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The following projector manual has not been modified or altered in any way.



# HT221



## Users Manual v1.0

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Complies with part 15 of the FCC rules. Operation is subject to:

1. This device may not cause harmful interference
2. This device must accept any interference received including interference that may cause undesired operation.

**WARNING:** TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE THE COVER, NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

**WARNING:** TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

## IMPORTANT SAFEGUARDS

These safety instructions are to ensure the long life of your projector and to prevent fire and shock. Please read them carefully and heed all warnings.

### Installation

- For best results, use your projector in a darkened room.
- Place the projector on a flat, level surface in a dry area away from dust and moisture or hang it from the ceiling with an approved mount kit.
- Do not place your projector in direct sunlight, near heaters or heat radiating appliances.
- Exposure to direct sunlight, smoke or steam can harm internal components.
- Handle your projector carefully. Dropping or jarring can damage internal components.
- Do not place heavy objects on top of the projector.
- If installing the projector in the ceiling:
  - The ceiling must be strong enough to support the projector.
  - The installation must be in accordance with any local building codes.
  - The projector must be installed by qualified Knöll dealer personnel.

### Power Supply

- The Projector is designed to operate on a power supply of 100-120 or 220-240 V 50/60 Hz AC. Ensure the mains power fits this requirement before attempting to use your Projector.
- Handle the power cable carefully and avoid excessive bending. A damaged cord can cause electric shock or fire.
- If the projector is not to be used for an extended period of time, disconnect the plug from the power outlet.

### Cleaning

- Unplug the projector before cleaning.
- Clean the cabinet periodically with a damp cloth. If heavily soiled, use a mild detergent. Never use strong detergents or solvents such as alcohol or thinner.
- Use a blower or lens cloth to clean the lens and be careful not to scratch the lens.

### Lamp Replacement

- Be sure to replace the lamp when the Status light comes on. If you continue to use the lamp after 1000 hours of use, the lamp will turn off.
- Allow **a minimum of one minute** to elapse between turning the lamp off and on. High voltage is applied to the lamp immediately when the power is turned on. Turning the power off and quickly back on may shorten the lamp life lamp and result in damage to the projector.

### Fire and Shock Precautions

- Ensure there is sufficient ventilation and the vents are unobstructed to prevent heat buildup inside the Projector. Allow at least 10cm (3”) of space between your projector and a wall.
- Prevent foreign objects such as paper clips and bits of paper from falling into your projector. Do not attempt to retrieve any objects that might fall into your projector. Do not insert any metal objects such as a wire or screwdriver into your projector. If something should fall into your projector, disconnect it immediately and have the object removed by a qualified Knöll service person.
- Do not place any liquids on top of your projector.
- **Do not look into the lens while the projector is on. Serious eye damage could result.**

## Table of Contents

<b>2</b>	<b>IMPORTANT SAFETY INFORMATION</b>
3	Table of contents
<b>4</b>	<b>Basic information</b>
4	Features
5	Remote control
<b>6</b>	<b>Connection Panel</b>
6	Projector part identification
7	Projector positioning
8	Connecting video equipment
9	Connecting a PC or Macintosh
10	Using the remote control as a computer mouse
<b>11</b>	<b>Using the projector</b>
12	Selecting the input source
14	Turning the projector off
14	Changing the computer's video resolution
15	Freezing and enlarging the picture
16	Menu operations
16	Selecting input sources (more)
17	Selecting the projection type
17	Selecting a display language
17	Adjusting the volume
17	Selecting the background
<b>18</b>	<b>Quick starting the projector</b>
18	Adjusting the image from the source connected to the RGB IN connector
19	Timing Chart
20	Adjusting the picture elements
22	Selecting the picture type
23	Activating the power saving function
23	Activating the on-screen function
23	Turning the projector off with the screen functions
24	Checking hours of lamp use
24	Resetting all to the factory settings
<b>25</b>	<b>Specifications</b>
25	D-Sub pin assignments
26	Troubleshooting
27	When the STATUS indicator lights or blinks
28	Replacing the lamp housing

## Basic HT221 Information

### **Congratulations On Your Purchase of the HT221 Projector!**

The HT221 is one of the very best Projectors available today. The HT221 enables you to project precise images up to 300 inches across (measured diagonally) from your PC or Macintosh computer (desktop or notebook), VCR, document camera, laser disc player, DVD player, etc. The Projector can be placed on a tabletop or cart, or permanently mounted on the ceiling. You may use the Projector to project images from behind the screen. The supplied remote control can be used as wireless control and with the supplied mouse receiver to operate the mouse functions on your PC or Macintosh.

### **The features you'll enjoy...**

- **Compatible with following various color systems:**
  - NTSC (U.S. and Canada standard)
  - PAL (Western Europe and Australia/New Zealand standard)
  - SECAM (France and Eastern Europe standard)
  - NTSC4.43 (Middle East country standard)
- **Superior brightness of 1300 ANSI lumens with small size and 2.6 kilograms**

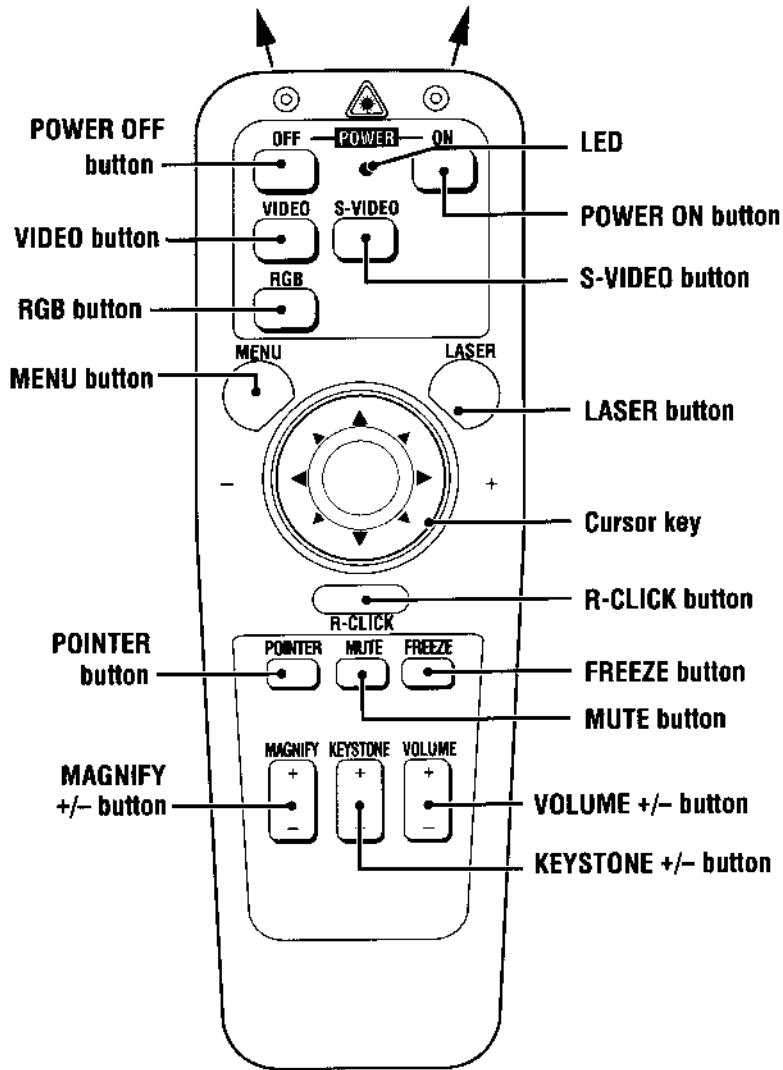
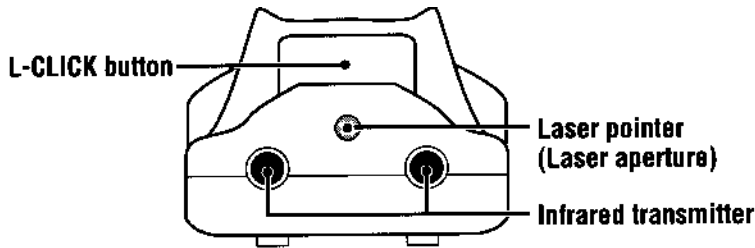
The DMD and our own optical design interact in a geometric effect to increase the light usage efficiency. Now you can reproduce the 3 basic colors (RGB) required for color reproduction on a single DMD. That means superior brightness, smaller size and lighter weight.
- **Sharp, clear images**

There is no RGB color separation, and the spaces between the individual pixels are not noticeable. That means sharp and clear reproduction of small characters and figures. Take a closer look and notice the difference in quality!
- **Outstanding beauty when reproducing DVDs and other high picture-quality information sources**

Faithful gray scale reproduction makes for more natural image displays. DVD and other high quality image sources bring out the true display capacity of the Projector.
- **Screen not distorted to a trapezoid (keystoning) when projecting to the height of the line of vision**

Because the projection position is already set to the height of the line of vision, there is no distortion of the screen to a trapezoid. Keystone is 13 °, which can be varied.
- **Fully compatible with true XGA using advanced intelligent compression technology**

The advanced intelligent compression technology of the HT221 enables it to present clear XGA images without any line omission.
- **The remote control can be used to operate your PC or Macintosh when the supplied remote mouse receiver is connected.**



## Remote Control

### Inserting the batteries

- 1) Press firmly and slide the battery cover off.
- 2) Insert the supplied two batteries (size AA/R6). Ensure that the polarities (+ and -) of the batteries are aligned correctly. Always replace batteries with fresh alkaline type.
- 3) Slip the cover back over the batteries until it snaps into place.

