dbx234/234XL- 223/223XL SPECIFICATIONS

INPUT:

Connectors: 1/4" TRS (223/234) or XLR (223K/234K)
Type: Electronically balanced/unbalanced, RF filtered
Impedance: Balanced 20 kΩ, unbalanced 10 kΩ
Max Input Level: +22 dBu typical, balanced or unbalanced
CMRR: >40 dB, typically > 50 dB at 1 kHz

OUTPUT (223/234):

Connectors: 1/4" TRS
Type: Electronically balanced/unbalanced, RF filtered
Impedance: Balanced 200 Ω, unbalanced 100 Ω
Max Output Level: +14 dBu balanced/unbalanced into 2 kΩ or greater

OUTPUT (223XL/234XL):

Connectors: XLR
Type: Electronically balanced/unbalanced, RF filtered
Impedance: Balanced 50 Ω, unbalanced 50 Ω
Max Output Level: +14 dBu balanced/unbalanced into 600Ω or greater

PERFORMANCE:

Bandwidth: 20 Hz to 20 kHz, +0/-0.5 dB
Frequency Response: 20 Hz to 20 kHz, +0/-1 dB
Signal-to-Noise: Ref +4 dBu, 22 kHz measurement bandwidth

	Stereo Mode	Mono Mode
234/234XL, Low Output	> 94 dB	> 94 dB
Low-Mid Output		
Mid Output	> 90 dB	> 90 dB
High Output	> 90 dB	> 90 dB
223/223XL, Low Output	> 94 dB	> 94 dB
Mid Output		> 90 dB
High Output	> 91 dB	> 91 dB

Dynamic Range: > 105 dB, unweighted, any output
THD+Noise: < 0.004% at +4 dBu, 1 kHz
< 0.008% at +4 dBu, 20 Hz - 20 kHz
Intermodulation Crosstalk: < -85 dB, 20 Hz to 20 kHz

CROSSOVER FREQUENCIES:

234/234XL, Stereo Mode:	
LowMid	45 to 900 Hz or 450 Hz to 9.6 kHz (x10 setting)
LowHigh	45 to 900 Hz or 450 Hz to 9.6 kHz (x10 setting)
MidHigh	450 Hz to 9.6 kHz
234/234XL, Mono Mode:	
LowLow-Mid	45 to 900 Hz or 450 Hz to 9.6 kHz (x10 setting)
Low-MidHigh-Mid	450 Hz to 9.6 kHz
LowHigh-Mid	45 to 900 Hz
223/223XL, Stereo Mode:	
LowMid	45 to 900 Hz or 450 Hz to 9.6 kHz (x10 setting)
MidHigh	45 to 900 Hz or 450 Hz to 9.6 kHz (x10 setting)
223/223XL, Mono Mode:	
LowMid	45 to 900 Hz or 450 Hz to 9.6 kHz (x10 setting)
MidHigh	45 to 900 Hz or 450 Hz to 9.6 kHz (x10 setting)
Filter Type:	Linkwitz-Riley, 24 dB/octave, slope-variable

FUNCTION SWITCHES:

Front Panel:	
Low Cut	Activates 40 Hz Butterworth, 12 dB/octave high-pass filter, one switch per channel
Phase Invert	Inverts the phase at the output, one switch per output
Rear Panel:	
x10	Multiplies crossover frequency range by 10, one switch per channel. Selects low frequency range for stereo operation
LF Sum	Selects normal (stereo) or mono-summed low frequency operation.

INDICATORS:

Stereo Operation:	Green LED
Mono Operation:	Yellow LED
Low Cut:	Green LED (per channel)
x10:	Green LED (per channel)
Phase Invert:	Red LED per output (3 per channel)

POWER SUPPLY:

Operating Voltage:	100 VAC 50/60 Hz, 120 VAC 60 Hz 220 VAC 50/60 Hz
Power Consumption:	10 Watts
Mains Connection:	IEC 320 receptacle

PHYSICAL:

Dimensions:	1.75" H X 19" W X 6.5" D (4.4cm x 48.3cm x 17.5cm)
Net Weight:	234: 4.9 lbs. (2.2 kg) 223: 3.7 lbs. (1.7 kg)
Shipping Weight:	234: 5.8 lbs. (2.6 kg) 223: 5.4 lbs. (2.5 kg)

Note: Specifications subject to change.

