

# Owners Manual

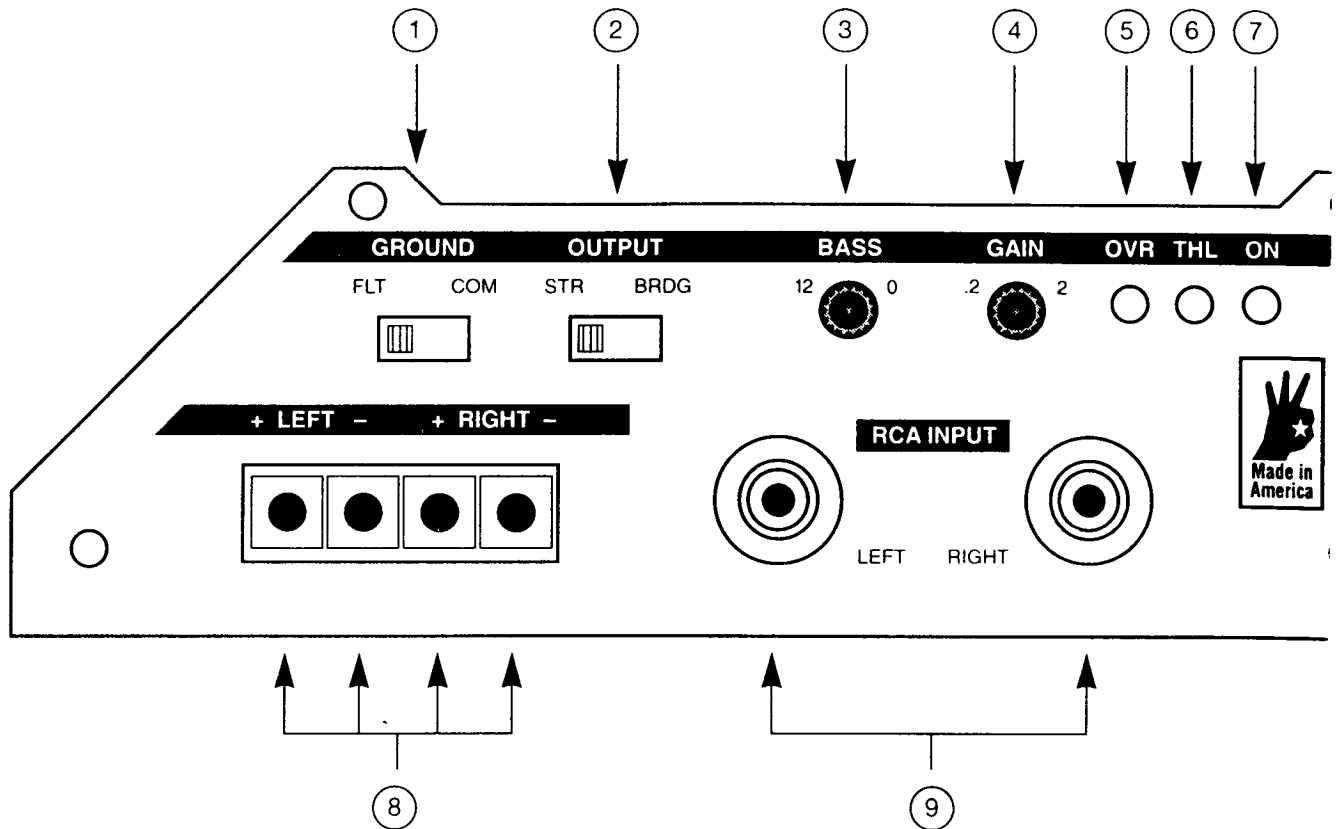
# MPS 2240

Triple Darlington Mobile Pro Power Amplifier

Phoenix Gold is  
a Proud Member of



# AMPLIFIER CONTROLS AND FUNCTIONS



## 1. GROUND (FLT/COM) SWITCH

Use the Ground Switch to get the lowest system noise in your installation. This switch should normally be in the common (COM) position. The floating (FLT) position isolates the input signal ground from amplifier chassis ground.

