MR20PA

Marine Public Address System Controller with Microphone

Congratulations on your purchase of a BOSS AUDIO SYSTEMS Marine Public Address System Controller.

It has been designed, engineered and manufactured to bring you the highest level of performance and quality, and will afford you years of listening pleasure.

Thank you for making **BOSS AUDIO SYSTEMS Marine** your choice for marine audio entertainment!

USER'S MANUAL

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Introduction

An important member of the BOSS AUDIO SYSTEMS **Marine** audio component series, we are pleased to introduce the unique MR20PA. This unique control center allows you to add public address capabilities to an existing marine audio amplifier, as well as provide a convenient way to make critical frequency adjustments to your system for enhanced sound reproduction.

The MR20PA has several qualities that make it a real performer:

Custom control microphone

We have designed a new microphone and custom circuitry specifically for our new line of marine audio components. The mic features a thumbwheel volume control and an on/off switch. Press and hold the on/off switch and the MR20PA automatically turns off the audio playing on your head unit, allowing you to speak clearly and loudly to your passengers.

The 13-foot long cable on the microphone allows you to move around the boat freely while you talk.

Accommodates 2 channel or 4 channel input sources

The MR20PA can accept input from either 2CH or 4CH audio sources, which means you don't need to upgrade your head unit or other audio source to build it into your system.

Adds crossover processing to audio input signals to create full range audio system

Many power amplifiers do not have a built-in crossover to allow you to set up your system with, for example, highs/mids in the front and woofers in the rear. The MR20PA features variable low pass crossovers and fixed high pass on all four input channels, allowing you to easily set up a 2-way system.

Even for amps that DO have a built-in crossover function, in a marine environment where you have placed your amp in a waterproof location, it may be difficult to get to the amp to make these adjustment. So for those setups, the MR20PA places the crossover controls at your fingertips.

Input level controls

The MR20PA features a set of input level controls on the audio source input channels. This allows you to adjust the output level from your head unit so that the input levels presented to the amplifier are high enough to allow the amplifier to operate at at moderate power level -- which can greatly extend the life of your amplifier.

This is a particularly great benefit if you are adding this unit as a front end to a marine amplifier that lacks input gain controls.

To give you even more control in your system setup, we have added an input sensitivity selector control, dividing the input voltage range into two, to allow you to set the input level controls with far greater accuracy.

Independent 0-+18dB Bass Boost on CH1/2 and CH3/4

When the party really takes off, who wouldn't want to increase the bass frequencies at least a little? This MR20PA feature allows you to do just that on either pair of channels.

PA bypass capability

Generally, most users will probably want the power to be turned on to the MR20PA when their head units are turned on. The MR20PA features a remote on/off feature that does just that.

But you may wish to disable the microphone system to prevent unruly revelers on your boat from using the mic. In this case, you can use the BYPASS setting on the control panel.

What is included?

When first unpacking your new MR20PA, please check first that the package contains all of the items below. If something is missing, contact the store where you purchased the player.

- **Marine PA System Controller**
- **Custom microphone and mounting bracket**
- **Line level (RCA) input cable with connectors**
- **Four (4) mounting screws**

Features

Your new BOSS AUDIO SYSTEMS **Marine** MR20PA Public Address System Controller features the following:

- **In conjunction with a 2CH or 4CH power amplifier, designed to work as full-featured PA (Public Address) System with included microphone**
- **Variable input level controls**
- **Variable low pass crossovers**
- **Fixed high pass crossovers (400Hz)**
- **Variable bass boost (0 to +18dB)**
- **Exclusive protective coating on PC board to prevent damage from humidity**
- **LED power and MIC ON mode indicators**

General precautions

Before installing and using your new BOSS AUDIO SYSTEMS Marine component, please become familiar with all the information contained in this manual.

Please keep this manual in a safe place for future reference.

• Do not open or attempt to repair this unit yourself. Dangerous high voltages are present which may result in electric shock. Refer any repairs to a qualified service technician.

• To avoid risk of electronic shock or damage to the component, do not permit any of this equipment to become damp or wet from water or drinks. If this does occur, immediately unplug the power wires and send the component to your local dealer or service center as soon as possible.

