



APPENDIX H
: USER'S MANUAL



LG
Life's Good

LCD TV OWNER'S MANUAL

42LH90
47LH90
55LH90

Please read this manual carefully before operating your set and retain it for future reference.

The model and serial number of the TV is located on the back and one side of the TV.

Record it below should you ever need service.

Model:

Serial:



This product qualifies for ENERGY STAR in the "factory default (Home Use)" setting and this is the setting in which power savings will be achieved.

ENERGY STAR

Changing the factory default picture setting or enabling other features will increase power consumption that could exceed the limits necessary to qualify for Energy Star rating.

1-800-243-0000 USA, Consumer User
1-888-865-3026 USA, Commercial User
1-888-542-2623 CANADA

LG Customer Information Center

P/NO : SAC33601906 (0902-REV00)

www.lgusa.com / www.lg.ca

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.

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

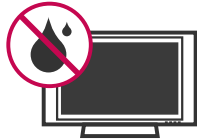
SAFETY INSTRUCTIONS

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 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.



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.



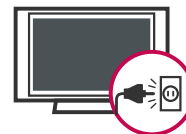
7 Only use attachments/accessories specified by the manufacturer.



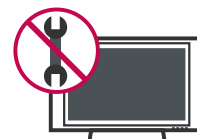
8 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



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.



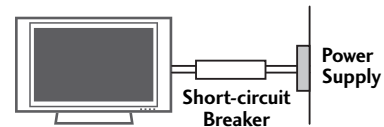
16 Do not expose to dripping or splashing and do not place objects filled with liquids, such as vases, cups, etc. on or over the apparatus (e.g. on shelves above the unit).



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 DEVICE FROM MAINS

Mains plug is the disconnecting device. The plug must remain readily operable.

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 SWITCH.

20 ANTENNAS

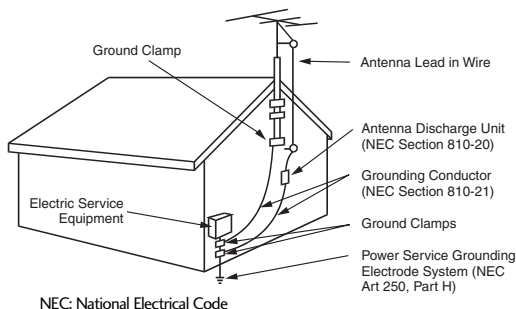
Outdoor antenna grounding

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

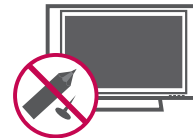
Make sure the product is turned off, unplugged and all cables have been removed. It may take 2 or more people to carry larger TVs. Do not press against or put stress on the front panel of the TV.

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

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



26 Keep the product away from direct sunlight.

27 For LCD TV

If the TV feels cold to the touch, there may be a small “flicker” when it is turned on. This is normal, there is nothing wrong with TV.

Some minute dot defects may be visible on the screen, appearing as tiny red, green, or blue spots. However, they have no adverse effect on the monitor’s performance.

Avoid touching the LCD screen or holding your finger(s) against it for long periods of time. Doing so may produce some temporary distortion effects on the screen.

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FEATURE OF THIS TV



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.



This TV contains the detailed calibrations necessary for professional certification by the Imaging Science Foundation. The resulting ISF “day” and “night” modes will then be accessible by the user to experience the best their LG HDTV has to offer.

CALIBRATE LIKE A PRO: Sophisticated and detailed calibrations can be made through the ISFccc mode. Detailed calibration requires a licensed technician. Please contact your local dealer to inquire about an ISF certified technician.



The AV Mode optimizes the picture into Cinema, Sports, and game Mode according to the video and audio content. The viewer has the ability to quickly choose the correct mode for the picture they are viewing.



LG TV include a unique invisible speaker system, tuned by renowned audio expert, Mr. Mark Levinson. Speakers are embedded in strategic spots behind the front cabinet and use minute vibrations to turn the entire front bezel into the speaker system. The result is a clean, polished look, and enhanced audio by increasing the “sweet spot”, giving a wider and richer sound field.



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



SRS[®] is a trademark of SRS Labs, Inc. TruSurround XT technology is incorporated under license from SRS Labs, Inc.



Automatically enhances and amplifies the sound of human voice frequency range to help keep dialogue audible when background noise swells.



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

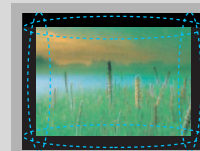
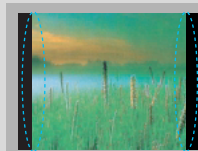


Displays HDTV programs in full 1920 x 1080p resolution for a more detailed picture.



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 TV).
- 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.

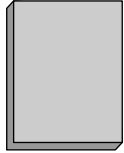


PREPARATION

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.

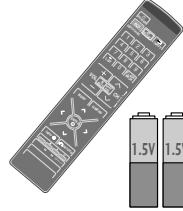
The accessories included may differ from the images below.



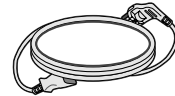
Owner's Manual



CD Manual



Remote Control,
Batteries



Power Cord

(For 42/47LH90)



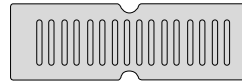
x 4

Bolts for stand assembly
(Refer to P.12)

(For 42LH90)

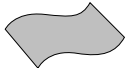


Screw for stand fixing
(Refer to P.17)



Protection Cover

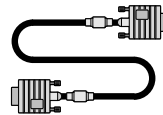
Not included with all models



Polishing Cloth

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

Option Extras



D-sub 15 pin Cable

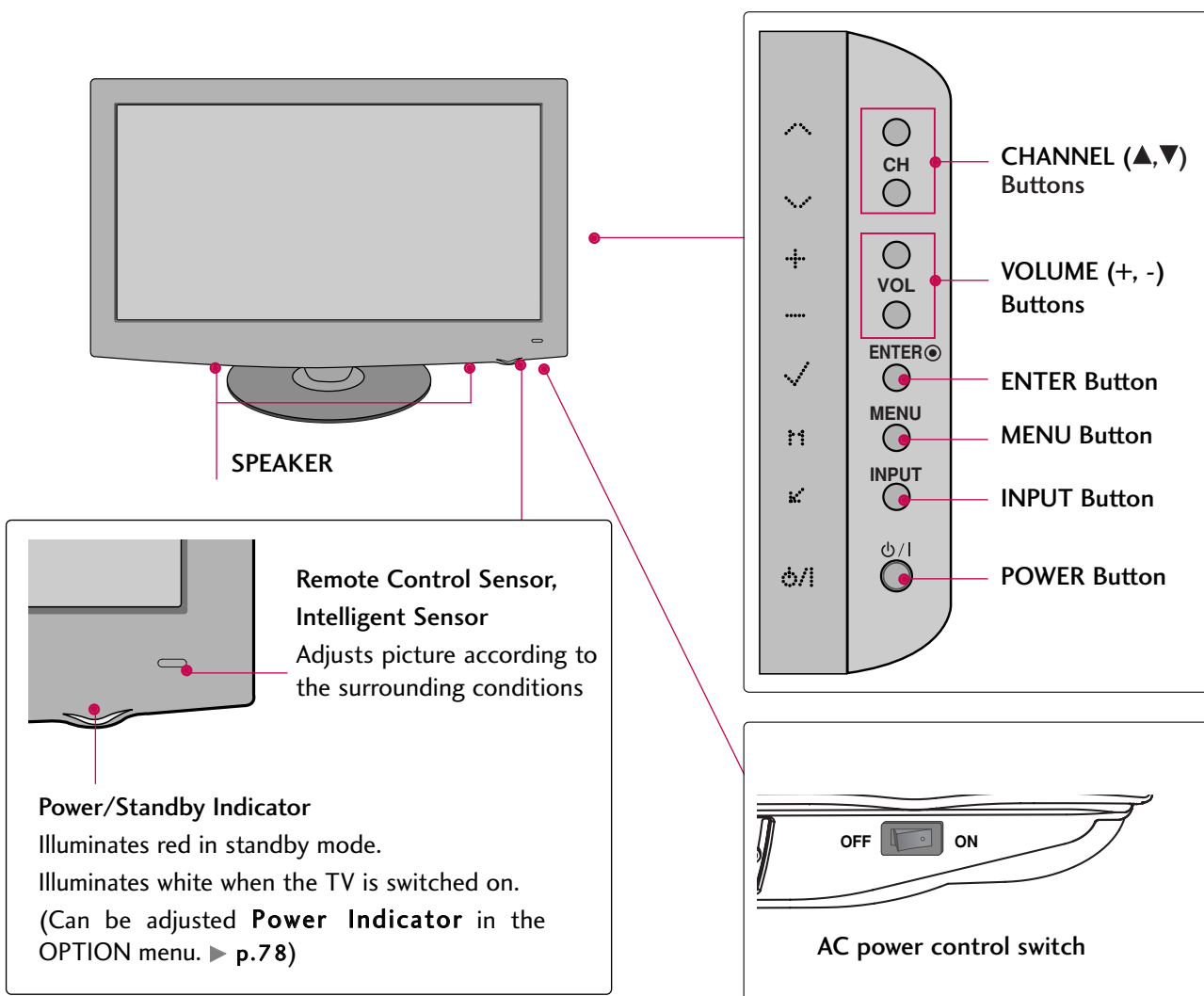
When using the VGA (D-sub 15 pin cable) PC connection, the user must use shielded signal interface cables with ferrite cores to maintain standards compliance.

PREPARATION

FRONT PANEL INFORMATION

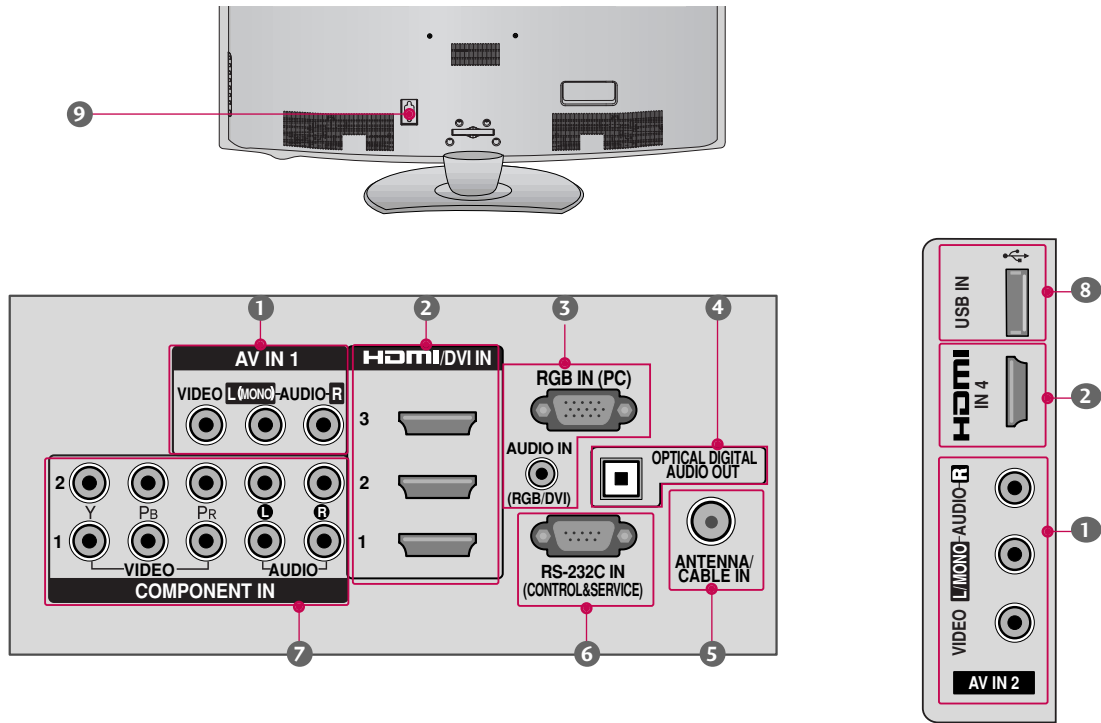
■ Image shown may differ from your TV.

