

# First Surface

By Rafael Lozano-Hemmer



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**This short section must be read for proper operation**

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## **General important information**

# First Surface, Shadow Object 3 (2012)

By Rafael Lozano-Hemmer

## Technique

Computer, Kinect, projector, metal, motor, Arduino processor, front surface mirrors

## Dimensions

projection: 175 cm x 122 cm

equipment: 25.4 cm x 34.5 cm x 71 cm (HxWxL)

equipment weight: 12 kg

crate dimensions: 82 cm x 45 cm x 35.5 cm

## Edition

Ed. 1/6 +1AP

## Description

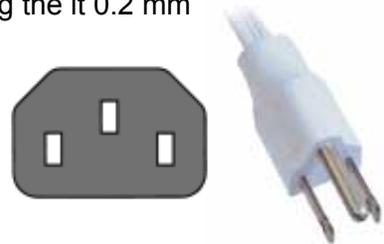
Two front surface mirrors are suspended from a thread and move with the air flow and with a small motor. Projected on the wall behind the mirrors is a real-time virtual representation of the public as seen from the perspective of the mirrors. The public is represented as patterned 3D silhouettes anchored in a reference prism that rotates with the mirrors. The piece is an "apocotron" (derived from the Greek Apo- for "away from" and katoptron, for "mirror") an attempt to construct an artificial perspective on the reflected subject.

PLEASE DO NOT TOUCH THE MIRROR, BUT YOU MAY BLOW AT IT.

## Operation

1. Take the piece out of the crate and mount it on the wall. Hang the it 0.2 mm nylon fishing wire.

2. Connect the piece to electrical power. Use the supplied combo cable which has a black box at the end.



The piece runs on 120 volt / 60 Hz and 240 volt / 50Hz.

3. To turn the piece ON, plug the above mentioned power plugs in to the a wall outlet. Then shortly press the round start button on the small box. Wait about 60 seconds until the piece is ready for operation. A calibration message will appear to ask you to step outside the camera view.

Startup details:

When pressing the start button the projectors lens door will open and the computer will start.

After 20 seconds the OS X operating system will be done booting and the art pieces software will start. A small motor will start turning the shadow object.

The camera view will be displayed along side a message asking you to step out of sight of the camera view.

The screen will go blank and calibration will take place.

Once the calibration is done a grey depth camera view will be displayed along side a message announcing the end of calibration.



Now the 3D shadow of the object will be displayed and the piece is ready for interaction.

4. To turn the piece OFF, press the power button on the side of the small box.  
Wait about 60 seconds until everything including the projectors finished their shutdown routine.  
The projector is ready to be used again once the lens door is closed.

## Cleaning and Maintenance

The white metal structure can be cleaned with regular all-purpose cleaner. Do not use harsh cleaners or rough sponges.

You can use a damp cloth to clean the shadow object.

## Placement Instructions

The projector structure should be hung parallel to the floor / perfectly horizontal in order for the projection to look perfectly straight.

You might have to use the projector's remote control to adjust the key-stoning of the image.  
You can also adjust the projector's tilt by loosening the four screws that attach the projector to the metal structure, on the top side of the structure.

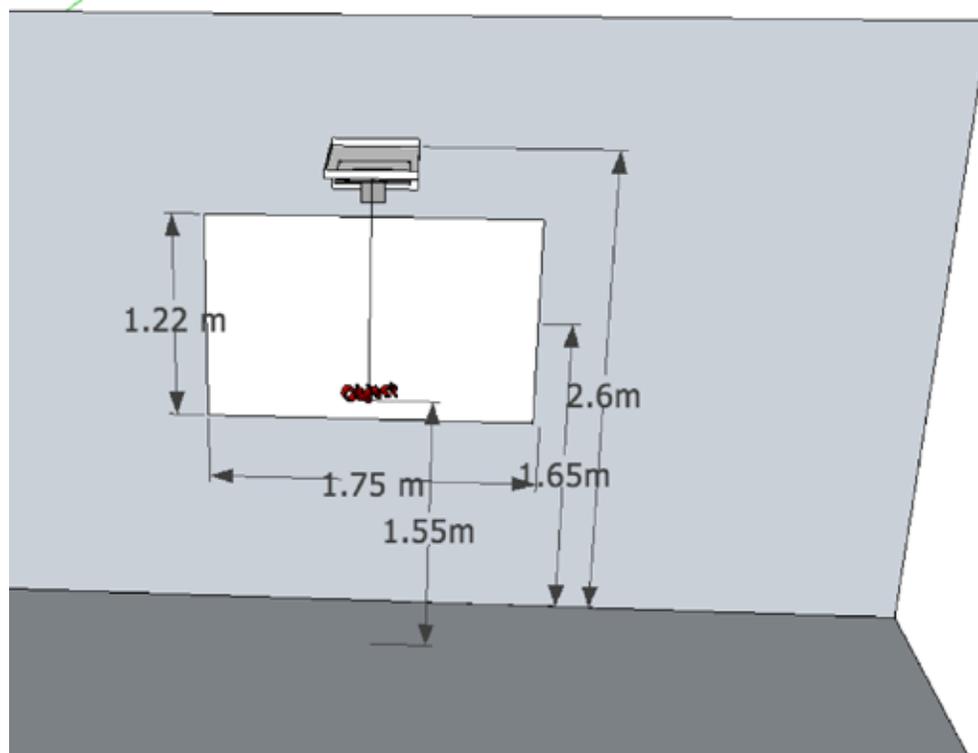
The ceiling height of the exhibition space should be at least 260 cm (102").

Mount the projector structure so that the top of the wall plate is at 260 cm.

Now attach the shadow object to a 0.2 mm nylon string and hang it on to the hook. The hook can be found close to the camera lenses.

The distance between hook and middle of the shadow object should be about 87 cm (34").

The piece has 3 long cables running from the projector structure to a small box. These cables can be hidden inside a white cable sleeve, or run inside the wall.



# Detailed technical information

# **Calibration**

**Mechanical Calibration**

**Software Calibrations**

# Troubleshooting

## **After pressing the power button the small motor start turning but the projector's lens door does not open.**

Try starting the projector using the included projector remote control.

If this does not help, unplug the whole piece from the main power. After 5 seconds, plug the cable back in and press the button on the small box.

## **The computer started and the app crashed after trying to start.**

Find the app's icon in the dock and restart the app.

## **The projected 3D shadow is not reacting or is not visible.**

Connect a USB mouse and keyboard to USB port on the small box. Double click the mouse to reveal the user interface. Click on the "restart" button. Find the app's icon in the dock and restart the app.

## **The motor which rotates the shadow object is too loud.**

There is a cable that runs from the motor to a small black box. This box also has two USB cables entering it. One USB cable connects the box to the computer and the other connects to the projector. Disconnect the USB that runs to the projector. This will shut the power of to the motor.

