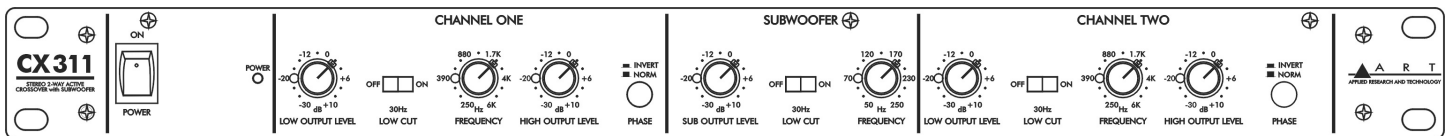


CX311

Stereo 2-Way Active Crossover with Subwoofer Output



USER'S GUIDE



IMPORTANT SAFETY INSTRUCTIONS – READ FIRST



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltages inside the enclosure that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual.

Read instructions

Retain these safety and operating instructions for future reference. Heed all warnings printed here and on the equipment. Follow the operating instructions printed in this user guide.

Do not open

There are no user serviceable parts inside. Refer any service work to qualified technical personnel only.

Power sources

Only connect the unit to mains power of the type described in this user guide or marked on the rear panel. The power source must provide a good ground connection.

Power cord

Use the power cord with sealed mains plug appropriate for your local main supply as provided with the equipment. If the provided plug does not fit into your outlet consult your service agent. Route the power cord so that it is not likely to be walked on, stretched or pinched by items placed upon or against.

Grounding

Do not defeat the grounding and polarization means of the power cord plug. Do not remove or tamper with the ground connection on the power cord.

Moisture

To reduce the risk of fire or electrical shock, do not expose the unit to rain, moisture or use in damp or wet conditions. Do not place container of liquid on it, which may spill into any openings

Heat

Do not locate the unit in a place close to excessive heat or direct sunlight, as this could be a fire hazard. Locate the unit away from any equipment, which produces heat such as: power supplies, power amplifiers and heaters.

Environment

Protect from excessive dirt, dust, heat, and vibration when operating and storing. Avoid tobacco ash, drink spillage and smoke especially that associated with smoke machines.

Handling

Protect the controls from damage during transit. Use adequate padding if you need to ship the unit. To avoid injury to yourself or damage to the equipment take care when lifting, moving or carrying the unit.

Servicing

Switch off the equipment and unplug the power cord immediately if it is exposed to moisture, spilled liquid or the power cord or plug becomes damaged during a lightning storm or if smoke odor or noise is noted. Refer servicing to qualified technical personnel only.

Installation

Install the unit in accordance with the instruction printed in the user guide.

IMPORTANT SAFETY INSTRUCTIONS – READ FIRST 2

OVERVIEW 4

 Features..... 4

INSTALLATION 5

 AC Power Hookup..... 5

 Input/Output Connections..... 5

OPERATION 6

FRONT PANEL CONTROLS 6

 Power Switch..... 6

 Low Output Level Controls 6

 Low Cut Filter Switch..... 6

 Crossover Frequency Control 6

 High Output Level Control 6

 Phase Switch..... 6

 Sub Output Level Control 7

 Subwoofer Frequency Control 7

REAR PANEL CONNECTORS..... 7

 XLR Input Jacks 7

 1/4” Input Jacks 7

 1/4” Output Jacks 7

APPLICATIONS..... 8

 Typical Setup 8

 Signal Flow 8

 Initial Setup Tips 8

WARRANTY INFORMATION 9

 Limited Warranty 9

 Exclusions..... 9

SERVICE 10

SPECIFICATIONS 11

OVERVIEW

The ART CX311 Stereo 2-Way Active Crossover with Subwoofer Output offers a superb level of sound quality and its straightforward user interface gives you quick and easy access to all of its features. Designed for home, club, or DJ system applications or live sound reinforcement, the CX311 employs 24dB/octave state-variable, fourth-order, Linkwitz-Riley filters. These filters guarantee in-phase outputs at all frequencies. This ensures the proper acoustic summing of common signals from adjacent drivers in the crossover region.

The CX311 is a stereo 2-way electronic crossover with an additional subwoofer output. Each crossover channel splits the frequency of an input signal into two separate signals, which may then be sent to amplifiers or other signal processing equipment in a sound system. The subwoofer output can be used to add punch to low bass audio.

