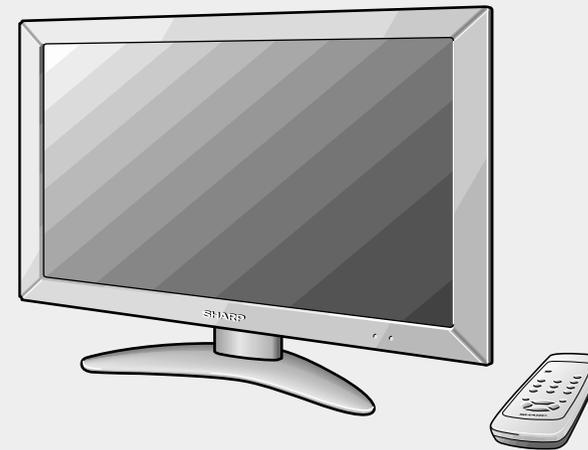




**LCD AV MONITOR  
MONITEUR AV À  
CRISTAUX LIQUIDES**

**SHARP®**

LC-28HM2



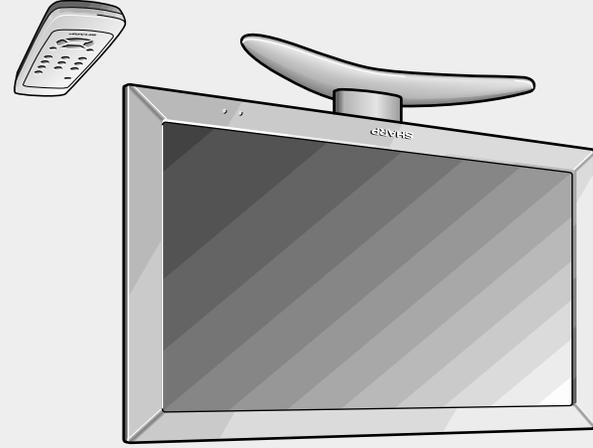
**OPERATION MANUAL  
MODE D'EMPLOI**

Printed on post-consumer recycled paper.  
Imprimé sur du papier recyclé.

Printed in Japan  
Imprimé au Japon  
TINS-7335CEZZ

**SHARP®**

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Impresso em papel reciclado.  
Impresso em papel reciclado pós utilização.

**MANUAL DE MANEJO  
MANUAL DE OPERAÇÃO**

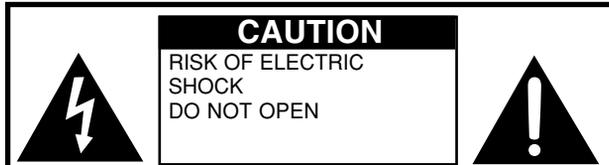
**MONITOR AV LCD  
MONITOR AV DE TELA  
DE CRISTAL LÍQUIDO**



Impreso en Japón  
Impresso no Japão  
TINS-7335CEZZ

# Important Information

**WARNING:** TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.



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



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within a triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

**WARNING:** FCC Regulations state that any unauthorized changes or modifications to this equipment not expressly approved by the manufacturer could void the user’s authority to operate this equipment.

U.S.A. ONLY

**CAUTION:** Use the supplied AC cord as it is. Do not remove the core part from the AC cord, and do not change the way of winding cables around the core part.

## INFORMATION

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 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:

- Relocate or adjust 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.

U.S.A. ONLY

## CAUTION

**Danger of explosion if battery is incorrectly replaced.**

**Replace only with the same or equivalent type recommended by the manufacturer.  
Dispose of used batteries according to the manufacturer’s instructions.**

ENGLISH

## OPERATION MANUAL

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# Dear SHARP Customer

---

**Thank you for your purchase of a SHARP LCD product. To ensure safety and many years of trouble-free operation of your product, please read the Safety Precautions carefully before using this product.**

## Safety Precautions

---

Electricity is used to perform many useful functions, but it can also cause personal injuries and property damage if improperly handled. This product has been engineered and manufactured with the highest priority on safety. However, improper use can result in electric shock and/or fire. In order to prevent potential danger, please observe the following instructions when installing, operating and cleaning the product. To ensure your safety and prolong the service life of your LCD product, please read the following precautions carefully before using the product.

1. Read instructions—All operating instructions must be read and understood before the product is operated.
2. Keep this manual in a safe place—These safety and operating instructions must be kept in a safe place for future reference.
3. Observe warnings—All warnings on the product and in the instructions must be observed closely.
4. Follow instructions—All operating instructions must be followed.
5. Cleaning—Unplug the power cord from the AC outlet before cleaning the product. Use a damp cloth to clean the product. Do not use liquid cleaners or aerosol cleaners.
6. Attachments—Do not use attachments not recommended by the manufacturer. Use of inadequate attachments can result in accidents.
7. Water and moisture—Do not use the product near water, such as bathtub, washbasin, kitchen sink and laundry tub, swimming pool and in a wet basement.
8. Stand—Do not place the product on an unstable cart, stand, tripod or table. Placing the product on an unstable base can cause the product to fall, resulting in serious personal injuries as well as damage to the product. Use only a cart, stand, tripod, bracket or table recommended by the manufacturer or sold with the product. When mounting the product on a wall, be sure to follow the manufacturer's instructions. Use only the mounting hardware recommended by the manufacturer.
9. When relocating the product placed on a cart, it must be moved with utmost care. Sudden stops, excessive force and uneven floor surface can cause the product to fall from the cart.
10. Ventilation—The vents and other openings in the cabinet are designed for ventilation. Do not cover or block these vents and openings since insufficient ventilation can cause overheating and/or shorten the life of the product. Do not place the product on a bed, sofa, rug or other similar surface, since they can block ventilation openings. Do not place the product in an enclosed place such as a bookcase or rack, unless proper ventilation is provided or the manufacturer's instructions are followed.
11. Power cord protection—The power cords must be routed properly to prevent people from stepping on them or objects from resting on them.
12. The LCD panel used in this product is made of glass. Therefore, it can break when the product is dropped or applied with impact. Be careful not to be injured by broken glass pieces in case the LCD panel breaks.
13. Overloading—Do not overload AC outlets or extension cords. Overloading can cause fire or electric shock.
14. Entering of objects and liquids—Never insert an object into the product through vents or openings. High voltage flows in the product, and inserting an object can cause electric shock and/or short internal parts. For the same reason, do not spill water or liquid on the product.
15. Servicing—Do not attempt to service the product yourself. Removing covers can expose you to high voltage and other dangerous conditions. Request a qualified service person to perform servicing.

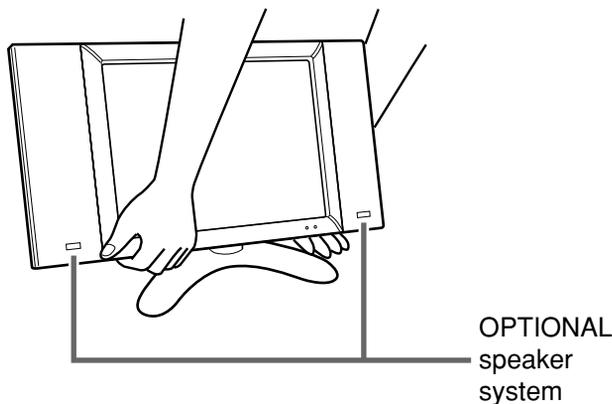


16. Repair—If any of the following conditions occurs, unplug the power cord from the AC outlet, and request a qualified service person to perform repairs.
  - a. When the power cord or plug is damaged.
  - b. When a liquid was spilled on the product or when objects have fallen into the product.
  - c. When the product has been exposed to rain or water.
  - d. When the product does not operate properly as described in the operating instructions.  
Do not touch the controls other than those described in the operating instructions. Improper adjustment of controls not described in the instructions can cause damage, which often requires extensive adjustment work by a qualified technician.
  - e. When the product has been dropped or damaged.
  - f. When the product displays an abnormal condition. Any noticeable abnormality in the product indicates that the product needs servicing.
17. Replacement parts—In case the product needs replacement parts, make sure that the service person uses replacement parts specified by the manufacturer, or those with the same characteristics and performance as the original parts. Use of unauthorized parts can result in fire, electric shock and/or other danger.
18. Safety checks—Upon completion of service or repair work, request the service technician to perform safety checks to ensure that the product is in proper operating condition.
19. Wall or ceiling mounting—When mounting the product on a wall or ceiling, be sure to install the product according to the method recommended by the manufacturer.
20. Heat sources—Keep the product away from heat sources such as radiators, heaters, stoves and other heat-generating products (including amplifiers).
21. Power source—This product must operate on a power source specified on the specification label. If you are not sure of the type of power supply used in your home, consult your dealer or local power company. For units designed to operate on batteries or another power source, refer to the operating instructions.

The LCD panel is a very high technology product with 2,949,120 thin film transistors, giving you fine picture details. Occasionally, a few non-active pixels may appear on the screen as a fixed point of blue, green or red. Please note that this does not affect the performance of your product.

### Precautions when transporting the display

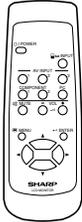
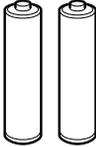
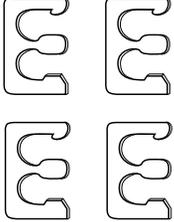
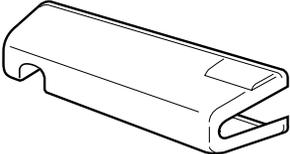
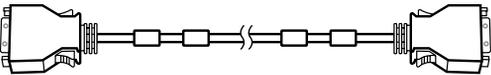
When transporting the display, never carry it by holding onto the speakers. Be sure to always carry the display by holding it with two hands—one hand on each side of the display.



# General Information

## Supplied Accessories

Make sure the following accessories are provided with the product.

Operation Manual (×1)	Remote Control (×1)	Size AA Dry Battery (×2)	Cable Clamp (×4)					
 <p>TINS-7335CEZZ</p>	 <p>RRMCG1619CESA</p>	 <p>UBATU0243GEZZ</p>	 <p>LHLDW1224CEZZ</p>					
AVC System Terminal Cover (×1)		AC Power Cord (×2)						
 <p>GCOVA1860CE02</p>		<table border="1"> <thead> <tr> <th data-bbox="672 714 810 752">Plug form</th> <th data-bbox="810 714 1213 752">Cord length</th> </tr> </thead> <tbody> <tr> <td data-bbox="672 752 810 864" rowspan="2">  <p>3 pins</p> </td> <td data-bbox="810 752 1213 864">                     12ft.5<sup>-39</sup>/<sub>64</sub>" [3.8m] (for Display)                      QACCD5023CEZZ                 </td> </tr> <tr> <td data-bbox="810 864 1213 977">                     5ft.10<sup>-55</sup>/<sub>64</sub>" [1.8m] (for AVC system)                      QACCD5024CEZZ                 </td> </tr> </tbody> </table>		Plug form	Cord length	 <p>3 pins</p>	12ft.5 <sup>-39</sup> / <sub>64</sub> " [3.8m] (for Display) QACCD5023CEZZ	5ft.10 <sup>-55</sup> / <sub>64</sub> " [1.8m] (for AVC system) QACCD5024CEZZ
Plug form	Cord length							
 <p>3 pins</p>	12ft.5 <sup>-39</sup> / <sub>64</sub> " [3.8m] (for Display) QACCD5023CEZZ							
	5ft.10 <sup>-55</sup> / <sub>64</sub> " [1.8m] (for AVC system) QACCD5024CEZZ							
System Cable (×1)								
 <p>QCNW-5948CEZZ</p>								

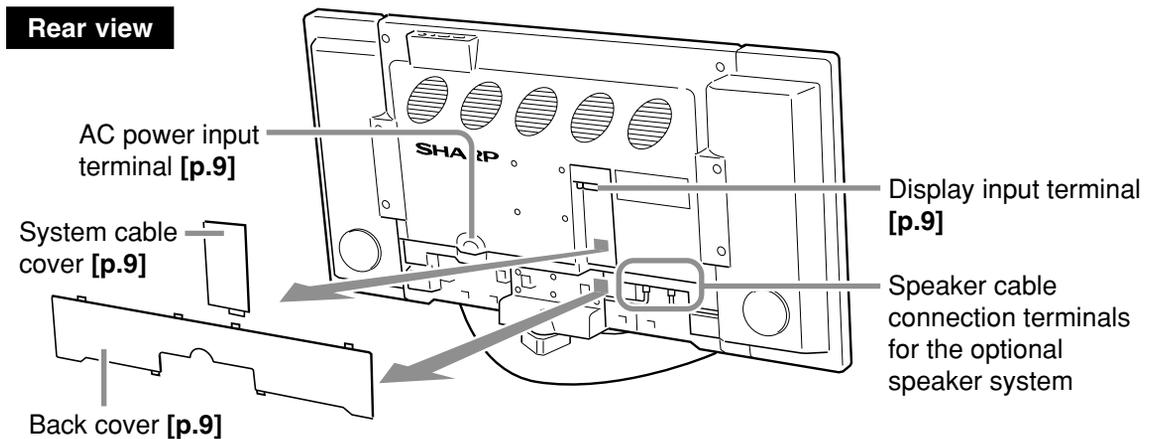
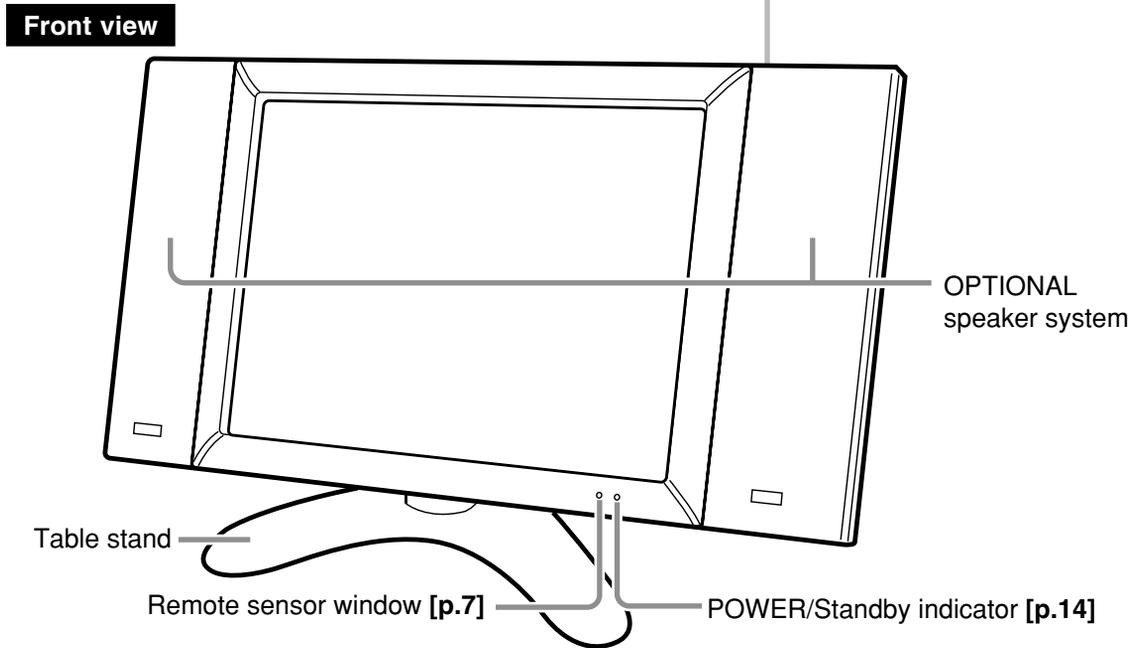
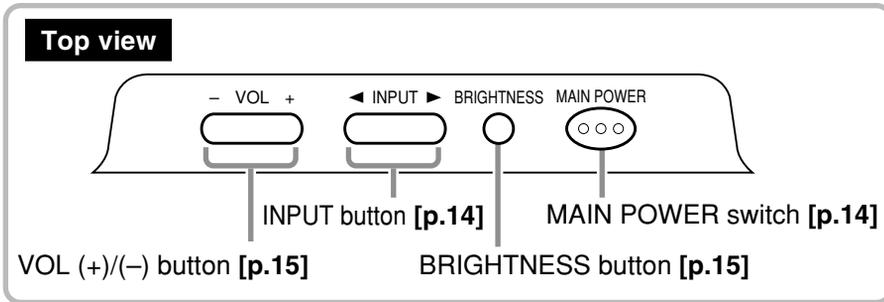
## Optional Accessories

