CARVER

TFM-15
High-Current/High-Voltage Power Amplifier
Owner's Manual

CARVER

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 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.

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 de-

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.

scribed 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.

STOP!
PLEASE READ THIS!

Key Points Are Highlighted in Boxes

Ultra-important information about hooking up and operating your TFM-15 is enclosed in boxes like this one.
If you're an experienced hi-fi buff and don't usually read manuals all the way through (or are just super-impatient), at least read all the info in the boxes throughout this manual.

A MESSAGE FROM BOB CARVER

Thank you for choosing a Carver power amplifier. We at Carver Corporation realize that there is an abundance of home electronics from which to choose, and that the differences between the various models are not always apparent at first glance. We strive to produce for you the finest in audio reproduction equipment. Our intent is to integrate the latest and best technology with the most competitive price possible.

High current and high voltage

Our TFM-15 is capable of high simultaneous current and voltage output. Judged against conventional amplifier standards, it is second to none; its sound quality is smooth, sweet and absolutely dynamically accurate. It can deliver more than 100 watts RMS per channel into an 8 ohm loudspeaker with less than 0.1% THD and even more power into lower impedances. In addition, the closed-loop frequency response extends from below 10 Hz to beyond 100,000 Hz.

Transfer Function Calibration

Your new TFM-15 Power Amplifier shares many of the the sonic charactaristics of my reference Silver Seven Tube amplifier, including extended low frequency performance, excellent power bandwidth, low residual noise, stable performance into complex impedances, flat frequency response, low distortion and high dynamic headroom.

Made where?

Carver is American-owned and based in Lynnwood, Washington. Of the almost 250 people who work here, most are engaged in building Carver home, mobile and professional audio products. Carver's goal is and always will be to provide audiophile-quality products at affordable prices. Thus, we strive to take advantage of manufacturing economies and methods wherever possible. As a result, we DO use outside production facilities for some products and take great pains to indicate the country of origin on your packing box. Suffice it to say that the TFM-15 is built to our specifications and is the great value it is because we have chosen the most effective production source for the particular model.

I am proud to present to you the best in craftsmanship and design found in Carver electronics.

Bob Carver

Robert W. Carver
President, Carver Corporation

HOOK-UP

Don't plug it in yet!

Do not connect the TFM-15 to AC power until all signal connections have been made and the installation is complete.

First things first.

Upon opening the box, please check for any visible sign of damage that does not appear on the outside of the box. If you do encounter what appears to be concealed damage, please consult your Dealer before proceeding to further unpack the unit.

If no damage is found, gently lift out the unit by grasping the handles. After lifting the amplifier out of the box, gently lift first one side, then the other and remove the molded side packing material.

Please save the box, as well as all of the internal packing materials! This container is the best way to store and move your new Amplifier. If your amplifier should need repair, the original container is ideal for shipping to a Carver Service Center.

Make a note of the serial number which is located on the back of your Amplifier. Record it in the space provided in this manual for convenient reference. You will need to refer to this number if you need service or if your unit is (perish the thought) stolen.

Model: TFM-15

Serial number _____

Purchased at _____

Date _____

Make sure to save your sales receipt. It is extremely important to establish the duration of your Limited Warranty and for insurance purposes.

Finally, take a moment to fill out and return the Warranty Card that came with the amplifier and return it to Carver.

Amplifier Placement

The real no-no's are listed on the first page of this manual. They include common sense stuff like "don't use the TFM-15 in your swimming pool." Assuming your location is OK, the amplifier can be positioned as part of a "stack" of components if some care is taken. Because the TFM-15 is convection-cooled it requires clearance for air to reach the ventilation slots on the top, bottom, and sides of the unit.

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

The TFM-15 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 such as that created by two shelves abutting a solid cabinet back panel. That creates a static air space where temperatures can rise quickly.

Connection tips

We're about to launch into the actual nitty gritty patch cord frenzy that results when you get a new component. First, though, consider the following tips.

- Turn all other components OFF before making any connections.
- 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 from CD player, tape deck etc.) to prevent hum. This is especially important for phono cables which carry very weak signals. 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 wrapped up with a hook-up cable. Carver components' power cords and convenience outlets are on the right side of the chassis (when viewed from

the back). This allows you to bundle all the power cords and keep them separate from signal connections.

