High-Definition Plasma TV Service Manual

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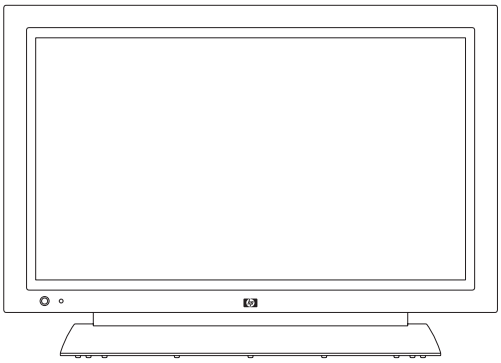
Service Manual



HP High-Definition Plasma Television

Models: PL4260N and PL5060N

In the interests of user-safety (required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

HP

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Important Service Safety Precautions

BEFORE SERVICING THE PDP MODULE, READ THE SAFETY PRECAUTIONS IN THIS MANUAL.

WHEN REPLACEMENT PARTS ARE REQUIRED, BE SURE TO USE REPLACEMENT PARTS SPECIFIED BY THE MANUFACTURER.

Proper service and repair is important to the safe, reliable operation of all HP equipment. The service procedures recommended by HP and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specifically designed for their purpose, and should be used as recommended.

It is important to note that this manual contains various Cautions and Notices that should be carefully read in order to minimize the risk of personal injury to service personnel. Improper service methods may damage the equipment. It is also important to understand that these Cautions and Notices are not exhaustive. HP could not possibly know, evaluate, and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, HP has not undertaken any such broad evaluation. Service technicians who use service procedures or tools that are not recommended by HP must exercise caution and be sure that neither their safety nor the safe operation of the equipment will be jeopardized by the service method selected.

Warnings and Cautions

WARNING: Critical components having special safety characteristics are identified with a ⚠ by the reference number in the parts list.

WARNING: Use of substitute replacement parts, which do not have the same specified safety characteristics, may create shock, fire, or other hazards. Under no circumstances should the original design be modified or altered without written permission from HP. HP assumes no liability, express or implied, arising out of any unauthorized modification of design. The service technician assumes all liability.

CAUTION: To ensure the continued reliability of this product, use only the original manufacturer's replacement parts, which are listed with their part numbers in the "Replaceable Parts List" section of this service manual.

WARNING: All ICs and many other semiconductors are susceptible to electrostatic discharges (ESDs). Careless handling during repair can be life-threatening. When repairing, make sure that you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.

WARNING:

1. Never replace modules or other components while the unit is turned on.
2. When making settings, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

WARNING: To prevent electrical shock, do not use the polarized AC plug with an extension cord, receptacle, or the outlet unless the blades can be fully inserted to prevent blade exposure. To prevent electrical shock, match the wide blade or plug to a wide slot and fully insert.

WARNING: When replacement parts are required, be sure to use 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.

WARNINGS:

Safety regulations require that after a repair the set must be returned in its original condition. In particular attention should be paid to the following points:

NOTE: The wiring should be routed correctly and fixed with the mounted cable clamps. The insulation of the main leads should be checked for external damage.

- Do not touch the signal and the power connector while this product is operating. Do not touch the EMI ground part and the heat sink of the film filter.
- Do not supply a voltage higher than that specified to this product. This may damage the product and may cause a fire.
- Do not use this product in locations where the humidity is extremely high, where it may be splashed with water, or where flammable materials surround it. Do not install or use the product in a location that does not satisfy the specified environmental conditions. This may damage the product and may cause a fire.
- If a foreign substance (such as water, metal, or liquid) gets inside the panel module, immediately turn off the power. Continuing to use the product, may cause fire or electric shock.
- If the product emits smoke or an abnormal smell, or it makes an abnormal sound, immediately turn off the power. Continuing to use the product, may cause fire or electric shock.
- Do not disconnect or connect the connector while power to the product is on. It takes some time for the voltage to drop to a sufficiently low level after the power has been turned off. Confirm that the voltage has dropped to a safe level before disconnecting or connecting the connector.
- Do not pull out or insert the power cable from or to an outlet with wet hands. It may cause electric shock.
- Do not damage or modify the power cable. It may cause fire or electric shock.
- If the power cable is damaged, or if the connector is loose, do not use the product; this can lead to fire or electric shock.
- If the power connector or the connector of the power cable becomes dirty or dusty, wipe it with a dry cloth. Continuing to use the product may cause fire or electric shock.
- The PDP module uses a high-voltage (maximum 450V DC). Be cautious of electric shock and do not touch the device circuitry when handling the PDP unit. Because the capacitor of the device circuitry may remain charged at the moment of power off, standing by for 1 minute is strongly recommended before touching the device circuitry.
- 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.

Safe Handling and Servicing

The work procedures shown with the Warning symbol are important for ensuring the safety of the product and the servicing work. Be sure to follow these instructions.

- Before starting the work, secure a sufficient workspace.
- At all times, other than when adjusting and checking the product, be sure to turn off the Power button and disconnect the power cable from the power source of the TV during servicing.
- To prevent electric shock and breakage of PC board, start the servicing work at least 30 seconds after the main power has been turned off. Especially when installing and removing the power supply board and the SUS board, which involve high voltages, start servicing at least 2 minutes after the main power has been turned off.
- While the main power is on, do not touch any parts or circuits other than the ones specified. The high-voltage power supply block within the PDP module has a floating ground. If any connection other than the one specified is made between the measuring equipment and the high voltage power supply block, it can result in electric shock or activation of the leakage-detection circuit breaker.
- When installing the PDP module into and removing it from the packing carton, be sure to have at least two people perform the work while being careful to ensure that the flexible printed-circuit cable of the PDP module does not get caught by the packing carton.
- When the surface of the panel comes into contact with the cushioning materials, be sure that there is no foreign matter on top of the cushioning materials. Foreign matter may scratch the surface of the panel.
- Be sure to remove static electricity from your body before handling the circuit board.

