221
	CAUTION LABEL(LENS K)	24L47231
	CAUTION LABEL(HOT K)	24L47241
	CAUTION LABEL(ELEC SHOCK K)	24L47251
M01	TOP COVER ASSY K(XGA-Z)	24PS2891
	BUTTON(TILT FOOT A)	24G07911
	BRACKET(TOP)	24H37401
	SPRING(TILT BUTTON)	24H37421
	CUSHION(T8*7*4)	24J19391
	SW PANEL(PA14)	7N900221
54	LABEL(1*10)	25765841
S09	SCREW(D-SUB)	24N03112
56	CBIPS*2.6*6*15BF	24N04011
S11	STAD(M2.5,H23.7,M/FM)	24N04861
S13	STAD(M2.5,H13,FM/FM)	24N04871
S01	SPECIAL SCREW(M2.5*6*3KF)	24N04881
S12	SPECIAL SCREW(P2*6*15BF)	24N04891
	PUSH NUT(1.5)	24N04901
S08	SPECIAL SCREW(2.5*4*3GF)	24N04911
	SPECIAL SCREW(2.5*4*3GF)	24N04921
	SPECIAL SCREW(4*4*3KF)	24N04931
	SCREW,SL-CPIMS*2*6*15BF	910D2031
	NUT,AHEXIN*2*15BF	91430201
M11	FAN RUBBER	79T08867
M14	FAN GUARD	79T08870

C-No	Description	Part No
A02	LAMP HOUSE ASSY	
	(M20+M19+M22+M21+M23)	79T09114
E11	THERMISTOR ASSY	79T08873
M10	LENS BASE POLYURETHANE FOAM	79T08877
E10	LIMIT SW BOARD ASSY	79T08878
M18	BRACKET"(I/O)	79T08879
M07	BALLAST LOCK BASE	79T08880
M08	INSULATE SHEET L/D-N	79T08881
E04	BALLAST CONNECTOR	79T08884
M26	REAR FOOT RUBBER	79T08886
M27	REAR FOOT	79T08887
M25	FRONT FOOT	79T08888
A01	LAMP COVER ASSY	
	(M05+M06+S03+S04)	79T09113
S02	POLYSLIDER CUT W	79T08930
S15	WHEEL SCREW	79T08893
E12	WHEEL SENSOR BOARD ASSY	79T08894
M28	WHEEL COVER	79T08895
M29	COLOR WHEEL UNIT	79T09112
M30	RUBBER SHEET	79T08896
M32	FORMATTER BRACKET	79T08933
A03	DMD SET(XGA)	
	(E13+M33+M34+E14)	79T09115
M33	ELASTOMER HOLDER	79T08900
M34	ELASTOMER	79T08901
1M35	HEAT SINK A	79T08934
1M36	HEAT SINK B	79T08935
1M39	LENS BASE ASSY	
	(M31+M40+M41+M42)	79T09111
M43	LENS BASE COVER	79T08906
M44	APERTURE	79T08907
M45	INSULATE SHEET LB-U	79T08908
S18	SCREW No.6-12	79T08918
S14	SCREW φ2.6-5	79T08922
S07	SCREW φ3-6	79T08923
S06	SCREW M3-6	79T08924
PRINTED & PACKING MATERIALS		
	BAND (L=100)	24280701
	SOFT CASE(DLV-100)	24BS6971
	SPACER	24M16321
	PROTECTION BOX(300*460)	24M16531
	CARTON BOX	24MU6831
	BATTERY LR6GRSP2A	6N800005
	POWER CODE UC3 L3.0 M K	7N080201
	RC-473E	7N900271
	STRAP	24C05051
	PUSH RIVET	24C04531
	CABLE,RGB	7N520001

