

# CARVER

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A-500x  
Magnified Current™  
THX® Stereo Power Amplifier

Owner's Manual

# CARVER

## 1. Safety Instructions

1. Read Instructions — All the safety and operation instructions should be read before the Carver Component is operated.

2. Retain Instructions — The safety and operating instructions should be kept for future reference.

3. Heed Warnings — All warnings on the Component and in these operating instructions should be followed.

4. Follow Instructions — All operating and other instructions should be followed.

5. Water and Moisture — The Component should not be used near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.

6. Ventilation — The Component should be situated so that its location or position does not interfere with its proper ventilation. For example, the Component should not be situated on a bed, sofa, rug, or similar surface that may block any ventilation openings; or placed in a built-in installation such as a bookcase or cabinet that may impede the flow of air through ventilation openings.

7. Heat — The Component should be situated away from heat sources such as radiators, or other devices which produce heat.

8. Power Sources — The Component should be connected to a power supply only of the type described in these operation instructions or as marked on the Component.

9. Power Cord Protection — Power-supply cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit the Component.

10. Cleaning — The Component should be cleaned only as recommended in this manual.


11. Non-use Periods—The power cord of the Component should be unplugged from the outlet when unused for a long period of time.

12. Object and Liquid Entry — Care should be taken so that objects do not fall into and liquids are not spilled into the inside of the Component.


13. Damage Requiring Service — The Component should be serviced only by qualified service personnel when:

- A. The power-supply cord or the plug has been damaged; or
- B. Objects have fallen, or liquid has spilled into the Component; or
- C. The Component has been exposed to rain; or
- D. The Component does not appear to operate normally or exhibits a marked change in performance; or
- E. The Component has been dropped, or its cabinet damaged.

14. Servicing — The user should not attempt to service the Component beyond those means described in this operating manual. All other servicing should be referred to qualified service personnel.




CAUTION




RISK OF ELECTRIC SHOCK  
DO NOT OPEN

**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK  
DO NOT REMOVE COVER (OR BACK)  
NO USER-SERVICEABLE PARTS INSIDE  
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL**




The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

**PORTABLE CART WARNING**



Carts and stands - The Component should be used only with a cart or stand that is recommended by the manufacturer. A Component and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the Component and cart combination to overturn.

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15. To prevent electric shock, do not use this polarized plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

Pour prévenir les chocs électriques ne pas utiliser cette fiche polarisée avec un prolongateur, un prise de courant ou une autre sortie de courant, sauf si les lames peuvent être insérées à fond sans laisser aucune partie à découvert.

16. Grounding or Polarization — Precautions should be taken so that the grounding or polarization means of the Component is not defeated.

17. Internal/External Voltage Selectors — Internal or external line voltage selector switches, if any, should only be reset and re-equipped with a proper plug for alternate voltage by a qualified service technician. See an Authorized Carver Dealer for more information.

18. Attachment Plugs for Alternate Line Voltage (Dual voltage models only) — See your Authorized Carver Dealer for information on the attachment plug for alternate voltage use. This pertains to dual-voltage units only.

This apparatus does not exceed the Class A/Class B (whichever is applicable) limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

ATTENTION — Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de class A/de class B (selon le cas) prescrites dans le règlement sur le brouillage radioélectrique édicté par les ministere des communications du Canada.

**WARNING – TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.**

**CAUTION: TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.**

**ATTENTION: POUR ÉVITER LES CHOCS ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU' AU FOND.**

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## 2. Prelude

Your new Carver Magnified Current™ THX Power Amplifier carries with it a heritage of over 15 years of audio research, development and design refinements. Carver engineers make use of the latest advances in electronics manufacturing techniques to provide state-of-the-art high-value audio products which emphasize innovative technologies and features at an affordable price.

An American electronics innovator based in the Pacific Northwest, Carver began in the early 80s with a series of product successes such as the C-4000 preamplifier with Auto-Correlator™ and Sonic Holography™, the TX-11 tuner with ACCD™ (Asymmetrical Charge-Coupled Detector) and the M-1.5 stereo power amplifier, one of the most powerful amplifiers available at the time for home hi-fi use. As technology has evolved, so have Carver's products. In fact, a number of audio technologies and features considered standard today— including surround-sound and advanced signal processing— had their first successful consumer applications in a Carver component! Many Carver products are now considered "classics", and most are still in use with their original owners who routinely upgrade their Carver-based systems rather than replace them. As it has since our company's beginning, the Carver name remains synonymous with leading edge technology expressed in audio components that never become obsolete.

At Carver, technology is regarded as a tool used for one purpose: to advance the science of reproducing sound in the home. Every Carver employee has this common goal, from our CEO and Board of Directors, our Engineering, Sales and Marketing, Accounting and Finance, Customer Service and Technical Support Staff to the Manufacturing and Quality Control people who actually put the products together here in Lynnwood, Washington. We love home entertainment. The vigilant pursuit of providing quality and reliable products aimed at reproducing audio with absolute accuracy

— whether it be from a treasured LP vinyl recording or the digital formats of tomorrow — is our corporate vision.

To this end, the A-500x was developed with a number of important design features and goals in mind. A power amplifier has only one job, but a very important one: amplifying the audio signal without being disturbed by the loudspeaker load. Ideally, the signal coming out of an amplifier should be identical in every way except magnitude to the signal that went into it. In reality, there are subtle ways in which the signal can be changed by an amplifier, which are described by measurements such as THD, noise, DC offset, crosstalk and phase shift. All these technical terms boil down to one thing — the signal has been changed (distorted) in some way from its original form by the amplifier.

There are a number of ways to minimize this distortion. One of the most effective and efficient is to minimize the signal path. While that may sound simple, it is actually very difficult to achieve. Our engineers went to great lengths to shorten the signal path (pun intended!) as much as technology and physics allow. A short signal path prevents corruption of the signal from the effects of EMI, strayfield magnetic radiation and cumulative reactance in the critical signal conductors. The result is a much cleaner (and very nearly perfect) reproduction of the signal at the amplifier's output.

The A-500x is rated conservatively at 250 watts per channel into 8 ohms and delivers over 400 watts per channel into 4 ohms. It also has the flexibility and power



reserves to become an 800 watt+ bridged mono amplifier when even higher power levels are needed. This is an enormous amount of power, made possible through the development of a new multi-state hybrid power amplifier design we call *Magnified Current™*. It uses two 160 amp peak current power MOSFETs per channel, with nanosecond switching speed to assign twice the continuous voltage to the output stage when high voltages are required, or more than twice the continuous current when higher current is needed. This maximizes both the voltage and current capability (peak or continuous) available for any loudspeaker load; even those that have a substantial reactive component that is difficult for conventional amplifiers to drive.

As a result of this difficulty in driving demanding loudspeaker loads, conventional amplifiers use stabilizing inductors on the output of the amplifier to keep the amplifier from oscillating and even self-destructing. Unfortunately, these inductors also cause low damping at high frequencies which can create high frequency coloration.

Carver has developed *Total Direct Coupling™* (TDC) to combat this problem. TDC means that the output circuitry is directly connected to the loudspeaker without the usual stabilizing inductor networks between the amplifier output and the loudspeaker terminals. Due to the wide open loop bandwidth, ideal stability and load immunity of the new Carver amplifier module, the traditional sound altering "stability band-aids" of conventional amplifiers are no longer necessary. This not only creates a totally stable power amplifier into all speaker loads, it also provides high damping factor at all frequencies— not just in the bass region.

That means full control in the bass, midrange and high frequencies. No more harsh or rolled off highs, just pure and natural clarity from top to bottom.

In addition to new audio technology, Carver engineers also designed the A-500x to set new standards in reliability and value. The A-500x makes full use of their modular design philosophy and open-frame architecture for efficient and cost-effective assembly. This has the added benefit of providing superior channel isolation, eliminating the detrimental effects of interchannel crosstalk. The amplifier's enclosure is designed to provide open air access to the heatsinks. This affords more efficient dissipation of heat away from the triple-diffused planar high-current output devices, which results in greater reliability and longevity of the amplifier.

The THX logo on the front panel of the Carver A-500x is another important feature of the amplifier. THX certification means that the A-500x meets a set of strict performance standards which ensure that the soundtrack's reproduction is faithful to the director's intent. The Carver A-500x can be used with other THX certified audio equipment to create a true Home THX Audio System.

Other features are included to provide convenience and flexibility such as variable input sensitivity controls, removable handles and front panel analog meters with two sensitivity settings.

