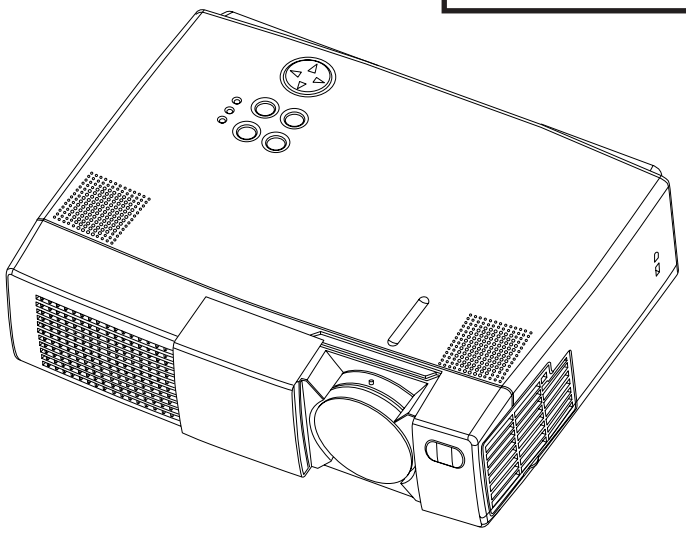
HITACHI

YK | No. 0507E

SERVICE MANUAL

CP-X325W



Caution

Be sure to read this manual before servicing. To assure safety from fire, electric shock, injury, harmful radiation and materials, various measures are provided in this Hitachi liquid crystal projector. Be sure to read cautionary items described in the manual to maintain safety before servicing.

Service Warning

1. When replace the lamp, to avoid burns to your fingers. The lamp becomes too hot.
2. Never touch the lamp bulb with a finger or anything else. Never drop it or give it a shock. They may cause bursting of the bulb.
3. This projector is provided with a high voltage circuit for the lamp. Do not touch the electric parts of power unit (main), when turn on the projector.
4. Do not touch the exhaust fan, during operation.
5. The LCD module ass'y is likely to be damaged. If replacing to the LCD module ass'y, do not hold the FPC of the LCD module ass'y.

Contents

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

Liquid Crystal Projector

October 2000 Digital Media Systems Division

1. Features

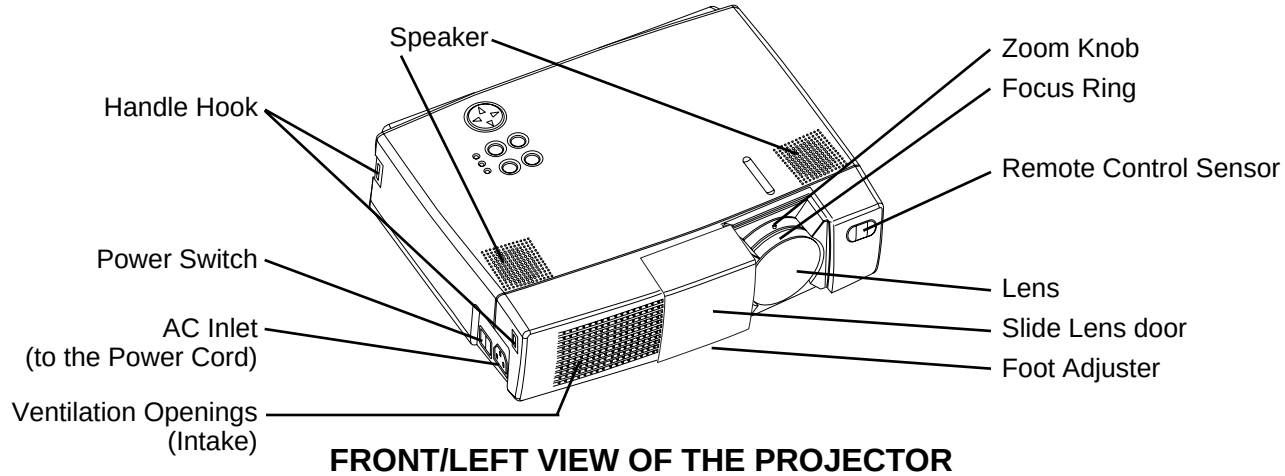
- High brightness, High resolution
- Compact size, light weight for portability
- RS-232C Communication
- Complies with VESA DDC1/2B specifications
- Auto-adjustment function

2. Specifications

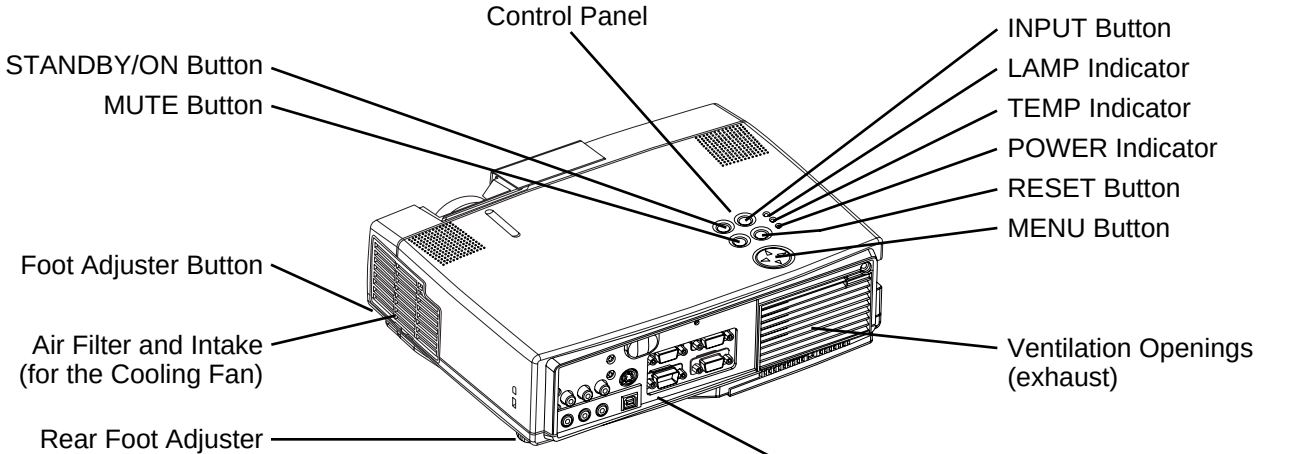
Liquid crystal panel	Drive system	TFT active matrix
	Panel size	0.9 inches
	Number of pixels	1024 (H) x 768 (V)
Lamp		160W UHB
Video input	System	NTSC , 4.43NTSC , PAL , M-PAL , PAL60 , N-PAL or SECAM
	Level	Composite 1.0Vp-p (75Ω termination) Y/C Y : 1.0Vp-p (75Ω termination) C : 0.286Vp-p (NTSC burst signal, 75Ω termination) 0.3Vp-p (PAL/SECAM burst signal, 75Ω termination)
RGB input	Video signal	Analog RGB input 0.7Vp-p (75Ω termination)
	Sync signal	H/V separate TTL level
RGB output	Video signal	Analog RGB output 0.7Vp-p (75Ω load output)
	Sync signal	H/V separate TTL level
Audio input		200mVrms, 47kΩ
Speaker output		1W + 1W (stereo)
Power supply		AC100~120V/2.8A , AC220~240V/1.2A
Power consumption		250W
Dimensions		298 (W) x 94.6 (H) x 228 (D) mm (expect the foot adjuster)
Weight		3.2kg (7.1lbs)
Temperature range		Operation : 0~35˚C Storage : -20~60˚C
Accessories		Remote control transmitter ..... 1 Battery ..... 2 POWER cord ..... 3 RGB cable ..... 1 User's manual(with Safety Instructions) .... 1 Audio/Video cable ..... 1 Mouse cable (PS/2) ..... 1 Carrying bag ..... 1 Handle 1

3. Names of each part

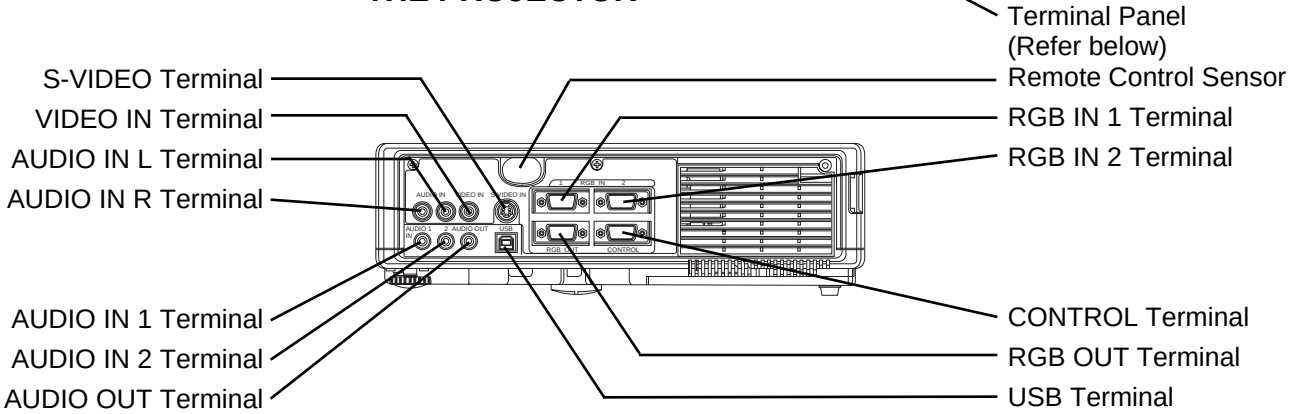
● Main unit



FRONT/LEFT VIEW OF THE PROJECTOR

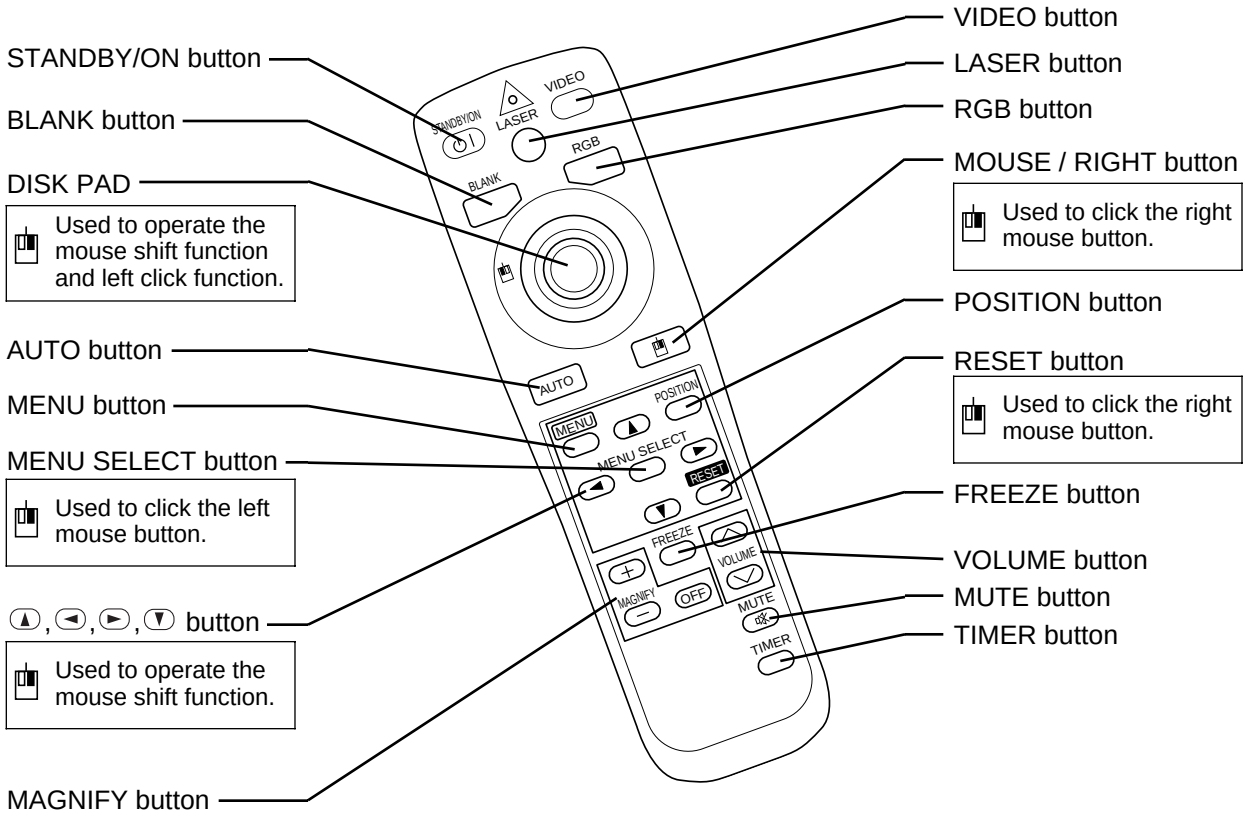


REAR/RIGHT VIEW OF THE PROJECTOR



TERMINAL PANEL

● Remote control transmitter

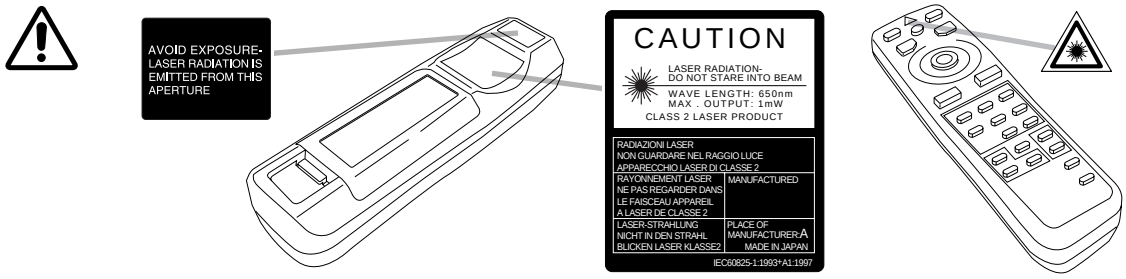


REMOTE CONTROL TRANSMITTER

: These functions works when the mouse control function is activated. Remember, the POSITION, BLANK ON and MENU ON functions disable the mouse control function.

WARNING

The laser pointer of the Remote control transmitter is used in place of a finger or rod.
Never look directly into the laser beam outlet or point the laser beam at other people.
The laser beam can cause vision problems.



NOTE: To prevent any malfunction;

- Do not give the Remote control transmitter any physical impact. Take care not to drop.
- Do not place the heavy objects on the Remote control transmitter.
- Do not wet the Remote control transmitter or place it on any wet object.
- Do not place the Remote control transmitter close to the cooling fan of the projector.
- Do not disassemble the Remote control transmitter in case of malfunction. Please bring it to the service station.

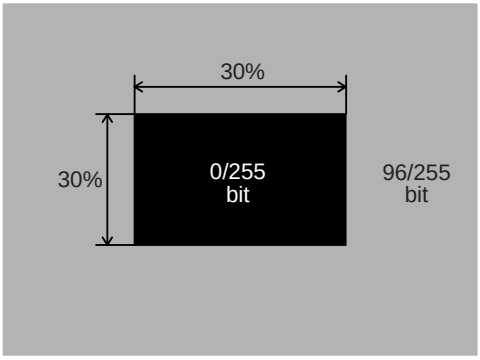
4. Adjustment

4 - 1 Before adjusting

1. Before starting adjustment, warm up the projector for about 10 min. (Blank white)
2. Set Zoom Wide to Max. and project an image a distance of 40 inches.
3. Normalizing the video adjustment.
   (Press the [MENU] button of the Remote control transmitter to display the Setup menu, then press the [RESET] button.)
   *note : The setup menu is not displayed on with no signal.
4. Perform all adjustments from the Adjustment menu.
   Perform the following operations to display the Adjustment menu.
   a.Press the [MENU] button of the Remote control transmitter (the Setup menu will appear).
   b.Next, press the [RESET] button for 5 sec. or more (the Adjustment menu will appear).

4 - 2 Ghost adjustment

Signals for internal adjustment

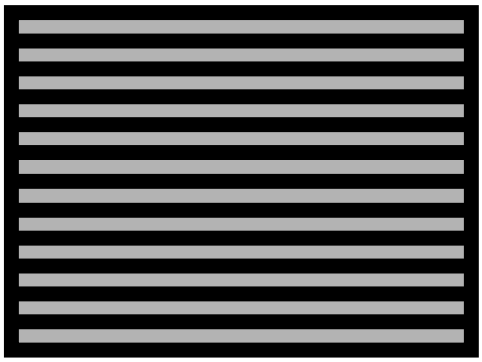


Adjustment procedure

1. Use DAC-P - GHOST-W: in the Adjustment menu to adjust so that ghost is at a minimum.
   (Set the adjustment value to 16, then raise the value. When a ghost appears to the left of a vertical line, reduce the value by 2 steps.)

