JVC

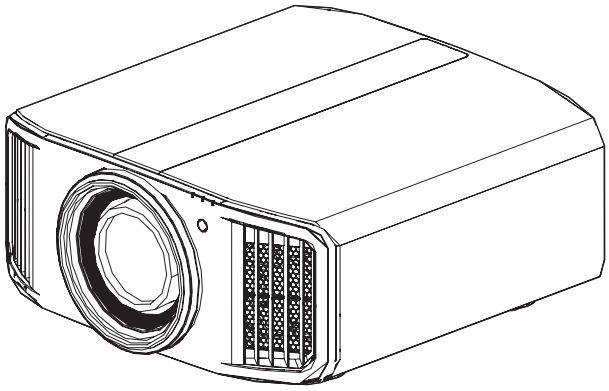
SERVICE MANUAL

D-ILA PROJECTOR

DLA-N11BC, DLA-N5BC, DLA-N5BE, DLA-N5WE, DLA-N6BC, DLA-N7BE, DLA-N8BC, DLA-NX5BK, DLA-NX7BK, DLA-NX9BE, DLA-NX9BK, DLA-RS1000E, DLA-RS1000K, DLA-RS2000E, DLA-RS2000K, DLA-RS3000E, DLA-RS3000K

D-ILA®

HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE



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No.PA062<Rev.001>
2018/12

SPECIFICATION

Product Name		D-ILA Projector
Display Panel/Size		D-ILA device *1, 2 0.69” 4K D-ILA (4096 x 2160 pixels) x 3
Projection Lens		2.0 x power zoom lens (1.4:1 to 2.8:1) motorized zoom and focus
Light-source Lamp		265 W ultra-high pressure mercury lamp [product no.: PK-L2618U] Average lifespan: 4500 hours (“Low” mode)
Screen Size		Approx. 60” to 280” (Aspect ratio of 16:9)
Brightness		2200 lm (N11BC, NX9BE, NX9BK, RS3000E, RS3000K) 1900 lm (N7BE, N8BC, NX7BK, RS2000E, RS2000K) 1800 lm (N5BC, N5BE, N5WE, N6BC, NX5BK, RS1000E, RS1000K)
Projection Distance		Refer to instruction manual P79
Input Compatibility Signal		Refer to instruction manual P83
Display Resolution		8192 x 4320 pixels *3 (N11BC, NX9BE, NX9BK, RS3000E, RS3000K) 4096 x 2160 pixels (Except N11BC, NX9BE, NX9BK, RS3000E, RS3000K)
Input Terminal	HDMI Input	Dual HDMI 19-pin x 2 (HDCP 2.2-compatible) *4
Output Terminal	Trigger Terminal	Single Ø 3.5 mm DC Power Jack (⊖-◉-⊕) DC OUT 12 V 0.1 A
	3D synchro	Dedicated terminal for 3D Synchro Emitter (single mini-DIN 3-pin)
Control Terminal	RS-232C Terminal	Single D-sub 9-pin (male) (external control)
	LAN Terminal	Single RJ-45 plug 10BASE-T/100BASE-TX
	Service Terminal	SERVICE Single (USB Type A) *5
Power Requirements		AC 100 V to 240 V, 50 Hz/60 Hz
Power Consumption		400 W (during normal standby: 1.5 W *6, during Eco Mode standby: 0.3 W *7)
Operation Environment		Temperature: 5°C to 35°C humidity: 20% to 80% storage temperature: -10°C to 60°C
Installation Height		Below 5,000 ft (1,524 m)
Dimensions (Width x Height x Depth)		500 mm x 234 mm x 518 mm (including feet) (N11BC, NX9BE, NX9BK, RS3000E, RS3000K) 500 mm x 234 mm x 495 mm (including feet) (Except N11BC, NX9BE, NX9BK, RS3000E, RS3000K)
Mass		21.8 kg (N11BC, NX9BE, NX9BK, RS3000E, RS3000K) 19.8 kg (Except N11BC, NX9BE, NX9BK, RS3000E, RS3000K)

*1 D-ILA is the abbreviation for Direct Drive Image Light Amplifier.
*2 D-ILA devices are manufactured using extremely high-precision technology with a pixel effectiveness of 99.99%.
Only 0.01% or less of the pixels are either missing or would remain permanently lit.
*3 During 3D playback, the display resolution is 4096 x 2160 pixels.
*4 HDCP is the abbreviation for High-bandwidth Digital Content Protection system. The image of the HDMI input terminal may not be displayed in some cases due to changes in the HDCP specifications.
*5 Exclusively for firmware update.
*6 The power consumption of this product during networked standby when all wired network ports are connected is 1.5 W.
*7 “During standby” refers to Eco Mode standby (Refer to instruction manual P61).

- Design and specifications are subject to change without prior notice.
- Please note that some of the pictures and illustrations may have been abridged, enlarged or contextualized in order to aid comprehension. Images may differ from the actual product.

SECTION 1
PRECAUTION

1.1 SAFETY PRECAUTIONS

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

1.1.1 PRECAUTIONS DURING SERVICING

(1) Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

(2) Parts identified by the ⚠ symbol and shaded ( ) parts are critical for safety.
Replace only with specified part numbers.

NOTE :

Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

(3) Fuse replacement caution notice.
Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

(4) Use specified internal wiring. Note especially:
- Wires covered with PVC tubing
- Double insulated wires
- High voltage leads

(5) Use specified insulating materials for hazardous live parts. Note especially:
- Insulation Tape
- PVC tubing
- Spacers
- Insulation sheets for transistors
- Barrier

(6) When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

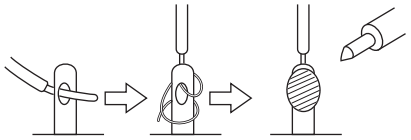


Fig.1-1-1

(7) Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

(8) Check that replaced wires do not contact sharp edged or pointed parts.

(9) When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

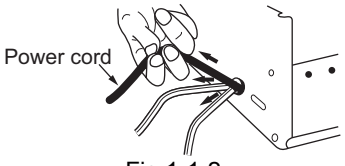


Fig.1-1-2

(10) Also check areas surrounding repaired locations.

(11) Products using cathode ray tubes (CRTs)In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits.Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

(12) Crimp type wire connector In such cases as when replacing the power transformer in sets where the connections between the power cord and power trans former primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
- **Connector part number** :E03830-001
- **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
- **Replacement procedure**

a) Remove the old connector by cutting the wires at a point close to the connector. Important : Do not reuse a connector (discard it).

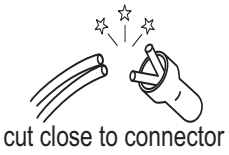


Fig.1-1-3

b) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

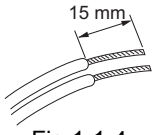


Fig.1-1-4

c) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

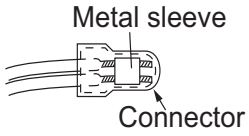


Fig.1-1-5

d) As shown in Fig.1-1-6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

Fig.1-1-6

e) Check the four points noted in Fig.1-1-7.

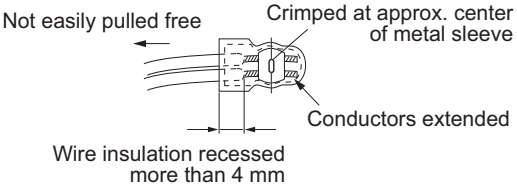


Fig.1-1-7

1.1.2 SAFETY CHECK AFTER SERVICING

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

(1) Insulation resistance test
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).See table 1 below.

(2) Dielectric strength test
Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See Fig.1-1-11 below.

(3) Clearance distance
When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See Fig.1-1-11 below.

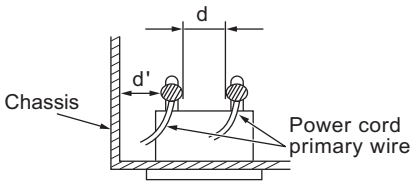


Fig.1-1-8

(4) Leakage current test
Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
Measuring Method : (Power ON)Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See Fig.1-1-9 and following Fig.1-1-12.

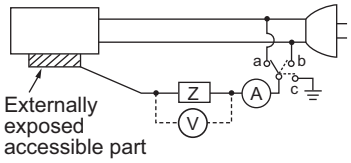
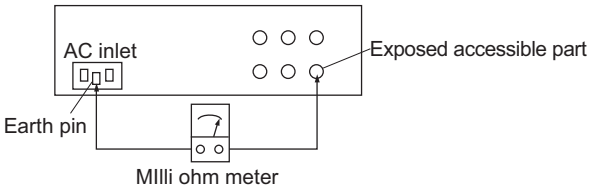


Fig.1-1-9

(5) Grounding (Class 1 model only)
Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).Measuring Method:
Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See Fig.1-1-10 and grounding specifications.



Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

Fig.1-1-10

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	1 MΩ ≦R≦ 12 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R≧ 10 MΩ/500 V DC	AC 3 kV 1 minute (Class Ⅱ) AC 1.5 kV 1 minute (Class Ⅰ)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Fig.1-1-11

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Fig.1-1-12

NOTE :
These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

1.2 WARNING AND CAUTION LABELS

- Labels advising of warning and caution are affixed on various locations of the product.
- Take careful notice of these during service and inspection.

⚠WARNING Risk of lethal or otherwise serious personal injury.
⚠CAUTION Risk of personal injury and damage to the product.