METHOD OF DISASSEMBLY

2. TOP COVER ASSY

(1) Remove the five screws ①, and take out the TOP
COVER ASSY.
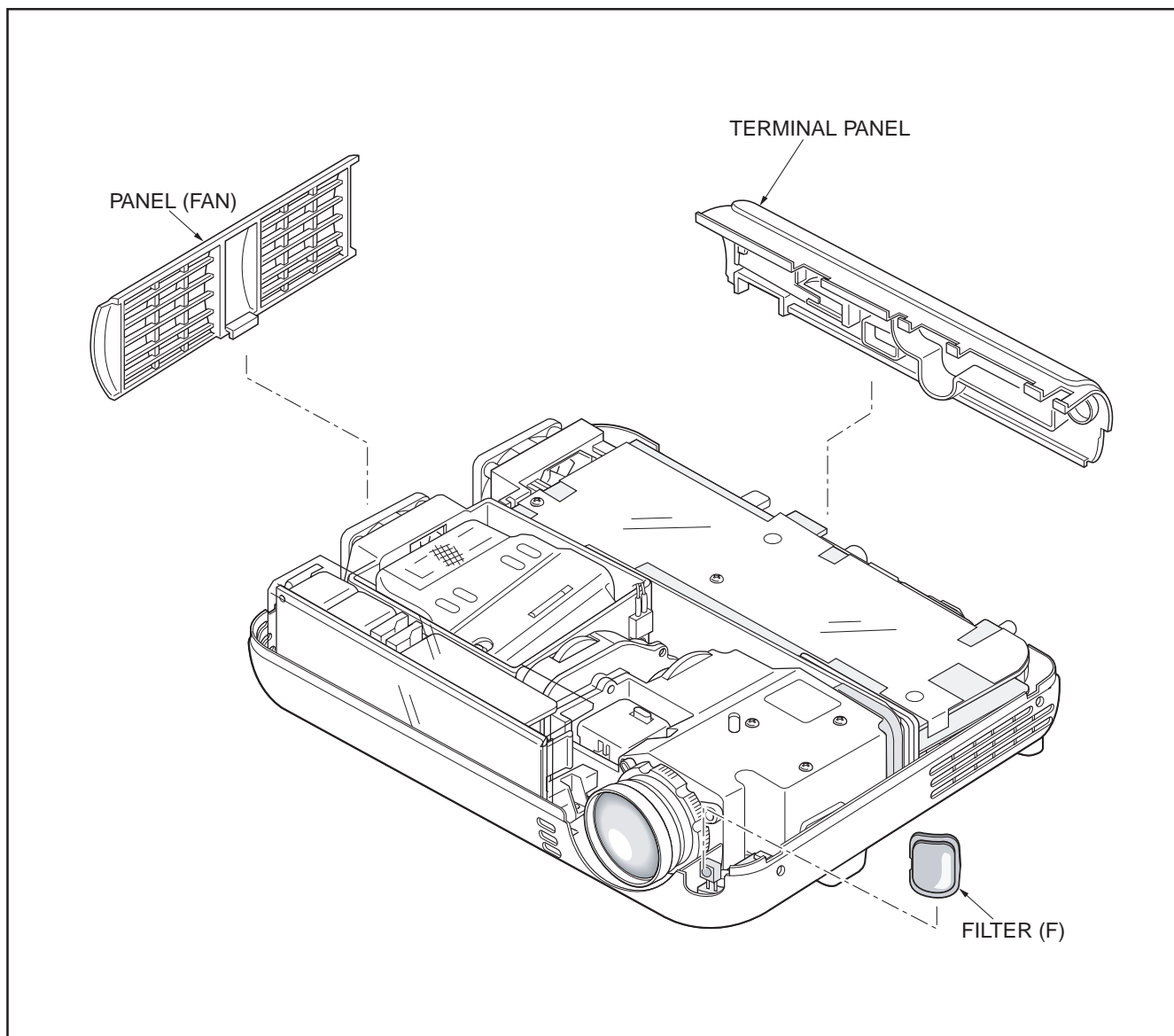**Note)** This action must be taken carefully because the
FFC of SW PANEL and SPEAKER CABLE is
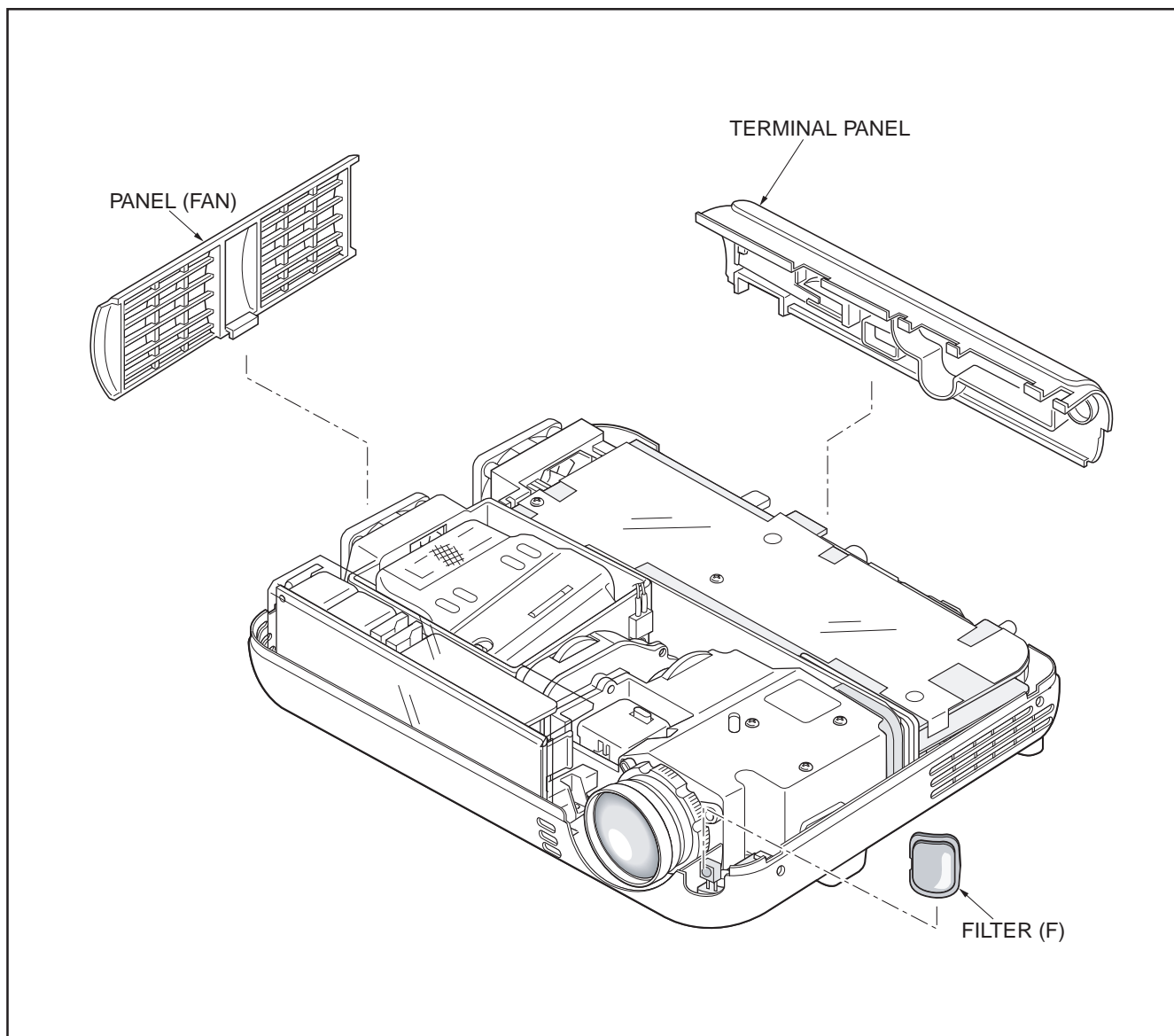connected to the MAIN PWB ASSY.
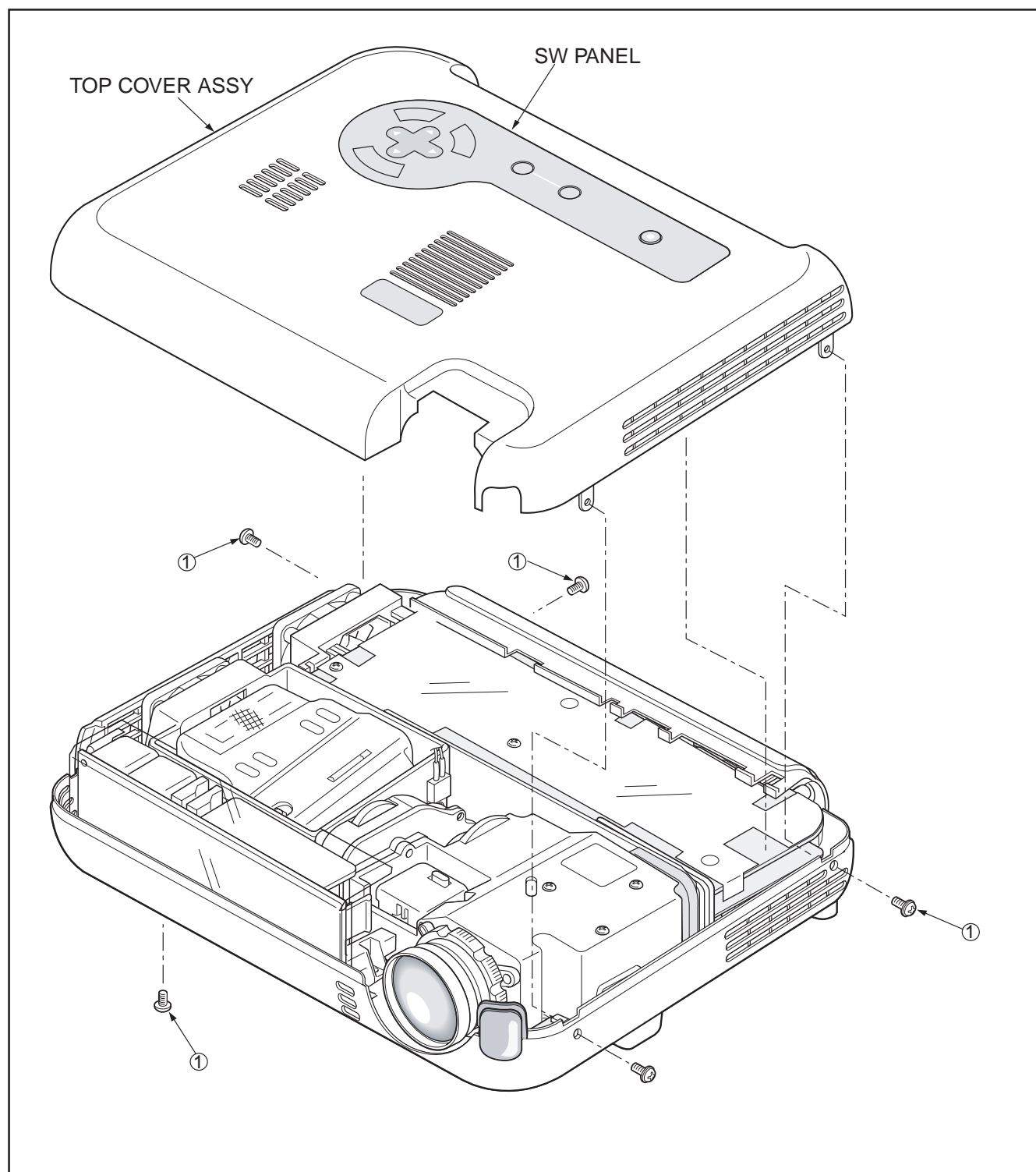
3. PANEL (FAN)/TERMINAL PANEL/FILTER (F)

