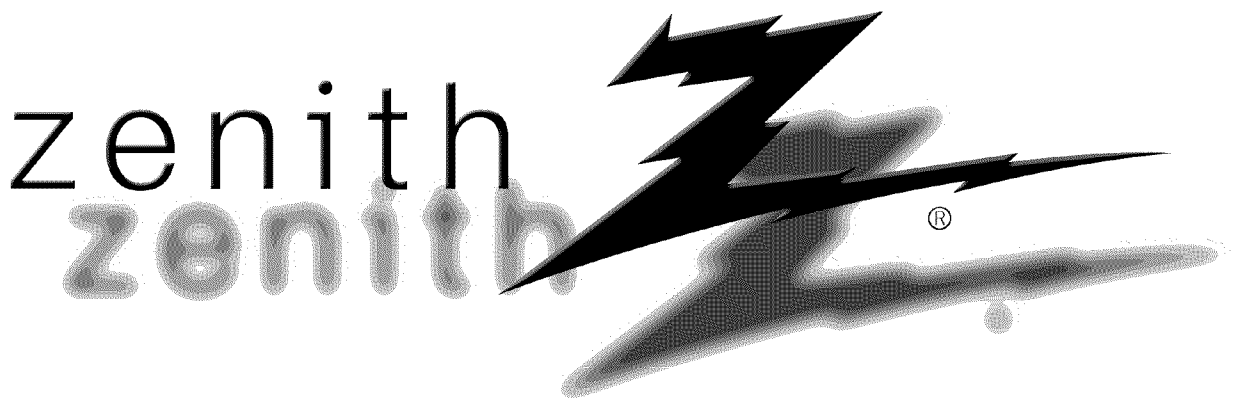



Installation and Operating Guide


Model Numbers | Z42PT320, Z50PT320, Z50PV220, Z60PV220 | PLASMA TV




WARNING / CAUTION




WARNING / CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



**TO REDUCE THE RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVER (OR BACK). NO
USER SERVICEABLE PARTS INSIDE. REFER 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 an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING/CAUTION

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

NOTE TO CABLE/TV INSTALLER

This reminder is provided to call the CATV system installer’s attention to Article 820-40 of the National Electric Code (U.S.A.). The code provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of the cable entry as practical.

WARNING / CAUTION

To prevent fire or shock hazards, do not expose this product to rain or moisture.

FCC NOTICE

Class B digital device

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 to 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.

This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause (harmful) interference, and (2) this device must accept any interference received, including interference that may cause undesired operation (of the device).

Any changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

CAUTION

Do not attempt to modify this product in any way without written authorization from LG Electronics. Unauthorized modification could void the user’s authority to operate this product

SAFETY INSTRUCTIONS

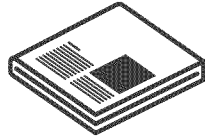
IMPORTANT SAFETY INSTRUCTIONS

Read these instructions.

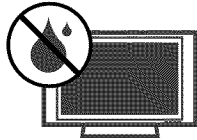
Keep these instructions.

Heed all warnings.

Follow all instructions.



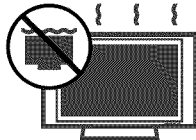
- 1** Do not use this apparatus near water.



- 2** Clean only with soft dry cloth.



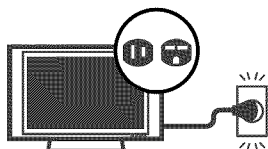
- 3** Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.



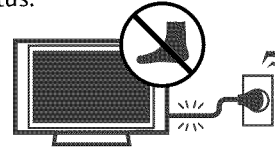
- 4** Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.



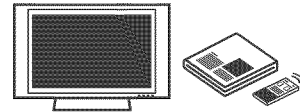
- 5** Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet. (Can differ by country)



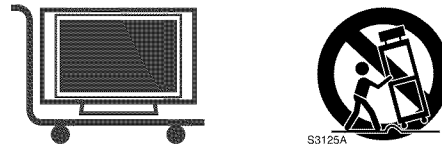
- 6** Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.



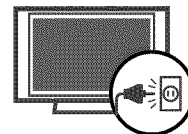
- 7** Only use attachments/accessories specified by the manufacturer.



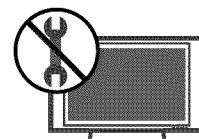
- 8** Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



- 9** Unplug this apparatus during lightning storms or when unused for long periods of time.



- 10** Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



SAFETY INSTRUCTIONS

- 11** Never touch this apparatus or antenna during a thunder or lightning storm.

- 12** When mounting a TV on the wall, make sure not to install the TV by the hanging power and signal cables on the back of the TV.

- 13** Do not allow an impact shock or any objects to fall into the product, and do not drop onto the screen with something.

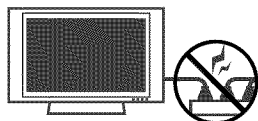
14 CAUTION concerning the Power Cord:

It is recommend that appliances be placed upon a dedicated circuit; that is, a single outlet circuit which powers only that appliance and has no additional outlets or branch circuits. Check the specification page of this owner's manual to be certain.

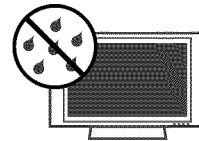
Do not connect too many appliances to the same AC power outlet as this could result in fire or electric shock.

Do not overload wall outlets. Overloaded wall outlets, loose or damaged wall outlets, extension cords, frayed power cords, or damaged or cracked wire insulation are dangerous. Any of these conditions could result in electric shock or fire. Periodically examine the cord of your appliance, and if its appearance indicates damage or deterioration, unplug it, discontinue use of the appliance, and have the cord replaced with an exact replacement part by an authorized servicer. Protect the power cord from physical or mechanical abuse, such as being twisted, kinked, pinched, closed in a door, or walked upon. Pay particular attention to plugs, wall outlets, and the point where the cord exits the appliance.

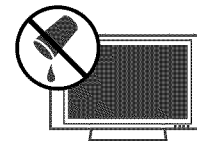
Do not make the TV with the power cord plugged in. Do not use a damaged or loose power cord. Be sure do grasp the plug when unplugging the power cord. Do not pull on the power cord to unplug the TV.



- 15** WARNING - To reduce the risk of fire or electrical shock, do not expose this product to rain, moisture or other liquids. Do not touch the TV with wet hands. Do not install this product near flammable objects such as gasoline or candles or expose the TV to direct air conditioning.



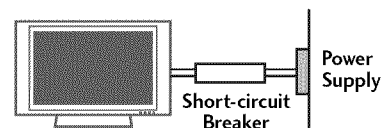
- 16** Do not expose to dripping or splashing and do not place objects filled with liquids, such as vases, cups, etc. on or over the apparatus (e.g. on shelves above the unit).



17 GROUNDING

Ensure that you connect the earth ground wire to prevent possible electric shock (i.e. a TV with a three-prong grounded AC plug must be connected to a three-prong grounded AC outlet). If grounding methods are not possible, have a qualified electrician install a separate circuit breaker.

Do not try to ground the unit by connecting it to telephone wires, lightning rods, or gas pipes.



18 DISCONNECTING THE POWER

The power outlet used must remain unobstructed in the event the device needs to be unplugged quickly.

- 19** "As long as this unit is connected to the AC wall outlet, it is not disconnected from the AC power source even if you turn off this unit by the SWITCH"

20 ANTENNAS

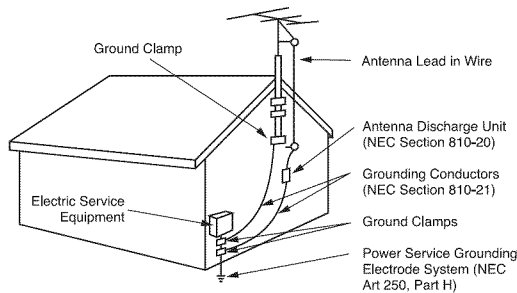
Outdoor antenna grounding

(Can differ by country) If an outdoor antenna is installed, follow the precautions below. An outdoor antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can come in contact with such power lines or circuits as death or serious injury can occur.

Be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges.

Section 810 of the National Electrical Code (NEC) in the U.S.A. provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes and requirements for the grounding electrode.

Antenna grounding according to the National Electrical Code, ANSI/NFPA 70



21 Cleaning

When cleaning, unplug the power cord and scrub gently with a soft cloth to prevent scratching. Do not spray water or other liquids directly on the TV as electric shock may occur. Do not clean with chemicals such as alcohol, thinners or benzene.

22 Moving

Make sure the product is turned off, unplugged and all cables have been removed. It may take 2 or more people to carry larger TVs. Do not press against or put stress on the front panel of the TV.

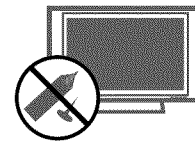
23 Ventilation

Install your TV where there is proper ventilation. Do not install in a confined space such as a bookcase. Do not cover the product with cloth or other materials (e.g.) plastic while plugged in. Do not install in excessively dusty places.

24 Take care not to touch the ventilation openings. When watching the TV for a long period, the ventilation openings may become hot. This does not affect the performance of the product or cause defects in the product.

25 If you smell smoke or other odors coming from the TV, unplug the power cord and contact an authorized service center.

26 Do not press strongly upon the panel with hand or sharp object such as nail, pencil or pen, or make a scratch on it. Do not allow a impact shock onto the panel.



27 Keep the product away from direct sunlight.

28 Dot Defect

The Plasma or LCD panel is a high technology product with resolution of two million to six million pixels. In a very few cases, you could see fine dots on the screen while you're reviewing the TV. Those dots are deactivated pixels and do not affect the performance and reliability of the TV.

29 Generated Sound

“Cracking” noise: A cracking noise that occurs when watching or turning off the TV is generated by plastic thermal contraction due to temperature and humidity. This noise is common for products where thermal deformation is required.

Electrical circuit humming/panel buzzing: A low level noise is generated from a high-speed switching circuit, which supplies a large amount of current to operate a product. It varies depending on the product. This generated sound does not affect the performance and reliability of the product.

CONTENTS

WARNING / CAUTION	2
SAFETY INSTRUCTIONS	3
FEATURES OF THIS TV	8

PREPARATION

Accessories	9
Front Panel Information	10
Back Panel Information	11
Stand Instruction	12
Cable Management	14
Desktop Pedestal Installation	15
Swivel Stand	15
VESA Wall Mounting	16
Securing the TV to the wall to prevent falling when the TV is used on a stand	17
Antenna or Cable Connection	18

EXTERNAL EQUIPMENT SETUP

HD Receiver Setup	19
DVD Setup	22
VCR Setup	24
Other A/V Source Setup	25
Audio Out Connection	26
PC Setup	27

WATCHING TV / CHANNEL CONTROL

Remote Control Functions	32
Turning On TV	34
Channel Selection	34
Volume Adjustment	34
Initial Setting	35
On-Screen Menus Selection	36
Quick Menu	37
Channel Setup	
- Auto Scan (Auto Tuning)	38
- Add / Delete Channel (Manual Tuning)	39

- Channel Editing	40
Channel List	41
Favorite Channel Setup	42
Favorite Channel List	42
Brief Information	43
Input List	44
Input Label	45

PICTURE CONTROL

Picture Size (Aspect Ratio) Control	46
Power Saving	48
Preset Picture Settings(Picture Mode)	49
Manual Picture Adjustment - User Mode	50
Picture Improvement Technology	51
Expert Picture Control	52
Picture Reset	54
Image Sticking Minimization (ISM) Method	55

SOUND & LANGUAGE CONTROL

Auto Volume Leveler (Auto Volume)	56
Preset Sound Settings (Sound Mode)	57
Sound Setting Adjustment - User Mode	58
Infinite Surround	58
Balance	59
TV Speakers On/Off Setup	60
Audio Reset	61
Stereo/SAP Broadcasts Setup	62
Audio Language	63
On-Screen Menus Language Selection	64
Caption Mode	
- Analog Broadcasting System Captions	65
- Digital Broadcasting System Captions	66
- Caption Option	67

TIME SETTING

Clock Setting	
- Auto Clock Setup	68
- Manual Clock Setup	69
Auto On/Off Time Setting	70
Sleep Timer Setting	71

PARENTAL CONTROL / RATINGS

Set Password & Lock System	72
Channel Blocking	75
Movie & TV Rating	76
Downloadable Rating	79
External Input Blocking	80
Key lock	81

APPENDIX

Troubleshooting	82
Maintenance	84
Product Specifications	85
IR Codes	86
External Control Through RS-232C	88

FEATURES OF THIS TV

■ This feature is not available for all models.



High-definition television. High-resolution digital television broadcast and playback system composed of roughly a million or more pixels, 16:9 aspect-ratio screens, and AC3 digital audio. A subset of digital television, HDTV formats include 1080i and 720p resolutions.



Manufactured under license from Dolby Laboratories. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories.

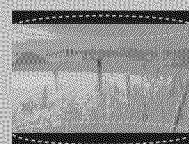
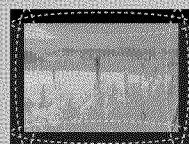


HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC."



IMPORTANT INFORMATION TO PREVENT "IMAGE BURN / BURN-IN" ON YOUR TV SCREEN

- When a fixed image (e.g. logos, screen menus, video game, and computer display) is displayed on the TV for an extended period, it can become permanently imprinted on the screen. This phenomenon is known as "image burn" or "burn-in." Image burn is not covered under the manufacturer's warranty.
- In order to prevent image burn, avoid displaying a fixed image on your TV screen for a prolonged period (2 or more hours for LCD, 1 or more hours for Plasma).
- Image burn can also occur on the letterboxed areas of your TV if you use the 4:3 aspect ratio setting for an extended period.

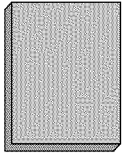


PREPARATION

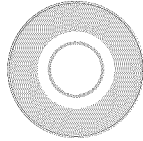
ACCESSORIES

Ensure that the following accessories are included with your TV. If an accessory is missing, please contact the dealer where you purchased the TV.

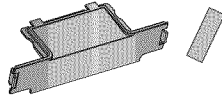
The accessories included may differ from the images below.



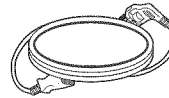
Owner's Manual



CD Manual



Protection Cover and Tape
(Refer to P.13)

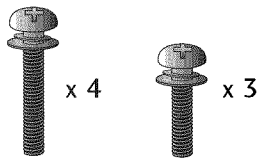


Power Cord



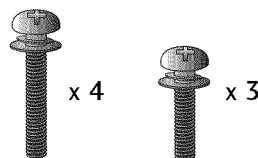
Ferrite Core
(Depending on model)

(For Z50PV220, Z42/50PT320)

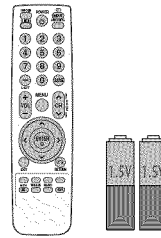


M4x26 M5x14.5
Screws for stand assembly
(Refer to P.12, 13)

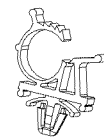
(For Z60PV220)



M4x28 M5x24
Screws for stand assembly
(Refer to P.12, 13)



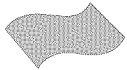
Remote Control,
Batteries (AAA)



Power Cord Holder



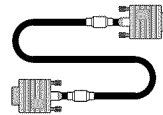
Cable Holder



Polishing Cloth
(Not included with all models)

- * Wipe spots on the exterior only with the polishing cloth.
- * Do not wipe roughly when removing spots. Excessive pressure may cause scratch or discoloration.

Option Extras

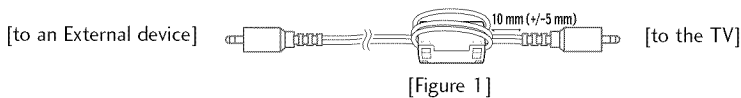


D-sub 15 pin Cable

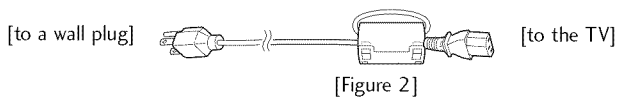
When using the VGA (D-sub 15 pin cable) PC connection, the user must use shielded signal interface cables with ferrite cores to maintain standards compliance.

■ How to use the Ferrite Core

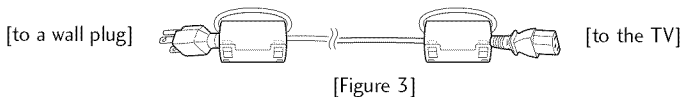
1. Use the ferrite core to reduce the electromagnetic interference in the PC audio cable.
Wind the PC audio cable on the ferrite core thrice. Place the ferrite core close to the TV.



2. Use the ferrite core to reduce the electromagnetic interference in the power cable.
Wind the power cable on the ferrite core once. Place the ferrite core close to the TV.



3. Use the ferrite core to reduce the electromagnetic interference in the power cable.
Wind the power cable on the ferrite core once. Place the ferrite core close to the TV and a wall plug.



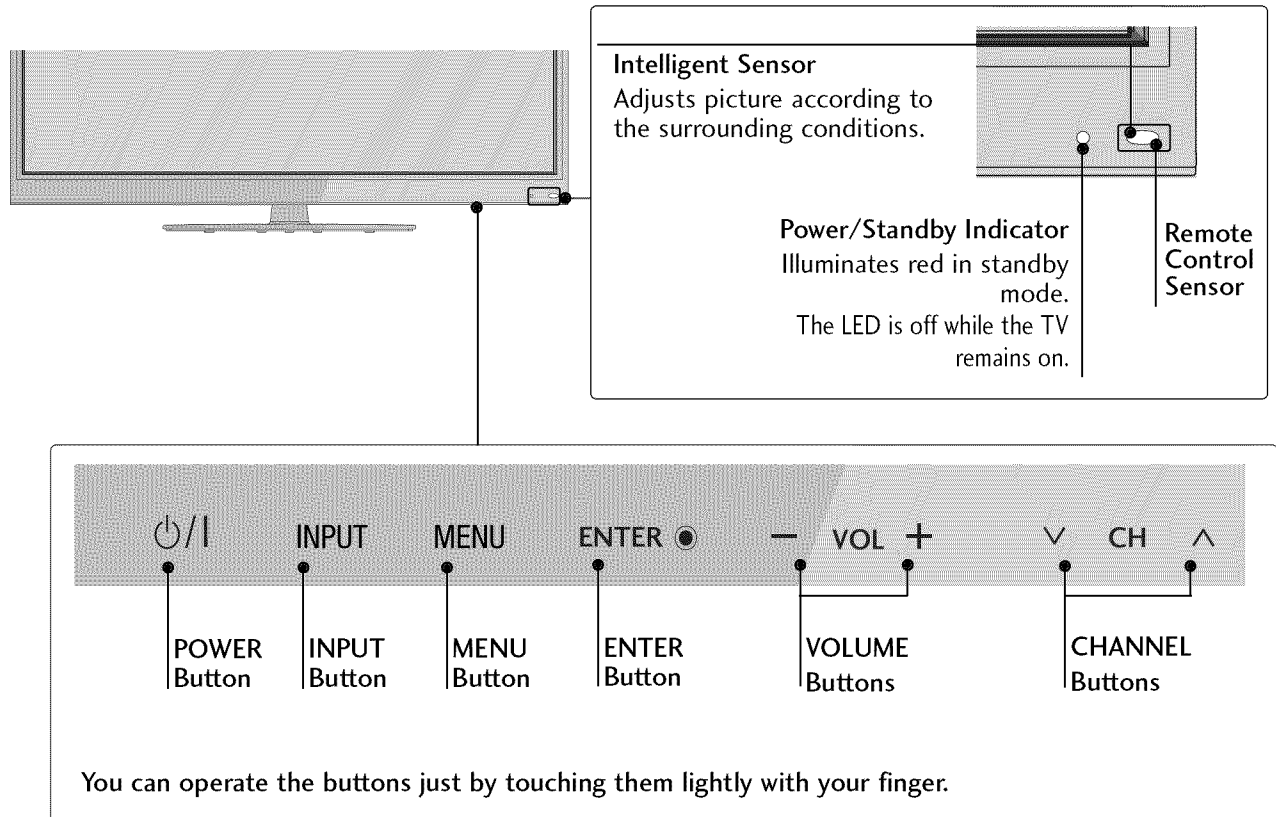
- If there is one ferrite core, follow as shown in Figure 1.
- If there are two ferrite cores, follow as shown in Figures 1 and 2.
- If there are three ferrite cores, follow as shown in Figures 1 and 3.

PREPARATION

FRONT PANEL INFORMATION

■ Image shown may differ from your TV.

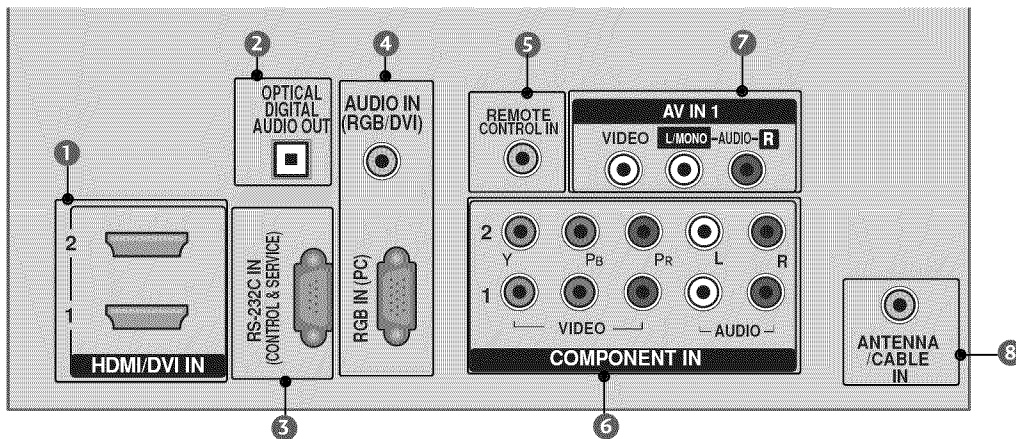
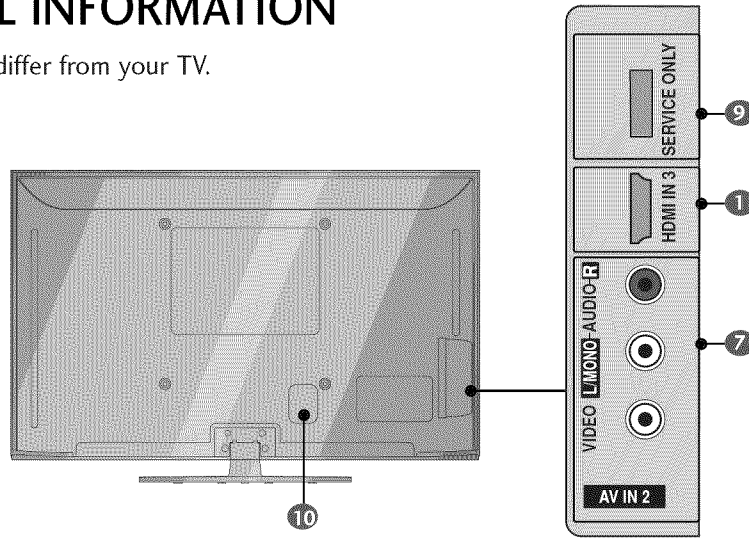
PREPARATION



- ▶ Do not step on the glass stand or subject it to any impact. It may break, causing possible injury from fragments of glass, or the TV may fall.
- ▶ Do not drag the TV. The floor or the product may be damaged.

BACK PANEL INFORMATION

■ Image shown may differ from your TV.



- 1 HDMI/DVI IN**
Digital Connection. Supports HD video and Digital audio. Doesn't support 480i.
Accepts DVI video using an adapter or HDMI to DVI cable (not included)
- 2 OPTICAL DIGITAL AUDIO OUT**
Optical digital audio output for use with amps and home theater systems.
Note: In standby mode, this port doesn't work.
- 3 RS-232C IN (CONTROL & SERVICE) PORT**
Used by third party devices.
- 4 AUDIO IN (RGB/DVI)**
1/8" headphone jack for analog PC audio input.
RGB IN (PC)
Analog PC Connection. Uses a D-sub 15 pin cable (VGA cable).
- 5 REMOTE CONTROL IN PORT**
For a wired remote control.

