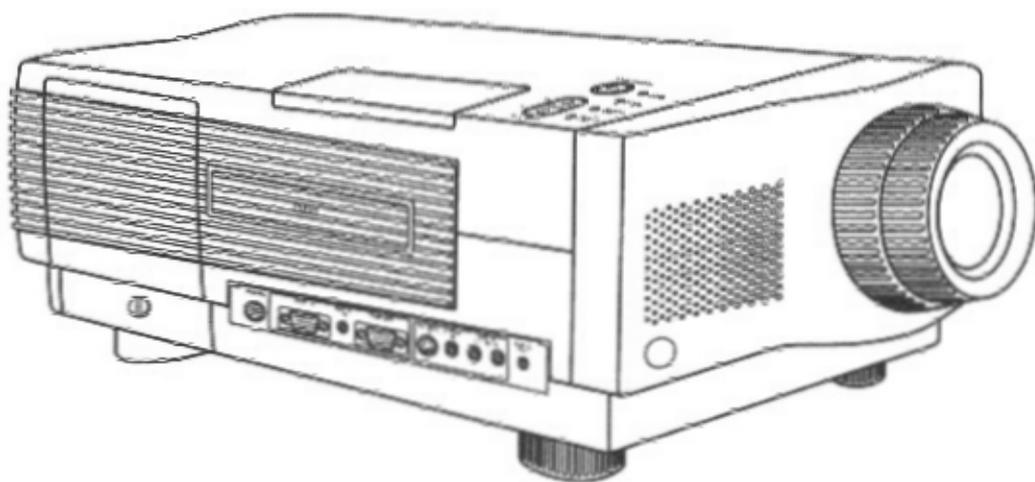


Operating Instructions

LCD Projector

MLP-1000



Panasonic®

Please read these completely before operating this LCD Projector.

Things You Should Know

Caution: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Warning: To assure continued compliance, use only the provided grounded power supply cord and shielded interface cables when connecting this device to a computer. Also, any unauthorized changes or modifications to this equipment could void the user's authority to operate this device.

Congratulations

on your purchase of one of the most sophisticated and reliable products on the market today. Used properly, it will give your family years of service. Please take time to fill in the information below. The serial number is on the tag located on the back of your LCD Projector. You'll want to keep this manual handy as your convenient LCD Projector information source. For your own protection and prolonged operation of your LCD Projector, please be sure to read the "Important Safeguards" carefully, before use.

Date of Purchase _____
Dealer Purchased From _____
Dealer Address _____
Dealer Phone No. _____
Model No. **MLP-1000** _____
Serial No. _____

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Important Safeguards



CAUTION: Please read all of these instructions before you operate your LCD Projector. Save these instructions for future reference.

Electrical energy can perform many useful functions. This LCD Projector has been engineered and manufactured to meet applicable safety standards. But IMPROPER USE CAN RESULT IN POTENTIAL ELECTRICAL SHOCK OR FIRE HAZARDS. In order not to defeat the safeguards incorporated into this LCD Projector, observe the following basic rules for its installation, use and servicing.

- 1 Unplug the LCD Projector from the wall outlet before cleaning.
- 2 Do not use liquid cleaners or aerosol cleaners. Use a soft dry cloth to clean the LCD Projector unit. If the unit is very dirty, wet a cloth with neutral detergent, squeeze it tight, wipe the unit with it, and finish by wiping with a dry cloth. Do not use a chemical duster or polisher-cleanser because it can adversely affect the unit and peel the paint coat.
- 3 Do not use attachments not recommended by Panasonic, as they may cause hazards.
- 4 Do not use the LCD Projector near water; for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, near a swimming pool, etc. Never spill liquid into the LCD Projector.
- 5 Do not place the LCD Projector on an unstable cart, stand, or table. The LCD Projector may fall, which may cause serious injury to a child or an adult, and/or serious damage to the unit. Use only with a cart or stand recommended by its manufacturer, as being suitable for use with an LCD Projector.
- 6 Ceiling, wall or shelf mounting for installation should use a mounting kit approved by the manufacturer for use with an LCD Projector and should follow the manufacturer's instructions.
- 7 LCD Projector equipment and cart combinations should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the equipment and cart combination to overturn.
- 8 Slots and openings in the cabinet back and bottom are provided for ventilation. To ensure reliable operation of the LCD Projector and to protect it from overheating, these openings must not be blocked or covered. These openings should never be covered with cloth or other material. The bottom opening should not be blocked by placing the LCD Projector on a bed, sofa, rug, or other similar surface. The LCD Projector should not be placed near or over a radiator or heating vent. The LCD Projector should not be placed in a built-in installation such as a bookcase unless proper ventilation is provided. Never operate the LCD Projector without adequate ventilation. Provide at least four inches (4") clearance on both sides of the LCD Projector and at least 12 inches (12") clearance from the rear of the LCD Projector.
- 9 The LCD Projector should be operated only from the type of power source indicated on the back of the LCD Projector or in the specifications. If you are not sure of the type of power supplied to you business, consult your LCD Projector dealer or local power company.
- 10 Do not allow anything to rest on the power cord. Do not place the LCD Projector where the cord will be walked on.
- 11 Follow all warnings and instructions marked on the LCD Projector.
- 12 As a safety feature, this LCD Projector is equipped with a 3-prong grounded plug. The 3-prong grounded plug will fit only into a grounding type power outlet. If the plug does not fit, use an adaptor that is properly grounded or have an electrician install a grounded type outlet. Do not attempt to modify this AC plug.
- 13 For added protection of the LCD Projector during a lightning storm, or when it is left unattended or not in use for long periods of time, unplug it from the wall outlet and disconnect any cable systems. This will prevent damage to the projector due to lightning and power-line surges.
- 14 Do not overload wall outlets and extension cords, because this can result in fire or electric shock.



- 15** Never push objects of any kind into the LCD Projector through cabinet slots as they may touch dangerous voltage points or short out parts, which could result in a fire or electric shock.
- 16** Do not attempt to service the LCD Projector yourself. Opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
- 17** Unplug the LCD Projector equipment from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - A. When the power cord or plug is damaged or frayed.
 - B. If liquid has been spilled into the LCD Projector.
 - C. If the LCD Projector has been exposed to rain or water.
 - D. If the LCD Projector does not operate normally when you follow the operating instructions. Adjust only those controls that are covered by the operating instructions; improper adjustment of other controls may cause damage and will often require extensive work by a qualified technician to restore the LCD Projector to normal operation.
 - E. If the LCD Projector has been dropped or the cabinet has been damaged.
 - F. When the LCD Projector exhibits a distinct change in performance – this indicates a need for service.
- 18** Upon completion of any service or repairs to the LCD Projector, ask the service technician to perform a routine safety check to determine that the LCD Projector is in safe operating condition.
- 19** When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer that have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.
- 20** Air filter must be cleaned every 100 lamp on hours.
LCD Projector may become too hot if filter is not cleaned when required.
- 21** If lens becomes dirty, or smudged, clean with a clean, dampened cloth. Never touch the lens with your fingers.
- 22** Do not look directly into the aperture and lens while operating as this may result in damage to your eyes.
- 23** Do not operate the LCD Projector where hot or cold air can blow on it directly, near a heater, in the outside air where wind can blow on it or expose it to direct sunlight.
- 24** Do not use an extension cord to operate the LCD Projector. The LCD Projector must be operated directly from an AC outlet on an independent line that has a 15 Amp rating, is properly grounded and must not have conducted line noise generating equipment connected to it such as air-conditioners, copiers, shredders, binders, washing machines, dryers, dishwashers, electric heaters, power saws, power drills or other heavy current demanding equipment.

Contents of LCD Projector Box

Please confirm that the following items are packed in the LCD Projector box. They are provided to help you use or set up your LCD Projector.

- (1) LCD Projector
- (2) Remote Control
- (3) 2 "AA" Batteries
- (4) 9.8 Foot UL/CSA Power Cord
- (5) DOS/V VGA Cable
- (6) VGA MAC Adaptor
- (7) PC Audio Cable
- (8) Video RCA Cable
- (9) RCA - BNC pin Adaptor
- (10) Audio RCA Cable
- (11) RS-232C Cable
- (12) RS-232C 9P Adaptor
- (13) RS-232C 25P Adaptor
- (14) S-Video Cable
- (15) Operating Instructions (Please read completely before operating.)
- (16) Quick Reference Guide
- (17) Warranty Card
- (18) Software Diskette

LCD Projector Features

1 High Brightness and Resolution

922k-pixel, 300-lumen (ANSI) offers clear images even when ambient light level is high.

2 Portable Multimedia LCD Projector

You can give attractive multimedia presentations at any location by connecting the MLP-1000 to a notebook computer, AC power source, etc.

3 30 to 650 Inch Screen Capability

30" (2.5 feet) to 650" (54.2 feet) throw distance. (See table on page 9.)

4 Compatible with Most Personal Computers

The RGB input accepts signals from VGA and MAC compatible computers with no additional hardware. Other compatible computers require a separate cable (Not included).

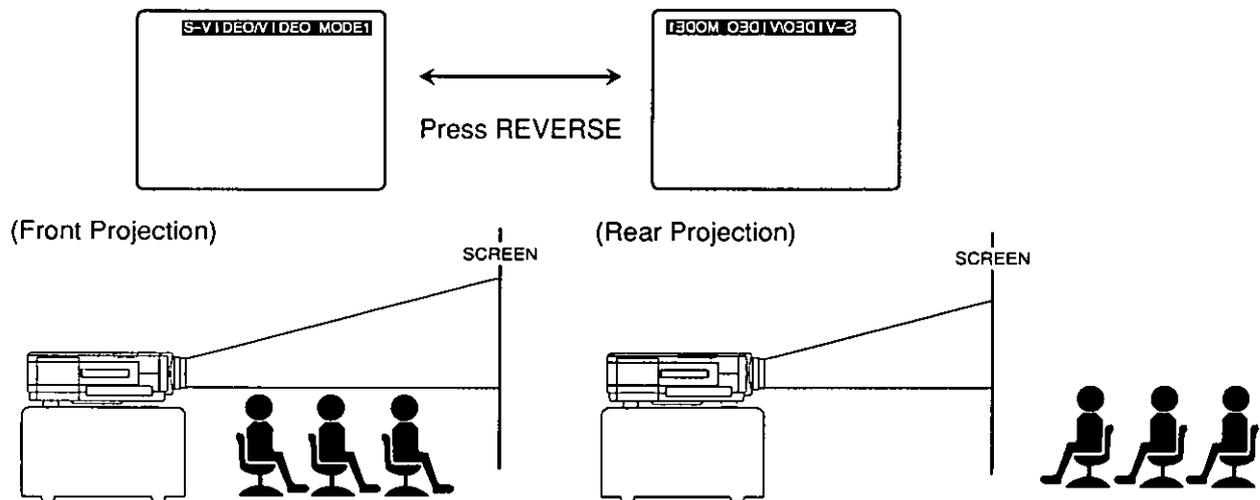
5 Rear Screen Mode

The LCD Projector is equipped with a reverse scan function which allows the image to be reversed for rear projection.

Press REVERSE on the LCD Projector.

- When REVERSE is pressed, the image is flipped to a mirror image of the input video signal.

Press REVERSE once more to return to the standard projection format.



6 RS232C Remote Control

The LCD Projector can be controlled by your personal computer when this connection is made.

7 IR Remote Control

Front and rear sensors allow you to control the projector from almost anywhere in the room.

8 Stereo Audio Output

For external audio equipment connection. Audio follows video source.

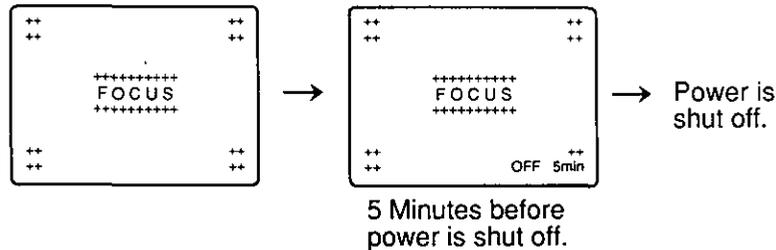
9 Blue Screen with No Video Input

The LCD Projector is equipped with an internal Blue Screen function which turns the screen blue when the video equipment connected to the input jack is turned off, or when there is nothing connected to the input jack.

- If the power is turned on when no video signal is input to the LCD Projector, the screen will turn blue.

The "FOCUS" overlay appears only until the video equipment is connected to the input jack and turned on.

If no video signal input is received (the screen is blue) for 15 minutes, the lamp will turn off automatically.



- The following display will appear when the RGB input is within the LCD Projector's frequency range, but is not one of the LCD Projector's programmed formats. (See page 23).



- Should an RGB signal be input which is out of the LCD Projector's frequency range, no indication will be present.

10 Manual V/A Mute Function

Blanks out the screen and mutes the sound.

Press the VA Mute button or key to blank the video to black and mute the audio.

Press the button or key once again to return to the normal screen and sound.

11 Audio Mute

Press the A Mute button or key to instantly mute the sound.

Press again to restore the previous sound level.

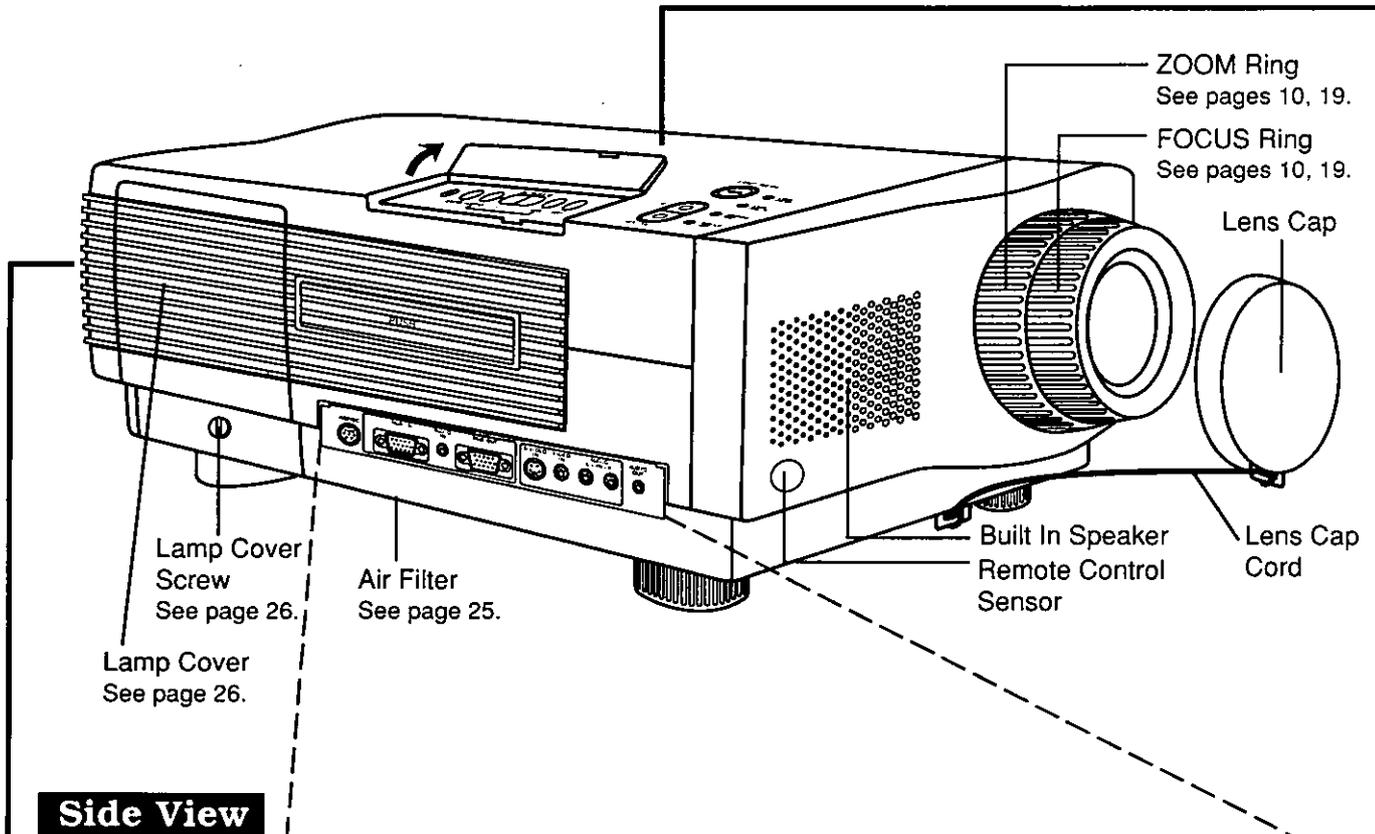
12 On Screen Displays

Information screens and menus make setting up and operating the LCD Projector extremely easy.

