HD6224A-R2

4K60 HDMI DUAL-HEAD KVM SWITCH

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3. Optionally connect audio cables from the computers to the respective ports on the KVM Switch.

4. Optionally connect RS-232 for control functions.

5. Connect the USB keyboard and mouse to the two USB ports with keyboard and mouse symbols.

6. Optionally connect speakers to the KVM Switch.

7. Optionally connect up to 2 USB peripheral devices such as printers or flash drives.

8. Connect the display monitors to the OUTPUT connectors on the KVM Switch.

9. Power on the KVM Switch.

FRONT-PANEL CONTROL

To switch to an input port, simply push the desired input button on the front-panel of the KVM.

If an input port is selected, the green LED indicator of that port will turn on.

COMMANDS

TABLE QS-1. COMMANDS

COMMANDS	HOTKEYS	RS-232 CONTROL
Switch all devices (KVM, USB 2.0, and Audio)	[CTRL] [CTRL] [port #] [ENTER]	//m [port #] [ENTER]
Switch KVM only	[CTRL] [CTRL] c [port #] [ENTER]	//c [port #] [ENTER]
Switch Audio only	[CTRL] [CTRL] a [port #] [ENTER]	//a [port #] [ENTER]
Switch USB 2.0 only	[CTRL] [CTRL] u [port #] [ENTER]	//u [port #] [ENTER]
EDID Learning	[CTRL] [CTRL] e [ENTER]	//e [ENTER]
Same as front panel Activity button	[CTRL] [CTRL] [up-arrow]	n/a
Same as front panel Activity button	[CTRL] [CTRL] [down-arrow]	n/a
Reset	[CTRL] [CTRL] r [ENTER]	//r [ENTER]
Factory Default Reset	[CTRL] [CTRL] f [ENTER]	//f [ENTER]

Users can customize the keys that trigger hotkeys. The default trigger for hotkey function on the keyboard is **Ctrl + Ctrl**. The trigger function can be used to change to the following keys:
Ctrl (Left / Right), **Alt**, **Shift** (Left / Right), **Caps Lock**, **Scroll Lock**, F1-F12.

To view the current hotkey trigger setting:
Use the RS-232 command: **/ + / + ? + ? + Enter** to view the current hotkey trigger. To reset the
Hotkey Trigger, use the "**Factory Defaults**" command.

To change the hotkey trigger setting:
[hotkey] + [hotkey] + **X** + [desired]

Example: If the user's current hotkey trigger is **Shift** and they want to change it to **Scroll Lock**, the
user would type **Shift** + **Shift** + **X** + **Scroll Lock**.

CHAPTER 1: SPECIFICATIONS

SPECIFICATIONS FOR HD6224A-R2	
VIDEO	
LINK RATE	5.4 Gbps/lane
INPUT INTERFACE	(8) HDMI 2.0 female
OUTPUT INTERFACE	(2) HDMI 2.0 female
RESOLUTION	Ultra-HD 4K (3840 x 2160) @ 30/50/60 Hz
INPUT EQUALIZATION	Automatic
VIDEO BANDWIDTH	300 MHz, 10.2 Gbps
INPUT/OUTPUT MAX. CABLE LENGTH	20 ft. (6.2 m) (depending on cable quality)
AUDIO	
INPUT INTERFACE	(4) 3.5-mm stereo audio jack
OUTPUT INTERFACE	(1) 3.5-mm stereo audio jack
FREQUENCY RESPONSE	20 Hz to 20 KHz
COMMON MODE	Rejection @ 60 dB
NOMINAL LEVEL	0.0 to 1.0 V
CONTROL	
FRONT PANEL	(4) Computer LEDs, (4) Activity buttons and LEDs
RS-232	DB9 female, 115200 bps, N, 8, 1, No flow control
HOTKEYS	Via keyboard
EMULATION	Keyboard, Video, and Mouse
USB	
SIGNAL TYPE	USB 2.0, 1.1, and 1.0 w/ internal hub
INPUT INTERFACE	(4) USB Type B (female)
DEVICE INPUT INTERFACE	(2) USB 1.1 Type A (female) for keyboard-mouse; (2) USB 2.0 Type A Transparent
OTHER	
OPERATING TEMPERATURE	23 to 95° F (-5 to +35° C)
STORAGE TEMPERATURE	-4 to +185° F (-20 to +85° C)
HUMIDITY	5 to 90%, noncondensing
POWER	External 100-240 VAC/12 VDC, 3 A
DIMENSIONS	2.875" H x 12.75" W x 5.75" D (7.3 x 32.4 x 14.6 cm)
WEIGHT	4.1 lb. (1.9 kg)
APPROVALS	UL, CE, ROHS, Reach, TSCA Compliant