• If there is smoke or any peculiar odor present during use or if there is damage to any of the component enclosures, immediately unplug the power cord and send the component to your local dealer or service center as soon as possible .

SHOCK HAZARD! Do not open the case of this product. There are dangerous voltages present within the unit. There are no user-serviceable parts within the unit.

Installation location

Choose a mounting location where the unit will not distract or otherwise interfere with the pilot's ability to control the boat.

Use only the installation parts and hardware provided with the unit to ensure proper installation. Using other parts can cause malfunction and possible damage to your crossover.

Avoid installing the unit in a location which is subject to high temperatures, direct sunlight, hot air from such sources as heaters or exhaust lines, or where it will be subject to contact with dust, dirt, moisture or excessive vibration.

While we have made an effort to provide a certain degree of resistance to the damaging effects of water and moisture, this unit is not waterproof. Do not install it in a location subject to splashing or rainfail.

Mounting the unit

When you have found a suitable location in the marine vessel in which to mount the component, mark the location for the mounting hole screws by positioning the component where you wish to install it.

Use a scribe or mounting screw, inserted through each of the amp's mounting holes, to mark the mounting surface. If the mounting surface is carpeted, measure the hole centers and mark with a felt tip pen.

Drill pilot holes in the mounting surface for the mounting screws. Place the component in position, and attach the component to the mounting surface securely using screws.

Installation precautions

Before you drill or cut any holes, investigate your vessel's layout very carefully. Take special care when you work near the gas tank, fuel lines, hydraulic lines and electrical wiring.

Never operate this unit when it is unmounted. Attach all audio system components securely within the amplifier to prevent damage, especially in an accident.

Do not mount this unit so that wire connections are unprotected, in a pinched condition, in contact with any metal surfaces in your marine vessel, or likely to be damaged by nearby objects.

Before making or breaking power connections in your system, disconnect the marine vessel battery. Confirm that your head unit or other equipment is turned off while connecting the input jacks or speaker terminals.

If you need to replace the power fuse, replace it only with a fuse identical to that supplied. Using a fuse of a different type or rating may result in damage to your audio system or this component which is not covered by the manufacturer's warranty.

Fuses

Power fuses protect both the MR20PA and the electrical system of your boat from fault conditions. If you must replace a fuse, use a fuse of exactly the same type and rating. Using a different type or rating of fuse may result in damage to this product or your marine vessel or cause a fire.

Making electrical and audio connections

Using the connector sets provided, connect the following:

+12V (constant):
Use a minimum 16GA wire and connect it directly to the vehicle's (+) battery terminal, with a inline 3A fuse within 18 inches of the battery.

GND (Ground):
Use a minimum 16GA wire and connect it to a clean, solid chassis ground point as close to the crossover as possible.

REM (Remote):
Use a minimum 16GA wire and connect it to the Remote Turn-On lead of your head unit.

Microphone Input:
The included custom microphone features a permanent cable which you can plug directly into the microphone input connector.

Line Level Audio Inputs:
Use high quality RCA cables. Make connections as shown in the diagram shown elsewhere in this manual.

Getting started

Before powering up your system:

1) Recheck all connections

2) Set all level controls properly (see below)

3) Set all crossover controls and switches to the desired positions.

Power up your system and set the volume control on your head unit to a moderate level (typically this is a level where you can still have a normal conversation and be heard over the audio). You may need to further fine tune the system to suit your taste.

Why set the level controls?

The harder an amplifier works, the hotter it gets. An amp that has been allowed to run cool will have a much longer life. By boosting the signal level that is presented to the amplifier inputs, the amplifier will not need to work as hard to attain the desired volume level. For this reason, proper input levels presented to an amplifier will greatly extend its lifetime.

Setting level controls

Every head unit or other signal source is different, and provide a different level of output voltage.

Since output voltage varies, you will need to first select the input voltage range on the MR20PA's Input Sensistivity Selector in which your radio's output fall.

If you do not have the original manual which came with your radio and so cannot look up the output voltage specification (and also do not have a means with which to measure it), first try the higher range (2V-8V). If you find that the signal level is too low when you try to make subsequent adjustments, switch to the MR20PA Input Sensistivity Selector's lower range (100mV-2V) which will provide more signal boost.

