

CONFIDENTIAL

LCD PROJECTOR

PRODUCT SPECIFICATIONS

MODEL PJ-TX10 (C10H)
PJ-TX10W for Asia, Canada and USA(HAL-HED)
PJ-TX10E for Europe
PJ-TX10W(AU) for Australia

VER.1.1

Approved by

Date _____

History

Ver 1.1

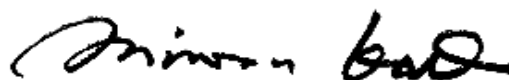
3.4 CIE SATURATION

Blue center value $y = 0.05 \rightarrow 0.04$

August 04, 2003

Hitachi, Ltd.

Digital Media Division



Minoru Kato
Senior Engineer

1.GENERAL

- 1.1 OPTICAL STRUCTURE 3 LCD panels, one projection lens, RGB shutter method
- 1.2 LCD PANEL 0.55inch, P-Si TFT panel x 3, Stripe pixel configuration
854 dots x 480 lines x 3 panels
Drive method: TFT Active Matrix, with micro lens
- 1.3 LENS F1.6~2.9 (f=14.2 ~ 28.4mm)
Manual Zoom x 2
Manual Focus
- 1.4 LAMP UHB 130W @ Normal mode
Lifetime 2000 hours This means below.
More than 50 % of lamps will operate 2000 hours.
Less than 50 % of them will stop operation before 2000 hours
including lamp burst. More than 50% performance is typical @ 2000 hours.
(Internal timer to shut projector down sets 2000 hours.
Lamp power drop around 20% down @ Whisper mode.)
- 1.5 FOCUS DISTANCE 0.7m ~ 7.8m (Wide), 1.5m ~ 15.7m (TELE)
- 1.6 DISTANCE TO SCREEN WIDTH RATIO (:1) 1.15 (WIDE), 2.35 (TELE) --- reference purpose only
- 1.7 DISPLAY SIZE 30 inches ~ 300 inches (60 inches (16:9) at 1.5m, wide)
- 1.8 LENS SHIFT Vertical 10:0 ~ 0:10, Horizontal 7:3 ~ 3:7.
- 1.9 COLOR 16.7 million colors
- 1.10 RESOLUTION
Video 480 TV lines (@ overscan mode)
RGB 848 dots x 480 lines
- 1.11 SIGNAL
Composite Video NTSC, NTSC4.43, PAL(-BGDHI), SECAM, PAL-M, PAL-N, PAL60
Component Video 525i(480i), 525p(480p), 625i(575i),
1125i(1080i@50/60,1035i@60, 750p(720p@60)
R,G,B IBM Compatible VGA, SVGA/XGA/SXGA/ (compressed)
MAC13",MAC16"
fv ; 56 ~ 120Hz , fH ; 31.5 ~ 91kHz (See 4.2table for compatibility)
- 1.12 AUDIO
Speakers 1.0 W x 1
Input RCA jack(L,R) x 1(video), ϕ 3.5 stereo mini jack x 1 (computer)
Output NONE

1.13 ADDITIONAL FEATURES

Mirror Reverse Image

Up-side Down Image

Picture Freeze by RS-232C

Magnify 4 times by RS232C

My Memory

3D Y/C Separation for NTSC composite signal

2-3 Pull Down for NTSC

3D Noise Reducer

Digital Gamma Correction

R/G/B Color Adjustment

ASPECT selection

For Video: 4:3/16:9/Wide/MOVIE-1/MOVIE-2

For RGB: 4:3/16:9/15:9/31:15

15 Languages OSD (English, French, German, Spanish, Italian, Norwegian, Dutch, Japanese,
Portuguese, Chinese, Korean, Swedish, Russian, Finnish, Polish)

Vertical Digital Keystone Correction: ± 15 degrees

(Note: Input signal is WVGA @ 60Hz, Zoom position is Wide max.)