Class	Label advisory	Location
⚠ WARNING	Never open any cover on the projector except the lamp and filter covers. Do not block the ventilation holes.	REAR PANEL
⚠ CAUTION	High-pressure lamp may burn, explode, or give electric shock. Remove the power plug from the outlet before removing the lamp cover, and allow a cooling period of 1 hour before lamp replacement. Refer to instruction manual before replacement.	LAMP DOOR
⚠ CAUTION	Never look into the lens while the projector is on.	TOP CABINET

1.3 INSTALLATIONS

1.3.1 INSTALLATION METHOD

This projector comes with the D-ILA system (reflecting type active matrix liquid crystal system) that does not require convergence adjustment.
Note the following when placed on a floor (refer to OPERATING INSTRUCTIONS for actual operating method).

(1) Place the projector at the position needed for the required image size, and observe that the projector is not tilted horizontally. [Depending on the image size (60 to 200 inches diagonal: wide side), the projection distance is approx. 1.8 to 12 m approximately.]
(2) Adjust the placement site and screen tilt so that the projection angle is perpendicular to the screen. Adjust the placement site and screen position (height) so that the projection lens center is at the lower edge of the screen.
(3) Project an image on the screen. (Connect video equipment and power source, switch power on and select the input.)
(4) Fine adjust the projected image position and angle. If adjusting the placement site and screen cannot correct the projected position (too low) or angle (lower part of image widened), adjust front feet.
(5) By using "ZOOM" in LENS CONTROL, adjust for suitable image size.
(6) By using "FOCUS" in LENS CONTROL, adjust to correct image blur.

1.3.2 INSTALLATION SITE AND STATUS

The projector contains some fans for cooling. If the air inlets or the vent holes of cooling fans are blocked, cooling efficiency may deteriorate and temperature inside this unit will rise, and then it can lead to abnormal operation and failure. Also make sure or ensure there is plenty of free space between the projector and adjacent walls, ceiling and other equipment. Note that excess heat can cause failure and damage to both the projector and nearby equipment.
Therefore, please make sure pay attention not to block the air inlets or the vent holes of cooling fans and allow sufficient space around this unit.

REQUIRED SPACING:

Top = 15 cm / left and right sides = 30 cm / rear = 20 cm (When this unit is enclosed in a space with dimensions as indicated above, ventilate accordingly so that the internal and external temperatures are the same.)

- Avoid locations that are wobbly or tilted. If the setting site floor has protrusions or horizontal cannot be maintained, there is risk the projector may drop, fall over, etc. particularly the optical system components can be severely affected and there is risk basic performance and quality of the projector cannot be maintained.
- Observe the site can stably bear the weight of the projector over a long period of time.
- If mounted on a stand with casters, same as above the casters are securely broken to prevent movement.
- Avoid suspending in a location subject to vibration. Both the projector and mounting fixture can be damaged.
- Do not place in the following types of locations.
  Especially, avoid locations subject to dust, grit, smoke or other airborne contaminants. For dust protection, use adequate caution when providing external ventilation, filters.
  ◆Near water or in humid sites
  ◆Dust or grit
  ◆Oily or tobacco smokes
  ◆Near heaters or heat generating equipment
  ◆Direct sunlight
  ◆Very high or very low temperature
- To attach the unit to the ceiling mount bracket, set the torque between the range of 1.5N m to 2.0N m.

1.4 PROJECTION SPECIFICATIONS AND NOTES

1.4.1 PROJECTION DISTANCE

- The usable projection distance (focus obtainable) is tele side: approx. 3.63m to 12.23m / wide side: approx., 1.78m to 6.08m. The picture size (16 : 9) is 60 to 200 inches.
- Use the wide side for sizes bigger than 200 inches.

1.4.2 PROJECTION IMAGE AND IMAGE SIZE

The projection distances and image size relationship given in the operation manual is approximate for general reference.
The actual values may vary due to lens tolerance and other factors.

1.4.3 OTHER CAUTIONS

- Use care not to directly touch the lens. Clear soiling from the lens with optical lens paper or a photographer's blower.
- Sunlight or other illumination can render the image difficult to see. Use a curtain or other means to shield the screen from stray light.

1.5 ADDITIONAL CAUTIONARY ITEMS

- High voltage is applied for lighting the lamp. During adjustments and other work with the cover removed, extreme care is needed to avoid electric shock.
- Use care to avoid touching the fan or safety switch terminals during work with the cover removed.
- Select a stable, horizontal work site to prevent dropping the product and components.
- Use the power cord and interface cable supplied with the product.

  Before starting work, be sure to also check the safety notices contained in the instruction manual.

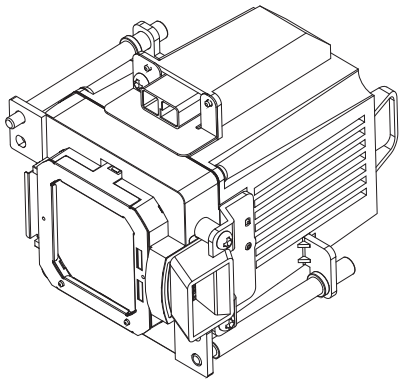
1.6 LAMP UNIT INSTRUCTIONS

Refer to the INSTRUCTIONS for a detailed operating description.

1.6.1 LAMP LIFE

- When the lamp is used with “Lamp Power” set to ”Low”, the lamp life on this unit is approximately 4500 hours. This is the average usable time and not a guaranteed value.
- The lamp life may not reach 4500 hours depending on the operating conditions.
- When the lamp has reached the end of its usable life, deterioration progresses rapidly.
- When the video image appears dark, when the color tone looks unnatural, or when the image flickers, replace the lamp unit with a new one promptly.

* Lamp use time can be checked at the menu < Information > - [Lamp time].



Model	Part No.
DLA-N5BE DLA-N5WE DLA-N7BE DLA-NX5BK DLA-NX7BK DLA-NX9BE DLA-NX9BK DLA-RS1000E DLA-RS1000K DLA-RS2000E DLA-RS2000K DLA-RS3000E DLA-RS3000K	PK-L2618UW
DLA-N11BC DLA-N5BC DLA-N6BC DLA-N8BC	PK-L2618UC

1.6.2 OPERATION WHEN LAMP USE TIME EXCEEDS 2900 HOURS

●2900 AND AFTER HOURS

- Power ON: [LIGHT] LED lights.
- Operation: “Lamp replacement” message appears on screen (*press [BACK] to extinguish).

1.6.3 HANDLING CAUTIONS

- Use a cross-head screwdriver to take out and reinstall the lamp unit. Refer to the INSTRUCTIONS.
- Observe the following cautions.
  - Be sure to disconnect the power cord from the AC power source.
  - The lamp remains quite hot after power off. Be sure to allow plenty of time (30 minutes to 1 hour) to cool before proceeding.
  - The lamp can break if dropped or subjected to physical shock.
  - Use care not to directly touch or soil the lamp projecting (glass) face.
- When installing the lamp unit, ensure (or make sure) the interior projections of the lamp cover are securely inserted into the holes of the projector. Since the lamp cover projections engage the interlock switch part of the protector circuit (normal operating state), be sure the cover is properly positioned and secure with screws.
- Do not place the removed lamp unit at locations that is reachable by children or near combustible items.
  Dispose used lamp units in the same way as fluorescent lamps. Follow your local community rules for disposal.

1.6.4 LAMP USE TIME RESET

- Be sure to reset the Lamp use time after replacing the lamp unit. Unless reset, the projector will cease operation (lamp will not light).
  * Conversely, reset the use time only after replacing the lamp.

■RESET THE LAMP TIME FROM THE MENU SCREEN

(1) Display the setting menu.
(2) Select "Function" → "Lamp Reset"
(3) Select "Yes" and the lamp time is set to zero.

■RESET THE LAMP TIME BY REMOTE CONTROL

(1) Set for stand-by mode.
(2) In sequence, press the [BACK], [OK] and [HIDE] buttons of the remote control unit.
(3) Press the [▼] button for more than 2 seconds.
(4) The STAND-BY and LIGHT LEDs alternately flash for about 3 seconds, then only the STAND-BY LED lights steadily.

SECTION 2
SPECIFIC SERVICE INSTRUCTIONS

2.1 DIFFERENCE POINT

Item	DLA-N5BC DLA-N5BE DLA-N6BC DLA-NX5BK DLA-RS1000E DLA-RS1000K	DLA-N5WE	DLA-N7BE DLA-N8BC DLA-NX7BK DLA-RS2000E DLA-RS2000K	DLA-N11BC DLA-NX9BE DLA-NX9BK DLA-RS3000E DLA-RS3000K
Model Code	B2A3	B2A3	B2A2	B2A1
Cabinet color	Black	White	Black	Black
Contrast	40000:1	40000:1	80000:1	100000:1
Brightness	1800lm	1800lm	1900lm	2200lm
Resolution	4096 x 2160	4096 x 2160	4096 x 2160	8192 x 4320
8K e-shift	No	No	No	Yes

2.2 SUPPORT THE REPAIR OF EACH PCB/BLOCK

Item	Part No.			Method for repair
	DLA-N5BC DLA-N5BE DLA-N5WE DLA-N6BC DLA-NX5BK DLA-RS1000E DLA-RS1000K	DLA-N7BE DLA-N8BC DLA-NX7BK DLA-RS2000E DLA-RS2000K	DLA-N11BC DLA-NX9BE DLA-NX9BK DLA-RS3000E DLA-RS3000K	
CPU PWB	XD1-037W-00	←	←	PWB exchange
MOTOR PWB	KD1-038W-001	←	←	PWB exchange
3D PWB	KD1-038W-006	←	←	PWB exchange
FRONT PWB	KD1-038W-002	←	←	PWB exchange
KEYPAD PWB	KD1-038W-003	←	←	PWB exchange
INTERLOCK PWB	KD1-038W-008	←	←	PWB exchange
TEMP SENSOR PWB	KD1-038W-004	←	←	PWB exchange
POWER PWB	W0H-0081-00	←	←	PWB exchange
BALLAST PWB	W0H-0080-00	←	←	PWB exchange
DD PWB	XD1-036W-00	←	←	PWB exchange
OPTICAL BLOCK (Including DD PWB)	NX5OP-S	NX7OP-S	NX9OP-S	OPTICAL BLOCK exchange
LAMP EXHAUST FAN	F0K-0295-00	←	←	Parts exchange
POWER INTAKE FAN	F0K-0295-00	←	←	Parts exchange
POWER EXHAUST FAN	F0K-0295-00	←	←	Parts exchange
LAMP/PCS COOLING FAN	F0K-0294-00	←	←	Parts exchange
B DEVICE COOLING FAN	F0K-0294-00	←	←	Parts exchange
RG DEVICE COOLING FAN	F0K-0294-00	←	←	Parts exchange
DD FPGA COOLING FAN	F0K-0294-00	←	←	Parts exchange
DD ASIC COOLING FAN	F0K-0294-00	←	←	Parts exchange
FILTER	J3K-0094-00	←	←	Parts exchange

2.3 FUNCTIONS

2.3.1 LED INDICATIONS

The LED operations are as follows.