To begin setting up the level controls, set your system as follows:

HEAD UNIT VOLUME CONTROL: 75%
AMPLIFIER GAIN (LEVEL) CONTROL (if present): 50%
MR20PA INPUT LEVEL CONTROLS: 0%

Turn on the radio or play a familiar song on your CD player and listen. Carefully increase the MR20PA's Input Level Control(s) until the sound is as loud as possible, but still free from distortion, and then reduce the setting slightly.

If the sound level is satisfactory and you do not think you will ever need to listen louder, you are done with the setup. If you want still more volume, slowly increase the Amplifier Gain (Level) Control until the sound approaches the desired level, but is still free from distortion, then reduce the setting slightly.

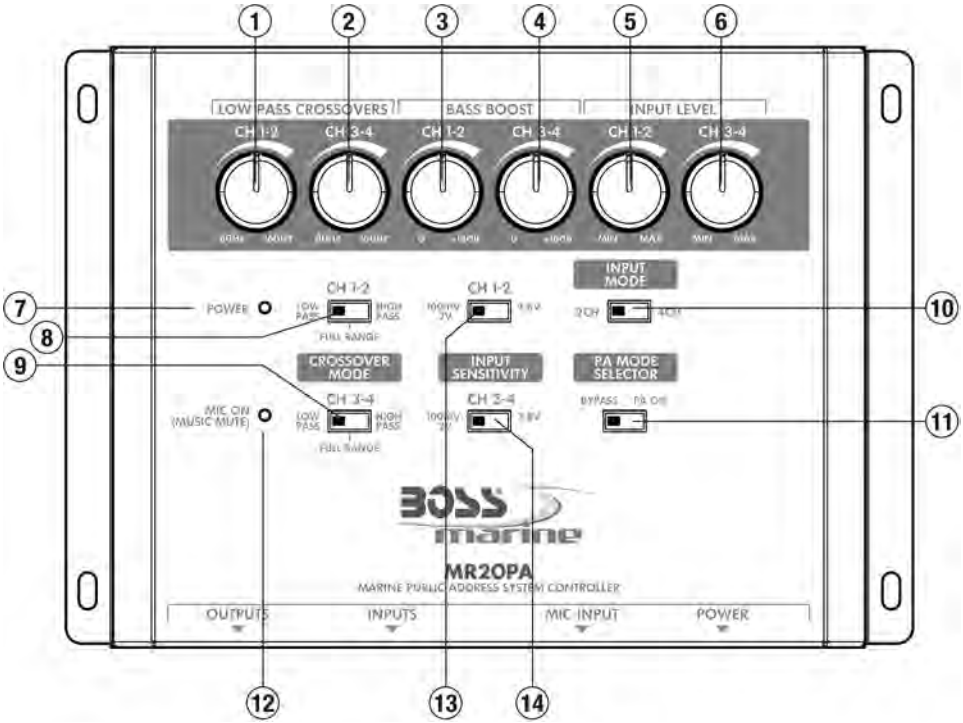
Don't misuse the level control!

Do not mistake the input level control for a volume control! It is designed ONLY to match the output level of your audio source to the input level of your amplifier.

Do not adjust this input level to maximum unless your input level requires it.

Ignoring these instructions will result in an input overload to the amplifier, and excessive audio distortion. It can also cause the protection circuit to engage.

Features and Controls



1 LOW PASS CROSSOVER FREQUENCY CONTROLS
2
Use this to select the frequency range sent to the subwoofer outputs. The selected frequency is the *highest* frequency which will be reproduced by the subwoofer(s).

3 BASS BOOST CONTROLS
4
This control allows you to increase the level of the bass up to +18dB.

5 INPUT LEVEL CONTROLS
6
This control allows you to adjust the input voltage level presented to the amplifier so that volume level AND audio quality are the best possible.

7 POWER INDICATOR
This unit is usually turned on and off powering up the attached head unit. When the head unit is turned on and power is applied to the MR20PA, this LED indicator will be illuminated.

