

SHARP®

AQUOS

4K Ultra HD Commercial LCD TV
Téléviseur LCD commercial 4K ULTRA HD
Televisor LCD comercial 4K Ultra HD

OPERATION MANUAL
MODE D'EMPLOI
MANUAL DEL USUARIO

- Please choose your favorite page from the content.
If you want to close the operation manual, press the EXIT button.
Also, if you want to return to the previously displayed page, press the RETURN button.
- Veuillez choisir votre page favorite dans le contenu.
Appuyez sur le bouton EXIT pour refermer le mode d'emploi. Par ailleurs, appuyez sur le bouton RETURN si vous souhaitez revenir à la page précédemment affichée.
- Elija su página favorita entre los contenidos.
Si desea cerrar el manual de instrucciones, pulse el botón EXIT.
Además, si desea volver a la página mostrada anteriormente, pulse el botón RETURN.

 DOLBY AUDIO™

 HDMI™
HIGH DEFINITION MULTIMEDIA INTERFACE

 WiFi
CERTIFIED

 WONDERSHARE
SETUP

 4K



Important



DEAR SHARP CUSTOMER

Thank you for your purchase of the Sharp LCD TV. To ensure safety and many years of trouble-free operation of your product, please read the Important Safety Instructions carefully before using this product.

IMPORTANT SAFETY INSTRUCTIONS

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

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) 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.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) 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.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) 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.





Important



IMPORTANT SAFETY INSTRUCTIONS

Additional Safety Information

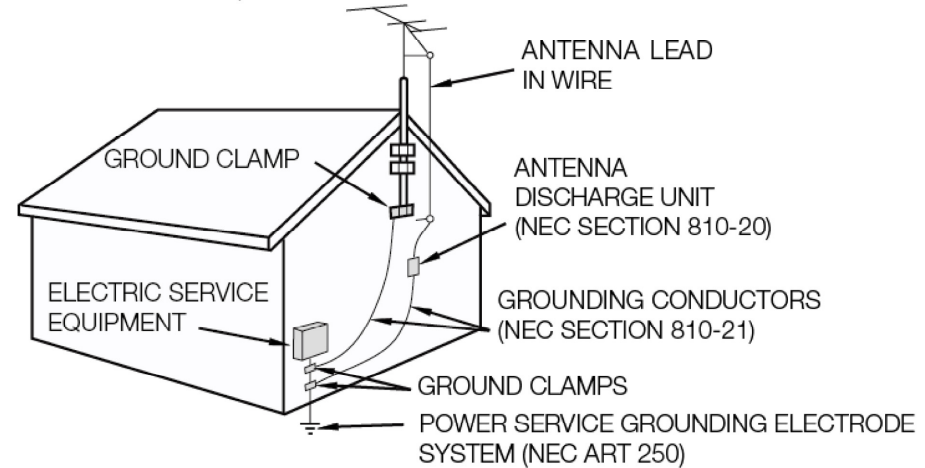
- 15)Power Sources—This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.
- 16)Overloading—Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.
- 17)Object and Liquid Entry—Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
- 18)Damage Requiring Service—Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - a)When the AC cord or plug is damaged,
 - b)If liquid has been spilled, or objects have fallen into the product,
 - c)If the product has been exposed to rain or water,
 - d)If the product does not operate normally by following the operating instructions.
Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation,
 - e)If the product has been dropped or damaged in any way, and
 - f)When the product exhibits a distinct change in performance - this indicates a need for service.
- 19)Replacement Parts—When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.
- 20)Safety Check—Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
- 21)Wall or ceiling mounting—When mounting the product on a wall or ceiling, be sure to install the product according to the method recommended by the manufacturer.

ENG

**Important****IMPORTANT SAFETY INSTRUCTIONS**

- Outdoor Antenna Grounding — If an outside antenna is connected to the television equipment, be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard 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.

EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE, ANSI/NFPA 70



NEC — NATIONAL ELECTRICAL CODE

ENG



Important



IMPORTANT SAFETY INSTRUCTIONS

- Water and Moisture — Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.
- Stand — Do not place the product on an unstable cart, stand, tripod or table. Placing the product on an unstable base can cause the product to fall, resulting in serious personal injuries as well as damage to the product. Use only a cart, stand, tripod, bracket or table recommended by the manufacturer or sold with the product. When mounting the product on a wall, be sure to follow the manufacturer's instructions. Use only the mounting hardware recommended by the manufacturer.
- Selecting the location — Select a place with no direct sunlight and good ventilation.
- Ventilation — The vents and other openings in the cabinet are designed for ventilation. Do not cover or block these vents and openings since insufficient ventilation can cause overheating and/or shorten the life of the product. Do not place the product on a bed, sofa, rug or other similar surface, since they can block ventilation openings. This product is not designed for built-in installation; do not place the product in an enclosed place such as a bookcase or rack, unless proper ventilation is provided or the manufacturer's instructions are followed.
- The front panel used in this product is made of glass. Therefore, it can break when the product is dropped or applied with impact. Be careful not to be injured by broken glass pieces in case the panel breaks.
- Heat — The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.
- The Liquid Crystal panel is a very high technology product with 8,294,400 pixels, giving you fine picture details. Occasionally, a few non-active pixels may appear on the screen as a fixed point of blue, green or red. Please note that this does not affect the performance of your product.
- Lightning — For added protection for this television equipment during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna. This will prevent damage to the equipment due to lightning and power-line surges.
- Power Lines — An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.
- To prevent fire, never place any type of candle or flames on the top or near the TV set.
- To prevent fire or shock hazard, do not place the AC cord under the TV set or other heavy items.

ENG



Important



IMPORTANT SAFETY INSTRUCTIONS

WARNING – Stability Hazard

A television set may fall causing serious personal injury or death. Many injuries, particularly to children, can be avoided by taking simple precautions such as:

- ALWAYS use cabinets or stands or mounting method recommended by the manufacturer of the television set.
- ALWAYS use furniture that can safely support the television set.
- ALWAYS ensure the television set is not overhanging the edge of the supporting furniture.
- ALWAYS educate children about the dangers of climbing on furniture to reach the television set or its controls.
- ALWAYS route cords and cables connected to your television so they cannot be tripped over , pulled or grabbed.
- NEVER place a television set in an unstable location.
- NEVER place the television set on tall furniture (for example, cupboards or bookcases) without anchoring both the furniture and the television set to a suitable support.
- NEVER place the television set on cloth or other materials that may be located between the television set and supporting furniture.
- NEVER place items that might tempt children to climb, such as toys and remote controls, on the top of the television or furniture on which the television is placed.

If the existing television set is going to be retained and relocated, the same considerations as above should be applied.

CAUTION

- Replacement of a battery with an incorrect type that can defeat a safeguard(for example, in the case of some lithium battery types) ;
- Disposal of a battery into fire or a hot oven , or mechanically crushing or cutting of a battery, that can result in an explosion ;
- Leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas ;
- A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas.
- Risk of fire or explosion if the battery is replaced by an incorrect type.



Important



IMPORTANT SAFETY INSTRUCTIONS

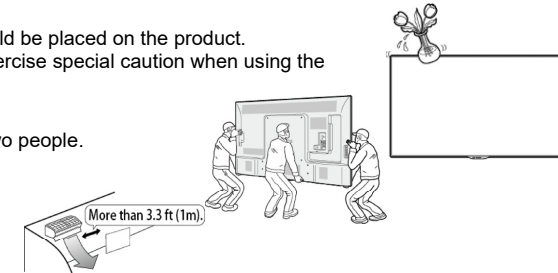
- Do not display a still picture for a long time, as this could cause an afterimage to remain.
- To prevent fire or shock hazard, do not expose this product to dripping or splashing. No objects filled with liquids, such as vases, should be placed on the product.
- Do not insert foreign objects into the product. Inserting objects in the air vents or other openings may result in fire or electric shock. Exercise special caution when using the product around children.

Precautions when transporting the TV (For SHARP dealer and service engineers)

- When transporting the TV, never carry it by holding or otherwise putting pressure onto the display. Be sure to always carry the TV by two people.

Do not install the TV in a location in which it will be subject to water drops such as underneath an air conditioning unit or in the vicinity of a humidifier

- Water drops falling onto the TV and water entering inside it may result in fire, electric shock, or malfunctions.
- We recommend that you install the TV at least 3.3 ft (1m) away from the outlet of an air conditioner.

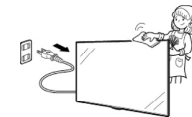


Caring for the cabinet

- Use a soft cloth (cotton, flannel, etc.) and gently wipe the surface of the cabinet.
 - Using a chemical cloth (wet/dry sheet type cloth, etc.) may deform the components of the main unit cabinet or cause cracking.
 - Wiping with a hard cloth or using strong force may scratch the surface of the cabinet.
 - If the cabinet is very dirty, wipe with a soft cloth (cotton, flannel, etc.) soaked in neutral detergent diluted with water and thoroughly wrung out, and then wipe with a soft dry cloth.
 - Avoid using benzene, thinner, and other solvents, as these may deform the cabinet and cause the paint to peel off.
 - Do not apply insecticides or other volatile liquids.
- Also, do not allow the cabinet to remain in contact with rubber or vinyl products for a long period of time. Plasticizers inside the plastic may cause the cabinet to deform and cause the paint to peel off.

Caring for the front panel

- Turn off the main power and unplug the AC cord from the wall outlet before handling.
- Gently wipe the surface of the front panel with a soft cloth (cotton, flannel, etc.). To protect the front panel, do not use a dirty cloth, liquid cleaners, or a chemical cloth (wet/dry sheet type cloth, etc.). This may damage the surface of the front panel.
- Wiping with a hard cloth or using strong force may scratch the surface of the front panel.
- Use a soft damp cloth to gently wipe the front panel when it is really dirty. (It may scratch the surface of the front panel when wiped strongly.)
- If the front panel is dusty, use an anti-static brush, which is commercially available, to clean it.
- To avoid scratching the frame or screen, please use a soft, lint free cloth for cleaning. Approved cleaning cloths are available directly from Sharp in single (00Z-LCD-CLOTH) or triple (00Z-LCD-CLOTH-3) packs. Call 1-877-PRO-ADV1 (1-877-776-2381) for ordering, or VISIT <http://www.sharpusa.com>.





Important



IMPORTANT SAFETY INSTRUCTIONS

Especially for child safety

- Don't allow children to climb on or play with the TV.
- Don't place the TV on furniture that can easily be used as steps, such as a chest of drawers.
- Remember that children can become excited while watching a program, especially on a "larger than life" TV. Care should be taken to place or install the TV where it cannot be pushed, pulled over, or knocked down.
- Care should be taken to route all cords and cables connected to the TV so that they cannot be pulled or grabbed by curious children.

Wireless LAN

This TV has received the following certifications.

- Wi-Fi CERTIFIED™ (certification program from the Wi-Fi Alliance®)
- Wi-Fi Protected Setup™ (certification program from the Wi-Fi Alliance®)

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. To comply with the FCC RF exposure compliance requirements, this device and its antenna must not be co-located or operated in conjunction with any other antenna or transmitter.



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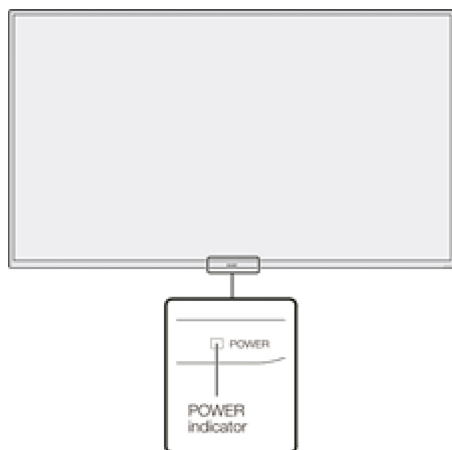


Part Names

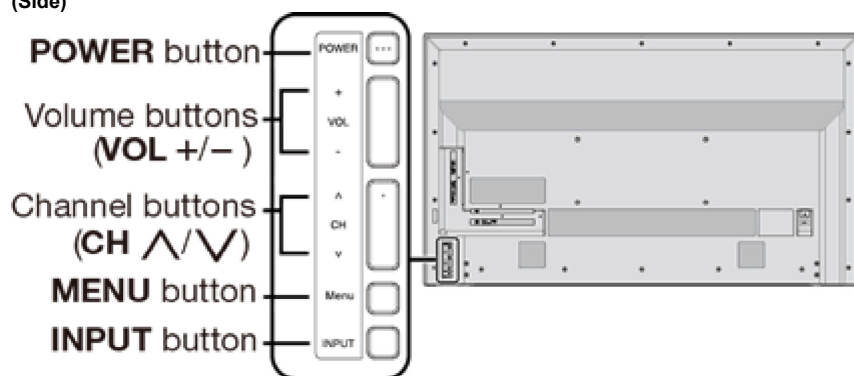


TV (4T-B60CJ1U/4T-B70CJ1U/4T-B80CJ1U)

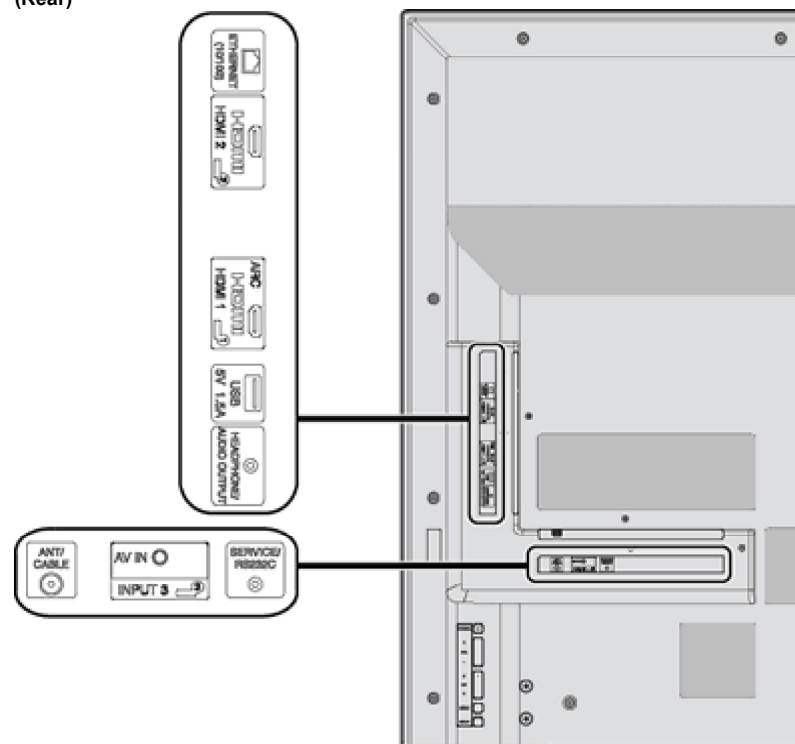
(Front)

*1 [See page 4-26.](#)

(Side)

* [See pages 2-1](#) and [4-4](#) for button operations.

(Rear)



- The illustrations and on-screen displays in this operation manual are for explanation purposes and may vary slightly from the actual operations.
- The examples used throughout this manual are based on the 4T-B60CJ1U model.

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Part Names

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Remote Control Unit

**NOTE**

- When using the remote control unit, point it at the TV.

- 1 POWER:** Switch the TV power on or enter standby.
- 2 DISPLAY:** Display the channel information.
- 3 SLEEP:** Set the sleep timer
(See page 3-6.)
- 4 0-9:** Set the channel.
(See pages 3-1.)
- 5 • (DOT):** Set the channel.
(See pages 3-1.)
- 6 OPTION:** Display the Link Operation Menu screen. This button will function only when LINK Operation is used.
(See page 6-1 to 6-4.)
- 7 VOL+/-:** Set the volume.
(See page 3-2.)
- 8 AUDIO:** Select the MTS/SAP or the audio mode during multichannel audio broadcast.
(See page 3-5.)
- 9 MUTE:** Mute the sound.
(See page 3-3.)
- 10 ▲/▼/◀/▶, ● (ENTER):** Select a desired item on the screen.
- 11 EXIT:** Turn off the menu screen.
- 12 A/B/C/D:** Select 4 preset favorite channels in 4 different categories.
(See page 4-6.)
- 13 MANUAL:** Display the operation manual.
(See page 4-15.)
- 14 APPS:** Display the application window.
(See page 3-4.)
- 15 INPUT:** Select a TV input source.
(See page 2-1.)
- 16 CH:** Select the channel.
(See page 3-1.)
- 17 MENU:** Display the menu screen.
(See page 4-1.)
- 18 RETURN:** Return to previous menu screen.

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Introduction

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Initial Installation

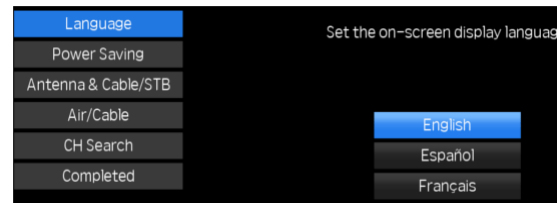
Perform the following steps before you press **POWER** on the remote control unit.

1. Insert the batteries into the remote control unit.
2. Connect the antenna cable to the TV.
3. Plug in the AC cord to the AC outlet.

Language (Language setting)

Select from among 3 languages: English, French and Spanish.

- 1 Press ▲/▼ to select the desired language listed on the screen, and then press **ENTER**.





Introduction

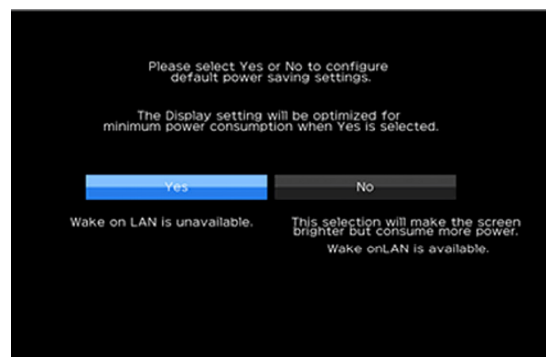


Initial Installation (Continue)

Power Saving

Select "Si" or "No" to configure default Display settings.

- 2 Press to select "Yes" or "No".
Press **ENTER** to enter the setting.



Yes: AV MODE is set to "STANDARD".

No: AV MODE is set to "DYNAMIC (Fixed)". Picture Reset can be set.

Picture Reset: AV MODE will be set to "DYNAMIC (Fixed)" regardless of whether Picture Reset is "On" or "Off".

- If you select "On" and there is no operation for 30 minutes:
 - AV MODE will be reset to "DYNAMIC (Fixed)".
- When "Off" is selected:
 - Even after 30 minutes elapses, AV MODE is not reset to "DYNAMIC (Fixed)".

Antenna & Cable/STB

Select the type of connection you will use to watch TV.