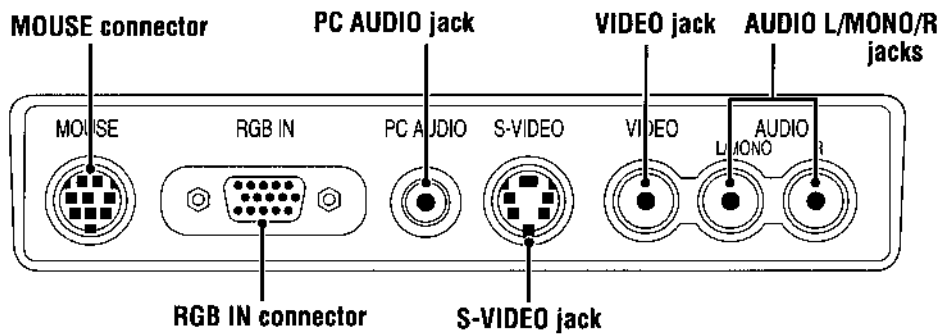
### Notes

- If the remote control gets wet, wipe it dry immediately.
- Avoid excessive heat and humidity.
- If you will not be using the remote control for a long time, remove the batteries.
- Do not mix new and old or different types of batteries.
- There are operations that can only be carried out by remote control. Handle the remote control carefully.

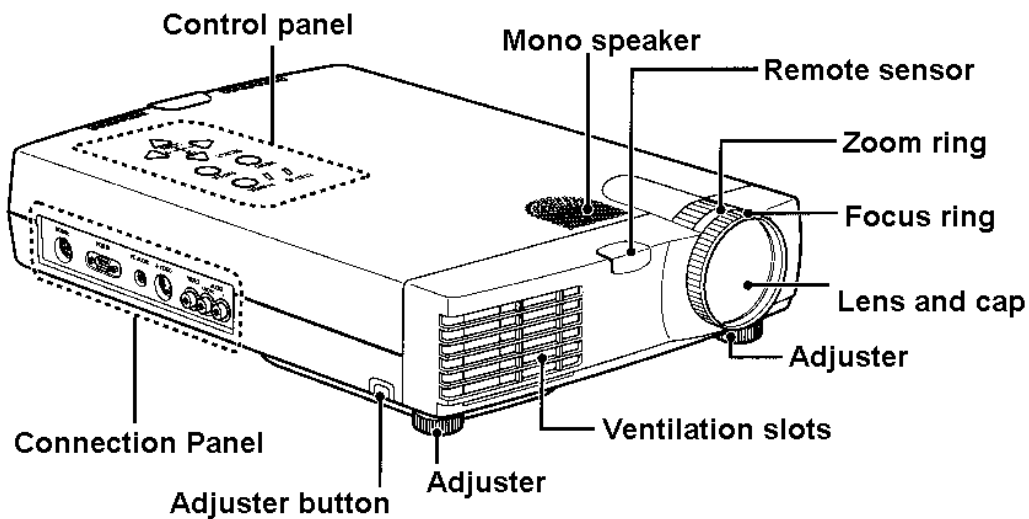
### Remote control effective range

Each side of the projector has a remote sensor. The controllable range is 50 degrees horizontally and 30 degrees vertically relative to a line that is at a right angle to the remote sensor. And the distance between the point of the remote control and remote sensor must be no more than four to five meters (about 15').

## Connection Panel



## Projector Part Identification



## Installation

The distance from the projector lens to the screen determines the size of the projected image, therefore, you need to consider the place where you set up the projector and screen before making connections. You also need to consider the screen size and height of the unit and screen as other important factors.

**Tip:** Although not advised, a non-glossy wall may be used as a substitute for a screen.

## WARNING

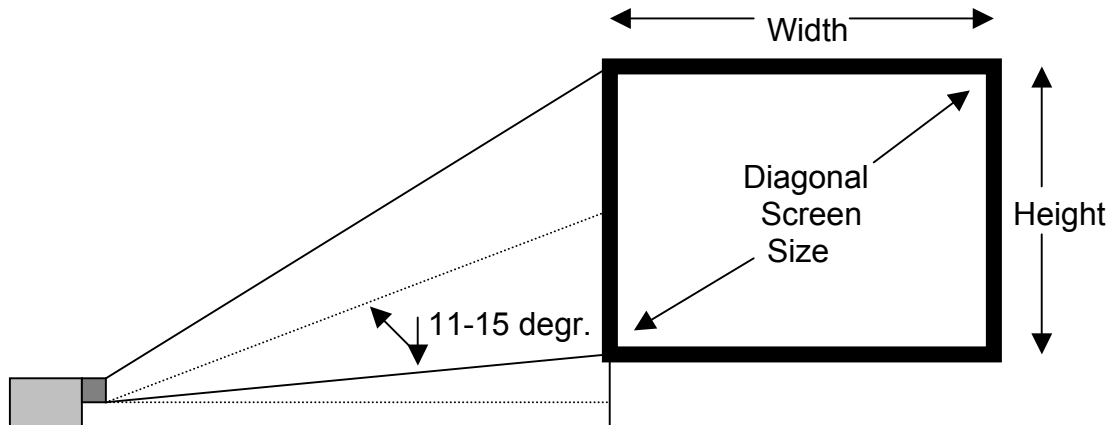
- **Carrying The Projector**

Ensure that the power cord and any other cables connecting to video sources are disconnected before moving the projector. When moving the projector or when it is not in use, cover the lens with the lens cap.

- Only use your Projector on a solid flat level surface. If the projector falls to the ground, you can be injured and the projector severely damaged.
- Do not use the Projector where temperatures vary greatly. The projector must be used at temperatures between 5 degree Celsius (41 degree Fahrenheit) and 35 degree Celsius (95 degree Fahrenheit).
- Do not expose the Projector to moisture, dust, or smoke. This may harm the image.
- Ensure that you have adequate ventilation around your Projector to allow heat dissipation. Do not cover the vents on the bottom or the side of the projector.

## Projector Positioning

The projected image becomes larger as the distance between the unit and screen increases. The minimum image size is about 25 inches (0.64m) diagonally at a distance of about 1.2m (3.9 feet) and the maximum size is about 300 inches (7.6m) at a distance of 12.3m (40.4 feet) from the screen.



Use the following information to position the projector. Horizontally the projector needs to be positioned with the lens-centered left to right

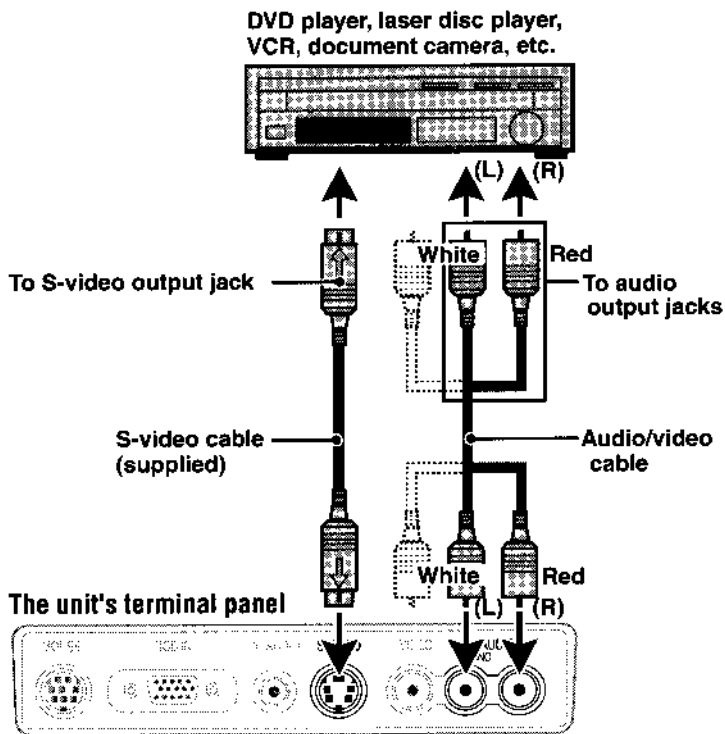
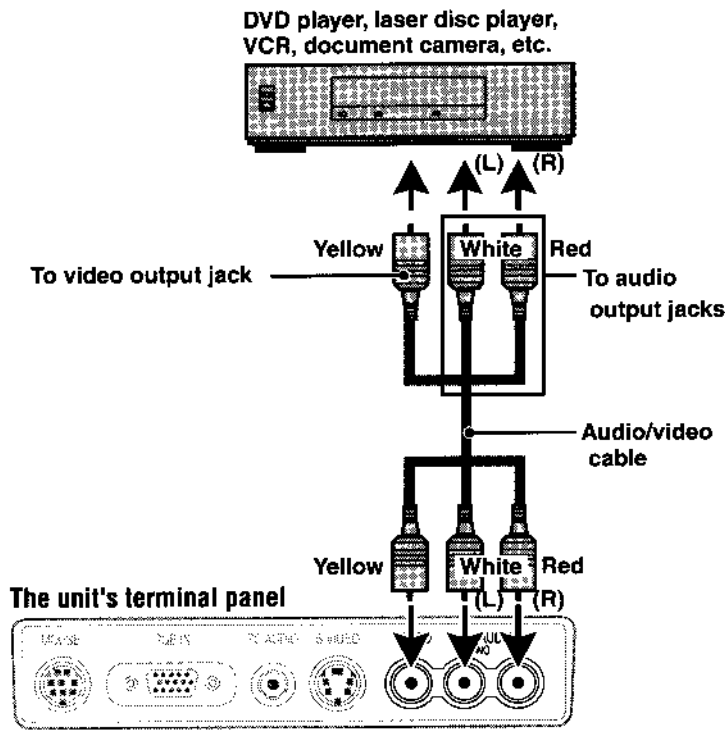
## Projection Distance 4:3 Video Screen