- Bose System Side Speaker (Model: AN-28SP2)
- Wall Mount Bracket (Model: AN-28AG1)

## Names of Parts

### Display

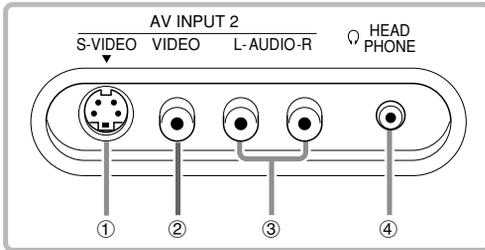
For details on the use of each control, refer to the page number indicated in the brackets.



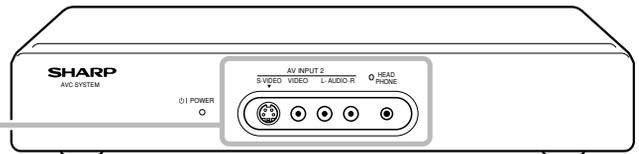
# General Information

## AVC System

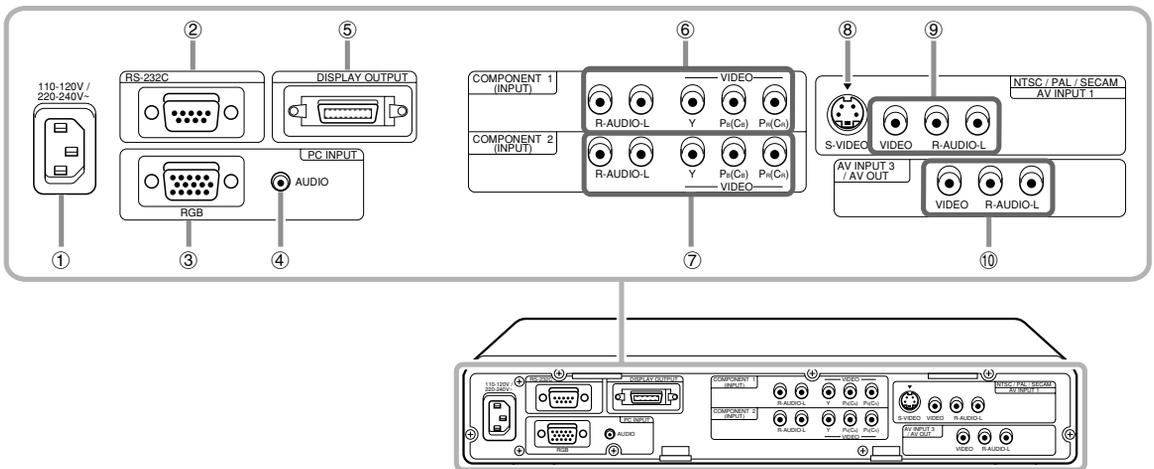
### Front view



- ① S-VIDEO input terminal (AV INPUT 2) [p.12]
- ② VIDEO input terminal (AV INPUT 2) [p.12]
- ③ AUDIO input terminal (AV INPUT 2) [p.12]
- ④ HEAD PHONE jack [p.8]



### Rear view



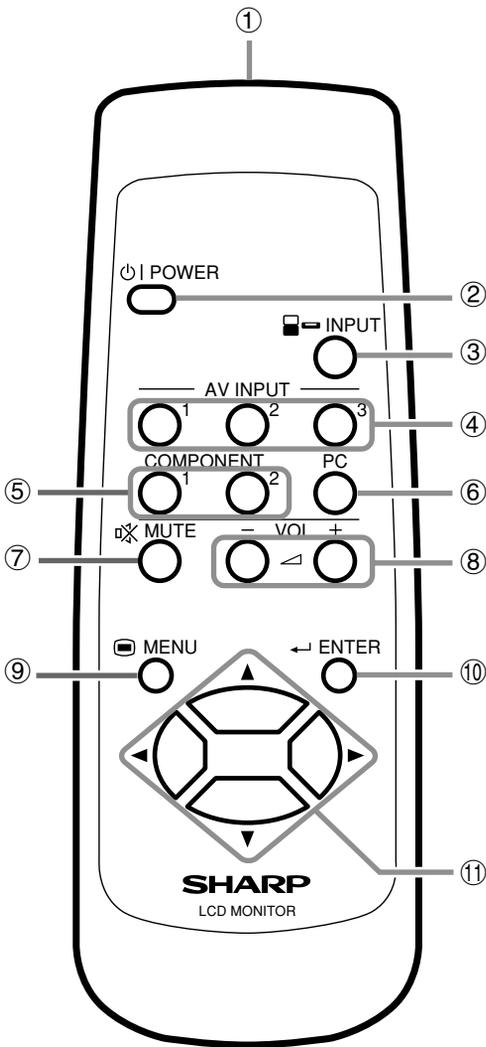
- ① AC Power input terminal [p.9]
- ② RS-232C input terminal [p.31]
- ③ PC RGB input terminal [p.30]
- ④ PC AUDIO input terminal [p.30]
- ⑤ DISPLAY output terminal [p.9]
- ⑥ AUDIO/VIDEO input terminal (COMPONENT1) [p.12]
- ⑦ AUDIO/VIDEO input terminal (COMPONENT2) [p.12]
- ⑧ S-VIDEO input terminal (AV INPUT 1) [p.12]
- ⑨ VIDEO/AUDIO input terminal (AV INPUT 1) [p.12]
- ⑩ VIDEO/AUDIO input terminal (AV INPUT 3/AV OUT) [pp.12, 29]

\* ⑩ can also be used as video/audio output terminals.

#### Note

If video input and S-video input are both connected to the AV-1 input and/or AV-2 input, S-video input has priority.

Remote Control



- ① Infrared transmitter window
- ② **POWER button [p.14]**
  - To switch on the power, press this button. The POWER/Standby indicator lights up green.
  - To switch off the power, press this button. The POWER/Standby indicator lights up red.
- ③ **INPUT button [p.14]**

Use this button to select an input source.

→ AV-1 → AV-2 → COMPONENT1  
PC ← COMPONENT2 ←

  - The input source mode is skipped if the corresponding input terminal is not connected with external equipment (except "PC").
  - If you change the AV INPUT 3/AV OUT select, you can select "AV-3". See page 29 for details.
- ④ **AV INPUT buttons**

Use these buttons to select an AV input terminal directly.

  - You can not select an input source to which external equipment is not connected.
- ⑤ **COMPONENT buttons**

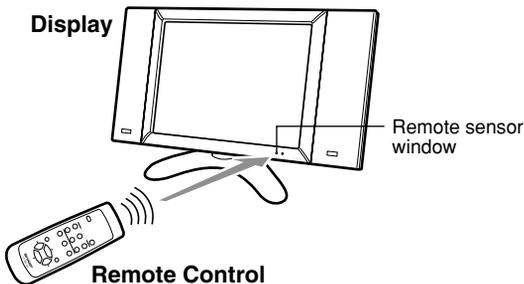
Use these buttons to select a COMPONENT terminal directly.

  - You can not select an input source to which external equipment is not connected.
- ⑥ **PC button**

Use this button to select the PC mode.
- ⑦ **MUTE button**

Use this button to temporarily turn off the sound. Press the button again to turn the sound back to the previous level.
- ⑧ **VOL (+)/(-) buttons [p.15]**

Use these buttons to increase/decrease sound volume. The sound volume can be adjusted in the range 0~60.



- ⑨ **MENU button [p.17]**

Use this button to turn on/off the MENU screen.
- ⑩ **ENTER button [p.18]**

Use this button to execute a command.
- ⑪ **Cursor buttons [p.18]**

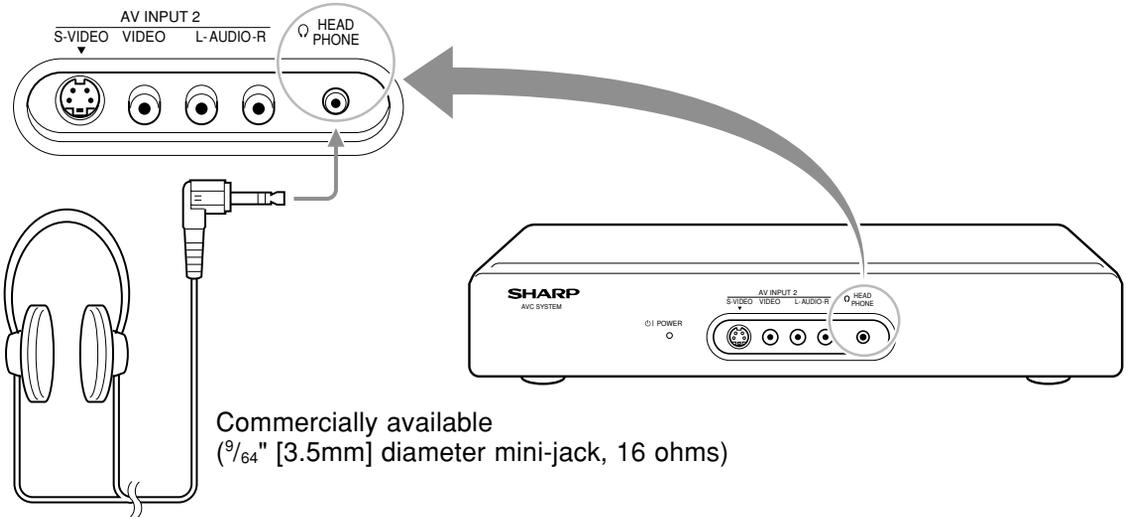
Use these buttons to select a desired item on the setting screen.

## General Information

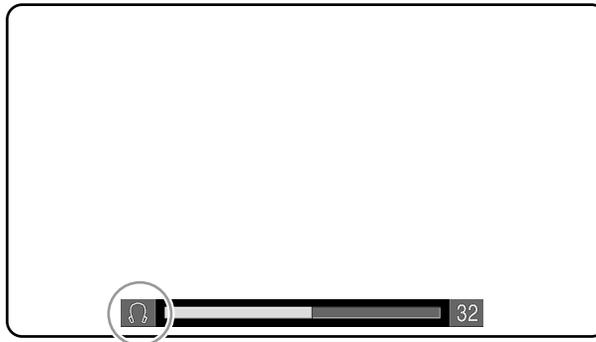
### Example of Application

#### Using Headphones

You can use any pair of headphones ( $\frac{9}{64}$ " [3.5mm] diameter mini-plug) to listen to the sound.



#### Indicator



#### Note

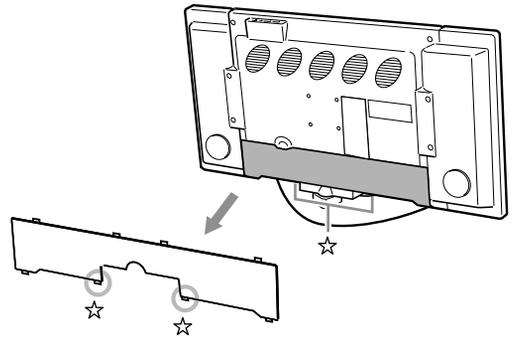
- When connecting headphones, the sound from the display speakers is muted.
- “” indicator appears when a pair of headphones is connected.