## 2. OUTPUT (STR/BRDG) SWITCH

The Output Switch sets the MS275/MPS2240 to stereo (STR) or bridged (BRDG) mode. If you desire to operate the amplifier in normal stereo or TRI-LINEAR™ mode, leave the switch in the stereo (STR) position. For bridged mono operation, set the switch to the bridged (BRDG) position: this causes the left input signal to drive both channels (the right input is not used.)

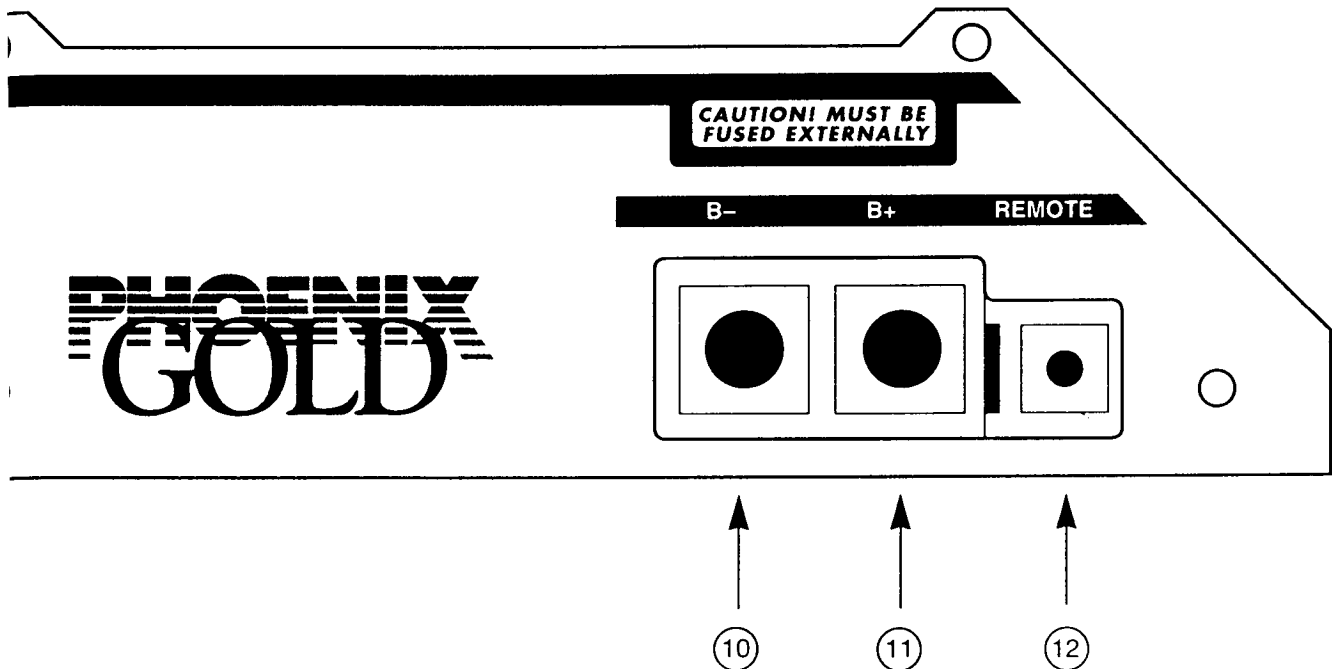
## 3. BASS ADJUSTMENT

The Bass Adjustment circuit allows for matching of the subwoofer/ enclosure in any vehicle. Continuously variable from 0 to +12dB at 45Hz.

## 4. GAIN ADJUSTMENT

The Gain Adjustment allows for the correct matching of any signal source (CD player, AM/FM cassette deck, etc.) from its pre-amp output into the MS275/MPS2240. In the minimum gain position (2V) a 2VRMS input signal

# AMPLIFIER CONTROLS AND FUNCTIONS



will drive the amplifier to full output power. At the maximum gain position (.2V) a 200 $\mu$ VRMS input signal will produce full power.

## 5. **OVR: OVERLOAD LED**

The Overload LED lights when the amplifier has either:

- A. Passed more than 25 Amps of current in the output stage, or
- B. Passed more than 350 total Watts RMS! Obviously a bit more than rated power. This is another part of the amplifier's protection system.