4 - 3 Flicker adjustment (V.COM adjustment)

Signals for internal adjustment



Adjustment procedure

1. Make this adjustment after completing the adjustment in 4-2 Ghost adjustment.
2. Use DAC-P - V.COM - R: in the Adjust menu to adjust so that the flicker at the center of the screen is less than the flicker at the periphery.
   (When the flicker is about the same across the whole screen, adjust so that the flicker at the center of the screen is somewhat less than elsewhere.)
3. In the same way, use DAC-P - V.COM - G: in the Adjustment menu to adjust the G color flicker.
4. In the same way, use DAC-P - V.COM - B: in the Adjustment menu to adjust the B color flicker.

4 - 4 PSIG adjustment (vertical stripe adjustment)

Signals for internal adjustment

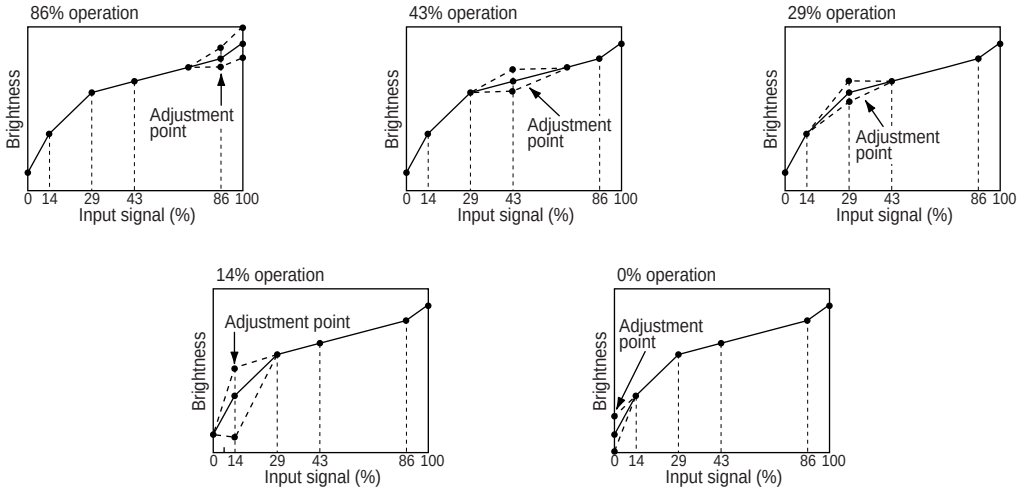
Adjustment procedure

1. Make this adjustment after completing the adjustment in 4-3 Flicker adjustment.
2. Use DAC-P - PSIG - G: in the Adjust menu to adjust so that the vertical lines spaced every 6 dots are as inconspicuous as possible.

4 - 5 White balance adjustment

1. Perform these adjustments after the PSIG adjustment described in Section 4-4.
2. First, adjust the G color.
3. Place the cursor on Slide Show in the Adjust menu [A/D], press the [▶] key three times to display G monochrome and adjust the illuminance at the center of the screen. Make a note of the setting (here assumed to be A [lx]). Press the MENU key to return.
4. Adjust Gamma 86% and G: in the Adjust menu so that illuminance (Y) at the center of the screen is adjusted as follows.
   Y = A x 0.712 ± 20 [lx]
5. Adjust Gamma, 43% and G: in the Adjust menu so that illuminance (Y) at the center of the screen is adjusted as follows.
   Y = A x 0.155 ± 5 [lx]
6. Adjust Gamma, 29% and G: in the Adjust menu so that illuminance (Y) at the center of the screen are adjusted as follows.
   Y = A x 0.064 ± 3 [lx]
7. Adjust Gamma, 14% and G: in the Adjust menu so that illuminance (Y) at the center of the screen is adjusted as follows.
   Y = A x 0.014 ± 2 [lx]
8. Adjust Gamma 0% and G: in the Adjust menu so that illuminance (Y) at the center of the screen is adjusted as follows.
   Y = A x 0.005 ± 0.5 [lx]
9. Now, adjust the R and B colors.
10. Place the cursor on [A/D] - [SLIDE SHOW] in the ADJUST menu and press the [▶] key once to display a white screen. Then measure the color coordinates at the center of the screen and take a note of the setting (here assumed to be x1, y1). Press the [MENU] key to return.
11. Adjust Gamma, 86%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.
    x = (x1 - 0.005) ± 0.003
    y = (y1 - 0.010) ± 0.005
12. Adjust Gamma, 43%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.
    x = (x1 - 0.005) ± 0.003
    y = (y1 - 0.015) ± 0.005
13. Adjust Gamma, 29%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.
    x = (x1 - 0.010) ± 0.003
    y = (y1 - 0.020) ± 0.005
14. Adjust Gamma, 14%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.
    x = (x1 - 0.010) ± 0.003
    y = (y1 - 0.025) ± 0.005

Adjustment operations (reference)



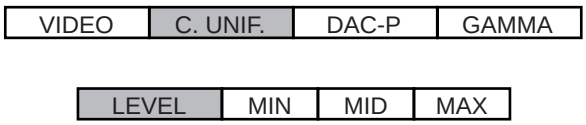
4 - 6 Color uniformity adjustment

Preparations

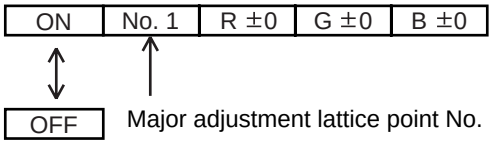
1. Perform these adjustments after the white balance adjustment described in Section 4-5.
2. Make a color uniformity adjustment for the following three tones.
   - MIN tone (approx. 10% input signal)
   - MID tone (approx. 50% input signal)
   - MAX tone (approx. 75% input signal)

   (Note that the MIN tone need not be adjusted when there is no conspicuous color shading during a black signal input.)
3. Place the cursor on the tone to be adjusted in the Adjust menu and press the [▼] key. This displays the Adjust Tone menu at the bottom of the screen. Select the major adjustment lattice point No. and color, then adjust them.
4. The major adjustment lattice point numbers (a total of 17 points) corresponds to the major adjustment lattice point positions in the diagram on the right. The color uniformity of the entire screen can be adjusted by adjusting the white balance for each of the points starting in order from the low numbers.
5. Adjustment point No. 1 should not be adjusted, because it controls the brightness of the entire screen.
6. To temporarily turn correction off, place the cursor on ON in the Adjust Tone menu and press the [▼] key. To turn it on again, place the cursor on OFF in the Adjust Tone menu and press the [▲] key.
7. Although this adjustment can also be made using internal signals, we will here use the [MENU SELECT] key on the Remote control transmitter to select the following two signals.
   - Solid monochrome adjustment color (use G color adjustment when a color differential meter is used)
   - Solid white (use for adjustment other than above)
8. Reset color shading correction before adjustment.
   - When 3 tones and all colors are to be reset, place the cursor on [C. UNIF]. in the Adjust menu, press the [RESET] key and select [DEFAULT].
   - When only 1 tone is to be reset, place the cursor on the tone to be reset press the [RESET] key and select [DEFAULT].
   - Single tone and monochrome resets cannot be performed.

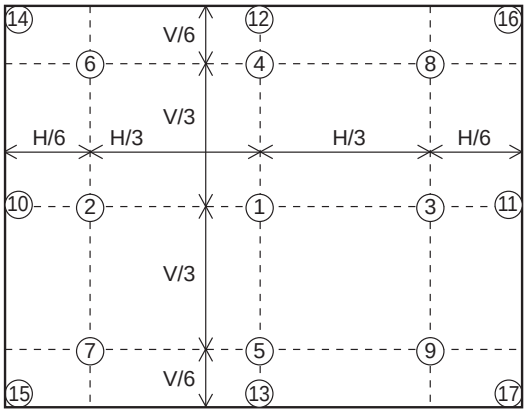
Adjust menu



Adjust Tone menu



Major adjustment lattice point position



Adjustment procedure 1
(when a color differential meter is used)

1 First adjust [MIN] tone [G:].
Unless there is conspicuous black uniformity, there is no need to adjust. (Go to step 7 if no adjustment is required.)

2 Select adjustment point [No. 2] [G:].
When the background is [G] monochrome, press the [MENU SELECT] key on the Remote control transmitter to change to solid white.

3 Adjust the color coordinates of adjustment point [No. 1] and make a note of them.
Assume that they are x = x1, y = y1.
Note : When the CL-100 color and color difference meter is used, the [Δ](delta) mode is convenient. When adjustment point [No. 1] color coordinate has been selected, set the slide switch on the side to [Δ](delta) while holding down the [F] button on the front panel. The measurement shown after this displays the deviation from measurement point 1.

4 Now measure the color coordinates of measurement point [No. 2] and adjust [No. 2] and [G:] so that the color coordinates are as follows.
y = y1 ± 0.030 (adjust Y only)
Similarly, measure adjustment points [No. 3] to [No. 9] and adjust their color coordinates starting in order from the small number points.

5 Then measure the color coordinates for adjustment point [No. 10] and adjust [No. 10] and [G:] so that the color coordinates are as follows.
y = y1 ± 0.050 (adjust Y only)
Similarly measure adjustment points [No. 11] to [No. 17] and adjust their color coordinates starting in order from the small number points.

6 This completes the adjustments required for [MIN].
Note : Since excessive correction may lead to a correction data overflow during internal calculations, use the following values for reference.
[No. 2] to [No. 9] ± 40 or less
[No. 10] to [No. 17] ± 70 or less

7 Then adjust [MAX] tone [G].
Select [No. 2] [G:]. If the background is white solid, press the [MENU SELECT] key on the Remote control transmitter to change to [G] monochrome.

8 Measure the illuminance of measurement point [No. 2] and [No. 3]. Temporarily set [No. 2] to illuminance Y2 and [No. 3] to illuminance Y3 [lx].

9 Adjust the illuminance of measurement point [No. 2] and [No. 3] to their average values. Thus illuminance Y2' and Y3' of measurement points [No. 2] and [No. 3] should be the following after adjustment.
Y2' = Y3' = (Y2 + Y3) ÷ 2 ± 20 [lx]

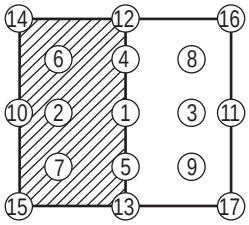
10. Next, measure the illuminance of measurement point [No. 10] and [No. 11].
Adjust the illuminance of measurement point [No. 10] and [No. 11] to their average values. Thus illuminance Y10' and Y11' of measurement points [No. 10] and [No. 11] should be the following after adjustment.
Y10' = Y11' = (Y10 + Y11) ÷ 2 ± 20 [lx]
This completes [G] color adjustments.

11. Then adjust [MAX] tone [R] and [B].
    Select [No. 2] [B:] and press the [MENU SELECT] key on the Remote control transmitter to change to solid white.
12. Adjust the color coordinates of adjustment point [No. 1] and make a note of them.
    Assume that they are x = x1, y = y1.
13. Now measure the color coordinates of measurement point [No. 2] and adjust [No. 2] [R:] and [B:] so that the color coordinates are as follows.
    x = x1 ± 0.005, y = y1 ± 0.010
    Similarly, measure adjustment points [No. 3] to [No. 9] and adjust their color coordinates starting in order from the small number points.
14. Then measure the color coordinates for adjustment point [No. 10] and adjust [No. 10] [R:] and [B:] so that the color coordinates are as follows.
    x = x1 ± 0.005, y = y1 ± 0.010
    Similarly measure adjustment points [No. 11] to [No. 17] and adjust their color coordinates starting in order from the small number points.
15. This completes [MAX] tone adjustments.
16. Now make similar adjustments for [MID] tone. (Note that [G] color adjustment tolerance is ± 10 [lx].)

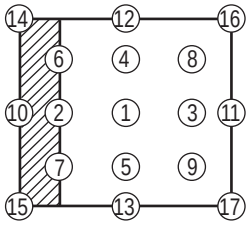
Adjustment procedure 2 (visual inspection)

1. First adjust [MIN] tone [G:].
   Unless there is conspicuous black shading, there is no need to adjust. (Go to step 4 if no adjustment is required.)
2. Adjust only [G:] of measurement points [No. 2] to [No. 17] in number order to minimize color shading.
   (Use the deviation range information for each measurement point given below as reference.)
3. This completes [MIN] tone adjustments.
4. Then adjust [MAX] tone [G] color.
5. Select [No. 2] [G:].
   If the background is [G] monochrome, press the [MENU SELECT] key on the Remote control transmitter to change to solid white.
6. View measurement point [No. 2] and [No. 3]. Lower the [G] color intensity only of the color point whose [G] color is more intense than measurement point [No. 1].
7. View measurement point [No. 10] and [No. 11]. Lower the [G] color intensity only of the color point whose [G] color is more intense than measurement point [No. 1], and raise the intensity of the point whose color intensity is lower than measurement point [No. 1].
8. This completes adjustments for [MAX] tone [G].
9. Now adjust the [MAX] tone for colors [R] and [B].
10. View measurement points [No. 2], [No. 3], [No. 10] and [No. 11]. Adjust the [R] and [B] of each measurement point so that they have the same color as measurement point [No. 1].
    Adjustment technique :
    First, adjust [B:] of the point whose color is to be adjusted so that it approximates that of [No. 1]. If [R:] is low at this time, the image will have cyan cast, in which case [R:] is increased. On the other hand, if [R:] is excessive, the image will have a magenta cast, in which case [R:] is decreased.
    Overall, a cyan cast makes it easy to see color shading.
11. Next, view measurement points [No. 4], [No. 5], [No. 12] and [No. 13] and make similar adjustments.
12. Then adjust measurement points [No. 6], [No. 7], [No. 8], [No. 9], [No. 14], [No. 15], [No. 16] and [No. 17]. This completes the [MAX] tone adjustment.
13. Make similar [MID] adjustments as described in steps 4 to 12 above.

