CARVER

Powerful • Musical • Accurate

TFM-35x
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.

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.

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.

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 préevenir les chocs électriques ne pas utiliser cette fiche polariseé 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 pariie 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 las 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.

Contents

2. Introduction

Congratulations on your purchase of a new Carver Stereo Power Amplifier. It is backed by state-of-the-art engineering and manufacturing techniques to bring you the best in quality craftsmanship and reliable performance.

The TFM-35x is designed for all home hi-fi applications. It is especially suited for home theater systems because of its ample power and accurate sound. And the THX logo on the front panel lets you know that it has passed the rigorous tests and qualifications imposed by LucasArts Entertainment Company, and has been licensed for use in Home THX sound systems.

The TFM-35x amplifier is rated at 250 watts per channel into 8 ohms and 350 watts per channel into 4 ohms. In bridged mono operation, it can produce 700 watts into 8 ohms.

The sophisticated protection circuits designed into the amplifier will protect your amplifier from damage due to extreme external conditions, as well as protect your speakers if an unexpected fault should occur.

Your power amplifier was designed and manufactured in Lynnwood, Washington by people with a lifetime commitment to providing the world's finest components for music reproduction and home entertainment. Thanks for placing your confidence in Carver. We know your new power amplifier will provide many years of listening enjoyment.

3. Features and Specifications

TFM-35x Special Features

- 250 watts per channel into 8 ohms
  350 watts per channel into 4 ohms
  700 watts bridged mono into 8 ohms
- Bridged Mono mode for combining the power of both channels into a single higher powered channel
- Independent CH 1/CH 2 speaker relays will instantaneously disconnect if one of the following fault conditions is detected:
  D.C. Offset
  Over Temperature
  Short Circuit
- Dual analog lighted meters with range selection switch
- Meter light On/Off switch
- Gold-plated RCA input jacks
- Heavy duty multi-way binding post speaker outputs
- THX® approved for use in home theater applications
- Removable handles for placement in 17" wide cabinet space

Specifications

Power Output:

Continuous Average Output Power, both channels driven:

250 watts per channel into 8 ohms from 20 Hz to 20 kHz, with no more than 0.5% THD

350 watts per channel into 4 ohms from 20 Hz to 20 kHz, with no more than 0.5% THD

Bridged-mono operation:

700 watts into 8 ohms from 20 Hz to 20 kHz, with no more than 0.5% THD

Dynamic Headroom: 2.5dB @ 8 ohms
2.8dB @ 4 ohms

Frequency Response: 20 Hz to 20 kHz (+0,-0.25 dB)

Crosstalk: > 60 dB @ 1kHz

Damping Factor: > 150

Input Impedance: 47 kilohms

Sensitivity: 1.58V rms for rated power into 8 ohms at 1 kHz

Gain: 29.0 dB (+/- 0.5dB)

Input-to-Output Phase: 0° (±10°)

IM Distortion: < 0.03%

THD: < 0.2%

Signal-to-Noise Ratio: > 115 dB
A-weighted, referenced to rated power
> 91 dBW
A-weighted, referenced to 1W

Slew Rate: > 10V/µS

Power Consumption:
70W at idle
400W with musical program
1100W at full power into 8 Ω (continuous)

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

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

Size (H x W x D): 4.5" x 19" x 15.75"
114mm x 483mm x 400mm
with handles
4.5" x 17" x 14.5"
114mm x 432mm x 368mm
without handles

Net Weight: 25.3 lbs. (11.5 kgs)
Shipping Weight: 29 lbs. (13.2 kgs)

Features and specifications are subject to change without notice.

4. Unpacking and Paperwork

Carefully unpack your TFM-35x 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: **TFM-35x**

Serial Number: _____

Purchased at: _____

Date: _____

Finally, take a moment to fill out and return 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 TFM-35x:

- 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 positioned as part of a "stack" of components if some care is taken. Because the TFM-35x is convection-cooled it requires clearance for air to reach the ventilation slots on the top, bottom and side of the unit.

Do NOT place the amplifier on carpeting or any surface that might tend to block its ventilation slots from air circulation.

The TFM-35x can be placed in an equipment rack 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 cubbyhole. That creates a static air space where temperatures can rise quickly.

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 handles on the TFM-35x can be removed to fit in a 17" wide cabinet. Simply remove the two screws on each side of the chassis securing the handles in place with a Phillips screwdriver. Reinstall the screws into the chassis after removing the handles to maintain the mechanical integrity of the unit (and to avoid losing the screws!).

AC Power Considerations

Ensure that the TFM-35x 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 TFM-35x can draw momentary current peaks up to 10 amps, with musical programs the amplifier will typically require an average of 3.5 amps or less (when powering 8 ohm speakers).

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 becomes too intimately involved with a hook-up cable. Carver components' power cords and convenience outlets are all on the right side of the chassis (when viewed from the back). This allows you to bundle all the component power cords and keep them separate from signal connections.

❍ 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 TFM-35x as a 700 watt (at 8 ohms) mono amplifier. See page 16 (*Hook-up*) for more information on input/output connections in mono operation.

Stereo Mode:	4 ohms minimum per channel
Mono Mode:	8 ohms minimum

2. LEFT and RIGHT INPUT Connectors

These line level input jacks connect to the audio output jacks of your preamplifier.