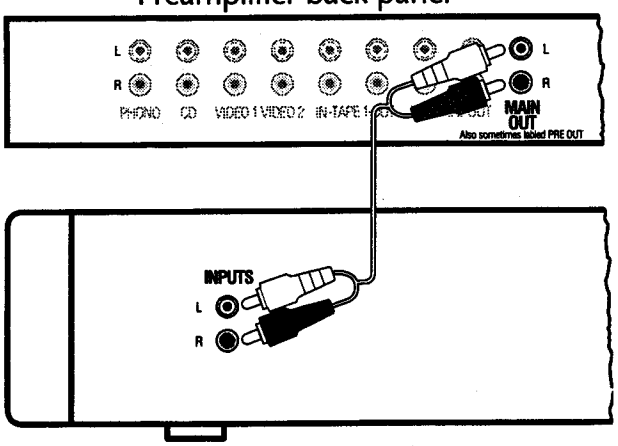
- *Type of hook-up cords.* Also called interconnects, patch cords or RCA cables. There are lots of different grades of hook-up cables. You can pay as much as $30 per foot for some of them! Whether or not you get an incremental increase in sound quality with "audiophile" interconnects is up to your own ears. However, really CHEAP connection cables can sometimes DIS-connect themselves inside, causing a loss of sound in one channel or hum problems. Before you send a component in for service, swap hook-up cables to see if they're the culprit.

Amp-to-preamp connection

The TFM-15 is designed to be compatible with virtually any quality preamplifier, preamplifier/tuner or CD player direct output.

1. Make sure that the TFM-15 is turned off. Better yet, actually disconnect it from the wall socket momentarily.
2. Use standard audio cables to connect the RIGHT and LEFT INPUTS on the rear panel of the TFM-15 to the appropriate OUTPUTS of the preamplifier. It might help to refer to your preamplifier (or tuner/preamplifier's Owner's Manual at this point).

Preamplifier back panel



TFM-15 back panel

Speaker connections

Your Carver TFM-15 has two sets of speaker outputs on its back panel. You may connect two sets of speakers and play either or both of them at the same time using the SPEAKER A/B button on the front panel. However . . .

Speaker impedances

While the TFM-15 is capable of high current output into low-impedances, we do not recommend playing two sets of 4-ohm speakers at high volume at the same time (see "A further note about impedances" farther on in this section). If you're not sure of the Rated Nominal Impedance of your speakers, consult the owner's manual which came with the speakers, or call the manufacturer or your dealer.

Wire. Use thick wire for speaker connections. Your Carver dealer can recommend a brand of high quality, oxygen-free speaker 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-15 to your speakers. Use the following chart as a guide:

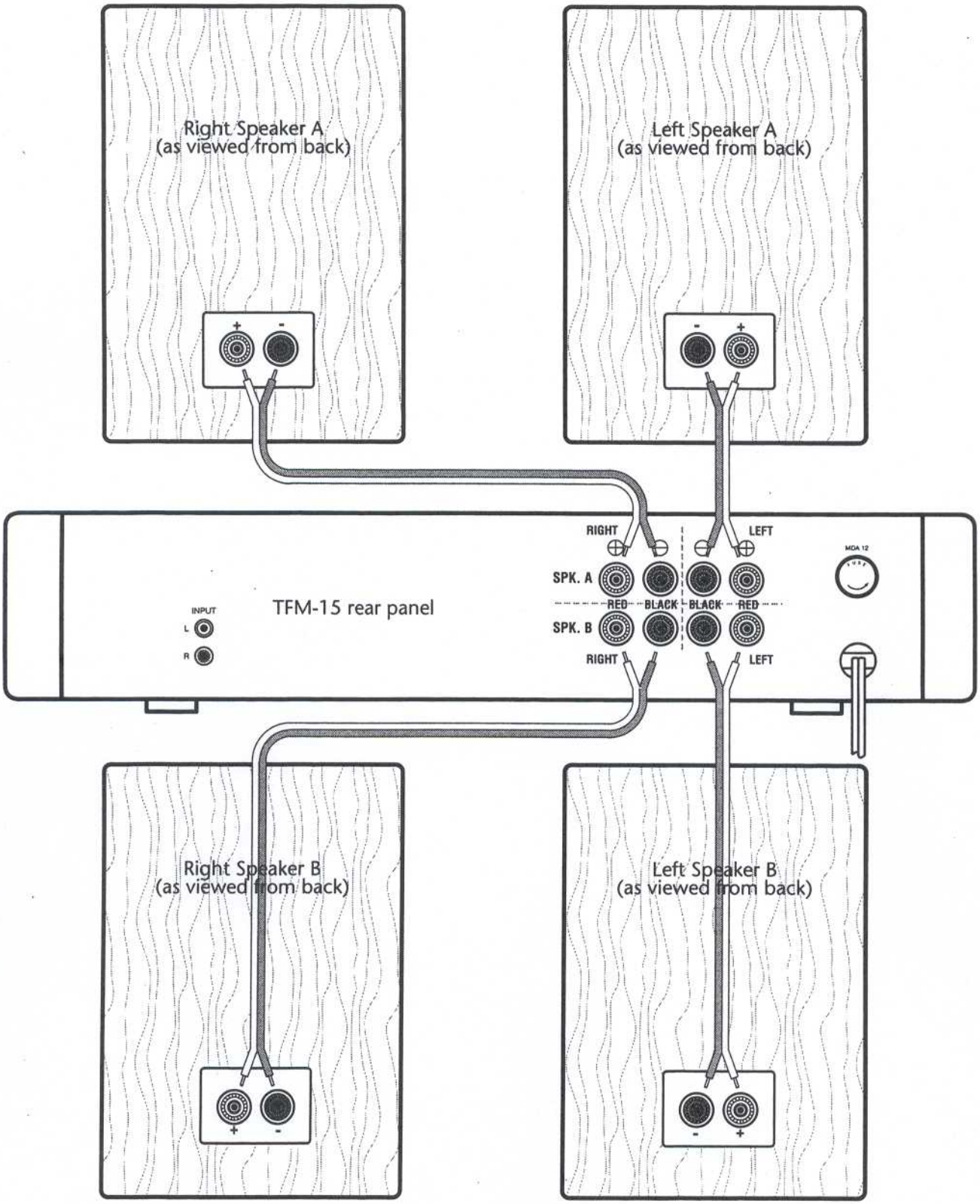
WIRE LENGTH	GAUGE OF ZIP CORD
Up to 8 ft	18 gauge
Up to 12 ft	16 gauge
Up to 20 ft	14 gauge
Up to 30 ft	12 gauge
Up to 50 ft	10 gauge

The greater the distance between your TFM-15 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).

Use the same length of speaker wire for both speakers, even if one is closer to the amp than the other. Coil up the excess and make sure it's well away from your preamplifier's turntable cables.

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 A or B terminals are hooked up the same way:

1) "-" at the TFM-15 speaker outputs to "-" on the speaker back, and "+" at the TFM-15 speaker outputs to "+" on the speaker back...and



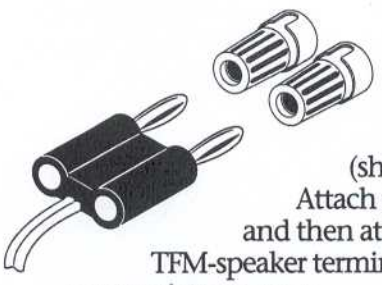
2) Left TFM-15 speaker outputs to left speaker inputs, and right TFM-15 speaker outputs to right speaker inputs.

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.

Hook-up. The TFM-15 speaker terminals are designed to accept bare wire, spade lugs, bananna plugs.

1. If you're using bare wire, 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 each TFM-15 speaker terminal and insert the wire as shown.
3. Tighten the connection again.
4. Larger-gauge "audiophile" speaker cables may be too thick to be inserted directly into the TFM-15 terminals. They may require special connections such as banana plugs (shown) or spade lugs. Attach the wires to the plugs and then attach them to the TFM-speaker terminals in the appropriate manner.



5. After you've hooked up one or two sets of speakers, double-check your connections. This may sound redundant, but we repeat: 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.

Amp-to-wall-socket connection

The TFM-15 may be plugged into an extension cord, splitter or properly rated preamplifier convenience outlet (500 W rating). Avoid using thin, lightweight cords. Note that one line plug prong (spade) is slightly wider than the other and will only insert one way into an outlet. Make sure this polarity is maintained if an extension cord is used.

If you're using your new TFM-15 with just one set of speakers, you can skip the next information and go directly to page 10. If you're using both A and B speaker connections, read on . . .