The Carver A-500x was designed and manufactured by people with a lifetime commitment to providing the world's finest components for sound reproduction and home entertainment. Thanks for placing your confidence in Carver. We know your new amplifier will provide many years of listening enjoyment.



If you have access to the Internet, you can check out the full line of Carver products and company announcements on our World Wide Web page (<http://www.carver.com>).

## 3. Features and Specifications

### A-500x Special Features

- ❑ 250 watts per channel into 8 ohms  
400 watts per channel into 4 ohms  
750 watts per channel into 2 ohms (IHF dynamic power)  
800 watts bridged mono into 8 ohms
- ❑ Certified by Lucasfilm, Ltd. for use in Home THX Audio Systems
- ❑ Magnified Current™ technology for increased voltage and current capability
- ❑ Total Direct Coupling™ for high damping factor at all frequencies
- ❑ Each channel protected by:
  - Individual fusing
  - DC fault sense
  - Shorted-load sense
  - Excess temperature sense
  - Power-on delay
- ❑ Minimal signal path design, with on-card I/O connectors eliminating internal inter-connect cables
- ❑ Precision passive components used in all critical signal paths (no electrolytic capacitors in signal path)
- ❑ Fully-complementary differential circuitry using low-noise, high speed transistors throughout
- ❑ DC Servo correction using new Texas Instrument Excalibur™ operating point controller
- ❑ Double-stage ground isolation system prevents ground loops and RF interference
- ❑ Triple-diffused planar high-current output devices with a combined output safe operating capability of 1000 watts
- ❑ Dual analog lighted meters with range selection switch
- ❑ Meter light On/Off switch
- ❑ Gold-plated RCA input jacks
- ❑ International safety compliant binding posts
- ❑ Individual calibrated level trim controls for each channel
- ❑ Removable handles for placement in 17" wide cabinet space (with trim end caps)
- ❑ Made in USA

#### Power Output:

##### Stereo operation:

Power FTC 20Hz-20kHz, 8 ohm  
250 watts per channel with < 0.08% THD  
400 watts per channel into 4 ohms  
750 watts per channel into 2 ohms (IHF dynamic power)

##### Bridged mono operation:

800 watts into 8 ohms

#### Dynamic Headroom:

> 1.0dB @ 8 ohms both channels driven

**Frequency Response:** 20 Hz to 20 kHz  
(+0,-0.2 dB)

**Separation:** > 70 dB @ 1kHz

### Specifications

**Damping Factor:** > 150  
(20 to 20kHz)

**Input Impedance:** 47 kohms

#### Sensitivity:

Per THX standard:  
1.0V rms input for 100W output into 8 ohms  
1.58V rms for rated power into 8 ohms @ 1 kHz

**Gain:** 29.0 dB (+/- 0.5dB)

**Input-to-Output Phase:** 0° (±10°)

## 4. Unpacking and Paperwork

IM Distortion:	
SMPTE	< 0.03%
CCIF	< 0.01%
THD:	< 0.08%
Signal-to-Noise Ratio:	> 117 dB
A-weighted, referenced to rated power	
A-weighted, referenced to 1W	> 93 dBW

Power Consumption:	
50W at idle	
330W with musical program	
880W at full power into 8 $\Omega$ (continuous)	

Power Requirements:	
120VAC/60Hz (USA and Canada)	
Other voltages as required for export	

Display:	2 Analog Meters;
	0dB = 250 watts into 8 $\Omega$
	or 25 watts into 8 $\Omega$ (x10 range)

Size (H x W x D):	5.75" x 19" x 18.8"
	146mm x 483mm x 478mm
	with handles
	5.75" x 17" x 17.8"
	146mm x 432mm x 452mm
	without handles

Net Weight: 29 lbs. (13.2 kgs)

Shipping Weight: 34 lbs. (15.4 kgs)

Features and specifications are subject to change without notice.

Carefully unpack your A-500x and keep the original carton and packing materials for future moving, shipment or long-term storage.

After opening the box, please check for any visible signs of damage that were not apparent from the outside of the box. If you do encounter what appears to be concealed damage, please consult your Carver Dealer before proceeding to further unpack or install the unit.

### Important Paperwork

***Make sure to save your sales receipt.***

Your receipt is extremely important to establish the duration of your Limited Warranty, and for insurance purposes. Next, make a note of the serial number which is located on the back of the amplifier. Record it in the space provided below for convenient reference.

Model: A-500x

Serial Number: \_\_\_\_\_

Purchased at: \_\_\_\_\_

Date: \_\_\_\_\_

Finally, take a moment to fill out the Customer Registration Card packed with the amplifier and return it to Carver. This allows us to keep you informed of new products and technologies as they become available.

## 5. Installation

### Location and General Precautions

Observe the following precautions when choosing a location for the A-500x:

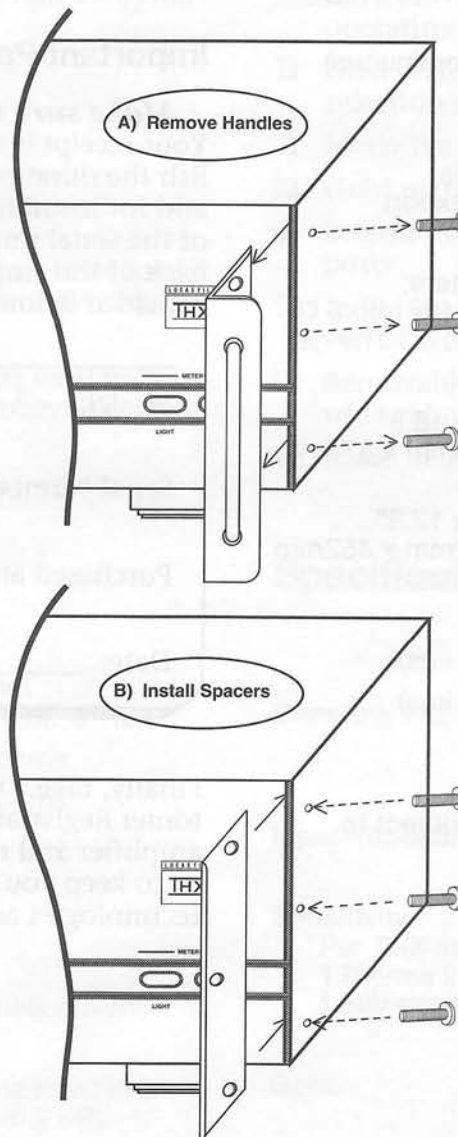
- Do not expose the unit to rain or moisture.
- Protect from prolonged exposure to direct sunlight.
- Avoid excessive exposure to extreme cold or dust.
- Do not place heavy objects on the unit.
- Do not place magnetic storage media such as audio or video tapes near the amplifier. All power amplifiers contain transformers that are surrounded by a fluctuating magnetic field which can erase magnetic tapes (or floppy disks).
- Protect from heat and **allow adequate ventilation**. Place away from direct sources of heat, such as heating vents and radiators. All components produce some heat during operation, so make sure that the ventilation holes are not covered and that air is allowed to circulate freely behind, beside and above the unit. Excessive heat is the single greatest source of both short-term and long-term component failure.

The amplifier can be placed in an equipment rack or cabinet which has adequate ventilation. If your shelves do not have open backs, make sure there are vent holes in them. The situation you want to avoid is placing your power amplifier in a sealed cubby hole. That creates a static air space where temperatures can rise quickly.

- Allow at least 3 inches of air space above the unit, and at least 1 inch on either side.
- Do NOT place the amplifier on carpeting or any surface that might tend to block its ventilation slots from air circulation.

○ If possible, place the A-500x in its own shelf space, separate from other components.

○ If a fluid or foreign object should enter the unit, disconnect the power plug and contact an authorized dealer or service center. Do not pull out the plug by pulling on the cord; grasp the plug firmly.



### Handle Removal

The A-500x is shipped with the handles installed. To remove the handles, use a Phillips screwdriver to remove the three screws on each side of the chassis just behind the front panel. Remove the handles and install the spacers provided as shown in Figure 4. Reinstall the three screws on each side of the chassis to secure the spacers in place.

Store the handles in a safe place for future use.

Figure 4. Handle Removal



## AC Power Considerations

Ensure that the A-500x is plugged into an outlet capable of supplying the correct voltage specified for your model and enough current to allow full-power operation of all the components connected to it.