- 6 COMPONENT IN**
Analog Connection. Supports HD.
Uses a red, green, and blue cable for video & red and white for audio.
- 7 AV (Audio/Video) IN**
Analog composite connection. Supports standard definition video only (480i).
- 8 ANTENNA/CABLE IN**
Connect over-the air signals to this jack.
Connect cable signals to this jack.
- 9 SERVICE ONLY**
Used for software updates.
- 10 Power Cord Socket**
For operation with AC power.
Caution: Never attempt to operate the TV on DC power.

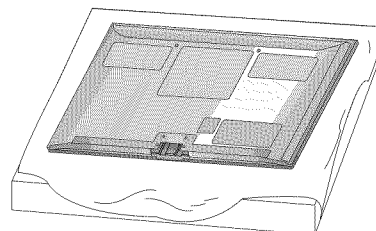
PREPARATION

STAND INSTRUCTION

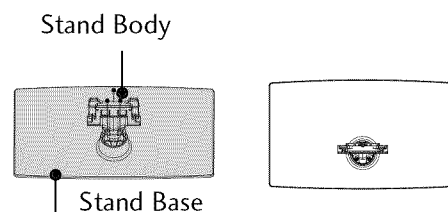
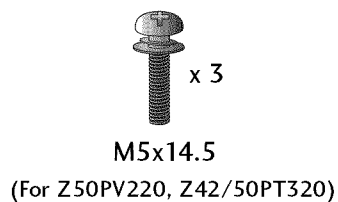
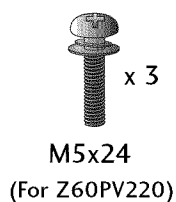
▣ Image shown may differ from your TV.

Installation

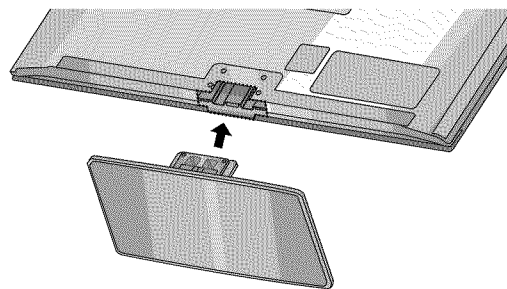
- 1 Carefully place the TV screen side down on a cushioned surface to protect the screen from damage.



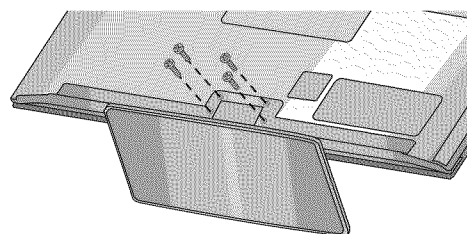
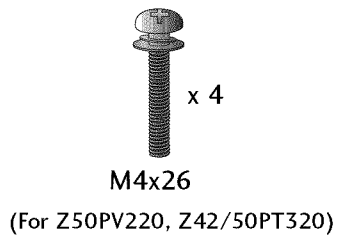
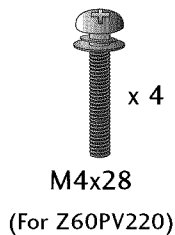
- 2 Assemble the parts of the Stand Body with the Stand Base of the TV.



- 3 Assemble the TV as shown.

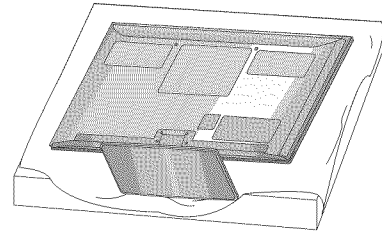


- 4 Fix the 4 screws securely using the holes in the back of the TV.

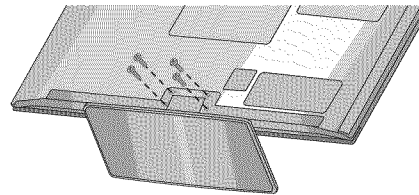
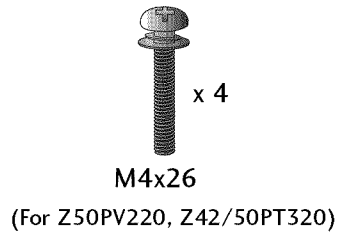
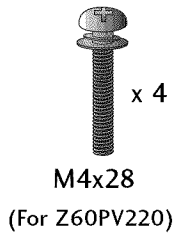


Detachment

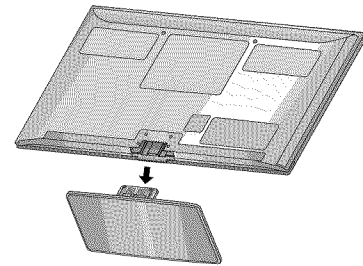
- 1 Carefully place the TV screen side down on a cushioned surface to protect the screen from damage.



- 2 Loosen the screws from TV.



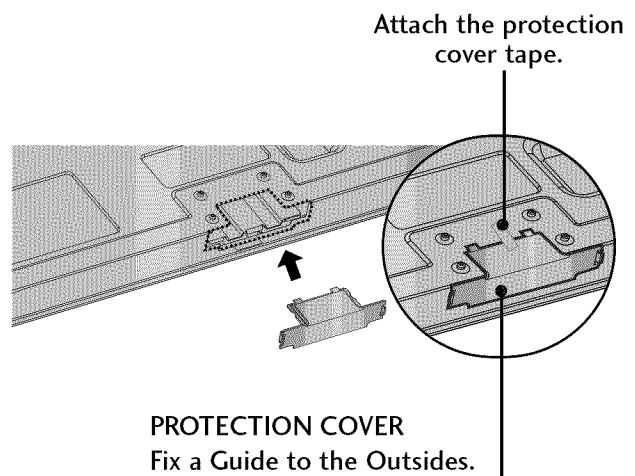
- 3 Detach the stand from TV.



- 4 After removing the stand, install the included **PROTECTION COVER** over the hole for the stand.

Attach the protection cover tape.

When installing the wall mounting bracket, use the **PROTECTION COVER**.

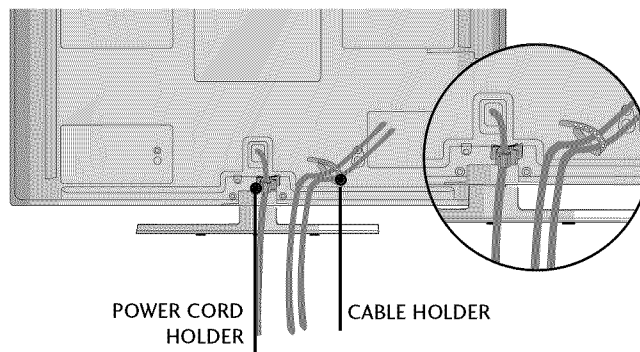


PREPARATION

CABLE MANAGEMENT

■ Image shown may differ from your TV.

- 1** Install the power cord holder and power cord.
It will help prevent the power cable from being removed by accident.
- 2** Gather and bind the cables with the cable holder.



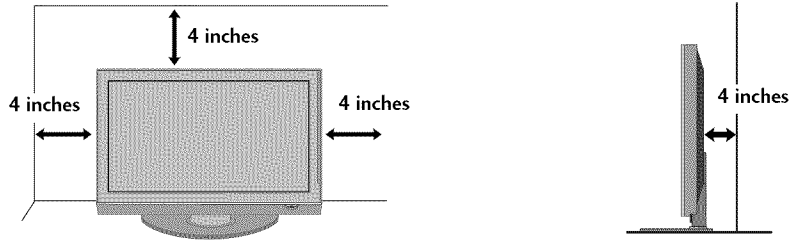
▲ CAUTION

- ▶ Do not move the TV by holding the cable holder and power cord holder, as the cable holders may break, and injuries and damage to the TV may occur.

DESKTOP PEDESTAL INSTALLATION

■ Image shown may differ from your TV.

For proper ventilation, allow a clearance of 4 inches on all four sides from the wall.



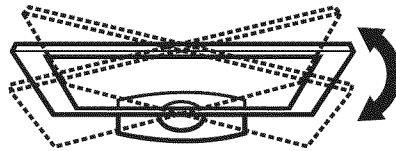
⚠ CAUTION

- ▶ Ensure adequate ventilation by following the clearance recommendations.
- ▶ Do not mount near or above any type of heat source.

SWIVEL STAND

(This feature is not available for all models.)

After installing the TV, you can adjust the TV manually to the left or right direction by 20 degrees to suit your viewing position.



PREPARATION

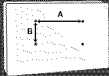
VESA WALL MOUNTING

Install your wall mount on a solid wall perpendicular to the floor. When attaching to other building materials, please contact your nearest installer.

If installed on a ceiling or slanted wall, it may fall and result in severe personal injury.

We recommend that you use an LG brand wall mount when mounting the TV to a wall.

LG recommends that wall mounting be performed by a qualified professional installer.

Model	VESA (A * B) 	Standard Screw	Quantity	Wall Mounting bracket (sold separately)
Z42/50PT320, Z50PV220	400 * 400	M6	4	PSW400B, PSW400BG, DSW400BG
Z60PV220	600 * 400	M8	4	PSW600B, PSW600BG

NOTE

- ▶ Screw length needed depends on the wall mount used. For further information, refer to the instructions included with the mount.
- ▶ Standard dimensions for wall mount kits are shown in the table.
- ▶ When purchasing our wall mount kit, a detailed installation manual and all parts necessary for assembly are provided.
- ▶ Do not use screws longer than the standard dimension, as they may cause damage to the inside to the TV.
- ▶ For wall mounts that do not comply with the VESA standard screw specifications, the length of the screws may differ depending on their specifications.
- ▶ Do not use screws that do not comply with the VESA standard screw specifications.
Do not use fasten the screws too strongly, this may damage the TV or cause the TV to a fall, leading to personal injury. LG is not liable for these kinds of accidents.
- ▶ LG is not liable for TV damage or personal injury when a non-VESA or non specified wall mount is used or the consumer fails to follow the TV installation instructions.

CAUTION

- ▶ Do not install your wall mount kit while your TV is turned on. It may result in personal injury due to electric shock.

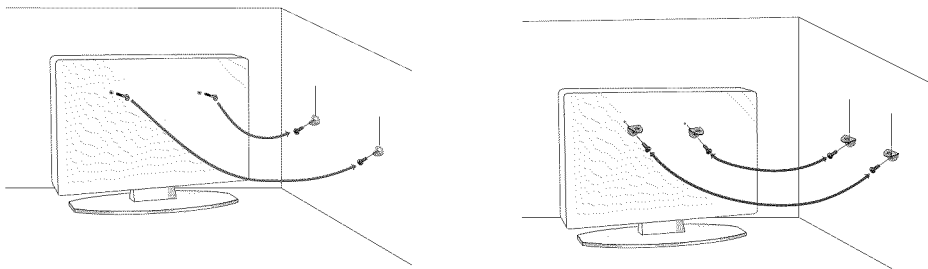
SECURING THE TV TO THE WALL TO PREVENT FALLING WHEN THE TV IS USED ON A STAND

- You should purchase necessary components to prevent the TV from tipping over (when not using a wall mount).
- Image shown may differ from your TV.

We recommend that you set up the TV close to a wall so it cannot fall over if pushed backwards.

Additionally, we recommend that the TV be attached to a wall so it cannot be pulled in a forward direction, potentially causing injury or damaging the product.

Caution: Please make sure that children don't climb on or hang from the TV.



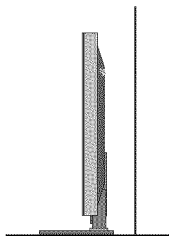
- Insert the eye-bolts (or TV brackets and bolts) to tighten the product to the wall as shown in the picture.

* If your product has the bolts in the eye-bolts position before inserting the eye-bolts, loosen the bolts.

* Insert the eye-bolts or TV brackets/bolts and tighten them securely in the upper holes.

Secure the wall brackets with the bolts (sold separately) to the wall. Match the height of the bracket that is mounted on the wall to the holes in the product.

Ensure the eye-bolts or brackets are tightened securely.



- Use a sturdy rope (sold separately) to tie the product. It is safer to tie the rope so it becomes horizontal between the wall and the product.

! NOTE

- ▶ Use a platform or cabinet strong enough and large enough to support the size and weight of the TV.
- ▶ To use the TV safely, make sure that the height of the bracket on the wall and the one on the TV are the same.

PREPARATION

PREPARATION

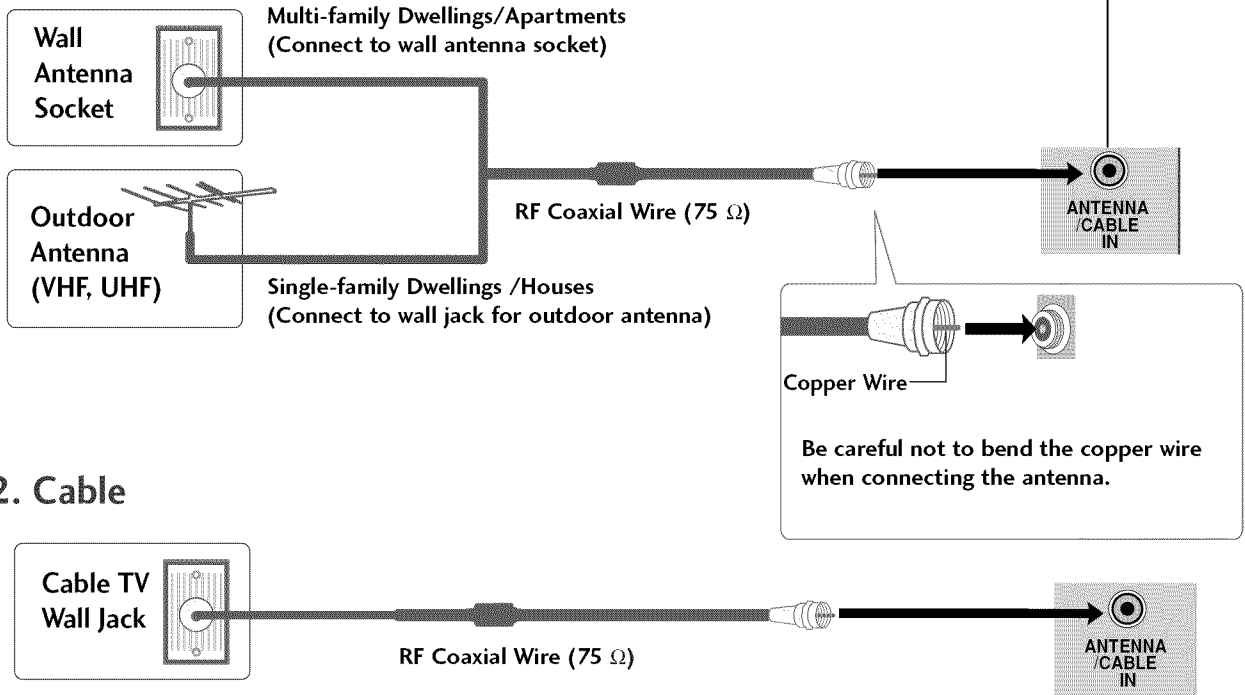
ANTENNA OR CABLE CONNECTION

■ To prevent damage do not connect to the power outlet until all connections are made between the devices.

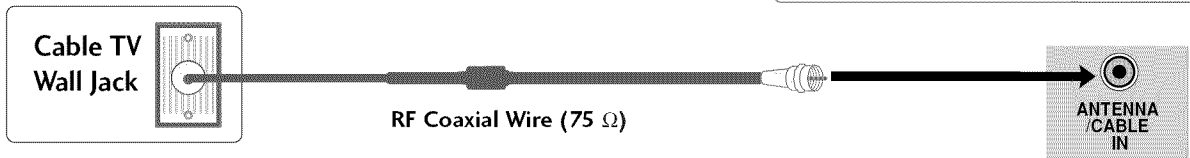
1. Antenna (Analog or Digital)

Wall Antenna Socket or Outdoor Antenna without a Cable Box Connection.

For optimum picture quality, adjust antenna direction if needed.



2. Cable



- To improve the picture quality in a poor signal area, please purchase a signal amplifier and install properly.
- If the antenna needs to be split for two TV's, install a 2-Way Signal Splitter.
- If the antenna is not installed properly, contact your dealer for assistance.

EXTERNAL EQUIPMENT SETUP

HD RECEIVER SETUP

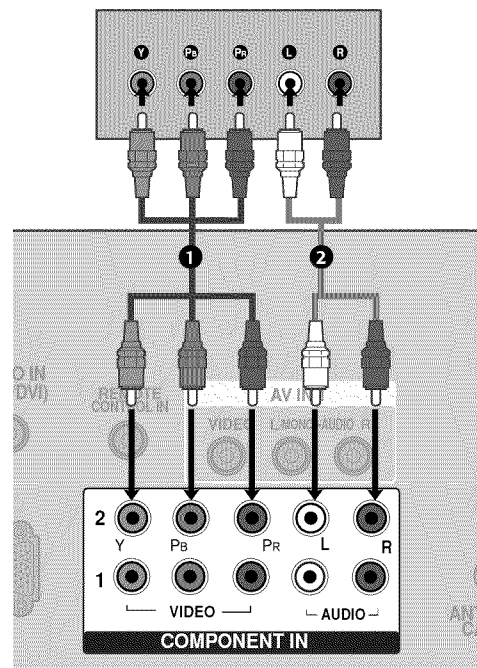
- To prevent the equipment damage, never plug in any power cords until you have finished connecting all equipment.
- Image shown may differ from your TV.

This TV can receive Digital Over-the-air/Cable signals without an external digital set-top box. However, if you do receive digital signals from a digital set-top box or other digital external device, refer to the figure as shown below.

Component Connection

1. How to connect

- 1** Connect the video outputs (Y, PB, PR) of the digital set-top box to the **COMPONENT IN VIDEO 1** jacks on the TV. Match the jack colors (Y = green, PB = blue, and PR = red).
- 2** Connect the audio output of the digital set-top box to the **COMPONENT IN AUDIO 1** jacks on the TV.



2. How to use

- Turn on the digital set-top box.
(Refer to the owner's manual for the digital set-top box operation)
- Select the **Component1** input source on the TV using the **INPUT** button on the remote control.
- If connected to **COMPONENT IN 2** input, select the **Component2** input source on the TV.

Supported Resolutions

Signal	Component	HDMI
480i	Yes	No
480p	Yes	Yes
720p	Yes	Yes
1080i	Yes	Yes
1080p	Yes	Yes

Y, CB/PB, CR/PR

Resolution	Horizontal Frequency(KHz)	Vertical Frequency(Hz)
720x480i	15.73	59.94
	15.73	60.00
720x480p	31.47	59.94
	31.47	60.00
1280x720p	44.96	59.94
	45.00	60.00
1920x1080i	33.72	59.94
	33.75	60.00
1920x1080p	27.00	24.00
	33.75	30.00
	67.432	59.939
	67.50	60.00
	26.97	23.94
	33.71	29.97

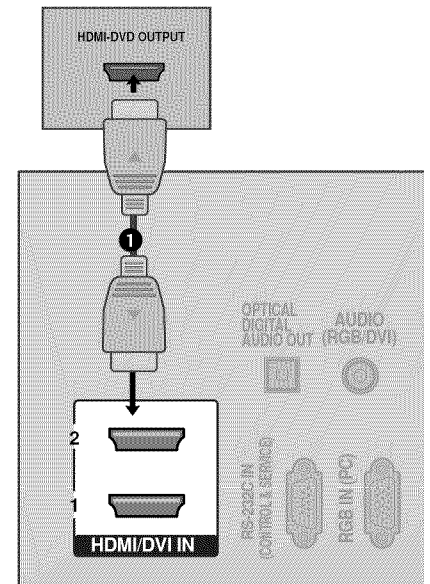
HDMI Connection

1. How to connect

- 1 Connect the digital set-top box to HDMI/DVI IN 1, 2, or HDMI IN 3 jack on the TV.
- 2 No separate audio connection is necessary. HDMI supports both audio and video.

2. How to use

- Turn on the digital set-top box.
(Refer to the owner's manual for the digital set-top box.)
- Select the HDMI1, 2, or 3 input source on the TV using the INPUT button on the remote control.



NOTE

- ▶ If an HDMI cable doesn't support High Speed HDMI, it can cause flickers or no screen display. In this case use the latest cables that support High Speed HDMI.
- ▶ HDMI mode supports PCM, AC-3 (Dolby Digital) audio format.

HDMI-DTV

Resolution	Horizontal Frequency(KHz)	Vertical Frequency(Hz)
720x480p	31.47	59.94
	31.47	60.00
1280x720p	44.96	59.94
	45.00	60.00
1920x1080i	33.72	59.94
	33.75	60.00
1920x1080p	27.00	24.00
	33.75	30.00
	67.432	59.939
	67.50	60.00
	26.97	23.94
	33.71	29.97

DVI to HDMI Connection

1. How to connect

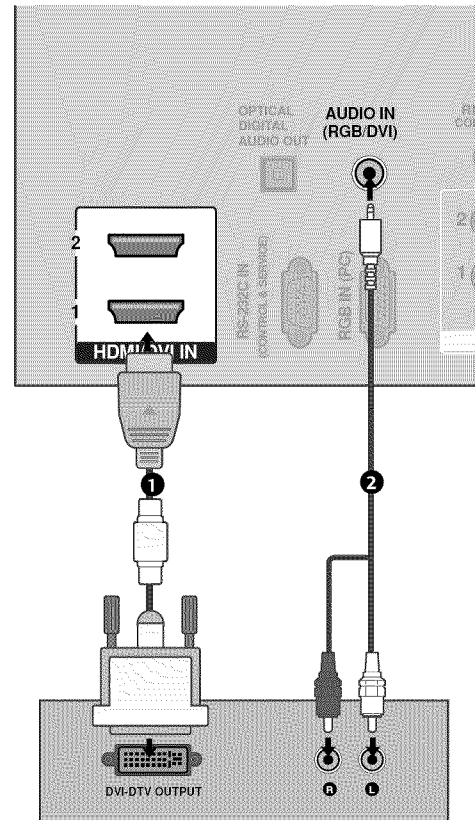
- 1 Connect the DVI output of the digital set-top box to the HDMI/DVI IN 1 or 2 jack on the TV.
- 2 Connect the audio output of the digital set-top box to the AUDIO IN (RGB/DVI) jack on the TV.

2. How to use

- Turn on the digital set-top box. (Refer to the owner's manual for the digital set-top box.)
- Select the HDMI1 or 2 input source on the TV using the INPUT button on the remote control.

NOTE

- ▶ A DVI to HDMI cable or adapter is required for this connection. DVI doesn't support audio, so a separate audio connection is necessary.



EXTERNAL EQUIPMENT SETUP

DVD SETUP

Component Connection

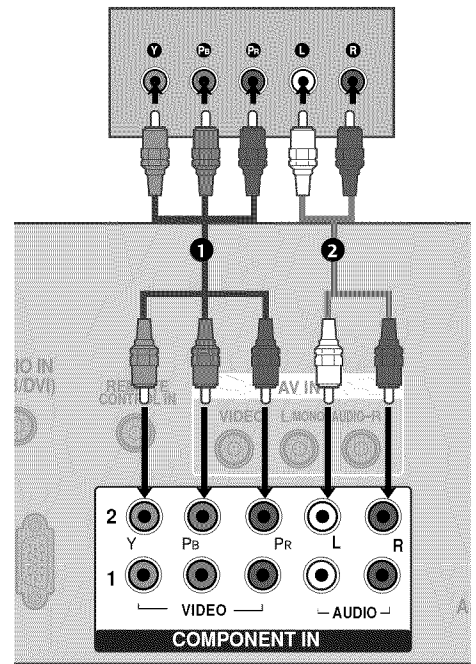
1. How to connect

- 1
 Connect the video outputs (Y, PB, PR) of the DVD to the **COMPONENT IN VIDEO 1** jacks on the TV.
 Match the jack colors (Y = green, PB = blue, and PR = red).