(1) Take out the PANEL (FAN) and the TERMINAL
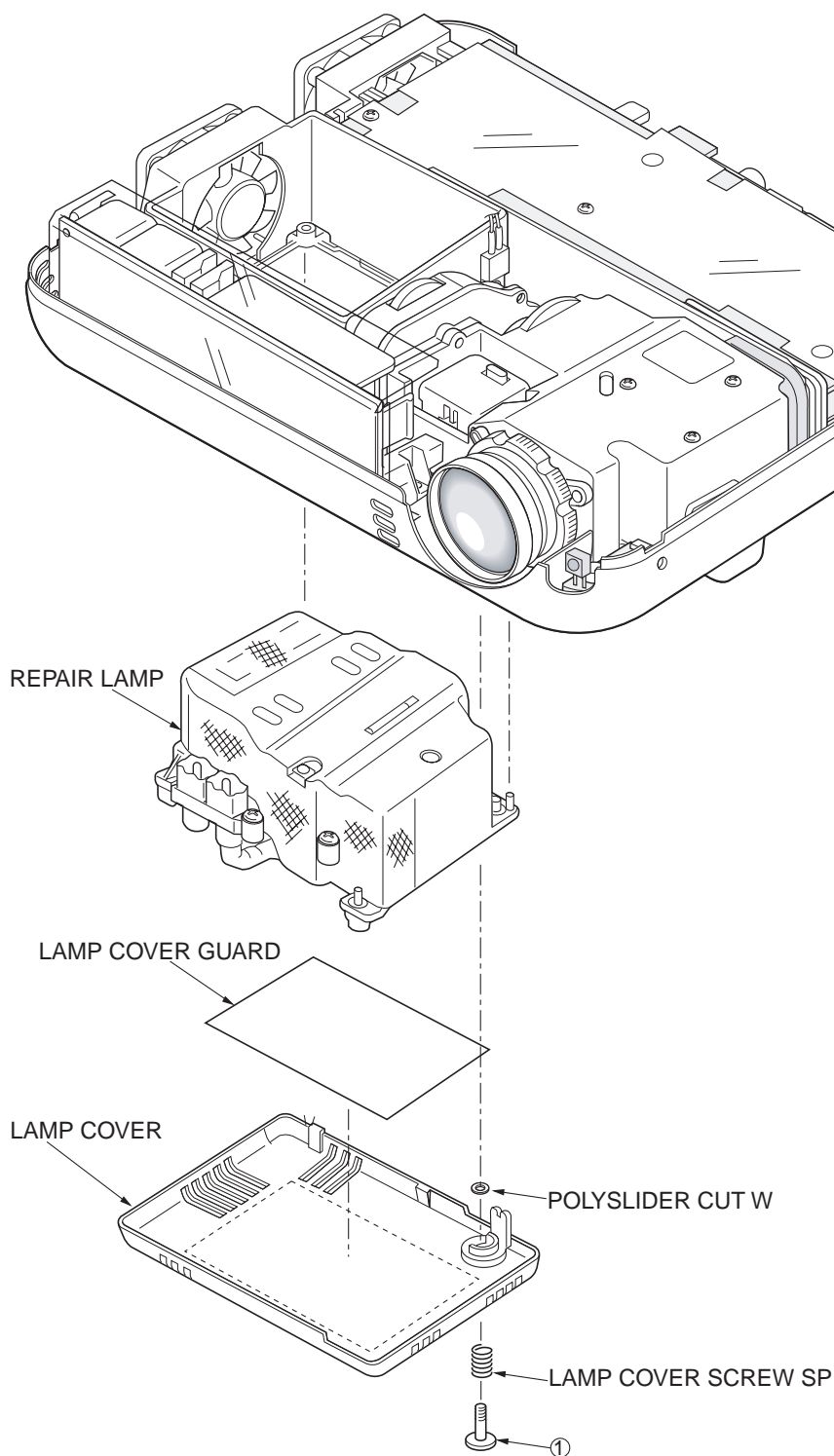   PANEL, FILTER (F).

3. PANEL (FAN)/TERMINAL PANEL/FILTER (F)

(1) Take out the PANEL (FAN) and the TERMINAL
PANEL, FILTER (F).

METHOD OF DISASSEMBLY

4. REPAIR LAMP/LAMP COVER/LAMP COVER GUARD

(1) Loosen the one screw ① and remove the LAMP
COVER. Then take out the LAMP COVER GUARD
and REPAIR LAMP successively.

REPAIR LAMP

LAMP COVER GUARD

LAMP COVER

POLYSLIDER CUT W

LAMP COVER SCREW SP

①

5. LAMP DRIVER/BALLAST HOLDER N/BALLAST LOCK BASE/BALLAST CONNECTOR/ INSULATE SHEET L/D-N/REM PWB ASSY

(1) Remove the one screw ①, and disconnect the CONNECTOR of the LAMP DRIVER.

(2) Remove the one screw ② and another screw ④, and take out the LAMP DRIVER.

(3) Remove the one screw ⑤ and take out the REM PWB ASSY.
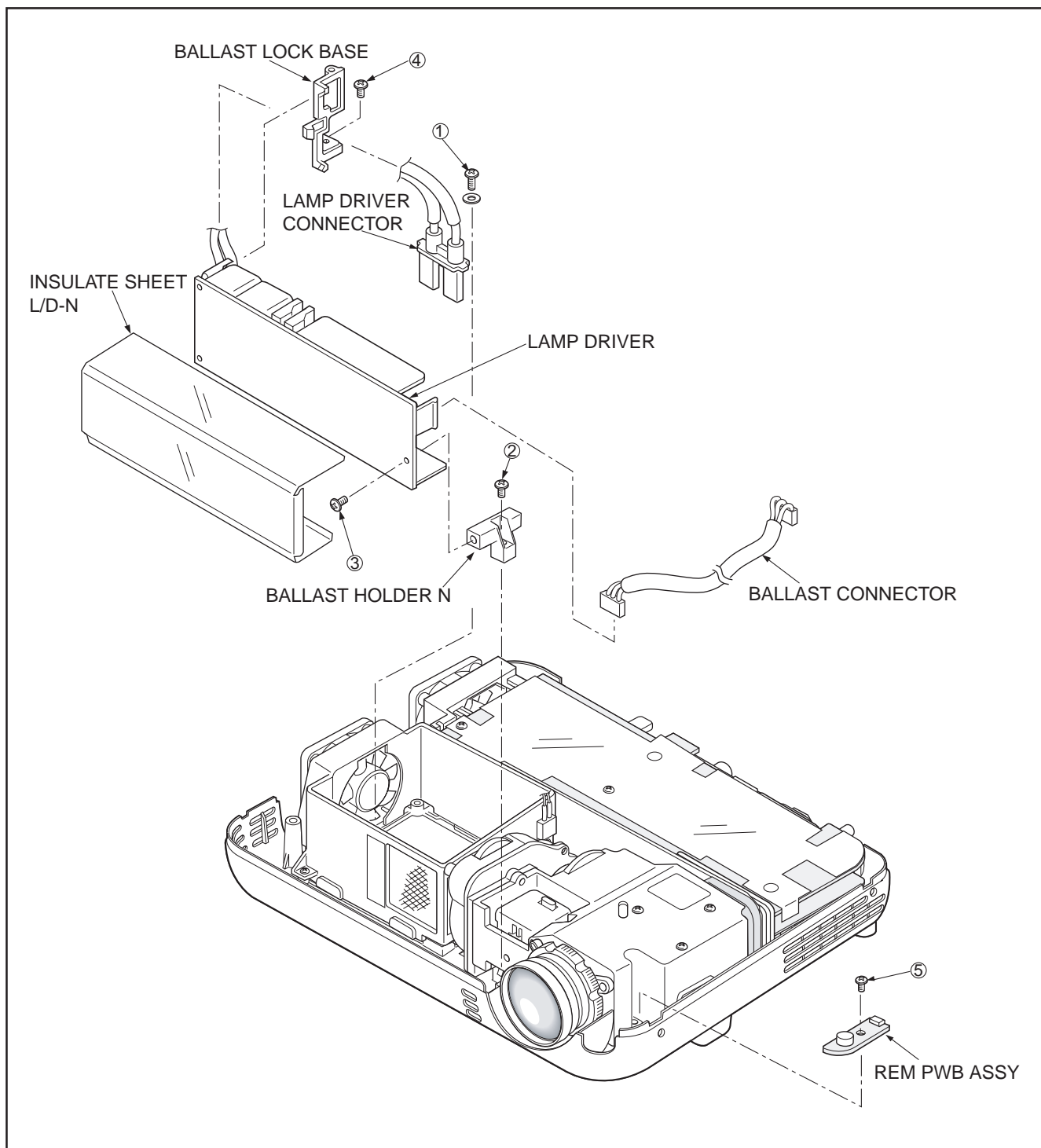
METHOD OF DISASSEMBLY

6. OPTICAL ENGINE ASSY

(1) Remove the four screws ①, and take out the OP-
TICAL ENGINE ASSY.