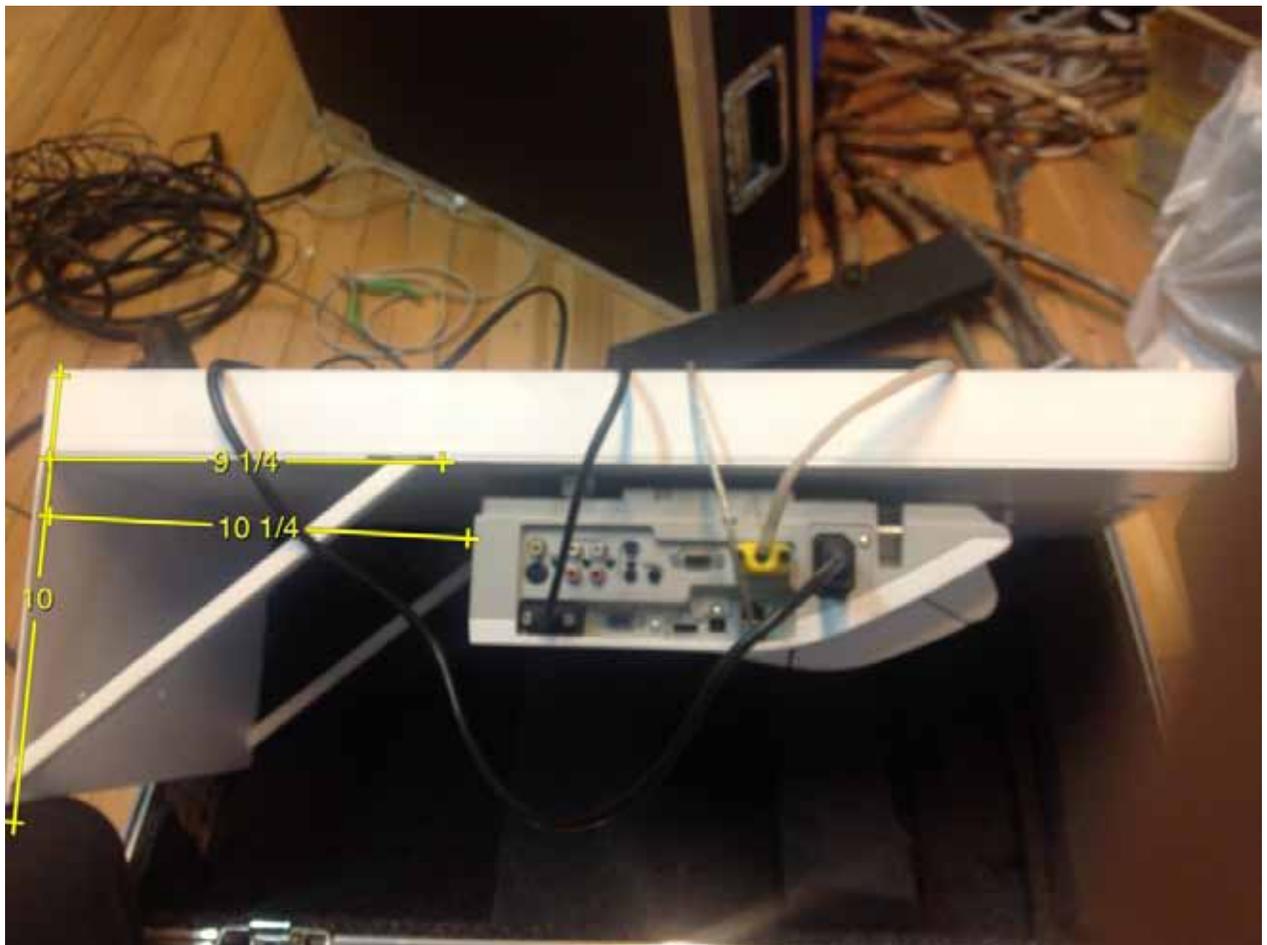
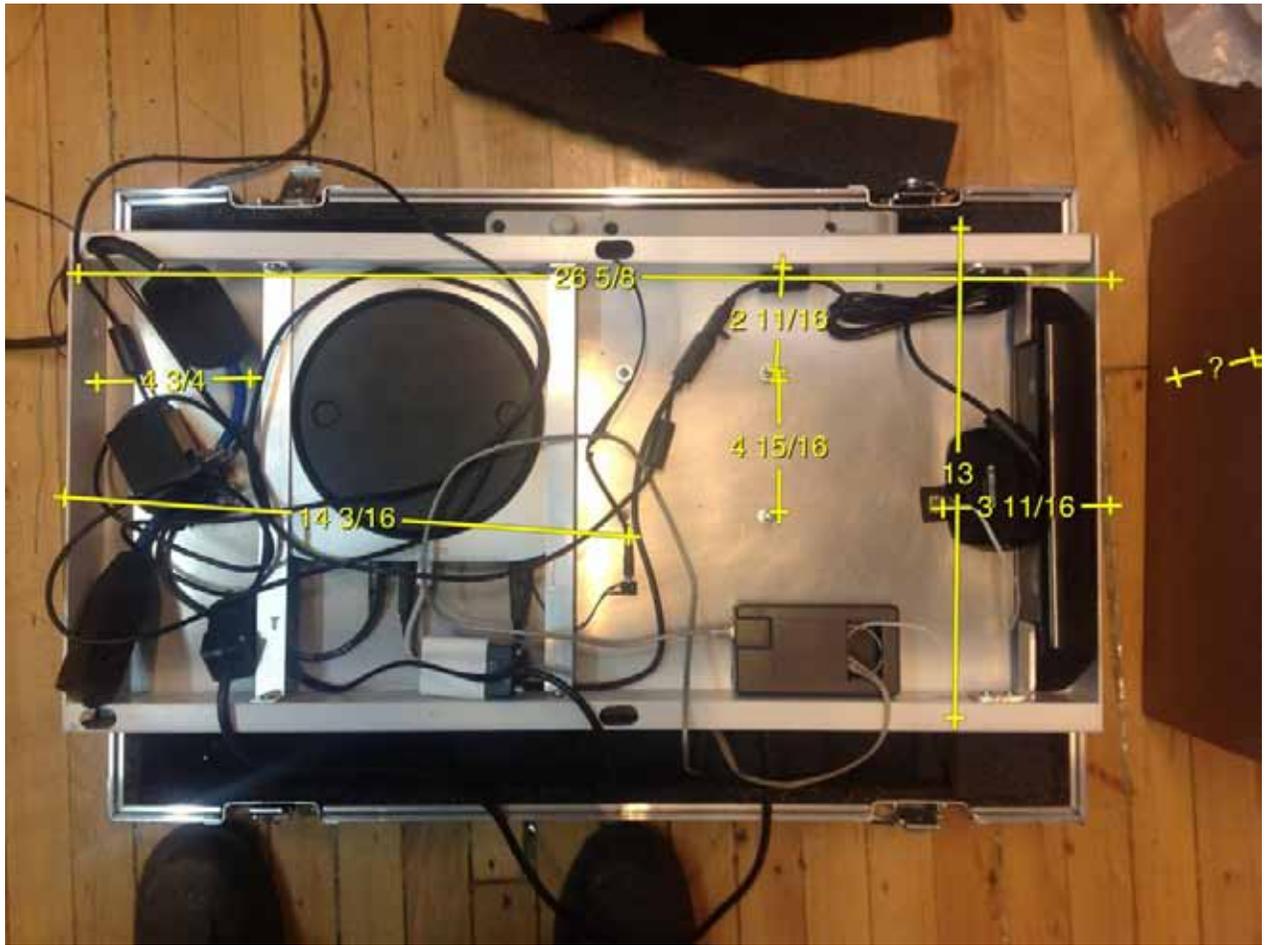
## **After transport the cable cover on the side of the projector is dislodged.**

See projector manual page 9 for instruction on how to re-attach this cable cover.

## **On startup of the app the RGB video feed is black.**

This means the kinect camera was not initialized correctly. The software is programmed to automatically try to reconnect to the kinect camera. If this was successful you should see the RGB video. If not, use the "restart" button in the GUI to restart the softwares. Or shut the computer down and restart it.