PREPARATION



BACK PANEL INFORMATION

■ Image shown may differ from your TV.



1 AV (Audio/Video) IN

Analog composite connection. Supports standard definition video only (480i).

2 HDMI/DVI IN, HDMI 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).

3 RGB IN (PC)

Analog PC Connection. Uses a D-sub 15 pin cable (VGA cable).

AUDIO IN (RGB/DVI)

1/8" (0.32 cm) headphone jack for analog PC audio input.

4 OPTICAL DIGITAL AUDIO OUT

Digital optical audio output for use with amps and home theater systems.

Note: In standby mode, this port doesn't work.

5 ANTENNA/CABLE IN

Connect over-the air signals to this jack.
Connect cable signals to this jack.

6 RS-232C IN (CONTROL & SERVICE) PORT

Used by third party devices.
This port is used for Service or Hotel mode.

7 COMPONENT IN

Analog Connection.
Supports HD.
Uses a red, green, and blue cable for video & red and white for audio.

8 USB INPUT

Used for viewing photos and listening to MP3s.

9 Power Cord Socket

For operation with AC power.
Caution: Never attempt to operate the TV on DC power.

PREPARATION

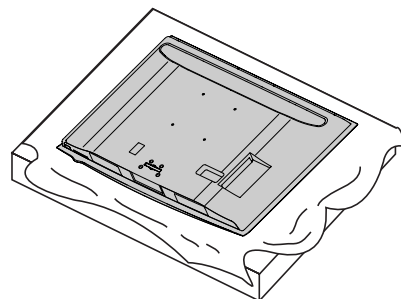
STAND INSTRUCTION

- Image shown may differ from your TV.

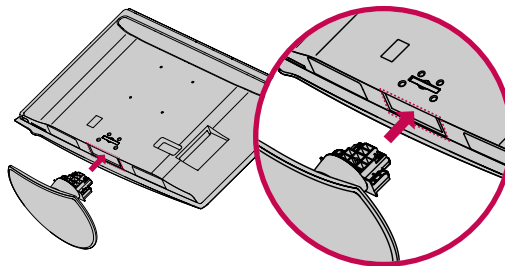
PREPARATION

INSTALLATION (For 42/47LH90)

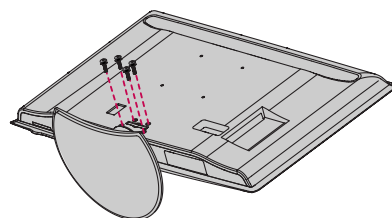
- 1 Carefully place the TV screen side down on a cushioned surface to protect the screen from damage.



- 2 Assemble the TV as shown.



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

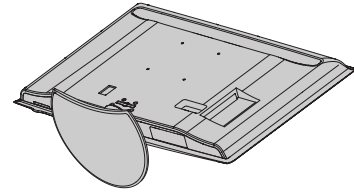


! NOTE

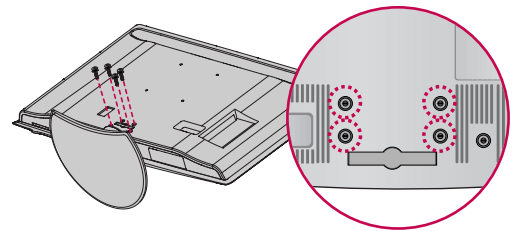
- ▶ When assembling the desk type stand, make sure the bolt is fully tightened (If not tightened fully, the TV can tilt forward after the product installation). Do not over tighten.

DETACHMENT

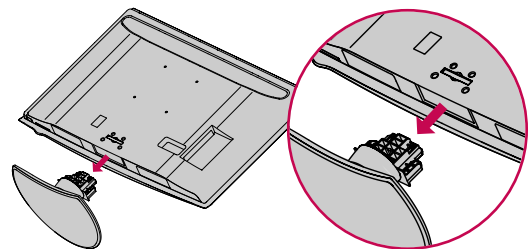
- 1 Carefully place the TV screen side down on a cushioned surface to protect the screen from damage.



- 2 Loosen the bolts from TV.

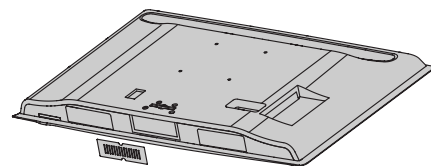


- 3 Detach the stand from TV.



PROTECTION COVER

- 4 Insert the **PROTECTION COVER** into the TV. After removing the protection paper from the protection cover, adhere it to the TV as shown.



PREPARATION

VESA WALL MOUNTING


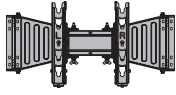
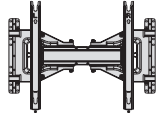
Install your wall mount on a solid wall perpendicular to the floor. When attaching to other building materials, please contact your nearest installer.

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.

PREPARATION

| Model | VESA (A * B)  | Standard Screw | Quantity | Wall Mounting Bracket (sold separately) |
|-------------------|---|----------------|----------|--|
| 42LH90, 47LH90 | 200 * 200 | M6 | 4 |  AW-47LG30M |
| 55LH90 | 400 * 400 | M6 | 4 |  AW-55LH40M |

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.

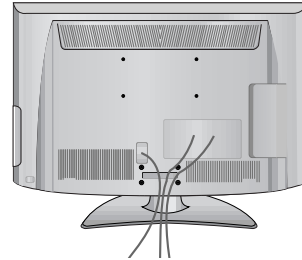
CAUTION

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

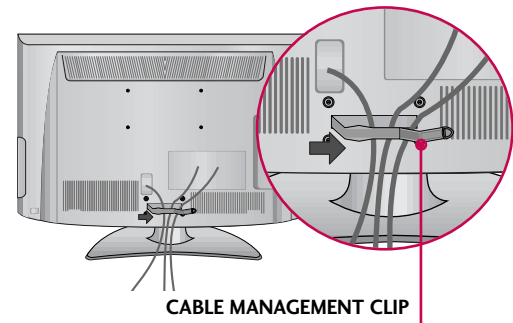
CABLE MANAGEMENT

■ Image shown may differ from your TV.

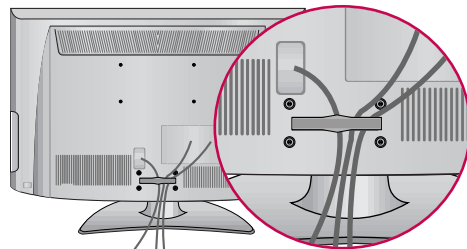
- 1 Connect the cables as necessary.
To connect additional equipment, see the **EXTERNAL EQUIPMENT SETUP** section.



- 2 Install the **CABLE MANAGEMENT CLIP** as shown.



- 3 Put the cables inside the **CABLE MANAGEMENT CLIP** and snap it closed.

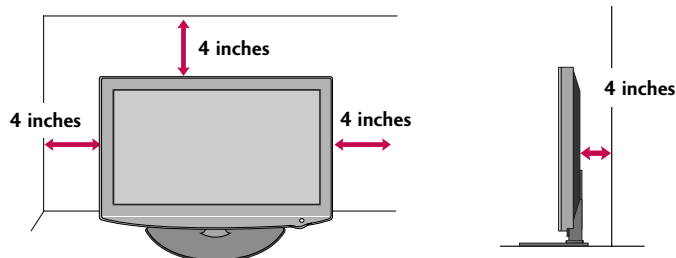


PREPARATION

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.

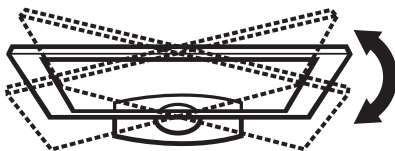


⚠ CAUTION

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

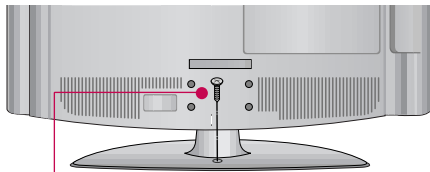
SWIVEL STAND

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

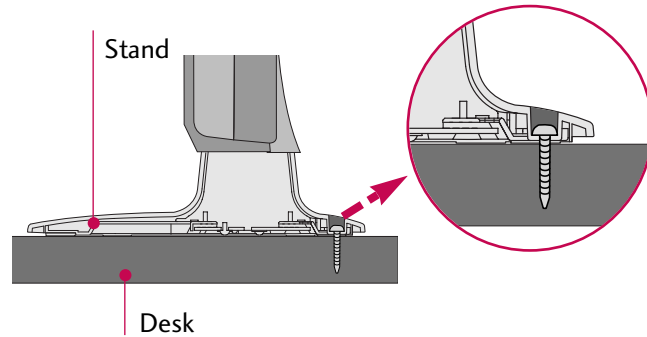


ATTACHING THE TV TO A DESK (For 42LH90)

The TV must be attached to a desk so it cannot be pulled in a forward/backward direction, potentially causing injury or damaging the product.



1-Screw
(provided as parts of the product)



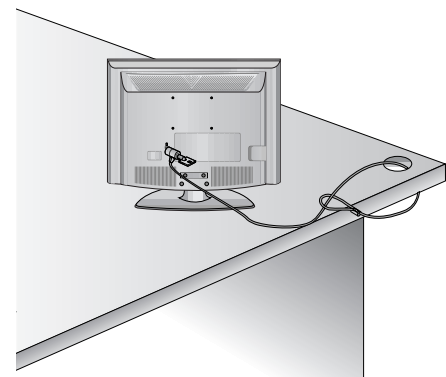
⚠ WARNING

- ▶ To prevent TV from falling over, the TV should be securely attached to the floor/wall per installation instructions. Tipping, shaking, or rocking the machine may cause injury.