1.14 PLUG & PLAY

DDC1/2B(VESA) for RGB INPUT

1.15 INTERFACE CONNECTORS

(1) VIDEO INPUT

Composite Video RCA jack X 1

S-Video Mini-Din 4 pin X 1

Component Video RCA jack x 3

Audio RCA jack x 2 (Video Use)

(2) RGB Input

Analog RGB 15 pin D-Sub shrink x 1

Pin Assignments See Table below

Audio $\phi 3.5$ stereo mini jack x 1 (RGB use)

(3) RGB MONITOR OUTPUT

NONE

(4) Control

9 Pin D-Sub shrink x 1

RS-232C (Serial)

NO Mouse emulation

(5) Audio output

NONE

R.G.B in (RGB)

15 Pin D-Sub			Pin assignments		
NO.	RGB	Component Video	NO.	RGB	Component Video
1	Red	Cr/Pr	9	N.C.	PLUG DETECT
2	Green	Y	10	GND	GND
3	Blue	Cb/Pb	11	N.C.	ID3
4	N.C.	ID1	12	SDA (DDC)	NC
5	GND	GND	13	H/Composite Sync	NC
6	GND(Red)	GND(Cr/Pr)	14	Vsync	ID2
7	GND(Green)	GND(Y)	15	SCL (DDC)	NC
8	GND(Blue)	GND(Cb/Pb)			

Control (RS232C)

9 Pin D-sub Pin assignments	
1	
2	RD
3	TD
4	
5	GND
6	
7	RTS
8	CTS
9	

1.16 POWER SUPPLY AC90 ~ 132V / AC198 ~ 264V (50/60Hz), 3 Wire Grounded

1.17 POWER CONSUMPTION 100 ~ 120V/220 ~ 240V, 50/60Hz 2.4 /1.1A typ., Max. + 10%
100V, 50/60Hz, 220W typ., Max. + 10%

1.18 DIMENSIONS 350X121X285 mm, 13.8X4.8X11.2 inch.(WXHXD)
Excluding extrusions

1.19 WEIGHT 3.6 kg, 7.9 lbs

1.20 NOISE LEVEL

Whisper mode; 26 dB average (A-weighted) at 1 m from the unit at 23 °C (Target)

Normal mode; 29 dB average (A-weighted) at 1 m from the unit at 23 °C (Target)

1.21 TEMPERATURES (at 35°C ambient)

SURFACE Metal 60 °C maximum except screws and terminals

SURFACE Plastic 65 °C maximum except around ventilation holes

EXHAUST AIR 83 °C maximum around ventilation holes

SCREWS AND TERMINALS 75 °C maximum

1.22 CONTAMINATION

AIR Filtration at intake vent

Dust Protection to prevent visible dust collection all optical component
on or near the focal plane. (*)

*) At just focused position on image, dust is not clearly noticed and size is 16 pixels
maximum (4x4, 3x5, 2x8)

1.23 KENSINGTON SLOT

1.24 REGULATORY (AGENCY, SAFETY, EMI/RFI) APPROVALS

US/Canada	UL 60950/C-UL FCC Part15 subpart B class B
Europe	CE approval EN61000-3-2, EN61000-3-3, EN55022, EN55024 TUV EN60950, Low voltage directive
Australia	AS/NZS3260 AS/NZS3548

1.25 INCLUDED ACCESSORIES

Power Cord

For US/Canada/Asia; (US, Euro, UK) x 1

For Europe; (UK, Euro) x 1

For Australia; (Au) x 1

RCA Video/Audio Cable (3 m) x 1

Wireless Remote Control Unit

"AA" Batteries x 2

Rivet x 1

Strap x 1

Scart Adapter x 1 (Supplied by HEL and packed exclusively for Europe)

10 ^(*) Language Operator's Manual x 2 (5 languages each)