## Appendix I - Technical Drawing and Dimensions



## **Appendix II - List of Components**

apple mac mini with osx lion 10.7.x, 4GB ram, core i7, 2.5 ghz

lcd projector, hitachi cp-aw251n

kinect for xbox

arduino uno

rs232 level shifter, digikey 28560D-ND

motor controller, pololu TB6612FNG

arduino enclosure

Metal Gearmotor, pololu 499:1 25Dx58L mm

Tripp Lite B202-150 Transmitter & Receiver - USB extender

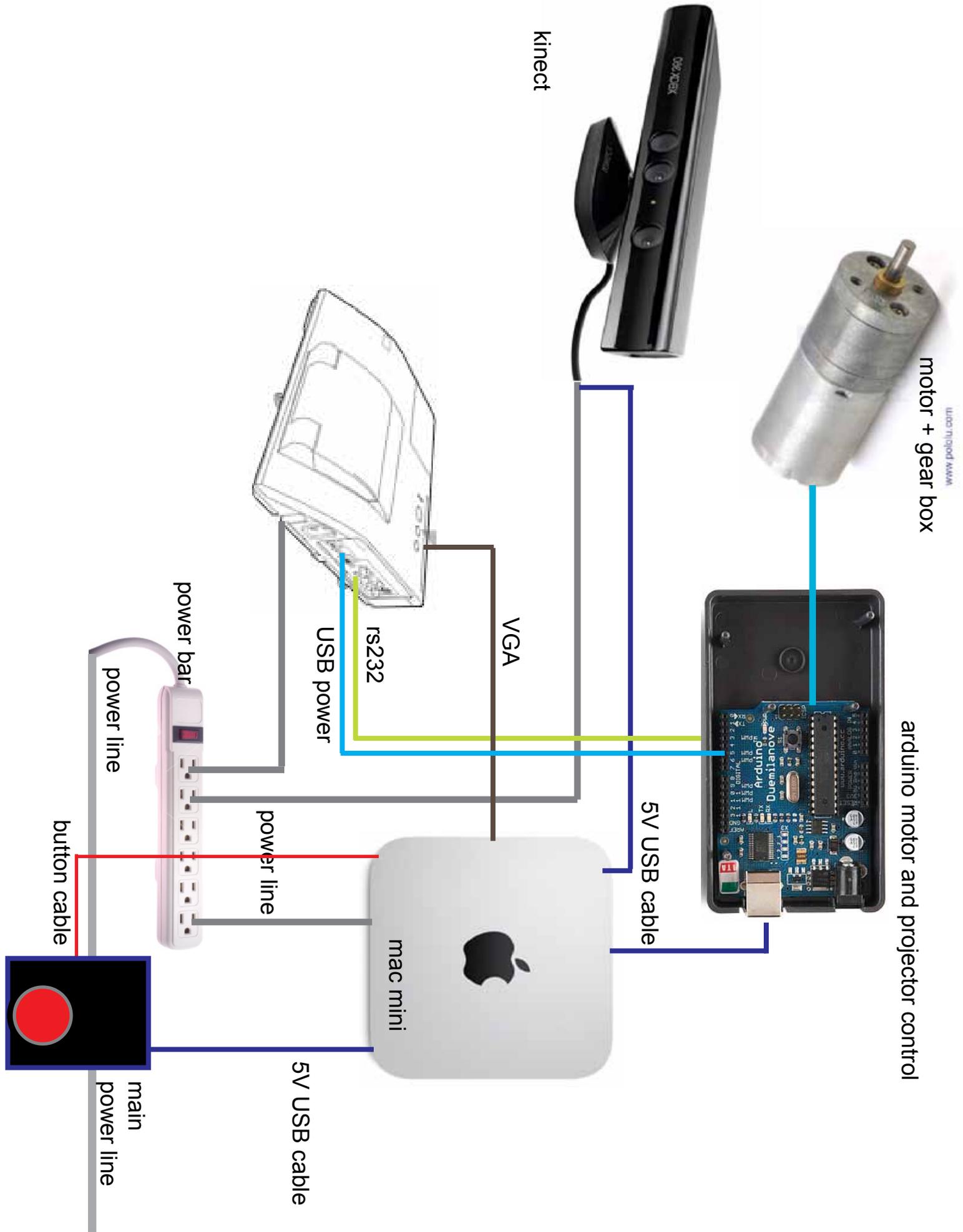
external power button, digikey IPR3SAD2

small black box to contain power leads, digikey HH-3641

white cable sleeve Expandable Mesh Sleeving, 3/4" ID, 1/2" to 1-1/4"