KENSINGTON SECURITY SYSTEM

- This feature is not available for all models.
 - The TV is equipped with a Kensington Security System connector on the back panel. Connect the Kensington Security System cable as shown below.
 - For the detailed installation and use of the Kensington Security System, refer to the user's guide provided with the Kensington Security System.
- For further information, contact <http://www.kensington.com>, the internet homepage of the Kensington company. Kensington sells security systems for expensive electronic equipment such as notebook PCs and LCD projectors.

NOTE: The Kensington Security System is an optional accessory.



PREPARATION

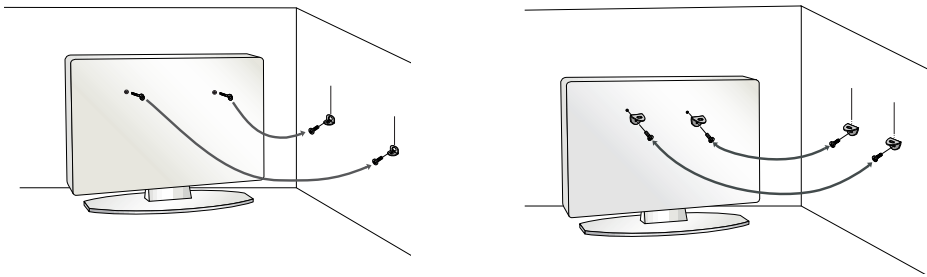
PREPARATION

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.



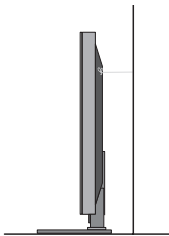
- Insert the eye-bolts (or TV brackets and bolts) to tighten the product to the wall as shown in the picture.

* 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.

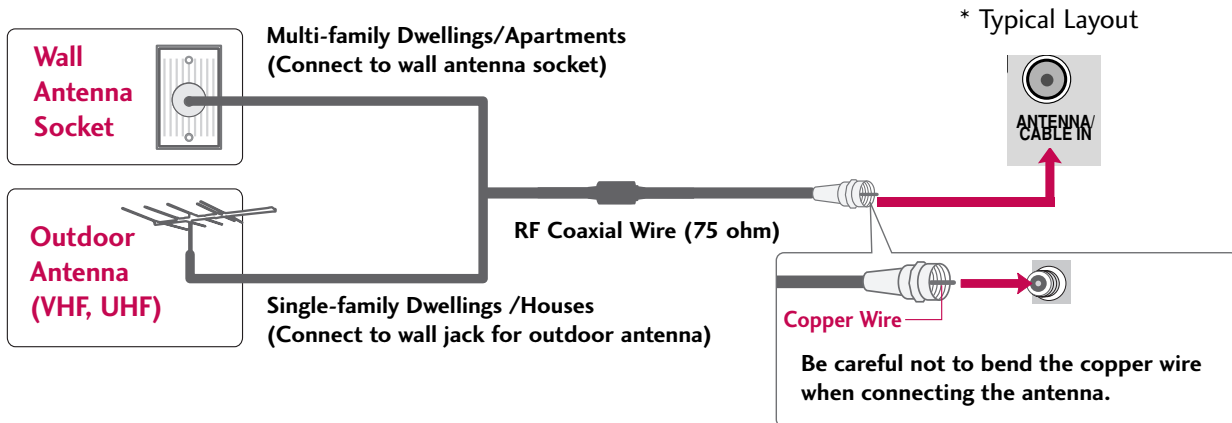
- To prevent damage do not connect to the power outlet until all connections are made between the devices.
- Image shown may differ from your TV.

ANTENNA OR CABLE CONNECTION

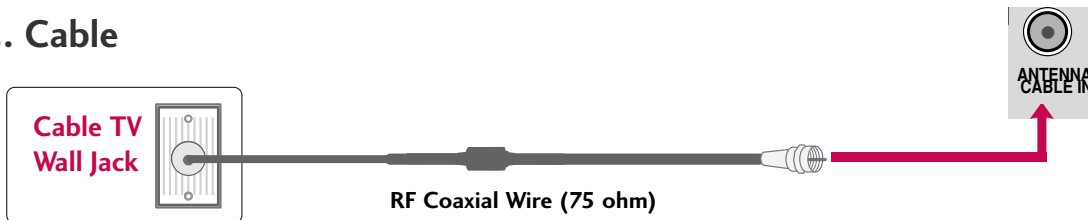
1. Antenna (Analog or Digital)

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

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

- 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.

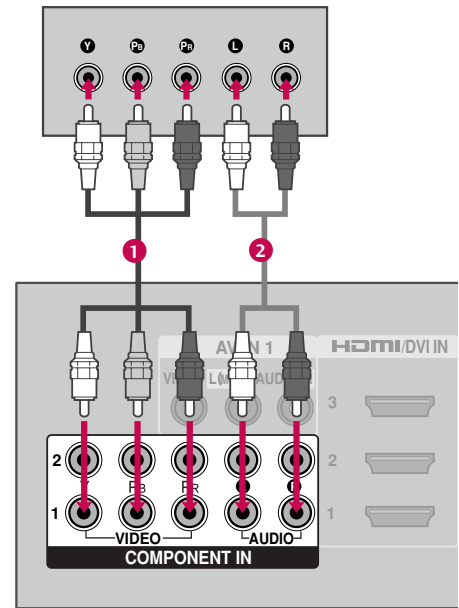
HD RECEIVER SETUP

This TV can receive digital over-the-air/digital 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.

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 |
| | 31.50 | 60.00 |
| 1280x720p | 44.96 | 59.94 |
| | 45.00 | 60.00 |
| 1920x1080i | 33.72 | 59.94 |
| | 33.75 | 60.00 |
| 1920x1080p | 26.97 | 23.976 |
| | 27.00 | 24.00 |
| | 33.71 | 29.97 |
| | 33.75 | 30.00 |
| | 67.432 | 59.94 |
| | 67.50 | 60.00 |

HDMI Connection

1. How to connect

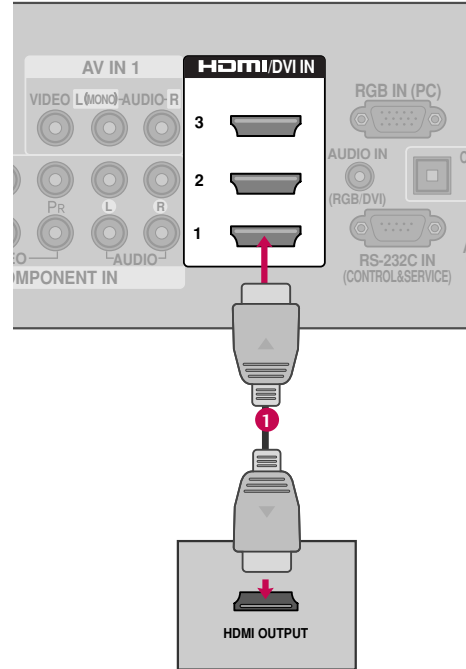
- 1 Connect the digital set-top box to **HDMI/DVI IN 1, 2, 3, or 4** jack on the TV.
- 2 No separate audio connection is necessary. HDMI supports both audio and video.

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, HDMI2, HDMI3, or HDMI4** input source on the TV using the **INPUT** button on the remote control.

! NOTE

- ▶ Check HDMI cable over version 1.3.
If the HDMI cables don't support HDMI version 1.3, it can cause flickers or no screen display. In this case use the latest cables that support HDMI version 1.3.



HDMI-DTV

| Resolution | Horizontal Frequency(KHz) | Vertical Frequency(Hz) |
|------------|---------------------------|------------------------|
| 720x480p | 31.47 | 59.94 |
| | 31.50 | 60.00 |
| 1280x720p | 44.96 | 59.94 |
| | 45.00 | 60.00 |
| 1920x1080i | 33.72 | 59.94 |
| | 33.75 | 60.00 |
| 1920x1080p | 26.97 | 23.976 |
| | 27.00 | 24.00 |
| | 33.71 | 29.97 |
| | 33.75 | 30.00 |
| | 67.432 | 59.939 |
| | 67.50 | 60.00 |

WATCHING TV / CHANNEL CONTROL

DVI to HDMI Connection

1. How to connect

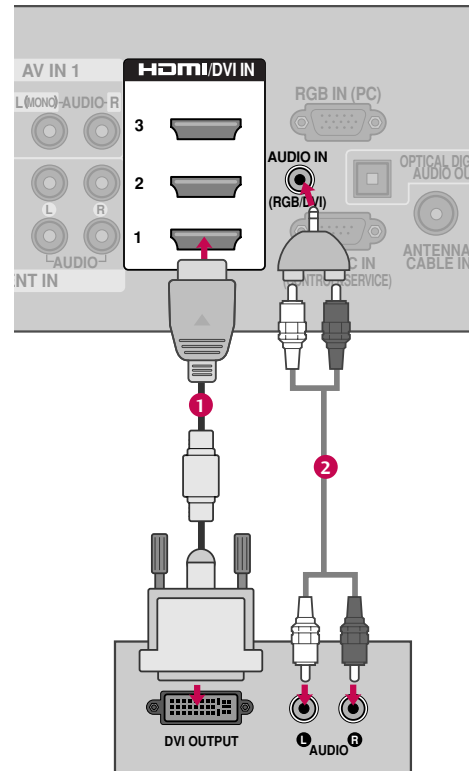
- 1 Connect the DVI output of the digital set-top box to the **HDMI/DVI IN 1, 2, or 3** jack on the TV.
- 2 Connect the digital set-top box audio output to the **AUDIO IN (RGB/DVI)** jack on the TV.

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, HDMI2, or HDMI3** 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.



DVD SETUP

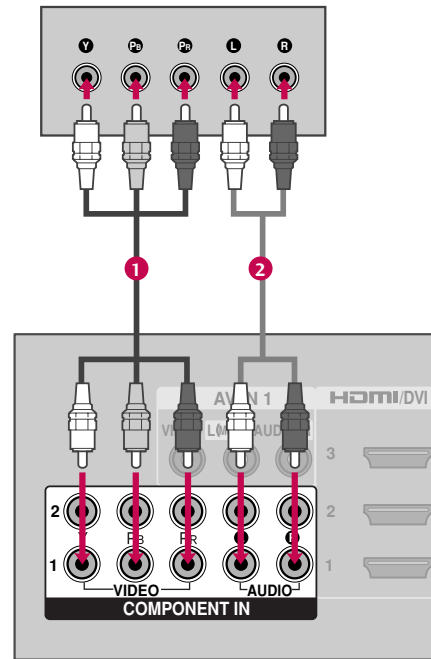
Component Connection

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 | P _B | P _R |
|----------------------------------|---|----------------|----------------|
| Video output ports on DVD player | Y | P _B | P _R |
| | Y | B-Y | R-Y |
| | Y | C _b | C _r |
| | Y | P _b | P _r |

EXTERNAL EQUIPMENT SETUP

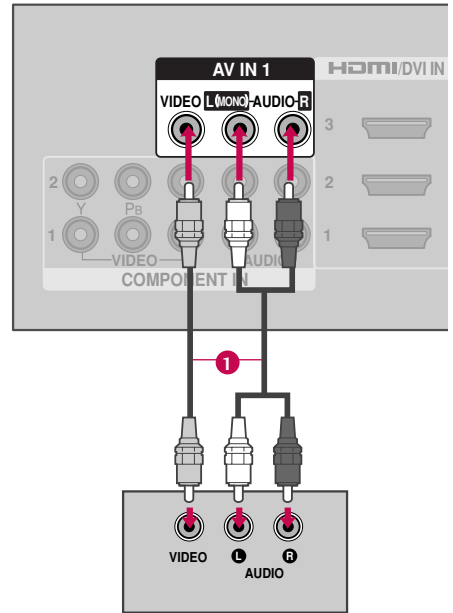
Composite (RCA) Connection

1. How to connect

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

2. How to use

- Turn on the DVD player, insert a DVD.
- Select the **AV1** or **AV2** input source on the TV using the **INPUT** button on the remote control.
- Refer to the DVD player's manual for operating instructions.