3. LEFT and RIGHT SPEAKER Outputs

These multi-way binding posts are designed to accept banana plugs, spade lugs or direct wire connections. Please check the Speaker Connection instructions on page 15 for information on cable selection and connections to your loudspeakers.

✍ **Note:** The output of the TFM-35x can develop hazardous voltages. Care should be taken in connecting the speakers to prevent electric shock or damage to the amplifier. Turn the TFM-35x OFF before making any change to speaker wiring or when connecting the unit to another component.

4. Fuse

Always replace with the same type fuse as indicated on the rear panel. Repeated fuse blowing is a sign of internal distress. Refer to an authorized Carver Service Center or contact Carver Customer Service (see page 21).

Warning: NEVER replace or check the fuse while the TFM-35x is connected to an AC outlet. Be sure the amplifier is turned off AND unplugged before removing the fuse.

5. Power Cord

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

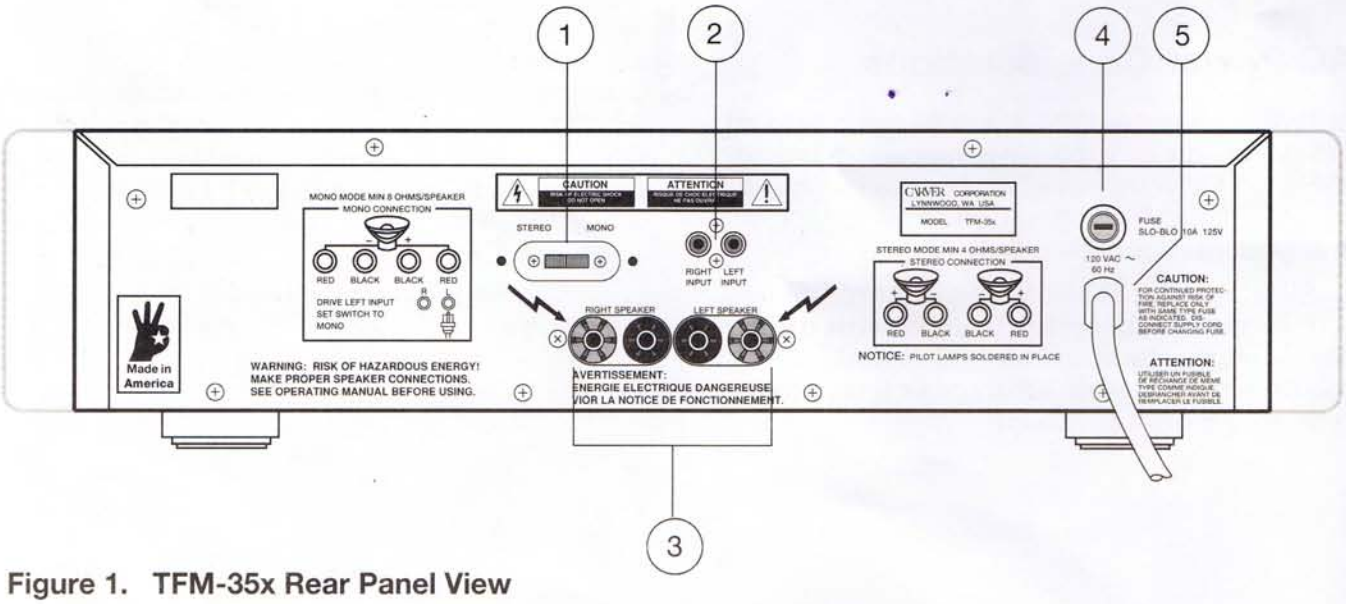

Figure 1. TFM-35x Rear Panel View

6. Operation

Front Panel Features

6. POWER Switch

When the TFM-35x is first turned on, the inputs 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 TFM-35x 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 TFM-35x's power reserves. If this should occur, you should reduce the volume level to prevent the TFM-35x's overload protection circuit from being activated.

8. METER RANGE Switch

When pushed in, analog meter sensitivity will be increased ten-fold (0dB = 25 watts). If you are running the TFM-35x at louder volume levels, do not activate this switch.

9. 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.

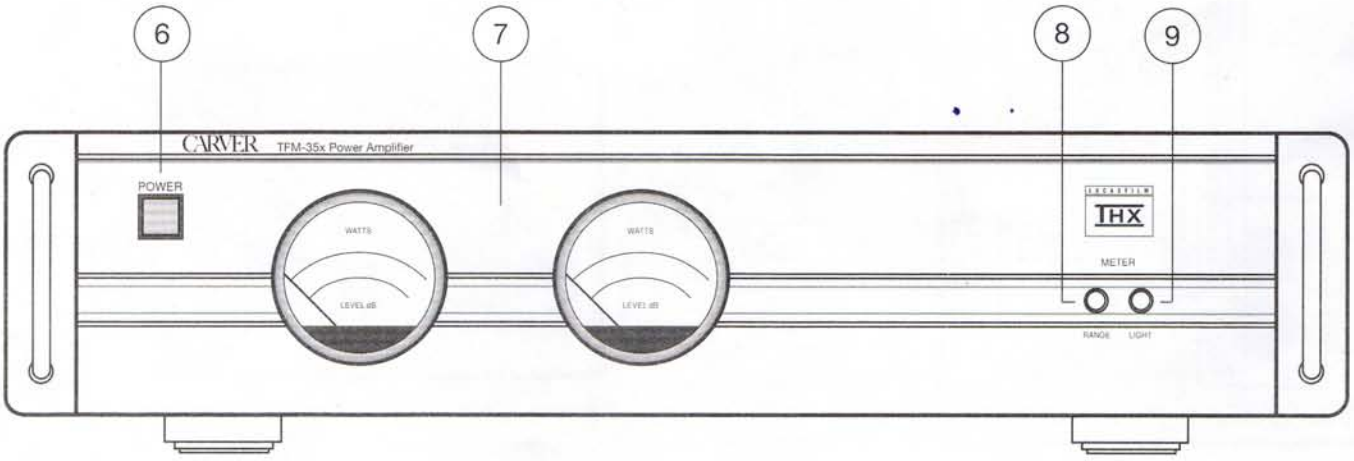

Figure 2. TFM-35x Front Panel View

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 TFM-35x are interconnected with other audio components.

