

# Carvin

## XC-1000 Electronic Crossover

### Please Read Before Operating

#### UNPACKING

Carefully remove by opening the carton and holding the carton flaps out. Turn the carton upside down (referenced by the lettering on the outside of the box) and lift it off. Now turn the product right-side up. In the event it is moved or re-shipped "ALWAYS" use the original carton and packing material. If not, structural damage could deface the unit. Carvin or the Shipping Company will not be liable. **SAVE ALL PACKING MATERIALS!** Also, keep your invoice as it will be required for warranty servicing. If you did not receive all the items you ordered, allow several extra days as your order may have been separated in shipping.

#### INSPECTION

Inspect the unit for damage that may have occurred in transit. If damage is found, notify the transportation company immediately, and file a damage claim. The Claim must be instituted by yourself, the consignee. Save all cartons for proof of damage. Please notify Carvin of any damage done.

#### CROSSOVER SET UP — Do Not Turn On Yet

The XC-1000 is set up for table top or rack mounting. The four rubber feet may be removed at your option if you wish to rack mount the unit. Air flow is not a necessary concern in rack mounting the XC-1000, however, be sure you have mounted the unit securely and that it is in a convenient position for ease of operation and control.

#### XC-1000 POWER UP

Plug the A.C. line cord in a suitable grounded receptacle. Check the line voltages in your area to be sure the XC-1000 voltage selector control on the back panel of the unit is selected properly. (See back panel descriptions.) If a grounded receptacle is not available, use an approved 3 prong to 2 prong adaptor. Do not defeat the 3rd grounding pin on your line cord as this is for your protection. Connect all necessary Bi/Tri-amp connections (See Bi/Tri-amp connections.) Use only shielded connection cords as this will allow for lowest noise and eliminate RF interference problems. Note: it is preferred to use low impedance and balanced connections for highest gain and best signal quality. Now turn the crossover "on" and note the power LED indicator light glow for indication of power "on" for the XC-1000. Turn the gain controls up to a nominal position and adjust the crossover frequency controls to your operating crossover frequencies. Note: Check frequency selector switch (1X/10X) to be sure low frequencies are not admitted to the horn speaker array. Damage may result to your horn system if sub-low frequencies are delivered directly to the horn driver.

#### XC-1000 DESCRIPTION

The XC-1000 crossover represents the finest in currently available fully parametric electronic crossovers. The XC-1000 features fully parametric filters with (1X/10X) switching to allow you full control of any crossover point or points between 95Hz to 16KHz. The XC-1000 is easily tri-ampable by switching a tri-amp switch at the back panel of the unit. This enables you to tri-amp your system without extra patch cords or alternate patch modifications. Stereo bi-amplification is also easily attainable with the XC-1000, setting selected crossover points and patching to the proper outputs at the back panel of the unit. The XC-1000 is designed for maximum signal quality and control, while affording years of trouble free service. If you have any questions regarding the XC-1000 please feel free to contact Carvin at your convenience.

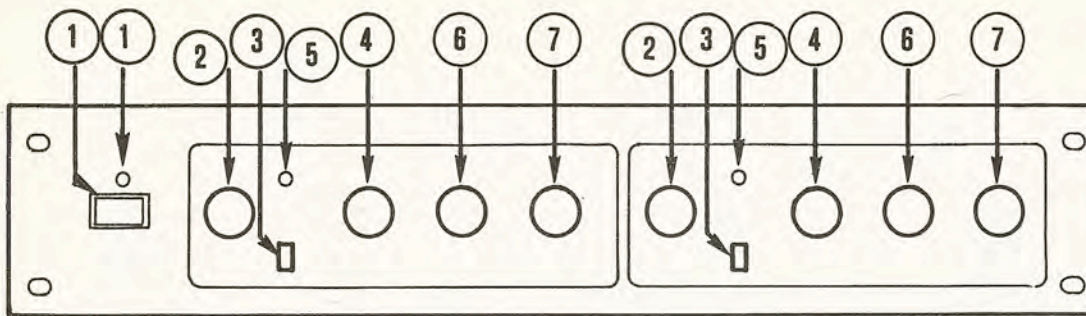
#### BI-AMP TRI-AMP THEORY

Bi-amplification and Tri-amplification involve higher protection to sound systems as well as increased power handling capacity and efficiency. Therefore, it is usually recommended that all high level sound reinforcement utilize bi-amping or tri-amping for maximum reliability and performance.