■STAND-BY LED

Light on (Red): Standby mode
Light on (Green): While activating the lamp (about 1 minute)
Blinking (Green): When "Hide" is set to ON
Blinking (Red): Cool Down mode
Blinking (Red/Green): Adjust mode
All Off: During image projection

■LAMP LED

Light on: Lamp replacement is near. (The LED lights when the lamp is used more than 2900 hours)
Extinguished: Other than the above. (The lamp is normal)

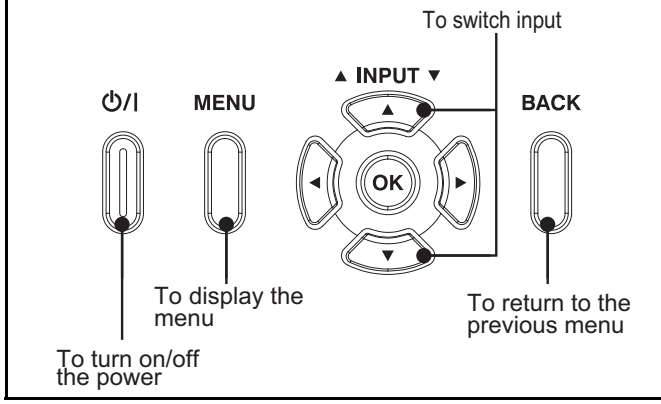
■WARNING LED

Light on: WARNING mode

CAUTION:
Please refer to the Trouble Shooting section for the details of warning indications by LED

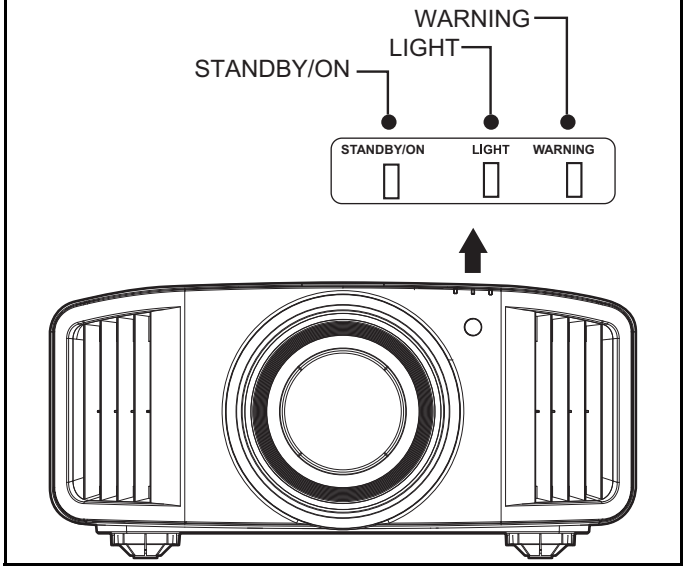
2.3.2 OPERATION BUTTON LOCATION

REAR VIEW



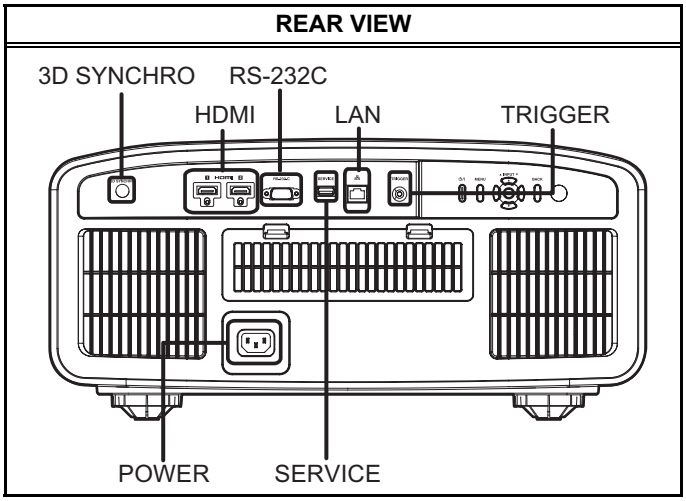
2.3.3 LED LOCATION

FRONT VIEW



2.3.4 INPUT / OUTPUT TERMINAL LOCATION

REAR VIEW



2.4 SERVICE MENU

The service menu contains items not ordinarily needed by the user. Use these as necessary during service.

2.4.1 ENTER

(1) No menu shown.
(2) Press the [OK] button.
(3) Within press the [◂] button.
(4) Within press the [▸] button.
(5) Within press the [OK] button.
(6) Within press the [BACK] button.
(7) Within press the [OK] button to display the service menu.

NOTE:

When the Service Menu Screen is not displayed, go back to the beginning. It is recommended that you press the buttons a little earlier and steadily.

2.4.2 EXIT

Press the [MENU] button to exit the menu indication.

2.4.3 BASIC OPERATION

Use the following buttons to operate the service menu.

(1) Choose the SETTING MENU with the [▲] or [▼] button.
(2) When the [▸] button is pressed after choosing the SETTING MENU, the cursor will shift to the SETTING / ADJUSTMENT ITEMS of each SETTING MENU.
(3) When the cursor is shifted, choose the SETTING / ADJUSTMENT ITEMS with the [▲] or [▼] button.
(4) Using the [◂] or [▸] button, change the setup values and adjustment values, respectively.
(5) When the [BACK] button is pressed, the cursor will return to the SETTING MENU.
(6) When the [MENU] button is pressed, the SERVICE MENU will go out of the screen.

2.4.4 Service Menu Screen

Main menu screen

Service	
Soft Ver.	>
Adjust Pattern	>
Factory Reset	>

Soft version screen

> Soft Ver.	
Model / Location	XXXX / XX
Soft Ver.	vXXXX
Main	XXXXX
VP FPGA	XXXXX
VP CPU 1	XXXXX
VP CPU 2	XXXXX
Mecha	XXXXX
HDMI_DRV	XXXXXXXX
CMS_DATA	XXXXXX
Ballast	XX

Adjustment pattern screen *Display in the following order.

1. Color Cross Hatch	8. Optical meas 50%	15. Ramp(Green)	22. Raster(Blue)
2. Cross Hatch(Green)	9. Optical meas 10%	16. Ramp(Blue)	23. Raster(Cyan 100%)
3. Focus / Zoom / Shift	10. Dark level	17. Raster(White 100%)	24. Raster(Megenta 100%)
4. Cross Hatch(pixel adjust)	11. Bright level	18. Raster(Gray 50%)	25. Raster(Yellow 100%)
5. Color Bar	12. Color palette	19. Raster(Gray 0%)	
6. ANSI Cntrast	13. Ramp(White)	20. Raster(Red)	
7. Optical meas 100%	14. Ramp(Red)	21. Raster(Green)	

2.4.5 SETTING ITEMS

Item	Adjustment range	Initial value	Function
Soft Ver.			
Model/Location	Only the display	-	Display of model name
Main	Only the display	-	Display of Main CPU software version
VP FPGA	Only the display	-	Display of VP FPGA version
VP CPU 1	Only the display	-	Display of VP CPU_1 version
VP CPU 2	Only the display	-	Display of VP CPU_2 version
Mecha	Only the display	-	Display of Mecha CPU version
HDMI_DRV	Only the display	-	Display of HDMI driver IC version
CMS_DATA	Only the display	-	Display of Color Management version
BALLAST	Only the display	-	Display of Lamp ballast version
Adjust Pattern	-	Color crosshatch	Select of the adjust pattern
Factory Reset	-	-	Resets all items supporting all reset to factory settings. * The calibration adjustment also returns to the initial value.

SECTION 3
DISASSEMBLY

3.1 CAUTION AT DISASSEMBLY

- Make sure that the power cord is disconnected from the outlet.
- Pay special attention not to break or damage the parts. Also, please pay attention to lens dirt and fingerprints.
- Make sure that there is no bent or stain on the connectors before inserting, and firmly insert the connectors.
- Be sure to reattach the wire clamps removed during the procedure to the original positions. (Attaching the wire clamps in wrong positions may affect the performance.)

REFERENCE:

When removing each board, remove the connector if necessary. The operation is easier if you write down the connection points (connector numbers) of the connector. For connection of each board, refer to the "WIRING DIAGRAM" of the Standard Circuit Diagram.

3.2 DISASSEMBLY PROCEDURE

3.2.1 REMOVING THE LAMP UNIT (Fig.3-1)

(1) Remove the 1 screws (a), and remove the LAMP DOOR.
(2) Loosen the 2 screws (b), and remove the LAMP UNIT.