LENS BASE POLYURETHANE FOAM
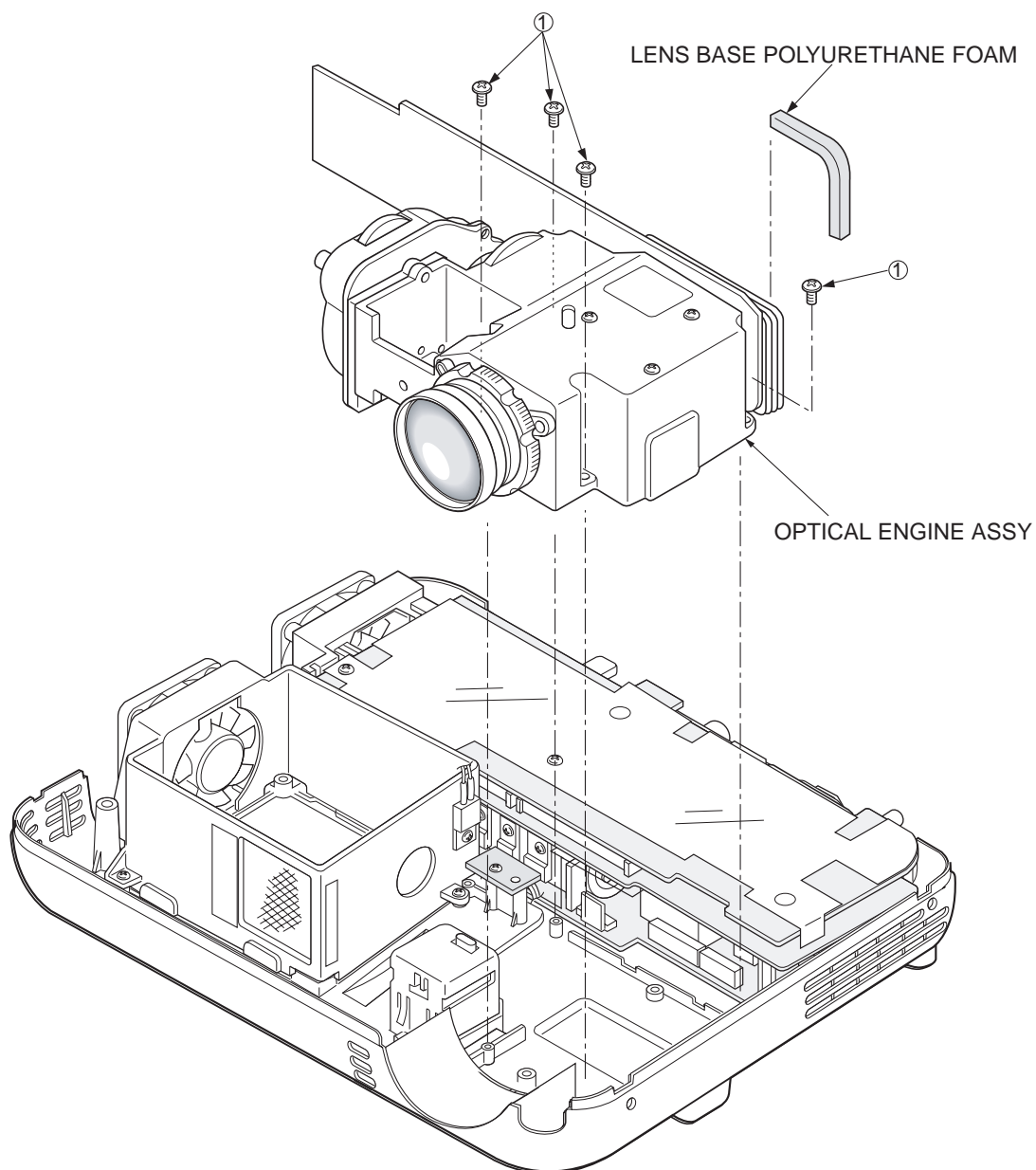
OPTICAL ENGINE ASSY

7. 40 FAN ASSY (L-F)/40 FAN ASSY (DC)/FAN BASE

(1) Remove the two screws ①, and take out the FAN BASE.
(2) Remove the 40 FAN ASSYs (L-F) and the 40 FAN ASSYs (DC).

40 FAN ASSY (L-F)

FAN RUBBER

①

FAN BASE

FAN CUSHION

①

40 FAN ASSY (DC)

FAN RUBBER

FAN GUARD
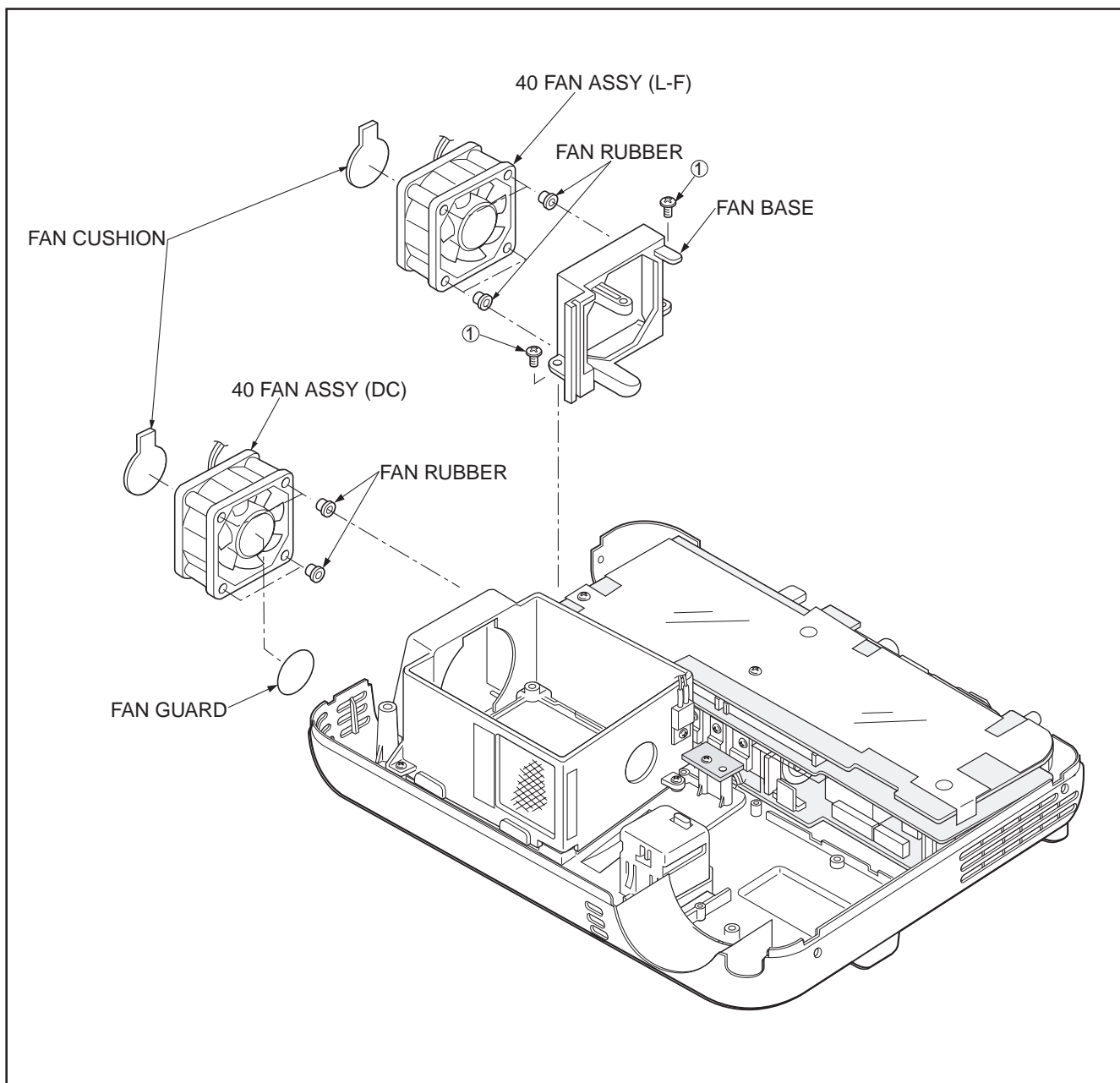
METHOD OF DISASSEMBLY

8. MAIN PWB ASSY/SUB PWB ASSY/POWER SUPPLY/LIMIT SW BOARD ASSY/ SHEET INSULATOR/PLATE (I/O)

(1) Remove the one screw ①.
(2) Remove the one screw ②and one screw ⑦, and take out the SHEET INSULATOR.
(3) Remove the three screws ③, and take out the MAIN PWB ASSY and the SUB PWB ASSY.