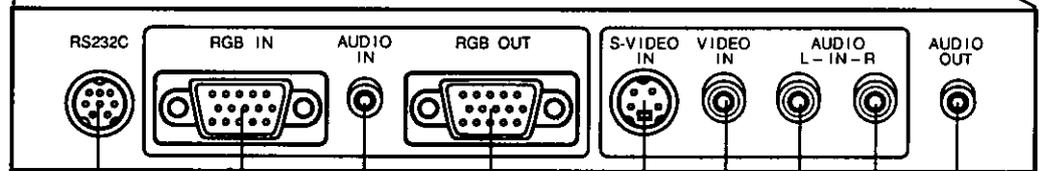
13 Automatic Universal Power Supply with Automatic Power Down

This unit has an operating voltage range of AC 100 - 240V. The lamp power is automatically turned off if there is no video input for 15 minutes.

Product Information

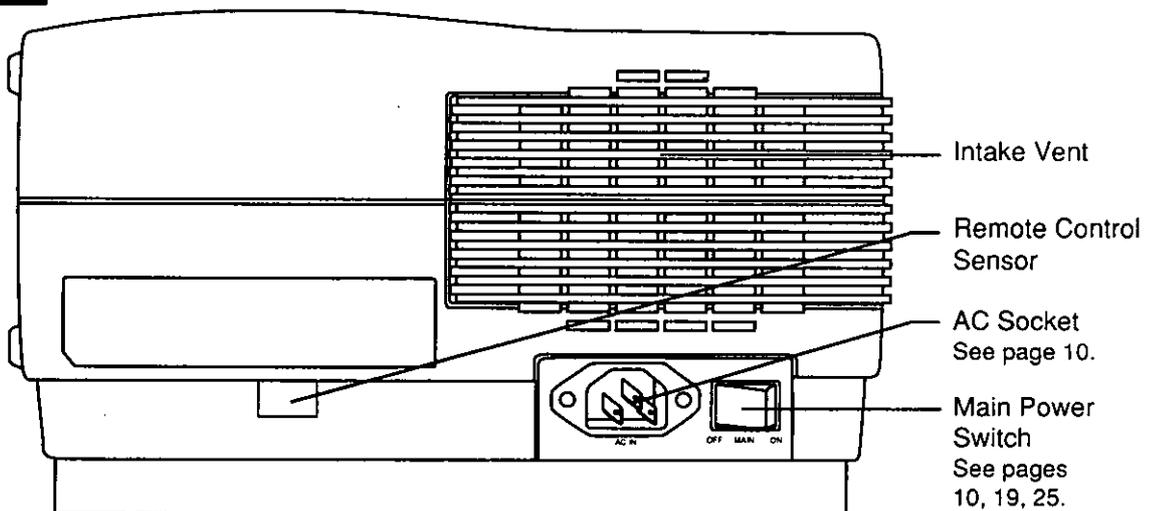


Side View

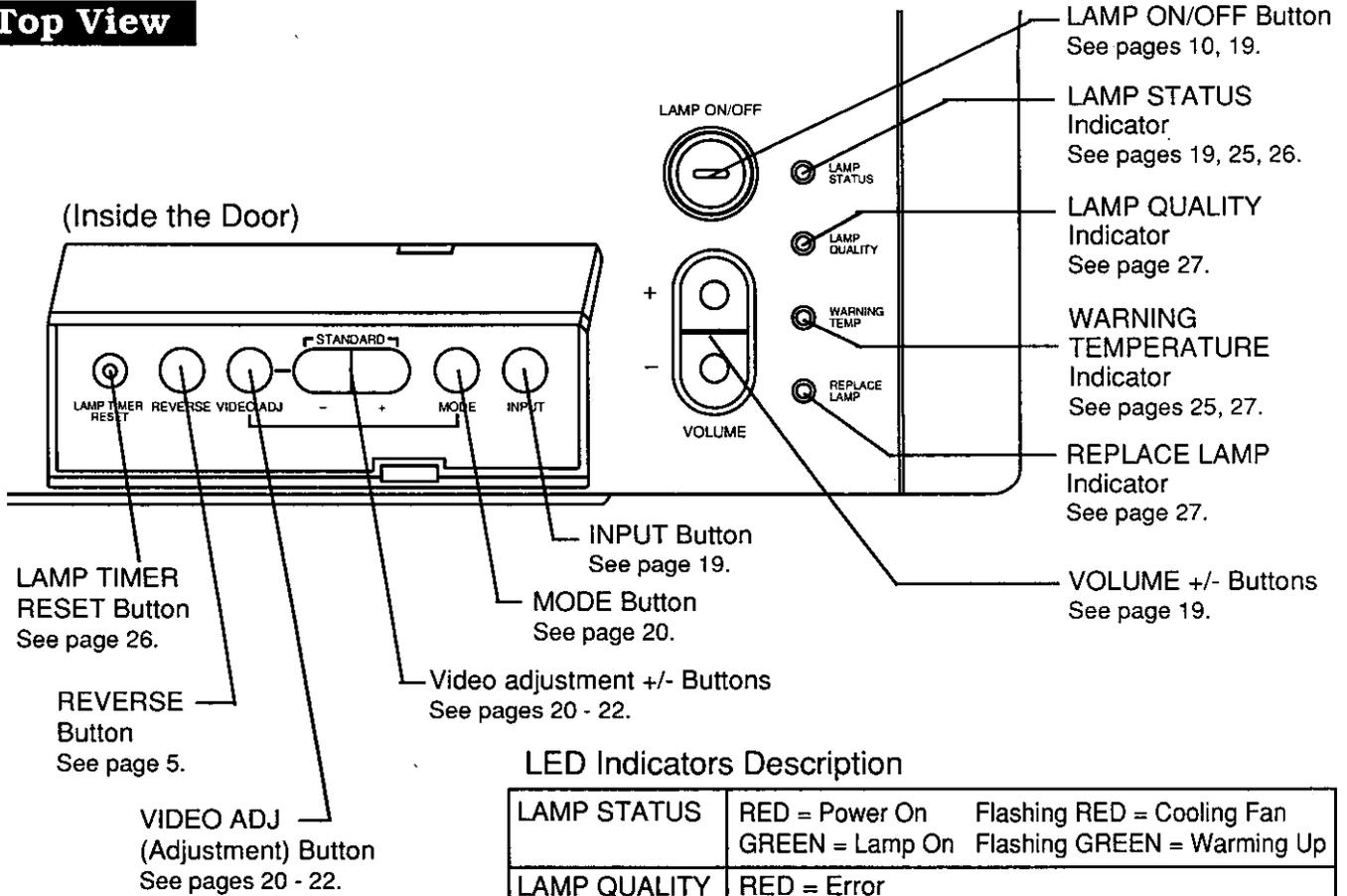


- RS232C Connector
See pages 14 - 16.
- RGB Input Connector
See pages 14 - 16.
- Audio Input Connector
See pages 14 - 16.
- RGB Output Connector
See pages 14 - 16.
- S-Video Input Connector
See page 13.
- Video Input Connector
See page 13.
- Audio Input Connector (L/R)
See page 13.
- Audio Output Connector
See pages 13 - 16.

Rear View



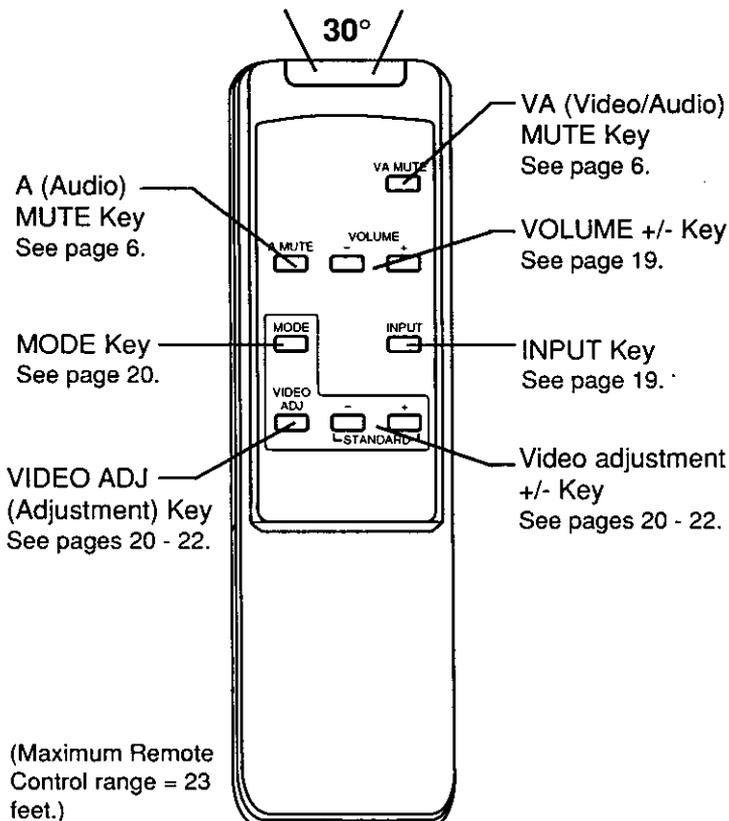
Top View



LED Indicators Description

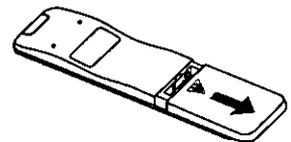
LAMP STATUS	RED = Power On Flashing RED = Cooling Fan GREEN = Lamp On Flashing GREEN = Warming Up
LAMP QUALITY	RED = Error
WARNING TEMP	RED Flashing = Temperature Error
REPLACE LAMP	RED Flashing > 1,000 hrs RED ≥ 1,100 hrs

REMOTE CONTROL

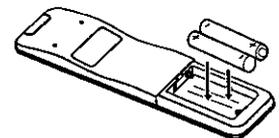


Load the 2 "AA" batteries in the Remote Control

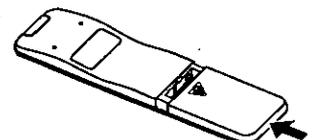
1 Slide the lid in the direction of the arrow.



2 Install two batteries as indicated inside the Battery Compartment.



3 Replace the lid and snap into place.



Battery replacement caution

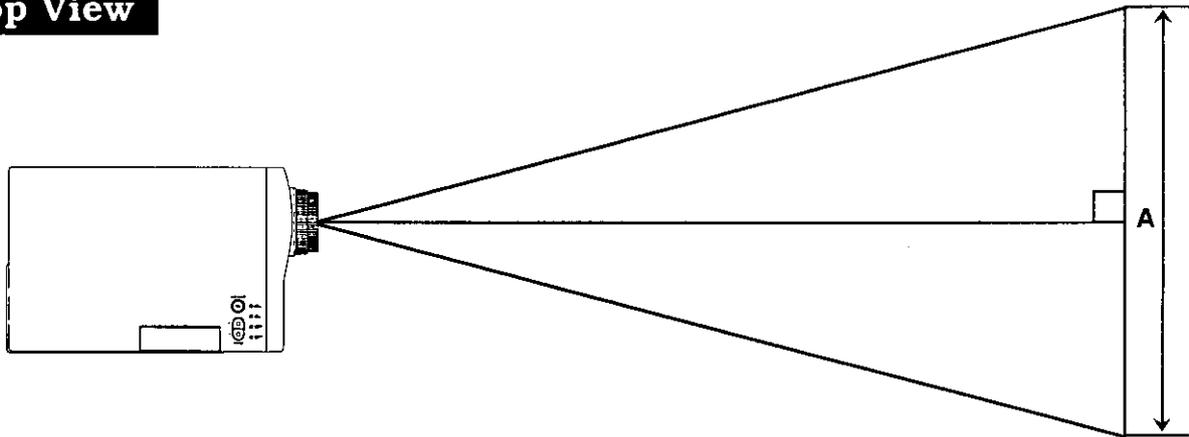
- Do not mix old and new batteries. (Also never mix alkaline with manganese batteries.)

(Maximum Remote Control range = 23 feet.)

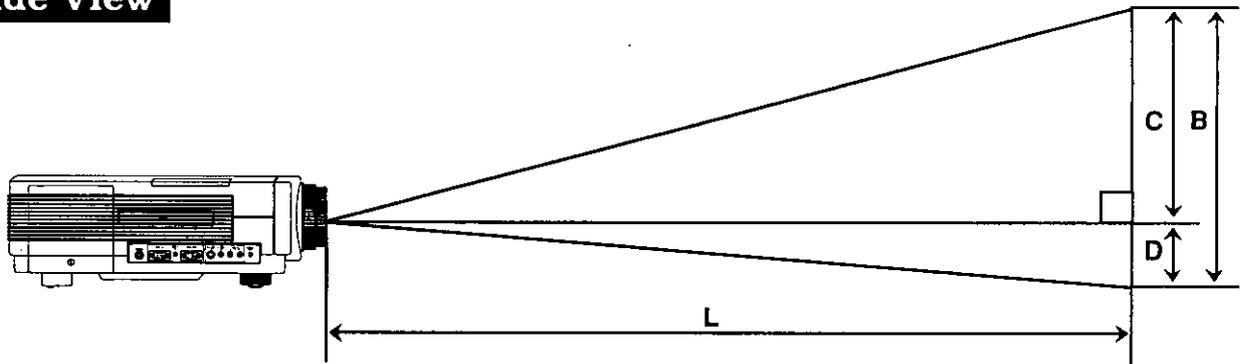
Positioning the LCD Projector and Screen

The screen should be positioned so that it is not directly touched by sunlight or room light as this will wash out the colors of the picture making it hard to see. When possible, close all blinds, curtains, etc. and dim the lights. Also, the LCD Projector should be at a 90° angle to the screen for the best picture results. To determine the distance for the desired size, please refer to the LCD Projector/Screen Relationship Chart below.