Each stereo channel features high and low output level and crossover frequency rotary controls, while the subwoofer channel features its own output level and crossover frequency rotary controls. A low cut switch for each channel may be used to remove unwanted subsonic audio that can damage amplifiers or speakers. Each stereo channel also includes a phase switch that can be used to detect or correct audio path connection errors. The rear panel features balanced XLR and 1/4" TRS input and output connectors. Power for the CX311 is internal.

The ART CX311 Stereo 2-Way Active Crossover with Subwoofer Output has been carefully designed, engineered and manufactured to provide you with years of great sound and reliable service.

Features

- Stereo 2-way operation with separate subwoofer output
- Fourth-order Linkwitz-Riley filters
- Balanced XLR and 1/4" TRS inputs and unbalanced 1/4" outputs
- Adjustable, wide crossover frequency range (250Hz to 6kHz)
- Independent output level control for each output
- Switchable low cut (30Hz) filters on each stereo channel and subwoofer
- Phase reverse switch on each stereo channel's High output
- Rugged, fully shielded all-steel chassis
- Internal AC power supply with standard IEC connector
- Three year warranty

INSTALLATION

The ART CX311 may be used in a wide variety of applications and environments. Enclosed in a 1U (1.75 inches high) rack-mountable, all-steel enclosure, the unit is designed for continuous professional use. The depth is 5 inches. Mounting location is not critical. However, for greater reliability, we recommend that you not place the unit on top of power amps or other sources of heat.

AC POWER HOOKUP

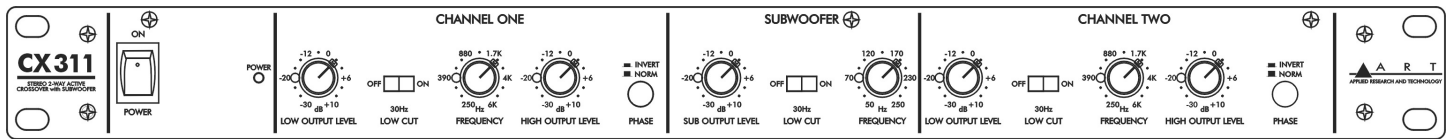
The CX311 has an internal power supply designed to operate from 105 to 120VAC at 50/60Hz. Units manufactured for use outside of the United States have been modified to comply with the required electrical specifications for the country of destination. Before plugging the CX311 into the AC mains, make sure that all of the equipment following the crossover outputs are turned off or that all of the outputs are turned down.

INPUT/OUTPUT CONNECTIONS

The CX311 has XLR and 1/4" TRS phone jack connectors for each input. Audio input connections are active balanced although the 1/4" phone jack connections can easily be converted to unbalanced operation by using two-conductor phone plugs. All output connections are unbalanced and use 1/4" TS phone jacks.

OPERATION

FRONT PANEL CONTROLS



POWER SWITCH

The POWER switch applies and removes power to the unit. Make sure that all equipment after the CX311 is either off or the outputs are turned all the way down before turning the CX311 on or off.

LOW OUTPUT LEVEL CONTROLS

Each channel of the CX311 has a LOW OUTPUT LEVEL control. These controls are used to trim the output levels to the LOW OUTPUT jacks on the rear of the unit.

These controls cover the range of -30dB to $+10\text{dB}$ of output gain trim, as indicated on the front panel. In most cases you would set them to 0dB , for flattest response from the crossover. You can use these controls to compensate for amplifier gain variations or efficiency of your speakers.

LOW CUT FILTER SWITCH

The LOW CUT switch activates a 30Hz high pass filter. There is one for each of the LOW OUTPUT jacks and one for the SUBWOOFER OUTPUT. This filter is a 2-pole Butterworth design (12dB/octave). Its response reduces spurious subsonic frequencies, which tightens up the low end and helps to protect your amplifiers and speakers.

CROSSOVER FREQUENCY CONTROL

Each channel of the CX311 has a crossover FREQUENCY control to set the crossover point for the high and low frequencies. These controls cover the frequency range of 250 Hz to 6 kHz. All frequencies below the set frequency will be sent to the LOW OUTPUT and all frequencies above the set frequency will be sent to the HIGH OUTPUT.

The main crossover filters are 4-pole Linkwitz-Riley designs (24dB/octave). This yields a sharp rolloff to help protect speakers and the outputs sum to a flat response.