Although the A-500x can draw momentary peaks of 1400 watts or more, with musical programs the amplifier will typically require an average of 330 watts or less.

## Connection Tips

Before launching into the actual cable-connection frenzy of setting up your new system, consider the following tips.

○ Make sure all components are OFF before making any connections. It's a good idea to plug in your AC power cord last to avoid accidentally turning on the unit while installing.

○ Make sure that "left is hooked to left and right is hooked to right" at each connection. The obvious way to assure this is to assign one hook-up cord plug color to left and the other to right. Generally RED is used to signify RIGHT. White, grey or black then represents left.

○ Whenever possible, keep power cords away from signal cables (inputs to CD player, tape deck, etc.) to prevent hum. While hum is less of a problem today than it was in the past, noise can still find its way into your system if

a component's power cord gets too close to a hook-up cable.

○ Choose reliable hook-up cables (also called interconnects, patch cords or RCA cables). There are lots of different grades of hook-up cables. You can pay more than \$50 per foot for some of them! Whether or not you hear an improvement in sound quality with "audiophile" interconnects is up to your own ears. However, really CHEAP or old connection cables can sometimes DIS-connect themselves inside, causing hum or a loss of sound in one or both channels. Before you send a component in for service, swap hook-up cables to see if they're the culprit.

## Rear Panel Connections and Controls

### 1. STEREO/MONO Switch

For normal stereo operation, this switch should remain in the STEREO position. By switching it to the mono position, you may use the A-500x as a 800 watt (at 8 ohms) mono amplifier. See page 18 for more information on input/output connections in mono operation.

### 2. LEVEL Controls

These calibrated controls are used to adjust the input sensitivity of each channel. When using the A-500x in a THX system, leave these controls in the fully clockwise position. Each

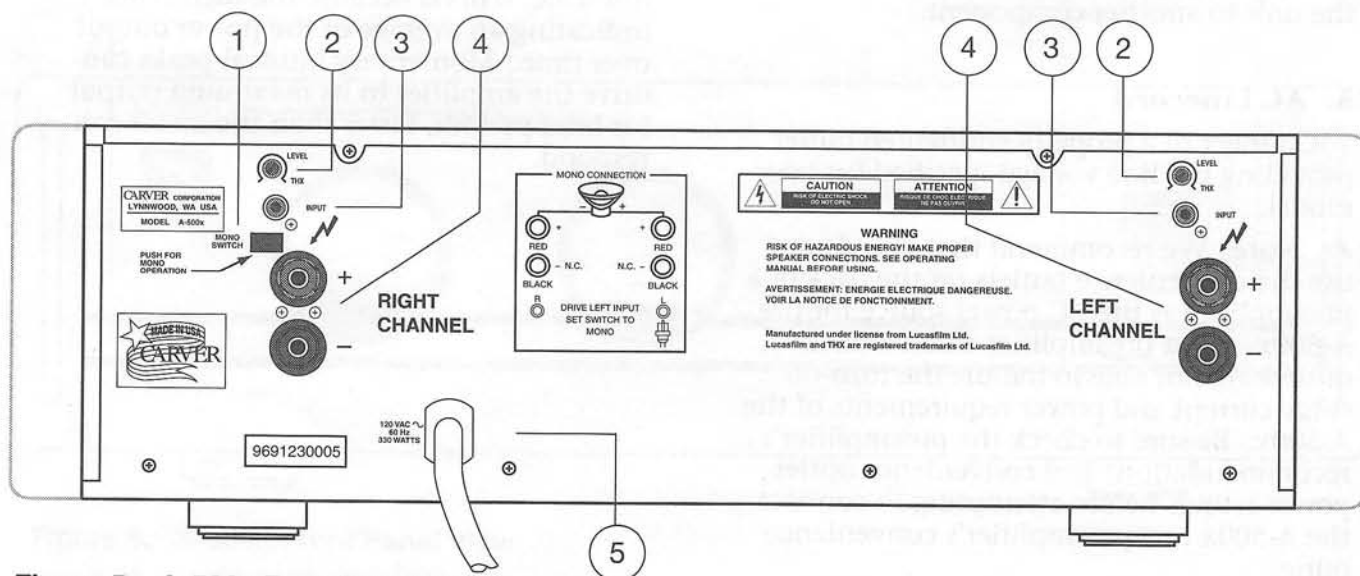


Figure 5. A-500x Rear Panel View

channel will then provide a sensitivity of 1V Input = 100 watts Output that is required for a Home THX Audio System. Individual channel adjustments are then made using the balance controls provided on the THX controller.

For non-THX systems, the LEVEL controls on the A-500x can be used to adjust and fine tune the balance between the various channels in your surround sound system.

*Note: For THX Audio Systems, leave the LEVEL controls on the A-500x in their fully clockwise position.*

### 3. LEFT and RIGHT INPUT Connectors

These line level input RCA jacks connect to the audio output jacks of your preamplifier or surround sound decoder. See page 14 for the recommended method of connecting a surround sound system to the A-500x.

### 4. LEFT and RIGHT SPEAKER Outputs

These international safety approved binding posts are used to connect the loudspeakers to the amplifier outputs. Please check the *Amp-to-Speaker Connection* instructions on page 17 for information on cable selection and connections to your loudspeakers.

⚠ **Note:** The output of the A-500x can develop hazardous voltages. Care should be taken in connecting the speakers to prevent electric shock or damage to the amplifier. Turn the A-500x OFF before making any change to speaker wiring or when connecting the unit to another component.

### 5. AC Linecord

Connect to a properly configured outlet providing the line voltage specified for your model.

⚠ **Note:** We recommend that you *do not* use the convenience outlets on the back of a preamplifier as the AC power source for the A-500x. Most preamplifier convenience outlets are not able to handle the turn-on surge current and power requirements of the A-500x. Be sure to check the preamplifier's recommendations and convenience outlet power ratings before attempting to connect the A-500x to a preamplifier's convenience outlet.

## 6. Operation

### Front Panel Features

#### 6. POWER Switch

When the A-500x is first turned on, the indicating LED illuminates green (6a) and the outputs will be muted for about four seconds to allow the amplifier to stabilize. This delay circuit helps prevent speaker-damaging thumps when powering up. We suggest you turn on the amplifier AFTER you have turned on your signal source equipment (preamplifier, CD player, tuner, etc.). Also make sure that a loud signal source is not playing when the amplifier is first turned on, or you'll be in for a big surprise when the muting circuit disengages.

#### 7. Power Meters

The A-500x features ballistically-weighted power meters that are calibrated in decibels. The main dB scale has a top value of +3dB, with 0dB equal to the maximum rated continuous power (into 8 ohms) of 250 watts per channel.

The meter ballistics include a fixed amount of overshoot that's standard for this type of metering. So, on some musical material, the meter will often move past the 0dB level and on to +3dB (when played VERY loud).

At the same time, on some musical material the amplifier could be reaching its maximum power even though the meters aren't reaching full scale. This is because the meters are indicating an average of the power output over time. Momentary musical peaks can drive the amplifier to its maximum output for brief periods, faster than the meter can respond.

Because different musical material reacts differently with the ballistics of the meter, the best way to tell whether the amplifier is overloading is simply to listen. If the sound becomes distorted on musical peaks at the same time the meter is "pegging", you have probably exhausted the A-500x's power reserves. If this should occur, you should reduce the volume level to prevent the A-500x's overload protection circuit from being activated.

### 8. METER LIGHT Switch

This button will turn the meter lights ON and OFF. This allows you to improve the viewing of the meters, depending on the light level in your listening room.

### 9. METER RANGE Switch

When pushed in, analog meter sensitivity will be increased ten-fold (0dB = 25 watts). If you are running the A-500x at louder volume levels, do not activate this switch.

