

HITACHI

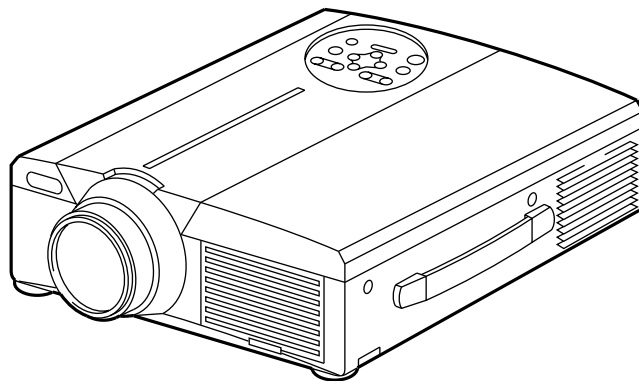
Liquid Crystal Projector

Model

CP-X960WA/970W

USER'S GUIDE

Thank you for purchasing the Hitachi liquid crystal projector. Please read this user's manual thoroughly to ensure correct usage through understanding. After reading, store this instruction manual in a safe place for future reference.



Outline

This liquid crystal projector is used to project various computer signals as well as NTSC/PAL/SECAM video signals onto a screen. Little space is required for installation and large images can easily be realized.

Features

(1) Outstanding brightness

The UHB lamp and high-efficiency optical system assure a high level of brightness.

(2) Partial magnification function

Interesting parts of images can be magnified for closer viewing.

(3) Distortion correction function

Distortion-free images are quickly available.

(4) Power zoom and power focus.

(5) P in P function

(6) USB jack

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About Trademarks

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FOR THE CUSTOMERS IN U.K

THIS PRODUCT IS SUPPLIED WITH A TWO PIN MAINS PLUG FOR USE IN MAINLAND EUROPE.
FOR THE U.K PLEASE REFER TO THE NOTES ON THIS PAGE.

IMPORTANT FOR UNITED KINGDOM

WORDING FOR CLASS I EQUIPMENT INSTRUCTION BOOKS AND LABELS

The mains lead on this equipment is supplied with a moulded plug incorporating a fuse, the value of which is indicated on the pin face of the plug. Should the fuse need to be replaced, an ASTA or BSI approved BS 1362 fuse must be used of the same rating. If the fuse cover is detachable never use the plug with the cover omitted. If a replacement fuse cover is required, ensure it is of the same colour as that visible on the pin face of the plug. Fuse covers are available from your dealer.

DO NOT cut off the mains plug from this equipment. If the plug fitted is not suitable for the power points in your home or the cable is too short to reach a power point, then obtain an appropriate safety approved extension lead or consult your dealer.

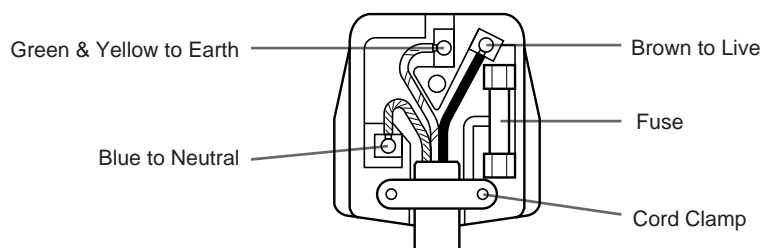
Should it be necessary to change the mains plugs, this must be carried out by a competent person, preferably a qualified electrician.

If there is no alternative to cutting off the mains plug, ensure that you dispose of it immediately, having first removed the fuse, to avoid a possible shock hazard by inadvertent connection to the mains supply.

WARNING: THIS EQUIPMENT MUST BE EARTHED **IMPORTANT:**

The wires in the mains lead are coloured in accordance with the following code:

Green and Yellow = Earth, Blue = Neutral, Brown = Live.



As these colours may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured Green and Yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol \oplus or coloured Green or Green and Yellow.

The wire coloured Blue must be connected to the terminal marked with the letter N or coloured BLUE or BLACK. The wire coloured BROWN must be connected to the terminal marked with the letter L or coloured BROWN or RED.

WARNING: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications, Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Instructions to Users:

This equipment complies with the requirements of FCC (Federal Communication Commission) Class A equipments provided that following conditions are met.

(1) Video signal cables:

Double shielded coaxial cables (so called FCC shield cable) must be used and the outer shield must be connected to the ground. Or, if normal coaxial cables are used, the cables must be enclosed in metal pipes or similar way to reduce the interference noise radiation.

(2) Power cord:

Shielded power cord must be used. The outer shield must be connected to the ground.

(3) Video inputs:

The input signal amplitude must no exceed the specified level.

Before Use

<Before Using>

About the Symbols Various symbols are used in this instruction manual and on the product itself to ensure correct usage, to prevent danger to the user and others, and to prevent property damage. The meanings of these symbols are described below. It is important that you read these descriptions thoroughly and fully understand the contents.



Warning

This symbol indicates information that, if ignored, could possibly result in personal injury or even death due to incorrect handling.



Caution

This symbol indicates information that, if ignored, could result possibly in personal injury or physical damage due to incorrect handling.

Typical Symbols



This symbol indicates an additional warning (including cautions). An illustration is provided to clarify the contents (the illustration to the left indicates danger of electrical shock).



This symbol indicates a prohibited action. The contents will be clearly indicated in an illustration or nearby (the symbol to the left indicates that disassembly is prohibited).



This symbol indicates a compulsory action. The contents will be clearly indicated in an illustration or nearby (the symbol to the left indicates that the power plug should be disconnected from the power outlet).

[Safety Precaution]

Warning

■ If a problem should occur.

- If smoke or a strange odor arise, continued use could result in fire or electrical shock. In such case, immediately turn off the power switch and then disconnect the power plug from the power outlet. After making sure that the smoke or odor has stopped, contact your dealer for repairs. Never attempt to make repairs yourself because this is dangerous.

- Do not use this projector if there is no image or sound, or if the sound is distorted. Continued use could result in fire or electrical shock.



Disconnect the plug from the power outlet.

In such case, immediately turn off the power switch, disconnect the power plug from the power outlet and contact your dealer.

- If water should enter the inside of this projector, immediately turn off the power switch, disconnect the power plug from the power outlet and contact your dealer.

■ Do not install on an unstable surface.

- Do not install this projector on an unstable surface such as a wobbly stand or incline because this could result in the projector falling and causing injury.



■ Do not open the cabinet.

- Never open the cabinet. There is high voltage inside which can cause electrical shock. Contact your dealer for internal inspection, adjustment and repair.



Do not disassemble.



Electric shock hazard.

■ Do not modify.

Do not modify this projector because this could result in fire or electrical shock.



Do not disassemble.

■ Do not use in the bathroom.

Do not use this projector in the bathroom because this could result in fire or electrical shock.



Do not use near water.

■ Do not insert foreign objects.

- Do not insert metal objects through the ventilation openings, etc., of this projector or drop such objects inside because this could result in fire or electrical shock.



- If a foreign object should enter this projector, immediately turn off the power switch, disconnect the power plug from the power outlet and contact your dealer.



Disconnect the plug from the power outlet.

Continued use could result in fire or electrical shock. Use special caution in households where children are present.

■ Do not look through the lens when the lamp is on.



Never look through the lens when the lamp is on. The powerful light could adversely affect vision. Use special caution in households where children are present.

■ Avoid shock or impact on the projector.

If the projector should fall, resulting in damage to the cabinet, immediately turn off the power switch, disconnect the power plug from the power outlet and contact your dealer. Continued use could result in fire or electrical shock.



Disconnect the plug from the power outlet.

■ Do not place this projector in a container containing liquid.

Do not place flower vases, flower pots, cups, cosmetics, liquids such as water, etc., on top of this projector. Spillage could result in fire or electrical shock.



■ Use only the indicated power supply.

Use only the indicated power supply. The use of any other power supply could result in fire or electrical shock.



Warning

■ Handle the power cord with care.

- **Do not damage, cut, process or strongly twist the power cord.** Placing heavy objects on the power cord, heating or strongly pulling the power cord can result in damage as well as fire or electrical shock.

- Pulling on the power cord
- Placing heavy objects on the power cord
- Damaging the cord
- Placing near heaters



- **Do not position the power cord under the projector.** This can damage the power cord and cause fire or electrical shock. Also, do not place a spread, cover, etc., over the power cord because this could result in the inadvertent placing of heavy objects on the concealed power cord.

- If the power cord is damaged (exposed or broken core wires, etc.), contact your dealer for replacement; otherwise, fire or electrical shock could result.

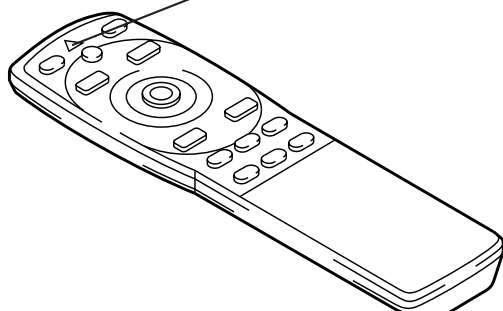


- Make sure there is no dust, etc., on the power plug and insert a knife blade to make sure that there is no looseness.

■ Do not allow the laser beam to enter the eyes.

- This remote control is equipped with a laser pointer and a laser beam is emitted from the laser outlet. Do not look directly into the laser beam outlet or direct the laser beam at other people.

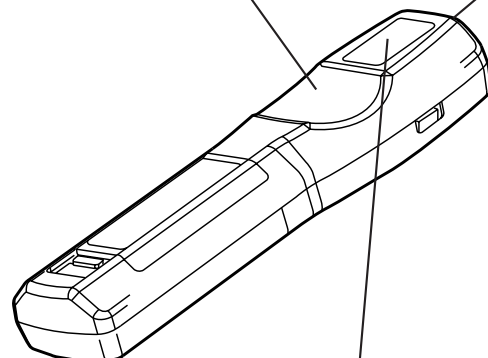
Vision can be impaired if the laser beam enters the eyes. Especially pay attention if children are present.



■ High temperatures are generated when the lamp is lit, so do not place objects in front of the lens.



Laser beam outlet



AVOID EXPOSURE-
LASER RADIATION IS
EMITTED FROM THIS
APERTURE

Caution

■ Do not sit or place heavy objects on this projector.

● Do not sit on this projector.

This could result in overturning, leading to damage or personal injury. Use special caution in households where children are present.



● Do not place heavy objects on this projector.

Placing heavy objects on this projector could result in loss of balance or falling and cause personal injury.

■ Do not block the ventilation openings. Do not block the ventilation openings of this projector.

Blocking ventilation could lead to internal overheating which could result in fire. Do not place this projector on its side during use or push it into a small, poorly ventilated location. Do not place this projector on a carpet or bedding or cover it with a table cloth, etc. Also, when installing this projector, make sure the ventilation openings are at least 30cm from the wall.



■ Care and maintenance.

For safety purposes, disconnect the power plug from the power outlet before starting the care and maintenance of this projector.



Disconnect the plug from the power outlet.

■ Battery usage.

● Use only the specified batteries with this projector. Do not mix old and new batteries because this could result in fire or personal injury due to battery cracking or leakage.



● Make sure the plus and minus terminals are correctly aligned when loading the batteries.



Incorrect loading could result in personal injury or contamination of the surroundings due to battery cracking or leakage.

■ Clean the projector interior once every two years.

Request your dealer to clean the interior of the projector approximately every two years. Accumulations of dust inside the projector can result in fire or malfunction if not cleaned for an extended period. This cleaning is more effective if performed before every humid periods such as rainy season, etc. Ask your dealer for details about internal cleaning.



■ Avoid installation in humid or dusty locations.

● Do not install this projector in a humid or dusty location. This could result in fire or electrical shock.



● Avoid installation near the kitchen, a humidifier or other locations where there is oily smoke or humidity. This could result in fire or electrical shock.

■ Use the caster brakes.

When installing this projector on a stand with casters, use the caster brakes to prevent the stand moving or overturning and causing personal injury.



■ Do not handle the power cord roughly.

● Keep the power cord away from heaters because the heat could melt the power cord and cause fire or electrical shock.

● Do not touch the power plug with wet hands because this could result in electrical shock.



● When disconnecting the power plug, do not pull on the power cord. This could damage the power cord and cause fire or electrical shock. Always grip the plug when disconnecting.

Caution

■ When the projector is not to be used for an extended period.

For safety purposes when the projector is not to be used for an extended period because of travel, etc., always disconnect the power plug from the power outlet. Also close the lens cover to prevent the lens surface being scratched.



Disconnect the plug from the power outlet.

■ Moving the projector.

- When moving the projector, be sure to replace lens cap, disconnect the power plug from the power outlet and disconnect all external connections. Failure to do this could damage the power cord and cause fire or electrical shock.



Disconnect the plug from the power outlet.

Avoid any impact or shock to the projector because this could result in malfunction.

- When moving this projector outdoors, protect it from wetting due to rain, etc. If the projector should become wet, dry it thoroughly before further use. Continued use while wet could result in fire or electrical shock.



[General Cautions]

■ Avoid excessively hot locations.

Do not place this projector in direct sunlight or near a hot object such as a stove, etc., because the heat could have adverse influence on the cabinet and other parts.



■ Sound volume.

Set the volume at a suitable level to avoid bothering other people. It is also better to keep the volume level low and close the windows at night to protect the neighborhood environment.