<b>Screen Diag.</b>	72"	78"	84"	100"	120"	160"	300"
<b>Min. Distance</b>	114"	123"	133"	158"	190"	253"	474"
<b>Max. Distance</b>	139"	151"	162"	193"	232"	309"	579"
<b>Drop or rise</b>	8.4"	9.1"	9.8"	11.5"	13.75"	18.3"	35"

**Note:** Maximum distance to screen is 1.93 x screen diagonal.

Minimum distance to screen is 1.58 x screen diagonal.





## Connecting Video Equipment

You can connect a document camera, VCR, laser disc player, and DVD player, etc.

### Connecting to the VIDEO IN VIDEO/S-VIDEO JACKS

You can connect up to two pieces of video equipment to the VIDEO IN jacks following the illustration below. Two types of connections can be made. Connect either using the cables indicated in dotted lines or those in gray as shown in the drawing below.

- You can switch the input source (picture) to VIDEO or S-VIDEO even if you connect more than one piece of equipment. S-VIDEO connection provides more vivid color and higher resolution compared to VIDEO connection.
- You can output the sound of one component through the unit speaker even when two components are connected.

### Before connecting

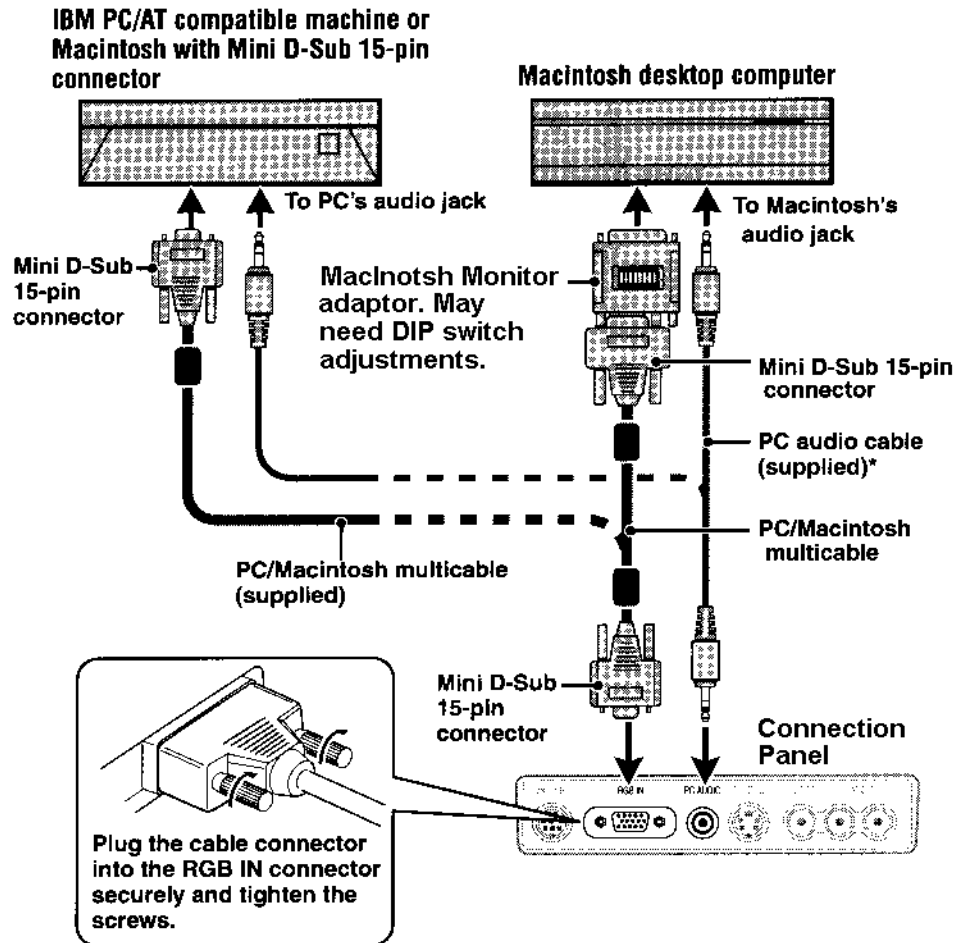
- Turn off the components that are to be connected.
- The unit and computer will be turned on in "Using the Projector" on page 13. Do not turn on either the computer or unit until you read this section.

- Please also refer to the manual of the video component to be connected.

**Connecting a PC or Macintosh to the Projector enables computer images for impressive presentations.**

- The following display standards are supported:
 

VGA 640x480 for graphics	VGA 640x400 for graphics	XGA 1024x768
VGA 640x350 for graphics	VGA 720x400 for text	Mac 1024X768
VGA 720x350 for text	SuperVGA 800x600	
Macintosh at 640x480	Macintosh at 832x624	



- If your PC does not support XGA you will need to install a XGA graphics board. Consult your computer's owner's manual for your XGA configuration. If you need to install a new board, refer to the manual supplied with your new graphics board for installation instructions

**Notes**

- Refer to the owner's manual supplied with your computer for more information about the video output requirements of the computer and any special identification or configuring required by the projector image and monitor.
- Some Macintosh PowerBooks may need to set the mirroring to off to output 800x600 dot signals. Please consult your PowerBook manual or computer dealer for details.

**Before connecting**

- Turn off the components that are to be connected.
- The projector and computer will be turned on in "Using the Projector" on page 13. Do not turn on either the computer or unit until you read this section.
- Please also refer to the manual of the video component to be connected.

**PowerBook Connection** Depending on the model of your PowerBook, the additional Apple video cable adaptor may be required with the above connection.

**Modifying the DIP switch (for Macintosh) setting**

Modify the DIP switch setting on the MAC cable as shown below.

**Macintosh adapter cable DIP switch setting (o=ON)**

MONITOR	RESOLUTION	1	2	3	4	5	6
	Multiple scan 21	o	o				o
	Multiple scan 17	o	o			o	
	Multiple scan 16	o	o			o	o
	VGA/SVGA			o	o		
21" Color	1152x870	o	o	o	o		
19" Color	1024x768		o	o			
16" Color	832x624		o		o		
13" Color	640x480	o	o				

**Some examples of DIP switch settings:**

Inch 13



Multiple Scan 17



VGA/SVGA



**Using the remote control as a computer mouse - Wireless mouse function**

The supplied remote mouse receiver enables you to operate your computer's mouse functions from the remote control. It is a great way to control your computer-generated presentations.

- The cursor key on the remote control operates the computer mouse functions.
- If a Windows computer is connected, the L-CLICK button on the remote control operates as the computer mouse left click button and the R-CLICK button as the computer mouse right click button.
- If the Macintosh computer is connected, the L-CLICK and R-CLICK buttons operate in the same way as the computer mouse click button.
- While the menu is displayed on the screen, the cursor key, L-CLICK and R-CLICK buttons will operate to control the menu.