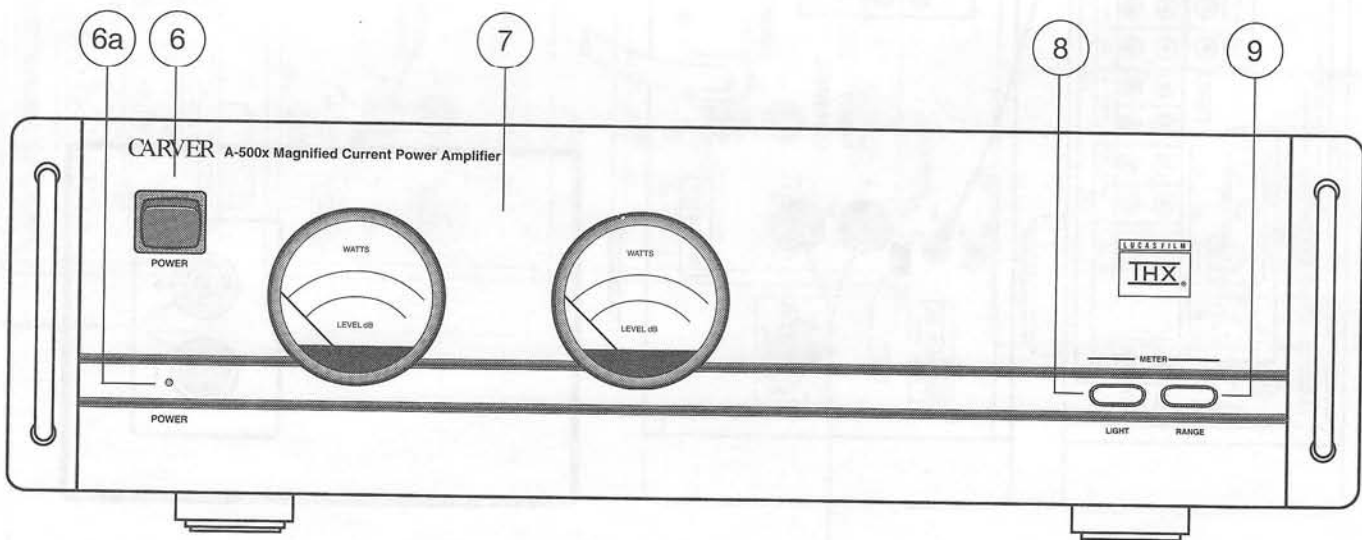


Figure 6. A-500x Front Panel View

## SYSTEM CONFIGURATIONS

The following pages contain drawings of typical connections that you might make in your installation. These drawings demonstrate how the inputs and outputs on the rear panel of the A-500x are interconnected with other audio components.

Stereo/Mono Switch set to STEREO position.

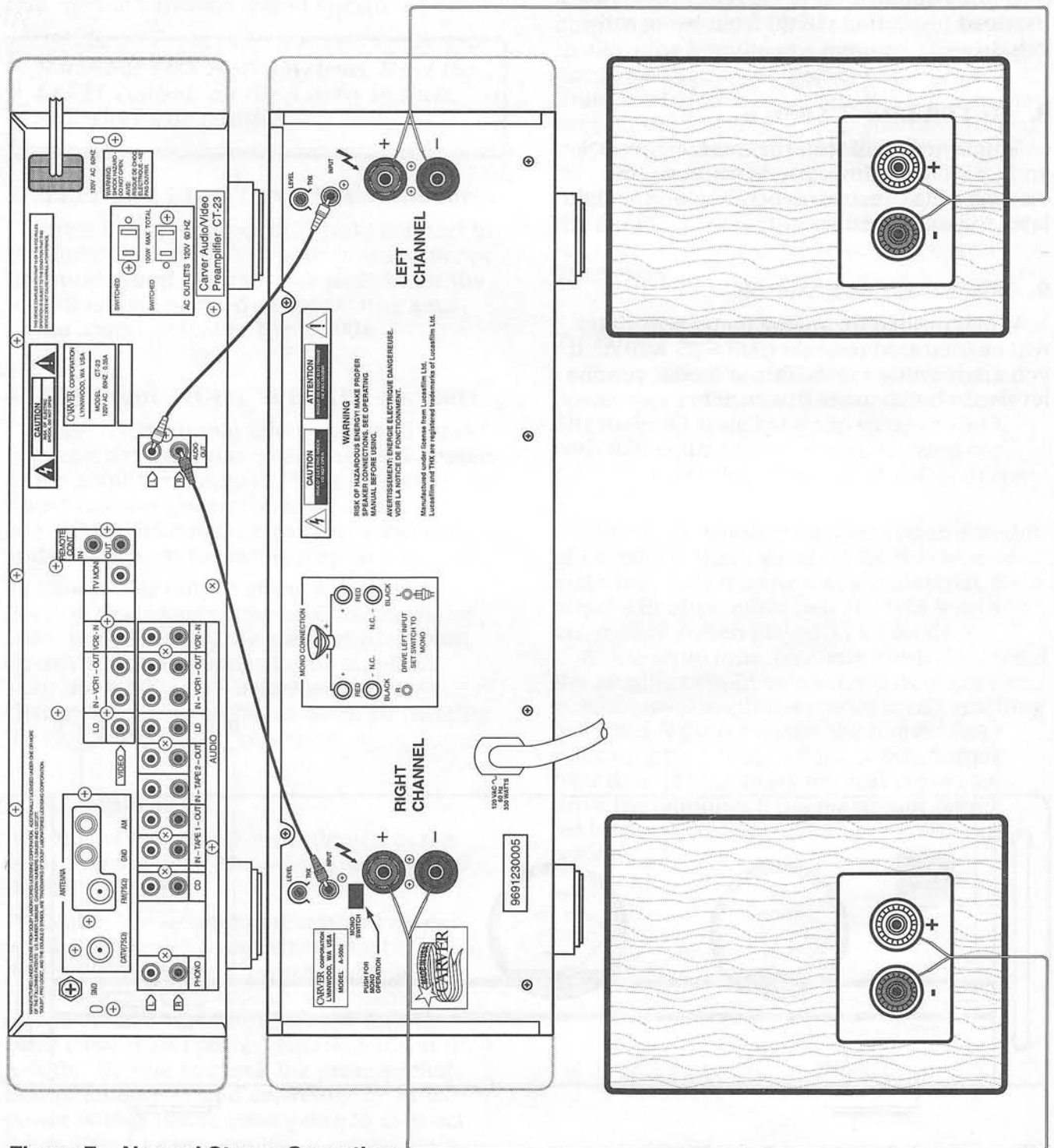


Figure 7. Normal Stereo Operation

**Installation Notes:**

Two A-500x amplifiers operating in bridged mono configuration.

Set Stereo/Mono Switch to MONO position.

Connect the Red LEFT SPEAKER Binding Post to the positive (+) speaker connection.

Connect the Red RIGHT SPEAKER Binding Post to the negative (-) speaker connection.

**Note:** Use a speaker rated at 4 ohms or more when operating in bridged mono mode. Use the LEFT LEVEL control to adjust the level.