■ Lens care

Use commercially available lens tissue to clean the lens (used to clean cameras, eyeglasses, etc.). Be careful not to scratch the lens with hard objects.



■ Cabinet care.

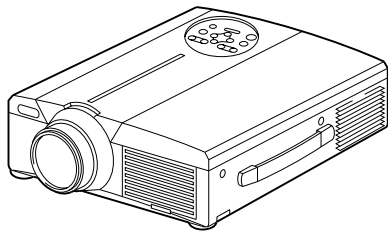
- The cabinet is made of plastic and discoloration or paint peeling can occur if wiped with a solvent such as benzine, thinner, etc.
- Before using chemical wipes, be sure to read and observe the instructions.
- Do not spray volatile substances such as insect repellent on the cabinet. Also, do not allow long-term close contact with rubber or vinyl products because this could result in discoloration, peeling paint, etc.
- Use a soft cloth to clean the cabinet and operation panel. When excessively soiled, dilute a neutral detergent in water, wet and wring out the cloth and afterward wipe with a dry cloth. Do not apply undiluted detergent directly to the projector.

■ Extended usage.

When using this projector for an extended period, stop periodically to rest the eyes to prevent eye fatigue.

Checking the package Contents

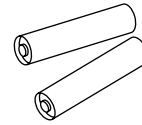
Make sure all of the following items are included in the package. If anything is missing, please contact your dealer.



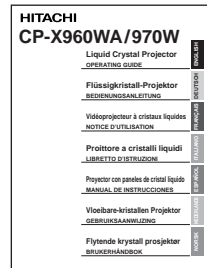
Projector unit



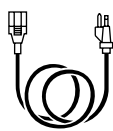
Remote control



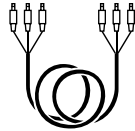
Remote control Batteries



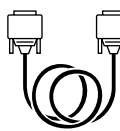
User's Guide (this document)



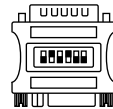
Power Cord
110V-US
220-UK, Europe



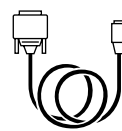
3-Conductor video/Audio cable



RGB cable
(15-15 pin M/M)



Mac adapter with dip switch



Mouse cable × 3

Names and functions of each part

Main unit

ZOOM button

Used to adjust the size of the image. (Refer to page 13.)

MUTE button

This button turns the sound on and off. Press once to turn the sound off; then press again to turn the sound back on.

STANDBY / ON button

Press this button to turn the power on and off. When turned off, the projector enters standby status. Refer to page 13 - 14 for details.

LAMP indicator

Lights or flashes when the temperature inside the projector increases or the lamp does not light. Refer to page 33 for details.

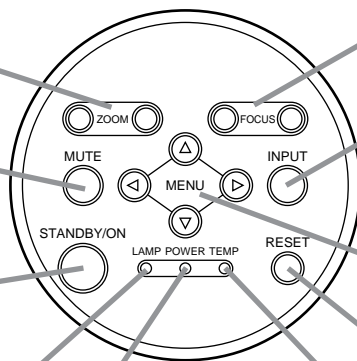
POWER indicator

This indicator lights or blinks during standby and during operation. Refer to page 33 for details.

Remote control I/R receiver

Lens

Lens cap



FOCUS button

Used to adjust the focus of the image on the screen. (Refer to page 13.)

INPUT button

Press this button to switch the input. The input changes in the following sequence each time this button is pressed.



MENU button

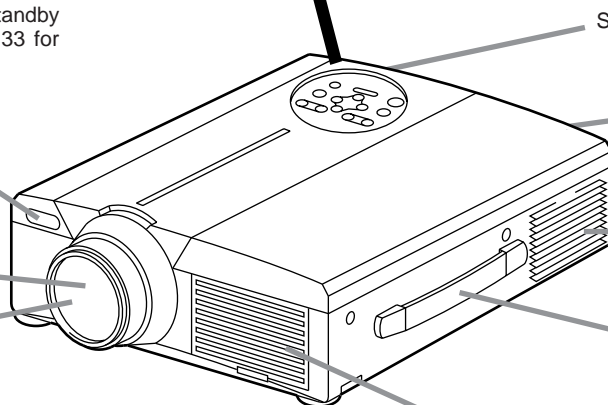
Displays the image menu. Refer to page 17 - 21 for details.

RESET button

Used to reset the initial settings. Refer to page 10.17.25.26 for details.

TEMP indicator

Blinks when the fan malfunctions. Refer to page 33 for details.



Speaker

Speaker

Cooling fan (exhaust side)

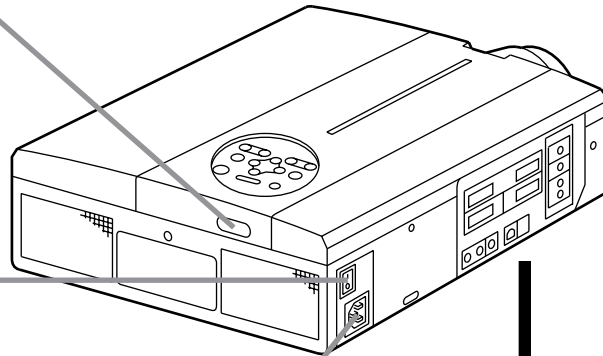
Carring handle

Cooling fan (intake side)

- Use the remote control in front of the remote control photoreceptor at a distance of about 5 m or less and an angle of 30 degrees to the left or right of the center.

Names and functions of each part (continued)

Remote control I/R receiver



Main power switch

Used to turn the power on and off.
 ○ : OFF
 | : ON

AC IN jack

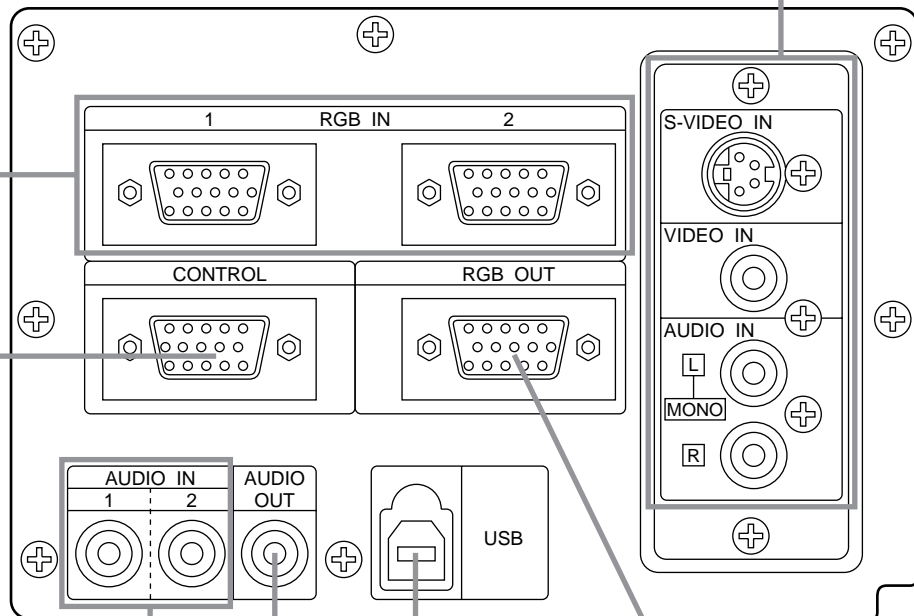
Used to connect the accessory power cord.

⚠ Caution Connecting to the AC IN jack

Make sure the accessory power cord is plugged into the AC IN jack as far as it will go. Incomplete connection can result in fire or electrical shock.

VIDEO IN jack

S-VIDEO IN jack
 Mini DIN 4-pin connector
 VIDEO IN jack
 RCA jack
 AUDIO L/R IN jack
 RCA jack



RGB IN jack

D-sub 15-pin shrink (1/2)

CONTROL jack

D-sub 15-pin shrink

AUDIO IN jack (RGB)
 Stereo mini jack

USB jack

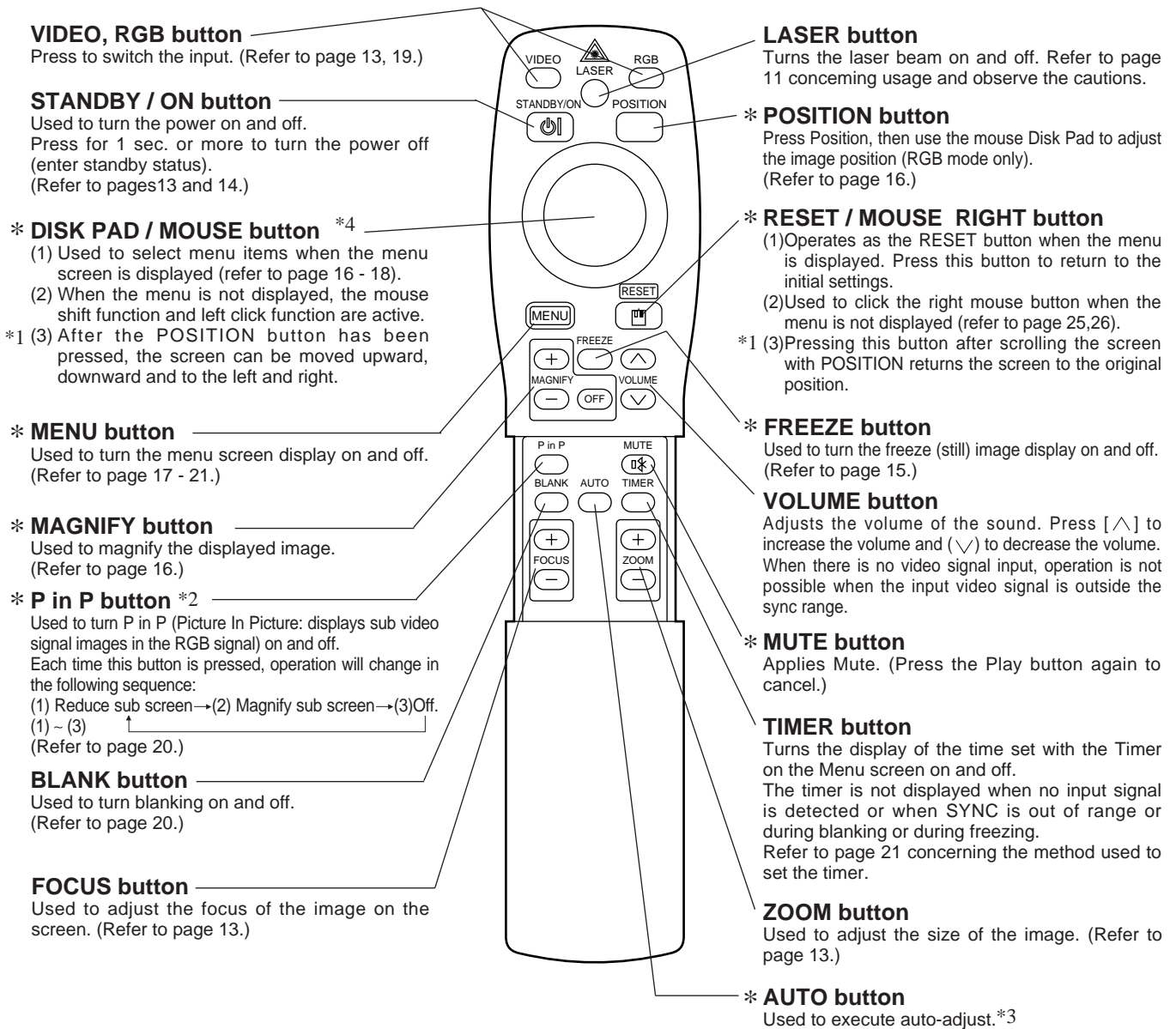
The mouse cursor can be controlled by remote control by connecting to a personal computer.

AUDIO OUT jack (RGB/VIDEO)
 Stereo mini jack

RGB OUT jack
 D-sub 15-pin shrink

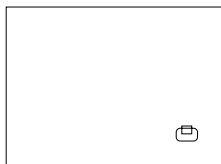
Names and functions of each part (continued)

Remote control transmitter



*These functions do not operate when initial screen message "NO INPUT IS DETECTED" or "SYNC IS OUT OF RANGE" is displayed.

***1 POSITION icon**
When the POSITION button is pressed, the moving display icon will appear at the bottom right of the screen.
While displaying the icon, you can operate POSITION.



***2 P in P function**
With the P in P function, signals are input to both RGB and VIDEO. This function operates only when the RGB signal has been selected. There is no display in the case of the no signal and when the RGB signal is outside the sync range.
When P in P is used, audio is automatically switched to video.
In P in P, audio input can be switched by pressing the VOL ^ and VOL v keys of the remote control, displaying the audio bar and moving DISK PAD left and right during the display.



***3 Auto adjustment function**
The projector automatically adjusts 4 items (V. POSIT, H. POSIT, H. PHASE, H. SIZE).
When you choose AUTO (move the cursor to the right from the manual operation position), the AUTO confirmation menu shown below is indicated.

***4 Disk Pad method of operation**

- Move and select by tilting Disk Pad in the required direction.
- Press Disk Pad in to realize the function of the mouse left button.
- A mouse cable is necessary if a mouse is to be used. (Refer to pages 26, 27.)