nylon fishing wire 0.2 mm diameter

## Appendix III - Wiring Diagram



power lead connection

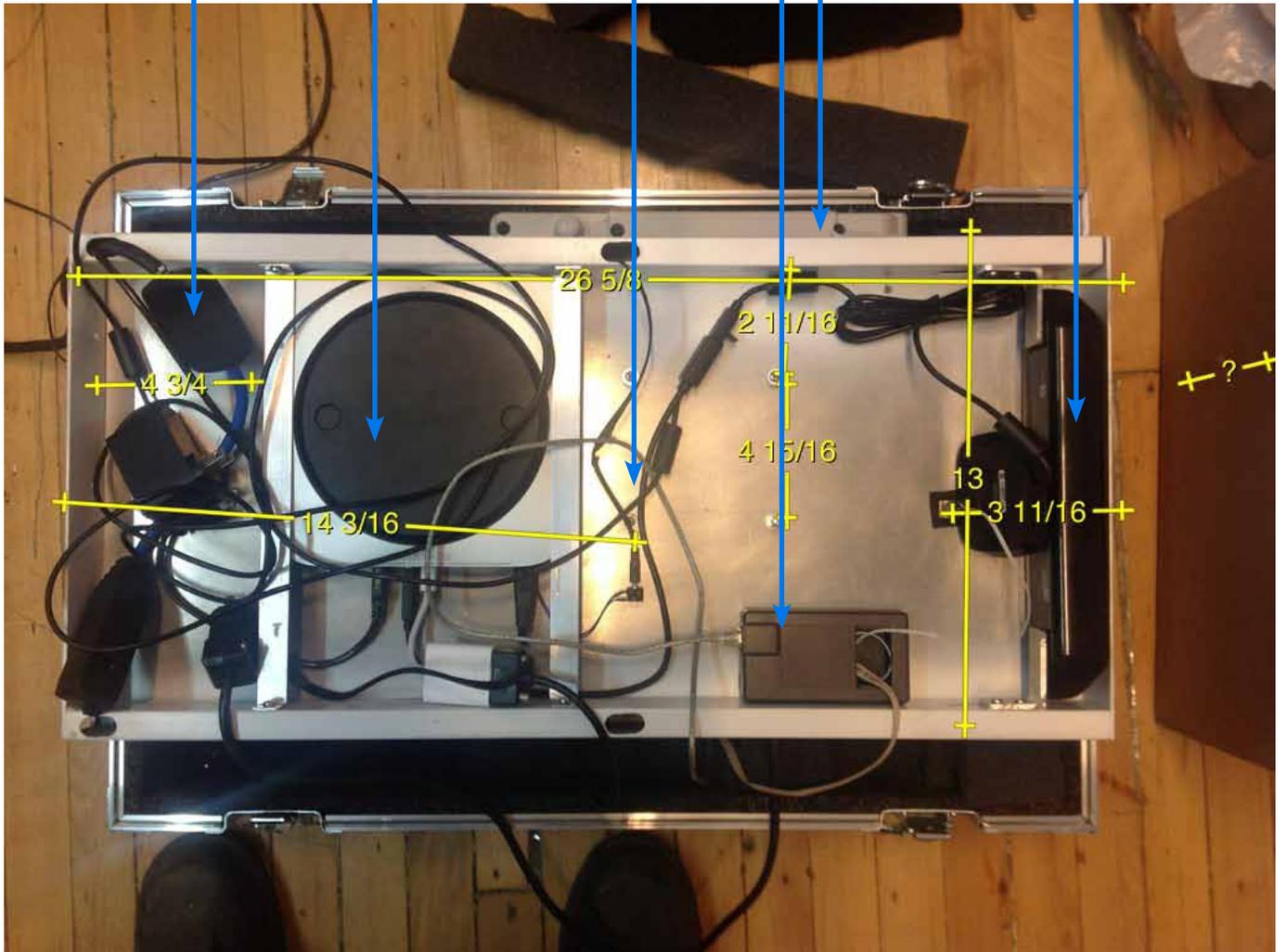
mac mini computer

external power button connection

arduino motor + projector control

projector

kinect camera



## **Appendix IV - Projector Manual**

find the extended projector manual at:  
<http://lozano-hemmer.com/texts/manuals/cp-aw251N.pdf>

**Regulatory notices (continued)**

**About Waste Electrical and Electronic Equipment**



The mark is in compliance with the Waste Electrical and Electronic Equipment Directive 2002/96/EC (WEEE).

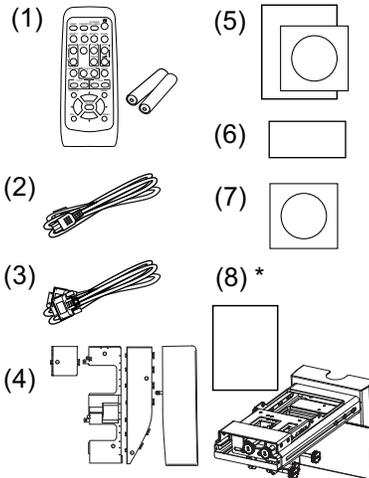
The mark indicates the requirement NOT to dispose the equipment including any spent or discarded batteries or accumulators as unsorted municipal waste, but use the return and collection systems available.

If the batteries or accumulators included with this equipment, display the chemical symbol Hg, Cd, or Pb, then it means that the battery has a heavy metal content of more than 0.0005% Mercury or more than, 0.002% Cadmium, or more than 0.004% Lead.

**Contents of package**

Your projector should come with the items shown below. Check that all the items are included. Require of your dealer immediately if any items are missing.

- (1) Remote control with the two AA batteries
- (2) Power cord
- (3) Computer cable
- (4) Parts of cable cover
- (5) User's manuals (Book x1, CD x1)
- (6) Security label
- (7) Application CD
- (8) Wall mount unit and User's manual \*



\* CP-AW250N does not bundle them.

**⚠ WARNING ►** Do not attempt to install the projector yourself. Have your dealer or service center handle all installation work. Note that manufacturer will accept no liability whatsoever for accidents or injuries resulting from an incorrect installation or improper use.

**NOTE •** Keep the original packing materials for future reshipment. Be sure to use the original packing materials when moving the projector. Use special caution for the lens.

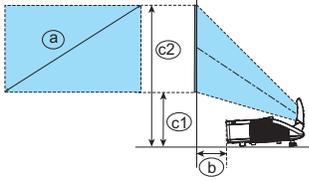
# Arrangement

Refer to the illustrations and tables below to determine screen size and projection distance.

The values shown in the table are calculated for a full size screen: 1280 x 800

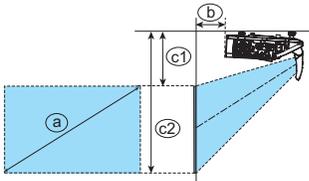
Ⓐ Screen size (diagonal) Ⓑ Projection distance (±8%) Ⓒ1, Ⓒ2 Screen height (±8%)

- On a horizontal surface



Screen size (diagonal) Ⓐ		Projection distance Ⓑ		Screen height Ⓒ1		Screen height Ⓒ2	
type(inch)	m	m	inch	m	inch	m	inch
60	1.5	0.120	4.7	0.295	11.6	1.102	43.4
70	1.8	0.188	7.4	0.332	13.1	1.274	50.2
80	2.0	0.256	10.1	0.369	14.5	1.446	56.9
90	2.3	0.324	12.8	0.407	16.0	1.618	63.7
100	2.5	0.392	15.4	0.444	17.5	1.791	70.5

- Mounted on the wall or ceiling



- Keep a space of 30 cm or more between the sides of the projector and other objects such as walls. Do not place or attach anything that would block the lens or vent holes.
- For the case of installation in special conditions such as on the wall or ceiling, the specified mounting accessories (Ⓔ1) and service may be required. Before installing the projector, consult your dealer about your installation.

- The screen position may shift after installation if the projector is mounted on locations such as the wall or ceiling, due to the flexibility of the plastic projector body. If readjustment is necessary, consult with your dealer or service personnel.
- The projected image position and/or focus may change during warm-up (approx. 30 minutes after the lamp is turned on) or when the ambient conditions change. Readjust the image position and/or focus as necessary.
- Since the projector features an ultra short throw, be aware that it is required to select a screen carefully to have better performance.
  - A soft screen such as a pull-down screen may cause serious distortion of a projected image. A hard screen such as a board screen is recommended for use with this projector.
  - A high-gain screen such as a bead screen that has narrow viewing angle is not suitable for this projector. A low-gain screen (around 1.0) such as a matte screen that has wide viewing angle is recommended for use with this projector.
  - A screen with a weave pattern may cause moiré on the projected image, which is not a failure of the projector. A screen that has less moiré effects is recommended for use with this projector.

**⚠ WARNING** ▶ Install the projector in a stable horizontal position.

- ▶ Place the projector in a cool place, and ensure that there is sufficient ventilation. Do not place the projector where the air from an air conditioner or similar unit will blow on it directly.
- ▶ Do not place the projector anywhere where it may get wet.
- ▶ Use only the mounting accessories the manufacturer specified, and leave installing and removing the projector with the mounting accessories to the service personnel.
- ▶ Read and keep the user's manual of the mounting accessories used.

**⚠ CAUTION** ▶ Avoid placing the projector in smoky, humid or dusty place.

- ▶ Position the projector to prevent light from directly hitting the projector's remote sensor.

**NOTE** • The projector may make a rattling sound when tilted, moved or shaken, since a flap to control the air flow inside of the projector has moved. Be aware that this is not a failure or malfunction.