# Preparation

## Connecting the Display and AVC System

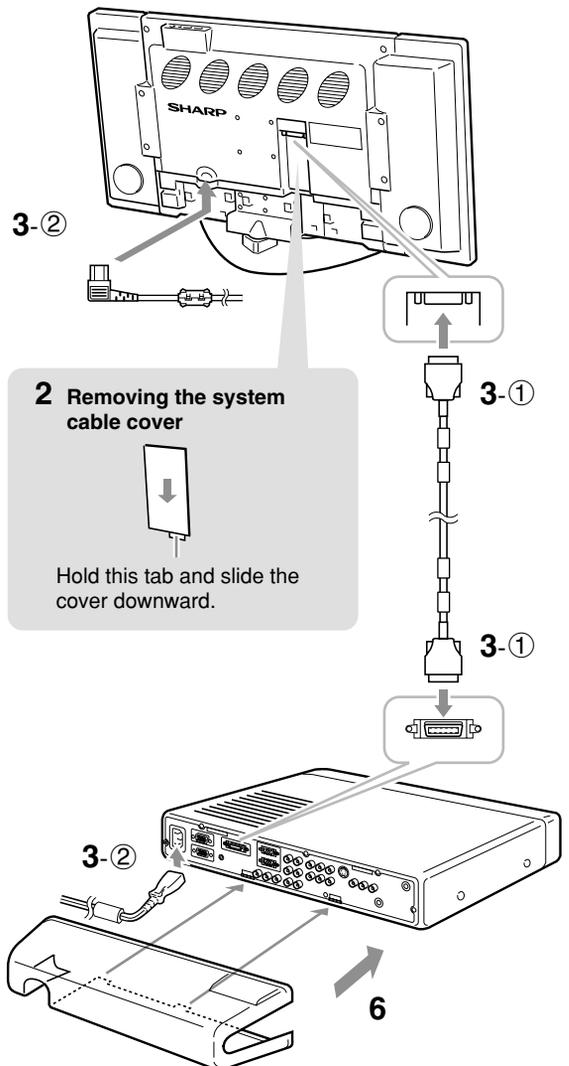
Use the supplied system cable.

- 1 Remove the back cover of the display.
  - Press both of your thumbs upwards against the two tabs on lower side of the cover (☆) and pull down the cover.

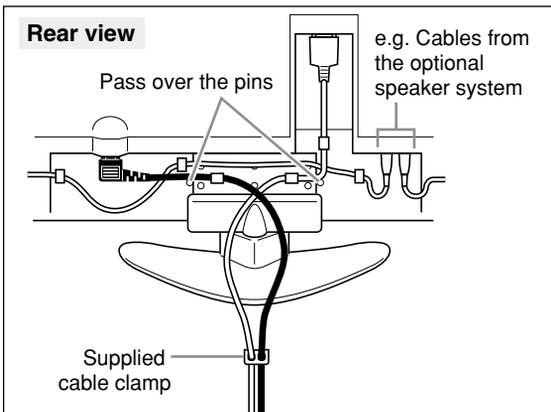


- 2 Remove the system cable cover.

- 3
  - ① Insert the system cable connectors into the display input terminal on the display and the output terminal on the AVC system until they click.
  - ② Connect the AC power cords to the AC power inputs on the display and the AVC system.

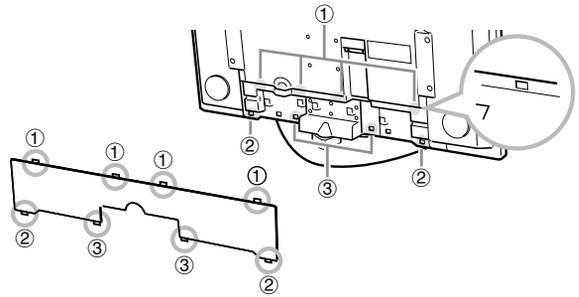


- After connecting the various cables, fasten them using the provided cable clamps as shown in the diagram below before mounting the cover.



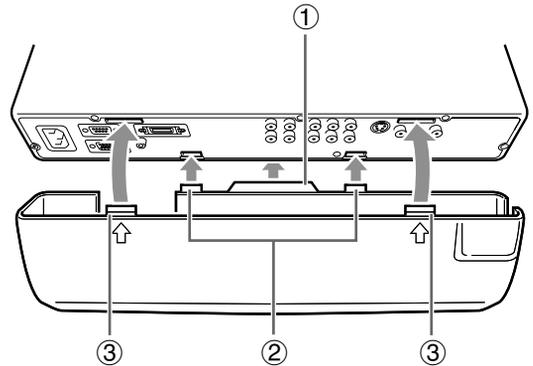
## Preparation

- 4** Mount the back cover of the display and the system cable cover.
- ① Insert the four tabs on the upper side of the cover (①) into the grooves on the rear of the display.
  - ② Press the two tabs on the lower side of the cover (②) into the grooves on the rear of the display until they produce a click sound.
  - ③ Press the two tabs on the lower side of the cover (③) into the grooves on the rear of the display until they produce a click sound.



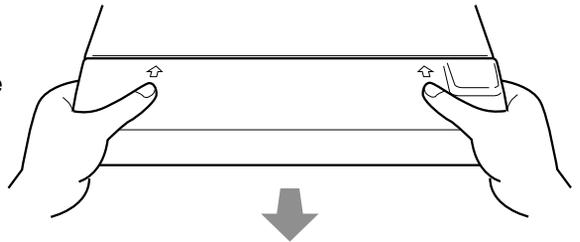
- 5** Connect desired external equipment (e.g. DVD player: See page 12).

- 6** Mount the supplied AVC system terminal cover.
- ① Align the protruding part in the center of the cover (①) with the outside of the AVC system.
  - ② Align the two tabs on the lower side of the cover (②) with the two grooves in the lower side of the AVC system and push them gently in.
  - ③ Align the two tabs on the upper side of the cover (③) with the two grooves in the upper side of the AVC system and push them gently in.



### Removing the AVC system terminal cover

- ① Press both of your thumbs against the arrow marks (2 locations) on the upper side of the cover and pull out gently to release the tabs on the upper side.
- ② Now pull away the entire cover to release the tabs on the lower side.



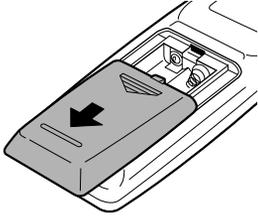
### Note

- Before connecting the power cord, be sure to set the MAIN POWER button on the top-of display to "OFF".
- When not using the unit for extended periods of time, be sure to always unplug the power cord.
- The display and the AVC system do not operate independently. Be sure to always plug-in both AC power cords in order to operate the display.
- When connecting external equipment to the AVC system, be sure to always make the necessary connections before plugging in the power cords.
- Do not remove the system cable while operating the unit. Doing so can cause a malfunction.
- Do not place anything over the ventilation openings on the top of the AVC system.

## Batteries for Remote Control

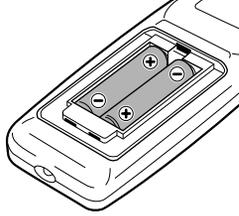
If the remote control fails to operate the display, replace the batteries in the remote control.

- 1** Open the battery compartment cover.



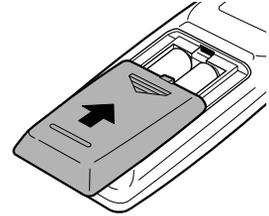
- Slide the cover in the direction of the arrow.

- 2** Load the supplied AA batteries.



- Place the batteries with their terminals corresponding to the (+) and (-) indications in the battery compartment.

- 3** Close the battery compartment cover.



- Slide the cover in the direction of the arrow.

### **CAUTION**

#### **Battery handling precautions**

Improper use of the dry batteries can result in leakage of the battery fluid and/or rupture. Be sure to follow the guidelines outlined below.

- Place the batteries with their terminals according to the (+) and (-) locations.
- Different types of batteries have different characteristics. Do not mix batteries of different types.
- Do not use old and new batteries together. Mixing old and new batteries can shorten the life of new batteries and/or cause old batteries to leak battery fluid.
- Remove batteries as soon as they are exhausted. Fluid leaking from the batteries can cause a rash. If fluid has leaked out, wipe it off with a cloth.

#### **Remote control handling precautions**

- Do not expose the remote control to excessive shock. Do not place the remote control where it can get wet or where the humidity is high.
- Do not place the remote control in a location where it is exposed to direct sunlight. The heat can deform its plastic exterior.
- When the remote sensor window of the display is exposed to direct sunlight or to strong light source, remote control may prove to be difficult. Change the direction of the light source or of the display or operate the remote control from a location closer to the remote sensor window.

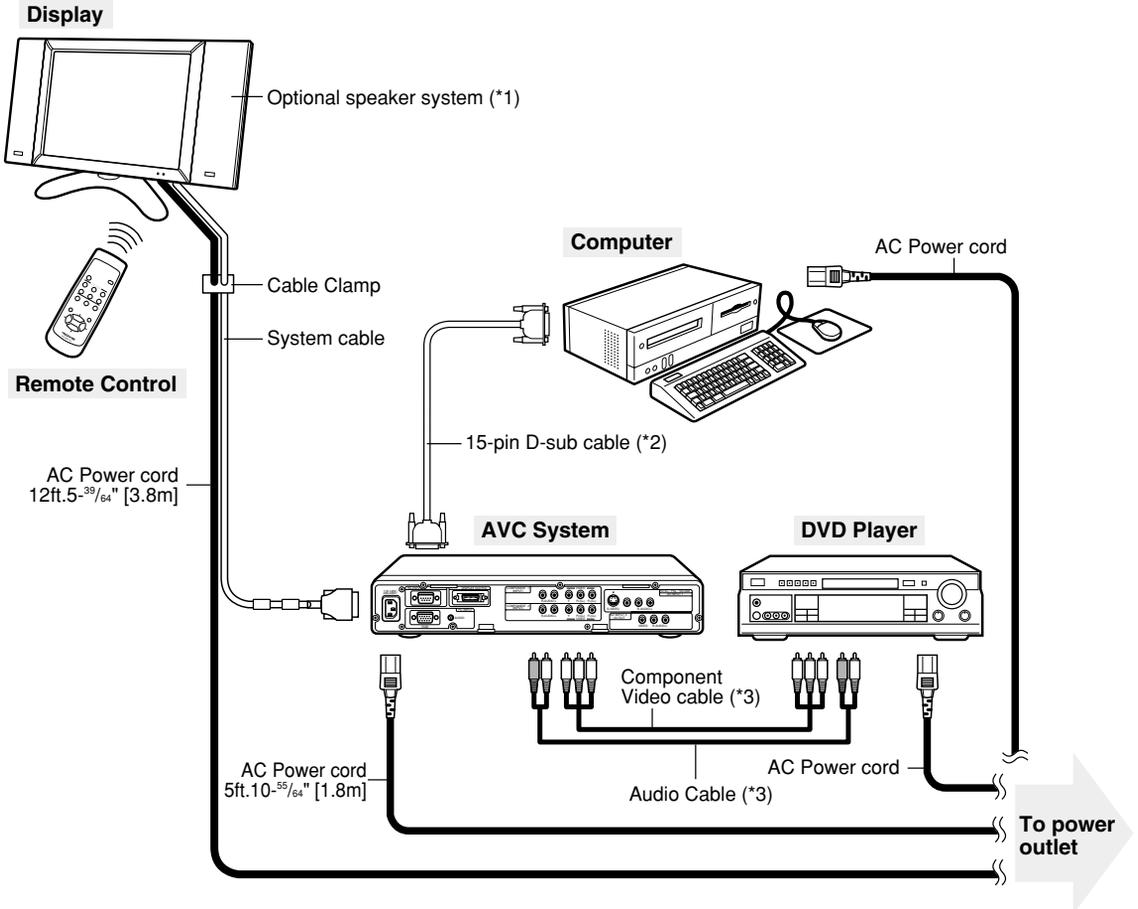
#### **Note**

- The batteries included with the unit may not last as long as new batteries due to aging. Replace them when they fail to operate the remote control.
- If the remote control is not used for extended periods of time, remove the batteries.

## Preparation

### System Connection (Example)

The following diagram shows an example of system connection, on which this Operation Manual is based.



(\*1) For the best sound quality, we recommend you purchase the optional speaker system with built-in amplifier. The optional speakers are connected to the rear cabinet of the display.

(\*2) (\*3) These cables are sold separately.

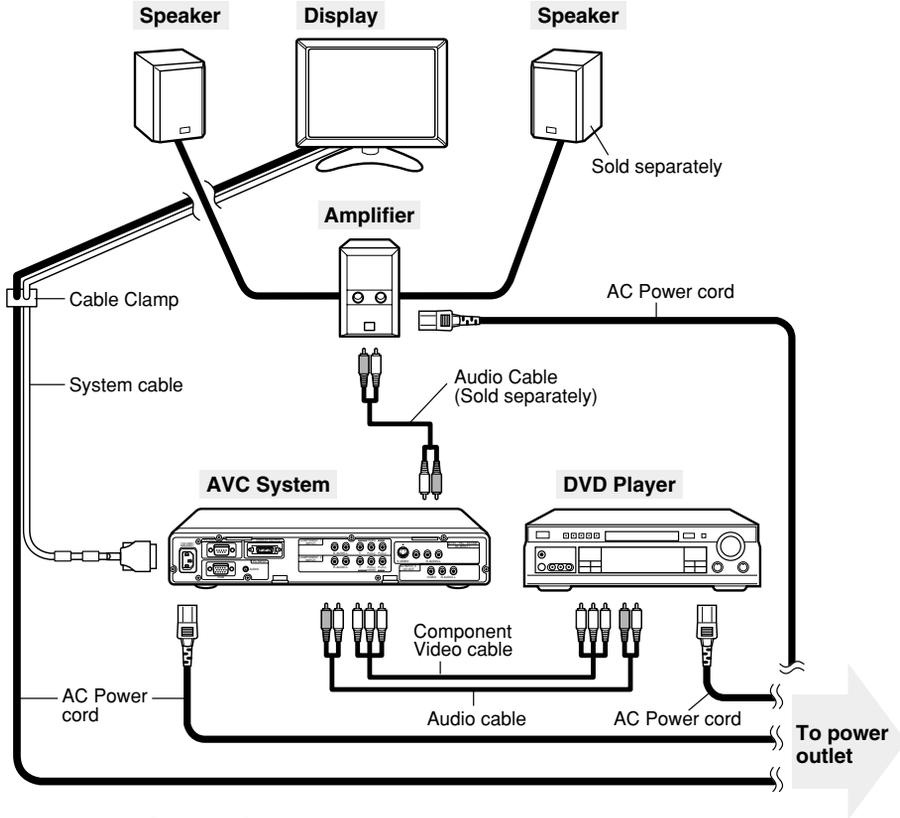
#### To enjoy the beautiful sound with optional Bose System side speakers

**1** Make sure that the AV-3 setting of the OPTION mode in "OUTPUT" to "FIX" position.

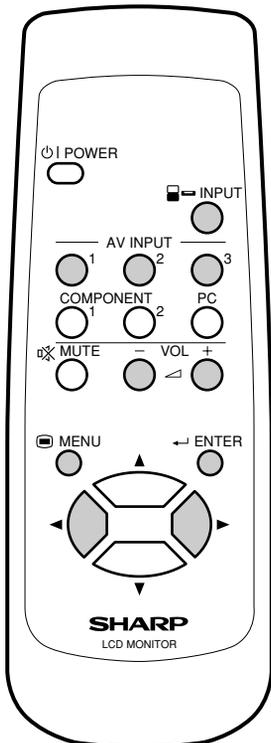
**Note** If it is set to "VARIABLE" position, the sound does not come out from the speakers. Change the setting to "FIX" position so that you will be able to hear the sound. The setting procedures are shown on page 27.