WEAK AND/OR DISTORTED AUDIO

- Check that a clean signal is being fed to the crossover.
- Confirm that the input wiring is correct.
- Check that the grounds of the audio signal path and the chassis and power line of all units in the system are connected.

HUM AND/OR BUZZ

If you suspect that the hum is caused by a ground loop:

- Check the audio all an carrier stage in the audio chain.
- Low level equipment should be mounted away from power amplifiers to avoid induction of this type of hum.
- Be certain that all audio wiring except for loudspeaker lines is well shielded, and that low level wiring is not run parallel to and/or in close proximity to AC power wiring.

INTERMITTENT AUDIO

- Check the other equipment and the wiring to make certain that the signal is not intermittent earlier in the chain.
- Check the integrity of all cables using a cable tester.

RACK MOUNTING, GROUNDING AND SAFETY

anyway; it will not detract from the true stereo picture of the source material.

We have provided 4 rack screws and washers for easy mounting in standard audio racks. You should avoid mounting the unit near large power transformers or motors. Route the AC cord away from audio lines and plug it into a power source close by. If the power cord must cross over audio lines, you should take care to have them cross at 90 degree angles.

The input and output connectors are balanced/unbalanced 1/ 4" TRS-type connectors. The tip of the plug is wired as hot (+), the ring is wired as cold (-), and the sleeve is wired as the ground or shield.

The 234/234XL-/223/223XL crossovers have differentially balanced input and output circuits. Balanced wiring is recommended, even with unbalanced source devices, especially when running long paths. Twin-conductor, shielded cable is more reliable since it does not depend on the shield wire itself to complete the signal connection. Using twin conductor cable, a broken shield may only result in a slight increase in noise or hum due to the lack of shielding. You may also use unbalanced cables to connect to and from the crossover.

TROUBLESHOOTING

NO SOUND

If there appears to be no power:

- Check that either the stereo or mono LED on the front panel of the 234/234XL-/223/223XL is lit.
- Check that the power cord is seated properly in the back panel of the crossover and that it is plugged into an active AC power source.

If there appears to be power, but no audible signal:

- Confirm that active audio lines are connected to the crossover's inputs and outputs.
- Check that both the input and output gain controls are advanced sufficiently.
- Check to make sure that you have turned up the amplifiers' outputs.

ABNORMAL AUDIO OUTPUT

- Ensure that the proper mode for your setup has been selected via the rear panel mode switches.
- Check the **LF Sum** switch.
- Check the **x10** switch. This changes the range of the crossover frequency from 45 - 960 Hz to 450 Hz - 9.6 kHz.

crossover, as this may cause severe damage not covered under the dbx warranty. Connect the power cord to the crossover first, then to a power source that is properly grounded. Never lift the ground as a shock hazard may result.

After you have safely plugged in the crossover, turn on the source device(s). Turn the amplifiers' outputs all the way down (←) and turn on the amplifiers. All of the elements of your sound system should now be on, and the amplifiers should be turned all the way down. Turn the source device to its nominal operating level, sending a nominal (average) level to the 234/234XL-223/223XL. Slowly turn up the amplifiers' outputs until you can hear signal at a comfortable volume. Make adjustments as you desire.

If you are using your system in stereo 2-way or 3-way mode, the needed crossover frequency may be higher than 960 Hz; making it necessary to set the x10 switch to the active position. This changes the range of operation of the frequency selector from 45-960 Hz to 450 Hz to 9.6 kHz. All other frequency selectors remain the same. When using the X10 switch, ALWAYS ensure that the amplifiers feeding all speaker systems are turned off or that the input gain controls on the power amplifiers are turned down before changing the setting of the X10 switch. Not doing so may send a spurious signal to the outputs of the crossover when the X10 switch is engaged, and may damage speaker systems which are powered at the time of the spurious signal.