(4) Remove the two screws ④, and take out the PLATE (I/O).
(5) Remove the one screw ⑤ and the three STAD ①, and take out the POWER SUPPLY.
(6) Remove the one screw ⑥, and take out the LIMIT SW BOARD ASSY.
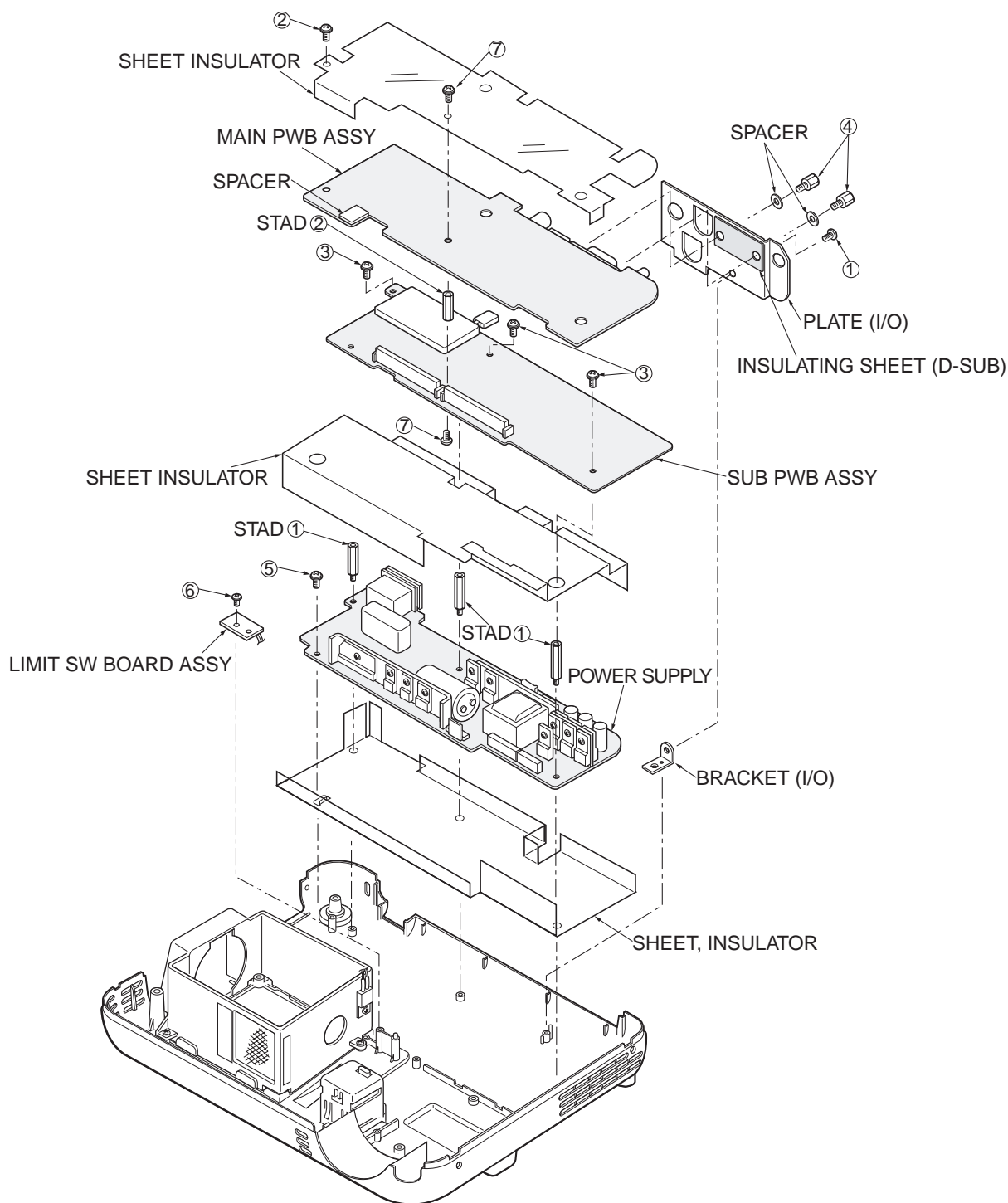
9. LAMP HOUSE/THERMISTOR ASSY/FRONT FOOT/REAR FOOT

(1) Remove the one screw ②, and take out the THER-MISTOR ASSY.