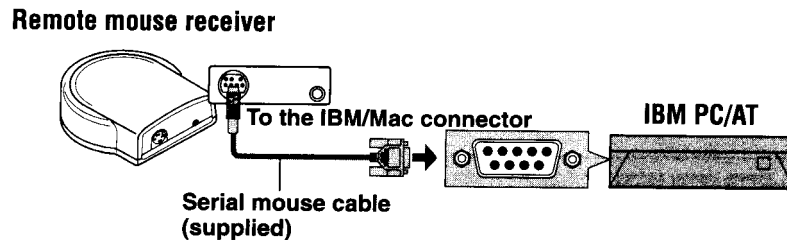
**Before connecting:**

- Turn off the computer, and then remove the current mouse.
- Connect the computer and remote mouse receiver with the supplied serial mouse cable as shown in the above illustration.

- The projector and computer will be turned on as described in "Using the Projector" on page 13. Do not turn on either the computer or unit until you read this section.
- Please also refer to the manual of the computer to be connected.

### Connecting the remote mouse receiver to an IBM PC/AT computer

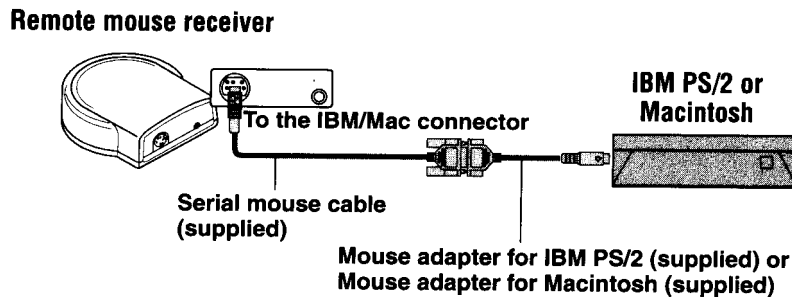
Connect the IBM/Mac connector on the remote mouse receiver and PC's mouse port with the supplied serial cable.



### Connecting the remote mouse receiver to an IBM PS/2 or Macintosh computer

Connect the supplied serial cable to the IBM/Mac connector on the remote mouse receiver.

Connect the supplied mouse adapter to the other end of the serial cable and the computer mouse port. Note that two types of mouse adapters are supplied; one is for IBM PS/2 and the other is for Macintosh.



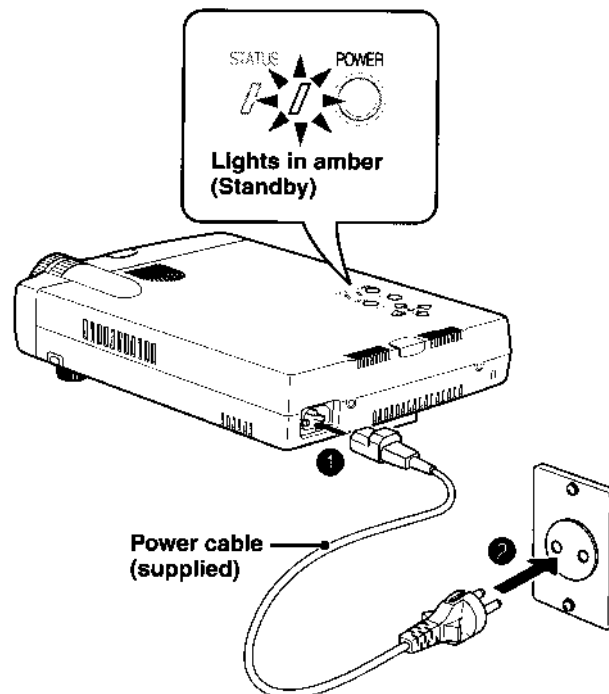
## Operation

### Using the Projector

#### Before starting

- Remove the lens cap from the lens. Please retain it because it must be replaced after use.
- Don't use the Projector in a bright room and don't expose the screen to direct sunlight or other strong light sources.

- 1) Connect the supplied power cable to the unit, then to the wall outlet (the mains). The **POWER** indicator on top of the unit lights in amber.



**2) Press the POWER ON button on the remote control or the POWER button on top of the unit to turn on the unit.**

The POWER indicator on top of the unit turns to green and start blinking. It will take one minute for the projector to be ready to use. Wait until the indicator stops blinking and lights steadily in green.

**Note:** While the POWER indicator is blinking, the unit doesn't turn off even if you press the POWER OFF button on the remote control or the POWER button on the unit.

**Tip:** If you set "AUTO START" to "ON" in the menu, the projector will turn on automatically after setting the POWER switch to on in step 1.

**3) Turn on the connected source (computer, VCR, DVD player, etc.).**

If you use a video component, start playback for screen/image adjustment.

**4) Press VIDEO, S-VIDEO, or RGB to select the input source.**

You can also select the input source with the menu operation.

**Notes**

- If the blue, black or focus pattern screen (the background type differs depending on the "BACKGROUND" setting.) is projected, check the following:
  - Is the source is properly connected to the unit?
  - Is the source component or computer turned on?
  - Is the video signals are coming to the projector?
- The video resolution of the connected computer can be changed.

**5) Adjust the position and height.**

Move the unit to the position where the projected image is horizontally centered to the screen.

**• When the projected image is offset horizontally**

Adjust the position of the unit so that the unit is square to the screen

**• When the projected image is offset vertically**

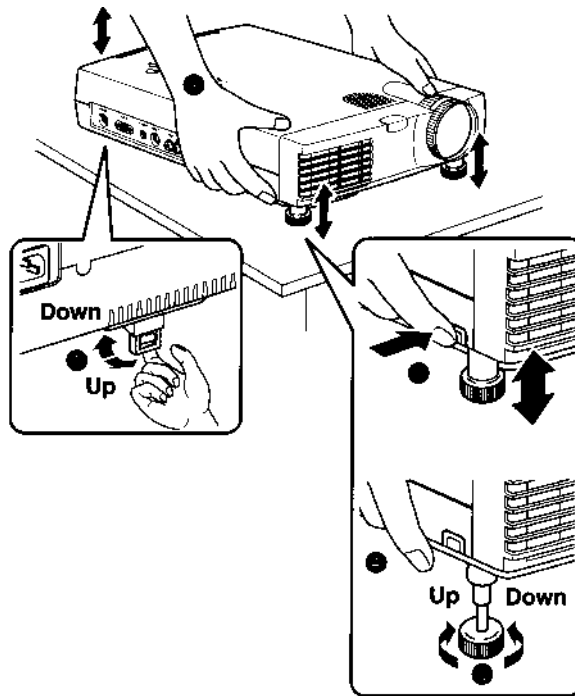
Adjust the height balance of the unit with the adjusters.

**Using the adjusters to adjust the height balance**

There are two front adjusters and a rear adjuster.

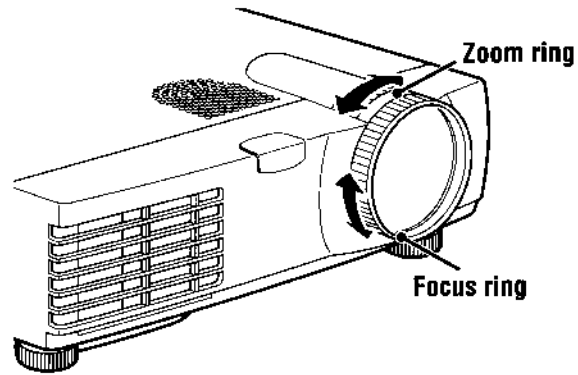
To lower the position of the screen, pull out the folded leg of the rear adjuster.

For the front adjusters, rotate each adjuster until the unit is vertically parallel to the screen.



If the vertical offset cannot be adjusted with the adjusters or the ceiling mount kit, press the **keystone +/-** key to correct for the offset. The maximum correction value is 29° including the optical correction.

6) Adjust the image size with the zoom ring lever, and then adjust the focus with the focus ring.



7) Change the unit setting to suit to the projecting method and selected source as described in step 4.

- **Select the type of projection**

- If the projected image is horizontally reversed or upside down, change the projection type. This setting can provide the correct image.
- Adjust the projected image from the source connected to the RGB IN connector. The resolutions most suitable to the incoming signals will automatically be selected. However, if any vertical banding, noise, dot interference, or crosstalk appears on the screen, adjust "PICTURE ADJ," then "FINE PICTURE" using the menus. You can also adjust the horizontal and vertical position of the image.

6) **Adjust the picture elements and select the picture type.**

You can adjust the picture elements; select the picture type according to the video contents.

7) **Start using the Projector.**

The following functions are available while using the Projector:

- **Adjusting the volume of the unit speaker,**
- **Using the laser pointer,**
- **Turning off the image and muting the sound temporarily,**
- **Freezing a moving picture, and**
- **Enlarging the picture.**

**Note**

If "POWER OFF" is set to "ON", the image will be turned off if the unit has been projecting a blank screen for five minutes with an RGB input source.

If the image is suddenly turned off while projecting a computer image, the computer's screen saver or the unit's POWER OFF function may be activated.