- Be sure to handle the circuit board by holding the large parts such as the heat sink or transformer. Failure to observe this precaution may result in the occurrence of an abnormality in the soldered areas.
- Do not stack the circuit boards. Failure to observe this precaution may result in problems resulting from scratches on the parts, the deformation of parts, and short-circuits due to residual electric charge.
- Routing the wires and fixing them in position must be done in accordance with the original routing and fixing configuration when servicing is completed. All the wires are routed far away from the areas that become hot (such as the heat sink). These wires are fixed in position with the wire clamps so that the wires do not move, thereby ensuring that they are not damaged and their materials do not deteriorate over long periods of time. Therefore, route the cables and fix the cables to the original position and states using the wire clamps.
- Perform a safety check when servicing is completed. Verify that the peripherals of the serviced points have not undergone any deterioration during servicing. Also verify that the screws, parts, and cables removed for servicing purposes have all been returned to their proper locations in accordance with the original setup.
- A glass plate protects the plasma display. This glass plate can be cleaned with a slightly moist cloth. If dirt appears between the glass plate and the plasma display panel have only a qualified service employee clean it.

Repair Tips

WARNING: All ICs and many other semiconductors are susceptible to electrostatic discharges (ESDs). Careless handling during repair can be life-threatening. When repairing, make sure that you are connected with the same potential as the mass of the unit via a wrist wrap with resistance. Keep components and tools also at the same potential.

About Lead-Free Solder

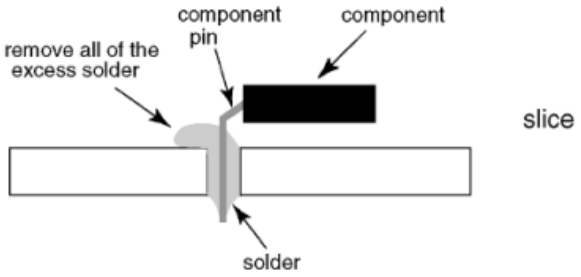
NOTE: LEAD IS LISTED AS (PB) IN THE PERIODIC TABLE OF THE ELEMENTS. IN THE INFORMATION THAT FOLLOWS, PB WILL REFER TO LEAD SOLDER, AND PBF WILL REFER TO LEAD-FREE SOLDER. THE LEAD-FREE SOLDER USED IN OUR MANUFACTURING PROCESS AND DISCUSSED HERE IS (SN+AG+CU). THAT IS TIN (SN), SILVER (AG), AND COPPER (CU), ALTHOUGH OTHER TYPES ARE AVAILABLE.

This model is manufactured using Pb-free solder for the sake of environmental conservation. For service and repair work, we suggest using Pb-free solder as well, although Pb solder may be used.

PCBs manufactured using Pb-free solder have the sign (Pb) stamped on the PCB.

CAUTIONS:

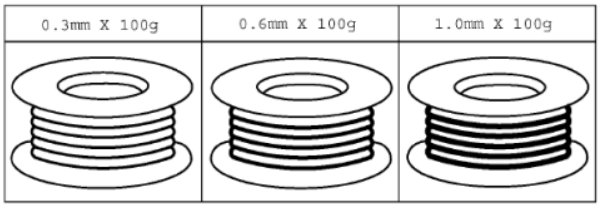
- Pb-free solder has a higher melting point than Pb solder. Typically the melting point is 50–70°F (30–40°C) higher. Use a high temperature soldering iron. Adjust your solder tool so that a temperature around 360–380°C is reached and stabilized at the solder joint. Heating time of the solder joint should not exceed 4 seconds. Avoid temperatures above 400°C; wear-out of tips will rise drastically and flux-fluid will be destroyed.
- Pb-free solder will tend to splash when heated too high (about 1,100°F or 600°C).
- Mix of Pb-free solder Tin (SN)/parts with leaded soldering Tin (SN) in/parts is possible but not recommended. If you have to use Pb solder, completely remove all of the Pb-free solder on the pins or solder area before applying Pb solder. If this is not practical, be sure to heat the Pb-free solder until it melts, before applying Pb solder.
- After applying Pb-free solder to double-layered boards, check the component side for excess solder that may flow onto the opposite side (see the following illustration).



- Special information for Pb-free BGA-ICs: These ICs will be delivered in so-called dry-packaging to protect the IC against moisture and with the Pb-free logo on it. This packaging may only be opened shortly before it is used (soldered). Otherwise the body of the IC gets wet inside, and during the heating time the structure of the IC will be destroyed from steam pressure. If the packaging was opened before usage the IC has to be heated up for about 90 hours to dry. Make sure you use ESD protection!

Suggested Pb-Free Solder

Several kinds of Pb-free solder (some shown in the following illustration) are available for purchase. This product uses Sn+Ag+Cu (Tin (SN), Silver (AG), Copper (CU)) solder. However, Sn+Cu (Tin (SN), copper), Sn+Zn+Bi (Tin (SN), zinc, bismuth) solder can also be used.



Servicing of Surface-Mounted Devices (SMDs)

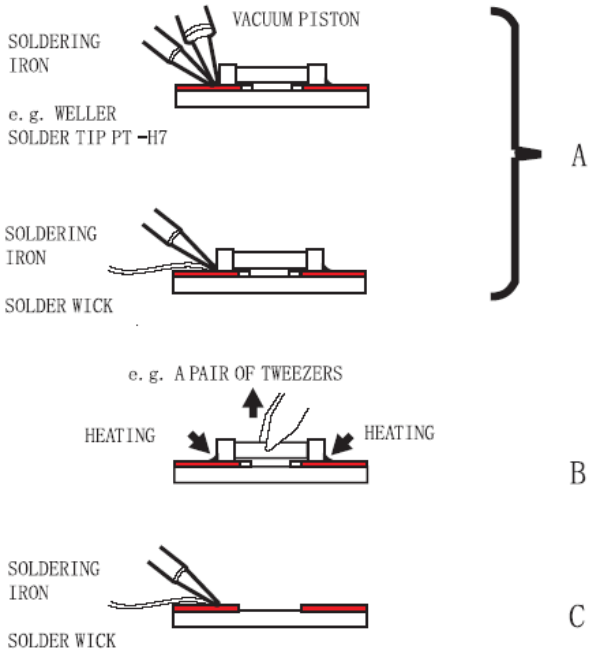
CAUTIONS:

General cautions on handling and storage:

- Oxidation on the terminals of SMDs results in poor soldering. Do not handle SMDs with bare hands.
- Avoid using storage places that are sensitive to oxidation, such as places with sulphur or chlorine gas, direct sunlight, high temperatures, or a high degree of humidity. The capacitance or resistance value of the SMDs may be affected by these conditions.
- Rough handling of circuit boards containing SMDs may cause damage to the components as well as the circuit boards. Circuit boards containing SMDs should never be bent or flexed. Different circuit board materials expand and contract at different rates when heated or cooled and the components and/or solder connections may be damaged due to the stress.
- Never rub or scrape chip components as this may cause the value of the component to change. Similarly, do not slide the circuit board across any surface.