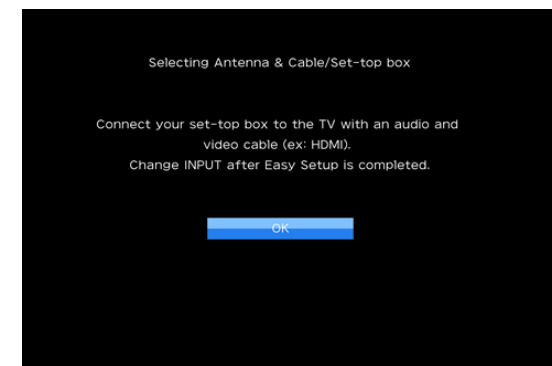
- 3 Press to select "Antenna & Cable" or "Set-top box", and then press **ENTER**.



To watch TV via an antenna or cable connection (without using a set-top box):

Select "Antenna & Cable", and then go to step 4. To watch TV via set-top box:

- 1 Select "Set-top box" and then press **ENTER**.
- 2 Check that the set-top box connected to the TV is on.



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Introduction

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Initial Installation (Continue)

CH Search (Channel search)

Channel auto search makes the TV look for all channels viewable in the set area.

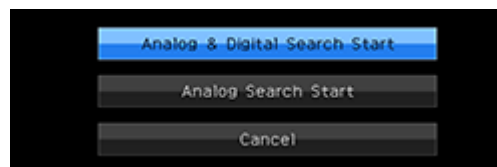
4 When "Air" is selected in Antenna setting:

Press to select "Start", and then press **ENTER**.



When "Cable" is selected in Antenna setting:

Press / to select "Analog & Digital Search Start" to search both analog and digital broadcasts, or to select "Analog Search Start" to search only analog broadcasts, and then press **ENTER**.



- The Channel search will start automatically.
- To exit the Channel search screen, select "Cancel", and then press **ENTER**.

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Introduction

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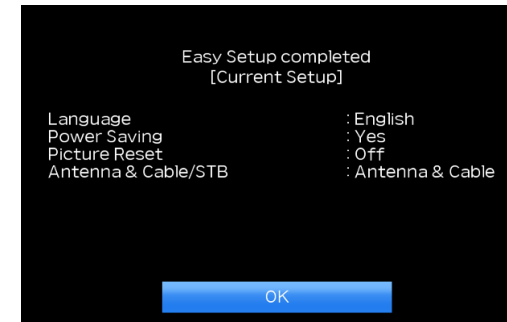


Initial Installation (Continue)

Completed

5 The settings confirmation screen is displayed. Confirm the information displayed on the screen, and then press **ENTER**.

Examples of the settings confirmation screen
When "Antenna & Cable" was selected in step 3.



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Introduction

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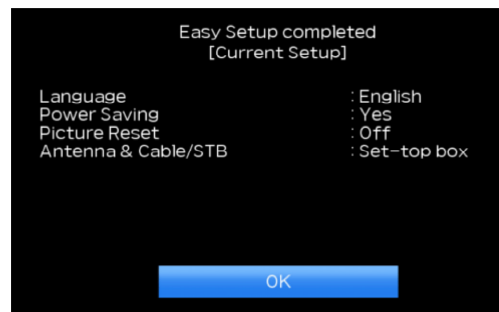


Initial Installation (Continue)

NOTE

- If no channel is found, confirm the type of connection made with your TV and try "Easy Setup" again. ([See page 4-5.](#))

When "Set-top box" was selected in step 3.



- Click "OK" to display the confirmation screen for input source switching.

Show the input list: You can check the current connection status of external equipment. Confirm which input terminal is connected to the set-top box.

OK: Clicking "OK" will complete the Easy Setup procedure.

NOTE

- For changing the settings of the Initial Installation, perform "Easy Setup" on the Initial Setup menu on [page 4-5.](#)

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Direct Button Operation



Changing Channels

You can change channels in several ways.

Method 1

Using **CH** on the remote control unit or on the TV.

Method 2

Using remote control buttons **0-9**, • (DOT).

Examples:

To select a 1 or 2-digit channel number (e. g., Channel 5):

Press **5** → **ENTER**

To select a 3-digit channel number (e. g., Channel 115):

Press **1** → **1** → **5** → **ENTER**

To select a 4-digit channel number (e. g., Channel 22.1):

Press **2** → **2** → **• (DOT)** → **1** → **ENTER**

NOTE

- When selecting a 1-digit channel number, it is not necessary to press **0** before the number.
- When you enter **0-9** only, channel selection will be made if there is no operation within a few seconds.
- if you push "0" by itself, nothing will happen.
- Complete the above steps within a few seconds.
- When you enter 0-9 and • (DOT), channel selection will be made if there is no operation within a few seconds.

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Direct Button Operation

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Changing Volume

You can change the volume by pressing **VOL +/-** on the TV or on the remote control unit.

- To increase the volume, press **VOL +**.
- To decrease the volume, press **VOL -**.



Audio status

Output device	Audio Output Select	
	Audio Out	Headphone
TV Speaker	Variable Sound	Mute
AUDIO OUT / HEADPHONE	Fixed Sound (Volume MAX)	Variable Sound

ENG 3-2

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Direct Button Operation

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MUTE

Mutes the current sound output.

Press (MUTE).

- will be displayed on the screen for 30 minutes, and the sound is silenced.

NOTE

- Mute can be cancelled by pressing **VOL+/-** or **MUTE**.

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Direct Button Operation



APPS

Allows you to directly activate various types of applications.

- 1 Press **APPS** to display the application window.
 - Press **APPS** again to switch back to the currently select input.
- 2 Press **ENTER** to select the desired application, and then press **ENTER**.
 - If "E" is displayed, check the USB connection.
 - If "N" is displayed, check your Monitor's network settings and connection.

NOTE

- [See page 5-2, 8-4 to 8-7](#) for details of viewable applications.
- When this function is not available, "Can not operate this function now" will display.

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Direct Button Operation

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MPX

Switching the digital audio format (DTV only)

If multi sound modes are received, each time you press **AUDIO** (MPX) the mode switches.

NOTE

- The sound mode screen disappears in three seconds.
- Selectable items vary depending on the received broadcasts.
- The audio description sound is selected depending on the main audio.

Switching the analog audio format

You can switch between multiple audio modes when watching a multiple audio or stereo broadcast program.

When receiving a stereo signal

Each time you press **AUDIO** (MPX), the mode switches between Stereo and Mono.

Stereo mode

Stereo ↔ Mono

When receiving a Stereo + SAP signal

Each time you press **AUDIO** (MPX), the mode switches among SAP, Mono and Stereo.

Stereo + SAP mode

SAP → Mono
 ↓
 Stereo

When receiving a monaural signal

When you press **AUDIO** (MPX), "Mono" displays.

Monaural mode

Mono

When receiving a monaural signal + SAP signal

Each time you press **AUDIO** (MPX), the mode switches between Mono and SAP.

Mono + SAP mode

Mono ↔ SAP

When receiving a bilingual signal

Each time you press **AUDIO** (MPX), the mode switches among Dual I and Dual II.

Bilingual mode

Dual I → Dual II

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Direct Button Operation

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Sleep Timer

Allows you to set a time when the TV automatically switches to standby.

Press **SLEEP**.

- The remaining time displays when the sleep timer has been set.
- Each time you press **SLEEP**, the remaining time switches as shown below.

```

Off  → 0hr30min → 1hr00min
  ↑      ↓
2hr30min ← 2hr00min ← 1hr30min
  
```

- When set, the time automatically starts counting down.
- If you want to adjust the sleep timer, you can press **SLEEP** twice then change the time setting.
- When it is 5 minutes before the time expires, the remaining time will start to keep appearing every minute.

NOTE

- Select "Off" by pressing SLEEP to cancel the sleep timer.
- The TV will enter standby when the remaining time reaches 0.

>>

On-Screen Display Menu

<<



Introduction



① Guide display

- This indicates the buttons that can be operated on the displayed screen. The guide display varies depending on the menu setting screen.
- The operations for some selected items may be displayed in the operational guide bar at the bottom of the screen.

② Item displayed in blue

- This indicates the item currently selected.
- Press **ENTER** to go to the adjustment screen for this item.

③ Item in brackets

- This indicates the current setting for the item.

④ Item displayed in white

- This indicates that the item can be selected.

⑤ Item displayed in gray

- This indicates that the item cannot be selected. There are various reasons why the items cannot be selected, but the main reasons are as follows:
 - Nothing is connected to the selected input terminal.
 - The function is not compatible with the current input signal.
 - When this conflicts with other functions, you must change the settings for the other functions.

>>

On-Screen Display Menu

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Introduction (Continue)

About Menu Items

- Some menu items may not be displayed depending on the selected input source.

NOTE

- The screens in the operation manual are for explanation purposes (some are enlarged, others cropped) and may vary slightly from the actual screens.
- The order of explanations for each menu item in the following pages is not necessarily in accordance with the alignment of the items on the screen.



LCFONT:

- This product is embedded with LC Font technology, which was developed by SHARP Corporation for clearly displaying easy-to-read characters on LCD screens.

>>

On-Screen Display Menu

<<



On-Screen Display Menu Operation

Example



1 Press **MENU** to display the MENU screen.

2 ① Press **◀▶** to select the desired menu.

② Press **▲▼** to select a specific adjustment item, and then press **ENTER**.

- Additional related adjustment items may be displayed. Press **▲▼** to select the desired item.

③ Adjust the item while referring to the guide display.

- Operations vary depending on the function or item. Refer to the guide display corresponding to the menu setting screen for button operations.

3 Press **MENU** to exit.

NOTE

- Menu options differ in the selected input modes, but the operating procedures are the same.

>>

On-Screen Display Menu

<<



Menu Operation Buttons

Using the remote control

Use the following buttons on the remote control to operate the menu.

MENU: Press to open or close the menu screen.

▲/▼/◀/▶: Press to select a desired item on the screen or adjust a selected item.

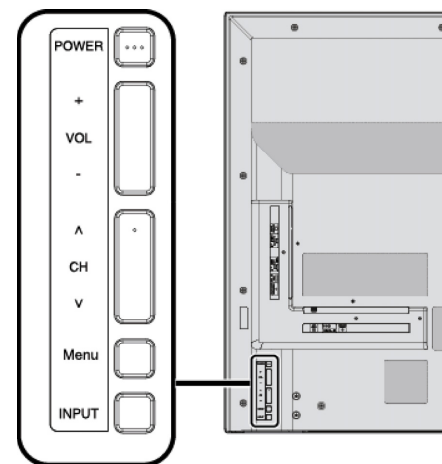
ENTER: Press to go to the next step or complete the setting.

RETURN: Press to return to the previous step.

Using the control panel of the TV

You can also operate the menu with the control panel of the TV.

Button operations on the control panel correspond to the ones on the remote control as shown below.



MENU: MENU on the remote control.

INPUT: ENTER on the remote control.

CH▲/▼: Cursor ▲/▼ on the remote control.

VOL+/-: Cursor ◀/▶ on the remote control.

>>

On-Screen Display Menu

<<

Example



Initial Setup

NOTE

- For operating the on-screen display menu, [see page 4-3](#).

Easy Setup

You can change the settings of the Initial Installation.

Language: Select from among 3 languages (English, French and Spanish).

Power Saving: Select "Yes" or "No" to configure default Display settings.

Yes: AV MODE is set to "STANDARD".

No: AV MODE is set to "DYNAMIC (Fixed)". Picture Reset can be set.

Picture Reset: AV MODE will be set to "DYNAMIC (Fixed)" regardless of whether Picture Reset is "On" or "Off". If you select "On", AV MODE will be reset to "DYNAMIC (Fixed)" if there is no operation for 30 minutes. When "Off" is selected, even after 30 minutes elapses, AV MODE is not reset to "DYNAMIC (Fixed)".

Antenna & Cable/STB: Select the type of connection you will use to watch TV.

Air/Cable: Make sure what kind of connection is made with your TV when selecting "Air" or "Cable".

CH Search: Channel auto search makes the TV look for all channels viewable in the set area.

Completed: The settings confirmation screen is displayed. Confirm the information displayed on the screen.

NOTE

- See Initial Installation on [pages 2-2 to 2-6](#) for setting each item.
- If no channel is found, confirm the type of connection made with your TV and try "Easy Setup" again.
- If you select "Analog Search Start" and initiate the channel search, the CH Memory for Cable Digital will be deleted.

Language

You can also select a language from the Initial Setup menu. Select from among 3 languages: English, French and Spanish.

NOTE

- To change the language of the manual, select "MENU" > "Initial Setup" > "Language" to change the language. Then, press **MANUAL** again.

TV Channel Setup


Channel Setup


If Initial Installation does not memorize all the channels in your region, follow the instructions below to manually memorize the channels.

Air/Cable: Make sure what kind of connection is made with your TV when selecting "Air" or "Cable".

CH Search: Channel auto search makes the TV look for all channels viewable in the set area.

CH Memory: You can select the channels to skip in each ANALOG (Air), ANALOG (Cable), DIGITAL (Air) and DIGITAL (Cable).

On: Skips channels. (Channel selection disabled using **CH** )

Off: Does not skip channels. (Channel selection enabled using **CH** )

NOTE

- See Initial Installation on [pages 2-2 to 2-6](#) for setting each item.
- If no channel is found, confirm the type of connection made with your TV and try channel search again.
- If you select "Analog Search Start" and initiate the channel search, the CH Memory for Cable Digital will be deleted.

>>

On-Screen Display Menu

<<

Example



Initial Setup (Continue)

TV Channel Setup

Favorite CH (Favorite Channel Setting)

This function allows you to program 4 favorite channels, in 4 different categories. By setting the favorite channels in advance, you can select your favorite channels easily.

To register your favorite channel:

Select "Register" and then press **ENTER**. Press **▲/▼/◀/▶** to select the position in the category, and then press **ENTER** to register.

To delete your favorite channel:

Select "1 Data Clear" and then press **ENTER**. Press **▲/▼/◀/▶** to select the channel you want to delete, and then press **ENTER**. Select "Yes" and then press **ENTER**.

To delete all the favorite channels, select "All Data Clear".

NOTE

- Before setting the channel, select the channel you want to register as a favorite channel.
- You can display the "Favorite CH" screen by pressing **FAV CH** on the remote control.

Antenna Setup-DIGITAL

In order to receive digital air broadcasts, you need a digital broadcast antenna. You can confirm the antenna configuration through the "Antenna Setup-DIGITAL" screen. If necessary, adjust the direction of the antenna to obtain the maximum signal strength.

Signal Strength: The signal strength of DIGITAL channel is displayed. The signal information is based on the current channel.

Channel Strength: Input the 2-digit channel number to check the signal strength of the selected channel. Make sure the signal is strong enough for each channel.

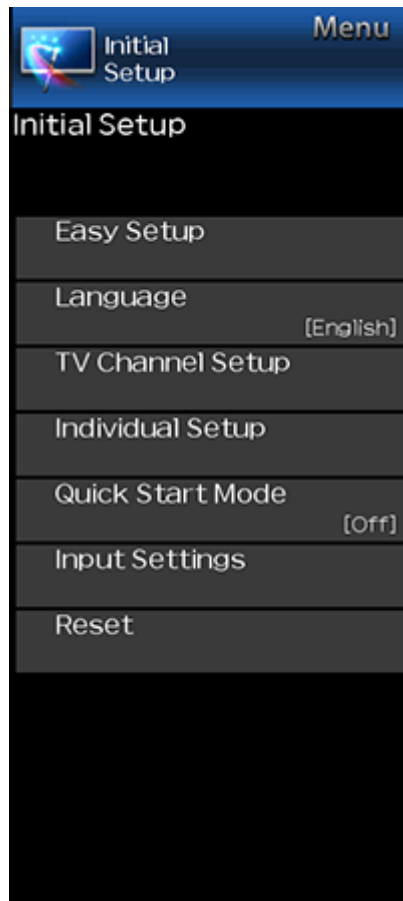
- This function is available for DIGITAL (Air) only.

>>

On-Screen Display Menu

<<

Example



Initial Setup (Continue)

Individual Setup

Secret No.

Allows you to use a secret number to protect certain settings from being accidentally changed.

IMPORTANT:

Three conditions must be met to enable the V-Chip

1. Secret No. is registered.
2. V-Chip/V-Chip (DTV Only) settings have been made.
 - The "V-Chip (DTV Only)" will only be selectable when a new rating system can be downloaded via digital broadcasting in the U.S.
3. "Status" is set to "Enable".

Setting Secret No.

You can set and change the secret number by using **0-9**.

New Secret No.: Changes or sets the Secret No.

Confirm Secret No.: Enter Secret No. to confirm.

NOTE

- As a precautionary measure, make a note of your secret number and keep it in a familiar place.

Parental Control (Parental Control Setting)

V-Chip

V-CHIP is an electronic filtering device built into your TV. This tool gives parents a great degree of control over broadcasts accessed by their children. It allows parents to select programs judged suitable for child viewing while blocking ones judged not suitable. It does so automatically once you activate the V-CHIP feature in your TV. "V-Chip" and "Status" will not be selectable from the menu if you do not first configure your secret number.

- The U.S. has two rating systems for viewing content: TV Parental Guidelines and movie ratings.
- The TV Parental Guidelines work in conjunction with the V-CHIP to help parents screen out inappropriate television shows from their children.
- Movie ratings are used for original movies rated by the Motion Picture Association of America (MPAA) as watched on cable TV and not edited for television. The V-CHIP can also be set to block MPAA-rated movies.

NOTE

- The setting automatically enters "Block" for any ratings below your selection.
- If Status is not set to "Enable", the configuration settings will not work.

MPAA (Voluntary movie rating system) Example



Press ▲/▼ to adjust the item to your desired position. "■" indicates the item is blocked. Press **MENU** to exit.

G: General audiences. All ages admitted.

PG: Parental guidance suggested. Some material may not be suitable for children.

PG-13: Parents strongly cautioned. Some material may be inappropriate for children under 13.

R: Restricted. Under 17 requires accompanying parent or adult guardian (age varies in some jurisdictions).

NC-17: No one 17 and under admitted.

X: X is an older rating that is unified with NC-17 but may be encoded in the data of older movies.

NOTE

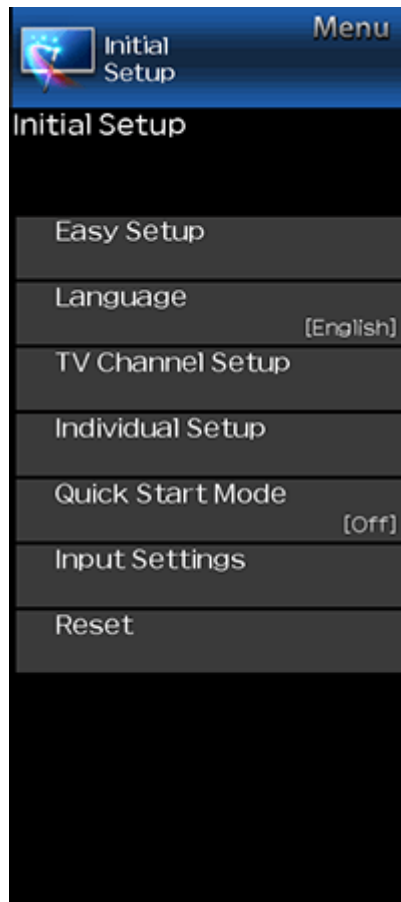
- Voluntary movie rating system only uses an age-based rating.