A further note about speaker impedances

Why do we publish specifications for "2-ohm dynamic power" and then warn you about not using two sets of 4-ohm speakers at the same time? Because impedance has several definitions and becomes a factor at different times.

Speakers are not simply resistive loads. Instead they are complex and reactive, drawing disproportionately large "in-rush" currents in reaction to transient voltage signals. Because music is dynamic, with multiple instantaneous peak power demands, the speaker is constantly bombarded with short transient voltage drive signals and constantly drawing high "in-rush" currents. The overall long term voltage and power draws are not significantly higher than those of a resistive load. But at any given moment, peak "in-rush" currents must be delivered far in excess of the average demands. If these cannot be supplied by an amplifier , distortion and reduced dynamic range result. Impedance is a complex product 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, is often printed on the back of the loudspeaker and can also be found in Audio Magazine's Annual Equipment Directory.

The TFM-15 is designed for CONTINUOUS use with 4-ohm or 8-ohm speaker impedances. If you're just using one set of speakers, there's no problem — virtually anything you connect to the TFM-15 will have a nominal impedance of 4, 6, or 8 ohms. But if you're connecting TWO sets of

speakers, the impedance of both sets becomes important — and interactive.

Impedances for two sets of speakers being operated at the same time uses the following formula

Total impedance (Z) of such a system is calculated with the following formula:

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

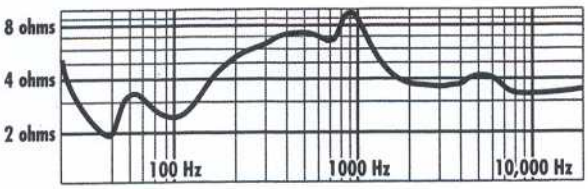
Where Z_1 and Z_2 are the individual impedances of the two speaker systems. That leads to the following chart:

Recommended Impedance Combinations

Speaker Pair A	Speaker Pair B	Combined Impedance	OK/not OK
8	not used	8	OK
6	not used	6	OK
4	not used	4	OK
8	8	4	OK
6	8	3.4	Marginally OK
6	6	3	NO
4	8	2.7	NO
4	4	2	NO

As you can see, two sets of 8-ohm speakers in parallel represent a 4-ohm total load, which is OK. However, two sets of 4-ohm speakers is a 2-ohm load and is not recommended.

Now what about "2-ohm dynamic power"? First, it's important to understand that NOMINAL is a fancy way of saying average. While a speaker is nominally rated at a single impedance, it can actually vary widely over the entire frequency range. Shown below is a popular 3-way loudspeaker's true impedance curve. Note that it varies almost 10 ohms across the 20Hz to 20,000 Hz musical spectrum.



And yet its published "Nominal Impedance" is 6 ohms! Obviously, 6 ohms is an optimistic average, NOT a constant.

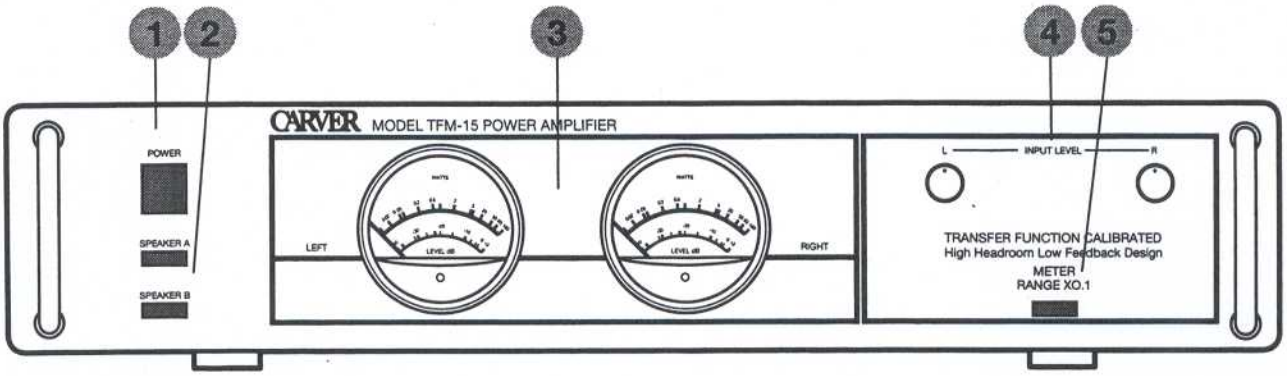
Note also that this popular, widely-distributed speaker takes its most serious impedance plunge in the lowest frequencies where the most power is required from a power amplifier. This design's perilous 50 Hz and 100 Hz dips correspond with many musical instruments including kick drums, floor tom drums, tympani, plucked double bass viols and electric bass guitars. You can imagine how an amplifier is taxed on a well-recorded CD at realistic listening levels with this speaker.