Stereo/Mono Switch set to STEREO position.

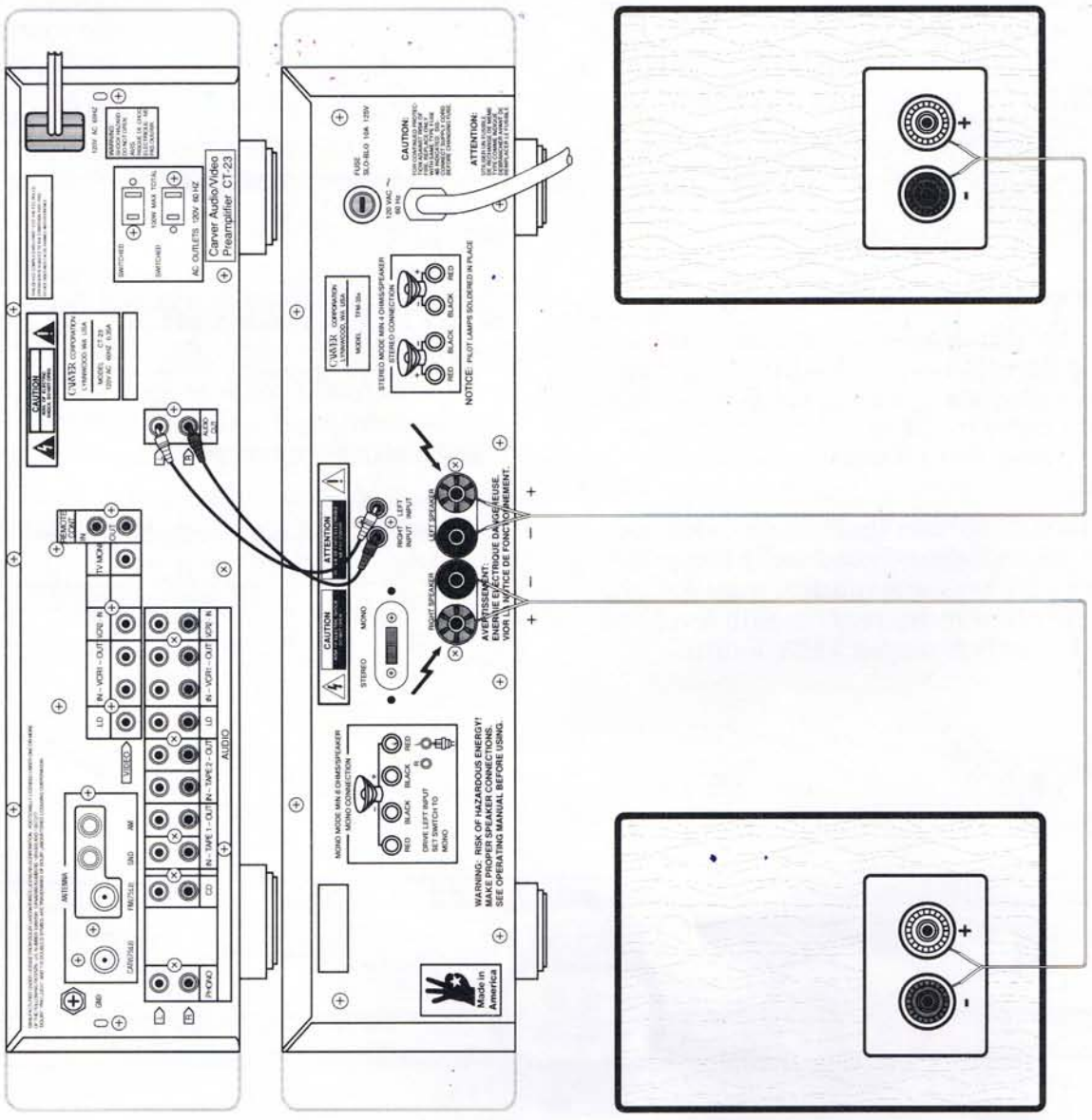

Figure 3. Normal Stereo Operation

Installation Notes:

Two TFM-35x 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 8 ohms or more when operating in mono mode. Use of a 4 ohm speaker could cause harm to the TFM-35x when set to mono mode.