- 2
 Connect the audio outputs of the DVD to the **COMPONENT IN AUDIO 1** jacks on the TV.

2. How to use

- Turn on the DVD player, insert a DVD.
- Select the **Component1** input source on the TV using the **INPUT** button on the remote control.
- If connected to **COMPONENT IN 2** input, select the **Component2** input source on the TV.
- Refer to the DVD player's manual for operating instructions.



Component Input ports

To get better picture quality, connect a DVD player to the component input ports as shown below.

Component ports on the TV	Y	PB	PR
Video output ports on DVD player	Y	Pb	Pr
	Y	B-Y	R-Y
	Y	Cb	Cr
	Y	Pb	Pr

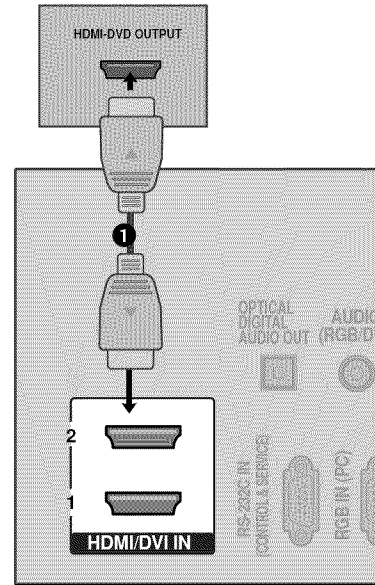
HDMI Connection

1. How to connect

- 1 Connect the HDMI output of the DVD to the HDMI/DVI IN 1, 2, or HDMI IN 3 jack on the TV.
- 2 No separate audio connection is necessary. HDMI supports both audio and video.

2. How to use

- Select the HDMI1, 2, or 3 input source on the TV using the INPUT button on the remote control.
- Refer to the DVD player's manual for operating instructions.



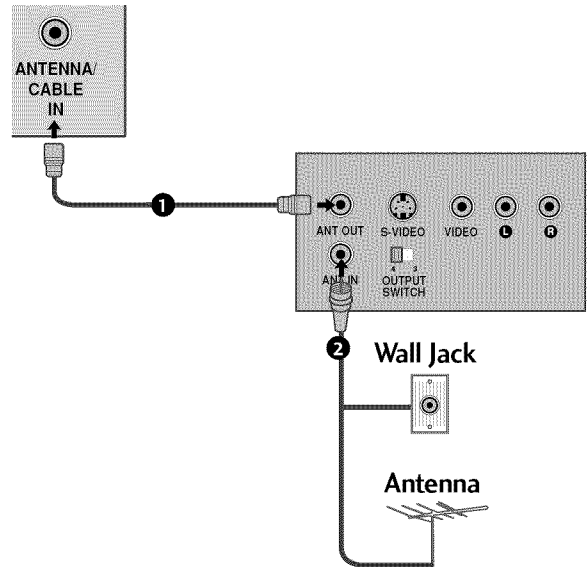
EXTERNAL EQUIPMENT SETUP

VCR SETUP

Antenna Connection

1. How to connect

- 1 Connect the RF antenna out socket of the VCR to the **ANTENNA/CABLE IN** socket on the TV.
- 2 Connect the antenna cable to the RF antenna in socket of the VCR.



2. How to use

- Set VCR output switch to 3 or 4 and then tune TV to the same channel number.
- Insert a video tape into the VCR and press PLAY on the VCR. (Refer to the VCR owner's manual.)

Composite (RCA) Connection

1. How to connect

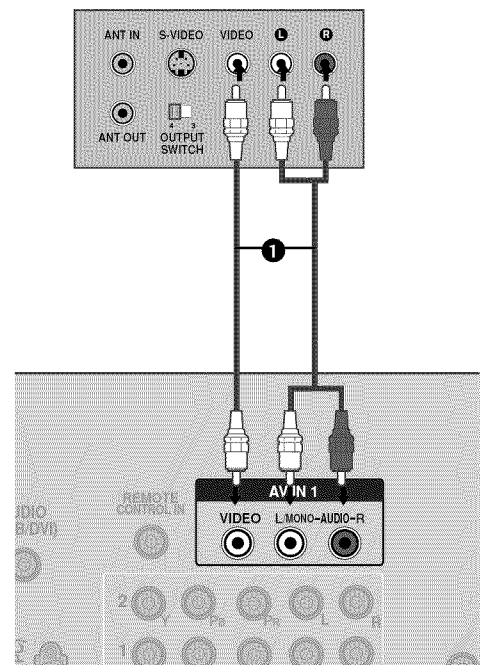
- 1 Connect the **AUDIO/VIDEO** jacks between TV and VCR. Match the jack colors (Video = yellow, Audio Left = white, and Audio Right = red)

2. How to use

- Insert a video tape into the VCR and press PLAY on the VCR. (Refer to the VCR owner's manual.)
- Select the **AV 1** input source on the TV using the **INPUT** button on the remote control.
- If connected to **AV IN 2**, select **AV 2** input source on the TV.

NOTE

- ▶ If you have a mono VCR, connect the audio cable from the VCR to the **AUDIO L/MONO** jack of the TV.



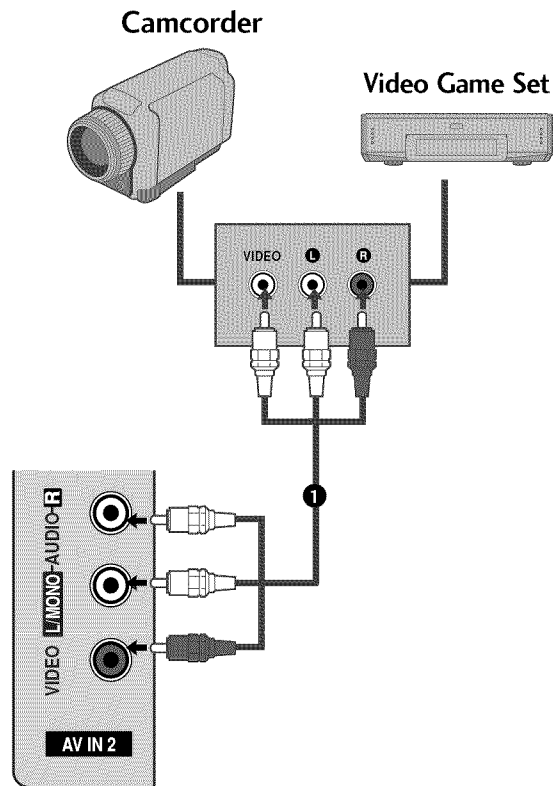
OTHER A/V SOURCE SETUP

1. How to connect

- 1 Connect the **AUDIO/VIDEO** jacks between TV and external equipment. Match the jack colors. (Video = yellow, Audio Left = white, and Audio Right = red)

2. How to use

- Select the **AV2** input source on the TV using the **INPUT** button on the remote control.
- If connected to **AV IN 1** input, select the **AV1** input source on the TV.
- Operate the corresponding external equipment.



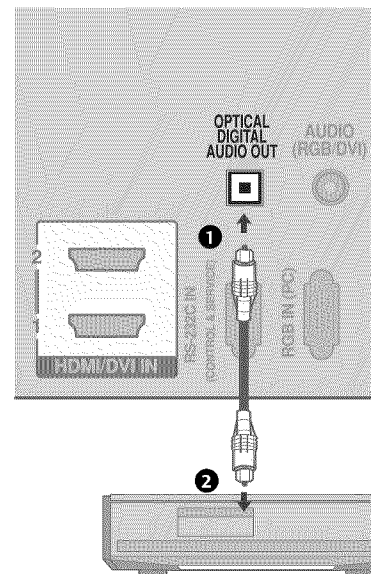
EXTERNAL EQUIPMENT SETUP

AUDIO OUT CONNECTION

Send the TV's audio to external audio equipment via the Audio Output port.

1. How to connect

- 1 Connect one end of the optical cable to the TV's **OPTICAL** port of **DIGITAL AUDIO OUT**.
- 2 Connect the other end of the optical cable to the digital audio input on the audio equipment.
- 3 Set the "TV Speaker option - Off" in the **AUDIO** menu. (▶ p.60). See the external audio equipment instruction manual for operation.



! NOTE

- ▶ When connecting with external audio equipment, such as amplifiers or speakers, you can turn the TV speakers off in the menu. (▶ p.60)

⚠ CAUTION

- ▶ Do not look into the optical output port. Looking at the laser beam may damage your vision.
- ▶ Audio with ACP (Audio Copy Protection) function may block digital audio output.

PC SETUP

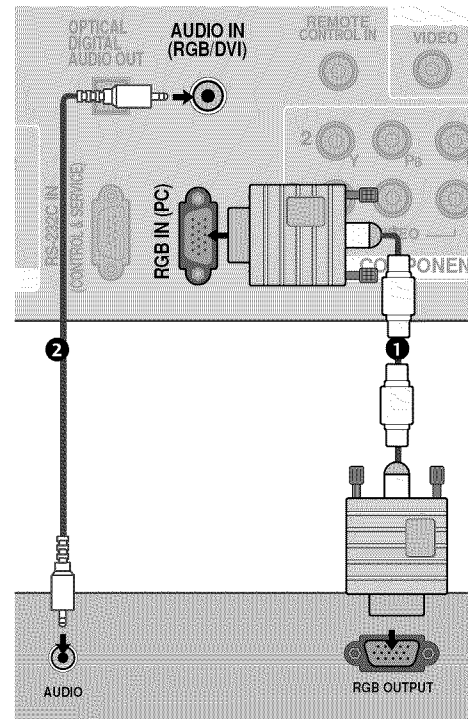
VGA (D-Sub 15 pin) Connection

1. How to connect

- 1 Connect the VGA output of the PC to the RGB IN (PC) jack on the TV.
- 2 Connect the PC audio output to the AUDIO IN (RGB/DVI) jack on the TV.

2. How to use

- Turn on the PC and the TV.
- Select the RGB-PC input source on the TV using the INPUT button on the remote control.



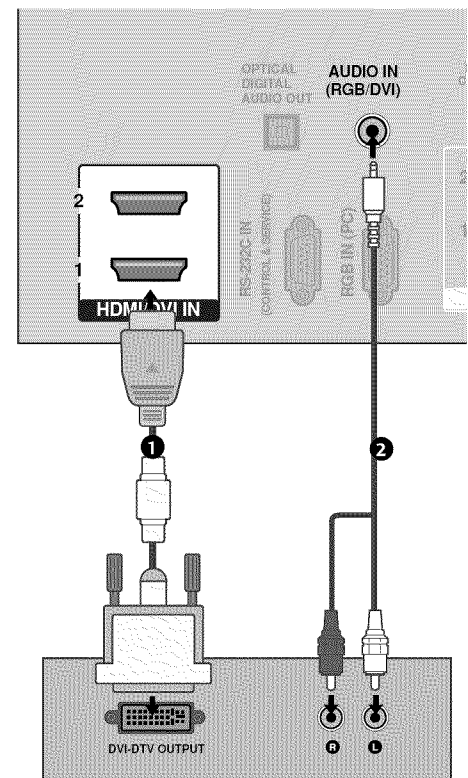
DVI to HDMI Connection

1. How to connect

- 1 Connect the DVI output of the PC to the HDMI/DVI IN 1 or 2 jack on the TV.
- 2 Connect the PC audio output to the AUDIO IN (RGB/DVI) jack on the TV.

2. How to use

- Turn on the PC and the TV.
- Select the HDMI1 or 2 input source on the TV using the INPUT button on the remote control.



EXTERNAL EQUIPMENT SETUP

NOTE

- ▶▶ Depending on the graphics card, DOS mode may not work if a HDMI to DVI Cable is in use.
- ▶▶ In PC mode, there may be noise associated with the resolution, vertical pattern, contrast or brightness. If noise is present, change the PC output to another resolution, change the refresh rate to another rate or adjust the brightness and contrast on the PICTURE menu until the picture is clear.
- ▶▶ Avoid keeping a fixed image on the screen for a long period of time. The fixed image could become permanently imprinted on the screen.
- ▶▶ The synchronization input form for Horizontal and Vertical frequencies is separate.
- ▶▶ Depending on the graphics card, some resolution settings may not allow the image to be positioned on the screen properly.

Supported Display Specifications (RGB-PC, HDMI-PC)

Resolution	Horizontal Frequency(KHz)	Vertical Frequency(Hz)
640x350	31.468	70.09
720x400	31.469	70.08
640x480	31.469	59.94
800x600	35.156	56.25
	37.879	60.31
1024x768	48.363	60.00
1280x768	47.776	59.87
1360x768	47.712	60.015
1280x1024	63.981	60.020
1600x1200	74.537	59.869
1920x1080	66.587	59.934

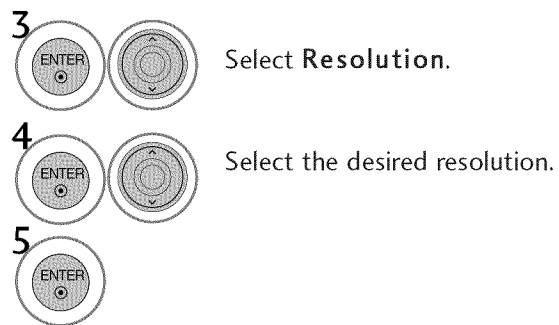
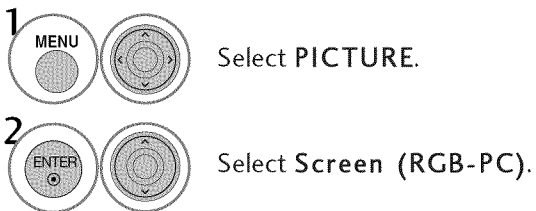
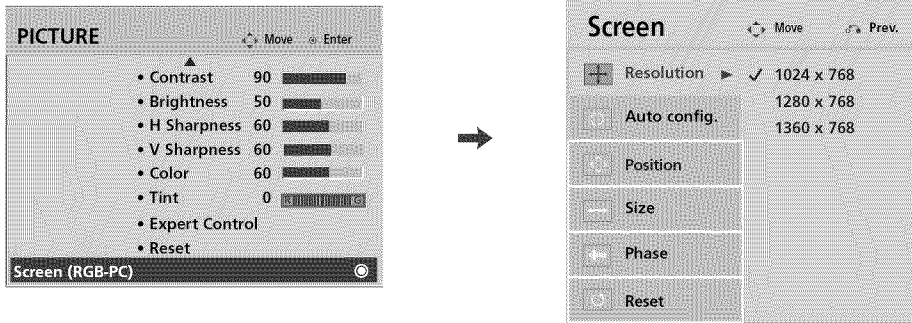
For Z50/60PV220

Screen Setup for PC mode

Selecting Resolution

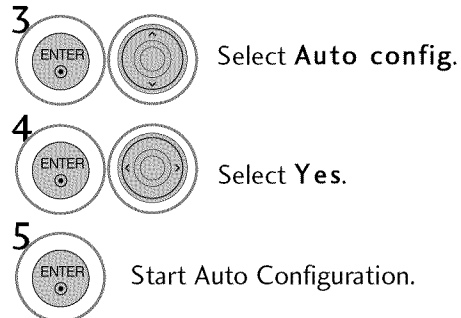
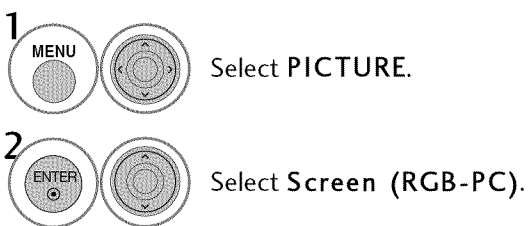
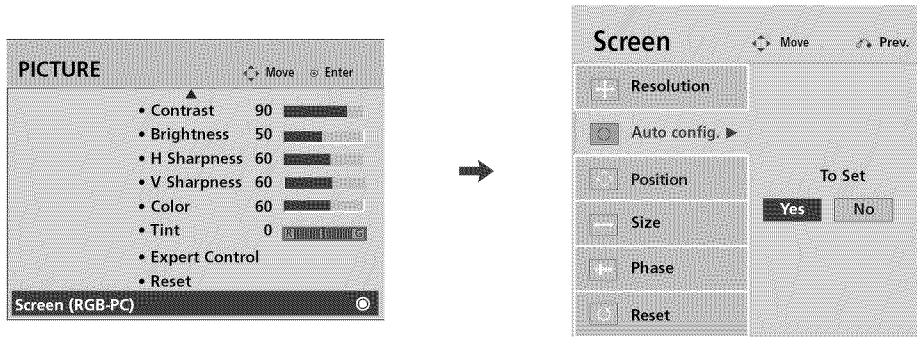
You can choose the resolution in RGB-PC mode.

The Position, Phase, and Size can also be adjusted.



Auto Configure

Automatically adjusts picture position and minimizes image instability. After adjustment, if the image is still not correct, try using the manual settings or a different resolution or refresh rate on the PC.



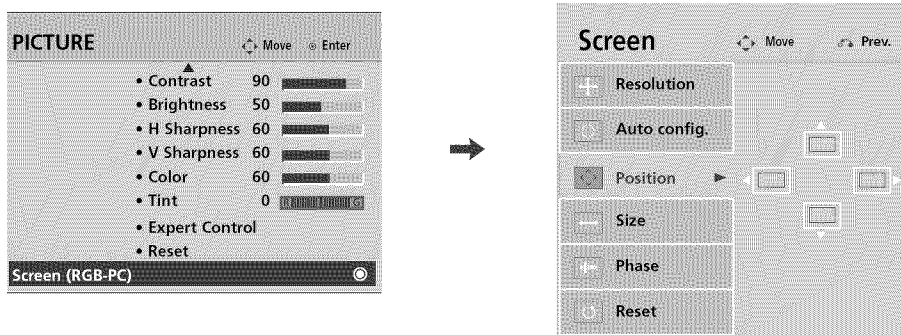
- If the position of the image is still not correct, try Auto adjustment again.
- If picture needs to be adjusted again after Auto adjustment in RGB-PC, you can adjust the Position, Size, or Phase.

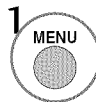

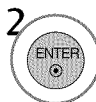
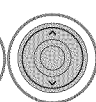
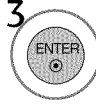
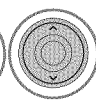

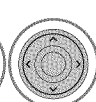
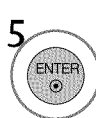
EXTERNAL EQUIPMENT SETUP

Adjustment for screen Position, Size, and Phase

If the picture is not clear after auto adjustment and especially if characters are still trembling, adjust the picture phase manually.

This feature operates only in RGB-PC mode.

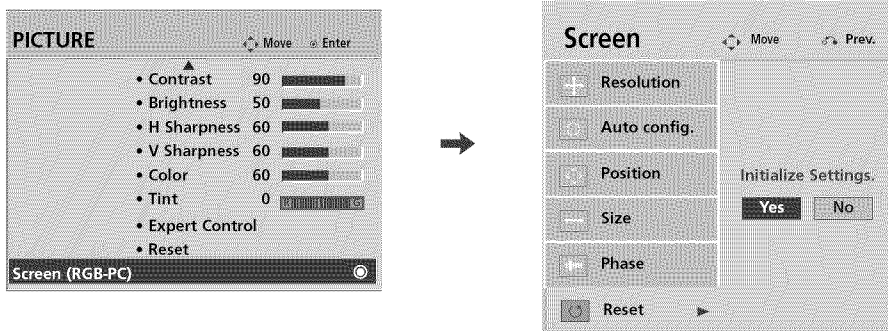











-   Select PICTURE.
-   Select Screen (RGB-PC).
-   Select Position, Size, or Phase.
-   Make appropriate adjustments.
- 

- **Position:** This function is to adjust picture to left/right and up/down as you prefer.
- **Size:** This function is to minimize any vertical bars or stripes visible on the screen background. And the horizontal screen size will also change.
- **Phase:** This function allows you to remove any horizontal noise and clear or sharpen the image of characters.

Screen Reset (Reset to original factory values)

Returns **Position**, **Size**, and **Phase** to the default factory settings.
This feature operates only in RGB-PC mode.



- 1   Select PICTURE.
- 2   Select Screen (RGB-PC).
- 3   Select Reset.
- 4   Select Yes.
- 5 

WATCHING TV / CHANNEL CONTROL

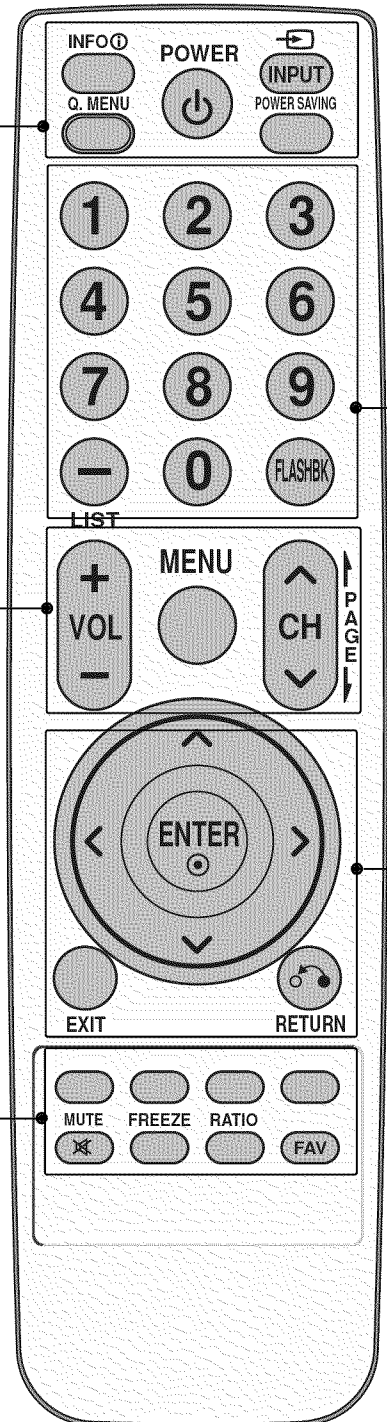
REMOTE CONTROL FUNCTIONS

When using the remote control, aim it at the remote control sensor on the TV.

INFO	Displays channel information at the top of the screen.
Q.MENU	Opens the list of Quick Menu options.
POWER	Turns the TV on from standby or off to standby.
INPUT	Rotates through inputs. Also switches the TV on from standby. ▶ p.44
POWER SAVING	Adjusts the Power Saving level.

VOLUME UP /DOWN	Adjusts the volume.
MENU	Displays the main menu or clears all on-screen displays and return to TV viewing.
CHANNEL UP/DOWN	Changes the channel.
PAGE UP/DOWN	Moves from one full set of screen information to the next one.

Color button	Blue button have channel edit and channel block function. The other is not functional.
FREEZE	Freezes the current frame.
RATIO	Changes the aspect ratio. ▶ p.46
FAV	Scroll through the programmed Favorite channels. ▶ p.42
MUTE	Switch the sound on or off. ▶ p.34



NUMBER button — (DASH) Used to enter a program number for multiple program channels such as 2-1, 2-2, etc.

LIST Displays the channel list.

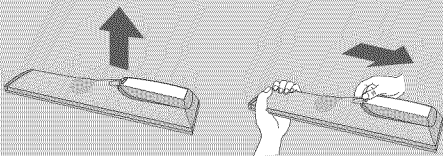
FLASHBK Tunes to the last channel viewed.

THUMBSTICK (Up/Down/Left Right/ENTER) Navigates the on-screen menus and adjusts the system settings to your preference.

EXIT Displays the main menu or clears all on-screen displays and returns to TV viewing.