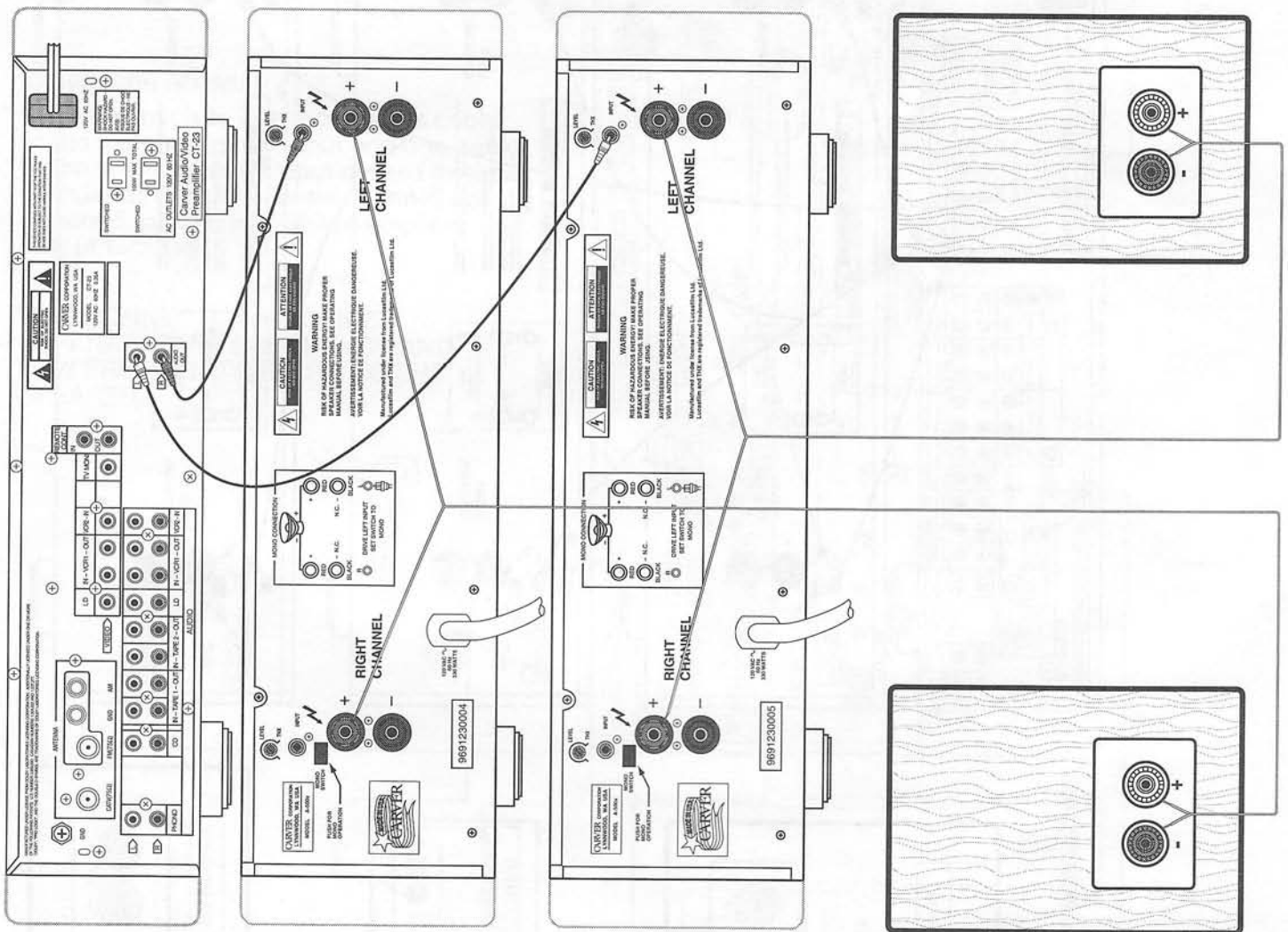


Figure 8. Bridged Mono Operation

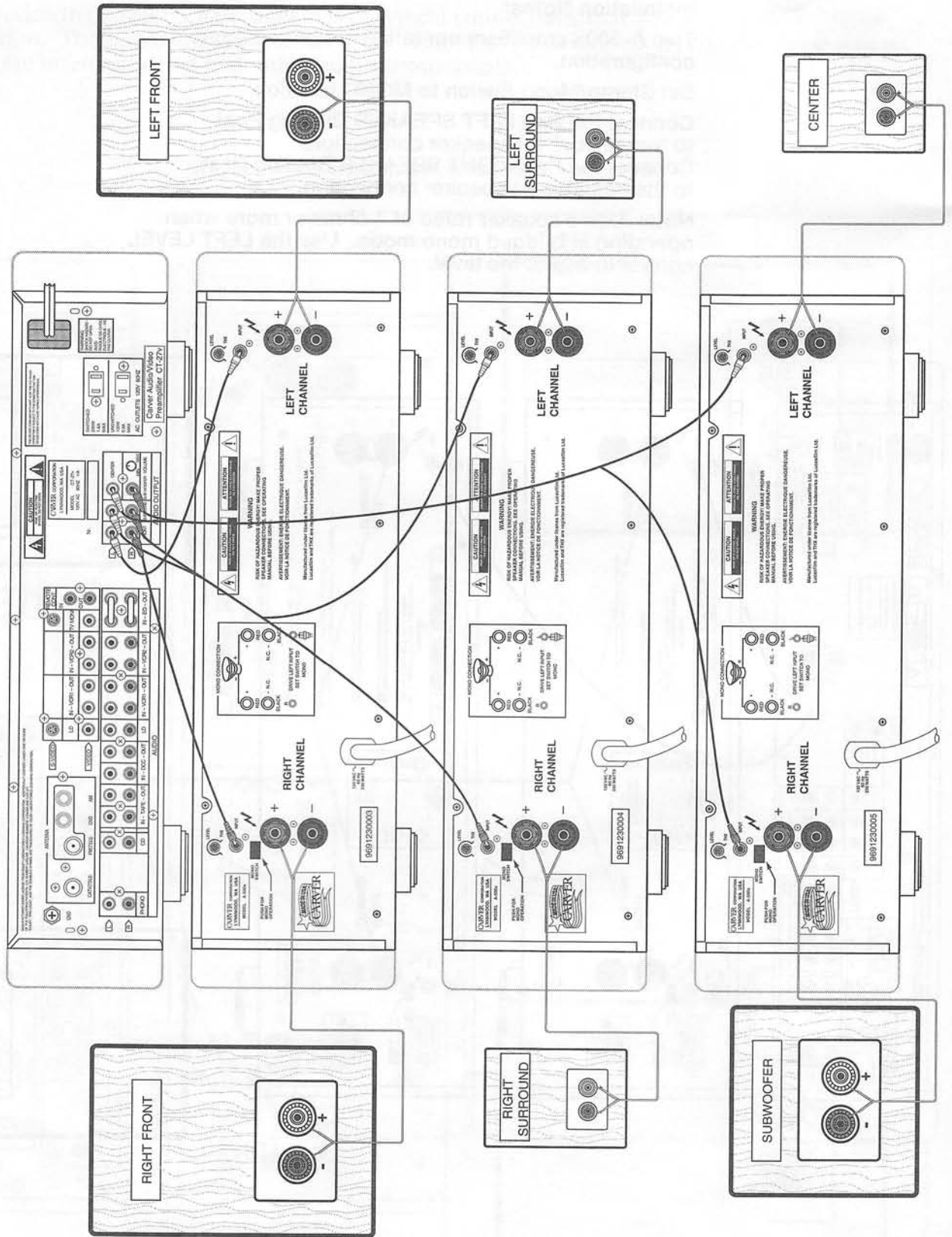


Figure 9. Home Theater 5.1 Channel Surround Sound System

**Installation Notes:**

Bi-wiring involves connecting one cable to the high frequency input and one cable to the low frequency input of the speaker. Both leads (from the same channel) are attached to the same power amplifier output terminal.