## Turning the Projector off

1)

Operating with the remote control:	<b>Press the POWER OFF button a little bit longer.</b>
Operating with the projector keypad	<b>Press the POWER button for 2-3 seconds.</b>

When the projector is turned off, the POWER indicator will start blinking then turn to amber in about one minute.

**\*\*\*Never disconnect the power cable while the POWER indicator is blinking.\*\*\***

2) **If the POWER indicator is lit in amber, the power cable may be disconnected.**

We suggest disconnecting the power cord if it is not to be used for an extended period.

## **Changing computer's video resolutions**

Depending on your computer's graphic capability, you may be able to select one of several resolutions. Generally a computer- either a PC or Macintosh- with 1 MB VRAM will run:

640 x 480 at 16.7 million colors (24 bit True color)

800 x 600 at 65,000 colors.

1024 x 768 at 256 colors.

As the resolution increases, the number of colors you can run decreases. With 2 MB VRAM a computer will run:

640 x 480 at 16.7 million colors (24 bit True color).

800 x 600 at 16.7 million colors (24 bit True color).

1024 x 768 at 65,000 colors.

1280 x 1024 at 256 colors.

### **Windows 95**

There are two methods you can use to change your resolution.

#### **Method 1**

1. Move your cursor to the background image and click.
2. In the "Properties" menu, select "Settings."
3. Change your resolution and click "OK."
4. You may be asked to reboot for the changes to take effect, or a message saying, "Windows is about to resize your display" may appear. You'll be asked if you want to keep your settings. Select "Yes."

#### **Method 2**

1. Click on your "My Computer" icon.
2. Open "Control Panel" and select "Display."
3. Change your resolution and click "OK." After the new resolution is selected.
4. You may be asked to reboot for the changes to take effect, or a message saying, "Windows is about to resize your display" may appear. You'll be asked if you want to keep your settings. Select "Yes."

### **Windows 3.1**

1. Click on the "Main" icon and open "Control Panel."
2. Select "Change System Settings" and click on "Option."
3. Choose "Change Display Settings."
4. Select the resolution you want.
5. Choose the current or desired drive.
6. Restart Windows for the changes to take effect.

### **Macintosh**

1. Under the Apple menu, select "Control Panels" and open "Monitors."
2. Click and open "Options."
3. Select your new resolution and click "OK."

### **Notebook computers and resolution standards**

This Projector is designed to project industry-standardized video such as VESA (Video Electronics Standards Association) or VGA (Video Graphics Array). Notebook computers do not use industry standards. They use whatever timing is necessary to match their local LCD display. The end result is typically not standard. By turning off your notebook's display, the timing parameters are a bit more like the real VESA or VGA signal.

## **Adjusting the volume of the projector speaker**

Press **VOLUME +** to increase the volume or **-** to decrease.

The volume can also be adjusted with the menu operation.

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## **Using the laser pointer**

You can highlight the desired point on the screen with the beamed red light.

**\*\*\*Caution\*\*\*** Do not look into the laser pointer while it is on. Do not point the laser beam at any other persons. This could result in serious eye damage or blindness.

Press the **LASER** button. The red laser light will be on while pressing the button.

---

## **Turning off the image and muting the sound temporarily**

Press the **MUTE** button. The image will turn off and the sound will be muted at the same time. To restore the picture and sound, press the **MUTE** button again.

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## **Freezing a moving picture**

You can capture the desired frame of the moving picture.

Press the **FREEZE** button. A still image of the current frame will be displayed. To restore the present picture, press the button again.

**Tip:** The still picture can also be enlarged (see next page).

---

## **Enlarging the picture**

You can enlarge a portion of the picture up to four times its normal size. The overall picture size will remain the same and the enlarged picture will completely fill the overall picture frame.

Press **MAGNIFY +**. While the button is pressed the picture is enlarged until it becomes a maximum of four times the normal size. Release the button at the desired size.

### **To reduce the size of the enlarged picture**

Press **MAGNIFY -**. While the button is pressed the picture is reduced until it becomes the normal size.

### **To move to the desired portion of the enlarged picture**

- 1) Press **POSITION**. The button lights in red. If you don't proceed to step 2 within ten seconds, the button goes off.
- 2) Press the desired portion of the cursor key while **POSITION** lights.  
The moving directions are indicated by the eight triangle marks on the cursor key. The picture will move in the direction pointed by the mark where you are pressing.  
**Note:** The full size image cannot be moved because the whole image is fully displayed.

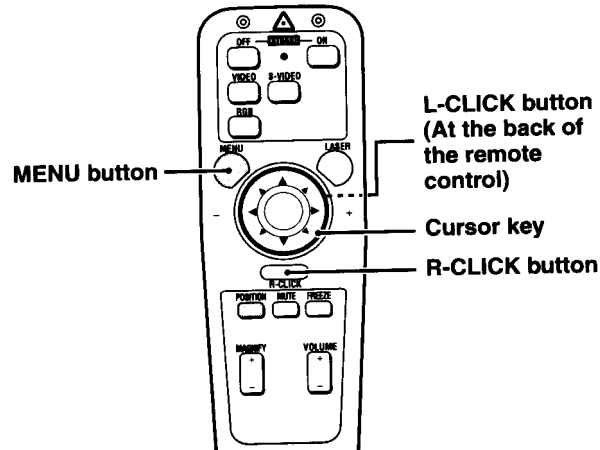
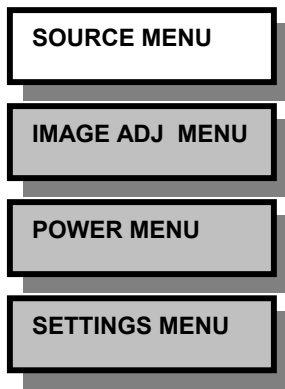


## Menu operation- Selecting the input source with the remote

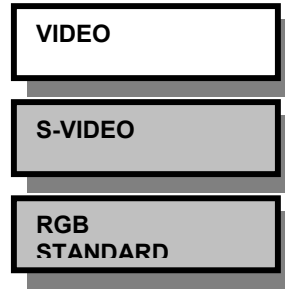
- 1) Press **MENU**. The button lights in red and the main menu appears on the screen. If you don't proceed to step 2 within ten seconds, the button goes off.

**Note:** The menu will not be displayed if the picture is enlarged even slightly. In such a case, reduce the picture size to normal before starting the menu operation.

- 2) Press the cursor up or down to select "SOURCE MENU."



- 3) Press **L-CLICK**. (the button on the remote bottom)  
The source menu appears on the screen.



- 4) Press the big round cursor up or down to select the desired input source.
- 5) Press **L-CLICK** again. The source you've selected in step 4 will be confirmed, then the picture from the selected source will be projected on the screen.
- 6) Press **R-CLICK** (the button next to the big round cursor key) to turn off the menu display.  
Whenever you wish to turn off the menu display, press **R-CLICK** button.

## Menu operation- Selecting the input source with the projector

The menu operation is explained above using the remote control. It can also be controlled with the projector keypad buttons. **The remote control and unit button comparison table**

Remote control buttons	Projector operation buttons
<b>MENU</b> The main menu appears on the screen when you press this button. To turn off any menu, press <b>R-CLICK</b> .	<b>MENU</b> The main menu appears on the screen when you press this button. To turn off any menu, press <b>R-CLICK</b> on the remote control.
<b>Cursor up or down key</b> Press either key to select the menu item.	<b>SELECT</b> Each press changes the menu item to the next.
<b>L-CLICK</b> Press this button whenever confirming operation is required.	<b>ENTER</b> Press this button whenever confirming operation is required.
<b>Cursor +/- key</b> Press either key to choose the setting or value of the selected menu item.	<b>ADJUST +/-</b> Press either button to choose the setting or value of the selected menu item.

## **Selecting the projection type; Floor, Ceiling, Rear and Front**

This reorients your image for your type of projection.

1. Press MENU to display the main menu.
2. Press the cursor up or down key to select "SETTING MENU."
3. Press L-CLICK to display the SETTING MENU.
4. Press the cursor up or down key to select "PROJECTION."
5. Press the cursor +/- key to select the projection type, which suits the Projector setup conditions.

The following four projection types can be selected:

- a. FRONT FLOOR (Normal).
  - b. REAR CEILING (Upside down and horizontally reversed).
  - c. REAR FLOOR (Horizontally reversed), or
  - d. FRONT CEILING (Upside down).
6. Press L-CLICK.

## **Selecting a display language**

1. Press MENU to display the main menu.
2. Press the cursor up or down key to select "SETTING MENU."
3. Press L-CLICK to display the SETTING MENU.
4. Press the cursor up or down key to select "LANGUAGE," then press the cursor + / - to select one of the following languages:

ENGLISH (English),  
DEUTSCH (German),  
FRANCAIS (French),  
ITALIANO (Italiano),  
ESPANOL (Spanish),  
SVENSKA (Swedish),  
JAPANESE

5. Press L-CLICK again.

## **Adjusting the volume**

The volume can also be adjusted with VOLUME +/- on the remote control.