Every output is equipped with a polarity (Ø) reverse switch on the front panel. When speakers are not "in phase", the frequency response of the system is compromised, particularly in the low frequencies. Out of phase signals can also cause "comb-filtering" in the high frequencies. The polarity switch is extremely useful for fine tuning your sound system for peak performance. An LED is activated when the output polarity is reversed.

POLARITY SWITCH

LOW FREQUENCY SUMMING

The other feature accessed on the back panel is "low frequency summing". This is useful with systems that utilize mono subwoofers. Activating the LF sum switch "sums" the low frequencies of both the left and right inputs. The sum is sent to channel one's low output marked "LF SUM", while channel two's low output is not used, and channel two's phase invert led is disabled, indicating it is not operational in "LF Sum" mode. The summed low frequencies represent all the low frequencies of both the left and right inputs, and since lows are generally non-directional

On the back panel of the 234/234XL, there are markings to help you connect the source devices and amplifiers to your crossover. To operate the 234/234XL in stereo 3-way operation, follow the top row of markings horizontally along the length of the 234/234XL. For stereo 2-way operation of the 234/234XL, use the second row of markings directly above the connectors. For mono 4-way operation of the 234/234XL, use the markings directly below the connectors. The connectors not used in the selected mode are marked "not used". This designation applies only to **that mode** of operation.

223XL REAR PANEL

223 REAR PANEL

The 223/223XL is marked in a similar way: for stereo 2-way operation use the markings above the connectors. To operate the 223/223XL in mono 3-way mode use the markings below the connectors. The connectors which are not used in the selected mode are marked "not used". This designation applies only to **that mode** of operation.

234/234XL-/223/223XL AUDIO CONNECTIONS

- Before connecting anything to the crossover, make sure it is not connected to any power source.
- Be sure that the source device (equalizer, compressor, mixing console, etc.) for the 234/234XL-223/223XL is turned off. Connect the output(s) of the source device to the inputs of the crossover, following the rear panel markings carefully.
- Make sure that the amplifiers which will be used to drive your speaker system are turned off. Using the back panel markings as a guide, use high quality cables to connect the amplifiers to the appropriate outputs of the 234/234XL-223/223XL.

ELECTRICAL CONNECTIONS

Ensure that your 234/234XL-223/223XL crossover conforms to the AC power specifications in your area, by checking the marked voltage spec on the rear of the unit. Never plug the incorrect voltage into your

234/234XL-223/223XL REAR PANEL OPERATIONS

MODE SWITCHES

The mode switches on the back panel of the unit are used to select one of the three modes of operation in the 234/234XL and one of two modes of operation in the 223/223XL. There could be disastrous consequences if the crossover were improperly setup or the switches were mistakenly pushed during the regular operation of a sound system. Therefore great care should be taken when setting these switches. There is a mode diagram on the back panel to help you understand at a glance how this is done. The following steps should be taken in setting up your system:

- Know the loudspeaker manufacturer's requirements regarding the amplification needs of your particular speaker system. Follow the manufacturer's guidelines carefully, as dbx is not responsible for damage relating to improper setup or implementation of the 234/234XL-/223/223XL.
- Without any audio or power connections in place, use the back panel switches on the crossover to set it to the proper mode of operation; either stereo 2-way, stereo 3-way, or mono 4-way for the 234/234XL, or stereo 2-way or mono 3-way for the 223/223XL.
- Use the literature that came with your speaker system to properly set up the mode of operation and crossover frequencies to the manufacturer's specifications.
- There is one of the four possible mode button combinations for the 234/234XL which is marked "not valid". Be sure you have not selected this combination as the 234/234XL will not operate correctly in this mode.

234XL REAR PANEL

234 REAR PANEL

When you are certain that the proper selections have been made, complete the steps described below and in the "234/234XL-223/223XL Audio Connections" section on page 7.

dbx 223/223XL Front Panel

Note: There are no front panel differences between the 223 and the 223XL. Therefore the 223XL is shown below, representing both the 223 and the 223XL.

STEREO 2-WAY MODE

In 2-way stereo mode the controls are marked BELOW the horizontal blue line.
Channel One and Channel Two functions are identical in the stereo mode. LEDs are disabled for controls which are non-functional in this mode.