Top View



Side View



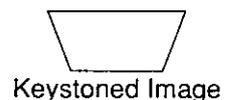
- Your LCD Projector is equipped with an image reverse feature. So, in addition to front projection, you can also reverse the image for rear projection. (See page 5.)

LCD Projector /Screen Relative Position Chart

The picture can be adjusted to the desired size within the range of the zoom lens.

Screen size	Throw distance (L)	Measure (A)	Measure (B)	Measure (C)	Measure (D)
20 inches	2.46 – 3.61 ft (0.75 – 1.1 m)	1.35 ft (0.41 m)	0.98 ft (0.3 m)	0.89 ft (0.27 m)	1.18 in. (3 cm)
40 inches	4.92 – 7.22 ft (1.5 – 2.2 m)	2.66 ft (0.81 m)	2.00 ft (0.61 m)	1.80 ft (0.55 m)	2.36 in. (6 cm)
60 inches	7.55 – 10.83 ft (2.3 – 3.3 m)	3.94 ft (1.2 m)	2.99 ft (0.91 m)	2.69 ft (0.82 m)	3.54 in. (9 cm)
80 inches	9.84 – 14.44 ft (3.0 – 4.4 m)	5.25 ft (1.6 m)	3.94 ft (1.2 m)	3.54 ft (1.08 m)	4.72 in. (12 cm)
100 inches	12.47 – 18.04 ft (3.8 – 5.5 m)	6.56 ft (2.0 m)	4.92 ft (1.5 m)	4.43 ft (1.35 m)	5.91 in. (15 cm)
200 inches	24.93 – 36.09 ft (7.6 – 11.0 m)	13.45 ft (4.1 m)	9.84 ft (3.0 m)	8.86 ft (2.7 m)	11.81 in. (30 cm)
300 inches	37.40 – 54.13 ft (11.4 – 16.5 m)	20.01 ft (6.1 m)	15.09 ft (4.6 m)	13.58 ft (4.14 m)	18.11 in. (46 cm)

- If the LCD Projector and the screen are not properly placed, the picture will be distorted producing a keystone image as shown at right.



Caution: When you set up the LCD Projector

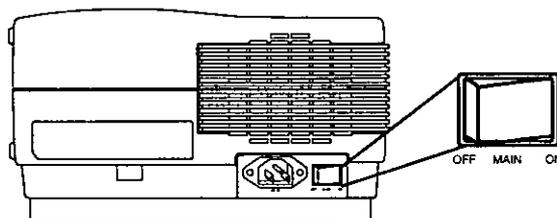
- do not place it in humid or dusty places, or places where the air is sooty or full of cigarette smoke. If the lens, mirror, or other optical components become dirty, the picture will blur or darken, making viewing difficult.
- do not expose to extreme heat or cold. Operating temperature: 5°C - 40°C (41°F - 104°F)

Initial Set Up of the LCD Projector

Place the LCD Projector on a stable, flat surface according to the LCD Projector/ Screen Relative Position Chart on page 9.

- Remove the lens cap.

1 Ensure that the Main POWER switch is off first, then insert Power Cord into LCD Projector AC socket and connect to properly grounded wall outlet.



2 Set the Main POWER Switch to ON.

- The LAMP STATUS indicator lights red.

3 Press LAMP ON/OFF on the LCD Projector ON.

- The LAMP STATUS indicator changes to green.

4 Use the FOCUS and ZOOM Rings

to adjust the focus and size of the image.

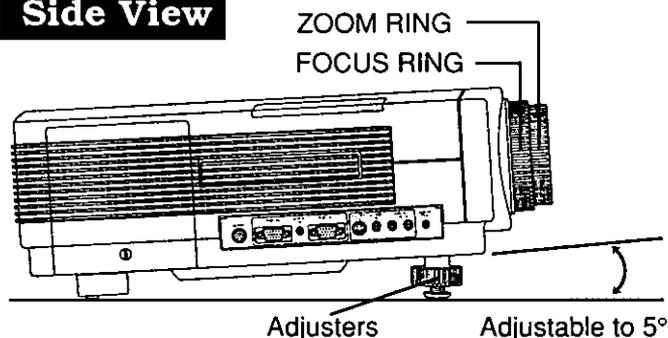
5 Use the Height and Level Adjusters

to adjust the vertical angle of the projector. (See illustration below.)

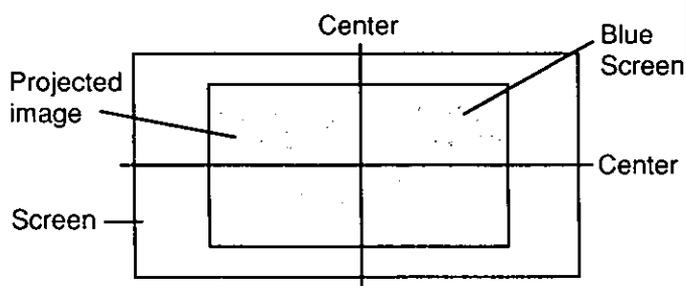
6 Use the FOCUS and ZOOM Rings

to readjust the focus and size of the image.

Side View



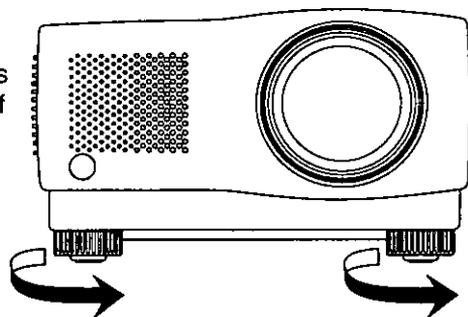
Center the projected image on the screen.



Front View

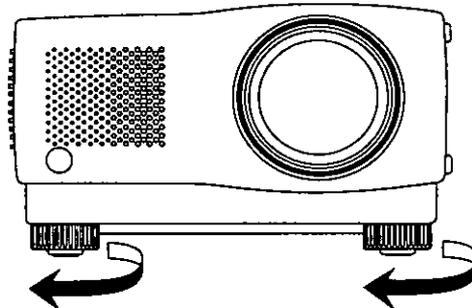
To Raise:

turn adjusters in direction of arrows.



To Lower:

turn adjusters in direction of arrows.



Notes:

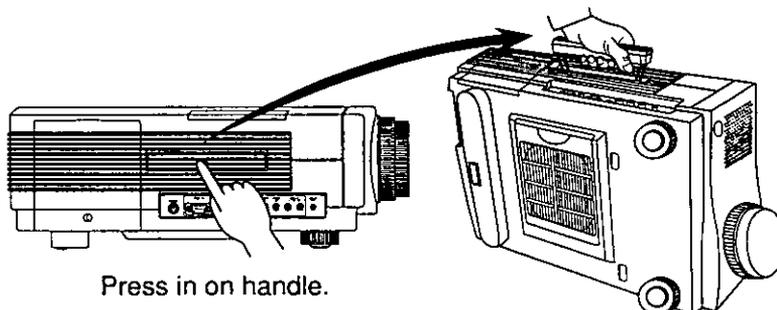
- When adjustments are made improperly, the picture may become distorted, depending on the relative positions of the LCD Projector and the screen.
- To prevent the LCD Projector from wobbling, adjust both adjusters so that they firmly contact the mounting surface.

Moving the LCD Projector

First, turn Main Power Switch OFF and disconnect Power Cord. Second, disconnect all other cables.

Press in on handle to release or store handle.

- Make sure the lens cap is in place to prevent damage to the lens.



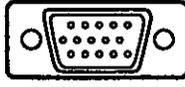
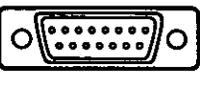
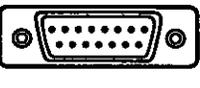
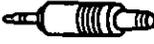
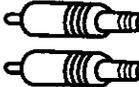
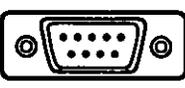
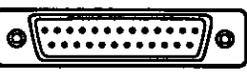
Specifications

LCD panels		1.3" Poly silicon LCD panel 3X, RGB shutter method, using Translucent TN crystal panels
Drive method		Active Matrix 4:3 Aspect Ratio panels, TFT (Thin Film Transistor)
No. of pixels		921,600 stripe pixels (480 X 640 X 3)
Lens		1 - 1.44 zoom lens, F2.8 - 3.4, f 50 - 72mm Manual Focus
Projector lamp		Metal halide 250W
Contrast ratio		150 : 1
Brightness		300 lumen / ANSI
Colors		16,777,216
Screen size		20" - 300" (measured diagonally)
Projection (throw) distance		2.5' - 54.2'
Keystone Correction		1 : 9 Low position
Video input signal		NTSC Composite video, 1 Vp-p, sync negative, 75Ω terminated
S-Video input signal		Y (luminance signal) : 1 Vp-p, sync negative, 75Ω terminated C (chrominance signal) : burst 0.286 Vp-p, 75Ω terminated
RGB input signal	Video signal	RGB Analog (0.7 Vp-p, 1.0 Vp-p with sync on green, 75Ω) Unlimited numbers of colors
	Sync signal	H/V separate, H/V combined, or Sync-on-Green
	H-Sync	15.73 - 39.38 KHz (TTL Level) ← Refer to page 24.
	V-Sync	59.7 - 85.1 Hz (TTL Level) ← Refer to page 24.
Terminals		NTSC Video Input : One RCA jack S-Video Input : One 4-pin mini DIN connector Computer Display Input: One 15 pin mini D-Sub Computer Display Output: One 15 pin mini D-Sub Serial Port (RS-232C) : One 8 pin mini Din Video Audio Input : 2 RCA jacks (L + R) Computer Audio Input : M3 stereo jack Through Audio output : M3 stereo jack
Controls	External Button Switches	Main Power, Lamp ON/OFF, Volume +/-
	Under Cover Button Switches	Reverse, Mode, Input, Video Adj +, Video Adj -, Lamp Timer Reset
	Remote Control Key Switches	Volume +/-, VA Mute, A Mute, Mode, Input Video Adj, Video Adj +, Video Adj -
Audio output		1.5 W
Speaker		3.1" round X 1
Operating Temperature		41°F to 104°F (5°C to 40°C)
Operating Humidity		10% - 80 % (non-condensation)
Storage Temperature		-13°F to 140°F (-25°C to 60°C)
Storage Humidity		5% - 85% (non-condensation)
Power Supply		100 - 240 V AC (50 or 60 Hz) Automatic
Power Consumption		390 W
Dimensions W X H X D		11 - 7/16" X 6 - 7/8" X 19"
Weight		21 lbs.
Approvals		FCC, UL, C-UL

Note: Specifications and design subject to change without notice.
This product may be subject to export control regulations.

Video/ Computer Cables & Adaptors

These accessories are supplied in order to connect the LCD Projector to Computer/ AV equipment. The numbers in the left column correspond with the numbers in the connection diagrams on pages 13-16.

No.	CABLE/ADAPTOR	PORT				LENGTH
		Projector side		Computer/AV products side		
1	DOS/V VGA Cable	D-Sub M 15P (male)		D-Sub M 15P (male)		6.56 ft (2.0 m)
2	VGA MAC Adaptor (for input)	D-sub M 15P (female)			MAC 15P (male)	—
3	VGA MAC Adaptor (for output)	D-sub M 15P (male)			MAC 15P (female)	—
4	PC Audio Cable	M3 stereo mini pin (male)		M3 stereo mini pin (male)		6.56 ft (2.0 m)
5	Video RCA Cable	RCA pin (male)		RCA pin (male)		4.92 ft (1.5 m)
6	RCA-BNC pin Adaptor	RCA pin (male)		BNC pin (female)		—
7	Audio RCA Cable	RCA pin (male) X 2		RCA pin (male) X 2		4.92 ft (1.5 m)
8	RS-232C Cable	mini DIN 8P (male)		D-Sub 9P (female)		6.56 ft (2.0 m)
9	RS-232C 9P Adaptor	D-Sub 9P (male)			mini DIN 8P (male)	—
10	RS-232C 25P Adaptor	D-Sub 9P (male)			D-Sub 25P (female)	—
11	S-Video Cable	S-Connector (male)		S-Connector (male)		4.92 ft (1.5 m)

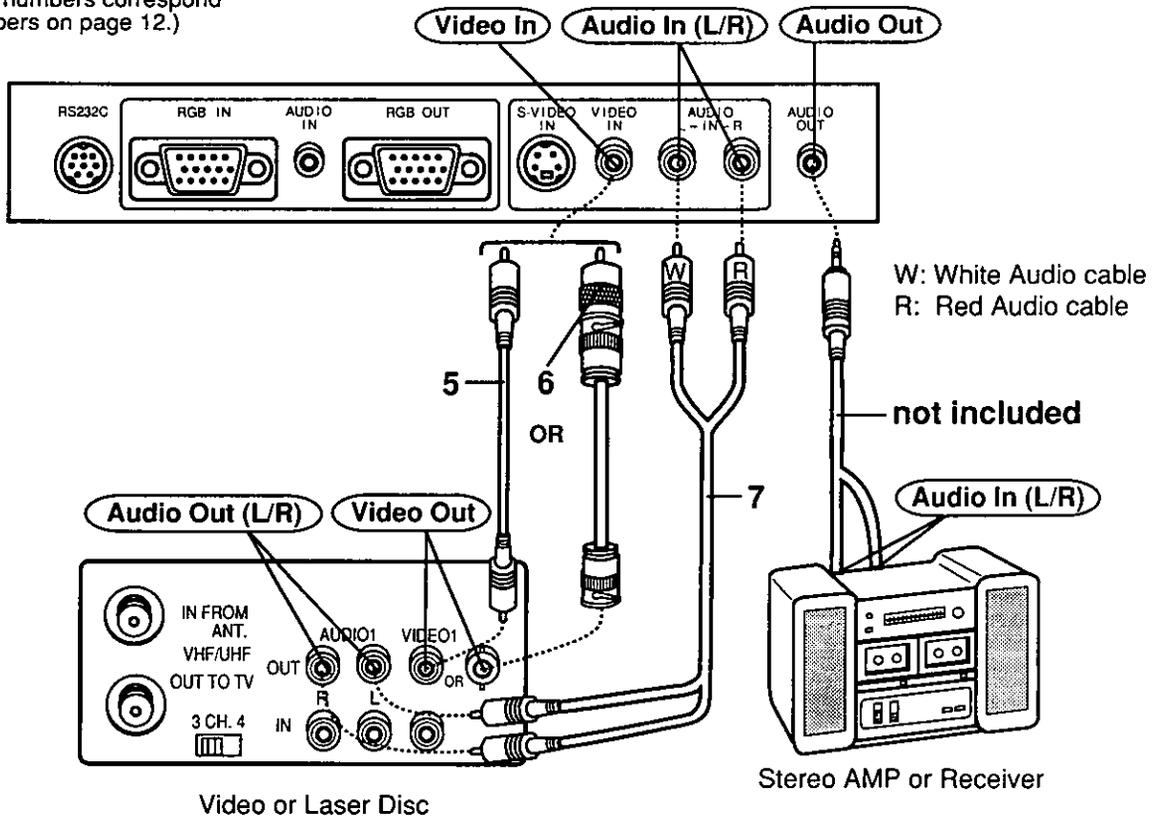
Connecting the LCD Projector

Connecting to audio/video output equipment (Video signal)

- Always turn off the Main Power Switch of the LCD Projector while connecting to video equipment, in order to protect both the LCD Projector and the equipment being connected.

