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## **MODEL PM-200**

Low Feedback/High Headroom Magnetic-Field Power Amplifier

### **OWNER'S MANUAL**

#### **IMPORTANT NOTICE**

*Please read carefully!*

This amplifier was originally manufactured by Carver Corporation. There are references contained within this manual to addresses and telephone numbers that should no longer be used to obtain technical support or factory service.

For any assistance with this product please contact:

#### **Carver Professional**

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Portland, Oregon 97203  
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WARNING: To prevent fire or shock hazard, do not expose this equipment to rain or moisture.

TO AVOID ELECTRICAL SHOCK, DO NOT OPEN CHASSIS. NO USER-SERVICEABLE PARTS INSIDE. REFER ALL SERVICING TO QUALIFIED PERSONNEL.

CAUTION: When installing this equipment, read and follow all safety and operating instructions.

IMPORTANT: Carefully unpack your PM-200 and keep the original carton and packing materials for moving, shipment, or long-term storage.

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PERSONAL WARRANTY INFORMATION

SERIAL NUMBER \_\_\_\_\_

DEALER \_\_\_\_\_

DATE OF PURCHASE \_\_\_\_\_

PERSONAL ID NUMBER/LOCATION \_\_\_\_\_

## INTRODUCTION

Congratulations on purchasing a Carver PM-200 Low Feedback/High Headroom Power Amplifier. Your new amplifier is completely unique in design and execution, as well as unsurpassed in overall sonic performance.

The second Magnetic-Field Power Amplifier<sup>™</sup> exclusively intended for commercial sound applications, the PM-200 stands in a class by itself when compared with the standards of conventional commercial power amplifiers. In any application, from the rigors and harsh demands of musical instrument amplification to the critical sonic requirements of driving studio monitors, the PM-200 can be counted on to be a superior performer in every way.

It is a perfect choice for any system application requiring an amplifier that will do justice to high-contrast live performance musical program material.

When conventional amplifiers weighing just fifteen pounds are called on to amplify the crash of a cymbal or dynamic sound of a synthesizer, they simply can't provide enough power on demand to keep up with these rapid musical transients. The conventional amplifier runs out of headroom and is pushed into hard clipping. The result is dirty, obnoxious sound and the risk of damaging expensive loudspeaker systems.

As a monitor amplifier or mid/high PA power source, the PM-200 can deliver a stunning amount of power in a compact space.

What makes all this and more possible is Bob Carver's design breakthrough in power supply engineering concepts that has become the real key to the many benefits the PM-200 can offer the audio professional. Years were spent in developing this proven design concept which is centered around a small, lightweight power supply capable of processing and storing vast amounts of energy with amazing efficiency.

Instead of the massive transformers, storage capacitors, and heat sinks that contribute to conventional commercial amplifier size, weight, and cost, the PM-200 uses a vastly-superior method of electronic control in their place.

The most obvious benefit of magnetic-field technology is the PM-200's remarkably compact size and weight. Conventional amplifiers capable of producing as much power can, and usually do, weigh two or three times as much as the PM-200, and occupy a lot of valuable rack space in an equipment rack or enclosure. By contrast, your amplifier takes up only two vertical rack spaces (3-1/2 inches) and weighs just over 14 lbs! That's less than many effects generators.

When it comes to output power, the PM-200 can deliver over 100W RMS per channel into an 8 ohm loudspeaker impedance, 150W per channel into a 4 ohm loudspeaker impedance, and 350W into an 8 ohm loudspeaker impedance in mono bridged mode.

Amplifiers of that wattage rating are far larger, heavier and often actually deliver less available headroom than the PM-200.

All this power and operating efficiency is available with an absolute minimum of noise and distortion. Excellent engineering and design of the audio stages have been blended with quality components to produce the PM-200's impeccable specifications and superb sound quality. The ultra-linear semiconductors and circuitry used have the added benefit of reducing the need for power-consuming negative feedback. Just enough has been applied to the design to ensure linear operation and promote amplifier stability without coloring the sound or inhibiting the best performance.

The Carver Corporation understands that all this power and performance won't help if your amplifier doesn't work. To that end, the PM-200 employs a rugged mechanical design with heavy-duty chassis components and features -- put together by people that know your amplifier must be reliable for years of active, hard use.

Regardless of expertise or knowledge, please read the rest of this owner's manual to take full advantage of the practical features and remarkable weight-to-output ratio which the PM-200 has to offer. Follow all operation and installation instructions exactly.

#### FILL OUT THE WARRANTY CARD FIRST!

It's highly unlikely the PM-200 will ever need service if properly installed, maintained, and operated.

But should the unlikely occur, the Warranty Card is a passport to Carver's One-year Limited Parts/Labor Warranty Repair. The serial number, date of purchase and proof of purchase will be required.

So take a moment to fill out and return the Warranty Card that came in the amplifier's packing kit. You should also fill out the personal warranty information on the inner leaf of this manual. Be sure to include any personal ID number used to further identify the PM-200. And don't forget to file your sales receipt in a separate place for warranty and insurance purposes.

#### PACKING MATERIAL/SHIPPING CONTAINER

Even though the PM-200 will probably be installed in an equipment rack or other rack-mount enclosure, keep the carton and packing material it came in. For long-term storage or service shipment, the best container is the original carton.