[1] & [5]	INPUT GAIN	Controls the INPUT level with +/- 12 dB of gain.
[9] & [15]	LOW CUT	Switch for selecting the 40 Hz high pass filter. An LED indicates the selection.
[2] & [6]	LOWHIGH	Selects crossover point between LOW and HIGH outputs.
[10] & [16]	x10 LED	Indicates that the LOW/HIGH crossover frequency range is 450 Hz to 9.6 kHz.
[3] & [7]	LOW OUTPUT	Controls the Low Frequency output level with a range of -∞ to +6 dB.
[11] & [17]	PHASE INVERT	Switch for reversing the polarity on the Low Output. An LED indicates the selection.
[4] & [8]	HIGH OUTPUT	Controls the High Frequency output with a range of -∞ to +6 dB.
[12] & [18]	PHASE INVERT	Switch for reversing the polarity on the High Output. An LED indicates the selection.
[14]	STEREO	LED indicating stereo mode operation.

MONO 3 -WAY MODE

In 3-way mono operation the controls are marked ABOVE the horizontal blue line. Front panel controls not described in this section are not active in mono 3-way mode. LEDs are disabled for controls which are non-functional in this mode.

[1]	INPUT GAIN	Controls the input level with +/- 12 dB of gain.
[9]	LOW CUT	Switch for selecting the 40 Hz high pass filter. An LED indicates the selection.
[2]	LOWMID	Selects crossover point between LOW and MID frequencies.
[10]	x10 LED	Indicates that the LOW/MID crossover range is 450 Hz to 9.6 kHz.
[6]	MIDHIGH	Selects the crossover point between MID and HIGH frequencies.
[16]	x10 LED	Indicates that the MID/HIGH crossover frequency range is 450 Hz to 9.6 kHz
[3]	LOW OUTPUT	Controls the LOW frequency output level with a range of -∞ to +6 dB.
[11]	PHASE INVERT	Switch for reversing the polarity on the Low Output. An LED indicates the phase is reversed.
[7]	MID OUTPUT	Controls the MID frequency output level with a range of -∞ to +6 dB.
[17]	PHASE INVERT	Switch for reversing the polarity on the Mid Output. An LED indicates the phase is reversed.
[8]	HIGH OUTPUT	Controls the HIGH frequency output level with a range of -∞ to +6 dB.
[18]	PHASE INVERT	Switch for reversing the polarity on the High Output. An LED indicates the phase is reversed.
[13]	MONO	LED indicating mono mode operation.

STEREO 3-WAY MODE

In 3-way stereo operation the controls are marked BELOW the horizontal blue line.
Channel One and Channel Two functions are identical in the stereo mode. LEDs are disabled for controls which are non-functional in this mode.

[1] & [7]	INPUT GAIN	Controls the INPUT level with +/- 12 dB of gain.
[13] & [20]	LOW CUT	Switch for selecting the 40 Hz high pass filter. An LED indicates the selection.
[2] & [8]	LOWMID	Selects crossover point between LOW and MID frequencies.
[14] & [21]	x10 LED	Indicates that the LOW/MID crossover frequency range is 450 Hz to 9.6 kHz.
[3] & [9]	MIDHIGH	Selects crossover point between MID and HIGH frequencies.
[4] & [10]	LOW OUTPUT	Controls the Low Frequency output level with a range of -∞ to +6 dB.
[15] & [22]	PHASE INVERT	Switch for reversing the polarity on the Low Output. An LED indicates the selection.
[5] & [11]	MID OUTPUT	Controls the Mid Frequency output with a range of -∞ to +6 dB.
[16] & [23]	PHASE INVERT	Switch for reversing the polarity on the Mid Output. An LED indicates the selection.
[6] & [12]	HIGH OUTPUT	Controls the High Frequency output with a range of -∞ to +6 dB.
[17] & [24]	PHASE INVERT	Switch for reversing the polarity on the High output. An LED indicates the selection.
[19]	STEREO	LED indicating stereo mode operation.