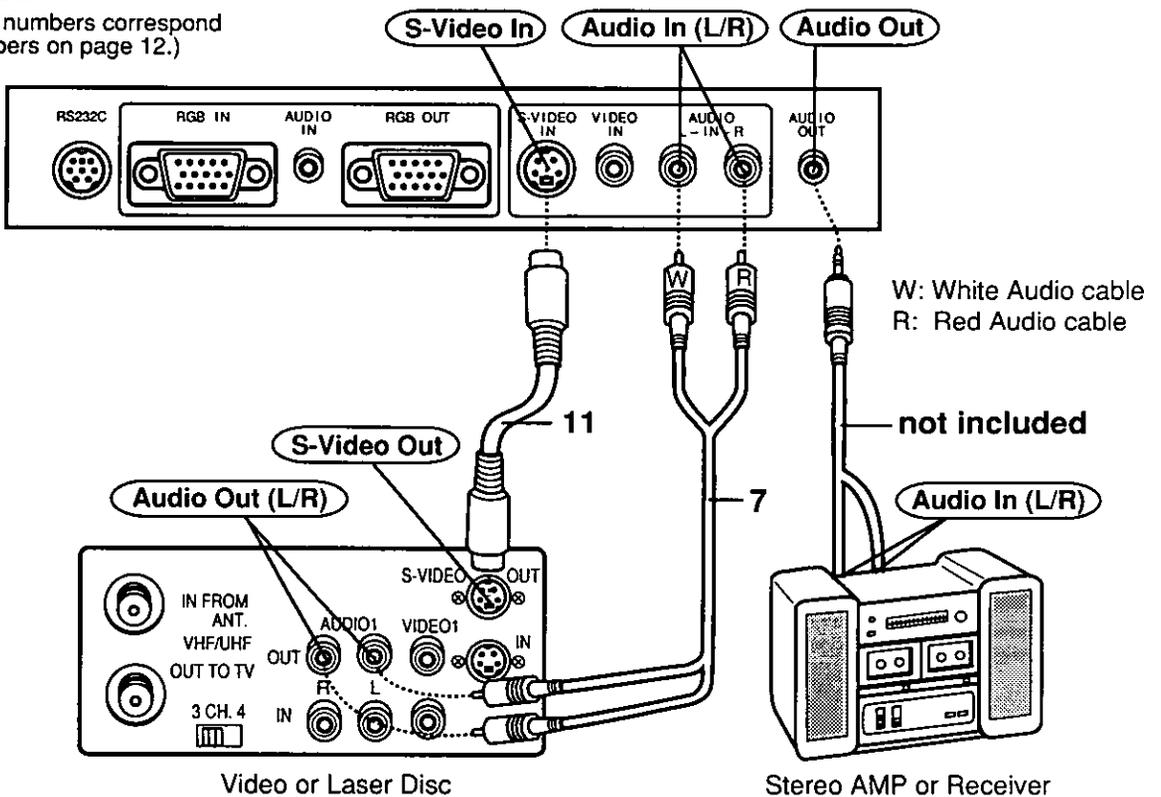
1. NTSC Video

(Diagram numbers correspond with numbers on page 12.)



2. S-Video

(Diagram numbers correspond with numbers on page 12.)

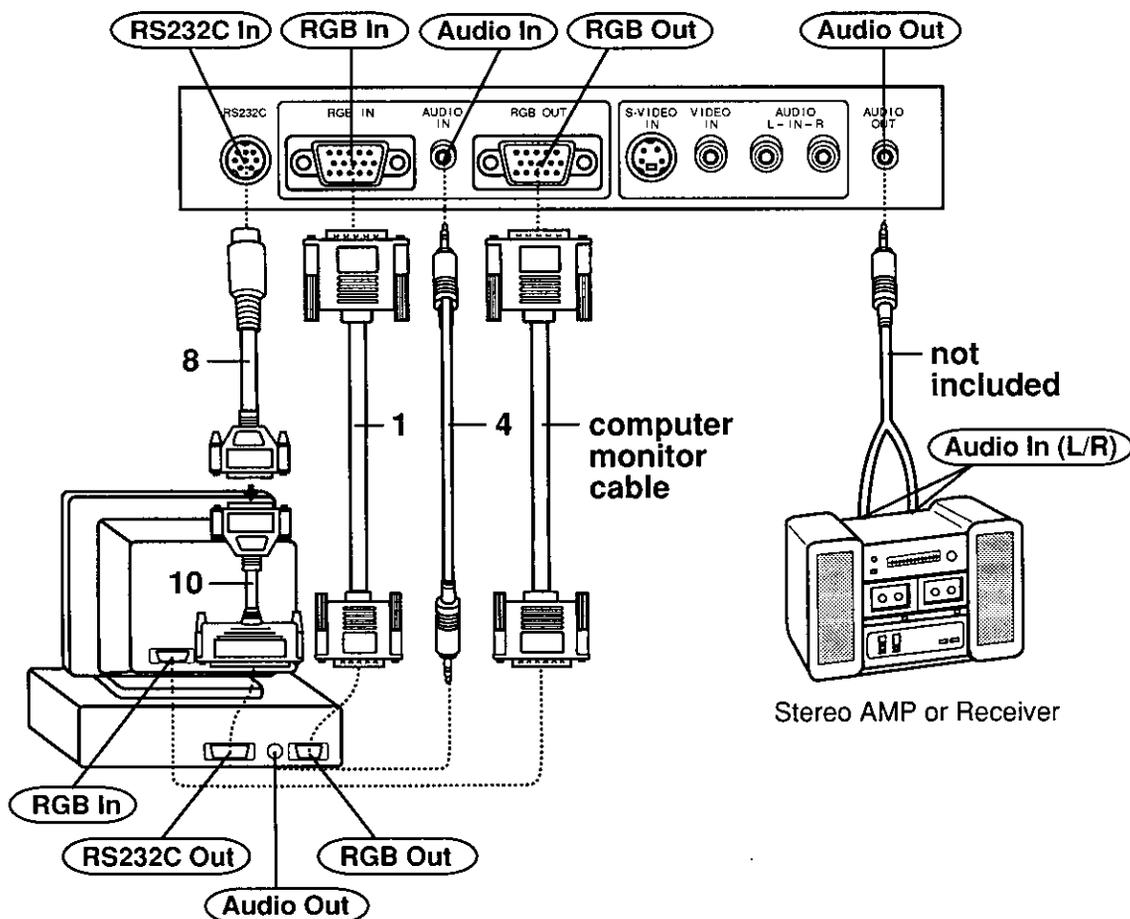


Connecting to a computer (RGB signal)

- Always turn off the Main Power Switch on the LCD Projector while connecting to computer equipment, in order to protect both the LCD Projector and the equipment being connected.
- The RGB input accepts signals from VGA and MAC compatible computers without the need for any additional hardware.
- Plug the VGA signal cable (supplied) correctly into the RGB IN terminal on the LCD Projector and into the RGB signal output terminal on the computer, and secure the plugs by tightening the thumb screws.
- Connect the MAC/VGA adaptor (supplied) to the RGB-signal output or input terminal on your Macintosh Series computer. Then, firmly plug the VGA signal cable into both the RGB IN or RGB OUT terminal on the LCD projector and the MAC/VGA adaptor on the computer, and secure the plugs by tightening the thumb screws.
- To view images simultaneously on the monitor and projection screen, connect your computer monitor to the LCD Projector's RGB OUT terminal.
- When connecting the LCD Projector to a compatible computer other than a VGA or Macintosh series, a separate cable is needed.
- When the LCD Projector is connected to external devices (ex. personal computer etc.) using the RS232C connector, the LCD Projector will work by control commands from the external device. And, the LCD Projector will also return information to the external device.

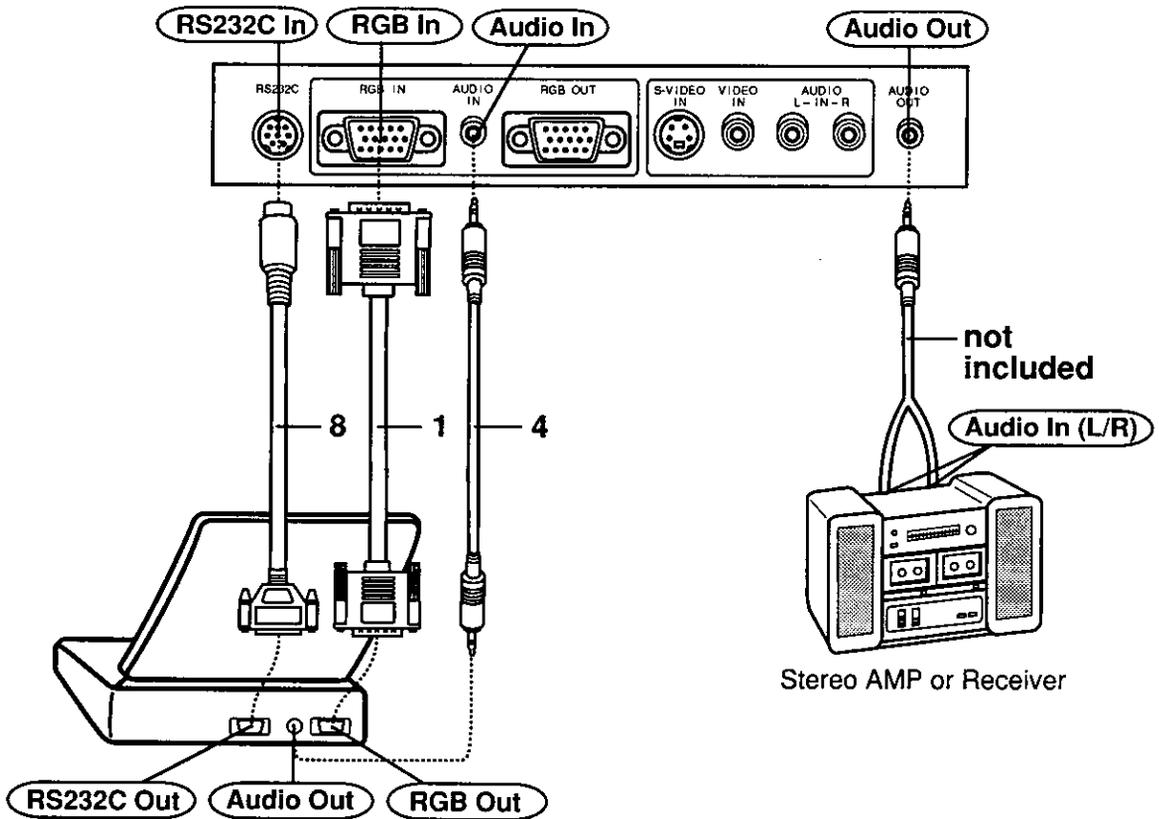
1. PC (Desk Top)

(Diagram numbers correspond with numbers on page 12.)



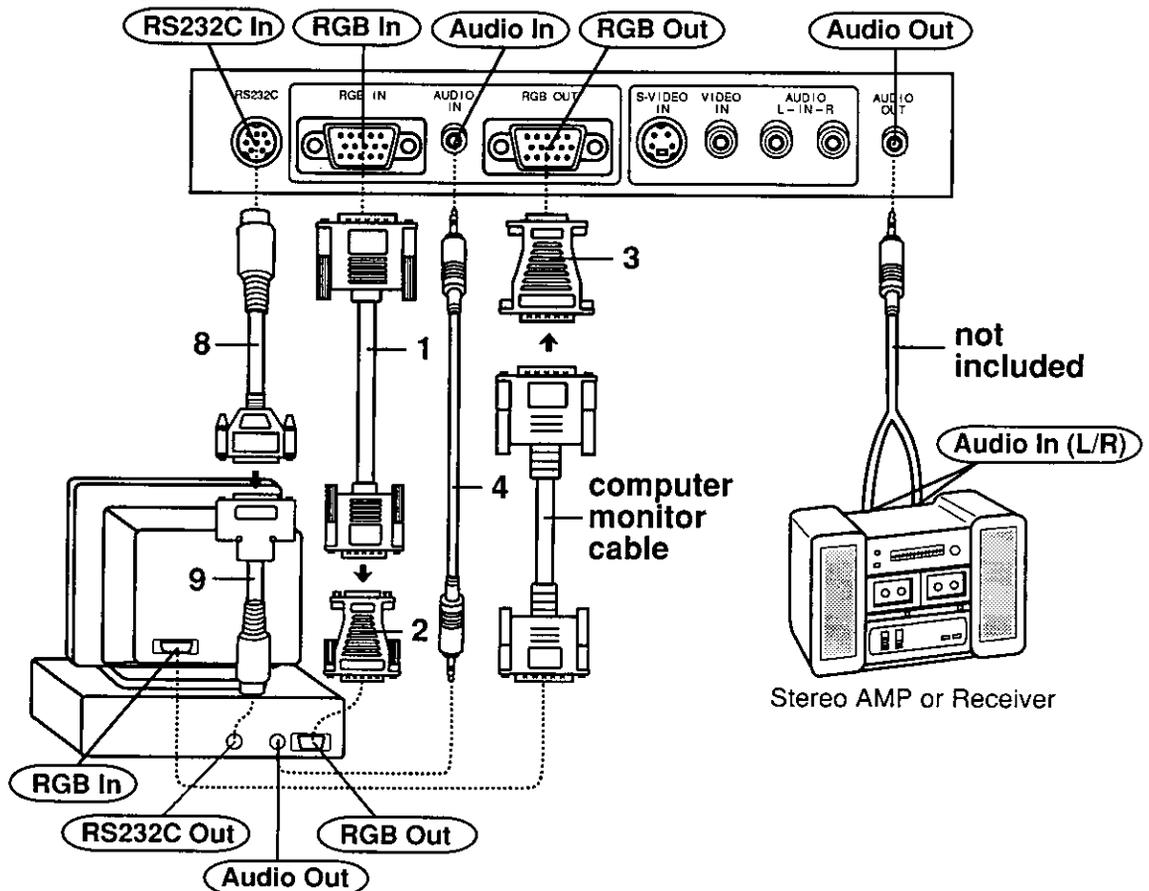
2. PC (Lap Top)

(Diagram numbers correspond with numbers on page 12.)