## 6. **THL: THERMAL PROTECTION LED**

The Thermal Protection LED lights when the amplifier has "thermaled" or shut off temporarily to protect itself because the temperature of the heatsink has reached 90°C or 200°F. However, the amplifier will turn on automatically after it cools.

## 7. **ON: POWER ON LED**

The Power On LED lights when Amplifier is **on**, with 12 Volts at B+, B- and remote terminals.

## AMPLIFIER FEATURES: MS275 & MPS2240

- ❑ **MS275: 2x75** Watts per channel  
**MPS2240: 2x24** Watts per channel
- ❑ TRI-LINEAR™ output configuration allows simultaneous stereo and bridged mono operation.
- ❑ Adjustable Bass EQ 0 to +12dB at 45Hz
- ❑ Pulse Width Modulated MOSFET Switching Power Supply
- ❑ RIBBON-WINDING™ of Power Toroid
- ❑ **MS275:** Stable into Bridged Mono 2Ω loads, 1 Ω Stereo  
**MPS2240:** Stable into Bridged Mono 1 Ω loads, ½Ω Stereo
- ❑ High-Current Triple-Darlington Output Design
- ❑ Two layer, 2 oz. GOLD-PLATED G10 Glass-Epoxy Printed Circuit Board
- ❑ Thermal overload protection
- ❑ Overcurrent/Overload protection
- ❑ Variable input sensitivity 200mV to 2V
- ❑ Fully muted turn-on circuitry
- ❑ Optically isolated power and signal grounds
- ❑ VI limiting circuitry with overcurrent LED
- ❑ Extensive burn-in and QC testing for the ultimate in reliability
- ❑ Made in the good ol' U.S.A.

## AMPLIFIER SPECIFICATIONS: MS275 & MPS2240

- ❑ Continuous Output Power per Channel  
Both Channel Driven:
 

<b>MS275:</b>	Into 4Ω @ 12/13.8V DC.....	75/100 WRMS
	Into 2Ω @ 12/13.8V DC.....	125/140 WRMS
	Bridged Into 4Ω.....	225 WRMS
<b>MPS2240:</b>	Into 4Ω @ 12/13.8V DC.....	24/32 WRMS
	Into 2Ω @ 12/13.8V DC.....	48/64 WRMS
	Bridged Into 1Ω.....	288 WRMS
- ❑ THD at rated power into 4Ω ..... <0.02%
- ❑ SMPTE at rated power into 4Ω.....<0.05%
- ❑ DIM at rated power into 4Ω..... <0.01%
- ❑ Frequency response..... .15Hz to 20KHz ±1dB
- ❑ Signal to Noise Ratio ..... > 100dB (20 to 20KHz)
- ❑ Input Sensitivity .....200mV to 2V
- ❑ Input Impedance ..... .1OKR
- ❑ Idle Current .....1.5A
- ❑ Current Consumption - *Full Power Hard Clip*:
 

<b>MS275:</b>	@ 4Ω stereo.....	25A
	@ 2Ω stereo.....	45A
	@ 2Ω stereo, 4Ω mono (TRI-LINEAR™ mode).....	60A
<b>MPS2240:</b>	@ 4Ω stereo.....	15A
	@ 2Ω stereo.....	25A
	@ 1 Ω stereo, 2Ω mono (TRI-LINEAR™ mode).....	60A
- ❑ Efficiency .....> 80% (Power Supply)
- ❑ Damping Factor (@ 40Hz into 4Ω) ..... ,250 to 1
- ❑ Min to Max Voltage requirements ..... 10.2 to 15.5V DC
- ❑ Dimensions ..... .8.5in L x 11.4in W x 2.4in H