HIGH OUTPUT LEVEL CONTROL

Each channel of the CX311 has a HIGH OUTPUT LEVEL control. These controls are used to trim the output levels to the HIGH OUTPUT jacks on the rear of the unit.

These controls cover the range of -30dB to $+10\text{dB}$ of output gain trim, as indicated on the front panel. In most cases you would set them to 0dB , for flattest response from the crossover. You can use these controls to compensate for amplifier gain variations or efficiency of your speakers.

PHASE SWITCH

Each channel of the CX311 has a PHASE switch. These switches are used to switch the polarity (invert the phase) of the signals going to the HIGH OUTPUT jacks. Normally you would leave these

switches in the out (NORM) position. Pushing a button in (INVERT position) may be used to help correct audible phase-related problems.

SUB OUTPUT LEVEL CONTROL

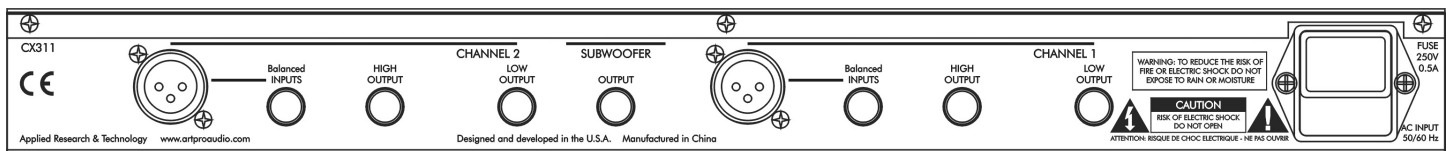
This control is used to trim the audio output level to the SUBWOOFER OUTPUT jack on the rear of the unit. The subwoofer signal is used to provide extra bass via a mono subwoofer speaker in your system.

This control covers the range of -30dB to $+10\text{dB}$ of output gain trim, as indicated on the front panel. In most cases you would set it to 0dB . You can use this control to compensate for amplifier gain variations or efficiency of your speaker.

SUBWOOFER FREQUENCY CONTROL

The SUBWOOFER FREQUENCY control sets the crossover point for signals going to the SUBWOOFER OUTPUT jack. This control covers the frequency range of 50 Hz to 250 Hz . For this function, both of the input channel signals are combined and frequencies below the set frequency will be sent to the SUBWOOFER OUTPUT. This is in addition to the normal signals that are sent to each of the channels other outputs.

REAR PANEL CONNECTORS



It is easy to interface the unit with a wide variety of equipment. The rear panel has balanced XLR and 1/4" inputs as well as unbalanced 1/4" outputs.

XLR INPUT JACKS

The XLR input connections are balanced and follow the AES standard for wiring: Pin 1 = Ground, Pin 2 = Hot (+) and Pin 3 = Cold (-). These inputs directly parallel the 1/4" inputs.

1/4" INPUT JACKS

The 1/4" input connections are balanced with Tip = Hot (+), Ring = Cold (-), and Sleeve = Ground. These inputs directly parallel the XLR inputs.

1/4" OUTPUT JACKS

The 1/4" output jacks are unbalanced with Tip = Hot (+) and Sleeve = Ground. They are used for sending signals to amplifiers, or other unbalanced equipment.

APPLICATIONS

Typical Setup

For a stereo 2-way system, separate high frequency (horn or tweeter) and low frequency (bass) speaker cabinets are used for each channel (left and right) of the sound system and are driven by their own power amplifiers.

The crossover is used to split each channel's signal into two frequency bands, which feed separate amplifiers. This delivers the proper frequencies to each speaker cabinet as well as allowing its associated amplifier to produce acoustic power more efficiently.

It is very important that you use caution when selecting the crossover points for any system. Refer to the documentation that came with your speaker cabinets for information on their proper frequency ranges. This is especially important for high frequency horns; damage may occur from sending lower frequencies than specified into the drivers!

Signal Flow

In most situations, the crossover is the last piece of equipment in the signal chain before the power amplifiers. Signal flow is as follows:

Mixer → Equalizer → Crossover → Power Amplifier → Speaker Cabinets

Sometimes a limiter is placed between the mixer outputs and the equalizer or after the equalizer for system protection.