CHAPTER 2: OVERVIEW

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2.1 INTRODUCTION

The 4K60 HDMI Dual-Head KVM Switch - 4-Port is a dedicated multi-platform KVM switch capable of managing four dual-head 4K computers through a single KVM. Built with ultra-HD ready HDMI outputs, the KVM Switch offers full 4K emulation at 60 Hz directly from the device. Until now, HDMI switches lost emulated picture when disconnected from monitors, leading to confusion and disorganization upon reconnecting. With the 4K60 HDMI Dual-Head KVM Switch, full EDID-assisted HDMI video emulation ensures visual workspaces and screen resolutions are remembered.

The KVM Switch supports screen resolutions up to 4K Ultra-HD (3840 x 2160 @ 60 Hz) with responsive EDID emulation. Additionally, the KVM Switch is compatible with any USB peripheral.

The KVM Switch is also easy to control with both a simple front-panel interface, as well as RS-232 or hot-keys.

SOURCE SWITCHING MADE EASY
The KVM Switch offers simplified management between four dual-head HDMI equipped computers' USB 2.0 outputs. Keyboards, mice, and other connected USB devices can be switched between with ease. This dynamic KVM switch can be controlled via hot keys or RS-232 commands, as well as directly through the console's easy-to-read front panel.

EDID PASSTHROUGH AND RECOGNITION
The KVM Switch features EDID passthrough technology and source recognition, which enable smooth and efficient switching in virtually any scenario. This plug-and-play EDID functionality makes set up hassle-free and simple.

FULL USB KEYBOARD AND MOUSE EMULATION
The USB keyboard and mouse emulation used by the KVM Switch provides quick source switching via keyboard hotkeys. The KVM Switch simulates the presence of a keyboard and mouse for every attached computer. This essential function simulates keyboard and mouse control for all connected computers, so switching between each is kept seamless and completely uninterrupted.

2.2 FEATURES

- Supports up to Ultra-HD 4K (3840 x 2160) @ 30/50/60 Hz
- Supports 3D
- Supports LPCM, Dolby-AC3, DTS7.1, and DSD/Dolby TrueHD/DTS-HD master audio
- Supports HDMI 1.3, 1.4, and 2.0
- Control up to four dual-head computers with a single KVM
- Full EDID HDMI video emulation
- Zero pixel loss with TMDS signal correction
- Supports USB keyboard-mouse emulation
- Supports all USB 2.0 devices
- Uses hotkey commands for quick channel selection
- Independent (asynchronous) switching of KVM and peripheral USB ports. Users can scan a document and save in another computer
- Complete KVM emulation for error-free booting
- Easy switching via front-panel, RS-232 or hotkeys
- Full HDMI support, backwards compatibility

2.3 WHAT'S INCLUDED

Before you install this switch, verify that your package contains the following items:
- (1) 4K60 HDMI Dual-Head KVM Switch - 4-Port
- (1) 12VDC, 3A power adapter with international clips

If anything is missing or damaged, contact Black Box Technical Support at 877-877-2269 or info@blackbox.com.

2.4 HARDWARE DESCRIPTION

2.4.1 FRONT PANEL

Figure 2-1 shows the front panel of the HD6224A-R2. Table 2-1 describes its components.

FIGURE 2-1. FRONT PANEL OF THE HD6224A-R2

TABLE 2-1. HD6224A-R2 FRONT-PANEL COMPONENTS

NUMBER IN FIGURE 2-1	COMPONENT	DESCRIPTION
1	(4) Computer LEDs	Computer 1, 2, 3, 4
2	(4) Push Buttons w/ USB 2.0 LED	USB 2.0 Control 1, 2, 3, 4

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CHAPTER 2: OVERVIEW

2.4.2 BACK PANEL

Figure 2-2 shows the back panel of the HD6224A-R2. Table 2-2 describes its components.