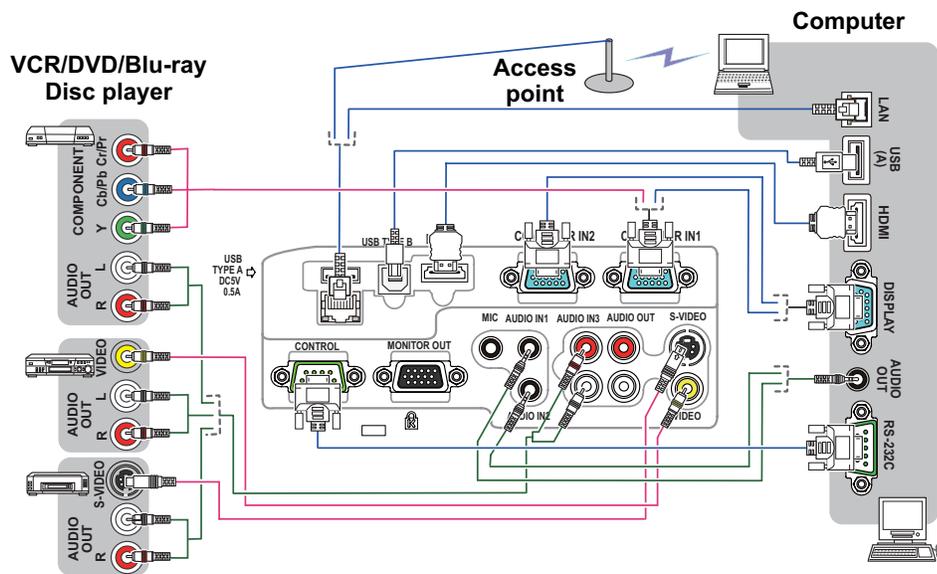


## Connecting with your devices

Be sure to read the manuals for devices before connecting them to the projector. Make sure that all the devices are suitable to be connected with this product, and prepare the cables required to connect. Please refer to the following illustrations to connect them.

For details, please see “User’s Manual” - “Operating Guide” and “Network Guide”.  
( 20, 22)

- When AUTO is selected for the **COMPUTER IN1** or **COMPUTER IN2** port in COMPUTER IN of the INPUT menu, that port will accept component video signals.
- To use network functions of the projector, connect the **LAN** port with the computer’s LAN port, or with an access point that is connected to the computer with wireless LAN, using a LAN cable.



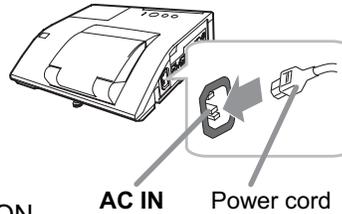
- If you insert a USB storage device, such as a USB memory, into the **USB TYPE A** port and select the port as the input source, you can view images stored in the device.
- You can connect a dynamic microphone to the **MIC** port with a 3.5 mm mini-plug. In that case, the built-in speaker outputs the sound from the microphone, even while the sound from the projector is output.

(continued on next page)



## Connecting power supply

1. Put the connector of the power cord into the **AC IN** (AC inlet) of the projector.
2. Firmly plug the power cord's plug into the outlet. In a couple of seconds after the power supply connection, the **POWER** indicator will light up in steady orange.



Please remember that when the DIRECT POWER ON function activated, the connection of the power supply make the projector turn on.

**⚠ WARNING** ► Please use extra caution when connecting the power cord, as incorrect or faulty connections may result in fire and/or electrical shock.

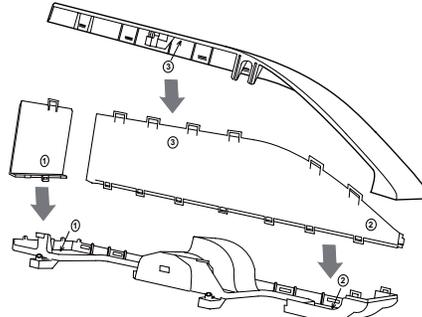
- Only use the power cord that came with the projector. If it is damaged, consult your dealer to get a new one.
- Only plug the power cord into an outlet whose voltage is matched to the power cord. The power outlet should be close to the projector and easily accessible. Remove the power cord for complete separation.
- Never modify the power cord.

**NOTICE** ► This product is also designed for IT power systems with a phase-to-phase voltage of 220 to 240 V.

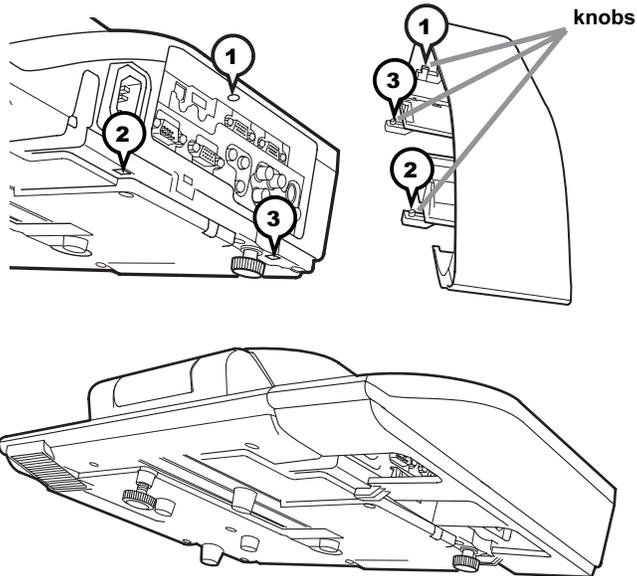
## Using the cable cover

Utilize the cable cover as the guard and blind for the connecting parts.

1. Connect the signal cables and the power cord to the projector first.
2. Combine parts as shown in figure, and assemble the cable cover.



3. Insert the three knobs on the cable cover into the three holes on the projector as shown in the figure. Pass the cables through the holes on the bottom of the cable cover.

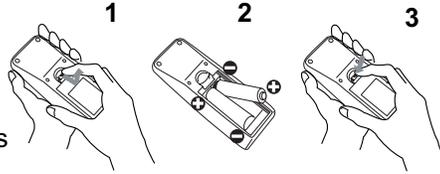


**⚠ CAUTION** ► Be careful not to pinch the cables in the cable cover, to prevent damage to the cables.  
► Use the cable cover that is supplied with the projector. Do not attempt any modifications to the cable cover.

## Preparing for the remote control

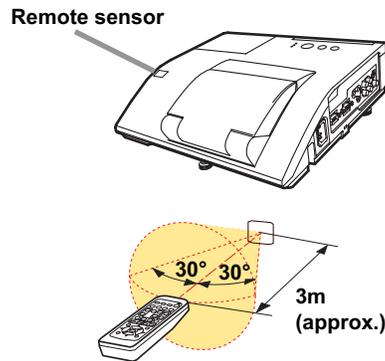
Please insert the batteries into the remote control before using it. If the remote control starts to malfunction, try to replace the batteries. If you will not use the remote control for long period, remove the batteries from the remote control and store them in a safe place.

1. Holding the hook part of the battery cover, remove it.
2. Align and insert the two AA batteries (HITACHI MAXELL, Part No.LR6 or R6P) according to their plus and minus terminals as indicated in the remote control.
3. Replace the battery cover in the direction of the arrow and snap it back into place.



### NOTE

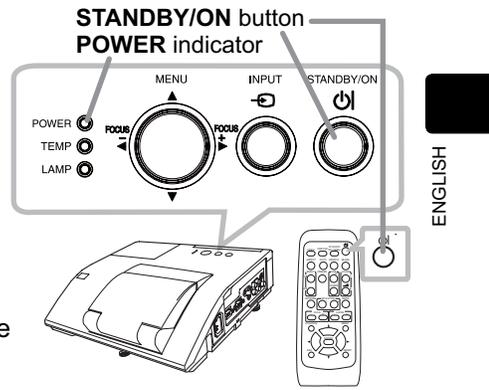
- Try changing the batteries when the remote control malfunctions.
- This remote control works with the remote sensors on the projector using infrared light (Class 1 LED). The active sensor senses the remote control signal assigned within 60 degrees to right and left, and within 3 meters. For details, see the Operating Guide in the CD.
- Prevent the remote sensors from being hit by a strong ray. It may cause malfunction of the projector and remote control.