8 CROSSOVER MODE SELECTORS
9
This three position selector determines whether or not a crossover will be used to filter the audio channel and if so, what type of crossover. If you wish the entire frequency spectrum to be delivered to the amplifier, leave this switch set to full range.

If your intention is to send the audio channel to a subwoofer amplifier, select LOW PASS and then set an appropriate upper frequency limit on the corresponding LOW PASS FREQUENCY CONTROL. If you want all frequencies above 400Hz (mids and highs) to be sent to the amplifier, select HIGH PASS.

10 INPUT MODE SELECTORS
Set this control to reflect whether you have a 2-channel or 4-channel audio source connected. If you have a two channel source connected, setting this to 2CH will allow the signal to be present in all four channels, which gives you the opportunity to have a stereo 2-way system.

⑪ **PA MODE SELECTOR**
In normal usage (with selector set to PA ON position), when the system is on, anyone who picks up the mic and presses the button can interrupt the audio and address the people on your boat.

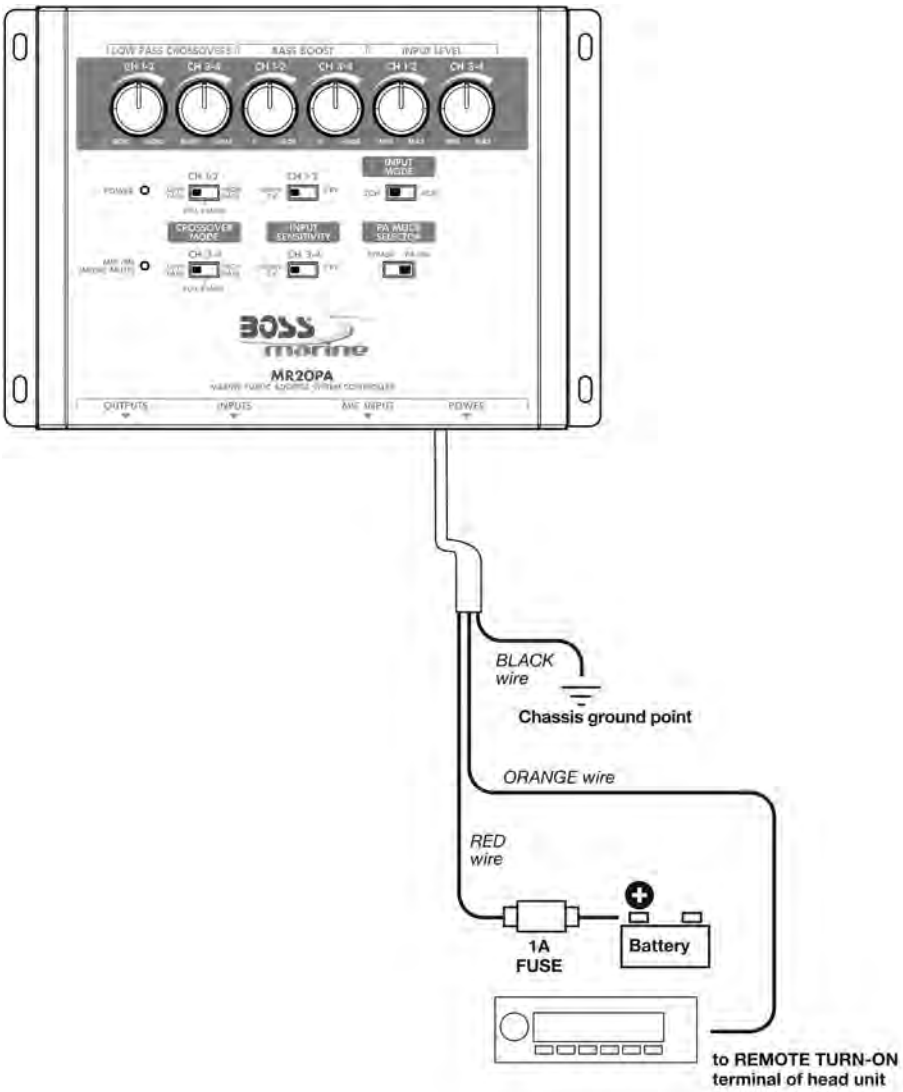
You might have visitors on the boat who you would rather not be able to do this. In that situation, by switching the PA Mode Selector to BYPASS, the PA function is disabled, and the audio track will not be interrupted even if someone uses the mic.