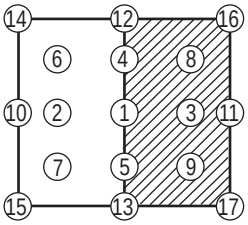
No. 2 deviation range



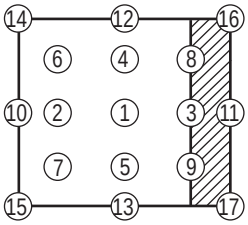
No. 10 deviation range



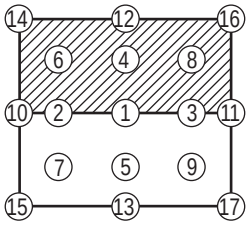
No. 3 deviation range



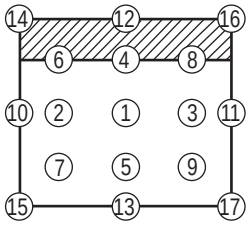
No. 11 deviation range



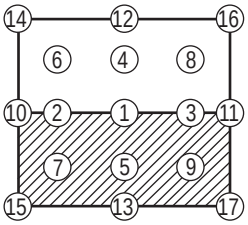
No. 4 deviation range



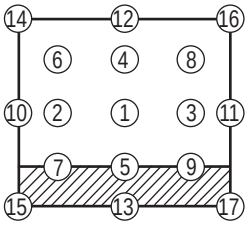
No. 12 deviation range



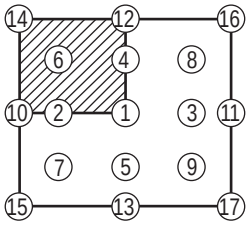
No. 5 deviation range



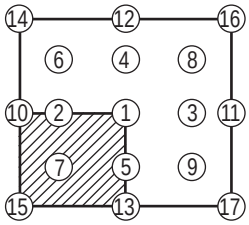
No. 13 deviation range



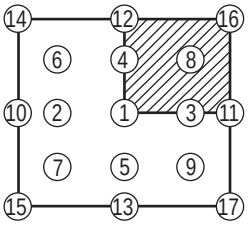
No. 6 deviation range



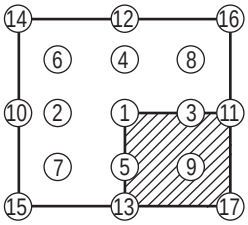
No. 7 deviation range



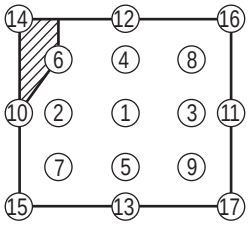
No. 8 deviation range



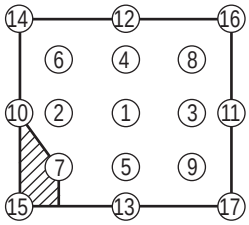
No. 9 deviation range



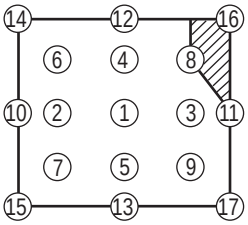
No. 14 deviation range



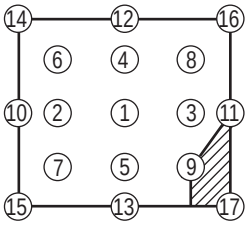
No. 15 deviation range



No. 16 deviation range

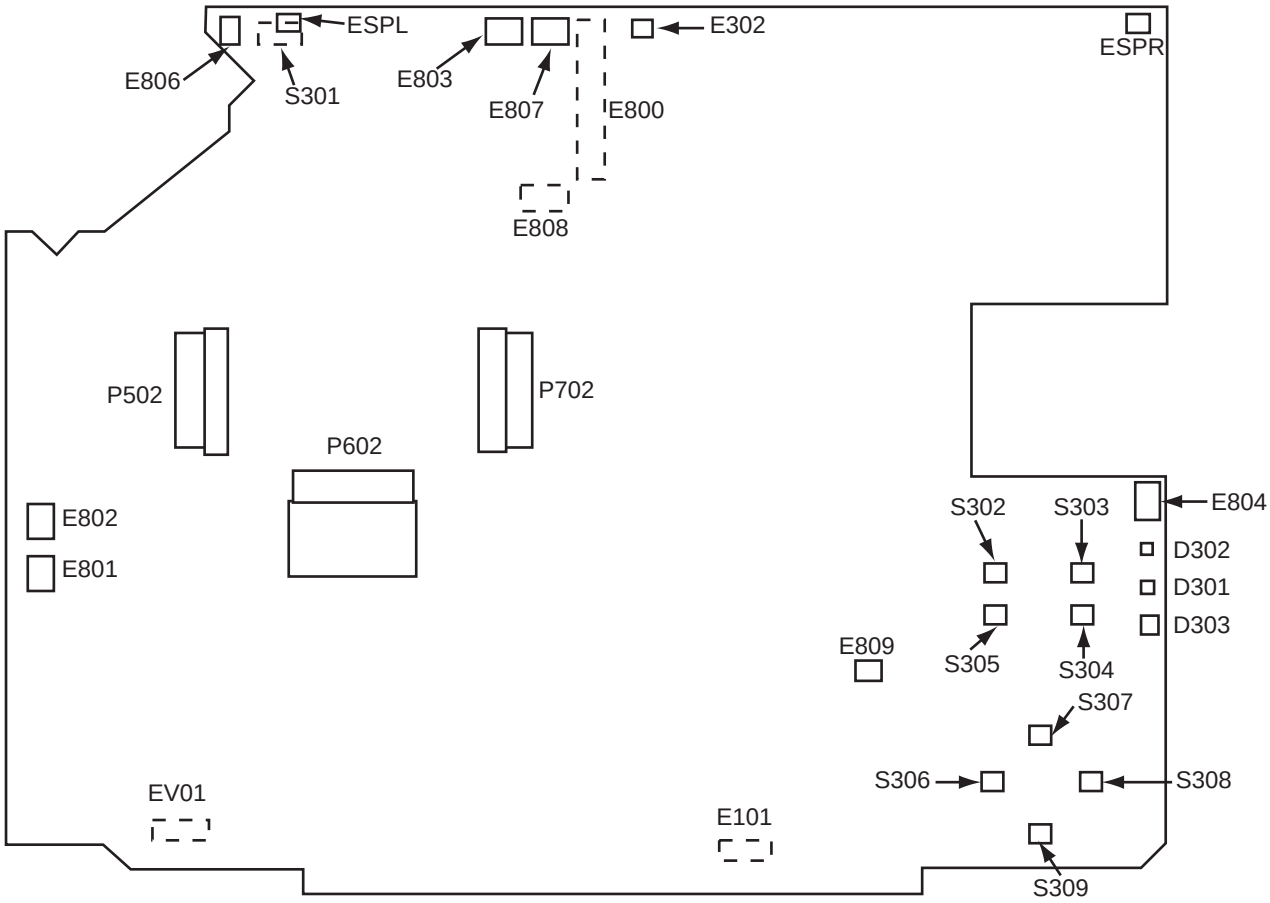


No. 17 deviation range

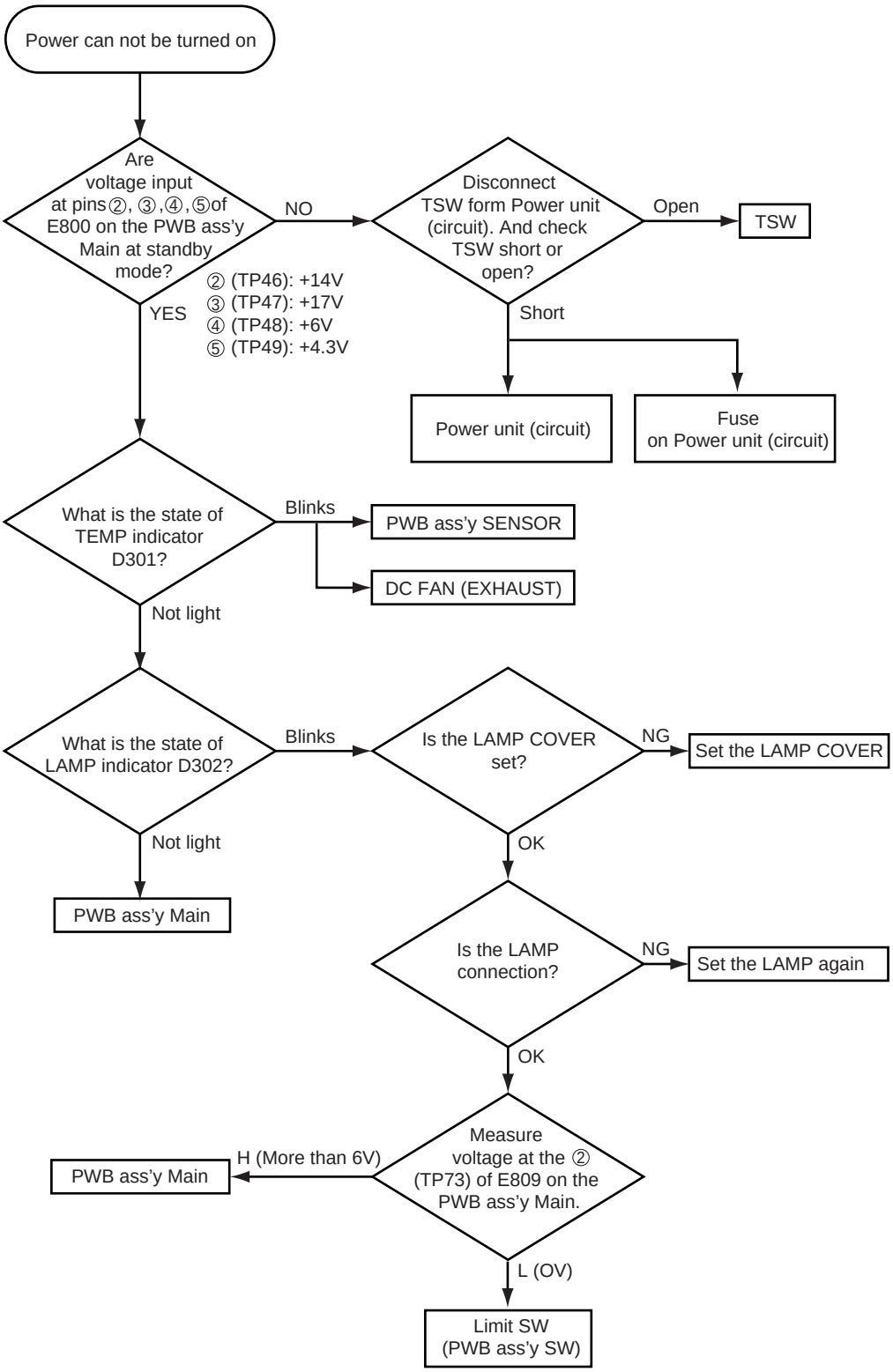


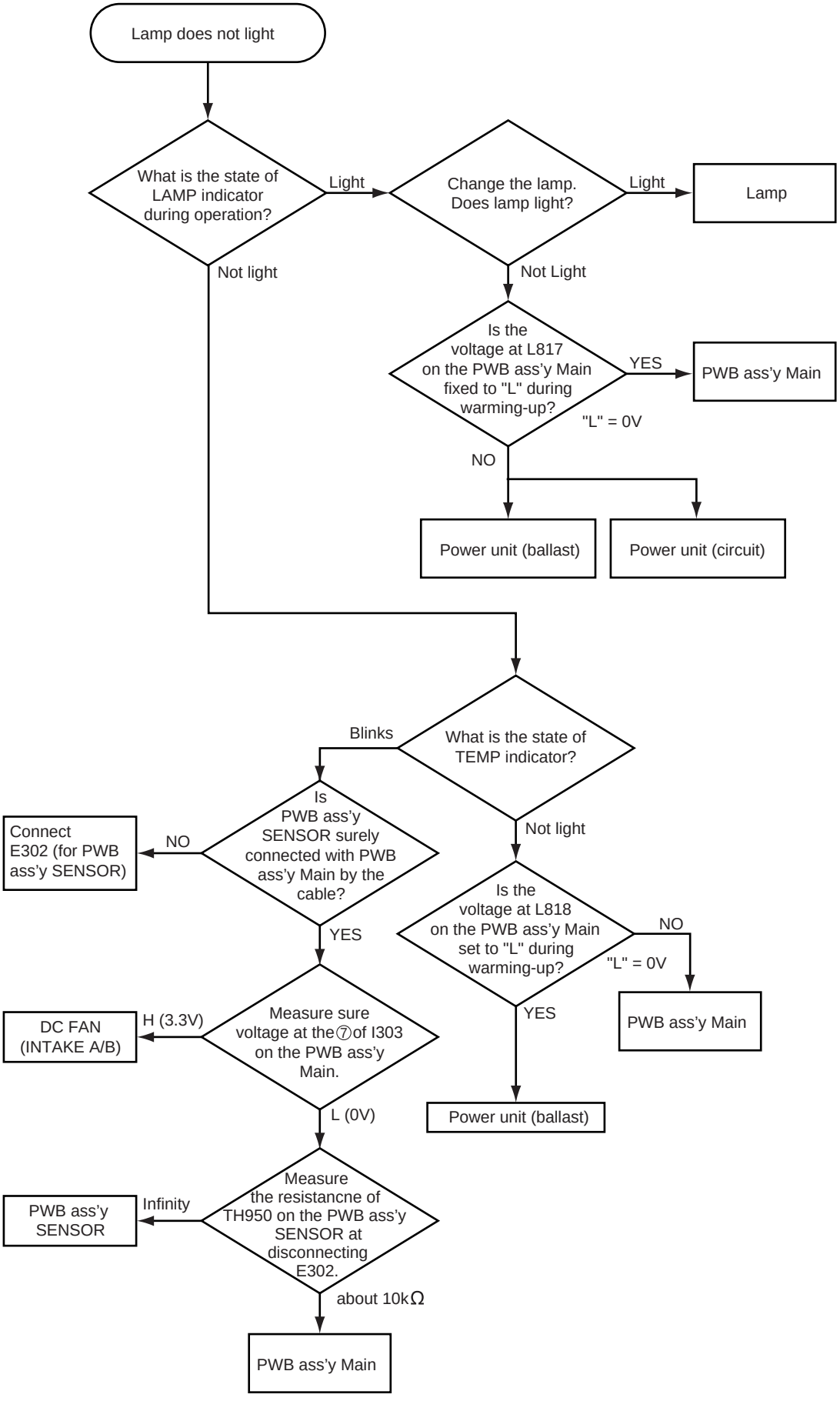
5. Troubleshooting

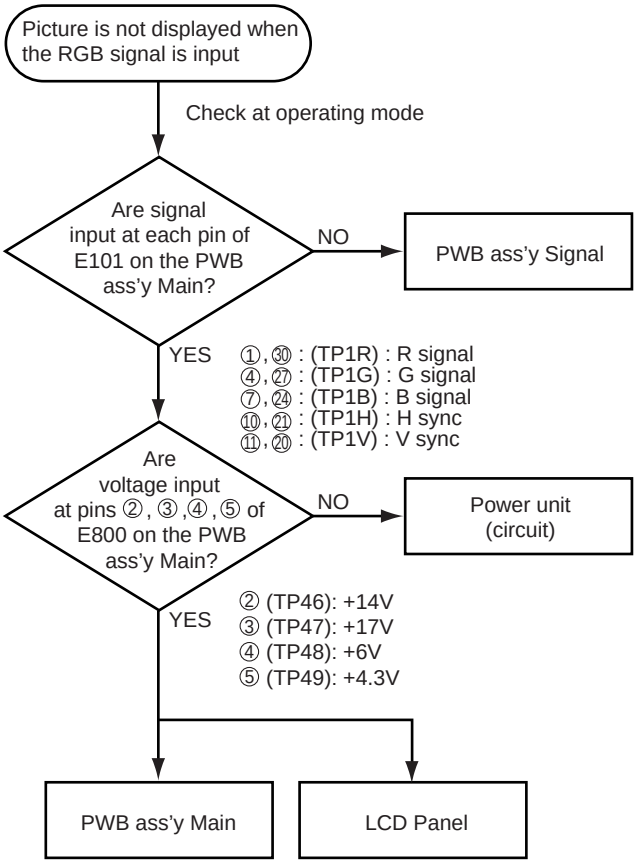
Check points at trouble shooting

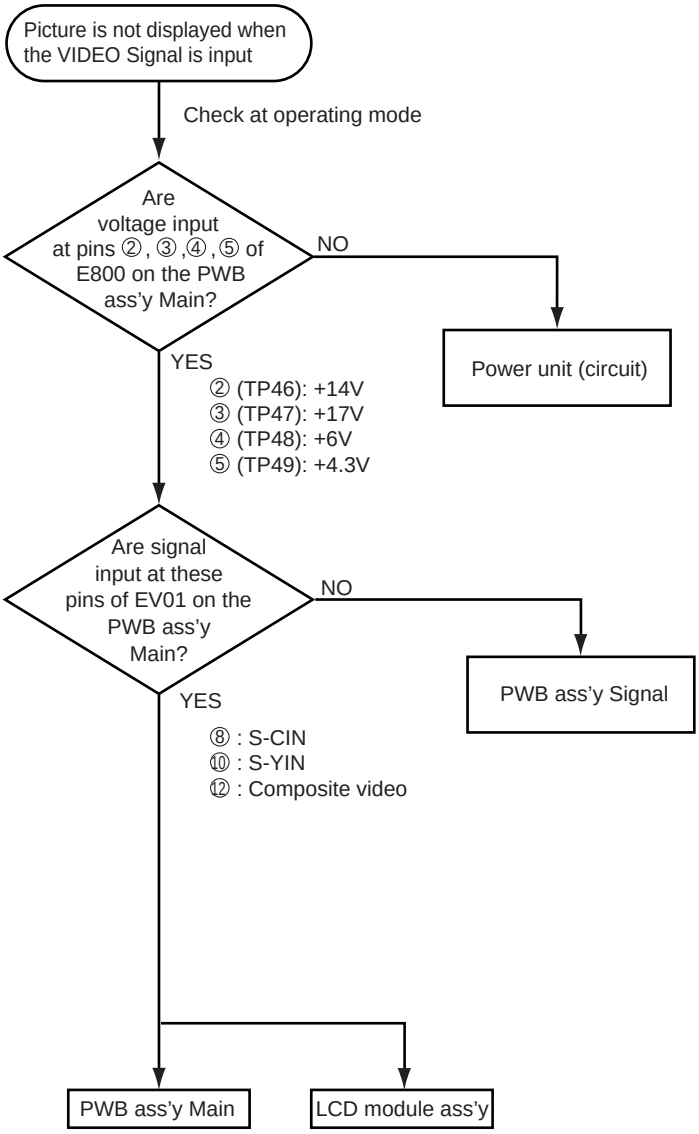


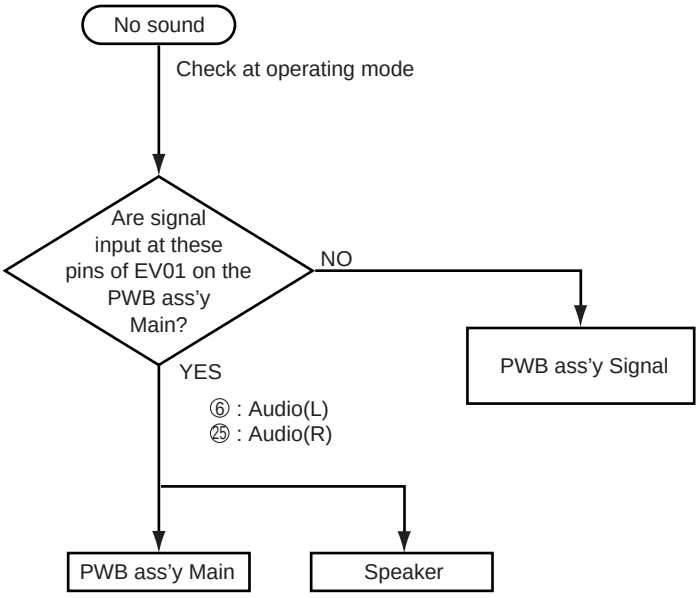
PWB ass'y Main

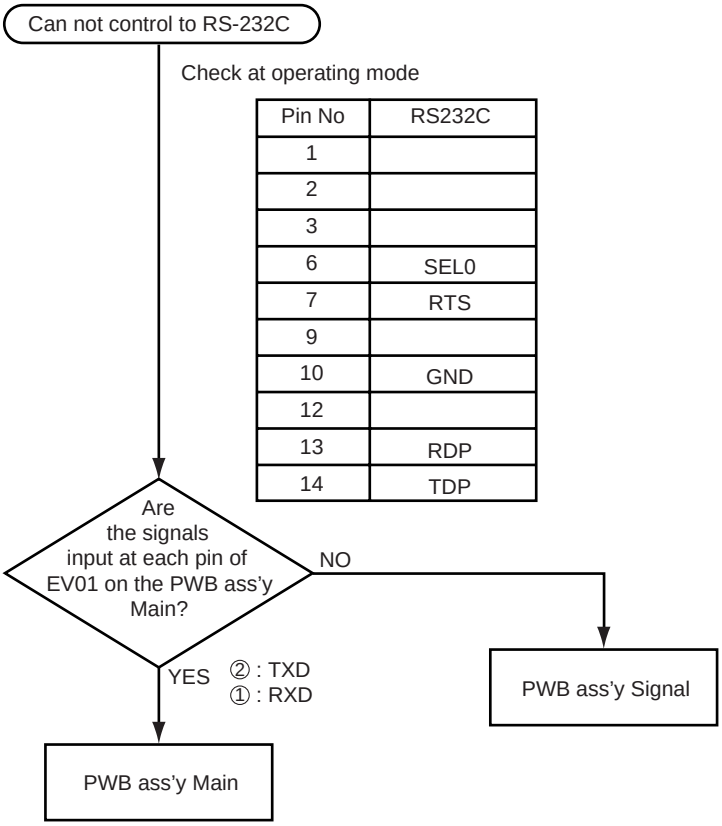

Power can not be turned on
Are voltage input at pins②, ③,④,⑤of E800 on the PWB ass'y Main at standby mode?
NO
Disconnect TSW form Power unit (circuit). And check TSW short or open?
Open
TSW
② (TP46): +14V
③ (TP47): +17V
④ (TP48): +6V
⑤ (TP49): +4.3V
YES
Short
Power unit (circuit)
Fuse on Power unit (circuit)
What is the state of TEMP indicator D301?
Blinks
PWB ass'y SENSOR
DC FAN (EXHAUST)
Not light
What is the state of LAMP indicator D302?
Blinks
Is the LAMP COVER set?
NG
Set the LAMP COVER
Not light
OK
PWB ass'y Main
Is the LAMP connection?
NG
Set the LAMP again
OK
Measure voltage at the ② (TP73) of E809 on the PWB ass'y Main.
H (More than 6V)
PWB ass'y Main
L (OV)
Limit SW (PWB ass'y SW)


Lamp does not light
What is the state of LAMP indicator during operation?
Light
Change the lamp. Does lamp light?
Light
Lamp
Not light
Not Light
Is the voltage at L817 on the PWB ass'y Main fixed to "L" during warming-up?
YES
PWB ass'y Main
"L" = 0V
NO
Power unit (ballast)
Power unit (circuit)
What is the state of TEMP indicator?
Blinks
Not light
Is PWB ass'y SENSOR surely connected with PWB ass'y Main by the cable?
NO
Connect E302 (for PWB ass'y SENSOR)
YES
Is the voltage at L818 on the PWB ass'y Main set to "L" during warming-up?
NO
"L" = 0V
PWB ass'y Main
YES
Power unit (ballast)
Measure sure voltage at the⑦of I303 on the PWB ass'y Main.
H (3.3V)
DC FAN (INTAKE A/B)
L (0V)
Measure the resistancne of TH950 on the PWB ass'y SENSOR at disconnecting E302.
Infinity
PWB ass'y SENSOR
about 10kΩ
PWB ass'y Main


Picture is not displayed when the RGB signal is input
Check at operating mode
Are signal input at each pin of E101 on the PWB ass'y Main?
NO
PWB ass'y Signal
YES
①, ㉚ : (TP1R) : R signal
④, ㉗ : (TP1G) : G signal
⑦, ㉔ : (TP1B) : B signal
⑩, ㉑ : (TP1H) : H sync
⑪, ⑳ : (TP1V) : V sync
Are voltage input at pins ②, ③, ④, ⑤ of E800 on the PWB ass'y Main?
NO
Power unit (circuit)
YES
② (TP46): +14V
③ (TP47): +17V
④ (TP48): +6V
⑤ (TP49): +4.3V
PWB ass'y Main
LCD Panel


Picture is not displayed when the VIDEO Signal is input
Check at operating mode
Are voltage input at pins ②, ③, ④, ⑤ of E800 on the PWB ass'y Main?
NO
Power unit (circuit)
YES
② (TP46): +14V
③ (TP47): +17V
④ (TP48): +6V
⑤ (TP49): +4.3V
Are signal input at these pins of EV01 on the PWB ass'y Main?
NO
PWB ass'y Signal
YES
⑧ : S-CIN
⑩ : S-YIN
⑫ : Composite video
PWB ass'y Main
LCD module ass'y





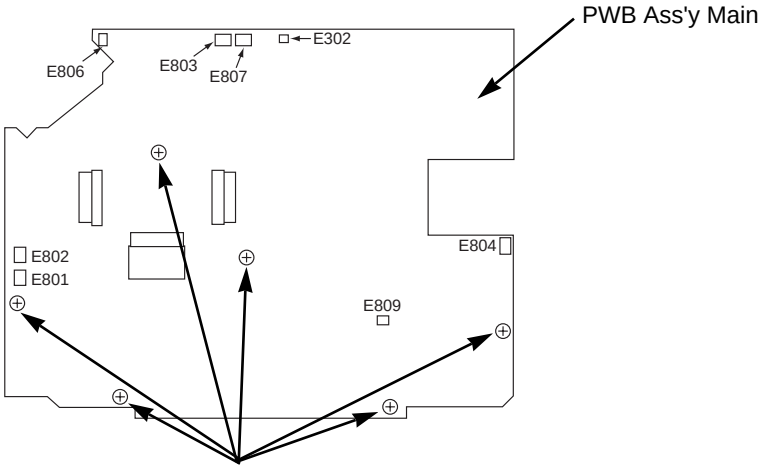
Pin No	RS232C
1	
2	
3	
6	SEL0
7	RTS
9	
10	GND
12	
13	RDP
14	TDP

6. Service points

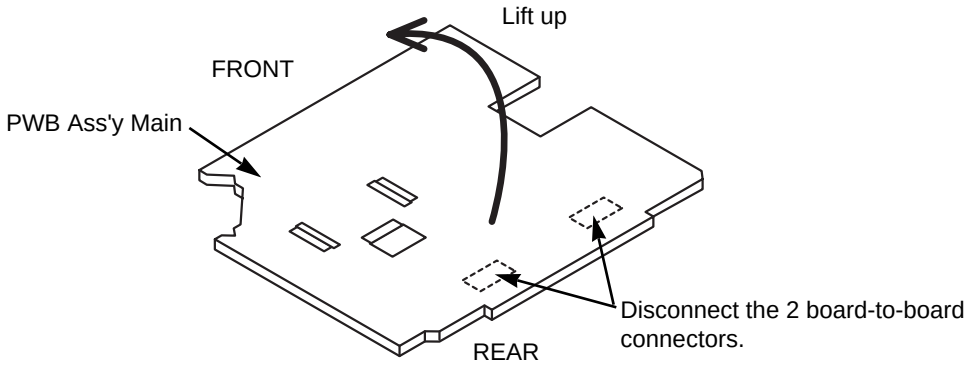
• Cautions when removing the PWB Ass'y Main

When removing the PWB Ass'y Main, there is danger of damaging the connector connecting cables and the PWB Ass'y Signal.

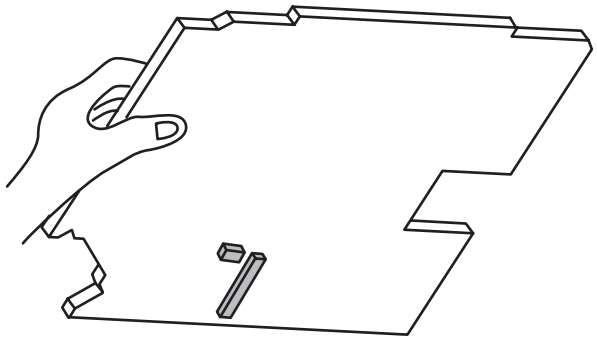