Bi-amping involves dividing a full range signal into two distinct **low pass** and **high pass** (low frequency, high frequency) signals and then amplifying these crossed over frequencies with separate amplifiers for later connection to their proper woofer and horn connections.

Tri-amplification involves the same principle as bi-amping except that separate high pass, mid band, and low pass signals are fed to (3) separate amplifiers for subsequent connection to proper woofer, midrange, and high frequency speakers.

These frequency divisions are done actively with an efficient 18dB/octave roll off prior to the power amplifiers, allowing the amplifiers to power a defined frequency range (Low, Mid, or High) instead of a full range frequency signal. Due to increased efficiency of the amplifier in amplifying a distinct frequency range, a much cleaner and more powerful output is afforded. Bi/Tri-amplification also eliminates the use of passive crossovers which can cause power loss and possible phase distortion. Also, Bi/Tri-amplification is especially useful in selecting any number of various crossover points and adjusting individual frequency level gains enabling you to better control the overall response of your sound system. This further allows you the flexibility of controlling any speaker system and fine tuning any system to its maximum potential. Bi/Tri-amplification is therefore useful as a means of offering greater protection, more power with less distortion and better overall control of your sound system.

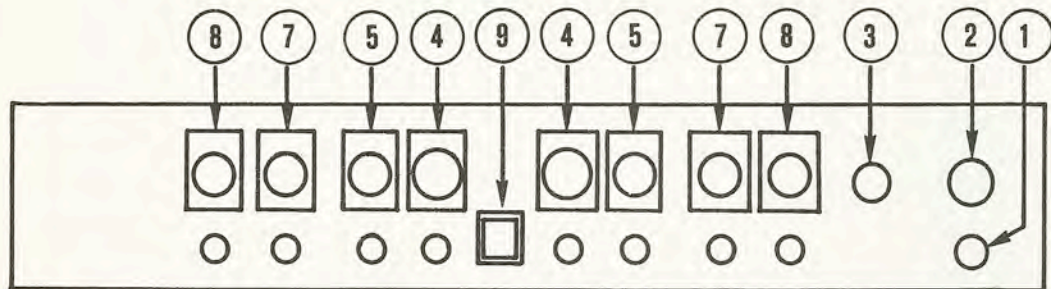


### FRONT PANEL

- 1. POWER SWITCH** Push this switch horizontally to the "on" position as indicated by the red LED indicator located directly above that switch. This will apply power to the crossover unit.
- 2. FREQUENCY** This control delivers a continuously variable parametric frequency control setting desired crossover points. The frequency indicated by the pointer of this control will establish the crossover point selected for that channel. In the case of a bi-amp control this control will establish the low pass and high pass outputs of the crossover. In the case of tri-amplification, this control in conjunction with the same control of Channel "B" will establish the low pass, mid pass, and high pass crossover points.
- 3. 1X/10X BUTTON** This button multiplies the selected frequency by 1X or 10X as needed to establish a full range frequency spectrum from 95Hz to 16KHz. With the 1X button in the "out" position the crossover will sweep from 95Hz to 1600Hz. With the 10X button pushed "in" the crossover has a range from 700Hz to 16KHz.
- 4. GAIN** This control establishes the amount of input gain for the crossover. This control will also affect the output drive of the crossover thereby affecting the overall gain of the crossover as well. Note: This control is best used in conjunction with the "peak" level indicator as a means of monitoring the amount of input gain and output distortion as it relates to any overload conditions.
- 5. PEAK** The peak indication LED light is used to monitor both input overloading and output distortion. This indicator will flash whenever any of these two conditions or a combination of these conditions exist. Should the peak indicator ever flash, you can compensate this condition by adjusting the gain controls down (lower) accordingly. Note: The XC-1000 has over 112dB of dynamic headroom range which should require minimal adjustment of the gain controls to compensate output distortion, however, appropriate monitoring of any overloading conditions exists should you ever need it.
- 6. LO FREQ** The lo frequency control level is a gain control over the low pass frequency output as set by the crossover point of that channel. For example, if the frequency control is set at 1000Hz, those frequencies at and below 1000Hz would be volumetrically boosted or cut by adjustment of the Lo Freq. Level control.
- 7. HI FREQ** This control is identical in operation to the Lo Freq. control except that it volumetrically controls those frequencies above the crossover point as determined by the crossover point set up by the frequency selection control.

