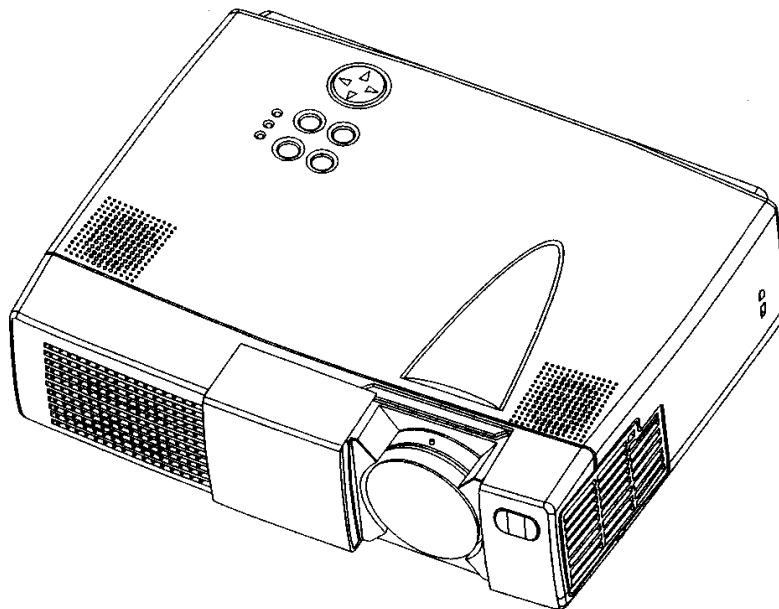


Liesegang

Liesegang, type 286

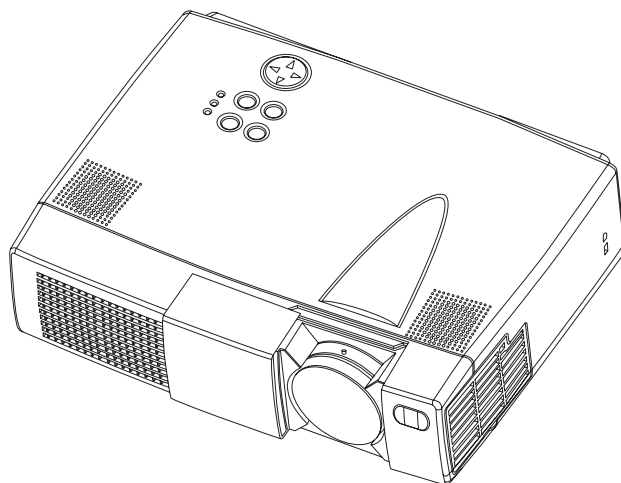


Service Manual

Liesegang

SERVICE MANUAL

dv355



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 Multimedia LCD 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 assembly is likely to be damaged. If replacing to the LCD module assembly, do not hold the FPC of the LCD module assembly.
6. Use the cables which are included with the projector or specified.

Contents

1. Features -----	2	8. Connector connection diagram -----	23
2. Specifications-----	2	9. Wiring diagram -----	24
3. Names of each part-----	3	10.Basic circuit diagram-----	30
4. Adjustment -----	5	11.Disassembly diagram-----	65
5. Troubleshooting -----	12	12.Replacement parts list -----	67
6. Service points -----	17	13.RS-232C communication -----	68
7. Block diagram -----	22		

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

Multimedia LCD Projector

February 2002

1. Features

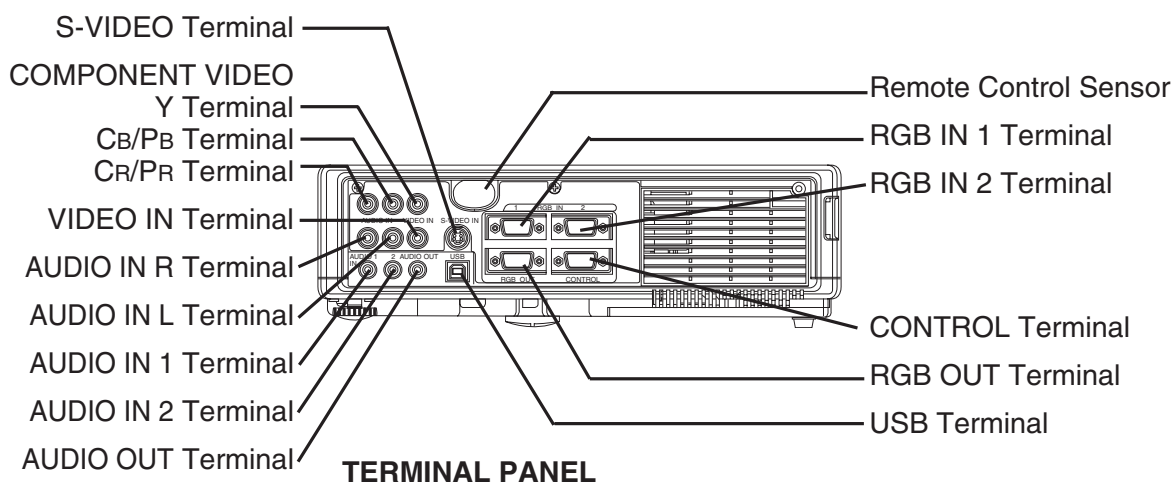
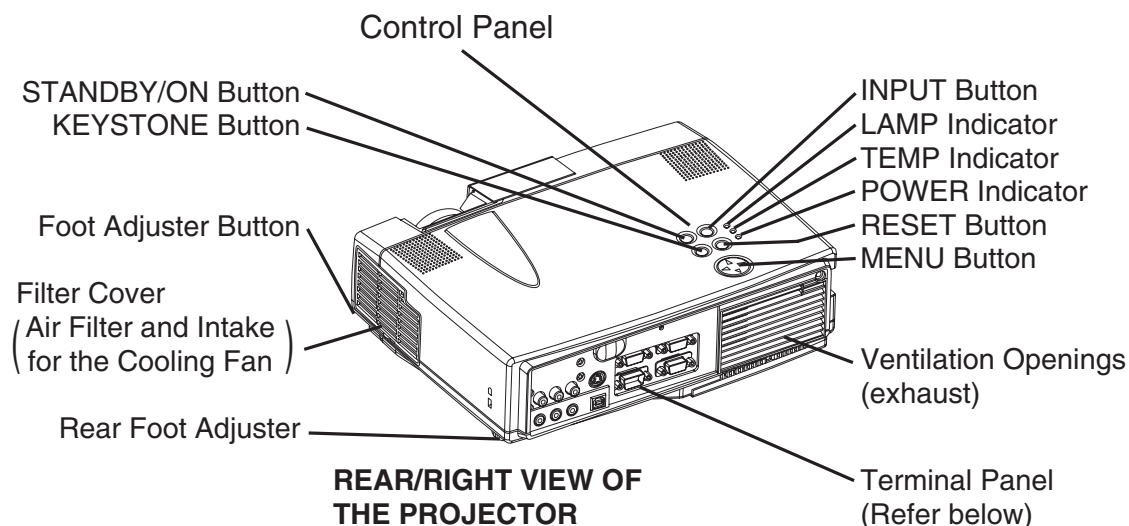
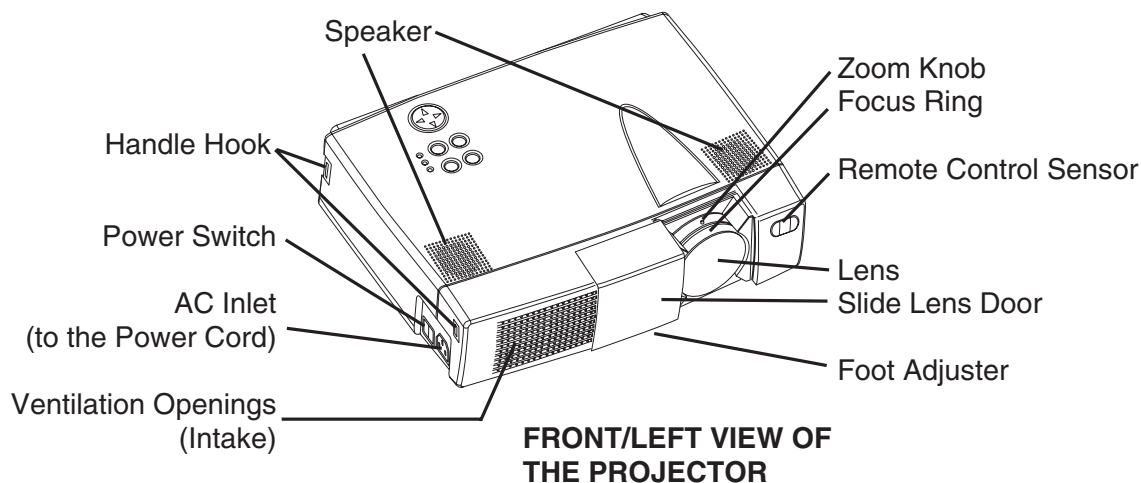
- ▶ High brightness, High resolution
- ▶ Compact size, light weight for portability
- ▶ RS-232C Communication
- ▶ Complies with VESA DDC1/2B specifications
- ▶ Auto-adjustment function

2. Specifications

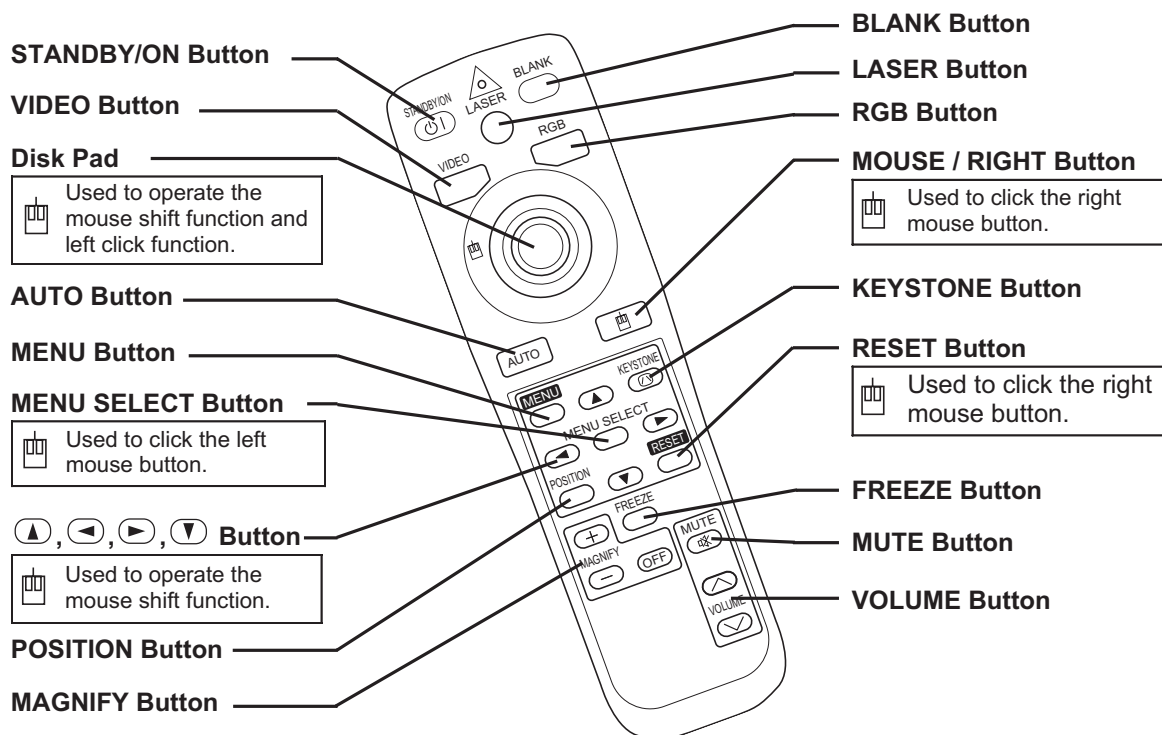
Liquid crystal panel	Drive system		TFT active matrix	
	Panel size		0.9 inches	
	Number of pixels		1024 (H) × 768 (V)	
Lamp			200W UHB	
RGB signal input	RGB IN	1	Video: Analog 0.7Vp-p, 75Ω terminator H/V. sync.: TTL level (positive/negative) Composite sync.: TTL level D-sub 15-pin shrink jack	
		2		
	AUDIO IN	1	200mVrms, 47kΩ (max. 3.0Vp-p) Stereo mini jack	
		2		
Video signal input	VIDEO IN		1.0Vp-p, 75Ω terminator RCA jack	
	S-VIDEO IN		Brightness signal: 1.0Vp-p, 75Ω terminator Color signal: 0.286Vp-p (NTSC, burst signal), 75Ω terminator 0.3Vp-p (PAL/SECAM, burst signal), 75Ω terminator Mini DIN 4-pin jack	
	COMPONENT VIDEO	Y	1.0Vp-p, 75Ω terminator (positive)	
		CB/CR	0.7Vp-p, 75Ω terminator (positive)	
		PB/PR	0.7Vp-p, 75Ω terminator (positive)	
	AUDIO IN	L	200mVrms, 50kΩ (max. 3.0Vp-p) RCA jack	
		R		
Signal output	RGB OUT		Video: Analog 0.7Vp-p, 75Ω output impedance (positive) H/V. sync.: TTL level (positive/negative) Composite sync.: TTL level D-sub 15-pin shrink jack	
	AUDIO OUT		200mVrms, output impedance 1kΩ (max. 3.0Vp-p) Stereo mini jack	
Audio input			200mVrms, 47kΩ	
Speaker output			1W +1W (stereo)	
Power supply			AC100~120V/3.3A, AC220~240V/1.4A	
Power consumption			310W	
Dimensions			298 (W) × 94.6 (H) × 228 (D) mm	
Weight			3.25kg (7.2lbs)	
Temperature range			Operation : 0~35°C Storage : -20~60°C	
Accessories			Remote control transmitter × 1 RGB cable × 1 Component cable × 1 Mouse cable (PS/2) × 1 S-cable × 1	POWER cord × 2 Battery × 2 Carrying bag × 1 Handle × 1 User's manual (with Safety Instructions)× 1

3. Names of each part

● Parts names

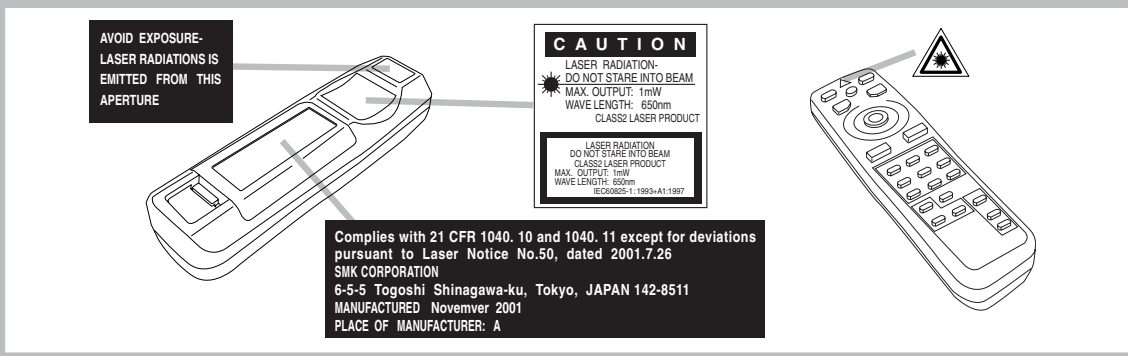


● Remote control transmitter



These functions work 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 • Keep the remote control transmitter away from children and pets.

- 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.