1) Disconnect 11 cables and remove 6 screws.



2) Lift up the rearward of the PWB Ass'y Main to the front.



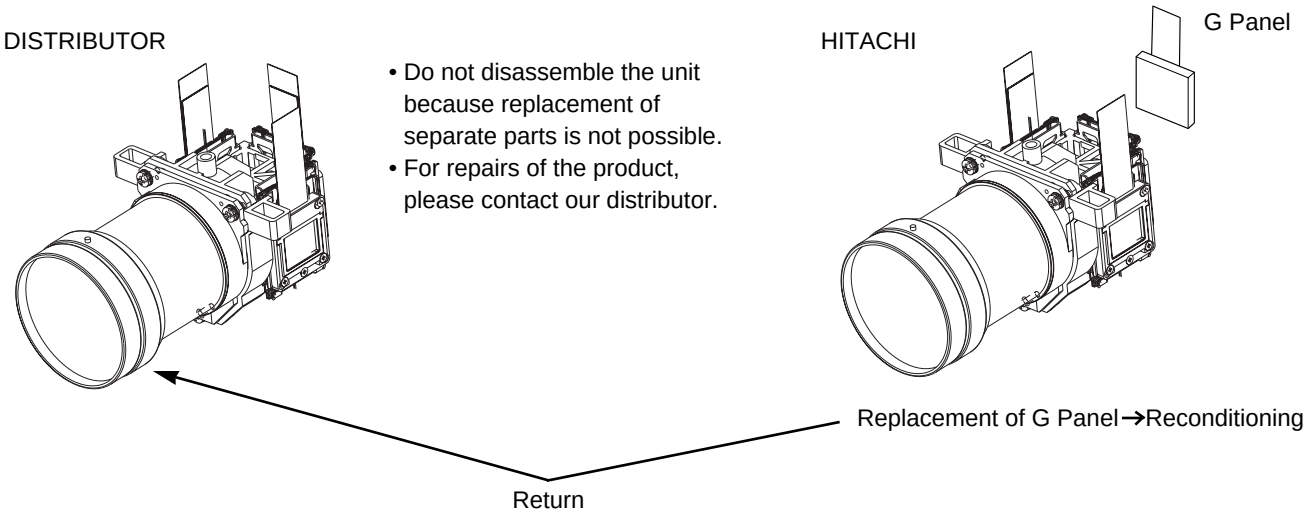
3) Disconnect 2 cables lifting the PWB Ass'y Main.



Disconnect 2 cables

• Before Replacing the LCD / Lens Prism

You should not replace separately the parts of the liquid crystal LCD / Lens Prism because it works properly only when used together. Therefore, regarding these parts, you can either replace part , LCD / Lens Prism Ass'y, or send the whole unit LCD / Lens Prism Ass'y back to HITACHI, where we will replace the malfunctioning part, recondition the device and send it back to you. In that case please contact our distributor.



• Air Filter Maintenance

The air filter should be cleaned as described below at intervals of approximately 100 hours.

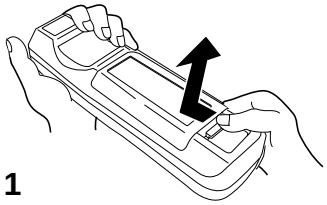
1. Switch the projector power supply OFF, and remove the power cord from the power outlet.
2. Clean the air filter with a vacuum cleaner.

⚠
- Switch power OFF and remove the power cord from the power outlet before beginning maintenance work. Please read the separate “SAFETY INSTRUCTIONS” thoroughly to ensure that maintenance is performed correctly.
- Replace the air filter if contamination cannot be removed, or if it is damaged. Contact your dealer in such case.(Option Air filter : MU01291)
- Do not use the equipment with the air filter removed.
- When the air filter is clogged with dust etc. the CHECK AIR FLOW message appears on the screen and the power supply is switched OFF automatically to prevent the temperature rising inside the projector.

• Loading the Battery

Install the AA batteries into the remote control.

1. Remove the battery cover.
   Push the knob while lifting up the battery cover.
2. Loading the batteries.
   Make sure the plus and minus poles are correctly oriented.
3. Close the battery cover.



CAUTION

- Use only the specified batteries with this remote control. Also, do not mix new and old batteries. This could cause in battery cracking or leakage, which could result in fire or personal injury.
- When loading the batteries, make sure the plus and minus terminals are correctly oriented as indicated in the Remote control transmitter transmitter. Incorrect orientation could cause battery cracking or leakage, which could result in personal injury or pollution of the surrounding environment.
- When you dispose the battery, you obey the law in the relative area or country.
- Keep the battery away from children and pets.
- When not to be used for an extended period, remove the batteries from the Remote control transmitter.

NOTE: Replace the batteries when remote control operation becomes difficult.

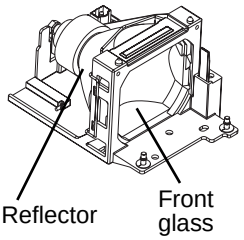
• Lamp

HIGH VOLTAGE
HIGH TEMPERATURE
HIGH PRESSURE

Contact your dealer before replacing the lamp.
(Option lamp: DT00331)
Before replacing the lamp, switch power OFF, remove the power cord from the power outlet, and wait approximately 45 minutes until the lamp has cooled. The lamp may explode if handled at high temperatures.

- For disposal of used lamp, treat according to the instruction of community authorities.
- Since the lamp is made of glass, do not apply shock to it and do not scratch it.
- Also, do not use old lamp. This could also cause explosion of the lamp.
- If it is probable that the lamp has exploded (explosive sound is heard), disconnect the power plug from the power outlet and ask your dealer to replace lamp.
  The lamp is covered by front glass , but, in rare cases, the reflector and the inside of the projector may be damaged by scattered broken pieces of glass, and broken pieces could cause injury when being handled.
- Do not use the projector with the lamp cover removed.

Lamp



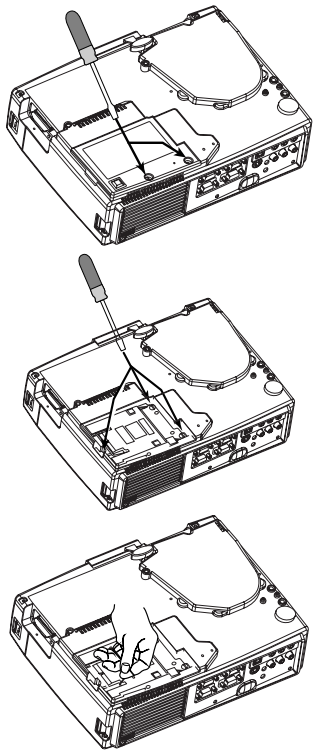
Lamp life

Projector lamps have a finite life. The image will become darker, and hues will become weaker, after a lamp has been used for a long period of time.
Replace the lamp if the LAMP indicator is red, or the CHANGE THE LAMP message (see P.20 Table 8) appears when the projector is switched ON.