RETURN Allows the user to move return one step in an interactive application or other user interaction function.

Installing Batteries



- Open the battery compartment cover on the back and install the batteries matching correct polarity.
- Install two 1.5V AAA batteries. Do not mix old or used batteries with new ones.
- Close cover.

WATCHING TV / CHANNEL CONTROL

TURNING ON TV

- 1** First, connect power cord correctly.
At this moment, TV is in standby mode.
 - In standby mode to turn TV on, press the $\phi/1$, INPUT, CH (^ or v) button on the TV or press the POWER, INPUT, CH (^ or v), Number (0~9) button on the remote control.

- 2** Select the viewing source by using the INPUT button on the remote control.

- 3** When finished using the TV, press the POWER button on the remote control. The TV reverts to standby mode.

! NOTE

- ▶ If you intend to be away on vacation, disconnect the power plug from the wall power outlet.

CHANNEL SELECTION

- 1** Press the CH (^ or v) or NUMBER buttons to select a channel number.

VOLUME ADJUSTMENT

Adjust the volume to suit your personal preference.

- 1** Press the VOL (+ or -) button to adjust the volume.

- 2** If you want to switch the sound off, press the MUTE button.

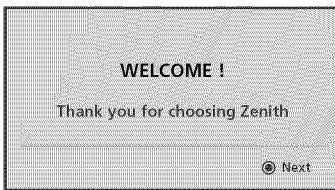
- 3** You can cancel the Mute function by pressing the MUTE or VOL (+ or -) button.

INITIAL SETTING

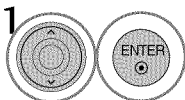
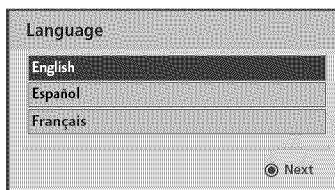
This Function guides the user to easily set the essential items for viewing the TV for the first time when purchasing the TV. It will be displayed on the screen when turning the TV on for the first time. It can also be activated from the user menus.

- Default selection is “**Home Use**”. We recommend setting the TV to “**Home Use**” mode for the best picture in your home environment.
- “**Store Demo**” Mode is only intended for use in retail environments. Customers can adjust the “**Picture menu - Picture mode**” manually while inspecting the TV, but the TV will automatically return to preset in-store mode after 5 minutes.
- You can also adjust **Initial Setting** in the **OPTION** menu.
Factory defaults are set when you choose “**Home Use**”.
- If you do not complete the **Initial setting**, it will appear whenever the TV is switched on until the **Initial setting** procedure is completed.

Step1. Welcome

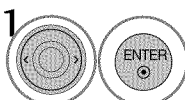


Step2. Language Selecting



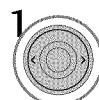
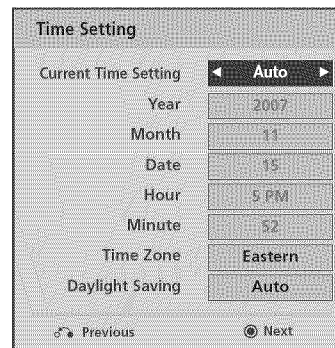
Select menu Language.

Step3. Mode setting

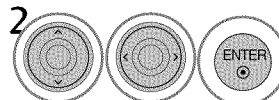


Select Home Use mode.

Step4. Time setting

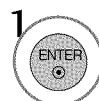
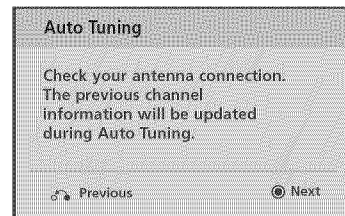


Select Auto or Manual.



Select desired time option.

Step5. Auto Tuning

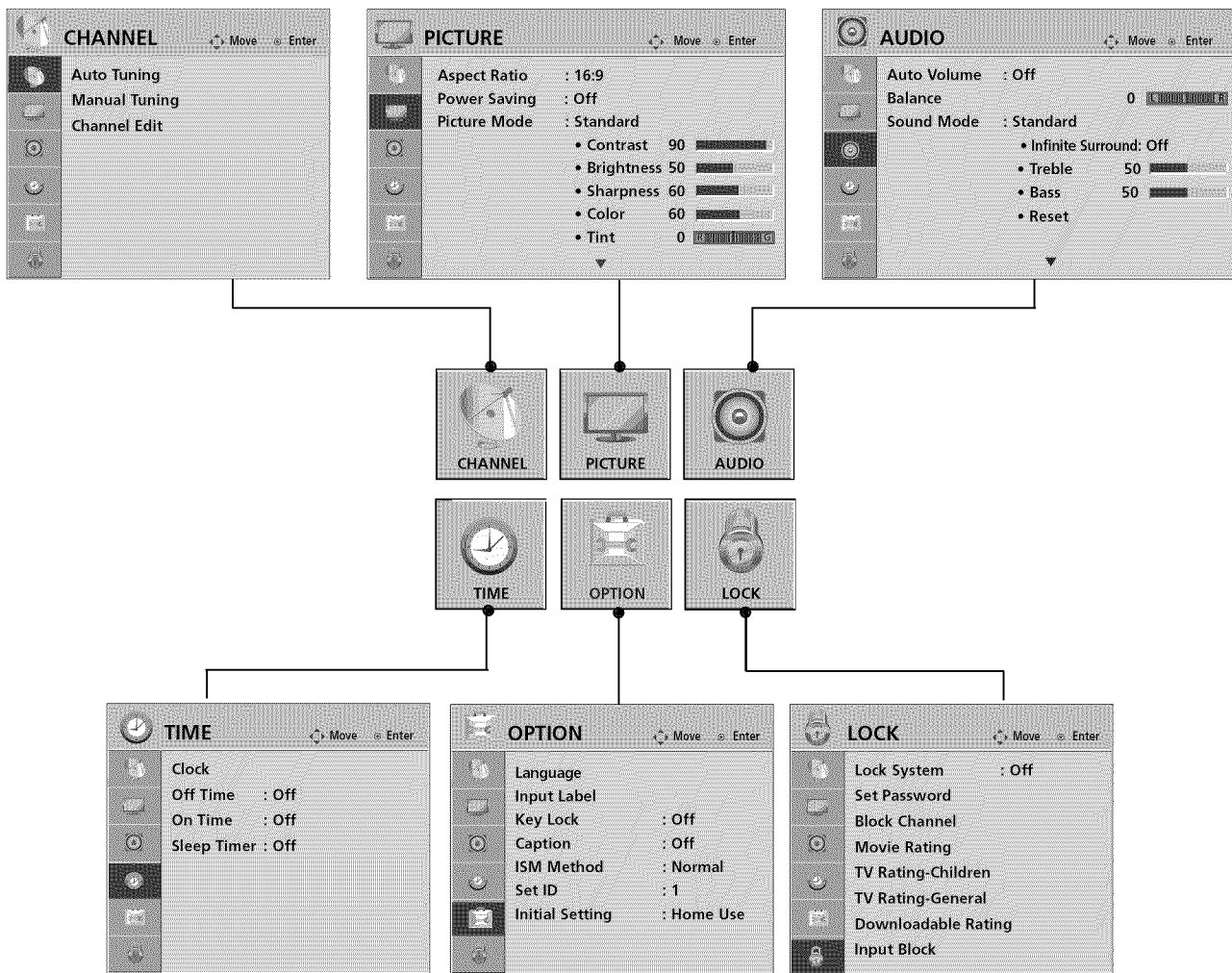


Start Auto Tuning.

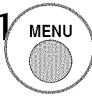



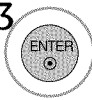

WATCHING TV / CHANNEL CONTROL

ON-SCREEN MENUS SELECTION

Your TV's OSD (On Screen Display) may differ slightly from that shown in this manual.



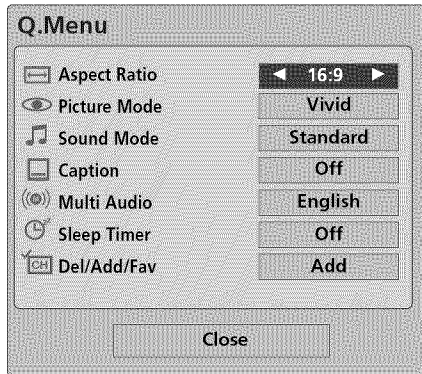
WATCHING TV / CHANNEL CONTROL

-   Display each menu.
-   Select a menu item.
-  Accept the current selection.
-  Return to TV viewing.

QUICK MENU


Your TV's OSD (On Screen Display) may differ slightly from what is shown in this manual.


Q.Menu (Quick Menu) is a menu of features which users might use frequently.



- ☰ **Aspect Ratio:** Selects your desired picture format.
- 👁️ **Picture Mode:** Selects the factory preset picture depend on the viewing environment.
- 🎵 **Sound Mode:** Selects the factory preset sound for type of program.
- ☑️ **Caption:** Select on or off.
- 🗣️ **Multi Audio:** Changes the audio language (Digital signal).
- 🗣️ **SAP:** Selects MTS sound (Analog signal).
- 🕒 **Sleep Timer:** Select the amount of time before your TV turns off automatically.
- 📺 **Del/Add/Fav:** Select channel you want to add/delete or add the channel to the Favorite List.

1   Display each menu.

2  Make appropriate adjustments.

3  Return to TV viewing.

WATCHING TV / CHANNEL CONTROL

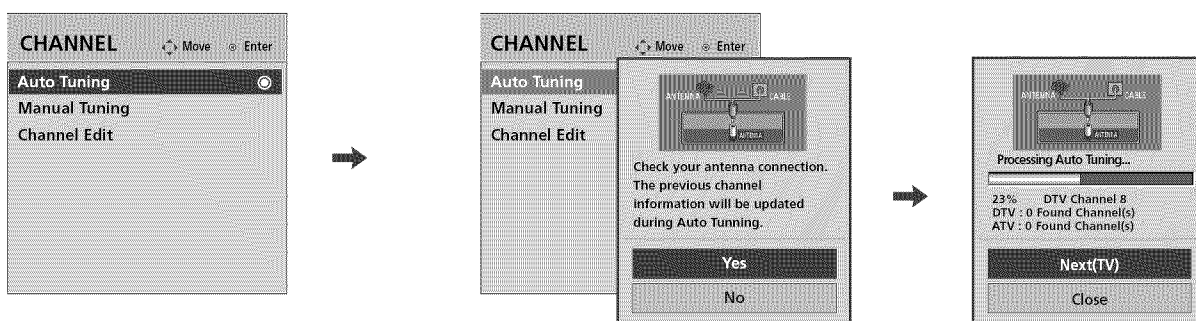
CHANNEL SETUP


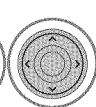
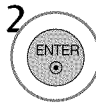
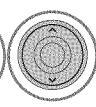
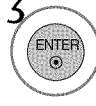
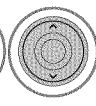
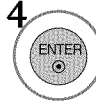


Auto Scan (Auto Tuning)

Automatically finds all channels available through antenna or cable inputs, and stores them in memory on the channel list.

Run this function if you change your residence or move the TV. Also, make sure to run this function with the antenna connected during TV broadcasting hours.

Auto Tuning memorizes only the channels available at the time.

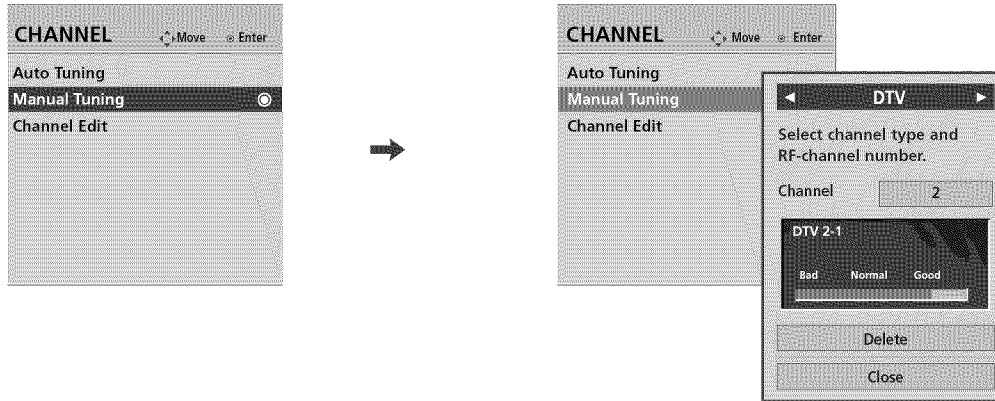












-   Select **CHANNEL**.
-   Select **Auto Tuning**.
-   Select **Yes**.
-  Run **Auto Tuning**.
-  Return to the previous menu.
-  Return to TV viewing.

- The TV will ask for a password if parental control has been activated (LOCK Menu). Use the password you set up in the LOCK Menu to allow a channel search.
- When setting the Auto tuning or Manual tuning, the number of maximum channel you can store is 900.
It is subject to change depending on the broadcasting signal environment.
- Memorizes all the available channels in the order of DTV, TV, CADTV, and CATV.

Add/Delete Channel (Manual Tuning)

If you select DTV or CADTV input signal, you can view the on-screen signal strength monitor to see the quality of the signal being received.



- 1   Select **CHANNEL**.
- 2   Select **Manual Tuning**.
- 3   Select **DTV, TV, CADTV, or CATV**.
- 4   Select channel you want to add or delete.
- 5   Select **Add** or **Delete**.
- 6  Return to the previous menu.
-  Return to TV viewing.

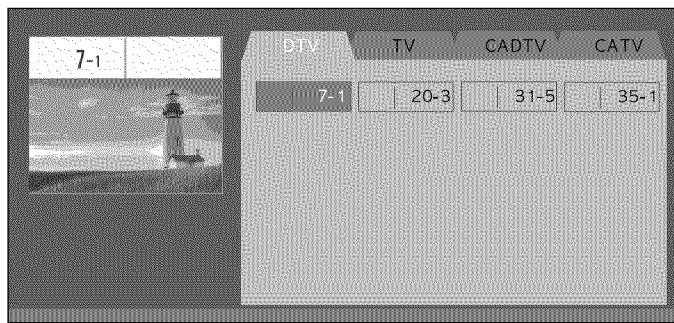
- The TV will ask for a password if parental control has been activated (LOCK Menu). Use the password you set up in the LOCK Menu to allow a channel search.
- When setting the Auto tuning or Manual tuning, the number of maximum channel you can store is 900. It is subject to change depending on the broadcasting signal environment.

WATCHING TV / CHANNEL CONTROL

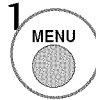
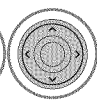
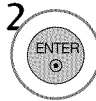
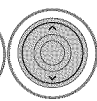

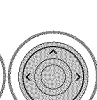
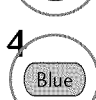

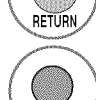
Channel Editing

When a channel number is deleted, it means that you will be unable to select it using CH ^, ∨ button during TV viewing.

If you wish to select the deleted channel, directly enter the channel number with the NUMBER buttons or select it in the Channel Edit menu.



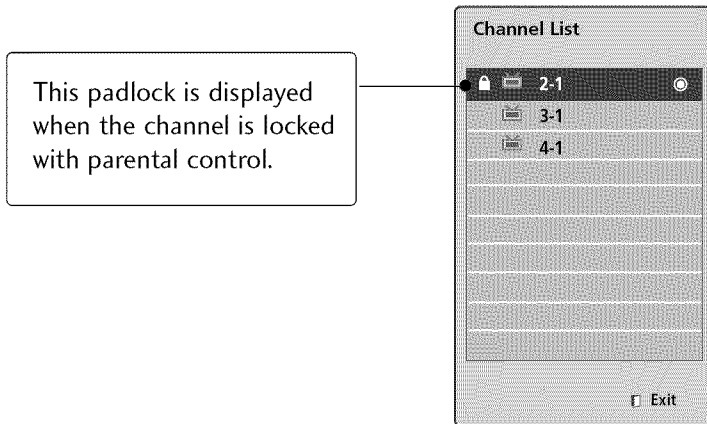
Ch.Change Move CH Move Page Previous Add/Delete

-   Select **CHANNEL**.
-   Select **Channel Edit**.
-   Select a channel.
-  Add or delete the channel.
-  Return to the previous menu.
-  Return to TV viewing.


■ Keep pressing the ^ button and use the < or > buttons to move between DTV, TV, CADTV, and CATV.
■ If the channel list is too long, use the CH ^ or ∨ button to move between pages.

CHANNEL LIST



You can check channels which are stored in the memory by displaying the channel list.





Displaying Channel List

- 1  Display the Channel List.

Selecting a channel in the channel list

- 1  Select a channel.
- 2  Switch to the chosen channel number.

Paging through a channel list

- 1  Turn the pages.
- 2  Return to TV viewing.

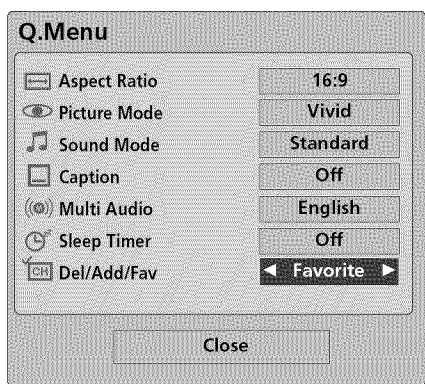
WATCHING TV / CHANNEL CONTROL

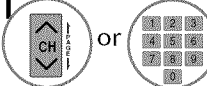





FAVORITE CHANNEL SETUP

Your TV's OSD (On Screen Display) may differ slightly from what is shown in this manual.

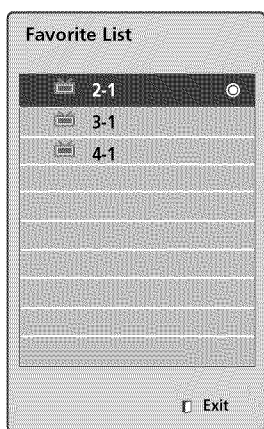
Favorite Channels are a convenient feature that lets you quickly select channels of your choice without waiting for the TV to select through all the in-between channels.

To tune to a favorite channel, press the **FAV (Favorite)** button repeatedly.




- 1  or  Select your desired channel.
- 2   Select Del/Add/Fav.
- 3  Select Favorite.
- 4  Return to TV viewing.



FAVORITE CHANNEL LIST





Displaying the favorite channel list

- 1  Display the Favorite channel list.

Selecting a channel in the favorite channel list



- 1  Select a channel.
- 2  Switch to the chosen channel number.


Paging through a favorite channel list

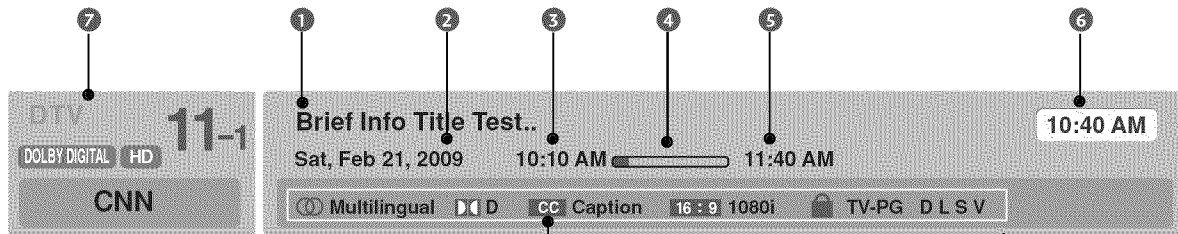
- 1  Turn the pages.
- 2  Return to TV viewing.

BRIEF INFORMATION

Brief Info shows the present screen information.

1  or  Show the Brief Info on the screen.

2  Return to TV viewing



Multilingual : The program contains two or more audio services. Use the **Q.MENU** menu to select wanted Audio.



Caption : The program contains one or more caption services. Use the **Q.MENU** menu to select wanted Closed caption.



Dolby Digital: The program contains a Dolby Digital audio signal in TV and HDMI input source.



The original aspect ratio of the video is 4:3



The original aspect ratio of the video is 16:9 (wide)



The video resolution is 720x480i



The video resolution is 720x480p



The video resolution is 1280x720p



The video resolution is 1920x1080i



The video resolution is 1920x1080p



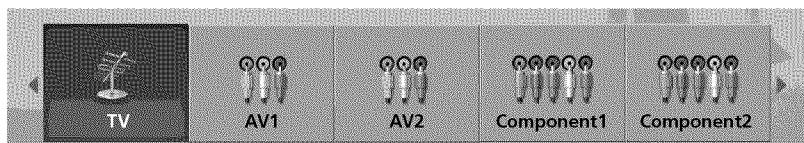
V-Chip: The program contains V-Chip information. Refer to the LOCK menu: A (Age), D (Dialogue), L (Language), S (Sex), V (Violence), FV (Fantasy Violence)

- ① Program title
- ② Day, Month, Year
- ③ Program start time
- ④ Program progress bar
- ⑤ Program finish time
- ⑥ Present time
- ⑦ Banner information

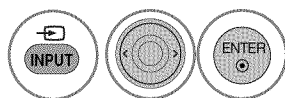
WATCHING TV / CHANNEL CONTROL

INPUT LIST

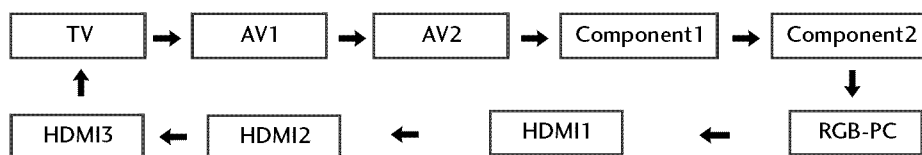
Only these input signals which are connected to a TV can be activated and selected.



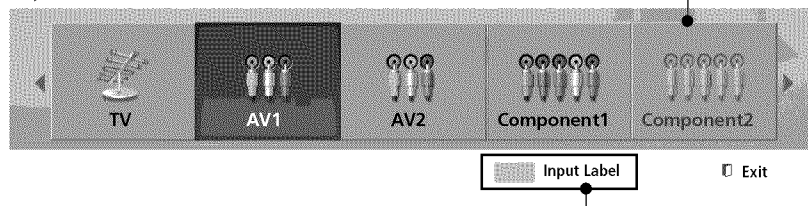
1



Select the desired input source.



ie)

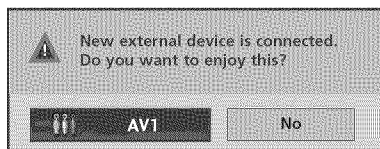


Disconnected inputs are inactive (grayed out)

Select a desired input source (except TV). Then, you can select your desired **Input Label** with using Blue button. ► p.45

ie) In case of changing the input label with using Blue button

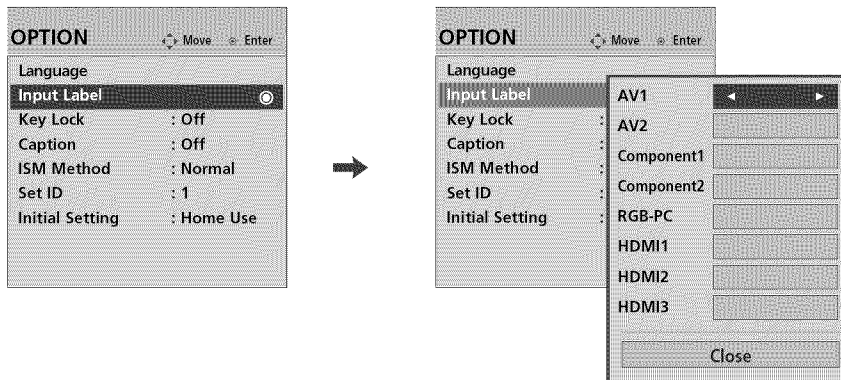
- When new external device is connected, this popup menu is displayed automatically. If selecting **Yes**, you can select input source that you want to appreciate.