>>

On-Screen Display Menu

<<

Example



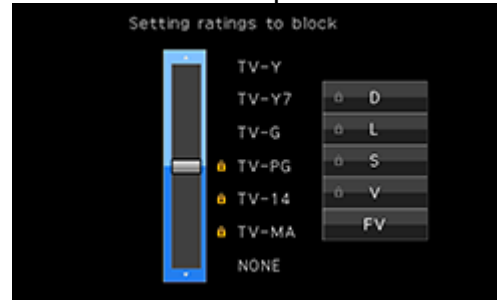
Initial Setup (Continue)

Individual Setup

Parental Control (Parental Control Setting)

TV Parental Guidelines

Example



Suggested age

TV-Y: All children.**TV-Y7:** Directed to older children.**TV-G:** General audience.**TV-PG:** Parental Guidance suggested.**TV-14:** Parents strongly cautioned.**TV-MA:** Mature audience only.**When setting an individual content-based rating item:**

- 1 Press **▶** or **ENTER** to access blocked content items from the currently selected age-based rating item.
- 2 Press **▲/▼** to select an individual item, and then press **ENTER** to unblock it ("■" is removed). Repeat the same steps for the other items.
- 3 Press **◀** or **RETURN** to register after all individual content rating items are set.

Content

FV: Fantasy violence.**V:** Violence.**S:** Sexual situation.**L:** Adult language.**D:** Sexually suggestive dialog.

Rating	Content					
	FV	V	S	L	D	
Suggested age	TV-Y	☒	☒	☒	☒	☒
	TV-Y7	☒	☒	☒	☒	☒
	TV-G		☒	☒	☒	☒
	TV-PG		☒	☒	☒	☒
	TV-14		☒	☒	☒	☒
	TV-MA		☒	☒	☒	

☒ : The content rating can be set, but this rating is not normally broadcast by TV stations.

☒ : Content rating can be set.

Canadian Rating Systems (Canadian English ratings and Canadian French ratings)

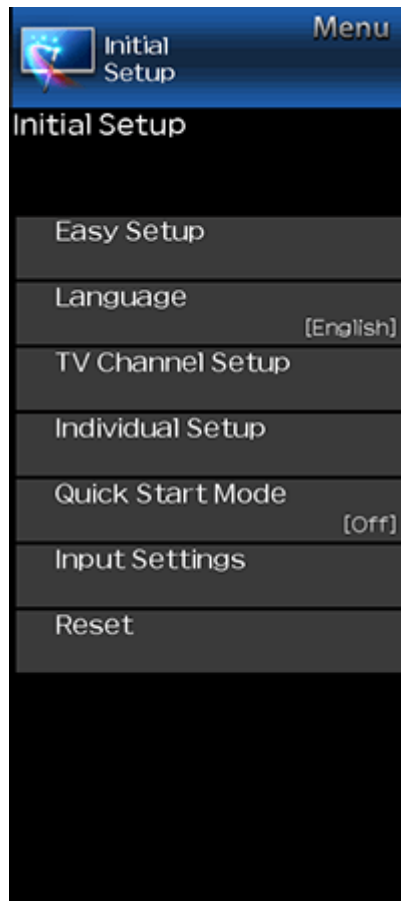
- The TV rating systems in Canada are based on the Canadian Radio-Television and Telecommunications Commission (CRTC) policy on violence in television programming.
- While violence is the most important content element to be rated, the structure developed takes into consideration other program content like language, nudity, sexuality and mature themes.
- When setting the V-CHIP on the Canadian system you can choose either the Canadian English ratings or the Canadian French ratings.

>>

On-Screen Display Menu

<<

Example



Initial Setup (Continue)

Individual Setup

Parental Control (Parental Control Setting)

Canadian English Ratings

E: Exempt: Includes news, sports, documentaries and other information programming; talk shows, music videos, and variety programming.

C: Children: Intended for younger children under the age of 8 years. Pays careful attention to themes that could threaten their sense of security and well-being.

C8+: Children over 8 years old: Contains no portrayal of violence as the preferred, acceptable, or only way to resolve conflict; nor encourage children to imitate dangerous acts which they may see on the screen.

G: General: Considered acceptable for all age groups. Appropriate viewing for the entire family, contains very little violence, physical, verbal or emotional.

PG: Parental Guidance: Intended for a general audience, but may not be suitable for younger children (under the age of 8) because it could contain controversial themes or issues.

14+: Over 14 years: Could contain themes where violence is one of the dominant elements of the storyline, but it must be integral to the development of plot or character. Language usage could be profane and nudity present within the context of the theme.

18+: Adults: Intended for viewers 18 years and older and might contain depictions of violence, which while related to the development of plot, character or themes, are intended for adult viewing. Could contain graphic language and portrayals of sex and nudity.

Canadian French Ratings

E: Exempt programming.

G: General: All ages and children, contains minimal direct violence, but may be integrated into the plot in a humorous or unrealistic manner.

8ans+: General but inadvisable for young children: May be viewed by a wide public audience, but could contain scenes disturbing to children under 8 who cannot distinguish between imaginary and real situations.

Recommended for viewing with parent.

13ans+: Over 13 years: Could contain scenes of frequent violent scenes and therefore recommended for viewing with parent.

16ans+: Over 16 years: Could contain frequent violent scenes and intense violence.

18ans+: Over 18 years: Only for adult viewing. Could contain frequent violent scenes and extreme violence.

How to temporarily release the V-CHIP BLOCK

When the V-CHIP BLOCK is working and censors a broadcast, "V-CHIP HAS BEEN ACTIVATED." displays.

1 Press **ENTER** while the V-CHIP is working, and then the secret number setting menu displays.

2 Input the 4-digit secret number by using **0-9**. At this time V-CHIP BLOCK temporarily releases.

>>

On-Screen Display Menu

<<

Example



Initial Setup (Continue)

Individual setup

Parental Control (Parental Control Setting)

Reactivating the temporary released V-CHIP BLOCK
You can reactivate the temporarily released V_CHIP BLOCK as shown below.

- Select "Status" setting from the Parental Control menu to reactivate BLOCK.
- Select "V_Chip" setting ("MPAA", "TV Guidelines", "Can. English Ratings" or "Can. French Ratings") from the Parental Control to reactivate BLOCK.
([See pages 4-7 to 4-9](#))
- Switch off the TV power. (When "Quick Start Mode" is "OFF".)

NOTE

- Performing any of the three above will activate the V-CHIP BLOCK.

Status

Used to enable or disable the parental control function. This function will not be selectable from the menu if you do not first configure your secret number.

Quick Start Mode

When this function is activated, you can reduce the Monitor's start-up time or even let the TV in standby mode start displaying images and so on via the connected equipment on the network.

NOTE

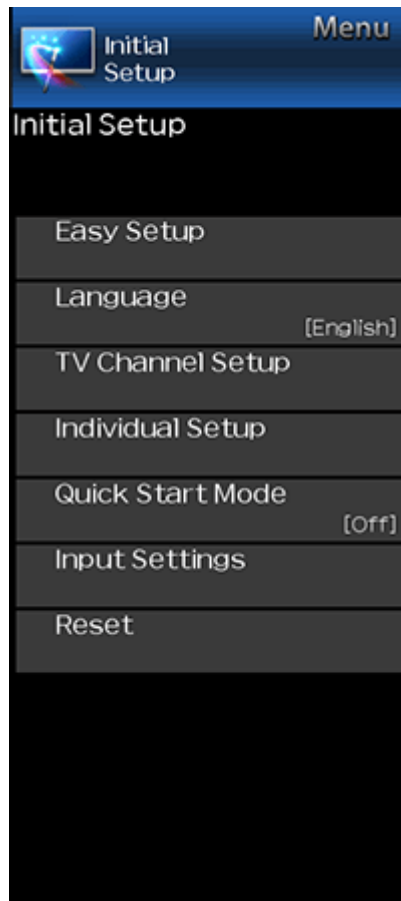
- Setting "Quick Start Mode" to "On" consumes more power.

>>

On-Screen Display Menu

<<

Example



Initial Setup (Continue)

Input Settings

HDMI auto view

When you view images sent from external equipment in an HDMI connection, this function allows the image size on the TV to automatically switch to an appropriate one.

NOTE

- Refer to your external equipment operation manual for the signal type.

HDMI type selection

Sets the HDMI type for HDMI INPUT 1 and 2 terminals. Set to "Full" when a HDMI 4K60P 4:4:4 device is connected, and data to "Limited" when an HDMI 4:2:0 device is connected.

Digital Audio Output

You can output digital audio to an AV amplifier or similar device whose DIGITAL AUDIO INPUT terminal is connected to the DIGITAL AUDIO OUT terminal on the TV. Please select an audio output format compatible with the audio format of the program you are watching and the equipment connected.

PCM: For connecting to equipment that does not support Dolby Digital. The same audio (main, sub, or main/sub) as the audio of the program being viewed is output.

2-channel audio with a sampling rate of 48 kHz or less is output as linear PCM audio.

Bitstream: For connecting to an audio system that supports Dolby Digital. Audio is output through both the main and sub channels.

NOTE

- Video input audio are output in PCM mode even when "Bitstream" is selected.
- PCM digital input signals are output in PCM mode even when "Bitstream" is selected.

Audio Output Select

You can select which device is used for outputting audio.

Headphone: Output audio through headphones.

Audio out: Output audio through an external AMP.

NOTE

- If you select "Headphone" when a cable is inserted in the AUDIO OUT terminal, the TV speakers are muted and all Audio menu items cannot be adjusted except for Balance.
- If you select "Audio out", sound via the AUDIO OUT terminal is not adjustable and constantly outputs.

CAUTION

- AUDIO OUT terminal is also used for headphones. Reduce the volume before using headphones. Overwhelming sound may damage your hearing.

Input Skip

This setting allows you to skip the TV, HDMI1, HDMI2 or Input3 on the Input Selection operation.

>>

On-Screen Display Menu

<<

Example



Initial Setup (Continue)

Input Settings

Color System

Select the video signal system compatible with your equipment from the list below:

AUTO/NTSC/PAL-N/PAL-M

NOTE

- "Color System" can only be set for the TV or VIDEO IN.

HDMI CEC Link

Make the settings to use LINK Operation.

Set the settings with "Initial Setup" > "Input Settings" > "HDMI CEC Link".

[\(See page 6-2.\)](#)

Reset

If complex adjustments are made and the settings cannot be restored to normal, you can reset the settings to the factory preset values.

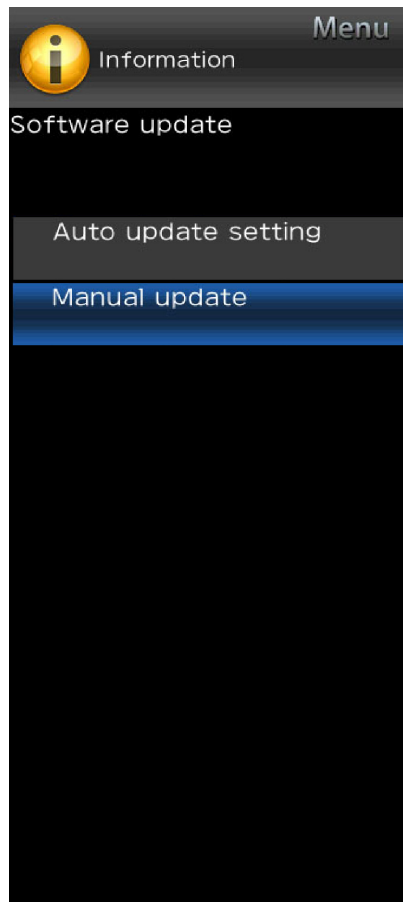
- If you have already set the Secret No., input the 4-digit secret number here.



On-Screen Display Menu



Example



Information

NOTE

- For operating the on-screen display menu, [see page 4-3.](#)

Identification

The current version of the TV software and model name is displayed.

Digital Caption Info. (Digital Caption Information)

This function allows viewing of digital closed caption information for the digital broadcast program being viewed.

NOTE

- This list is not displayed for analog broadcasts or external input audio/video.
- This information is not included in CC1, CC2, Text1, or Text2, and is not displayed in a list.

Software Update

This is used to upgrade the system software to enhance the TV functions.

- Press **MENU** to display the MENU screen, and then press **◀/▶** to select "Information".
- Press **▲/▼** to select "Software Update", and then press **ENTER**.
- Press **▲/▼** to select "Manual Update" or "Auto Update Setting", and then press **ENTER**.
 - The operations thereafter vary depending on the setting.

Manual Update

Select the method for manually updating the software.

USB Update: Updates the software using a USB memory device containing the update file. (See "Updating the Software with a USB Memory Device".)

Network Update: Downloads the update file via the network and then updates the software. [\(See page 4-15.\)](#)

NOTE

- A broadband connection and Internet Setup are required to update the software using the network. [\(See page 8-1.\)](#)
- It may take time to access and download the update depending on the Internet connection and other factors.

Auto Update Setting

When the TV is on, or when an Internet application is being accessed, this function enables the TV to connect to the network and check for updates automatically.

When an update is available, a message is displayed. Press **◀/▶** to select "Yes", and then press **ENTER** to display the download screen. [\(See page 4-15.\)](#)

NOTE

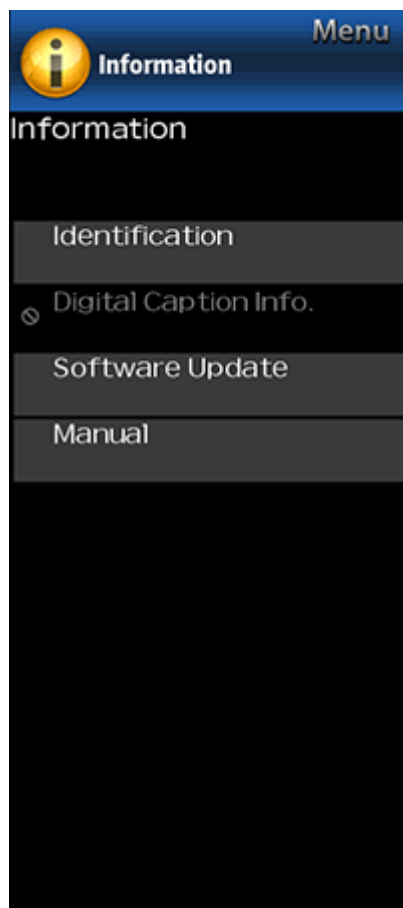
- This function does not work when a broadband connection or Internet Setup is not available.
- A message may also be displayed when an application is running. The message varies depending on the application.

>>

On-Screen Display Menu

<<

Example



Information (Continue)

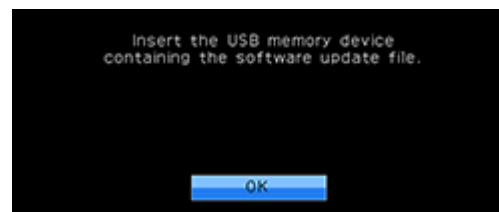
Software Update

Manual Update

CAUTION

- Do not remove the USB memory device or unplug the AC cord while the software is being updated.
- Be sure to properly follow the whole procedure described below, step by step. Otherwise, for example, the TV cannot read the data in the USB memory device and software updating will fail.

- 1 Insert the USB memory device with the update file into the USB terminal on the TV.
- 2 Press ▲/▼ on the Manual Update screen to select "USB Update", and then press **ENTER**.
- 3 Press **ENTER** to start checking the data in the USB memory device.



4 During the data checking, "Checking" blinks.

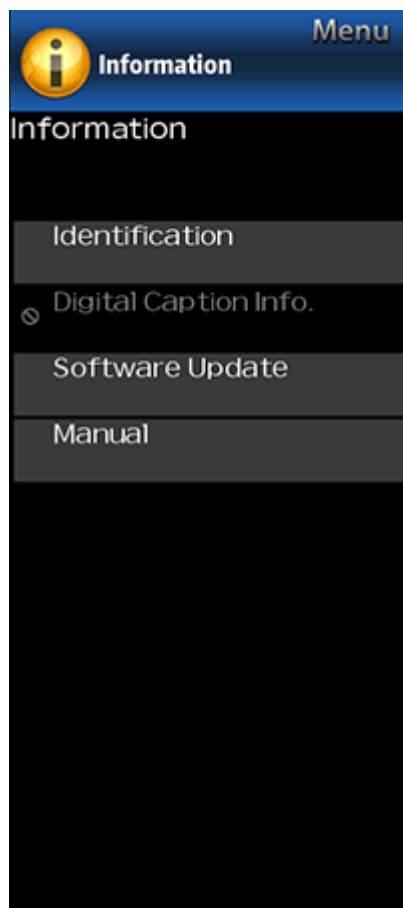
- The current version of the Monitor software and the version of the update file on the USB memory device are displayed.
- If the USB memory device is not properly installed or the correct update file cannot be found on the USB memory device, an error message is displayed. Check the file on the USB memory device, and then reinsert the USB memory device correctly.

>>

On-Screen Display Menu

<<

Example



Information (Continue)

Software Update

Manual Update

CAUTION

- **Do not remove the USB memory device or unplug the AC cord while the software is being updated.**

5 When the software is successfully updated, a screen is displayed indicating that the update process is completed.

After this screen is displayed, the TV automatically turns off and then turns on again.

- If the update has failed, check the file in the USB memory device and try Software Update again.

6 Remove the USB memory device.

Updating the Software via the Network

1 Press ▲/▼ on the Manual Update screen to select "Network Update", and then press **ENTER**.

- The TV connects to the network and checks for updates.
- To cancel, press **ENTER**.

2 The current version of the TV and the latest version of software are displayed. To update the TV software, select "Yes", and then press **ENTER**.

- When a server connection cannot be established or an update is not available, a message is displayed. If a server connection cannot be established, check the broadband connection and Internet Setup.

3 After the update file is downloaded, the software update process begins.

CAUTION

- **Do not unplug the AC cord while the software is being updated.**

4 When the software is successfully updated, a screen is displayed indicating that the update process is completed. A screen indicating that the update is completed is displayed. 4 seconds later, the TV restarts automatically.

- If the software was not updated successfully, check the broadband connection and Internet Setup, and then try updating the software again.

Manual

Displays the built-in operation manual on the screen. You can read information about how to use this device.

>>

On-Screen Display Menu

<<

Example



Picture Settings

Adjusts the picture to your preference with the following picture settings.

NOTE

- For operating the on-screen display menu, [see page 4-3](#).

Selected item	◀ button	▶ button
Backlight	The screen dims	The screen brightens
Contrast	For less contrast	For more contrast
Brightness	For less brightness	For more brightness
Color	For less color intensity	For more color intensity
Tint	Skin tones become reddish	Skin tones become greenish
Sharpness	For less sharpness	For more sharpness

- For resetting all Picture adjustment items to the factory preset values, press ▲/▼ to select "Reset", press **ENTER**, press ▲/▼ to select "Yes", and then press **ENTER**.

AV MODE (Changing Pic.Quality)

The audio and picture settings can be changed to suit the program or input content being watched. You can use USER Mode to create customized settings for each TV input. These settings will be automatically saved on each input for convenience.