4. Adjustment

4-1 Before adjusting

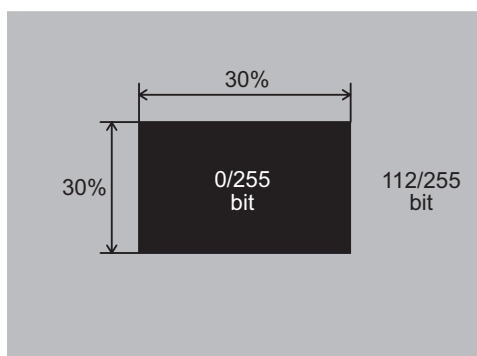
1. Before starting adjustment, warm up the projector for about 10 minutes.(Blank white)
2. Set Zoom Wide to Max. And project an image a distance of more than 40 inches and set the normal at "WHISPER" mode.
3. Normalizing the video adjustment.
(Press the [MENU] button of the Remote control transmitter to display the Setup menu, and then press the [RESET] button. And select the [DEFAULT].)

*note : The setup menu is not displayed on with no signal.

4. Set the another [MENU] as follows.
 - a. GAMMA in the IMAGE menu is NORMAL.
 - b. COLOR TEMP. in the IMAGE menu is NORMAL.
 - c. WHISPER in the OPT menu is NORMAL.
5. 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 one time. And press the [RESET] button again for 5 seconds or more (the Adjustment menu will appear).

4-2 Ghost adjustment

Signals for internal adjustment

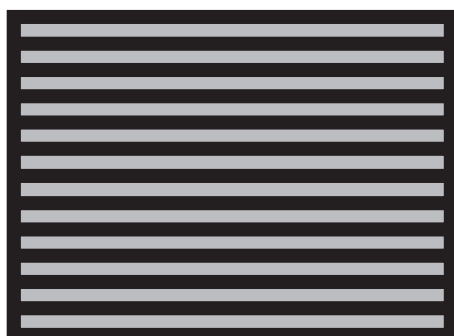


Adjustment procedure

1. Use DAC-P - GHOST - R: in the Adjustment menu to adjust so that R color ghost is at a minimum.
(Set the adjustment value to default, and then raise the value. When a ghost appears to the left of a vertical line, reduce the value by 2 steps.)
2. In the same way, use DAC-P - GHOST-G: in the Adjustment menu to adjust so that G color ghost is at a minimum.
3. In the same way, use DAC-P - GHOST-B: in the Adjustment menu to adjust so that B color ghost is at a minimum.

4-3 Flicker adjustment (V.COM adjustment)

Signals for internal adjustment

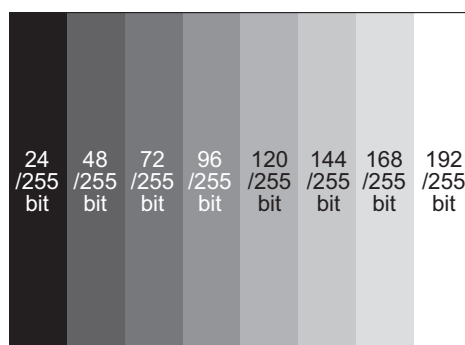


Adjustment procedure

1. Make this adjustment after completing the adjustment in 4-2 Ghost adjustment.
2. Use DAC-P - V.COM - R: in the Adjustment 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 NRSH 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 - NRSH - R: in the Adjustment menu to adjust so that the vertical lines spaced every 6 or 12 dots are as inconspicuous as possible.
(Reduce the adjustment value when black stripes appear in the 2nd or 3rd tone from the black side. Note that when the adjustment value is lowered, white stripes may appear in the 2nd or 3rd tone from the bright side. Should this happen, adjust so that the stripes are as inconspicuous as possible.)
3. In the same way, use DAC-P - NRSH - G: in the Adjustment menu to adjust vertical stripes of G color.
4. In the same way, use DAC-P - NRSH - B: in the Adjustment menu to adjust vertical stripes of B color.

4-5 White balance adjustment

Preparations

1. Perform these adjustments after the NRSH adjustment described in Section 4-4.
2. Reset gamma correction before adjustment.
 - Place the cursor on [GAMMA] in the Adjustment menu, press the [RESET] key and select [DEFAULT].

Adjustment procedure

1. First, adjust the G color.
2. BRIGHT and CONTRAST set to MAX in the Setup menu.
3. Place the cursor on Slide Show in the Adjustment menu [A/D], press the [▶] key three times to display G monochrome and adjust the luminance 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. BRIGHT and CONTRAST is returned to default in the Setup menu.
5. Adjust Gamma, SHIFT, and G: in the Adjust menu so that luminance (Y) at the center of the screen is adjusted as follows.
 $Y = A \times 0.798 \pm 1 [\%]$
6. Adjust Gamma, 86%, and G: in the Adjust menu so that luminance (Y) at the center of the screen is adjusted as follows.
 $Y = A \times 0.675 \pm 1 [\%]$

- Now press the [RESET] key again and press the [MGNIFY-OFF] button of the Remote control transmitter for 5 seconds or more (the confirming to "MICRO" reset menu will appear).

7. Adjust Gamma, 75%, and G: in the Adjust menu so that luminance (Y) at the center of the screen is adjusted as follows.
 $Y = A \times 0.504 \pm 1 [\%]$
8. Adjust Gamma, 43%, and G: in the Adjust menu so that luminance (Y) at the center of the screen is adjusted as follows.
 $Y = A \times 0.147 \pm 2 [\%]$
9. Adjust Gamma, 29%, and G: in the Adjust menu so that luminance (Y) at the center of the screen is adjusted as follows.
 $Y = A \times 0.060 \pm 2 [\%]$
10. Adjust Gamma, 14%, and G: in the Adjust menu so that luminance (Y) at the center of the screen is adjusted as follows.
 $Y = A \times 0.014 \pm 2 [\%]$

11. Adjust Gamma, 0%, R: and B: so that the following values.

$$[0\%][R:] = -96 - [\text{SHIFT}][R:]$$

$$[0\%][G:] = -96 - [\text{SHIFT}][G:]$$

$$[0\%][B:] = -112 - [\text{SHIFT}][B:]$$

12. Now, adjust the R and B colors.

13. Adjust Gamma, 86%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.

$$x = 0.290 \pm 0.001$$

$$y = 0.350 \pm 0.002$$

14. Adjust Gamma, 93%, R: and B: so that the following values.

$$[93\%][R:] = [86\%][G:]$$

$$[93\%][B:] = [86\%][B:]$$

15. Adjust Gamma, 75%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.

$$x = 0.284 \pm 0.001$$

$$y = 0.340 \pm 0.002$$

16. Adjust Gamma, 43%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.

$$x = 0.280 \pm 0.001$$

$$y = 0.340 \pm 0.002$$

17. Adjust Gamma, 29%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.

$$x = 0.270 \pm 0.001$$

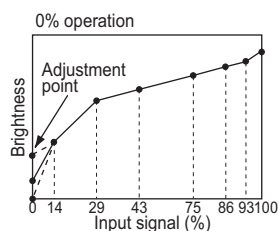
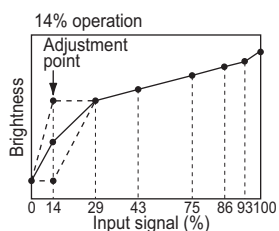
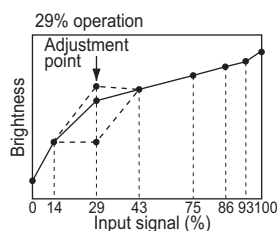
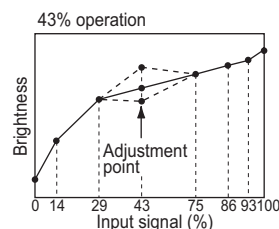
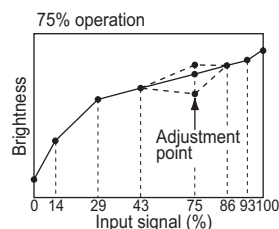
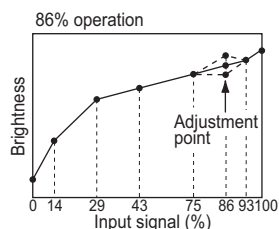
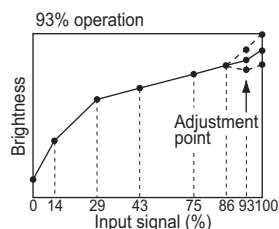
$$y = 0.330 \pm 0.002$$

18. Adjust Gamma, 14%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.

$$x = 0.260 \pm 0.001$$

$$y = 0.300 \pm 0.002$$

Adjustment operations (reference)

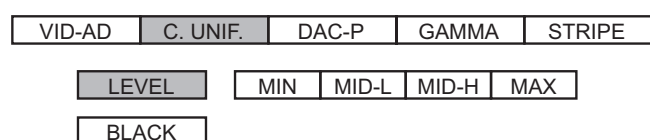


4-6 Color uniformity adjustment

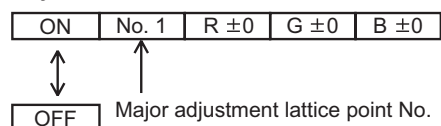
Preparations

1. Perform these adjustments after the white balance adjustment described in Section 4-5.
2. Make a color uniformity adjustment for the following four tones.
 - MIN tone (approx. 10% input signal)
 - MID-L tone (approx. 21% input signal)
 - MID-H tone (approx. 50% input signal)
 - MAX tone (approx. 75% input signal)
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, and 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 4 tones and all colors are to be reset, place the cursor on [C.UNIF.] in the Adjustment 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.

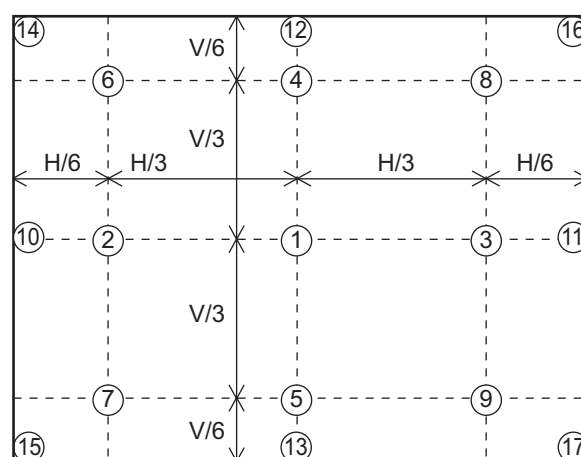
Adjust menu



Adjust Tone menu



Major adjustment lattice point position



Adjustment procedure 1

(when a color differential meter is used)

1. First adjust [MID-L] tone [G:].
2. Select adjustment point [No.2][G:].
When the background is not [G] monochrome, press the [MENU SELECT] key on the Remote control transmitter to change to solid [G] monochrome.
3. Measure the illumination at adjustment points No. 2, No.3, No.10 and No.11.
The values should be:
No.2 = Y2 [lx] No.10 = Y10 [lx]
No.3 = Y3 [lx] No.11 = Y11 [lx]
4. No.2 and No.3 adjustment point have the average of Y2 and Y3.
 $Y2 = (Y2 + Y3) / 2 \pm 2 [\%]$
 $Y3 = (Y2 + Y3) / 2 \pm 2 [\%]$
5. No.10 and No.11 adjustment point have the average of Y10 and Y11.
 $Y10 = (Y10 + Y11) / 2 \pm 2 [\%]$
 $Y11 = (Y10 + Y11) / 2 \pm 2 [\%]$
6. Then adjust [MID-L] tone [R] and [B].
When the background is [G] monochrome, press the [MENU SELECT] key on the Remote control transmitter to change to solid white.
7. Measure 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 $[\Delta]$ (delta) mode is convenient. When adjustment point [No.1] color coordinate has been selected, set the slide switch on the side to $[\Delta]$ (delta) while holding down the [F] button on the front panel. The measurement shown after this displays the deviation from measurement point 1.
8. Measure the color coordinates of measurement point [No.2] and adjust [No.2][R:] and [B:] so that the coordinates are as follows.
 $x = x1 \pm 0.005$, $y = y1 \pm 0.010$

9. Similarly, measure adjustment points [No.3] to [No.17] and adjust their color coordinates starting in order from the small number points.

This completes adjustments required for [MIN].

Note: Since excessive correction may lead to a correction data overview during internal calculations, use the following values for reference.

[No.2] to [No.5] ± 40 or less

[No.6] to [No.9] ± 50 or less

[No.10] to [No.13] ± 70 or less

[No.14] to [No.17] ± 120 or less

10. Then adjust [MIN] tone [G] so that the adjustment data set two times as much as [MID-L] tone [G].

This completes [G] color adjustments.

11. Then adjust [MIN] 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. Measure 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 coordinates are as follows.

$x = x1 \pm 0.005$, $y = y1 \pm 0.010$ (Target)

$x = x1 \pm 0.020$, $y = y1 \pm 0.040$

14. Similarly, measure adjustment points [No.3] to [No.17] and adjust their color coordinates starting in order from the small number points.

This completes [MIN] tone adjustments.

15. Now make similar adjustments for [MID-H] tone.

(Adjust [MID-H] tone [G] so that the adjustment data set half as many as [MID-L] tone [G].)

16. Now make similar adjustments for [MAX] tone.

(Adjust [MAX] tone [G] so that the adjustment data set half as many as [MID-L] tone [G].)

Adjustment procedure 2

(visual inspection)

1. First adjust [MIN] tone [G:].
2. 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.
3. 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].
4. 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].
5. Now adjust the [MIN] tone for colors [R] and [B].

6. 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].

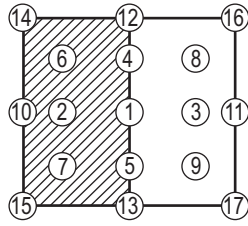
Adjustment technique:

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.

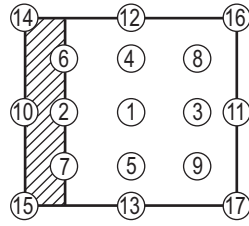
Overall, a cyan cast makes it easy to see color shading.

7. Next, view measurement points [No.4], [No.5], [No.12], [No.13] and make similar adjustments.
8. Then adjust measurement points [No.6], [No.7], [No.8], [No.9], [No.14], [No.15], [No.16] and [No.17].
This completes the [MIN] tone adjustments.
9. Make similar another three tones as described in steps 1 to 8 above.