**2** You can control the sound volume with **VOLUME (+)/(-)** on the remote control or the top of the display.

If you connect your audio amplifier or system speakers to the unit, please refer to the system example below.



## Using an external speaker system

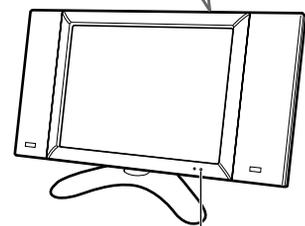
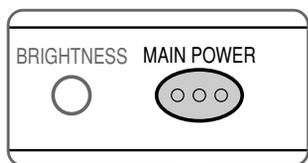


- 1** Connect an audio cable from the audio input terminal (LINE-IN) of the amplifier to the AV INPUT 3/AV OUT terminal on the rear of the AVC system.
- 2** Set the AV-3 setting of the OPTION mode in "OUTPUT" (VARIABLE). See page 27 for the setting procedure.
- 3** Press **VOLUME (+)** on the top of the display or the remote control to increase sound volume.
- 4** Set the maximum volume for the connected amplifier.
- 5** Check the volume level of the connected DVD player or VCR, then adjust **VOLUME (-)** on the remote control to set the appropriate volume.

# Basic Operation

## Turning on POWER

### Top view



POWER/Standby indicator

#### When the POWER/Standby indicator is “OFF”:

Press **MAIN POWER** on the top panel of the display.

If the power cannot be switched on by pressing **MAIN POWER**, first press **MAIN POWER** in the “OFF” position, then while keeping **INPUT** pressed, press **MAIN POWER** again.

#### When the POWER/Standby indicator lights up “red”:

Press **POWER** on the remote control.

- When the power is switched on, the POWER/Standby indicator lights up green and a mode indicator appears on the upper right corner of the display.

#### Indicator (Example)

COMPO-1

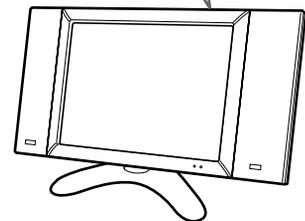
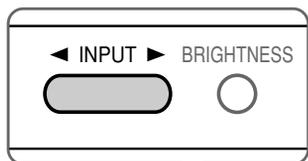
#### **CAUTION**

Never pull the plug of the power cord before you switch off the power by using the **MAIN POWER** button on the top panel.

#### **Note**

Unless external AV equipment is connected, the indicator “AV-1” appears on the display.

## Switching INPUT Source



Press **INPUT** and select the applicable input source.

→ AV-1 ↔ AV-2 ↔ COMPONENT1 ↔ COMPONENT2 ↔ PC ←

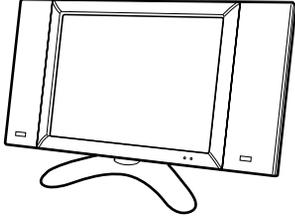
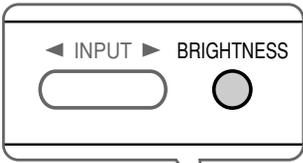
#### Indicator (Example)

AV-1

#### **Note**

- The input source mode is skipped if the corresponding input terminal is not connected with external equipment (except “PC”).
- If you change the AV INPUT 3/AV OUT select, you can select “AV-3”. See page 29 for details.

## Adjusting BRIGHTNESS



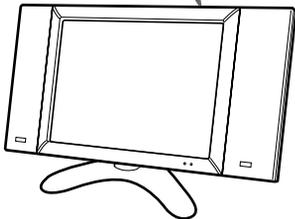
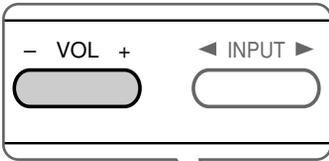
Press **BRIGHTNESS** and adjust the brightness of the display.

→DARK→ BRIGHT→ NORMAL←

**Indicator** (Example)



## Sound VOLUME



Press **VOL (+)** to increase sound volume.

Press **VOL (-)** to decrease sound volume.

**Indicator**



\* No sound is output under the following conditions.

Mark	Meaning
	Set to "Line output" with an external amplifier connected (page 13)
	When headphones are connected (page 8)

By pressing **MUTE** on the remote control, you can temporarily turn the sound off.

**Indicator**

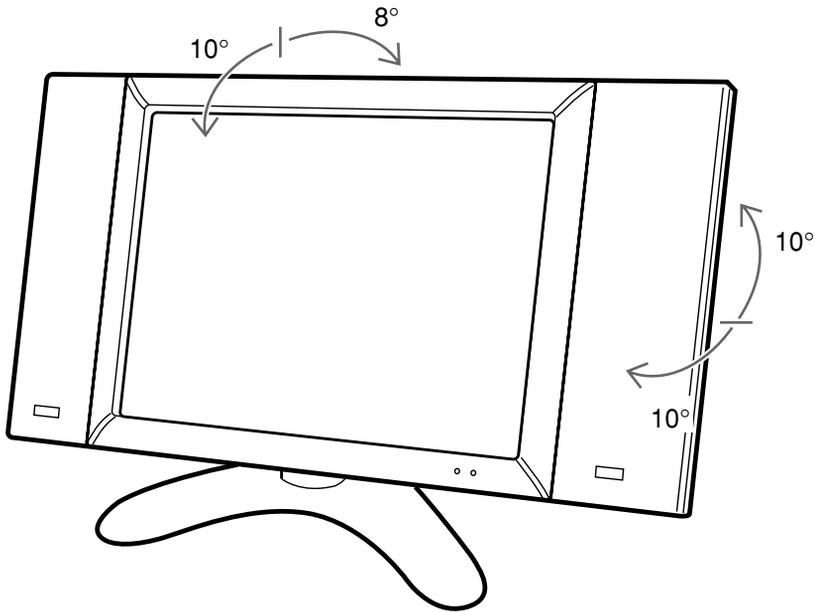


To turn the sound on again, press **MUTE** once more, or **VOL (+)/(-)** on the remote control or on top of the display.

## Basic Operation

### Adjusting the display's position

The display can be inclined between  $10^\circ$  to the front and  $8^\circ$  to the back. In addition it can be rotated from left to right and vice versa within a range of  $20^\circ$ .



### Cleaning

Make sure to always switch the MAIN POWER button at the top of the display "OFF", and then remove the AC power cord.

If the screen becomes dirty, wipe it off with a damp cloth.

#### Taking care of the screen of your LCD display

- Never spray liquid directly on the display.
- When dust has accumulated on the screen, use a commercially available cleaning brush (anti-static brush).
- To protect the screen, do not wipe with a dry cloth or a chemically treated cloth.

#### Taking care of the cabinet

- Wipe dirt off using a soft cloth made of flannel, for example.
- Never use volatile agents such as benzene or thinner as they will deteriorate the exterior and the coating.
- Never apply other volatile chemicals such as insecticides.  
Never let the exterior stay in contact with rubber or vinyl surfaces for long periods of time. This could cause the cabinet to deteriorate or the coating to peel off.

# Adjustments to the On-Screen Display

## Menu List

The list below shows all the items you can set and adjust. See the following pages for details on each setup procedure.

:Factory setting

### AV Mode

VIEW (p.18)	SIDE BAR	
	CINEMA	
	WIDE	
BRIGHT. (p.22)	BRIGHT	
	NORMAL	
	DARK	
PICTURE (p.23)	NORMAL	
	MOVIE	
	GAME	
SOUND (p.25)	NORMAL	
	MOVIE	
	GAME	
OPTION (p.27)	IMAGE	NORMAL
	WIDE VIEW	FULL
	AV-3	OUTPUT
	C-SYSTEM	AUTO
	DISPLAY	ON
	RESET	

### PC Mode

VIEW (p.18)	SIDE BAR	
	CINEMA	
	FULL	
	DOT BY DOT	
BRIGHT. (p.22)	BRIGHT	
	NORMAL	
	DARK	
PICTURE (p.23)	CONTRAST	+30
	BRIGHT	0
	RED	0
	BLUE	0
	RESET	
SOUND (p.25)	TREBLE	0
	BASS	0
	BALANCE	0
	LOUDNESS	OFF
	RESET	
	OPTION (p.27)	IMAGE
	AUTO SYNC	
	AV-3	OUTPUT
	SIGNAL INFO	
	DISPLAY	ON
	RESET	

Adjustments to the On-Screen Display

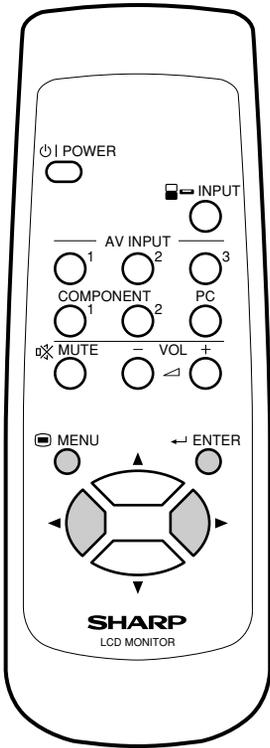
### AV Mode Factory Setting Details

		NORMAL	MOVIE	GAME	
PICTURE	CONTRAST	60	50	45	
	TINT	0	0	0	
	COLOR	0	0	0	
	BRIGHT. (Black level)	0	-5	0	
	SHARP (SHARPNess)	0	0	-20	
	PRO.	BLACK (Black stretching: sense of depth)	OFF	OFF	OFF
		VDE (Vertical Detail Enhancement) *Only for N358	OFF	OFF	OFF
		F-TONE (Flesh Tone)	ON	ON	OFF
C-TEMP (Color TEMPerature) *Only for PAL/PAL-60/PAL-M		0	0	0	
SOUND	TREBLE	0	0	0	
	BASS	0	0	0	
	BALANCE	0	0	0	
	LOUDNESS	OFF	OFF	OFF	

# Adjustments to the On-Screen Display

## Adjusting the VIEW Settings

This menu allows you to select a picture size manually.  
Details of modes and adjustment items are described on the following pages.



- 1 Press **MENU** to display the Menu screen. Press **◀▶** to move the cursor to **VIEW** and then press **ENTER**.



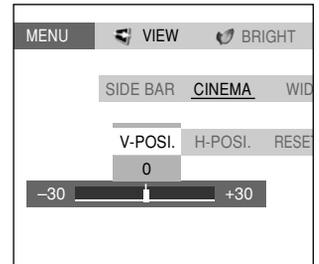
- 2 Press **◀▶** to move the cursor and select the desired mode. Then press **ENTER**.



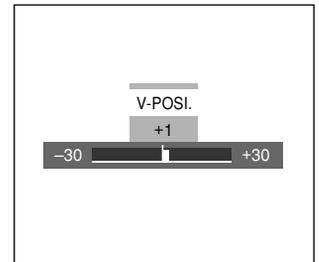
### Adjusting the Position of the Picture

Continue the following procedure if you want to adjust the position vertically/horizontally.

- 3 Press **◀▶** to move the cursor and select the desired adjustment. Then press **ENTER**.

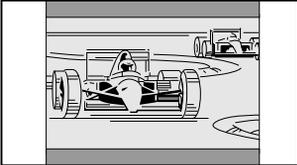
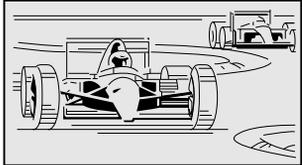
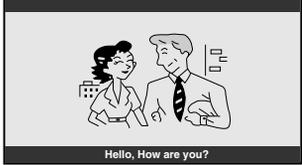


- 4 Press **◀▶** to make the adjustment and then press **ENTER**.



# Adjustments to the On-Screen Display

## AV mode

Mode		
<b>SIDE BAR</b>	The screen shows the regular display (height:width ratio is 4:3).	<p><b>Regular TV display</b></p>  
<b>CINEMA</b>	The screen shows a movie size display for (software-driven) movies.	<p><b>Display with bands at the top and bottom</b></p>  
<b>WIDE</b>	Compressed to the 4:3 format, a video image is shown full size.	<p><b>Display with subtitles at the bottom</b></p>  

**Note** The SIDE BAR mode and the WIDE mode has an AUTO setting that automatically sets pictures with letter box signals to a suitable size (for NTSC only). Please select "ON" in the AUTO setting using the ▲▼◀▶ buttons. See page 37.

## PC mode

Mode										
<b>FULL</b>	Widened picture to full-screen size									
<b>DOT BY DOT</b>	<p>Picking out the display mode of the input signal of the connected computer, this function displays the picture in the center without enlargement.</p> <ul style="list-style-type: none"> <li>This unit is compatible with the following display modes.</li> </ul>	<table border="1"> <thead> <tr> <th>Horizontal dot</th> <th>Vertical dot</th> </tr> </thead> <tbody> <tr> <td>640</td> <td>480</td> </tr> <tr> <td>800</td> <td>600</td> </tr> <tr> <td>1024</td> <td>768</td> </tr> </tbody> </table>	Horizontal dot	Vertical dot	640	480	800	600	1024	768
Horizontal dot	Vertical dot									
640	480									
800	600									
1024	768									

## Adjustments to the On-Screen Display

### AV mode

Mode	Selected item	Setting
SIDE BAR	[AUTO] Automatically sets to a suitable picture size	"ON"
		"OFF"
	[POSITION] Manually set to a desired position	"V" Shifting the picture vertically (-10~+10)
		"H" Shifting the picture horizontally (-30~+30)
"RESET" Returning to the factory setting		
CINEMA	[V-POSI.]	Shifting the picture vertically (-30~+30)
	[H-POSI.]	Shifting the picture horizontally (-30~+30)
	[RESET]	Returning to the factory setting
WIDE	[AUTO] Automatically sets to a suitable picture size	"ON"
		"OFF"
	[POSITION] Manually set to a desired position	"V" Shifting the picture vertically (-15~+15)
		"H" Shifting the picture horizontally (-30~+30)
"RESET" Returning to the factory setting		

### PC mode

Mode	Selected item	Setting
SIDE BAR	[CLOCK]	Adjust when flicker in the form of vertical stripes appears. (-90~+90)
CINEMA	[PHASE]	Adjust if contrast can not be obtained or flicker occurs when letters, etc. are displayed. (-20~+20)
FULL	[V-POSI.]	Adjust when the picture is too high or too low. (-60~+60)
DOT BY DOT	[H-POSI.]	Adjust when the picture is too far to the right or too far to the left. (-90~+90)
	[RESET]	Returning to the factory setting

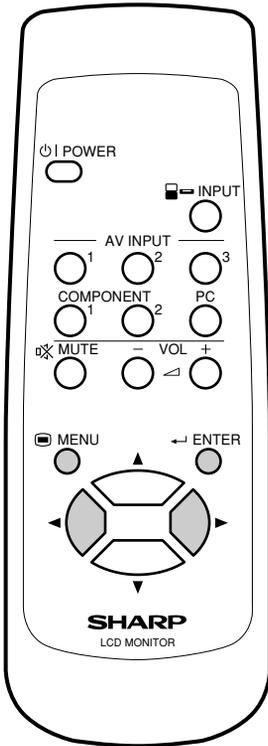
\* "Clock" and "PHASE" will only be displayed during the PC mode.