STANDARD: For a highly defined image in a normal lighting.

MOVIE: For a movie.

PC: For PC.

USER: Allows the user to customize settings as desired. You can set the mode for each input source.

DYNAMIC: For a clear-cut image emphasizing high contrast, useful for sports viewing.

DYNAMIC (Fixed): Changes the image and sound settings to the factory preset values. No adjustments are allowed.

NOTE

- You can select a different AV MODE item for each input mode. (For example, select STANDARD for TV input and DYNAMIC for COMPONENT.)
- The selectable items vary depending on the input source and on the model of your TV.

>>

On-Screen Display Menu

<<

Example



Picture Settings (Continue)

Advanced

Digital Noise Reduction

Produces a clearer video image.

AUTO: Automatically adjusts the level of noise reduction.

High/Medium/Low: You can select a desired level for viewing a clearer video image.

Off: No adjustment.

Color Temp. (Color Temperature)

For a better white balance, use color temperature correction.

High: White with bluish tone

Middle:



Low: White with reddish tone

>>

On-Screen Display Menu

<<

Example



Picture Settings (Continue)

Advanced

Active Contrast

Automatically adjusts the image contrast according to the scene.

On: Produces high contrast image.

Off: No adjustment.

Reset

Returns Picture Settings to their factory preset values. To reset, select "YES" and then press **ENTER**.

>>

<<

On-Screen Display Menu

Example



Audio Settings

You can adjust the sound quality to your preference with the following settings.

NOTE

- For operating the on-screen display menu, [see page 4-3](#).

Selected item	◀ button	▶ button
Treble	For weaker treble	For stronger treble
Bass	For weaker bass	For stronger bass
Balance	Decrease audio from the right speaker	Decrease audio from the left speaker

NOTE

- The Audio menu is grayed out when "Audio Output Select" is set to "Variable". ([See page 4-11.](#))
- For resetting Audio adjustment items to the factory preset values, press ▲/▼ to select "Reset", press **ENTER**, press ▲/▼ to select "Yes", and then press **ENTER**.

SURROUND

The surround function produces Surround effect from the speakers.

NOTE

- The Audio Settings menu is grayed out when "Audio Output Select" is set to "Variable". ([See page 4-11.](#))
- For some discs, setup may be required on your BD/DVD player. In this case, please refer to the operation manual of your BD/DVD player.

Bass enhancer powered by SRS Labs, Inc.

This function allows you to enjoy bass-enhanced sound.

Off: Outputs the normal sound.

On: Bass enhancer function is on.

NOTE

- If distorted bass sound is heard, set to "Off".

Auto Volume

Different sound sources sometimes do not have the same loudness level, such as a program and its commercial breaks. The Automatic Volume Control(Auto Volume) reduces this problem by equalizing.

ON: Reduces the loudness gaps among different sound source. The result is automatically adjusted according to the sound sources.

OFF: No adjustment.

Reset

Returns Audio Settings to their factory preset values. To reset, select "YES" and then press **ENTER**.

>>

On-Screen Display Menu

<<

Example



Network Settings

Dashboard

You can display a list of the main Network settings.

Connection Type

Select the connection type.

Wired: The signal is detected and setup is performed automatically. Use "Wired Setup" to check and change the settings as necessary.

Wireless: Configure the access point settings on "Wireless Setup".

Wired Setup

You can make adjustments manually for the IP.

- You can switch the "Connection Type" to "AUTO" or "Manual".
- Check that numbers are displayed for each setting.
- If there are any settings without numbers, specify the numbers by following the on-screen instructions.
- Input the IP address etc by using remote control buttons 0-9.

Wireless Setup

Make adjustments and confirm the settings necessary for wireless LAN connection (push as search for the access point and registration of it).

WPS

WPS push button: Allows the TV to automatically establish the connection using a button on the access point.

WPS PIN code: Sets up the connection by registering a PIN code for the access point.

Search: Searches for and selects the access point to be connected.

Manual Setup: Allows you to make the connection by entering an SSID for the access point.

If your access point supports Wi-Fi Protected Setup (WPS push button method), it is recommended that you use this function for the wireless connection. You can press the WPS button on the access point to configure the settings automatically.

- The name of the WPS button function may differ depending on the access point. See the operation manual of the access point for details.

1 Confirm the current settings in "Connection Type".

- If "Wired" is selected, press ▲/▼ to select "Wireless".

2 Select the desired connection method and follow the instructions shown on the display.

3 When a connection is established, the connection details are displayed. Press ENTER.

IP Control

Set this function when operating the TV from equipment connected by LAN.

>>

On-Screen Display Menu

<<

Example

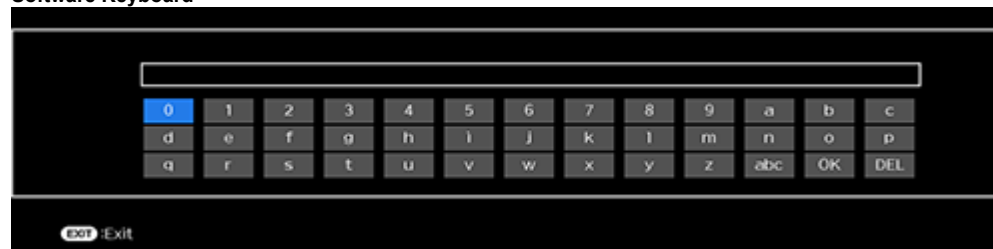


Network Settings (Continue)

Device Name

Set this function when operating the TV from equipment connected by LAN or wireless LAN. Use the software keyboard when you need to input text at Device Name Setting.

Software Keyboard



ABC

Switches character to uppercase. If "abc" is pressed again, switches character to lowercase.

":&12"

Changes character set into the alphabet, numbers, symbols, etc.

OK

Applies the entered information and closes the software keyboard.

Space

Enters a space.

DEL

Erases the character string.

Wake on Wi-Fi/LAN

Enable the TV to be started by a signal over a Wi-Fi/LAN.

NOTE

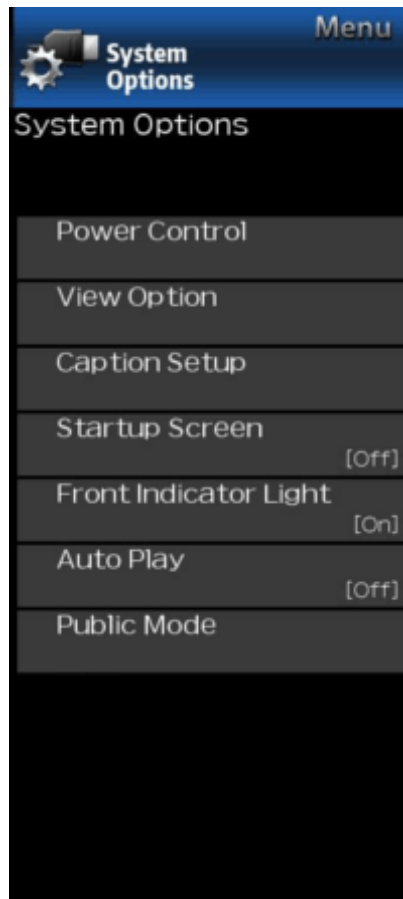
- If you want to use Wake on Wi-Fi function, it is recommended to keep Quick start mode to be ON. ([See page 4-10.](#))
- Standby power consumption will be increase when Wake on Wi-Fi/LAN is turned ON.

>>

On-Screen Display Menu

<<

Example



System Options

NOTE

- For operating the on-screen display menu, [see page 4-3.](#)

Power Control

Power control setting allows you to save energy.

No Signal Off

When this function is enabled, the TV automatically shuts down if no signal is received for more than 15 minutes.

NOTE

- When it is 5 minutes before the power shuts down, the remaining time will start to keep appearing every minute.
- When a TV program finishes, this function may not operate.

No Operation Off

When you enable this function, the TV automatically shuts down if no operation is performed for more than 3 hours. (Disable, 30 min, 3 hours)

NOTE

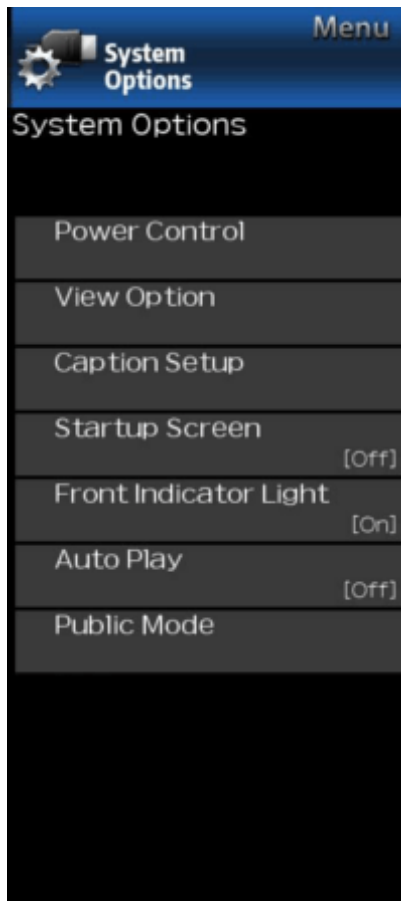
- When it is 5 minutes before the power shuts down, the remaining time will start to keep appearing every minute.

>>

On-Screen Display Menu

<<

Example



System Options (Continue)

View option

Wide mode

This function changes the screen size. Select "View Option" on the menu to display the Wide mode menu screen. The Wide mode menu varies depending on the input source.

For HD Video source

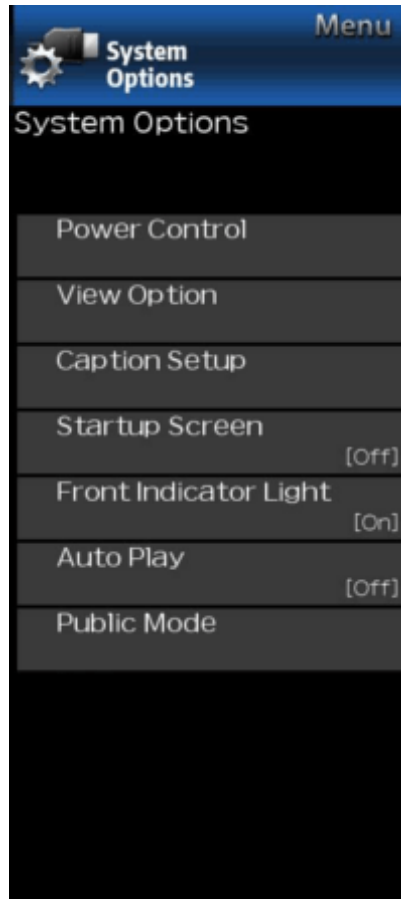
Overscan	Full
<p>Displays with an overscan image. Crops all sides of screen.</p>	<p>Displays an image with the same number of pixels on the screen when receiving UHD signals only.</p>

>>

On-Screen Display Menu

<<

Example







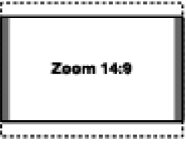
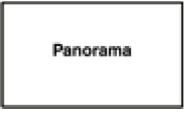
System Options (Continue)

View option

Wide mode

For SD Video source
Example: Screen size images

Normal	Full	Cinema 16:9
 <p>Keeps the original aspect ratio in a full screen display.</p>	 <p>For 16:9 squeeze pictures.</p>	 <p>For 16:9 letterbox pictures. Bars may appear on the top and bottom with some programs.</p>

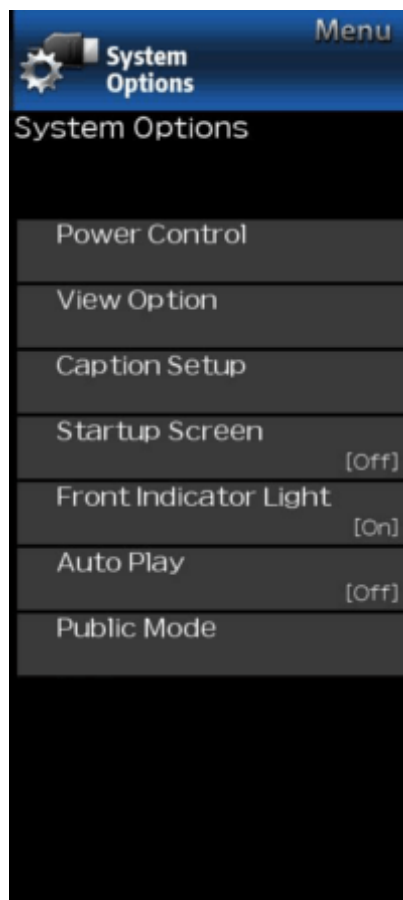
Cinema 14:9	Zoom 14:9	Panorama
 <p>For 14:9 letterbox pictures. Bars may appear on the top and bottom with some programs.</p>	 <p>For 14:9 letterbox pictures. A thin side bar appears on each side, and you may also see bars on the top and bottom with some programs.</p>	 <p>In this mode, the picture is stretched toward each side of the screen. The picture may appear similar to "Full" depending on broadcast signals.</p>

>>

On-Screen Display Menu

<<

Example



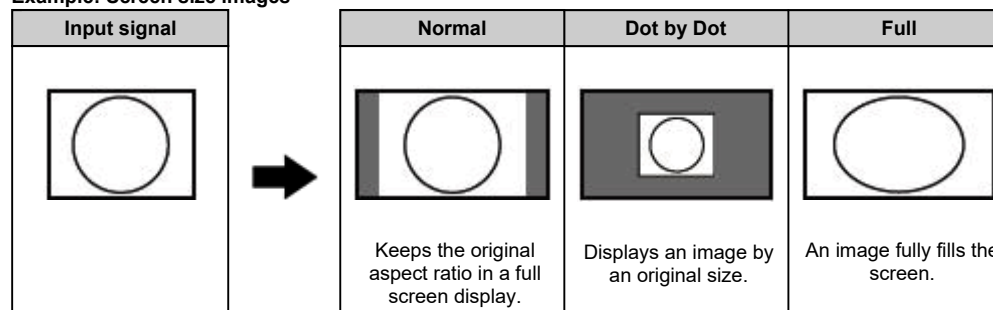
System Options (Continue)

View option

Wide mode

For USB-Video, Home Network, HDMI VGA (PC format)

Example: Screen size images



NOTE

- Connect the PC before making adjustments.
- Selectable screen size may vary with input signal type.

MPX

Allows you to change the audio when multiple audio is available for the video you are watching.

NOTE

- You can change Audio by pressing AUDIO on the remote control unit. [See page 3-5](#) for details of Audio function.

Change CC

Allows you to change the Closed Caption display. Select "Change CC" on the menu to display the Closed Caption information.

- The information displayed varies depending on the video you are watching.

NOTE

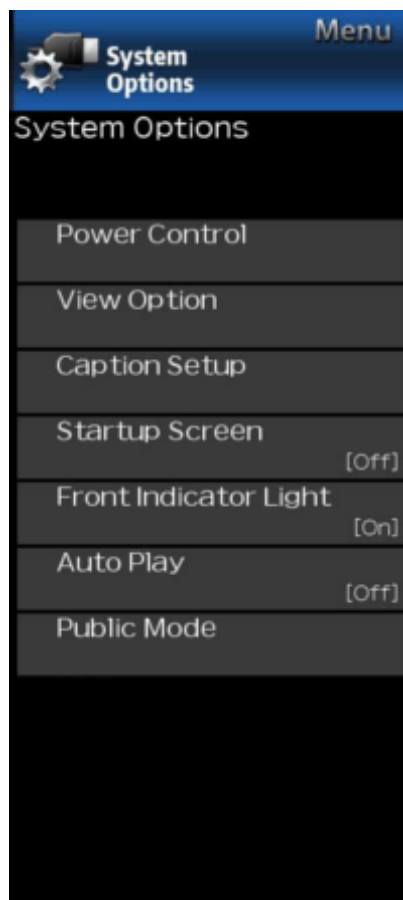
- Closed Caption is available for TV and Video input and is unavailable for Component input.

>>

On-Screen Display Menu

<<

Example



System Options (Continue)

Caption Setup

This function allows you to adjust the closed caption screen appearance to suit your preference.

Size/Edge Effect/Edge Color/Text Color/Background Color/Text Opacity/Background Opacity

Startup Screen

With this function activated, the SHARP logo will be displayed when you turn on the TV.

NOTE

- This function is not available when the TV is set to "Quick Start Mode".

Front Indicator Light

When this function is set to "On", the LED on the front of the Monitor turns on.

NOTE

- "On" is the factory preset value. If you want to turn off the LED, set the function to "Off".

AutoPlay

You can automatically start USB media player or web browser.

Off: This function does not work.

USB: After the power is turned on, the video is played back continuously or slide show of still images automatically starts.

Web Browser: After the power is turned on, the Web Browser starts automatically and displays the Home Page.

NOTE

- When more than one video is played back continuously, the screen goes black while the data of the next video is being loaded. To shorten this blackout time, adjust the data size of the content.
- Create a folder named "AutoPlay" in the root directory of the USB memory device (the first directory when the USB memory device is opened), and store into the folder the video or still images you want to playback.

- When both video and still images are saved in "AutoPlay" folder, video has priority and still images will not be played.
- You must insert the USB memory device to the Monitor before turning off the TV.
- If there are images on the USB memory device but they do not appear on the screen, switch to USB mode and check whether the image files on the USB memory device are shown correctly.
- It will be interrupted by any operation. After a few minutes, it will automatically start again.

Public Mode

1. How to start Public Mode setup screen.

1. There are two ways to enter the public mode.

① Press ▲/▼/◀/▶ to select "MENU" > "System Options" > "Public Mode", and then press ENTER.

② Press the "INPUT" and "VOL (+)" keys on the set at once and turn on the power.

2. Get the password input screen displayed.



Procedure

- The Input starts with the left most digit.
- Use the numeric keys [1] thru [9] and [0] keys on the remote controller. The other keys are not acceptable.
- With a numeric-key input, "-" will change to "*". The input position will move one digit to the right.
- With all the 3 digits entered, the password will be verified.

3. The 3-digit password is now verified.

The password [0] [2] [7] provides for the public mode screen.

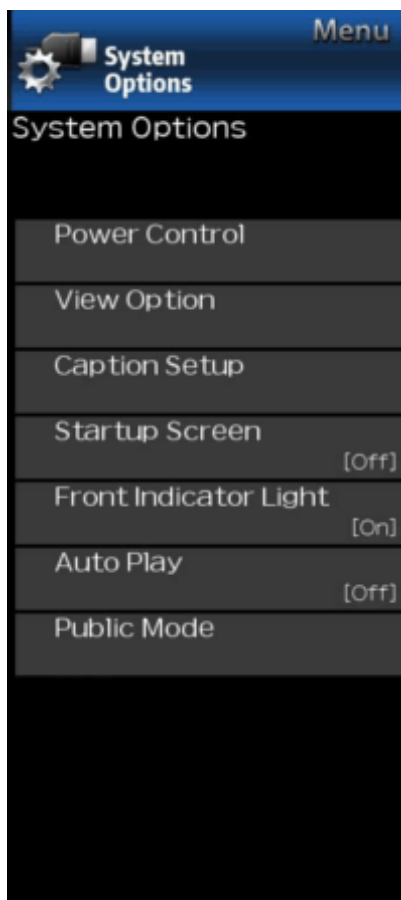
With any other passwords, the screen changes to the normal mode.