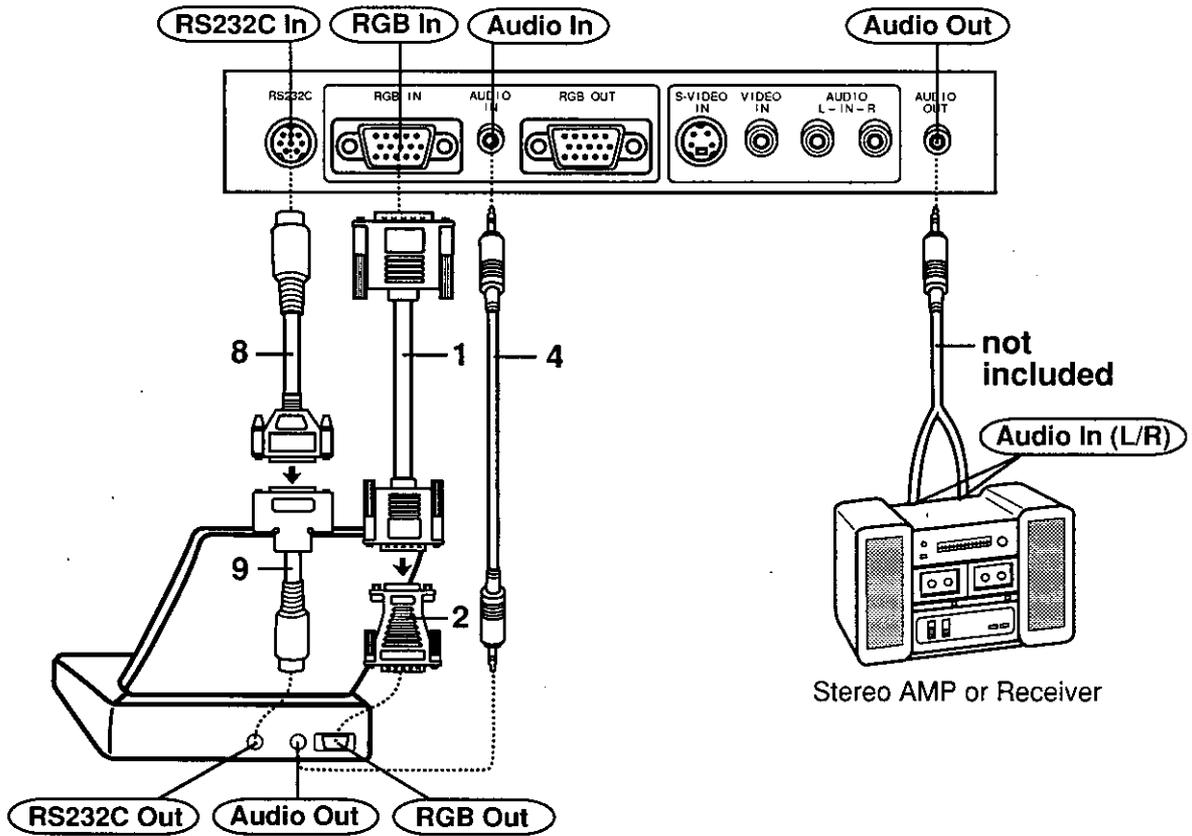
3. Macintosh (Desk Top)

(Diagram numbers correspond with numbers on page 12.)



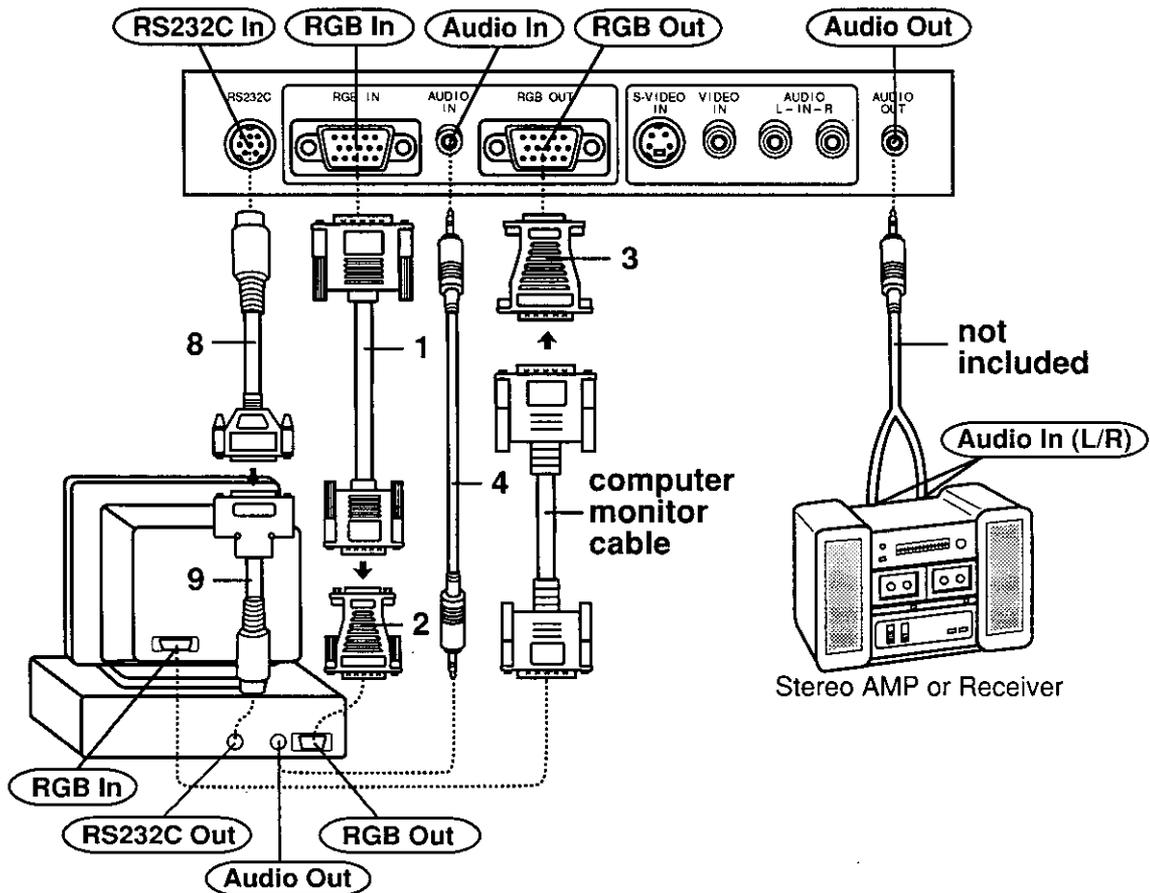
4. Macintosh (Power Book)

(Diagram numbers correspond with numbers on page 12.)



5. Macintosh (Power Mac)

(Diagram numbers correspond with numbers on page 12.)



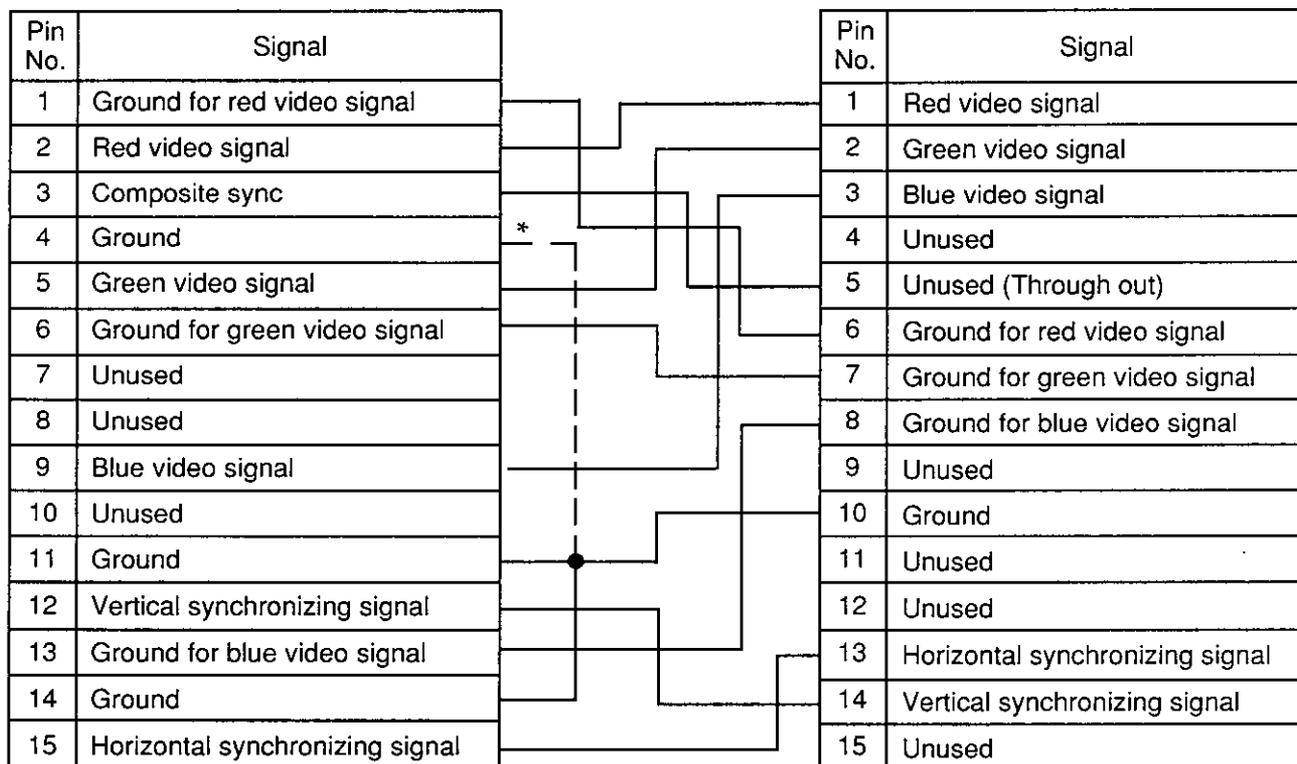
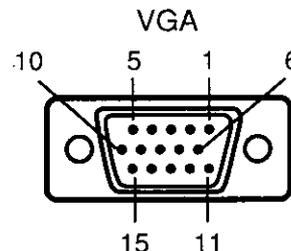
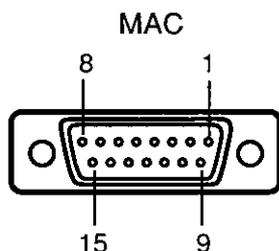
Pin Assignment

Follow the instructions below when connecting to a computer. Refer to page 12 for list of cables and adaptors.

A. Signal connector: 15-pin mini D-sub (PC/AT compatible model) Connect the signal cable to the 15-pin mini D-sub connector on the LCD Projector unit.

B. Signal connector: 15-pin D-sub (MAC)

To convert a MAC 15-pin D-sub connector to a 15-pin mini D-sub connector, use a VGA-MAC adaptor (included) and connect it to the 15-pin mini D-sub connector on the LCD Projector unit.



* For input adaptor only

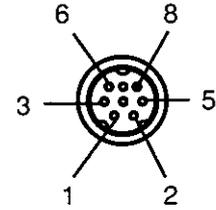
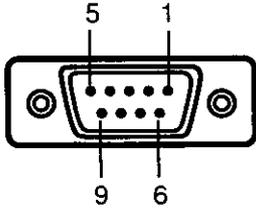
Note:

- When using a Composite Sync Output type Macintosh, please use a Composite Sync type VGA MAC Adaptor (pin 3 and pin 13 are connected).

C. RS-232C Connector: 9-pin D-Sub Connect the RS-232C Cable to the 8-pin mini DIN connector on the LCD Projector unit.

D. RS-232C Connector: 8-pin mini DIN

To convert a 9-pin D-Sub connector to a 8-pin mini DIN connector, use a RS-232C 9-pin adaptor (included). Connect the 9-pin D-Sub adaptor and RS-232C cable. Then, connect it to the 8-pin mini DIN connector on the LCD Projector unit.

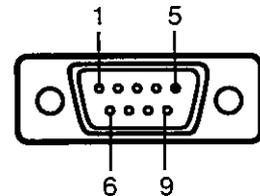
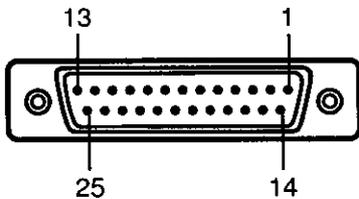


Pin No.	Signal
1	Unused
2	Received data
3	Transmitted data
4	Unused
5	Ground
6	Unused
7	Unused (Request to send)
8	Unused (Clear to send)
9	Unused

Pin No.	Signal
1	Unused (Request to send)
2	Unused (Clear to send)
3	Transmitted data
4	Ground
5	Received data
6	Unused
7	Unused
8	Unused

E. RS-232C connector: 25-pin D-Sub

To convert a 25-pin D-Sub connector to a 8-pin mini DIN connector, use a RS232C 25-pin adaptor (included). Connect the 25-pin D-Sub adaptor and RS-232C cable. And then connect it to the 8-pin mini DIN connector on the LCD Projector unit.



Pin No.	Signal
1	Unused
2	Transmitted data
3	Received data
4	Unused (Request to send)
5	Unused (Clear to send)
6	Unused
7	Ground
8~25	Open

Pin No.	Signal
1	Unused
2	Received data
3	Transmitted data
4	Unused
5	Ground
6	Unused
7	Unused (Request to send)
8	Unused (Clear to send)
9	Unused

Basic LCD Projector Operation

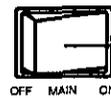
Before you begin, make sure...

- All connections are made. (See pages 10 and 13 to 16.)
- LCD Projector is positioned properly. (See page 9.)
- LCD Projector is plugged in.
- Remove lens cap.
- You have read Important Safeguards. (See pages 2, 3.)

1 Press the Main Power Switch ON.

The LAMP STATUS indicator lights red on the top panel.

- The first time you turn on the power, or whenever the LAMP STATUS indicator is not lit, press the Main Power Switch (ON/OFF) to turn on the power.



Main Power Switch
Located on rear of the LCD Projector. See page 7.

2 Press LAMP ON/OFF Switch on the LCD Projector ON.

on the LCD Projector ON.

When the LAMP ON/OFF Switch is turned on, the red LAMP STATUS indicator changes to green.

When the LAMP ON/OFF Switch is turned off, the green LAMP STATUS indicator changes to flashing red while the LCD Projector cools down and then to solid red when fan stops.

When the power is on, the LAMP STATUS indicator indicates the operating condition of the lamp.