### Note

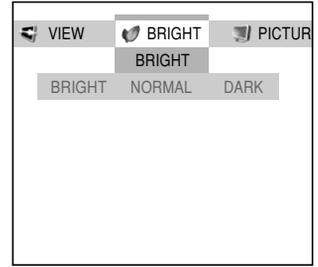
- The screen size is slightly different when receiving 1080i signals and other type of signals.
- When the AUTO setting is "ON", the picture may become larger and smaller, but this is only because the AUTO setting is automatically selecting the most appropriate image for the incoming video signal and does not indicate a malfunction. If it is disturbing, please set the AUTO setting to "OFF" and select the appropriate picture size.
- Depending on the picture you are watching the time it takes for the selection to take place may differ.
- For wide picture signals (cinema size, etc.), black bands at the top and bottom of the screen may remain.
- When watching special playback functions (video search, slow playback, etc.) on the VCR, the AUTO setting may stop operating.
- This unit is equipped with functions, which select appropriate picture mode for all types. Note that if a size mode is selected that differs from the video display ratio of the software, the view will be different from the original picture.
- When watching a 4:3 format (SIDE BAR) picture adjusted to a full size using the VIEW mode, the peripheral picture may be invisible or partly deformed. In order to watch the original picture as intended by the copyright holder; please watch using the SIDE BAR mode.
- Depending on the signal received or the movie software, correct operation cannot be obtained with the AUTO setting. In this case, after setting the AUTO setting of the VIEW mode to "OFF", select the appropriate picture size.
- When displaying with the CINEMA mode during the PC mode, the picture will be shown with the top and bottom of the parts cut off.
- When displaying a wide movie from the DVD with the PC mode, use the CINEMA mode.
- Depending on the type of commercial software, parts of subtitles, etc. may disappear. In this case, please select an appropriate picture mode using the VIEW mode and adjust the vertical position using position adjustment. Noise and bending of the picture may occur at the top or the edges of the picture but this does not indicate a malfunction.
- Depending on the picture displayed, the display position may not change even though the value of the adjustment changes.

## Adjustments to the On-Screen Display

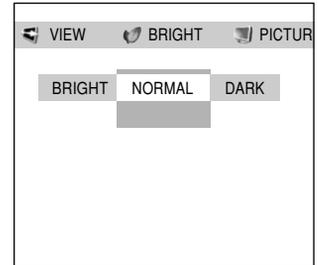
### Adjusting the BRIGHT Settings



- 1 Press **MENU** to display the Menu screen. Press **◀▶** to move the cursor to **BRIGHT** and then press **ENTER**.



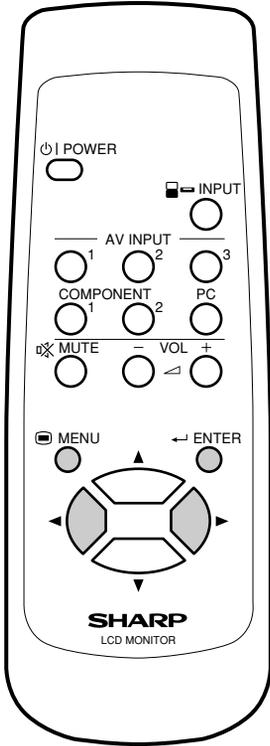
- 2 Press **◀▶** to make the adjustment. Then press **ENTER**.



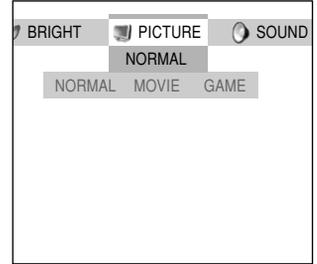
<b>Mode</b>	<b>BRIGHT</b> Maximum brightness
	<b>NORMAL</b> Brightness 60% → Suitable for viewing in well-lit areas. Saves energy.
	<b>DARK</b> Brightness 20% → Sufficiently bright when viewing in dim areas.

## Adjusting the PICTURE Settings

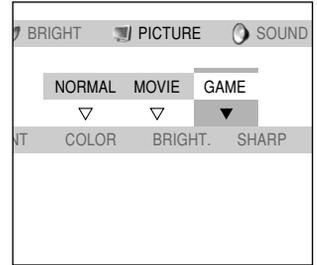
This menu allows you to select an appropriate position for contents of the picture or lighting of the place. Details of modes and adjustment items are described on the following pages.



- 1 Press **MENU** to display the Menu screen. Press **◀▶** to move the cursor to **PICTURE** and then press **ENTER**.



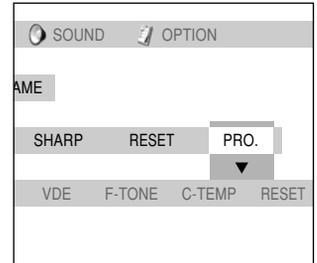
- 2 Press **◀▶** to move the cursor and select the desired mode. Then press **ENTER**.



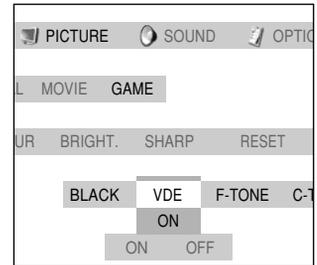
### For Fine Picture Adjustment

Continue the following procedure if you want to adjust the picture item by item.

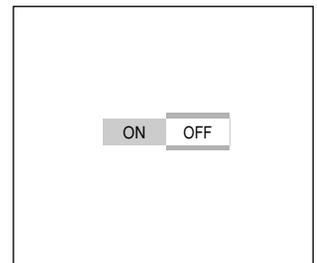
- 3 Press **◀▶** to move the cursor and select the desired adjustment. Then press **ENTER**.



- 4 Press **◀▶** to move the cursor and select the desired adjustment. Then press **ENTER**.



- 5 Press **◀▶** to make the adjustment and then press **ENTER**.



## Adjustments to the On-Screen Display

### AV mode

Mode	<b>NORMAL</b> Suitable for viewing a most program material
	<b>MOVIE</b> Suitable for viewing a movie
	<b>GAME</b> Suitable for playing a TV game

Selected item	Setting
[CONTRAST]	Decrease/Increase contrast (0~+60)
[TINT]	Toward purple/Toward green (-30~+30)
[COLOR]	Lower/Higher color intensity (-30~+30)
[BRIGHT]	Adjusting the black level (-30~+30)
[SHARP]	Adjusting the sharpness (-30~+30)
[RESET]	Returning to the factory setting
[PRO.]	"BLACK" Adjusts the degree of dark portions of the picture and changes the depth. (OFF/HIGH/LOW)
	"VDE" Switches on/off the degree of emphasis on the contours of the picture in the vertical direction. (ON/OFF) Please use when picture is soft. *Only for N358 regular video signal
	"F-TONE" Changes the degree of emphasis on the skin color. (ON/OFF)
	"C-TEMP" Decrease/Increase color temperature (-5~+5) *Only for PAL/PAL-60/PAL-M regular video signal
	"RESET" Returning to the factory setting

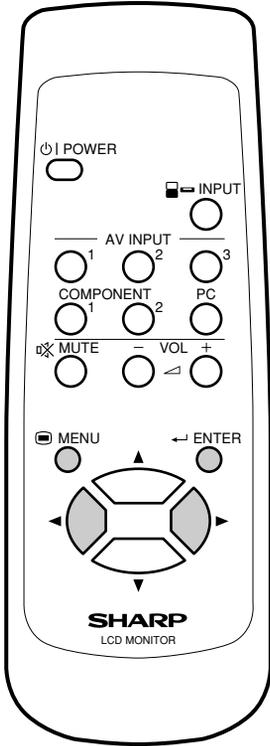
### PC mode

Mode	<b>CONTRAST</b> Adjusting the contrast of the picture
	<b>BRIGHT</b> Adjusting the black level of the picture
	<b>RED</b> Adjusting the red level of the picture
	<b>BLUE</b> Adjusting the blue level of the picture
	<b>RESET</b> Returning to the factory setting

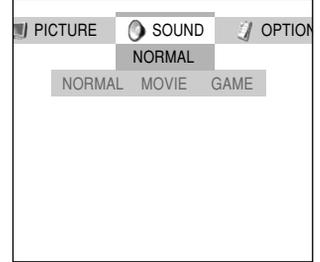
Selected item	Setting
[CONTRAST]	Decrease/Increase contrast (0~+60)
[BRIGHT]	Less/More bright (-30~+30)
[RED]	Less/More red level (-30~+30)
[BLUE]	Less/More blue level (-30~+30)
[RESET]	Returning to the factory setting

## Adjusting the SOUND Settings

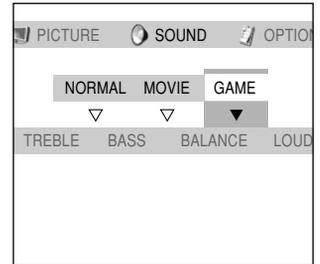
This menu allows you to select an appropriate position for contents of the picture. Details of modes and adjustment items are described on the following pages.



- 1 Press **MENU** to display the Menu screen. Press **◀▶** to move the cursor to **SOUND** and then press **ENTER**.



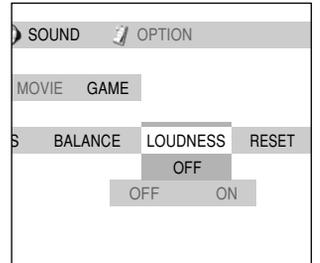
- 2 Press **◀▶** to move the cursor and select the desired mode. Then press **ENTER**.



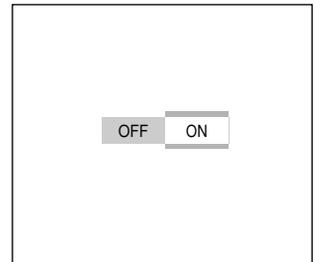
### For Fine Sound Adjustment

Continue the following procedure if you want to adjust the sound item by item.

- 3 Press **◀▶** to move the cursor and select the desired adjustment. Then press **ENTER**.



- 4 Press **◀▶** to make the adjustment and then press **ENTER**.



## Adjustments to the On-Screen Display

### AV mode

<b>Mode</b>	<b>NORMAL</b> Suitable for viewing a most program material
	<b>MOVIE</b> Suitable for viewing a movie
	<b>GAME</b> Suitable for playing a TV game

Selected item	Setting
[TREBLE]	Decrease/Increase treble level (-30~+30)
[BASS]	Decrease/Increase bass level (-30~+30)
[BALANCE]	Adjusts the balance of right and left sound. L30 is from the most left and R30 is from the most right.
[LOUDNESS]	Modulation of the sound ON/OFF
[RESET]	Returning to the factory setting

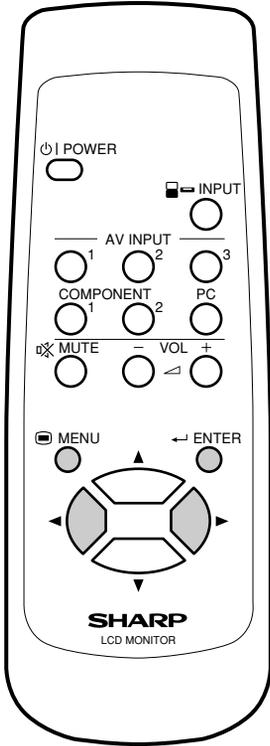
### PC mode

<b>Mode</b>	<b>TREBLE</b> Decrease/Increase treble level (-30~+30)
	<b>BASS</b> Decrease/Increase bass level (-30~+30)
	<b>BALANCE</b> Adjusts the balance of right and left sound. L30 is from the most left and R30 is from the most right.
	<b>LOUDNESS</b> Modulation of the sound ON/OFF
	<b>RESET</b> Returning to the factory setting

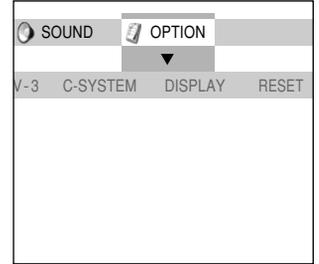
## Adjusting the OPTION Settings

This menu is for advanced functions.

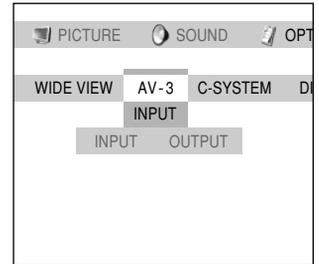
Details of adjustment items are described on the following pages.



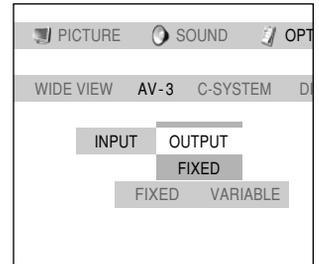
- 1 Press **MENU** to display the Menu screen. Press **◀▶** to move the cursor to **OPTION** and then press **ENTER**.