>>

On-Screen Display Menu

<<

Example



System Options (Continue)

Public Mode

2. How to exit from Public Mode setup screen

There are the following ways to quit the public mode setup screen.

- Turn off the power with the "POWER" key.
- Select "EXECUTE".

3. Public Mode Menu

The guidance is not displayed on screen.

Setup procedure

- Turn off the power with the "POWER" key.
- To move the cursor up and down, use the "cursor UP/DOWN" key (remote controller) or "CH (▲)/(▼)" key (remote controller and TV set).
- To change the settings, use the "cursor RIGHT/LEFT" key (remote controller) or "VOL (+)/(-)" key (remote controller and TV set).
- To save new settings, select "EXECUTE" and press "ENTER" key (remote controller and TV set).

4. How to use USB clone

This is the function that copying the one TV's user setting to other TVs or copying previous user setting to itself. Cloning is available between the same model.

1. Insert the USB memory to TV.
2. Enter public mode.
3. Select "COPY MODE".
4. Then select the "TV→USB [Start]".
5. "USB Cloning Finished." message is displayed when it is finished , then select "Reset" . TV will restart.
6. Insert the USB which has the data from TV to another TV or itself.
7. Enter public mode.
8. Select "COPY MODE".
9. Then select the "USB→TV [Start]".
10. "USB Cloning Finished." message is displayed when it is finished , then select "Reset" . TV will restart.
11. Confirm the user setting is copied.

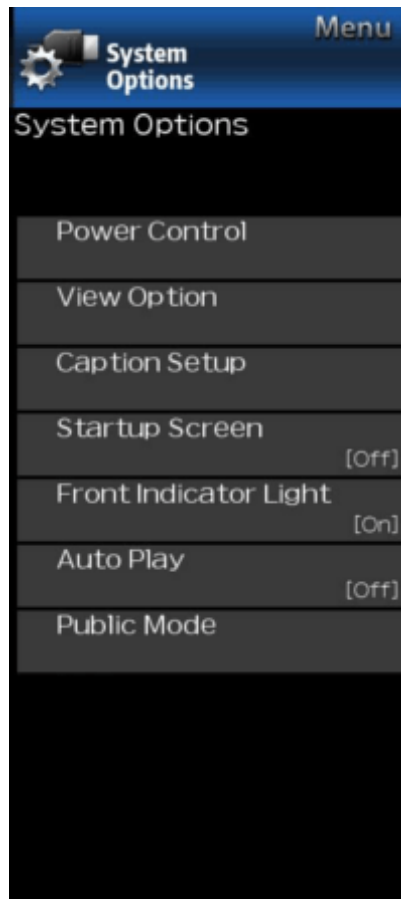
PUBLIC MODE	
POWER ON FIXED	[VARIABLE]
MAXIMUM VOLUME	[100]
VOLUME FIXED	[VARIABLE]
VOLUME FIXED LEVEL	[30]
RC BUTTON	[RESPOND]
PANEL BUTTON	[RESPOND]
MENU BUTTON	[RESPOND]
AV POSITION FIXED	[VARIABLE]
ON SCREEN DISPLAY	[YES]
INPUT MODE START	[NORMAL]
INPUT MODE FIXED	[VARIABLE]
RC_PATH_THROUGH	[OFF]
PUBLIC MODE	[OFF]
RESET	
EXECUTE	
COPY MODE	

>>

On-Screen Display Menu

<<

Example



System Options (Continue)

Public Mode

5. On Setting Items

1. POWER ON FIXED

Selection	Selection between "Variable" and "Fixed"
Default	- (Variable)
Explanation	In "Fixed setting, the power-off by the power key of the unit is invalidated and the image is kept being received. The power can be turned off by stopping the power supply from AC.
Limit in Setting	None
Exception	None
Remarks	<ul style="list-style-type: none"> In "Variable" setting, the power operation is in wait for 1 sec and then turn off when the main power switch is off.

2. MAXIMUM VOLUME

Selection	Adjustment from 0 to 100
Default	100
Explanation	Sound volume can not be adjusted higher than the present value.
Limit in Setting	<ul style="list-style-type: none"> When the sound volume is set lower than 99, only figures are displayed and the sound volume bar is not displayed.
Exception	None
Remarks	None

3. VOLUME FIXED

Selection	Selection between "Variable", "Fixed", "ACON (AC CTRL)" and "AC/RCON (AC/RC CTRL)"
Default	(Variable)
Explanation	<ul style="list-style-type: none"> FIXED: Fixed at the level adjusted for a fixed volume. AC CTRL: Start-up at the level specified for a fixed volume at ACON. AC/RC CTRL: Start-up at the level specified for a fixed volume at start.
Limit in Setting	<ul style="list-style-type: none"> The sound volume for the ON-timer (Wake up timer) is fixed also without display of menu. Besides, the setting is made impossible. (Basically, the menu is not displayed.) The following keys become invalid when set to "Fixed": <ul style="list-style-type: none"> Sound volume Up/Down (VOL +/-) [for both remote control and the unit] Mute (MUTE)
Exception	None
Remarks	<ul style="list-style-type: none"> As for sound volume fixing and sound volume MAX level, the sound volume fixing has priority.

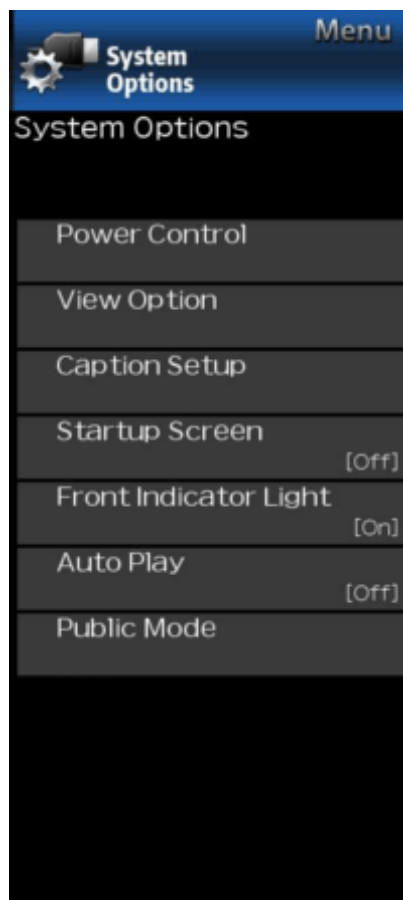
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>>

On-Screen Display Menu

<<

Example



System Options (Continue)

Public Mode

4. VOLUME FIXED LEVEL

Selection	Adjustment from 0 to 100
Default	30
Explanation	The sound volume to be fixed by "Volume fixed" is determined.
Limit in Setting	None
Exception	None
Remarks	Setting is valid when "Volume fixed" is selected for "fixed" , "ACON (AC CTRL)" or "AC/RCON (AC/RC CTRL)".

5. RC BUTTON

Selection	Selection between "Respond", "No Respond" and "Limited"
Default	Respond
Explanation	<p>Making the remote controller settings.</p> <ul style="list-style-type: none"> At the "No Respond" setting, the remote controller keys are disabled. Its power key (reception/standby key) is disabled too. At the "Limited" setting, volume ▲ / ▼ , channel ▲ / ▼ , POWER button are operative.
Limit in Setting	• In "No respond" setting, all the keys (including the power key) are not accepted.
Exception	None
Remarks	None

6. PANEL BUTTON

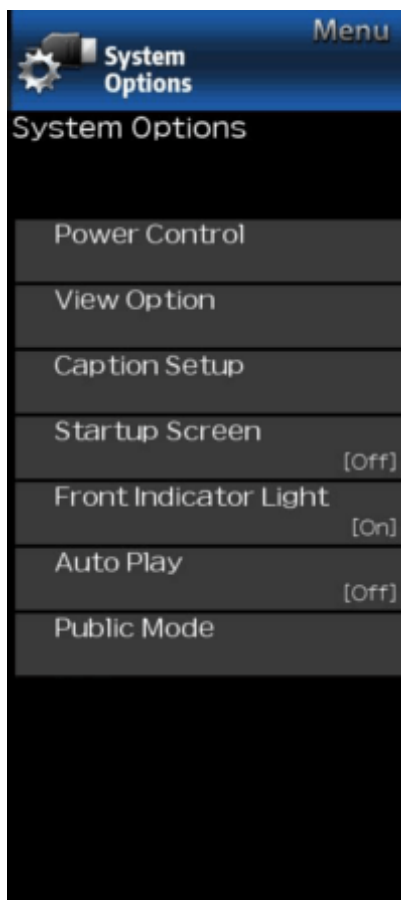
Selection	Selection between "Respond" and "No respond"
Default	Respond
Explanation	In case of "No respond" setting, all operations by keys (except the power key) of the unit can be invalidated.
Limit in Setting	None
Exception	None
Remarks	None

>>

On-Screen Display Menu

<<

Example



System Options (Continue)

Public Mode

7. MENU BUTTON

Selection	Selection between "Respond" and "No respond"
Default	Respond
Explanation	In "No respond" setting, the menu operation by the menu key of the remote control and the menu key of the unit are invalidated.
Limit in Setting	None
Exception	None
Remarks	None

8. AV POSITION FIXED

Selection	Selection between "Variable" and "Fixed"
Default	Variable
Explanation	In case of "Fixed" setting, –Menu "Picture" and "Audio" setting can't be changed like "Dynamic (Fixed)".
Limit in Setting	None
Exception	None
Remarks	None

9. ON SCREEN DISPLAY

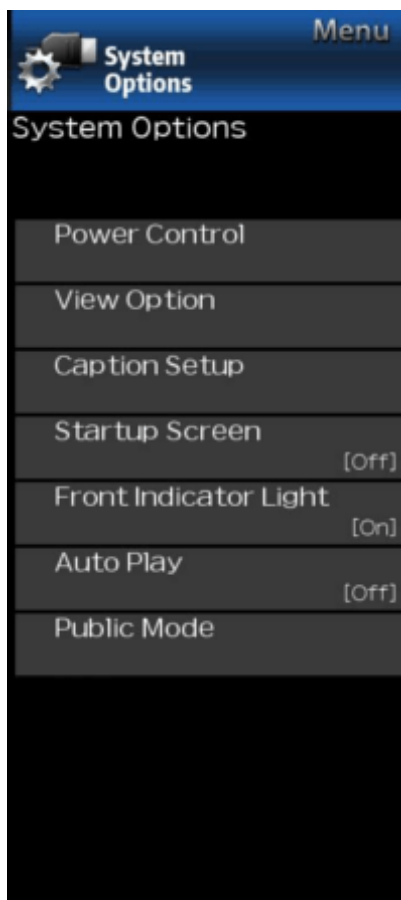
Selection	Selection between "Yes", "No"
Default	Yes
Explanation	<ul style="list-style-type: none"> At the "No" setting, all OSD except public mode menu aren't displayed on screen. An input selection is immediately made because the menu is not displayed.
Limit in Setting	<ul style="list-style-type: none"> Keys falling under any of the following items become invalid. <ul style="list-style-type: none"> ① Appearance of screen changes and the sound changes. ② Personal functions which are hard to restore. Screen display, menu, OFF-timer, AV MODE, screen size switching, sound changeover, LANGUAGE, CLOSED CAPTION
Others	<ul style="list-style-type: none"> Simple input switching is generated
Exception	<ul style="list-style-type: none"> Such a caution which is displayed independently is displayed as it is. Non-responding signal caution
Remarks	<ul style="list-style-type: none"> When CC has already been ON, CLOSED CAPTION is displayed.

>>

On-Screen Display Menu

<<

Example



System Options (Continue)

Public Mode

10. INPUT MODE START

Selection	Selection between "Normal", "Air (*)", "Cable (*)", "Input3", "HDMI 1", "HDMI 2", "USB", "Home Network"
Default	Normal
Explanation	In power-ON, the input source to be started or channel can be set. (In standard mode, the operation follows the last memory.)
About options	<ul style="list-style-type: none"> All the input sources in the model are made selectable. In TV mode, the channel to be set follows the last memory and the content of the last memory is included in the notation by options. Ex.) Air (2), Cable (98.1) etc.
Limit in Setting	<ul style="list-style-type: none"> The display of channel setting menu and the channel setting operation are prohibited.
Exception	None
Remarks	<ul style="list-style-type: none"> In setting at "Normal", the setting of "Input mode fixed" is changed to "Variable" and selection should be prohibited.

11. INPUT MODE FIXED

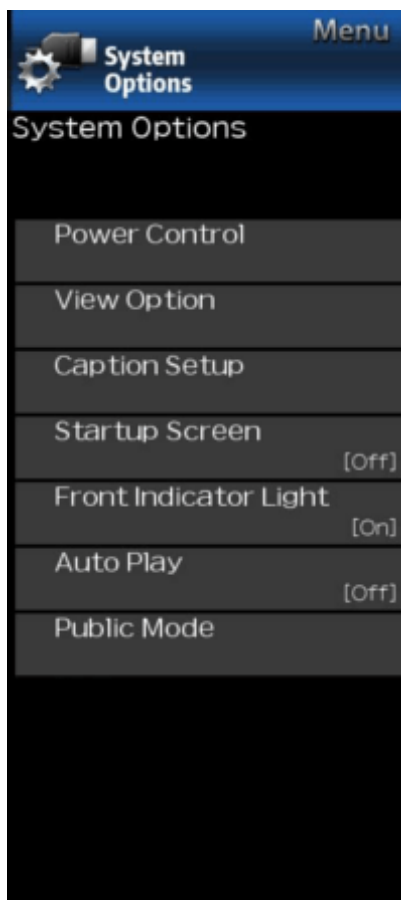
Selection	Selection between "Variable", "Fixed", "ACON (AC CTRL)" and "AC/RCON (AC/RC CTRL)"
Default	- (Variable)
Explanation	<ul style="list-style-type: none"> At the "Fixed" setting, the TV set gets started with the settings of "Input mode start", and then any other channels and inputs are not accepted. At the "ACON (AC CTRL)" setting, the TV set gets started with the settings of "Input mode start" under AC control. At the "AC/RCON (AC/RC CTRL)" setting, the TV set gets started with the settings of "Input mode start" under either control.
Limit in Setting	<ul style="list-style-type: none"> The following keys are invalidated. CH ▲ / ▼, direct tuning button, input. * However, the keys (input switching and CH ▲ / ▼ keys) of the unit for menu operation remain valid.
Exception	None
Remarks	<ul style="list-style-type: none"> In the following case, setting is cancelled and mode is changed to "Variable". When the setting of "Input mode start" is set to "Normal".

>>

On-Screen Display Menu

<<

Example



System Options (Continue)

Public Mode

12. RC PATH THROUGH

Selection	Selection between "OFF", "ON: Display RCE" and "ON: Display RCD"
Default	OFF
Explanation	Function to feed the remote controller-received signal to Pin 9 (open) on the RS232C.
Limit in Setting	None
Exception	None
Remarks	When the setting is "ON: Display RCD", TV doesn't respond to the RC operation.

13. PUBLIC MODE

Selection	Selection between "ON" and "OFF"
Default	OFF
Explanation	In case of "ON", public mode settings are effected.
Limit in Setting	None
Exception	None
Remarks	The public mode settings are operable only when this item is set at ON.

>>

Enjoying Photo/Music/Video Playback

<<

Preparation

You can connect the Monitor to a USB memory device, USB hard drive or Home Network server to enjoy viewing pictures, listening to music, and watching videos.

NOTE

- Depending on the USB memory device/USB hard drive/Home Network server, the Monitor may not be able to recognize the recorded data.
- It may take time to read the recorded data if the USB TV device/USB hard drive/Home Network server contains many files or folders.
- Use only alphanumeric characters for naming files.
- File names over 80 characters (may vary depending on character set) may not be displayed.

Connecting a USB Memory Device/USB Hard Drive

Insert the USB memory device with recorded photos, music or videos into the USB terminal on the TV.

When connecting a USB hard drive, be sure to use a hard drive with an AC adapter.

Do not remove a USB memory device or memory card from the TV while transferring files, using the slide show function, or switching screens, or before you exit "USB" from the INPUT list.

Do not insert and remove a USB memory device/USB hard drive to and from the TV repeatedly.

When using a card reader, be sure to insert a USB memory device first.

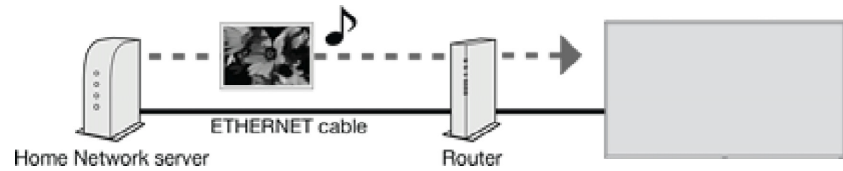
CAUTION

- **Do not use a USB extension cable when connecting a USB memory device to the USB terminal on the TV.**
- **Using a USB extension cable with the USB memory device may prevent the TV from performing correctly.**

Connecting a Home Network Server

Connect the TV to the Home Network server using an ETHERNET cable.

You can also connect a Home Network server by using a wireless LAN.



NOTE

- Do not disconnect a Home Network server from the TV while transferring files, when a screen is switching to another or before you exit "Home Network" from the INPUT list.
- Do not connect and disconnect a Home Network server from the TV repeatedly.

>>

<<

Enjoying Photo/Music/Video Playback

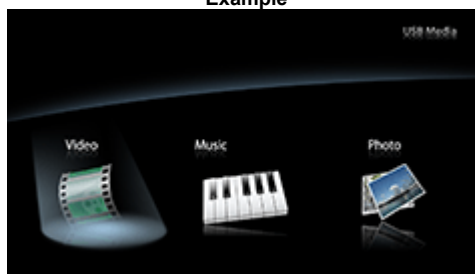


Selecting the Folders to Play Back

- To play back data on a USB memory device, insert the USB memory device on the TV.
- Use the following procedure to switch back to USB mode after switching from USB mode to another mode.

- 1 Select "USB" or "Home Network" from INPUT list screen.
- 2 Press ◀▶ to select "Photo", "Music" or "Video", and then press **ENTER**.

Example



- 3 Press ◀▶ to select the desired folder, and then press **ENTER**.
 - "Wide mode" is fixed during the Music mode. During "Video mode", you can select "Normal", "Full" or "Dot by Dot".
 - During "Video mode", videos that are smaller than the number of pixels on the screen are displayed at their original size. In these cases, switch "Wide mode" to "Full" to have the video fill the screen.

NOTE

- 16 is the maximum number of USB drives and 10 is the maximum number of Home Network servers that can be displayed.