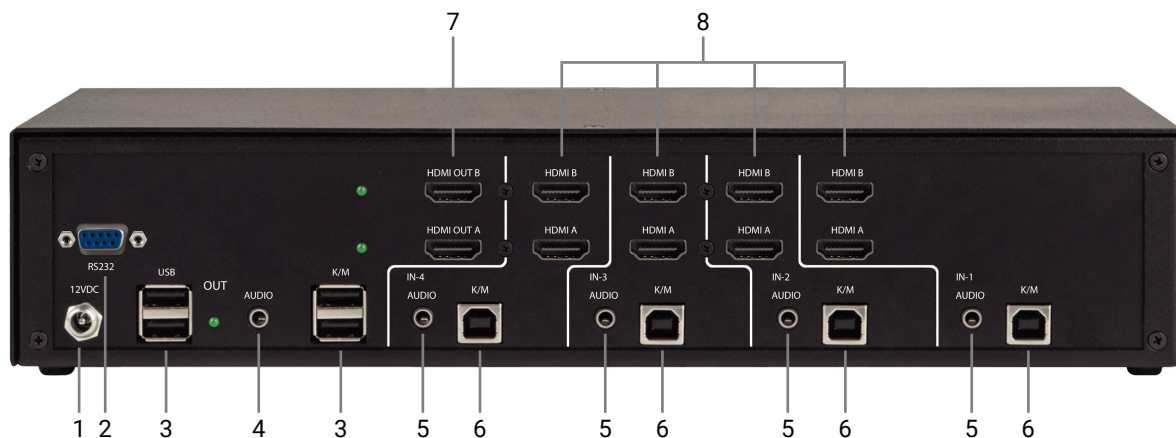FIGURE 2-2. BACK PANEL OF THE HD6224A-R2

TABLE 2-2. HD6224A-R2 BACK-PANEL COMPONENTS

NUMBER IN FIGURE 2-2	COMPONENT	DESCRIPTION
1	(1) barrel connector	Links to 12V power supply (see Note below)
2	(1) DB9 female connector	Used for RS-232 control
3	(4) USB Type A connectors	Connects to device output interfaces
4	(1) Audio OUT connector	Connects to output audio
5	(4) Audio IN connectors	Connectors to input audio
6	(4) USB Type B connectors	Connects to computer input interfaces
7	(2) HDMI 2.0 female connectors	Links to Output A and Output B
8	(8) HDMI 2.0 female connectors	Links to Inputs 1A, 2A, 3A, 4A, 1B, 2B, 3B, and 4B

Note: The power receptacle on the KVM switch uses a threaded locking interface for applications that require a locking mechanism. The product ships with a non locking power supply.

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CHAPTER 3: HARDWARE INSTALLATION

1. Ensure that power is disconnected from the 4K60 HDMI Dual-Head KVM Switch.

2. Connect the HDMI cables and USB cables (male-A to male-B) from the computers to the respective ports on the KVM Switch.

3. Optionally connect audio cables from the computers to the respective ports on the KVM Switch.

4. Optionally connect RS-232 for control functions.

5. Connect the USB keyboard and mouse to the two USB ports with keyboard and mouse symbols.

6. Optionally connect speakers to the KVM Switch.

7. Optionally connect up to 2 USB peripheral devices such as printers or flash drives.

8. Connect the display monitors to the OUTPUT connectors on the KVM Switch.
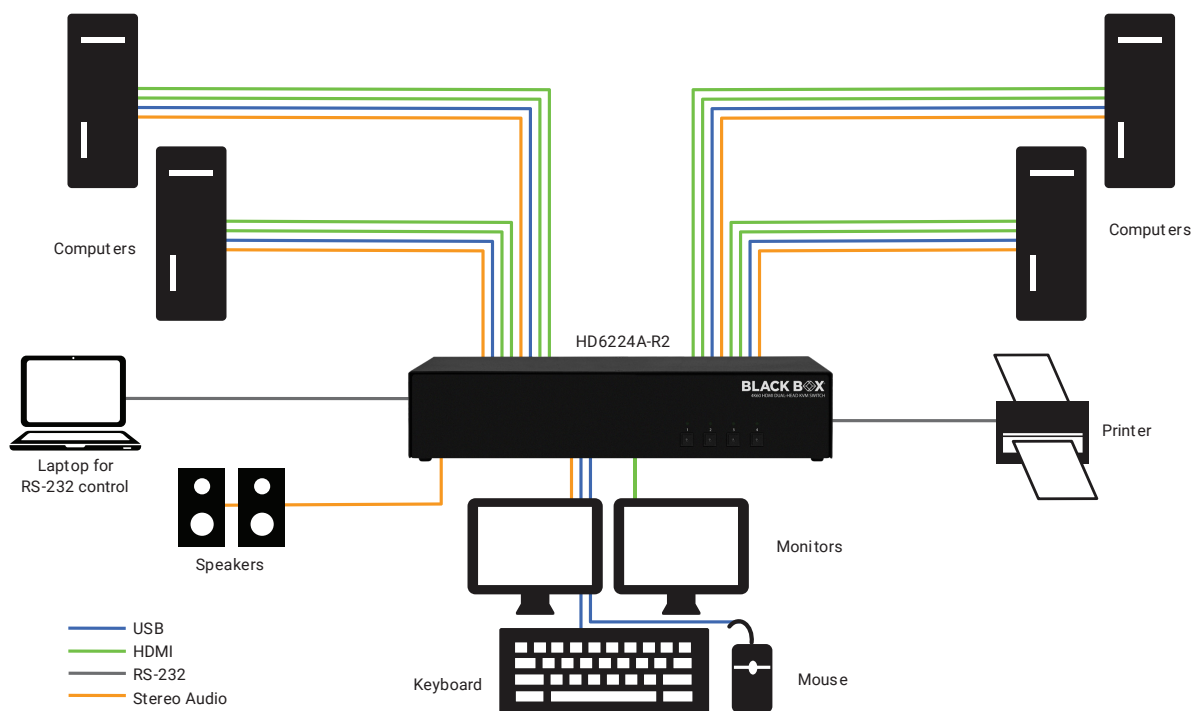
9. Power on the KVM Switch.