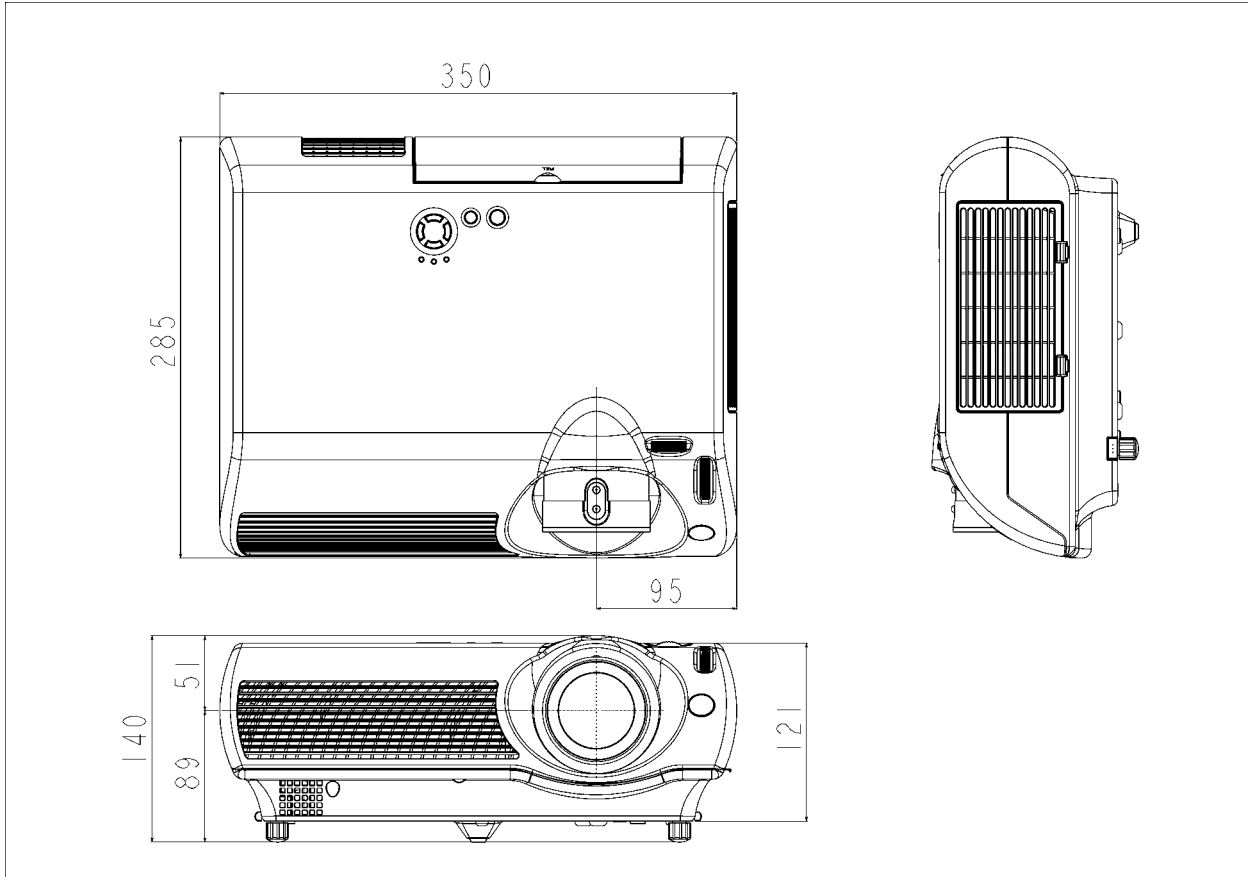
15 ^(**) Language Safety Instructions x 1

10 ^(*) Language Quick Guide x 1

^(*) (English, French, Spanish, German, Italian, Norwegian, Dutch, Portuguese, Simplified Chinese, Korean)

^(**) (English, French, Spanish, German, Italian, Norwegian, Dutch, Portuguese, Simplified Chinese, Traditional Chinese, Korean, Swedish, Russian, Finnish, Polish)

OUTWARD



2. ENVIRONMENTAL CONDITION

2.1 AMBIENT TEMPERATURE

Operating	0 ~ 35 °C
Storage	-20 ~ 60 °C

2.2 HUMIDITY

Operating	10 ~ 85% RH Without condensation
Storage	10 ~ 85% RH Without condensation

2.3 ALTITUDE From sea level to 6000 feet

2.4 SHOCK (HANDLING) Withstand 50 mm drop on bottom on wooden table

2.5 GAS No corrosive gas and combustible gas existed

2.6 ELECTROSTATIC DISCHARGE

Withstands 10 times 10kV electrostatic discharge from a 150 pF capacitor through a 100 ohms resistor on any exterior surface of the unit

3. IMAGE QUALITY

Apply following condition except where noted.