#### BEFORE GOING ANY FARTHER...

Here are some suggested do's and don'ts that will make operating the PM-200 a safe and successful experience:  
Don't operate the PM-200 on any ac line voltage other than 120V, 60 Hz.

Make all connections to and from the PM-200 with its switch off (very important), and the power for all other components in the system switched off and/or with line cords unplugged.

To prevent possible shock or fire hazard, don't expose the PM-200 to rain or moisture. Should the amplifier get soaked, remove from service and have it dried, checked out, or cleaned before returning it to operation.

Should it be necessary to replace the main fuse, replace with the same type and rating only (MDX5). Using a larger fuse or fuse bypass can result in serious amplifier damage and will void the warranty. Unplug the amplifier's ac line cord before servicing the fuse.

If the PM-200 will be used in mobile or portable sound systems, be sure it's securely rack-mounted.

Don't operate the PM-200 into nominal loudspeaker impedances less than 4 ohms in dual-channel operation, 8 ohms nominal loudspeaker impedance in mono-bridged mode.

Of course, you already have been told that there are no user-serviceable parts inside the PM-200. Please, resist any temptation to fiddle around inside its chassis. Avoid electrical shock and/or extreme embarrassment: Refer all service work to a qualified technician.

#### MOBILE/PORTABLE RACK INSTALLATION

If your sound system is portable or mobile, with regular set-up in clubs across town or across the country, it's an understatement to say that your gear will take some hard knocks just getting to and from the job. Even when it's installed in a road/flight case or rack. Road/flight cases act as an "insurance policy" to make sure the system works when it has to. However, provisions must be made for protecting the components in a road/flight case when the enclosure is called on to do its job in an extreme handling situation.

These "extreme handling" situations can include the jarring and impacts encountered when with airplane, truck, or other common-carrier transportation. Even if the components are ruggedly-built and the road/-flight cases are constructed of the best materials, the contents of a rack can be reduced to kit form if heavy equipment (like big, conventional amplifiers) breaks loose or stresses chassis material beyond endurance.

When a rack of equipment falls from an aircraft loading bay or from a truck tailgate, tremendous forces are placed on the components on impact with the ground. These "G-forces" can be very high, causing equipment to weigh three or four times their normal for an instant. In that instant, the damage takes place; but even less-severe shocks can structurally damage components housed in a rack or case.

Since the PM-200 is so lightweight and compact, it lends itself to portable applications in systems that are shipped by air freight, or other means of transportation where the shipment of the output-power equivalent in conventional amplifiers would "break the bank" in shipping fees alone.

### Installation Tips

\* The PM-200 should never be operated with the front or rear covers in place on the case or enclosure. This will restrict the flow of air to the amplifier.

\* In a fixed or permanent installation where the PM-200 is housed in a special amp room, be sure the room has enough ventilation. Like a case or enclosure, the amplifier should not be operated in a "sealed" room.

\* Even though your amplifier is extremely efficient and generally cool running, it will still generate some heat when called upon to produce high levels of output power. And it will heat up and cool down more quickly than any conventional amplifier since a shorter thermal-time constant results from the reduced mass of the PM-200 (about one-third that of conventional amplifiers). Less material bulk to build internal heat allows the PM-200 to be mounted flush with other conventional amplifiers and equipment in a rack without concern about overheating it or the adjacent components.

However, certain sensitive low-level components might pick up noise or hum from the PM-200 or other high-performance power amplifiers. If this is a problem, separate the components and amplifiers by as much as necessary to eliminate the noise. Another option is installing a heavy shielding plate between them for the same results.

\* When mounting equipment in a case or rack, it's a good practice to install the heaviest components in the bottom of the enclosure. This effectively lowers the case's "center of gravity" and promotes physical stability of the enclosure during handling and transportation.

### POWERING THE PM-200 IN PORTABLE/RACK INSTALLATIONS

The PM-200 should be connected to an AC outlet or receptacle rated at no less than 400W.

If your sound system uses several PM-200s or other conventional amplifiers, a multi-receptacle power bar, outlet strip, or special power block should be used to ease the problem of finding enough common-point outlets to safely power the complete sound system. If you're going this route, make sure it will handle the total maximum wattage of all the sound system components.

The power bar(s) or outlet strip(s) should be plugged into an AC line circuit capable of handling the system's power requirements without tripping a circuit breaker.

If the outlets used to power the system are exposed to traffic, secure the plugs to the outlet and the ac line to the wall/floor with "gaff" or duct tape in temporary situations. This will help avoid a possibly disastrous, accidental disconnection.

#### Using Extension Cords.

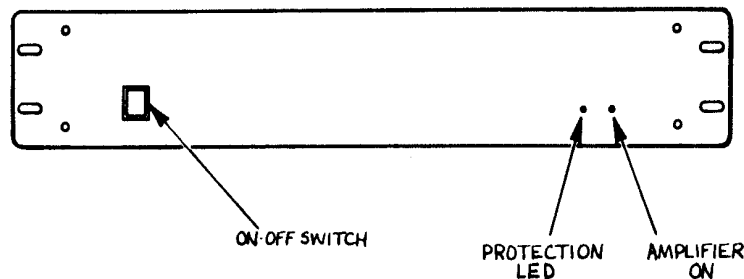
The PM-200's AC line cord should be long enough to reach a proper outlet in most applications. If an extension cord is necessary to supply AC power to the amplifier, use one that's three-prong grounded and 12-gauge or heavier. The longer the extension cord, the heavier the gauge for safety and minimization of line loss. Securely tape the connection between the extension cord's receptacle and the amplifier's AC line cord to prevent accidental disconnection.