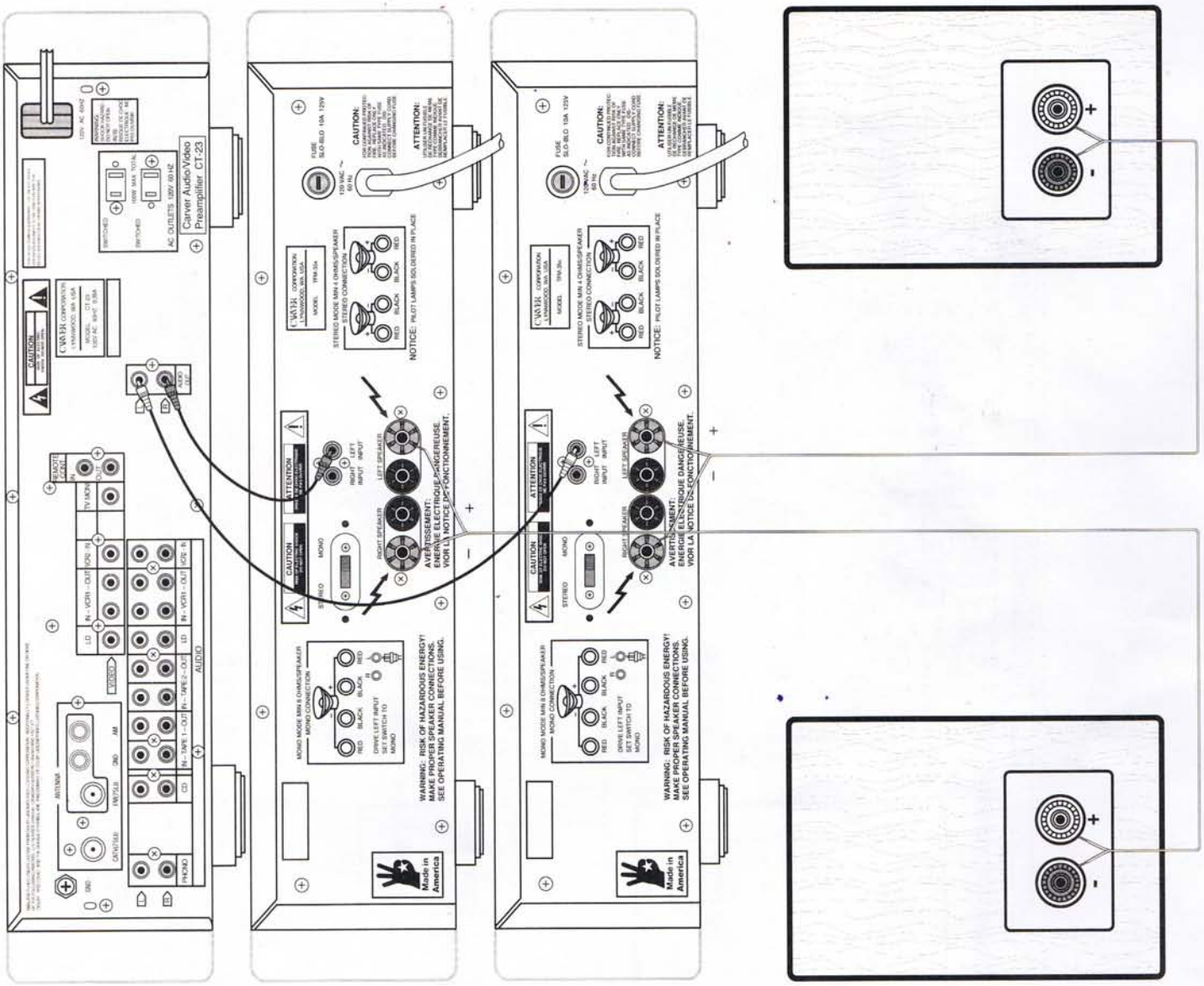

Figure 4. Bridged Mono Operation

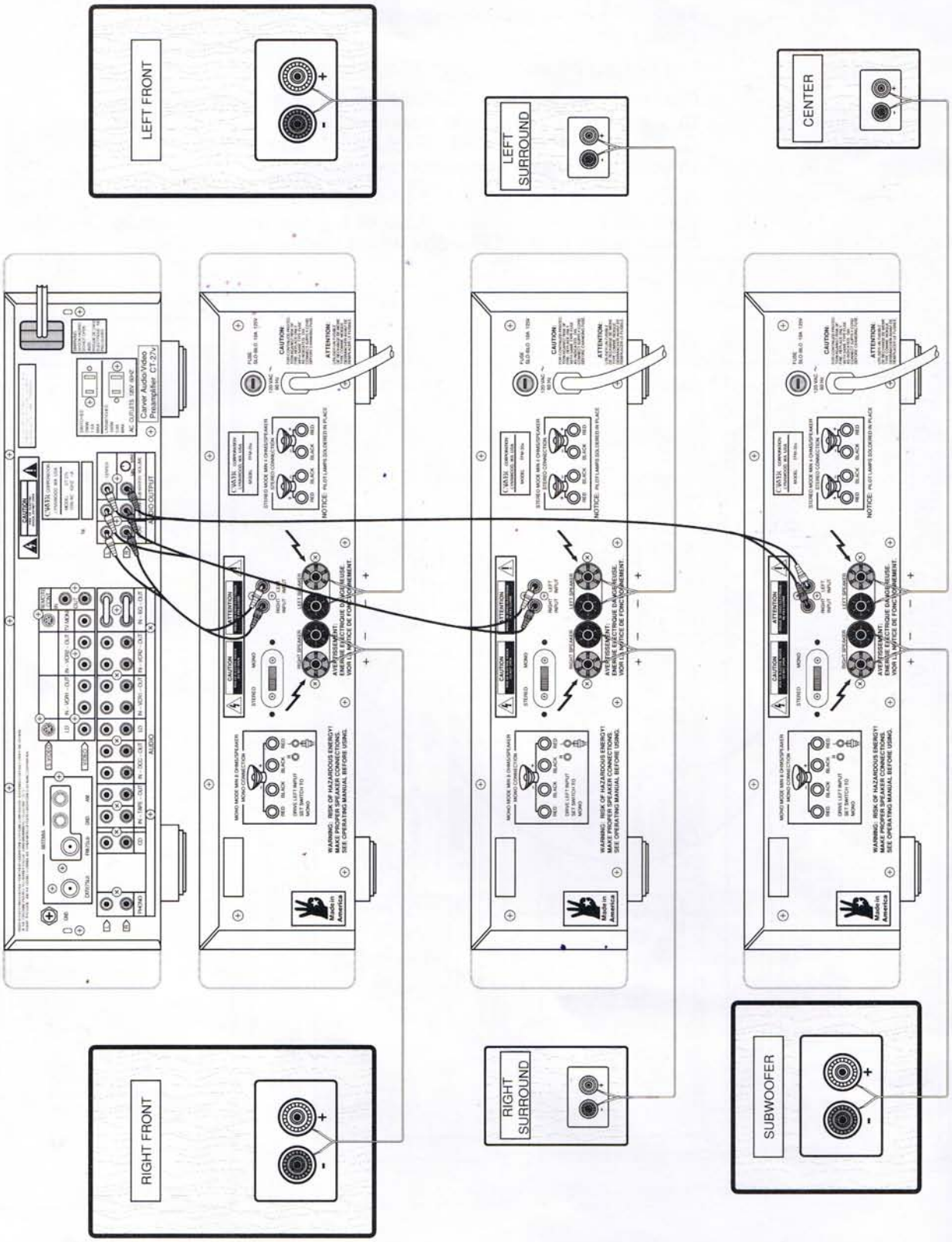

Figure 5. Home Theater 5.1 Channel Surround Sound System