**THIS CONNECTION REQUIRES SEPARATE HIGH FREQUENCY AND LOW FREQUENCY INPUTS TO THE SPEAKER.**

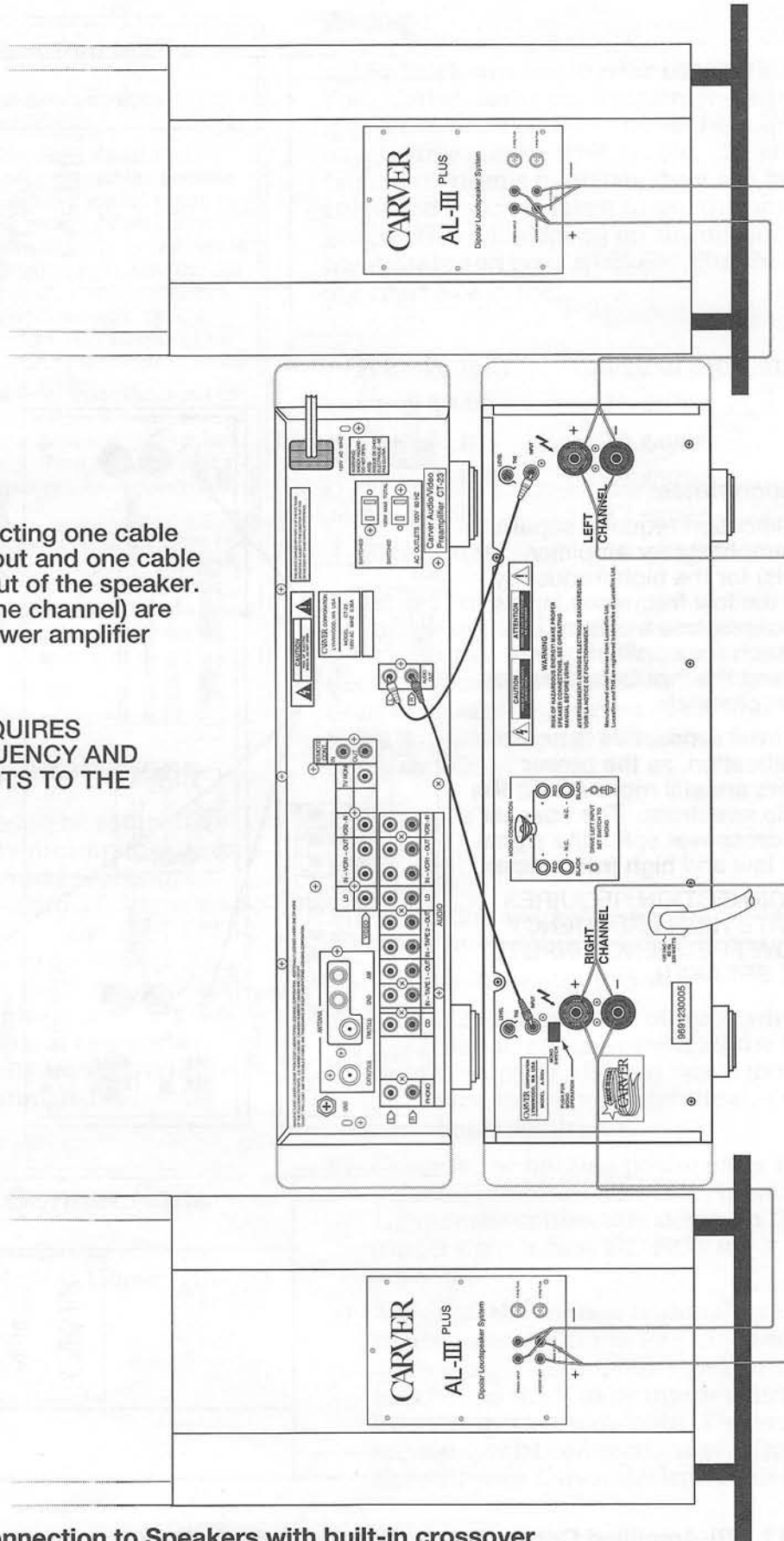


Figure 10. Bi-Wired Connection to Speakers with built-in crossover

**Installation Notes:**

Bi-amplification requires separate power amplifiers (or amplifier channels) for the high frequency and for the low frequency inputs to the speakers. Use a Y-cord between each preamplifier output (L & R) and the inputs to the two amplifier channels.

In its purest sense, this is not true bi-amplification, as the power amplifiers are still reproducing the full audio spectrum. The speaker's built-in crossover splits the signal into the low and high frequencies.

**THIS CONNECTION REQUIRES SEPARATE HIGH FREQUENCY AND LOW FREQUENCY INPUTS TO THE SPEAKER.**

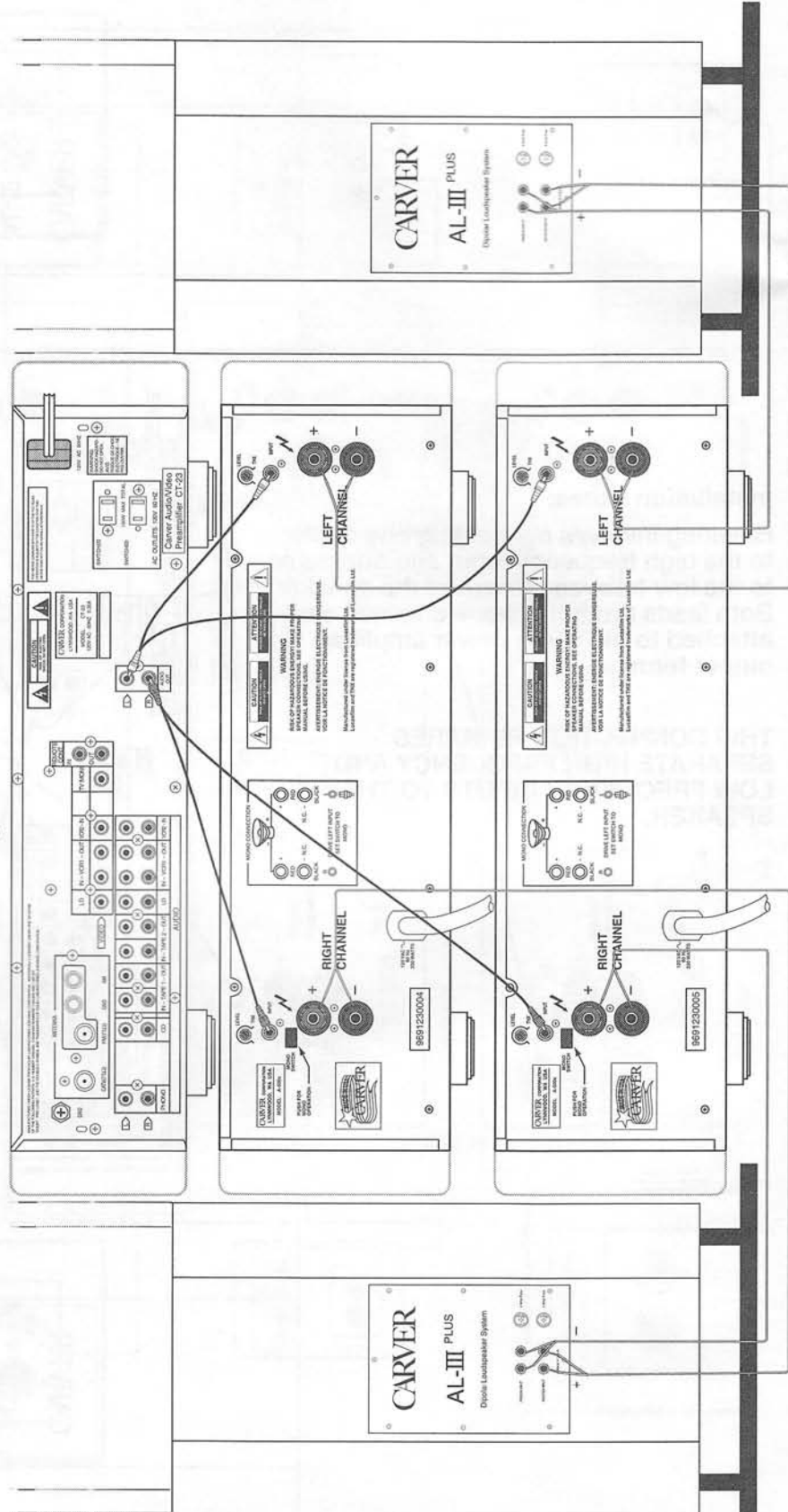


Figure 11. Bi-Amplified Connection to Speakers with built-in crossover



### A quick note on input/output levels

Input and output levels for audio equipment are usually divided into three categories.

**Phono Level:** This is a very low level signal that comes from the cartridge of your turntable. Because of its extremely low voltage, it has a special input connection provided on most preamplifiers and receivers. It provides extra gain to increase the signal, as well as reverse RIAA equalization to restore the flat frequency response that was altered by the equalization used in making phonograph records. Only a turntable should be connected to the PHONO input jacks.

**Line Level:** This is the signal level that comes out of almost all audio components produced today, except for power amplifiers. It ranges from several hundred millivolts to several volts (AC). Your preamplifier produces a line level signal that can be connected to the input of the A-500x.

**Speaker Level:** This is the signal level that comes out of the speaker output terminals on a power amplifier or receiver. It can range from several volts to several tens of volts (AC). Some high powered amplifiers can reach voltage levels approaching that present on a household AC outlet! These connections should only be made to a speaker.

## Amp-to-Preamp Connections

The A-500x is designed to be compatible with virtually any quality preamplifier, preamplifier/tuner, surround sound processor or THX controller. Use standard RCA-type audio cables to connect the RIGHT and LEFT OUTPUTS of the preamplifier to the RIGHT and LEFT INPUTS on the rear panel of the A-500x. It might help to refer to the owner's manual for your other components at this point. System hook-up variations are shown in the diagrams on pages 12 through 16.

## Amp-to-Speaker Connections

The A-500x is designed for use with any type of loudspeaker, including Home THX-certified loudspeakers.