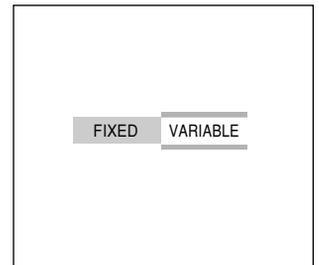
- 2 Press **◀▶** to move the cursor and select the desired mode. Then press **ENTER**.



- 3 Press **◀▶** to move the cursor and select the desired adjustment. Then press **ENTER**.



- 4 Press **◀▶** to make the adjustment and then press **ENTER**.



## Adjustments to the On-Screen Display

### AV mode

Mode	Selected item
IMAGE	<b>[NORMAL]</b> Normal horizontal picture orientation
	<b>[MIRROR]</b> Mirror image → To display mirror picture for special uses.
WIDEVIEW (See page 38.)	<b>[FULL]</b> This mode displays the full screen of the video signal received. (The picture is displayed slightly stretched vertically.)
	<b>[STRETCH]</b> This mode displays pictures based on the width of the screen. Bands are present at the top and bottom. (Aspect ratio is 16:9)
AV-3	<b>[INPUT]</b> AV INPUT 3 put in input mode
	<b>[OUTPUT]</b> The current image and sound are output from AV INPUT 3/AV OUT terminal, when switching to "OUTPUT". "FIXED": The sound level is fixed. → Adjust it from the connected AV device (e.g. an amplifier) "VARIABLE": The sound level is not fixed. (The maximum level is as much as in the FIXED setting) *No sound from side speakers
C-SYSTEM	<b>[AUTO]/[N358]/[N443]/[PAL]/[PAL-60]/[PAL-M]/[SECAM]</b> *The settings are stored per connection terminal (AV-1/2/3). Even if the power to the unit is cut off, the settings will remain in the memory.
DISPLAY	Turns <b>[ON]</b> or <b>[OFF]</b> the channel indicators which are displayed when changing channels.
RESET	Returning to the factory setting



### PC mode

Mode	Selected item
AUTO SYNC	Using this function, a stable computer screen without flicker in the display can be obtained. Press <b>ENTER</b> for adjustment. * Depending on the signal, the AUTO SYNC function may not provide enough adjustment. In this case, perform fine adjustment manually. Even if the output setting is the same at the computer side (e.g. XGA), slight discrepancies may occur in the adjustment of the hardware. * Canceling the AUTO SYNC function: Press <b>ENTER</b> to cancel the above function, when "Adjusting the image" is being displayed.
SIGNAL INFO	This measures and sets the frequency when the display is used as a computer monitor.

# Notes for Connection

## Connecting a DVD Video Player

When connecting a DVD player, always connect it directly to this unit.  
If the signals is input via a video deck, the picture may not be displayed properly.

## Connecting a VCR/GAME System (AV-1 and AV-2)

When connecting game system: "Shooting games" played with a pistol cannot be used.

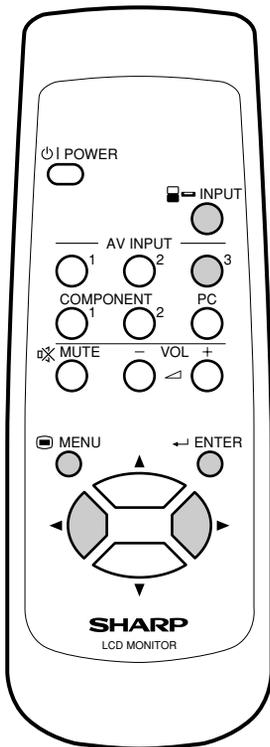
## Connecting AV Equipment (AV INPUT 3/ AV OUT)

- You can output the video and audio signals of AV-1/2 from the AV INPUT 3/AV OUT terminal.
- Set AV-3 setting to "OUTPUT", and connect the AV INPUT 3/OUT terminal to an input terminal of a video equipment, and you can record the received video and audio signal on the video equipment.

### Note

- Component input signals and PC input signals are disabled for monitor output (recording).
- When using AV-1 or AV-2 with S-video input signal and the AV INPUT 3/AV OUT terminal is set to "OUTPUT", the signal is converted to a regular video signal output from AV OUT.

## Switching the AV INPUT/OUTPUT



### Changing "OUTPUT" to "INPUT"

- 1 Set the AV-3 setting in the OPTION mode to "INPUT". For the operation, refer to "Adjusting the OPTION Settings" (page 27).
- 2 Select "AV-3" for the input source by using either the INPUT button or the AV INPUT buttons.

→AV-1 → AV-2 → **AV-3** → COMPONENT1 → COMPONENT2 → PC

### Indicator

AV-3

### Changing "INPUT" to "OUTPUT"

- \* Select the input source other than "AV-3" before going to the OPTION mode to perform Step 1.

- 1 Set the AV-3 setting in the OPTION mode to "OUTPUT".  
For the operation, refer to "Adjusting the OPTION Settings" (page 27).
- 2 Select "FIXED" (for the optional side speakers) or "VARIABLE" (for a commercially available speaker system).

### Note

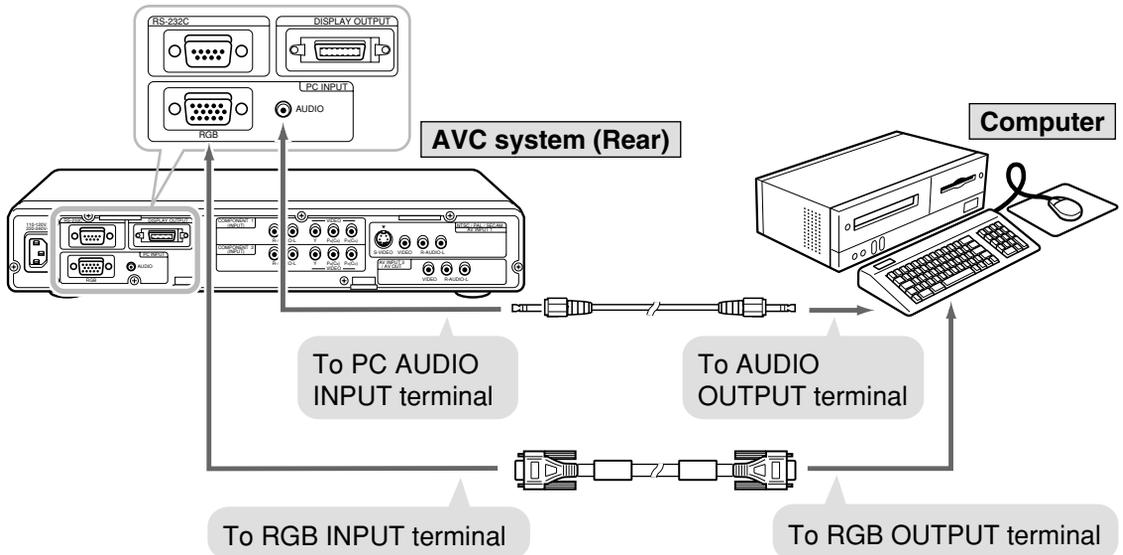
- FIXED: The sound level of the AV OUT is fixed and you can not adjust the volume using the VOLUME buttons of the unit. Adjust the volume from the AV equipment that is connected to the unit.
- VARIABLE: The sound level of the AV OUT is variable so that you can use the VOLUME buttons of the unit to adjust the volume. Note that the sound from the optional side speakers connected to the unit is muted.
- The default setting is "VARIABLE".

# Connecting to a Computer

## Connection

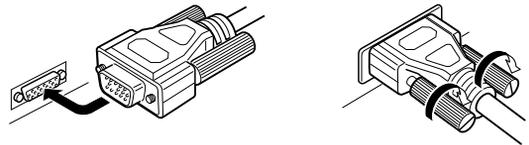
This display can be used as the monitor of personal computer. Check the following system requirements in advance.

Computer	Display mode (Horizontal dots × Vertical lines)	Vertical frequency	Clock frequency	Note
IBM PC(DOS/V, PC/V, PC/AT) and compatible computers	640×480	60-85 Hz	Approx.30 MHz	VGA
	800×600		Approx.50 MHz	SVGA
	1024×768		Approx.80 MHz	XGA



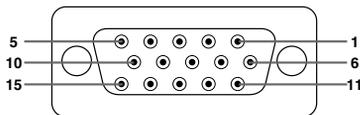
## Handling of the RGB Connection Cable

Align the pins of this unit and those of the RGB connection cable used to connect the computer and insert, then securely fasten with the screws located at both ends.



## RGB input terminal pin layout

### Computer Input/Analog



1. Video input (red)
2. Video input (green/sync on green)
3. Video input (blue)
4. Reserve input 1
5. Composite sync
6. Earth (red)
7. Earth (green/sync on green)
8. Earth (blue)
9. Not connected
10. GND
11. GND
12. Bi-directional data
13. Horizontal sync signal
14. Vertical sync signal
15. Data clock

## Computer Control of the Display

- When a program is set, the display can be controlled from the computer using the RS-232C terminal. The input signal (computer/video) can be selected, the volume can be adjusted and various other adjustments and settings can be made, enabling automatic programmed playing.
- Attach an RS-232C cable cross-type (commercially available) to the supplied Din-D/sub RS-232C for the connections.

**Note** This operation system should be used by a person who is accustomed to using computers.

### Communication conditions

Set the RS-232C communications settings on the computer to match the display's communications conditions.

The display's communications settings are as follows:

Baud rate	9,600 bps
Data length	8 bits
Parity bit	None
Stop bit	1 bit
Flow control	None

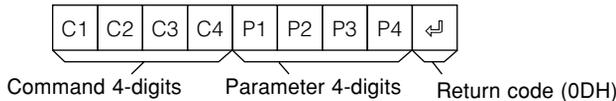
### Communication procedure

Send the control commands from the computer via the RS-232C connector.

The display operates according to the received command and sends a response message to the computer.

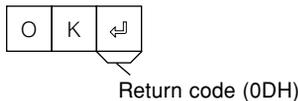
Do not send multiple commands at the same time. Wait until the computer receives the OK response before sending the next command.

#### Command format

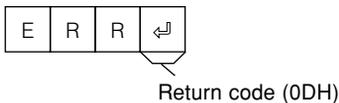


#### Response code format

Normal response



Problem response (communication error or incorrect command)



## Connecting to a Computer

### Commands

If an asterisk (\*) appears, enter a value in the range indicated under CONTROL CONTENTS.

CONTROL ITEM	COMMAND	READ/ WRITE	WRITE PARAMETER	CONTROL CONTENTS
POWER SETTING	POWR	RW	*	0: Sets the unit to the standby status
INPUT MODE	IMOD	R		Responds to current input source (Read only) 1: RGB (PC) input 2: video input 3: component input
INPUT CHECK	ICLK /SYSE	W	0	Inputs confirmation Displays the input source as a CH call
DISPLAY (CH CALL)	CHCL	RW	*	0: Display (CH call) off 1: Display (CH call) on
INPUT SELECTION	IRGB	RW	1	Inputs RGB (PC)
	IVED	RW	*	Inputs VIDEO (*) (* = 1-3)
	ICED	RW	*	1: Input COMPONENT1 2: Input COMPONENT2
COLOR SYSTEM SELECTION	MESY	RW	*	1: AUTO 2: PAL 3: SECAM 4: NTSC 443 5: NTSC 358 6: PAL-M 7: (reserve) 8: PAL-60
AV mode (NORMAL) PICTURE settings	VAPI	RW	***	CONTRAST (0-+60)
	VABR	RW	***	BRIGHT (-30-+30)
	VACO	RW	***	COLOR (-30-+30)
	VATI	RW	***	TINT (-30-+30)
	VASH	RW	***	SHARP (-30-+30)
	VARE	W	*	0: Displays the setting value on OSD (except PRO. settings) 1: Resets the setting value (except PRO. Settings)
	VABK	RW	*	BLACK 0: OFF 1: LOW 2:HIGH
	VAVE	RW	*	VDE 0: OFF 1: ON
	VAPK	RW	*	F-TONE 0: OFF 1: ON
	VACT	RW	**	C-TEMP (-5-+5) (Only for PAL/PAL-60/PAL-M)
AV mode (MOVIE) PICTURE settings	VBPI	RW	***	CONTRAST (0-+60)
	VBBR	RW	***	BRIGHT (-30-+30)
	VBCO	RW	***	COLOR (-30-+30)
	VBTI	RW	***	TINT (-30-+30)
	VBSH	RW	***	SHARP (-30-+30)
	VBRE	W	*	0: Displays the setting value on OSD (except PRO. settings) 1: Resets the setting value (except PRO. Settings)
	VBBK	RW	*	BLACK 0: OFF 1: LOW 2:HIGH
	VBVE	RW	*	VDE 0: OFF 1: ON
	VBPK	RW	*	F-TONE 0: OFF 1: ON
	VBCT	RW	**	C-TEMP (-5-+5) (Only for PAL/PAL-60/PAL-M)

Note: The unit cannot be controlled from a computer, when it is in Standby mode.