HDMI Connection

1. How to connect

- 1 Connect the HDMI output of the DVD to the **HDMI/DVI IN 1, 2, 3** or **4** jack on the TV.

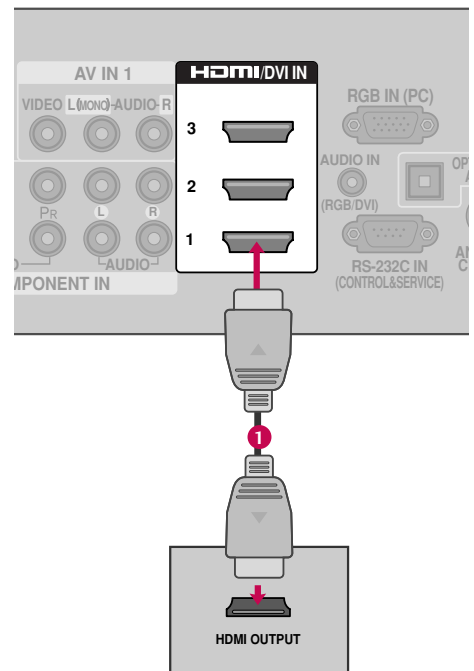
- 2 No separate audio connection is necessary. HDMI supports both audio and video.

2. How to use

- Select the **HDMI1**, **HDMI2**, **HDMI3**, or **HDMI4** input source on the TV using the **INPUT** button on the remote control.
- Refer to the DVD player's manual for operating instructions.

! NOTE

- ▶ Check HDMI cable over version 1.3. If the HDMI cables don't support HDMI version 1.3, it can cause flickers or no screen display. In this case use the latest cables that support HDMI version 1.3.

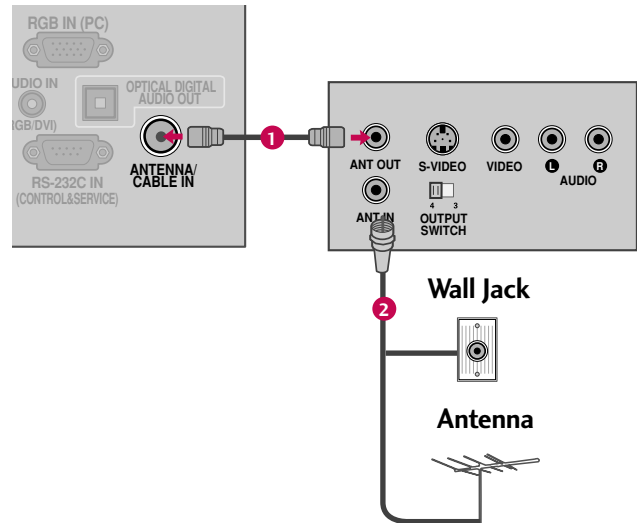


VCR SETUP

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

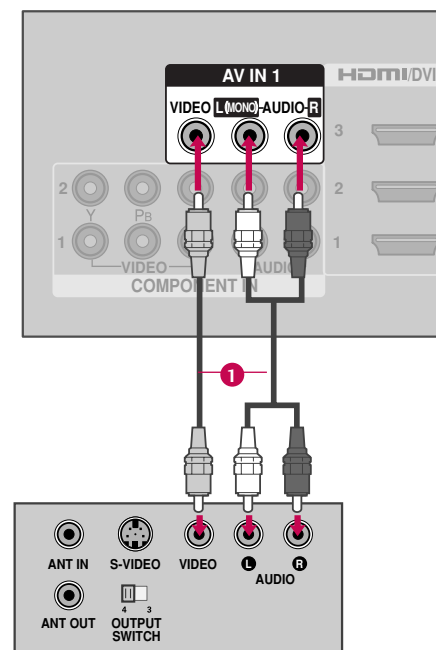
- 1 Connect the **AUDIO/VIDEO** jacks between TV and VCR. Match the jack colors (Video = yellow, Audio Left = white, and Audio Right = red)

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.



EXTERNAL EQUIPMENT SETUP

PC SETUP

This TV provides Plug and Play capability, meaning that the PC adjusts automatically to the TV's settings.

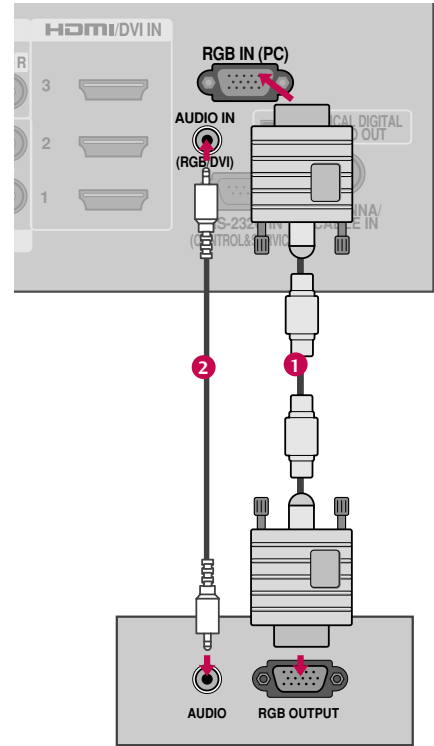
VGA (D-Sub 15 pin) Connection

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

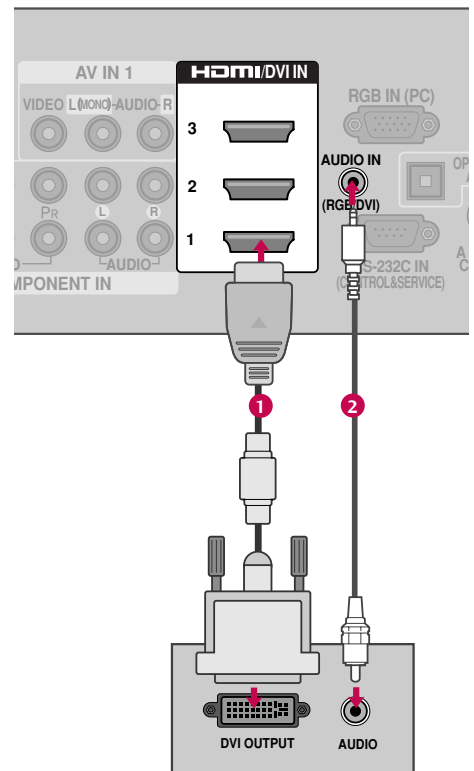
- 1 Connect the DVI output of the PC to the **HDMI/DVI IN 1, 2, or 3** jack on the TV.
- 2 Connect the PC audio output to the **AUDIO IN (RGB/DVI)** jack on the TV.

2. How to use

- Turn on the PC and the TV.
- Select the **HDMI1**, **HDMI2**, or **HDMI3** input source on the TV using the **INPUT** button on the remote control.

! NOTE

- ▶ Check HDMI cable over version 1.3. If the HDMI cables don't support HDMI version 1.3, it can cause flickers or no screen display. In this case use the latest cables that support HDMI version 1.3.



! NOTES

- ▶ To get the the best picture quality, adjust the PC graphics card to **1920x1080**.
- ▶ 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 may 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.
- ▶ If there are overscan in HDMI-PC 1920x1080, change aspect ratio to **Just scan**.
- ▶ When selecting HDMI-PC, set the “Input Label - PC” in the OPTION menu.
- ▶ The TV provides EDID data to the PC system with a DDC protocol. DDC protocol is preset for RGB (Analog RGB), HDMI (Digital RGB) mode.
- ▶ If the Audio setting is set to Dolby/DTS/Bitstream in some DVDP/STB, make sure to change the setting to PCM.

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 | 37.879 | 60.31 |
| 1024x768 | 48.363 | 60.00 |
| 1280x768 | 47.776 | 59.87 |
| 1360x768 | 47.712 | 60.015 |
| 1280x1024 | 63.981 | 60.02 |
| 1600x1200 | 75.00 | 60.00 |
| 1920x1080 RGB-PC | 66.587 | 59.934 |
| 1920x1080 HDMI-PC | 67.5 | 60.00 |

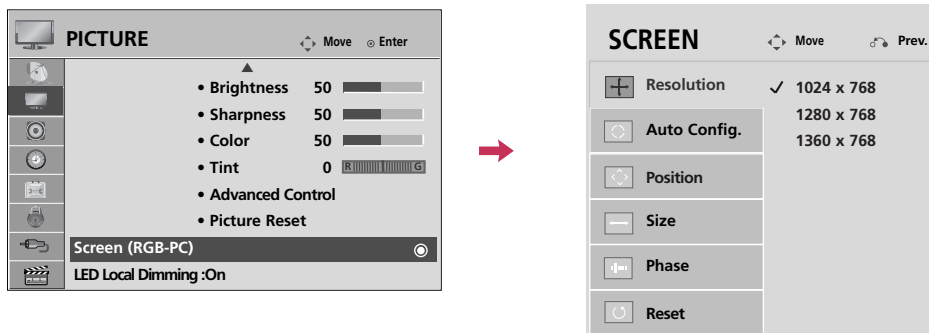
EXTERNAL EQUIPMENT SETUP










Screen Setup for PC mode

Selecting Resolution

You can choose the resolution in RGB-PC mode.

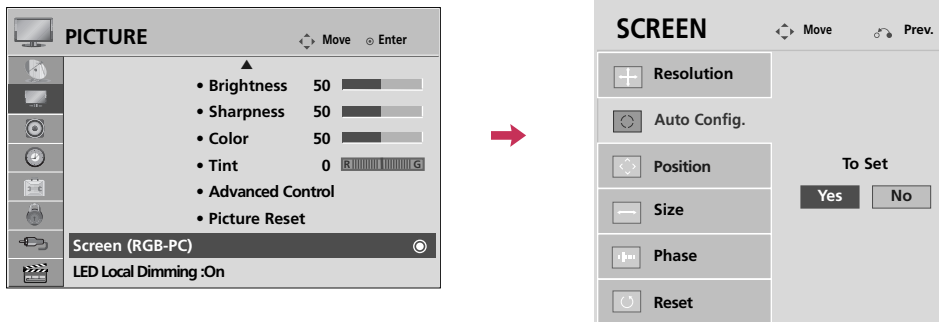
The **Position**, **Phase**, and **Size** can also be adjusted.