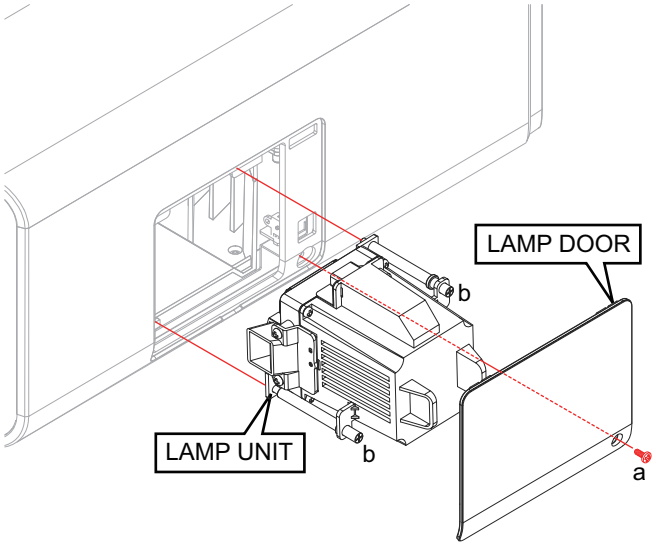


Fig.3-1

3.2.2 REMOVING THE SIDE PANEL (Fig.3-2)

(1) Remove the 6 screws, and remove the SIDE PANEL of both side.

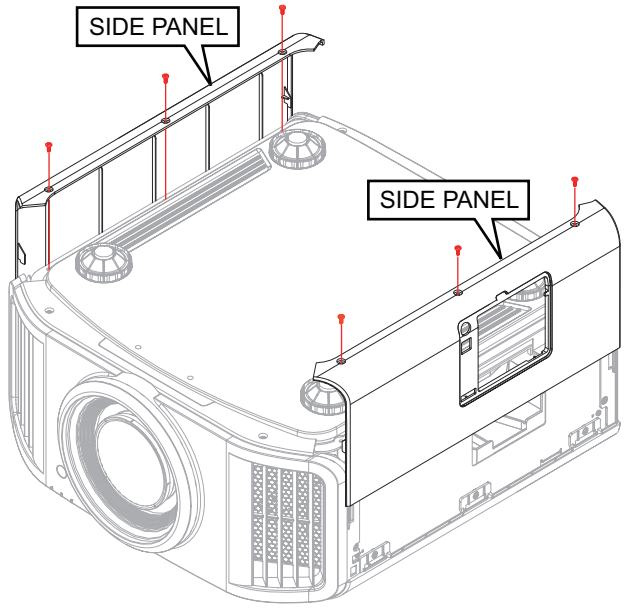


Fig.3-2

3.2.3 REMOVING THE TOP CABINET (Fig.3-3)

(1) Remove the 13 screws.
(2) Lift rear side of the TOP CABINET about 2 cm, and slide the TOP CABINET forward to remove it.

NOTE:

Be careful as the SCREW BASE of the top cabinet is easy to break.

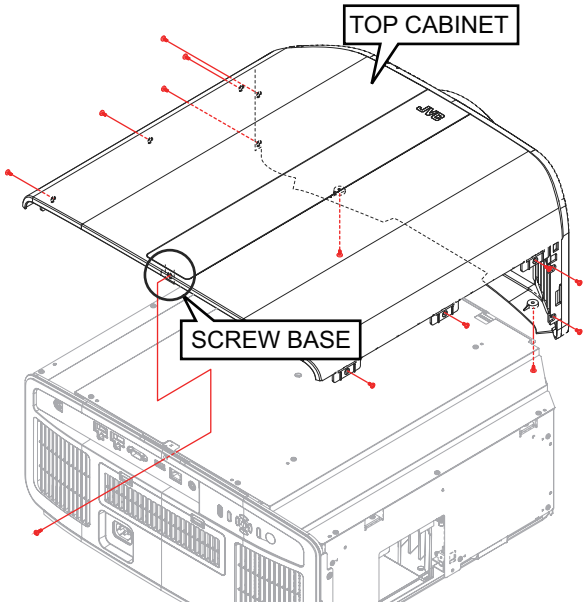


Fig.3-3

3.2.4 REMOVING THE FRONT PWB (Fig.3-4)

(1) Remove the 2 screws, and remove the FRONT PWB.

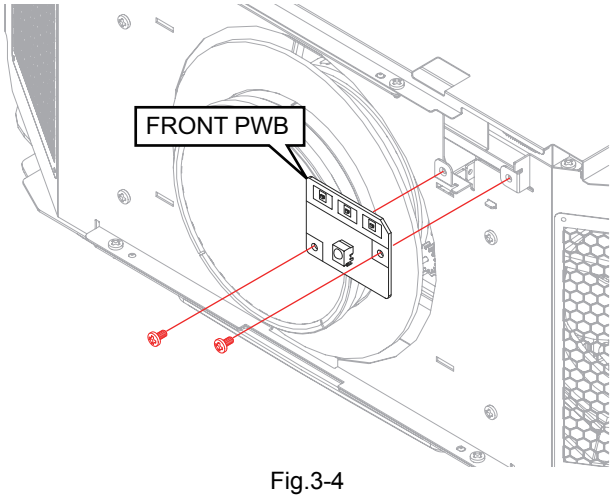


Fig.3-4

3.2.5 REMOVING THE KEY PAD PWB (Fig.3-5)

(1) Remove the 4 screws (a), and remove the REAR PANEL.
(2) Remove the 3 screws (b), and remove the KEY PAD PWB.

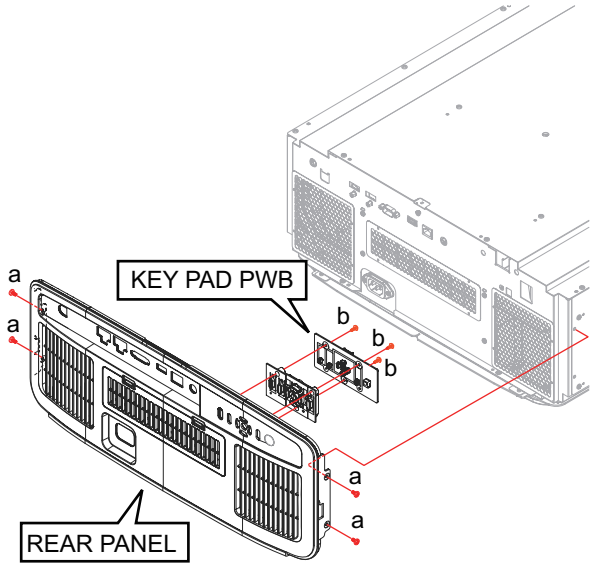


Fig.3-5

3.2.6 REMOVING THE DD FPGA COOLING FAN and DD ASIC COOLING FAN (Fig.3-6)

(1) Remove the 13 screws (a), and remove the TOP PLATE.
(2) Remove the 3 screws (b), and remove the DD FPGA COOLING FAN.
(3) Remove the 3 screws (c), and remove the DD ASIC COOLING FAN.

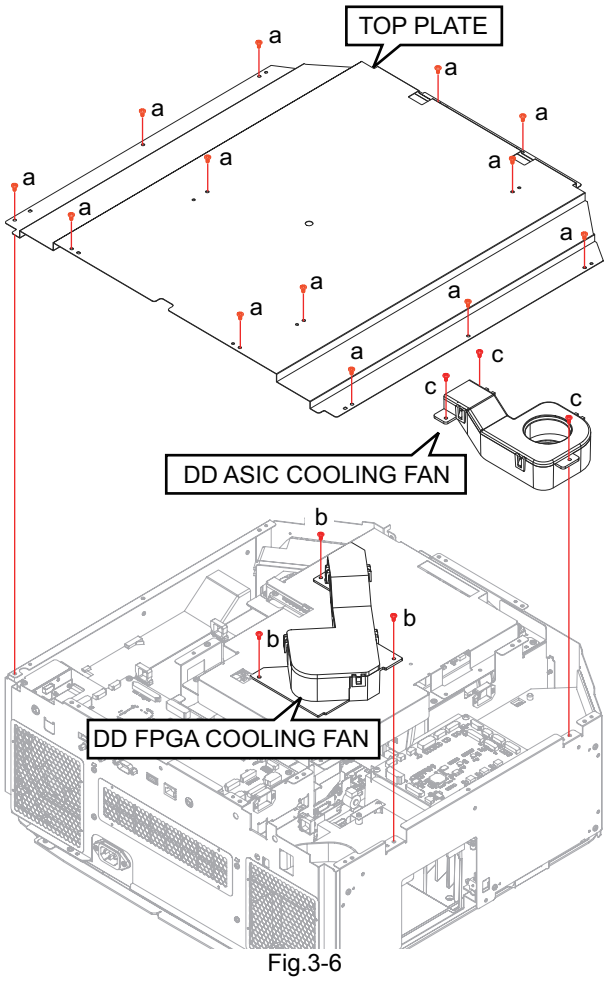


Fig.3-6

3.2.7 REMOVING THE CPU PWB and MOTOR PWB (Fig.3-7)

(1) Remove the 9 screws (a,b), and remove the CPU PWB.
(2) Remove the 4 screws (c), and remove the MOTOR PWB.