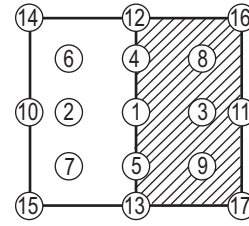
No. 2 deviation range



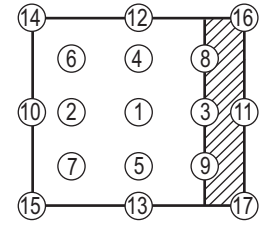
No. 10 deviation range



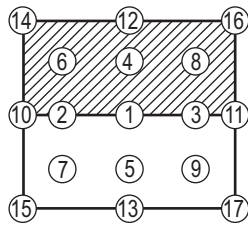
No. 3 deviation range



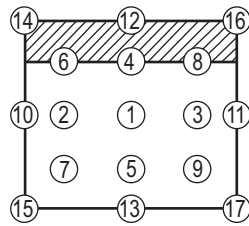
No. 11 deviation range



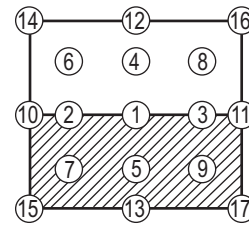
No. 4 deviation range



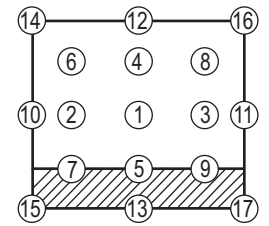
No. 12 deviation range



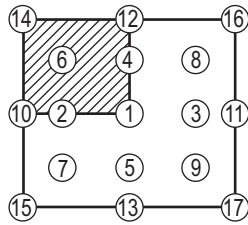
No. 5 deviation range



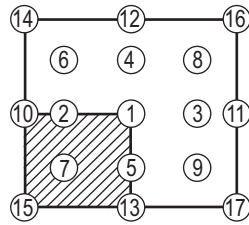
No. 13 deviation range



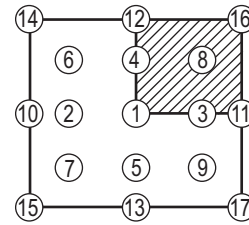
No. 6 deviation range



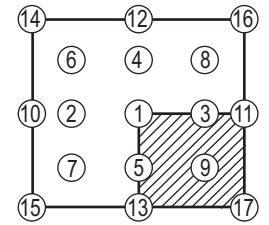
No. 7 deviation range



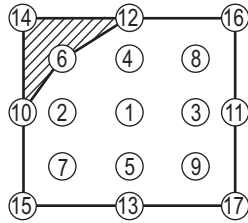
No. 8 deviation range



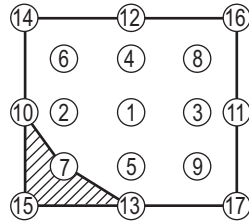
No. 9 deviation range



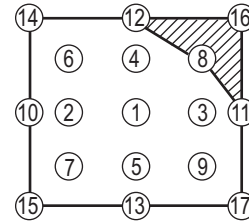
No. 14 deviation range



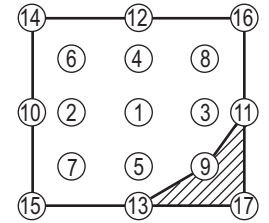
No. 15 deviation range



No. 16 deviation range

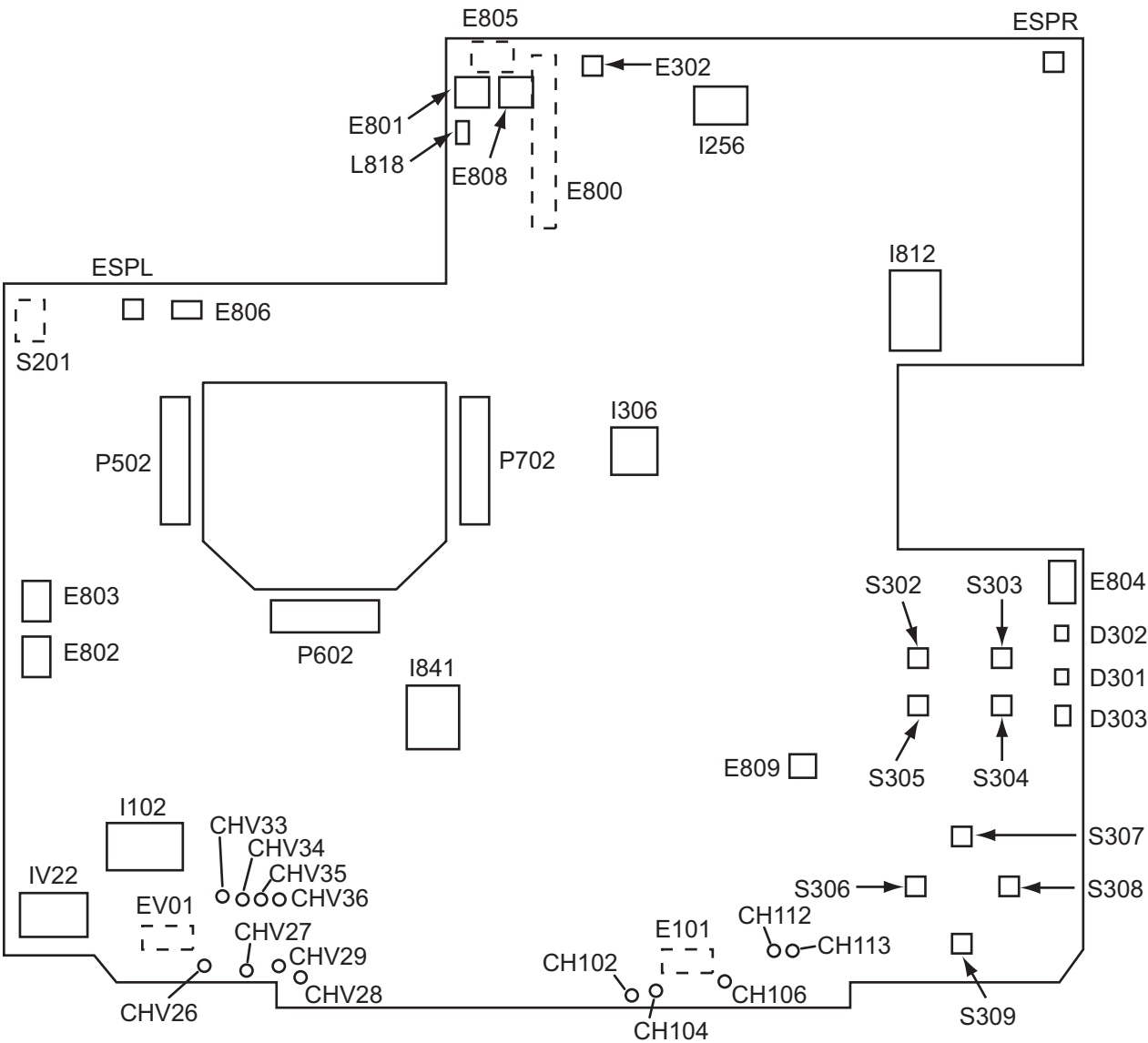


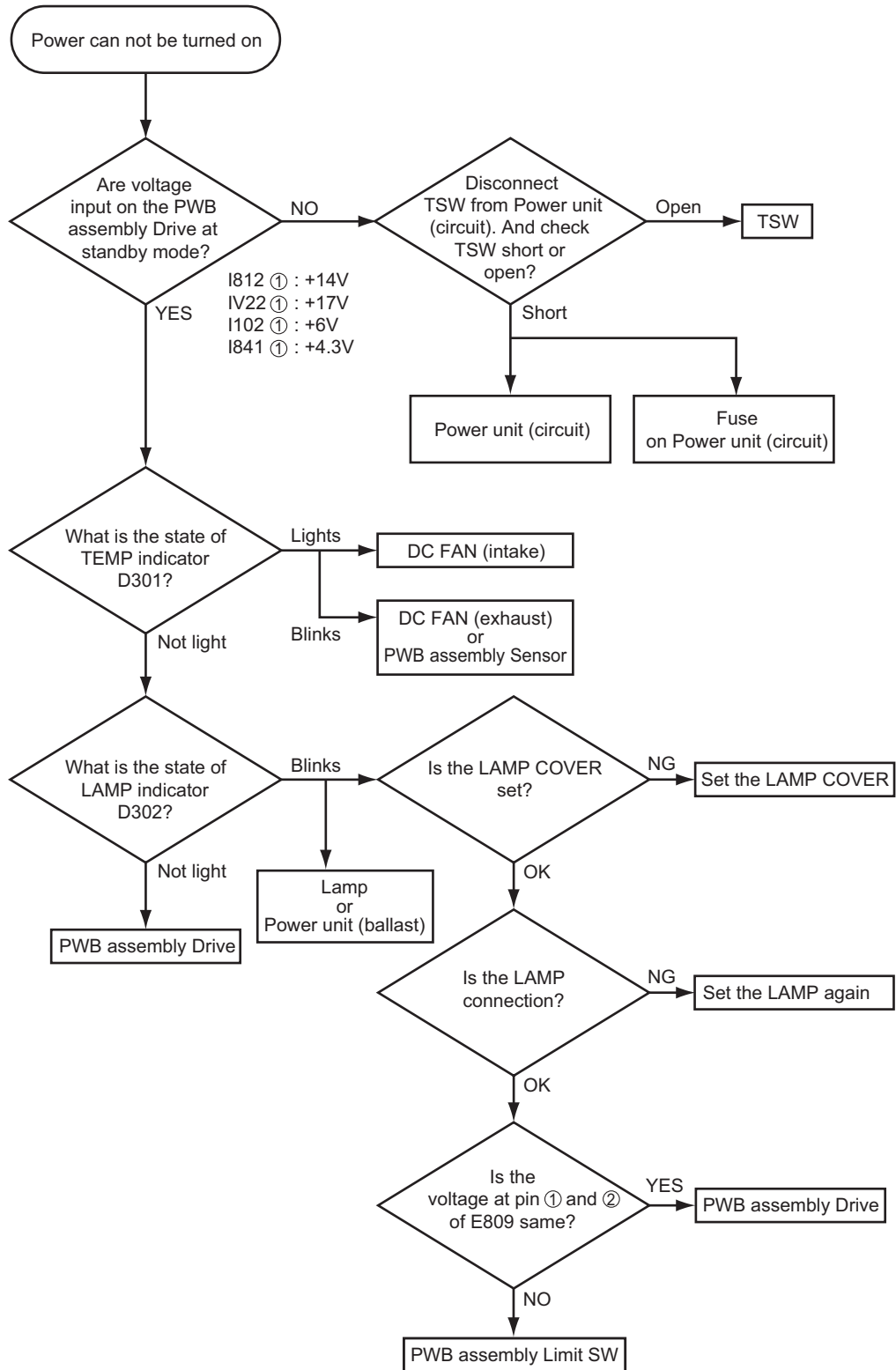
No. 17 deviation range

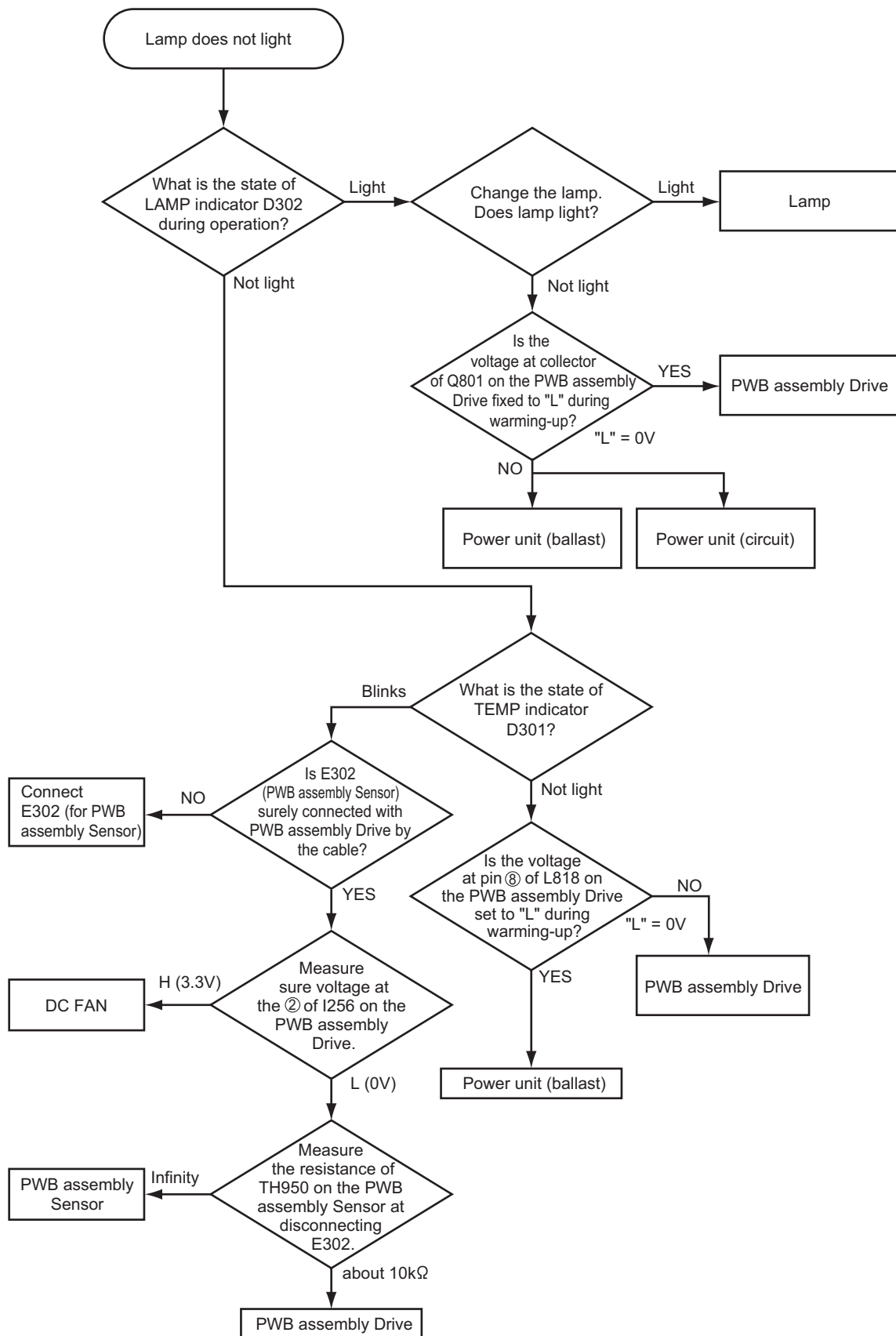


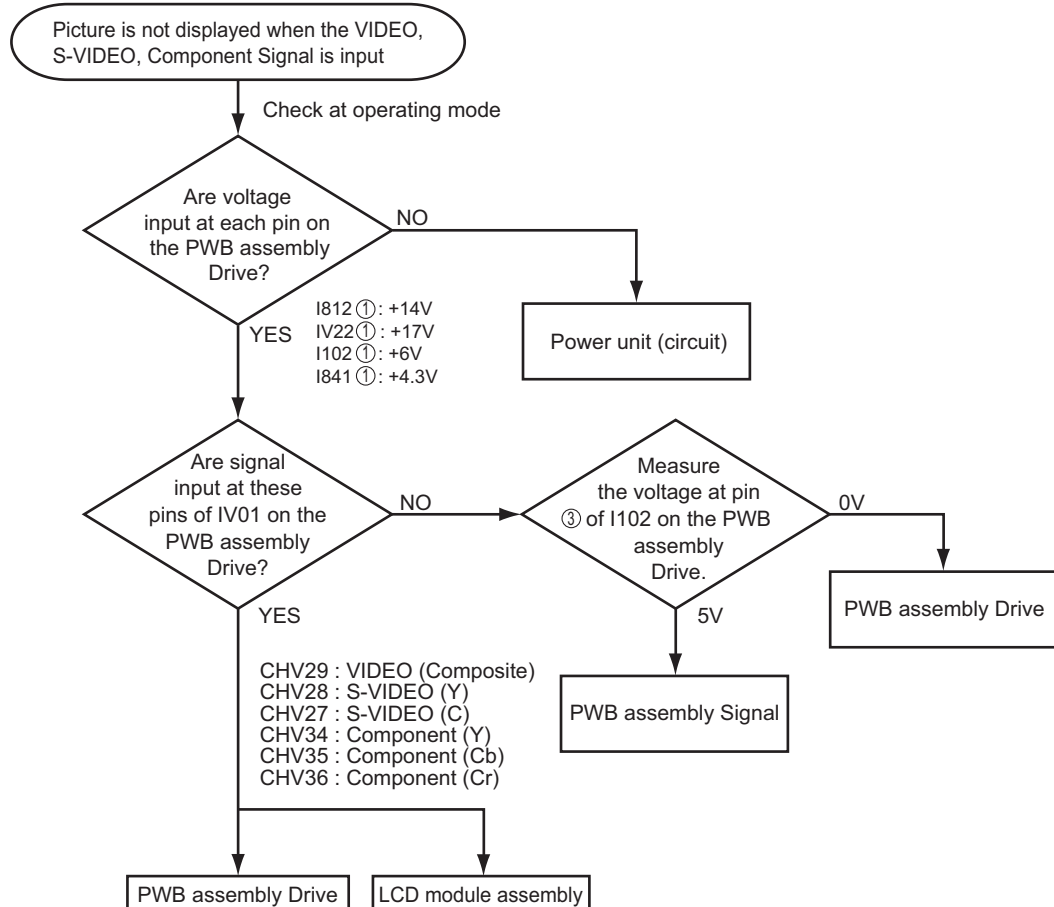
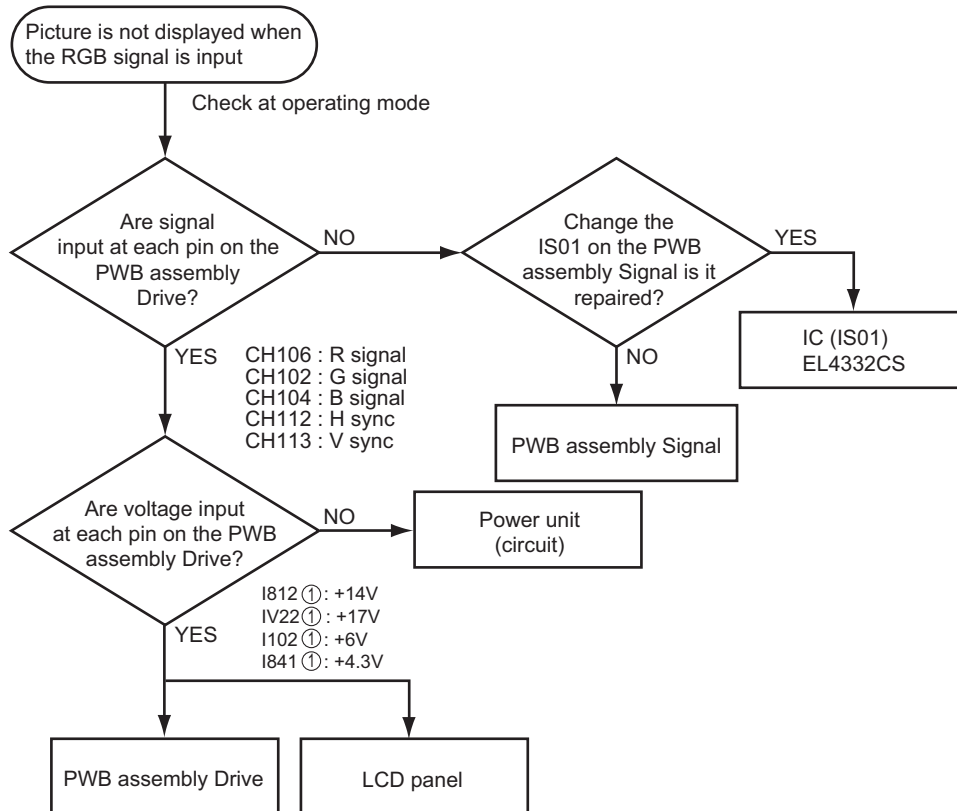
5. Troubleshooting

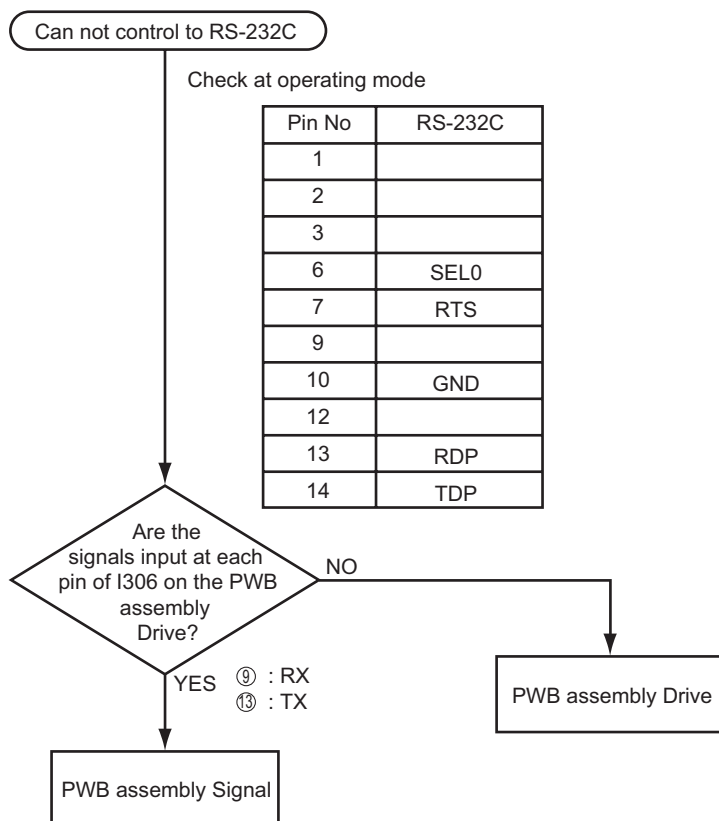
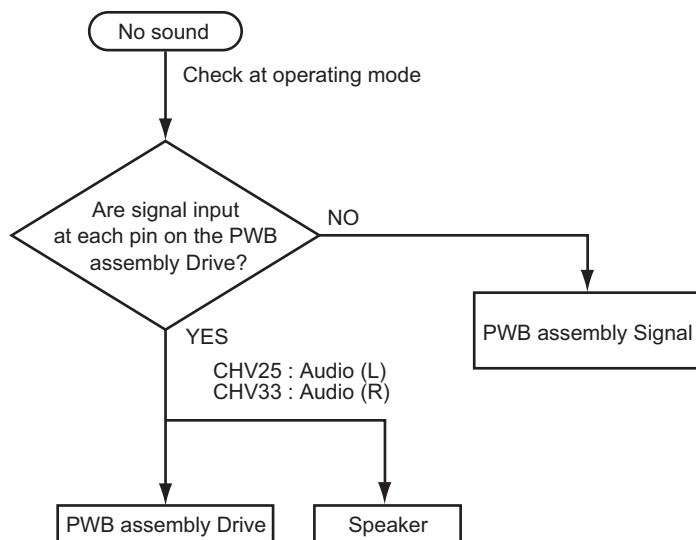
Check points at trouble shooting







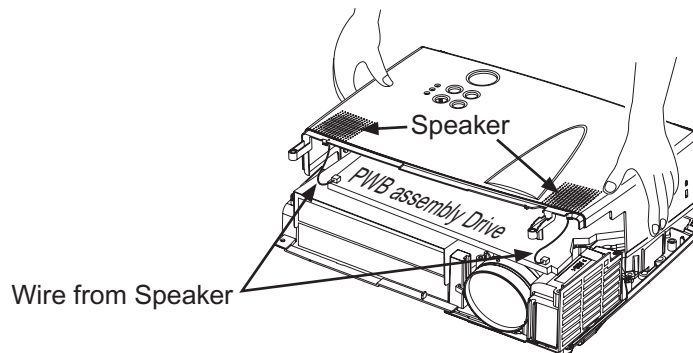




6. Service points

● Cautions when removing the Upper case assembly

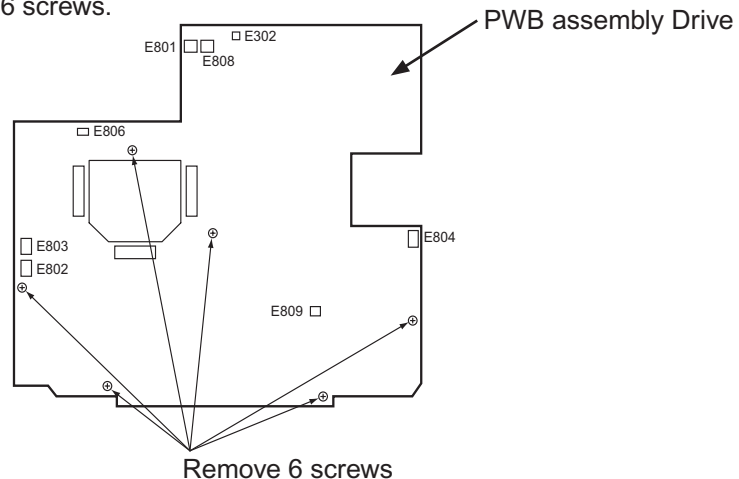
When you remove the Upper case assembly, avoid to damage wires between speakers on the Upper case assembly and PWB assembly Drive on the Bottom case assembly.



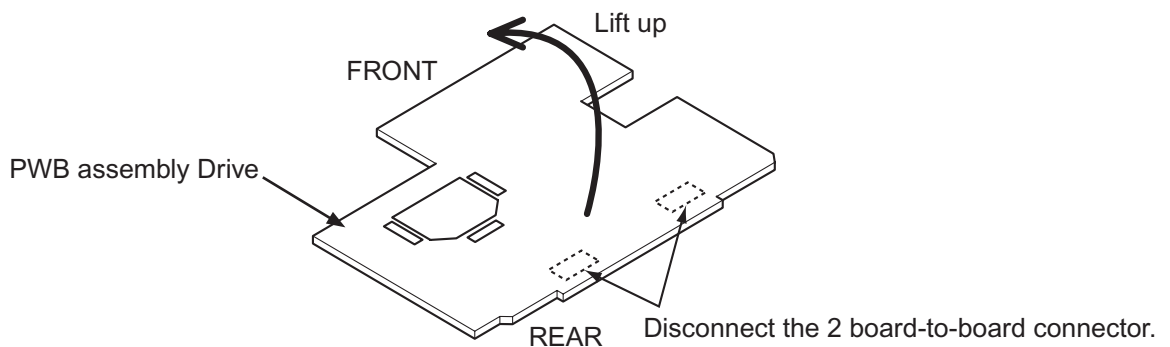
● Cautions when removing the PWB assembly Drive

When removing the PWB assembly Drive, there is danger of damaging the connector connecting cables and the PWB assembly Signal.

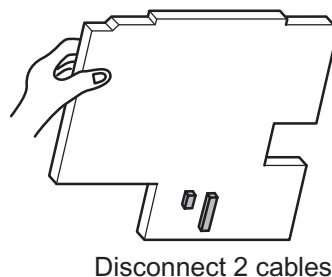
- 1) Disconnect 10 cables and remove 6 screws.



- 2) Lift up the rearward of the PWB assembly Drive to the front.

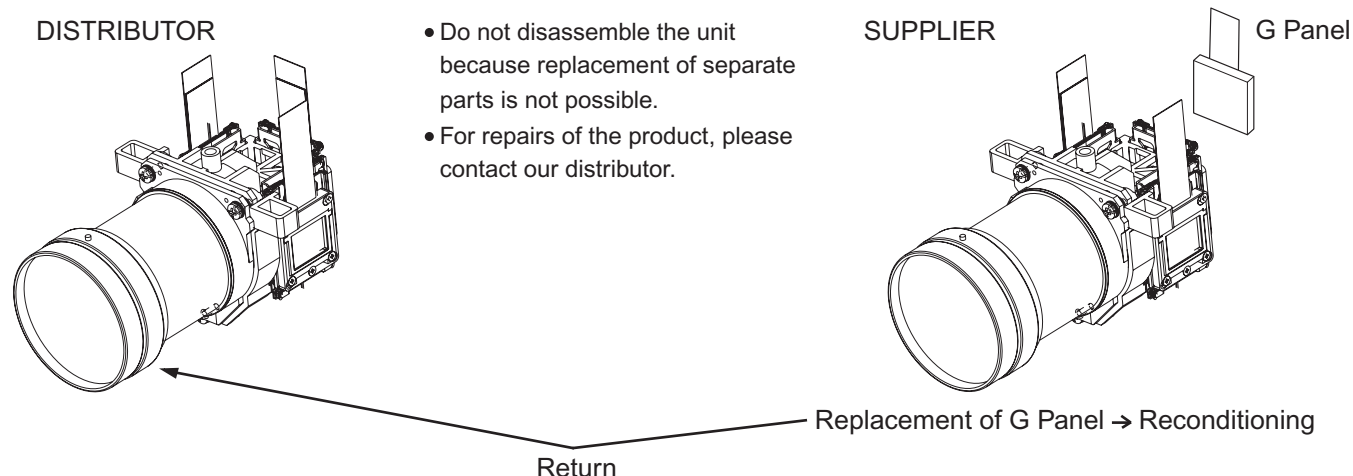


- 3) Disconnect 2 cables lifting the PWB assembly Drive.



● 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 assembly, or send the whole unit LCD / Lens Prism assembly back to SUPPLIER, 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

Cleaning the Air filter