### CHANNEL "B"

The controls of Channel "B" are identical to the controls of Channel "A". Note: In triamplification application Channel "A" Hi Pass and Channel "B" Low Pass controls interact to provide a mid pass filter output. (See Tri-amplification.)



### REAR PANEL

- 1. LINE CORD** All Carvin equipment is supplied with 3 conductor line cords for maximum safety, greatly reducing the chance of electrical shock. If the XC-1000 unit is to be plugged into a (2) prong outlet, use a quality 3 to 2 prong grounded adaptor. Do not defeat the grounding pin of your AC line cord as this is for your protection.
- 2. FUSE** The XC-1000 crossover will accommodate both 110 and 220 volt sources (AC). The 3/4 amp fuse supplied with your unit is designed to protect your unit against damage from either voltage source.
- 3. 110/220 V** This switch is recessed and plugged. If you have need of foreign voltage switching (i.e. 220 volts) remove the rubber plug and insert a small standard screwdriver. Push the switch all the way to the right. This will enable the XC-1000 to accommodate a 220 volt source.
- 4. INPUT** The XC-1000 input will accept either a balanced line through the D3F connector, or an unbalanced line through the phone jack. The D3F connector wiring is as follows: Pin #1 ground, Pin #2 Negative Balance, Pin #3 Positive Balance. Note: It is recommended that you use Low Impedance balanced pre-amp inputs for lowest noise and best performance of your crossover. Note: You can change the phase by switching Pins 2 and 3.
- 5. SPARE XLR INPUT CONNECTOR** An extra XLR connector has been provided enabling you to cascade your balanced inputs to other power amps or input sources. This connector is wired in parallel with the input XLR.
- 6. INPUT (TRI-AMP)** Input "A" is also used as the input for tri-amplification using the XC-1000 crossover. When the tri-amp switch is engaged to the "on" position, the XC-1000 channels "A" and "B" interact to deliver a low pass, mid pass, and high pass output. (See tri-amplification section for XC-1000.) Therefore Channel "A" acts as the tri-amplification input for the XC-1000 as well.

**7. LO OUTPUT** The low output D3M connector and 1/4" connector are the output connections for the low pass filter of Channel "A". This connection is also the low pass output of the crossover for the tri-amp mode. Therefore Channel "A" low pass output is the low frequency output for both the bi-amp output of Channel "A" and or the tri-amp mode of the XC-1000.

**8. HI OUTPUT** The Hi output connection of the Channel "A" of the XC-1000 is functional when the tri-amp switch is off and the crossover is in the bi-amp mode. This output then becomes the high pass output of the XC-1000 for Channel "A" for connection to your horn or high frequency amplifier. Note: When in the tri-amp mode, this control (Front Panel) and "lo level output" control of Channel "B" interact to establish the output gain of the mid pass filter.

**9. TRI-AMP OFF/TRI-AMP ON** When the tri-amp switch is in the off position the XC-1000 crossover is engaged in the bi-amp mode. Individual channels "A" and "B" will have separate input sources, crossover those frequencies selected by the frequency selector knob and deliver both high pass and low pass outputs from the Hi and Low Output connections at the output of either channel. When the Tri-amp switch is in the "ON" position, Channel "A" becomes the input source. The XC-1000 will use both channels interactively as a Tri-amp, (hi, mid, low) pass filter network.