Names and functions of each part (continued)

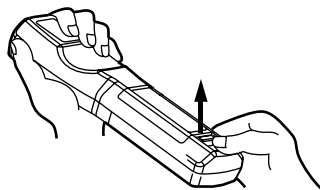
Caution

- Auto adjust can take up to 30 seconds.
- Auto adjust may not operate correctly in some cases, depending on the computer connected and the signal.
- Be sure to expand images to full screen size when displaying low resolution images.
- After auto adjust, the image may be slightly dark in some cases due to automatic adjustment of the signal level.
- Auto adjust can not execute when the initial display is “NO INPUT IS DETECTED” or “SYNC IS OUT OF RANGE” during FREEZE or MAGNIFY.
- Auto Adjust is executed when the following operations are performed.
 1. When the type of input source signal is changed.
 2. When the Auto Adjust (AUTO) button is pressed.
- The message AUTO IN PROGRESS will be displayed on the screen during automatic adjustment.
- The screen may be disrupted during automatic adjustment but this is not a malfunction.
- RGB1 or RGB2 only can be used as the input signal.
- Auto Adjust can also be executed using the operation buttons of the main unit. Hold down the RESET button and press the input switch (INPUT) button.

Loading the batteries Loading AA batteries into the remote control.

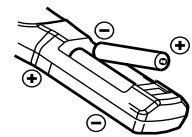
1 Remove the battery cover.

Push the knob while lifting up the battery cover.



2 Loading the batteries.

Make sure the plus and minus poles are correctly oriented.



3 Close the battery cover.

Caution Battery usage cautions

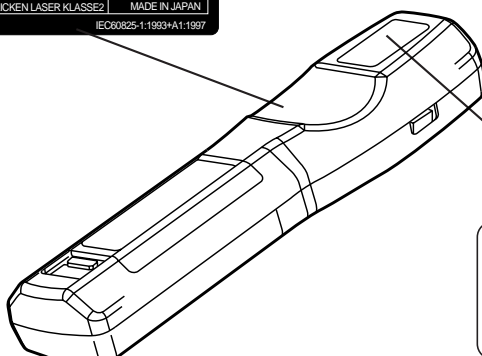
- Use only the specified batteries with this projector. Also, do not mix new and old batteries. This could cause in battery cracking or leakage, which could result in fire or personal injury.
- When loading the batteries, make sure the plus and minus poles are correctly oriented as indicated in the projector. Incorrect orientation could cause battery cracking or leakage, which could result in personal injury or pollution of the surrounding environment.

Caution Remote control usage cautions

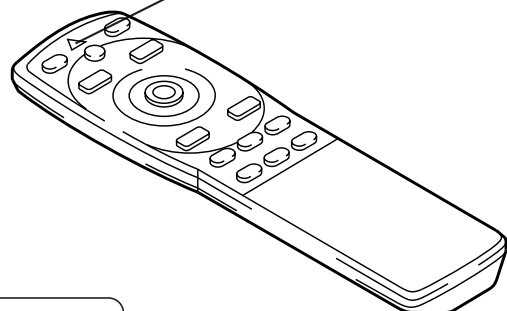
- Do not drop the remote control or apply impact.
- Do not wet the remote control or place it on any wet object. Such actions could result in malfunction.
- When not to be used for an extended period, remove the batteries from the remote control.
- Replace the batteries when remote control operation becomes difficult.
- Do not place the remote control close to the cooling fan of the projector.
- Do not disassemble the remote control in case of malfunction. please bring it to the service station.

Warning

The laser pointer of the remote control is used as a pointer. Never look directly into the laser beam outlet or point the laser beam at other people. The laser beam can cause vision problems.



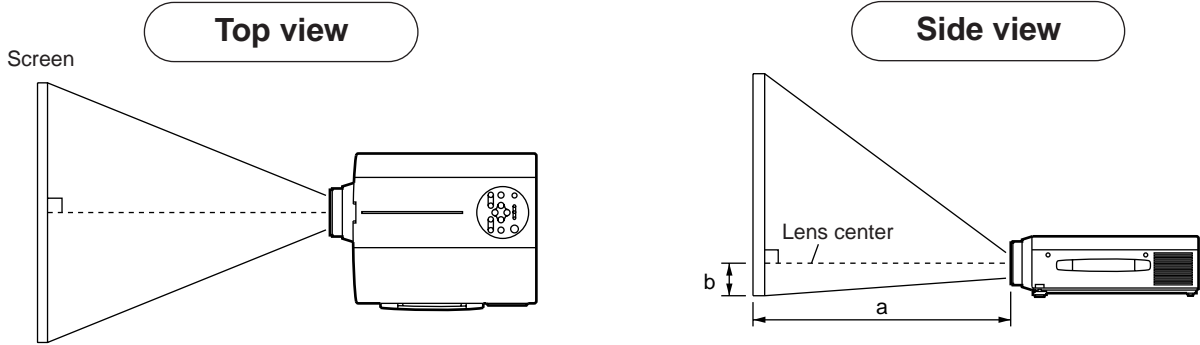
AVOID EXPOSURE-
LASER RADIATION IS
EMITTED FROM THIS
APERTURE



Installation

Typical LCD Projector and Screen Installation

Use the diagram below as reference to determine the screen size and projection distance.



| Screen size (inches) | a (inches) | | b (inches) |
|----------------------|------------|---------|------------|
| | Minimum | Maximum | |
| 40 | 55 | 73 | 1 |
| 60 | 85 | 114 | 2 |
| 80 | 114 | 151 | 2 |
| 100 | 144 | 191 | 3 |
| 120 | 176 | 231 | 3 |
| 150 | 220 | 282 | 4 |
| 200 | 291 | 386 | 6 |

- a. Distance from the LCD projector to the screen
- b. Distance from the lens center to the bottom of the screen (a,b : +/-10%).

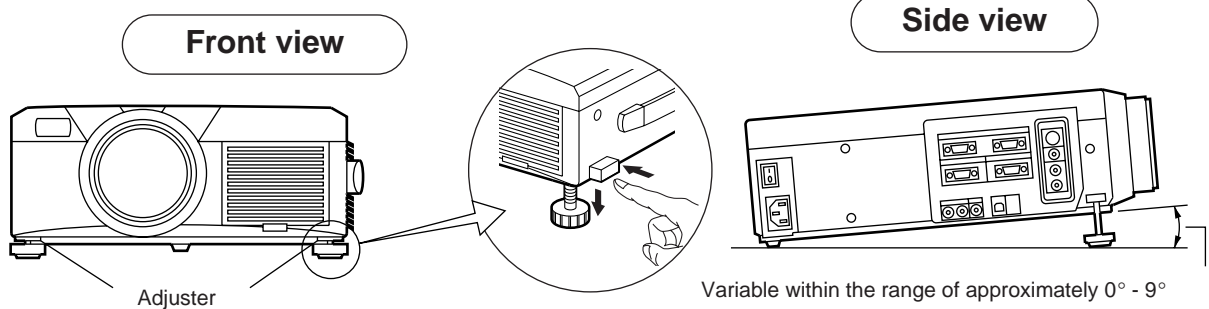
Caution

The LCD projector should normally be used level (the legs can point upward). Positioning the projector sideways, or with the lens pointing upward or downward can cause the internal temperature to rise, which could result in a malfunction.

The projection distances shown in the diagram to the left are for full size (1,024 x 768 dots).

Using the adjusters

Use the adjusters on the bottom to adjust the projection angle.



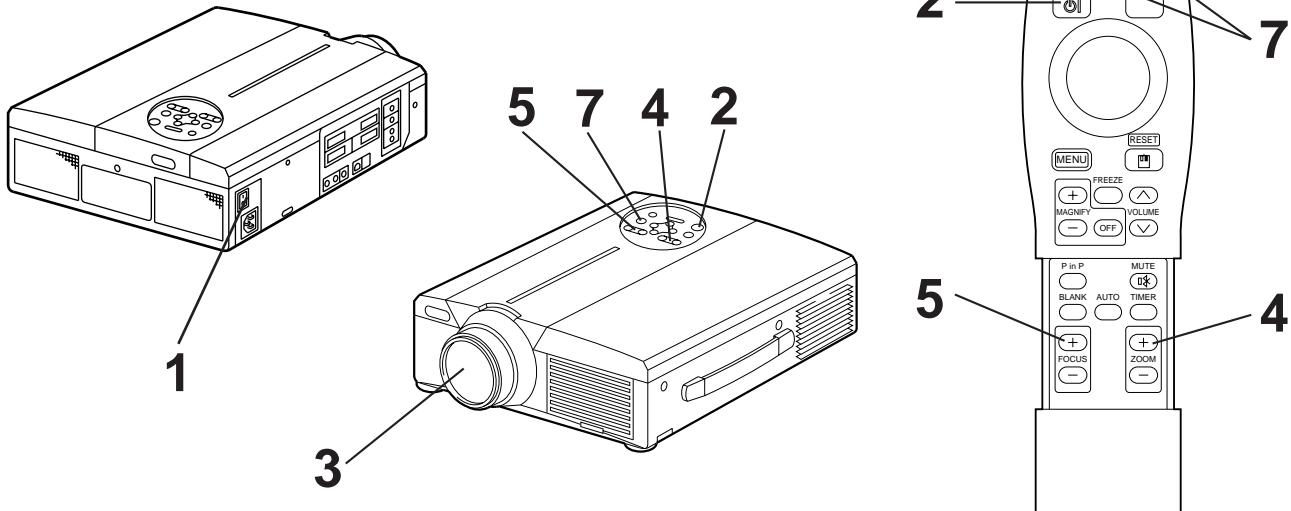
1. Lift up the projector and release the adjuster lock.
2. After adjusting the projection angle, firmly lock the adjusters.
3. Rotate the adjusters for fine adjustment.

Caution

- Do not release the locks unless the projector is being held; otherwise, the projector could overturn or the fingers could get caught and cause personal injury.
- Do not force the adjusters to rotate. This could damage the adjusters or cause the lock to fail.
- Lock the adjusters firmly. If the lock is difficult to operate, change the angle slightly and try again.

Basic operations

To project



1 Turn on the main power switch of the projector [I: ON].

- The Power indicator lights orange.

2 Press the STANDBY / ON button.

- The Power indicator will blink green and then light green.
- The green blinking indicates warmup.

3 Remove the lens cap.

4 Use the ZOOM button to adjust the screen size.

5 Use the FOCUS button to adjust the focus.

- (1) The display shown to the right will appear when the FOCUS button is pressed.
- (2) Use the FOCUS button to adjust the focus until the image is sharp.
- (3) The message “Focus” will disappear if any other button is pressed.

- (When there is no input signal, the Focus characters are not displayed when the input signal is outside the sync range.)

+++FOCUS+++

6 Turn on the power to the connected equipment.

Refer to page 31 concerning the connection of other equipment.

7 Press either the INPUT button of the projector or the VIDEO/RGB button of the remote control to select the signal to be projected on the screen.

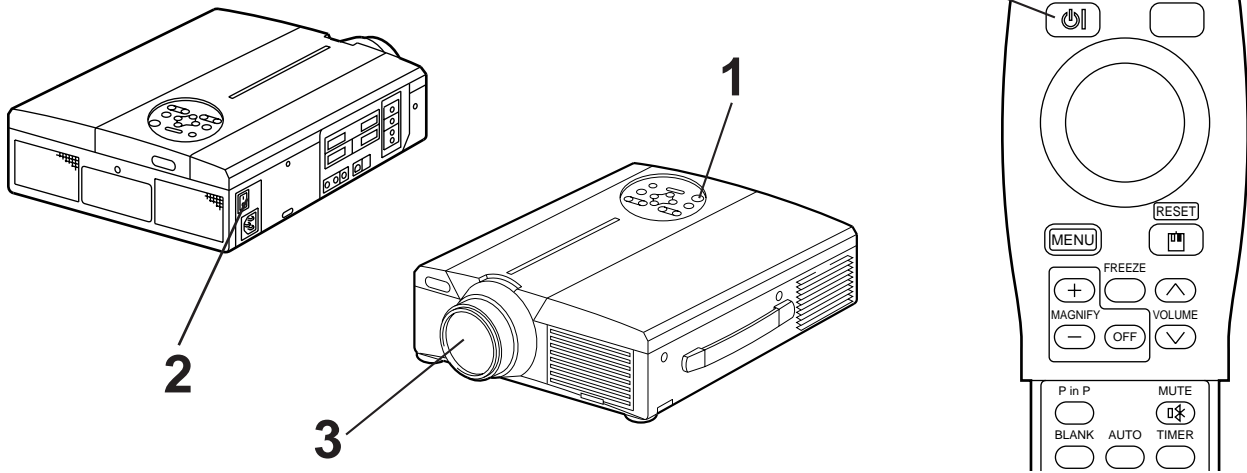
The selected signal input channel will be displayed in the lower right part of the screen.

Example on-screen display

RGB 1

Basic operations (continued)

Turning off the power



1 Press the **STANDBY/ON** button for approximately 1 sec.

- The Power indicator will blink orange, then the lamp will turn off. Approximately 1 sec. after that, the indicator will light orange.
- After the power is turned off, the lamp will be cooled for approximately 1 min. and the power cannot be turned off even by pressing the **STANDBY/ON** button.
- The standby status will not be entered if the time which the **STANDBY/ON** button is pressed is too short.