## Connecting to a Computer

CONTROL ITEM	COMMAND	READ/ WRITE	WRITE PARAMETER	CONTROL CONTENTS
AV mode (GAME) PICTURE settings	VCPI	RW	***	CONTRAST (0-+60)
	VCBR	RW	***	BRIGHT (-30-+30)
	VCCO	RW	***	COLOR (-30-+30)
	VCTI	RW	***	TINT (-30-+30)
	VCSH	RW	***	SHARP (-30-+30)
	VCRE	W	*	0: Displays the setting value on OSD (except PRO. settings) 1: Resets the setting value (except PRO. Settings)
	VCBK	RW	*	BLACK 0: OFF 1: LOW 2:HIGH
	VCVE	RW	*	VDE 0: OFF 1: ON
	VCPK	RW	*	F-TONE 0: OFF 1: ON
VCCT	RW	**	C-TEMP (-5-+5) (Only for PAL/PAL-60/PAL-M)	
RGB (PC) mode PICTURE settings	RAPI	RW	***	CONTRAST (0-+60)
	RABR	RW	***	BRIGHT (-30-+30)
	RARD	RW	***	RED(-30-+30)
	RABE	RW	***	BLUE(-30-+30)
	RARE	W	*	0: Displays the setting value on OSD 1: Resets the setting value
VOLUME	VOLA	RW	**	Controls the current volume
	VSPV	RW	**	Controls the volume of AV speakers /headphones
	RSPV	RW	**	Controls AV line volume
	VLNV	RW	**	Controls the volume of PC speakers/headphones
	RLNV	RW	**	Controls PC line volume
MUTE	MUTE	RW	*	0: MUTE OFF 1: MUTE ON
SOUND settings (in the current picture mode)	AABL	RW	***	BALANCE (-30-+30)
	AABA	RW	***	BASS (-30-+30)
	AATE	RW	***	TREBLE(-30-+30)
	AALD	RW	*	0: LOUDNESS OFF 1: LOUDNESS ON
	AARE	W	*	0: Displays the setting value on OSD 1: Resets the setting value
AV mode (NORMAL) SOUND settings	VABL	RW	***	BALANCE (-30-+30)
	VABA	RW	***	BASS (-30-+30)
	VATE	RW	***	TREBLE(-30-+30)
	VALD	RW	*	0: LOUDNESS OFF 1: LOUDNESS ON
	VAAR	W	*	0: Displays the setting value on OSD 1: Resets the setting value
AV mode (MOVIE) SOUND settings	VBBL	RW	***	BALANCE (-30-+30)
	VBBA	RW	***	BASS (-30-+30)
	VBTE	RW	***	TREBLE(-30-+30)
	VBLD	RW	*	0: LOUDNESS OFF 1: LOUDNESS ON
	VBAR	W	*	0: Displays the setting value on OSD 1: Resets the setting value
AV mode (GAME) SOUND settings	VCBL	RW	***	BALANCE (-30-+30)
	VCBA	RW	***	BASS (-30-+30)
	VCTE	RW	***	TREBLE(-30-+30)
	VCLD	RW	*	0: LOUDNESS OFF 1: LOUDNESS ON
	VCAR	W	*	0: Displays the setting value on OSD 1: Resets the setting value

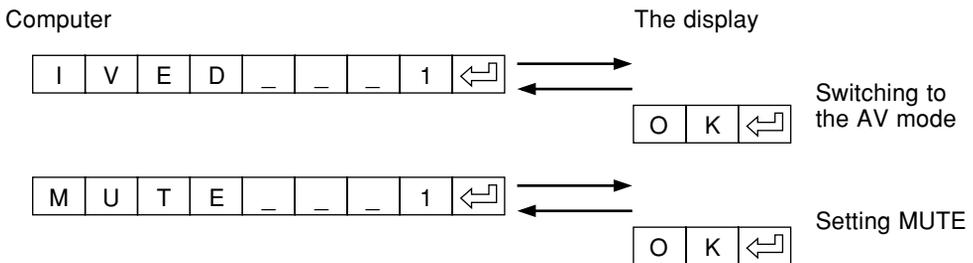
## Connecting to a Computer

CONTROL ITEM	COMMAND	READ/ WRITE	WRITE PARAMETER	CONTROL CONTENTS
RGB (PC) mode SOUND settings	VRBL	RW	***	BALANCE (-30~+30)
	VRBA	RW	***	BASS (-30~+30)
	VRTE	RW	***	TREBLE (-30~+30)
	VRLD	RW	*	0: LOUDNESS OFF 1: LOUDNESS ON
	VRAR	W	*	0: Displays the setting value on OSD 1: Resets the setting value
POSITION settings (in the current picture mode) AV mode/ PC mode common	INCL	RW	***	*In the AV mode, the CLOCK cannot be adjusted.
	INPH	RW	***	*In the AV mode, the PHASE cannot be adjusted.
	IAHP	RW	***	H-POSI.
	IAVP	RW	***	V-POSI.
	IARE	W	*	0: Displays the setting value on OSD 1: Resets the setting value
AV mode (SIDE BAR) POSITION settings	(VACL)	RW	***	(CLOCK) (reserve)
	(VAPH)	RW	***	(PHASE) (reserve)
	VAHP	RW	***	H-POSI.
	VAVP	RW	***	V-POSI.
	VAFR	W	*	0: Displays the setting value on OSD 1: Resets the setting value
AV mode (CINEMA) POSITION settings	(VBCL)	RW	***	(CLOCK) (reserve)
	(VBPH)	RW	***	(PHASE) (reserve)
	VBHP	RW	***	H-POSI.
	VBVP	RW	***	V-POSI.
	VBFR	W	*	0: Displays the setting value on OSD 1: Resets the setting value
AV mode (WIDE) POSITION settings	(VCCL)	RW	***	(CLOCK) (reserve)
	(VCPH)	RW	***	(PHASE) (reserve)
	VCHP	RW	***	H-POSI.
	VCVP	RW	***	V-POSI.
	VCFR	W	*	0: Displays the setting value on OSD 1: Resets the setting value
PC mode (SIDE BAR) POSITION settings	RACL	RW	***	CLOCK
	RAPH	RW	***	PHASE
	RAHP	RW	***	H-POSI.
	RAVP	RW	***	V-POSI.
	RAFR	W	*	0: Displays the setting value on OSD 1: Resets the setting value
PC mode (CINEMA) POSITION settings	RBCL	RW	***	CLOCK
	RBPH	RW	***	PHASE
	RBHP	RW	***	H-POSI.
	RBVP	RW	***	V-POSI.
	RBFR	W	*	0: Displays the setting value on OSD 1: Resets the setting value
PC mode (FULL) POSITION settings	RCCL	RW	***	CLOCK
	RCPH	RW	***	PHASE
	RCHP	RW	***	H-POSI.
	RCVP	RW	***	V-POSI.
	RCFR	W	*	0: Displays the setting value on OSD 1: Resets the setting value

## Connecting to a Computer

CONTROL ITEM	COMMAND	READ/ WRITE	WRITE PARAMETER	CONTROL CONTENTS
PC mode (DOT BY DOT)	RDCL	RW	***	CLOCK
	RDPH	RW	***	PHASE
	RDHP	RW	***	H-POSI.
	RDVP	RW	***	V-POSI.
	RDFR	W	*	0: Displays the setting value on OSD 1: Resets the setting value
PC Picture size	RASR	RW	*	1: SIDE BAR 2: FULL 3: DOT BY DOT 4: (DOT BY DOT-WIDE) (reserve) 5: CINEMA
AV Picture size	RASV	RW	*	1: SIDE BAR 2: WIDE (/STRETCH) 3: (reserve) 4: (reserve) 5: CINEMA
WIDE VIEW setting (Fit to screen)	RFSV /IMFS	RW	*	1: (reserve) 2: STRETCH 3: FULL
INPUT DISPLAY	IMDI	RW	*	Presence/absence of CH call when selecting input source using command 0: OFF 1: ON
MIRROR image	IMRE	RW	*	0: OFF 1: ON
AUTO SYNC setting	ADJS	RW	*	0: AUTO SYNC STOP 1: AUTO SYNC START During AUTO SYNC operation, only the ADJS command is valid.
	IMAS	RW	*	0: No AUTO SYNC OSD 1: Displays AUTO SYNC OSD
BRIGHTNESS setting	VLMP	RW	*	Brightness (AV) 1: DARK 2: NORMAL 3: BRIGHT
	RLMP	RW	*	Brightness (PC) 1: DARK 2: NORMAL 3: BRIGHT
PICTURE mode	IMPI	RW	*	1: NORMAL 2: MOVIE 3: GAME
SOUND mode	IMAU	RW	*	1: NORMAL 2: MOVIE 3: GAME
AV-3 setting	IMV3	RW	*	1: INPUT 2: OUTPUT (FIXED) 3: OUTPUT (VARIABLE)
AUTO setting	IMAW	RW	*	0: OFF 1: ON

**Communication Example:** Switching to the AV mode, and muting the sound



# Connecting to a Computer

## Computer Compatibility Chart

Horizontal Frequency: 15-68.7 kHz

Vertical Frequency: 60-85 Hz

Pixel Clock: 12-80 MHz

Recommended display signals and personal computer signals are as follows;

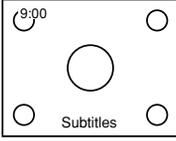
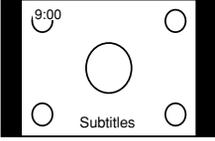
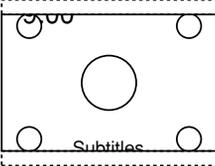
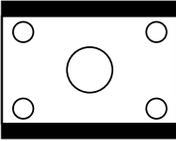
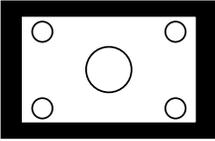
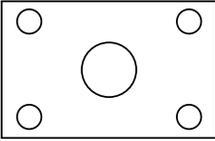
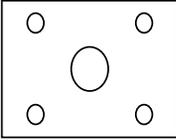
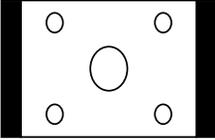
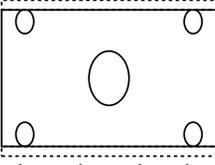
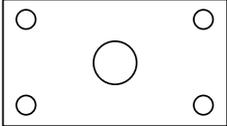
Resolution		Horizontal Frequency (kHz)	Vertical Frequency (Hz)	VESA Standard
VGA	720 × 400	27.0	60	
		31.5	70	×
		37.9	85	×
	640 × 480	31.5	60	×
		34.7	70	
		37.9	72	×
		37.5	75	×
		43.5	85	×
SVGA	800 × 600	37.9	60	×
		44.5	70	
		48.1	72	×
		46.9	75	×
		53.7	85	×
XGA	1,024 × 768	56.5	70	×
		58.1	72	

# Reference

## Picture Sizes

### In the VIEW mode

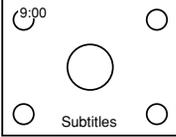
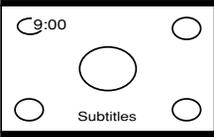
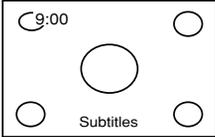
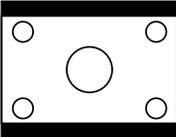
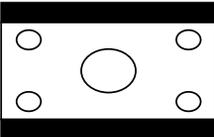
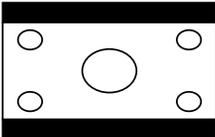
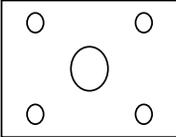
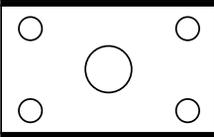
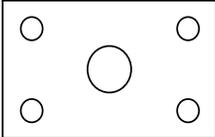
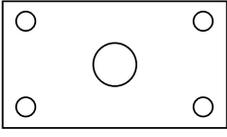
The AUTO setting of the SIDE BAR mode and the WIDE mode is a function that allows you to enjoy automatic switching to the CINEMA picture when NTSC letter box signal is received.

Input signal	SIDE BAR	CINEMA
 <p>Regular video (broadcast) signal</p>	 <p>Side Bars appear on the left and right.</p>	 <p>Picture is perfectly round with projections enlarged at the top and bottom.</p>
 <p>Letter Box Wide screen with black bands at the top and bottom of the display</p>	 <p>Screen with black bands at the top and bottom and left and right of the display.</p>	 <p>Full picture is included. The picture is perfectly round.</p>
 <p>Squeeze (left-right compression) Picture when playing back DVD's with squeeze recording</p>	 <p>Screen with black bands at the left and right of the display. Picture appears stretched vertically.</p>	 <p>Picture is projected at the top and bottom. The picture is stretched vertically.</p>
 <p>For high-grade pictures such as HDTV (Wide size)</p>	<p>Automatically switches to the wide mode.</p>	

# Reference

## In the OPTION mode

Depending on the WIDE VIEW setting, the display of the wide mode changes. The display also changes depending on the input video signal.

WIDE VIEW		
Input signal	STRETCH	FULL
 <p>Regular video (broadcast) signal</p>	 <p>Picture is stretched horizontally while black bands appear to make the vertical-horizontal ratio 16:9.</p>	 <p>Picture is stretched over the entire screen.</p>
 <p>Letter Box Wide screen with black bands at the top and bottom of the display</p>	 <p>Full picture is visible but black bands appear at the top and bottom. (Maximum stretching in the horizontal direction)</p>	 <p>Picture is stretched over the entire screen.</p>
 <p>Squeeze (left-right compression) Picture when playing back DVD's with squeeze recording</p>	 <p>Full picture is visible. Picture becomes perfectly round. Black bands appear at the top and bottom.</p>	 <p>Full picture is visible. Picture is slightly stretched vertically.</p>
 <p>For high-grade pictures such as HDTV (Wide size)</p>		

## Troubleshooting

Problem	Check item	Page
 No picture on screen and no sound from speakers	• Insert the AC power cord plug securely in AC power outlet.	9
	• Make sure the remote control is not in the standby mode (The POWER/Standby indicator is red.)	7
	• Turn on the MAIN POWER button on the top of the display.	14
	• Make sure the display and the AVC system is securely connected with system cable.	9
 No picture/No picture from AV1 terminal	• Check the brightness setting of the display.	15, 22
	• Lamp may have malfunction. Contact your nearest Authorized Sharp Industrial LCD products dealer or service center for lamp replacement.	–
	• Make sure a cable with no VIDEO input signal is connected to the S-VIDEO INPUT terminal.	6
 Picture is displayed, but no sound from the speakers.	• Check the sound setting.	7, 15
	• Make sure the sound is not muted.	7
	• Make sure a pair of headphones is not connected.	8
	• Make sure the connectors of the optional speaker system are securely inserted.	9
	• Make sure the setting of AV OUTPUT terminal is "FIXED" (for the optional side speakers)/"VARIABLE" (for a commercially available speaker system).	28
 Picture is too light or improperly tinted.	• Make sure COLOR and TINT settings.	24
	• Make sure CONTRAST and BLACK level settings are not set too high.	24
	• Check that RED and BLUE settings are near the center.	24
 Picture is too dark.	• Make sure BRIGHTNESS setting is not set too low.	15, 22
	• Check to see if BRIGHTNESS mode is not set to DARK. Change to MEDIUM or BRIGHT.	15, 22
	• Lamp may have malfunction. Contact your nearest Authorized Sharp Industrial LCD products dealer or service center for lamp replacement.	–
Remote control does not work.	• Change the batteries.	11
	• Make sure the infrared transmitter window is not receiving strong light such as light from fluorescent lamps.	11
No picture from AV OUT terminal.	• Make sure AV-3 INPUT is not set.	29
	• Make sure the input source other than AV-1~3.	29