### ROUTINE CARE AND MAINTENANCE

Routine care of the PM-200 is relatively simple. Since your amplifier is intended for commercial sound applications, it may be exposed to quite a bit of dirt and grime -- even when installed in a case or rack. You'll probably want to wipe the front panel and chassis (if exposed) from time-to-time with a soft, dry cloth. If you have to get something stubborn off, use a mild dish soap or detergent sparingly applied to a soft cloth. Don't use alcohol, ammonia, or other strong solvents.



## CARVER PM-200 FEATURES AND FUNCTIONS



### Power On/Off

This switch, on the left hand side of the PM-200's front panel, engages the triac control and turns the amplifier on or off.

### Amplifier On LED

Self explanatory.

### Protection LED

Normally off. Consult section of this manual on protection circuitry for specific indications.

## Power-Up/Power-Down Procedures

Switching the PM-200 on and off brings up another important topic: Preventing damage to your loudspeakers from turn-on and turn-off transients.

Simply stated, the high-energy voltage spikes are caused by a component's power-supply devices charging up when switched on, discharging when switched off. This is very important when talking about a system using amplifiers as powerful as the PM-200. Even a smaller transient could be amplified into a shattering snap with several hundred watts behind it. The result? Damaged loudspeaker elements that could cost a lot of money to recone; worse, could cost you the night's performance -- all in the twinkling of an eye.

It's obviously far better to prevent and avoid the problem in the first place. To avoid the possible problems associated with turn-on/off transients, do the following:

With the master gain controls on the mixing console or instrument preamp down or off, switch on all the low-level components in the system. This includes mixing consoles, on-stage instruments, effects devices, tape machines, signal processing equipment, crossovers, etc. Wait a moment for their power supplies to stabilize, then switch on the PM-200(s) and other amplifiers (house main and stage monitor).

When powering the system down, reverse the procedure. Reduce master gain control levels at the console or preamp, then switch off the PM-200(s) and other amplifiers. Wait a few moments for their power supplies to discharge, then switch off the low-level equipment.

Even though your PM-200 generates only a small turn-on and turn-off transient (less than 1V rms turn-off transient), that can't be said about all other components or equipment. Despite relays and other transient-eliminating features on some equipment, observe the proper procedures to prevent unleashing potentially-destructive forces on your loudspeakers needlessly. The extra moment spent doing it the right way will keep your loudspeakers working with you, not making money for a re-coning shop.

If power is interrupted to the sound system, it's a good idea to immediately reduce master gain controls at the board, then restart the whole system when power is fully restored. Never switch the PM-200 on or off during operation when signal is present at the inputs.

## Inputs

Signals to drive the PM-200 are supplied from either a dual differentially-balanced pair of female XLR-type connectors or a pair of TRS 1/4-inch phone jacks.

Both styles of connector have the same input impedance: 15 k ohms each leg balanced to ground for a total input impedance of 30 k ohms with an input sensitivity of 1.4 V rms at a rated 8 ohms.

The balanced XLR-type and TRS inputs have been designed to allow single-ended (unbalanced) input operation without switches or adaptors. The only thing required here is a set of properly wired signal cables. See **Cables and Cords** later in this manual.

The input connectors on the PM-200 are wired in parallel to allow signals to be passed on when "cascading" multiple amplifier arrays.

### **Mono-Bridging Switch**

A switch recessed between and below the pair of XLR-type input connectors is used to operate the PM-200 as a mono (single-channel) amplifier.

Before operating the PM-200 in mono-bridged mode, the switch must be pushed in to phase-invert the left-channel drive signal. Push it in GENTLY with a narrow screwdriver. NEVER activate this switch with the amplifier plugged in and/or operating. Also, be sure the switch is out when resuming dual-channel operation.

**NOTE:** Before attempting to operate the PM-200 in mono-bridged mode, please read the section on Mono-Bridged Operation later in this manual.

### **Ground**

A small barrier strip located above the output terminals provides a means of altering the grounding scheme of the PM-200's inputs. As it comes from the factory, a jumper bar connects the input grounds to the amplifier's chassis. For normal use, the jumper should remain in place. The jumper may be removed for certain types of installations and applications, or may be helpful in solving certain ground-loop hum and noise troubles. Removing the jumper leaves a 0.1 micro-farad capacitor in parallel with a 27 k ohm resistor between the amp ground and the chassis.

### **Output Terminals**

Two vertical pairs of five-way binding posts supply output to the loudspeakers for both dual-channel and mono-bridged operation.

Connections to the loudspeakers may be made in several different termination styles. The Output Terminals accept both single- and dual-banana plugs, spade lugs, and stripped or tinned leads.

The type of connection you make will depend, again, on the application of the system the PM-200 is a part of. For example, dual-banana plugs are a safe, convenient method of terminating speaker wires at the amplifier and loudspeakers. Other than the locator tab (along one edge of the connector) being perfect for assuring polarity -- even in the dark, cramped space behind an equipment rack -- this style connector provides a margin of safety during an accidental trip-and-stumble routine with a speaker wire. The banana plugs just pull out of the terminals; the equipment doesn't get pulled to the floor. If your sound system gets set-up and taken apart on a regular basis, a tinned speaker-wire lead or spade-lug terminal would undoubtedly fail from flexing and bending -- leaving no connections to the loudspeakers and no sound. However, tinned leads or spade lugs provide excellent terminations for fixed and permanent installations that put a minimum of wear and tear on the output-terminal connections.