USB Device Compatibility

USB device	USB Memory
File system	FAT32, NTFS

Photo file format

Format	JPEG (.jpg)/PNG/BMP
--------	---------------------

Music file format

Format	Bit rate
MP3	32k, 40k, 48k, 56k, 64k, 80k, 96k, 112k, 128k, 160k, 192k, 224k, 256k, 320kbps

>>

Enjoying Photo/Music/Video Playback

<<



Selecting the Folders to Play Back (Continue)

Video file format		
Container	Video	Audio
AVI	H.264 MPEG4 Motion JPEG	MP3 ADPCM AC3
MKV	H.264 MPEG2	MP3 AC3
MP4	H.264 MPEG4	MP3 AC3
MPEG2-PS	MPEG2	LPCM AC3 MP3
MPEG2-TS	H.264 MPEG2 H.265	MP3 AC3

NOTE

- USB 1.1 devices may not be played properly.
- Operation using USB hubs is not guaranteed.
- Some video file formats may not be played depending on the file.
- Some images may not be displayed in the appropriate aspect ratio depending on the file format.

>>

<<

Enjoying Photo/Music/Video Playback



Playing Back Files on a USB Memory Device/Home Network Server

NOTE

- The screen images in this section are for the USB mode. It may be slightly different in the Home Network mode.

Photo Mode

Viewing Thumbnails

Example



Buttons for thumbnail operations

Buttons	Description
▲/▼/◀/▶	Select a desired item.
ENTER	When selecting a folder icon: Enter this directory. When selecting a photo thumbnail: Start the slide show.
RETURN	Return to the previous process.
A (red)	Clear the file information display.
B (green)	
C (blue)	
D (yellow)	

NOTE

- A few seconds after the cursor is positioned on a thumbnail, the file information is displayed in the right of the center of the screen.

>>

Enjoying Photo/Music/Video Playback

<<



Playing Back Files on a USB Memory Device/Home Network Server (Continue)

Slide Show

The photos displayed on the thumbnail selection screen are displayed as a slide show.

Buttons for slide show operation

Buttons	Description
RETURN	Return to the thumbnail selection screen.
B (green)	Previous file
C (blue)	Displaying/hiding operation guidance
D (yellow)	Next file

NOTE

- Rotating photos only applies to the temporarily selected item and this setting is not saved.

>>

Enjoying Photo/Music/Video Playback

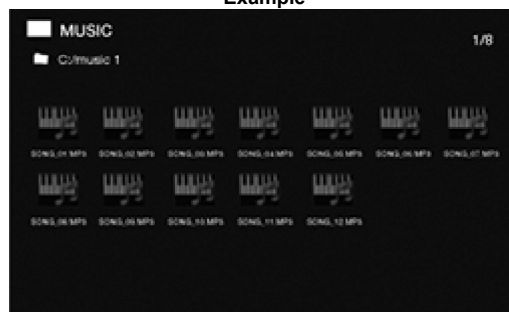
<<



Playing Back Files on a USB Memory Device/Home Network Server (Continue)

Music Mode

Example



Buttons for music mode

Buttons	Description
▲/▼/◀/▶	Select a desired item.
ENTER	When selecting a folder icon: Enter this directory. When selecting a music file: Play music.
RETURN	Return to the previous process.
A (red)	Clear the file information display.
B (green)	
C (blue)	
D (yellow)	

NOTE

- The displayed play time may differ slightly from the actual play time depending on the files.
- A few seconds after the cursor is positioned on a thumbnail, the file information is displayed in the right of the center of the screen.

>>

<<

Enjoying Photo/Music/Video Playback



Playing Back Files on a USB Memory Device/Home Network Server (Continue)

Video Mode

Example



Buttons for file selecting operations

Buttons	Description
▲/▼/◀/▶	Select a desired item.
ENTER	When selecting a folder icon: Enter this directory. When selecting a video file: Play the video.
RETURN	Return to the previous process.
A (red)	Clear the file information display.
B (green)	
C (blue)	
D (yellow)	

NOTE

- A few seconds after the cursor is positioned on a thumbnail, the file information is displayed in the right of the center of the screen.
- When more than one video is played back continuously, the screen goes black while the data of the next video is being loaded. To shorten this blackout time, adjust the data size of the content.

>>

Enjoying Photo/Music/Video Playback

<<



Playing Back Files on a USB Memory Device/Home Network Server (Continue)

Buttons for playing mode

Buttons	Description
▲	Stop playback
▼	Stop playback
▶	Fast forward
◀	Fast rewind
A (red)	Subtitle
B (green)	Previous file
C (blue)	Display/hide operation guide
D (yellow)	Next file
RETURN	Go back to the file selection screen.

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>>

Using LINK Operation

<<

Controlling HDMI Equipment Using LINK Operation

What's LINK Operation?

- Using the HDMI CEC (Consumer Electronics Control) protocol, with LINK Operation you can interactively operate compatible system equipment (Blu-ray disc equipment, AV amplifier, DVD).
- LINK Operation allows you to operate the HDMI-connected equipment with one remote control.

NOTE

- For connecting the TV to LINK-compatible equipment, use commercially available cables.
- Point the remote control toward the TV, not to connected HDMI equipment.
- Video noise may occur depending on the type of HDMI cable used. Make sure to use an HDMI-certified cable.
- Up to 2 pieces of HDMI recording equipment and one AV amplifier can be connected using this system.
- These operations affect the HDMI equipment selected as the current input source. If the equipment does not operate, turn on the equipment and select the appropriate input source using **INPUT**.
- The LINK feature may not operate properly when an HDMI splitter or AV selector unit is used. These devices may cause interruptions to the image and/or sound.

Connected LINK-compatible devices can be operated without changing the settings of the remote control unit.

The **OPTION** button will function only when LINK Operation is used.

Control the LINK-compatible audio system

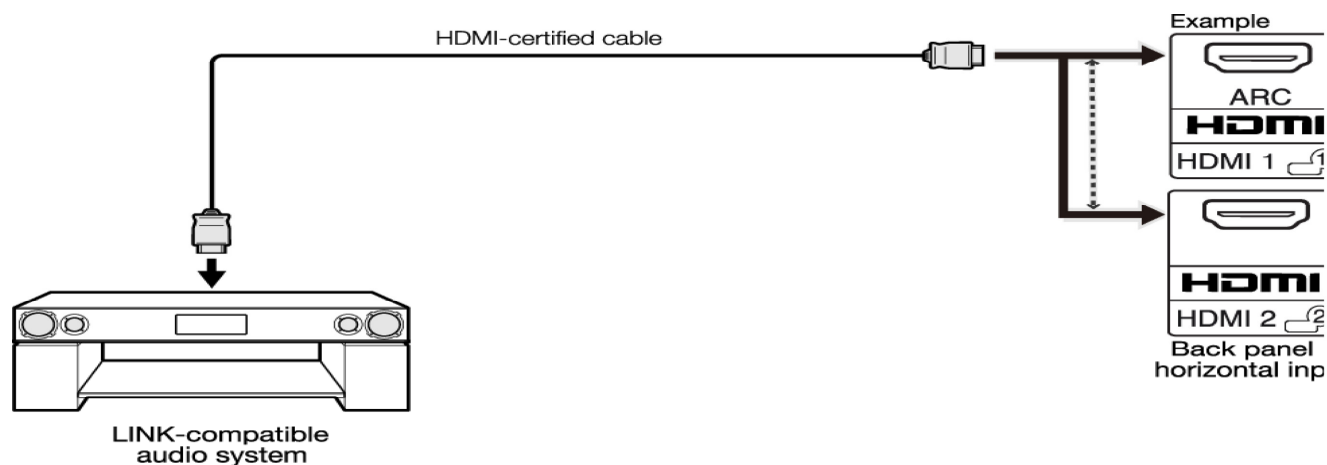
Set the volume of LINK-compatible audio system.

NOTE

- The steps in "HDMI CEC LINK" on [page 6-2](#) need to be completed beforehand.
- Refer to this operation manual and the operation manual of the LINK device to be used with this TV.

Buttons for playing mode

Buttons	Description
▲/▼/◀▶	Select a desired item
ENTER	Activate the selected function
A (red)	Stop
B (green)	Previous chapter
C (blue)	Play
D (yellow)	Next chapter
RETURN	Go back to the previous page
EXIT	Exit from the page





Using LINK Operation



Controlling HDMI Equipment Using LINK Operation (Continue)

HDMI CEC LINK

Make the settings to use LINK Operation. Set the settings with "Initial Setup" > "Input Settings" > "HDMI CEC LINK".

Link Operation

Select LINK Operation Control to disable the LINK function even when a LINK-compatible HDMI device is connected to the TV. This function prevents the device from starting to operate unexpectedly.

Auto Power On

If this is activated, the One Touch Play function is enabled. While the TV is in standby mode, it automatically turns on and plays back the image from the HDMI source.

Audio Return Channel

This function allows you to listen to the TV audio via audio equipment without using an optical fiber cable, which conventionally is required.

Requirements for using an ARC-compatible AV amplifier:

- ARC-compatible AV amplifier connected to the ARC-compatible HDMI IN terminal. (HDMI IN 1) (Refer to the operation manual of the ARC-compatible equipment for details.)
- Use of an ARC-compatible cable.

Auto: You can listen to the TV audio with ARC-compatible audio equipment.

Off: This function does not work.

NOTE

- If the TV audio cannot be output from the AV amplifier even after making the necessary settings, connect the TV to the AV amplifier with an optical fiber cable and select "Off".

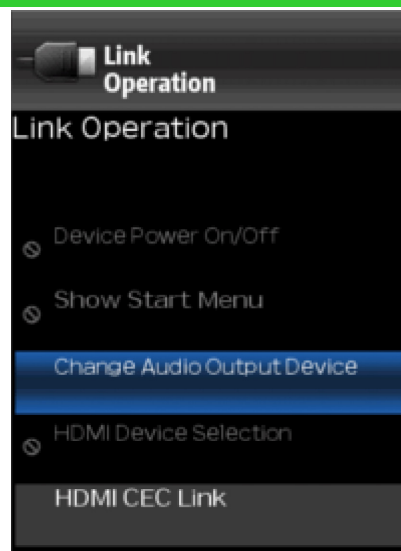
>>

Using LINK Operation

<<



Link Operation Menu



Device Power On/Off

You can manually turn on/off the power of the connected LINK-compatible equipment. Each time you press **ENTER**, the connected equipment switches on or off.

The Link Operation Menu allows you to make adjustments during operation of LINK-compatible equipment.

- 1 Press **OPTION** to display the Link Operation Menu.
- 2 Press **▲/▼** to select the desired item, and then press **ENTER**.
 - Specific operations differ depending on the item you select. Following are the basic operations for each item.

>>

Using LINK Operation

<<



Link Operation Menu (Continue)

Show Start Menu

You can call up a setup menu from the connected LINK-compatible equipment.

NOTE

- Depending on the status of the equipment (recording or in standby mode, etc), the setup menu will not be displayed.

Change Audio Output Device

You can select to listen to the TV sound only from the LINK-compatible audio system.

Audio Return Channel: The sound from the TV speaker is muted and only the sound from the LINK-compatible audio system is audible.

- You can use **VOL+/-** and **MUTE**.

Built-in Speaker: The sound is output from the TV speaker.

HDMI Device Selection

If multiple HDMI devices are connected in a daisy chain, you can specify which device to control here.

Press **▲/▼** to select the desired device from a list of connected HDMI devices, and then press **ENTER**.

HDMI CEC LINK

You can also display the HDMI CEC LINK screen from the Link Operation Menu.



Using a PC



Control of the TV

The TV can be controlled from a PC, control panels and other devices using the RS-232C or IP. Use a cross-type RS-232C cable, ETHERNET cable (commercially available) or wireless LAN for the connections. (Needs the conversion cable to minijack (Terminal : "SERVICE ONLY") for using RS-232C.)

NOTE

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

IP Control

Set this function when operating the TV from equipment connected by LAN. To perform the operation, refer to "Network Settings".

IP Control

When "IP Control" is selected, "Change" will be highlighted. Press **ENTER**.

Detailed Settings

Make the detailed settings (Login ID, password, etc.). Follow the on-screen instructions to configure the settings.

Device Name

Set the name of the TV displayed on other network devices.

- Use the software keyboard to set the name.
[See page 4-21](#) for details on the software keyboard.

Communication Conditions for IP

Connect to the TV with the following settings made for IP on the PC.

IP protocol:	TCP/IP
Host IP address:	Set the IP address on the TV menu
Service:	None (Do not select Telnet or SSH)
TCP port#:	Set a port number on the TV menu (Control port)

When you set your ID and password on the TV menu, you need to enter them as soon as you connect to the TV.

NOTE

- When you use this function, make settings for "IP Control".
- The connection will be cut off when there has been no communication for 3 minutes.

Communication Conditions for RS-232C

Set the RS-232C communication settings on the PC to match the Monitors communication conditions.

The Monitor's communication settings are as follows:

Baud rate:	115,200 bps
Data length:	8 bits
Parity bit:	None
Stop bit:	1 bit
Flow control:	None

Communication procedure

Send the control commands from the PC via the RS-232C or IP.

The TV operates according to the received command and sends a response message to the PC. Do not send multiple commands at the same time.

Wait until the PC receives the OK response before sending the next command.

>>

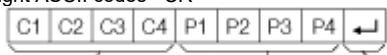
Using a PC

<<

Control of the TV (Continue)

Command format

Eight ASCII codes +CR



Command 4-digits Parameter 4-digits Return code

Command 4-digits: Command. The text of four characters.

Parameter 4-digits: Parameter 0-9, x, blank, ?

Parameter

Input the parameter values, aligning left, and fill with blank(s) for the remainder. (Be sure that 4 values are input for the parameter.)

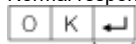
When the input parameter is not within an adjustable range, "ERR" returns. (Refer to "Response code format".)

Any numerical value can replace the "x" on the table.

0				When "?" is input for some commands, the present setting value responds.	?			
0	0	0	9		?	?	?	?
-	3	0						

Response code format

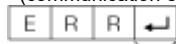
Normal response



Return code (ODH)

Problem response

(communication error or incorrect command)



Return code (ODH)

Command table

- Commands not indicated here are not guaranteed to operate.

CONTROL ITEM		COMMAND				PARAMETER				CONTROL CONTENTS	
POWER SETTING *2		P	O	W	R	0	-	-	-	Power Off	It shifts to standby.
						1	-	-	-	Power On	Power On *1
INPUT SELECTION	TOGGLE	I	T	G	D	-	-	-	-	(Toggle)	It input-switches by the toggle. (It is the same as an input change key)
	TV	I	T	V	D	0	-	-	-		It input-switches to TV. (A channel remains as it is. (Last memory))

*1 Select "Initial Setup" from the menu screen and set "Quick Start Mode" to "On" to enable the Power On command for LAN and Wi-Fi.

When "Quick Start Mode" is set to "Off" and "Wake on Wi-Fi/LAN" is set to "Enable", you can use "Wake on LAN (Magic Packet)" to turn on the power via LAN.

When "Quick mode" is "Off" and the power of the display is off, you can use only "POWR1"

command by setting the baud rate as "9,600" on PC side.

After using "POWR1" command, the baud rate becomes the original setting before turning off the display.

*2 The minijack (Terminal: "SERVICE ONLY") outputs the system boot message for service other than command response when the TV turns on / off. Please ignore the system boot message.

NOTE

- If an underbar () appears in the parameter column, enter a space.
- If an asterisk (*) appears, enter a value in the range indicated in brackets under CONTROL CONTENTS.
- Any numerical value can replace the "x" on the table.

>>

Using a PC

<<

Control of the TV (Continue)

CONTROL ITEM	COMMAND	PARAMETER	CONTROL CONTENTS
INPUT SELECTION	0-5 I A V D	* _ _ _	0: TV 1: HDMI IN 1, 2: HDMI IN 2, 3: VIDEO IN, 4: USB 5: Home Network
AV MODE SELECTION	A V M D	* _ _ _	0: (Toggle), 1: STANDARD, 2: MOVIE, 4: USER, 5: DYNAMIC, 6: DYNAMIC (Fixed) Although it can choose now, it is toggle operation in inside.
VOLUME	V O L M	* * * _	Volume (0-100)

CONTROL ITEM	COMMAND	PARAMETER	CONTROL CONTENTS
WIDE MODE	W I D E	* * _ _	0: (Toggle), 1: Normal, 2: Zoom 14:9, 3: Panorama, 4: Full, 5: Cinema 16:9, 6: Cinema 14:9, 10: Dot by Dot, 14: Overscan It is the same as Wide Mode key.
MUTE	M U T E	* _ _ _	0: (Toggle), 1: On, 2: Off

NOTE

- If an underbar (_) appears in the parameter column, enter a space.
- If an asterisk (*) appears, enter a value in the range indicated in brackets under CONTROL CONTENTS.
- Any numerical value can replace the "x" on the table.

>>

Using a PC

<<

Control of the TV (Continue)

CONTROL ITEM	COMMAND				PARAMETER				CONTROL CONTENTS
SURROUND	A	C	S	U	*	-	-	-	0: (Toggle), 1: On, 2: Off
AUDIO SELECTION	A	C	H	A	-	-	-	-	(Toggle)
SLEEP TIMER	O	F	T	M	*	-	-	-	0: Off, 1: Sleep timer - 0 hr. 30 min., 2: Sleep timer - 1 hr. 00 min., 3: Sleep timer - 1 hr. 30 min., 4: Sleep timer - 2 hr. 00 min., 5: Sleep timer - 2 hr. 30 min.

CONTROL ITEM		COMMAND				PARAMETER				CONTROL CONTENTS	
CHANNEL	DIRECT CHANNEL (ANALOG)	D	C	C	H	*	*	*	-	The channel number of TV (1-135)	An input change is included if it is not TV display. In Air, 2-69ch is effective. In Cable, 1-135ch is effective.
	DIRECT CHANNEL (DIGITAL)	D	A	2	P	*	*	*	*	(0100-9999)	DIGITAL Air (Two-Part numbers, 2-digit plus 2-digit)
		D	C	2	U	*	*	*	-	(1-999)	DIGITAL Cable (Two-Part numbers, 3-digit plus 3-digit) Front half of DIGITAL CABLE CHANNEL NO. (Designate major channel)
		D	C	2	L	*	*	*	-	(0-999)	DIGITAL Cable (Two-Part numbers, 3-digit plus 3-digit) Rear half of DIGITAL CABLE CHANNEL NO. (Designate minor channel)

NOTE

- If an underbar () appears in the parameter column, enter a space.
- If an asterisk (*) appears, enter a value in the range indicated in brackets under CONTROL CONTENTS.
- Any numerical value can replace the "x" on the table.

>>

Using a PC

<<

Control of the TV (Continue)

CONTROL ITEM		COMMAND				PARAMETER				CONTROL CONTENTS	
CHANNEL	DIRECT CHANNEL (DIGITAL)	D	C	1	0	*	*	*	*	(0-6383)	DIGITAL Cable (One-Part numbers, 5-digit, less than 10,000)
		D	C	1	1	*	*	*	*	(0-9999)	DIGITAL Cable (One-Part numbers, 5-digit, more than 10,000)
	CH UP	C	H	U	P	-	-	-	-	The channel number of TV +1	If it is not TV display, it will input-switch to TV. (same function as CH \wedge)
	CH DOWN	C	H	D	W	-	-	-	-	The channel number of TV -1	If it is not TV display, it will input-switch to TV. (same function as CH \vee)
CC		C	L	C	P	x	-	-	-	(Toggle)	Toggle operation of a closed caption.
DEVICE NAME		T	V	N	M	1	-	-	-		The device name set in "Device Name Setting" is displayed.
MODEL NAME		M	N	R	D	1	-	-	-		The model name of the TV.