FIGURE 3-1. TYPICAL INSTALLATION

To switch to an input port, simply push the desired input button on the front-panel of the KVM.

If an input port is selected, the green LED indicator of that port will turn on.

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CHAPTER 5: HOTKEY COMMANDS

A hotkey command is a keyboard sequence used to trigger an action on the KVM Switch through the use of the keyboard connected on the USB port of the KVM Switch. To activate the hotkey sequence, press the CTRL key twice and then enter the desired hotkey commands. See Table 5-1.

TABLE 5-1. COMMANDS

COMMANDS	HOTKEYS	RS-232 CONTROL
Switch all devices (KVM, USB 2.0, and Audio)	[CTRL] [CTRL] [port #] [ENTER]	//m [port #] [ENTER]
Switch KVM only	[CTRL] [CTRL] c [port #] [ENTER]	//c [port #] [ENTER]
Switch Audio only	[CTRL] [CTRL] a [port #] [ENTER]	//a [port #] [ENTER]
Switch USB 2.0 only	[CTRL] [CTRL] u [port #] [ENTER]	//u [port #] [ENTER]
EDID Learning	[CTRL] [CTRL] e [ENTER]	//e [ENTER]
Same as front panel Activity button	[CTRL] [CTRL] [up-arrow]	n/a
Same as front panel Activity button	[CTRL] [CTRL] [down-arrow]	n/a
Reset	[CTRL] [CTRL] r [ENTER]	//r [ENTER]
Factory Default Reset	[CTRL] [CTRL] f [ENTER]	//f [ENTER]

Users can customize the keys that trigger hotkeys. The default trigger for hotkey function on the keyboard is **Ctrl + Ctrl**. The trigger function can be used to change to the following keys:
Ctrl (Left / Right), **Alt**, **Shift** (Left / Right), **Caps Lock**, **Scroll Lock**, **F1-F12**.

To view the current hotkey trigger setting:
Use the RS-232 command: **/ + / + ? + ? + Enter** to view the current hotkey trigger. To reset the
Hotkey Trigger, use the "**Factory Defaults Reset**" command.

To change the hotkey trigger setting:
[hotkey] + [hotkey] + **X** + [desired]

Example: If the user's current hotkey trigger is **Shift** and they want to change it to **Scroll Lock**, the
user would type **Shift** + **Shift** + **X** + **Scroll Lock**.

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Controlling the KVM Switch via RS-232 requires an RS-232 card installed on your computer or a USB to RS-232 adapter.

Check the KVM Switch and your computer to determine if you need a male-to-male or a male-to-female cable and how long it needs to be. The KVM Switch requires a straight-through cable. You can use a null-modem adapter to convert a crossed cable to a straightthrough cable. An example of a straight through cable pinout is shown in Figure 6-1. The standard maximum length for an RS-232 cable is 50 feet (15.2 meters). Contact Black Box Technical Support at 877-877-2269 or info@blackbox.com if you require more information.
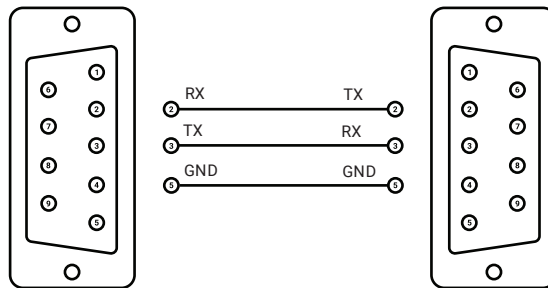

FIGURE 6-1. RS-232 DB9-TO-DB9 STRAIGHT-THROUGH CABLE

You will need to identify the COM port number used. On a Windows PC:

1. Click on the start button.

2. Click on Control Panel.

3. Click on Device Manager.

4. Click on the arrow next to Ports (COM & LPT).

You should see the COM port number in use.