2 Turn off the main power switch of the projector [: **OFF**].

3 Attach the lens cap.

Caution The fan will continue running for approximately 1 min. after the **STANDBY/ON** button is pressed. Do not turn off the main power switch while the lamp is on because this will shorten the service life of the lamp.

Plug & Play

This projector is VESA DDC 1/2B compatible. Plug & play is possible by connecting to a computer that is VESA DDC (Display Data Channel) compatible.

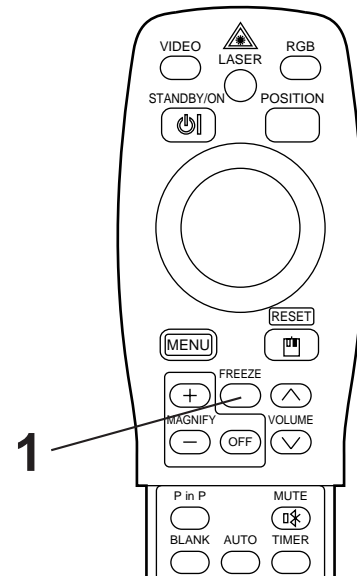
(Plug & play is a system configured with peripheral equipment including a computer and display, and an operating system.)

- Caution**
- Use the RGB cable included with this projector when using plug & play. With other cables, pins (12) - (15) are sometimes not connected (effective only for RGB1).
 - This device is recognized as a plug-and-play monitor. Use the standard Windows95/98 display drivers.
 - This function may not operate, depending on the personal computer used.
 - When the DDC function does not operate on a personal computer running Windows95/98, select the display type from Screen Priority. It is recommended that Super VGA 1024 x 768 (60-75Hz) be selected as the display type.
The DDC function will not operate when connected to a Macintosh.

Basic operations (continued)

Freeze function

This function is used to freeze the image being displayed.
(refer to page 10)



1 Press the FREEZE button.

- The image being displayed will freeze.
- The [||] mark appears in the lower right corner of the screen when the Freeze function is on.

Cancelling the FREEZE function

1 Press the FREEZE button.

- The FREEZE function will be cancelled.
- The [▶] mark will be displayed for approximately 3 sec. when the FREEZE function is cancelled.

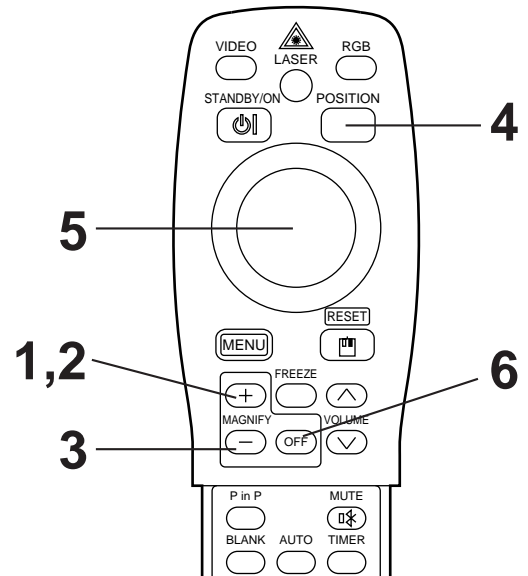
Caution

- When there is no input signal, the Freeze function is not effective when the input signal is outside the sync range.
- Pressing the FREEZE button alternately turns the freeze function on and off.
- The FREEZE function will be cancelled when the input select button is pressed or the display mode of the PC being used for display is changed.
- When a still image signal is input when the FREEZE function is on, make sure not to forget to cancel the FREEZE function.
- FREEZE function will be cancelled after the operations such as “FOCUS +, -”, “TIMER”, “P in P”, “AUTO”, “BLANK”, “VOLUME ^ v”, “MENU”, “MUTE” and “POSITION”.

Basic operations (continued)

Magnify function

Part of an image can be displayed magnified.
(refer to page 10)



1 Press the MAGNIFY + button.

- The center part of the image will be displayed magnified approximately 2x.

Changing the magnification ratio

2 Press the MAGNIFY + button.

- When this button is pressed, the image will be displayed even larger.

3 Press the MAGNIFY – button.

- When this button is pressed, the image will be displayed even smaller.

Moving the display area

4 Press the POSITION button.

5 Press the DISK PAD up, down, left and right buttons.

- The magnified area will move in accordance with the button pressed.

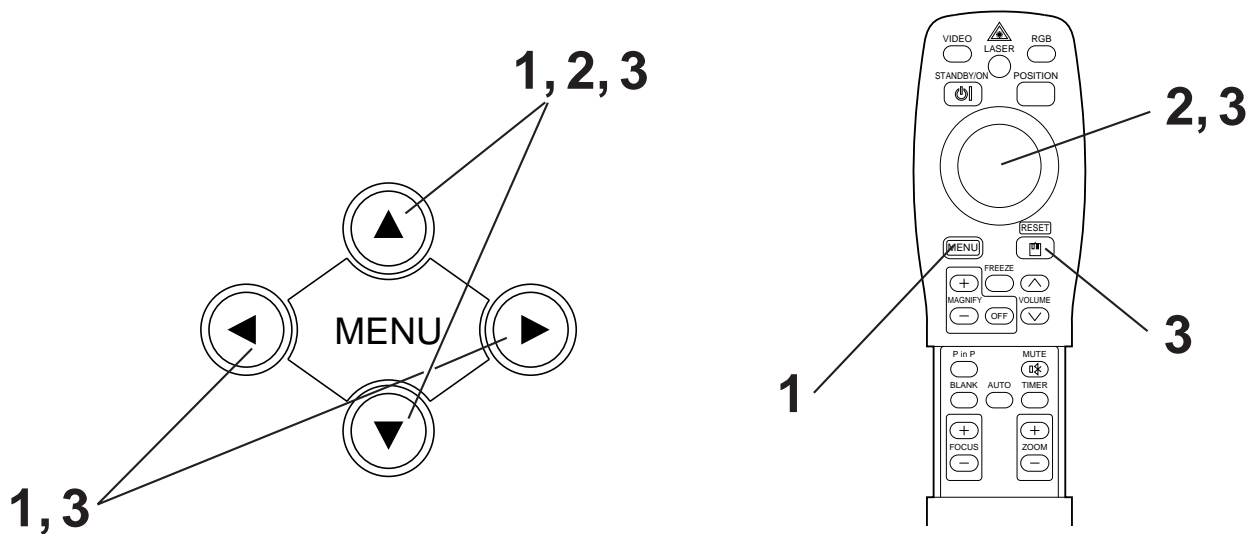
Returning to normal display

6 Press the MAGNIFY OFF button.

Caution

- When there is no video signal input, Magnify is not effective when the video signal input is outside the sync range.
- The magnify function will be cancelled when the input select button is pressed or the display mode of the PC being used for display is changed.
- The Magnify function will be cancelled after the operations such as “AUTO”, “KEYSTONE”.

Adjustments and functions



1 Press the MENU (▲▼◀▶) buttons of the projector or the MENU button of the remote control.

- The Menu screen will appear. (refer to page 18 - 21 for details.)

2 Press the MENU (▲▼◀▶) buttons of the projector or the DISK PAD button of the remote control to select the menu item to be adjusted. • The selected menu item will be displayed in orange.

3 Adjust the selected menu item with the MENU (▲▼◀▶) buttons of the projector or the DISK PAD button of the remote control.

- The selected menu item will be displayed in orange.

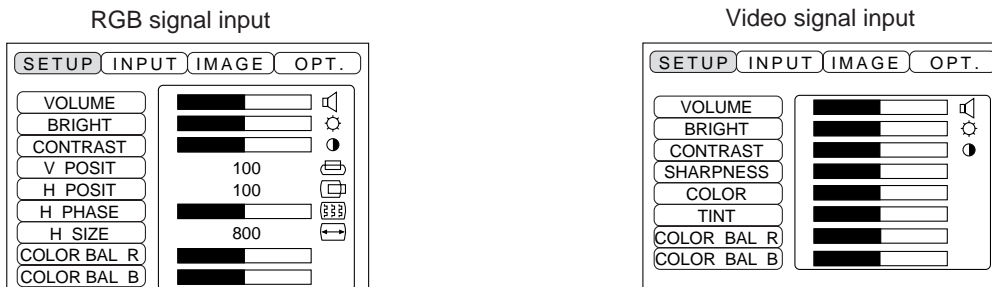
Returning to the initial settings

- Select the adjustment item to be returned to the initial settings.
- Press the RESET button.

Adjustments and functions (continued)

SET UP

Images and display positions can be adjusted from the SETUP menu.



| Adjustment item | Adjustment description |
|---|---|
| VOLUME | Volume decreases ← → Volume increases |
| BRIGHT (BRIGHTNESS) | Darker ← → Brighter |
| CONTRAST | Lower contrast ← → Stronger contrast |
| SHARPNESS | Softer image ← → Sharper image |
| COLOR | Less ← → More |
| TINT | Redder ← → Greener |
| V. POSIT (V. POSITION) | Moves the image up and down. |
| H. POSIT (H. POSITION) | Moves the image left and right. |
| H. PHASE | Eliminates blanking. |
| H. SIZE | Adjusts the horizontal size of the image. |
| COLOR BAL R (COLOR BALANCE Red) | Less red ← → More red |
| COLOR BAL B (COLOR BALANCE Blue) | Less blue ← → More blue |

Using the SETUP Menu

Move the cursor to the item to be adjusted and move the MENU button of the projector or the DISK PAD button of the remote control to change the length of the bar display.

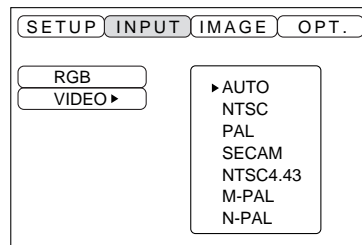
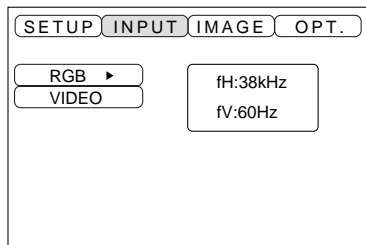
Caution

- The menu cannot be displayed while the initial screen (“No input is detected.” or “Sync is out of range.”) is being displayed.
- Tint cannot be adjusted with N-PAL, M-PAL, PAL or SECAM video signal input.
- Tint, color and sharpness cannot be adjusted with RGB signal input.
- V. POSIT, H. POSIT, H. PHASE and H. SIZE cannot be adjusted with video signal input.
- FREEZE function will be cancelled after the operation “Menu”.
- Displaying the menu cancels freeze operations.

Adjustments and functions (continued)

INPUT

The INPUT menu is used to select RGB signal sync signal frequency of the monitor and the VIDEO signal.

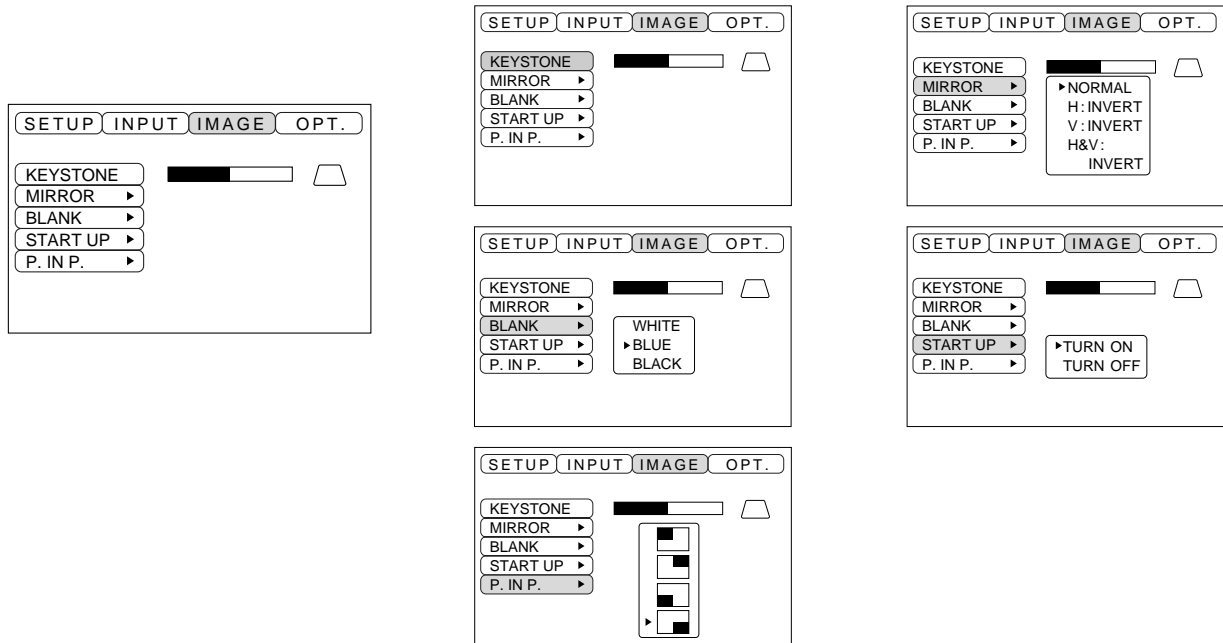


| Adjustment item | Adjustment description |
|-----------------|---|
| RGB | Displays the following RGB inputs fH: horizontal sync frequency fV: vertical sync frequency |
| VIDEO | Sets the video signal system. When the screen is unstable (no color) or rolls, select the mode that matches the input signal. |

Adjustments and functions (continued)

IMAGE

Projection image inversion, etc., can be selected from the IMAGE menu.