- **TV**: Select it to watch over-the-air, cable and digital cable broadcasts.
- **AV**: Select them to watch a VCR or other external equipment.
- **Component**: Select them to watch DVD or a Digital set-top box.
- **RGB-PC**: Select it to view PC input.
- **HDMI**: Select them to watch high definition devices.

INPUT LABEL







This indicates which device is connected to which input port.



With using OPTION menu

- 1   Select OPTION.
- 2   Select Input Label.
- 3   Select the source.
- 4  Select the label.
- 5  Return to the previous menu.
-  Return to TV viewing.

With using INPUT button

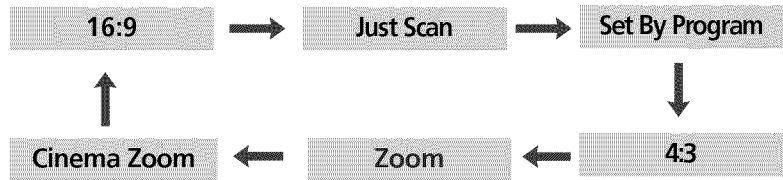
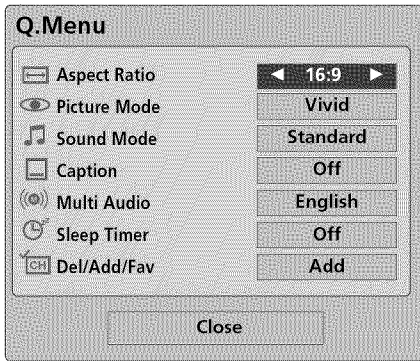
- 1   Select the source(except TV).
- 2   Select the label.
- 3  Return to the previous menu.
-  Return to TV viewing.





PICTURE CONTROL

PICTURE SIZE (ASPECT RATIO) CONTROL

This feature lets you choose the way an analog picture with a 4:3 aspect ratio is displayed on your TV.

- RGB-PC input only supports 4:3 and 16:9 aspect ratio.

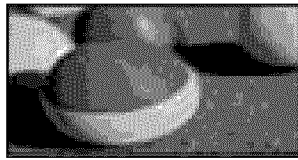


- 1   Select the **Aspect Ratio**.
- 2  Select the desired picture format.
- 3  Return to TV viewing.

■ You can also press the **RATIO** button repeatedly on the remote control.

16:9

Adjust the picture horizontally, in a linear proportion to fill the entire screen.



Just Scan

Normally the edges of video signals are cropped 1-2%. Just Scan turns off this cropping and shows the complete video.

Notes: If there is noise on the edges of the original signal, it will be visible when Just Scan is activated.

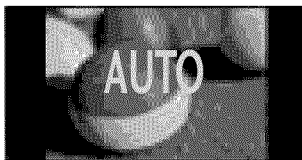
Just Scan operates only in DTV/CADTV/Component/HDMI-DTV/DVI-DTV (720p/1080i/1080p) input source.



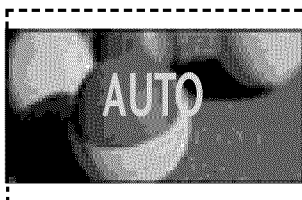
Set By Program

Selects the proper picture proportion to match the source's image.

(4:3 → 4:3)

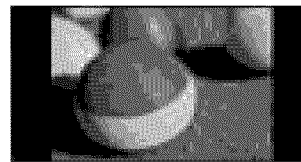


(16:9 → 16:9)



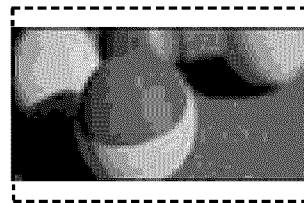
4:3

Choose 4:3 when you want to view a picture with an original 4:3 aspect ratio.



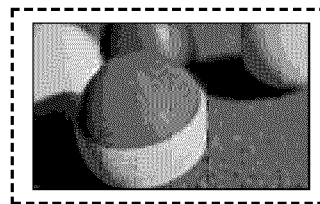
Zoom

Choose Zoom when you want to view the picture without any alteration. However, the top and bottom portions of the picture will be cropped.



Cinema Zoom

Choose Cinema Zoom when you want to enlarge the picture in correct proportion. Note: When enlarging or reducing the picture, the image may become distorted.



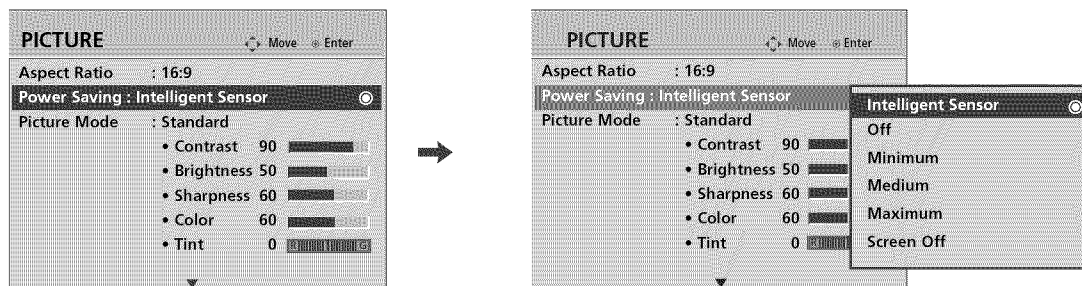
■ The adjustment range is 1-16.









PICTURE CONTROL

POWER SAVING

It reduces the TV's power consumption.

You can increase the brightness of your screen by adjusting the Power Saving level or by setting the Picture Mode. This feature is disabled in "Picture Mode-Cinema".

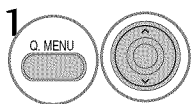
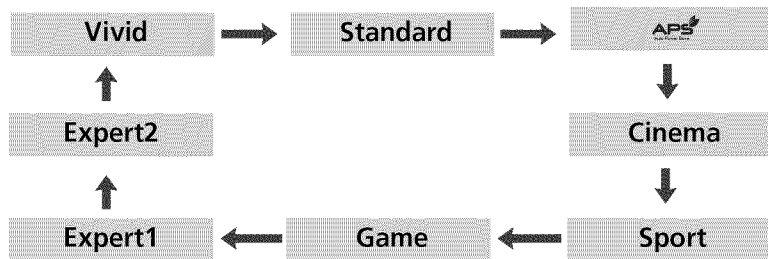
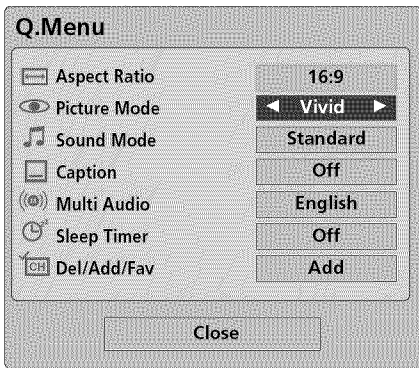


-   Select PICTURE.
-   Select Power Saving.
-   Select Intelligent Sensor, Off, Minimum, Medium, or Maximum.
-  Return to the previous menu.
-  Return to TV viewing.

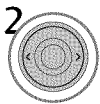
- You can also adjust the **POWER SAVING** button on the remote control.
- **Intelligent Sensor?**
This function automatically adjusts the brightness of screen to the most suitable picture according to the surrounding conditions.
- If you adjust "Power Saving - Intelligent Sensor", Sharpness, Color, Color Temperature feature will not work.

PRESET PICTURE SETTINGS (PICTURE MODE)

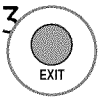
There are factory presets for picture settings available in the user menus. You can use a preset, change each setting manually.



1 Select Picture Mode.



2 Select Vivid, Standard, APS, Cinema, Sport, Game, Expert1, or Expert2.



3 Return to TV viewing.

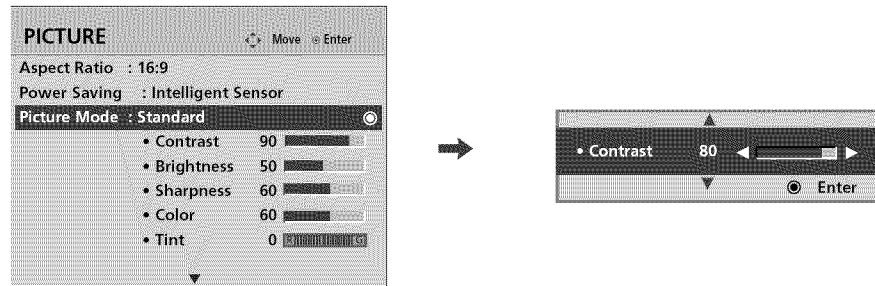
- **Vivid, Standard, APS, Cinema, Sport, and Game** Settings are preset for the optimum picture quality at the factory.
- You can also adjust **Picture Mode** in the **PICTURE** menu.
- **Vivid:** This is the mode to maximize the effect of the video in the retail store. Strengthen the contrast, brightness, color and sharpness for vivid picture.
- **APS:** This mode maximizes reducing the power consumption without hurting the picture quality. When you selecting APS, it changes contrast, brightness, sharpness, color and color temperature automatically.












- **Standard:** This is the mode to realize optimum viewing condition for the general user.
- **Cinema:** This mode optimizes video for watching movies. When you selecting Cinema, Power Saving function is disabled.
- **Sport:** This is the video mode to emphasize dynamic video and primary color (Ex, white, uniform, grass, sky blue etc.) by realizing the optimal screen for sports.
- **Game:** This is the mode to realize fast response speed in a fast gaming screen.
- **Expert:** This is the mode to adjust the video in detail for video quality expert and general user.

PICTURE CONTROL

MANUAL PICTURE ADJUSTMENT-USER MODE

Adjust the picture appearance to suit your preference and viewing situations.

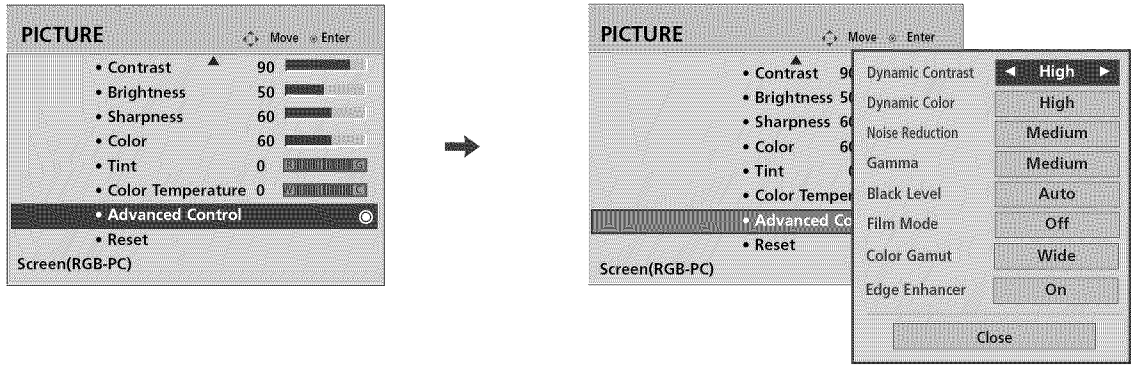











- 1   Select PICTURE.
- 2   Select Picture Mode.
- 3   Select Vivid, Standard, Cinema, Sport, or Game.
- 4   Select Contrast, Brightness, Sharpness, Color, Tint, or Color Temperature.
- 5   Make appropriate adjustments.
- 6  Return to the previous menu.
-  Return to TV viewing.

- **Contrast:** Increase or decrease the gradient of the video signal. You may use Contrast when the bright part of picture is saturated.
- **Brightness:** Adjusts the base level of the signal in the picture. You may use brightness when the dark part of the picture is saturated.
- **Sharpness:** Adjusts the level of crispness in the edges between the light and dark areas of the picture. The lower the level, the softer the image.
- **Color:** Adjusts intensity of all colors.
- **Tint:** Adjusts the balance between red and green levels.
- **Color Temperature:** Set to warm to enhance hotter colors such as red, or set to cool to make picture bluish.

PICTURE IMPROVEMENT TECHNOLOGY

You can calibrate the screen for each Picture Mode or set the video value according to the special video screen. You can set the video seeing differently for each input. To reset to the factory default screen after making adjustments to each video mode, execute the “Reset” function for each Picture Mode.



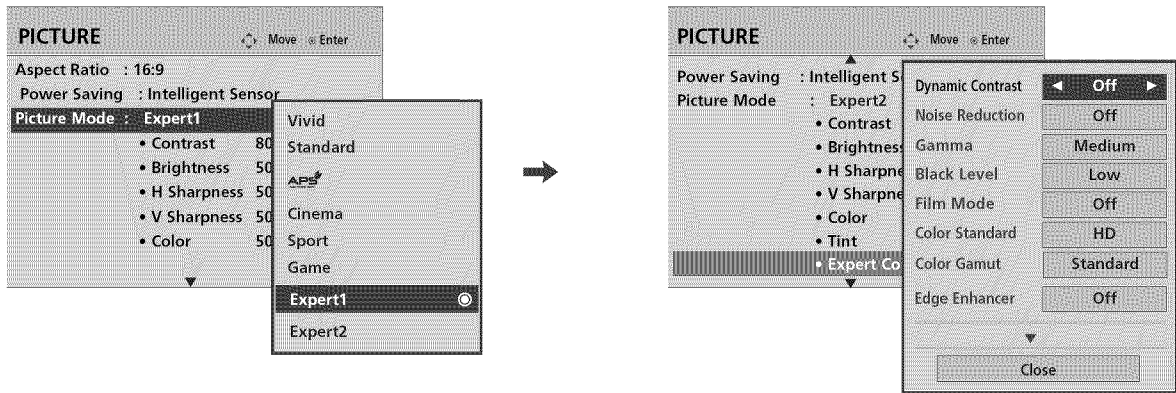
- 1   Select PICTURE.
- 2   Select **Advanced Control**.
- 3   Select your desired options.
- 4  Make appropriate adjustments.
- 5  Return to the previous menu.
-  Return to TV viewing.

PICTURE CONTROL














EXPERT PICTURE CONTROL

Expert1 and Expert2 provide even more advanced picture settings for users.

This may also be used by a professional to help optimize the TV performance in the environment the TV is in.



PICTURE CONTROL

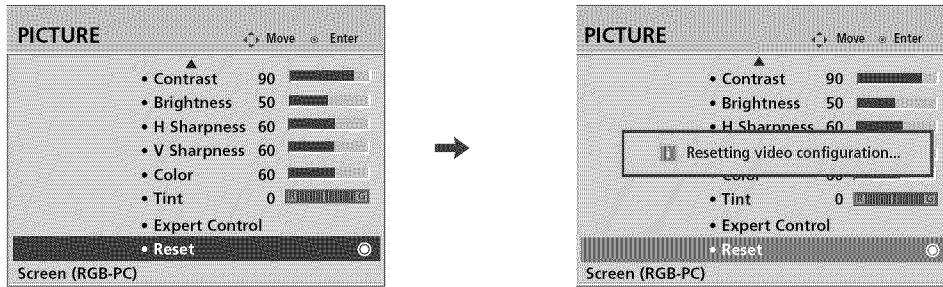
- 1   Select PICTURE.
- 2   Select Picture Mode.
- 3   Select Expert1 or Expert2.
- 4   Select Expert Control.
- 5   Select your desired menu option.
- 6  Make appropriate adjustments.
- 7  Return to the previous menu.
-  Return to TV viewing.

Dynamic Contrast	<ul style="list-style-type: none"> Adjusts the contrast to keep it at the best level according to the brightness of the screen. The picture is improved by making bright parts brighter and dark parts darker.
Dynamic Color	<ul style="list-style-type: none"> Adjusts screen colors so that they look livelier, richer and clearer. This feature enhances hue, saturation and luminance so that red, blue, green and white look more vivid.
Noise Reduction	<ul style="list-style-type: none"> Reduces screen noise without compromising video quality.
Gamma	<p><i>Low</i> : Make dark and middle gray level area of the picture brighter. <i>Medium</i>: Express original picture levels. <i>High</i>: Make dark and middle gray level area of the picture darker.</p> <ul style="list-style-type: none"> You can adjust brightness of dark area and middle gray level area of the picture.
Black Level	<p><i>Low</i>: The reflection of the screen gets darker. <i>High</i>: The reflection of the screen gets brighter. <i>Auto</i>: Realizing the black level of the screen and set it to High or Low automatically.</p> <ul style="list-style-type: none"> Set black level of the screen to proper level. This function enables to select 'Low' or 'High' in the following mode: AV (NTSC-M), HDMI or Component. Otherwise, 'Black level' is set to 'Auto'.
Film Mode	<ul style="list-style-type: none"> Makes video clips recorded in film look more natural by eliminating judder effect. DVD and Blu-ray movies are filmed at 24 frames per second.
Color Gamut	<p><i>Standard</i>: Displays standard color area. <i>Wide</i>: Mode to use and set the rich color area of the display.</p> <ul style="list-style-type: none"> Maximize the utilization of color to increase color quality.
Edge Enhancer	<ul style="list-style-type: none"> Show clearer and distinctive yet natural corners of the video.
Color Standard	<ul style="list-style-type: none"> Convert the color of a different video to HD color.
White Balance	<ul style="list-style-type: none"> This is the function to adjust the overall color of the screen to the feeling you want. <ol style="list-style-type: none"> Method : 2 Points <ul style="list-style-type: none"> Pattern: Inner, Outer Red/Green/Blue Contrast, Red/Green/Blue Brightness: The adjustment range is -50 - +50. Method : 20 Point IRE <ul style="list-style-type: none"> Pattern: Inner, Outer IRE (Institute of Radio Engineers) is the unit to display the size of the video signal and can be set among 5, 10, 15 - 95, 100. You can adjust Red, Green or Blue according to each setting. Red/Green/Blue: The adjustment range is -50 - +50.
Color Management System	<ul style="list-style-type: none"> As the tool used by the experts to make adjustments by using the test patterns, this does not affect other colors but can be used to selectively adjust the 6 color areas (Red/Green/Blue/Cyan/Mgt/Yellow). Color difference may not be distinctive even when you make the adjustments for the general video. <ul style="list-style-type: none"> Adjusts Red/Green/Blue/Yellow/Cyan, Magenta. <ul style="list-style-type: none"> Red/Green/Blue/Yellow/Cyan, Magenta Color: The adjustment range is -30 - +30. Red/Green/Blue/Yellow/Cyan, Magenta Tint: The adjustment range is -30 - +30. This feature is disable in RGB-PC and HDMI (PC) mode.

PICTURE CONTROL

PICTURE RESET

Settings of the selected picture modes return to the default factory settings.



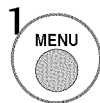

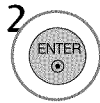
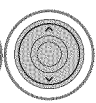

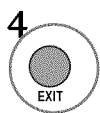
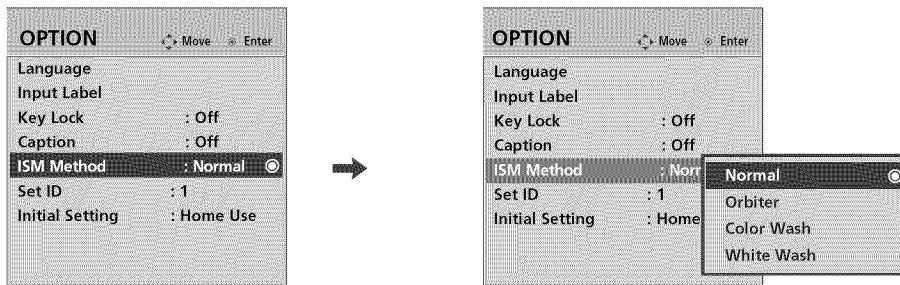








-   Select PICTURE.
-   Select Reset.
-  Initialize the adjusted value.
-  Return to TV viewing.

IMAGE STICKING MINIMIZATION (ISM) METHOD

A frozen still picture displayed on the screen for prolonged periods can result in a ghost image. You can use Orbiter to help prevent image sticking. The other two functions are for removing a ghost image.



- 1   Select **OPTION**.
- 2   Select **ISM Method**.
- 3   Select **Normal, Orbiter, Color Wash, or White Wash**.
- 4  Return to the previous menu.
-  Return to TV viewing.

- **Normal:** If image sticking is never a problem, ISM is not necessary - set to Normal.
- **Orbiter:** Orbiter may help prevent ghost images. However, it is best not to allow any fixed image to remain on the screen. To avoid a ghost image on the screen, the image will move every 2 minutes.
- **Color Wash:** The color block with the screen moved a little and the white pattern are alternately displayed. It is difficult to see the after image on all colors. Once it has been corrected it will not be visible in any color.
- **White Wash:** White Wash removes ghost images from the screen. Use sparingly. Watch the TV normally for a while before using this feature to see if the ghost image disappears on its own.

NOTE

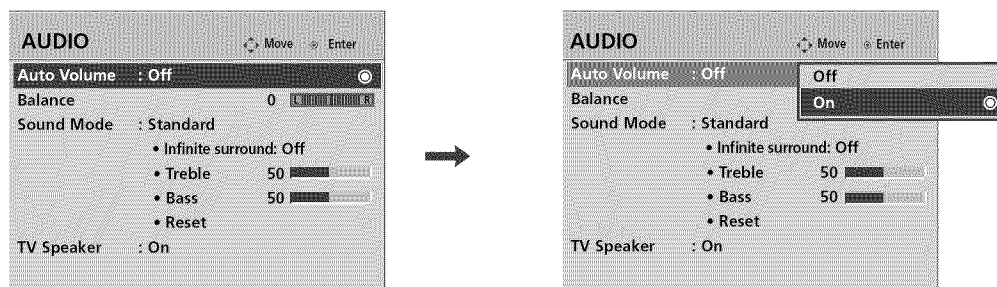
- ▶ An excessive ghosted image may be impossible to clear entirely with White Wash. To return to normal viewing, press the any button.









SOUND & LANGUAGE CONTROL

AUTO VOLUME LEVELER (AUTO VOLUME)

Auto Volume makes sure that the volume level remains consistent whether you are watching a commercial or a regular TV program.

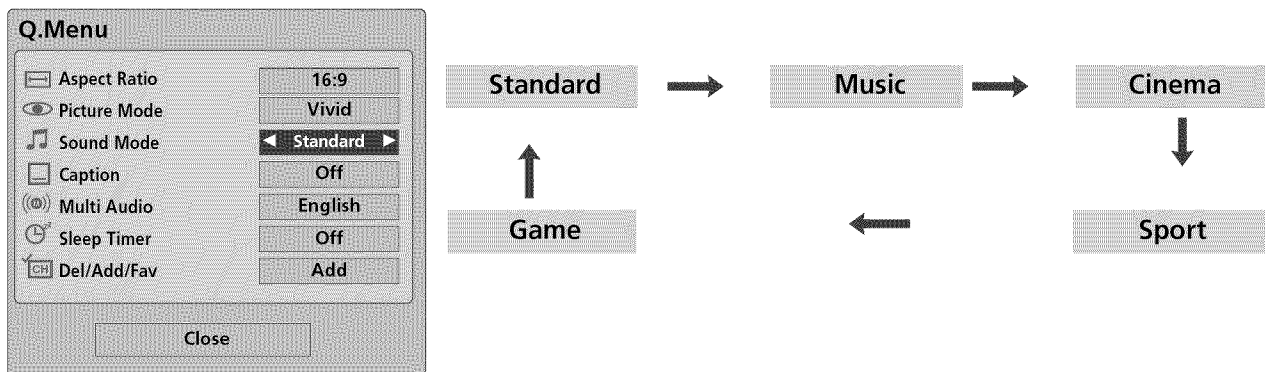
Because each broadcasting station has its own signal conditions, volume adjustment may be needed every time the channel is changed. This feature allows users to enjoy stable volume levels by making automatic adjustments for each program.



-   Select **AUDIO**.
-   Select **Auto Volume**.
-   Select **On** or **Off**.
-  Return to the previous menu.
-  Return to TV viewing.