See **Cable and Cords**, later in this manual before attempting any connections between your PM-200 and loudspeakers.

## Fuse

Replace it with the same type and rating ONLY (MDX5, slo-blo equivalent). The PM-200's fuse type and value have been selected to allow full dynamic range, and allow the amplifier to track the most powerful musical waveforms without compromising the safety of the transformer and triac control circuitry.

Never replace the fuse with a different type of rating: Never, never use a fuse bypass or "cheater." Doing either of these things can result in serious amplifier damage and will void the warranty. Make sure the AC line cord is unplugged before attempting to service the fuse. If the fuse blows more than once after the initial replacement, remove the amplifier for immediate service inspection.

## ABOUT YOUR AMPLIFIER'S PROTECTION SYSTEMS

To further enhance your PM-200's operational reliability, safety, and dependability, protective circuits have been built-in to guard against major faults that could damage the amplifier or loudspeakers -- maybe both.

Some major faults/conditions that can activate the PM-200's shutdown protection circuits include:

1. Output Short Circuit: Shorted speaker wires at the amplifier output terminals, in the cables or at the speakers.
2. Excessive High-Frequencies: Excessive high-frequency signals (non-musical) present at the outputs.
3. DC Offset: Significant DC offset (2-4V DC) present at the outputs (internal or external cause).
4. Internal, Low-Level Supply Fault: Internal component problem causing imbalance in the amplifier's low-level power supplies.
5. Amplifier Overheated: Activated when the chassis temperature exceeds 90 (degree) C.

Depending on the fault condition or problem that activates the PM-200's protection circuits, the amplifier will give a visually positive indication and/or simply shut itself off in response.

For example, in shutdown protection conditions 1 through 4, the Protection LED will illuminate. In condition 5, the amplifier will shut down completely until cool. In condition 2, the protection circuits have been designed to react only to signals and oscillations that are different to any conceivable music signal.

As a rule, feedback troubles and auxiliary component problems will be the cause that activates these circuits. If the PM-200's protection circuits go into action, they will remain working as long as the problem exists or until it's removed. Another advantage to the PM-200 shutdown protection circuitry is its "totally on or totally off" mode of operation only when a clear need arises for it to work. This is in direct comparison to conventional amplifiers' protection circuits that often interfere with, or compromise, the sound quality when conditions are near their operating thresholds.

NOTE: It is normal that this protection LED turn on only for a fraction of a section when the PM-200 is turned on.

### CABLES AND CORDS

One of the most important aspects of setting up a sound system -- virtually any sound system -- is the condition, type, and quality of the cords and cables used to interconnect the various components within the system.

Cables and cords appear in all parts of a sound system, and may be the "weakest link" in the audio signal chain. Why?

Consider that cables and cords are subjected to the most physical abuse during set-ups, the performance, and when the system is broken down at the end of a show. The microphone cables running from the stage box termination of a multi-paired snake cable are probably subject to the most strain and wear from repeated connections, disconnections, being stepped on, etc. As a result, these cables are prone to failure: If they fail, the sound system won't work if the cords are in a critical (and what isn't) part of the signal chain.

Of course, we're concerned with the cords and cables used to supply drive signal to the PM-200 and those within the amplifier rack. Pay close attention to the following information. Part of the complete operational success is preventing system failure from faulty interconnect cables. Other than the important low-level signal cables, there are the speaker wires that connect the PM-200 to the loudspeakers for consideration.

Drive signals are supplied to the PM-200 via dual differentially-balanced XLR-type (female) and 1/4 inch TRS input jacks. The connections may be made in either balanced or unbalanced mode, depending on your requirements.

It may be that your mixing console, instrument preamp, or signal processing components have both balanced and unbalanced outputs, or exclusively one or the other. The decision to operate a sound system in either mode will depend a great deal on where and how the system is installed and operated.

Running a balanced system has many advantages in reducing noise and rejecting interference, particularly when it comes to long runs of snake cable or interconnect lines from the console/crossover components. On the other hand, an unbalanced system is fine for instrument kits and other applications where maximum noise suppression is less of a concern or consideration.

Of course, there's the obvious aspect of component flexibility: If your preamp or adjoining component only comes with unbalanced outputs, then your choice can be somewhat limited. The thing to remember is that if you plan to operate a balanced system, make sure everything is balanced -- in short, balanced outputs from the console going to the balanced inputs on an equalizer, or crossover going to the balanced inputs on the PM-200. If other amplifiers are being supplied signal via the paralleled input connectors on the PM-200, the connections between them must be to their balanced inputs, etc.

The same holds true for running the system in an unbalanced mode: Keep your connections one way or the other. If you run part of the system balanced and the rest unbalanced, it can cause severe noise and hum problems -- even damage the output circuitry on some balanced-drive, low-level components.