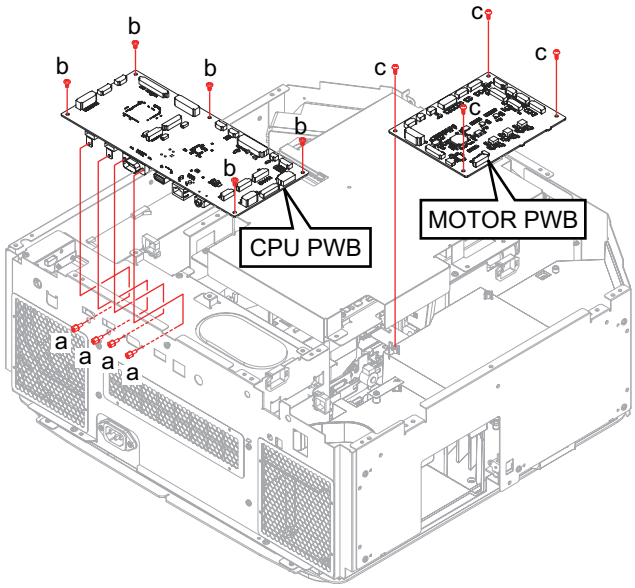


Fig.3-7

3.2.8 REMOVING THE DD PWB (Fig.3-8)

(1) Remove the 4 screws (a), and remove the SHIELD CASE ASS'Y.
(2) Remove the 8 screws (b), and remove the HAET SINK.
(3) Remove the 2 screws (c), and remove the DD PWB.

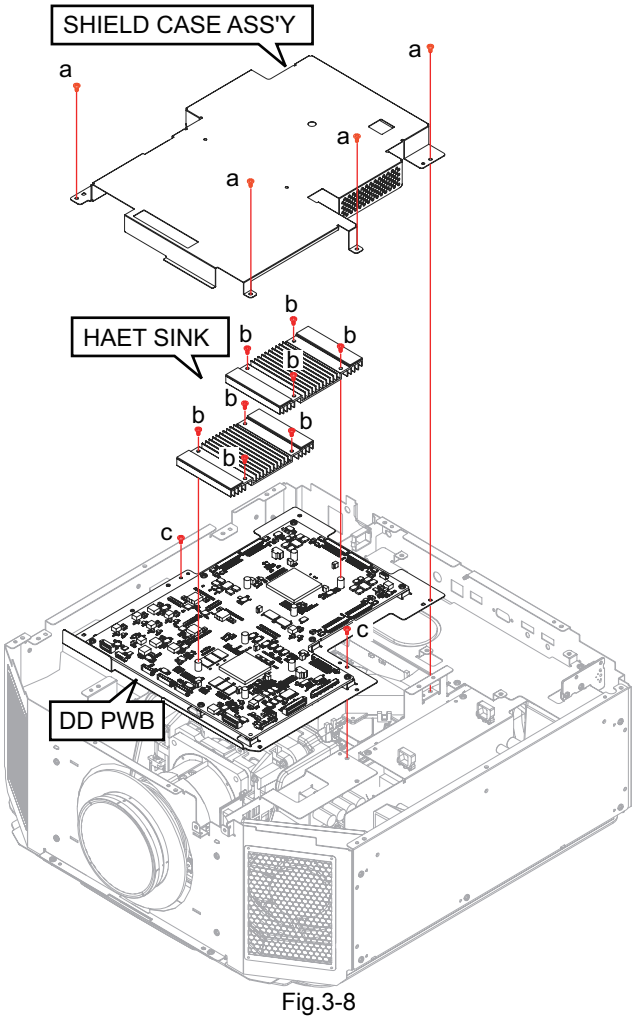


Fig.3-8

3.2.9 REMOVING THE 3D PWB AND DEVICE COOLING FAN ASS'Y (Fig.3-9)

(1) Remove the 5 screws (a), and remove the BRACKET.
(2) Remove the 2 screws (b), and remove the 3D PWB.
(3) Remove the 4 screws (c), and remove the DEVICE COOLING FAN ASS'Y.

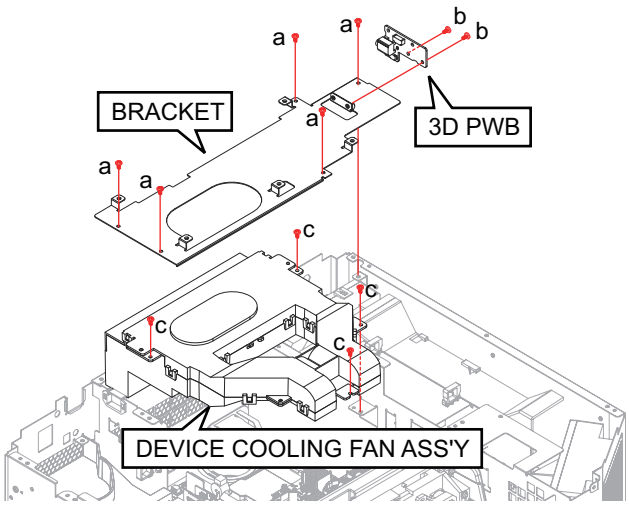


Fig.3-9

3.2.10 REMOVING THE BALLAST PWB (Fig.3-10)

(1) Remove the 4 screws (a), and remove the SIDE PLATE.
(2) Remove the 2 screws (b), and remove the BALLAST PWB.

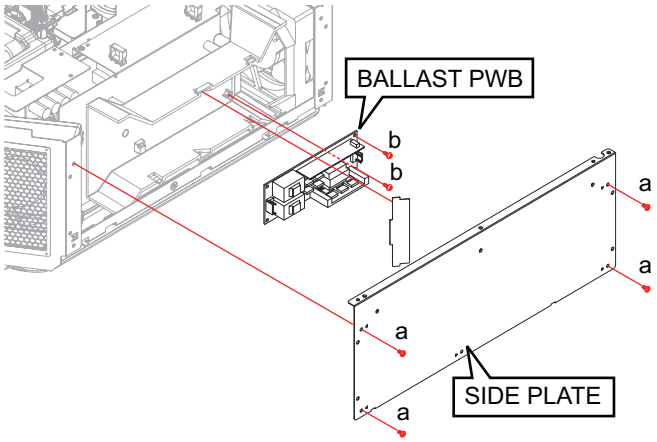


Fig.3-10

3.2.11 REMOVING THE INTER LOCK PWB (Fig.3-11)

(1) Remove the 5 screws (a), and remove the SIDE PLATE.
(2) Remove the 1 screw (b), and remove the INTER LOCK PWB.

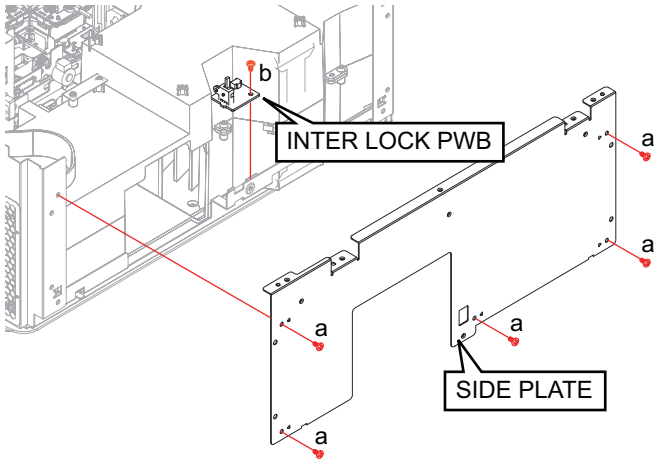


Fig.3-11

3.2.12 REMOVING THE POWER INTAKE FAN (Fig.3-12)

(1) Remove the 6 screws (a), and remove the REAR BASE.
(2) Remove the 3 screws (b), and remove the DUCT.
(3) Remove the 3 screws (c), and remove the POWER INTAKE FAN.

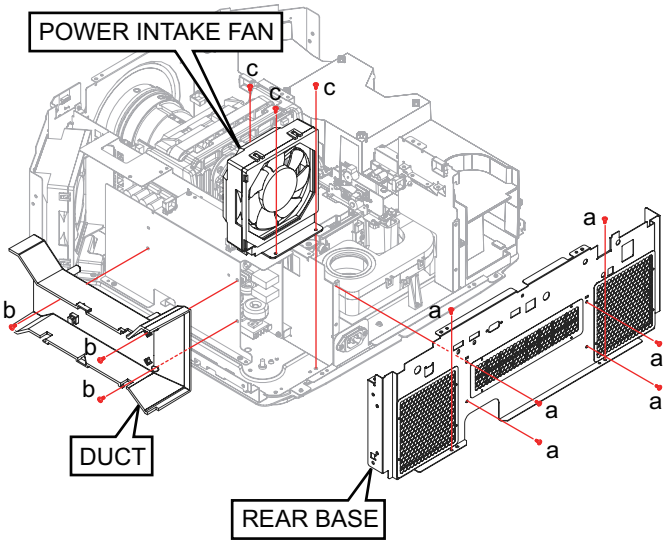


Fig.3-12

3.2.13 REMOVING THE POWER EXHAUST FAN (Fig.3-13)

(1) Remove the 6 screws (a), and remove the FRONT BASE.
(2) Remove the 2 screws (b), and remove the POWER EXHAUST FAN.

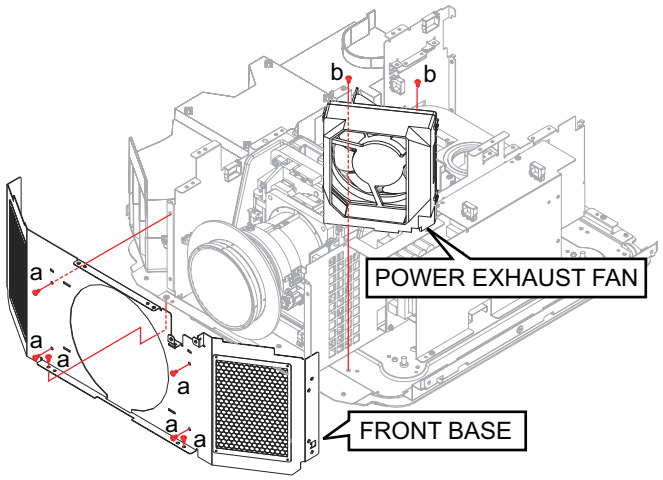


Fig.3-13

3.2.14 REMOVING THE POWER PWB (Fig.3-14)

(1) Remove the 4 screws (a), and remove the BRACKET.
(2) Remove the 6 screws (b), and remove the POWER PWB.