PRESET SOUND SETTINGS (SOUND MODE)

Sound Mode lets you enjoy the best sound without any special adjustment as the TV sets the appropriate sound options based on the program content.



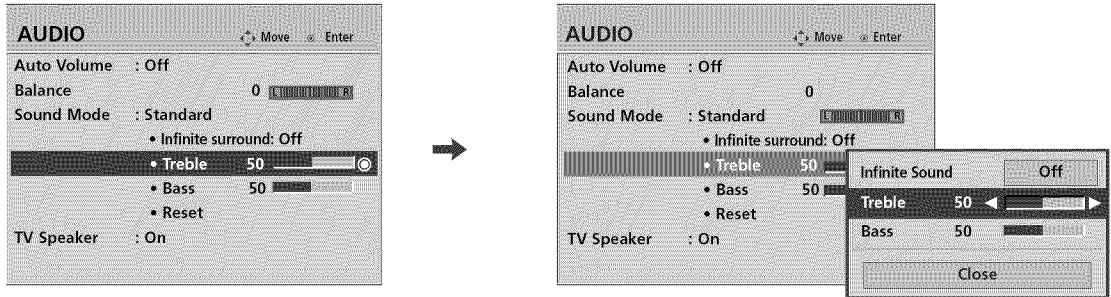
-   Select **Sound Mode**.
-  Select **Standard, Music, Cinema, Sport, or Game**.
-  Return to TV viewing.

- **Standard, Music, Cinema, Sport, and Game** are preset for optimum sound quality at the factory.
- You can also adjust **Sound Mode** in the **AUDIO** menu.
- **Standard**: Offers standard-quality sound.
- **Music**: Optimizes sound for listening to music.
- **Cinema**: Optimizes sound for watching movies.
- **Sport**: Optimizes sound for watching sports events.
- **Game**: Optimizes sound for playing games.

SOUND & LANGUAGE CONTROL

SOUND SETTING ADJUSTMENT - USER MODE

Adjust the sound to suit your taste and room situations.

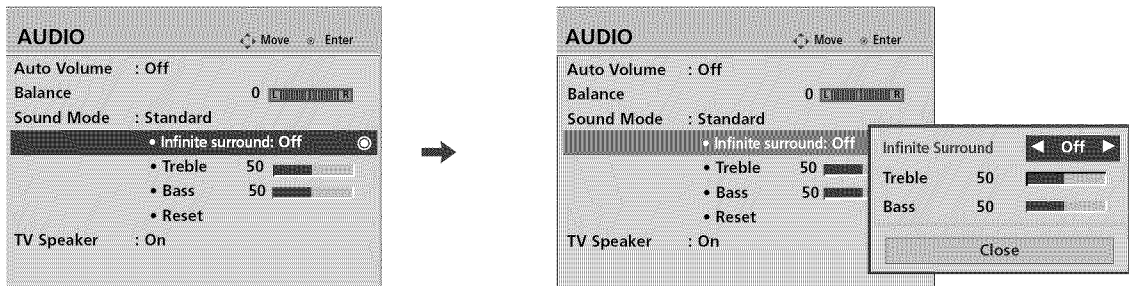


- 1 Select AUDIO.
- 2 Select Sound Mode.
- 3 Select Standard, Music, Cinema, Sport, or Game.

- 4 Select Treble or Bass.
- 5 Make appropriate adjustments.
- 6 Return to the previous menu.
- Return to TV viewing.

INFINITE SURROUND

Select this option to sound realistic.



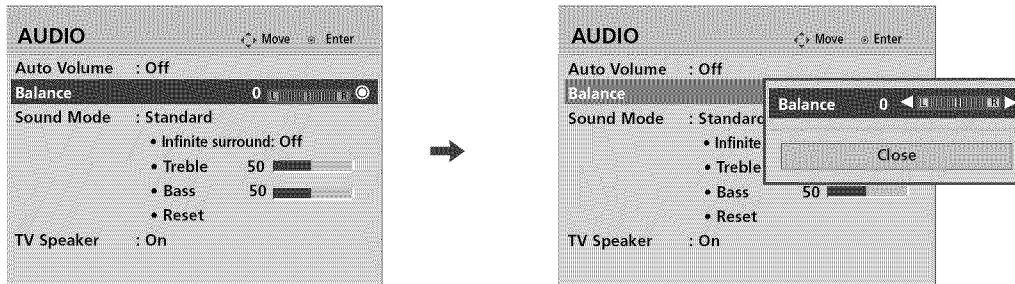
- 1 Select AUDIO.
- 2 Select Infinite Surround.
- 3 Select On or Off.

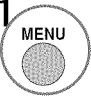



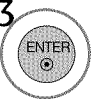
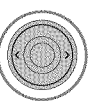


- 4 Return to the previous menu.
- Return to TV viewing.

■ If sound quality or volume is not at the level you want, it is recommended to use a separate home theater system or amp to cope with different user environments.

BALANCE

Adjust the left/right sound of speaker to suit your taste and room situations.

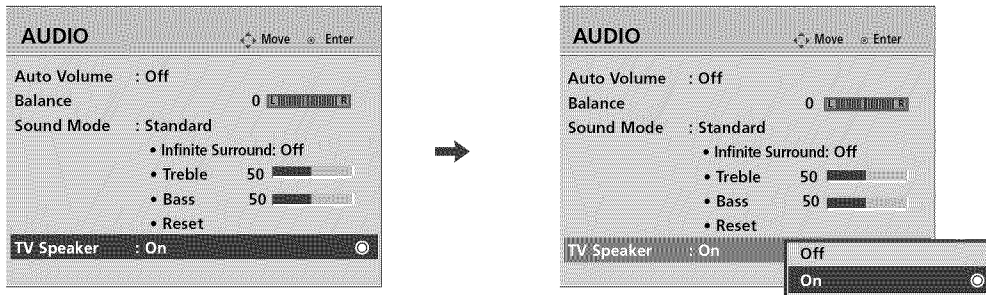


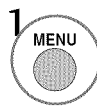
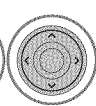

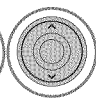
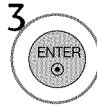
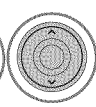


-   Select **AUDIO**.
-   Select **Balance**.
-   Make appropriate adjustments.
-  Return to the previous menu.
-  Return to TV viewing.

SOUND & LANGUAGE CONTROL

TV SPEAKERS ON/OFF SETUP

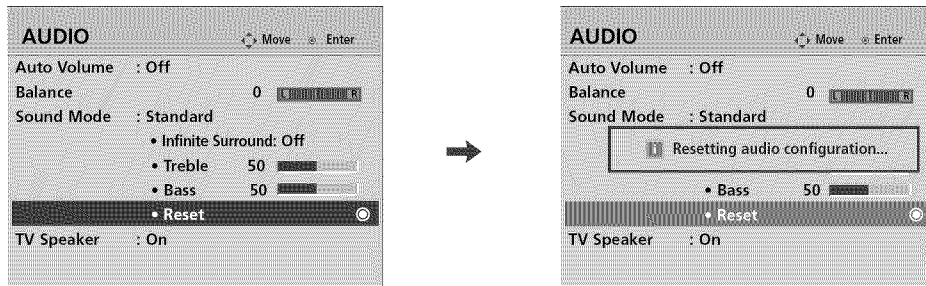
Turn the TV speakers off if using external audio equipment.









-   Select **AUDIO**.
-   Select **TV Speaker**.
-   Select **On** or **Off**.
-  Return to the previous menu.
-  Return to TV viewing.

AUDIO RESET

Settings of the selected Sound Mode return to the default factory settings.

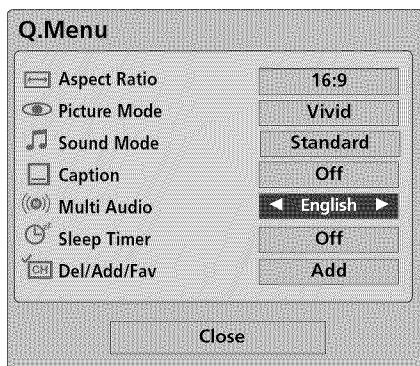


-   Select **AUDIO**.
-   Select **Reset**.
-  Initialize the adjusted value.
-  Return to TV viewing.

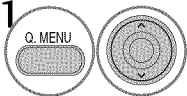


SOUND & LANGUAGE CONTROL

STEREO/SAP BROADCAST SETUP

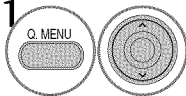


For Analog only: This TV can receive MTS stereo programs and any SAP (Secondary Audio Program) that accompanies the stereo program if the station transmits an additional sound signal. Mono sound is automatically used if the broadcast is only in Mono.



Analog TV

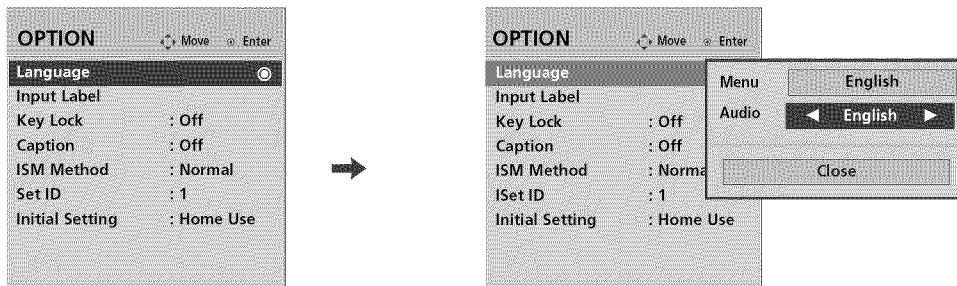
- 1  Select **SAP**.
- 2  Select **Mono, Stereo, or SAP**.
- 3  Return to TV viewing.











Digital TV

- 1  Select **Multi Audio**.
- 2  Select other languages.
- 3  Return to TV viewing.

AUDIO LANGUAGE

Other languages may be available if a digital signal is provided by the broadcasting station.
This feature operates only in DTV/CADTV mode.

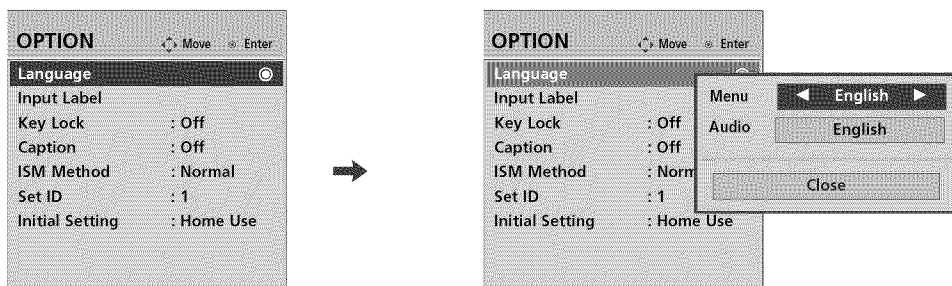


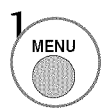

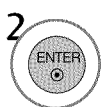

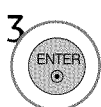
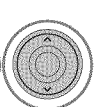

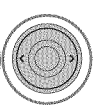
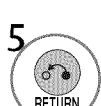
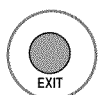
-   Select **OPTION**.
-   Select **Language**.
-   Select **Audio**.
-   Select your desired language.
-  Return to the previous menu.
-  Return to TV viewing.

SOUND & LANGUAGE CONTROL

ON-SCREEN MENUS LANGUAGE SELECTION

The menus can be shown on the screen in the selected language.

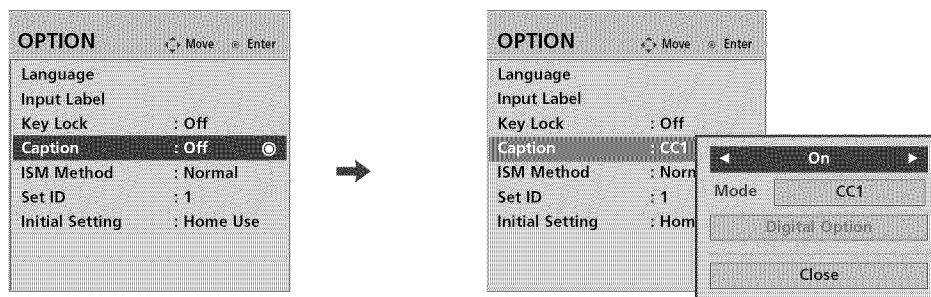


-   Select **OPTION**.
-   Select **Language**.
-   Select **Menu**.
-   Select your desired language.
From this point on, the on-screen menus will be shown in the selected language.
-  Return to the previous menu.
-  Return to TV viewing.

CAPTION MODE

Analog Broadcasting System Captions

Captions are provided to help people with hearing loss watch TV. Select a caption mode for displaying captioning information if provided on a program. Analog caption displays information at any position on the screen and is usually the program's dialog. Caption/Text, if provided by the broadcaster, would be available for both digital and analog channels on the Antenna/Cable. This TV is programmed to memorize the caption/text mode which was last set when you turned the power off. This function is only available when **Caption Mode** is set **On**.



- 1 Select **OPTION**.
- 2 Select **Caption**.
- 3 Select **On**.
- 4 Select **CC1-4** or **Text1-4**.
- 5 Return to the previous menu.
- Return to TV viewing.

- When selecting **Off**, Sub-menus for Analog, DTV, and Digital Option become disabled.
- **CAPTION**
The term for the words that scroll across the bottom of the TV screen; usually the audio portion of the program provided for the hearing impaired.
- **TEXT**
The term for the words that appear in a large black frame and almost cover the entire screen; usually messages provided by the broadcaster.

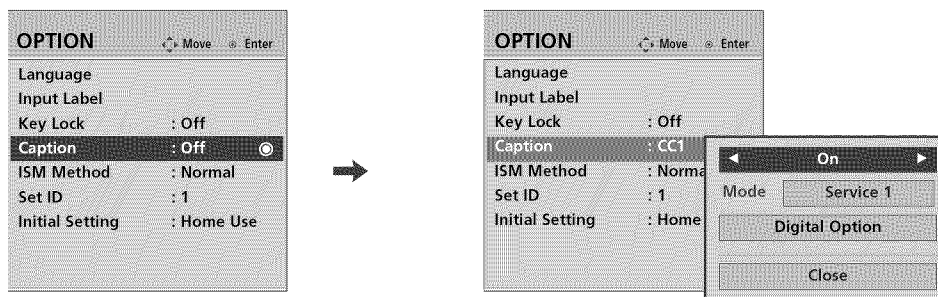
SOUND & LANGUAGE CONTROL

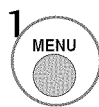
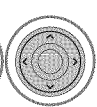
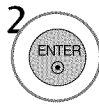
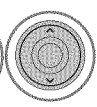
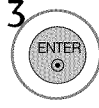
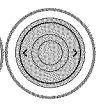
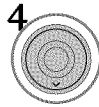
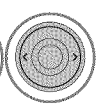


Digital Broadcasting System Captions

Choose the language you want the DTV/CADTV Captions to appear in.

Other Languages can be chosen for digital sources only if they are included on the program.

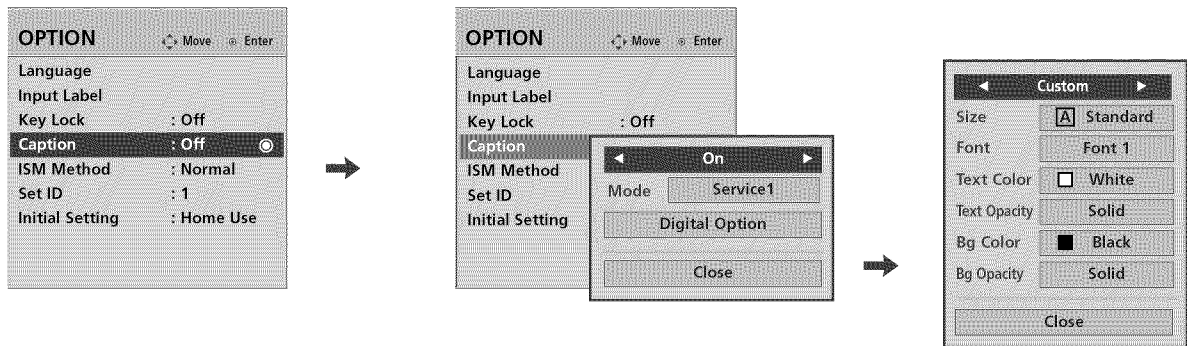
This function is only available when Caption Mode is set On.



-   Select **OPTION**.
-   Select **Caption**.
-   Select **On**.
-   Select **CC1-4, Text1-4, or Service1 - 6**.
-  Return to the previous menu.
-  Return to TV viewing.

Caption Option

Customize the DTV/CADTV captions that appear on your screen.
This function is only available when Caption Mode is turned On.



1 Select **OPTION**.

2 Select **Caption**

3 Select **On**.

4 Select **Digital Option**.

5 Select **Custom**.

6 Customize the **Style, Font**, etc., to your preference. A preview icon is provided at the bottom of the screen, use it to see the caption language.

7 Return to the previous menu.

Return to TV viewing.

- **Size:** Set the word size.
- **Font:** Select a typeface for the text.
- **Text Color:** Choose a color for the text.
- **Text Opacity:** Specify the opacity for the text color.
- **Bg (Background) Color:** Select a background color.
- **Bg (Background) Opacity:** Select the opacity for the background color.

TIME SETTING

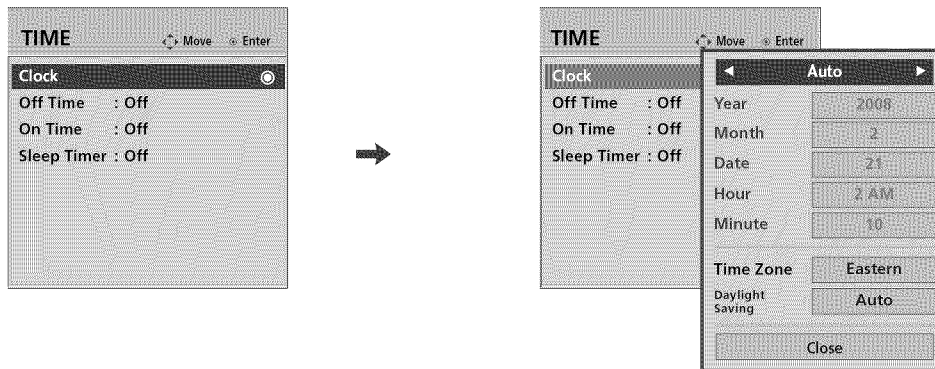
CLOCK SETTING

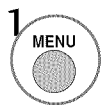

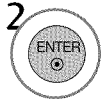



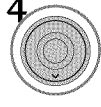

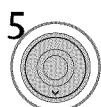
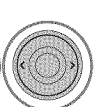

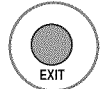
Auto Clock Setup

The time is set automatically from a digital channel signal.

The digital channel signal includes information for the current time provided by the broadcasting station.

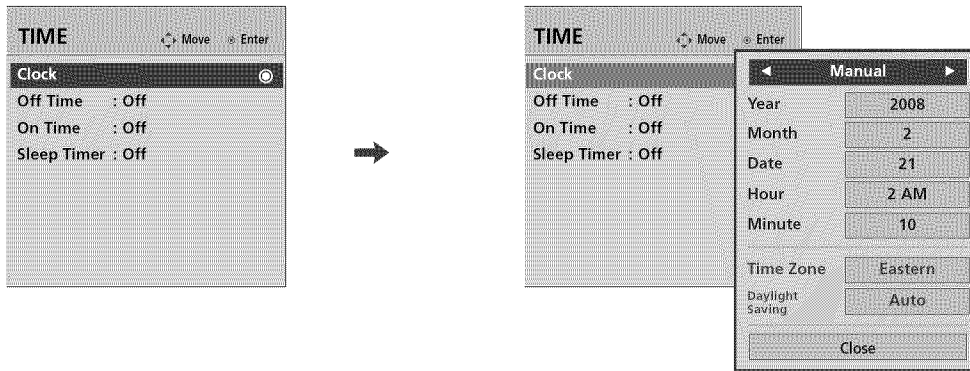
Set the clock manually if the current time is set incorrectly by the auto clock function.













-   Select **TIME**.
-   Select **Clock**.
-   Select **Auto**.
-   Select your viewing area time zone.
Eastern, Central, Mountain, Pacific, Alaska, or Hawaii.
-   Select **Auto, On, or Off** (depending on whether or not your viewing area observes Daylight Saving time).
-  Return to the previous menu.
-  Return to TV viewing.

Manual Clock Setup

If the current time setting is wrong, set the clock manually.



-   Select **TIME**.
-   Select **Clock**.
-   Select **Manual**.
-  Select the Year, Month, Date, Hour, or Minutes option.
-  Set the Year, Month, Date, Hour, or Minutes option.
-  Return to the previous menu.
-  Return to TV viewing.

▶ If you unplug the TV once or turn the main power off, the clock function reset.

TIME SETTING

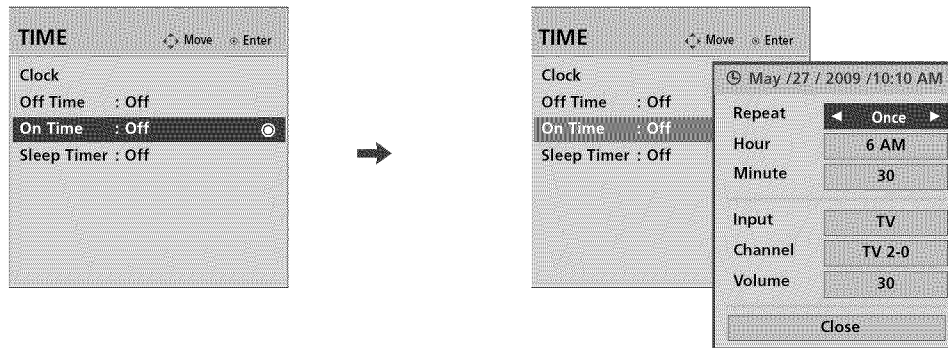
AUTO ON/OFF TIME SETTING












This function operates only if the current time has been set.

The **Off Time** function overrides the **On Time** function if they are both set to the same time.








The TV must be in standby mode for the **On Time** to work.

If you do not press any button within 2 hours after the TV turns on with the **On Time** function, the TV will automatically revert to standby mode.



- 1   Select **TIME**.
- 2   Select **Off time** or **On time**.
- 3   Select **Repeat**.
- 4  Select **Off, Once, Daily, Mon.~Fri., Mon.~Sat., Weekend, or Sunday**.
- 5   Select and set **Hour** or **Minute**.
- 6  Return to the previous menu.
-  Return to TV viewing.

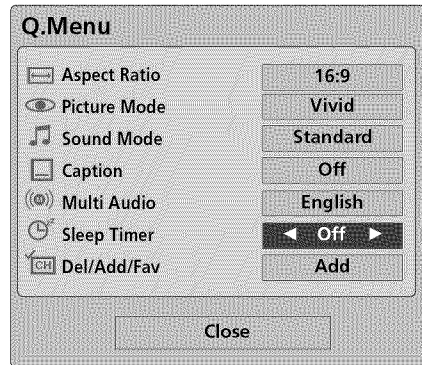
- To cancel **On/Off Time** function, select **Off**.
- Only for **On Time** function

- 1   Select **Input**.
- 2  Select the desired input source.
- 3   When Selecting **TV**: set the channel at turn-on.
- 4   Adjust to sound level at turn-on.


SLEEP TIMER SETTING


The Sleep Time turns the TV off at the preset time.

Note that this setting is cleared when the TV is turned off.



1   Select Sleep Timer.

2  Select Off, 10, 20, 30, 60, 90, 120, 180, or 240 minutes.

3  Return to TV viewing.

■ You can also adjust Sleep Timer in the TIME menu.