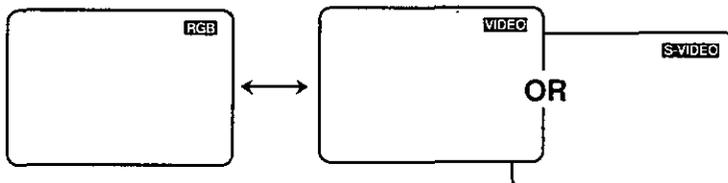
- | | |
|-----------------|--------------------------|
| Red: | Main Power On (Lamp Off) |
| Green: | lamp is ready |
| Flashing green: | warming up |
| Flashing red: | Cooling Fan operating |

See page 27, "Maintenance Indicators", for details.

3 Open door cover and press INPUT or press INPUT on the remote control to select the desired input mode.

to select the desired input mode.

Continue to press INPUT to set the desired input mode. Each press will change the display as shown below:



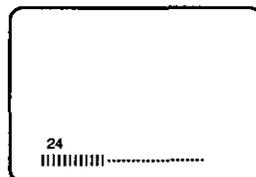
- If unit is connected with both VIDEO and S-VIDEO cables, the S-VIDEO mode has priority.

4 Turn on your computer (RGB) or start video playback (Video or S-Video).

- Adjust FOCUS and ZOOM RING if necessary.

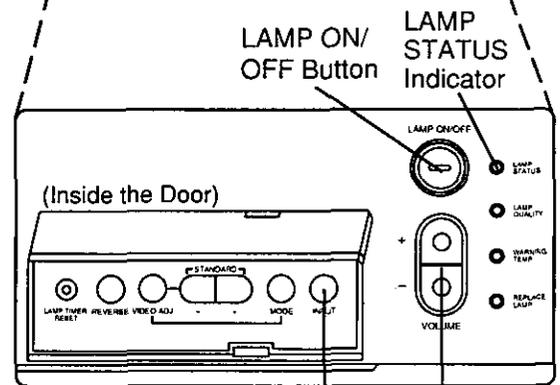
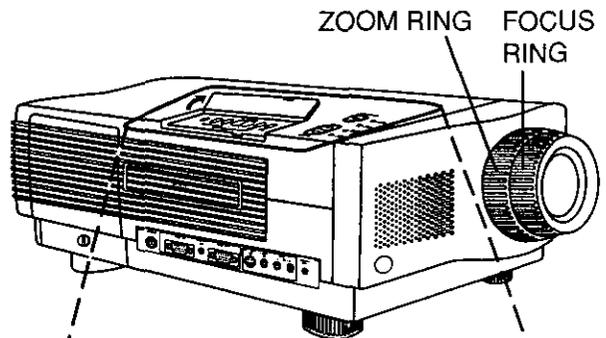
5 Press VOLUME +/- on the remote or LCD Projector to adjust the volume level of the built-in speaker.

The number of segments (0 - 63) increases or decreases as the volume is adjusted.

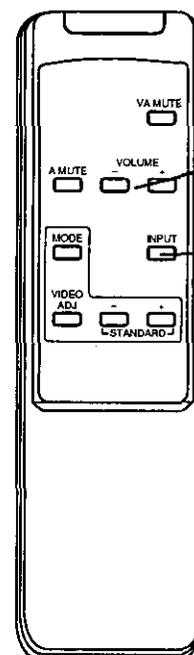


6 Press LAMP ON/OFF on the LCD Projector OFF.

- Do not turn off the Main Power Switch until the LCD Projector cooling fan has stopped and LAMP STATUS indicator turns solid red.



INPUT VOLUME +/- Buttons



VOLUME +/- Keys

INPUT Key

Video Adjustment

This LCD projector's picture is set to standard specifications at the factory. However, you can adjust it to suit your own preferences by using VIDEO ADJ on the remote or LCD Projector. For video signal input, five items can be adjusted: "COLOR", "TINT", "BRIGHT", "PICTURE", and "SHARPNESS". For RGB signal input, six items can be adjusted: "BRIGHT", "PICTURE", "V POS", "H POS", "H SIZE", and "PHASE". Up to 3 sets of settings can be memorized for each input signal.

Selecting the Picture Memory

Press MODE on the remote control or LCD Projector to select the desired picture mode.

- When MODE on the remote or LCD Projector is pressed, the preset settings will be displayed on the screen for about 5 seconds.
- Each time you press the MODE on the remote or LCD Projector, the display will change as shown below:



Adjusting the Projected Image

Select active input (No blue screen).

1 Press VIDEO ADJ on the remote or LCD Projector to display one of the video adjust overlays below.

[For Video or S-Video Input]

S-VIDEO/VIDEO MODE1	
>COLOR	0
TINT	0
BRIGHT	0
PICTURE	0
SHARPNESS	0
SELECT : PUSH VIDEO ADJ	
ADJUST : PUSH +/-	

[For RGB Input]

RGB MODE1	
>BRIGHT	0
PICTURE	0
V POS	0
H POS	0
H SIZE	0
PHASE	0
SELECT : PUSH VIDEO ADJ	
ADJUST : PUSH +/-	

Mode control allows you to save 3 different sets of control adjustment for each input (3 for Video/S-Video and 3 for RGB).

2 Press MODE on the remote or LCD Projector to choose the mode memory (1-3) you want to adjust.

When you press VIDEO ADJ, the selected control function characters will turn red with blue background. Stop when you come to the control function you want. If you go past the desired control function keep on pressing VIDEO ADJ. After you select a control function by pressing VIDEO ADJ, then press "+" or "-" key to adjust.

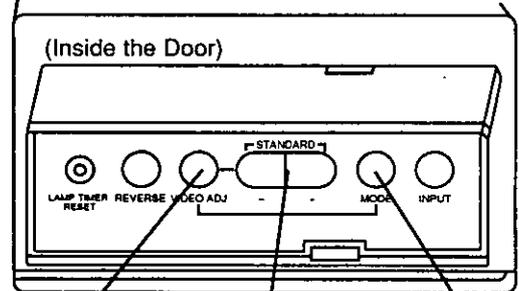
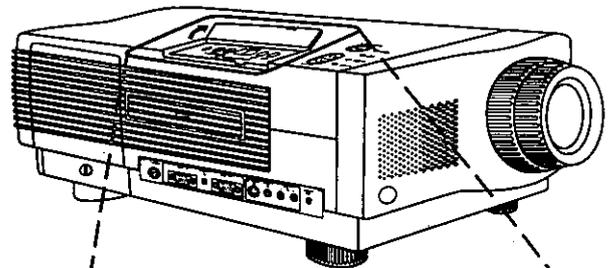
3 Press VIDEO ADJ repeatedly on the remote or LCD Projector to choose the item you want to adjust.

- See pages 21, 22 for description of adjustments.

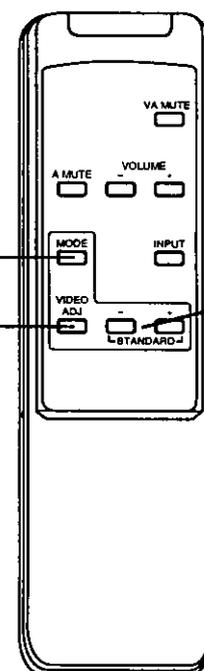
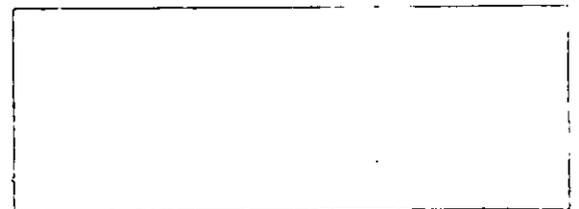
4 Press VIDEO ADJ "+" or "-" to adjust the control. This means your adjustments are saved in memory.

5 When finished wait 10 seconds for video adjust overlay to disappear.

- Press "+" and "-" together while the desired mode memory is being displayed to recall standard settings.



VIDEO ADJ Button VIDEO ADJ +/- Buttons MODE Button



MODE Key VIDEO ADJ Key VIDEO ADJ +/- Keys

Adjustment Description for Video/S-Video Input

The LCD Projector has been set to standard specifications at the factory. However, you may wish to set picture parameters manually to suit your own preference.

Each time you press VIDEO ADJ, the item to be adjusted changes in the order shown below.

COLOR Control

To adjust the color intensity level. Press "+" to deepen the color, or press "-" to make the color paler.

TINT Control

To adjust the hue for more realistic tones. Press "+" for more green, or press "-" for more purple.

BRIGHT Control

To adjust the black level according to the brightness of the room. Press "+" to brighten the image, or press "-" to darken the background.

PICTURE Control

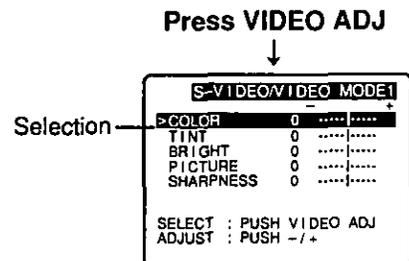
To adjust the overall intensity of the picture. Press "+" for a stronger picture, or press "-" for a fainter picture.

SHARPNESS Control

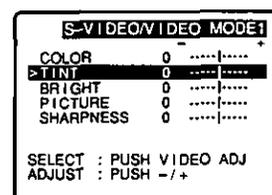
To adjust the sharpness of the picture. Press "+" to sharpen the edges of the image, or press "-" to soften the edges of the image.

Example:

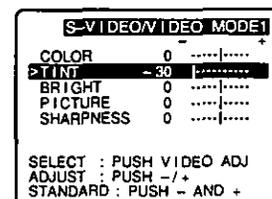
To adjust the TINT Control, do the following:



Press VIDEO ADJ

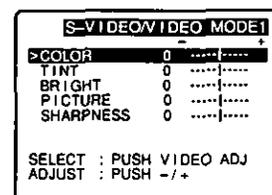


Press "-"



After 10 seconds

↓
Video/S-Video Screen



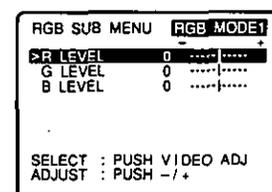
To Recall the Factory Settings

Pressing "+" and "-" together on the LCD Projector or the remote control resets the controls to the standard settings.

Adjusting the RGB Input Levels

The RGB input levels are preset at the factory and in most cases they will not need adjustment. However, depending on the connected computer, the levels may need adjustment. Up to 3 sets of parameters can be memorized for RGB input.

1. Press VIDEO ADJ for more than 5 seconds to display the RGB sub menu overlay.
2. Press VIDEO ADJ repeatedly to choose the item you want to adjust.
3. Press "-" or "+" to adjust the value level.
4. Press MODE to go to mode 2 if desired.
 - Press "-" and "+" together to recall standard levels.
 - This overlay times out in 10 seconds if no button is pressed.



Adjustment Description for RGB Input

The LCD Projector has been set to standard specifications at the factory. However, you may wish to set the parameters manually to suit your own preference. For V POS, H POS, and H SIZE adjustments, see the PC output timing relative value chart below right.

Each time you press VIDEO ADJ,
the item to be adjusted changes in the order shown below.

BRIGHT Control

To adjust the black level according to the brightness of the room.

Press "+" to brighten the image, or press "-" to darken the background.



PICTURE Control

To adjust the overall intensity of the picture.

Press "+" for a stronger picture, or press "-" for a fainter picture.



V POS (Vertical Position) Control

To adjust the vertical position of the image within the projected screen.

See the relative value chart above right.



H POS (Horizontal Position) Control

To adjust the horizontal position of the image within the projected screen.

See the relative value chart above right.



H (Horizontal) SIZE Control

To adjust the data display timing and attain the correct horizontal image size. For best results, use the test pattern shown at right. Then, press "+" or "-" so that the screen is free of black lines.

See the relative value chart above right.



PHASE Control

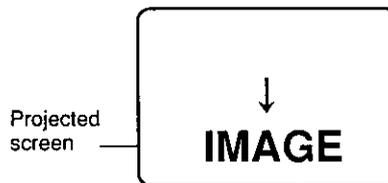
To adjust the vertical line strength so that text is readable. For best results, use the test pattern shown at right. Then, press "+" or "-" so that the white horizontal lines are clear and distinct.

PC Output Timing Relative Value Chart

Model	Vertical Position	Horizontal Position	Horizontal size
MAC 640	-28 - +32	-24 - +24	-50 - +90
VGA	-20 - +32	-24 - +24	-50 - +90
VGA350	-10 - + 5	-24 - +24	-50 - +90
VGA400	-10 - + 5	-24 - +24	-50 - +90
MAC LC	-16 - + 8	-24 - +24	-50 - +90
VESA	-16 - +32	-24 - +24	-50 - +50