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.

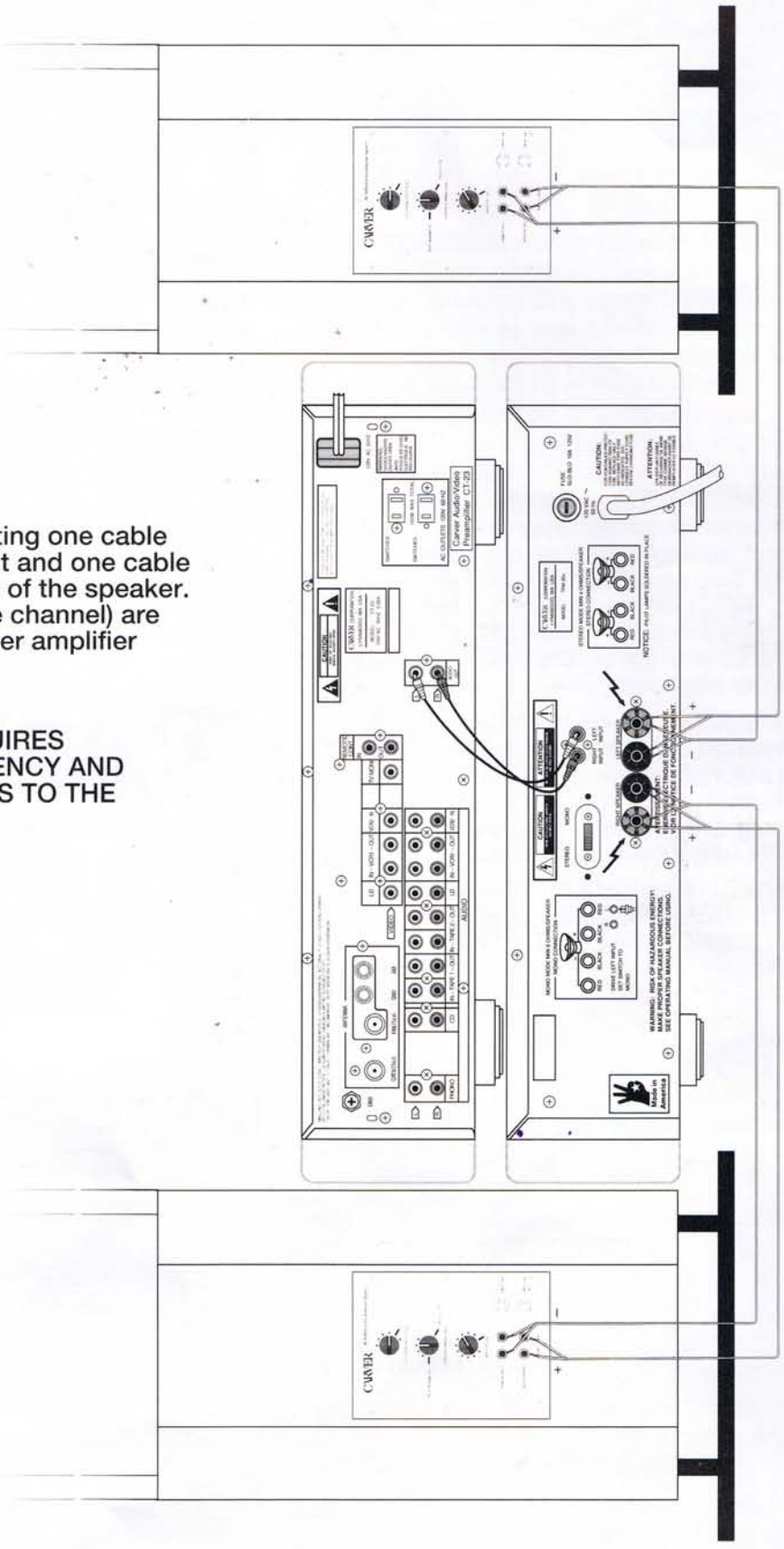

Figure 6. Bi-Wired Connection to Speakers with built-in crossover

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.