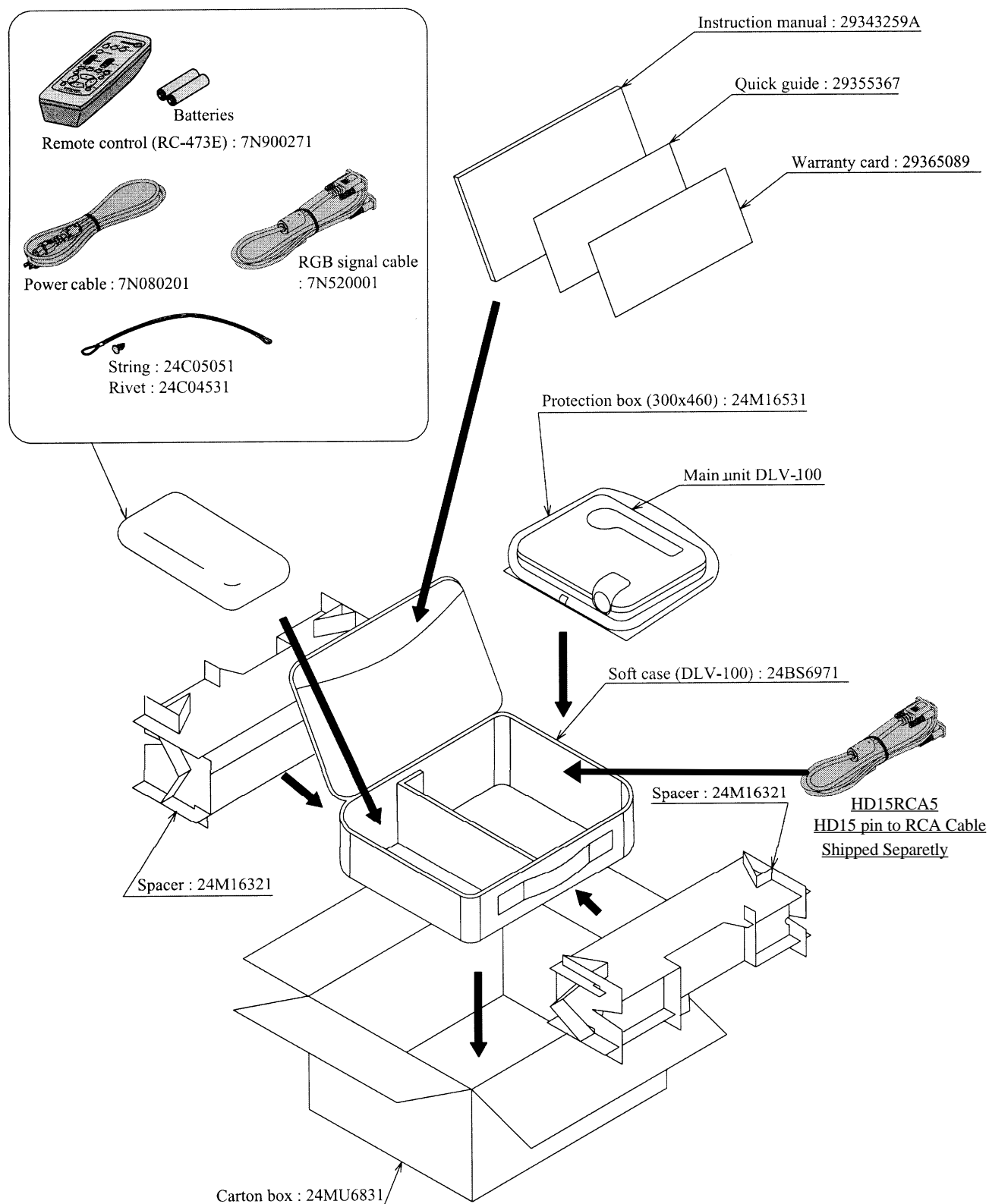(2) Remove the three screws ①, and take out the LAMP HOUSE.
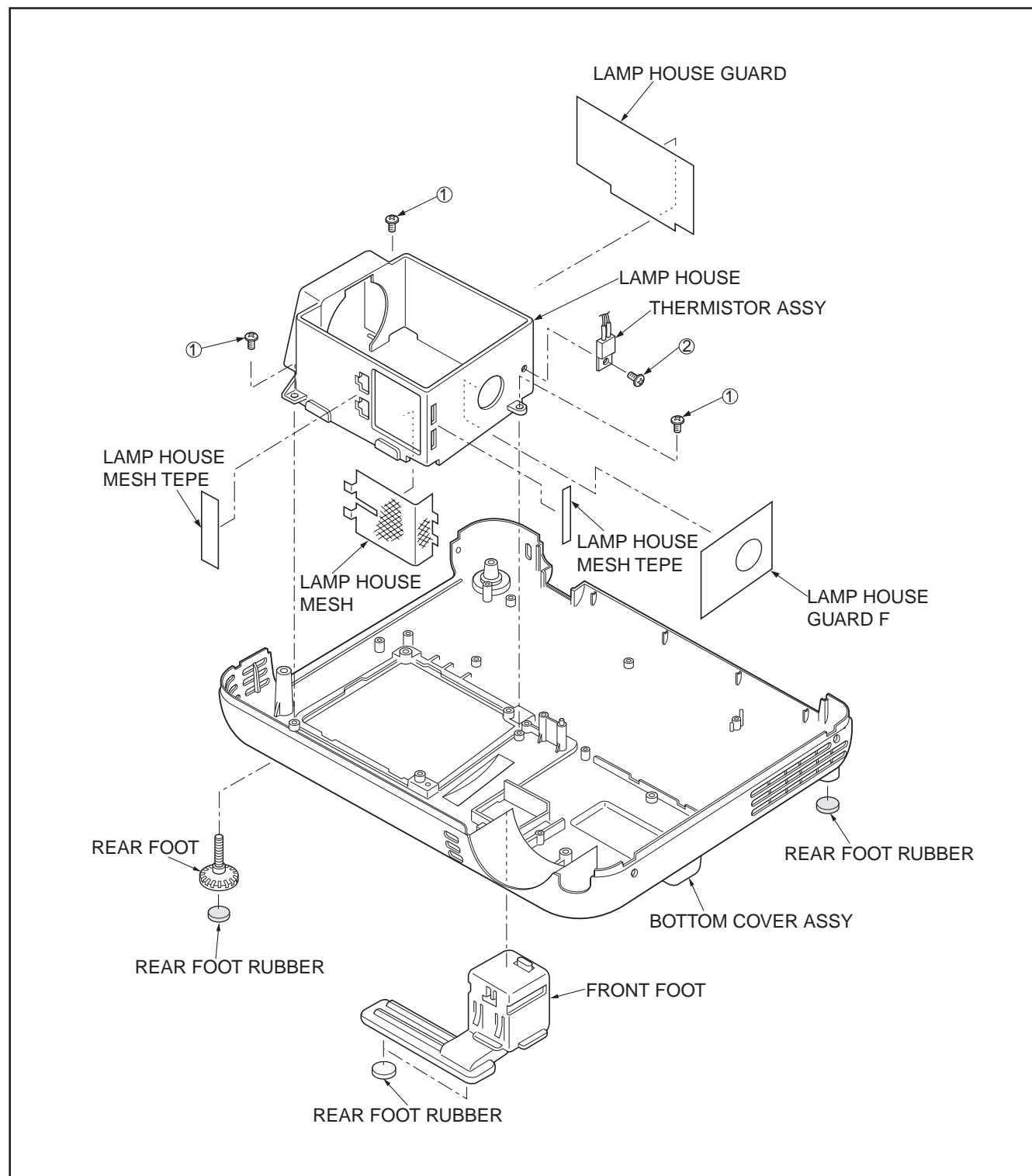
METHOD OF DISASSEMBLY

10. OPTICAL ENGINE ASSY

(1) Remove the one screw ① and the two screws ②, and take out the WHEEL SENSOR BOARD ASSY and WHEEL COVER.

(2) Remove the one screw ③, and take out the COLOR WHEEL and RUBBER SHEET.

(3) Remove the three screws ④ and take out the LIGHT TUNNEL ASSY.

(4) Remove the three screws ⑤ and take out the LENS UNIT.

(5) Remove the one screw ⑥ and take out the MIRROR ASSY.

(6) Remove the one screw ⑦ and take out the APERTURE/LENS BASE COVER.

(7) Remove the one screw ⑧ and take out the CYLINDER MIRROR ASSY.

(8) Remove the two screws ⑨, and take out the HEAT SINK A and HEAT SINK B.

(9) Remove the four screws ⑩, and take out the FORMATTER BOARD, FORMATTER BRACKET, ELASTOMER HOLDER, ELASTOMER, and DMD.
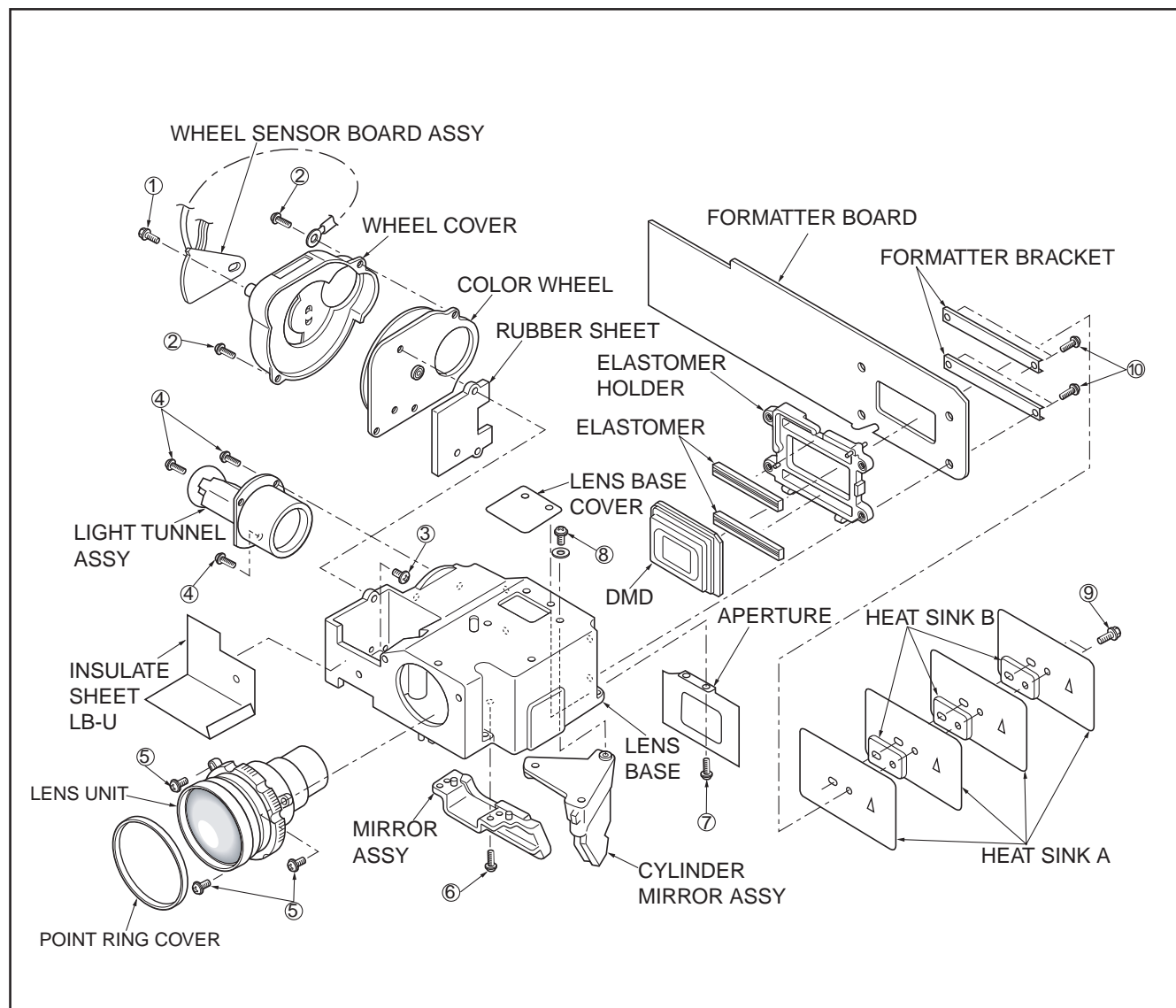
PACKING VIEW