### **Balanced Cables/Connectors**

Selecting which rear-panel connectors to use to supply drive signals will depend on the type of connectors used as terminations on the stage box of a multi-paired snake cable or the output connectors on the component supplying signal. The PM-200's input connector group provides a great deal of flexibility in this area. Signal may be supplied via the XLR-type, 1/4-inch TRS jacks, or both. The point configurations for the PM-200's input connectors are as follows:

1. Female XLR-Type Inputs: The connectors are wired so that Pin 1 is ground, Pin 2 is "-" (Low), Pin 3 is "+" (High).

2. 1/4-Inch TRS (Tip, Ring, Sleeve): These jacks are wired so that the Tip is "+" (High), Ring is wired "-" (Low), and the plug sleeve is ground.

Balanced cord configurations should always be made in-phase, or so that Pin 1 on the PM-200's female XLR-type input corresponds to Pin 1 on a male XLR-type connector at the output of the component supplying drive signal, etc. The same holds true for using a 1/4-inch TRS jack (at a stage box) being run to the XLR-type inputs on the amplifier; where the Sleeve of the TRS jack is connected to Pin 1 on the amp, etc.

Consult the operating guides and/or inspect the wiring arrangement on components supplying drive signal for the PM-200 for their pin out arrangement.

Since the PM-200's input connectors are wired together in parallel, the "unused" connectors can supply signals when cascading several amplifiers with the same drive signal. Patch cords should be wired in-phase, and should be balanced in configuration if everything else is run in balanced mode. Either TRS or XLR-type may be used in this manner.

## Unbalanced Cables/Connectors

Female XLR-Type Inputs: The connectors on the PM-200 are wired so that cables supplying unbalanced drive signals are wired so the "+" is connected to Pin 3 and the ground to Pins 1 and 2.

Note: Failure to connect Pins 1 and 2 will result in an approximate 50% reduction in gain. This is done automatically when using TRS jacks to supply unbalanced drive signal to the PM-200 with standard 1/4-inch phone plugs.

1/4-inch TRS (Tip, Ring, Sleeve): The TRS jacks are wired so that cables supplying drive signal in the unbalanced mode are wired so the tip of a standard 1/4-inch phone plug is "+" and the barrel portion is ground.

Signals to cascaded amplifiers are still supplied as they are in balanced mode. In this case, the main drive signal should ideally be supplied to the XLR-type connectors on the PM-200. The signals to the other amplifiers can be made from the 1/4-inch TRS jacks using cables terminated in standard 1/4-inch phone plugs.

As we mentioned earlier, cables and cords can be a source of potential trouble for any operator of any sound system. We strongly recommend that you obtain a cable tester to check the interconnect cables and cords in a system before each use. These cable testers check for conditions that will cause a failure, but probably aren't visible. The cable tester checks for shorts, phasing problems, and broken shielding between conductors. The cable or cord to be tested is plugged into the appropriate connectors on the tester, then the cable can be flexed, stretched, or whatever. LED'S on the tester give a positive indication of a cable that's okay, or one that has a problem — even a subtle problem that never seems to become obvious until halfway through the night's performance.

If you plan to do-it-yourself and build the cables needed to interconnect the PM-200 in the system, please, know how to solder. Cold or improper solder joints will be a source of headaches and trouble. Also, use the best materials to ensure long life of the cable and fewer related problems. An excellent alternative is obtaining the necessary cables from your Carver Professional Products Dealer. Many companies manufacture high-quality, reliable cables and speaker wires in many different configurations, connector styles, and lengths.

Some of these pre-made cables even come with a performance guarantee — the peace of mind and operating security can more than justify the cost of such a cable.

Another thing to remember is to inspect and/or replace any cable going from or to a component "suspect" of causing a system failure. It's a sad fact, but the vast majority of problems in a sound system relate directly to the cords and cables used to hook-up the components. Look at the cables, test them, even replace them before jumping to the conclusion that something is "wrong" with the PM-200 or other component.

## Speaker Wire

As important as using good quality, properly wired cables to supply drive signals to your PM-200, it's equally important to use a quality speaker wire to connect the output terminals to the loudspeakers.

There are different types of speaker wire intended for use in commercial sound systems, but there are two common choices: "zip" or lamp cord and rubber-covered, two-conductor cables. Both types are readily available and fairly inexpensive, and use a coding system for phase identification of the conductors.

Lamp cord has a small ridge or marking on the insulating jacket of one conductor; some use silver- and copper-colored wires to note the difference between the conductors. Rubber-covered, two-conductor speaker wires use a color code on the insulating jackets of each conductor (white/black, red/black, etc.).

While speaker wires as light as 16-gauge can be used to connect the amplifier to the loudspeakers, heavier-gauged speaker wires should be used in any wire run over a few feet. Heavier speaker wires minimize line losses and will improve the damping factor.

The speaker wires can be terminated at the amplifier by hard-wiring to the binding posts, spade-lug terminals attached to the conductors, or with dual-banana plugs. The banana plug is a good choice for most applications. These connectors, as we mentioned earlier, have a locator tab along one side that's clocked so it denotes the negative ("-") side of the terminals and speaker wire. Like the low-level signal cables, speaker wires may be purchased with the proper terminations and wire gauge for your amplifier and loudspeakers. If you aren't sure how to put a good speaker wire together, consult your Carver Professional Products Dealer. They will undoubtedly carry a speaker wire that will suit your needs and requirements.

A final warning to people that plan to use the PM-200 in an instrument system: Don't use a guitar cord to connect the PM-200 to your loudspeaker cabinet. The conductors in a guitar cord are flimsy and too light for the job -- even in a pinch, so to speak. Use the proper speaker wire in any application.