1. Press MENU to display the main menu.
2. Press the cursor up or down key to select "IMAGE ADJ MENU."
3. Press L-CLICK to display the IMAGE ADJ MENU.
4. Press the cursor up or down key to select "VOLUME," then press the cursor +/- key to adjust the volume.

## **Selecting the background**

1. Carry out steps 1 to 3 in "Selecting the projection type" on the left column.
2. Press the cursor up or down key to select "BACKGROUND."
3. Press the cursor +/- key to select one of the following background types:
  - BLUEBACK,
  - BLACKBACK, or
  - FOCUS PATTERN.
4. Press L-CLICK.

### **Adjusting the image from the source connected to the RGB IN connector**

The Projector selects the most suitable resolutions as shown in the "Timing Chart" below according to the incoming signals from the RGB IN connector. However, you may need manual adjustment depending on the computer or video component connected to the RGB IN connector. If you have any of vertical banding, noise, dot interference, or crosstalk on the projected picture, adjust clock frequency with "PICTURE ADJ" then clock phase with "FINE PICTURE" (see next page). You can also adjust the horizontal and vertical position of the image.

### **Quick starting the projector**

The projector can be turned on by switching the main power on the unit (see step 1 on page 11). There is no need to press the remote control POWER ON button or the projector POWER button.

1. Press MENU to display the main menu.
2. Press the cursor up or down key to select "POWER MENU."
3. Press L-CLICK to display the POWER MENU.
4. Press the cursor up or down key to select "AUTO START," then press the cursor + key to select "ON" to activate the function.

To deactivate this function, set "AUTO START" to "OFF" by pressing the cursor – key.

### **Adjusting the image from the source connected to the RGB IN connector**

The Projector selects the most suitable resolutions as shown in the "Timing Chart" below according to the incoming signals from the RGB IN connector (When "RGB" is set to "STANDARD"). However, you may need manual adjustment depending on the computer or video component connected to the RGB IN connector. If you have any of vertical banding, noise, dot interference, or crosstalk on the projected picture, adjust clock frequency with "PICTURE ADJ" then clock phase with "FINE PICTURE" (see next page). You can also adjust the horizontal and vertical position of the image.

### Timing Chart

	Signal	Resolution	H. Sync. (kHz)	V. Sync. (Hz)	Dot Clock (MHz)
1	NTSC	640 x 480	15.734	59.94	-
2	PAL	768 x 576	15.625	50	-
3	SECAM	768 x 576	15.625	50	-
4	VESA	640 x 350	37.86	85.08	31.5
5	Mac	640 x 400	35	66	30.24
6	IBM	640 X 400	31.47	70	25.175
7	VESA	640 X 400	37.86	85.08	31.5
8	VESA	640 X 480	31.47	59.94	25.175
9	IBM	640 X 480	31.47	60	25.175
10	Mac	640 X 480	31.47	60	25.175
11	Mac	640 X 480	34.97	66.67	31.334
12	Mac	640 X 480	35	66.67	30.24
13	VESA	640 X 480	37.86	72.81	31.5
14	VESA	640 X 480	37.5	75	31.5
15	IBM	640 X 480	39.375	75	31.49
16	VESA	640 X 480	43.269	85.01	36
17	IBM	720 X 350	39.44	87.85	35.5
18	IBM	720 X 350	31.469	70.09	28.322
19	IBM	720 X 400	31.469	70.09	28.322
20	VESA	720 X 400	37.927	85.04	35.5
21	IBM	720 X 400	39.375	87.7	35.5
22	VESA	800 X 600	35.16	56.25	36
23	VESA	800 X 600	37.879	60.32	40
24	VESA	800 X 600	48.077	72.19	50
25	VESA	800 X 600	46.88	75	49.5
26	VESA	800 X 600	53.674	85.06	56.25
27	Mac	832 X 624	49.725	74.55	57.283 *
28	VESA	1024 X 768	48.363	60	65 *
29	VESA	1024 X 768	57.476	70.07	75
30	IBM	1024 X 768	58.131	72.03	79
31	Mac	1024 X 768	60.241	74.93	80 *
32	VESA	1024 X 768	60.023	75.03	78.75 *
33	Mac19	1024 X 768	74.93	60.241	80
34	NEC	1120 X 750	60.06	50.025	60.06
34	VESA	1280 X 960	85	85.938	148.5
36	Mac	1280 X 1024	60.38	64.31	107
37	NEC	1280 X 1024	59.93	64.603	107.5
38	Mac	1280 X 1024	69.89	74.882	118.5
39	HP	1280 X 1024	72.01	78.125	135
40	VESA	1280 X 1024	74.12	78.855	135
41	SUN	1280 X 1024	76.11	81.13	135

\* AccuBlend TM

The resolution of the Data Project is 1024 x 768. Other resolution images (e.g. 1280 x 1024) are compressed into 1024 x 768. In such a case, projected letters and lines on the screen might appear unevenly.

## **Adjusting the clock frequency (PICTURE ADJ) and clock phase (FINE PICTURE) manually**

When "AUTO PICTURE" is set to "ON," the clock frequency and clock phase will be adjusted automatically. However, if you need any manual adjustment for these two items, you first need to set "AUTO PICTURE" to "OFF" as indicated in the following steps. Adjust the clock frequency to eliminate any vertical banding, then clock phase to reduce any video noise, dot interference, or cross talk. (When clock phase is not matched evidently, the image appears to be shimmering.)

### **1. Setting the input source to "RGB"**

Select the input source RGB

### **2. Setting "AUTO PICTURE" to "OFF" for manual adjustment**

1. Press MENU to display the main menu.
2. Press the cursor up or down key to select "IMAGE ADJ MENU."
3. Press L-CLICK to display the IMAGE ADJ MENU.
4. Press the cursor up or down key to select "ALIGNMENT."
5. Press L-CLICK to display the ALIGNMENT menu.
6. Press the cursor up or down key to select "AUTO PICTURE."
7. Press the cursor - key to select "OFF," then press L-CLICK.  
"PICTURE ADJ" and "FINE PICTURE" appear below "AUTO PICTURE."

### **3. Adjusting the clock frequency**

1. Press the cursor up or down key to select "PICTURE ADJ."
2. Press the cursor - key until the vertical banding disappears.  
Press + to increase the frequency and - to decrease.

### **4. Adjusting the clock phase**

1. Press the cursor up or down key to select "FINE PICTURE."
2. Press the cursor +/- key until the video noise, dot interference, and cross talk are reduced.  
Press + to increase the number and - to decrease the number.

### **If the image (and the menu) has disappeared while setting the clock frequency or clock phase, please carry out the following steps:**

1. Turn off the source connected to the RGB IN connector. The incoming signals from the source go down and blue, black, or focus pattern screen (the background type differs depending on the "BACKGROUND" setting will be displayed).
2. Carry out "Resetting the present settings to factory settings" on the next page.
3. Turn on the source, then carry out "Adjusting the clock frequency and clock phase manually" from the beginning.

### **When you have connected another computer or video component**

Set "AUTO PICTURE" to "ON" by pressing the cursor + key in Step 2-7 above.

## **Adjusting the horizontal (H POSITION) and vertical (V POSITION) position of the image**

1. Carry out step 1 to 2-5 above.
2. Press the cursor up or down key to select "H POSITION."
3. Press the cursor +/- key to adjust the horizontal position. Press + to move the image right and - to move it left.
4. Press the cursor up or down key to select "V POSITION."
5. Press the cursor +/- key to adjust the vertical position. Press + to move the image up and - to move it down.

### **Storing the most recent “PICTURE ADJ,” “FINE PICTURE,” “H POSITION,” AND “V POSITION” settings**

You can store the above present settings in the memory. CUSTOM 1 to 5.

1. Select the input source RGB (see page 13).
2. Press MENU to display the main menu.
3. Press the cursor up or down key to select “SETTING MENU.”
4. Press L-CLICK to display the SETTING MENU.
5. Press the cursor up or down key to select “CUSTOM MEMORY.”
6. Press the cursor +/- key to select the memory CUSTOM 1 to 5.
7. Press L-CLICK to store the settings. The menu will be turned off after storing the settings.

### **Retrieving data from the custom memory/Setting “RGB” to “STANDARD”**

The stored settings in the CUSTOM 1 to 5 memories can be retrieved as follows:

1. Select “RGB” as the input source (see page 13).
2. Press the cursor +/- key to select the memory CUSTOM 1 to 5 or “STANDARD.”  
If you select “STANDARD,” the unit will select the most suitable resolution automatically.
3. Press L-CLICK to retrieve the settings.

**If the image (and the menu) has disappeared because the wrong custom memory is selected**  
Carry out the following steps.