⑫ **MIC ON INDICATOR**
This LED tells you that the microphone is in use, and confirms that this is the reason the music is muted.

⑬ **INPUT SENSITIVITY SELECTOR**
⑭ This selector serves as a range selector for the Input Level controls. Select an input voltage range that is appropriate for your head unit.

Power connections

Please note that the MR20PA contains an internal ON/OFF switch, which is activated when the head unit is turned on. For this reason, in order to use this component, your head unit must have a remote-turn on lead.

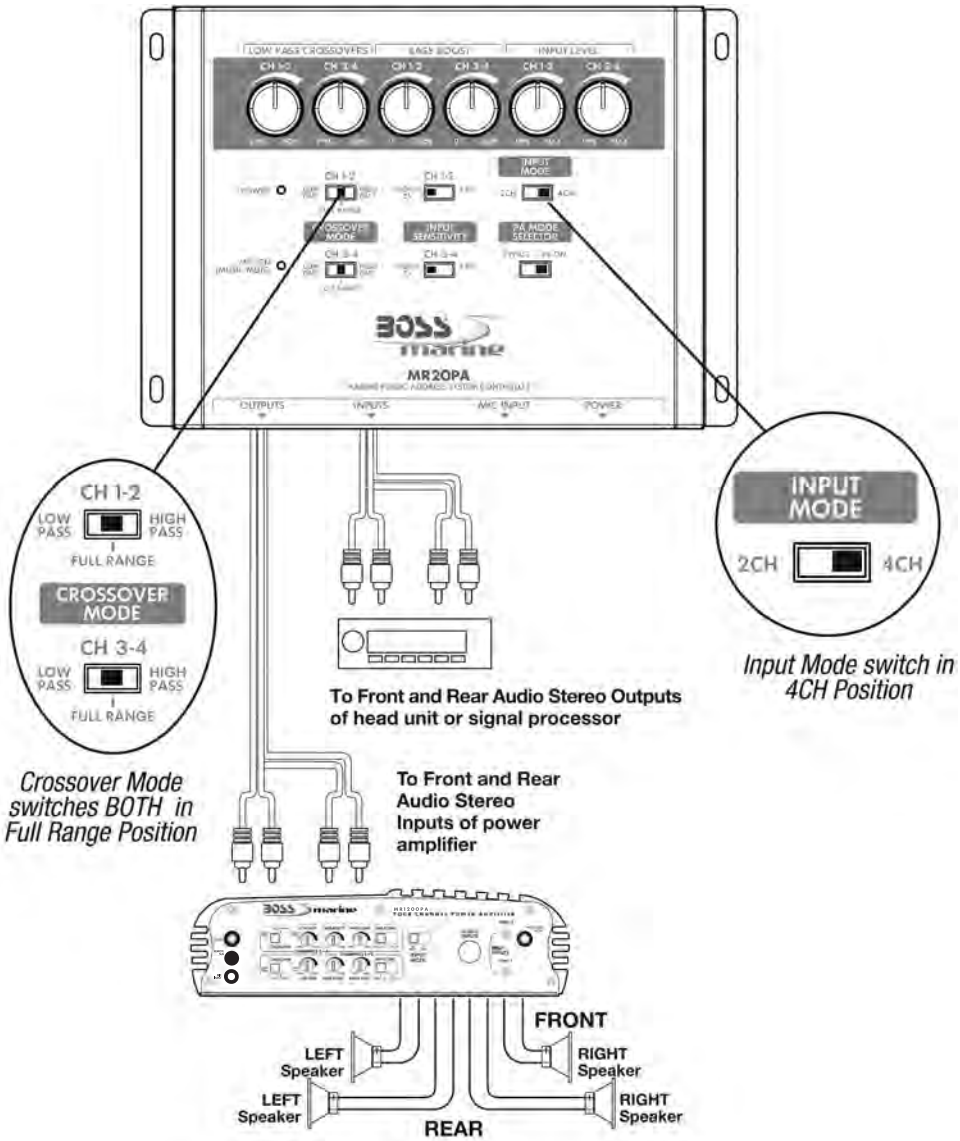


Low Level Input and Output Wiring examples

Low-level (RCA) input wiring is preferred for best audio performance. Always use a high-quality RCA cable for best audio performance.