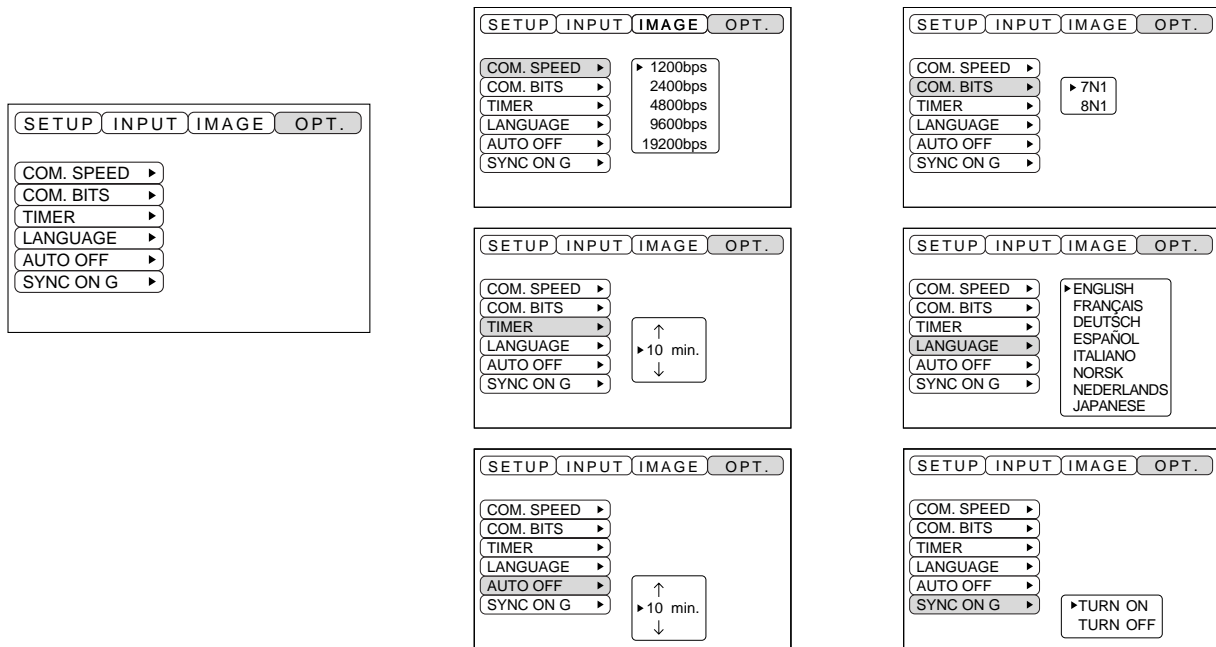


| Adjustment item | Adjustment description |
|-----------------|---|
| KEYSTONE | Reduces keystone distortion at the bottom \longleftrightarrow Reduces keystone distortion at the top |
| MIRROR | Sets vertical or horizontal inversion of the projected image. H: horizontal inversion only V: vertical inversion only H&V: both horizontal and vertical inversion. |
| BLANK | Sets the color to be used for blanking with BLANK ON or when there is no signal. Blanking is turned on, when there is no signal for approximately 5 min. |
| START UP | Opens and closes the initial settings screen during signal input at start up. When canceled, the background color will change to blue. |
| P in P | Selects the P in P sub screen display position. |

Adjustments and functions (continued)

OPT

Communication functions, etc., can be set from the OPT menu.



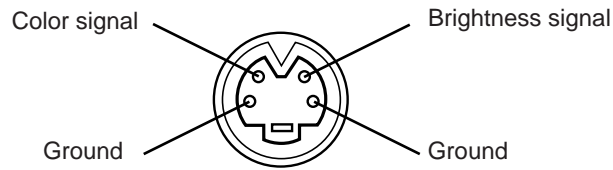
| Adjustment item | Adjustment description |
|-------------------|--|
| COM. SPEED | Sets the communication speed (5 steps). |
| COM. BITS | Sets the bit configuration for the communication data. 7N1...7 data bits, No parity, 1 stop bit. 8N1...8 data bits, No parity, 1 stop bit. |
| TIMER | Sets the timer display time (0 - 99) min. |
| LANGUAGE | Selects the menu screen language (English, French, German, Spanish, Italian, Norwegian, Dutch, Japanese). |
| AUTO OFF | Sets the time after which the power will be turned off (standby status) when there is no input signal. The settings are 1 - 99 min, 0 and None. |
| SYNC ON G | Sets the SYNC ON G feature on/off. |

Connection to the video signal terminals

1. Input signals

| | | | |
|----------------|--------|-------------------|--|
| S-VIDEO signal | | Brightness signal | 1.0V p-p, 75 Ω terminator |
| | | Color signal | 0.286V p-p (burst signal), 75 Ω terminator |
| VIDEO signal | | | 1.0V p-p, 75 Ω terminator |
| Audio signal | Input | | 200mV rms, 20k Ω or less (max. 3.0V p-p) |
| | Output | | 0~200mVrms, 1k Ω |

2. Signal input jacks



S-VIDEO input (mini DIN 4-pin)

Caution

The priority sequence of the video input jacks is as follows.

(1) S-VIDEO input jack (2) RCA jack input jack

When video signals are being projected, the audio input by the video is output to the audio output jack (RGB/VIDEO).

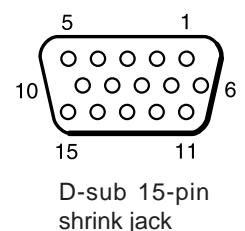
Connection to the RGB signal terminal

1. Input signals

| | | |
|------------------------|--------|---|
| Video signal | | Analog, 0.7V p-p, 75 Ω terminator (positive polarity) |
| Horizontal sync signal | | TTL level (positive/negative polarity) |
| Vertical sync signal | | TTL level (positive/negative polarity) |
| Compound sync signal | | TTL level |
| Audio signal | Input | 200mV rms, 20k Ω or less (max. 3.0V p-p) |
| | Output | 0~200mVrms, 1k Ω |

2. Signal input jacks

| | | | |
|---|---------------------|----|---|
| 1 | Video input (red) | 9 | N.C |
| 2 | Video input (green) | 10 | Ground |
| 3 | Video input (blue) | 11 | N.C |
| 4 | N.C | 12 | DDC jack (Display Data Channel) |
| 5 | N.C | 13 | Horizontal sync signal/compound sync signal |
| 6 | Ground (red) | 14 | Vertical sync signal |
| 7 | Ground (green) | 15 | DDC jack (Display Data Channel) |
| 8 | Ground (blue) | | |

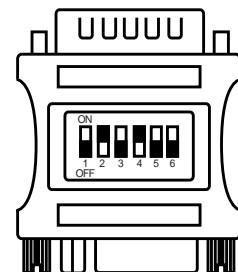


Connection to the RGB signal terminal (continued)

3. Example of computer signal

| Resolution H × V | fH (kHz) | fV (Hz) | Rating | Signal mode | Display mode | Note 1 |
|---------------------|-------------|------------|--------|-------------|--------------|--------------------|
| 640 × 400 | 24.8 | 56.4 | | NEC PC9800 | Zoom in | |
| 640 × 350 | 37.9 | 85.1 | VESA | VGA-1 | Zoom in | |
| 640 × 400 | 37.9 | 85.1 | VESA | VGA-2 | Zoom in | |
| 720 × 400 | 37.9 | 85.0 | VESA | TEXT | Zoom in | |
| 640 × 480 | 31.5 | 59.9 | VESA | VGA-3 | Zoom in | |
| 640 × 480 | 35.0 | 66.7 | | Mac13"mode | Zoom in | SW 1 ON SW 2 ON |
| 640 × 480 | 37.9 | 72.8 | VESA | VGA-3(72Hz) | Zoom in | |
| 640 × 480 | 37.5 | 75.0 | VESA | VGA-3(75Hz) | Zoom in | |
| 640 × 480 | 43.3 | 85.0 | VESA | VGA-3(85Hz) | Zoom in | |
| 800 × 600 | 35.2 | 56.3 | VESA | SVGA(56Hz) | Zoom in | |
| 800 × 600 | 37.9 | 60.3 | VESA | SVGA(60Hz) | Zoom in | |
| 800 × 600 | 48.1 | 72.2 | VESA | SVGA(72Hz) | Zoom in | |
| 800 × 600 | 46.9 | 75.0 | VESA | SVGA(75Hz) | Zoom in | |
| 800 × 600 | 53.7 | 85.1 | VESA | SVGA(85Hz) | Zoom in | |
| 832 × 624 | 49.7 | 74.5 | | Mac16"mode | Zoom in | SW 2 ON SW 4 ON |
| 1024 × 768 | 48.4 | 60.0 | VESA | XGA(60Hz) | | |
| 1024 × 768 | 56.5 | 70.1 | VESA | XGA(70Hz) | | |
| 1024 × 768 | 60.0 | 75.0 | VESA | XGA(75Hz) | | |
| 1152 × 864 | 67.5 | 75.0 | VESA | SXGA(75Hz) | Zoom out | |
| 1280 × 960 | 60.0 | 60.0 | VESA | SXGA(60Hz) | Zoom out | |
| 1280 × 1024 | 64.0 | 60.0 | VESA | SXGA(60Hz) | Zoom out | |
| 1280 × 1024 | 80.0 | 75.0 | VESA | SXGA(75Hz) | Zoom out | |

Note 1: Mac adapter is necessary to the resolution mode.
 Projector is compatible with 13 inch mode and 16 inch mode.
 Mac 13" mode=switch 1 and switch 2 are ON.
 Mac 16" mode=switch 2 and switch 4 are ON.



(Example 16 inch mode)

Caution

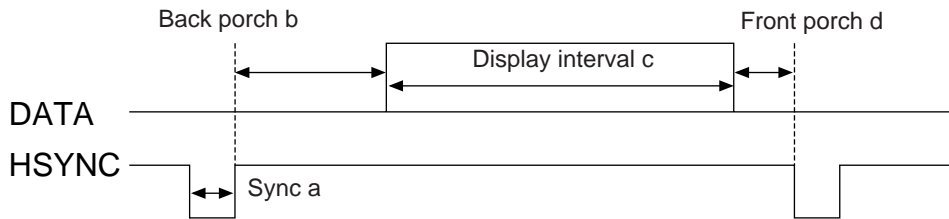
- Some computers may have multiple display screen modes. Use of some of these modes will not be possible with this projector.
- Be sure to check jack type, signal level, timing and resolution before connecting this projector to a computer.
- Depending on the input signal, full-size display may not be possible in some cases.

Connection to the RGB signal terminal (continued)

4. Initial set signals

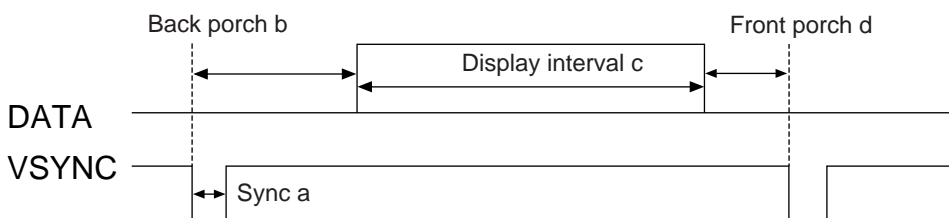
The following signals are used for the initial settings.