NOTE: The LAMP is also red when the lamp unit reaches high temperature. Before replacing the lamp, switch power OFF, wait approximately 20 minutes, and switch power ON again. If the LAMP indicator is still red, replace the lamp.

Replacing the lamp:

1. Switch the projector OFF, remove the power cord from the power outlet, and wait at least 45 minutes for the unit to cool.
2. Prepare a new lamp.
3. Check that the projector has cooled sufficiently, and gently turn it upside down.
4. Loosen the two screws as shown in the diagram, and remove the lamp cover.
5. Loosen the three screws, and gently remove the lamp while holding the grips. Touching the inside of the lamp case may result in uneven coloring.
6. Install the new lamp and tighten the three screws firmly. Also steadily push the opposite side of the screwed lamp into the unit.
7. Replace the lamp cover in position and tighten the two screws firmly.
8. Gently turn the projector right-side up.



CAUTION

- Ensure that screws are tightened properly. Screws not tightened fully may result in injury or accidents.
- Do not use the projector with the lamp cover removed.

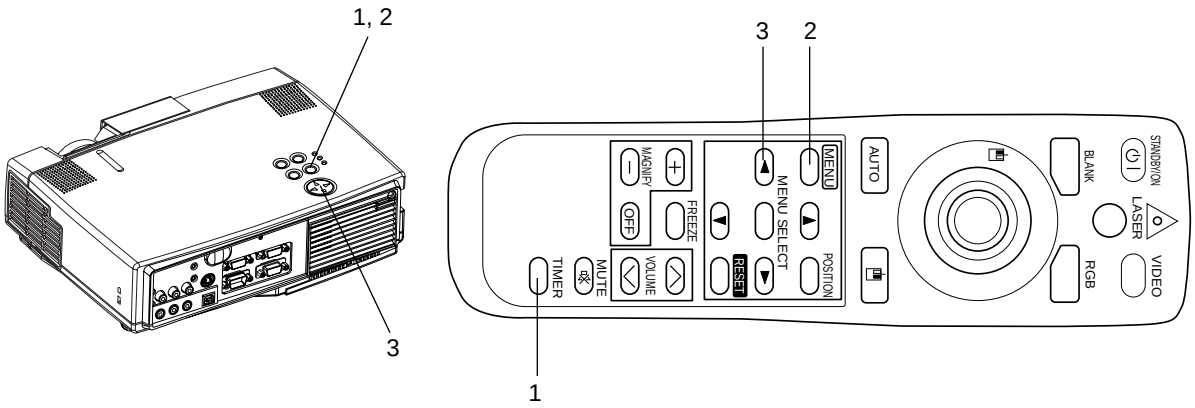
Resetting the lamp timer:

Reset the lamp timer after replacing the lamp. When the lamp has been replaced after the LAMP indicator is red, or the CHANGE THE LAMP message is displayed, complete the following operation within ten minutes of switching power ON. The power will be turned off automatically in over 10 minutes.

1. Switch power ON, and press the TIMER button on the Remote control transmitter, or the RESET button on the control panel, for approximately three seconds. The 'LAMP xxxx hr' message will appear on the lamp timer on the bottom of the screen.
2. Press the MENU button on the Remote control transmitter, or the RESET button on the control panel, while the lamp timer is displayed. The 'LAMP xxxx □ → 0 CANCEL' message will then appear.
3. Press the ◄ and select 0, and wait until the timer display is cleared.

NOTE:

Do not reset the lamp timer without replacing the lamp. Reset the lamp timer always when replace the lamp. The message functions will not operate properly if the lamp timer is not reset correctly.



Message table

On-screen display

The following messages are displayed on the screen.

"CHANGE THE LAMP" "AFTER REPLACING LAMP, RESET THE LAMP TIMER"	Lamp has 1,700 hours on it and may need to be changed.
"CHANGE THE LAMP" "AFTER REPLACING LAMP, RESET THE LAMP TIMER" "THE POWER WILL TURN OFF AFTER 20 Hr."	Lamp has 1,979 hours on it. See "Reset the lamp timer"
Blinking of "CHANGE THE LAMP" "AFTER REPLACING LAMP, RESET THE LAMP TIMER" "THE POWER WILL TURN OFF AFTER 0 Hr."	When the lamp has 2,000 hours or more on it, the message will blink, and the power will turns off after 10 minutes.
"NO INPUT IS DETECTED"	Signal is not in.
"SYNC IS OUT OF RANGE"	The horizontal or vertical frequency of the input signal exceeds the range of the projector, it cannot be displayed.
"CHECK THE AIR FLOW"	Please remove the obstruction before the suction port.

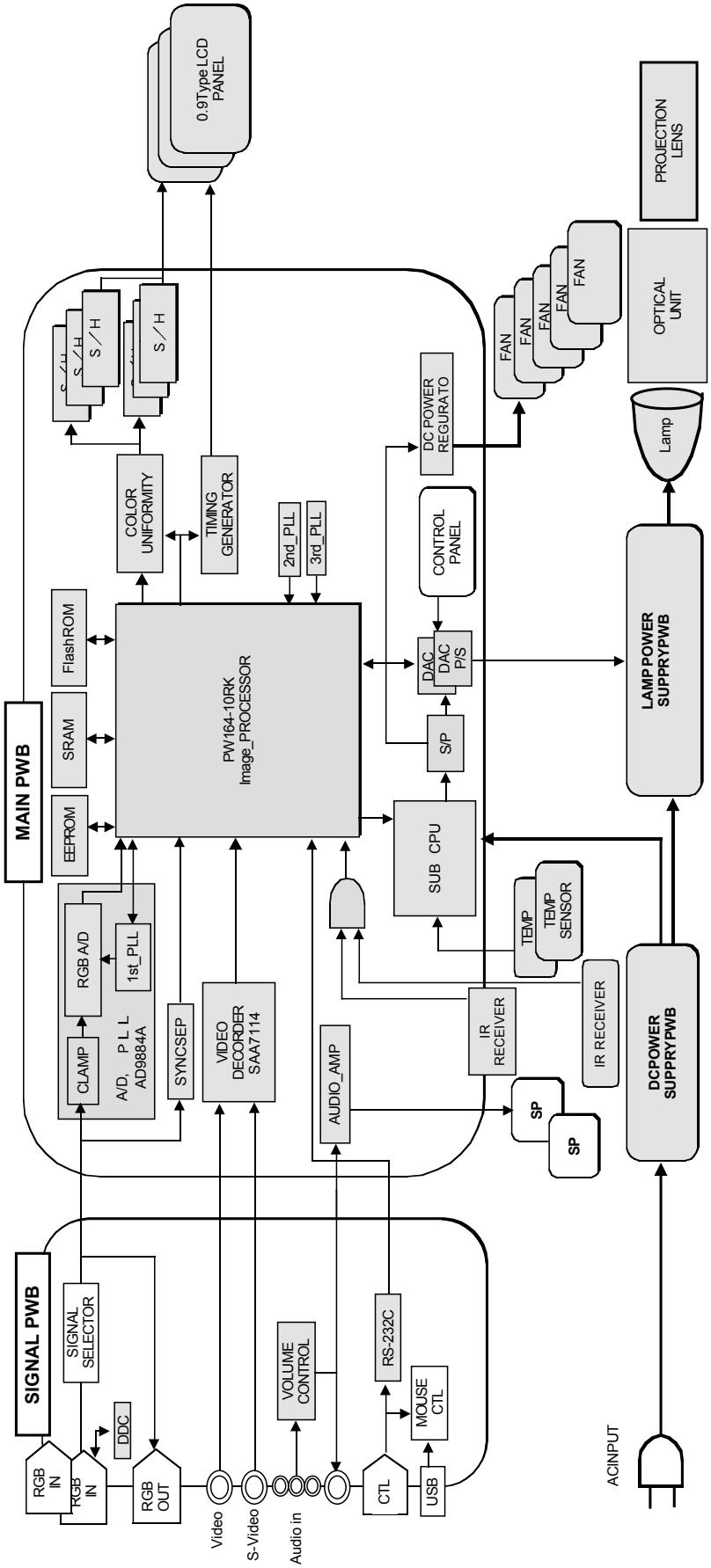
Indicator display

The ON indicator, LAMP indicator and TEMP indicator will light or blink in the following cases.

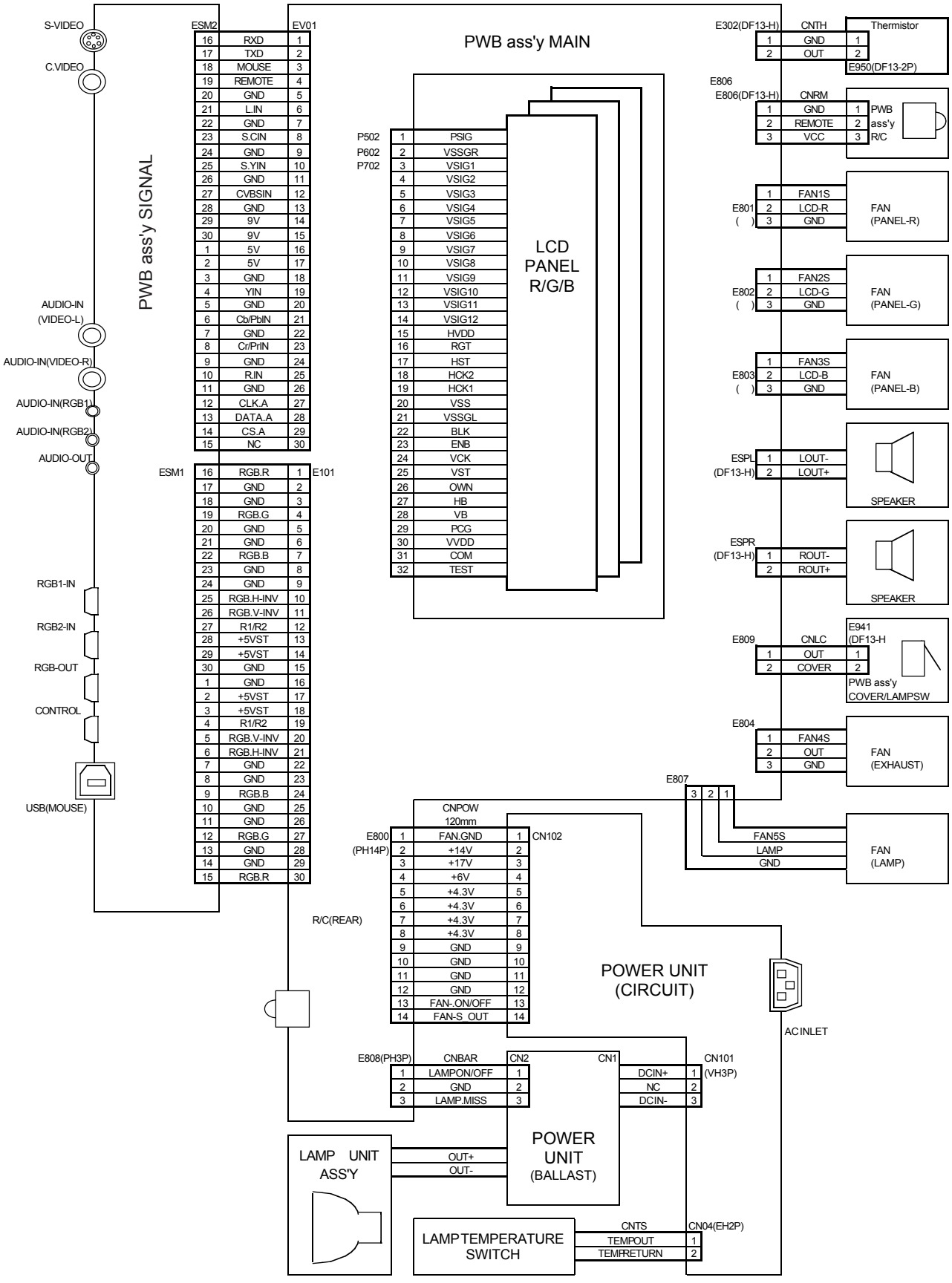
ON indicator	LAMP indicator	TEMP indicator	Meaning	Remedy
Lights orange	Goes off	Goes off	Standby mode	————
Blinks green	Goes off	Goes off	During warming up	————
Lights green	Goes off	Goes off	During operation	————
Blinks orange	Goes off	Goes off	During cooling down	————
Lights red	Lights red	Goes off	Lamp cannot light	Cool projector by power off for 20 minutes. If the indicator is still lit, lamp may be defective. Replace.
Lights red	Blinks red	Goes off	Lamp is not inserted or Lamp cover is open	Securely insert the lamp or shut the lamp door.
Lights red	Goes off	Blinks red	Cooling fan accidented or PWB ass'y SENSOR accidented.	Replace fan, PWB ass'y SENSOR or connect CNTH.
Lights red	Goes off	Lights red	Inside temperature becomes high	Please remove the obstruction before the suction port.

When inside temperature becomes high, to protect the projector, the lamp may be turned off and the lamp indicator lights red, or the projector will be shut down and the all indicator display goes off.

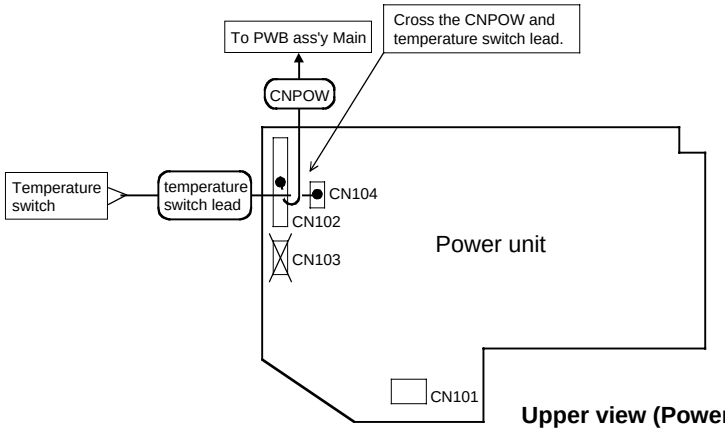
7. Block diagram



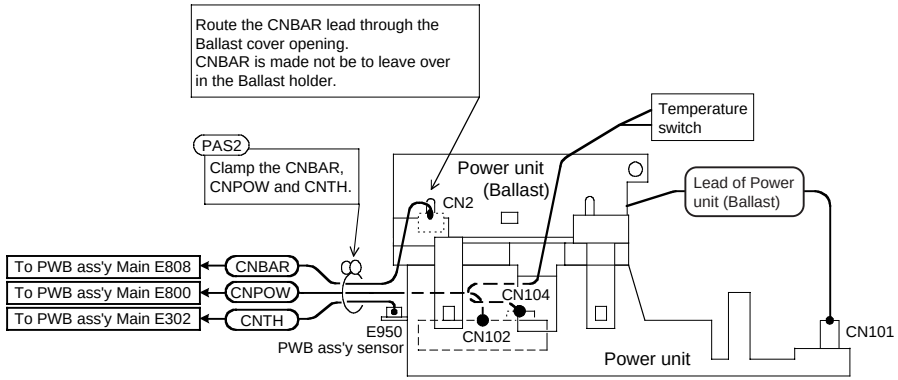
8. Connector connection diagram



Preparation for wiring of Power unit

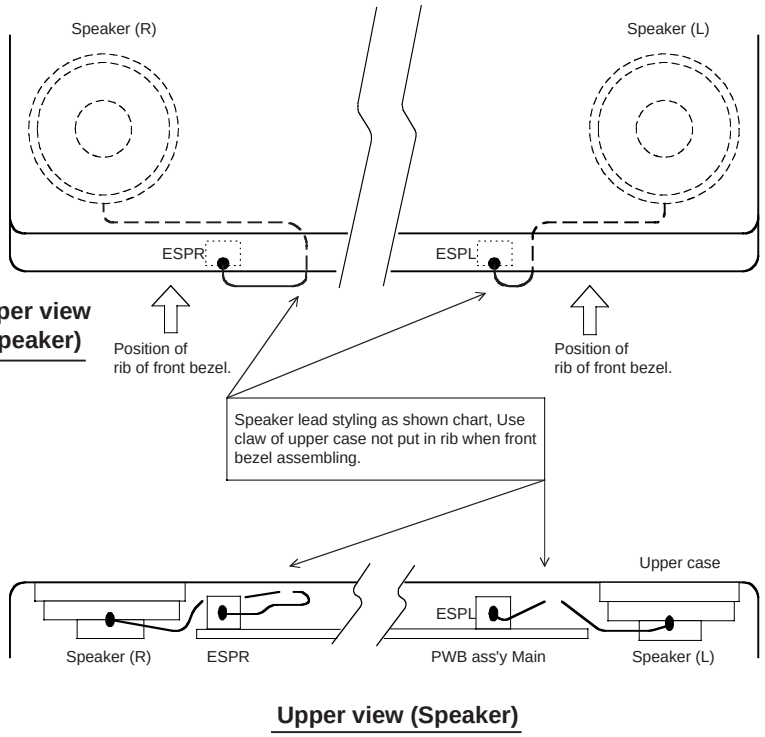


Upper view (Power unit (circuit))