- Apply heat-running for 10 minutes or more before checking
- Ambient temperature is 23 °C
- Whisper: Normal, Gamma: Normal,
- Vertical Lens shift: 1:1, Horizontal Lens shift: 1:1
- Zoom: Wide max, Foot adjust: Retracted (Set should be even with the ground.)

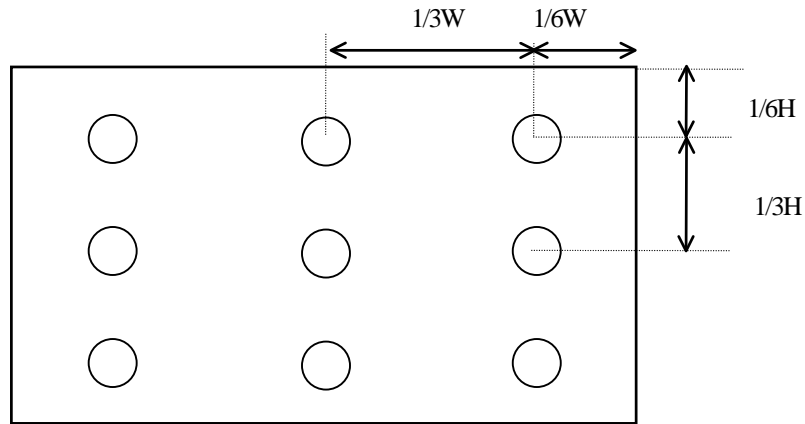
3.1 BRIGHTNESS

560 lumens minimum

(Note 1) ANSI 9 point Standard measurement at Screen size 40inch, Meter CL-200

Brightness = Luminance intensity averaged over 9 points x screen area

Typical 700 lumens (Target)



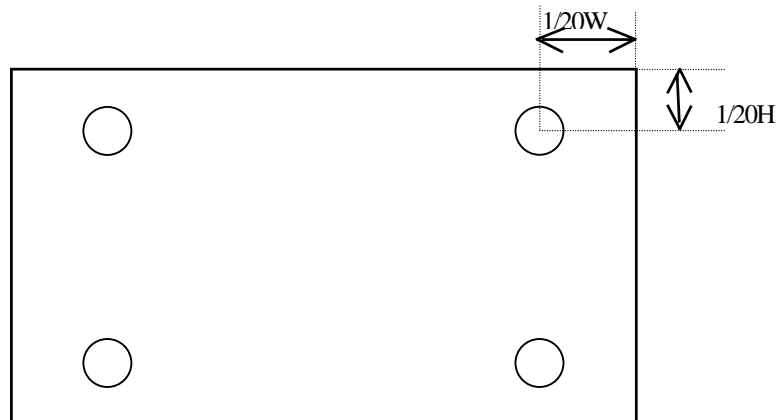
Brightness: Max. Contrast: Max.

3.2 BRIGHTNESS UNIFORMITY

BRIGHTNESS UNIFORMITY 60% minimum, 70% typical (Target)

(Note) ANSI Standard measurement

Brightness uniformity = Minimum of the four corner measurements/average of 9 points measurements



Zoom position: wide, Brightness/Contrast; Default setting

3.3 CONTRAST RATIO

120:1 minimum 200:1 Typical (Target)

(Note) ANSI standard measurement. Vertical Lens shift: 10:0.

(A black-and-white " chessboard " pattern consisting of 16 equal rectangles)

All white, All black 560:1 Minimum, 800:1 Typical (Target)

(Note) Vertical Lens shift: 10:0.