The signal timing of some computer models may be different. In such case, refer to pages 17 and 18 and adjust the V.POSIT and H.POSIT of the menu.



| Computer/Signal | Horizontal signal timing (μs) | | | |
|-----------------|-------------------------------|-----|------|-----|
| | a | b | c | d |
| VGA-1(85Hz) | 2.0 | 3.0 | 20.3 | 1.0 |
| VGA-2(85Hz) | 2.0 | 3.0 | 20.3 | 1.0 |
| PC-9800 | 3.0 | 3.8 | 30.4 | 3.0 |
| TEXT | 2.0 | 3.0 | 20.3 | 1.0 |
| VGA-3 | 3.8 | 1.9 | 25.4 | 0.6 |
| Mac 13"mode | 2.1 | 3.2 | 21.2 | 2.1 |
| VGA-3(72Hz) | 1.3 | 3.8 | 20.3 | 1.0 |
| VGA-3(75Hz) | 2.0 | 3.8 | 20.3 | 0.5 |
| VGA-3(85Hz) | 1.6 | 2.2 | 17.8 | 1.6 |
| SVGA(56Hz) | 2.0 | 3.6 | 22.2 | 0.7 |
| SVGA(60Hz) | 3.2 | 2.2 | 20.0 | 1.0 |

| Computer/Signal | Horizontal signal timing (μs) | | | |
|--------------------------|-------------------------------|-----|------|-----|
| | a | b | c | d |
| SVGA (72Hz) | 2.4 | 1.3 | 16.0 | 1.1 |
| SVGA (75Hz) | 1.6 | 3.2 | 16.2 | 0.3 |
| SVGA (85Hz) | 1.1 | 2.7 | 14.2 | 0.6 |
| Mac 16"mode | 1.1 | 3.9 | 14.5 | 0.6 |
| XGA (60Hz) | 2.1 | 2.5 | 15.8 | 0.4 |
| XGA (70Hz) | 1.8 | 1.9 | 13.7 | 0.3 |
| XGA (75Hz) | 1.2 | 2.2 | 13.0 | 0.2 |
| SXGA (1152 X 864, 75Hz) | 1.2 | 2.4 | 10.7 | 0.6 |
| SXGA (1280 X 960, 60Hz) | 1.0 | 2.9 | 11.9 | 0.9 |
| SXGA (1280 X 1024, 60Hz) | 1.0 | 2.9 | 11.9 | 0.9 |
| SXGA (1280 X 1024, 75Hz) | 1.1 | 1.8 | 9.5 | 0.1 |

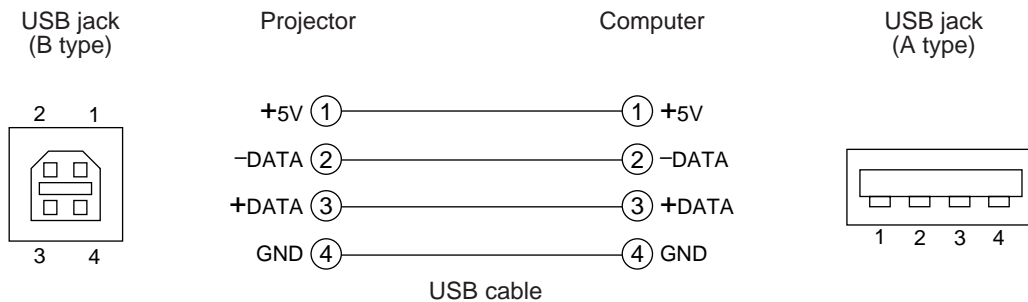


| Computer/Signal | Vertical signal timing (lines) | | | |
|-----------------|--------------------------------|----|-----|----|
| | a | b | c | d |
| VGA-1 (85Hz) | 3 | 60 | 350 | 32 |
| VGA-2 (85Hz) | 3 | 41 | 400 | 1 |
| PC-9800 | 8 | 25 | 400 | 7 |
| TEXT | 3 | 42 | 480 | 1 |
| VGA-3 | 2 | 33 | 480 | 10 |
| Mac 13"mode | 3 | 39 | 480 | 3 |
| VGA-3 (72Hz) | 3 | 28 | 480 | 9 |
| VGA-3 (75Hz) | 3 | 16 | 480 | 1 |
| VGA-3 (85Hz) | 3 | 25 | 480 | 1 |
| SVGA (56Hz) | 2 | 22 | 600 | 1 |
| SVGA (60Hz) | 4 | 23 | 600 | 1 |

| Computer/Signal | Vertical signal timing (lines) | | | |
|--------------------------|--------------------------------|----|------|----|
| | a | b | c | d |
| SVGA (72Hz) | 6 | 23 | 600 | 37 |
| SVGA (75Hz) | 3 | 21 | 600 | 1 |
| SVGA (85Hz) | 3 | 27 | 600 | 1 |
| Mac 16"mode | 3 | 39 | 624 | 1 |
| XGA (60Hz) | 6 | 29 | 768 | 3 |
| XGA (70Hz) | 6 | 29 | 768 | 3 |
| XGA (75Hz) | 3 | 28 | 768 | 1 |
| SXGA (1152 X 864, 75Hz) | 3 | 32 | 864 | 1 |
| SXGA (1280 X 960, 60Hz) | 3 | 36 | 960 | 1 |
| SXGA (1280 X 1024, 60Hz) | 3 | 38 | 1024 | 1 |
| SXGA (1280 X 1024, 75Hz) | 3 | 38 | 1024 | 1 |

Connecting the USB

1. Connect the projector and computer with a suitable commercially available cable. Disconnect the mouse cable from the projector.
2. Press the INPUT button of the projector or the RGB 1/2 button of the remote control and select the input where the computer is to be connected.
3. Start the mouse function.
4. Refer to page 10 concerning the remote control of mouse operations.
5. Varying the force with which the DISK PAD button is pressed varies the speed of mouse operation.



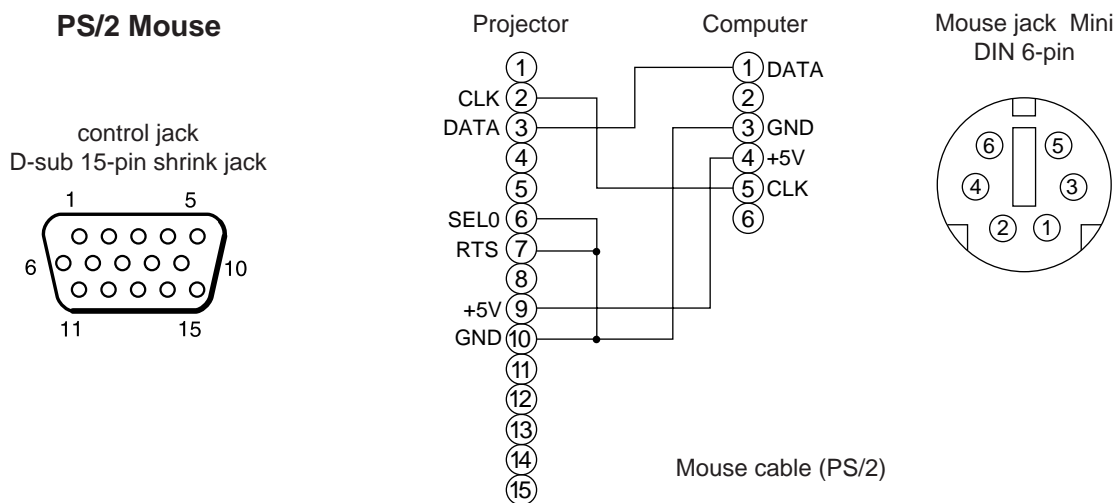
Caution

- Before making connections, read the instruction manual of the equipment to be connected.
- Use the optional USB cable to connect.
- Effective with USB only when the mouse is used.
- Do not use with any device other than a personal computer.
- When using with Windows 95, it is necessary to set so that USB can be used with version OSR 2.1 or higher. Depending on the kind or the version of the host controller, operation may not be possible in some cases.
- In the case of notebook type computers with a built-in pointing device such as a track ball, in some cases the built-in pointing device will have priority even if a mouse is connected and the mouse may not be selected.
In such case, disable the built-in pointing device and change the BIOS setting (system setup) so that an external mouse can be selected.
After changing the BIOS setting, perform the operations described in 1 - 3 above.
Refer to the computer hardware manual concerning the BIOS setting.
Also, some computers may not have a utility program to operate a mouse. Refer to the computer hardware manual.

Connection to the control signal terminal

1. Mouse functions

- (1) Turn off the main power switches of the projector and computer and connect the two units with the cable provided or an optional suitable commercially available cable. Disconnect the USB cable from the projector.
- (2) Turn on the main switch of the projector (the POWER indicator lamp will light green).
- (3) Press the INPUT button of the projector or the RGB button of the remote control and select the input where the computer is to be connected.
- (4) Turn on the computer power supply.
- (5) Start the mouse function.
If the mouse has not been started, reboot the computer (soft reboot or reboot buttons).
- (6) Refer to page 10 concerning remote control operation.
- (7) Varying the force with which the DISK PAD button is pressed varies the speed of mouse operation.



Use the mouse cable provided or a PS/2 mouse cable (for IBM and compatibles).
Cables for ADB mouse (Apple), bus mouse (NEC) and serial mouse are available as options.

Caution

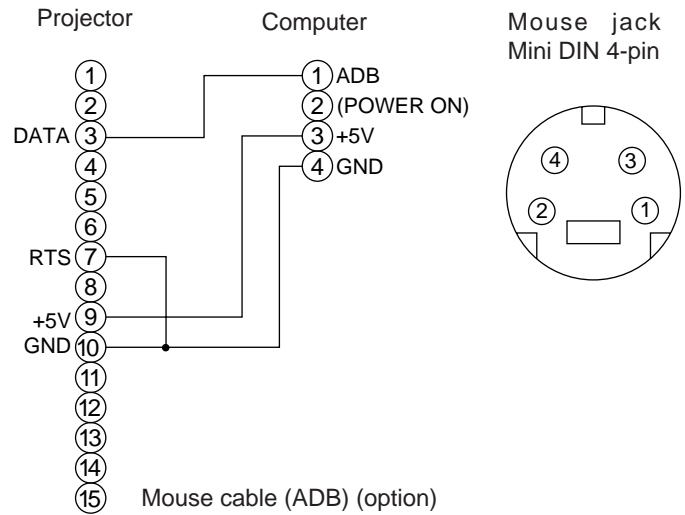
- Before making connections, read the instruction manual of the equipment to be connected.
- Turn off the projector and computer power supplies before connecting.
Connecting the mouse cable with the computer power on can result in a malfunction.
Use the mouse cable provided or an optional mouse cable to make the connection.
- In the case of notebook type computers with a built-in pointing device such as a track ball, in some cases the built-in pointing device will have priority even if a mouse is connected and the mouse may not be selected.
In such case, disable the built-in pointing device and change the BIOS setting (system setup) so that an external mouse can be selected.
After changing the BIOS setting, perform the operations described in (1) - (3) above.
Refer to the computer hardware manual concerning the BIOS setting.
Also, some computers may not have a utility program to operate a mouse. Refer to the computer hardware manual.

Connection to the control signal terminal (continued)

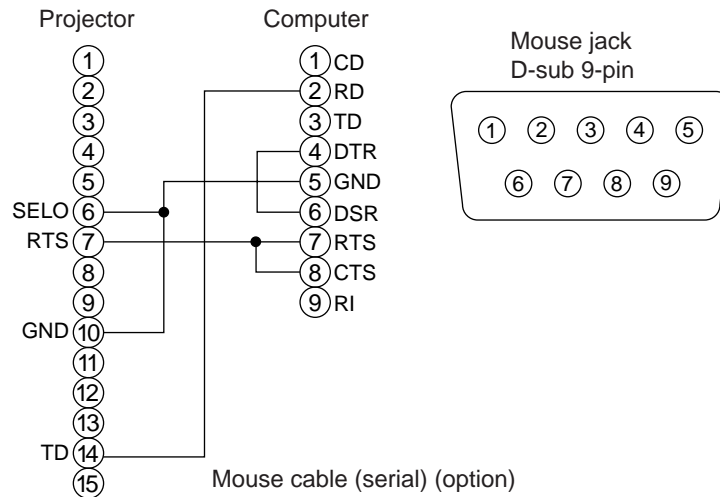
CONTROL signal jack

| Pin no. | RS-232C | Mouse | | |
|---------|---------|-------|------|--------|
| | | PS/2 | ADB | Serial |
| 1 | | | | |
| 2 | | CLK | | |
| 3 | | DATA | DATA | |
| 4 | | | | |
| 5 | | | | |
| 6 | SELO | SELO | | SELO |
| 7 | RTS | RTS | RTS | RTS |
| 8 | | | | |
| 9 | | +5V | +5V | |
| 10 | GND | GND | GND | GND |
| 11 | | | | |
| 12 | | | | |
| 13 | RD | | | |
| 14 | TD | | | TD |
| 15 | | | | |

ADB (Mac) mouse



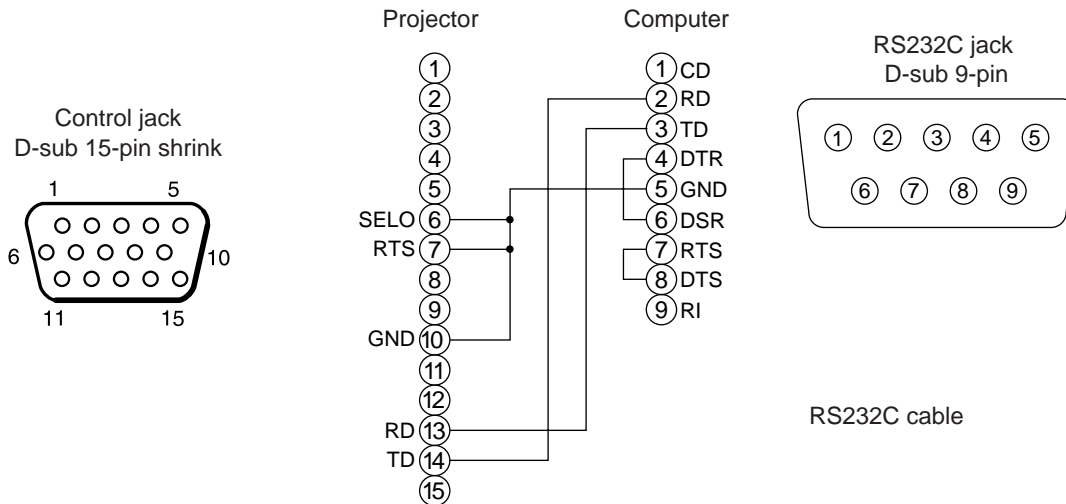
Serial mouse



Connection to the control signal terminal (continued)

2. RS232C communication

- (1) Turn off the projector and computer power supplies and connect with the RS232C cable.
- (2) Turn on the computer power supply and, after the computer has started up, turn on the projector power supply.
- (3) Refer to page 21 and set the communication speed and the number of communication bits.
- (4) Start RS232C communication.