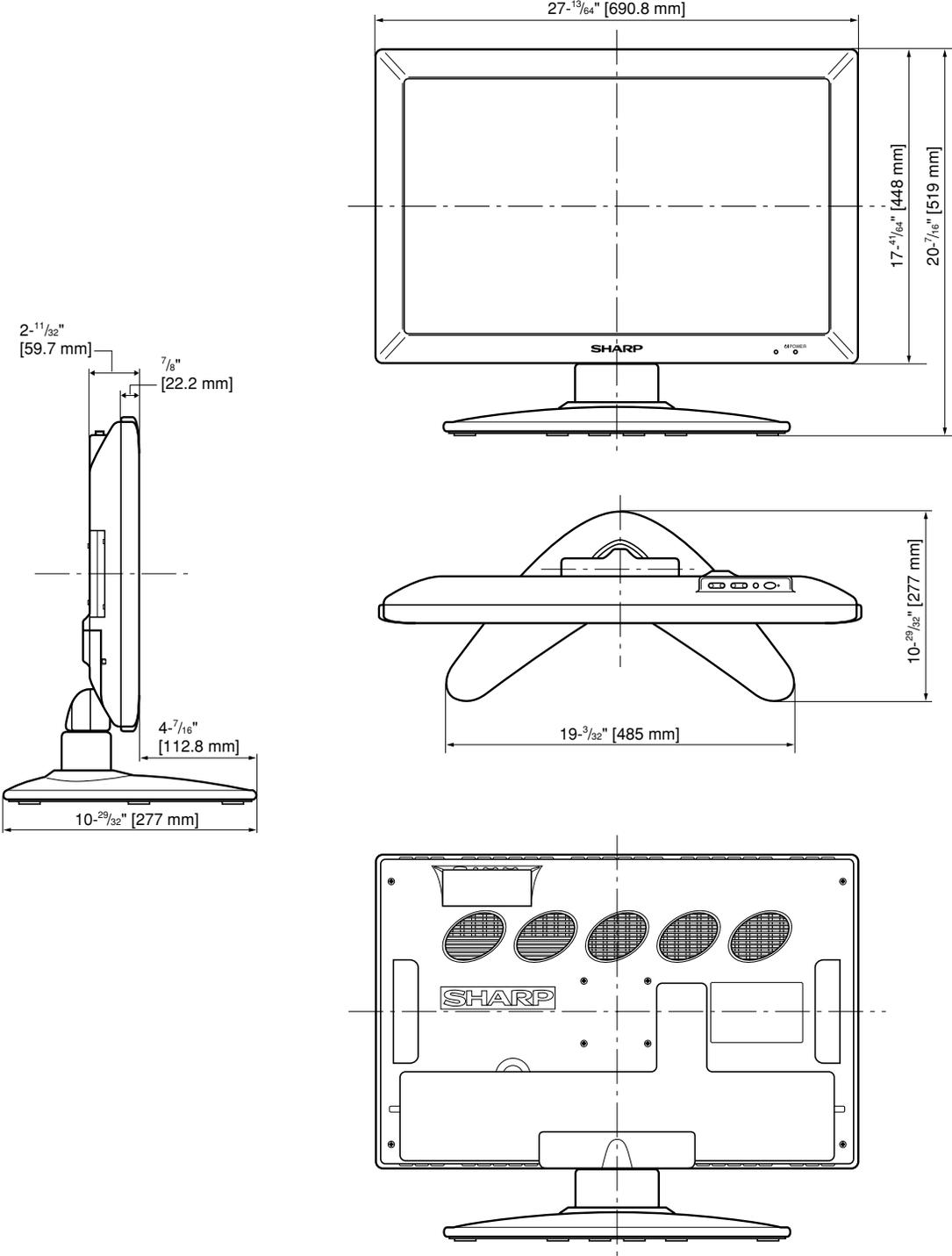
## Reference

### Specifications

ITEM		LC-28HM2	
LCD	Size (Diagonal)	28" WIDE XGA LCD	
	Number of pixel	2,949,120 (1280 dots × 3 RGB × 768 lines)	
	Low reflection	Low reflection coating	
	Brightness	400 cd/m <sup>2</sup> (at normally white)	
	Viewable angle	Left to right	160°
		Up to down	150°
	Life of backlight	60,000 hours (at normal mode)	
VIDEO	Multi system capability	PAL/PAL-M/PAL-60/NTSC(N358/N443)/SECAM	
	Digital comb filter for PAL/SECAM	Yes	
	3D Y/C separator for NTSC	Yes	
	Wide-band chroma IC	Yes	
	Gamma correction circuit	Yes	
	Line scanning for PAL/SECAM	Yes	
AUDIO	Separate speaker system	–	
	Recommendable optional speaker	Bose System side speakers; 25 W (12.5 W+12.5 W)	
INTERFACES (TERMINALS)	Display:	Display input	26 pins System link
		Speaker terminals	For Bose System side speaker
		Power	Inlet for AC power cord
	AVC system:	Display output	26 pins System link
		AV input1	S-video, Video, Audio; R/L
		AV input2	S-video, Video, Audio; R/L
		AV input3/AV OUTPUT	Video, Audio; R/L
		COMPONENT1	Audio; R/L, Video; Y, Pb(Cb), Pr(Cr)
		COMPONENT2	Audio; R/L, Video; Y, Pb(Cb), Pr(Cr)
		PC	RGB input, Audio input, RS-232C control
		Headphones jack	9/64" [3.5 mm] diameter mini-jack, 16 ohms
		Power	Inlet for AC power cord
	FUNCTIONS	OSD Language	English
Reverse/Invert		Mirror image only	
Brightness		NORMAL/BRIGHT/DARK	
Component capability		480i/480p/1080i/720p	
PC capability		VGA/SVGA/XGA	
WIDE view mode		STRETCH/FULL	
AUTO wide view (NTSC picture only)		Automatically changing to CINEMA mode.	
POWER SUPPLY	AC auto power voltage capability	AC 110 V-240 V, 50/60 Hz	
	Power consumption	AVC system; AC 32 W Display; AC 140 W	
RATED	Left terminal out put for speakers	DC 13.65 V max.	
INDICATORS	RS-232C input terminal	DC 15 V max.	
APPEARANCE	Exterior color	Silver	
	Outside dimensions (W) × (H) × (D)	AVC system; 14-11/64" [360 mm] × 2-9/16" [65 mm] × 14-3/8" [365 mm] Display with stand; 27-13/64" [690.8 mm] × 20-7/16" [519 mm] × 10-29/32" [277 mm] Display without stand; 27-13/64" [690.8 mm] × 17-41/64" [448 mm] × 2-11/32" [59.7 mm]	
	Net weight	Display; 29.3 lbs [13.3 kg] AVC system; 7.7 lbs [3.5 kg]	
ACCESSORIES	Remote control	Infrared wireless type	
	Batteries for R/C	Size AA×2	
	AC power cord	Type A ×2 (12ft.5-39/64" [3.8 m] for Display, 5ft.10-55/64" [1.8 m] for AVC system)	
	System cable	26 pins plug (male to male)	
	Cable clamp	4 pcs	
	AVC system terminal cover	1 pc	
	Operation manual	language: English/French/Spanish/Portuguese	

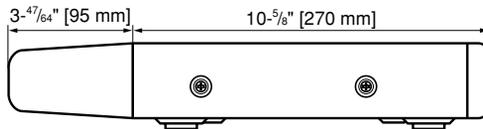
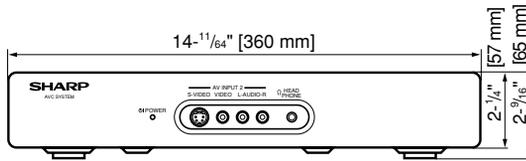
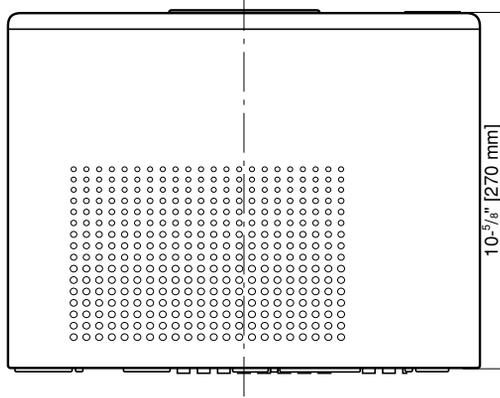
# Dimensional Drawings

## Display



# Reference

## AVC System

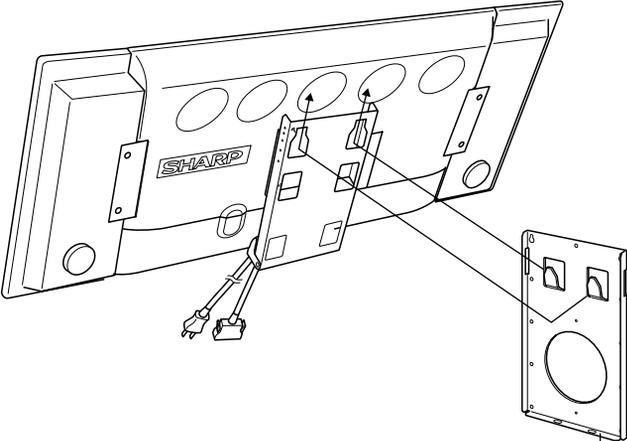
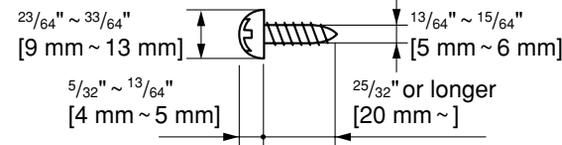


## Using the Wall Mount Bracket (Option)

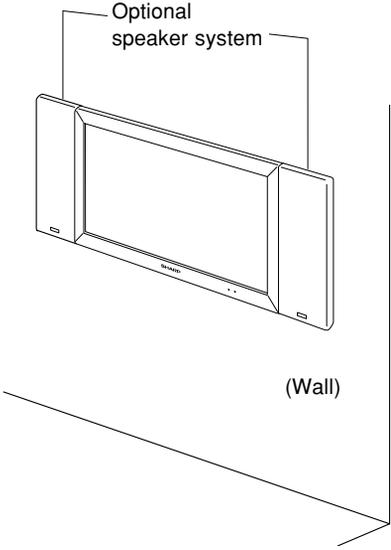
The wall mount bracket (Model: AN-28AG1) is specially designed for the 28" display.

**Note**

- Consult with your dealer and leave the installation up to a specified person at Sharp dealer or authorized service shop.
- Make sure that the wall or place where the display is mounted should be made of plywood or real wood of  $\frac{5}{8}$ " [15 mm] or over in thickness, otherwise the wall would be necessary a reinforcement work for the safety.
- The screws to fix the base bracket on the wall are not included in the product and in the optional bracket. Use the commercially available screws, however, make sure the dimensions shown as follows. (7 to 11 pieces)



Based bracket



(Wall)

# Calling for Service

For location of the nearest Sharp Authorized Service, or to obtain product literature, accessories, supplies, or customer assistance, please call 1-800-BE-SHARP.

## LIMITED WARRANTY

### END-USER LIMITED WARRANTY

SHARP ELECTRONICS CORPORATION warrants to the first end user purchaser that this Sharp brand product (the "Product"), when shipped in its original container, will be free from defective workmanship and materials, and agrees that it will, at its option, either repair the defect or replace the defective Product or part thereof with a new or remanufactured equivalent at no charge to the purchaser for parts or labor for the period(s) set forth below.

This warranty does not apply to any appearance items of the Product nor to the additional excluded item(s) set forth below nor to any Product the exterior of which has been damaged or defaced, which has been subjected to improper voltage or other misuse, abnormal service or handling, or which has been altered or modified in design or construction.

In order to enforce the rights under this limited warranty, the purchaser should follow the steps set forth below and provide proof of purchase to the servicer.

To the extent permitted by applicable state law, the warranties set forth herein are in lieu of, and exclusive of, all other warranties, express or implied. Specifically, ALL OTHER WARRANTIES OTHER THAN THOSE SET FORTH ABOVE ARE EXCLUDED. ALL EXPRESS AND IMPLIED WARRANTIES INCLUDING THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR USE, AND FITNESS FOR A PARTICULAR PURPOSE ARE SPECIFICALLY EXCLUDED. If, under applicable state law, implied warranties may not validly be disclaimed or excluded, the duration of such implied warranties is limited to the period(s) from the date of purchase set forth below.

Neither the sales personnel of the seller nor any other person is authorized to make any warranties other than those described herein, or to extend the duration of any warranties beyond the time period described herein on behalf of Sharp.

The warranties described herein shall be the sole and exclusive warranties granted by Sharp and shall be the sole and exclusive remedy available to the purchaser. Correction of defects, in the manner and for the period of time described herein, shall constitute complete fulfillment of all liabilities and responsibilities of Sharp to the purchaser with respect to the Product, and shall constitute full satisfaction of all claims, whether based on contract, negligence, strict liability or otherwise. In no event shall Sharp be liable, or in any way responsible, for any damages or defects in the Product which were caused by repairs or attempted repairs performed by anyone other than an authorized servicer. Nor shall Sharp be liable or in any way responsible for any incidental or consequential economic or property damage. Some states do not allow limits on warranties or on remedies for breach in certain transactions; in such states, the limits herein may not apply.

### Model Specific Section

<b><u>Your Product Model Number &amp; Description:</u></b>	LC-28HM2 LCD AV Monitor (Be sure to have this information available when you need service for your Product.)
<b><u>Warranty Period for this Product:</u></b>	One (1) year parts and labor from the date of purchase.
<b><u>Additional Item(s) Excluded from Warranty Coverage (if any):</u></b>	None
<b><u>Where to Obtain Service:</u></b>	From a Sharp Authorized Servicer located in the United States. To find the location of the nearest Sharp Authorized Servicer, call Sharp toll free at 1-800-BE-SHARP.
<b><u>What to do to Obtain Service:</u></b>	Ship prepaid or carry in your Product to a Sharp Authorized Servicer. Be sure to have <b>Proof of Purchase</b> available. If you ship the Product, be sure it is insured and packaged securely.

TO OBTAIN PRODUCT INFORMATION, CALL 1-888-GO-SHARP.

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