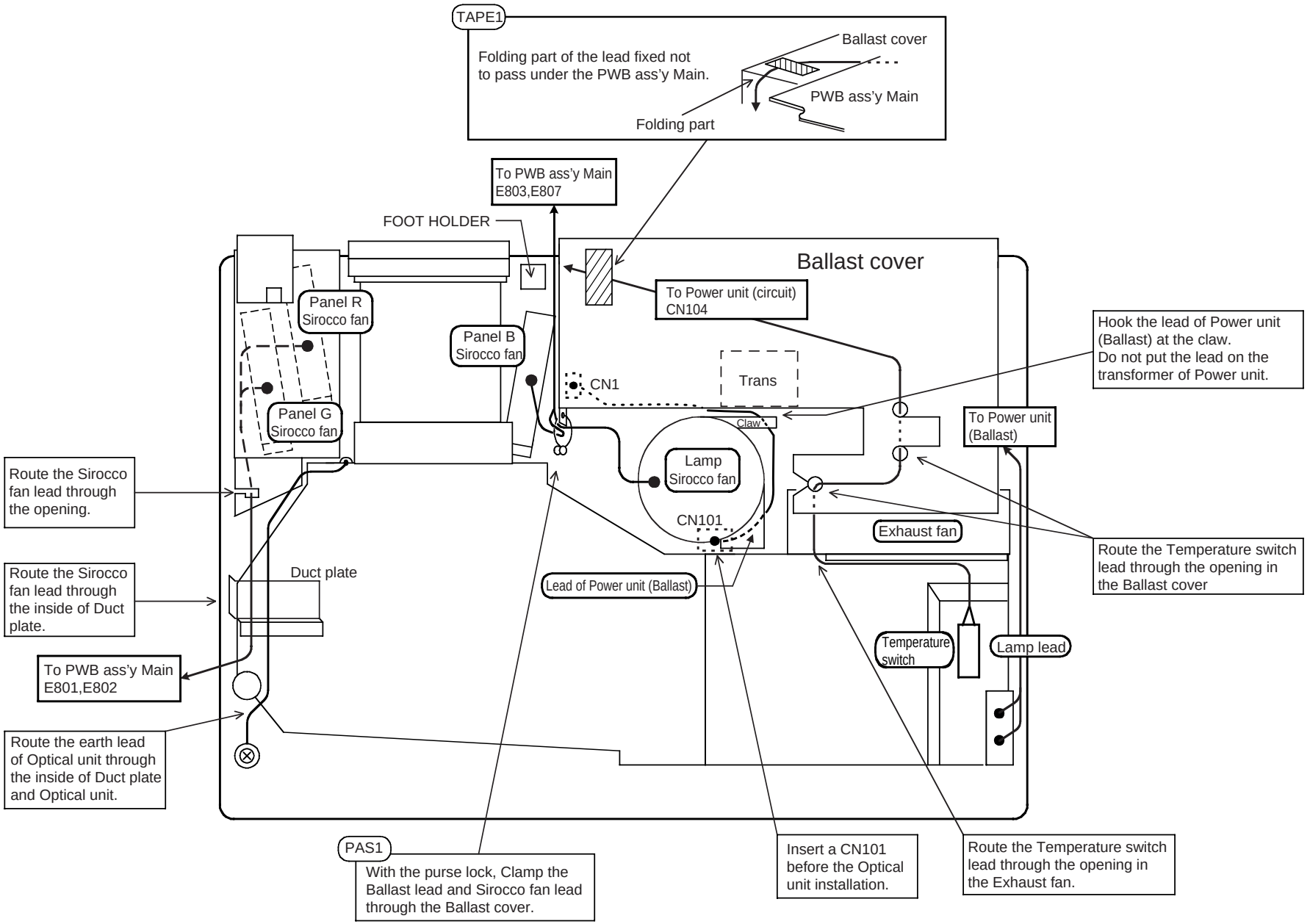


Side view (Power unit (Circuit / Ballast))
Projection lens side

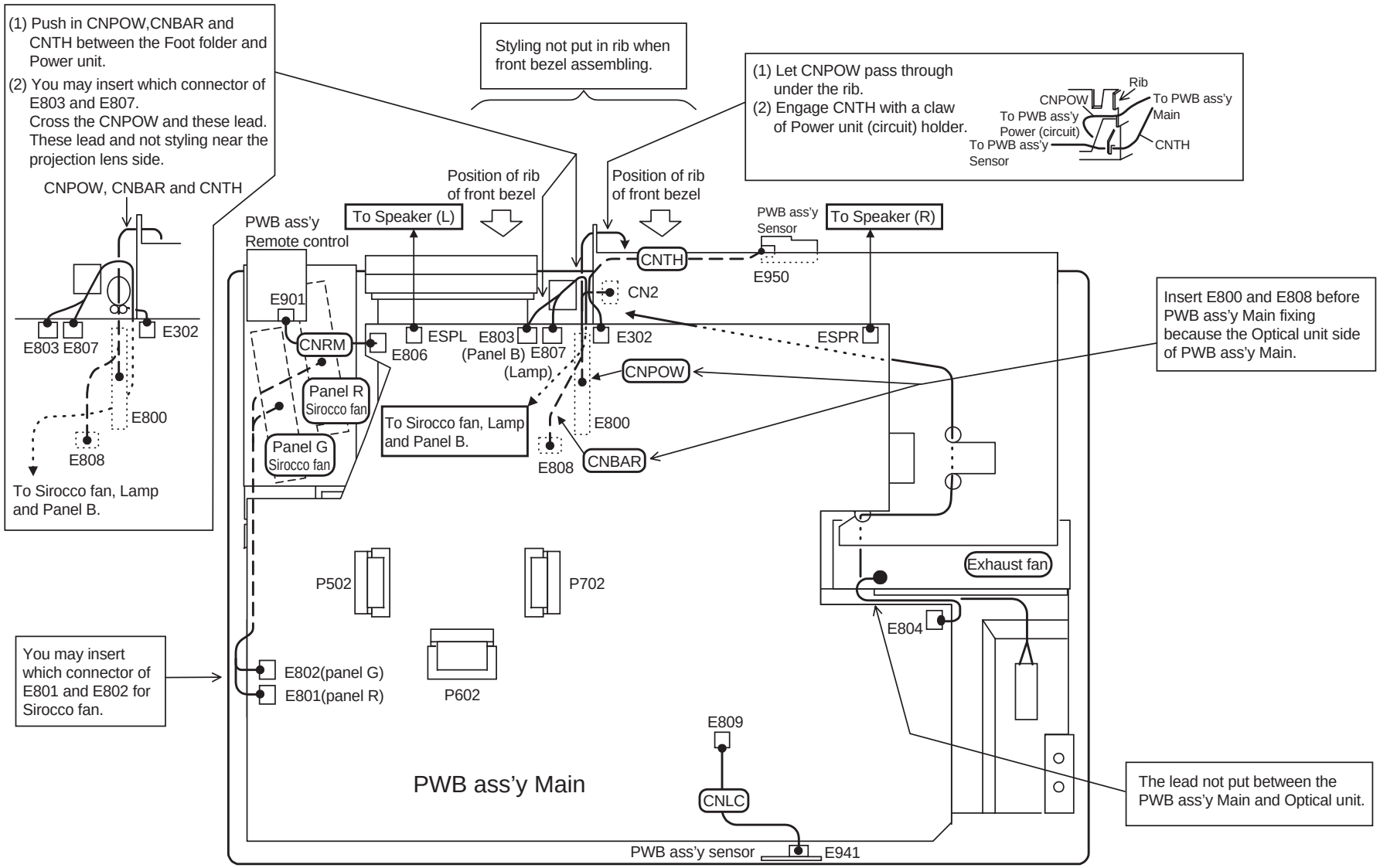
Wiring of Speaker



Upper view (Speaker)



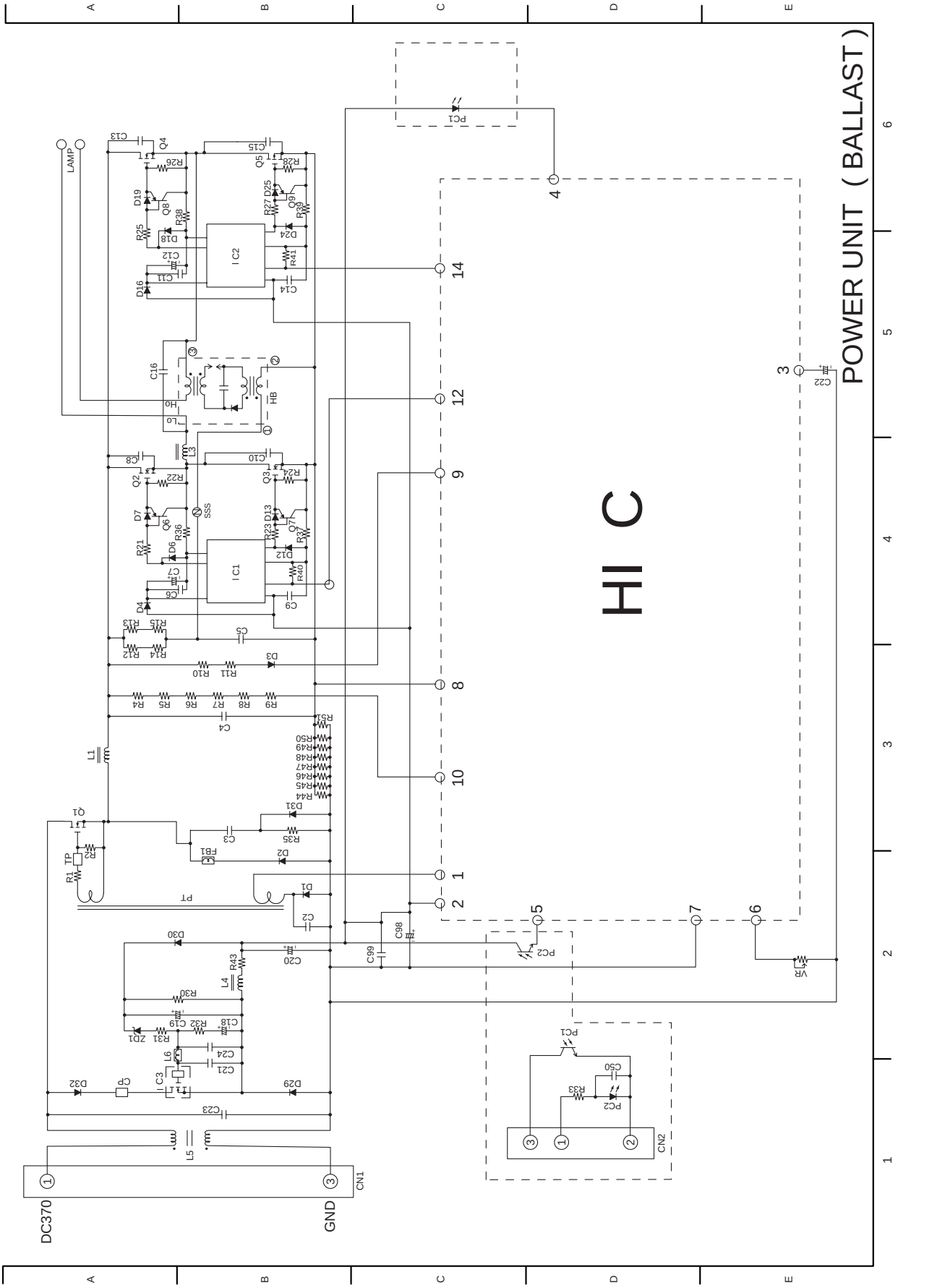
Upper view (Removed PWB ass'y Main)

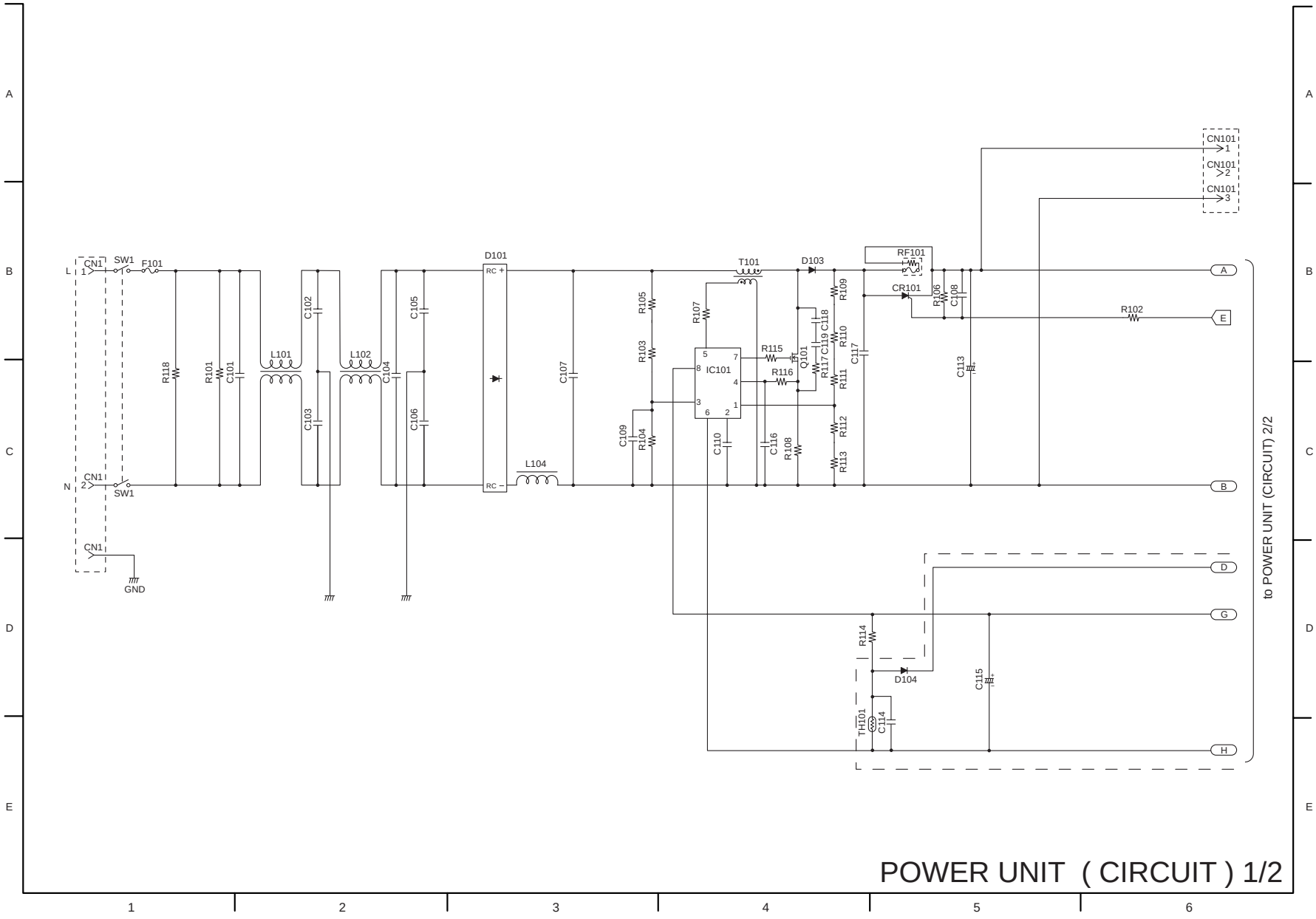


Upper view (Attached PWB ass'y Main)