-   Select **PICTURE**.
-   Select **Screen (RGB-PC)**.
-   Select **Resolution**.
-   Select the desired resolution.
- 

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.



- 1   Select **PICTURE**.
- 2   Select **Screen (RGB-PC)**.
- 3   Select **Auto Config..**
- 4   Select **Yes**.
- 5  Start Auto Configuration.

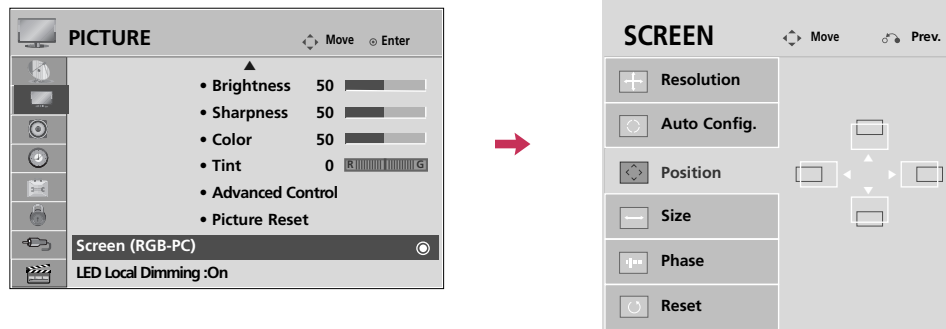
- If the position of the image is still not correct, try Auto adjustment again.
- If picture needs to be adjusted again after Auto adjustment in RGB-PC, you can adjust the **Position**, **Size** or **Phase**.










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 

EXTERNAL EQUIPMENT SETUP

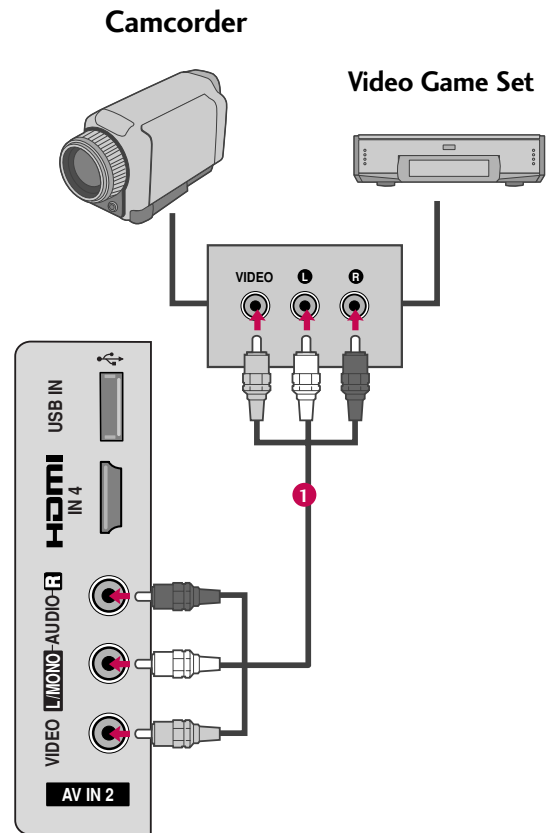
OTHER A/V SOURCE SETUP

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.



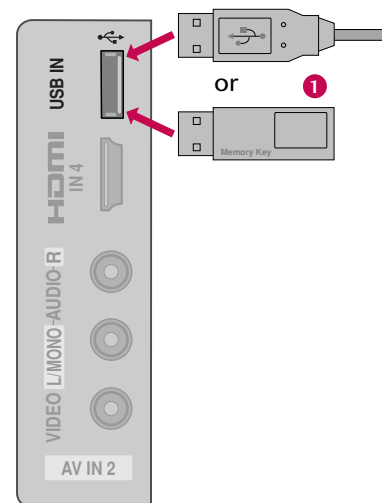
USB CONNECTION

1. How to connect

- 1 Connect the USB device to the **USB IN** jack on the Media Box or TV.

2. How to use

- After connecting the **USB IN** jack, you use the USB function. (▶ p.52)



AUDIO OUT CONNECTION

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

If you want to enjoy digital broadcasting through 5.1-channel speakers, connect the OPTICAL DIGITAL AUDIO OUT terminal on the back of TV to a Home Theater (or amp).

1. How to connect

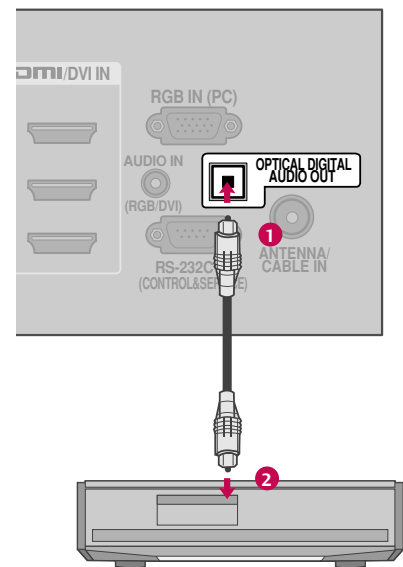
- 1 Connect one end of the optical cable to the TV port of OPTICAL DIGITAL AUDIO OUT.
- 2 Connect the other end of the optical cable to the digital audio input on the audio equipment.
- 3 Set the "TV Speaker option - Off" in the AUDIO menu. (▶ p.86). See the external audio equipment instruction manual 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.86)

! 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.



WATCHING TV / CHANNEL CONTROL

REMOTE CONTROL FUNCTIONS

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

POWER Turns the TV on from standby or off to standby.

ENERGY SAVING Adjusts the Energy Saving. ▶ p.76

AV MODE Toggles through preset Video and Audio modes. ▶ p.48

INPUT Rotates through inputs.
Also switches the TV on from standby. ▶ p.46

VOLUME UP /DOWN Adjusts the volume.

MUTE Switches the sound on or off. ▶ p.36

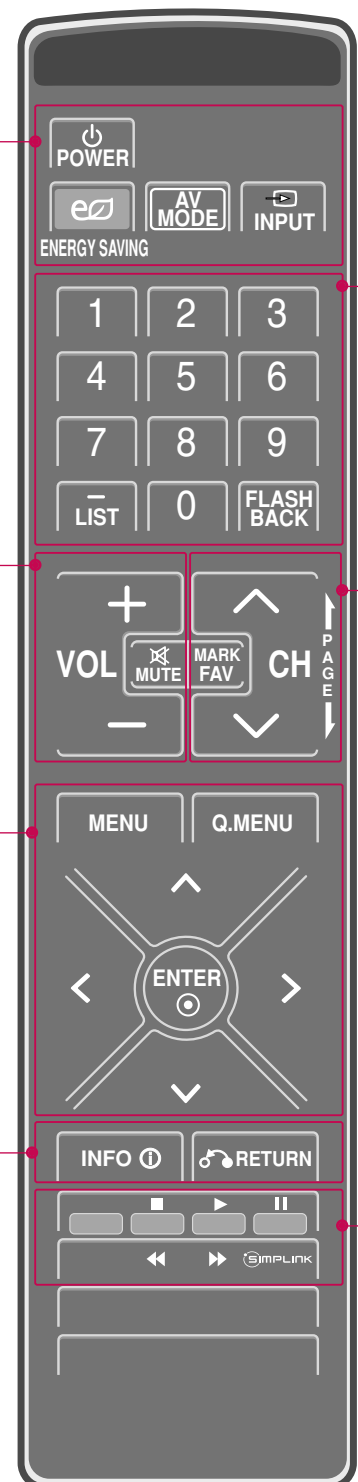
MENU Displays the main menu or clears all on-screen displays and return to TV viewing.

Q.MENU Opens the list of Quick Menu options. ▶ p.39

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

INFO Displays channel information at the top of the screen. ▶ p.45

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

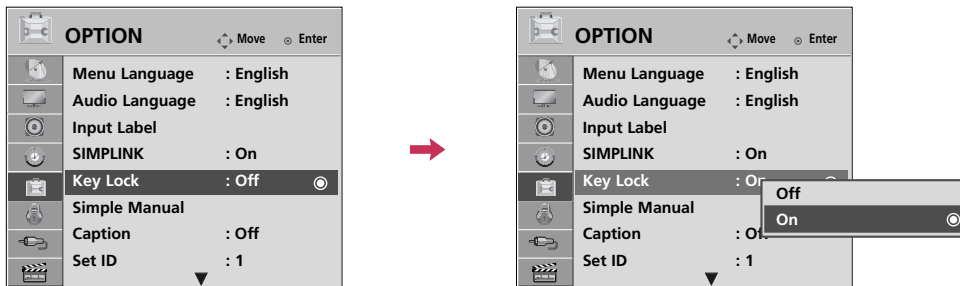










KEY LOCK

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.



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

- In **Key Lock 'On'**, if the TV is turned off, press the **⏻ / I**, **INPUT, CH (▲▼ or ^ v)** button on the TV or **POWER, INPUT, 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 on the front panel is pressed while viewing the TV.

MOVIE LIST

The movie list is activated once USB is detected. It is used when playing movie files on TV.



Displays the movies in the USB folder and supports play.




Allows playback of all movies in the folder and user desired files.


Editing such as delete and add is not allowed.

It is a movie list that displays folder information and Divx file.