## MS-250 / MPS-2220 AMPLIFIER FEATURES

- ❑ 2 X 50 watts per channel (MS-250)  
**2 X 22 watts per channel (MPS-2220)**
- ❑ Bridgeable
- ❑ TRI-LINEAR™ output capability, stereo and bridged mono simultaneously set up is possible
- ❑ Adjustable Bass EQ 0 to +12dB
- ❑ Pulse Width Modulated (PWM) MOS-FET Switching Power Supply
- ❑ RIBBON-WINDING™ of Power Toroid
- ❑ MS-250 is stable into 2 ohm loads  
**MPS-2220 is stable into 1 ohm loads**
- ❑ High-Current / High-Voltage Triple-Darlington Output Design
- ❑ 2-layer 20 mil thick GOLD-PLATED G-10 Glass-Epoxy Printed Circuit Board
- ❑ Variable input sensitivity 200mV to 2V
- ❑ Fully muted turn-on/turn-off circuitry
- ❑ Floating/common ground switch
- ❑ Optically isolated input design
- ❑ Master/Slave "sync" connection
- ❑ VI limiting circuitry with overcurrent LED
- ❑ Extensive burn-in and QC testing for the ultimate in reliability
- ❑ Low RFI / EMI design
- ❑ MADE IN THE GOOD OL' USA

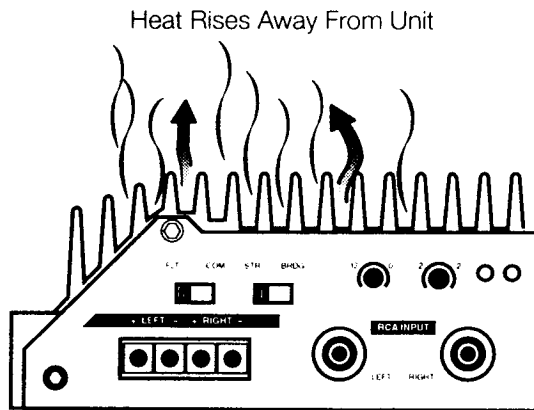
## SPECIFICATIONS:

- ❑ Output Power per Channel- Both Channels Driven
  - MS-250**  
Into 4 ohms @ 12V DC- 50 WRMS  
Into 2 ohms @ 12V DC- 90 WRMS  
Bridged Power into 4 ohms- 180 WRMS
  - MPS-2220**  
Into 4 ohms @ 12V DC- 22 WRMS  
Into 2 ohms @ 12V DC- 44 WRMS  
Into 1 ohms @ 12V DC- 80 WRMS  
Bridged Power into 4 ohms- 120 WRMS
- ❑ THD at rated power 4 ohms- 0.01%
- ❑ SMPTE at rated power 4 ohms- 0.03%
- ❑ DIM at rated power 4 ohms- 0.07%
- ❑ Frequency response- 15Hz to 20KHz +/-1dB
- ❑ Signal to Noise Ratio- > 100+ dB (20 to 20kHz)
- ❑ Input Sensitivity- 200mV to 2V
- ❑ Output Impedance- 2 to 16 ohms
- ❑ Input Impedance- 10K ohms
- ❑ Idle Current- 2 Amps
- ❑ Current Consumption MS-250 / **MPS-2220**-
  - @ 4 ohms stereo-15 amps / **7.5 amps**
  - @ 2 ohms stereo- 30 amps / **15 amps**
  - @ 1 ohms stereo- / **30 amps**
  - @ 2 ohms stereo, 4 ohms mono- 35 amps / **18 amps**
- ❑ Efficiency- > 80% (Power Supply)
- ❑ Damping Factor @ (20 to 10Khz) - 1000 to 1
- ❑ Min to Max Voltage requirements- 10.2 to 15.5V DC
- ❑ Dimensions- 8.5" L X 11.4" W X 2.4" H

## AMPLIFIER LOCATION

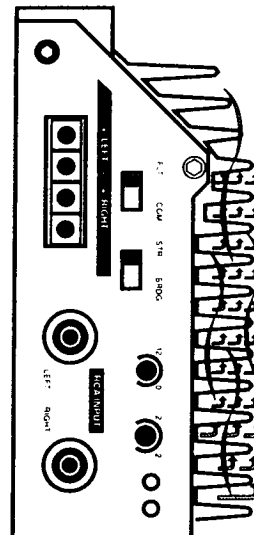
The MS275/MPS2240 has been designed to dissipate heat more efficiently than any other amplifier manufactured today. However, prolonged operation at high volumes or extremely low impedances without the aid of a **fan shroud** can cause the unit to overheat and protect itself. Regardless of where you decide to mount the MS275/MPS2240, make sure that there is at least a 2" clearance above and around the amplifier.