## DUAL-CHANNEL OPERATION AND CONNECTIONS

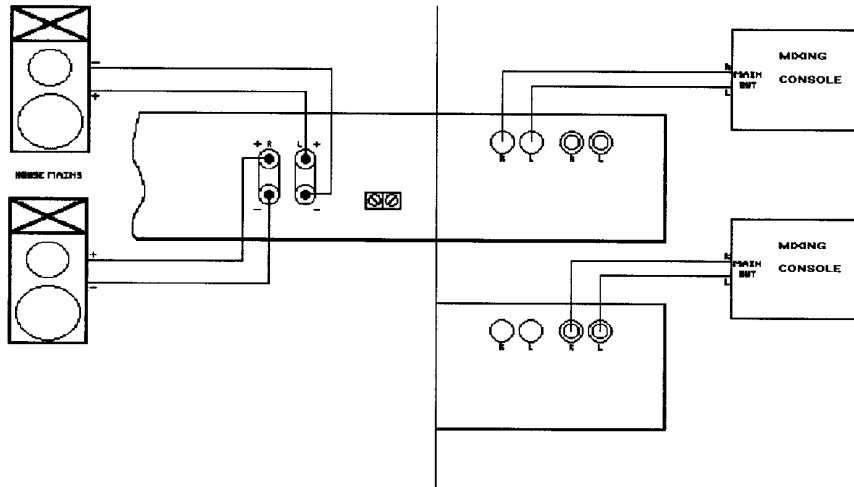
The PM-200 can be operated with both channels amplifying a stereo pair of drive signals or two mono signals independently in dual-channel mode. Of course, there are bi-amplified/multi-amplified loudspeaker systems that will take advantage of the dual-channel mode of operation when driving separate low-frequency/upper-frequency elements.

With the power for the PM-200 and other components in the system completely off, connect the cables that run from the outputs of the mixing console, instrument preamp, crossover, etc. to the appropriate left/right channel inputs on the PM-200. Be sure that the connectors are seated

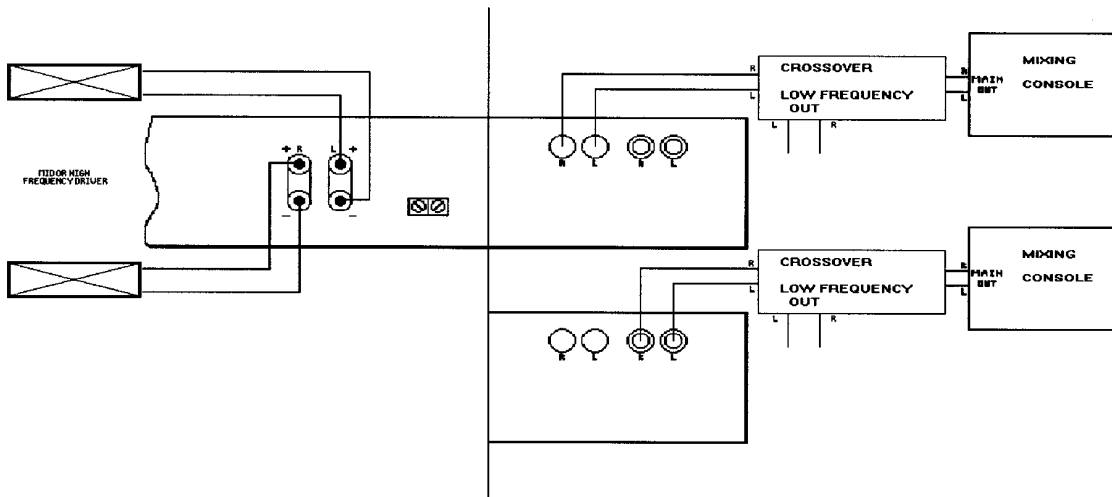


firmly in their respective jacks. Connect the speaker wires between the output terminals of the amplifier and the loudspeakers, being careful to maintain proper speaker phasing. The PM-200 should be connected to loudspeakers with an impedance of 4-ohms or greater ONLY in dual-channel operation.

In the first sample system shown below, the left-main output of the mixing console is connected to the left-channel input of the PM-200. The right-main output of the mixing console is connected to the right-channel of the amplifier.

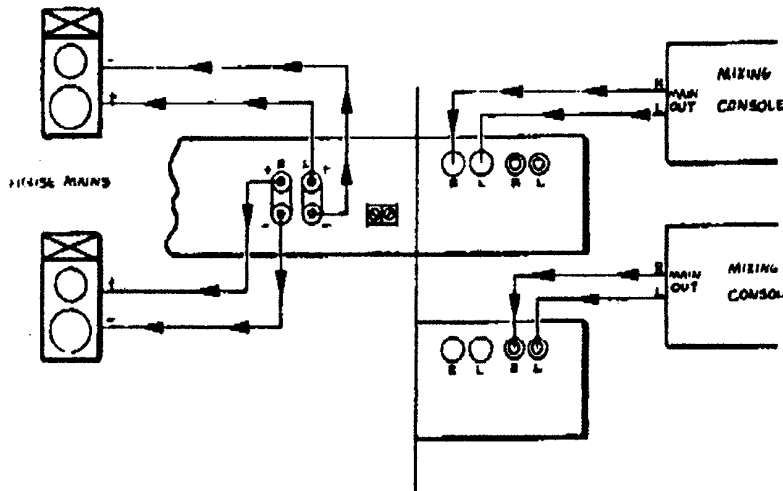


If your sound system uses bi-amplified or multi-amplified loudspeakers, connections are from the high frequency output of the crossover to the amplifier's inputs as shown in this second sample system.