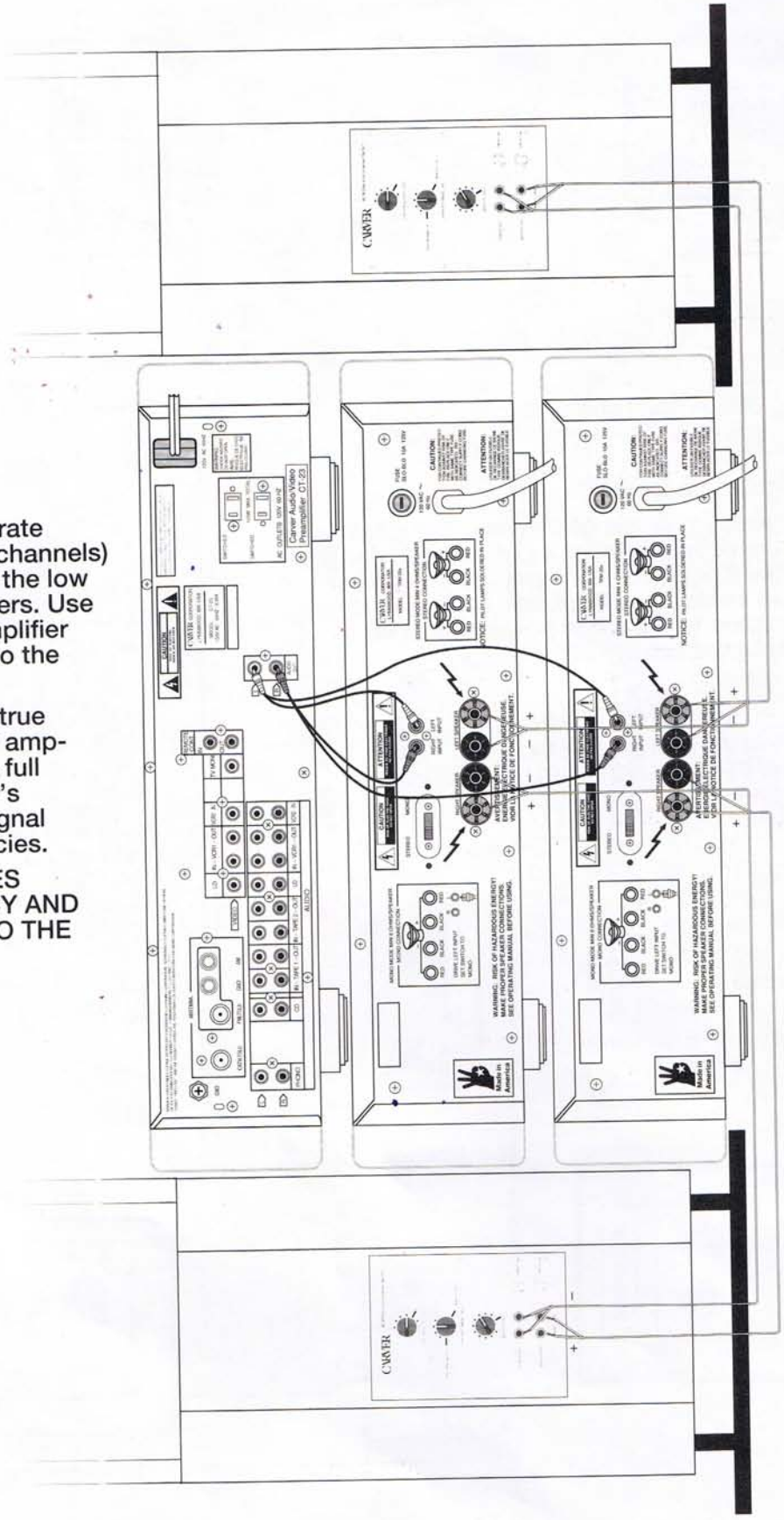

Figure 7. Bi-Amplified Connection to Speakers with built-in crossover

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 TFM-35x.

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 TFM-35x is designed to be compatible with virtually any quality preamplifier, preamplifier/tuner or surround sound processor. 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 TFM-35x. 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 10 through 14.

Amp-to-Speaker Connections

Speaker Connections

You can connect one or more sets of speakers to the TFM-35x, depending on the impedance rating of the speakers.

We recommend connecting 4 ohm or 8 ohm speakers to the speaker connections on the TFM-35x. If two sets of speakers are going to be used at the same time, we recommend using 8 ohm (or 16 ohm) speakers. This is because when two sets of speakers are connected in parallel with each other, the total impedance seen by the amplifier drops to one-half the impedance of one speaker by itself. Two 8 ohm speakers in parallel become 4 ohms.