The air filter should be cleaned as described below at intervals of approximately 300 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.

Replacing the Air filter

Replace the air filter if contamination cannot be removed, or if it is damaged.

1. Remove the filter cover.
2. Remove the old filter.
3. Set the new filter and filter cover.

CAUTION



- 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 assembly : EK 0286088010)
- Do not use the equipment with the air filter removed.
- When the air filter is clogged with dust etc. the power supply is switched OFF automatically to prevent the temperature rising inside the projector.

● Loading the Batteries

Install the AA batteries into the remote control transmitter.

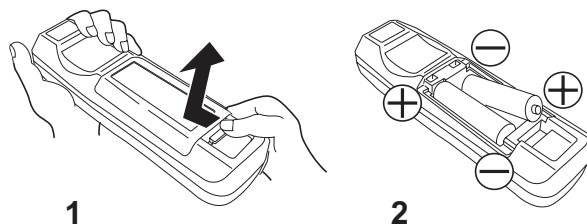
1. Remove the battery cover.

Push the knob while lifting up the battery cover.

2. Load 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 transmitter. 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. 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 should 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 transmitter operation becomes difficult.

● Lamp (Option Lamp: ZU 0286044010)



**HIGH VOLTAGE
HIGH TEMPERATURE
HIGH PRESSURE**

Contact your dealer before replacing the lamp.

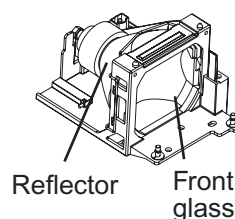
Before replacing the lamp, switch power OFF, remove the power cord from the power outlet, and wait approximately 45 minutes until the lamp has cooled. The lamp may explode if handled at high temperatures.

WARNING



- 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.
- Premature lamp failure MAY be caused by an electronic component in the projector and not necessarily the lamp. If unsure contact your local service center.
- 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.

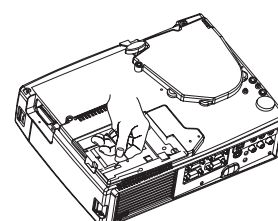
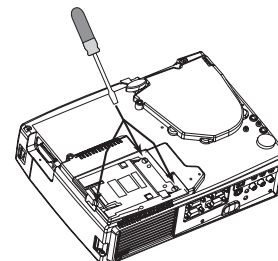
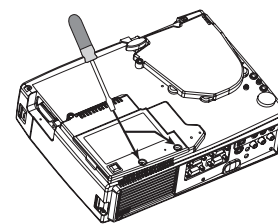
Replace the lamp if the LAMP indicator is red, or the CHANGE THE LAMP message appears when the projector is switched ON.

NOTE: The LAMP indicator 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 “THE POWER WILL TURN OFF AFTER 0 Hr” 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 RESET button, 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 replacing 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 turn 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.