MONO 4 -WAY MODE

In 4-way mono operation the controls are marked ABOVE the horizontal blue line. Front panel controls not described in this sections are not active in mono 4-way mode. LEDs are disabled for controls which are non-functional in mono 4-way mode.

[1]	INPUT GAIN	Controls the INPUT level with +/- 12 dB of gain.
[13]	LOW CUT	Switch for selecting the 40 Hz high pass filter. An LED indicates the selection.
[2]	LOWLOW-MID	Selects crossover point between LOW and LOW-MID frequencies.
[14]	x10 LED	Indicates that the LOW/LOW-MID crossover frequency range is 450 Hz to 9.6 kHz
[3]	LOW-MIDHIGH-MID	Selects the crossover point between LOW-MID and HIGH-MID frequencies.
[9]	HIGH-MIDHIGH	Selects the crossover point between HIGH-MID and HIGH frequencies.
[4]	LOW OUTPUT	Controls the LOW frequency output level with a range of -∞ to +6 dB.
[15]	PHASE INVERT	Switch for reversing the polarity on the Low Output. An LED indicates the selection.
[5]	LOW-MID OUTPUT	Controls the LOW-MID frequency output level with a range of -∞ to +6 dB.
[16]	PHASE INVERT	Switch for reversing the polarity on the Low-Mid Output. An LED indicates the selection.
[11]	HIGH-MID OUTPUT	Controls the HIGH-MID frequency output level with a range of -∞ to +6 dB.
[23]	PHASE INVERT	Switch for reversing the polarity on the High-Mid Output. An LED indicates the selection.
[12]	HIGH OUTPUT	Controls the HIGH frequency output level with a range of -∞ to +6 dB.
[24]	PHASE INVERT	Switch for reversing the polarity on the High Output. An LED indicates the selection.
[18]	MONO	LED indicating mono mode operation.

INSPECTION

Before going any further, you should take time to fill out your warranty registration card and inspect the contents of the shipping carton. Inside both the 223/223XL and 234/234XL boxes you should find the following:

- either the dbx model 223, 223XL, 234 or 234XL crossover.
- operation manual (you are reading it!)
- 4 rack screws and washers
- power cord.

The contents of this manual are subject to change at any time without notice.

dbx 234/234XL Front Panel

Note: There are no front panel differences between the 234 and the 234XL. Therefore the 234XL is shown below, representing both the 234 and the 234XL.

STEREO 2-WAY MODE

In 2-way stereo mode the controls are marked BELOW the horizontal blue line.
Channel One and Channel Two functions are identical in the stereo mode. Front panel controls not described in this section are not active in stereo 2-way operation.

[1] & [7]	INPUT GAIN	Controls the INPUT level with +/- 12 dB of gain.
[13] & [20]	LOW CUT	Switch for selecting the 40 Hz high pass filter. An LED indicates the selection.
[2] & [8]	LOWMID*	Selects crossover point between the LOW and HIGH outputs.
[14] & [21]	x10 LED	Indicates that the LOW/HIGH crossover frequency range is 450 Hz to 9.6 kHz.
[4] & [10]	LOW OUTPUT	Controls the Low frequency output level with a range of -∞ to +6 dB.
[15] & [22]	PHASE INVERT	Switch for reversing the polarity on the Low Output. An LED indicates that the phase is inverted.
[9] & [12]	HIGH OUTPUT	Controls the High frequency output with a range of -∞ to +6 dB.
[17] & [24]	PHASE INVERT	Switch for reversing the polarity on the High Output. An LED indicates that the phase is inverted.
[19]	STEREO	LED indicating stereo mode operation.

* although this control is labeled as "**LOWMID**", it operates as the crossover frequency control between low and high frequencies in stereo 2-way operation.