In addition, because music has wildly varying frequency distribution (and listeners have wildly different opinions of what to do with bass and loudness controls), problems stemming from low speaker impedances can be frustratingly intermittent.

Whether anything unpleasant happens when a speaker's impedance dips into the 2-ohm range during a song depends on the amplifier design — particularly its ability to produce large amounts of current for short periods of time into low impedances. We have designed the TFM-15 to satisfy momentary low impedance power demands and that's where the design's "2-ohm dynamic power" rating comes from. Still, it doesn't mean you should operate the amp into a "nominal" 2-ohm load which may actually dip under 1 ohm.

Following a short section on the TFM-15's front panel features, you'll be ready to start enjoying your new Carver power amplifier.

Front panel features



1. **POWER SWITCH.** The TFM-15's POWER switch should not be switched ON if your preamplifier is turned up loud. Press MUTE on the preamp, lower the volume control or choose an input which is not playing, before turning on the TFM-15.

Switched outlet power rating

The TFM-15's POWER switch can be left in the ON position if the amplifier has been plugged into the SWITCHED outlet of a preamplifier or tuner/preamplifier.

However, the switched outlet's power rating should not be LESS than 500 watts. Consult your preamplifier manual if necessary.

NOTE: When the TFM-15 is first switched ON, the inputs will be muted for about four seconds to allow the amplifier to stabilize. This transient delay circuit helps prevent speaker-damaging THUMP's when powering up. But because we cannot vouch for the rest of your signal chain, it is suggested that you turn on the TFM-15 after your preamplifier, CD player, tuner, etc. However, make sure that a loud signal source is not playing through the preamplifier when you turn on the power amplifier.

2. **SPEAKERS A/B buttons** select the pair of speakers you intend to listen to. If you have connected two pair of 8-ohm speakers, you can select both A and B speaker systems and play them both at the same time. If one or more of the speaker systems has a lower impedance (see page 8), you should only select A or B, not both at the same time.

Speaker switching at high levels

Avoid switching the TFM-15's A-B speaker selector when playing the power amplifier at high volumes.

3. **POWER METERS.** The TFM-15 employs ballistically-weighted analog power meters which are calibrated in watts. These "1" and "X 0.1" scales serve as relative indications of amplifier output voltage. Meter ballistics include a specified amount of over-shoot. Therefore, on much musical material, the meter will often go past 0dB. At this point, the TFM-15's headroom will be exhausted. Because different musical material interacts differently with the ballistics of the meter, the best way to tell if the amplifier is overloaded is to simply listen. If you hear distortion at the same time the meter is "pegging", you have probably exhausted the TFM-15's power reserves.

4. **INPUT LEVEL** controls are used to adjust the incoming signal level. Normally both left and right INPUT LEVEL knobs should be set at MAX (see the next section for more information). Wherever they end up being set, both should be adjusted to the same relative position.

5. **METER RANGE button.** When this control is in its OUT position (not pushed), the TFM-15's meters will indicate watts of output power via the upper meter scale. You could think of this as the "TIMES 1" position.
However, amplifier power output and volume are not linear. At moderate background music levels, your speakers may not be drawing much more than 1 watt, and you won't see much meter movement. So we've provided a second level of meter sensitivity, the "X0.1" setting. When you press the METER RANGE button in, the meter indicates just 1/10th of the total amplifier output on the lower meter scale. In other words, the meter's display has been "magnified" ten times. With the button in the "X0.1" position, a watt of power now moves the meter as much as 10 watts does when the METER RANGE button is not pushed in.
If you are playing the TFM-15 at high volumes, do not leave the METER RANGE button in the "X0.1" position, to avoid damage to the meter movement.