| Command | Projector→computer | | Computer→projector | | | | | |
|-----------------|--------------------|--------|--------------------|-----|--------------|--------|----------------------|-----|
| | Response code | | Inquiry code | | Setting code | | Default setting code | |
| | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd |
| MOUSE | 11h | 05h +1 | 20h | 05h | 31h | 05h +1 | 40h | 05h |
| COMMUNICATE | 11h | 06h +1 | 20h | 06h | 31h | 06h +1 | 40h | 06h |
| POWER | 11h | 11h +1 | 20h | 11h | 31h | 11h +1 | --- | --- |
| ZOOM | 11h | 12h +1 | --- | --- | 31h | 12h +1 | --- | --- |
| FOCUS | 11h | 13h +1 | --- | --- | 31h | 13h +1 | --- | --- |
| MIRROR | 11h | 14h +1 | 20h | 14h | 31h | 14h +1 | 40h | 14h |
| INPUT | 11h | 21h +1 | 20h | 21h | 31h | 21h +1 | 40h | 21h |
| (VIDEO)SYSTEM | 12h | 22h +2 | 20h | 22h | 32h | 22h +2 | 40h | 22h |
| VOLUME | 11h | 23h +1 | 20h | 23h | 31h | 23h +1 | 40h | 23h |
| MUTE | 11h | 24h +1 | 20h | 24h | 31h | 24h +1 | 40h | 24h |
| BRIGHT | 13h | 31h +3 | 20h | 31h | 33h | 31h +3 | 40h | 31h |
| CONTRAST | 13h | 32h +3 | 20h | 32h | 33h | 32h +3 | 40h | 32h |
| COLOR | 13h | 33h +3 | 20h | 33h | 33h | 33h +3 | 40h | 33h |
| TINT | 13h | 34h +3 | 20h | 34h | 33h | 34h +3 | 40h | 34h |
| SHARPNESS | 13h | 35h +3 | 20h | 35h | 33h | 35h +3 | 40h | 35h |
| H.PHASE | 13h | 37h +3 | 20h | 37h | 33h | 37h +3 | 40h | 37h |
| H.POSIT | 14h | 38h +4 | --- | --- | 34h | 38h +4 | 40h | 38h |
| H.SIZE | 14h | 36h +4 | --- | --- | 34h | 36h +4 | 40h | 36h |
| V.POSIT | 14h | 3Ah +4 | --- | --- | 34h | 3Ah +4 | 40h | 3Ah |
| COLOR BALANCE R | 13h | 3Bh +3 | 20h | 3Bh | 33h | 3Bh +3 | 40h | 3Bh |
| COLOR BALANCE B | 13h | 3Dh +3 | 20h | 3Dh | 33h | 3Dh +3 | 40h | 3Dh |
| AUTO ADJUST | 11h | 3Ch +1 | 20h | 3Ch | 31h | 3Ch +1 | 40h | 3Ch |
| BLANK | 11h | 41h +1 | 20h | 41h | 31h | 41h +1 | 40h | 41h |
| MAGNIFY | 11h | 15h +1 | 20h | 15h | 31h | 15h +1 | 40h | 15h |
| FREEZE | 11h | 16h +1 | 20h | 16h | 31h | 16h +1 | 40h | 16h |

Connection to the control signal terminal (continued)

Command data chart

| Item | Data code |
|-----------------|--|
| MOUSE | 00h=disable mouse function, 01 ~ 7Fh=start mouse function |
| COMMUNICATE | 0Xh=8N1, 1Xh=7N1 X0h=1200bps, X1h=2400bps, X2h=4800bps, X3h=9600bps, X4h=19200bps |
| POWER | 3Eh=power off (standby status), 3Fh=power on |
| ZOOM | 01 ~ 3Fh=Zoom +, 41 ~ 7Fh=Zoom - |
| FOCUS | 01 ~ 3Fh=Focus +, 41 ~ 7Fh=Focus - |
| MIRROR | 00h=Normal, 01h=H : Invert, 02h=V : Invert, 03h=H & V : Invert |
| INPUT | 11h=VIDEO, 21h=RGB1, 22h=RGB2 |
| SYSTEM (VIDEO) | 00h 00h=Auto, 00h 01h=NTSC, 00h 04h=NTSC4.43 00h 02h=PAL, 00h 03h=SECAM, 00h 05h=M-PAL, 00h 06h=N-PAL |
| VOLUME | 00h (low volume) ~ 24h (high volume) |
| MUTE | 00h=mute off, 01h=mute on |
| BRIGHT | 00h 00h 00h (dark) ~ 00h 00h 24h (bright) |
| CONTRAST | 00h 00h 00h (low) ~ 00h 00h 24h (strong) |
| COLOR | 00h 00h 00h (pale) ~ 00h 00h 24h (dense) |
| TINT | 00h 00h 00h (reddish) ~ 00h 00h 24h (greenish) |
| SHARPNESS | 00h 00h 00h (soft) ~ 00h 00h 24h (sharp) |
| H.PHASE | 00h 00h 00h ~ 00h 00h 24h |
| H.POSIT | 00h 00h 00h 01h (Right) moves one step 00h 00h 00h 7Fh (Left) moves one step |
| H.SIZE | 00h 00h 00h 01h (Large) moves two step 00h 00h 00h 7Fh (Small) moves two step |
| V.POSIT | 00h 00h 00h 01h (Up) moves one step 00h 00h 00h 7Fh (Down) moves one step |
| COLOR BALANCE R | 00h 00h 00h (Light red) ~ 00h 00h 24h (Dark red) |
| COLOR BALANCE B | 00h 00h 00h (Light blue) ~ 00h 00h 24h (Dark blue) |
| AUTO ADJUST | 00h (AUTO ADJUST (Play)) |
| BLANK | 0Xh=blanking off, 1Xh=blanking on X=8 Black, X=9 Blue, X=F White |
| MAGNIFY | 00h=normal display, 01h=zoom Magnify display or Magnify ratio up. 7Fh=zoom ratio down |
| FREEZE | 00h=normal display, 01h=still image display |

The command code configuration consists of a 2-byte command and the following data.

- The first byte of a command indicates the command type with 3 bits on the MSB side and the data length with 4 bits on the LSB side.

| | |
|--------------------------|------------------------------|
| Projector - computer | Computer - projector |
| '0xH' : Error code | '2xH' : inquiry code |
| '1xH' : response code | '3xH' : setting code |
| '70H' : frame error code | '4xH' : default setting code |

'x' indicates the data length (example: x=2 means a 2-byte command).
- The second byte of a command indicates the command contents.

Connection to the control signal terminal (continued)

Requesting projector status

- (1) Send the request code '20H' + 'yyH' from the computer to the projector.
- (2) The projector returns the response code '1xH' + 'yyH' +data to the computer.

Changing the projector settings

- (1) Send the setting code '3xH' + 'yyH' +data from the computer to the projector.
- (2) The projector changes the setting based on the above setting code.
- (3) The projector returns the response code '1xH' + 'yyH' +data to the computer.

Caution The response data in (3) above need not match the setting data in (1). For example, when the projector cannot set the setting data in (1), the projector may set the closest value. That value will be used as the response data in (3). Or else the projector will return the error code '0xH' + 'yyH' +data.

Using the projector default settings

- (1) The computer sends the default setting code '40H' + 'yyH' to the projector.
- (2) The projector changes the specified setting to the default value.
- (3) The projector returns the default value with the response code '1xH' + 'yyH' =data.

When a command sent by the projector cannot be understood by the computer

- (1) The computer sends the command code '3xH' , '4xH' or '4xH' + 'yyH' +data to the projector.
- (2) When the command sent by the projector cannot be understood, the error command '00H' + 'yyH' is returned by the computer.

When data sent by the projector cannot be understood

- (1) The computer sends the command code '3xH' , '4xH' or '4xH' + 'yyH' +data to the projector.
- (2) When the command sent by the projector cannot be understood, the the error code '0xH' + 'yyH' +data is returned.

When the data length is greater than indicated by the data length code, the projector will ignore the excess data code. Conversely, when the data length is shorter than indicated by the data length code, an error code will be returned to the projector.

When a frame error occurs

Repeats 10 times per second until there is some sort of response to the error code 70H + 70H.

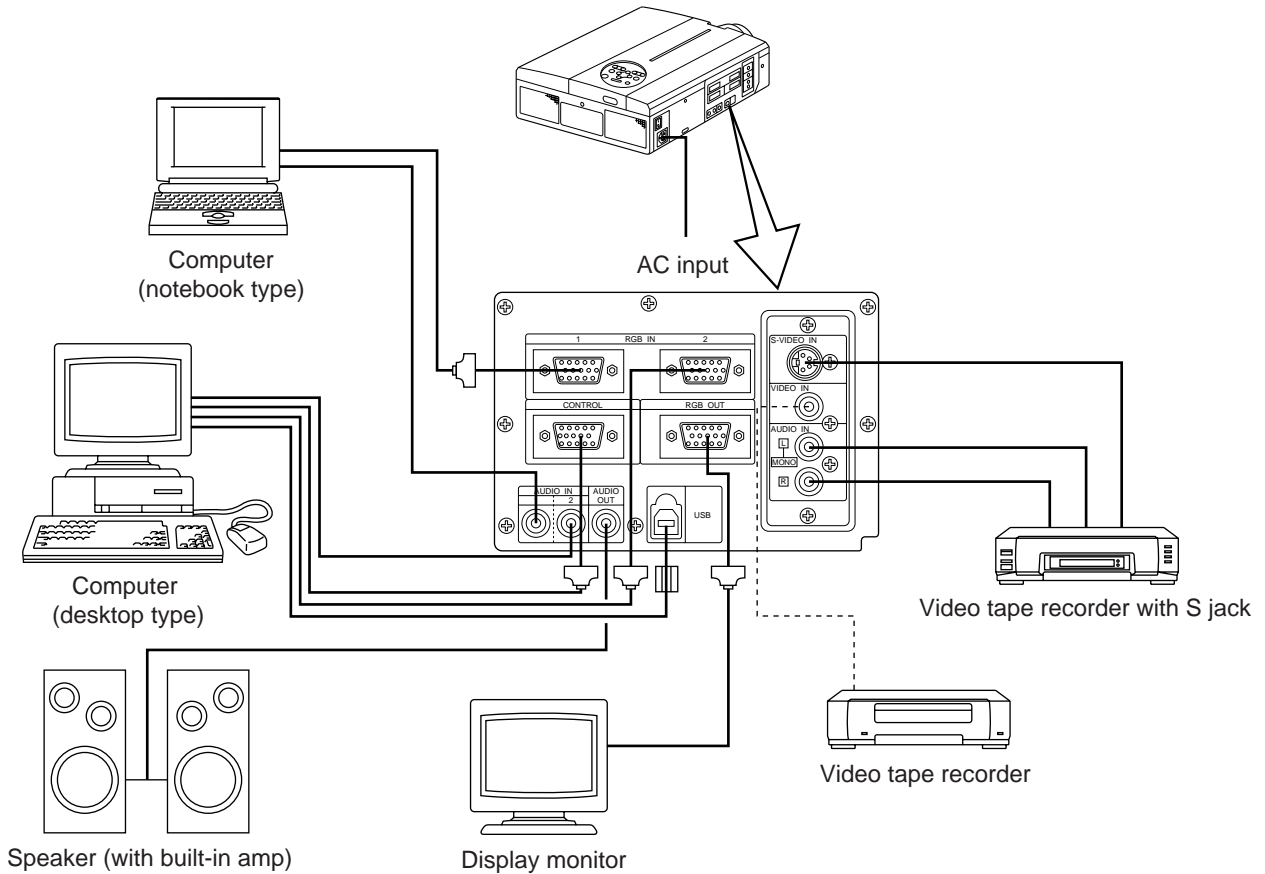
When the interval between bytes in one command is 500ms or greater

When a command or data is not sent within 500ms after the command code '2xH' , '3xH' or '4xH' is sent by the computer, the error command '70H' + '70H' will be returned as soon as the 500ms elapses. After this, if there is no response within 1 sec., a frame error will occur.

Caution

- Operation cannot be guaranteed when the projector receives an undefined command or data.
- Provide an interval of at least 40ms between the response code and any other code.

Example of system setup

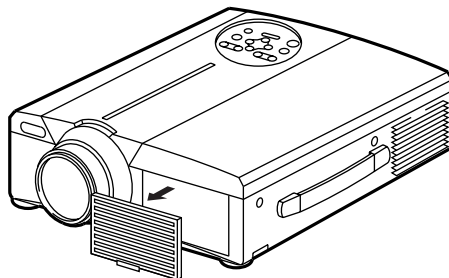


Caution Turn power off to all devices before connecting.
Refer to the instruction manual of each device before connecting.

Cleaning the Air filter

Clean the air filter about every 100 hours .

- 1** Turn off the **MAIN POWER** switch of the projector and pull out the power cord.
- 2** Remove the front air filter.



| Filter | Parts Number |
|------------|--------------|
| Air Filter | MU00831 |

Cleaning the Air filter (continued)

3 Cleaning the air filter with a vacuum cleaner

4 Installing the air filter

Caution When the air filter becomes clogged with dust, etc., the projector power may turn off to prevent the internal heat level rising. (The lamp indicator color changes to red.) Do not operate the projector with the air filter removed. (If used with the air filter removed, dust can enter the LCD panel and produce an adverse effect on image quality.)

Lamp

The light source lamp has a service life.