CONTROL ITEM	COMMAND				PARAMETER				CONTROL CONTENTS	
SOFTWARE VERSION	S	W	V	N	1	-	-	-		The current version of the TV software is displayed.
IP PROTOCOL VERSION	I	P	P	V	1	-	-	-		The currently supported version of IP protocol is displayed.

NOTE







- If an underbar () appears in the parameter column, enter a space.
- If an asterisk (*) appears, enter a value in the range indicated in brackets under CONTROL CONTENTS.
- Any numerical value can replace the "x" on the table.

>>

Using a PC

<<

Control of the TV (Continue)

CONTROL ITEM	COMMAND				PARAMETER				CONTROL CONTENTS
	R	C	K	Y	*	*	-	-	
REMOTE CONTROL BUTTONS					*	*	-	-	0-9: 0-9, 10: DOT, 12: POWER, 13: DISPLAY, 23: OPTION, 24: SLEEP, 31: MUTE, 32: VOL -, 33: VOL +, 34: CH  , 35: CH  , 36: INPUT, 38: MENU, 39: APPS, 40: ENTER, 41:  , 42:  , 43:  , 44:  , 45: RETURN, 46: EXIT, 49: AUDIO, 50: A (red), 51: B (green), 52: C (blue), 53: D (yellow), 61: MANUAL
RS232C BAUD RATE CHANGE	B	A	U	D	0	0	9	6	baud rate: 9,600
					1	1	5	2	baud rate: 115,200

NOTE

- If an underbar () appears in the parameter column, enter a space.
- If an asterisk (*) appears, enter a value in the range indicated in brackets under CONTROL CONTENTS.
- Any numerical value can replace the "x" on the table.



Using a PC



PC Compatibility Chart

It is necessary to set the PC correctly to display XGA and WXGA signal.

Resolution		Horizontal Frequency	Vertical Frequency	VESA Standard
VGA	720 x 400	31.5 kHz	70 Hz	—
	640 x 480	31.5 kHz	60 Hz	○
		37.9 kHz	72 Hz	○
		37.5 kHz	75 Hz	○
SVGA	800 x 600	35.1 kHz	56 Hz	○
		37.9 kHz	60 Hz	○
		48.1 kHz	72 Hz	○
		46.9 kHz	75 Hz	○
XGA	1024 x 768	48.4 kHz	60 Hz	○
		56.5 kHz	70 Hz	○
		60.0 kHz	75 Hz	○
WXGA	1360 x 768	47.7 kHz	60 Hz	○
SXGA	1280 x 1024	64.0 kHz	60 Hz	○
SXGA+	1400 x 1050	65.3 kHz	60 Hz	○
1080p	1920 x 1080	67.5 kHz	60 Hz	—
UHD	3840 x 2160	112.5 kHz	50 Hz	—
		135 kHz	60 Hz	—

VGA and XGA are registered trademarks of International Business Machines Corp.

AV Compatibility Chart

Resolution	Vertical Frequency	HDMI
640 x 480p	59.94 Hz	○
	60 Hz	○
720 x 480p	59.94 Hz	○
	60 Hz	○
720 x 576p	50 Hz	○
720(1440) x 480i	59.94 Hz	○
	60 Hz	○
720(1440) x 576i	50 Hz	○
1280 x 720p	50 Hz	○
	59.94 Hz	○
	60 Hz	○
1920 x 1080i	50 Hz	○
	59.94 Hz	○
1920 x 1080p	60 Hz	○
	24 Hz	○
	50 Hz	○
	59.94 Hz	○
3840 x 2160p	60 Hz	○
	30 Hz	○



Using the Internet



By connecting your TV to a broadband system, you can access the Internet from the TV.

Connecting to the Internet

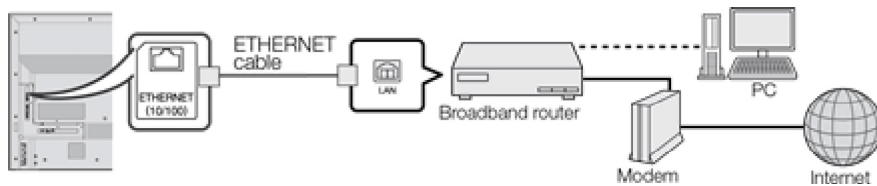
To connect your TV to the Internet, you must have a broadband Internet connection.

If you do not have a broadband Internet connection, consult the store where you purchased your TV or ask your Internet service provider or telephone company.

When an Internet connection is made, an Ethernet and wireless connection cannot be used at the same time. Use only one of the connection types.

Using an ETHERNET cable

Use an ETHERNET cable (commercially available) to connect the ETHERNET terminal on the TV to your broadband router (commercially available).



Using the wireless LAN

This TV is equipped with a wireless LAN function.

For a wireless LAN connection, you must use "Wireless Setup" to connect the access point and TV.



Network Settings

Perform the procedure below to make adjustments or to confirm the settings for accessing the Internet.

- 1 Press **MENU** to display the MENU screen, and then press **ENTER**.
- 2 Press **◀▶** to select "Network Setting", and then press **ENTER**.
- 3 Press **▲/▼** to select "Connection Type", and then press **ENTER**.
 - Press **▲/▼** select "Wired" or "Wireless". and press **ENTER**.
- 4 Press **▲/▼** to select "Wired Setup", or "Wireless Setup", and then press **ENTER**.
 - Select "Wired Setup" when you make general adjustments to connect to the Internet.
[See page 4-20.](#)
- 5 Press **MENU** to exit.

NOTE

- This TV has a built-in wireless LAN function. Using a separate wireless USB LAN adapter may result in radio communications that do not comply with regulations on radio communications. Therefore, do not use a separate wireless LAN.
- A wireless LAN connection and performance cannot be guaranteed for all residential environments. In the following cases, the wireless LAN signal may be poor or drop, or the connection speed may become slower.
 - When used in buildings made with concrete, reinforced steel, or metal
 - When placed near objects that obstruct the signal
 - When used with other wireless devices that emit the same frequency
 - When used in the vicinity of microwave ovens and other devices that emit a magnetic field, electrostatic charge, or electromagnetic interference.

>>

<<

Using the Internet



Entering Text (Software Keyboard)

When you are editing an input screen or specifying the Network settings used for accessing the Internet, enter text from the software keyboard.

NOTE

- You can enter up to 128 characters for text.
- Some special characters or diacritics may not be available depending on where you enter the text.

The text you enter is displayed as you type it in.

To move the cursor (the current input position), use "**<**" or "**>**" on the software keyboard.



While you are entering text, likely input conversion candidates are displayed based on what you typed in.

↑Shift

If "alphabet" is selected, this switches characters between uppercase and lowercase. Each time you press **ENTER**, the character type switches.



Press **ENTER** to select the type of characters entered: alphabet, or sign.



Erases text one character at a time.

>>

<<

Using the Internet



Entering Text (Software Keyboard) (Continue)

Enter

Applies the entered information and closes the software keyboard.

Space

Enters a space.

Clear

Erases the character string.

- When the cursor is somewhere in a line: the character string to the right of the cursor will be erased.
- When the cursor is at the right end of a line: the entire line will be erased.

Close

Closes the software keyboard without applying the entered information.

Buttons on the remote control unit	Description
▲/▼/◀▶	Moves the focus. When moved at the far edge, the focus moves to the opposite edge.
ENTER	Performs the processing for the button currently in the focus.
EXIT	Closes the software keyboard without applying the original input elements for the entered text.
RETURN	
0-9	Directly enters the single-byte number for that button.
• (DOT)	Erases text one character at a time.

>>

<<

Using the Internet



Using the Browser

- 1 Press **APPS**, press **◀▶** to select the browser icon from the application window, and then press **ENTER**.
 - Press **APPS** again to switch back to the currently tuned channel.

Buttons for Using the Browser

ENTER, ▲▼◀▶

- Press ▲▼◀▶ to select a link that you want to jump, and then press **ENTER**.

EXIT

- Press the button to return to the Monitor screen.

RETURN

- Press the button to return to the previous page.

NOTE

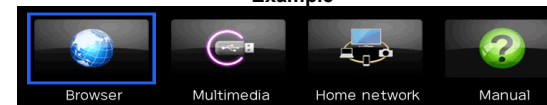
- Restrictions apply to window display.

Using the Application Window

During Dock Display

You can move the application icons.

Example



- 1 Select an application, and then press ▲.
- 2 Press ◀▶ to move the icon to the desired location.

Move the Icons

You can move the icons of the more commonly used applications closer to the left.

Press ◀▶ to move the icon to the desired location.

>>







Using the Internet




<<



Using the Browser (Continue)



Selected item	Description
	Allows you to go back to the previous page.
	Allows you to go to the next page.
	Refreshes the page. Interrupts a page while it is loading.
	Displays the home page.
	Displays the page in the full-screen size.
	Allows you to expand or reduce the page.

Selected item	Description
	Displays the bookmarks list.
	Displays your browsing history.
	Configures browser settings.


Using the Toolbar

You can use the toolbar to control the browser and to specify settings.

- 1 Press  to select a function, and then press **ENTER**.

Browsing Web Contents

You can display the web content you want to enjoy.

- 1 Press  to move to the address area in the toolbar, and then press **ENTER**.
 - The Enter Address menu is displayed.
- 2 Enter an address, and then press **ENTER**.
 - The web content you want to view is displayed.

>>

Using the Internet

<<



Using the Browser (Continue)

CAUTION

- If the power is cut due to a power failure or the TV being unplugged while you are using the Internet, information such as bookmarks or cookies may not be saved correctly.

To users who access the Internet from a PC

- When you access the Internet from this TV, the procedures may not be the same as regular browser-based access on a PC.
- On some pages, video and audio, text or images may not be displayed correctly.
- Due to a large number of pictures or information, the loading time for an internet site can be considerably extended. Sometimes Internet pages can not be loaded.

About links

- Web pages on the Internet often include "links" that allow you to jump to other web pages (or sites).
- "Links" can take various forms, including words or images, but they always work in the same way letting you jump to the link destination when you select them.
- Selected items (such as links of text input fields) are enclosed in a frame.
- You can jump from a "link" to the corresponding link destination.

>>

Using the Internet


<<



Using the Browser (Continue)

Browser Settings

You can check or modify your browser settings from the Browser menu.

- 1 Press to select "  " in the toolbar, and then press **ENTER**.
- 2 Press /// to specify the required setting, and then press **ENTER**.

ENG 8-7

>>

Using the Internet

<<



Using Keyboard and Mouse

You can use a keyboard or mouse for operating the TV while using the browser.

- When you use the USB devices, connect the device to the USB terminal on the TV.

NOTE

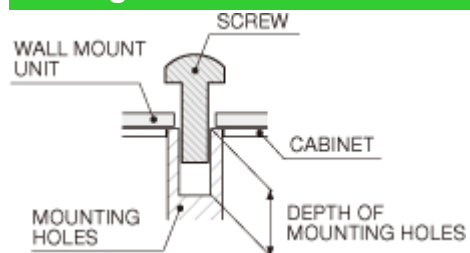
- The keyboard and mouse can only be used on a browser screen.
The keyboard or mouse may not operate properly depending on the application being used.



Appendix



Setting the TV on the Wall



Unit: inch
(mm)

For the screws, refer to the table shown below.

	80/70/60 inch models
Standard screws	M6 (Use 1.0 pitch screws.)
Length(Depth of mounting holes)	25/64 (10)
Quantity	4 pcs.

NOTE

- To use this TV mounted on a wall, remove the cable tie as needed.
- Do not use screws that do not comply with the VESA standard screw specifications.
- Do not use screws that are longer than the standard length. Screws that are too long may cause damage to the inside of the TV.
- Do not fasten the screws too firmly or loosely. This may damage the product or cause the product to fall, leading to personal injury. SHARP is not liable for these kinds of accidents.
- SHARP is not liable for product damage or personal injury when a non-VESA or non-specified wall mount is used or the consumer fails to follow the product installation instructions.



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

>>

Appendix

<<

Troubleshooting

Problem	Possible Solution
<ul style="list-style-type: none"> No power 	<ul style="list-style-type: none"> Check if you pressed POWER on the remote control unit. Is the AC cord disconnected? Has the power been turned on?
<ul style="list-style-type: none"> Unit cannot be operated. 	<ul style="list-style-type: none"> External influences such as lightning, static electricity, may cause improper operation. In this case, operate the unit after first turning off the power of the TV or unplugging the AC cord and replugging it in after 1 or 2 minutes.
<ul style="list-style-type: none"> Remote control unit does not operate. 	<ul style="list-style-type: none"> Are batteries inserted with polarity (+, -) aligned? Are batteries worn out? (Replace with new batteries.) Are you using it under strong or fluorescent lighting? Is a fluorescent light illuminated near the remote control sensor?
<ul style="list-style-type: none"> Picture is cut off/with sidebar screen. 	<ul style="list-style-type: none"> Is the image position correct? Page 7-1 Are screen mode adjustments such as picture size made correctly? Pages 4-23 to 4-25
<ul style="list-style-type: none"> Strange color, light color, or color misalignment 	<ul style="list-style-type: none"> Adjust the picture tone. Pages 4-16 to 4-18 Is the room too bright? The picture may look dark in a room that is too bright.
<ul style="list-style-type: none"> Power is suddenly turned off. 	<ul style="list-style-type: none"> Is the sleep timer set? Pages 3-6 Check the power control settings. Page 4-22 The unit's internal temperature has increased. Remove any objects blocking vent or clean.

Problem	Possible Solution
<ul style="list-style-type: none"> No picture 	<ul style="list-style-type: none"> Is connection to other components correct? Is the correct input selected? Pages 2-1 If the PC image is not displayed, check the following: <ul style="list-style-type: none"> When connecting a laptop PC to the TV, check that display output mode of the PC is set to external TV. Check the resolution setting on the PC. Is a non-compatible signal being input? Page 7-7
<ul style="list-style-type: none"> Picture quality of HD videos is poor. 	<ul style="list-style-type: none"> To enjoy HD images from external equipment, you are required to set up HDMI connection or component connection. If the Video source is not of HD quality, HD images cannot be displayed. Check that the Video source you are viewing provides HD images. The HD cable/satellite set-top box may need to be configured to output HD images via cable/satellite.
<ul style="list-style-type: none"> The TV sometimes makes a cracking sound. 	<ul style="list-style-type: none"> This is not a malfunction. This happens when the cabinet slightly expands and contracts according to change in temperature. This does not affect the Monitor's performance.
<ul style="list-style-type: none"> Some Internet functions used on a PC are not available from the TV. 	<ul style="list-style-type: none"> The TV has only limited functions compared with regular PC browsers. Pages 8-4 to 8-6

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Appendix

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Troubleshooting (Continue)

Problem	Possible Solution
<ul style="list-style-type: none"> No sound 	<ul style="list-style-type: none"> Is connection to other components correct? Is the volume too low? Page 3-2 Have you pressed MUTE on the remote control unit? Page 3-3 Check the audio output of the connected external equipment. Is the volume too low or muted? When external equipment is connected via an HDMI cable, you may need to configure the audio to be output through the HDMI cable.

Cautions regarding use in high and low temperature environments

- When the unit is used in a low temperature space (e.g. room, office), the picture may leave trails or appear slightly delayed. This is not a malfunction, and the unit will recover when the temperature returns to normal.
- Do not leave the unit in a hot or cold location. Also, do not leave the unit in a location exposed to direct sunlight or near a heater, as this may cause the cabinet to deform and the front panel to malfunction.
Storage temperature: -4°F to +140°F (-20°C to +60°C)



Specifications



TV (4T-B60CJ1U/4T-B70CJ1U/4T-B80CJ1U)

Item		4T-B60CJ1U	4T-B70CJ1U	4T-B80CJ1U
LCD Panel		60" Class(60 3/32" Diagonal)	70" Class(69 1/2" Diagonal)	80" Class(80 4/9" Diagonal)
Resolution		8,294,400 pixels (3840 x 2160)		
Video color system		NTSC-M/PAL-N/PAL-M		
TV Function	TV- Standard (CCIR)	American TV Standard ATSC/NTSC System		
	Receiving Channel	VHF/UHF	VHF 2-13ch, UHF 14-69ch	
		CATV	1-135ch (non-scrambled channel only)	
		Digital Terrestrial Broadcast (8VSB)	2-69ch	
		Digital cable*1 (64/256 QAM)	1-135ch (non-scrambled channel only)	
STEREO/BILINGUAL		BTSC system		
Audio amplifier		10 W x 2		
Terminals	Antenna terminal ANTENNA/CABLE IN (Antenna input)	75Ω Unbalance, F Type x 1 for Analog (VHF/UHF/CATV) and Digital (AIR/CABLE)		
	SERVICE ONLY Ø3.5 mm jack	Ø3.5 mm jack		
	INPUT 1 (ARC) HDMI	HDMI (HDMI input), ARC		
	INPUT 2 HDMI	HDMI (HDMI input)		
	AV IN (INPUT 3)	AUDIO in, VIDEO in		
	AUDIO OUT	AUDIO out, Headphone (Ø3.5 mm stereo)		
	USB	Photo/Music/Video mode, Software update		
ETHERNET (10/100 BASE-T)	Network connector			
OSD language		English/French/Spanish		
Power Requirement		AC 120 V, 60 Hz		
Power Consumption		180W	200W	240W
Dimensions with stands		1360.2 x 855.7 x 305.5 mm	1568.5 x 976.4 x 286.9 mm	1825.9 x 1125.7 x 387.2 mm
Dimensions without stands		1360.2 x 787.7 x 72.8 mm	1568.5 x 904.9 x 72.3 mm	1825.9 x 1050.3 x 81.1 mm
Weight/Weight without stands		20.2 kg/19.8 kg	25.7 kg/25.2 kg	36.0 kg/35.0 kg
Operating temperature		0°C to +40°C		

*1 Emergency alert messages via Cable are unreceivable.

- As a part of policy of continuous improvement, SHARP reserves the right to make design and specification changes for product improvement without prior notice. The performance specification figures indicated are nominal values of production units. There may be some deviations from these values in individual units.
- Continuous operating time and warranty. This product is designed for a maximum daily use of 16 hours. Continual use in excess of 16 hours per day is not covered by the warranty.

CAUTION

- Installing the Liquid Crystal Television requires special skill that should only be performed by qualified service personnel. Customers should not attempt to do the work themselves. SHARP bears no responsibility for improper mounting or mounting that results in accident or injury.
- Carefully read the instructions that come with the bracket before beginning work.