The amplifier may be mounted either upright (Figure 1) or horizontally (Figure 2), but **never** upside down (Figure 3); that causes the rising heat to “feed back” into the amplifier, causing a premature system shut down.

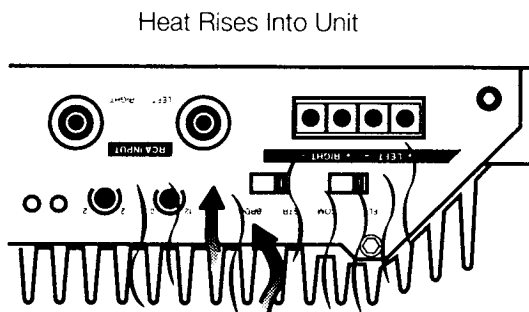


**Figure 1**

Heat Rises Through Heatsink Causing Each Fin To Heat More Rapidly.



**Figure 2**



**Figure 3**

The MS275/MPS2240 should be protected from exposure to moisture. It is best to mount the amplifier:

1. On the floor or side panel of the trunk.
2. Under the seat.
3. Any other location where the amplifier has good ventilation for the heatsink.

Place amplifier in the position that you wish to use, making sure there is room for the amplifier cables to reach the amplifier's sockets.

# AMPLIFIER MOUNTING

## Mounting considerations:

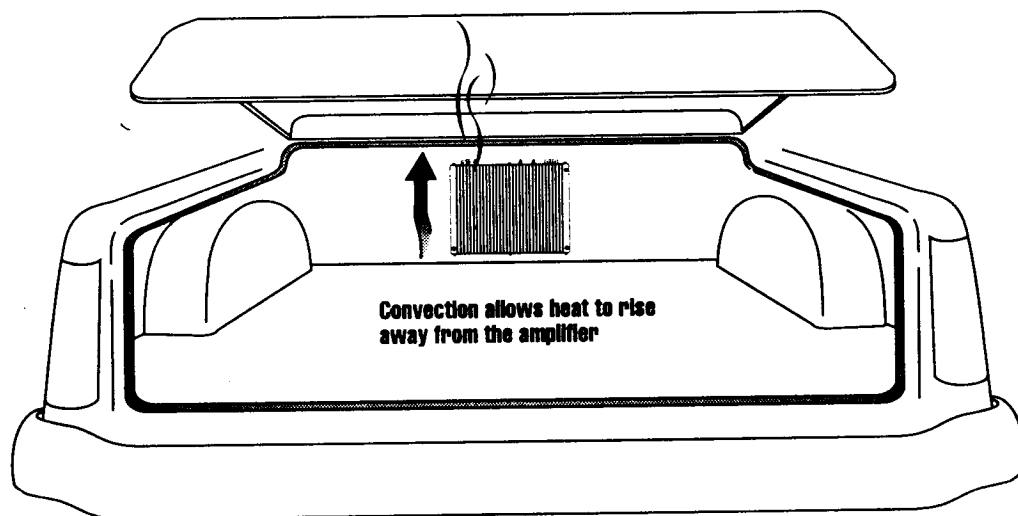
- Is there enough space for the signal input plugs?
- Will the speaker and power cables be able to enter the terminal connectors straight?
- Will your mounting position allow easy viewing of indicator LEDs and amplifier controls?

Follow these steps to mount your new amplifier properly:

1. Use the MS275/MPS2240 as the template. Mark the mounting surface with a felt pen or pencil. Placing masking tape on the surface first will make these marks more visible.
2. Drill  $\frac{1}{8}$  inch pilot holes.
3. Mount the amplifier with the four (4) #8 by  $\frac{1}{4}$  inch panhead phillips screws provided.

The mounting shown in Figure 4 is excellent; it allows the heat sink fins to act as a chimney, keeping the amplifier cool over longer periods on time.