RGB MODE1	
BRIGHT	0 +
PICTURE	0 +
V POS	0 +
H POS	0 +
H SIZE	0 +
PHASE	0 +
SELECT : PUSH VIDEO ADJ	
ADJUST : PUSH -/+	

Press "-" to move down



Press "+" to move up



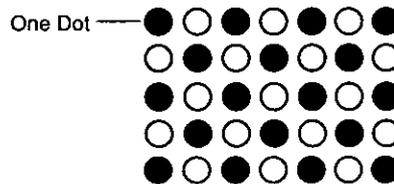
Press "-" to move left



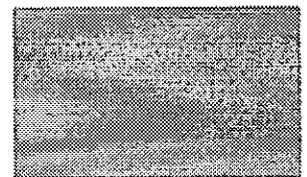
Press "+" to move right



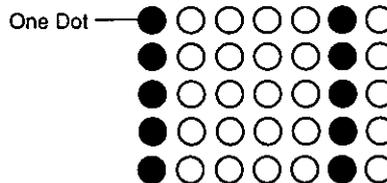
Test Pattern



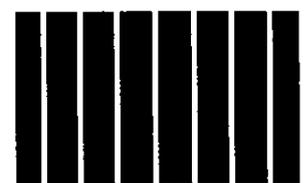
Properly adjusted screen



Test Pattern



Properly adjusted screen

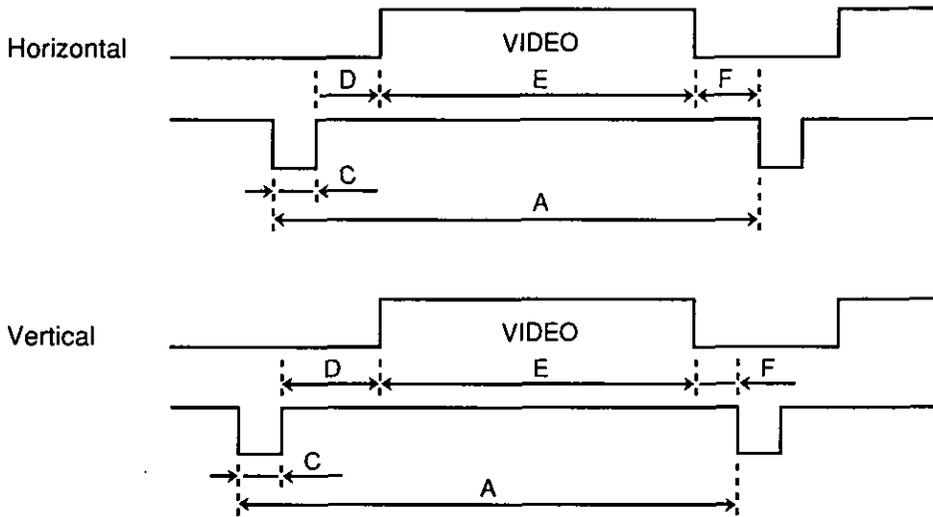


To Recall the Factory Settings

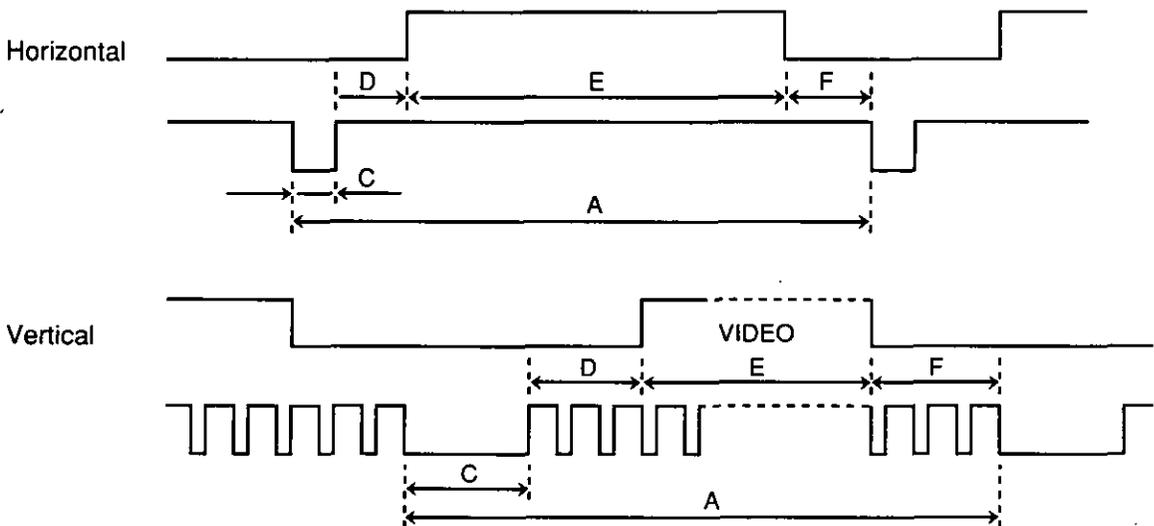
Pressing "+" and "-" together on the LCD Projector or the remote control resets the BRIGHT and PICTURE controls only to the standard settings.

Timing Specifications

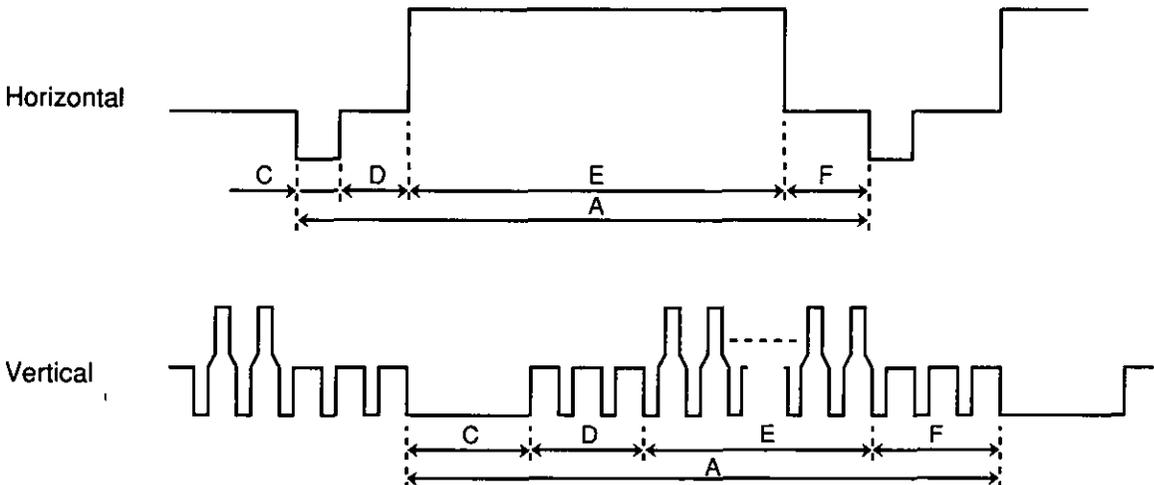
Separate Sync.



H/V Composite Sync.



Sync. on Green



Factory Preset Timing

		Preset timing		
		IBM 640 X 400 at 70 Hz	IBM 640 X 350 at 70 Hz	IBM 640 X 480 at 60 Hz
DOT CLOCK		25.1745 MHz	25.1745 MHz	25.1745 MHz
H O R I Z	f H	31.4681 KHz	31.4681 KHz	31.4681 KHz
	A - PERIOD	31.778 μ s (800 dots)	31.778 μ s (800 dots)	31.778 μ s (800 dots)
	B - BLANKING	6.356 μ s (160 dots)	6.356 μ s (160 dots)	6.356 μ s (160 dots)
	C - SYNC WIDTH	3.813 μ s (96 dots)	3.813 μ s (96 dots)	3.813 μ s (96 dots)
	D - BACK PORCH	1.907 μ s (48 dots)	1.907 μ s (48 dots)	1.907 μ s (48 dots)
	E - ACTIVE TIME	25.423 μ s (640 dots)	25.423 μ s (640 dots)	25.423 μ s (640 dots)
	F - FRONT PORCH	0.636 μ s (16 dots)	0.636 μ s (16 dots)	0.636 μ s (16 dots)
V E R T	f V	70.0849 Hz	70.0849 Hz	59.939 Hz
	A - PERIOD	14.268 ms (449 lines)	14.268 ms (449 lines)	16.684 ms (525 lines)
	B - BLANKING	1.557 ms (49 lines)	3.146 ms (99 lines)	1.430 ms (45 lines)
	C - SYNC WIDTH	0.064 ms (2 lines)	0.064 ms (2 lines)	0.064 ms (2 lines)
	D - BACK PORCH	1.112 ms (35 lines)	1.907 ms (60 lines)	1.049 ms (33 lines)
	E - ACTIVE TIME	12.711 ms (400 lines)	11.122 ms (350 lines)	15.253 ms (480 lines)
	F - FRONT PORCH	0.381 ms (12 lines)	1.176 ms (37 lines)	0.318 ms (10 lines)
SYNC POLARITY (H/V)		Negative / Positive	Positive / Negative	Negative / Negative

		Reservation timing		
		VESA 640 X 480 at 72 Hz	MAC II 640 X 480	MAC LC 640 X 480
DOT CLOCK		31.5 MHz	30.2410 MHz	31.334 MHz
H O R I Z	f H	37.861 KHz	35.0012 KHz	34.97 KHz
	A - PERIOD	26.413 μ s (832 dots)	28.570 μ s (864 dots)	28.598 μ s (896 dots)
	B - BLANKING	6.095 μ s (192 dots)	7.407 μ s (224 dots)	8.171 μ s (256 dots)
	C - SYNC WIDTH	1.270 μ s (40 dots)	2.803 μ s (63 dots)	2.043 μ s (64 dots)
	D - BACK PORCH	4.063 μ s (128 dots)	3.241 μ s (98 dots)	2.426 μ s (76 dots)
	E - ACTIVE TIME	20.317 μ s (640 dots)	21.163 μ s (640 dots)	20.425 μ s (640 dots)
	F - FRONT PORCH	0.762 μ s (24 dots)	2.083 μ s (63 dots)	3.702 μ s (116 dots)
V E R T	f V	72.8808 Hz	66.6689 Hz	66.61 Hz
	A - PERIOD	13.735 ms (520 lines)	15.000 ms (525 lines)	15.013 ms (525 lines)
	B - BLANKING	1.057 ms (40 lines)	1.286 ms (45 lines)	1.287 ms (45 lines)
	C - SYNC WIDTH	0.079 ms (3 lines)	0.086 ms (3 lines)	0.086 ms (3 lines)
	D - BACK PORCH	0.740 ms (28 lines)	1.114 ms (39 lines)	1.115 ms (39 lines)
	E - ACTIVE TIME	12.678 ms (480 lines)	13.714 ms (480 lines)	13.726 ms (480 lines)
	F - FRONT PORCH	0.238 ms (9 lines)	0.086 ms (3 lines)	0.886 ms (3 lines)
SYNC POLARITY (H/V)		Negative / Negative	Sync on Green or Composit	Negative / Negative

		Reservation timing		
		VESA 640 X 350 at 85 Hz	VESA 640 X 400 at 85 Hz	VESA 640 X 480 at 75 Hz
DOT CLOCK		31.5 MHz	31.5 MHz	31.5 MHz
H O R I Z	f H	37.861 KHz	37.861 KHz	37.500 KHz
	A - PERIOD	26.413 μ s (832 dots)	26.413 μ s (832 dots)	26.667 μ s (840 dots)
	B - BLANKING	6.095 μ s (192 dots)	6.095 μ s (192 dots)	6.349 μ s (200 dots)
	C - SYNC WIDTH	2.032 μ s (64 dots)	2.032 μ s (64 dots)	2.032 μ s (64 dots)
	D - BACK PORCH	3.048 μ s (96 dots)	3.048 μ s (96 dots)	3.809 μ s (120 dots)
	E - ACTIVE TIME	20.317 μ s (640 dots)	20.317 μ s (640 dots)	20.317 μ s (640 dots)
	F - FRONT PORCH	1.016 μ s (32 dots)	1.016 μ s (32 dots)	0.507 μ s (16 dots)
V E R T	f V	85.080 Hz	85.080 Hz	75.0000 Hz
	A - PERIOD	11.754 ms (445 lines)	11.754 ms (445 lines)	13.333 ms (500 lines)
	B - BLANKING	2.509 ms (95 lines)	1.189 ms (45 lines)	0.533 ms (20 lines)
	C - SYNC WIDTH	0.079 ms (3 lines)	0.079 ms (3 lines)	0.080 ms (3 lines)
	D - BACK PORCH	1.585 ms (60 lines)	1.083 ms (41 lines)	0.427 ms (16 lines)
	E - ACTIVE TIME	9.244 ms (350 lines)	10.565 ms (400 lines)	12.800 ms (480 lines)
	F - FRONT PORCH	0.845 ms (32 lines)	0.026 ms (1 line)	0.027 ms (1 line)
SYNC POLARITY (H/V)		Positive / Negative	Negative / Positive	Negative / Negative

Maintenance

Air Filter

The air filter should be cleaned about every 100 hours. Also, clean the air filter if the WARNING TEMP indicator lights up. Clean the filter more often when the projector is used in a dusty or smoky location.

Replace the filter when it is clogged or dirty even after cleaning. Order new filter part number ET-AF201.

Cleaning the Filter

Tools required: Vacuum Cleaner or lint brush .

- Wait until the cooling fan stops and the LAMP STATUS indicator turns off.

1 Set the Main Power Switch to OFF and unplug the power cord.

2 Remove the Filter Holder.

Place the Projector on its side with the handle facing up. Grasp the filter holder by the depressed portion and slide it out to remove.

3 Remove the Filter.

Hold the filter holder and lift up on the long tab to remove the filter from the filter holder.

4 Clean the Filter.

Gently remove any accumulated dust from the air filter with your vacuum cleaner.

CAUTION: Operating LCD Projector with torn or damaged Filter may cause damage to LCD Projector.

5 Replace the Filter.

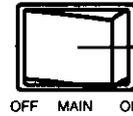
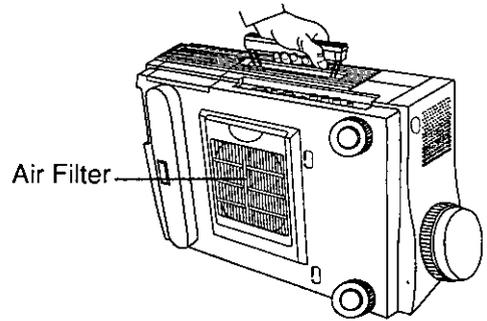
Replace the air filter so that all the locking tabs snap into place in the filter holder.

6 Replace the Filter Holder.

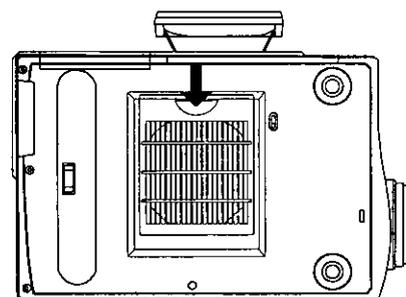
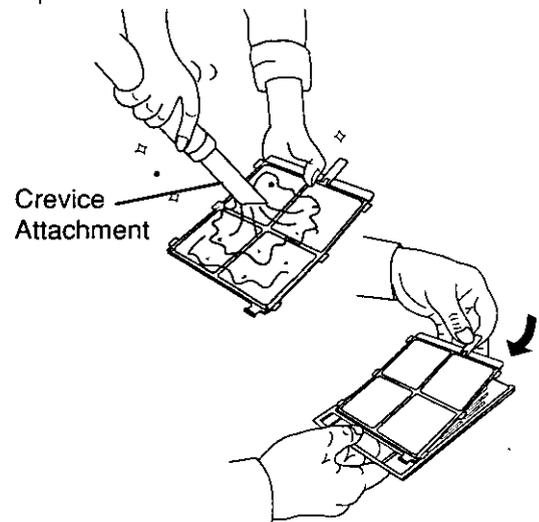
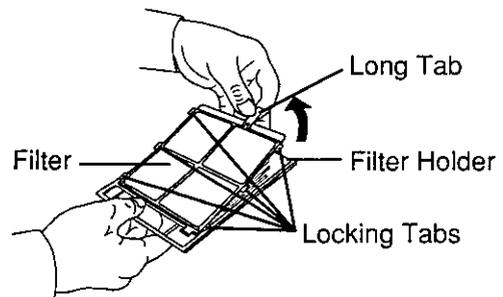
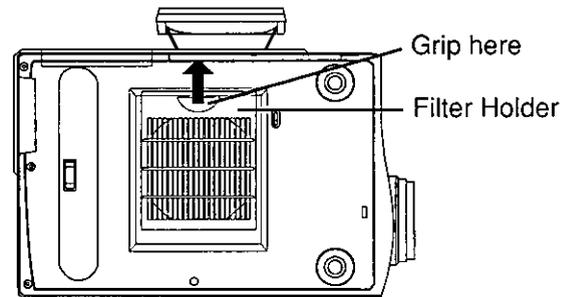
Line up the filter so that the guide tabs of the LCD Projector fit into the grooves in the sides of the Filter Holder and slide it back into place.

Note:

- The LCD Projector power cannot be turned on unless the filter holder is correctly installed.



Main Power Switch
Located on rear of the LCD Projector. See page 7.