### **BI-AMPLIFYING WITH THE XC-1000**

**Mono Bi-amping** If your system requires only mono-bi-amplification, you will only utilize one side of the XC-1000 (Channel "A" or Channel "B"). Simply plug your full range frequency source into the Channel "A" inputs at the rear panel of the unit. This connection can be either male or female XLR connections or 1/4" phone jack connections. Then connect either an XLR female or 1/4" connection to the Lo Output on the rear panel of the unit to the amplifier you will be using to power your woofer system. Utilize the Hi Output connection of the XC-1000 in the same manner for connection to the amplifier used to power your horn system. Note: If a stereo amplifier is used, you will make your connections to either side "A" or side "B" of the amplifier as respectively used in connection to the horns and woofers in your system.

**Stereo Bi-amping** Stereo bi-amplification works in exactly the same manner as in mono bi-amping except that you have (2) full range input sources (stereo inputs). Connect (1) connection from the stereo source to one side (side "A") of the XC-1000 and connect the other source to (side "B") of the XC-1000. The crossover frequency separation will work in the exact same manner as in mono bi-amplification, however, Channel "A" will bi-amplify one side of your stereo system. Note: In stereo bi-amplification you will have to utilize (4) separate power amplifiers or (2) stereo amplifiers. This will be required to amplify both low pass (woofer) and both high pass (horn) signals to your stereo speaker array. As a general rule, the high pass amplifiers of your stereo speaker array only have to be 1/3 the wattage of the low pass amplifiers due to the higher efficiency and lower power consumption of the horns. Be sure to adjust the gain controls and level controls for each channel to the lowest possible distortion as indicated by the peak LED on each channel. Also be careful to note the position of the (1X/10X) switch per channel, and the respective frequency crossover point in order not to deliver harmful low frequencies to the horn arrays.

### **TRI-AMPING WITH THE XC-1000**

**Mono-tri-amplification** can be accomplished with (1) XC-1000 crossover unit. If you wish to stereo tri-amplify your system, you will require (2) XC-1000 crossovers. The XC-1000 crossover will allow you the flexibility of selecting your respective low, mid and high frequency crossover points through the use of Channel "A" and Channel "B" frequency selector controls and the related interaction between these channels in the tri-amp mode. The following is the procedure for tri-amping with the XC-1000.

#### **Tri-Amp Procedure**

1. Connect a full range input source to the XC-1000 crossover at Channel "A" input connection on the rear panel.
2. Push the tri-amplification switch to the "on" position.
3. Connect the Channel "A" Lo Output connection to the amplifier you wish to power your lo frequencies.
4. Connect Channel "B" Lo Output connection to the amplifier you wish to use in amplifying your mid frequencies.
5. Connect Channel "B" Hi Output connection to the amplifier you wish to power your high frequencies.

**Tri-Amp Operation** The XC-1000 is now ready for operation as a tri-amp crossover. Select the desired upper crossover point for your low frequency system by dialing in your crossover point with the Channel "A" frequency selector knob on the front panel. Now dial in the upper range of frequency crossover you desire for your mid band pass filter (Midrange control) using the frequency control knob of Channel "B" on the XC-1000 crossover. The midrange frequencies to be manipulated by the crossover are established by the upper crossover point of Channel "A" frequency selector knob (front panel) and the lower crossover point established by Channel "B" frequency control knob. The high frequency output of the XC-1000 is established by the upper crossover range of Channel "B" frequency selector knob.

For example, if you dial in 1000Hz on Channel "A" and 2000Hz on Channel "B", the Channel "A" low pass output will deliver those frequencies at and below 1000Hz. The Channel "B" Lo Output connection will deliver those frequencies between 1000Hz and 2000Hz establishing a midrange output. Those frequencies above 2000Hz will be delivered by the Hi Output of Channel "B".