Removal of SMDs

1. Heat the solder (for 2 to 3 seconds) at each terminal of the chip. By means of litz wire and a slight horizontal force, small components can be removed with the soldering iron. They can also be removed with a solder sucker (**A**).
2. While holding the SMD with a pair of tweezers, take it off gently using the soldering iron's heat applied to each terminal (**B**).
3. Remove the excess solder on the solder lands by means of litz wire or a solder sucker (**C**).

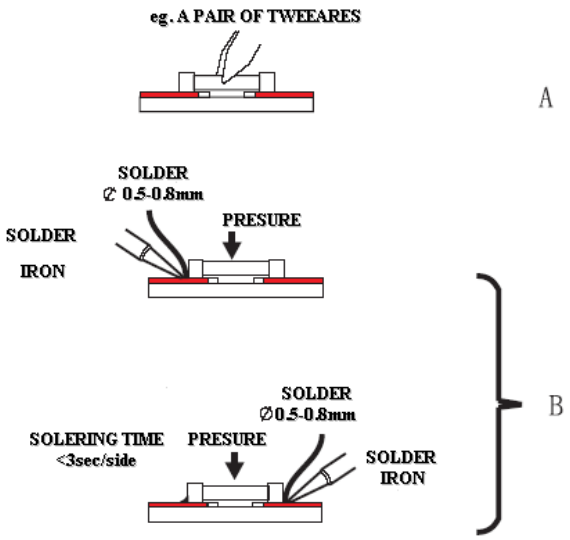


CAUTIONS:

- When handling the soldering iron, use suitable pressure and be careful.
- When removing the chip, do not use undue force with the pair of tweezers.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250° C).
- Once removed, the chip cannot be reused.

Attachment of SMDs

1. Locate the SMD on the solder lands by means of tweezers and solder the component on one side. Ensure that the component is positioned correctly on the solder lands (A).
2. Complete the soldering of the terminals of the component (B).



CAUTIONS:

- When soldering the SMD terminals, do not touch them directly with the soldering iron. The soldering should be done as quickly as possible; care must be taken to avoid damage to the terminals of the SMDs themselves.
- Keep the SMD's body in contact with the printed board when soldering.
- The soldering iron to be used (approximately 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250° C).
- Soldering should not be done outside the solder land.
- Soldering flux (of rosin) may be used but should not be acidic.
- After soldering, let the SMD cool down gradually at room temperature.
- The quantity of solder must be proportional to the size of the solder land. If the quantity is too great, the SMD might crack or the solder lands might be torn loose from the printed board.

Rework on Ball Grid Array (BGA) ICs

General information

Although (LF) BGA assembly yields are very high, there may still be a requirement for component rework. By *rework*, we mean the process of removing the component from the PWB and replacing it with a new component. If an (LF) BGA is removed from a PWB, the solder balls of the component are deformed drastically so the removed (LF) BGA has to be discarded.

Device removal

As is the case with any component that, it is essential when removing an (LF) BGA, the board, tracks, solder lands, or surrounding components are not damaged. To remove an (LF) BGA, the board must be uniformly heated to a temperature close to the reflow soldering temperature. A uniform temperature reduces the chance of warping the PWB. To do this, we recommend that the board is heated until it is certain that all the joints are molten. Then carefully pull the component off the board with a vacuum nozzle. For the appropriate temperature profiles, see the IC data sheet.

Area Preparation

When the component has been removed, the vacant IC area must be cleaned before replacing the (LF) BGA.

Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent. After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the (LF) BGA.

NOTE: Do not apply solder paste, as this has shown to result in problems during resoldering.

Device replacement

The last step in the repair process is to solder the new component on the board. Ideally, the (LF) BGA should be aligned under a microscope or magnifying glass. If this is not possible, try to align the (LF) BGA with any board markers. To reflow the solder, apply a temperature profile according to the IC data sheet. To avoid damaging neighboring components, it may be necessary to reduce some temperatures and times.

Product Information and Specifications

Product Information

This specification table describes the key areas of all hardware service requirements of large entertainment 42" and 50" 16:9 aspect ratio High-Definition Plasma Television models PL4260N and PL5060N. This document is for HP service personnel (bench and in-home technicians) and ASP technicians in the repair and refurbishment of HP flat-panel televisions.

Product Profile

HP High-Definition Digital TV models PL4260N and PL5060N can display both ATSC and NTSC TV signals. Both models also support High Definition Multimedia Interface (HDMI) and YPbPr (HD) display technology. Both models can be used as monitors for your PC with a VGA connector.

Specifications

PDP Panel Module Specifications

Model name	PDP42X3#### (42X3 Model)	PDP50X3#### (50X3 Model)	Comments
Number of pixels	1024 (H) x 768 (V)	1366 (H) x 768 (V)	1 pixel = 3 RGB cells
Pixel pitch	900㎛ (H) x 676㎛ (V)	810㎛ (H) x 810㎛ (V)	
Cell pitch	300㎛ (H) x 676㎛ (V)	270㎛ (H) x 810㎛ (V)	Green Cell basis
Display area	920.1 (H) x 518.4 (V) ± 0.5 mm	1106.5(H) x 622.1(V) ± 0.5 mm	
Outline dimension	1005 (H) x 597 (V) x 60.7 (D) ± 1 mm	1190(H) x 700(V) x 58(D) ± 1 mm	
Pixel type	RGB Closed type	RGB Closed (Well) type	
Number of gradations	(R)1024 x (G)1024 x (B)1024	(R)1024 x (G)1024 x (B)1024 colors	
Aspect ratio	16:9	16:9	
Peak brightness	Typical 1200 cd/㎡	Typical 1000 cd/㎡	1/100 White Window
	Typical 1200 cd/㎡	Typical 1000 cd/㎡	1/100 White Window pattern at center
Contrast ratio	Typical 140:1	Average 90:1	In a bright room with 150Lux at center
	Typical 10,000:1	Typical 8,000:1 Maximum 10,000:1	In a dark room 1/100 White Window pattern at center
Weight	14.7 Kg ± 0.5 kg	21.4 ± 0.5 kg	Net 1EA
	100 Kg ± 5 kg	130 ± 5 kg	5EA/1BOX
Power consumption	Typical 250 W Maximum 330 W	Maximum 400 W	Full White
Expected lifetime	60,000 hours	60,000 hours	

NOTE: For panel inspections, refer to the panel specification documentation in the Appendix.