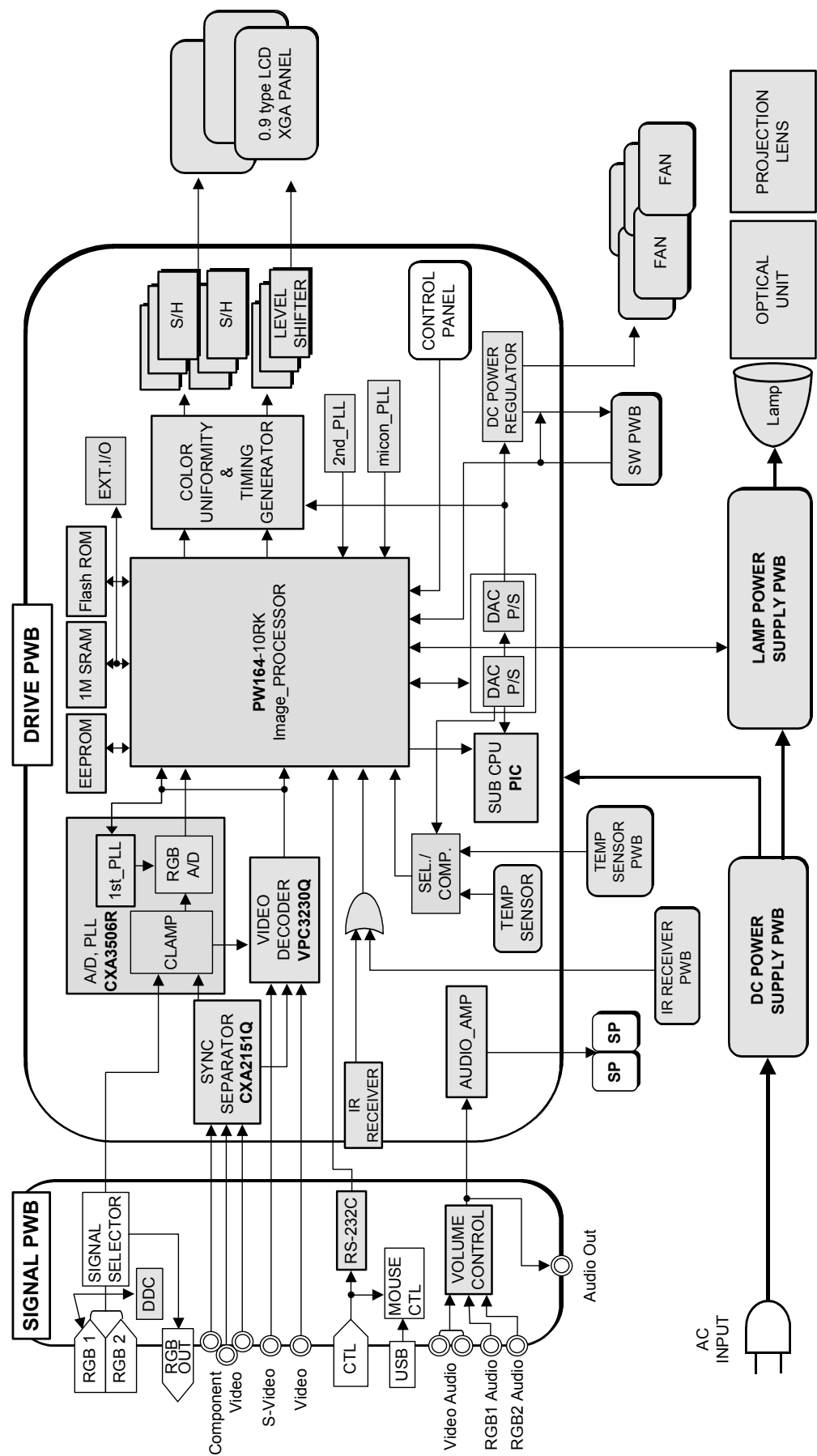
Indicator display

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

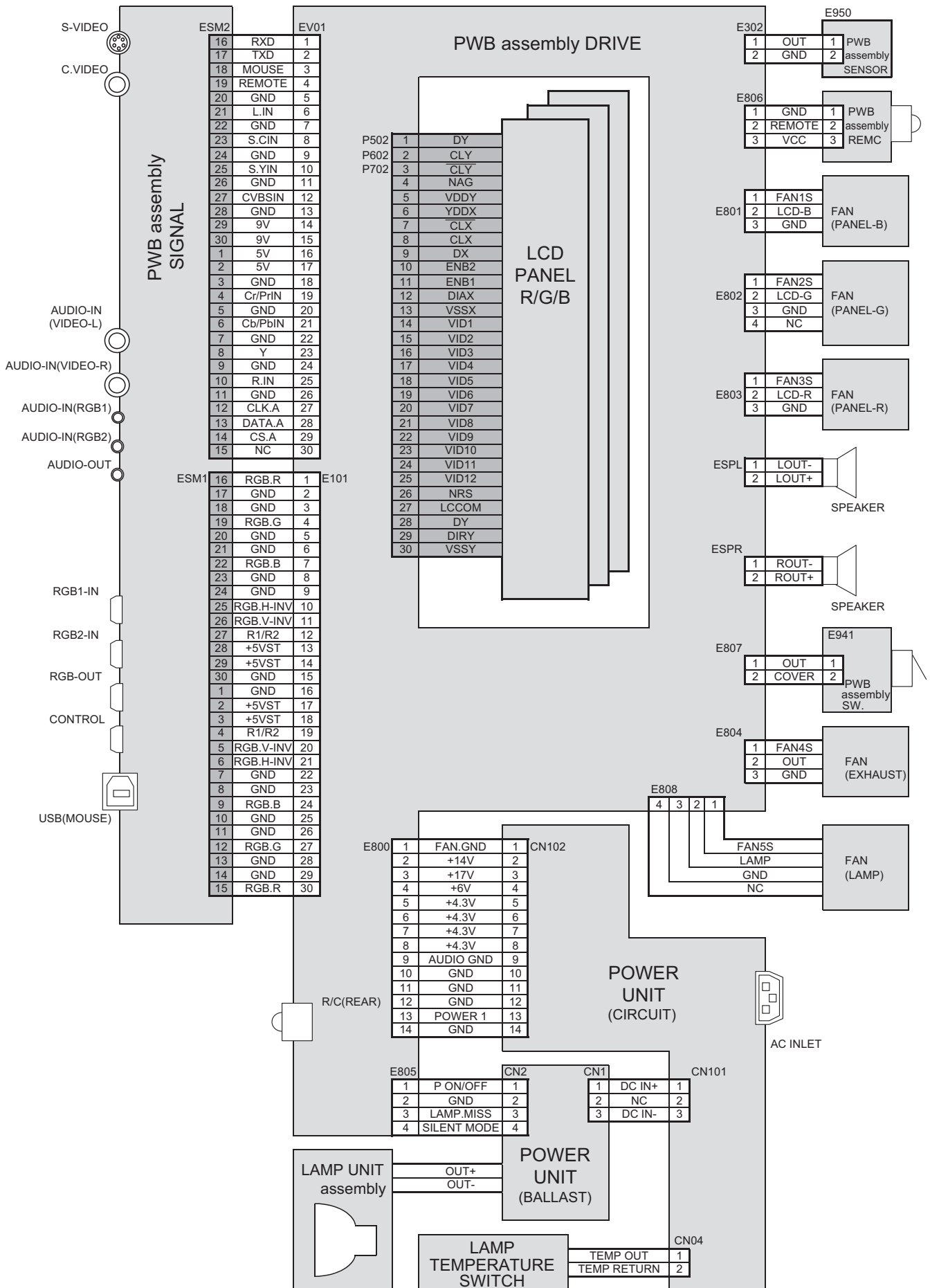
ON indicator	LAMP indicator	TEMP indicator	Meaning	Remedy
Lights orange	Goes off	Goes off	Standby mode	_____
Blinks green	Goes off	Goes off	During warming up	_____
Lights green	Goes off	Goes off	During operation	_____
Blinks orange	Goes off	Goes off	During cooling down	_____
Lights red	Lights red	Goes 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 assembly SENSOR accidented.	Replace fan, PWB assembly 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.