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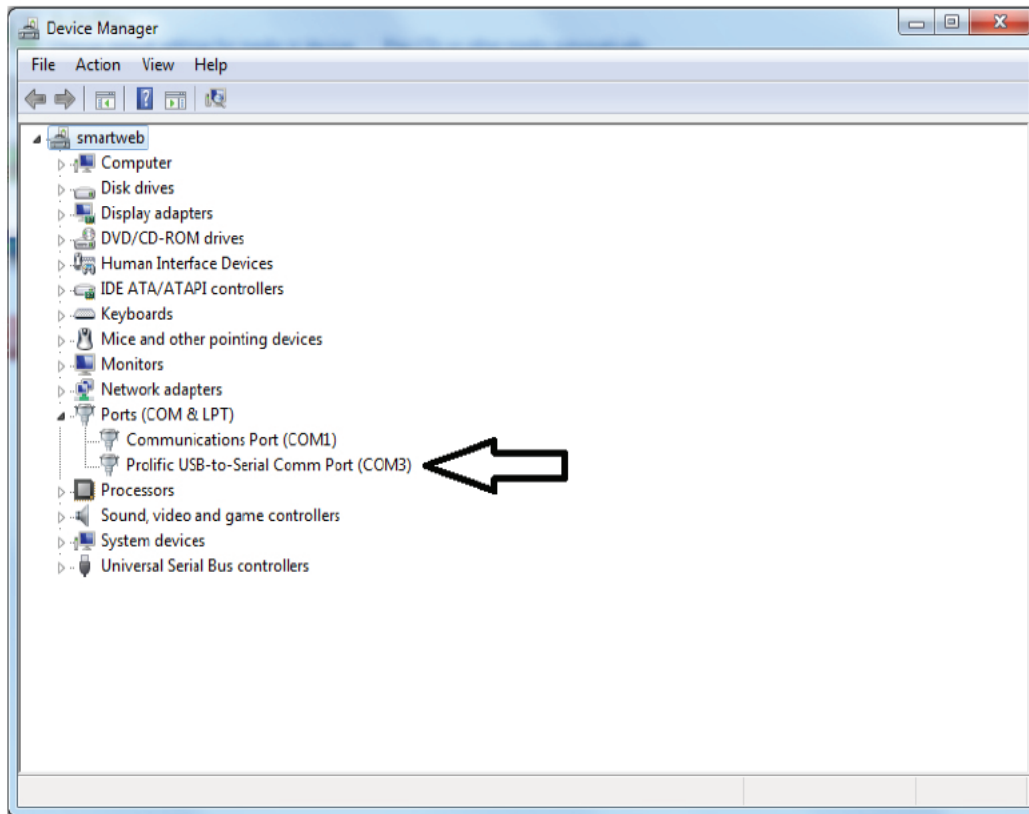**TECHNICAL**
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FIGURE 6-2. COM PORT NUMBER

Run the terminal client of your choice such as HyperTerminal or PuTTY. Select the correct COM port on the computer. Use the following connection settings: 115200, N, 8, 1, no flow control.

Cycling power on your unit will display a boot up message in your terminal software if the connection is correct.

NOTE: Your terminal software may not default to or display all of the settings above. If you attempt to connect and the settings above are not set correctly, after you set them correctly you may need to cycle power on your unit for communication to be established.

See Table 5-1 for a list of RS-232 commands.

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APPENDIX A: REGULATORY INFORMATION

A.1 FCC CLASS A STATEMENT

This equipment has been found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interferences when the equipment is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

Shielded cables must be used with this equipment to maintain compliance with radio frequency energy emission regulations and ensure a suitably high level of immunity to electromagnetic disturbances.

All power supplies are certified to the relevant major international safety standards.

This equipment complies with the CE mark and Declaration of Conformity.

This equipment complies with the Restriction of hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive and the Waste Electrical and Electronic Equipment Directive (WEEE).

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APPENDIX A: REGULATORY INFORMATION

A.2 NOM STATEMENT

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A. El cable de poder o el contacto ha sido dañado; u

    B. Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C. El aparato ha sido expuesto a la lluvia; o

    D. El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E. El aparato ha sido tirado o su cubierta ha sido dañada.

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APPENDIX B: DISCLAIMER/TRADEMARKS

B.1 DISCLAIMER

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