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[β® ³]

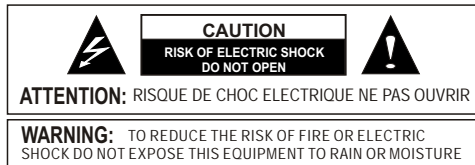## C223
Stereo 2-Way/Mono
3-Way Crossover

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 the 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.

WARNING

FOR YOUR PROTECTION. PLEASE READ THE FOLLOWING:

WATER AND MOISTURE: Appliance should not be used near water(e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

POWER SOURCES: The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

GROUNDING OR POLARIZATION: Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.

POWER CORD PROTECTION: Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

SERVICING: To reduce the risk of fire or electric shock, the user should not attempt to service the appliance beyond that described in the operating instruction. All other servicing should be referred to qualified service personnel.
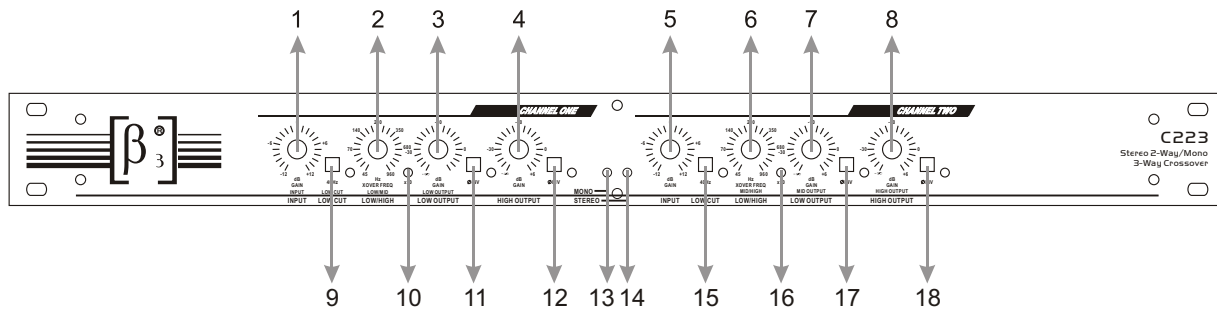
FOR UNITS EQUIPPED WITH EXTERNALLY ACCESSIBLE FUSE RECEPTACLE: Replace fuse with same type and rating only.

FRONT PANEL

Stereo 2-way mode
In 2-way stereo mode the controls are marked BELOW the horizontal red 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.
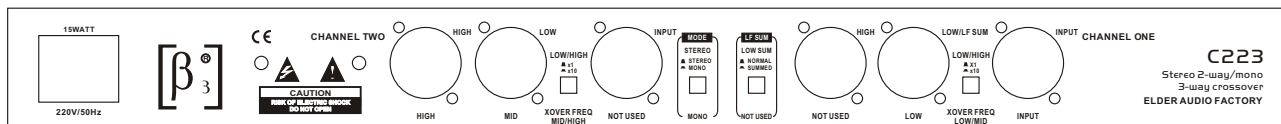

[1]&[5]	INPUT GAIN	Controls the INPUT level with +/- 12dB of gain.
[9]&[15]	LOW CUT	Switch for selecting the 40Hz high pass filter. An LED indicates the selection.
[2]&[6]	LOW/HIGH	Selects crossover point between the LOW and HIGH outputs.
[10]&[16]	X10 LED	Indicates that the LOW/HIGH crossover frequency range is 450Hz to 9.6kHz.
[3]&[7]	LOW OUTPUT	Controls the Low Frequency output level with a range of -∞ to +6dB.
[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 +6dB.
[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 Red line. Front panel controls not described in this section are not active in mono 3-way mode. LEDs are disabled for controls which are nonfunctional in this mode.

[1]	INPUT GAIN	Controls the INPUT level with +/- 12dB of gain.
[9]	LOW CUT	Switch for selecting the 40Hz high pass filter. An LED indicates the selection.
[2]	LOW/MID	Selects crossover point between the LOW and MID frequencies.
[10]	X10 LED	Indicates that the LOW/MID crossover range is 450Hz to 9.6kHz.
[6]	MID/HIGH	Selects the crossover point between MID and HIGH frequencies.
[16]	X10 LED	Indicates that the MID/HIGH crossover frequency range is 450Hz to 9.6kHz.
[3]	LOW OUTPUT	Controls the Low Frequency output level with a range of $-\infty$ to +6dB.
[11]	PHASE INVERT	Switch for reversing the polarity on the low output. An LED indicates that the phase is reversed.
[7]	MID OUTPUT	Controls the Mid Frequency output Level with a range of $-\infty$ to +6dB.
[17]	PHASE INVERT	Switch for reversing the polarity on the Mid Output. An LED indicates that the phase is reversed.
[8]	HIGH OUTPUT	Controls the HIGH frequency output level with a range of $-\infty$ to +6dB.
[18]	PHASE INVERT	Switch for reversing the polarity on the high output. An LED indicates that the phase is reversed.
[13]	MONO	LED indicating mono mode operation.