General TV Specifications

Brand		**HP**	**HP**
Model number		PL4260N	PL5060N
Description		42" HDTV	50" HDTV
Availability (On Ad)		4/20/06	4/20/06
Video	Brightness	1200 cd/m2	1000 cd/m2
	Resolution	1024 x 768	1366 x 768
	Contrast ratio	10,000:1	8,000:1
	Displayable colors	1.07 bn true colors	1.07 bn true colors
	Shades of gradation	1,024 shades	1,024 shades
	Panel life	60,000 hours	60,000 hours
	Viewing angles	H: 160° V: 160°	H: 160° V: 160°
	Scanning frequencies	Horizontal: 31–65 kHz	Horizontal: 31–65 kHz
	Video dot rate	Vertical: 59–76 Hz	Vertical: 59–76 Hz
		<108 MHz	<108 MHz
Tuning	ATSC/NTSC/Clear - QAM	1	1
	Cable Card	No	No
Video enhancers	Digital comb filter		Yes
	Video noise reduction		Yes
	3:2 Pull down	Yes	Yes
	Auto brightness enhancer	Yes	Yes
	Fine detail enhancement	Yes	Yes
	Vivid color enhancer	Yes	Yes
Burn-in protection	Whitewash	Yes	Yes
	Auto brightness adjustment	Yes	Yes
Audio	No. of speakers	2 x 3 (1 tweeter, 2 midrange)	2 x 3 (1 tweeter, 2 midrange)
	Audio output	2 x 8 W	2 x 8 W
	Dolby Digital	Yes	Yes
	Surround Sound	SRS WOW	SRS WOW
Connectivity	HDMI	1	1
	Component In	2	2
	S-video In	2	2
	Composite Video In	2	2
	PC input	1 (RGB-VGA)	1 (RGB-VGA)
	Antenna In (RF)	1	1
	PC or DVI Audio In	1	1
	Analog Audio In	4	4
	Digital Audio Out	1	1
	Video Out (composite)	1	1
	Audio Out (analog)	1	1
	RS-232	1	1

General TV Specification Continued

Brand		**HP**	**HP**
Convenience	OSD language	English/French/Spanish	English/French/Spanish
	Split screen	No	No
	V-Chip	Yes	Yes
	Closed captioning	Yes	Yes
	Sleep/On-off	Yes	Yes
Fit/Finish	Bezel Color	Black metallic	Black metallic
	Bezel Finish	Flat	Flat
Accessories	Stand	Detachable (included)	Detachable (included)
	Speakers	Detachable (included)	Detachable (included)
	Remote	TV only (Included)	TV only (Included)
	Wall mounts	Optional/recommended	Optional/recommended
	Media Center/DEC	Optional/recommended	Optional/recommended
Warranty	Parts & labor	1 Year	1 Year
	Extended warranty (3 yrs)	Optional/recommended	Optional/recommended
General	Power supply	AC 100–240 V∿, 50/60 Hz	AC 100–240 V∿, 50/60 Hz
	Power consumption (W)	340 W	450 W
	Dimensions with speakers and stand (H/W/D)	28.9/53.5/12.3	32.8/61.1/12.3
	Dimensions with speakers but without stand (H/W/D)	25.9/53.5/3.7	29.8/61.1/4.3
	Dimensions without speakers and without stand (H/W/D)	25.9/41.4/3.7	29.8/49.0/4.3
	Weight (with speakers and stand)	90.4 lb	113.5 lb
	Weight (with speakers, without stand)	84.9 lb	108.0 lb
	Weight (without speakers and without stand)	67.2 lb	95.9 lb
	VESA wall mount standard	Optional/recommended	Optional/recommended
	Ventilation clearance requirements	4 in. (10 cm) above, 4 in. (10 cm) sides, 2.8 in. (7 cm) rear	4 in. (10 cm) above, 4 in. (10 cm) sides, 2.8 in. (7 cm) rear
	Ambient temperature	0–40 ºC	0–40 ºC
Regulatory compliance	Safety	CUL and UL UL 60065 7th and CSA-C22.2 No.60065	CUL and UL UL 60065 7th and CSA-C22.2 No.60065
	EMI	FCC, FCC Part 15 Class B	FCC, FCC Part 15 Class B

I/O Connectors

Video Input Connectors

Name	Description
HDMI	HDMI Video Input Connector — Type A
VGA	15-pin D Sub (PC analog RGB)
Composite-1	Composite input connector
Composite-2	Composite input connector
S-video-1	S-video input connector
S-video-2	S-video input connector
Component-1	HD component YPbPr RCA video input connectors
Component-2	HD component YPbPr RCA video input connectors

Audio Input Connectors

Name	Description
VGA/DVI Audio Input	Analog line-in audio input on stereo 3.5 mm jack. Supports DVI audio for HDMI-to-DVI converter.
Composite-1 or S-video 1 Audio Input	Analog line-in audio input on L/R RCA connectors
Composite-2 or S-video 2 Audio Input	Analog line-in audio input on L/R RCA connectors
YPbPr-1 Audio Input	Component analog line-in audio input on L/R RCA connectors
YPbPr-2 Audio Input	Component analog line-in audio input on L/R RCA connectors

Output Connectors

Name	Description
Composite	Composite video output
Composite Audio	Composite audio output RCA right/left
S/PDIF	Digital audio output

Factory Preset Display Modes

Preset	Pixel format	Horizontal frequency (kHz)	Horizontal polarity	Vertical frequency (Hz)	Vertical polarity	Pixel Clk (MHz)	Source
1	640 x 480	31.469	–	59.940	–	25.175	VGA
2	640 x 480	37.500	–	75.000	–	31.500	VESA
3	720 x 400	31.469	–	70.087	+	28.322	VGA
4	800 x 600	37.879	+	60.317	+	40.000	VESA
5	800 x 600	46.875	+	75.000	+	49.500	VESA
6	1024 x 768	48.363	–	60.004	–	65.000	VESA
7	1024 x 768	56.476	–	70.069	–	75.000	VESA
8	1024 x 768	60.023	–	75.029	–	78.750	VESA
9	1280 x 768	47.396	+	59.995	–	68.250	VESA
10	1280 x 1024	63.981	+	60.020	+	108.000	VESA
11	1360 x 768	47.712	+	60.015	+	85.500	VESA

NOTE: Timing 11 is supported by the PL5060N model only.