WARRANTY

1. The warranty registration card that accompanies this product must be mailed within 30 days after purchase date to validate this warranty. Proof-of-purchase is considered to be the burden of the consumer.
2. dbx warrants this product, when bought and used solely within the U.S., to be free from defects in materials and workmanship under normal use and service.
3. dbx liability under this warranty is limited to repairing or, at our discretion, replacing defective materials that show evidence of defect, provided the product is returned to dbx WITH RETURN AUTHORIZATION from the factory, where all parts and labor will be covered up to a period of two years. A Return Authorization number must be obtained from dbx by telephone. The company shall not be liable for any consequential damage as a result of the product's use in any circuit or assembly.
4. dbx reserves the right to make changes in design or make additions to or improvements upon this product without incurring any obligation to install the same additions or improvements on products previously manufactured.
5. The foregoing is in lieu of all other warranties, expressed or implied, and dbx neither assumes nor authorizes any person to assume on its behalf any obligation or liability in connection with the sale of this product. In no event shall dbx or its dealers be liable for special or consequential damages or from any delay in the performance of this warranty due to causes beyond their control.

TABLE OF CONTENTS

WARRANTY 2
INTRODUCTION 2
INSPECTION 3
234/234XL FRONT PANEL OPERATION 3
223/223XL FRONT PANEL OPERATION 5
234/234XL-223/223XL REAR PANEL OPERATIONS 6
234/234XL-223/223XL AUDIO CONNECTIONS 7
ELECTRICAL CONNECTIONS 7
FEATURES 7
RACK MOUNTING, GROUNDING AND SAFETY 8
TROUBLESHOOTING 9
234/234XL-223/223XL SPECIFICATIONS 11

INTRODUCTION

Congratulations on your purchase of the dbx 223/223XL or 234/234XL crossover. We are confident you will find this crossover to be the finest product of its kind in this price range. We have taken care to include all of the features you need to make your system sound its best. Some of the features common to both the 234/234XL and the 223/223XL crossovers are:

- back panel switches for selecting the operating mode of the crossover.
- back panel switches indicating the selected range of crossover frequencies. Both of these features have LED indicators on the front panel so you can see at a glance which mode the unit is in.
- low frequency summed output designed specifically for mono subwoofer applications.
- phase invert switches on all outputs.
- individual level controls on every output.

We are sure you will agree that these crossovers are built to provide extremely high quality frequency division for all applications.

IMPORTANT SAFETY INSTRUCTIONS

LITHIUM BATTERY WARNING

CAUTION!
This product may contain a lithium battery.There is danger of explosion if the battery is incorrectly replaced. Replace only with an Eveready CR 2032 or equivalent. Make sure the battery is installed with the correct polarity. Discard used batteries according to manufacturer's instructions.

ADVARSEL!
Lithiumbatteri - Eksplosionsfare.Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

ADVARSEL!
Lithiumbatteri - Eksplosionsfare ved feilaktig batteribytte. Benytt samme batteritype eller en ekvivalent type som anbefaltes av apparatfabrikanten. Kasser anvendt batteri ifølge fabrikantens instruksjoner.

ELECTROMAGNETIC COMPATIBILITY

This unit conforms to the Product Specifications noted on the **Declaration of Conformity**. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

Operation of this unit within significant electromagnetic fields should be avoided.

- use only shielded interconnecting cables.

U.K. MAINS PLUG WARNING

A molded mains plug that has been cut off from the cord is unsafe. Discard the mains plug at a suitable disposal facility. **NEVER UNDER ANY CIRCUMSTANCES SHOULD YOU INSERT A DAMAGED OR CUT MAINS PLUG INTO A 13 AMP POWER SOKET.** Do not use the mains plug without the cover on the fuse compartment. Replacement fuse covers can be obtained from your local retailer. Replacement fuses are 13 amps and MUST be ASTA approved to BS1362.

DECLARATION OF CONFORMITY

Manufacturer's Name: dbx Professional Products
Manufacturer's Address: 8760 S. Sandy Parkway, Sandy, Utah 84070, USA

declares that the product:

Product name: dbx223, 234, 223XL and 234XL
Note:Product name may be suffixed by the letters/EU or V.

Product option: None

conforms to the following Product Specifications:

Safety: IEC 60065 (1998)

EMC: EN 55013 (1990)
EN 55020 (1991)

Supplementary Information:

The product hereinafter complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC, as amended by Directive 93/68/EEC.