Screen Components

1   Select **USB**.

2    Select **Movie List**.



1 Moves to upper level folder

2 Current page/Total pages

3 Total number of marked movie

4 Corresponding buttons on the remote control

| Title | Duration |
|-----------|----------|
| Up Folder | |
| KR1 | |
| KR2 | |
| SJS001 | 00:00:00 |
| SJS002 | 00:00:00 |
| SJS003 | 00:00:00 |

Navigation Popup Menu CH Page Change MARK Mark Exit

NOTE

- ▶ A video file name and its subtitle file name must be identical for it to be displayed.
- ▶ Use the < > button to move to a specific frame forward or backward while playing a movie. (< > button may not work properly for some files while playing a movie.)

| File Extension | Container | Video Codec | Spec | Note |
|----------------|-------------------------|---|----------------------------|--|
| DAT, MPG, MPEG | DAT, MPG, MPEG, DVD | Mpeg1,2 | 720X480@30P | |
| mpg | MPEG-1 | MPEG-1 | 720X480@30P | |
| VOB | MPEG2 -PS | Mpeg1, 2 | 720X480@30P | Microsoft MPEG4-v2, v3 is not supported. |
| mp4 | AVI, MP4 | MPEG4 Divx 3.11, Divx 4.12, Divx 5.x, Divx 6, Xvid 1.00, Xvid 1.01, Xvid 1.02, Xvid 1.03, Xvid 1.10-beta1/2 | 800x432@30P | WMV serie is not supported. |
| MKV | MKV | MPEG-1,2,4 | 720X480@30P | Spec resolution means up to max supporting resolution. |
| divx, avi | AVI(1.0, 2.0), DMF0,1,2 | MPEG2, MPEG4 Divx 3.11, Divx 4.Divx 5, Divx 6, Xvid 1.00, Xvid 1.01, Xvid 1.02, Xvid 1.03, Xvid 1.10-beta1/2 | 720X480@30P 800x432@30P | |

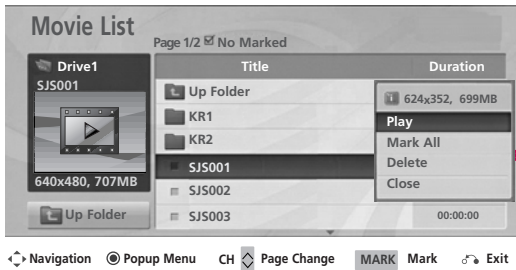
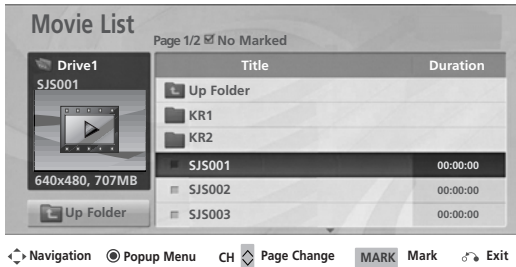
Audio Codec

| | | |
|------|-----|---|
| MP3 | MP3 | 32kbps - 320kbps (Bit rate), 32kHz -48kHz (Sample rate) |
| AC3 | AC3 | 32kbps - 640kbps (Bit rate), 32kHz, 44.1 kHz, 48kHz (Sample rate) |
| MPEG | MPA | 32kbps - 448kbps (Bit rate), 32kHz - 48kHz (Sample rate) |
| LPCM | - | 64Kbps - 1.5Mbps (Bit rate), 8KHz - 48KHz (Sample rate) |

Trick play

- a. Pause & Resume
- b. Fast forward (2x, 4x, 8x, 16x, 32x)
- c. Fast backward (2x, 4x, 8x, 16x, 32x)

Movie Selection and Popup Menu



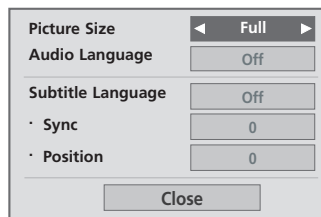
- ▶ **Play** (During stop): Play the selected movie titles.
If you go to a different folder and press the **ENTER** button, the current movie in playback will stop.
- ▶ **Play Marked**: Play the selected movie titles. Once a movie finishes playing, the next selected one will be played automatically.
- ▶ **Stop Play** (During playback): Stop the playing movies.
- ▶ **Mark All**: Mark all movies in the folder.
- ▶ **Unmark All**: Deselect all marked movies.
- ▶ **Delete**: Delete the selected movie.
- ▶ **Close**: Close the pop-up menu.

- ### Using the remote control
- You can adjust various method during movie play.
- ◀◀ / ▶▶: Increases the fast forward/reverse speed.
 - ||: Displayed the still screen.
 - < > : A cursor indicating the position can be viewed on the screen.
 - ▶: Return to normal playback.

- Use the **CH** ^ v button to navigation in the movie page.
- Use **MARK** button to mark or unmark a movie file. When one or more movie files are marked, the marked movie files will be played in sequence. If you want to see only one movie repeatedly, just mark that one file and play.


- 1 Select the target folder or drive.
- 2 Select the desired movies.
- 3 Show the Popup menu.
- 4 Select the desired Popup menu.
- 5 Return to the previous menu.


DivX Audio Language & Subtitle Language




1  Press the **RED** button when DivX is playing.

2  Select **Picture Size**, **Audio Language**, **Subtitle Language**, **Sync** or **Position**.

3  Select the desired option.

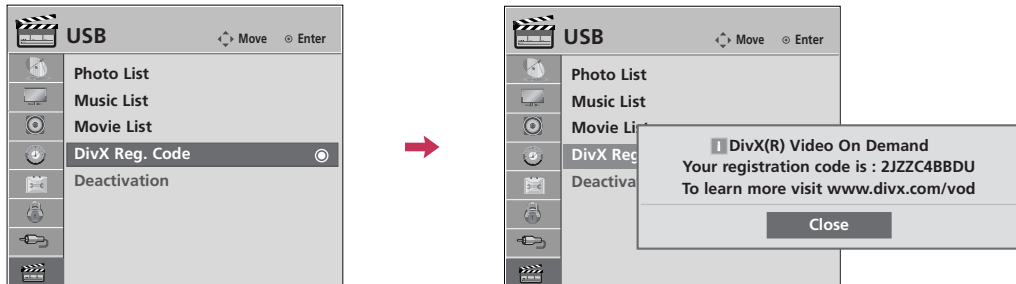
4  Return to the previous menu.

 Return to TV viewing.








DIVX REGISTRATION CODE

Confirm the DivX registration code number of the TV. Using the registration number, movies can be rented or purchased at www.divx.com/vod.

With a DivX registration code from other TV, playback of rented or purchased DivX file is not allowed (Only DivX files matched with the registration code of the purchased TV are playable).



USB

-   Select **USB**.
-   Select **DivX Reg. Code**.
-  Display **DivX Reg. Code**.
-  Return to the previous menu.
-  Return to TV viewing.



- Official DivX® Certified Product
- “Plays all versions of DivX® video (including DivX® 6) with standard playback of DivX® media files”
- DivX® Certified Products: “DivX, DivX Certified, and associated logos are trademarks of DivX, Inc. and are used under license.”

! NOTE

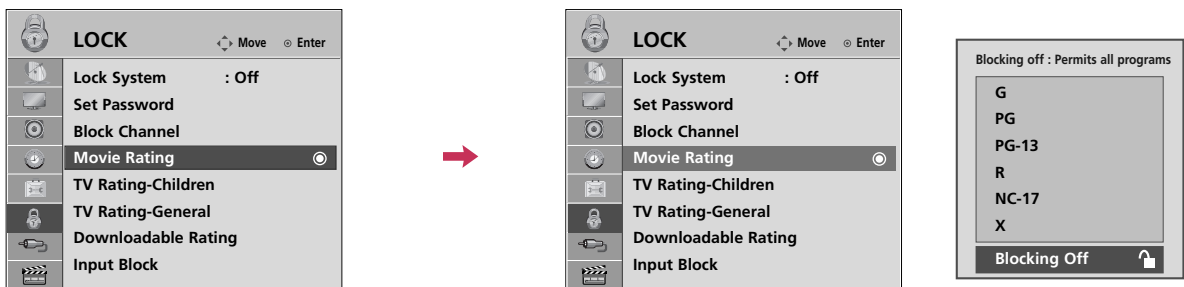
- ▶ When loading, some buttons may not work.
- ▶ If you use the DivX registration code of another device, the rented or purchased DivX file cannot be played. Therefore always use the DivX registration code assigned to this product.

PARENTAL CONTROL / RATINGS


MOVIE & TV RATING

Movie Rating (MPAA) - For USA

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.





1    Select **LOCK**.

2  Input the password.

3  Select **Movie Rating**.

4   Select **G, PG, PG-13, R, NC-17, X, or Blocking Off**.

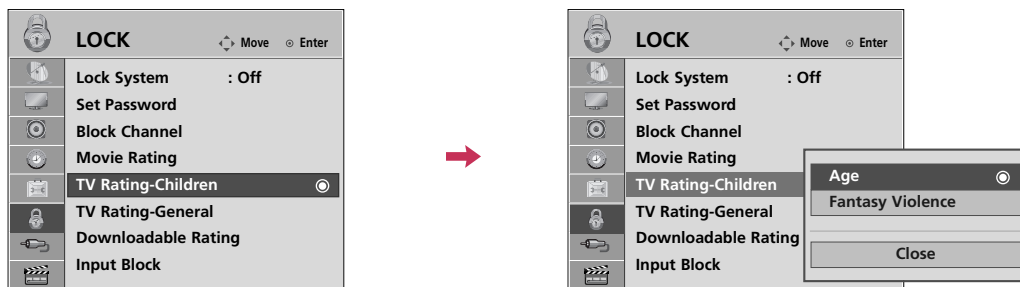
5  Return to the previous menu.

 Return to TV viewing.


- If a Movie rating is locked, enter the password to unlocked it temporarily.
- 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 - For USA

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.

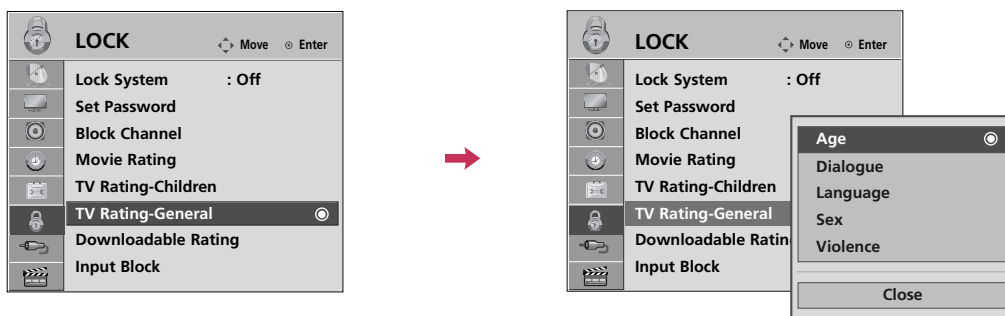
 Return to TV viewing.

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


PARENTAL CONTROL / RATINGS

TV Rating General - For USA

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




1    Select **LOCK**.


2  Input the password.

3  Select **TV Rating-General**.

4   Select **Age, Dialogue, Language, Sex or Violence**.

5   Select block options.

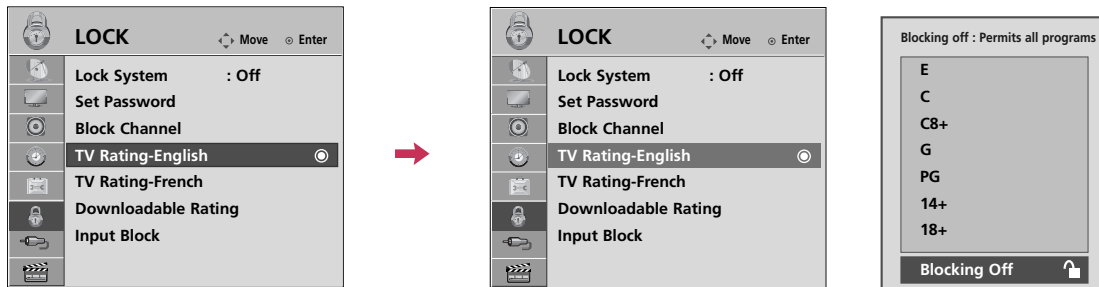
6  Return to the previous menu.