Initial Setup Tips

1. Set all level controls to their full counter-clockwise position (-30dB.)
2. Connect the outputs of your mixer (or equalizer) to the inputs of the CX311. If stereo, Channel One is left.
3. Connect the LOW output of Channel One to the power amplifier powering the low frequency cabinets (left).
4. Connect the HIGH output of Channel One to the power amplifier powering the high frequency cabinets (left).
5. Repeat for the right side of the system (Channel Two).
6. Connect the SUBWOOFER output to the subwoofer amplifier.
7. Set the crossover frequency for both channels (they should be the same if your PA cabinets are the same).
8. Set the crossover frequency for the SUBWOOFER output to that recommended for the subwoofer.
9. With the power amplifier volume controls turned all the way down, turn on all equipment in the system.
10. With a program source running through the system, turn up the power amplifier volume controls and slowly turn up the crossover output controls while checking each individual output for sound and performance.

WARRANTY INFORMATION

Limited Warranty

Applied Research and Technology will provide warranty and service for this unit in accordance with the following warrants:

Applied Research and Technology, (ART) warrants to the original purchaser that this product and the components thereof will be free from defects in workmanship and materials for a period of **three** years from the date of purchase. Applied Research and Technology will, without charge, repair or replace, at its option, defective product or component parts upon prepaid delivery to the factory service department or authorized service center, accompanied by proof of purchase date in the form of a valid sales receipt.

Exclusions

This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. This warranty is void if the serial number is altered, defaced, or removed.

ART reserves the right to make changes in design or make additions to or improvements upon this product without any obligation to install the same on products previously manufactured.

ART shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific rights and you may have other rights, which vary, from state to state.

For units purchased outside the United States, an authorized distributor of Applied Research and Technology will provide service.

SERVICE

The following information is provided in the unlikely event that your unit requires service.

1. Be sure that the unit is the cause of the problem. Check to make sure that the unit has power supplied, that all cables are connected correctly, and that the cables themselves are in working condition. You may want to consult with your dealer for assistance in troubleshooting or testing your particular configuration.
2. If you believe that the ART unit is at fault, go to www.artproaudio.com. You may contact Customer Service for more assistance, or directly request a Return Authorization for service in the “resources” area of the website.
3. If you are returning the unit for service, pack the unit in its original carton or a reasonable substitute. The original packaging may not be suitable as a shipping carton, so consider putting the packaged unit in another box for shipping. Print the RA number clearly on the outside of the shipping box. Print your return shipping address on the outside of the box.
4. Include with your unit: a note with the RA number and your contact information, including a return shipping address (we cannot ship to a P.O. box) and a daytime phone number, and a description of the problem, preferably attached to the top of the unit. Also include a copy of your purchase receipt.

Fill in the following information for your reference:

Date of purchase _____
Purchased from _____
Serial Number _____

SPECIFICATIONS

| | |
|---------------------------------|---|
| Input Connections | XLR, 1/4" TRS, balanced |
| Output Connections | 1/4" TS, unbalanced |
| Frequency Response | 10Hz to 40kHz, +0/-0.5dB |
| Crossover Frequency Range | 250Hz to 6kHz |
| Subwoofer Frequency Range | 50Hz to 250Hz |
| Crossover Filter Type | Fourth-order Linkwitz-Riley, 24dB/octave |
| Subwoofer Filter Type | Two-pole Butterworth, 12dB/octave |
| Dynamic Range | >114dB |
| Signal to Noise Ratio | >95dB, Ref: 0dBu, 20Hz-20kHz, unweighted |
| Input Impedance | 100k Ohms |
| Output Impedance | 220 Ohms |
| Maximum Input Level | +21dBu |
| Maximum Output Level | +21dBu |
| Total Harmonic Distortion (THD) | <0.01% (20Hz-20kHz, 0dBu) |
| Maximum Gain | +4dB |
| Power Requirements | 110-125V AC, 50-60hz, 15W (USA) Export units configured for country of destination |
| Dimensions (HWD) | 1.75" x 19" x 5" 44mm x 483mm x 127mm |
| Weight | 6.2 lbs. (2.8 kg) |

ART maintains a policy of constant product improvement. ART reserves the right to make changes in design or make additions or improvements to this product without any obligation to install these changes on products previously manufactured. Therefore, specifications are subject to change without notice.



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CX311
V1.1