3.4 CIE SATURATION at Default setting

	x	y
White	0.30±0.04	0.35±0.04
Red	0.65±0.04	0.34±0.04
Green	0.34±0.04	0.65±0.04
Blue	0.14±0.04	0.04±0.04

3.5 COLOR UNIFORMITY (Target) at Default setting

100% white, ANSI 9 points	$\Delta x \pm 0.045,$	$\Delta y \pm 0.045$
Extreme Corner	$\Delta x \pm 0.045,$	$\Delta y \pm 0.045$
50% white, ANSI 9 points	$\Delta x \pm 0.045,$	$\Delta y \pm 0.045$
Extreme Corner	$\Delta x \pm 0.045,$	$\Delta y \pm 0.045$

(Note) $\Delta x, \Delta y$ are the difference from the center point

Brightness, Contrast; Default setting

3.6 MISCONVERGENCE, FOCUS

(1) MISCONVERGENCE

1.0 pixel maximum at the center and top left, 1.2pixel others

(Note)

Misconvergence is the distance between G crosshatch lines and the other colors crosshatch lines

(2) FOCUS SHIFTS / FOCUS UNBALANCE / Flare (Screen Size 64")

Test Condition : Image size 70 inches, Zoom : wide, Contrast and Bright at default setting

Observing distance; 1.8 m from screen (at the projector)

Test method ; Focus on the center of the image white letter E (H x W x ; 5 x 3 pixels, 1 pixel gap)
on black background.

Every letter E should be resolved in whole area of the image.

3.7 DOT DEFECT

(1) SPECIFICATIONS

ITEM		Max. NUMBER			Transmittance
Mode	Color	A-Zone	B-zone	Total	
Sparkle	Green	1	1	2	More than 10% See below *1
	Red	1	2	3	
	Blue	*	*	5	
Black	Green	*	*	5	Area More than 75 %
	Red	*	*	5	
	Blue	*	*	5	

* ; not defined

- A sparkle mode defect and a faint sparkle mode defect
When a pixel is partially or completely transmittable during an entirely black raster.
- A black mode defect
When a pixel is partially or completely turned off during an entirely white raster.
- Transmittance
In case of a partial defect, the transmittance is average of a whole pixel transmittance.
- Line defect
There are no two or more continuous defects. (Sparkle mode)
There are no three or more continuous defects. (Black mode)

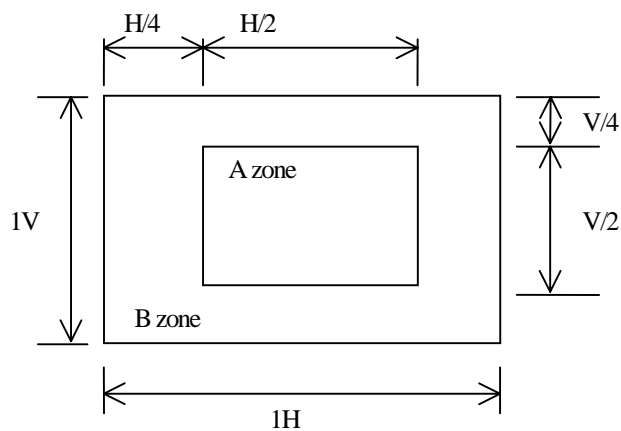
*1 Sparkle mode

Use Dot pattern with brightness and contrast maximum.

(Make Dot pattern by 0.7Vp-p R,G, B on black (0Vp-p white) background.)

Sparkle mode is brighter than signal (0.7Vp-p white) dots with 10% ND filter.