PARENTAL CONTROL / RATINGS

Parental Control can be used to block specific channels, ratings and other viewing sources.

The Parental Control Function (V-Chip) is used to block program viewing based on the ratings sent by the broadcasting station. The default setting is to allow all programs to be viewed. Viewing can be blocked by choosing the type of the program and the categories. It is also possible to block all program viewing for a time period. To use this function, the following must be done :

1. Set ratings and categories to be blocked.
2. Specify a password
3. Enable the lock

V-Chip rating and categories

Rating guidelines are provided by broadcasting stations. Most television programs and television movies can be blocked by TV Rating and/or Individual Categories. Movies that have been shown at the theaters or direct-to-video movies use the Movie Rating System (MPAA) only.

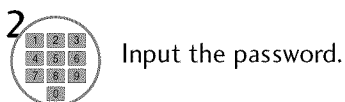
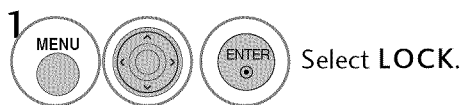
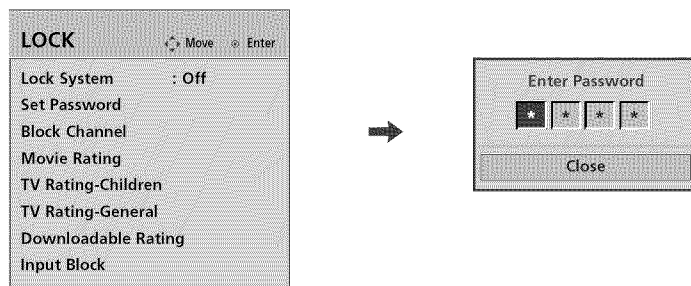
Ratings for Television programs including made-for-TV movies :

- TV-G (General audience)
- TV-PG (Parental guidance suggested)
- TV-14 (Parents strongly cautioned)
- TV-MA (Mature audience only)
- TV-Y (All children)
- TV-Y7 (Children 7 years older)

SET PASSWORD & LOCK SYSTEM

Setting up Your Password

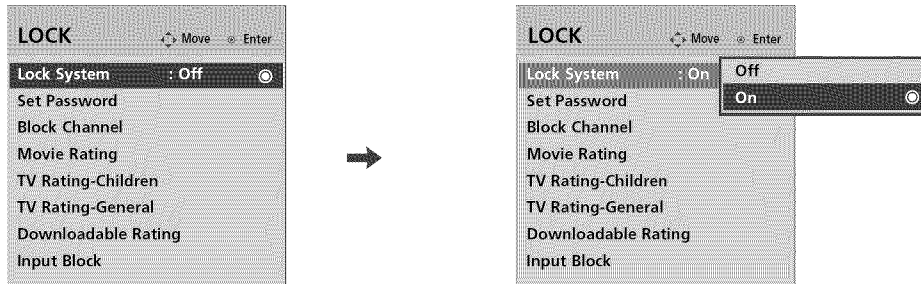
Set up blocking schemes to block specific channels, ratings, and external viewing sources. A password is required to gain access to this menu.







- Enter the password as requested.
- If you forgot your password, press "0-3-2-5" on the remote control.

Lock System

Enables or disables the blocking scheme you set up previously.





1    Select **LOCK**.

2  Input the password.

3  Select **Lock System**.

4   Select **On** or **Off**.

5  Return to the previous menu.

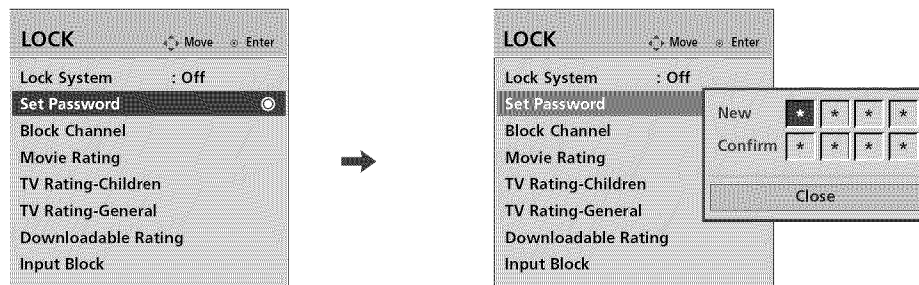
 Return to TV viewing.

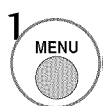


■ When you select **On**, the Lock System is enable.

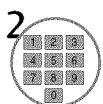
PARENTAL CONTROL / RATINGS

Set Password

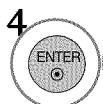
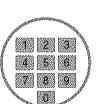
Change the password by inputting a new password twice.




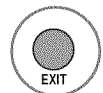
1    Select **LOCK**.

2  Input the password.

3  Select **Set password**.

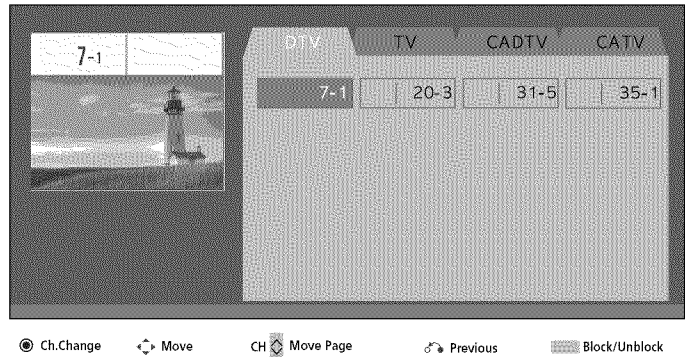
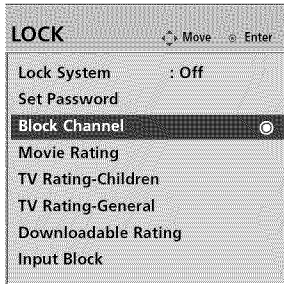
4   Choose any 4 digits for your new password.
As soon as the 4 digits are entered, re-enter the same 4 digits on the **Confirm**.











5  Return to the previous menu.

 Return to TV viewing.

CHANNEL BLOCKING

Blocks any channels that you do not want to watch or that you do not want your children to watch.



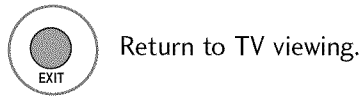
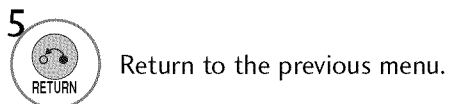
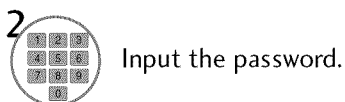
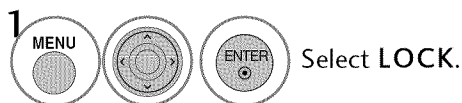
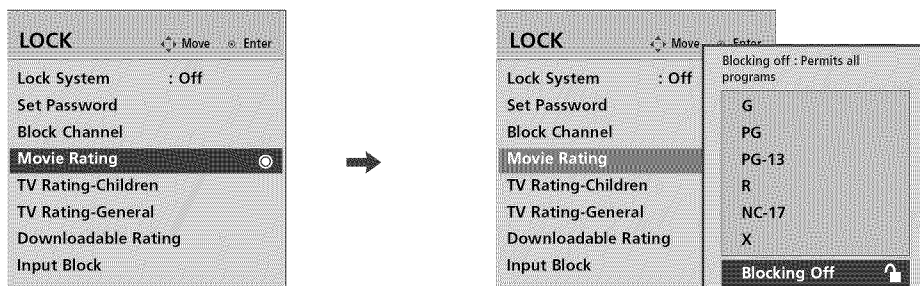
- 1    Select **LOCK**.
- 2  Input the password.
- 3  Select **Block Channel**.
- 4   Select a channel to block or unblock.
- 5  Block or unblock a channel.
- 6  Return to the previous menu.
-  Return to TV viewing.

PARENTAL CONTROL / RATINGS

MOVIE & TV RATING

Movie Rating (MPAA)

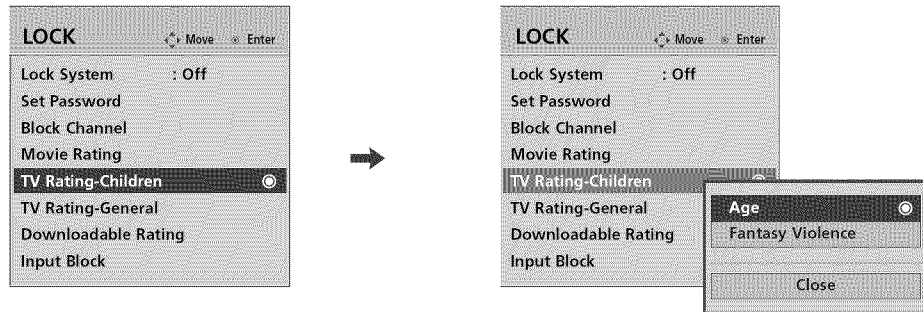
Blocks movies according to the movie ratings limits specified, so children cannot view certain movies. You can set the ratings limit by blocking out all the movies with the ratings above a specified level. Keep in mind that the movie ratings limit only applies to movies shown on TV, not TV programs, such as soap operas.














- G (General audience)
- PG (Parental guidance suggested)
- PG-13 (Parents strongly cautioned)
- R (Restricted)
- NC-17 (No one 17 and under admitted)
- X (Adult only)
- Blocking Off (Permits all programs)
- ▶ If you set PG-13: G and PG movies will be available, PG-13, R, NC-17 and X will be blocked.

TV Rating Children

Prevents children from watching certain children's TV programs, according to the ratings limit set. The children rating does not apply to other TV programs. Unless you block certain TV programs intended for mature audiences in the TV Rating - sub menu, your children can view those programs.



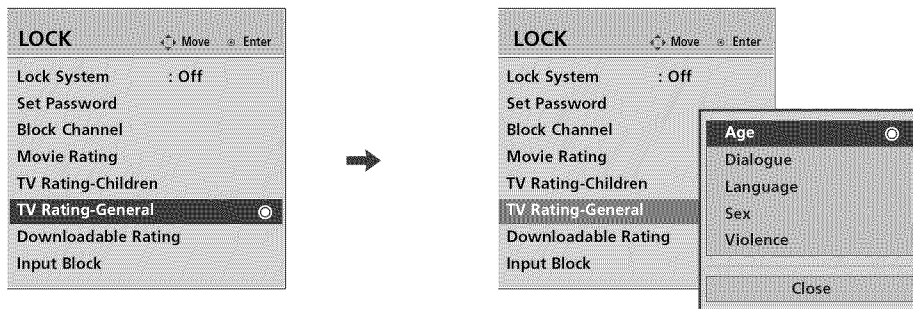
- 1    Select **LOCK**.
- 2  Input the password.
- 3  Select **TV Rating-Children**.
- 4   Select **Age** or **Fantasy Violence**.
- 5   Select block options.
- 6  Return to the previous menu.
-  Return to TV viewing.

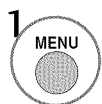
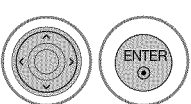
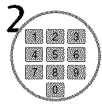
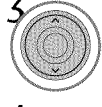


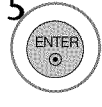
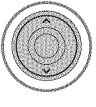

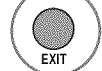
- Age (applies to TV-Y, TV-Y7)
- Fantasy Violence (applies to TV-Y7)

PARENTAL CONTROL / RATINGS

TV Rating General

Based on the ratings, blocks certain TV programs that you and your family do not want to view.



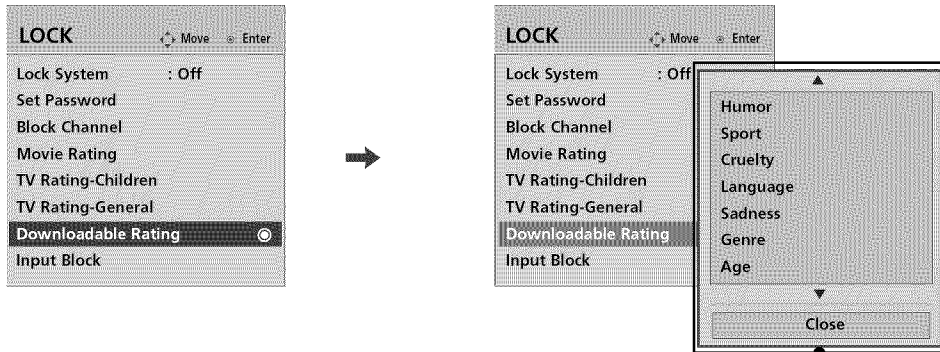
-   Select **LOCK**.
-  Input the password.
-  Select **TV Rating-General**.
-   Select **Age, Dialogue, Language, Sex, or Violence**.
-   Select block options.
-  Return to the previous menu.
-  Return to TV viewing.

- Age (applies to TV-G,TV-PG,TV-14,TV-MA).
- Dialogue-sexual dialogue (applies to TV-PG,TV-14).
- Language-adult language (applies to TV-PG, TV-14, TV-MA).
- Sex-sexual situations (applies to TV-PG, TV-14, TV-MA).
- Violence (applies to TV-PG, TV-14, TV-MA).












DOWNLOADABLE RATING

This function is available only for digital channels.

This function operates only when TV has received Region5 Rating data.



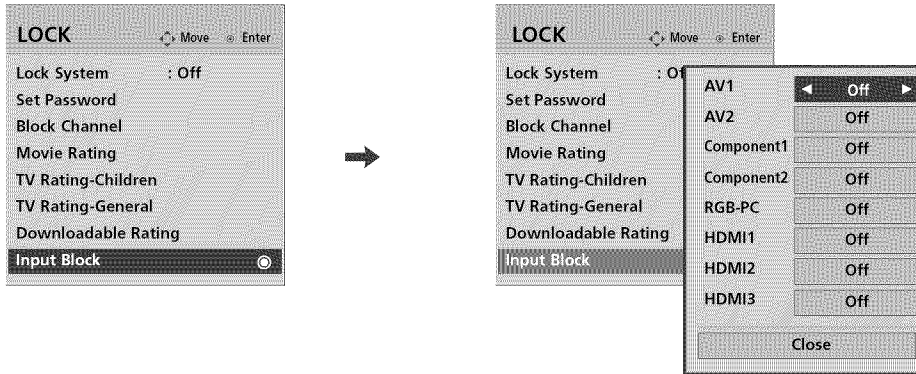
■ Based on rating table, your TV's OSD (On Screen Display) may differ slightly from what is shown in this manual.

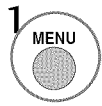
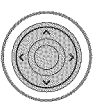
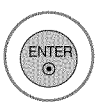
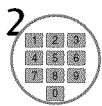
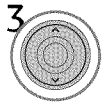
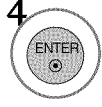

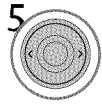

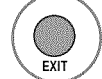
- 1    Select **LOCK**.
- 2  Input the password.
- 3  Select **Downloadable Rating**.
- 4   Select desired **Downloadable Rating** option.
- 5   Select desired option and block it.
- 6  Return to the previous menu.
-  Return to TV viewing.

PARENTAL CONTROL / RATINGS

EXTERNAL INPUT BLOCKING

Enables you to block an input.



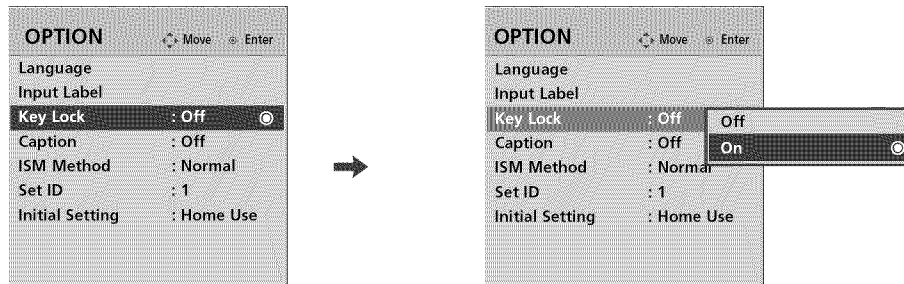
-    Select **LOCK**.
-  Input the password.
-  Select **Input Block**.
-   Select input source.
-  Select **On** or **Off**.
-  Return to the previous menu.
-  Return to TV viewing.









KEY LOCK

The TV can be set up so that it can only be used with the remote control.

This feature can be used to prevent unauthorized viewing by locking out the front panel controls.

This TV is programmed to remember which option it was last set to even if you turn the TV off.



- 1   Select **OPTION**.
- 2   Select **Key Lock**.
- 3   Select **On** or **Off**.
- 4  Return to the previous menu.
-  Return to TV viewing.

- In **Key Lock 'On'**, if the TV is turned off, press the $\phi/|$ (power), **INPUT**, **CH ^**, **CH v** button on the TV or **POWER**, **INPUT**, **CH ^**, **CH v** or **NUMBER** buttons on the remote control.
- With the **Key Lock On**, the display **'▲ Key Lock'** appears on the screen if any button (Except $\phi/|$ (power) button) on the front panel is pressed while viewing the TV.

APPENDIX

TROUBLESHOOTING

Abnormal Operation	
The remote control doesn't work	<ul style="list-style-type: none">■ Check to see if there is any object between the product and the remote control causing obstruction. Ensure you are pointing the remote control directly at the TV.■ Ensure that the batteries are installed with correct polarity (+ to +, - to -).■ Ensure that the correct remote operating mode is set: TV, VCR etc.■ Install new batteries. <p style="text-align: right;">*This feature is not available for all models.</p>
Power is suddenly turned off	<ul style="list-style-type: none">■ Is the sleep timer set?■ Check the power control settings. Power interrupted.■ TV will be automatically turned off, in case of no signal for 15 minutes.

Video Problems	
No picture & No sound	<ul style="list-style-type: none">■ Check whether the product is turned on.■ Try another channel. The problem may be with the broadcast.■ Is the power cord inserted into wall power outlet?■ Check your antenna direction and/or location.■ Test the wall power outlet, plug another product's power cord into the outlet where the product's power cord was plugged in.
Picture appears slowly after switching on	<ul style="list-style-type: none">■ This is normal, the image is muted during the product startup process. Please contact your service center, if the picture has not appeared after five minutes.
No or poor color or poor picture	<ul style="list-style-type: none">■ Adjust Color in menu option.■ Keep a sufficient distance between the product and the VCR.■ Try another channel. The problem may be with the broadcast.■ Are the video cables installed properly?■ Activate any function to restore the brightness of the picture.
Horizontal/vertical bars or picture shaking	<ul style="list-style-type: none">■ Check for local interference such as an electrical appliance or power tool.
Poor reception on some channels	<ul style="list-style-type: none">■ Station or cable product experiencing problems, tune to another station.■ Station signal is weak, reorient antenna to receive weaker station.■ Check for sources of possible interference.
Lines or streaks in pictures	<ul style="list-style-type: none">■ Check antenna (Change the direction of the antenna).
No picture when connecting HDMI	<ul style="list-style-type: none">■ Check High Speed HDMI cable.■ If an HDMI cable doesn't support High Speed HDM, it can cause flickers or no screen display. In this case use the latest cables that support High Speed HDMI.

Audio Problems

Picture OK & No sound	<ul style="list-style-type: none">■ Press the VOL or VOLUME button.■ Sound muted? Press MUTE button.■ Try another channel. The problem may be with the broadcast.■ Are the audio cables installed properly?
No output from one of the speakers	<ul style="list-style-type: none">■ Adjust Balance in menu option.
Unusual sound from inside the product	<ul style="list-style-type: none">■ A change in ambient humidity or temperature may result in an unusual noise when the product is turned on or off and does not indicate a fault with the product.
No sound when connecting HDMI	<ul style="list-style-type: none">■ Check High Speed HDMI cable.

*This feature is not available for all models.

PC Mode Problems

The signal is out of range	<ul style="list-style-type: none">■ Adjust resolution, horizontal frequency, or vertical frequency.■ Check the input source.
Vertical bar or stripe on background & Horizontal Noise & Incorrect position	<ul style="list-style-type: none">■ Work the Auto configure or adjust clock, phase, or H/V position. (Option)
Screen color is unstable or single color	<ul style="list-style-type: none">■ Check the signal cable.■ Reinstall the PC video card.

MAINTENANCE

Early malfunctions can be prevented. Careful and regular cleaning can extend the amount of time you can enjoy your new TV.

Caution: Be sure to turn the power off and unplug the power cord before you begin any cleaning.

Cleaning the Screen

- 1 Here's a great way to keep the dust off your screen for a while. Wet a soft cloth in a mixture of lukewarm water and a little fabric softener or dish washing detergent. Wring the cloth until it's almost dry, and then use it to wipe the screen.
- 2 Make sure the excess water is off the screen, and then let it air-dry before you turn on your TV.

Cleaning the Cabinet

- To remove dirt or dust, wipe the cabinet with a soft, dry, lint-free cloth.
- Please be sure not to use a wet cloth.

Extended Absence

CAUTION

- ▶ If you expect to leave your TV dormant for a long time (such as a vacation), it's a good idea to unplug the power cord to protect against possible damage from lightning or power surges.

PRODUCT SPECIFICATIONS

MODEL		Z50PV220 (Z50PV220-UA)	Z60PV220 (Z60PV220-UA)
Dimensions (Width x Height x Depth)	With stand	1171.9 mm x 770.9 mm x 289.8 mm (46.1 inch x 30.3 inch x 11.4 inch)	1390.8 mm x 905.2 mm x 334.7 mm (46.1 inch x 30.3 inch x 11.4 inch)
	Without stand	1171.9 mm x 712.2 mm x 52.5 mm (46.1 inch x 28 inch x 2 inch)	1390.8 mm x 835.5 mm x 52.5 mm (54.7 inch x 32.8 inch x 2 inch)
Weight	With stand	29.8 kg (65.6 lb)	42.6 kg (93.9 lb)
	Without stand	275 kg (60.6 lb)	38.5 kg (84.8 lb)
MODEL		Z42PT320 (Z42PT320-UC)	Z50PT320 (Z50PT320-UC)
Dimensions (Width x Height x Depth)	With stand	991.8 mm x 667 mm x 230.5 mm (39 inch x 26.2 inch x 9 inch)	1176.1 mm x 774.7 mm x 289.8 mm (46.3 inch x 30.5 inch x 11.4 inch)
	Without stand	991.8 mm x 613.8 mm x 52.5 mm (39 inch x 24.1 inch x 2 inch)	1176.1 mm x 716.5 mm x 52.5 mm (46.3 inch x 28.2 inch x 2 inch)
Weight	With stand	21.5 kg (47.3 lb)	29.6 kg (65.2 lb)
	Without stand	20 kg (44 lb)	273 kg (60.1 lb)
Power requirement	AC 100-240 V ~ 50/60 Hz		
Television System	NTSC-M, ATSC, 64 & 256 QAM		
Program Coverage	VHF 2-13, UHF 14-69, CATV 1-135, DTV 2-69, CADTV 1-135		
External Antenna Impedance	75 Ω		
Environment condition	Operating Temperature	32 - 104 °F (0 - 40 °C)	
	Operating Humidity	Less than 80%	
	Storage Temperature	-4 - 140 °F (-20 - 60 °C)	
	Storage Humidity	Less than 85%	

■ The specifications shown above may be changed without prior notice for quality improvement.

IR CODES

(This feature is not available for all models.)

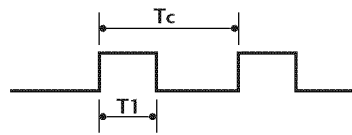
1. How to Connect

- Connect your wired remote control to the Remote Control port on the TV.