- ⚠ WARNING** ► Always handle the batteries with care and use them only as directed. Improper use may result in battery explosion, cracking or leakage, which could result in fire, injury and/or pollution of the surrounding environment.
- Be sure to use only the batteries specified. Do not use batteries of different types at the same time. Do not mix a new battery with used one.
  - Make sure the plus and minus terminals are correctly aligned when loading a battery.
  - Keep a battery away from children and pets.
  - Do not recharge, short circuit, solder or disassemble a battery.
  - Do not place a battery in a fire or water. Keep batteries in a dark, cool and dry place.
  - If you observe battery leakage, wipe out the leakage and then replace a battery. If the leakage adheres to your body or clothes, rinse well with water immediately.
  - Obey the local laws on disposing the battery.

## Turning on the power

1. Make sure that the power cord is firmly and correctly connected to the projector and the outlet.
2. Make sure that the **POWER** indicator is steady orange.
3. Confirm that there is nothing that the lens door hits while opening. Press the **STANDBY/ON** button on the projector or the remote control. The lens door opens, the projection lamp lights up, and the **POWER** indicator begins to blink green. When the power is completely on, the indicator will stop blinking and light in steady green.



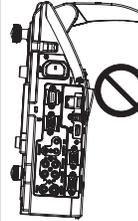
**⚠ WARNING** ▶ Never look into the projection lens or mirror while the projection lamp lights, since the projection lamp ray may cause a trouble on your eyes.

▶ Be careful not to pinch your finger with the lens door, to prevent an injury.

▶ Do not place the projector vertically with the lens door open as shown in the figure on the right. It could cause malfunction or injury.

▶ Do not stand under the projector mounted on the wall or ceiling, when its lens door is opening or closing. Moreover, do not look at the mirror when the lens door is opening or closing.

▶ Never touch a lens door or mirror. If the mirror is broken, the projected image will be distorted. Close the lens door, and contact your dealer.

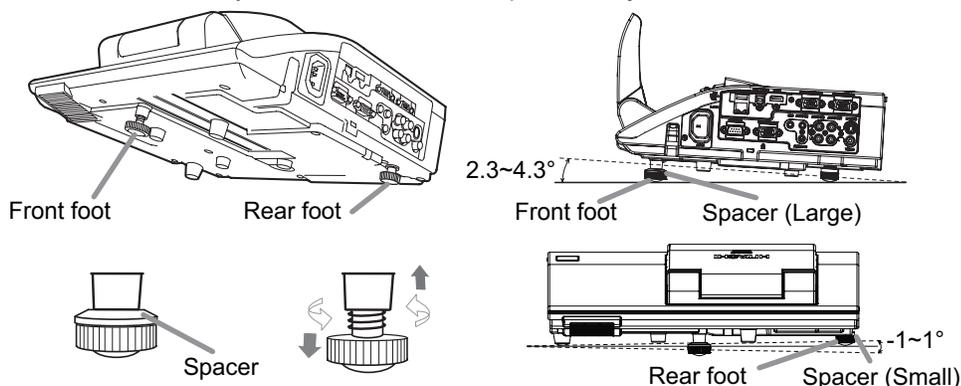


**NOTE** • Please power on the projector prior to the connected devices.

• The projector has the DIRECT POWER ON function, which can make the projector automatically turn on. For more information, please see the “Operating Guide” in the CD.

## Adjusting the projector's elevator

The projector has Front foot for inclinations and Rear foot for horizontals. Spacers on the each elevator foot are installed at the time of shipment, and projector is in a condition to be able to just project. If necessary, detach the spacer, and the elevator feet can be manually twisted to make more precise adjustments.

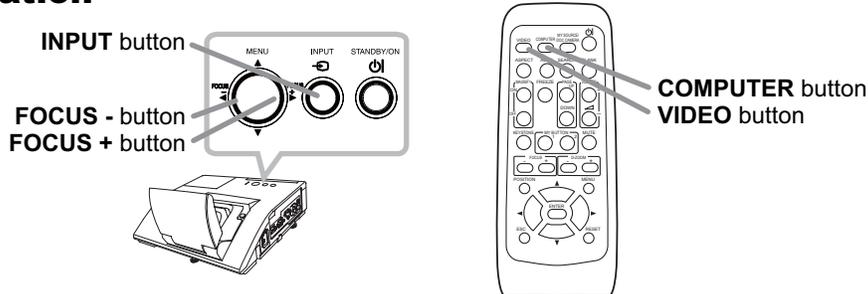


**⚠ WARNING** ▶ Keep the spacers away from children and pets. Be careful not to let them swallow the spacers. If swallowed consult a physician immediately for emergency treatment.

**NOTE** • The adjustment angle can be adjusted up to plus or minus 1° each of Front and Rear foot.

• After the foot is adjusted, it is possible to return it to the state of the shipment with a spacer. Install Large on the Front foot and Small on the Rear foot of the spacer. If change the setting place of the projector, it will recommend keep and reuse the spacers.

## Operation



## Displaying and switching the image

Press the **INPUT** button on the projector. Each time you press the button, the projector switches its input port in turn. You can also use the remote control to select an input signal. Press the **VIDEO** button for selecting an input signal from the **HDMI**, **S-VIDEO** or **VIDEO** port, or the **COMPUTER** button for selecting an input signal from the **COMPUTER IN1**, **COMPUTER IN2**, **LAN**, **USB TYPE A** or **USB TYPE B** port.

## Focusing

Use the **FOCUS +** and **FOCUS -** buttons on the projector or remote control to adjust the screen focus.

## Selecting an aspect ratio

Each time you press the **ASPECT** button on the remote control, it switches the aspect ratio of the image, in turn.

## Zooming

Use the **D-ZOOM +** and **D-ZOOM -** buttons on the remote control to adjust the screen size.

## Adjusting the picture position

After pressing the **POSITION** button on the remote control, use the **▲**, **▼**, **◀** and **▶** buttons. Press the **POSITION** button again to finish this operation.

## Correcting distortion

Press the **KEystone** button on the remote control. A dialog will appear on the screen to aid you in correcting the distortion.

Use the **▲/▼** cursor buttons to select, **MANUAL** or **PERFECT FIT** operation, and press the **▶** button to perform the following.

**MANUAL** displays a dialog for keystone correction.

**PERFECT FIT** displays a dialog for adjusting the shape of the projected image in each of the corners and sides.

Use the cursor buttons according to the dialog, checking the image.

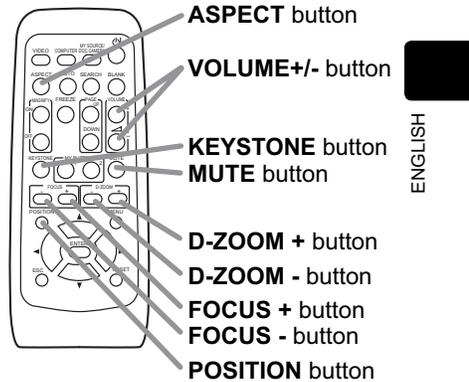
Press the **KEystone** button again to finish this operation.

## Adjusting the volume

Use the **VOLUME +/-** buttons to adjust the volume.

## Muting the sound

Press the **MUTE** button on the remote control. To restore the sound, press the **MUTE** or **VOLUME +/-** button.