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Specifications

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Wireless LAN

Specification	
Standard	IEEE 802.11b/g/n
Security	Static WEP (64/128 bit kry index 1 only) WPA-PSK (TKIP) WPA2-PSK (AES)
Modulation	IEEE802.11b: DBPSK, DQPSK, CCK / DSSS HRDSSS IEEE802.11g: BPSK, QPSK, 16QAM, DBPSK, DQPSK, CCK, PBCC / OFDM IEEE802.11n: BPSK, QPSK, 16QAM, 64QAM / OFDM
Throughput	IEEE802.11b: 1, 2.5, 5, 11Mbps IEEE802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps IEEE802.11n: ~300Mbps



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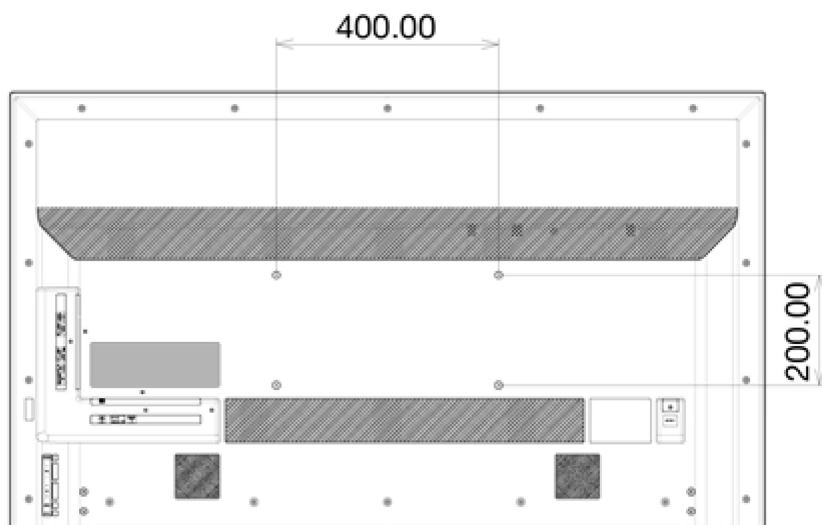
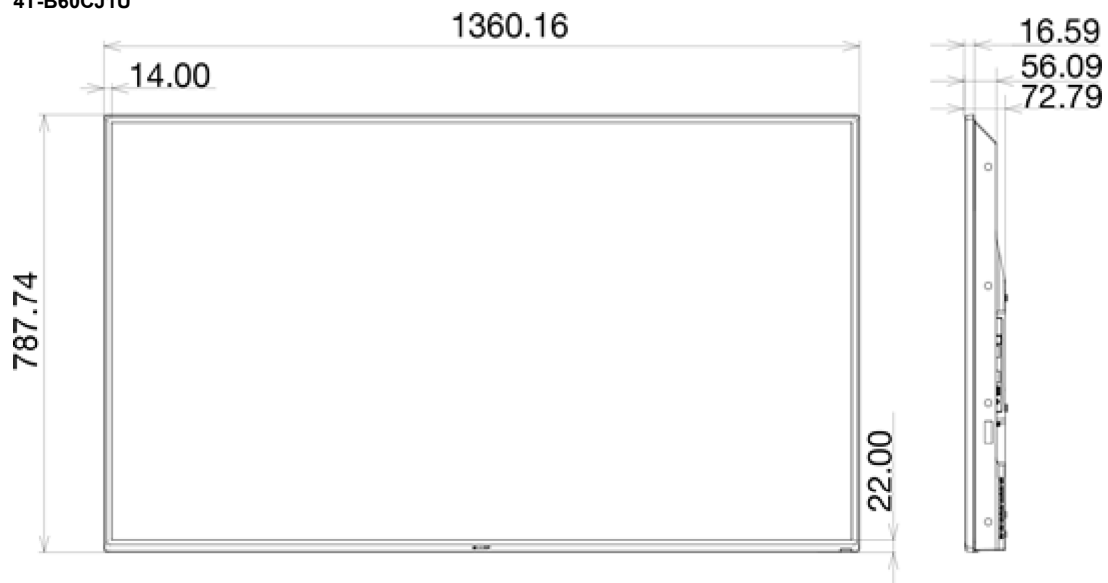


Dimensional Drawings



4T-B60CJ1U

Unit: mm



- *1 Active area
- *2 Thinnest part
- *3 Including projecting parts

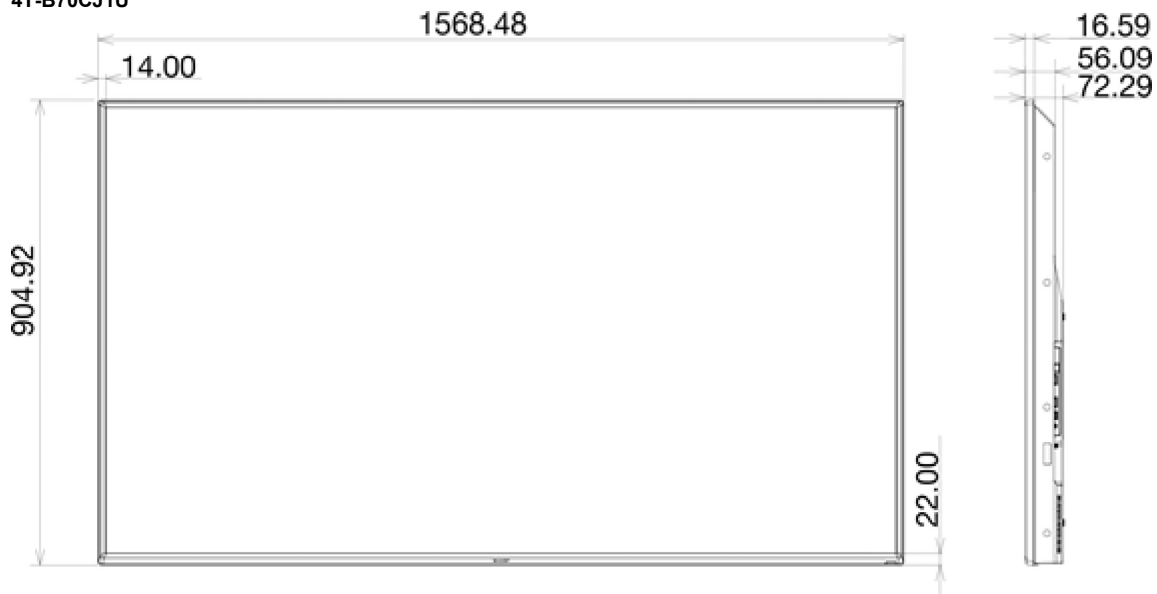
ENG 12-1



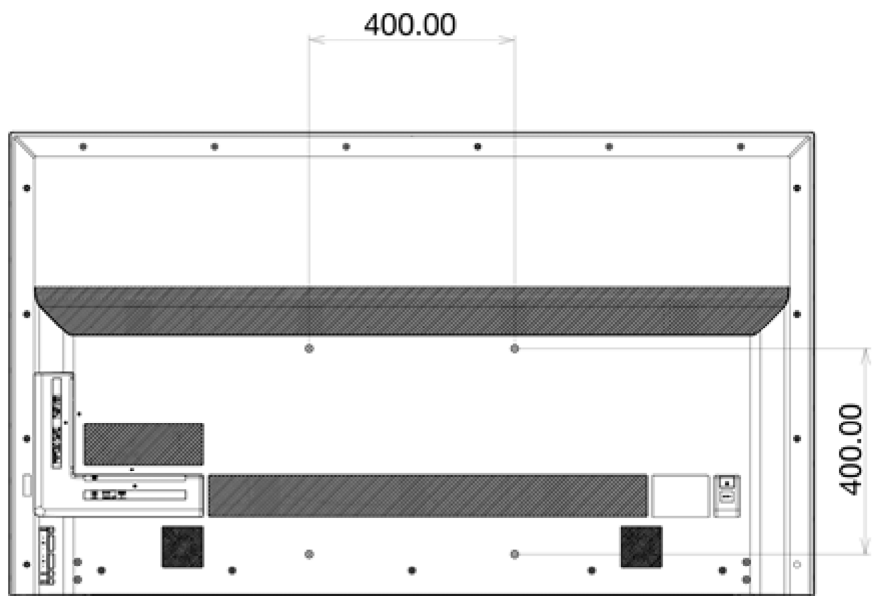
Dimensional Drawings



4T-B70CJ1U



Unit: mm



- *1 Active area
- *2 Thinnest part
- *3 Including projecting parts

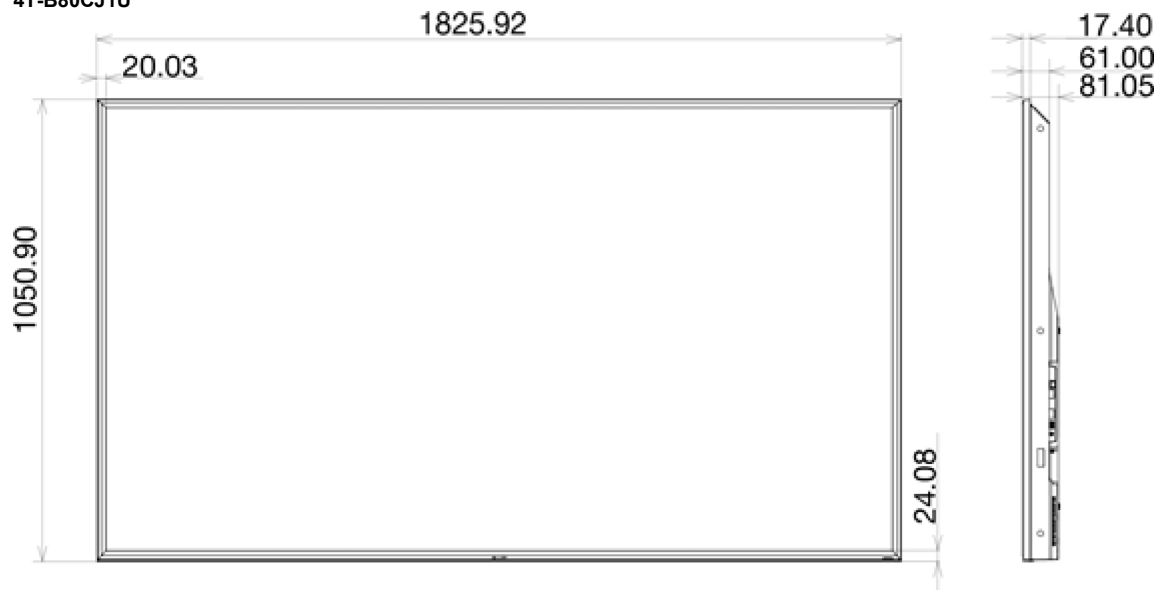
ENG 12-2



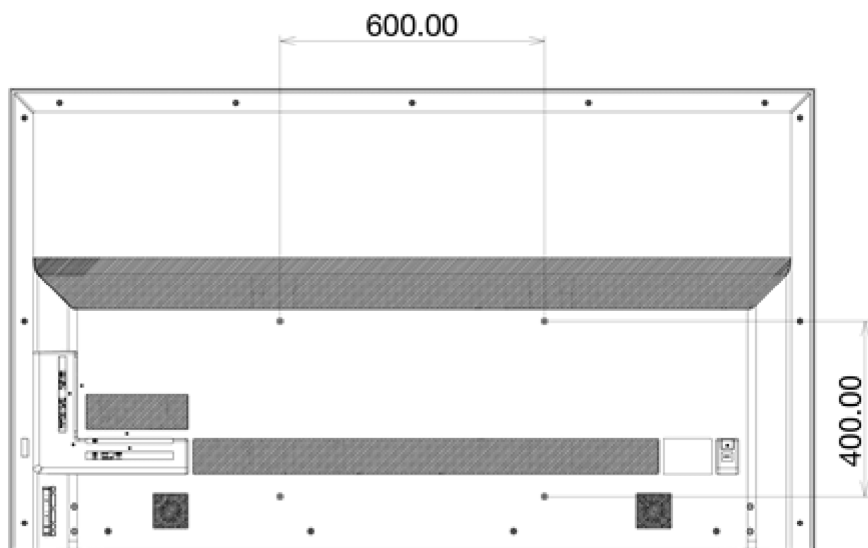
Dimensional Drawings



4T-B80CJ1U



Unit: mm



- *1 Active area
- *2 Thinnest part
- *3 Including projecting parts

ENG 12-3



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Acknowledgements

The following open source software components are included in this product:

```
/bootcode/uboot
/linux-3.7.2
/system/ap/develop/busybox/busybox-1.18.4
/system/lib/develop/e2fsprogs/e2fsprogs-1.42.6
/system/lib/develop/uClibc-0.9.30.3
/system/ap/develop/mtd/util
/system/tools/squashfs
/Platform_Lib/Graphics/FontRenderer/libotf-0.9.9
/Platform_Lib/Graphics/FontRenderer/fridibi-0.10.9
/Platform_Lib/Graphics/FontRenderer/freetype-2.3.5
/Utility/tinyxml
/Application/Win32/RSSClient/tinyxml
/Include/Utility/tinyxml"
```

```
/Utility/wpa_suppllicant
/system/tools/lzma
/open_source/icu-54.1
/open_source/harfbuzz/harfbuzz-0.9.35
/open_source/graphite2/graphite2-1.2.4
```

```
/src/Platform_Lib/Graphics/DirectFB/DirectFB-1.4.2
/open_source/curl/curl-7.32.0
/open_source/libwebp/libwebp-0.4.1
/open_source/FastJpegLib/jpeg-6b
/open_source/libmng/libmng-2.0.2
/open_source/Libpng
/open_source/font/freetype-2.4.11
/open_source/c-ares/c-ares-1.10.0
/open_source/openssl-1.0.1j
/open_source/expat
/open_source/zlib-1.2.3
/open_source/Tremor
/open_source/Alsa/alsa-lib-1.0.23
/open_source/picotts
```

```
/Utility/wpa_suppllicant
/libmediaplayerservice/wfdisplay/spu/core/bigd*
/open_source/HTTTPC
/open_source/upnp
/system/src/Platform_Lib/Graphics/JpegRenderer
/system/open_source/libpng
/system/open_source/gif
/system/open_source/libwebp
http://tv.realtek.com/LGPL/alsa-lib-1.0.23.tgz
http://tv.realtek.com/LGPL/curl-7.28.1.tgz
http://tv.realtek.com/LGPL/c-ares-1.9.1.tgz
http://tv.realtek.com/LGPL/icu-4.8.1.1.tgz
http://tv.realtek.com/LGPL/mpg123-1.21.0.tgz
http://tv.realtek.com/LGPL/fontconfig-2.11.0.tgz
http://tv.realtek.com/LGPL/expat.2.0.1.tar.gz
http://tv.realtek.com/LGPL/qt-everywhere-opensource-src-5.0.0.tgz
http://tv.realtek.com/LGPL/openssl-1.0.11.tgz
```

>>

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Bootcode:

uboot
GPL V2 <http://tv.realtek.com/LGPL/uboot.tgz>

Kernel:

vmlinux
GPL V2 <http://tv.realtek.com/LGPL/linux-3.7.2.tgz>

busybox

GPL V2 <http://tv.realtek.com/LGPL/busybox-1.18.4.tgz>

e2fsprogs

GPL V2 <http://tv.realtek.com/LGPL/e2fsprogs-1.42.6.tar.gz>
<http://tv.realtek.com/LGPL/e2fsprogs-libs-1.42.6.tar.gz>

uclibc

LGPL V2.1 <http://tv.realtek.com/LGPL/uClibc-0.9.30.3.tar.bz2>

mkfs.jffs2

GPL V2 <http://tv.realtek.com/LGPL/jffs2.tgz>

mksquashfs

GPL V2 <http://tv.realtek.com/LGPL/squashfs4.2.tar.gz>

Library:

libotf
LGPL V2.1 <http://tv.realtek.com/LGPL/libotf-0.9.9.tar.gz>

fribidi

LGPL V2.1 <http://tv.realtek.com/LGPL/fribidi-0.10.9.tar.gz>

freetype

FTL ~ BSD <http://tv.realtek.com/LGPL/freetype-2.4.11.tar.gz>

tinycl

zlib <http://sourceforge.net/projects/tinycl/files/>

openssl

Apache License 1.0 BSD
<http://tv.realtek.com/LGPL/openssl-1.0.11.tgz>
<http://tv.realtek.com/LGPL/openssl-1.0.1j.tar.gz>

Utility:

wpa_supplicant
BSD http://tv.realtek.com/LGPL/wpa_supplicant-2.4.tar.gz

lzma

public domain <http://tv.realtek.com/LGPL/lzma-4.65.tgz>

Harfbuzz

MIT
<http://tv.realtek.com/LGPL/harfbuzz-0.9.35.tar.bz2>

Graphite

Apache 2.0 <http://tv.realtek.com/LGPL/graphite2-1.2.4.tgz>

gperftools

New BSD License <http://tv.realtek.com/LGPL/gperftools-2.2.tar.gz>

directFB

LGPL V2 <http://tv.realtek.com/LGPL/DirectFB-1.4.2.tar.gz>

libjpeg

JPEG

libmng

MNG License

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FreeType
freetype

c-ares
MIT

Miracast:
openssl
OpenSSL/SSLeay

expat
MIT/X

zlib
Zlib

Tremor
Xiph.org

alsa
LGPL 2.1
<http://tv.realtek.com/LGPL/alsa-lib-1.0.23.tar.gz>
<http://tv.realtek.com/LGPL/alsa-lib-1.0.23.tgz>

picoTTS
apache 2
LGPL 2 <http://tv.realtek.com/LGPL/JavaScriptCore.r118995.tar.gz>
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BSD

Miracast:
openssl
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BSD
<http://tv.realtek.com/LGPL/openssl-1.0.1j.tar.gz>
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BigDigits
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Http:
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GPL <http://tv.realtek.com/LGPL/HTTTPC.tar.bz2>

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<http://tv.realtek.com/LGPL/libwebp-0.4.3.tar.gz>

Others:
alsa
LGPL 2.1
<http://tv.realtek.com/LGPL/alsa-lib-1.0.23.tar.gz>
<http://tv.realtek.com/LGPL/alsa-lib-1.0.23.tgz>

curl
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icu

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<http://tv.realtek.com/LGPL/icu-4.8.1.1.tgz>
http://tv.realtek.com/LGPL/icu4c-53_1.tgz
http://tv.realtek.com/LGPL/icu4c-54_1-src.tgz

mpg123

LGPL 2.1
<http://tv.realtek.com/LGPL/mpg123-1.21.0.tgz>

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 Copyright Ac 2008,2009 Red Hat, Inc.
 Copyright Ac 2008 Danilo A?egan
 Copyright Ac 2012 Google, Inc.
<http://tv.realtek.com/LGPL/fontconfig-2.11.0.tgz>

expat

same as the MIT/X Consortium license.
<http://tv.realtek.com/LGPL/expat.2.0.1.tar.gz>
<http://tv.realtek.com/LGPL/expat-1.95.tgz>

QT(including Webkit)

LGPL 2.1 <http://tv.realtek.com/LGPL/qt-everywhere-opensource-src-5.0.0.tgz>

openssl

Apache License 1.0 BSD
<http://tv.realtek.com/LGPL/openssl-1.0.1j.tar.gz>
<http://tv.realtek.com/LGPL/openssl-1.0.1l.tgz>

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