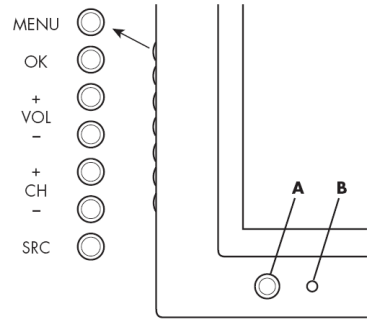
Controlling the Onscreen Display

The onscreen display (OSD) is controlled by using the remote control or the bezel buttons on the left side of the TV.

The TV indicators (**A** and **B**) are located on the front of the TV. The TV controls are located on the left side of the TV.

TV Indicators and Controls

MENU	**Menu** displays the onscreen display (OSD) or closes the OSD menu.
OK	**OK** starts the Auto Sync function for a connected PC signal. In an OSD menu, selects the highlighted item in the OSD.
+VOL **–VOL**	**Volume** (**VOL**) raises or lowers the sound level. In an OSD menu, press these buttons to move right or left in the menu or to adjust an item.
+CH **–CH**	**Channel** (**CH**) selects the next or previous channel. In an OSD menu, press these buttons to move up or down in the menu.
SRC	**Source** (**SRC**) selects the input Menu. In an OSD menu, this functions as a back button or moves you up one item or menu level.
A	**Power** button (**A**) turns on the TV or places it in standby mode.
B	**Remote control sensor** (**B**) receives the signal from the remote control.



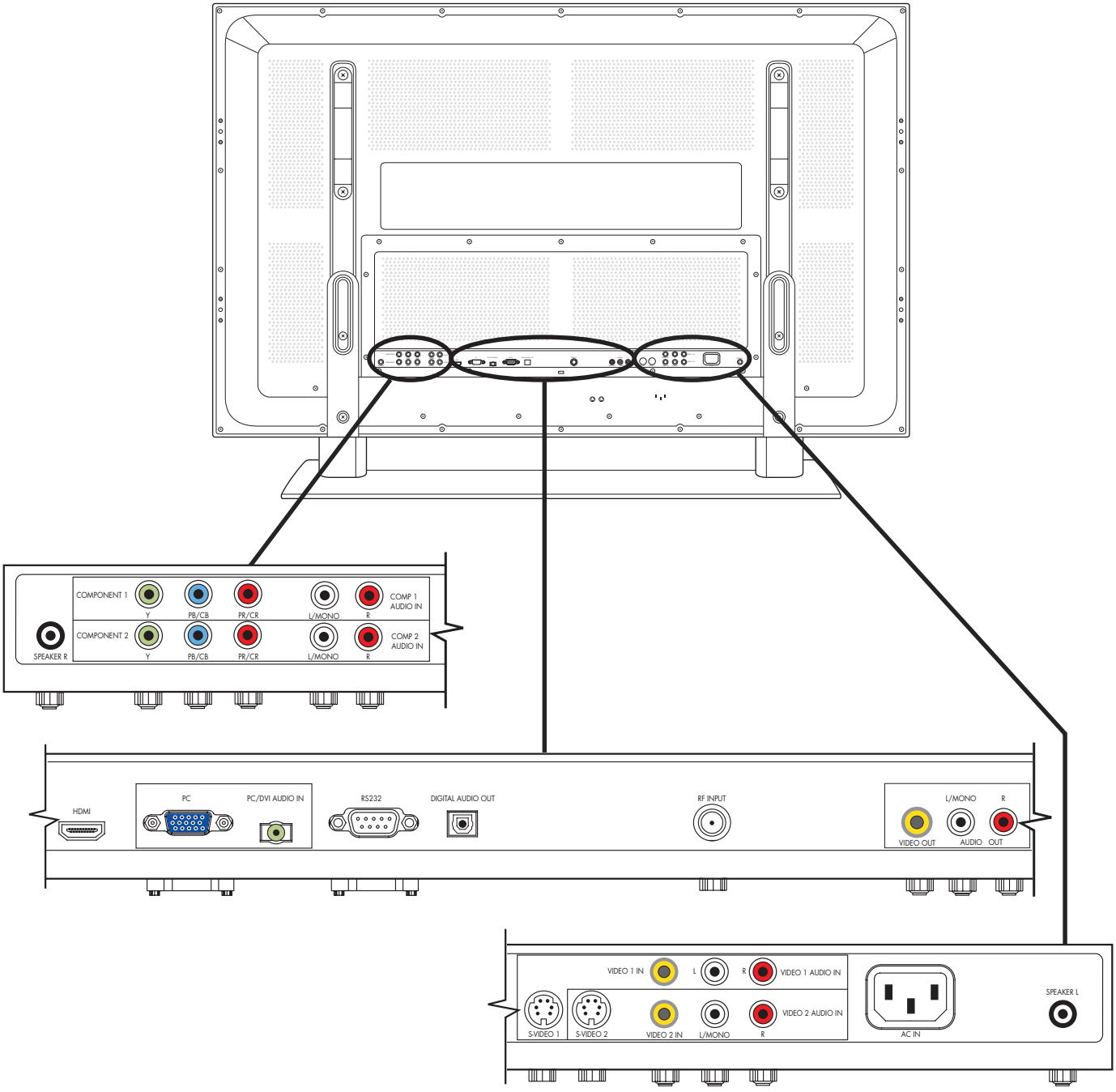
Remote Control

(IR protocol: RC6)