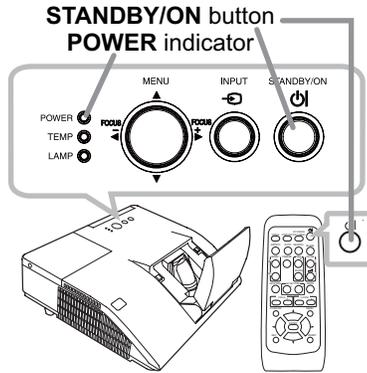
**⚠ CAUTION ▶** If you wish to have a blank screen while the projector's lamp is on, use the **BLANK** function (see the Operating Guide).

Any other method of blocking the projection light, such as attaching something to the lens or placing something in front of the lens, may cause the damage to the projector.

**NOTE** • The **ASPECT** button does not work when no proper signal is inputted.  
• For details, see the Operating Guide in the CD.

## Turning off the power

1. Press the **STANDBY/ON** button on the projector or the remote control.  
The message “Power off?” will appear on the screen for about 5 seconds.
2. Confirm that there is nothing that the lens door hits while closing. Press the **STANDBY/ON** button again while the message appears.  
The projector lamp will go off, and the **POWER** indicator will begin blinking in orange. Then the **POWER** indicator will stop blinking and light in steady orange when the lamp cooling is complete.



Do not turn the projector on for about 10 minutes or more after turning it off. Also, do not turn the projector off shortly after turning it on. Such operations might cause the lamp to malfunction or shorten the lifetime of some parts including the lamp.

- ⚠ WARNING** ▶ Be careful not to pinch your finger with the lens door, to prevent an injury.
- ▶ Do not touch around the lamp cover and the exhaust vents during use or just after use, since it is too hot.
  - ▶ Remove the power cord for complete separation. The power outlet should be close to the projector and easily accessible.

**NOTE** • Please power off the projector after any connected devices are powered off.

- This projector has the AUTO POWER OFF function that can make the projector turn off automatically. For more information, please see the “Operating Guide” in the CD.

## Replacing the lamp

A lamp has finite product life. Using the lamp for long periods of time could cause the pictures darker or the color tone poor. Note that each lamp has a different lifetime, and some may burst or burn out soon after you start using them.

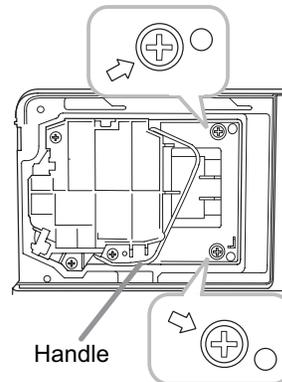
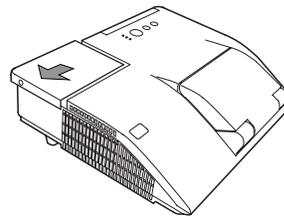
Preparation of a new lamp and early replacement are recommended. To prepare a new lamp, make contact with your dealer and tell the lamp type number.

**Type number : DT01181**

1. Turn the projector off, and unplug the power cord. Allow the projector to cool for at least 45 minutes.
2. Prepare a new lamp. If the projector is mounted on a wall or ceiling, or if the lamp has broken, also ask the dealer to replace the lamp.

**In case of replacement by yourself, follow the following procedure.**

3. Loosen the screw (marked by arrow) of the lamp cover and then slide and lift the lamp cover to the side to remove it.
4. Loosen the 2 screws (marked by arrow) of the lamp, and slowly pick up the lamp by the handle. Never loosen any other screws.
5. Insert the new lamp, and retighten firmly the 2 screws of the lamp that are loosened in the previous process to lock it in place.
6. While putting the interlocking parts of the lamp cover and the projector together, slide the lamp cover back in place. Then firmly fasten the screw of the lamp cover.
7. Turn the projector on and reset the lamp time using the LAMP TIME item in the OPTION menu.
  - (1) Press the **MENU** button to display a menu.
  - (2) Point at the **ADVANCED MENU** in the menu using the **▼/▲** button, then press the **▶** button.
  - (3) Point at the **OPTION** in the left column of the menu using the **▼/▲** button, then press the **▶** button.
  - (4) Point at the **LAMP TIME** using the **▼/▲** button, then press the **▶** button. A dialog will appear.
  - (5) Press the **▶** button to select "OK" on the dialog. It performs resetting the lamp time.



**⚠ CAUTION** ▶ Do not touch any inner space of the projector, while the lamp is taken out.

**NOTE** • Please reset the lamp time only when you have replaced the lamp, for a suitable indication about the lamp.

## Replacing the lamp (continued)

 **HIGH VOLTAGE**    **HIGH TEMPERATURE**    **HIGH PRESSURE**

**⚠ WARNING** ► The projector uses a high-pressure mercury glass lamp. The lamp can break with a loud bang, or burn out, if jolted or scratched, handled while hot, or worn over time. Note that each lamp has a different lifetime, and some may burst or burn out soon after you start using them. In addition, if the bulb bursts, it is possible for shards of glass to fly into the lamp housing, and for gas containing mercury and dust containing fine particles of glass to escape from the projector's vent holes.

► **About disposal of a lamp:** This product contains a mercury lamp; do not put it in a trash. Dispose of it in accordance with environmental laws.

- For lamp recycling, go to [www.lamprecycle.org](http://www.lamprecycle.org) (in the US).
- For product disposal, consult your local government agency or [www.eiae.org](http://www.eiae.org) (in the US) or [www.epsc.ca](http://www.epsc.ca) (in Canada).

For more information, ask your dealer.



Disconnect  
the plug  
from the  
power  
outlet

- If the lamp should break (it will make a loud bang when it does), unplug the power cord from the outlet, and make sure to request a replacement lamp from your local dealer. Note that shards of glass could damage the projector's internals, or cause injury during handling, so please do not try to clean the projector or replace the lamp yourself.
- If the lamp should break (it will make a loud bang when it does), ventilate the room well, and make sure not to inhale the gas or fine particles that come out from the projector's vent holes, and not to get them into your eyes or mouth.
- Before replacing the lamp, turn the projector off and unplug the power cord, then wait at least 45 minutes for the lamp to cool sufficiently. Handling the lamp while hot can cause burns, as well as damaging the lamp.



- Never unscrew except the appointed (marked by an arrow) screws.
- Do not open the lamp cover while the projector is mounted on a wall or ceiling. This is dangerous, since if the lamp's bulb has broken, the shards will fall out when the cover is opened. In addition, working in high places is dangerous, so ask your local dealer to have the lamp replaced even if the bulb is not broken.
- Do not use the projector with the lamp cover removed. At the lamp replacing, make sure that the screws are screwed in firmly. Loose screws could result in damage or injury.



- Use only the lamp of the specified type. Use of a lamp that does not meet the lamp specifications for this model could cause a fire, damage or shorten the life of this product.
- If the lamp breaks soon after the first time it is used, it is possible that there are electrical problems elsewhere besides the lamp. If this happens, consult your local dealer or a service representative.
- Handle with care: jolting or scratching could cause the lamp bulb to burst during use.
- Using the lamp for long periods of time, could cause it dark, not to light up or to burst. When the pictures appear dark, or when the color tone is poor, please replace the lamp as soon as possible. Do not use old (used) lamps; this is a cause of breakage.