Furthermore, speakers are not simply resistive loads. Instead they are complex and reactive, drawing disproportionately large "in-rush" currents in reaction to transient voltage signals. The impedance of a speaker is a complex product of things like resistance, inductive reactance and capacitive reactance. Realistically, it's a factor of how the speaker will behave when connected to an amplifier. The lower the impedance, the more amplifier current will be required.

Modern speaker systems most often have NOMINAL impedance ratings of 4, 6, or 8 ohms. This rating can be found in your speaker handbook, and is often printed on the back of the loudspeaker.

The TFM-35x is designed for CONTINUOUS use with 4-ohm speaker impedances (or higher). If you're just using one set of speakers, there's no problem – the amplifier sees the impedance at which the speakers are rated. But if you're connecting TWO sets of speakers, the impedance of both sets becomes important – and interactive.

To calculate the total impedance (Z_T) for two sets of speakers being operated at the same time, use the following formula:

$$Z_T = \frac{Z_1 \times Z_2}{Z_1 + Z_2}$$

where Z_1 and Z_2 are the individual impedances of the two speaker systems.

Remember:

4 ohm minimum impedance in stereo mode

8 ohm minimum impedance in mono mode

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 TFM-35x and your speakers. Use the following chart as a guide:

Wire Length	Gauge of Zip Cord
Up to 15 ft.	18 gauge
Up to 25 ft.	16 gauge
Up to 40 ft.	14 gauge
Up to 60 ft.	12 gauge
Up to 100 ft.	10 gauge
Up to 150 ft.	8 gauge
Up to 250 ft.	6 gauge

The greater the distance between your TFM-35x 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 TFM-35x speaker terminals are designed to accept bare wire, spade lugs 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 8). Tighten the connection down on the wire.
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.

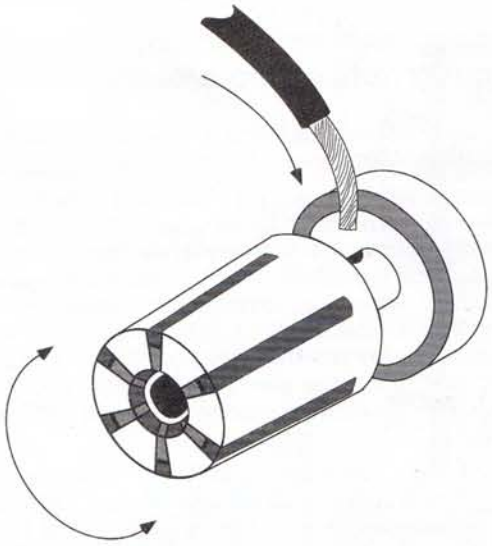

Figure 8. Bare Wire Connection

For spade lug connections

Spade lugs can be attached to the end of the speaker wire. Select a lug that is the correct size for the wire that you are using (specified by wire gauge). The terminal width should be 1/4" diameter to fit over the binding post shaft (see Figure 9).

1) Strip 1/2" of insulation off each wire as described above. Slip the bare wire into the barrel of the spade lug and crimp or solder into place.
2) Unscrew the binding post speaker terminal and slip the spade lug over the binding post shaft. Tighten the connection down on the lug.

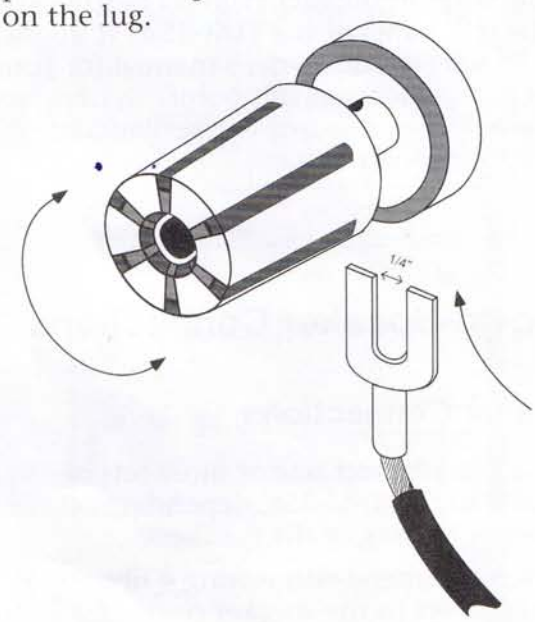

Figure 9. Spade Lug Connection

For banana plug connections:

Banana plugs can be attached to the end of the speaker cable and plugged directly into the TFM-35x's binding post sockets (see Figure 10). 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.

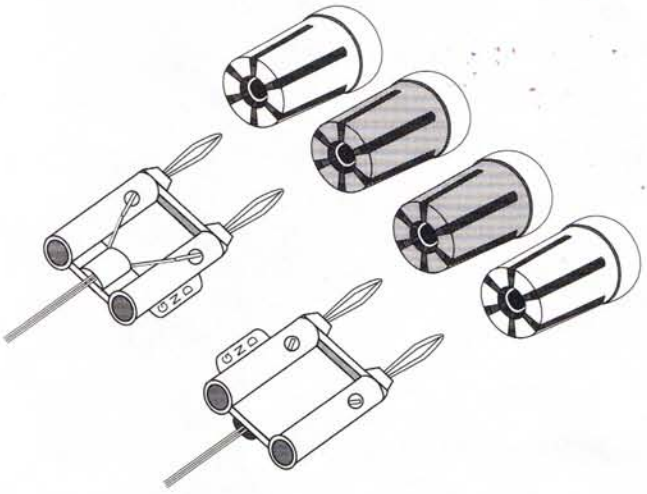

Figure 10. Banana Plug Connection

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 TFM-35x speaker outputs to "–" on the back of the speaker, and "+" at the TFM-35x speaker outputs to "+" on the back of the speaker.
2) Connect the TFM-35x left speaker outputs to the left speaker inputs, and the right TFM-35x 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 TFM-35x will provide 700 watts of power into 8 ohms when used in mono (bridged) mode. See page 11 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 TFM-35x 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 TFM-35x. DO NOT connect anything to the TFM-35x's RIGHT input jack during mono operation!
3. The speaker leads for ONE CHANNEL ONLY must be connected to the RED TERMINALS of the TFM-35x. 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 8 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 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