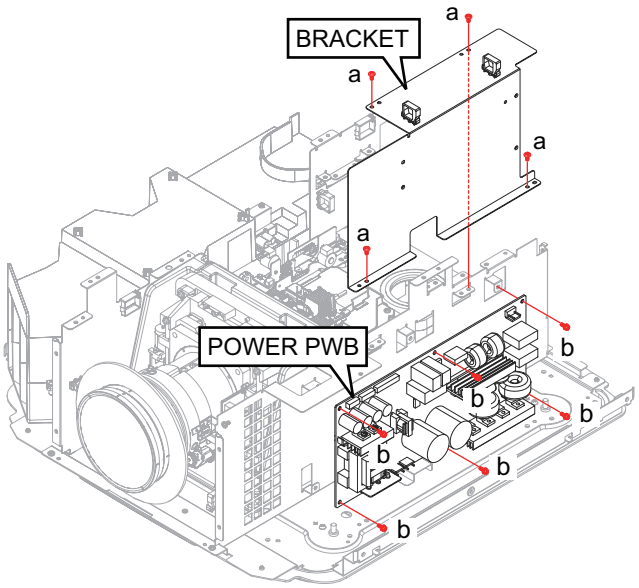


Fig.3-14

3.2.15 REMOVING THE LAMP EXHAUST FAN and TEMP SENSOR PWB (Fig.3-15)

(1) Remove the 6 screws (a), and remove the DUCT.
(2) Remove the 1 screw (b), and remove the TEMP SENSOR PWB.
(3) Remove the LAMP EXHAUST FAN.

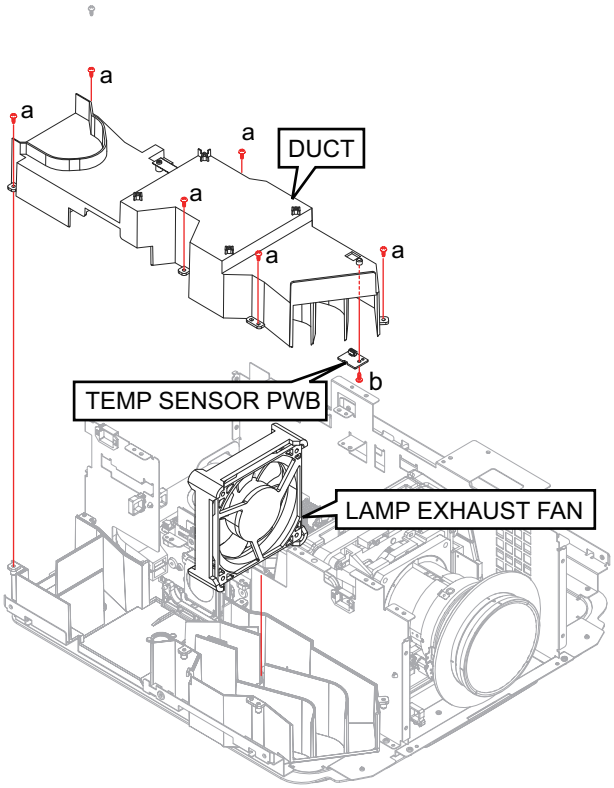


Fig.3-15

3.2.16 REMOVING THE LAMP/PCS COOLING FAN (Fig.3-16)

(1) Remove the 1 screw (a), and remove the SIDE BRACKET.
(2) Remove the 4 screws (b), and remove the LAMP/PCS COOLING FAN.

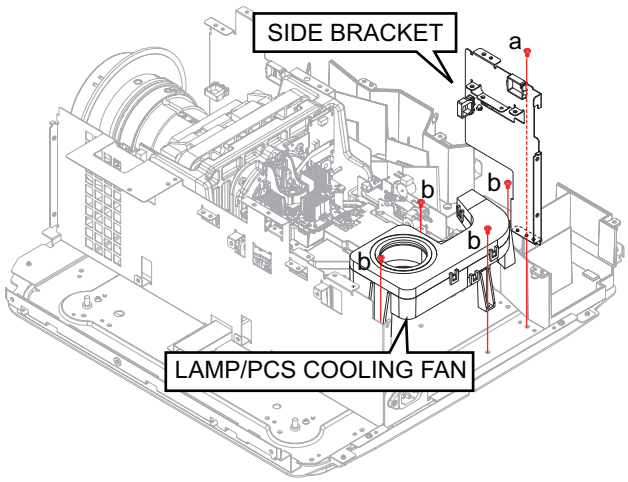


Fig.3-16

3.2.17 REMOVING THE OP BLOCK (Fig.3-17)

(1) Remove the 2 screws (a), and remove the SIDE BRACKET.
(2) Remove the 4 screws (c), and remove the OP BLOCK.

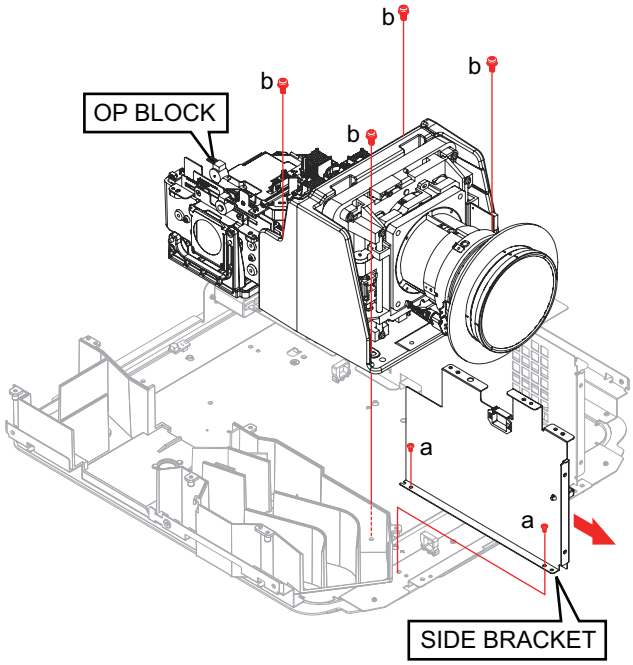


Fig.3-17

SECTION 4
ADJUSTMENT

4.1 BEFORE STARTING ADJUSTMENT

(1) Adjustment items utilize a personal computer. Be sure to use the latest adjustment software.
(2) Data back up is required before adjustments.
(3) Allow the equipment and test instruments adequate time (at least 10 minutes) to warm-up.
(4) Confirm the set is properly connected to the specified AC power source.
(5) Use care not to disturb internal controls and parts not specifically mentioned.
(6) Unless specifically mentioned in the "ADJUSTMENT" steps, do not change any data.

4.2 INSTRUMENTS AND TOOLS

- Oscilloscope
- Adjustment software
- RS-232C Reverse (Cross) cable
- USB cable
- LAN cable
- PC (WINDOWS machine, with NET Framework 4.0 installed)

OS	Windows7, 8, 10
Memory	More than 16 Mbytes
Hard disk free space	More than 5 Mbytes
RS-232C interface	At least 1 port
Display resolution	Minimum: 800 × 600 pixels Recommended: 1024 × 768 pixels or more
Display colors	Minimum: 8 bits/pixel Recommended: 16 bits/pixel or more
Input devices	Keyboard and mouse

4.3 REQUIRED ADJUSTMENTS BY REPLACING COMPONENTS

The following adjustment procedure is required after replacing PWB ASS'Ys and OPTICAL BLOCK.

4.3.1 COMPONENT REQUIRED ADJUSTMENT AT REPLACING

Adjustment items	CPU PWB	OP BLOCK	DD PWB	MOTOR PWB
Main EEPROM backup	●			
Model code writing	●			
Destination writing	●			
Adjustment data backup of CMS			●	
Adjustment data backup of DD PWB			●	
Pixel shift adjustment		●		
MAC address writing	●*1			
Setting of mechanical EEPROM initial value		●		
Mecha EEPROM (lens set value etc.) backup				●

*1: When the main EEPROM can not be backup.

4.4 ADJUSTMENT PROCEDURE

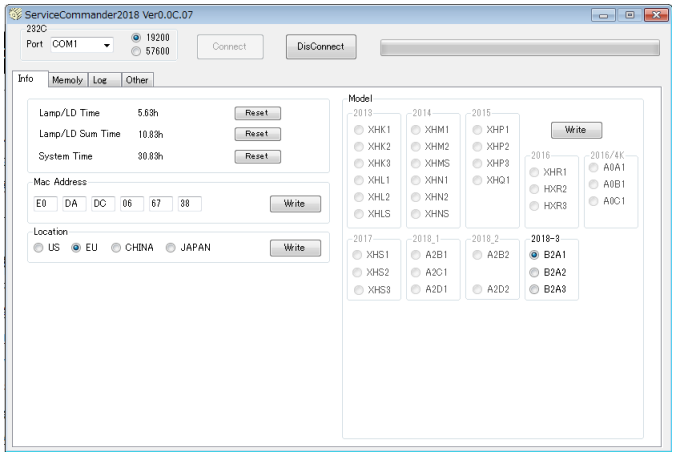


Fig.4-1 "Service Commander Software" screen

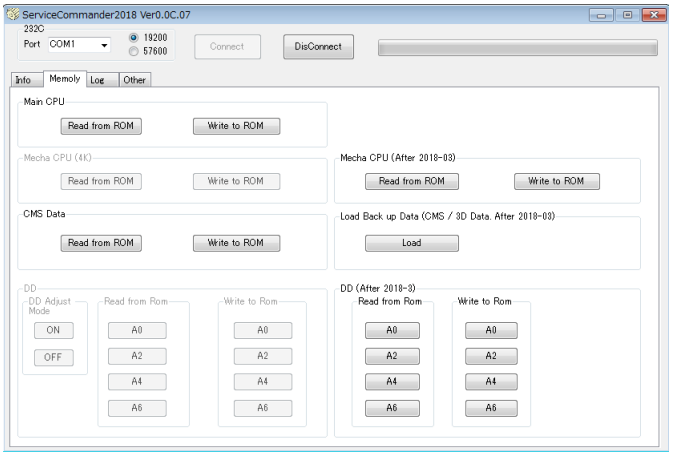


Fig.4-2 "Memory" menu screen

4.4.1 Main EEPROM backup

Instruments	ServiceCommander Software	REPLACING COMPONENTS ●CPU PWB
Test point		
Adjustment menu		
Preparation		

Note:
Perform this operation during standby mode.