2. Remote Control IR Codes

■ Output waveform

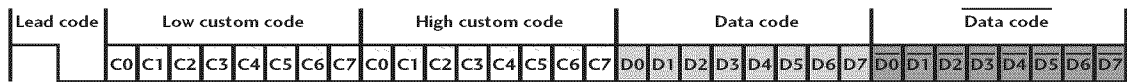
Single pulse, modulated with 37.917KHz signal at 455KHz



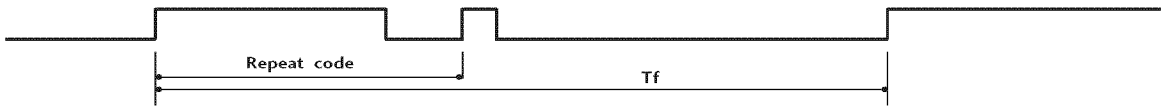
Carrier frequency
 $FCAR = 1/TC = fOSC/12$
 Duty ratio = $T1/TC = 1/3$

■ Configuration of frame

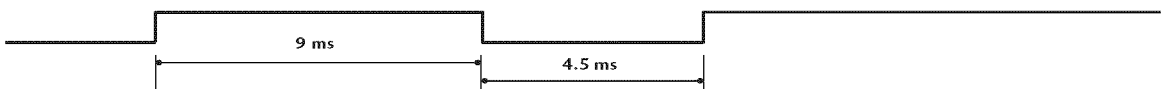
1st frame



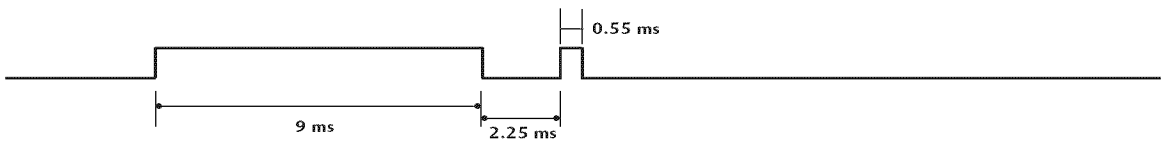
Repeat frame



■ Lead code



■ Repeat code

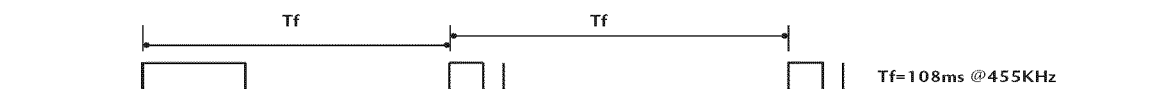


■ Bit description



■ Frame interval: Tf

The waveform is transmitted as long as a key is depressed.



Tf=108ms @455KHz

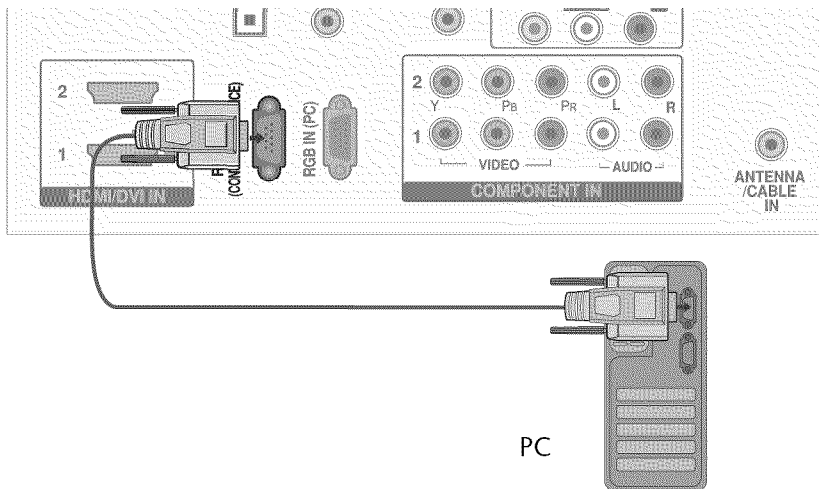
Code (Hexa)	Function	Note	Code (Hexa)	Function	Note
08	POWER	Remote control Button (Power On/Off)	D6	TV	Discrete IR Code (TV Input Selection)
45	Q.MENU	Remote control Button	C4	POWER ON	Discrete IR Code (Only Power On)
43	MENU	Remote control Button	C5	POWER OFF	Discrete IR Code (Only Power Off)
0B	INPUT	Remote control Button	5A	AV1	Discrete IR Code (AV1 Input Selection)
10-19	Number Key 0-9	Remote control Button	D0	AV2	Discrete IR Code (AV2 Input Selection)
4C	- Dash (List)	Remote control Button	BF	COMPONENT1	Discrete IR Code (Component1 Input Selection)
1A	FLASHBK	Remote control Button	D4	COMPONENT2	Discrete IR Code (Component2 Input Selection)
09	MUTE	Remote control Button	D5	RGB-PC	Discrete IR Code (RGB-PC Input Selection)
02	VOL +	Remote control Button	CE	HDMI1	Discrete IR Code (HDMI1 Input Selection)
03	VOL -	Remote control Button	CC	HDMI2	Discrete IR Code (HDMI2 Input Selection)
00	CH ^	Remote control Button	E9	HDMI3	Discrete IR Code (HDMI3 Input Selection)
01	CH v	Remote control Button	76	Ratio 4:3	Discrete IR Code (Only 4:3 Mode)
1E	FAV	Remote control Button	77	Ratio 16:9	Discrete IR Code (Only 16:9 Mode)
40	^	Remote control Button	AF	Ratio Zoom	Discrete IR Code (Only Zoom1 Mode)
41	v	Remote control Button			
07	<	Remote control Button			
06	>	Remote control Button			
44	ENTER	Remote control Button			
28	RETURN	Remote control Button			
79	RATIO	Remote control Button			
65	FREEZE	Remote control Button			
95	POWER SAVING	Remote control Button			
AA	INFO	Remote control Button			
72	Red	Remote control Button			
71	Green	Remote control Button			
63	Yellow	Remote control Button			
61	Blue	Remote control Button			
0F	TV	Remote control Button			
5B	EXIT	Remote control Button			

EXTERNAL CONTROL THROUGH RS-232C

The RS-232C port allows you connect the RS-232C input jack to an external control device (such as a computer or an A/V control system) to control the TV's functions externally.

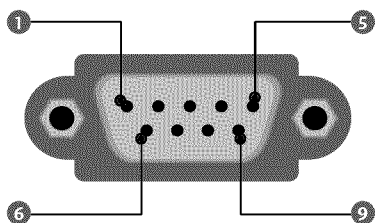
- Note: RS-232C on this unit is intended to be used with third party RS-232C control hardware and software. The instructions below are provided to help with programming software or to test functionality using telenet software.

RS-232C Setup



Type of Connector; D-Sub 9-Pin Male

No.	Pin Name
1	No connection
2	RXD (Receive data)
3	TXD (Transmit data)
4	DTR (DTE side ready)
5	GND
6	DSR (DCE side ready)
7	RTS (Ready to send)
8	CTS (Clear to send)
9	No Connection

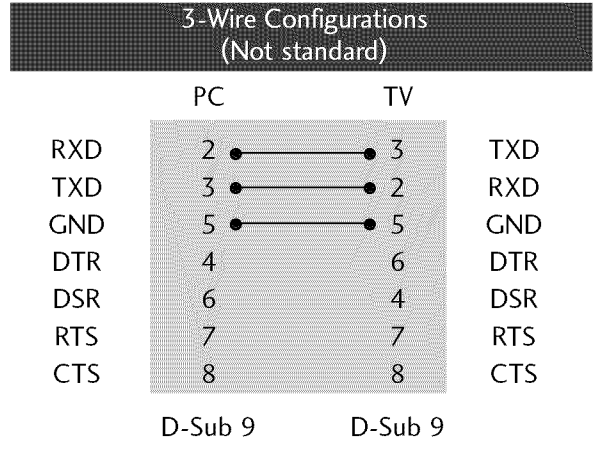
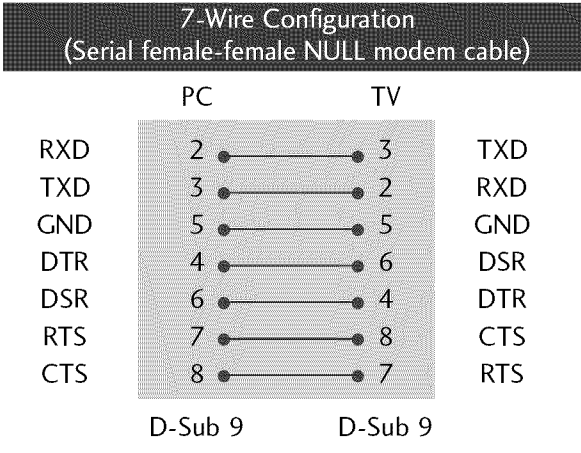


Communication Parameters

- Baud rate : 9600 bps (UART)
- Data length : 8 bits
- Parity : None
- Stop bit : 1 bit
- Communication code : ASCII code
- Use a crossed (reverse) cable.

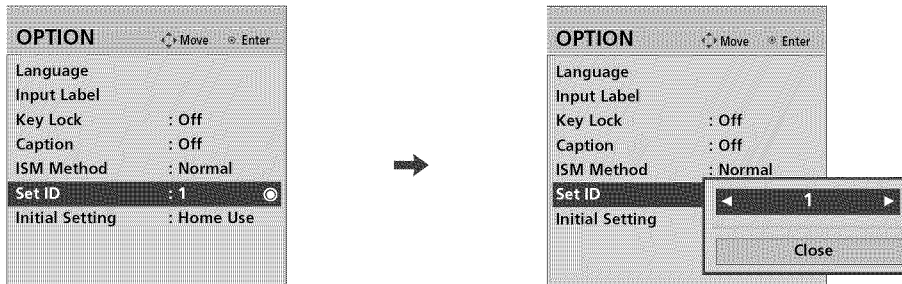
RS-232C Configurations

Either cable below can be used.



Set ID

Use this function to specify a TV ID number.
Refer to 'Real Data Mapping'.



- 1 Select **OPTION**.
- 2 Select **Set ID**.
- 3 Choose the desired TV ID number.
The adjustment range of Set ID is 1 ~ 99.
- 4 Return to the previous menu.
- Return to TV viewing.

*Real data mapping	
0	: Step 0
⋮	
A	: Step 10 (SET ID 10)
⋮	
F	: Step 15 (SET ID 15)
10	: Step 16 (SET ID 16)
⋮	
63	: Step 99 (SET ID 99)
64	: Step 100

Command Reference List

	COMMAND1	COMMAND2	DATA (Hexadecimal)		COMMAND1	COMMAND2	DATA (Hexadecimal)
01. Power	k	a	00 - 01	13. Remote Control			
02. Input Select	x	b	(▶ p.91)	Lock Mode	k	m	00 - 01
03. Aspect Ratio	k	c	(▶ p.91)	14. Treble	k	r	00 - 64
04. Screen Mute	k	d	00 - 01	15. Bass	k	s	00 - 64
05. Volume Mute	k	e	00 - 01	16. Balance	k	t	00 - 64
06. Volume Control	k	f	00 - 64	17. Color Temperature	x	u	00 - 64
07. Contrast	k	g	00 - 64	18. ISM Method	j	p	(▶ p.92)
08. Brightness	k	h	00 - 64	19. Power Saving	j	q	00 - 01
09. Color	k	i	00 - 64	20. Auto Configuration	j	u	(▶ p.92)
10. Tint	k	j	00 - 64	22. Channel Add/Del	m	b	00 - 01
11. Sharpness	k	k	00 - 64	23. Key	m	c	(▶ p.93)
12. OSD Select	k	l	00 - 01				

	COMMAND1	COMMAND2	DATA00 (Hexadecimal)	DATA01 (Hexadecimal)	DATA02 (Hexadecimal)	DATA03 (Hexadecimal)	DATA04 (Hexadecimal)	DATA05 (Hexadecimal)
21. Channel Tuning	m	a	physical program high	major program low	major low	minor high	minor low	attribute

Transmission / Receiving Protocol

Transmission

[Command1][Command2][][Set ID][][Data][Cr]

[Command 1] : First command to control the set.(j, k, m or x)

[Command 2] : Second command to control the set.

[Set ID] : You can adjust the set ID to choose desired TV ID number in Setup menu. Adjustment range is 1~99. When selecting Set ID '0', every connected the TV is controlled. Set ID is indicated as decimal (1~99) on menu and as Hexa decimal (0x0~0x63) on transmission/receiving protocol.

[DATA] : To transmit the command data.

Transmit the 'FF' data to read status of command.

[Cr] : Carriage Return

ASCII code '0x0D'

[] : ASCII code 'space (0x20)'

* In this model, TV will not send the status during the standby mode.

OK Acknowledgement

[Command2][][Set ID][][OK][Data][x]

The TV transmits ACK (acknowledgement) based on this format when receiving normal data. At this time, if the data is data read mode, it indicates present status data. If the data is data write mode, it returns the data of the PC computer.

* In this model, TV will not send the status during the standby mode.

* Data Format

[Command 2] : Use as command.

[Set ID] : Use the small character, if set ID is 10, it will send the '0', 'a'.

[DATA] : Use the small character, if data is 0 x ab, it will send the 'a', 'b'.

[OK] : Use the large character.

Error Acknowledgement

[Command2][][Set ID][][NG][Data][x]

The TV transmits ACK (acknowledgement) based on this format when receiving abnormal data from non-viable functions or communication errors.

Data1: Illegal Code

Data2: Not supported function

Data3: Wait more time

* In this model, TV will not send the status during the standby mode.

* Data Format

[Command 2] : Use as command.

[Set ID] : Use the small character, if set ID is 10, it will send the '0', 'a'.

[DATA] : Use the small character, if data is 0 x ab, it will send the 'a', 'b'.

[NG] : Use the large character

01. Power (Command: k a)

To control Power On/Off of the TV.

Transmission [k][a][][Set ID][][Data][Cr]

Data 00: Power Off Data 01: Power On

Acknowledgement [a][][Set ID][][OK/NG][Data][x]

* In a like manner, if other functions transmit 'FF' data based on this format, Acknowledgement data feedback presents status about each function.

* Note: In this model, TV will send the Acknowledge after power on processing completion.

There might be a time delay between command and acknowledge.

02. Input Select (Command: x b)

To select input source for TV.

Transmission [x][b][][Set ID][][Data][Cr]

Data 00: DTV (Antenna) Data 01: DTV (Cable)

Data 10: Analog (Antenna) Data 11: Analog (Cable)

Data 20: AV1 Data 21: AV2

Data 40: Component 1 Data 41: Component 2

Data 60: RGB-PC Data 90: HDMI1

Data 91: HDMI2 Data 92: HDMI3

Acknowledgement [b][][Set ID][][OK/NG][Data][x]

03. Aspect Ratio (Command: k c)

To adjust the screen format.

Transmission [k][c][][Set ID][][Data][Cr]

Data 01: 4:3 09: Just scan

02: 16:9 10: Cinema Zoom (1)

04: Zoom ⋮

06: Set by program 1f: Cinema Zoom (16)

Acknowledgement [c][][Set ID][][OK/NG][Data][x]

04. Screen Mute (Command: k d)

To select screen mute on/off.

Transmission [k][d][][Set ID][][Data][Cr]

Data 00: Screen mute off (Picture on), Video-Out Mute Off

Data 01: Screen mute on (Picture off)

Data 10: Video-Out Mute On

Acknowledgement [d][][Set ID][][OK/NG][Data][x]

* In case of Video-Out mute on only, TV will display On Screen Display(OSD). But, In case of Screen Mute On, TV will not display OSD.

05. Volume Mute (Command: k e)

To control volume mute on/off.

You can also adjust mute using the MUTE button on remote control.

Transmission [k][e][][Set ID][][Data][Cr]

Data 00: Volume mute on (Volume off)

Data 01: Volume mute off (Volume on)

Acknowledgement [e][][Set ID][][OK/NG][Data][x]

06. Volume Control (Command: k f)

To adjust volume.

You can also adjust volume with the volume buttons on remote control.

Transmission [k][f][][Set ID][][Data][Cr]

Data Min: 00 ~ Max: 64 (*transmit by Hexadecimal code)

Acknowledgement [f][][Set ID][][OK/NG][Data][x]

07. Contrast (Command: k g)

To adjust screen contrast.

You can also adjust contrast in the PICTURE menu.

Transmission [k][g][][Set ID][][Data][Cr]

Data Min: 00 ~ Max: 64 (*transmit by Hexadecimal code)

Acknowledgement [g][][Set ID][][OK/NG][Data][x]

08. Brightness (Command: k h)

To adjust screen brightness.

You can also adjust brightness in the PICTURE menu.

Transmission [k][h][][Set ID][][Data][Cr]

Data Min: 00 ~ Max: 64 (*transmit by Hexadecimal code)

Acknowledgement [h][][Set ID][][OK/NG][Data][x]

09. Color (Command: k i)

To adjust screen color.

You can also adjust color in the PICTURE menu.

Transmission [k][i][][Set ID][][Data][Cr]

Data Min: 00 ~ Max: 64 (*transmit by Hexadecimal code)

Acknowledgement [i][][Set ID][][OK/NG][Data][x]

10. Tint (Command: k j)

To adjust screen tint.

You can also adjust tint in the PICTURE menu.

Transmission [k][j][][Set ID][][Data][Cr]

Data Red: 00 ~ Green: 64 (*transmit by Hexadecimal code)

Acknowledgement [j][][Set ID][][OK/NG][Data][x]

11. Sharpness (Command: k k)

To adjust screen sharpness.

You can also adjust sharpness in the PICTURE menu.

Transmission [k][k][][Set ID][][Data][Cr]

Data Min: 00 ~ Max: 64 (*transmit by Hexadecimal code)

Acknowledgement [k][][Set ID][][OK/NG][Data][x]

12. OSD Select (Command: k l)

To select OSD (On Screen Display) on/off.

Transmission [k][l][][Set ID][][Data][Cr]

Data 00: OSD off Data 01: OSD on

Acknowledgement [l][][Set ID][][OK/NG][Data][x]

13. Remote Control Lock Mode (Command: k m)

To lock the remote control and the front panel controls on the TV.

Transmission [k][m][][Set ID][][Data][Cr]

Data 00: Lock off Data 01: Lock on

Acknowledgement [m][][Set ID][][OK/NG][Data][x]

If you're not using the remote control and front panel controls on the TV, use this mode. When main power is on/off, remote control lock is released.

14. Treble (Command: k r)

To adjust treble.

You can also adjust treble in the AUDIO menu.

Transmission [k][r][][Set ID][][Data][Cr]

Data Min: 00 ~ Max: 64 (*transmit by Hexadecimal code)

Acknowledgement [r][][Set ID][][OK/NG][Data][x]

15. Bass (Command: k s)

To adjust bass.

You can also adjust bass in the AUDIO menu.

Transmission [k][s][][Set ID][][Data][Cr]

Data Min: 00 ~ Max: 64 (*transmit by Hexadecimal code)

Acknowledgement [s][][Set ID][][OK/NG][Data][x]

16. Balance (Command: k t)

To adjust balance.

You can also adjust balance in the AUDIO menu.

Transmission [k][t][][Set ID][][Data][Cr]

Data Min: 00 ~ Max: 64 (*transmit by Hexadecimal code)

Acknowledgement [t][][Set ID][][OK/NG][Data][x]

17. Color Temperature (Command: x u)

To adjust color temperature.

You can also adjust color temperature in the PICTURE menu.

Transmission [x][u][][Set ID][][Data][Cr]

Data Min: 00 ~ Max: 64 (*transmit by Hexadecimal code)

Acknowledgement [u][][Set ID][][OK/NG][Data][x]

18. ISM Method (Command: j p)

To avoid having a fixed image remain on screen.

Transmission [j][p][][Set ID][][Data][Cr]

Data 02: Orbiter 04: White Wash

08: Normal

20: Color Wash

Acknowledgement [p][][Set ID][][OK/NG][Data][x]

19. Power saving (Command: j q)

To control the low energy function on/off.

Transmission [j][q][][Set ID][][Data][Cr]

Data 00: Power saving off

01: Power saving: Minimum

02: Power saving: Medium

03: Power saving: Maximum

05: Screen Off

10: Intelligent Sensor

Acknowledgement [q][][Set ID][][OK/NG][Data][x]

20. Auto Configuration (Command: j u)

To adjust picture position and minimize image shaking automatically. Auto configuration only works in RGB-PC mode.

Transmission [j][u][][Set ID][][Data][Cr]

Data 1: To set

Acknowledgement [u][][Set ID][][OK/NG][Data][x]

21. Channel Tuning (Command: m a)

To tune channel to following physical/major/minor number.

Transmission [m][a][][Set ID][][Data00][][Data01]

[][Data02][][Data03][][Data04][][Data05][Cr]

Digital channels have a Physical, Major, and Minor channel number. The Physical number is the actual digital channel number, the Major is the number that the channel should be mapped to, and the Minor is the sub-channel. Since the ATSC tuner automatically maps the channel to the Major number, the Physical number is not required when sending a command.

Data 00: Physical Channel Number

NTSC air: 02~45, NTSC cable: 01, 0E~7D

ATSC air: 01~45, ATSC cable: 01~87

Data 01 & 02: Major Channel Number

Data 01: High byte

Data 02: Low byte

Two bytes are available for the Major and Minor, normally only the second byte is used.

Data 03 & 04: Minor Channel Number

Not needed for NTSC.

Data 05:	7 Main/Sub Picture	6 Two/One Part Channel	5 Using Physical Channel	4 Reserved	3	2	1	0	Step
0 Main	0 Two	0 Use	x	0	0	0	0	0	NTSC Air
1 Sub	1 One	1 No Use	x	0	0	0	0	1	NTSC Cable
			x	0	0	1	0	0	ATSC Air
			x	0	0	1	1	1	ATSC Cable_std
			x	0	1	0	0	0	ATSC Cable_hrc
			x	0	1	0	1	1	ATSC Cable_irc
			x	0	1	1	1	0	ATSC cable_auto
			x	0	1	1	1	1	Reserved
			x	x	x	x	x	x	...
			x	1	1	1	1	1	Reserved

The table above lists the binary code which must be converted to Hexadecimal before sending. For example: The binary code to tune the sub source to an NTSC cable channel is "1000 0001", which translates to "81" in Hex.

- * 7th bit : For which source do you want to change the channel.
- * 6th bit: Use a two part or one part channel. Most cases just use 0 since it's ignored when using NTSC.
- * 5th bit: Use 0 with NTSC since it can only use the physical channel number. Normally use 1 for ATSC since most times it doesn't matter what the physical number is.
- * 4th bit: Set to 0.
- * 3-0 bits: Choose signal type.

* Tune Command Examples:

1. Tune to the analog (NTSC) cable channel 35.

Data 00 = Physical of 35 = 23
 Data 01 & 02 = No Major = 00 00
 Data 03 & 04 = No Minor = 00 00
 Data 05 = 0000 0001 in binary = 01
 Total = ma 00 23 00 00 00 00 01

2. Tune to the digital (ATSC) local channel 30-3.

Data 00 = Don't know Physical = 00
 Data 01 & 02 = Major is 30 = 00 1E
 Data 03 & 04 = Minor is 3 = 00 03
 Data 05 = 0010 0010 in binary = 22
 Total = ma 00 00 00 1E 00 03 22

Acknowledgement [a] [] [Set ID] [] [OK] [Data00] [Data01]
 [Data02] [Data03] [Data04] [x] [a] [] [Set ID]
 [] [NG] [Data00] [x]

22. Channel Add/Del (Command: m b)

To add and delete the channels.

Transmission [m] [b] [] [Set ID] [] [Data] [Cr]

Data 00: Channel Delete Data 01: Channel Add

Acknowledgement [b] [] [Set ID] [] [OK/NG] [Data] [x]

23. Key (Command: m c)

To send IR remote key code.

Transmission [m] [c] [] [Set ID] [] [Data] [Cr]

► p.87

Acknowledgement [c] [] [Set ID] [] [OK/NG] [Data] [x]

zenith ®