Remote control	Remote control button label	Remote control function
	Power	Use to turn power on or place TV into standby mode.
	SAP/MTS	Turn secondary audio program on and off.
	Sound	Select audio mode: Voice, Music, Standard, User.
	Picture	Select video mode: Vivid, Standard, Movie, or User.
	Source	Display list of input source.
	Menu	Open and exit OSD menu.
	Arrows	Move cursor left/right/up/down in the OSD menu or adjust a selected item
	OK	Choose the current menu option.
	Aspect	Change the image aspect ratio.
	Back	Go up one menu level when the OSD is displayed.
	Info	Display channel information about your current TV program.
	Volume	Turn volume up and down.
	Last	Go back to the previous channel.
	Mute	Turn the sound on and off.
	Ch+/Ch-	Move the channels up and down.
	CC	Display the closed caption content.
	Sleep	Display the sleep timer (15, 30, 60, 90,120 minutes).
	Ant	Press once to display information banner. Press twice to turn on TV mode.
	Numeric keypad	Enter channel number.
	_ (Dash)	Enter a dash for a subchannel number of a digital channel.
	Enter	Select desired channel after entering the channel number with the numeric keypad.

Back TV Connectors

The connectors listed in the following table are located on the left side, center, and right side of the back of the TV.



Connector label	Connector description
Speaker R	Sound output to the right speaker.
Component 1 Comp 1 Audio In Component 2 Comp 2 Audio4 In	Connect standard inputs 480i, 480p, 720p, and 1080i. The TV automatically determines what has been connected. Some set-top boxes must be set for a specific resolution out.
HDMI	Connect High-Definition Multimedia Interface, for digital, high-definition optional equipment.
PC	Connect D-sub pin 15.
PC/DVI Audio In	Connect PC Audio in or DVI Audio in when using a DVI-to-HDMI adapter.
RS232	SW upgrading or RS232 command input port. Use for service only.
Digital Audio Out	Connect a digital audio cable for external digital audio system (optional).
RF Input	Connect to an air antenna or cable signal source.
Video Out Audio Out	Connect composite video and left-right audio output port.
S-video 1 Video 1 Audio1 In S-video 2 Video 2 Audio2 In	Connect an S-video in connector and S-video left-right audio in connectors. (Audio connectors are shared with Video In.)
Video In 1 Audio1 In Video In 2 Audio2 In	Composite video in connectors, composite video left-right audio in connectors. (Audio connectors are shared with S-video.)
AC In	Connect the included power cord. **NOTE:** Use only the provided power cord.
Speaker L	Sound output to the left speaker.

Basic Operation

Basic Operation

For more information about using your HP Plasma TV, refer to the *HP HD Plasma TV User's Guide* included with your TV.

OSD Functions

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Factory Default and ADJ Range
Picture	Settings	Modes	Vivid	Default
			Standard	
			Movie	
			User	
		Brightness		0–100
		Contrast		0–100
		Saturation		0–100
		Hue		0–100
		Sharpness		0–100
		Blue Screen	On	Default
			Off	
		Color Temp.	Warm	
			Standard	
			Cold	Default
	Screen	H Size		0–100
		H Position		0–100
		V Size		0–100
		V Position		0–100
		Phase Adjust		0–100
		Clock Adjust		0–100
		Auto Sync		Button
		Default		Button
Audio	Settings	Volume		
		Balance		
		Sound Mode	Voice	
			Music	
			Standard	Default
			User	
		120Hz		
		200Hz		
		500Hz		
		1200 Hz		
		3000 Hz		
		7500 Hz		
		12KHz		
	Digital Audio	Dolby Digital		
		PCM		Default
	SRS WOW	Mode	On	
			Off	Default
		SRS WOW Settings	Focus	0–10
			TruBass	0–10

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Factory Default and ADJ Range
Time	Time Zone	Setting Time Zone	AST	
			EST	Default
			CST	
			MST	
			PST	
			AKST	
			HST	
			NST	
	Date/Time	Mode	Auto	Default
			Manual	
		Input Date/Time	YY	
			MM	
			DD	
			HR	
			MIN	
			AM/PM	
	Auto Turn-On	Mode	Off	Default
			Once	
			Daily	
		Setting turn-on time	HR	
			MIN	
			AM/PM	
	Auto Turn-Off	Mode	Off	Default
			Once	
			Daily	
		Setting turn-off time	HR	
			MIN	
			AM/PM	
	Sleep Timer	Mode	Off	Default
			On	
		Setting sleep time	15 Min	
			30 Min	
			60 Min	
			90 Min	
			120 Min	
	Daylight Saving	Daylight Savings	On	Default
			Off	

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Factory Default and ADJ Range
Channel	Auto Scan	Scan Source	Antenna	Default
			Cable	
		OK		Button
		Cancel		Button
	Manual Scan	Source Type		Not changeable
		Channel No.		
		Frequency		
		OK		Button
	Edit Program	Edit Program Table	Music	
			Ch No.	
			Name	
			Lock	
			Skip	
	Information	Channel No		
		Channel Name		
CC	CC Mode	Closed Caption Mode	On	
			Off	Default
			On when Mute	
	Analog Caption	Service	CC1	Default
			CC2	
			CC3	
			CC4	
			T1	
			T2	
			T3	
			T4	
	Digital Caption	Service	Service 1	Default
			Service 2	
			Service 3	
			Service 4	
			Service 5	
			Service 6	
	Style	Style	Style 1 to 8, Default, User	Default
		Size	Small, Large, Normal	Default
		Font	Font 1 to 8	Default
		Text Color	Gray, Black, Green	Default
		Text Opacity	Transparent, Solid	Default
		BG Color	Black, Blue, Yellow, etc.	Default
		BG Opacity	Transparent, Solid, etc	Default
		Preview	Text Preview	Default