(2) DEFINITION OF ZONE



4. ELECTRICAL

4.1 VIDEO SIGNAL INPUT

- (1) Composite
 Amplitude 1.0 ± 0.1 Vp-p at 75 Ω terminated
 Input impedance 75Ω
- (2) S-VIDEO
 Amplitude Y: 1.0 ± 0.1 Vp-p at 75 Ω terminated with composite sync
 C: 0.3 ± 0.1 Vp-p at 75 Ω terminated
 Input impedance 75Ω
- (3) Component
 Amplitude Y: 1.0 ± 0.1 Vp-p at 75 Ω terminated with composite sync
 C_B/P_B, C_R/P_R: 0.7 ± 0.1 Vp-p at 75 Ω terminated
 Input impedance 75 Ω

4.2 RGB SIGNAL INPUT

- (1) Analog RGB
 Amplitude 0.7 ± 0.1 Vp-p at 75 Ω terminated
 Input impedance 75 Ω
- (2) Sync. TTL level
- (3) Computer compatibility

Resolution H x V	Refresh Rate	Horizontal Frequency	Standard Type	Note
640x480	59.9 Hz	31.5 kHz	VESA	VGA-3
640x480	66.7 Hz	35.0 kHz		Mac 13"
640x480	72.8 Hz	37.9 kHz	VESA	
640x480	75.0 Hz	37.5 kHz	VESA	
640x480	85.0 Hz	43.3 kHz	VESA	
640x480	120.0Hz	61.8 kHz		
800x600	56.3 Hz	35.2 kHz	VESA	
800x600	60.3 Hz	37.9 kHz	VESA	
800x600	72.2 Hz	48.1 kHz	VESA	
800x600	75.0 Hz	46.9 kHz	VESA	
800x600	85.1 Hz	53.7 kHz	VESA	
800x600	120.0 Hz	77.2kHz		
832x624	74.5 Hz	49.7 kHz		Mac 16"
848x480	60.0 Hz	31.1 kHz		W VGA (60Hz)
1024x768	60.0 Hz	48.4 kHz	VESA	
1024x768	70.1 Hz	56.5 kHz	VESA	
1024x768	75.0 Hz	60.0 kHz	VESA	
1280x960	60.0 Hz	60.0 kHz	VESA	
1280x1024	60.0 Hz	64.0 kHz	VESA	

Note: SVGA/XGA /SXGA input signals shall be displayed but picture quality might be rude.

4.3 AUDIO SIGNAL INPUT

Amplitude 200 mV rms
Input impedance 47K Ω

4.4 REMOTE CONTROL

Range with new battery

Front Front: 5.0m minimum $\pm 30^\circ$ (Horizontal, Vertical)

5. PACKING

5.1 PACKAGING FORM

See Figure 5.1

Packaging materials;	Plastic bag, cushion and carton box
W x H x D	459x 333 x 401 mm (nominal)
Gross weight	7.6 kg
Pallet size	1223 x 1132 x 938 mm (W x H x D)

5.2 VIBRATION

There shall be no damage or change of performance out of this specification after the following vibration test with factory fresh packing.

Vibration frequency 7 ~ 100 Hz 20 minutes per axis (10 minutes one way)

Acceleration	Bottom 1.0G
	Back 0.8G
	Side 0.8G

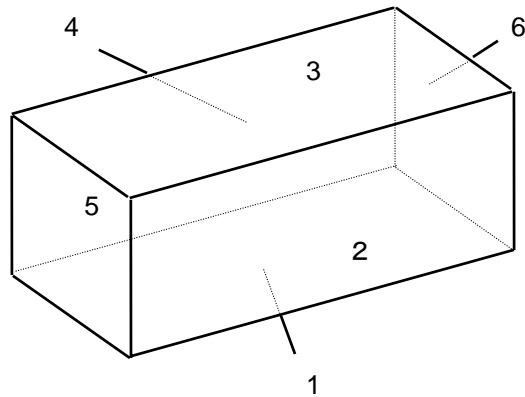
Duration 2.5 hours (1.5h for Bottom, 0.5h for Back & Side)

5.3 DROP TEST

There shall be no damage or change of performance out of this specification after the following drop test.

This test shall be done with factory fresh packing and the following sequence.