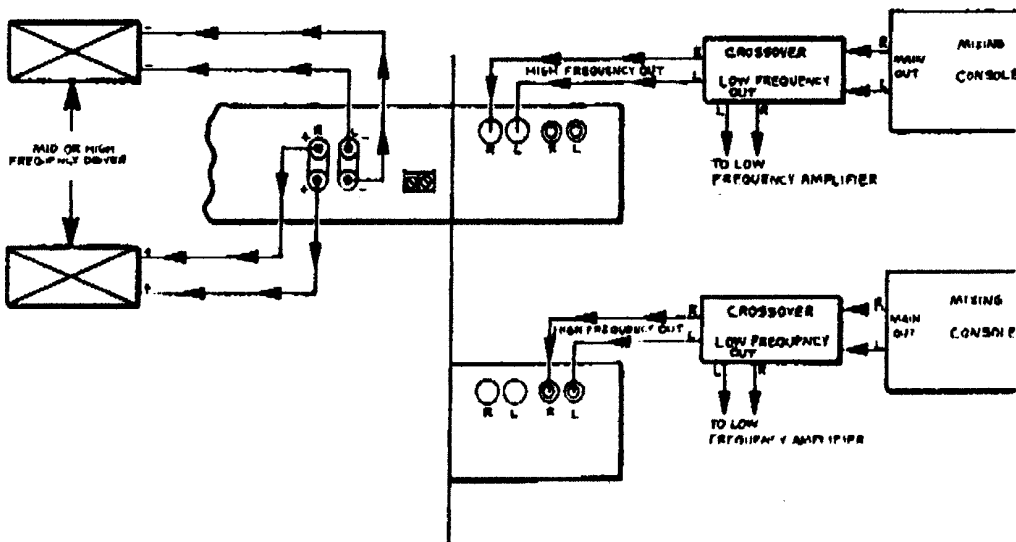


firmly in their respective jacks. Connect the speaker wires between the output terminals of the amplifier and the loudspeakers, being careful to maintain proper speaker phasing. The FM-200 should be connected to loudspeakers with an impedance of 4-ohms or greater ONLY in dual-channel operation.

In the first sample system show below, the left-main output of the mixing console is connected to the left-channel input of the FM-200. The right-main output of the mixing console is connected to the right-channel input of the amplifier.



If your sound system uses bi-amplified or multi-amplified loudspeakers, connections are from the high frequency output of the crossover to the amplifier's inputs as shown in this second sample system.



## MONO-BRIDGED OPERATIONS AND CONNECTIONS

The PM-200 may be used as a single-channel amplifier by setting-up and connecting it as follows. Be very certain the power to the PM-200 is off and/or the line cord unplugged.

### 1. Mono-Bridge Switch

The Mono-Bridge switch (recessed between and below the XLR-type input connectors) must first be pushed in. Use a narrow screwdriver or other thin device (insulated) to activate the switch by gently pushing it in. This switch inverts the phase of the left-channel input signal, necessary to operate this amplifier in mono-bridged mode. Do not activate this switch with the amplifier operating. Also, check to see that it is out if you plan to go back to using the PM-200 in dual-channel mode.

### 2. Signal Connections

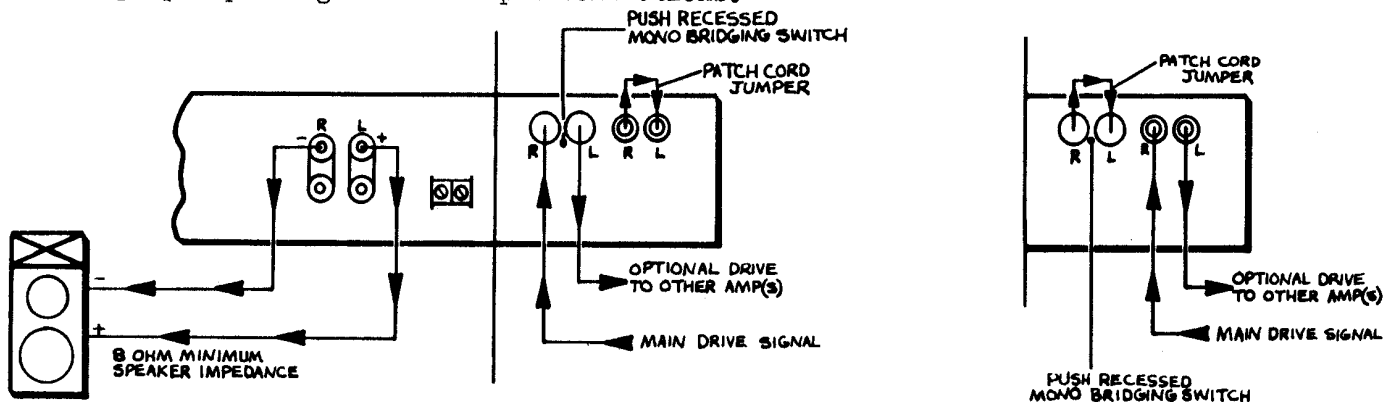
In balanced or unbalanced modes, signal must be equally supplied to both left- and right-channel inputs. This may be done by using a patch cord between the two TRS 1/4-input jacks while the main drive signal is supplied through one of the XLR-type connectors. It doesn't matter which one since the input connectors are wired in parallel.