Operating Tips

Make every effort to keep your amplifier away from high external temperatures, moisture, and airborne substances that can leave greasy deposits and dust. When panels and covers become dirty, they can be cleaned with a soft cloth slightly moistened with a diluted ammonia solution. Never use detergents, abrasives, or a wet cloth.

Since the TFM-15 is used in conjunction with a preamplifier or tuner/preamplifier, there aren't really any operating instructions except to turn it on AFTER the preamp and set the INPUT LEVEL knobs to the MAX position. Still, there are at least two things which you can check before general use: L/R connections and speaker polarity.

A short test-drive

1. Turn the TFM-15's INPUT LEVEL controls all the way down.
2. Turn on your preamplifier, sound source (such as a CD player) and then the TFM-15.
3. Make sure the volume control on the preamplifier is turned all the way DOWN (to MIN on Carver models).
4. Carefully turn the INPUT LEVEL controls on the TFM-15 to MAX. Listen for hum or noise. If you hear any, consult the "Help! Troubleshooting Guide" farther on in this manual.
5. Press PLAY on the sound source.
6. S-l-o-o-w-l-y turn up the preamplifier volume control to your "normal" listening level. If the volume increases quickly and you can't rotate the volume knob very far before the sound level gets deafening, see "Aggressive preamps" below.

   If you don't hear anything, consult "HELP! A troubleshooting Guide, farther on in this manual". Otherwise:
7. Rotate the preamp's BALANCE CONTROL all the way to the left. Does the sound move to the left speaker? If it heads the other way, 1) your LEFT and RIGHT SPEAKER OUTPUTS need to be switched or; 2) the hook-up cable connec-

tions between preamplifier and the TFM-15 have been interchanged and need to be switched. Make sure to turn off the TFM-15 before making either change.

Changing audio connections

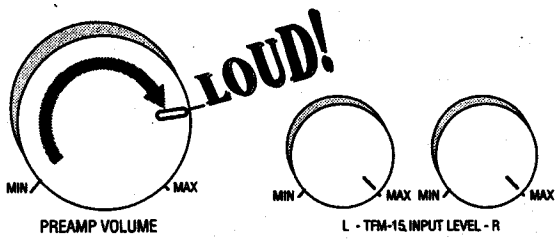
The amplifier must be turned OFF for at least ONE MINUTE before any AUDIO cables may be disconnected.

8. If your preamp has a MONO button, have someone push it while sitting in your normal listening position between the loudspeakers. If there is very little perceived change when MONO is pushed, the "+" and "-" leads of one speaker are connected differently than the other. This is called "out of phase" and results in poor bass response. On the other hand, if the stereo sound field "collapses" when MONO is pressed you've made your speaker-to-TFM-15 connections correctly.
   If your preamplifier doesn't have a MONO button, you can do the same test by listening, switching the "+" and "-" leads of ONE speaker and then listening again. Make sure to turn the TFM-15 off when making the temporary switch, however.
9. Turn the preamplifier volume down to a background listening level. Note how little the TFM-15's meters move. Now press the "X0.1" button. Big difference.

Aggressive preamps

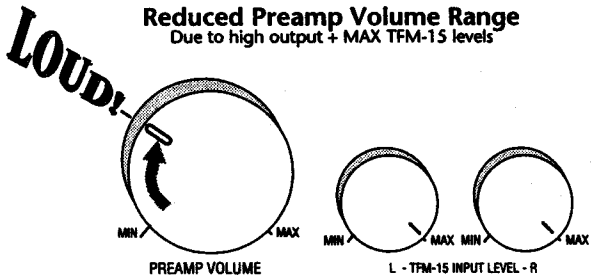
Normally, you should be able to turn the preamplifier's volume control knob up almost all the way (depending on your speakers and how loud you consider loud to be). The following drawing shows how things SHOULD work — and will with all Carver preamplifiers and preamp/tuners.

Normal Preamp Volume Range
With "standard" output preamplifier and TFM-15 controls set to MAX as recommended



However, occasionally a preamplifier design has a higher output level than the norm. In this case, setting the TFM-15's INPUT LEVEL controls to MAX severely restricts the range of control that's possible with the preamp's volume control. If the preamp is sufficiently high output, you may not be able to move the volume control past 11 o'clock before the sound level is deafening.