Full Range 4-Channel System

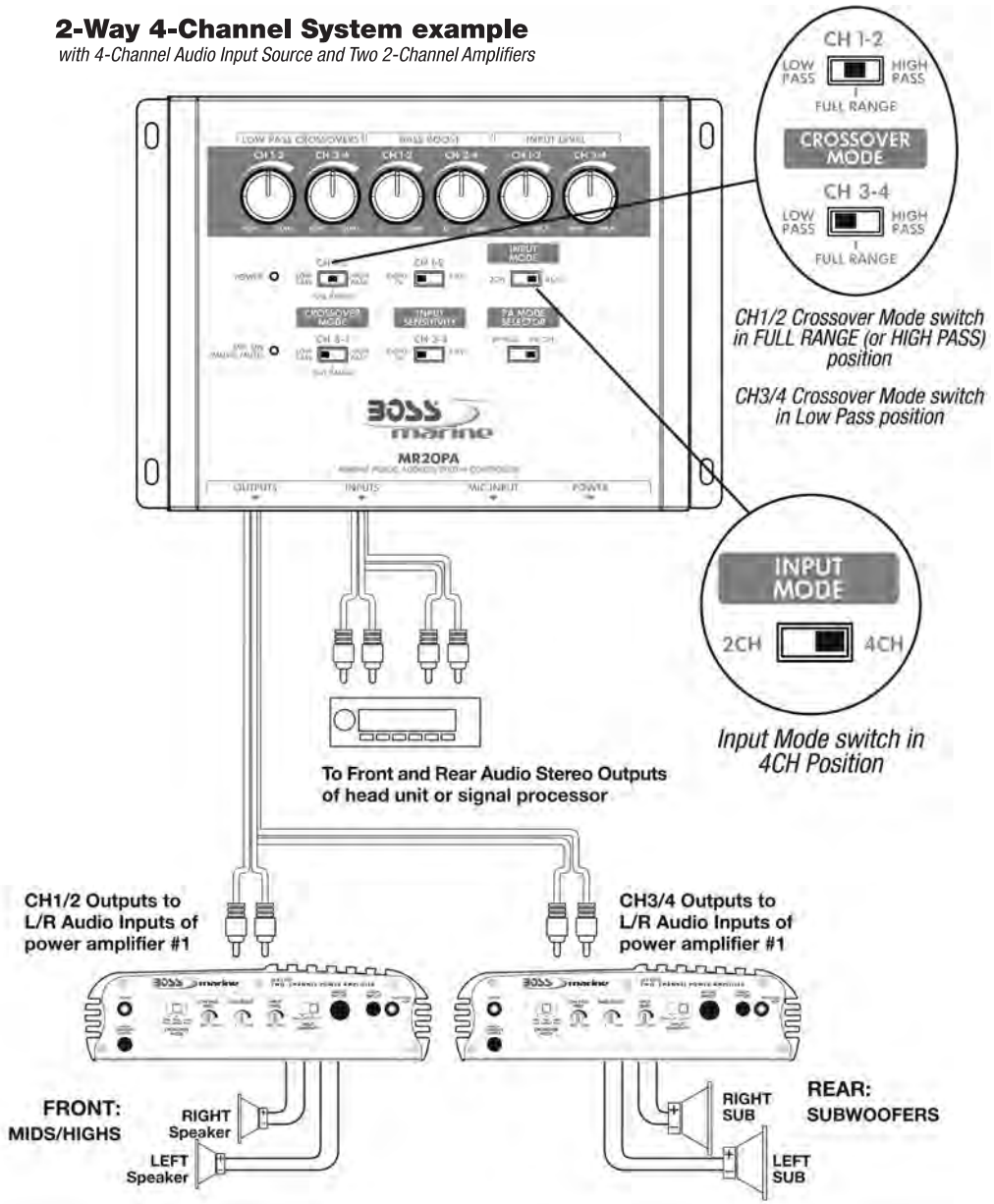
with 4-Channel Audio Input Source and a 4-Channel Amplifier



Low Level Input and Output Wiring examples, cont.