■ **PROCEDURE**

(1) Run ServiceCommander Software.
(2) Select Port, then connect the PC to the projector and click "Connect".
(3) Select the Memory menu.
(4) Before replacing the CPU PWB, click “Read from ROM" of Main CPU and save file (.mrd2) to PC.
(5) After replacing the CPU PWB, click "Write to ROM" of Main CPU and select the saved file (.mrd2) to write the backup data.

4.4.2 Model code writing

Instruments	ServiceCommander Software	REPLACING COMPONENTS ●CPU PWB
Test point		
Adjustment menu		
Preparation		

Note:
Perform this operation during standby mode.

■ **PROCEDURE**

(1) Run ServiceCommander Software.
(2) Select Port, then connect the PC to the projector and click "Connect".
(3) Select the info menu.
(4) Select the model code from the Model, and write the model code.

Model code	Model
B2A3	DLA-N5BC, DLA-N5BE, DLA-N5WE, DLA-N6BC, DLA-NX5BK, DLA-RS1000E, DLA-RS1000K
B2A2	DLA-N7BE, DLA-N8BC, DLA-NX7BK, DLA-RS2000E, DLA-RS2000K
B2A1	DLA-N11BC, DLA-NX9BE, DLA-NX9BK, DLA-RS3000E, DLA-RS3000K

4.4.3 Destination writing

Instruments	ServiceCommander Software	REPLACING COMPONENTS ●CPU PWB
Test point		
Adjustment menu		
Preparation		

Note:
Perform this operation during standby mode.

■ **PROCEDURE**

(1) Run ServiceCommander Software.
(2) Select Port, then connect the PC to the projector and click "Connect".
(3) Select the info menu.
(4) Select the destination from the Location, and write the destination.

4.4.4 Adjustment data backup of CMS

Instruments	ServiceCommander Software	REPLACING COMPONENTS ●DD PWB
Test point		
Adjustment menu		
Preparation		

Note:
- Perform the operation with the power ON.
- Input the signal from external equipment.

■ PROCEDURE

(1) Run ServiceCommander Software.
(2) Select Port, then connect the PC to the projector and click "Connect".
(3) Select the Memory menu.
(4) Before replacing the DD PWB, click “Read from ROM" of CMS Data and save file (.cms) to PC.
(5) After replacing the DD PWB, click "Write to ROM" of CMS Data and select the saved file (.cms) to write the backup data.

4.4.5 Adjustment data backup of DD PWB

Instruments	ServiceCommander Software	REPLACING COMPONENTS ●DD PWB
Test point		
Adjustment menu		
Preparation		

Note:
- Perform the operation with the power ON.
- Input the signal from external equipment.

■ BACKUP PROCEDURE

(1) Run ServiceCommander Software.
(2) Select Port, then connect the PC to the projector and click "Connect".
(3) Select the Memory menu.
(4) Before replacing the DD PWB, click A0 of "Read From ROM" of DD (After 2018-3) and save the anf0 file to the PC.
(5) In the similar procedure for save the A2,A4,A6 memory.

■ PROCEDURE

(1) Run ServiceCommander Software.
(2) Select Port, then connect the PC to the projector and click "Connect".
(3) Select the Memory menu.
(4) After replacing the DD PWB, click A0 of "Write to ROM" of DD (After 2018-3) and load of backup the anf0 file to the PC.
(5) In the similar procedure for the A2,A4,A6 memory.

4.4.6 Pixel shift adjustment

Instruments		REPLACING COMPONENTS ●OP BLOCK
Test point		
Adjustment menu	“Pixel shift” in Service menu	
Preparation		

Note:
- Before pixel shift adjustments, refer to "4.5 How to display confirmation pixel shift / lens center reset in the service menu" and display “Pixel Shift” in the service menu.
- Be sure to perform factory reset on the service menu after adjustment and check that the display is off.

■ PROCEDURE

(1) Input color cross-hatch signal.
(2) Select the < Pixel Shift > from the Service menu.
(3) Adjust [H Pixel Adj.R], [H Pixel Adj.B] to make H direction (Pixel Shift) to become the best point.
(4) Adjust [V Pixel Adj.R], [V Pixel Adj.B] to make V direction (Pixel Shift) to become best point.

4.4.7 MAC address writing

Instruments	ServiceCommander Software	REPLACING COMPONENTS ●CPU PWB
Test point		
Adjustment menu		
Preparation		

Note:
Perform this operation during standby mode.

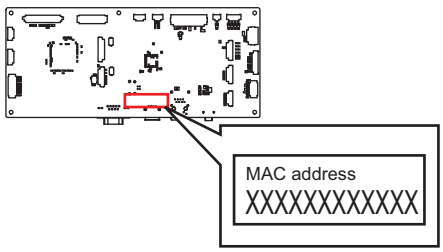
■ PROCEDURE

(1) Run ServiceCommander Software.
(2) Select Port, then connect the PC to the projector and click "Connect".
(3) Select the info menu.
(4) Set the MAC address and click "Write" button.
(5) Confirm the “OK” display.

■ MAC ADDRESS display position

MAC address is listed in the label of CPU PWB.
Please fill in the MAC address in the CPU PWB after the exchange.

Display position



4.4.8 Setting of mechanical EEPROM initial value

Instruments	ServiceCommander Software	REPLACING COMPONENTS ●OP BLOCK
Test point		
Adjustment menu		
Preparation		

Note:
- Perform the operation with the power ON.
- Input the signal from external equipment.

■ **PROCEDURE**

(1) Confirm the OP BLOCK lens position is aligned with the center.
(2) Run ServiceCommander Software.
(3) Select Port, then connect the PC to the projector and click "Connect".
(4) Select the Memory menu.
(5) Click "Write to Mecha ROM" of Mecha CPU (4K) and select the saved initial value file to write the backup data.

4.4.9 Mecha EEPROM (lens set value etc.) backup

Instruments	ServiceCommander Software	REPLACING COMPONENTS ●MOTOR PWB
Test point		
Adjustment menu		
Preparation		

Note:
- Perform the operation with the power ON.
- Input the signal from external equipment.

■ **PROCEDURE**

(1) Run ServiceCommander Software.
(2) Select Port, then connect the PC to the projector and click "Connect".
(3) Select the Memory menu.
(4) Before replacing the MOTOR PWB, Click "Read from Mecha ROM" of Mecha CPU (4K) and save file (.ebs) to PC.
(5) After replacing the MOTOR PWB, click "Write to ROM" of Mecha CPU (4K) and select the saved file (.ebs) to write the backup data.

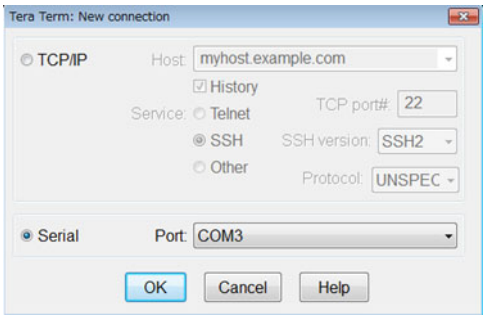
4.5 How to display confirmation pixel shift / lens center reset in the service menu

When transferring the "service_menuON.bin" file using the serial communication software, the pixel shift / lens center reset in the service menu is displayed.

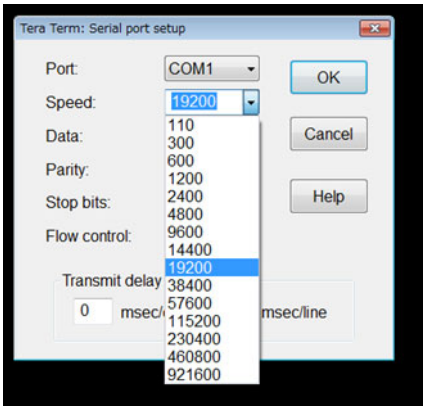
Note:
Be sure to perform factory reset on the service menu after adjustment and check that the display is off.

■ **PROCEDURE (When using Tera Tarm application)**

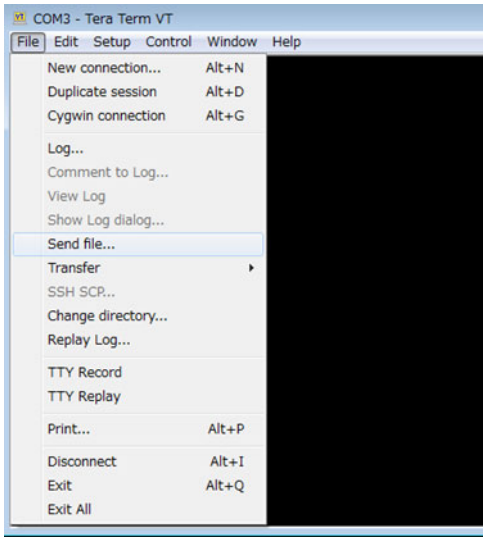
(1) Run Tera Tarm application.
(2) Select Serial and COM port and click OK.