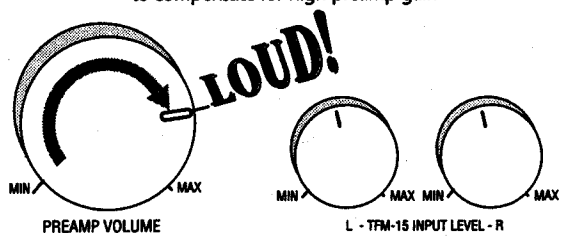
Reduced Preamp Volume Range
Due to high output + MAX TFM-15 levels



There are two drawbacks to that situation. First, you run the risk of seriously over-driving the TFM-15 and hence your speakers (even if YOU never turn the volume knob very far, someone else may come along and do so). Second, it's hard to make slight adjustments in volume when you have such a limited range.

The answer is to reduce the TFM-15's input sensitivity.

Optimal Hi-Output Preamp Volume Range
With TFM-15 input control levels reduced to compensate for high preamp gain



1. Turn on your preamplifier, sound source (such as a CD player) and then the TFM-15.
2. Make sure the volume control on the preamplifier is turned all the way DOWN (to MIN on Carver models).
3. Make sure both INPUT LEVEL controls on the TFM-15 are turned to MIN (that's all the way to the LEFT).
4. Press PLAY on the sound source.
5. Advance the preamplifier volume control to 3 o'clock (see illustration below).
6. S-l-o-o-w-ly advance the TFM-15's left and right INPUT LEVEL controls until the sound is as loud as you'll EVER play your system.
7. Reduce the preamplifier volume so that you don't get a headache and/or evicted.
8. Double-check that both TFM-15 INPUT LEVEL controls are set exactly to the same point. Then, if necessary, make fine adjustments to the individual LEFT and RIGHT controls to balance the sound level from left and right speakers.

HELP! A troubleshooting guide

Before returning your TFM-15 to the dealer or Service Center for repair, review the "symptoms" and "cures" in this section. In a vast majority of situations, the problem can be traced to one of the following:

1. Controls or connections incorrect.
2. TFM-15 internal protection circuits activated.
3. TFM-15 protection fuse blown

First, check connections and controls.

Handy Troubleshooting Shortcut

The TFM-15's power meters are a valuable troubleshooting aid. If the problems involves loss of sound in one or both channels, try the following:

1. Set the TFM-15 SPEAKER A and SPEAKER B switches both to OFF.

2. Turn the TFM-15 INPUT LEVEL controls fully down.

3. Set the TFM-15 METER RANGE switch to "X0.1."

4. Turn on the preamp and music source. THEN turn on the TFM-15.

5. Set the preamp volume control to the "12 o'clock" position (straight up).

6. Slowly turn up the TFM-15 INPUT LEVEL controls equally and watch the power meters for an indication of signal.

7. If both TFM-15 power meters indicate the presence of signal, then the entire signal chain (sound source/preamp/TFM-15) is probably OK. In this case, check you speaker connections.

8. If you have no indication from one or both power meters, use the troubleshooting tips that follow:

The meters don't light when POWER switch is turned on.

1. Line cord disconnected.
2. Poor fit between plug and wall receptacle.
3. Power off at wall receptacle (check it with a tester, lamp or VOM meter).
4. If amplifier is plugged into switched preamp receptacle, the preamplifier is turned off.
5. TFM-15 fuse is blown and needs replacement with one of the same rating. WARNING: NEVER replace or check a fuse while the unit is plugged into an AC outlet.

Amplifier runs initially, then no sound.

1. TFM-15 internal protection circuit has been activated. See below.
2. TFM-15 fuse has blown. WARNING: NEVER replace or check a fuse while the unit is plugged into an AC outlet. The amplifier must be turned OFF for at least one minute before any AUDIO cables may be disconnected.

Sound cuts off when preamplifier VOLUME control is turned up.

1. Check speaker wires for a short.
2. Check speakers for damage which may have caused an internal short.
3. Make sure that the TFM-15 is not driving an excessively low impedance due to more than one set of 4-ohms speakers being connected at once.

Amplifier lights up but no sound from both channels.