1. Surface 1	90 cm
2. Surface 2	90 cm
3. Surface 4	90 cm
4. Surface 5	90 cm
5. Surface 6	90 cm
6. Surface 3	90 cm
7. Edge 1-2	90 cm
8. Edge 1-4	90 cm
9. Edge 1-5	90 cm
10. Edge 1-6	90 cm



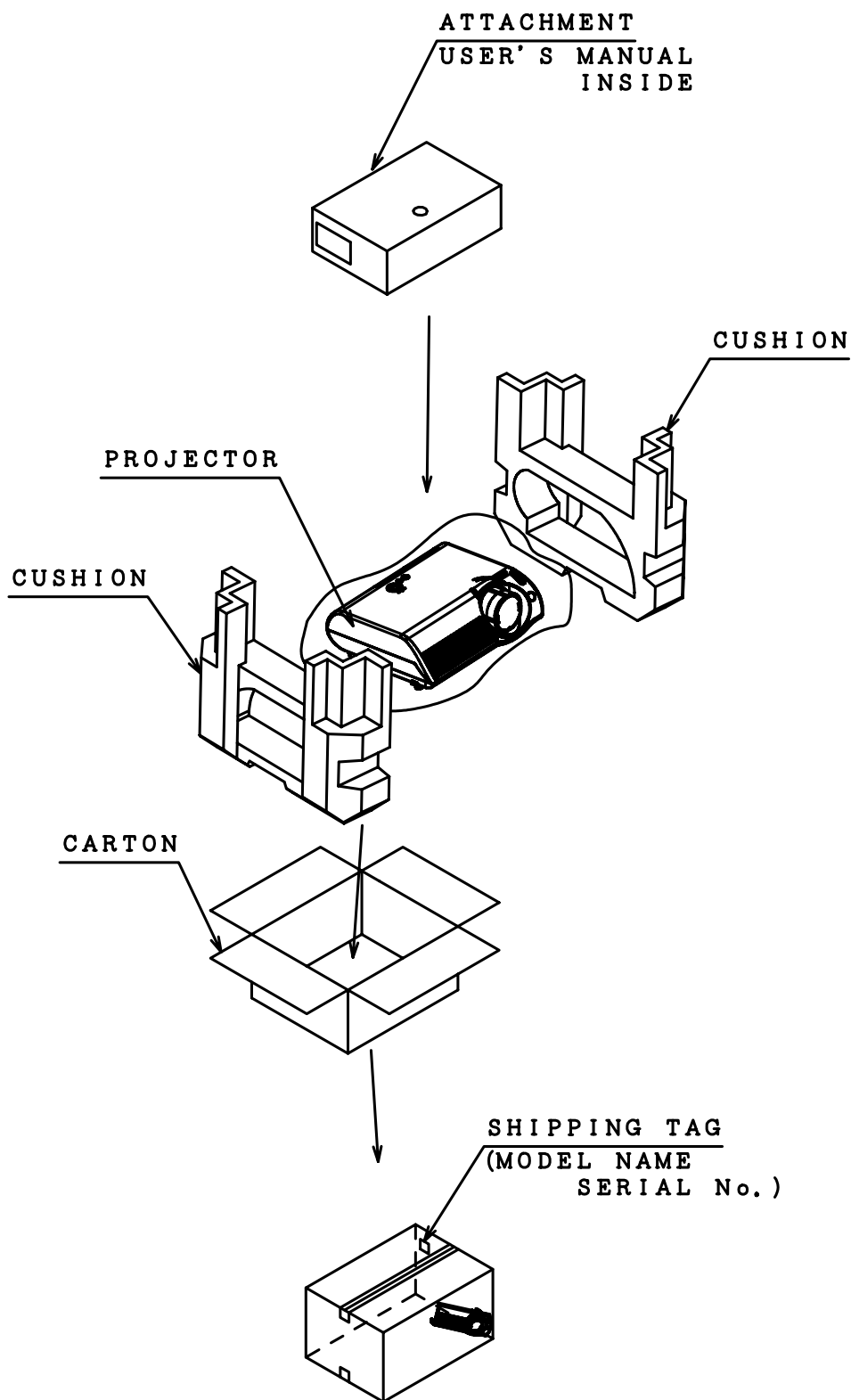


Figure 5.1