It's probably best to come into the right channel XLR-type input connector. This frees the left channel to feed signal to other amplifiers when cascading them. Another option is using a "Y" cord to feed drive signals to the left/right inputs on the amplifier.

### 3. Loudspeaker Connections

The PM-200 must be used with the loudspeaker impedances 8 ohms or greater when operating in mono-bridged mode (nominal). The connections at the output terminals are different than in the dual-channel mode.

Instead of two outputs, there's only one. The upper terminals of both output pairs are connected to the loudspeaker(s). The upper-right terminal becomes the "-" and the upper-left terminal becomes the "+". If you are using dual-banana plugs for terminating the speaker wire, clock the locator tab (on the "-" side) so it's to the upper-right terminal for proper phasing of the output connections.



MONO BRIDGED  
CONNECTIONS

## TROUBLESHOOTING

If you're having trouble or suspect a problem with the PM-200, try some simple troubleshooting first. More likely than not, the problem lies elsewhere in the system — not with your amplifier.

1. If one channel is "dead" (no sound), check the input cables to that channel. Inspect all connections to make sure they are firmly seated in their respective jacks — at the amplifier and at the component(s) driving it. This means from the amplifier inputs to the outputs of the mixing console or instrument preamp. Check the output terminals for disconnection there and at the loudspeakers. Inspect loudspeaker fuses.
2. If the shutdown protector circuits have been activated, attempt to isolate and correct the cause or fault along the output signal path. Inspect speaker wires for "frays" and shorts. If no cause or fault can be found, remove the amplifier for service inspection.
3. If the main fuse blows, try to determine what external problem is causing the short. If the fuse blows again, remove the amplifier for service inspection if no external cause can be found.

Again, the majority of troubles and problems with a sound system revolve around faulty interconnect cables and cords. We advise double-checking each cable and cord with a good cable tester. Replace any suspect cables before going any farther with the troubleshooting procedure.

If all methods of finding the problem don't work out, contact:

CARVER CORPORATION CUSTOMER SERVICE P.O. Box 1237  
Lynnwood, WA 98046 or call: (206) 775-6245

Your inquiry will be promptly responded to; we're glad to help. You might be directed to a Carver Professional Products Service Center, or be asked to return the unit to the factory. We must have the serial number of your PM-200 before its return can be authorized. When shipped to a service center or the factory, make sure it's in the original carton, well sealed. If convenient, your Carver Professional Products Dealer should be consulted and might be able to offer additional assistance.

### PM-200 SPECIFICATIONS

**Power:** 8 ohms 100W per channel (20 Hz-20 kHz with both channels driven and no more than 0.15% THD.)  
4 ohms 150W per channel (20 Hz-20 kHz with both channels driven and no more than 0.15% THD.)  
2 ohms 150W per channel (20 Hz-20kHz with both channels driven and no more than 0.15% THD.)

**IM Distortion:** Less than 0.1% SMPTE.

**Frequency Response:** -3 dB at 3 Hz, -3 dB at 60 kHz.

**Damping:** 100 at 1 kHz.

**Gain:** 27 dB.

**Noise:** Better than 103 dB below 100W (A-weighted).

**Inputs:** XLR-type or TRS 1/4-inch phone.

**Input Impedance:** 15 k each leg, balanced to ground.

**Mono-Bridging:** 350W into 8 ohms, 300W into 4 ohms, accessed through rear-panel recessed switch.

**Input Sensitivity:** 1.4V rms at rated 8-ohm power.

**Slew Rate:** 20v/microsecond

**Dimensions:** 19"x2.9"x9.7" (W/H/D).

**Weight:** 14 lbs.

**AC Power:** 120V, 60 Hz, 5A (600W).

The Carver Corporation reserves the right to improve its products at any time. Therefore, features, specifications, and prices subject to change without notice.

### CARVER LIMITED WARRANTY

Your Carver PM-200 Professional Magnetic Field Power Amplifier is warranted against defects for one year from date of purchase. Within this period, we will repair it without charge for parts and labor. Simply write to or call Carver Corporation (attention: Customer Service Department), P.O. Box 1237, 19210 33rd Ave. W., Lynnwood, WA 98046, (206) 775-6245.

You will be directed to an Authorized Carver Service Station or receive instructions to ship the unit to the factory. Please save the original shipping carton and packaging material in case shipping is required. Please do not ship by Parcel Post.

Be sure you have specific authorization from Carver Corporation and include a complete description of the problem, the associated components and connections, and a copy of the purchase receipt. Initial costs are not paid by Carver Corporation; return shipping costs will be prepaid if repairs are covered by the scope of this Warranty.

Carver Corporation's liability is limited to the repair or replacement, at our option of any defective product and shall not, in any event include property or any other incidental or consequential damages which may result from the failure of this product.

Some states do not allow limitation on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you.

This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state. We suggest that you attach your purchase receipt to this Warranty and keep them in a safe place.

Thank you for your choice of a Carver Corporation product.

NOTICE: The preceding warranty information is exclusive to the United States. Please see your local Carver dealer or distributor for the correct information for your area and locale.

# CARVER

CORPORATION

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