Vice-President of Engineering
8760 S. Sandy Parkway,
Sandy, Utah 84070, USA

97/3/93

European Contact: Your local dbx Sales and Service Office or

Harman Music Group
Attn: Dept. EMC, 8760 S. Sandy Pkwy
Sandy, Utah 84070, USA
Ph: (801) 566-8800
Fax: (801) 568-7583

IMPORTANT SAFETY INSTRUCTIONS

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

ATTENTION: RISQUE DE CHOC ELECTRIQUE - NE PAS OUVRIR

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

The symbols shown above are internationally accepted symbols that warn of potential hazards with electrical products. The lightning flash with arrowpoint in an equilateral triangle means that there are dangerous voltages present within this unit. The exclamation point in an equilateral triangle indicates that it is necessary for the user to refer to the owner's manual.

These symbols warn that there are no user serviceable parts inside the unit. Do not open the unit. Do not attempt to service the unit yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer's warranty. Do not get the unit wet. If liquid is spilled on the unit, shut it off immediately and take it to a dealer for service. Disconnect the unit during storms to prevent damage.

SAFETY INSTRUCTIONS.

NOTICE FOR CUSTOMERS IF YOUR UNIT IS SHIPPED WITH A POWER CORD.

WARNING: THIS APPLIANCE MUST BE EARTHED.

The cores in the mains lead are coloured in accordance with the following code:

GREEN and YELLOW - Earth BLUE - Neutral BROWN - Live

As colours of the cores in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- **The core which is coloured green and yellow must be connected to the terminal in the plug marked with the letter E, or marked with earth symbol, or coloured green or green and yellow.**
- **The core which is coloured blue must be connected to the terminal marked with the letter N or coloured black.**
- **The core which is coloured brown must be connected to the terminal marked or coloured red.**

This equipment may require the use of a different line cord, attachment plug or both, depending on the available power source at installation. If the attachment plug needs to be changed, refer servicing to qualified service personnel who should refer to the table below. The green/yellow wire shall be connected directly to the earth chassis.

	CONDUCTOR	WIRE COLOR	
		Normal	Alt
L	LIVE	BROWN	BLACK
N	NEUTRAL	BLUE	WHITE
E	EARTH GND	GREEN/YEL	GREEN

WARNING: If the ground is defeated, certain fault conditions in the unit or in the system to which it is connected can result in full line voltage between chassis and earth ground. Severe injury or death can then result if the chassis and earth ground are touched simultaneously.

WARNING FOR YOUR PROTECTION
READ THESE INSTRUCTIONS:

KEEP THESE INSTRUCTIONS!

HEED ALL WARNINGS!

FOLLOW ALL INSTRUCTIONS!

DO NOT USE THIS APPARATUS NEAR WATER

CLEAN ONLY WITH A DRY CLOTH.

DO NOT BLOCK ANY OF THE VENTILATION OPENINGS. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

DO NOT INSTALL NEAR ANY HEAT SOURCES SUCH AS RADIATORS, HEAT REGISTERS, STOVES, OR OTHER APPARATUS (INCLUDING AMPLIFIERS) THAT PRODUCE HEAT.

ONLY USE ATTACHMENTS/ACCESSORIES SPECIFIED BY THE MANUFACTURER.

UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.

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 your outlet, consult an electrician for replacement of the obsolete outlet.

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

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.

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.

POWER INVERT SWITCH For products provided with a power switch, the power switch DOES NOT break the connection from the mains.

MAINS DISCONNECT: The plug shall remain readily operable. For rack-mount or installation where plug is not accessible, an plugin mains switch with a contact separation of at least 3 mm in each pole shall be incorporated into the electrical installation of the rack or building.

FOR UNITS EQUIPPED WITH EXTERNALLY ACCESSIBLE FUSE RECEPTACLE: Replace fuse with same type and rating only.

VARIOUS INPUT VOLTAGES: This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. Connect this equipment only to the power source indicated on the equipment rear panel. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel or equivalent.

This Equipment is intended for rack mount use only.

2-Way, 3-Way 4-Way Crossovers 223/223XL - 234/234XL

Operation Manual