 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).

TV Rating English - For CANADA



Selecting Canadian English rating system.





1    Select **LOCK**.

2  Input the password.

3  Select **TV Rating-English**.

4   Select **E, C, C8+, G, PG, 14+, 18+, or Blocking Off**.

5  Return to the previous menu.

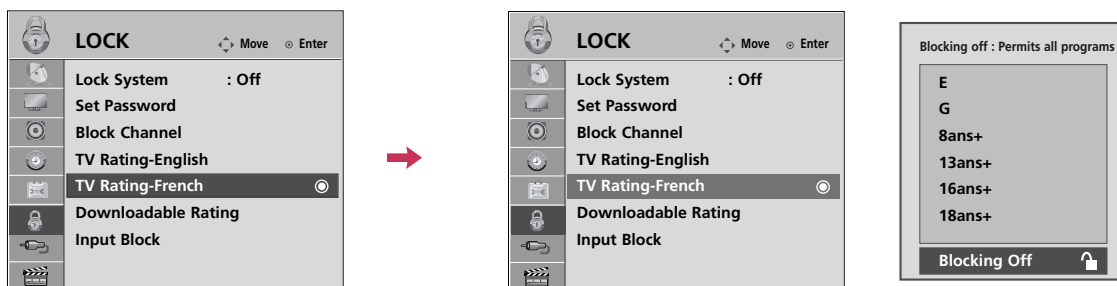
 Return to TV viewing.

- E (Exempt)
- C (Children)
- C8+ (Children eight years and older)
- G (General programming, suitable for all audiences)
- PG (Parental Guidance)
- 14+ (Viewers 14 years and older)
- 18+ (Adult programming)
- Blocking Off (Permits all programs)


PARENTAL CONTROL / RATINGS

TV Rating French - For CANADA



Selecting Canadian French rating system.





1    Select **LOCK**.

2  Input the password.

3  Select **TV Rating-French**.

4   Select **E, G, 8ans+, 13ans+, 16ans+, 18ans+, or Blocking off**.

5  Return to the previous menu.

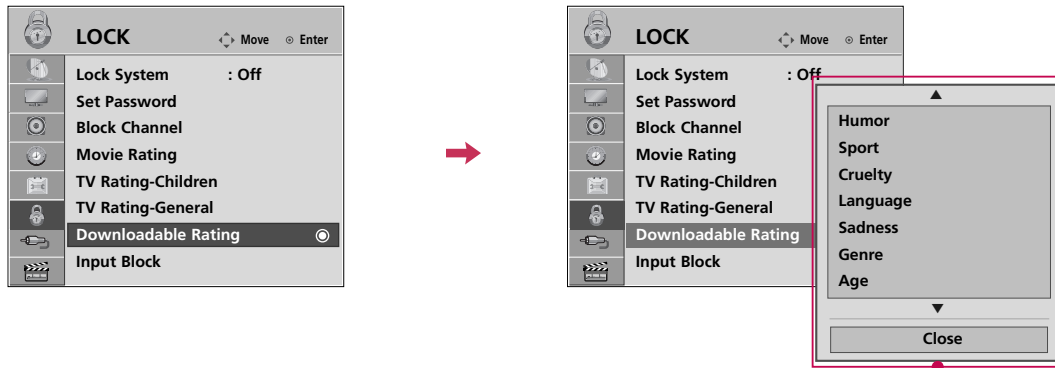
 Return to TV viewing.

- E (Exempt)
- G (General)
- 8ans+ (General-Not convenient for little children)
- 13ans+ (Not convenient for children of 13 years and younger)
- 16ans+ (Not convenient for children of 16 years and younger)
- 18ans+ (This programs is only for adults)
- Blocking off (Permits all programs)












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.

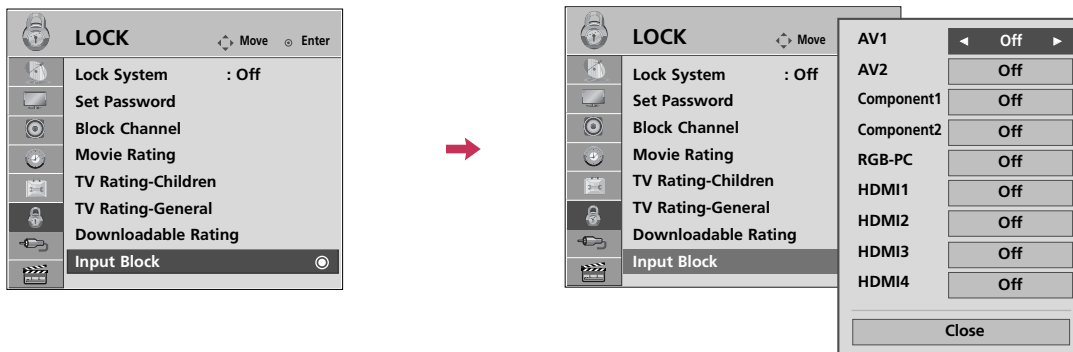
- 1    Select **LOCK**.
- 2  Input the password.
- 3  Select **Downloadable Rating**.
- 4   Select desired **Downloadable Rating** option.
- 5   Select desired option and block it.
- 6  Return to the previous menu.
-  Return to TV viewing.











■ If a Downloadable rating is locked, enter the password to unlocked it temporarily.

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.

APPENDIX

TROUBLESHOOTING

| The operation does not work normally. | |
|---------------------------------------|---|
| 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. |

| The video does not work. | |
|---|---|
| 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 HDMI cable over version 1.3. The HDMI cables don't support HDMI version 1.3, it cause flickers or no screen display. In this case use the latest cables that support HDMI version 1.3. |

The audio does not work.

| | |
|---------------------------------------|--|
| 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/USB | <ul style="list-style-type: none">■ Check HDMI cable over version 1.3.■ Check USB cable over version 2.0.■ Use normal MP3 file. <p style="text-align: right;">*This feature is not available for all models.</p> |

There is a problem in PC mode. (Only PC mode applied)

| | |
|--|---|
| 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

| MODELS | | 42LH90 (42LH90-UB) | 47LH90 (47LH90-UB) |
|--|---|--|--|
| Dimensions (Width x Height x Depth) | With stand | 40.7 x 28.3 x 11.6 inches 1036.0 x 721.3 x 296.2 mm | 45.4 x 31.1 x 13.2 inches 1153.2 x 791.5 x 337.4 mm |
| | Without stand | 40.7 x 25.8 x 3.5 inches 1036.0 x 655.4 x 89.8 mm | 45.4 x 28.3 x 3.9 inches 1153.2 x 719.0 x 99.8 mm |
| Weight | With stand | 41.6 lbs / 18.9 kg | 48.9 lbs / 22.2 kg |
| | Without stand | 37.6 lbs / 17.1 kg | 43.2 lbs / 19.6 kg |
| MODELS | | 55LH90 (55LH90-UB) | |
| Dimensions (Width x Height x Depth) | With stand | 52.7 x 35.4 x 16.6 inches 1339.0 x 901.0 x 423.0 mm | |
| | Without stand | 52.7 x 32.6 x 4.2 inches 1339.0 x 828.6 x 108.6 mm | |
| Weight | With stand | 79.3 lbs / 36.0 kg | |
| | Without stand | 71.6 lbs / 32.5 kg | |
| Power requirement Television System Program Coverage External Antenna Impedance | | AC100-240V ~ 50/60Hz NTSC-M, ATSC, 64 & 256 QAM VHF 2-13, UHF 14-69, CATV 1-135, DTV 2-69, CADTV 1-135 75 ohm | |
| Environment condition | Operating Temperature Operating Humidity | 32 ~ 104°F (0 ~ 40°C) Less than 80% | |
| | Storage Temperature Storage Humidity | -4 ~ 140°F (-20 ~ 60°C) Less than 85% | |

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

IR CODES

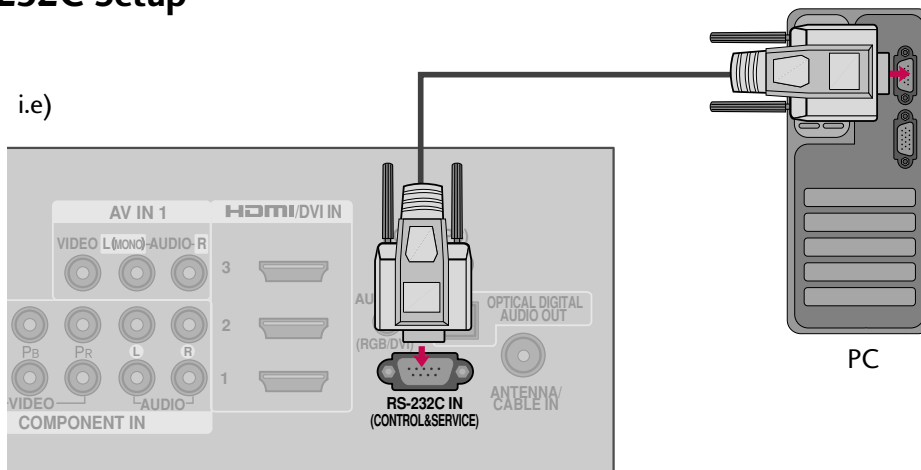
| Code (Hexa) | Function | Note | Code (Hexa) | Function | Note |
|-------------|----------------|--------------------------------------|-------------|------------|--|
| 08 | POWER | Remote control Button (Power On/Off) | D6 | TV | Discrete IR Code (TV Input Selection) |
| 45 | Q.MENU | Remote control Button | C4 | POWER ON | Discrete IR Code (Only Power On) |
| 43 | MENU | Remote control Button | | | |
| 0B | INPUT | Remote control Button | | | |
| 10-19 | Number Key 0-9 | Remote control Button | C5 | POWER OFF | Discrete IR Code (Only Power Off) |
| 4C | - (Dash)/LIST | Remote control Button | 5A | AV1 | Discrete IR Code (AV1 Input Selection) |
| 1A | FLASHBK | Remote control Button | | | |
| 09 | MUTE | Remote control Button | | | |
| 02 | VOL + | Remote control Button | D0 | AV2 | Discrete IR Code (AV2 Input Selection) |
| 03 | VOL - | Remote control Button | BF | COMPONENT1 | Discrete IR Code (Component1 Input Selection) |
| 00 | CH ^ | Remote control Button | | | |
| 01 | CH v | Remote control Button | | | |
| 1E | FAV/MARK | Remote control Button | D4 | COMPONENT2 | Discrete IR Code (Component2 Input Selection) |
| 40 | ^ | Remote control Button | D5 | RGB-PC | Discrete IR Code (RGB-PC Input Selection) |
| 41 | v | Remote control Button | | | |
| 07 | < | Remote control Button | | | |
| 06 | > | Remote control Button | CE | HDMI1 | Discrete IR Code (HDMI1 Input Selection) |
| 44 | ENTER | Remote control Button | CC | HDMI2 | Discrete IR Code (HDMI2 Input Selection) |
| 28 | RETURN | Remote control Button | | | |
| 95 | ENERGY SAVING | Remote control Button | | | |
| 7E | SIMPLINK | Remote control Button | E9 | HDMI3 | Discrete IR Code (HDMI3 Input Selection) |
| AA | INFO | Remote control Button | DA | HDMI4 | Discrete IR Code (HDMI4 Input Selection) |
| 30 | AV MODE | Remote control Button | | | |
| 72 | RED | Remote control Button | | | |
| 71 | GREEN (■) | Remote control Button | 76 | Ratio 4:3 | Discrete IR Code (Only 4:3 Mode) |
| 63 | YELLOW (▶) | Remote control Button | 77 | Ratio 16:9 | Discrete IR Code (Only 16:9 Mode) |
| 61 | BLUE (■) | Remote control Button | | | |
| 8F | ◀◀ | Remote control Button | | | |
| 8E | ▶▶ | Remote control Button | AF | Ratio Zoom | Discrete IR Code (Only Zoom Mode) |

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.