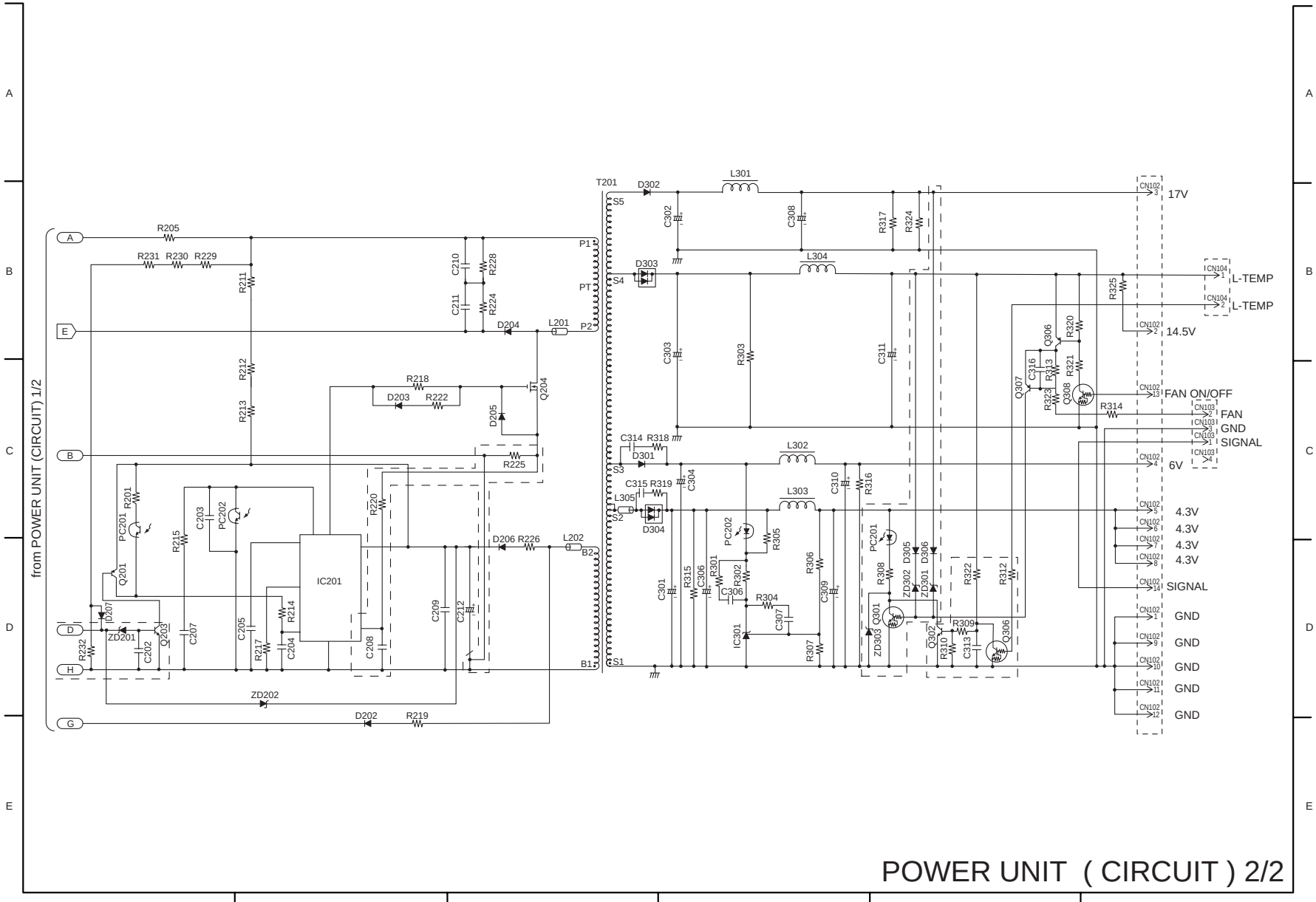
10. Basic circuit diagram

Parts with hatching are not mounted.

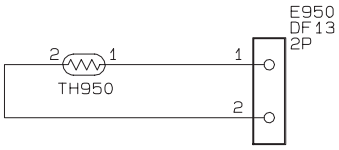




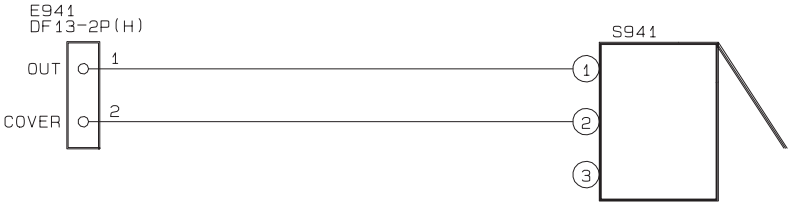
POWER UNIT (CIRCUIT) 1/2



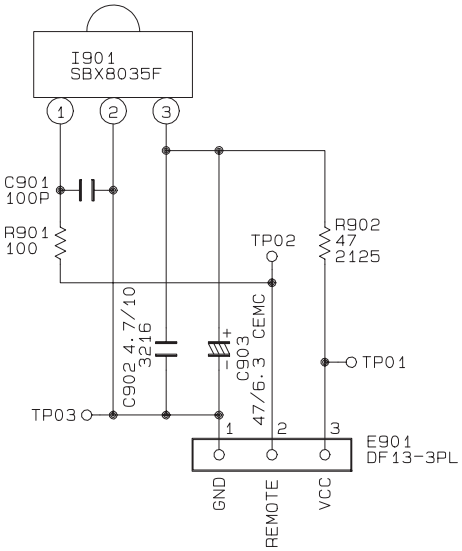
POWER UNIT (CIRCUIT) 2/2



PWB ass'y SENSOR



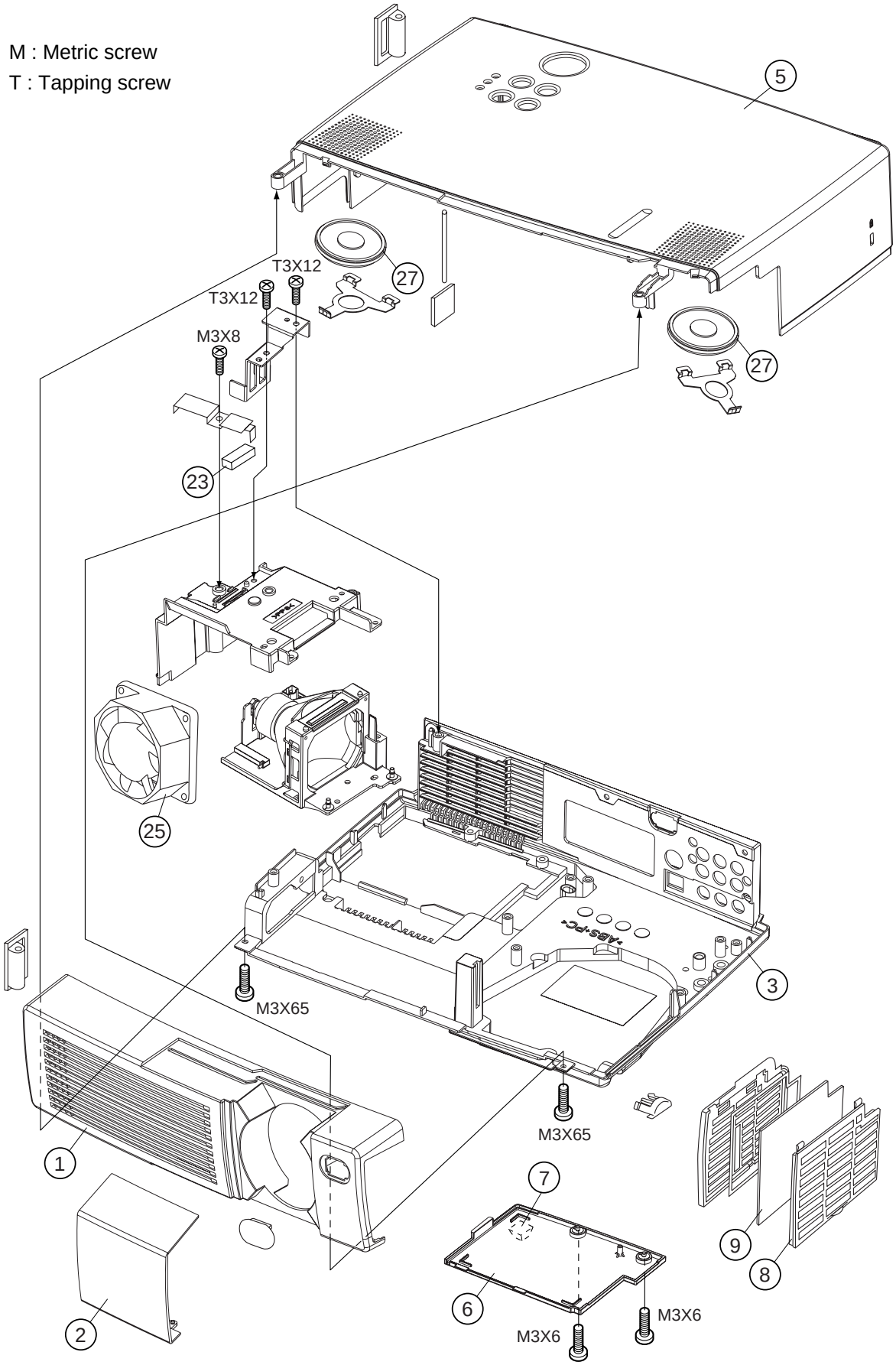
PWB ass'y SWITCH



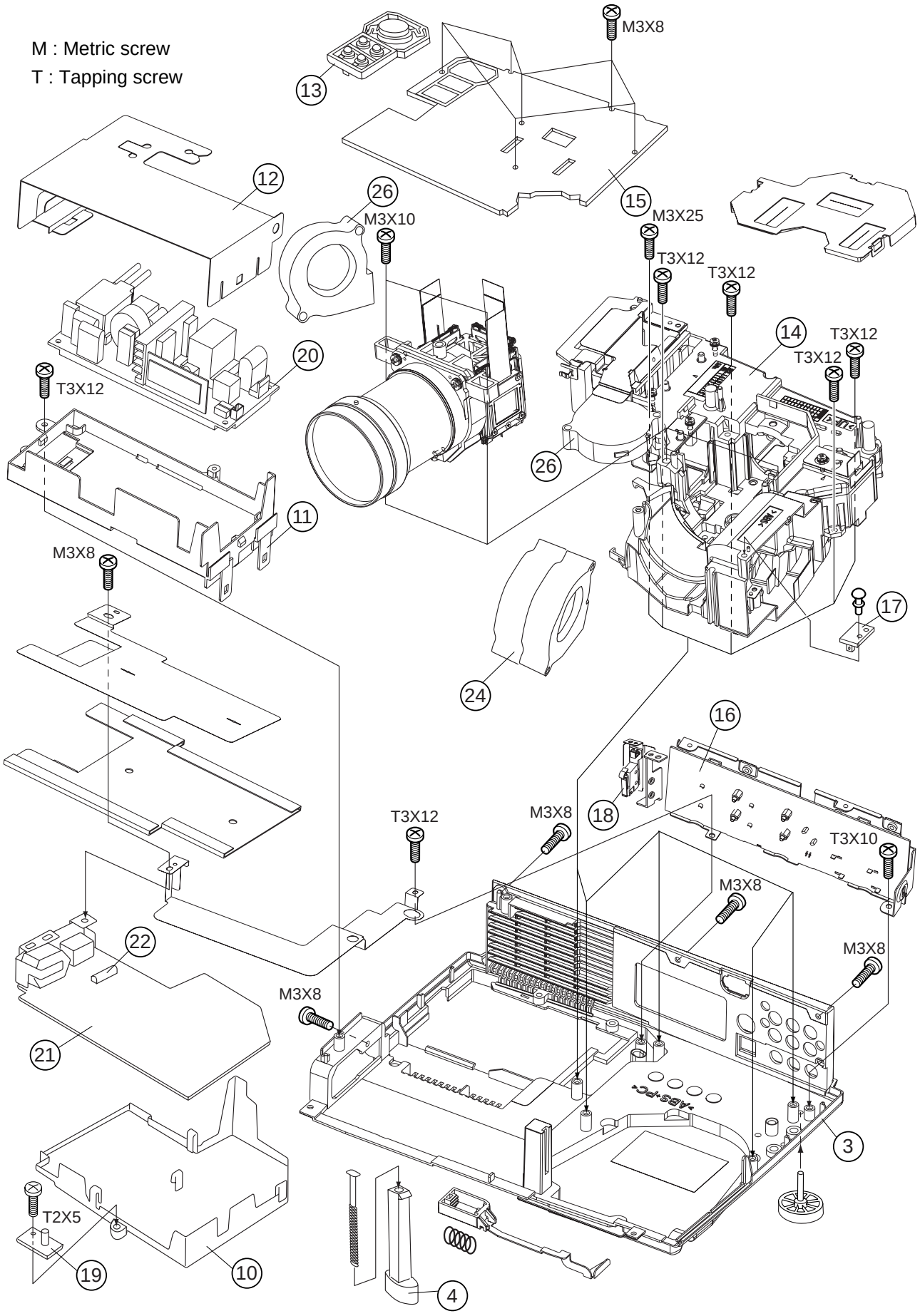
PWB ass'y REMOTE

11. Disassembly diagram

M : Metric screw
T : Tapping screw



M : Metric screw
T : Tapping screw



12. Replacement parts list

PRODUCT SAFETY NOTE : Components marked with a ⚠ have special characteristics important to safety. Before replacing any of there components, read carefully, the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

SYMBOL NO.	PARTS NO.	DESCRIPTION	SYMBOL NO.	PARTS NO.	DESCRIPTION
1	QD20542	FRONT BEZEL ASS'Y	⚠ 23	FH00203	TEMPERATURE SENSOR
2	QD20562	LENS SHUTTER (Slide Lens door)	⚠ 24	GS00452	DC FAN (INTAKE A)
3	QD20521	BOTTOM CASE ASS'Y	⚠ 25	GS00531	DC FAN (EXHAUST)
4	QJ00901	ADJUST FOOT ASS'Y	⚠ 26	GS00424	DC FAN (INTAKE B)
5	QD09761	UPPER CASE ASS'Y	27	GK00653	SPEAKER
6	PH08981	LAMP DOOR ASS'Y			
7	PE00111	RUBBER FOOT		UX07155	LCD/LENS PRISM ASS'Y
8	PH09271	FILTER COVER ASS'Y		DT00331	C4 LAMP UNIT ASS'Y
9	MU01261	AIR FILTER		PV00281	HANDLE C4
10	NJ04663	PWB HOLDER		EA00561R	CPC32 CONNECTOR
11	NJ04901	BALAST HOLDER		EA01032R	CPC32 LOW CONNECTOR
12	ME02542	BALAST COVER	⚠	EV00631	POWER SUPPLY CORD(US TYPE)
13	PC04831	CONTROL BUTTON ASS'Y	⚠	EV00891	POWER SUPPLY CORD(EUROPE TYPE) W/CORE
14	UE07625	DICHROIC OPTICS UNIT	⚠	EV00861	POWER SUPPLY CORD(UK TYPE) W/CORE
15	JP04221B	PWB ASS'Y MAIN		EW06031	3 CONDUCTOR VIDEO CABLE
16	JP04232	PWB ASS'Y SIGNAL		EW05017	RGB-D CABLE(15PIN MALE TO 15PIN MALE)
17	JP04233	PWB ASS'Y REMOTE CONTROL		EW02753	PS/2-2 MOUSE CABLE W/CORE
18	JP04234	PWB ASS'Y LIMIT SWITCH		HL01451	REMOTE CONTROL UNIT
19	JP04238	PWB ASS'Y SENSOR		NX05741	CLEANING TOOL FOR DUST
⚠ 20	HA00791	POWER UNIT (BALLAST)			
⚠ 21	HA00751	POWER UNIT (CIRCUIT)			
⚠ 22	2722448	FUSE 6.3A			

13. Option parts list

Caution The cables (power cord/video cable, audio cable, RGB cable and other cables) must be used with the core set to the projector side.
Use the cables which are included with the projector or specified.