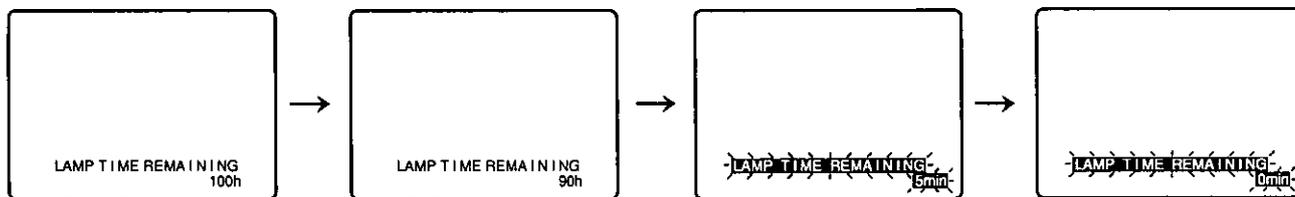
Maintenance

Lamp

The LCD Projector lamp has a limited operating life of approximately 1100 hours.

"LAMP TIME REMAINING 100h" will be displayed on-screen when operation time reaches approximately 1000 hours. Then, each time the power is turned on, the approximate Lamp life remaining will be displayed.

- A warning display will flash during the last 5 minutes of Lamp life. In this case, turn the LCD Projector off. The power can not be turned back on until lamp is replaced.



Lamp Replacement

Order Lamp ET-LA201.

Tools required: A coin.

- 1** After the cooling fan has stopped, and LAMP STATUS indicator turns solid red. Set the Main Power Switch to OFF. Then, unplug the LCD Projector by removing Power cord from LCD Projector AC socket.
- 2** First read caution and warning labels on Lamp cover. Then, remove the Lamp cover screw (1) by using coin, and take off the lamp cover.
- 3** Caution, be very careful. Lamp housing may still be hot to touch. Remove the lamp unit screw (1), then grasp the Lamp unit handle and carefully pull it from the LCD Projector. Keep Lamp housing opening to your right. Do not touch Lamp or point Lamp opening at anyone.

WARNING: The lamp may be hot. Be careful when handling.

CAUTION: High-pressure lamp may explode if improperly handled.

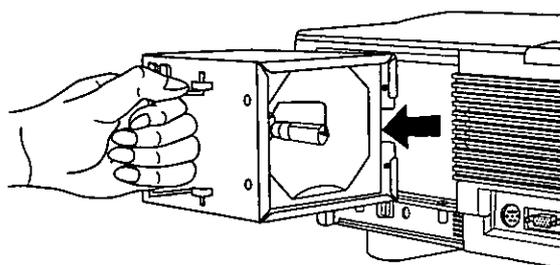
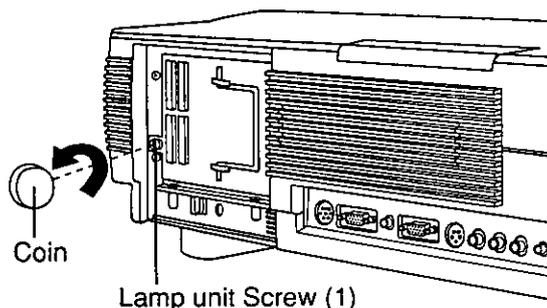
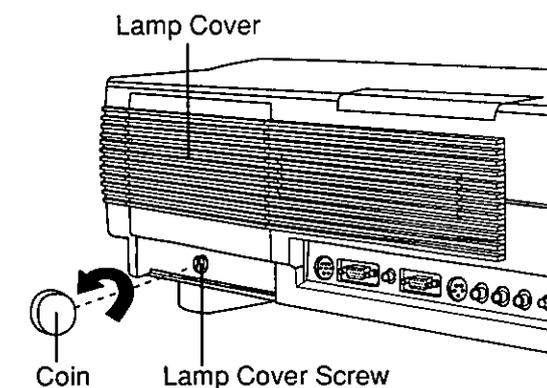
- 4** Carefully remove new Lamp ET-LA201, available from your Panasonic Dealer or Panasonic Consumable Sales at 1-800-346-4768, from its package at this time. Do not touch the Lamp or point Lamp opening at anyone. Do not drop, impact of dropping may cause the Lamp to explode

- 5** Replace the Lamp unit screw and the Lamp cover screw using a coin to tighten.

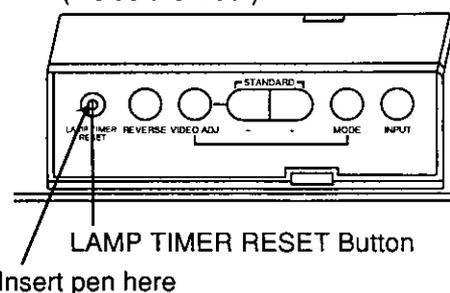
- 6** Plug the LCD Projector back in by inserting Power cord in LCD Projector AC socket and set the Main Power Switch to ON.

- 7** Press the LAMP TIMER RESET button by using a ball point pen. Do not reset unless Lamp is replaced. The Lamp Replacement indicator goes out.

- 8** Carefully put the old Lamp into the package the new ET-LA201 was removed from, replacing all packing material. Properly dispose of the old Lamp in this package.



(Inside the Door)

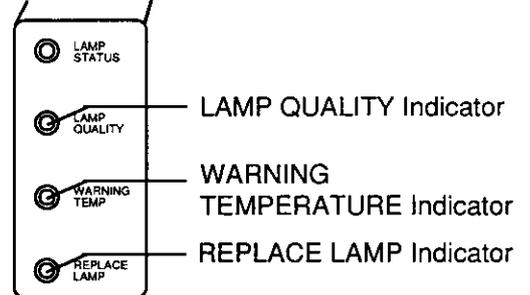
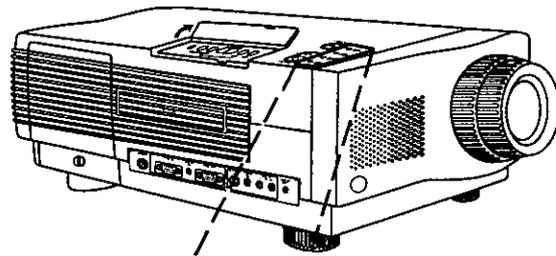


Maintenance

Warning Indicators

The warning lights on the LCD Projector indicate problems inside the projector.

- There are three warning lights; a LAMP QUALITY indicator which warns of a problem with the lamp, a WARNING TEMP indicator which warns that the projector is too hot, and a REPLACE LAMP indicator which lets you know when to change the bulb.
- If a problem causes either the LAMP QUALITY indicator or the WARNING TEMP indicator to light red, the power will automatically shut off. After turning off the Main Power Switch, follow the procedures given below.
- The power will not shut off automatically when the REPLACE LAMP indicator lights red (see below).



Warning Indicator	Symptom	Problem	Possible Solution
LAMP QUALITY indicator	The lamp does not light up.	<ul style="list-style-type: none"> • Burnt-out lamp • Lamp circuit failure 	<ul style="list-style-type: none"> • Take the projector to your nearest Panasonic Service Center.
WARNING TEMP indicator	The internal temperature is abnormally high.	<ul style="list-style-type: none"> • Blocked air intake. 	<ul style="list-style-type: none"> • Relocate projector to a proper location.
		<ul style="list-style-type: none"> • Clogged air filter. • Cooling fan breakdown. • Internal circuit failure. 	<ul style="list-style-type: none"> • Clean the filter. (See page 25.) • Take the projector to your nearest Panasonic Service Center.
	The power cannot be turned on.	<ul style="list-style-type: none"> • Misinstalled Filter Holder. 	<ul style="list-style-type: none"> • Filter Holder is properly installed. (See page 25.)
REPLACE LAMP indicator	REPLACE LAMP indicator starts flashing red approximately 100 hours before lamp is completely used up. The indicator then turns to solid red. In this case, turn the LCD Projector off. The power can not be turned back on until lamp is replaced.		<ul style="list-style-type: none"> • Replace the lamp. (See page 26.)

Notes:

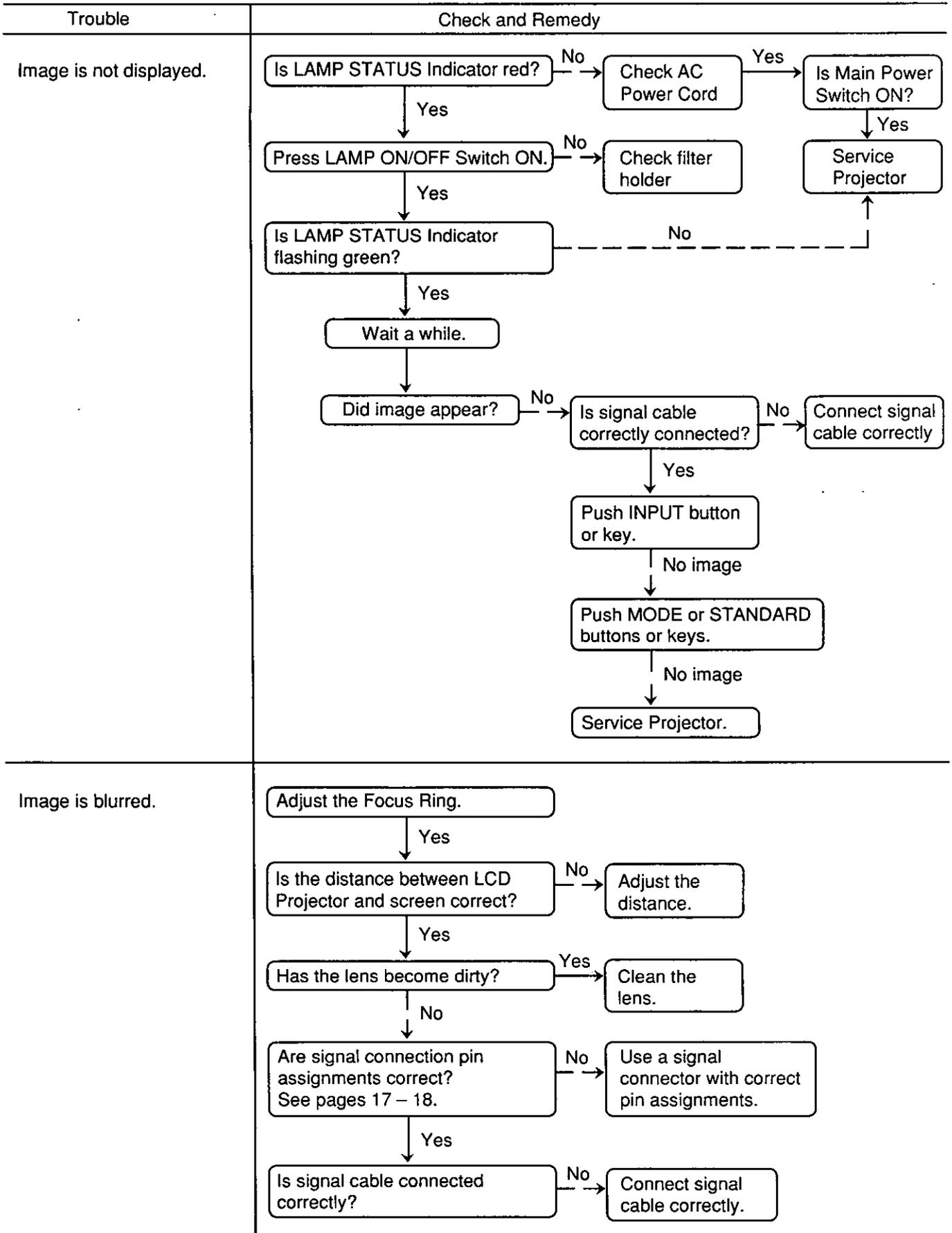
- If the WARNING TEMP indicator light comes on after servicing, please wait until the projector has cooled down completely before turning the power back on. (At least 5 minutes.)
- When the power is turned off and then turned on again, as during a brief rest, the LAMP QUALITY indicator may be triggered, preventing the power from going on. When this happens turn the Main Power Switch OFF, then unplug the power plug from the AC outlet and plug it back in again, then turn the Main Power Switch ON.

Trouble Shooting

If the LCD Projector unit fails, check the following before calling your dealer for service.

Troubleshooting Chart

Yes: —————> No: - - - ->



Trouble	Check and Remedy
Image does not match up with projector screen.	<p>Is computer in 640 X 480 mode? No →</p> <p style="text-align: center;">↓ Yes</p> <p>Change computer to 640 X 480 mode.</p> <p>Adjust the H-position or V-position. See page 22.</p>
Picture rolls.	<p>Are signal connector pin assignments correct? See pages 17 – 18. No →</p> <p style="text-align: center;">↓ Yes</p> <p>Use a signal connector with correct pin assignments.</p> <p>Is signal cable connected correctly? No →</p> <p style="text-align: center;">↓ Yes</p> <p>Connect signal cable correctly.</p> <p>Does computer's sync signals match LCD Projector specifications. (See pages 23 – 24 specifications, Input signals, Horizontal frequency & Vertical frequency.)</p>
No sound.	<p>Check if Audio cable is correctly connected. No →</p> <p style="text-align: center;">↓ Yes</p> <p>Connect Audio cable correctly.</p> <p>Push INPUT button or key.</p> <p style="text-align: center;">↓ No</p> <p>Push VOLUME + button or key.</p>
LCD Projector can not be remote controlled.	<p>Are remote control batteries fresh? No →</p> <p style="text-align: center;">↓ Yes</p> <p>Replace the batteries. See page 8.</p> <p>Is remote sensor on the unit blocked by obstacles? Yes →</p> <p style="text-align: center;">↓ No</p> <p>Remove all obstacles.</p> <p>Are operating distance and angle within specifications? Distance: 16.4 feet (5m) Angle: 30°</p>

Safety Precautions

- **If the LCD Projector is not operating properly, immediately switch it off and call the dealer where you purchased the unit.**
Do not operate the unit if it emits any smoke, an abnormal noise, or a foul odor. Immediately unplug the power cable from the electrical outlet and call your dealer.
- **Caution: Never remove the rear cover.**
To prevent electric shock, do not remove the rear cover. There are no user serviceable parts inside. Refer servicing to qualified service personnel.
- **Do not put anything inside the unit.**
If anything accidentally gets into the unit, unplug the power cable and call your dealer. Continued operation may cause fire or electric shock.

Technical Support

If you have read these Operating Instructions and tried the troubleshooting procedures and are still having difficulty, please contact the dealer from whom the unit was purchased. You may also call the end user technical support telephone number which is operational during East Coast business hours.

To contact the Technical Support Group call:
1-800-726-2797 (9:00 AM to 5:00 PM Eastern Time)

To locate the Nearest Authorized Panasonic Service Center call:
1-800-477-4700 (24 Hours a day)

To obtain Operating Instructions and Service Manuals call:
1-206-395-7343 (9:00 AM & 4:00 PM Pacific Time)

To locate the Nearest Sales Dealer call:
1-800-742-8086 (24 Hours a day)

To obtain ET-LA201 Lamp or ET-AF201 Air Filter from Panasonic Consumable Sales call:
1-800-346-4768 (Monday through Friday
9:00 AM to 7:00 PM Eastern Time)

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