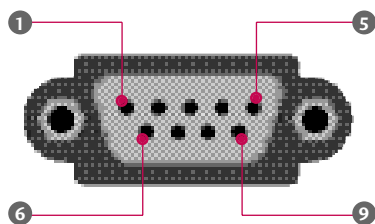
- Note: RS-232C on this unit is intended to be used with third party RS-232C control hardware and software. The instructions below are provided to help with programming software or to test functionality using telenet software.

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

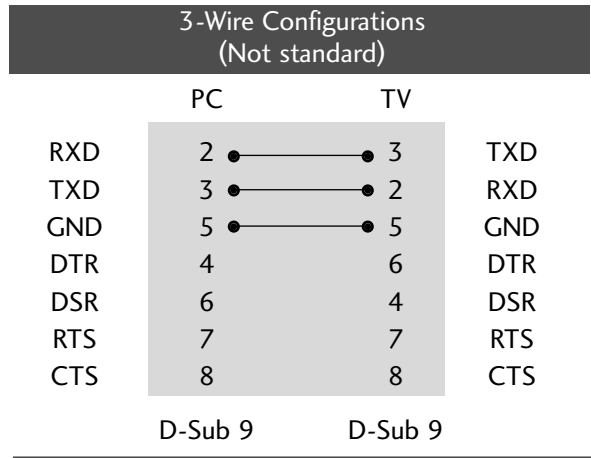
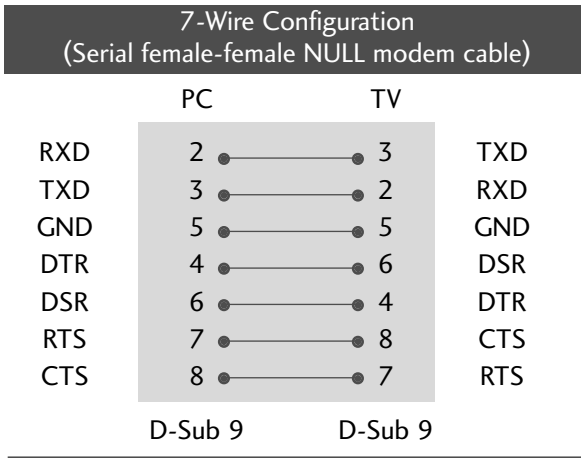
- Baud rate : 9600 bps (UART)
- Data length : 8 bits
- Parity : None
- Stop bit : 1 bit
- Communication code : ASCII code
- Use a crossed (reverse) cable.

! NOTE

- ▶ This product has command echo back in the RS-232C Command.

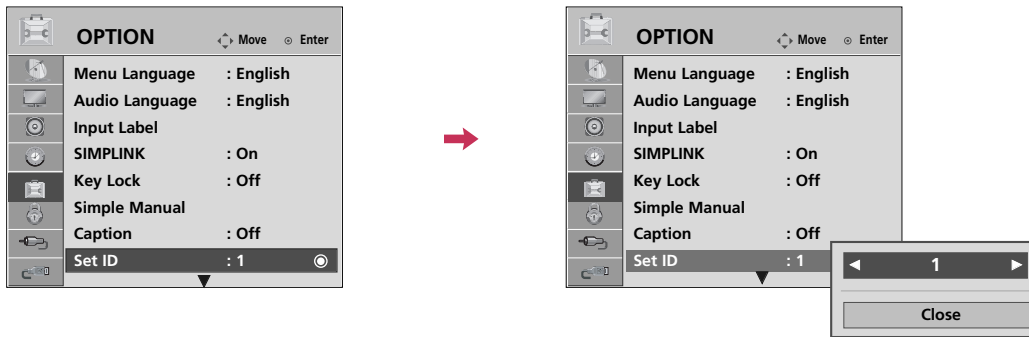
RS-232C Configurations

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 | 14. Treble | k | r | 00 ~ 64 |
| 02. Input Select | x | b | (▶ p.117) | 15. Bass | k | s | 00 ~ 64 |
| 03. Aspect Ratio | k | c | (▶ p.117) | 16. Balance | k | t | 00 ~ 64 |
| 04. Screen Mute | k | d | (▶ p.117) | 17. Color Temperature | k | u | 00 ~ 04 |
| 05. Volume Mute | k | e | 00 ~ 01 | 18. Energy Saving | j | q | (▶ p.118) |
| 06. Volume Control | k | f | 00 ~ 64 | 19. Auto Configuration | j | u | (▶ p.118) |
| 07. Contrast | k | g | 00 ~ 64 | 21. Channel Add/Del | m | b | 00 ~ 01 |
| 08. Brightness | k | h | 00 ~ 64 | 22. Key | m | c | (▶ p.119) |
| 09. Color | k | i | 00 ~ 64 | 23. Backlight | m | g | 00 ~ 64 |
| 10. Tint | k | j | 00 ~ 64 | | | | |
| 11. Sharpness | k | k | 00 ~ 64 | | | | |
| 12. OSD Select | k | l | 00 ~ 01 | | | | |
| 13. Remote Control Lock Mode | k | m | 00 ~ 01 | | | | |

| | COMMAND1 | COMMAND2 | DATA00 (Hexadecimal) | DATA01 (Hexadecimal) | DATA02 (Hexadecimal) | DATA03 (Hexadecimal) | DATA04 (Hexadecimal) | DATA05 (Hexadecimal) |
|--------------------|----------|----------|--------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 19. 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: Component1 Data 41: Component 2
Data 60: RGB-PC Data 90: HDMI1
Data 91: HDMI2 Data 92: HDMI3
Data 93: HDMI4

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 Zoom1
04: Zoom ⋮
06: Set by program 1F: Cinema Zoom16

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 On Screen 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)

*Refer to 'Real data mapping'.

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)

*Refer to 'Real data mapping'.

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)

*Refer to 'Real data mapping'.

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)

*Refer to 'Real data mapping'.

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)

*Refer to 'Real data mapping'.

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)

*Refer to 'Real data mapping'.

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 set.

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.

If Key Lock is on in the standby mode, TV will not turn on by POWER button of remote control and on the TV.

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)

*Refer to 'Real data mapping'.

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)

*Refer to 'Real data mapping'.

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)

*Refer to 'Real data mapping'.

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

17. Color Temperature (Command: k u)

To adjust color temperature.

You can also adjust color temperature in the PICTURE menu.

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

Data 00: Medium 01: Cool 02: Warm

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

18. Energy Saving (Command: j q)

To control the energy saving function.

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

Data 00: Energy saving - off

01: Energy saving - Minimum

02: Energy saving - Medium

03: Energy saving - Maximum

04: Energy saving - Auto

05: Energy saving - Screen off

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

19. 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 01: To set

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

20. 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.

Data5:

| 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 | 1 | 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 | 0 | 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 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]
```

21. 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]

22. Key (Command: m c)

To send IR remote control code.

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

See page 113.

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

When TV is in the standby mode, TV will turn on by POWER button of remote control only.

23. Backlight (Command: m g)

To adjust screen backlight.

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

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

*Refer to 'Real data mapping'.

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

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"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

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2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of section 1 above, provided that you also meet all of these conditions:

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- b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
- c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this license.
- d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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In addition, mere aggregation of another work not based on the library with the library (or with a work based on the library) on a volume of a storage or distribution medium does not bring the other work under the scope of this license.

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This option is useful when you wish to copy part of the code of the library into a program that is not a library.

4. You may copy and distribute the library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a “work that uses the Library”. Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this license.

However, linking a “work that uses the library” with the Library creates an executable that is a derivative of the Library (because it contains portions of the library), rather than a “work that uses the library”. The executable is therefore covered by this license. Section 6 states terms for distribution of such executable.

When a “work that uses the library” uses material from a header file that is part of the library, the object code for the work may be a derivative work of the library even though the source code is not.

Whether this is true is especially significant if the work can be linked without the library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessories, and small macros and small inline functions (ten lines or less in length), then the use of

the object file is unrestricted, regardless of whether it is legally a derivative work. (Executable containing this object code plus portions of the library will still fall under Section 6.)

Otherwise, if the work is a derivative of the library, you may distribute the object code for the work under the terms of Section 6. Any executable containing that work also fall under Section 6, whether or not they are linked directly with the library itself.

6. As an exception to the sections above, you may also combine or link a “work that uses the library” with the library to produce a work containing portions of the library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer’s own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the library is used in it and that the Library and its use are covered by this license. You must supply a copy of this license. If the work during execution displays copyright notices, you must include the copyright notice for the library among them, as well as a reference directing the user to the copy of this license. Also, you must do one of these things:

- a) Accompany the work with the complete corresponding machine-readable source code for the library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable “work that uses the Library”, as object code and/or source code, so that the user can modify the library and then relink to produce a modified executable containing the modified library. (It is understood that the user who changes the contents of definitions files in the library will not necessarily be able to recompile the application to use the modified definitions.)
- b) Use a suitable shared library mechanism for linking with the library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user’s computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.
- c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6, above, for a charge no more than the cost of performing this distribution.
- d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.
- e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the “work that uses the library” must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the library together in an executable that you distribute.

7. You may place library facilities that are a work based on the library side-by-side in a single library together with other library facilities not covered by this license, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:
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Version 1.1

1. Definitions.

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1.1. “Contributor” means each entity that creates or contributes to the creation of modifications.

1.2. “Contributor version” means the combination of the original code, prior modifications used by a contributor, and the modifications made by that particular contributor.

1.3. “Covered code” means the original code or modifications or the combination of the original code and modifications, in each case including portions thereof.

1.4. “Electronic distribution mechanism” means a mechanism generally accepted in the software development community for the electronic transfer of data.

1.5. “Executable” means covered code in any form other than source code.

1.6. “Initial developer” means the individual or entity identified as the initial Developer in the Source Code notice required by exhibit A.

1.7. “Larger work” means a work which combines covered code or portions thereof with code not governed by the terms of this License.

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1.10. “Original code” means source code of computer software

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