**Warning!** Do not drill any holes while using the amplifier as a template! It is very easy to damage the amplifier's powder coated surface in this manner.

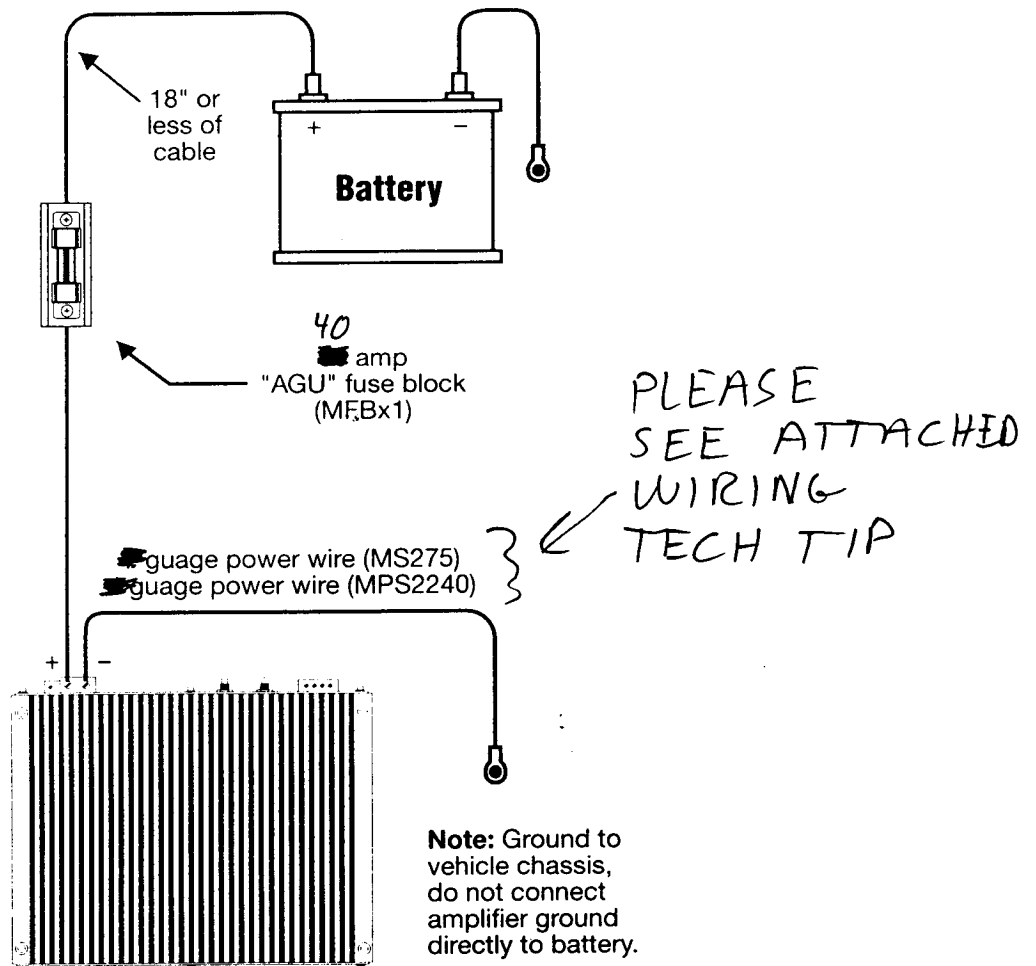


**Figure 4: Trunk Mount**

# ELECTRICAL INSTALLATION

**Note:** Disconnect battery ground before installation.

1. Always use the largest gauge power/ground cable possible. The MS275 accepts up to 7 gauge wire (Phoenix Gold Model# PS7R/PS7B, PRO7R/PRO7B.) The MPS2240 accepts up to 4 gauge wire (Model# PS4R/PS4B, PRO4R/PRO4B.)
2. Always place a fuse or circuit breaker no more than 18 inches from the battery. This protection is only for the vehicle, not the amp and should be no greater than 30 Amps per amplifier. (See Figure 5)



**Figure 5: PowerFlow System**



# -- Phoenix Gold Tech Tips --

## How to select the correct gauge power cable for single or multiple amplifier systems.

The maximum continuous amplifier power and the distance of the cable run determine the correct power cable size.