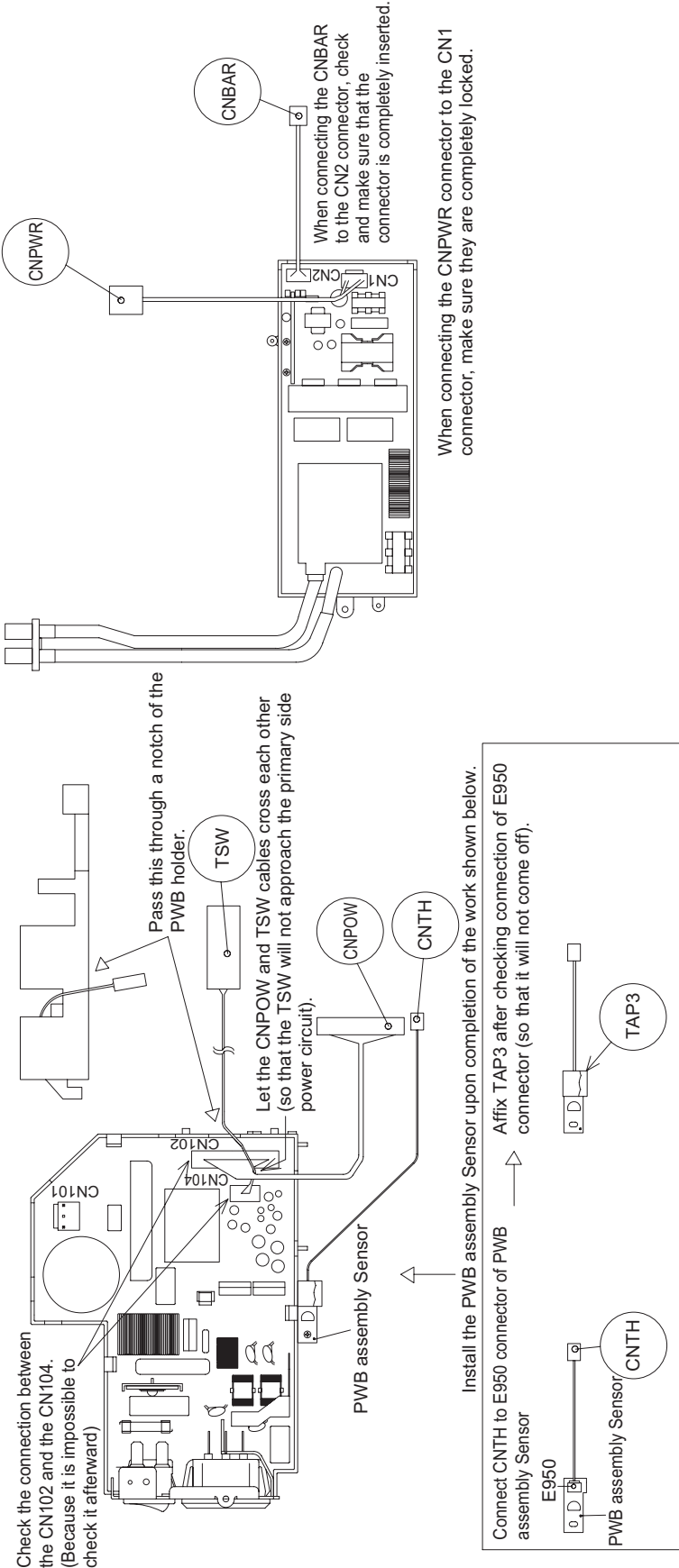
7. Block diagram

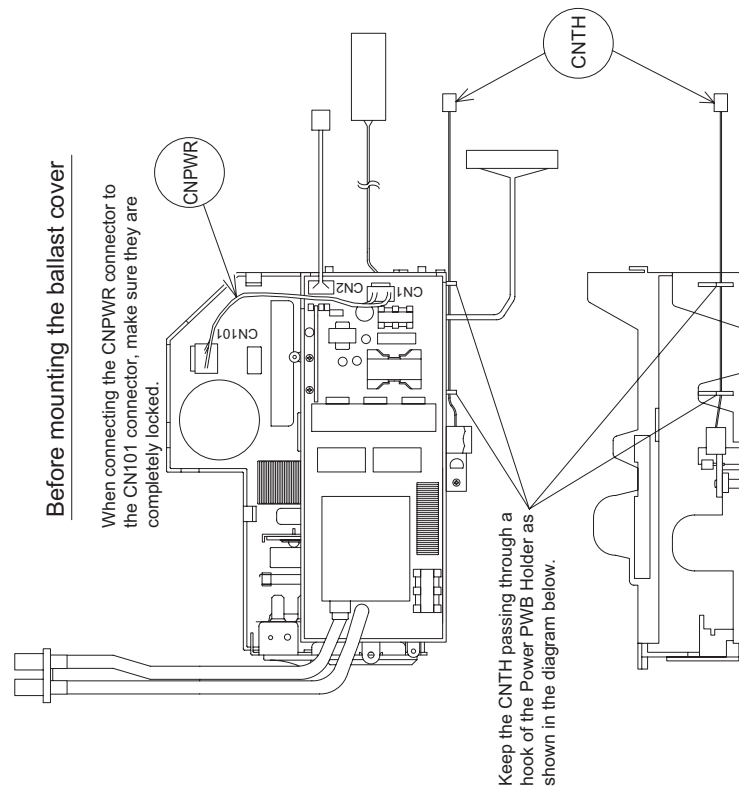


8. Connector connection diagram

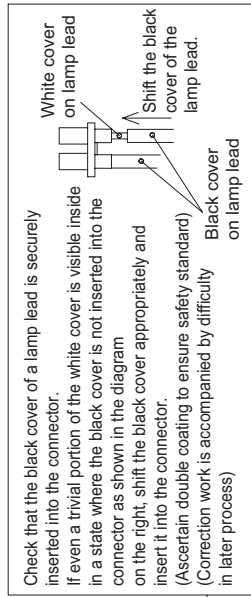


9. Wiring diagram

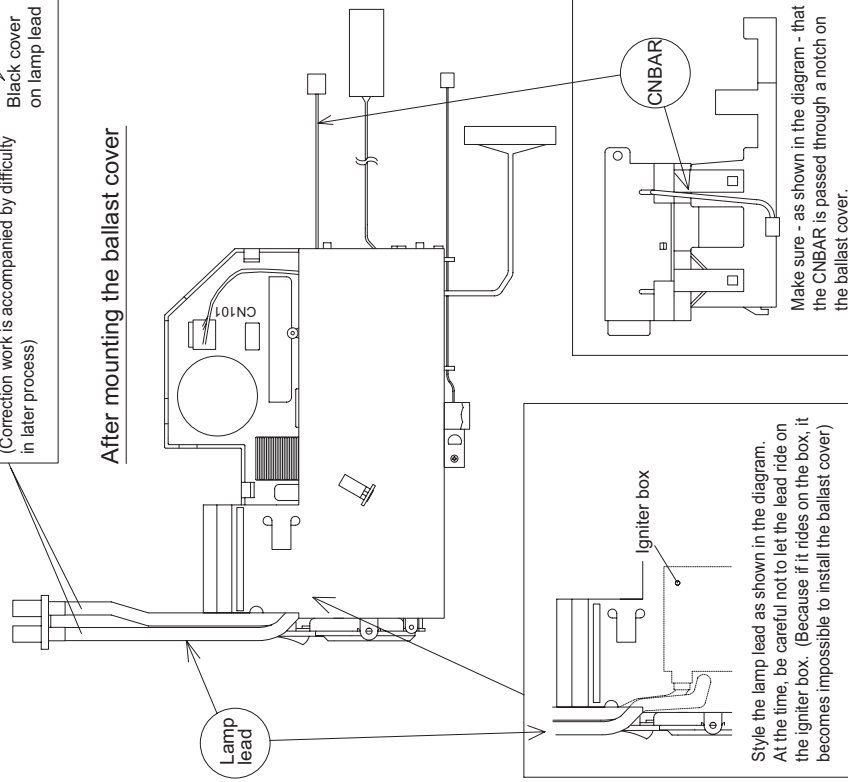


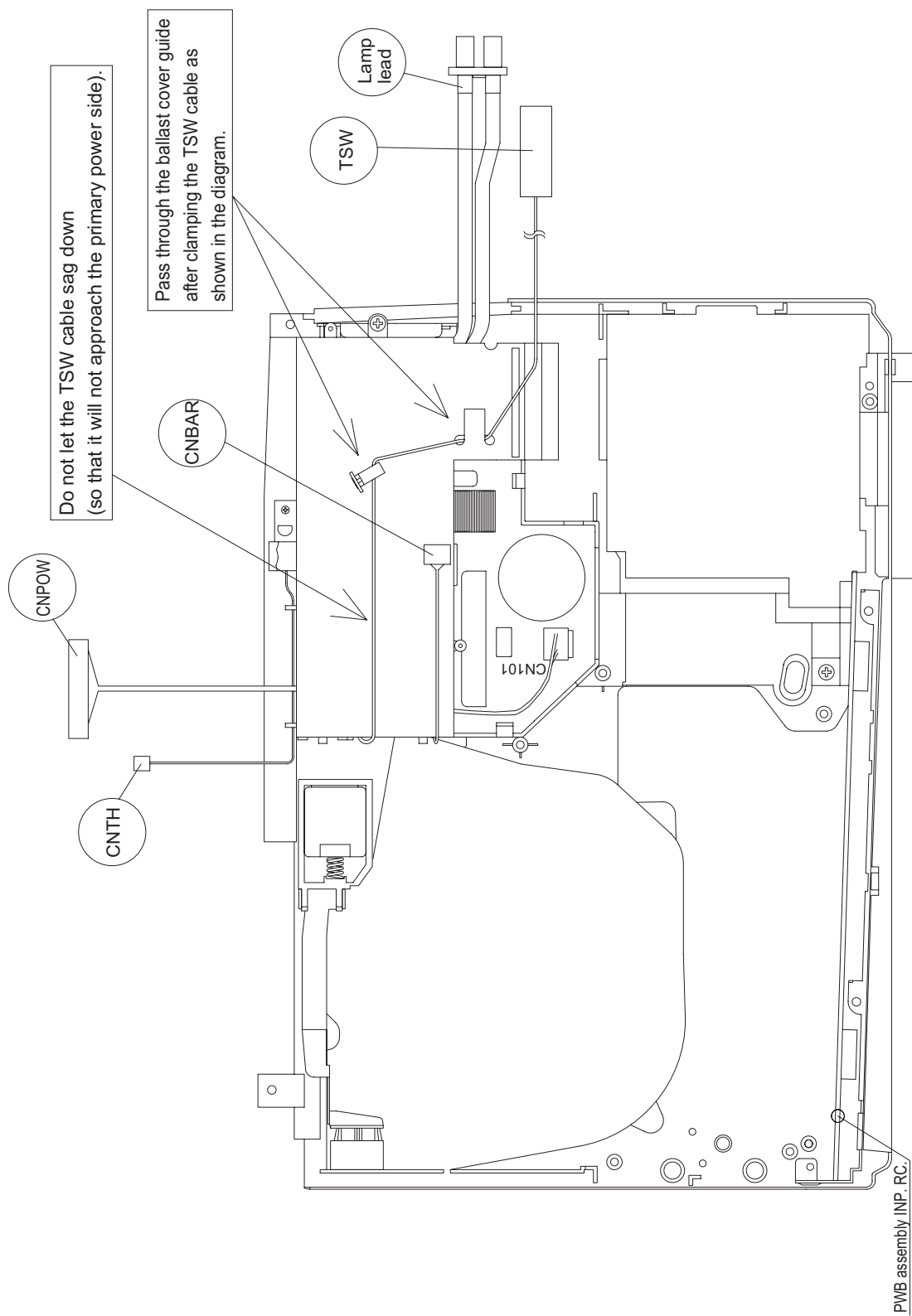


Before mounting the ballast cover



After mounting the ballast cover

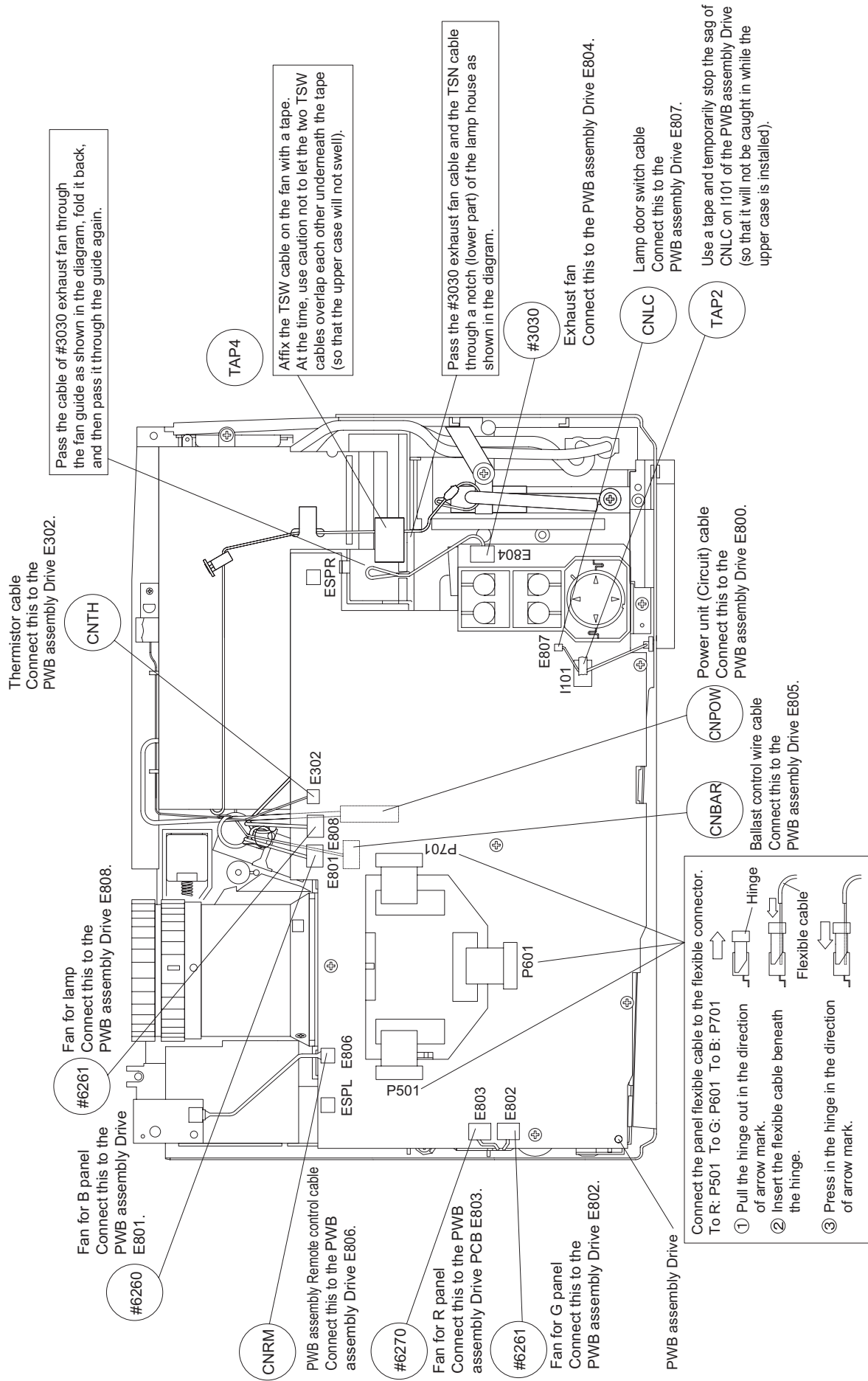


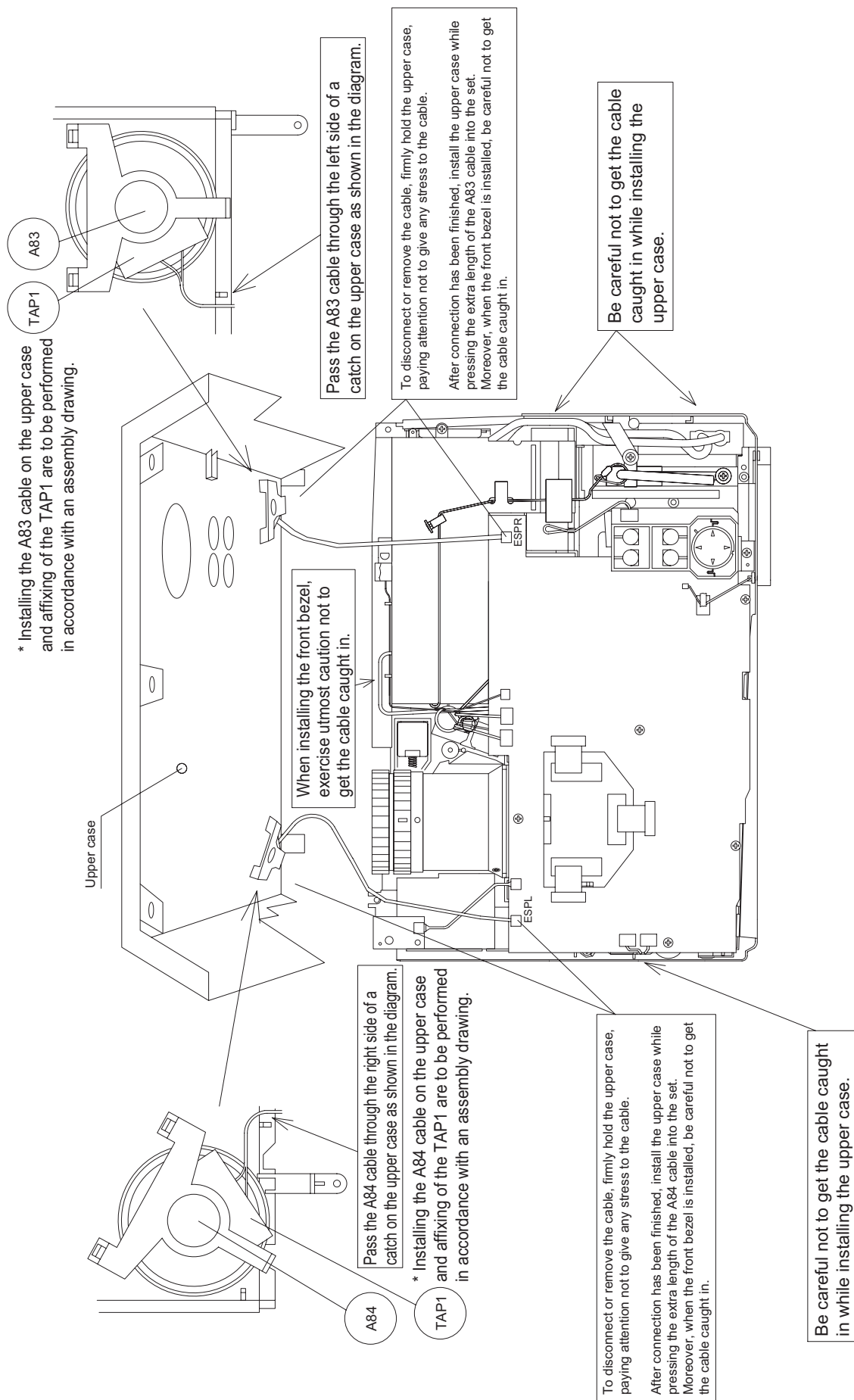


Keep individual cables away from positions to mount optical units as shown in the diagram so that the cables will not be caught in when optical units are mounted.

Procedures

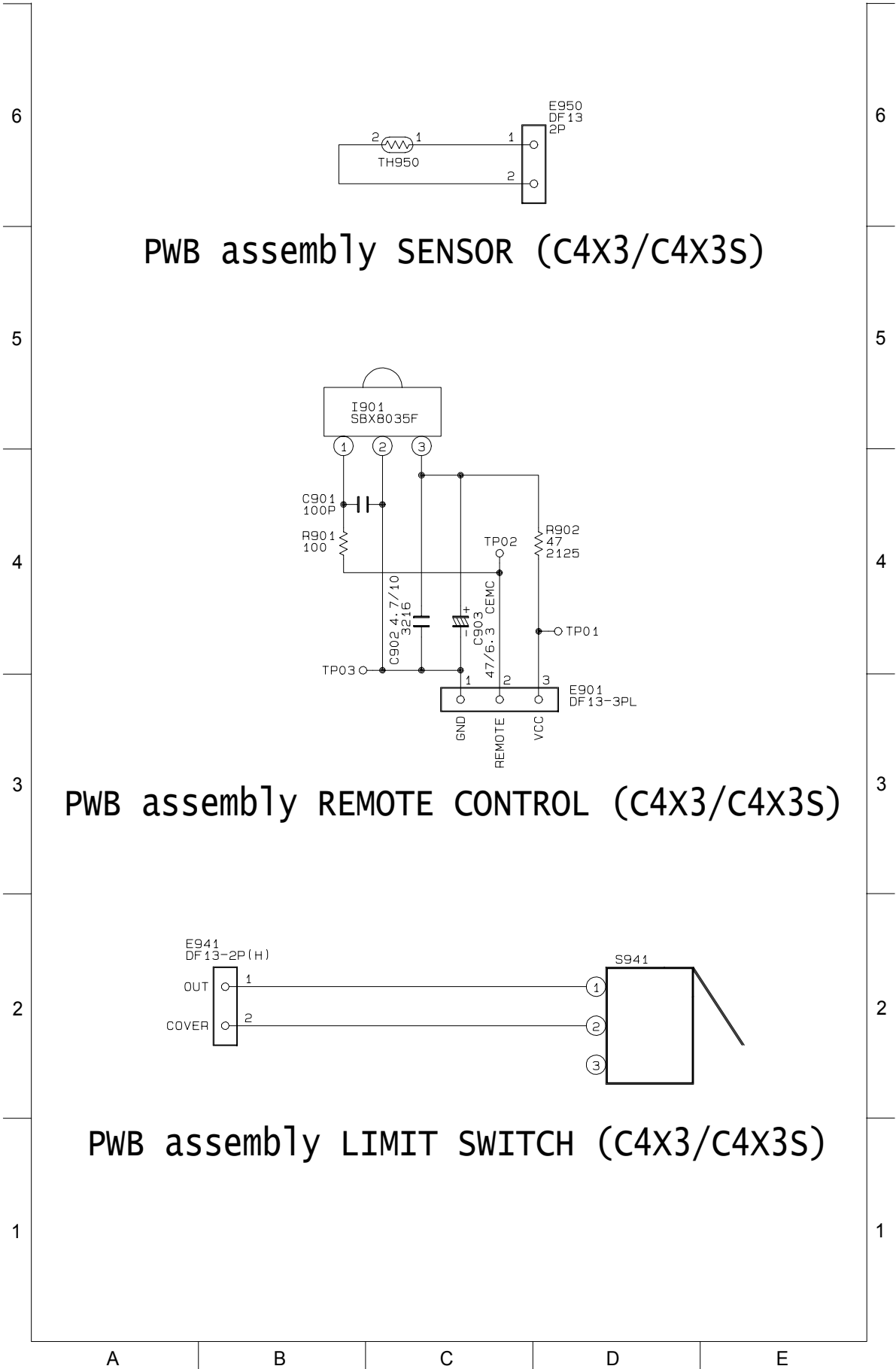
Before mounting the PWB assembly Drive, connect the CNBAR and the CNPOW to a connector on the back of the PWB in a state where you hold the PWB assembly Drive with your hands. Connect the other cables in a state where the PWB assembly Drive is mounted.