Menu Level 1	Menu Level 2	Menu Level 3	Menu Level 4	Factory Default and ADJ Range
Parental Ctrl	Password	Input Password		No password
		Confirm Password		
		Password	On	
			Off	Default
	MPAA Rating	X, NC-17, R, PG-13, PG, G, NR		All Ratings unlock
	TV Guidelines	TV-MA, TV-14, TV-PG, TV-G, TV-Y7, TV-Y		All Unlock
	Canadian English	Block All, 18+, 14+, PG, G, C8+,C		All Unlock
	Canadian French	Block All, 18 ans+, 16 ans+, 13 ans+, 8 ans+, G		All Unlock
System	OSD	Select Menu Language	English	Default
			Spanish (in Spanish characters)	
			French (in French characters)	
		Select OSD Timeout	Short	
			Middle	Default
			Long	
	Software Version	V X.Y.Z : X=Major, Y=Minor, Z=Rev #		
	Setup Wizard	Start the setup wizard	Yes	
			No	Default
	Default Settings	Default Settings		Button
	White Wash	Run White Wash (3 minutes):	Yes	
			No	Default
	Standby Mode	Mode	Low Power	Default
			Fast Power	

Command Table RS232

Control Item		Command				Parameter				Control Contents	
Power setting		P	O	W	R	0	_	_	_	Off	It shifts TV set to standby if it is in power on mode. In Slow boot mode, when TV is in the middle of booting sequence, this command should be processed by MCU.
		P	O	W	R	1				On	It shifts TV set to power on mode if it is in standby mode. In Slow boot mode, this command should be processed by external MCU.
Input Select		I	N	P	S	x	_	_	_	Input terminal number (0–8)	It input-switches to INPUT0 ~ INPUT8 (the sequence is Air/Cable, CBVBS1, S-Video1, CVBS2, S-Video2, YPbPr1, YPbPr2, VGA, HDMI)
AV mode selection		A	V	M	D	0	_	_	_	Movie	
						1	_	_	_	Vivid	
						2	_	_	_	Standard	
						3	_	_	_	USER	
Volume		V	O	L	M	*	*	*	_	Volume (0–100)	
Position	H-Position	H	P	O	S	*	*	*	_	PC mode (0–100)	
	V-Position	V	P	O	S	*	*	*	_	PC mode (0–100)	
	Clock	C	L	C	K	*	*	*	_	ONLY PC mode (0–100)	
	Phase	P	H	S	E	*	*	*	_	ONLY PC mode (0–100)	
Aspect		A	S	P	T	0	_	_	_	Auto mode	
						1	_	_	_	16:9 mode	
						2	_	_	_	4:3 mode	
						3	_	_	_	Zoom1 mode	
						4	_	_	_	Zoom2 mode	
						5	_	_	_	Panorama mode	Only TV mode
Mute		M	U	T	E	0	_	_	_	Mute On	
						1	_	_	_	Mute Off	
Dolby Virtual		A	C	D	V	0	_	_	_	PCM	
						1	_	_	_	Dolby	

Control Item		Command				Parameter				Control Contents	
Audio Selection		A	C	H	A	0	_	_	_	Analog- Mono/Digital-audio1	
						1	_	_	_	Analog- Sap/Digital-audio2	
						2	_	_	_	Analog- Stereo/Digital-audio3	
						3	_	_	_	Analog-Sap+Stereo /Digital-audio 4	
						*	*	_	_	Digital-audio X	
Sleep Timer		O	F	T	M	0	_	_	_	Off	
						1	_	_	_	Off Timer – 15 Min.	
						2	_	_	_	Off Timer – 30 Min.	
						3	_	_	_	Off Timer – 60 Min.	
						4	_	_	_	Off Timer – 90 Min.	
						5	_	_	_	Off Timer – 120 Min.	
Channel	Direct Channel (Analog)	D	C	H	A	*	*	*	_	The channel number of TV (1–125)	An input change is included if it is not TV display. In Air, channel 2 to channel 69 is effective. In Cable, channel 1 to channel 125 is effective.
	Direct Channel (Digital)	D	C	H	D	*	*	*	*	(1.0–135.99)	Digital channel number. The first two bytes are major number and following two bytes are minor number. Major number is in hex mode. If major number is less than 0xf, the first byte should be 0.
	CH Up	C	H	U	P	0	_	_	_	The channel number of TV +1	If it is not TV display, it will input-switch to TV. (same function as CH)
	CH Down	C	H	D	W	0	_	_	_	The channel number of TV –1	If it is not TV display, it will input-switch to TV. (same function as CH)
CC operation		C	L	C	P	0	_	_	_	CC off	
						1	_	_	_	CC on	
						2	_	_	_	CC Mute	Toggle CC on while audio muted
Brightness		B	R	T	N	*	*	*	_	Brightness (0–100)	
Contrast		C	T	R	T	*	*	*	_	Contrast (0–100)	
Color		C	L	O	R	*	*	*	_	Color (0–100)	
Hue		H	U	E	E	*	*	*	_	Hue (0–100)	
Sharpness		S	H	R	P	*	*	*	_	Sharpness (0–100)	
Color temperature		C	T	E	P	0	_	_	_	Warm	
						1	_	_	_	Normal	
						2	_	_	_	Cold	

Control Item		Command				Parameter				Control Contents	
Blue screen		B	L	S	C	0	_	_	_	Off	
						1	_	_	_	On	
Auto sync		A	U	S	Y	0				Do auto sync, only in pc mode	
Audio mode		A	U	M	D	0	_	_	_	Voice mode	
						1	_	_	_	Music mode	
						2	_	_	_	Standard mode	
						3	_	_	_	User mode	
Air/Cable selection for **Auto Search**		A	C	S	L	0	_	_	_	Air for **Auto Scan**	Move this command to **Auto Search**.
						1	_	_	_	Cable for **Auto Scan**	Need to state clearly in programming guide that this command does not change RF input or Channel map tables between Air and Cable. This command has NO Correlation with 'Ant' button in remote.
Start Auto search		A	T	S	H	0	_	_	_	Do/**Start** auto search if current source is TV, Need input type (Air/Cable) selection before starting Auto Search.	
Manual search		M	A	S	H	*	*	*	_	Manually search a certain channel if current source is TV. If failed ,go back to the previous status	Digital Air Channel 2~69 Cable Channel 2~135
Channel skip	Skip analog channel	C	H	K	A	*	*	*	_	Skip a certain valid analog channel	
	Skip digital channel	C	H	K	D	*	*	*	*	Skip a certain valid digital channel	
Reset to default		R	T	D	F	0	_	_	_	Reset all settings to default	
Set time mode		S	T	M	D	0	_	_	_	Auto	
						1	_	_	_	Manual	