Batteries
Remote control (RC-473E) : 7N900271

Power cable : 7N080201

RGB signal cable : 7N520001

String : 24C05051
Rivet : 24C04531

Instruction manual : 29343259A

Quick guide : 29355367

Warranty card : 29365089

Protection box (300x460) : 24M16531

Main unit DLV-100

Soft case (DLV-100) : 24BS6971

Spacer : 24M16321

HD15RCA5
HD15 pin to RCA Cable
Shipped Separetly

Spacer : 24M16321

Carton box : 24MU6831

METHOD OF ADJUSTMENTS _____

PC Control Software :

The completely adjusted servicing PWB ASSY are in stock.
Therefore, it is unnecessary to use the adjusting software.
For this model, adjustments are carried out only for the opticaln system.

Control of Optical System

The description below covers the control program for the color wheel sensor of the optical engine unit.

## 1. Preliminary arrangements for adjustment

ι Appropriate spanner (across 5.0mm)   Part No. : 9N000002
ι Signal generator (with signals of all white, all black, all red, all green, all blue)
ι Card remote control (set accessory)

2. Preliminary work for adjustment

ι Remove the top cabinet. Remove the membrane switch and the speaker cables from the main unit.
ι Actuate the set while a signal input is fed from the signal generator
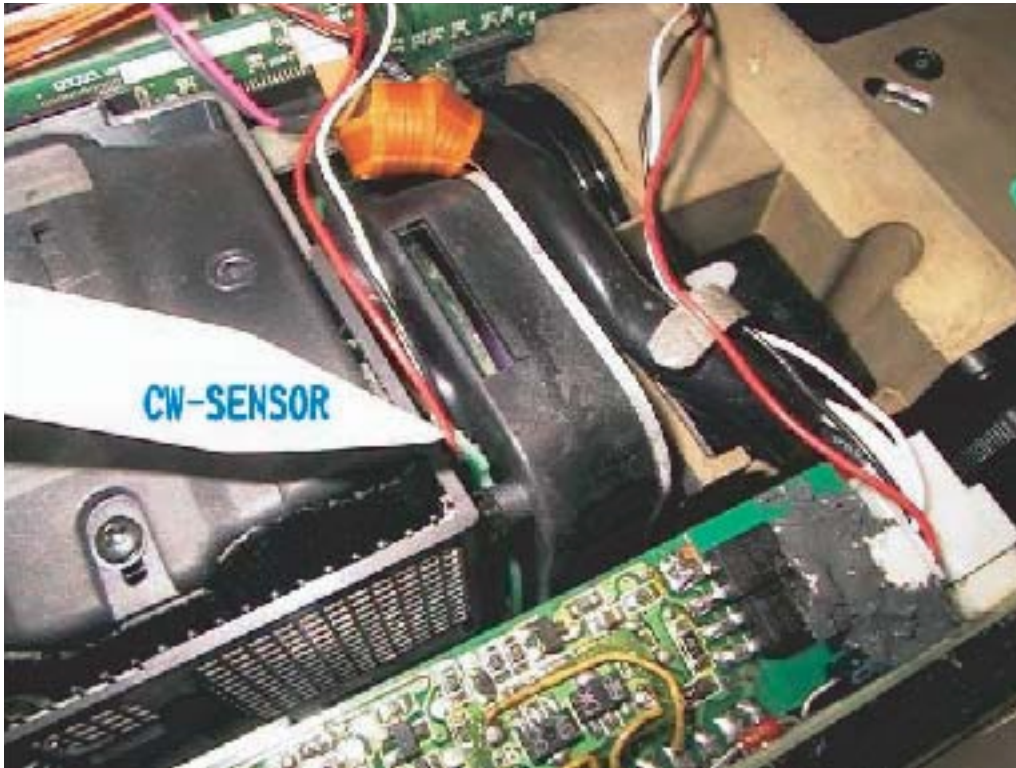
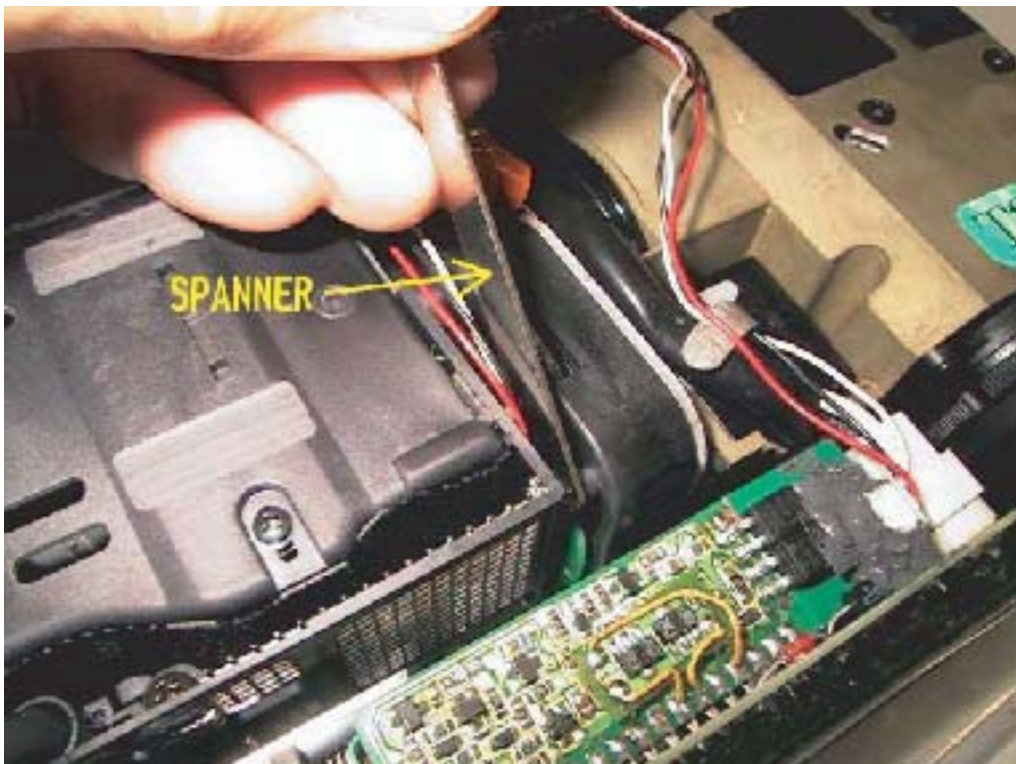* Caution points during work (white area)
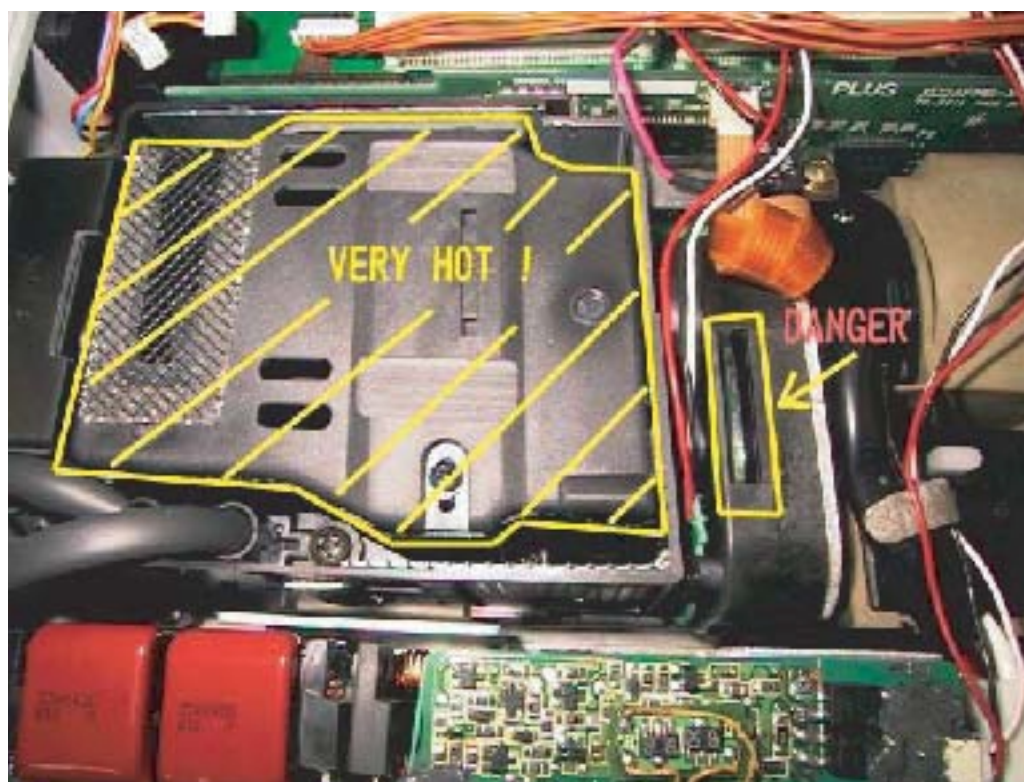
METHOD OF ADJUSTMENTS