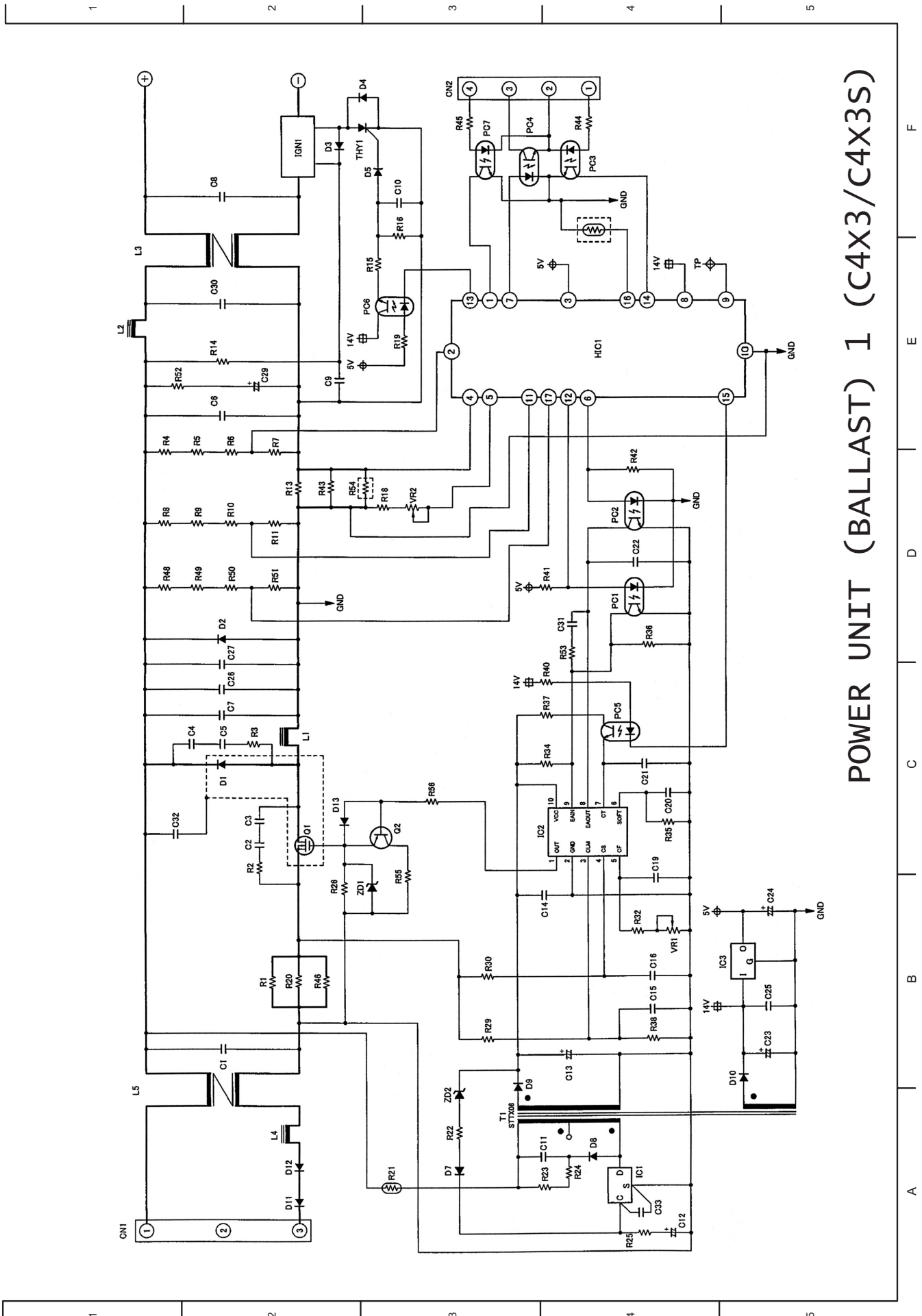




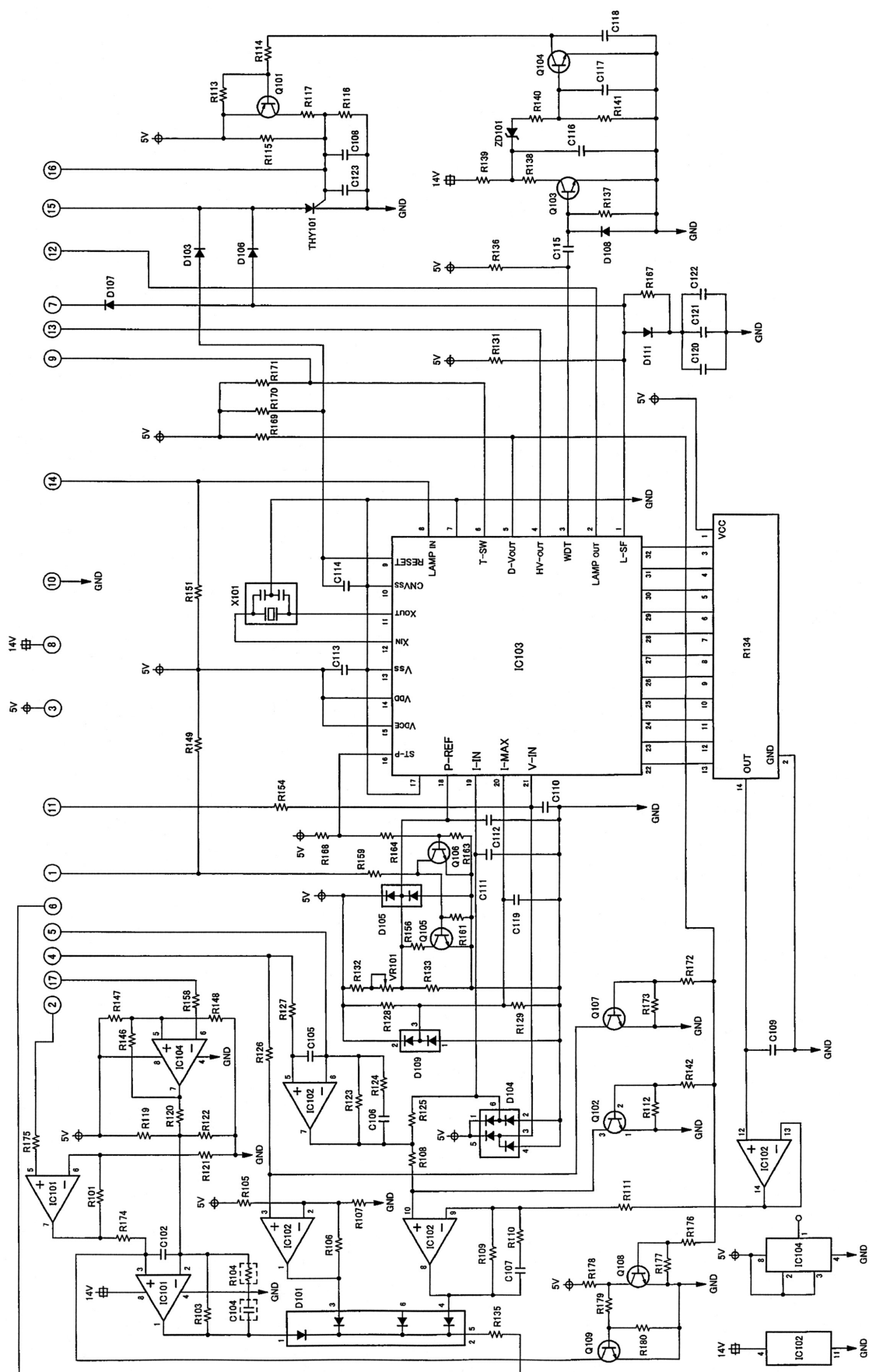
10. Basic circuit diagram

Parts with hatching are not mounted.





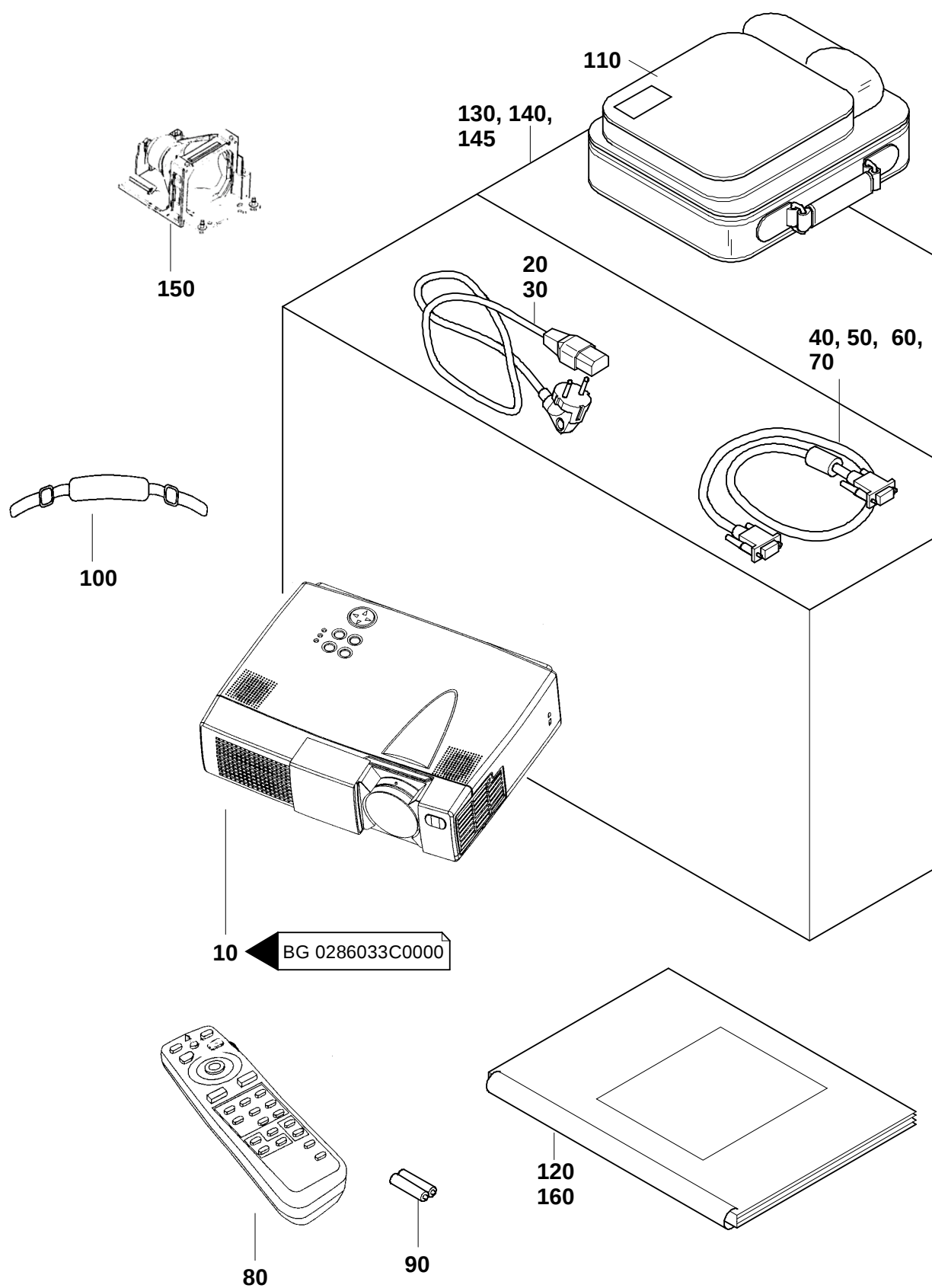
POWER UNIT (BALLAST) 1 (C4X3/C4X3S)

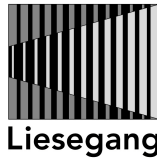


POWER UNIT (BALLAST) 2 (C4X3/C4X3S)

11. Disassembly diagram

02 86033C0000





11 Liesegang (type 286)

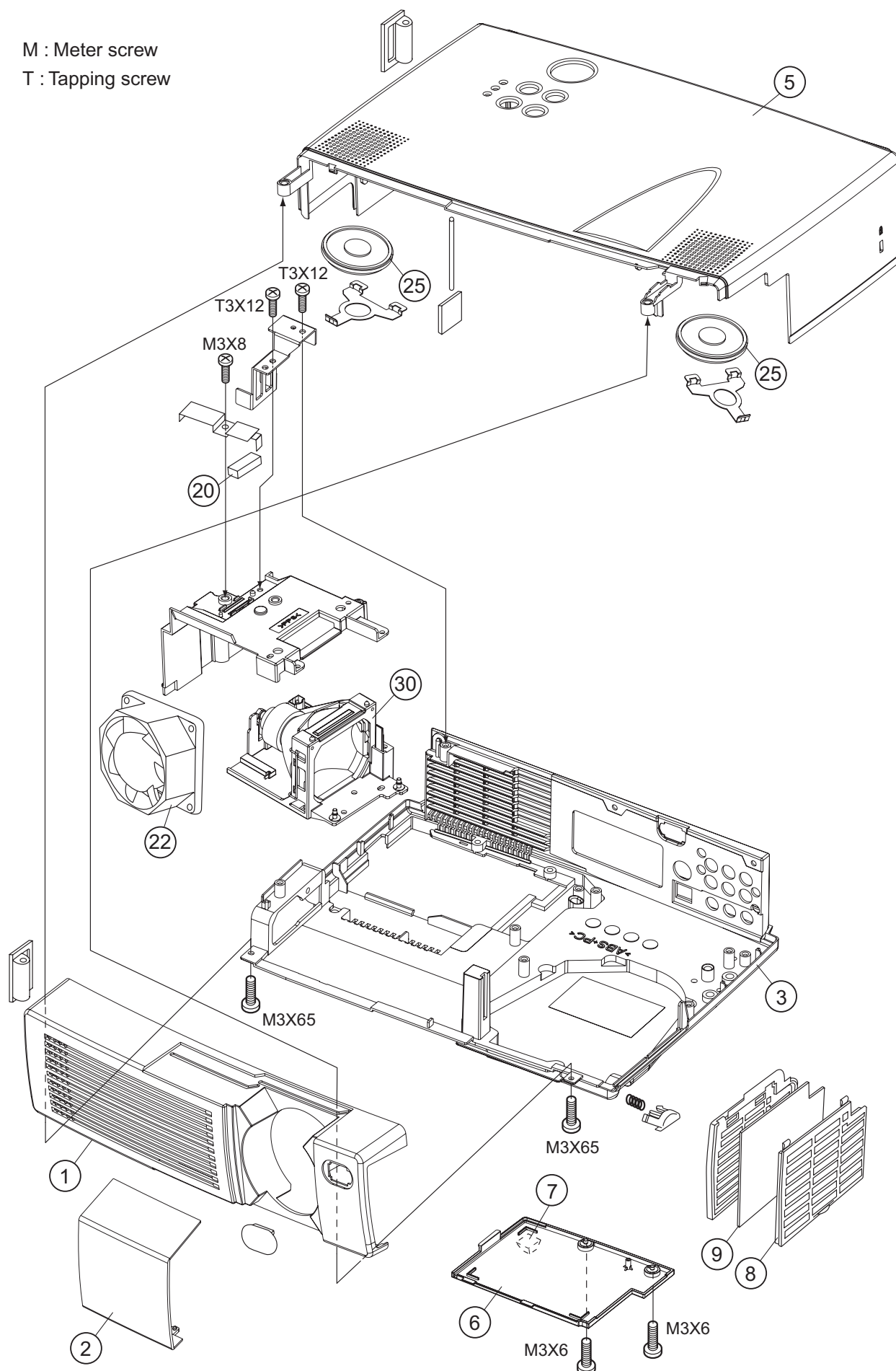
02 86033C0000

Position Item Neméro Número	Teile-Bezeichnung Description Description Descripción	Teile Part- No. No.	Serien-Nr. Serial-No. No. de serie No. de Serie
10	LIESEGANG dv 355	BG 0286033C0000	G2A000001
20	Netzkabel 3x1 3m D	EK 0242100012	G2A000001
30	Netzkabel 3x1 3m GB	EK 0242410012	G2A000001
40	Video-Kabel S-VHS	EK 0262700010	G2A000001
50	RGB-Kabel 2m	EK 0273700030	G2A000001
60	PS/2 Mauskabel m. Ferrit 2m	EK 0256700020	G2A000001
70	Komponenten Videokabel	EK 0273700020	G2A000001
80	IR-Fernbedienung	EK 0286088010	G2A000001
90	Alkali-Batterie 1,5 LR06	EK 0060580030	G2A000001
100	Tragegriff	EK 0270030060	G2A000001
110	Tragetasche	EK 0269980010	G2A000001
120	Bedienungsanleitung dv 355	EK 0286990010	G2A000001
130	Karton	EK 0269990030	G2A000001
140	Styropor-Schale vorn	EK 0286990020	G2A000001
145	Styropor-Schale hinten	EK 0279990040	G2A000001
150	Lampe dv 355	ZU 0286044010	G2A000001
160	Service-Manual Typ 286	EF 0286SM0001	G2A000001