## Wiring

Use thick wire for speaker connections. Your Carver dealer can recommend a brand of speaker cable. You may choose high quality, oxygen-free copper (OFC) cable. Or common "zip-cord" from a hardware store can be employed if care is taken to use the proper gauge. This will depend on the distance from the A-500x and your speakers. Use the following chart as a guide:

<u>Wire Length</u>	<u>Gauge of Zip Cord</u>
Up to 15 ft.	18 gauge
15 to 25 ft.	16 gauge
25 to 40 ft.	14 gauge
40 to 60 ft.	12 gauge
60 to 100 ft.	10 gauge

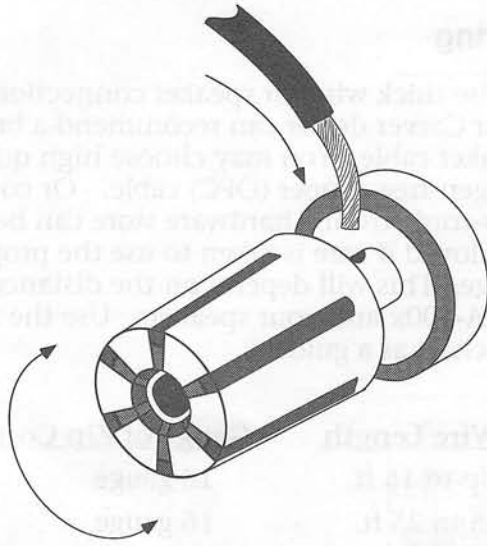
The greater the distance between your A-500x and speakers, the larger the diameter the wire should be (wire thickness specifications or "gauges" get larger as the wire gets thinner; thus 16-gauge wire is thicker than 22-gauge wire).

## Hook-up

The A-500x speaker terminals are designed to accept bare wire or standard banana plugs.

### For bare wire connections:

- 1) Strip 1/2" of insulation off each wire and make sure to carefully twist all the fine strands together. If even one is loose and can touch the opposite terminal, a short circuit may result.
- 2) Unscrew the binding post speaker terminals and insert the wire (see Figure 12). Tighten the connection down on the wire (finger tight is fine; DO NOT use a wrench!).
- 3) Although the speaker terminals are designed to accept up to 10 gauge wire, larger-gauge "audiophile" speaker cables may be too thick to be inserted directly into the speaker terminals. They may require special connections or adapters. Consult your Carver dealer for advice.

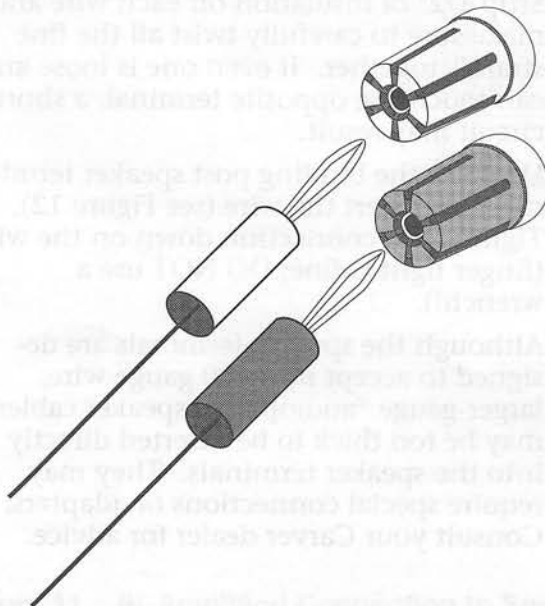


**Figure 12. Bare Wire Connection**

#### For banana plug connections:

Banana plugs can be attached to the end of the speaker cable and plugged directly into the A-500x's binding post sockets (see Figure 13). You can also purchase special speaker cable with banana connectors permanently attached or molded into the wire. This makes connecting and disconnecting speakers simple and quick. Make sure the outer terminal is completely screwed down (clockwise) on the binding post when using banana plugs to provide maximum electrical contact.

**Note:** The binding posts are deliberately spaced 1" apart, so that double-banana plugs cannot be used (3/4" spacing). This is to comply with international safety standards.



**Figure 13. Banana Plug Connection**

## Stereo Operation

For stereo operation be sure the STEREO/MONO Switch on the rear panel is in the STEREO position.

### Polarity

Loudspeakers must be connected with consistent polarity for correct phasing between them. Incorrect phasing will do no physical harm, but bass response will be diminished. The key is to make sure that both speakers connected to the speaker terminals are hooked up the same way.

- 1) Connect "-" at the A-500x speaker outputs to "-" on the back of the speaker, and "+" at the A-500x speaker outputs to "+" on the back of the speaker.
- 2) Connect the A-500x left speaker outputs to the left speaker inputs, and the right A-500x speaker outputs to the right speaker inputs.

If you're using special speaker interconnects, "+" and "-" will be identified. If you're using plain appliance-type zip cord, the two conductors will be differentiated in one of several ways. They may be different colors (silver vs. gold). One may have fine grooves on its outside. Or one may have a piece of yarn included in one of the conductors (visible after you strip off the insulation). It doesn't matter which one you decide to call "+" or "-", just do the same for both speakers.

## Mono Operation

The A-500x will provide 800 watts of power into 8 ohms when used in mono (bridged) mode. See page 13 for an illustration of the connections to be made in mono mode of operation.

### Polarity

For bridged-mono operation, you will use only the two red binding posts. The LEFT red post is the "+" side (hot, non-inverting) and the RIGHT red post is the "-" side (low, inverting).

To operate the A-500x as a mono amplifier:

1. Set the STEREO/MONO switch on the rear panel to the MONO position.
2. Connect one output from the preamplifier to the LEFT input jack of the A-500x. DO NOT connect anything to the A-500x's RIGHT input jack during mono operation! *The left level control will now control the total gain of the amplifier.*
3. The speaker leads for ONE CHANNEL ONLY must be connected to the RED TERMINALS of the A-500x. The black terminals must remain unconnected. Attach the positive (+) speaker connection to the RED LEFT SPEAKER binding post. Connect the negative (-) wire to the RED RIGHT SPEAKER binding post.

---

***Use a speaker with a rating of 4 ohms or more for mono operation.***

---

4. If you are using two power amplifiers in mono to create stereo, repeat these steps for hooking up the other channel.

⚠ **Note:** In bridged mono operation, the output connections are actually a balanced output configuration. This means that neither output terminal may be grounded (both are 'hot').

After you've hooked up the speakers, double-check your connections:

For stereo operation, be sure that both speakers are connected in the same way; positive (+) speaker terminal to positive (+) amplifier terminal, and negative speaker terminal (-) to negative (-) amplifier terminal.

For mono operation, be sure that the positive (+) speaker terminal is connected to the LEFT RED amplifier terminal, and the negative (-) speaker terminal to the RIGHT RED amplifier terminal.

## Amplifier Protection

### Fusing

All fusing is internal. There is an internal line fuse to protect the amplifier in case of a major internal failure (not likely). In addition, each channel has four internal fuses to protect the individual output stages.

**Warning:** These fuses are not user replaceable. If a fuse should blow, take the A-500x to a Carver Authorized Service Center for fuse replacement and testing to determine the reason for the failure.

### Current Limiting

This protection mechanism safeguards the amplifier against very low speaker impedances or short circuits at the speaker output terminals. If the amplifier is driven hard into a low impedance speaker, or the speaker wires should accidentally short together, the muting relays will switch off and the output of the amplifier will be disconnected.

After several seconds the relays will turn back on and normal operation will resume. If the amplifier senses that the high current situation still exists, the relays will switch off again. If this cycle persists, check the output connections and wiring to make sure there are no shorts. If not, it may become necessary to either reduce the volume or change the total impedance of the speakers connected to the amplifier.

### DC Offset

In the unlikely event that an amplifier channel should fail, a DC fault protection circuit prevents a potentially destructive amount of DC from damaging the speakers by immediately turning off the speaker relays.

## Speaker Protection

If you are using speakers that do not have a power rating high enough to match the maximum power produced by the A-500x, we recommend that you install in-line speaker fuses between the amplifier and your speakers. Use the fuse value recommended by the speaker manufacturer.

If you can't find this information, the following formula provides a good rule-of-thumb to determine the speaker fuse value to use.

$$I = \sqrt{P/4R}$$

where I = current rating of fuse in amperes  
 P = maximum recommended peak power handling capability of the loudspeaker in watts  
 R = speaker impedance in ohms

Use a fast-acting type fuse, NOT a slo-blo type. Install the in-line fuseholder between the amplifier's (+) speaker terminal and the speaker's (+) terminal. See Figure 14 for a graphical representation of the above formula.