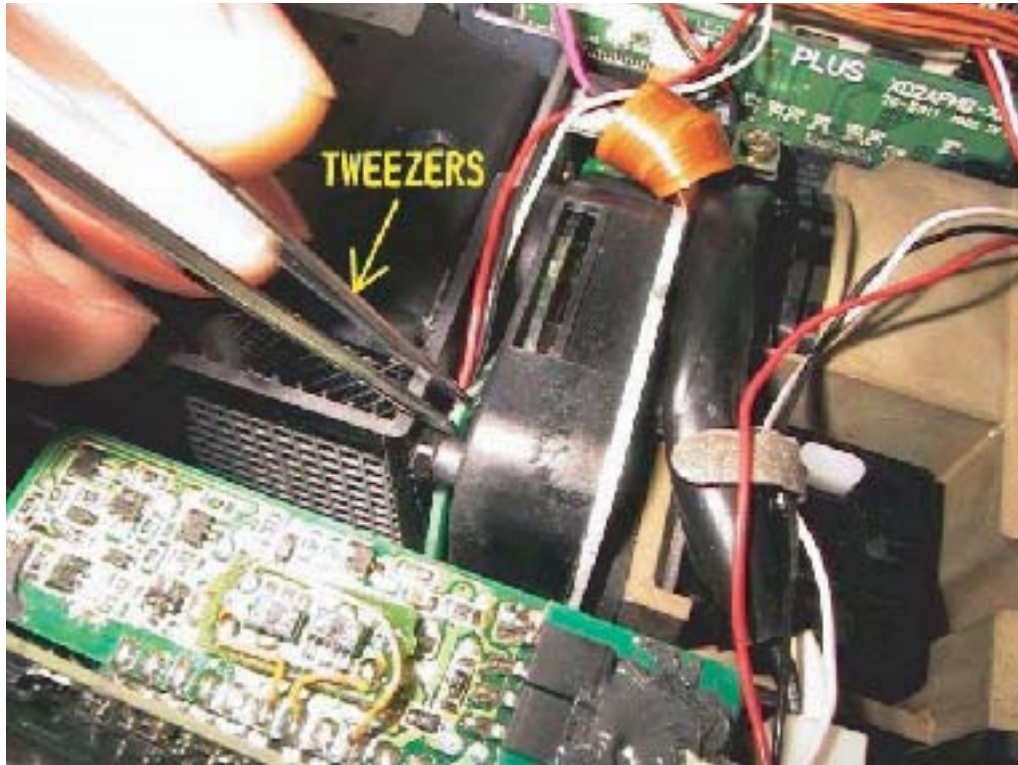### 3. Adjustment steps

1. Check the color wheel sensor position.

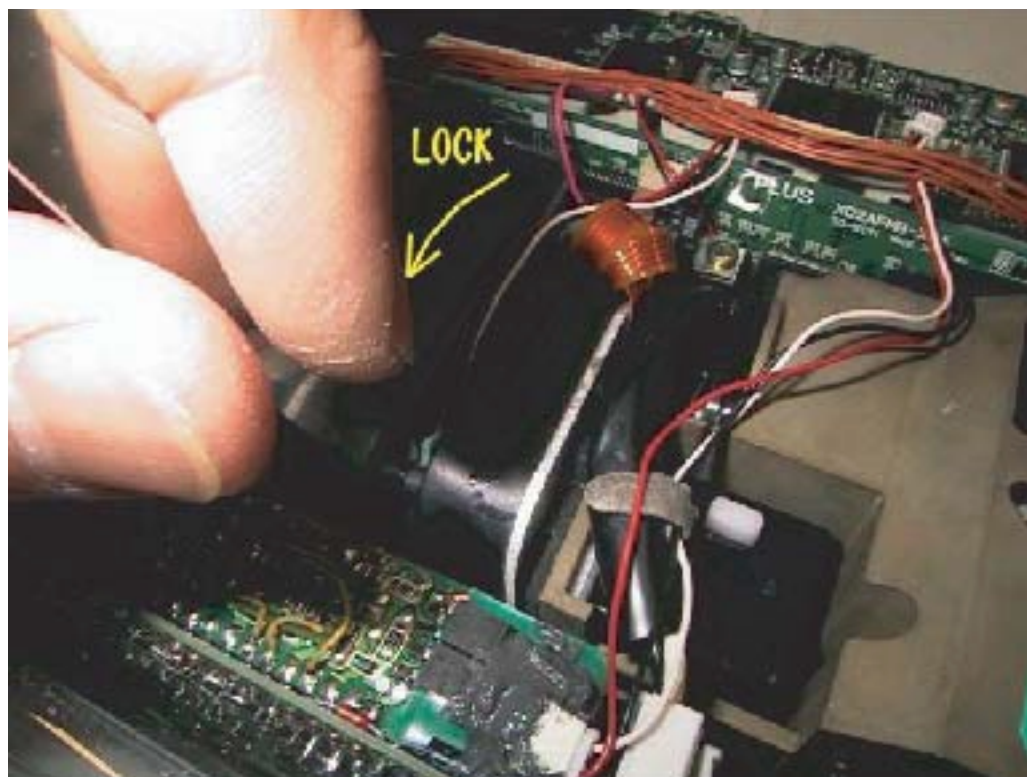2. Loosen the sensor lock nut. (About 1/4 turns counterclockwise)

3. Adjust the sensor by means of tweezers, using only a green image and viewing the screen.

4. Tighten the nut to its original position. (About 1/4 turns clockwise)
(**Note:** Never tighten it too much.)

METHOD OF ADJUSTMENTS

     5. When the nut has been completely tightened, check each screen of all white, all red, all blue, all green, and all black in order to confirm the freedom from any abnormality (chromaticity).
If any abnormality is perceived, adjust the sensor again (in the state of that screen) and check the resultant conditions again.

     6. Apply a screw lock agent to the area of the sensor and the nut.

Note) At the time of adjustments and operation check under the condition that the top cover is open, use a small-sized cooling fan or the like to avoid excessive temperature rise inside the set.
(The effect of cooling will be lowered if the top cover is removed. In case when the thermal protector should operate as a result of temperature rise inside the set, pull out the power cord and wait until the inside is cooled down. Restart is possible after confirming that the inside temperature has been sufficiently low.)