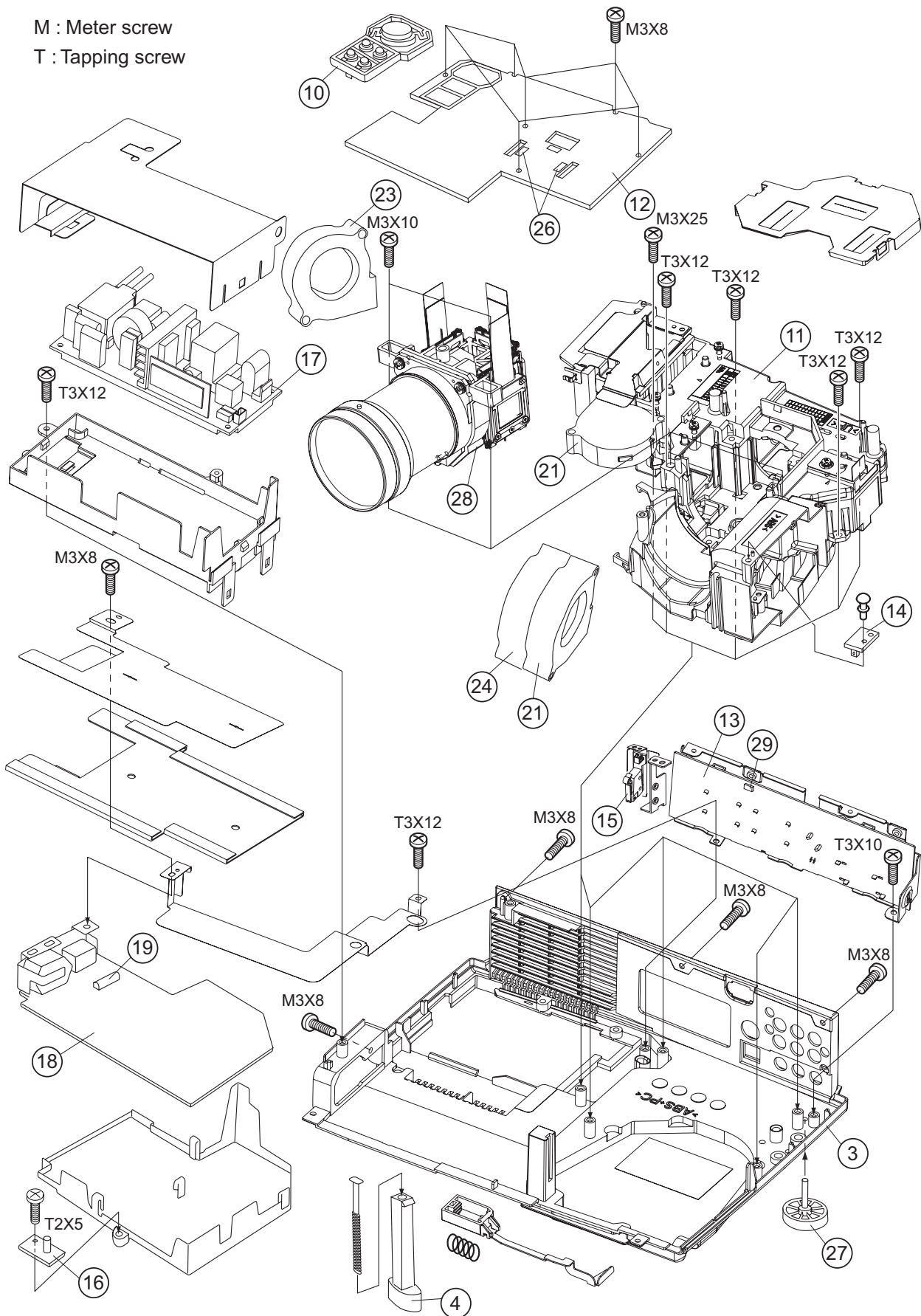
11. Disassembly diagram

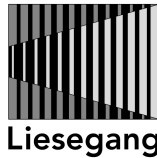
M : Meter screw

T : Tapping screw



M : Meter screw
T : Tapping screw

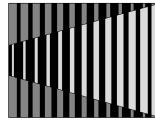




11 Liesegang (type 286)

BG 0286033C0000

Position Item Neméro Número	Teile-Bezeichnung Description Description Descripción	Teile-Nr. Part-No. No. d'article No. artículo	Serien-Nr. Serial-No. No. de serie No. de Serie
1	Vorderteil, vorm.	Front Brezel Ass'y	EK 0270011310 G2A000001
2	Objektivabdeckung	Lens Shutter	EK 0270011050 G2A000001
3	Gehäuse-Unterteil vorm	Bottom Case Aass'y	EK 0286011010 G2A000001
4	Fußjustierung, vorm.	Adjust Foot Ass'y	EK 0270011180 G2A000001
5	Gehäuse-Oberteil vorm	Upper Case Ass'y	EK 0286011020 G2A000001
6	Lampenklappe vorm.	Lamp Door Ass'y	EK 0270011120 G2A000001
7	Gummifuß	Rubber Foot	EK 0262011170 G2A000001
8	Filterdeckel, vorm.	Filter Cover Ass'y	EK 0270011110 G2A000001
9	Luftfilter	Aif Filter Ass'y	EK 0279011150 G2A000001
10	Tastatur vorm.	Control Button Ass'y	EK 0286011300 G2A000001
11	Lichtteiler	Dichroic Optics Unit	EK 0286011250 G2A000001
12	Leiterpl. LCD Treiber	PWB Ass'y Drive	EK 0286011060 G2A000001
13	Interface	PWB Ass'y Signal	EK 0286020040 G2A000001
14	IR-Empfänger	PWB Ass'y Remote Control	EK 0286020150 G2A000001
15	Trennschalterboard	PWB Ass'y Limit Switch	EK 0286020160 G2A000001
16	Sensorplatine	PWB Ass'y Sensor	EK 0286020170 G2A000001
17	Netzteil (Ballast)	Power Unit (Ballast)	EK 0286011040 G2A000001
18	Netzteil	Power Unit (Circuit)	EK 0286011030 G2A000001
19	Sicherung T 6,3 A	Fuse 6,3A	EK 0642055050 G2A000001
20	Thermoschalter	Temperature Sensor Switch	EK 0270022010 G2A000001
21	DC Lüfter (Lampe)	DC Fan (Lamp, Intake G)	EK 0286011090 G2A000001
22	DC Lüfter (Exhaust)	DC Fan (Exhaust)	EK 0286011070 G2A000001
23	DC Lüfter (Intake B)	DC Fan (Intake B)	EK 0270011080 G2A000001
24	DC Lüfter (Intake B)	DC Fan (Intake B)	EK 0270011090 G2A000001
25	Lautsprecher	Speaker	EK 0270011280 G2A000001
26	CPC30 Stecker	CPC30 Connector	EK 0286011210 G2A000001
27	Fuß hinten	Rear Adjust Foot	EK 0286011180 G2A000001
28	LCD/Prisma kpl	LCD Lens Prism Ass'y	EK 0286011230 G2A000001
29	EL4332CS	EL4332CS	EK 0288020200 G2A000001
30	Lampe dv 355	Lamp	ZU 0286044010 G2A000001



Liesegang

P Liesegang (type 286)

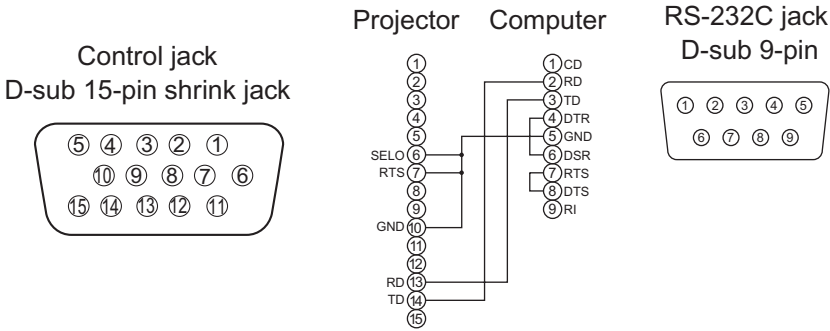
Preisgruppe Teile-Bezeichnung
Price group Description
Prix groupe Description
Precio grupo Descripción

Teile-Nr.
Part-No.
No. d'article
No. artículo

- - -	LIESEGANG dv 355	LIESEGANG dv 355	BG 0286033C0000
06	Service-Manual Typ 286	Service Manual type 286	EF 0286SM0001
01	Alkali-Batterie 1,5 LR06	Battery typ AAA	EK 0060580030
04	Netzkabel 3x1 3m D	Power Cord Europe-type	EK 0242100012
04	Netzkabel 3x1 3m GB	Power Cord UK-type	EK 0242410012
06	PS/2 Mauskabel m. Ferrit 2m	PS/2 Mouse Cable W/Core	EK 0256700020
02	Gummifuß	Rubber Foot	EK 0262011170
04	Video-Kabel S-VHS	Video Cable	EK 0262700010
15	Tragetasche	Carrying Case	EK 0269980010
03	Karton	Carton Box	EK 0269990030
05	Objektivabdeckung	Lens Shutter	EK 0270011050
11	DC Lüfter (Intake B)	DC Fan (Intake B)	EK 0270011080
10	DC Lüfter (Intake B)	DC Fan (Intake B)	EK 0270011090
02	Filterdeckel, vorm.	Filter Cover Ass'y	EK 0270011110
06	Lampenklappe vorm.	Lamp Door Ass'y	EK 0270011120
05	Fußjustierung, vorm.	Adjust Foot Ass'y	EK 0270011180
04	Lautsprecher	Speaker	EK 0270011280
11	Vorderteil, vorm.	Front Brezel Ass'y	EK 0270011310
03	Thermoschalter	Temperature Sensor Switch	EK 0270022010
03	Tragegriff	Handle	EK 0270030060
09	Komponenten Videokabel	Component Cable	EK 0273700020
06	RGB-Kabel 2m	RGB Cable	EK 0273700030
02	Luftfilter	Air Filter Ass'y	EK 0279011150
04	Styropor-Schale hinten	Cushion rear	EK 0279990040
15	Gehäuse-Unterteil vorm	Bottom Case Aass'y	EK 0286011010
13	Gehäuse-Oberteil vorm	Upper Case Ass'y	EK 0286011020
19	Netzteil	Power Unit (Circuit)	EK 0286011030
20	Netzteil (Ballast)	Power Unit (Ballast)	EK 0286011040
31	Leiterpl. LCD Treiber	PWB Ass'y Drive	EK 0286011060
06	DC Lüfter (Exhaust)	DC Fan (Exhaust)	EK 0286011070
09	DC Lüfter (Lampe)	DC Fan (Lamp, Intake G)	EK 0286011090
04	Fuß hinten	Rear Adjust Foot	EK 0286011180
02	CPC30 Stecker	CPC30 Connector	EK 0286011210
44	LCD/Prisma kpl	LCD Lens Prism Ass'y	EK 0286011230
28	Lichtteiler	Dichroic Optics Unit	EK 0286011250
06	Tastatur vorm.	Control Button Ass'y	EK 0286011300
20	Interface	PWB Ass'y Signal	EK 0286020040
09	IR-Empfänger	PWB Ass'y Remote Control	EK 0286020150
09	Trennschalterboard	PWB Ass'y Limit Switch	EK 0286020160
09	Sensorplatine	PWB Ass'y Sensor	EK 0286020170
16	IR-Fernbedienung	Remote Control	EK 0286088010
12	Bedienungsanleitung dv 355	User Manual dv 355	EK 0286990010
04	Styropor-Schale vorn	Cushion front	EK 0286990020
07	EL4332CS	EL4332CS	EK 0288020200
01	Sicherung T 6,3 A DIN 41661	Fuse 6,3A	EK 0642055050
*	Lampe dv 355	Lamp	ZU 0286044010

13. RS-232C communication

- (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_high.

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 practiced, 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.

NOTE:

- 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				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 Inverse	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			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
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
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_V Reset	Execute		BE EF	03	06 00	08 D0	06 00	0C 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
Error Status	Get		BE EF	03	06 00	D9 D8	02 00	20 60	00 00
			(Example of Return) 00 00 01 00 02 00 03 00 (Normal) (Cover-error) (Fan-error) (Lamp-error) 04 00 05 00 06 00 (Temp-error) (Air flow-error) (Lamp-Time-over)						
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	RGB1	BE EF	03	06 00	FE D2	01 00	00 20	00 00
		RGB2	BE EF	03	06 00	3E D0	01 00	00 20	04 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
		Component	BE EF	03	06 00	AE D1	01 00	00 20	05 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

Command data chart

Names	Operation type		Header				Command data		
							Action	Type	Setting code
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_V	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, Full	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
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

Command data chart

Names	Operation type		Header				Command data		
							Action	Type	Setting code
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
HDTV	Set	1080i	BE EF	03	06 00	F2 73	01 00	05 22	00 00
		1035i	BE EF	03	06 00	62 72	01 00	05 22	01 00
	Get		BE EF	03	06 00	C1 73	02 00	05 22	00 00

Command data chart

Names	Operation type		Header				Command data		
							Action	Type	Setting code
Sync on G	Set	off	BE EF	03	06 00	CB D0	01 00	08 30	01 00
		on	BE EF	03	06 00	5B D1	01 00	08 30	00 00
	Get		BE EF	03	06 00	68 D1	02 00	08 30	00 00
WHISPER	Set	NORMAL	BE EF	03	06 00	3B 23	01 00	00 33	00 00
		WHISPER	BE EF	03	06 00	AB 22	01 00	00 33	01 00
	Get		BE EF	03	06 00	08 23	02 00	00 33	00 00
GAMMA	Set	NORMAL	BE EF	03	06 00	C7 F0	01 00	A1 30	00 00
		CINEMA	BE EF	03	06 00	57 F1	01 00	A1 30	01 00
		DYNAMIC	BE EF	03	06 00	A7 F1	01 00	A1 30	02 00
	Get		BE EF	03	06 00	F4 F0	02 00	A1 30	00 00
COLOR TEMP	Set	NORMAL	BE EF	03	06 00	FB F5	01 00	B0 30	00 00
		LOW	BE EF	03	06 00	6B F4	01 00	B0 30	01 00
	Get		BE EF	03	06 00	C8 F5	02 00	B0 30	00 00

Liesegang

dv355