1. Turn off the source connected to the RGB IN connector. The incoming signals from the source go down and blue, black, or focus pattern screen will be displayed (the background type differs depending on the “BACKGROUND” setting. See page 19.).
2. Select the right custom memory by restarting *Retrieving data from the custom memory* above.

### **Selecting the starting mode for the next projector use**

Set “STARTING RGB” to “LATEST” to use the most recent settings (RGB STANDARD or CUSTOM 1 to 5) when you turn on the unit next. If you set “STARTING RGB” to “STANDARD,” the unit will select the most suitable resolution every time you turn on the unit.

1. Carry out steps 1 to 4 in “Storing the most recent settings” on the previous page.
2. Press the cursor up or down key to select “STARTING RGB.”
3. Press the cursor +/- key to select either “LATEST” or “STANDARD.”
4. Press L-CLICK. The change of settings will be confirmed.

### **Resetting the present settings to factory settings**

To reset the changed “PICTURE ADJ,” “FINE PICTURE,” “H POSITION,” and “V POSITION” to the factory settings, carry out the following steps.

1. Carry out steps 1 to 4 in “Storing the most recent settings” on the previous page.
2. Press the cursor up or down key to select “RESET.” The horizontal frequency of the present incoming signal appears under the title “RESET.”
3. Press and hold down the cursor + key for more than three seconds until “COMPLETE” appears instead of the horizontal frequency.

### **Resetting the present settings and all the custom memories to factory settings**

**Note:** If you carry out this procedure, not only the custom memories but also all the menu items except for “LAMP USAGE,” and “LANGUAGE” will be reset.

1. Carry out steps 1 to 4 in “Storing the most recent settings” on the previous page.
2. Press the cursor up or down key to select “ALL RESET.”
3. Press and hold down the cursor + key for more than three seconds until “COMPLETE” appears under the title “ALL RESET.”

## Adjusting the picture elements

The picture elements such as brightness, contrast, white balance, and so on can be adjusted individually for each input source. The adjustable items vary depending on the input source and “INPUT MODE” setting.

(The elements marked with “O” are adjustable.)	<b>VIDEO S-VIDEO</b>	<b>RGB</b>
<b>BRIGHTNESS</b>	O	O
<b>CONTRAST</b>	O	O
<b>COLOR</b>	O	--
<b>TINT</b>	O	--
<b>SHARPNESS</b>	O	--
<b>WHITE BALANCE</b>	O	O

1. Select the input source.
2. Press MENU to display the main menu.
3. Press the cursor up or down key to select “IMAGE ADJ MENU.”
4. Press L-CLICK to display the IMAGE ADJ MENU.
5. Press the cursor up or down key to select “BRIGHTNESS,” then press the cursor +/- key to adjust the brightness.
6. Press the cursor up or down key to select “CONTRAST,” then press the cursor +/- key to adjust the contrast.
7. Press the cursor up or down key to select “COLOR,” then press the cursor +/- key to adjust the color.  
If the input source is RGB and “INPUT MODE” is “RGB,” skip this step and go to step 10.
8. Press the cursor up or down key to select “TINT,” then press the cursor +/- key to adjust the tint.  
**Note:** The tint control doesn’t operate with a PAL or SECAM source.
9. Press the cursor up or down key to select “SHARPNESS,” then press the cursor +/- key to adjust the sharpness.  
If the input source is RGB, skip this step and go to the next step.
10. Press the cursor up or down key to select “WHITE BALANCE,” then press L-CLICK.  
The WHITE BALANCE menu appears.
11. Press the cursor up or down key to select each item in the WHITE BALANCE menu, and then press the cursor +/- key to adjust the item for the white color balance.

## Selecting the picture type

The picture types can be selected individually for each input source according to the video content and your preferences.

1. Select the input source.
2. Press MENU to display the main menu.
3. Press the cursor up or down key to select “IMAGE ADJ MENU.”
4. Press L-CLICK to display the IMAGE ADJ MENU.
5. Press the cursor up or down key to select “IMAGE MODE.”
6. Press L-CLICK to display the IMAGE MODE menu.
7. Press the cursor up or down key to select “GAMMA,” then press the cursor +/- key to select the gamma mode.

**The following three types of gamma modes can be selected according to your preferences:**

- NORMAL,
- NATURAL 1, or
- NATURAL 2.

8. Press L-CLICK.

9. Press the cursor up or down key to select “INPUT MODE,” then press the cursor +/- key to select the input mode.

If the input source is VIDEO or S-VIDEO, the following two types can be selected:

- GRAPHICS for displaying a graphic image, or
- TEXT for displaying a text image such as the image from the document camera.

10. Press L-CLICK

11. Press the cursor up or down key to select “WHITE PICTURE,” then press the cursor +/- key to select the white picture mode.

The following two types can be selected:

- NORMAL, or
- QUIET to reduce brightness for better color expression,

12. Press L-CLICK

### **Activating the power saving function**

This function operates only with an RGB input source.

If the input signals from the RGB IN connector go down for more than five minutes, the projector will automatically turn off and enter the standby mode.

1. Press MENU to display the main menu.

2. Press the cursor up or down key to select “POWER MENU.”

3. Press L-CLICK to display the POWER MENU.

4. Press the cursor up or down key to select “POWER OFF,” then press the cursor + key to select “ON” to activate the power saving function.

To deactivate the function, set “POWER OFF” to “OFF” by pressing the cursor – key.

### **Activating the on-screen function**

If you activate the on-screen function,

- The input source “VIDEO,” “S-VIDEO,” or “RGB” will be displayed for three seconds when you have selected the input source with the remote control, and
- The message “POWER OFF/ENTER” will be displayed on the screen when you press the projector POWER button. If “DISPLAY” is set to “ON” this prevents the projector from being turned off accidentally.

1. Press MENU to display the main menu.

2. Press the cursor up or down key to select “SETTING MENU.”

3. Press L-CLICK to display the SETTING MENU.

4. Press the cursor up or down key to select “DISPLAY,” then press the cursor + key to select “ON” to activate the on-screen function.

To deactivate the function, set “DISPLAY” to “OFF” by pressing the cursor – key.

### **Turning the projector off with on screen functions**

With the remote control: Press the POWER OFF button a for 2 seconds

(the projector will turn off regardless of the “POWER OFF” setting)

With the projector keypad: Press the POWER button for 2 seconds. The projector will turn off.



### **Checking hours of lamp use**

The lamp housing must be replaced after 1000 hours of use. When 1000 hours have elapsed the STATUS indicator will light in red. Periodically check hours of lamp use in the menu so that you will have time to purchase a new lamp housing before the old one is burnt out.

1. Press MENU to display the main menu.
2. Press the cursor up or down key to select "POWER MENU."
3. Press L-CLICK to display the POWER MENU.
4. Press the cursor up or down key to select "LAMP USAGE." to display the lamp hours.

### **Resetting the lamp use hours to zero**

You need to reset the lamp use hours to zero after replacing the lamp housing.

1. Carry out the steps above.
2. Press the POWER ON button on the remote control for more than ten seconds.  
"LAMP USAGE" will be set to zero.

### **If the projector doesn't turn on because lamp use exceeds 1100 hours.**

The projector is designed not to turn on after the lamp use has exceeded 1100 hours. (If the unit is in use, it will go off). If this happens you must replace the lamp housing with a new one immediately. After replacing the lamp housing, you need to reset the lamp use hours to zero to enable you to turn on the unit. **You should never reset the projector "lamp usage" with a lamp that has exceeded 1100 hours. There is a real possibility that the lamp could blow up destroying the projector innards and causing injury or death.**

1. Switch on the main power.
2. Press the POWER OFF button on the remote control for more ten seconds. "LAMP USAGE" will be reset to zero and the STATUS indicator will go off.

### **Resetting all to the factory settings**

All the menu items and CUSTOM 1 to 5 memories can be reset to the factory settings except for the followings:

- LANGUAGE
  - LAMP USAGE
1. Press MENU to display the main menu.
  2. Press the cursor up or down key to select "SETTING MENU."
  3. Press L-CLICK to display the SETTING MENU.
  4. Press the cursor up or down key to select "ALL RESET."
  5. Press the cursor + key for more than three seconds. "COMPLETE" appears under the title "ALL RESET" after the reset has completed.