(3) From the Serial port setup menu, select COM port and Speed "19200".



(4) Select Send File, check the Binary in the lower left option, transfer the file by specifying "service_menuON.bin".



SECTION 5
TROUBLESHOOTING

5.1 PROTECTIVE SENSOR AND PROTECTIVE SWITCH

In event of abnormal operation due to circuit or component failure, setting error or other reason, in order to prevent serious damage to the set and preserve the integrity of peripheral equipment, sensors and switches are provided for protective functions. Cooling is conducted at the same time a corresponding LED flashes (about 10 seconds). The LED indication with respect to the protective function is described below.

5.1.1 Protective sensor

Type	Monitor objective	Operating point
Temperature sensor	External temperature sensor	46°C
	Internal temperature sensor	66°C
	Lamp (thermostat)	95°C
	Near the DD FPGA IC	100°C
	Near the DD ASIC IC	100°C
	Heat sink of R device	75°C
	Heat sink of B device	75°C
	Heat sink of G device	75°C

5.1.2 Protective switch

Type	Monitor objective	State	Operation contents
Interlock switch	Lamp door	Open/ close	Control with microcomputer

5.2 LED (INDICATOR) WARNING INDICATIONS

5.2.1 Led indication contents

If an abnormality occurs during operation (projection), the content of the problem can be determined from flashing LED indicators.When an LED indicates, operation (projection) automatically stops and the cool-down mode (about 10 seconds) is entered then the stand-by mode.

Content	LED					
	WARNING	LIGHT	STANDBY/ON	On/Off time	Delay time	Blinking times
The lamp don't light	O	●	-	0.25s	0.5s	1
The lamp turn off	O	●	-	0.25s	0.5s	2
The lamp cover opening	O	●	-	0.25s	0.5s	4
The cooling fan lock	●	-	-	0.25s	0.5s	2
The internal temperature is too high	●	-	-	0.25s	0.5s	3
The exterior temperature is too high	●	-	-	0.25s	0.5s	4
DD PWB abnormal	●	●	-	0.25s	0.5s	1
MOTOR PWB abnormal	●	●	-	0.25s	0.5s	2
CPU PWB abnormal	●	●	-	0.25s	0.5s	3
POWER PWB abnormal	●	●	-	0.25s	0.5s	4
Lamp time warning	-	O	-			
During standby	-	-	O (Red)			
During cooling mode	-	-	● (Red)	0.5s		
During power up	-	-	O (Green)			
During Power On (Hide off)	-	-	-			
During Power On (Hide on)	-	-	● (Green)	0.5s		
FW update complete	O	O	O (Green)			
FPGA writing error	●	-	● (Red)	0.25s	0.5s	2

O: Turned on during operation, ●: Blinking on during operation, Blinking time: Each time of turning on/off

5.3 LOG (SELF-DIAGONOSIS RECORD AND INDICATION)

5.3.1 OUTLINE

By using the special setting and adjustment software, data related to abnormal operation (history) stored in the projector can be load.

On the basis of contents "LED (INDICATOR) WARNING INDICATONS" set and lamp use time, internal and external temperature, and the data prior to the previous usage time can be viewed as a table.

■ READING PROCEDURE

(1) Run ServiceCommander Software
(2) Select Port, click [Connect] to connect the PC and the projector.
(3) select Log menu
(4) Click to the [Read from set]
The first number is error code.
(5) Click the [Save to File] button and save the TEXT file to PC.
(6) Click the [Clean Log] button and delete all data stored in projector.

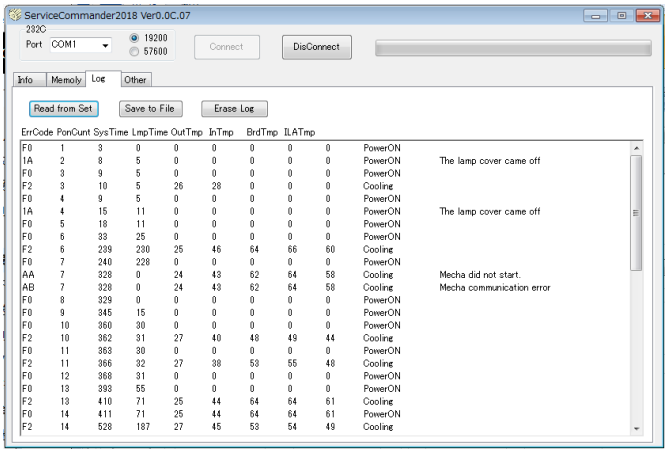


Fig.5-1 "Error log" screen

■ ERROR LOG

Error code	Content
01	Outside air temperature abnormality
02	Inside air temperature abnormality
03	Temperature abnormality of Rch D-ILA device
04	Temperature abnormality of Gch D-ILA device
05	Temperature abnormality of Bch D-ILA device
09	Temperature abnormality of the DD PWB VPM
0A	Temperature abnormality of DD ASIC
0B	Temperature abnormality of DD ASIC
0F	Temperature is not detected
1A	Interlock of lamp door detected abnormality
30	Fan error detected
31	Power exhaust fan is abnormal (stop)
32	Power intake fan is abnormal (stop)
33	Lamp/PCS cooling fan is abnormal (stop)
34	B device cooling fan is abnormal (stop)
35	RG device cooling fan is abnormal (stop)
37	DD FPGA fan abnormal (stop)
38	DD ASIC fan abnormality (stop)
39	Lamp exhaust fan is abnormal (stop)
70	Lamp usage time over
80	CPU PWB is abnormal
86	Receiving error of HDMI
90	Device communication error (Do not transition to emergency)
91	DD FPGA does not start up
92	DD VPM CPU does not start up
93	Communication error of DD FPGA
94	DD PWB does not start up
95	Communication error of DD ASIC
96	Communication error of DD PWB
97	Communication error of DD ASIC
98	Power supply error of D-ILA device
9A	Rch D-ILA device is not connected
9B	Rch D-ILA device is not connected
9C	Gch D-ILA device is not connected
9D	Gch D-ILA device is not connected
9E	Bch D-ILA device is not connected
9F	Bch D-ILA device is not connected
A1	Power PWB is abnormal
A3	Power on sequence error
A5	Communication error with C.SENS PWB
A6	Light quantity balance is abnormal
AA	Mecha CPU does not start.
AB	Communication error with Mecha CPU
B0	USB memory was disconnected during FW up by USB
B1	LAN line disconnected during FW up via LAN line
B2	Main FW up failed
B3	VPM FW up failed
B6	Mecha FW up failed
B7	HDMI_DRV FW up failed
B8	CMS_DATA FW up failed
B9	USB file format system is different
BA	UP data file (number of files) is insufficient

■ EVENT LOG

Event code	Content
F0	Recorded after power is turned on (After D-ILA logo is displayed)
F1	Record after 1 hour after power is turned on
F2	Recorded after power OFF operation (receiving)
FA	Power OFF is executed by the Off Timer function
FB	Power OFF is executed by the ECO Mode function
E0	VP: Confirm "TMDS LOCK"

5.4 USB update

Update files are distributed in a compressed format (ZIP) through CuSIS.

■ **USB memory for updating**

TYPE2

Format: "FAT32"

1 GB or more free space

Note:

During update, keys on the unit, remote control, and external control commands cannot be used.

5.4.1 Updating Method

(1) Unzip the ZIP file and copy the "UD_(B2A1)" folder and its contents into the root directory of the USB memory.

(2) Insert USB memory into USB terminal.

(3) Perform software update using functions in the user menu.

If the predetermined folder or file cannot be detected in the USB memory, a message "the predetermined folder or file does not exist" will appear. Insert the USB properly or use "Back" to exit the Update Mode.

If the predetermined file is detected, the unit will calculate the estimated required time for update (minimum unit), and display the required time, current version to new version, and a message "Do you wish to update?"

Press "Yes" on user menu to start writing.

After a short while, the LED will light up repeatedly in the order of WARNING → LIGHT → STANDBY/ON. The interval of lighting up will become shorter as it progresses.

Reference: Folder and file configuration saved in the USB memory

Folder name "UD_B2A1"

------UPINFO.UDI

------UPDATE0.UDP (1) MAIN CPU

------UPDATE1.UDP (2) VPM FPGA

------UPDATE2.UDP (3) MECHA CPU

------UPDATE3.UDP (4) HDMI driver

------UPDATE4.UDP (5) CMS Data

UPINFO.UDI: Update information management files

Note:

Perform only this when update is not available using the user menu.

Simultaneously press the "MENU" key and "Back" key on the projector for 5 seconds. The projector will shift to Overwrite mode. The 3 LEDs, STANDBY/ON, LIGHT, and WARNING will blink at the same time.

If the USB memory is inserted, mount and check whether the predetermined folder and files exist.

If the USB memory is inserted, mount and check whether the predetermined folder and files exist.

After a short while, the LED will light up repeatedly in the order of WARNING → LIGHT → STANDBY/ON. The interval of lighting up will become shorter as it progresses.

Once the LED of the "LAN terminal" of the projector turns off, update is completed.

Check that the power of the projector is turned off, and then remove the AC cable. (Hardware Reset)

Display during overwrite error:

When an overwrite error has occurred, the 3 LEDs, STANDBY/ON, LIGHT, and WARNING will blink. In this case, remove the AC cable.

JVC

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