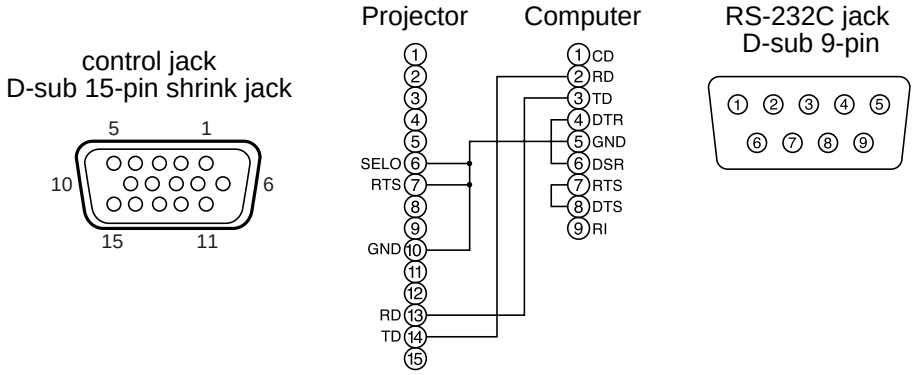
No.	PARTS NO.	PARTS NAME
1	HL01571	Remote control transmitter Unit With laser pointer
2 *	EW06471	PS/2 RMU-cable
3 *	EW06472	ADB RMU-cable
4	EW06473	SERIAL RMU-cable
5	EW05941	USB (A-B) cable w/core
6	HL01581	Remote Mouse Receiver Ass'y
7	UK04661	Remote control transmitter Unit Ass'y (No.1+2+3+4+5+6)
8	EW06561	RS-232C cable Ass'y

*) When you use the PS/2 RMU-cable (No.2 above) or the ADB RMU-cable (No.3) ,the serial RMU-cable (No.4) and the Remote Mouse Receiver Ass'y (No.6) must be used together.

RS-232C communication

Caution The specified RS-232C cable has the user's manual with RS-232C command table.

(1) Turn off the projector and computer power supplies and connect with the RS-232C cable.
(2) Turn on the computer power supply and, after the computer has started up, turn on the projector power supply.



Communications setting

19200bps, 8N1

1 Protocol

Consist of header (7 bytes) + command data (6 bytes).

2 Header

BE + EF + 03 + 06 + 00 + CRC_low + CRC_hige
CRC_low : Lower byte of CRC flag for command data.
CRC_high : Upper byte of CRC flag for command data.

3 Command data

Command data chart

byte_0	byte_1	byte_2	byte_3	byte_4	byte_5
Action		Type		Setting code	
low	high	low	high	low	high

Action (byte_0 - 1)

Action	Classification	Content
1	SET	Change setting to desired value.
2	GET	Read projector internal setup value.
4	INCREMENT	Increment setup value by 1.
5	DECREMENT	Decrement setup value by 1.
6	EXECUTE	Run a command.

Requesting projector status (Get command)

(1) Send the request code Header + Command data ('02H'+'00H'+ type (2 bytes) +'00H'+'00H') from the computer to the projector.
(2) The projector returns the response code '1DH'+ data (2 bytes) to the computer.

Changing the projector settings (Set command)

(1) Send the setting code Header + Command data ('01H'+'00H'+ type (2 bytes) + setting code (2 bytes)) from the computer to the projector.
(2) The projector changes the setting based on the above setting code.
(3) The projector returns the response code '06H' to the computer.

Using the projector default settings (Reset Command)

(1) The computer sends the default setting code Header + Command data ('06H'+'00H'+ type (2 bytes) +'00H'+'00H') to the projector.
(2) The projector changes the specified setting to the default value.
(3) The projector returns the response code '06H' to the computer.

Increasing the projector setting value (Increment command)

(1) The computer sends the increment code Header + Command data ('04H'+'00H'+ type (2 bytes) +'00H'+'00H') to the projector.
(2) The projector increases the setting value on the above setting code.
(3) The projector returns the response code '06H' to the computer.

Decreasing the projector setting value (Decrement command)

(1) The computer sends the decrement code Header + Command data ('05H'+'00H'+ type (2 bytes) +'00H' + '00H') to the projector.
(2) The projector decreases the setting value on the above setting code.
(3) The projector returns the response code '06H' to the computer.

When a command sent by the projector cannot be understood by the computer

When the command sent by the projector cannot be understood, the error command '15H' is returned by the computer. Some times, the projector ignores RS-232C commands during other works. If the error command '15H' is returned, please send the same command again.

When data sent by the projector cannot be practice

When the command sent by the projector cannot be practice, the the error code '1cH' +'xxxxH' is returned.
When the data length is greater than indicated by the data length code, the projector will ignore the excess data code.
Conversely, when the data length is shorter than indicated by the data length code, an error code will be returned to the projector.

Caution
- Operation cannot be guaranteed when the projector receives an undefined command or data.
- Provide an interval of at least 40ms between the response code and any other code.
- The projector outputs test data when the power supply is switched ON, and when the lamp is lit. Ignore this data.
- Commands are not accepted during warm-up.

Command data chart

Names	Operation type		Header	CRC	Command data		
					Action	Type	Setting code
Blank Color	Set	Red	BE EF 03 06 00	3B D3	01 00	00 30	00 00
		Orange	BE EF 03 06 00	AB D2	01 00	00 30	01 00
		Green	BE EF 03 06 00	5B D2	01 00	00 30	02 00
		Blue	BE EF 03 06 00	CB D3	01 00	00 30	03 00
		Purple	BE EF 03 06 00	FB D1	01 00	00 30	04 00
		White	BE EF 03 06 00	6B D0	01 00	00 30	05 00
		Black	BE EF 03 06 00	9B D0	01 00	00 30	06 00
	Get		BE EF 03 06 00	08 D3	02 00	00 30	00 00
Mirror	Set	Normal	BE EF 03 06 00	C7 D2	01 00	01 30	00 00
		H Inverse	BE EF 03 06 00	57 D3	01 00	01 30	01 00
		V lnverse	BE EF 03 06 00	A7 D3	01 00	01 30	02 00
		H&V Inverse	BE EF 03 06 00	37 D2	01 00	01 30	03 00
	Get		BE EF 03 06 00	F4 D2	02 00	01 30	00 00
Freeze	Set	Normal	BE EF 03 06 00	83 D2	01 00	02 30	00 00
		Freeze	BE EF 03 06 00	13 D3	01 00	02 30	01 00
	Get		BE EF 03 06 00	B0 D2	02 00	02 30	00 00
Menu Color	Set	Red	BE EF 03 06 00	7F D3	01 00	03 30	00 00
		Orange	BE EF 03 06 00	EF D2	01 00	03 30	01 00
		Green	BE EF 03 06 00	1F D2	01 00	03 30	02 00
		BLUE	BE EF 03 06 00	8F D3	01 00	03 30	03 00
		Purple	BE EF 03 06 00	BF D1	01 00	03 30	04 00
		Transparent	BE EF 03 06 00	2F D0	01 00	03 30	05 00
		Gray	BE EF 03 06 00	DF D0	01 00	03 30	06 00
	Get		BE EF 03 06 00	4C D3	02 00	03 30	00 00
Startup	Set	Turn ON	BE EF 03 06 00	0B D2	01 00	04 30	00 00
		Turn OFF	BE EF 03 06 00	9B D3	01 00	04 30	01 00
	Get		BE EF 03 06 00	38 D2	02 00	04 30	00 00
Language	Set	English	BE EF 03 06 00	F7 D3	01 00	05 30	00 00
		Français	BE EF 03 06 00	67 D2	01 00	05 30	01 00
		Deutsch	BE EF 03 06 00	97 D2	01 00	05 30	02 00
		Español	BE EF 03 06 00	07 D3	01 00	05 30	03 00
		Italiano	BE EF 03 06 00	37 D1	01 00	05 30	04 00
		Norsk	BE EF 03 06 00	A7 D0	01 00	05 30	05 00
		Nederlands	BE EF 03 06 00	57 D0	01 00	05 30	06 00
		Português	BE EF 03 06 00	C7 D1	01 00	05 30	07 00
		Japanese	BE EF 03 06 00	37 D4	01 00	05 30	08 00
	Get		BE EF 03 06 00	C4 D3	02 00	05 30	00 00

Command data chart

Names	Operation type		Header	CRC	Command data		
					Action	Type	Setting code
Magnify	Get		BE EF 03 06 00	7C D2	02 00	07 30	00 00
	Increment		BE EF 03 06 00	1A D2	04 00	07 30	00 00
	Decrement		BE EF 03 06 00	CB D3	05 00	07 30	00 00
Timer	Get		BE EF 03 06 00	C8 82	02 00	00 31	00 00
	Increment		BE EF 03 06 00	AE 82	04 00	00 31	00 00
	Decrement		BE EF 03 06 00	7F 83	05 00	00 31	00 00
Auto off	Get		BE EF 03 06 00	08 86	02 00	10 31	00 00
	Increment		BE EF 03 06 00	6E 86	04 00	10 31	00 00
	Decrement		BE EF 03 06 00	BF 87	05 00	10 31	00 00
Brightness Reset	Execute		BE EF 03 06 00	58 D3	06 00	00 70	00 00
Contrast Reset	Execute		BE EF 03 06 00	A4 D2	06 00	01 70	00 00
V.Position Reset	Execute		BE EF 03 06 00	E0 D2	06 00	02 70	00 00
H.Position Reset	Execute		BE EF 03 06 00	IC D3	06 00	03 70	00 00
H.Size Reset	Execute		BE EF 03 06 00	68 D2	06 00	04 70	00 00
Color Balance R Reset	Execute		BE EF 03 06 00	94 D3	06 00	05 70	00 00
Color Balance B Reset	Execute		BE EF 03 06 00	D0 D3	06 00	06 70	00 00
Aspect Reset	Execute		BE EF 03 06 00	2C D2	06 00	07 70	00 00
Video Format Reset	Execute		BE EF 03 06 00	38 D1	06 00	08 70	00 00
Sharpness Reset	Execute		BE EF 03 06 00	C4 D0	06 00	09 70	00 00
Color Reset	Execute		BE EF 03 06 00	80 D0	06 00	0A 70	00 00
Tint Reset	Execute		BE EF 03 06 00	7C D1	06 00	0B 70	00 00
Keystone Reset	Execute		BE EF 03 06 00	08 D0	06 00	0C 70	00 00
Mirror Reset	Execute		BE EF 03 06 00	F4 D1	06 00	0D 70	00 00
Blank Color Reset	Execute		BE EF 03 06 00	B0 D1	06 00	0E 70	00 00
Startup Reset	Execute		BE EF 03 06 00	4C D0	06 00	0F 70	00 00
Auto	Execute		BE EF 03 06 00	91 D0	06 00	0A 20	00 00
Blank on/off	Set	off	BE EF 03 06 00	FB D8	01 00	20 30	00 00
		on	BE EF 03 06 00	6B D9	01 00	20 30	01 00
	Get		BE EF 03 06 00	C8 D8	02 00	20 30	00 00
Timer on/off	Set	off	BE EF 03 06 00	07 D9	01 00	21 30	00 00
		on	BE EF 03 06 00	97 D8	01 00	21 30	01 00
	Get		BE EF 03 06 00	34 D9	02 00	21 30	00 00
Error Status	Get		BE EF 03 06 00	D9 D8	02 00	20 60	00 00
			(Example of Return) 00 00 (Normal) 01 00 (Cover-error) 02 00 (Fan-error) 03 00 (Lamp-error) 04 00 (Temp-error) 05 00 (Air flow-error) 06 00 (Lamp-Time-over)				

Command data chart

Names	Operation type		Header	CRC	Command data		
					Action	Type	Setting code
Power	Set	OFF	BE EF 03 06 00	2A D3	01 00	00 60	00 00
		ON	BE EF 03 06 00	BA D2	01 00	00 60	01 00
	Get		BE EF 03 06 00	19 D3	02 00	00 60	00 00
Input Source	Set	RGB	BE EF 03 06 00	FE D2	01 00	00 20	00 00
		Video	BE EF 03 06 00	6E D3	01 00	00 20	01 00
		SVideo	BE EF 03 06 00	9E D3	01 00	00 20	02 00
	Get		BE EF 03 06 00	CD D2	02 00	00 20	00 00
Volume	Get		BE EF 03 06 00	31 D3	02 00	01 20	00 00
	Increment		BE EF 03 06 00	57 D3	04 00	01 20	00 00
	Decrement		BE EF 03 06 00	86 D2	05 00	01 20	00 00
Mute	Set	Normal	BE EF 03 06 00	46 D3	01 00	02 20	00 00
		Mute	BE EF 03 06 00	D6 D2	01 00	02 20	01 00
	Get		BE EF 03 06 00	75 D3	02 00	02 20	00 00
Brightness	Get		BE EF 03 06 00	89 D2	02 00	03 20	00 00
	Increment		BE EF 03 06 00	EF D2	04 00	03 20	00 00
	Decrement		BE EF 03 06 00	3E D3	05 00	03 20	00 00
Contrast	Get		BE EF 03 06 00	FD D3	02 00	04 20	00 00
	Increment		BE EF 03 06 00	9B D3	04 00	04 20	00 00
	Decrement		BE EF 03 06 00	4A D2	05 00	04 20	00 00
Color Balance R	Get		BE EF 03 06 00	01 D2	02 00	05 20	00 00
	Increment		BE EF 03 06 00	67 D2	04 00	05 20	00 00
	Decrement		BE EF 03 06 00	B6 D3	05 00	05 20	00 00
Color Balance B	Get		BE EF 03 06 00	45 D2	02 00	06 20	00 00
	Increment		BE EF 03 06 00	23 D2	04 00	06 20	00 00
	Decrement		BE EF 03 06 00	F2 D3	05 00	06 20	00 00
Keystone	Get		BE EF 03 06 00	B9 D3	02 00	07 20	00 00
	Increment		BE EF 03 06 00	DF D3	04 00	07 20	00 00
	Decrement		BE EF 03 06 00	0E D2	05 00	07 20	00 00
Aspect	Set	4:3	BE EF 03 06 00	9E D0	01 00	08 20	00 00
		16:9	BE EF 03 06 00	0E D1	01 00	08 20	01 00
		Small	BE EF 03 06 00	FE D1	01 00	08 20	02 00
	Get		BE EF 03 06 00	AD D0	02 00	08 20	00 00
Display Position at 16 : 9 or Small	Set	Default	BE EF 03 06 00	62 D1	01 00	09 20	00 00
		Bottom	BE EF 03 06 00	F2 D0	01 00	09 20	01 00
		Top	BE EF 03 06 00	02 D0	01 00	09 20	02 00
	Get		BE EF 03 06 00	51 D1	02 00	09 20	00 00

Command data chart

Names	Operation type		Header	CRC	Command data		
					Action	Type	Setting code
V.Position	Get		BE EF 03 06 00	0D 83	02 00	00 21	00 00
	Increment		BE EF 03 06 00	6B 83	04 00	00 21	00 00
	Decrement		BE EF 03 06 00	BA 82	05 00	00 21	00 00
H.Position	Get		BE EF 03 06 00	F1 82	02 00	01 21	00 00
	Increment		BE EF 03 06 00	97 82	04 00	01 21	00 00
	Decrement		BE EF 03 06 00	46 83	05 00	01 21	00 00
H.Size	Get		BE EF 03 06 00	B5 82	02 00	02 21	00 00
	Increment		BE EF 03 06 00	D3 82	04 00	02 21	00 00
	Decrement		BE EF 03 06 00	02 83	05 00	02 21	00 00
H.Phase	Get		BE EF 03 06 00	49 83	02 00	03 21	00 00
	Increment		BE EF 03 06 00	2F 83	04 00	03 21	00 00
	Decrement		BE EF 03 06 00	FE 82	05 00	03 21	00 00
Sharpness	Get		BE EF 03 06 00	F1 72	02 00	01 22	00 00
	Increment		BE EF 03 06 00	97 72	04 00	01 22	00 00
	Decrement		BE EF 03 06 00	46 73	05 00	01 22	00 00
Color	Get		BE EF 03 06 00	B5 72	02 00	02 22	00 00
	Increment		BE EF 03 06 00	D3 72	04 00	02 22	00 00
	Decrement		BE EF 03 06 00	02 73	05 00	02 22	00 00
Tint	Get		BE EF 03 06 00	49 73	02 00	03 22	00 00
	Increment		BE EF 03 06 00	2F 73	04 00	03 22	00 00
	Decrement		BE EF 03 06 00	FE 72	05 00	03 22	00 00
Video Format	Set	Auto	BE EF 03 06 00	9E 75	01 00	00 22	0A 00
		NTSC	BE EF 03 06 00	FE 71	01 00	00 22	04 00
		PAL	BE EF 03 06 00	6E 70	01 00	00 22	05 00
		SECAM	BE EF 03 06 00	6E 75	01 00	00 22	09 00
		NTSC 4.43	BE EF 03 06 00	5E 72	01 00	00 22	02 00
		M-PAL	BE EF 03 06 00	FE 74	01 00	00 22	08 00
		N-PAL	BE EF 03 06 00	0E 71	01 00	00 22	07 00
	Get		BE EF 03 06 00	0D 73	02 00	00 22	00 00

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