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## Specifications

### Optical

DMD TM	Single Chip Digital Micro Device (DMD), 1024x768 dots
Lens	Manual zoom, manual focus F3.0 f=35 to 42mm
Lamp	High Performance compact lamp 150W
Image Size	635 to 7620mm (25 to 300 inches) diagonal
Projection Distance	1.2 to 12.3m
Light Output	1300 ANSI lumens (normally white)
Contrast Ratio	800:1
Color Temperature	7000 Kelvin

### Electrical

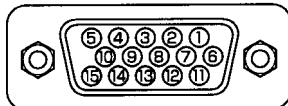
Inputs	Video (NTSC / PAL / SECAM / NTSC4.43) RGB (H:15 to 85 kHz, V:50 to 85 Hz)
Video Bandwidth	60 MHz
Color Reproduction	Full color, 16.7 million colors simultaneously.
Horizontal Resolution	NTSC 500, PAL 500, SECAM 300, NTSC4.43 350 TV lines RGB 1024 dots horizontal, 768 dots vertical
Power Requirement	100 to 120/220 to 240 VAC, 50/60 Hz
Input Current	2.2A/1.0 A (400W)

### Mechanical

Dimensions	23.5cm (W) x 5.8cm (H) x 29.7cm (D) 9.3 x 2.3 x 11.7"
Net Weight	2.6 kg/5.7 lbs
Operational Temperatures	<b>Data projector:</b> 5 degree to 35 degree Celsius (41 degree to 95 degree Fahrenheit), 30 to 85% humidity <b>Remote control:</b> 0 degree to 60 degree Celsius (32 degree to 140 degree Fahrenheit)
Regulations	UL Approved (UL 1950, CSA 950) Meets DOC Canada requirements Meets FCC Class A requirements Meets EMC Directive (EN55022, EN61000-3-2, EN61000-3-3, EN50082-1) Meets Low Voltage Directive (EN60950, TUV GS Approved) CE Approved for EU

### D-Sub Pin Assignments

#### PC 15-Pin mini D-Sub



1 Red	6 Red Gnd	11 GND
2 Green	7 Green Gnd	12 SDA
3 Blue	8 Blue Gnd	13 Horizontal Sync
4 GND	9 N/C	14 Vertical Sync
5 GND	10 Digital Gnd	15 SCL

## Troubleshooting

This section helps you resolve problems while setting up or using your projector.

### Common Problems & Solutions

<b><i>Problem</i></b>	<b><i>Check These Items</i></b>
<i>Does not turn on</i>	<p><b><i>Check that the cord is plugged in. Test the outlet.</i></b></p> <p><b><i>Check the status light to see if the projector has overheated or the lamp usage exceeds 1100 hours.</i></b></p>
<i>No picture</i>	<p><b><i>Use the menu icons to select your source (Video, S-Video, or RGB).</i></b></p> <p><b><i>Ensure your source cables are connected properly.</i></b></p> <p><b><i>Adjust the brightness and contrast</i></b></p> <p><b><i>Remove the lens cap.</i></b></p> <p><b><i>Is the STATUS indicator blinking?</i></b></p>
<i>Image isn't square to the screen</i>	<p><b><i>Reposition the projector to improve its angle to the screen</i></b></p> <p><b><i>Use remote control keystone button to correct offset.</i></b></p>
<i>Picture is blurred</i>	<p><b><i>Adjust the focus</i></b></p> <p><b><i>Reposition the projector to improve its angle to the screen.</i></b></p> <p><b><i>Ensure that the distance between the projector and screen is within the minimum and maximum adjustment range of the lens</i></b></p>
<i>Remote control does not work</i>	<p><b><i>Install new batteries. Low batteries may activate the laser but be insufficient to generate IR commands.</i></b></p> <p><b><i>Make sure there are no obstacles between you and the projector.</i></b></p> <p><b><i>Stand within 13 feet (4m) of the projector.</i></b></p>
<i>The STATUS indicator is lit or blinking</i>	<b><i>See the Status Light message chart on the next page.</i></b>
<i>Cross color in RGB mode</i>	<b><i>If "Auto Picture" is off, turn it on. If "Auto Picture" is on, turn it off and balance the image with the Picture Adjustment icon and Fine Picture Adjustment icon</i></b>

## When the STATUS indicator on the projector keypad lights or blinks

### Status Light Message

<i>Condition</i>	<i>Status</i>
<i>OFF</i>	<i>Normal</i>
<i>On Continually</i>	<i>The projector lamp has exceeded 1000 hours of operation and should be replaced.</i>
<i>Blinking Very Rapidly (On and off in a cycle of 1 sec.)</i>	<i>The lamp housing is not correctly installed. Install it correctly.</i>
<i>Blinking Rapidly (On and off in a cycle of 4 sec.)</i>	<p><i>The temperature protector has been triggered. If the room temperature is high, move the projector to a cool location. If the temperature within the projector is high, check the cooling fan ventilation hole and the ventilation hole on the bottom of the projector. If any holes are blocked, remove whatever is blocking them.</i></p> <p><i>The temperature protector has been triggered. If you switch the main Power switch Off, then immediately switch it On again; sometimes the power does not come on. If this happens, wait one minute, and then switch the power On again.</i></p> <p><i>The lamp lighting voltage error detection protector has been triggered. Wait at least one minute before switching it on again. If this does not solve the problem, please contact your dealer.</i></p>
<i>Blinking Slowly (On and off in a cycle of 8 sec.)</i>	<i>The cooling fan has stopped. Contact your Knoll dealer for service.</i>
<i>Blinking Very Slowly (On and off in a cycle of 12 sec.)</i>	<p><i>The lamp is not turned on.</i></p> <p><i>The projector was turned off and back on too quickly. Turn off the projector, wait one minute, then turn the projector back on. Or the lamp is burnt out.</i></p>

### Replacing the lamp housing

After the lamp has been operating for 1000 hours or longer, the STATUS indicator on the control panel will light and “LAMP USAGE” icon, which shows hours of total lamp use, will be displayed on the screen. When this happen, turn off the unit and replace the lamp housing with new one. The unit will not be go on after 1100 hours. (It will go off if it is in use.)

#### **\*\*\*CAUTION\*\*\***

- **DO NOT TOUCH THE LAMP** immediately after it has been used. It will be extremely hot. Allow at least one hour for the lamp to cool before handling.
- **DO NOT LOOSEN ANY SCREWS** except for those mentioned in the instructions below. There is danger of electric shock.

## Lamp housing replacement procedure

1. Wait at least one hour for the lamp to cool
2. Unplug the power cord.
3. Turn the unit upside down carefully.
4. Loosen the lamp cover securing screw and remove the lamp cover.

**CAUTION:** Do not use a lamp housing other than the Knoll replacement lamp housing. Order this from your Knoll dealer using your projector's model number (see "Note" below).

5. Loosen the three lamp housing securing screws. (This projector has a safety switch.)
6. Hold the handle then pull the lamp housing upward to remove it.
7. Install the new lamp housing.
8. Secure the lamp housing with the three screws.
9. Replace and secure the lamp cover with the securing screw.
10. Return the unit to the normal position, connect the power cord, and turn on the unit.
11. Reset the lamp time. Select the lamp usage time menu, then press the POWER ON button on the remote control and hold it down for at least ten seconds.

### Note:

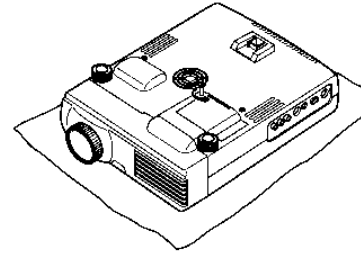
*When the lamp usage time reaches 1100 hours, it becomes impossible to switch on the power and menus are not displayed. In this case, press the remote control POWER OFF button for at least 10 seconds in the standby mode. It is possible to confirm whether it has been reset or not by checking whether the STATUS indicator is extinguished.*

*Obtain a replacement lamp from your dealer where the projector was purchased. When ordering a replacement lamp, specify the correct special replacement lamp – model name U2-150 (Product code 28-640).*

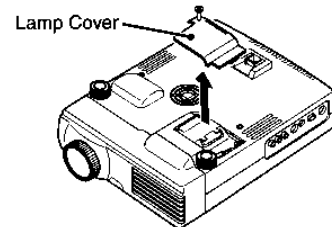
Knoll Systems  
145 Tye Drive Point Roberts, WA USA 98281  
11791 Machrina Way, Richmond BC Canada V7A 4V3

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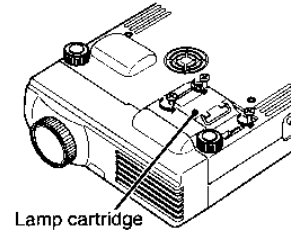
Step 3



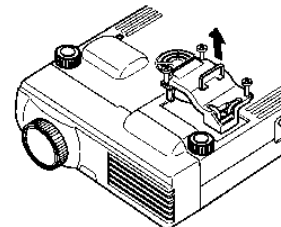
Step 4



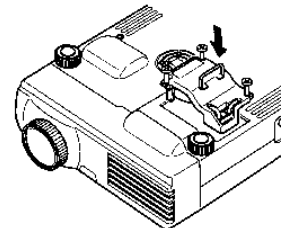
Step 5



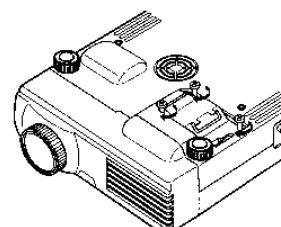
Step 6



Step 7



Step 8



Step 9