Control Item		Command				Parameter				Control Contents	
Set time	Set time year	S	T	T	Y	*	*	*	*	Year, if time mode is manual (1990~2037)	
	Set time month	S	T	T	M	*	*	_	_	Month, if time mode is manual (01~12)	
	Set time day	S	T	T	D	*	*	_	_	Day, if time mode is manual (01~31)	
	Set time hour	S	T	T	H	*	*	_	_	Hour, if time mode is manual (00~23)	
	Set time minute	S	T	T	I	*	*	_	_	Minute, if time mode is manual (00~59)	
Time Zone		T	M	Z	N	0	_	_	_	AST	New definition from HP.
						1	_	_	_	EST	
						2	_	_	_	CST	
						3	_	_	_	MST	
						4	_	_	_	PST	
						5	_	_	_	AKST	
						6	_	_	_	HST	
						7	_	_	_	NST	
Set auto on mode		S	A	O	M	0	_	_	_	Off	
						1	_	_	_	On ,but once	
						2	_	_	_	On, daily	
Set auto on time		S	A	O	N	*	*	*	*	Auto on time hour (00~23) minute (00~59)	If hour is less then 10, the first byte should be 0.
Set auto off mode		S	A	F	M	0	_	_	_	Off	
						1	_	_	_	On, but once	
						2	_	_	_	On, daily	
Set auto off time		S	A	O	F	*	*	*	*	Auto off time hour (00~23) minute (00~59)	If hour is less then 10, the first byte should be 0.
Select analog CC service		S	A	C	S	0	_	_	_	CC1	
						1	_	_	_	CC2	
						2	_	_	_	CC3	
						3	_	_	_	CC4	
						4	_	_	_	T1	
						5	_	_	_	T2	
						6	_	_	_	T3	
						7	_	_	_	T4	

Control Item	Command				Parameter				Control Contents	
Select digital CC service	S	D	C	S	1	_	_	_	Select a certain service 1	
					2	_	_	_	Service 2	
					3	_	_	_	Service 3	
					4	_	_	_	Service 4	
					5	_	_	_	Service 5	
					6	_	_	_	Service 6	
Select OSD language	S	O	L	G	0	_	_	_	English	
					1	_	_	_	French	
					2	_	_	_	Spanish	
All screen white mode	S	R	W	M	0	_	_	_	Off	
					1	_	_	_	On	This helps to erase remnants of long time still image on plasma screen.
Standby mode	S	B	M	D	0	_	_	_	Slow Boot mode	New definition from HP.
					1	_	_	_	Fast Boot mode	New definition from HP.

Control Item		Command				Parameter				Control Contents	
Audio Selection		A	C	H	A	0	_	_	_	Analog- Mono/Digital-audio1	
						1	_	_	_	Analog- Sap/Digital-audio2	
						2	_	_	_	Analog- Stereo/Digital-audio3	
						3	_	_	_	Analog-Sap+Stereo /Digital-audio 4	
						*	*	_	_	Digital-audio X	
Sleep Timer		O	F	T	M	0	_	_	_	Off	
						1	_	_	_	Off Timer – 15 Min.	
						2	_	_	_	Off Timer – 30 Min.	
						3	_	_	_	Off Timer – 60 Min.	
						4	_	_	_	Off Timer – 90 Min.	
						5	_	_	_	Off Timer – 120 Min.	
Channel	Direct Channel (Analog)	D	C	H	A	*	*	*	_	The channel number of TV (1–125)	An input change is included if it is not TV display. In Air, channel 2 to channel 69 is effective. In Cable, channel 1 to channel 125 is effective.
	Direct Channel (Digital)	D	C	H	D	*	*	*	*	(1.0–135.99)	Digital channel number. The first two bytes are major number and following two bytes are minor number. Major number is in hex mode. If major number is less than 0xf, the first byte should be 0.
	CH Up	C	H	U	P	0	_	_	_	The channel number of TV +1	If it is not TV display, it will input-switch to TV. (same function as CH)
	CH Down	C	H	D	W	0	_	_	_	The channel number of TV –1	If it is not TV display, it will input-switch to TV. (same function as CH)
CC operation		C	L	C	P	0	_	_	_	CC off	
						1	_	_	_	CC on	
						2	_	_	_	CC Mute	Toggle CC on while audio muted
Brightness		B	R	T	N	*	*	*	_	Brightness (0–100)	
Contrast		C	T	R	T	*	*	*	_	Contrast (0–100)	
Color		C	L	O	R	*	*	*	_	Color (0–100)	
Hue		H	U	E	E	*	*	*	_	Hue (0–100)	
Sharpness		S	H	R	P	*	*	*	_	Sharpness (0–100)	
Color temperature		C	T	E	P	0	_	_	_	Warm	
						1	_	_	_	Normal	
						2	_	_	_	Cold	

Control Item		Command				Parameter				Control Contents	
Blue screen		B	L	S	C	0	_	_	_	Off	
						1	_	_	_	On	
Auto sync		A	U	S	Y	0				Do auto sync, only in pc mode	
Audio mode		A	U	M	D	0	_	_	_	Voice mode	
						1	_	_	_	Music mode	
						2	_	_	_	Standard mode	
						3	_	_	_	User mode	
Air/Cable selection for **Auto Search**		A	C	S	L	0	_	_	_	Air for **Auto Scan**	Move this command to **Auto Search**.
						1	_	_	_	Cable for **Auto Scan**	Need to state clearly in programming guide that this command does not change RF input or Channel map tables between Air and Cable. This command has NO Correlation with 'Ant' button in remote.
Start Auto search		A	T	S	H	0	_	_	_	Do/**Start** auto search if current source is TV, Need input type (Air/Cable) selection before starting Auto Search.	
Manual search		M	A	S	H	*	*	*	_	Manually search a certain channel if current source is TV. If failed ,go back to the previous status	Digital Air Channel 2~69 Cable Channel 2~135
Channel skip	Skip analog channel	C	H	K	A	*	*	*	_	Skip a certain valid analog channel	
	Skip digital channel	C	H	K	D	*	*	*	*	Skip a certain valid digital channel	
Reset to default		R	T	D	F	0	_	_	_	Reset all settings to default	
Set time mode		S	T	M	D	0	_	_	_	Auto	
						1	_	_	_	Manual	