The 120V version of the TFM-35x is fused with a 10 amp slo-blo fuse. If necessary, replace with MDA 10 or equivalent. The 220V-240V export version of the TFM-35x is fused with a 5 amp slo-blo fuse.

Warning: NEVER replace or check the fuse while the TFM-35x is connected to an AC outlet. Be sure the amplifier is turned off AND unplugged before removing the fuse. If you replace the fuse, be sure you install a fuse of the same type and rating.

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 an impedance of less than 2 ohms, or the speaker wires should accidentally short together, the speaker 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.

Thermal

Each amplifier channel is protected by a thermal switch that turns off the speaker relays if the temperature on the heatsink exceeds a predetermined level. The amplifier will remain in "Standby mode" until the heatsink cools to a safe operating level, at which time the relays will turn back on and normal operation will resume.

DC Offset

In the unlikely event than 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 TFM-35x, 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.

7. In Case of Difficulty

If you're having trouble or suspect a problem with the TFM-35x, 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. In a vast majority of situations, the problem can be traced to one of the following:

1. Controls or connections are incorrect.
2. TFM-35x internal protection circuits are activated.
3. TFM-35x protection fuse is blown *.

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. TFM-35x 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. TFM-35x is plugged into a switched outlet. Verify that the outlet is live.
6. TFM-35x fuse has blown *.

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 TFM-35x.

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.
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. Turn off your stereo system and check preamplifier-to-power amplifier cable connections.
4. Move the input connections to another amplifier that you know is working to verify that it is not a source problem.
5. Turn the TFM-35x 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 that the setscrews in the plug are securely tightened.
6. If speaker fuses are installed in the loudspeakers or the speaker cables, verify that they are not blown.
7. Make sure the speakers are functioning correctly.
8. 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 17).

Amplifier runs at first, then no sound.

1. Heatsink thermal switch senses high temperature. Improve top cover ventilation. Make sure that the ventilation holes are not blocked.
2. Fuse is blown *.

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 TFM-35x is not driving an excessively low impedance speaker. For recommended speaker connections refer to page 15.

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 TFM-35x 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 TFM-35x, 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 TFM-35x, 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. Check or replace the connecting 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.

Distortion

Distortion is usually caused by an input signal that is too low (where the preamplifier can't produce enough output), overdriving resulting in output clipping, or 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 TFM-35x.
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.

* **Warning:** Never replace or check a fuse while the unit is plugged into an AC outlet. The TFM-35x must be turned OFF and unplugged for fuse replacement. Use a fuse of exactly the same rating as the one installed in the unit. If in doubt, contact your dealer or Carver Customer Service.

8. Care and Service Assistance

Care

You'll want to wipe off the TFM-35x'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.

Never short circuit the output terminals of the amplifier. When connecting the loudspeakers, avoid speaker wires touching at the terminals. Do not drop the amplifier. Never replace the fuse with one other than the specified rating. If you suspect a problem, try system troubleshooting first. Frequently, a problem lies elsewhere in the system or even in the connection cables.

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 (206) 775-6245 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 Service Department
P.O. Box 1237
Lynnwood, WA 98046-1237

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

(206) 775-9180 *Customer Service Fax*

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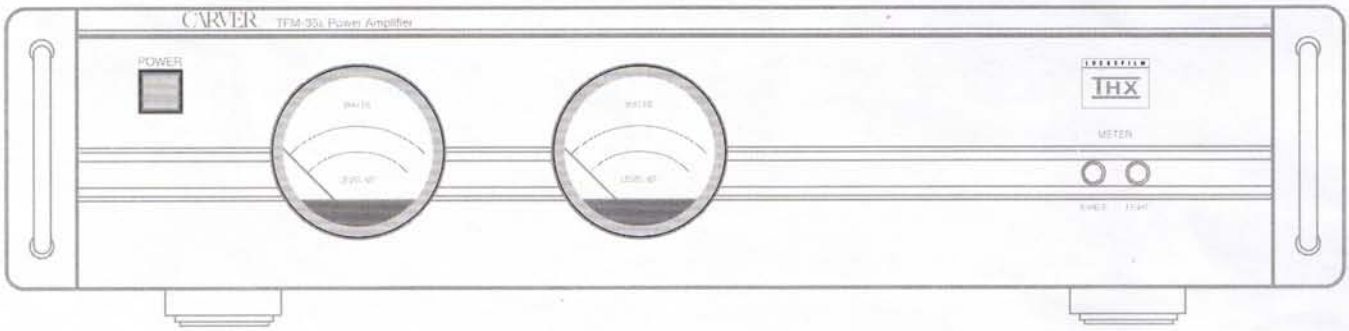

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