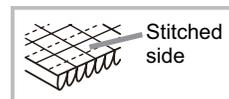
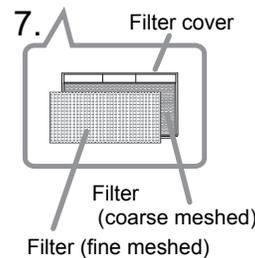
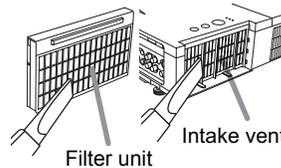
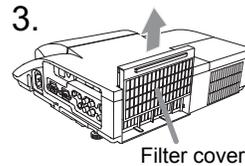
## Cleaning and replacing the air filter

The air filter has two kinds of filters inside. Please check and clean the air filter periodically. When the indicators or a message prompts you to clean the air filter, comply with it as soon as possible. If the filters are damaged or heavily soiled, replace them with the new ones. To prepare the new filters, make contact with your dealer and tell the following type number.

**Type number : UX37191 (Filter set)**

When you replace the lamp, please replace the air filter. An air filter of specified type will come together with a replacement lamp for this projector.

1. Turn the projector off, and unplug the power cord. Allow the projector to sufficiently cool down.
2. Use a vacuum cleaner on and around the filter cover.
3. Slide the filter unit upward to take it off from the projector.
4. Use a vacuum cleaner for the filter vent of the projector.
5. Take the fine meshed filter out while holding the filter cover. It is recommended to leave the coarse meshed filter in the filter cover as it is.
6. Use a vacuum cleaner on both sides of the fine meshed filter while holding it so it will not be sucked in. Use a vacuum cleaner for the inside of the filter cover to clean up the coarse meshed filter. If the filters are damaged or heavily soiled, replace them with new ones.
7. Put the fine meshed filter on the coarse meshed one, turning its stitched side up.
8. Put the filter unit back into the projector.
9. Turn the projector on and reset the filter time using the FILTER TIME item in the EASY MENU.
  - (1) Press the **MENU** button to display a menu.
  - (2) Point at the FILTER TIME using the **▼/▲** button, then press the **▶** button. A dialog will appear.
  - (3) Press the **▶** button to select "OK" on the dialog. It performs resetting the filter time.



- ⚠ WARNING ▶** Before taking care of the air filter, make sure the power cable is not plugged in, then allow the projector to cool sufficiently.
- ▶ Use only the air filter of the specified type. Do not use the projector without the air filter or the filter cover. It could result in a fire or malfunction to the projector.
  - ▶ Clean the air filter periodically. If the air filter becomes clogged by dust or the like, internal temperatures rise and could cause a fire, a burn or malfunction to the projector.

**NOTE** • Please reset the filter time only when you have cleaned or replaced the air filter, for a suitable indication about the air filter.

- The projector may display the message such as the "CHECK THE AIR FLOW" or turn off the projector, to prevent the internal heat level rising.

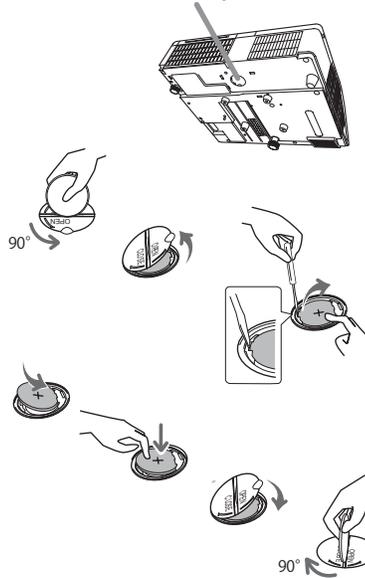
## Replacing the internal clock battery

This projector has internal clock that uses a battery. When the clock of the network function does not work correctly, please try solution by replacement of the battery:

**HITACHI MAXELL**, part number **CR2032** or **CR2032H**.

Battery Cover

1. Turn the projector off, and unplug the power cord. Allow the projector to cool sufficiently.
2. After making sure that the projector has cooled adequately, slowly turn over the projector, so that the bottom is facing.
3. Turn the battery cover fully in the direction indicated "OPEN" using a coin or the like, and pick the cover up to remove it.
4. Pry up the battery using a flathead screwdriver or the like to take it out. While prying it up, put a finger lightly on the battery since it may pop out of the holder.
5. Replace the battery with a new **HITACHI MAXELL**, Part No. **CR2032** or **CR2032H**. Slide the battery in under the plastic claw, and push it into the holder until it clicks.
6. Replace the battery cover in place, then turn it in the direction indicated "CLOSE" using such as coins, to fix.



**NOTE** • The internal clock will be initialized by removing the battery. For setting the clock, see "Network Guide". (☞ 20, 22)

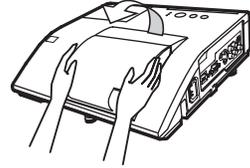
**⚠ WARNING** ► Be careful of handling a battery, as a battery can cause explosion, cracking or leakage, which could result in a fire, an injury, and environment pollution.

- Use only the specified and perfect battery. Do not use a battery with damage, such as a scratch, a dent, rust or leakage.
- When replacing the battery, replace it with a new battery.
- When a battery leaked, wipe the leakage out well with a waste cloth. If the leakage adhered to your body, immediately rinse it well with water. When a battery leaked in the battery holder, replace the batteries after wiping the leakage out.
- Make sure the plus and minus terminals are correctly aligned when loading a battery.
- Do not work on a battery; for example recharging or soldering.
- Keep a battery in a dark, cool and dry place. Never expose a battery to a fire or water.
- Keep a battery away from children and pets. Be careful for them not to swallow a battery. If swallowed consult a physician immediately for emergency treatment.
- Obey the local laws on disposing a battery.

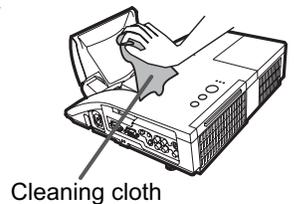
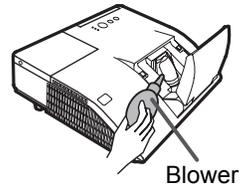
## Caring for the mirror and lens

If the projection mirror or lens is flawed, soiled or fogged, it could cause deterioration of display quality. Please take care of the mirror and lens, being cautious of handling.

1. Turn the projector off and unplug the power cord from the power outlet. And cool the projector down by leaving it for a while as it is.
2. The lens door can be opened manually. Please hold both side of the lens door and slowly open it until it is locked with clicking sound.
3. Wipe softly the mirror and lens with a damped soft cleaning cloth for lens on the market, being careful not to give any damage on the mirror and lens. For around edge of the mirror and lens where might be difficult to be wiped out, please use an air blower for cameras on the market to clean up.
4. To close the lens door properly, please take the following procedure.
  - (1) Insert the power cord with the lens door opened.
  - (2) The power indicator will light in orange, and the lens door closes automatically. Do not touch the lens door when the door is closing. Do not allow anything to obstruct the lens door.



ENGLISH



### NOTE

- When the lens door is closed manually, it may not shut properly.
- The lens door may not close when the LENS DOOR LOCK function of the SERVICE item in the OPTION menu is set to ON. For more information, please see the "Operating Guide" on the CD.

⚠ **WARNING** ▶ Before caring for the projection mirror and lens, turn the projector off and unplug the power cord, then cool the projector sufficiently.  
▶ Do not use a vacuum cleaner to clean the projection mirror or lens, since it might give some damage.  
▶ Do not use cleaners or chemicals other than those specified in this manual. Pay special attention to the mirror and lens as these materials could cause serious damage to either.

⚠ **CAUTION** ▶ Be careful not to pinch your finger with the lens door, to prevent an injury.

## **Appendix V - Installations shots**