The input gain and output distortion will be monitored by Channel "A" and "B" LED peak indicators. The Lo Frequency level control of Channel "A" will control the volumetric gain of the low frequencies at the low end of the crossover point selected by that control. Both the Hi Frequency Level control for Channel "A" and the low frequency level control for Channel "B" interact to set the amount of volumetric gain for the midrange output of the crossover unit. Note: The midrange controls must be turned up slightly to affect control over the high pass output of the crossover. The high frequency level control on Channel "B" establishes the gain for the high frequency output of the crossover as determined by the upper range of Channel "B" frequency selector control. Note: The "B" gain control controls the Input/Output gain of the mid and high frequencies.

Therefore, when the Tri-Amp switch is off, the XC-1000 crossover operates as 2 separate channels for standard stereo bi-amplification operation. When the Tri-Amp switch is "on", Channel "A" becomes the input for the crossover. Channel "A" Lo Output becomes the low frequency output as set up by Channel "A" Frequency control. Channel "B" Lo Output becomes the mid pass output adjusted by the gain of Channel "B" Lo Freq. Level control delivering an output between the settings of the upper level of Channel "A" frequency select and lower level Channel "B" frequency selector. Channel "B" Hi Output becomes the high pass output defined by the upper range of the Channel "B" frequency selector control.

Tri-amplification will afford you maximum speaker versatility and control adaptable to any speaker system. Tri-amplification also offers a maximum protection available for high powered speaker systems. Do not be afraid to experiment with the various crossover points of the XC-1000 in order to establish the proper response from your speaker system. If you have any questions regarding the operation of the XC-1000 unit feel free to contact Carvin at your convenience.

#### **CHANNEL "B"**

Channel "B" inputs and controls are identical to Channel "A". (Note: See Tri-amp switch back panel for tri-amp connection, and tri-amp theory/hook up.)

### LIMITED WARRANTY

*Your Carvin Professional Series Product is protected against failure for 1 YEAR. Carvin will service the unit, supply all parts, and pay the RETURN shipping charges at no charge to the customer providing the unit is under warranty. At no time will Carvin pay for Servicing or Parts except our own.*

*This warranty is extended to the original purchaser only (not transferable) and does not cover failures by incorrect use, inadequate care of unit, or natural disasters. A copy of the original invoice must be shown to verify warranty.*

*Carvin takes no responsibility for any horn driver or speaker damaged by this unit.*

*This warranty is in lieu of all other warranties, expressed or implied, and no representative or person is authorized to represent or assume for Carvin any liability in connection with the sale or servicing of Carvin products.*

### FACTORY SERVICING

We highly recommend utilizing our specialized servicing staff to bring your unit up to factory specifications. For Factory servicing "In" or "Out" of Warranty follow these requirements:

1. Enclose a full description of the malfunction. Use the "Service Authorization Form" included with this manual.
2. Include a copy of the original invoice to verify warranty.
3. Return the product in its original carton. Carvin and the Shipping Co. are not liable for damage caused by improper packing. Ship by United Parcel Service if possible. The shipment must be pre-paid by the customer.
4. Allow 5 working days for servicing plus shipping time to and from destination. All repairs in by Monday are ready the following Monday.
5. Carvin will pre-pay the shipping back to you providing the unit is under warranty. If you wish return shipment by AIR, you will be required to pay the difference COD.
6. If your unit is out of warranty, you will be charged a modest fee (generally lower than repair shops). You will also be required to pay shipping both ways. These charges will be collected COD.
7. If in doubt about the malfunction, please call a Carvin salesman first at 714-747-1710 as we've had units returned just because there was a oversight on its use or hookup.

### SERVICING IN YOUR AREA

You may select your own service center or have your qualified technician work on the unit at your own expense. This will not void the warranty for future repairs by us unless damage was done because of improper servicing or components. If damage was done, a normal fee for parts and servicing will be charged.

Under the 1 Year Warranty, Carvin will ship parts pre-paid to you or your technician providing the defective part(s) are returned first for our inspection.

If you do not have a qualified service person, we ask that you don't involve yourself in servicing the unit. By sending the unit back to us, you may save time and money in the long run, plus your unit will be factory serviced.

**Reminder: Carvin Does Not Pay for Servicing or Parts except our own — No Exceptions. If you elect to have your own servicing done, these bills must be paid by you.**