1. Make sure that the TFM-15 INPUT LEVEL controls are turned up.
2. Check preamplifier-to-power amplifier cables.
3. Make sure that all preamplifier controls, especially TAPE MONITORS are set correctly (A TAPE MON button accidently pushed in is the number one cause of unexpected silence).
4. Make sure that the correct preamplifier input sound source has been connected.
5. Check speaker fuses.
6. TFM-15 fuse has blown. WARNING: NEVER replace or check a fuse while the unit is plugged into an AC outlet. The amplifier must be turned OFF for at least one minute before any AUDIO cables may be disconnected.
7. Make sure that the correct speaker output has been selected with the TFM-15's SPEAKER A/B buttons.

No sound in ONE channel or ONE channel has distorted sound.

1. Check preamp BALANCE control. Turn back to center position.
2. Make sure both TFM-15 INPUT LEVEL controls are turned up.
3. After turning the TFM-15 off, check speaker wire connections by momentarily switching LEFT and RIGHT speaker cables at the amplifier's speaker output terminals. If the dead channel does not switch sides, one of the speaker wires is to blame. If the dead channel *does* switch sides, the problem lies in 1) the pre-amp-to-TFM-15 hook-up cable, 2) the amplifier, 3) one of your speakers.
4. Check speaker fuses.
5. Replace preamplifier-to-power amplifier cables. You can test them by simply switching LEFT and RIGHT plugs at the TFM-15 end. If the dead or weak channel switches sides, you have

a bad hook-up cable. (NOTE: Remember to leave the TFM-15 turned off for one minute before switching cable connections.)

Hum and constant noise

1. Defective signal cables.
2. Improper fit between signal cable plug and sockets.
3. Signal cables have been routed too closely to AC cables, power transformers, motors or TV sets.
4. Turntable or cassette deck may be oriented in such a way that it is picking up induced hum from internal AC wall wiring. Change component's position slightly.

The TFM-15's rear panel fuse

Your new amplifier incorporates a main fuse along with a specifically designed protection circuit. The fuse value and type allows the TFM-15 to track the most powerful musical waveforms without compromising amplifier protection. Do NOT increase the fuse value under any circumstance. Replace with original value and type only.

The TFM-15's internal protection circuits

Overcurrent Protection Circuit. The TFM-15 will mute if the speaker wire at either the amplifier or the speaker terminals is shorted (in some extreme instances, something actually shorts out inside the speaker itself. Not a pretty sight.). If such a short or abnormal load occurs, the amplifier will break the connection, protecting both amplifier and speakers.

Transformer Thermal Breaker. The TFM-15's power supply transformer is internally protected with a thermal-cutout switch which operates when the transformer core reaches 140 degrees centigrade. This generally occurs only when the amplifier has been driven flat out at high volumes for long periods of time, or when proper ventilation cannot occur.

DC Fault Detection. If one of the components inside the TFM-15 should malfunction and produce a significant DC voltage (above +-2 VDC, the amplifier will power down to a safe output level. Thus protecting the loudspeakers.

Service Assistance

We suggest that you read the LIMITED WARRANTY completely to fully understand what your warranty/service coverage constitutes, and its duration. It will greatly help us provide warranty service if you have returned the WARRANTY REGISTRATION CARD.

If your TFM-15 should require service, we suggest you first contact the Dealer from whom you purchased it. Make sure to bring your sales invoice, since it is necessary to establish when you bought the TFM-15 and hence, the duration of your Limited Warranty.

Should the Dealer be unable to take care of your needs, you may contact the CARVER Service Department by phoning (206) 775-6245, or by writing CARVER CORPORATION, Service Department, P.O. Box 1237, Lynnwood, WA 98046. We will then direct you to the nearest in our national network of Authorized Warranty Service Centers, or give you detailed instructions on how to return the product to us for prompt action.

We wish you many hours of musical enjoyment. If you should have questions or comments, please write to us at the above address.

Specifications

Power:
100 watts RMS per channel into 8 ohms both channels driven 20-20kHz with no more than 0.1% THD.
140 watts RMS per channel into 4 ohms both channels driven 20-20kHz with no more than 0.1% THD.
200 watts dynamic power into 2 ohms
Frequency Response:
+0,-0.3dB 20-20KHz
Noise:
110dB A-weighted referenced to rated power
Gain:
39 dB
Input impedance:
30K ohms
Power Requirements:
120 VAC, 60Hz, USA & Canada
220 VAC, 50Hz, Europe
Dimensions:
3-5/8" x 19" x 13"
92mm x 482mm x 332mm
Weight:
17.2 lbs
7.8 kgs

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