When used for an extended time, the images may become darker and the colors may deteriorate.

A malfunction could occur if the projector is used in this condition, so replace the lamp with a new one.

The following indicator or a message which appears when the power is turned on will indicate when the lamp should be replaced.

At such time, it is necessary to replace the lamp with a new one. For lamp replacement, please contact your dealer or service company.

Caution Even when the lamp is at a high temperature, the power to the projector may cut off to prevent an excessive temperature increase inside the projector. (The POWER indicator turns off.) Turn off the MAIN POWER switch, wait for some 20 minutes and turn on the MAIN POWER switch again. If the projector is not recovered after turning on the MAIN POWER switch, please contact your dealer or service company.

Message table

Screen displays

The following messages are displayed on the screen.

| | |
|---|--|
| CHANGE THE LAMP"CALL A MAINTENANCE PERSON" | The total lamp usage time is nearing the service life of the lamp. Replace with a new lamp. The lamp will turn off automatically when the lamp replacement time has been exceeded. *1 |
| "CHANGE THE LAMP" "CALL A MAINTENANCE PERSON" "THE POWER WILL TURN OFF AFTER * hr." | The total lamp time is nearing the lamp replacement time. After (*) hours, the lamp will turn off. Quickly replace with a new lamp. *1 *Indicates the number of hours until the lamp turns off automatically. |
| Blinking of "CHANGE THE LAMP" | The total lamp time has exceeded the replacement time. The indicator will blink for approximately 10 min. and then turn off automatically. Replace with a new lamp. |
| NO INPUT IS DETECTED | There is no signal input (refer to pages 22, 23). |
| SYNC IS OUT OF RANGE | The current horizontal or vertical frequency cannot be used by this projector (refer to pages 23, 24). |

*1 This display will disappear after 3min. but will reappear when the power is turned on again.

Message table (continued)

Indicators

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

| POWER indicator | LAMP indicator | TEMP indicator | Status | Processing |
|-----------------|----------------|----------------|--|---|
| Lights orange | Turns off | Turns off | Standby status | _____ |
| Flashes green | Turns off | Turns off | Warming up | _____ |
| Lights green | Turns off | Turns off | Operation status *1 | _____ |
| Flashes orange | Turns off | Turns off | Cool down | _____ |
| Lights red | Lights red | Turns off | The lamp does not light. *2 The interior is too hot. | Wait some time (approx. 20 min.) before turning the power on again. Clean the air filter before turning the power on. If the indicator still lights, contact your dealer. |
| Lights red | Flashes red | Turns off | A lamp has not been inserted or the lamp cover is missing. | Contact your dealer. |
| Lights red | Turns off | Flashes red | The cooling fan is not operating. | Contact your dealer. |
| Flashes red | Flashes red | Turns off | The total lamp time has exceeded the replacement time. | Contact your dealer. |

When the LAMP or TEMP indicator lights or flashes, turn off the MAIN POWER switch before proceeding. If the problem still persists, contact your dealer or service company.

*1: When the cooling fan is stopped and the interior becomes overheated, the power will turn off automatically to allow cooling (the indicator will turn off). In such cases, turn off the projector power, allow the set to cool and then turn the projector power on again. The lamp will then light. If the lamp does not light, contact your dealer or service company.

*2: In some cases, when the air holes become blocked and the interior temperature rises, the lamp will be turned off for protection and the LAMP indicator will flash red. In such cases, turn off the MAIN POWER switch, allow the set to cool (for approx. 20 min.) and then turn the power on again.

When you think something wrong

Before requesting repair, check in accordance with the following chart. If the situation cannot be corrected, then contact your dealer.

| Symptom | Possible cause | Remedy | Page |
|---|---|---|---|
| The power is not turned on. | <ul style="list-style-type: none"> The main power switch is not turned on. The power cord is disconnected. | <ul style="list-style-type: none"> Turn on the main power switch. Plug the power cord into an AC power outlet. | P.13 P.9 |
| No video or audio. | <ul style="list-style-type: none"> The input is not correctly set. No signal input. | <ul style="list-style-type: none"> Use the projector or remote control to set. Connect correctly. | P.8,10, 13,19 P.9,31 |
| Video is present but no audio. | <ul style="list-style-type: none"> The projector is not correctly connected. The volume is set to minimum. Mute is turned on. Audio is switched to RGB when P in P is on. | <ul style="list-style-type: none"> Connect correctly. Press VOLUME + on the remote control or display the menu screen and adjust the volume. Press the MUTE button. Displays the Volume bar and switches the Audio input. | P.9,31 P.10,18 P.8,10 P.10 |
| Audio is present but no video. | <ul style="list-style-type: none"> The projector is not correctly connected. The brightness adjustment knob is rotated fully clockwise. The lens cap is still on. | <ul style="list-style-type: none"> Connect correctly. Select BRIGHT with the MENU button and then press the (▶) key. Remove the lens cap. | P.9,31 P.17 P.13 |
| Colors are pale and color matching is poor. | Color density and color matching are not correctly adjusted. | Adjust the video. | P.18 |
| Images are dark. | <ul style="list-style-type: none"> Brightness and contrast are not correctly adjusted. The lamp is nearing the end of its service life. | <ul style="list-style-type: none"> Adjust the video. Replace with a new lamp. | P.18 P.32 |
| Video is blurred. | Focus or H PHASE is out of adjustment. | Adjust the focus or H PHASE. | P.13,18 |
| The LAMP indicator lights red. | Lamp failure. | Wait approximately 20 min. and then turn the power on again. | P.33 |
| | Internal overheating. | <ul style="list-style-type: none"> Make sure the ventilation openings are not blocked. Clean the air filter. Lower the ambient temperature to 35 degrees C or less. | P.31,32 |

A bright dot may be seen in the picture. This is a phenomenon peculiar to the liquid crystal and is not a problem.

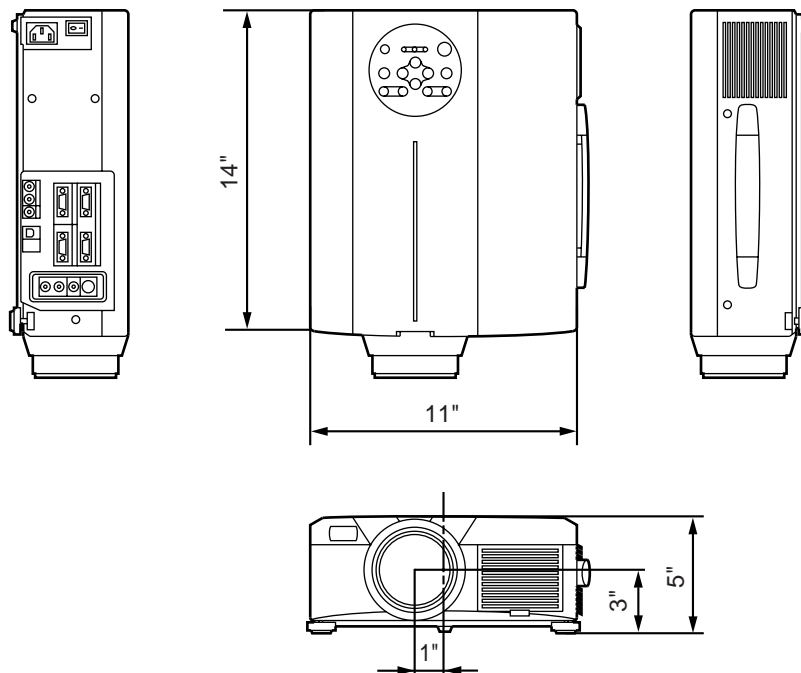
Specifications

· These specifications are subject to change without notice.

| | | |
|-------------------------------|------------------|--|
| Product name | | Liquid crystal projector |
| Model | | CP-X960WA/970W |
| Display method | | Three liquid crystal panels, three primary color system. |
| Liquid crystal panel | Panel size | 3.3 cm (1.3 type) |
| | Drive system | TFT active matrix |
| | Number of pixels | 786,432 pixels (1,024 horizontal × 768 vertical) |
| Lens | | Zoom lens F=1.7~2.3 f=49~64mm |
| Lamp | | 190w UHB |
| Speaker | | 1.2W + 1.2W (Stereo) |
| Power supply | | AC100 ~ 120V, 3.7A / AC220 ~ 240V, 1.5A. |
| Power consumption | | 320W |
| Operating temperature range | | 0 ~ 35°C |
| Size | | 11" (W) × 5" (H) × 14" (D), 289mm(W) × 124mm(H) × 345mm(D) |
| Weight (mass) | | 13 lbs, 5.9kg |
| VIDEO signal input jacks | | S VIDEO: mini DIN 4-pin jack VIDEO: RCA jack AUDIO: RCA jack |
| RGB signal input/output jacks | | RGB signals: D-sub 15-pin shrink jack Audio: stereo mini-jack |
| CONTROL signal jack | | D-sub 15-pin shrink jack |
| USB jack | | B type |

Dimensional Diagram

Unit: inches



About the warranty and after-service

About the warranty

A warranty is provided for this product. Fill in the necessary items and store in a safe place.

About after-service

When a problem occurs, please check first using the Troubleshooting Chart provided in this instruction manual. If the problem still persists, contact your dealer or service company.

About repairs during the warranty period

Repairs will be made as described in the warranty.
For details, please read the warranty.

Repairs after the warranty period has elapsed

Paid repairs will be made if desired in the event that the function can be restored by such repairs.
Parts will be made available for a minimum period of 8 years.

HITACHI

Hitachi Home Electronics (America), Inc.

Multimedia Systems Division.

National Headquarters: 3890 Steve Reynolds Blvd. Norcross GA 30093, U.S.A.
Tel: +1-770-279-5600 Fax: +1-770-279-5696

Hitachi Sales Corp. of Canada

6740 Campobello Road, Mississauga, Ontario L5N2L8, Canada
Tel: +1-905-821-4545 Fax: +1-905-821-1101

Hitachi Home Electronics (Europe), Ltd.

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire SL8 5XF UK
Tel: +44-162-864-3000 Fax: +44-162-864-3400

Hitachi Home Electronics Europe Ltd

426 Bergensesteenweg, 1500 Halle, Belgium
Tel: +32-2-363-9901 Fax: +34-2-363-9900

Hitachi Home Electronics Europe Ltd

Gewerbepark, Hintermattlistr, Postfach, 5506 Magenwil, Switzerland
Tel: +41-62-889-8011 Fax: +41-62-896-4771

Hitachi Europe GmbH

Business Systems Division

Via T. Gulli. 39, 20147 Milano, Italy
Tel: +39-2-487861 Fax: +39-2-48786322

Hitachi Sales Europa GmbH

Business Systems Division

Am Seestern 18, 40547 Dusseldorf, Germany
Tel: +49-211-529-1551 Fax: +49-211-529-1594

Hitachi Business Systems (Nordic)

Brugata 14, N-0184 Oslo, Norway
Tel: +47-2205-9060 Fax: +47-2205-9061

Hitachi Business Systems (Nordic)

Domnarvsgatan 29, Lunda, Box 62, S-163 91 Spanga, Sweden
Tel: +46-8-621-8260 Fax: +46-8-761-6250

Hitachi Business Systems (Nordic)

Kuldysen 13, DK-2630 Tåstrup, Denmark
Tel: +45-43-99-9200 Fax: +45-43-99-9392

Hitachi Business Systems (Nordic)

Tapiolan Keskustorni 11 Krs. Fin-02100 Espoo, Finland
Tel: +358-9-3487-1188 Fax: +358-9-455-2152

Hitachi France

Immeuble, 'Ariane', 18 Rue Grange Dame Rose, B.P. 134, 78148 Velizy, Cedex, France
Tel: +33-1-34630542 Fax: +33-1-34650761

Hitachi Sales Iberica S A

Gran Via Carlos 111, 101, 1-1, 08028 Barcelona, Spain
Tel: +34-3-330-8652 Fax: +34-3-339-7839

Hitachi Home Electronics Asia, (S) Pte Ltd.

16 Collyer Quay #20-00 Hitachi Tower Singapore 049318, Singapore
Tel: +65-536-2520 Fax: +65-536-2521

Hitachi Sales (Malaysia) Sdn. Bhd.

Wisma Hitachi, No.2, Lorong 13/6A, 46200 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7573455 Fax: +60-3-7556090

Hitachi Sales (Thailand), Ltd.

994,996 Soi Thonglor, Sukhumvit 55 Road, Klongton, Klongtoey, Bangkok 10110, Thailand
Tel: +66-2-381-8381 Fax: +66-2-381-9520

Hitachi (Hong Kong), Ltd.

8th Floor Park-in Commercial Centre, No.56, Dundas Street, Kowloon Bay, Kowloon, Hong Kong
Tel: +852-2-7804351 Fax: +852-2-7804915

Hitachi Sales Corp. of Taiwan.

2nd Floor, No.65, Nanking East Road, Section 3, Taipei, Taiwan
Tel: +886-2-516-0500 Fax: +886-2-516-1501

Hitachi Australia Ltd.

13-15 Lyonpark Road, North Ryde NSW 2113, Australia
Tel: +61-2-9888-4100 Fax: +61-2-9888-4144

Hitachi, Ltd.

15-12, Nishi Shimbashi 2-chome, Minato-ku, Tokyo, 105 Japan
Tel: +81-3-3502-2111 Fax: +81-3-3506-1440