REAR PANCEL

For stereo 2-way operation use the markings above the connectors. To operate the C223 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.

**C223
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 C223 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 C223.

**ELECTRICAL
CONNECTIONS**

Ensure that your C223 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 crossover, as this may cause severe damage not covered under the 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 C223 .slowly turn up the amplifiers' outputs until you can hear signal at a cornfortable volume. Make adjustments as you desire.

**FEATURES
X10 OPERATION**

If you are using your system in stereo 2-way or 3-way mode, the needed crossover frequency may be higher than 960Hz, making it necessary to set the x10 switch to the active position. This changes the range of operation of the frequency selector from 45-960Hz to 450Hz to 9.6kHz. 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.

**POLARITY
SWITCH**

Every output is equipped with a polarity(∅) 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.

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

LOW FREQUENCY SUMMING

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.

RACK MOUNTING, GROUNDING AND SAFETY

The input and output connectors are balanced/unbalanced XLR 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. 1GROUND、2+、3-。

The C223 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.

If there appears to be no power:
● Check that either the stereo or mono LED on the front panel of the C223 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.

● 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 45-1kHz to 450Hz-9.6kHz.
● 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.

TROUBLESHOOTING NO SOUND

ABNORMAL AUDIO OUTPUT

INPUT

Connectors:	XLR
Type:	Electronically balanced/unbalanced, RF filtered
Impedance:	Balanced>50k Ω,unbalanced>25k Ω
Max input level:	+22dBu typical, balanced or unbalanced
CMRR:	>40dB, typically >55dB at 1kHz

OUTPUT

Connectors:	XLR
Type:	Electronically-balanced/unbalanced, RF filtered
Impedance:	Balanced 200 Ω , unbalanced 30 Ω
Max output level:	>+20dBu balanced/unbalanced into 600 Ohm or greater

PERFORMANCE

Bandwidth:	20Hz to 20kHz, +0/-0.5dB
Frequency response:	<3Hz to >90kHz, +0/-3dB
Signal-to-noise:	Ref: +4dBu, 22kHz measurement bandwidth
Dynamic range:	>106dB, unweighted, any output
THD+noise:	<0.004% at +4 dBu, 1kHz
	<0.04% at +20 dBu, 1kHz
Interchannel crosstalk:	<-80dB, 20Hz to 20kHz

CROSSOVER FREQUENCIES:

Stereo mode	
low/high:	45 to 960Hz or 450Hz to 9.6kHz(x10 setting)
Mono mode	
Low/mid:	45 to 960Hz or 450Hz to 9.6kHz(x10 setting)
Mid/high:	45 to 960Hz or 450Hz to 9.6kHz(x10 setting)
Filter type:	Linkwitz-Riley, 24dB/octave,

Function switches:

Front panel	
Low cut:	Activates 40Hz Butterworth, 12dB/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.
Mode:	Selects stereo/mono and 2/3-way operation.
Lf sum:	Selects normal(stereo) or mono-summed low frequency operation.

INDICATORS

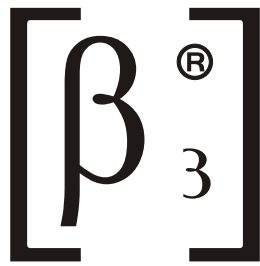|	
Stereo operation:	Green LED
Mono operation:	Yellow LED
Low cut:	Red LED per channel
X10:	Green LED per channel
Phase invert:	Red LED per output(3 peer channel)

POWER SUPPLY

Power consumption:	220V±10%/50Hz
Mains connection:	15WATT
	IEC 320 receptacle

PHYSICAL

Dimensions:	483x175x45mm
Weight:	1.7kg
Shipping weight:	2.5kg

Note: specifications subject to change.

Beta Three