Use the chart below to find the correct cable size

1. Find the distance (feet) of the cable run along the top.
2. Find the total continuous power (watts) the cable must support on the left.
3. Where the two meet indicates the proper gauge cable.

If the distance or power falls between two columns or rows, always round up to the next higher gauge.

Distance of cable run

		4 ft	8 ft	12 ft	16 ft	20 ft	24 ft
M a x i m u m  C o n t i n u o u s  p o w e r	100 w	10	10	8	8	4	4
	200 w	10	8	8	4	4	2
	400 w	8	8	4	4	2	2
	600 w	8	4	4	2	2	2
	800 w	4	4	2	2	2	2
	1000 w	4	2	2	2	2	1/0
	1400 w	2	2	2	2	1/0	1/0
	1800 w	2	2	2	1/0	1/0	1/0
	2200 w	2	2	1/0	1/0	1/0	1/0 x 2
	2600 w	2	1/0	1/0	1/0	1/0 x 2	1/0 x 2
	3000 w	1/0	1/0	1/0	1/0 x 2	1/0 x 2	1/0 x 3

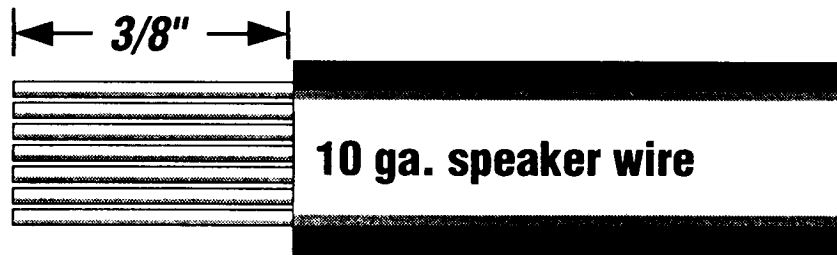
### Examples:

1. A system with one ZX450. The amplifier is mounted in the trunk and the battery is 18 feet away in the engine compartment. The amplifier can produce up to 500 watts. The chart above shows the need for a 2 cable.

2. A system with a ZPA0.5 for bass and a . The amplifier is mounted in the trunk and the battery is 18 feet away in the engine compartment. The amplifier can produce up to 500 watts. The chart above shows the need for a 2 cable.



## ELECTRICAL INSTALLATION (CONT.)



**Figure 6: Wire Stripping**

3. Always use the largest gauge speaker wire possible, to get the highest possible “damping factor” for the tightest, most accurate bass. The speaker terminal accepts up to 10 gauge cable.
4. Strip each cable approximately  $\frac{3}{8}$  inches (see Figure 6) and twist the exposed wire together.
5. Insert the twisted wire end into the connector. Tighten the set screw firmly. Avoid loose connections, as they have high contact resistance.  
**Note:** For **bridged mono** operation, connect the speaker to the **left+** and **right –** terminals.
6. Make sure to run your audio cables **AWAY** from your power wires. This reduces noise caused by the power wire radiating into the audio cables.  
For audio connections, we **strongly** recommend using high-quality audio interconnects like our STS (Super Triple Shielded) or Compact STS cables. The Triple-Shielded cables are the ultimate in sound quality and for eliminating unwanted “radiated noise” from your system.
  - The Green LED lights when the amplifier is **on**.
  - The Yellow LED lights when the amplifier has “thermaled”: the heatsink has reached 200°F and the amplifier has shut off to protect itself.
  - The Red LED lights if the speaker impedance is too low to allow safe operation, or if there is a wiring fault.
  - When the protective circuitry engages, the green LED flashes for a second, then the red LED will stay lit. The lights may recycle several times. This is the result of a short in the system. Make sure that none of the speakers are shorted. Having a shorted output will not damage your MS275/MPS2240, but it will cause the protection circuitry to engage. This condition is indicated by the green Power LED and the red Protection LED alternately cycling on and off.