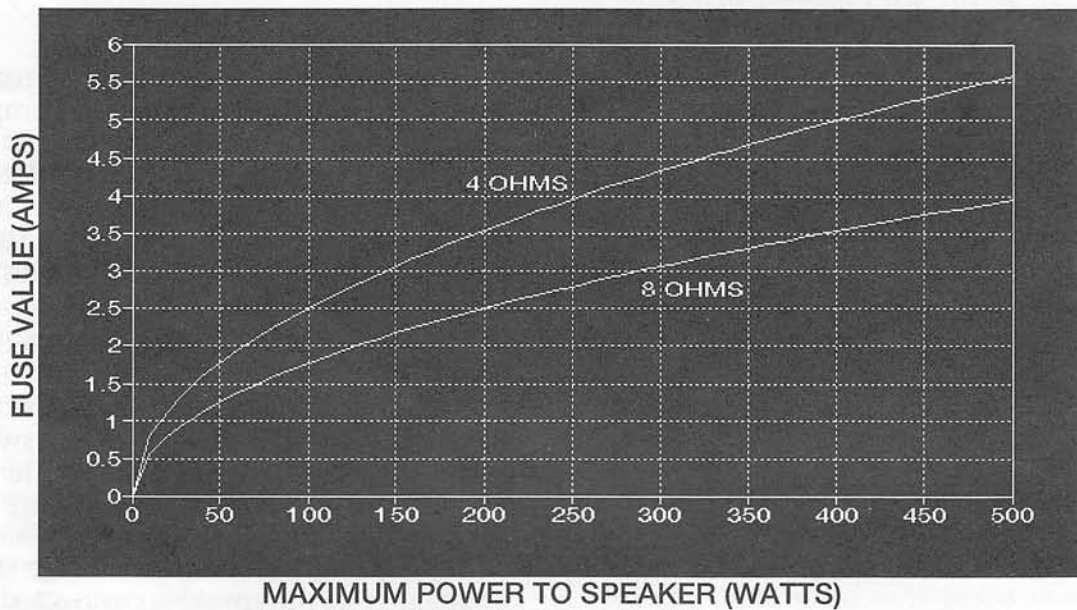


Figure 14. Fuse Protection for Speakers

## 7. In Case of Difficulty

If you're having trouble or suspect a problem with the A-500x, try some simple troubleshooting before contacting your Carver dealer or Carver Technical Service. Most likely, the problem lies elsewhere in the system or with a button or control inadvertently left in the wrong position.

### No Sound, No Power.

This is usually an indication of a power supply problem, either the power line itself or the amplifier's power supply.

1. A-500x power is switched off.
2. Linecord is disconnected.
3. Poor fit between the plug and wall receptacle. Try removing and reinserting the plug.
4. Power off at wall receptacle. You can test the wall receptacle by plugging in a lamp or AC tester.
5. A-500x is plugged into a switched outlet. Verify that the outlet is live.
6. A-500x fuse is blown. Refer to authorized Carver Service Center.

### Power On, Low Output or No Output

Low or no output problems are usually signal-source, bad cable or partial output short circuit related. If the items listed below check out, then the problem may be internal to the A-500x.

1. Check the input source to make sure it is working correctly. If the source unit has a headphone jack, you might use a set of headphones to check the operation of the source component.

Some preamplifier outputs are automatically disabled when headphones are plugged in. Try UNplugging the headphones.

2. Make sure that all preamplifier controls, especially the TAPE MONITOR button, are correctly set. (A TAPE MONITOR button accidentally pushed in is a frequent cause of total silence.)

3. MUTE is activated.
4. Turn off your audio system and check preamplifier-to-power amplifier cable connections.
5. Move the input connections to another amplifier that you know is working to verify that it is not a source problem.
6. Turn the A-500x off. Check the speaker connections. Be sure that there are no small strands of wire touching similar strands coming from the other wire in the cable. If you use banana plugs, be sure the setscrews in the plug are securely tightened.
7. If speaker fuses are installed in the loudspeakers or the speaker cables, verify that they are not blown.
8. Make sure the speakers are functioning correctly.
9. If you are using mono mode, ensure that the Stereo/Mono switch is set correctly and that the speaker cables are connected correctly (refer to page 13 – *Mono Operation*).

### Sound is very faint, even with the volume control all the way up

1. Inactive input is selected.
2. LD player or other sound source with independent volume control is turned down.
3. Tape Monitor switch or external processor switch on preamp/controller is unintentionally activated.

### Sound cuts off when volume control is turned up.

1. Check speaker wires for a short (bare wire from one connector touching another).
2. Check speakers for damage that may have caused an internal short.
3. Make sure that the A-500x is not driving an excessively low impedance speaker.

## **No sound in one channel or one channel has distorted sound.**

1. Check the preamplifier's BALANCE control and make sure that it is in the center position.
2. Turn the A-500x off. Then check speaker wire connections by momentarily switching LEFT and RIGHT speaker cables at the amplifier's speaker output terminals. After turning the unit back on, see if the same loudspeaker is dead or distorted. If it is, the fault lies with the speaker cable or the loudspeaker.
3. If speaker fuses are installed in the loudspeakers or the speaker cable, verify that they are not blown.
4. If, after following step 2, the dead channel DOES switch sides, the problem may be in the A-500x, the preamplifier, signal source or connecting cables. You can check for a possible cable problem by substituting a good set of cables.
5. Try switching the cables between the preamplifier and A-500x, connecting the left preamp output to the right amp input and the right preamp output to the left amp input. If the problem changes sides, the fault is in the preamplifier.

## **Playback is mixed with hum.**

1. Defective or loose signal cables.
2. Make sure that each connector is securely seated into its socket.
3. Signal cables may have been routed too closely to AC cables, power transformers, motors or other EMI inducing device.
4. Try connecting another source to the power amplifier inputs. If the hum stops, the problem lies with the original source component.
5. Try disconnecting cable FM lead from tuner/preamp. If the hum stops, contact your cable provider to check the cable ground.

## **Distortion**

Distortion is usually caused by: 1) an input signal that is too low (where the preamplifier can't produce enough output), 2) overdriving resulting in output clipping, or 3) current limiting caused by excessively low load impedances.

1. Check the setting of the preamplifier's volume control. If it is set too high, it may not have sufficient output to drive the A-500x.
2. Check the speaker connections and verify that all setscrews are tight and that there are no stray strands of wire to cause short circuits.
3. Verify that the total load impedance presented to the amplifier is within the limits described in this manual for the mode of operation selected.

## **Room lights dim slightly during loud musical passages**

Because of the high current requirements of an audio amplifier at the loudest volume levels, this effect is not unusual and should not cause any harm. If you wish to reduce this dimming effect, try plugging the amplifier into an outlet operating from a different circuit than the one operating the lights.

## 8. Care and Service Assistance

### Care

You'll want to wipe off the A-500x's front panel and chassis from time-to-time with a soft, dry cloth. If you have something stubborn to remove, use a mild dish soap or detergent sparingly applied to a soft cloth. Don't use alcohol, ammonia, or other strong solvents.

Make every effort to keep your amplifier away from high external temperatures, moisture and airborne substances that can leave greasy deposits and dust.

### Service Assistance

We suggest that you read the LIMITED WARRANTY completely to fully understand your warranty/service coverage. Also be sure to save the sales receipt in a safe place. It will be necessary for warranty service.

If your CARVER product should require service, we suggest you contact the Dealer from whom you purchased your unit. Should the Dealer be unable to take care of your needs, you may contact the CARVER Technical Service Department by phoning 1-800-521-4333 or by writing to us at the Factory address shown at the right. We will then give you detailed instructions on how to obtain prompt repair service.

If you should have questions or comments, please write to the Factory address given below. Please include the model and serial number of your Carver product, your complete address and a daytime phone number.

#### Factory Address

Carver Corporation  
P.O. Box 1237  
Lynnwood, WA 98046-1237

206-775-6245      *Customer Service and  
Technical Information*

or

800-521-4333

206-775-9180      *Customer Service Fax*  
service@carver.com      *Internet*

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Part #990-20222-00

Rev. A

Written, designed and printed in the U.S.A.

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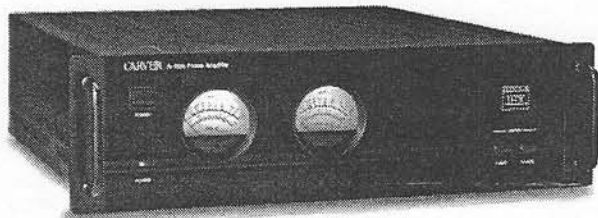
## CARVER

*Powerful • Musical • Accurate*

**A-760x/A-500x**

### ADDENDUM

This amplifier is THX certified for use in stereo mode only. The level controls must be turned to the full clockwise (THX) position to ensure proper performance in a THX system.



**Magnified Current™**  
**THX® Stereo Power Amplifier**