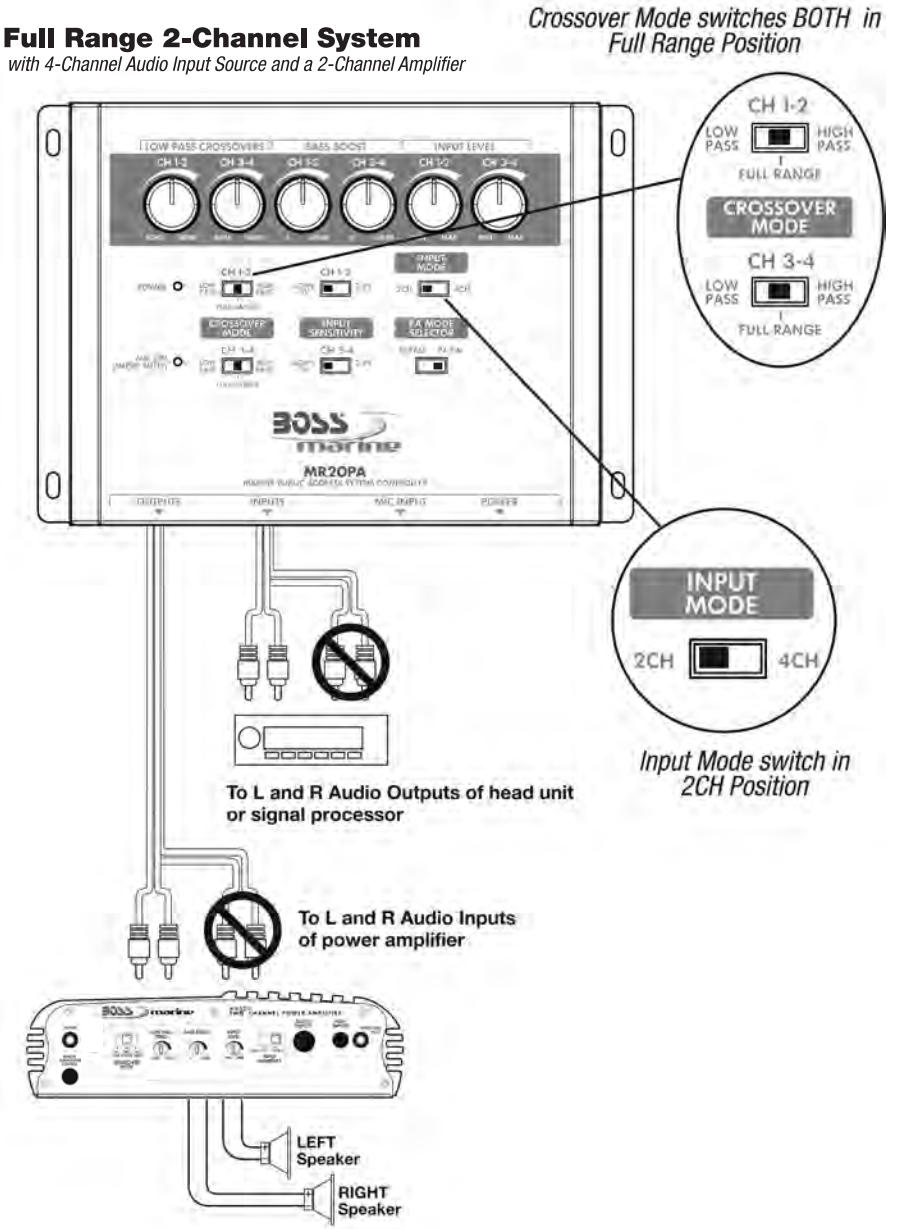
2-Way 4-Channel System example

with 4-Channel Audio Input Source and Two 2-Channel Amplifiers



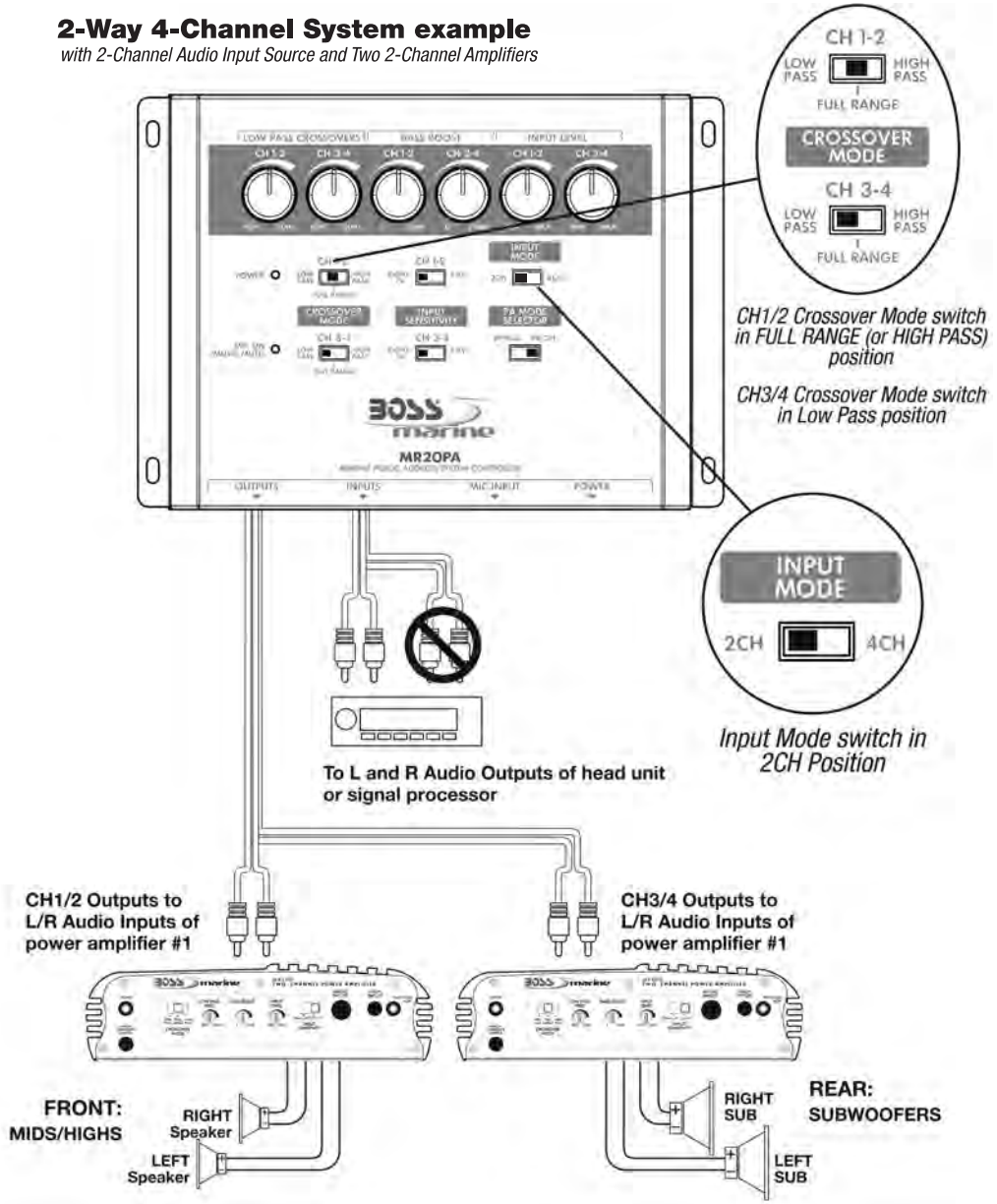
Full Range 2-Channel System

with 4-Channel Audio Input Source and a 2-Channel Amplifier



2-Way 4-Channel System example

with 2-Channel Audio Input Source and Two 2-Channel Amplifiers



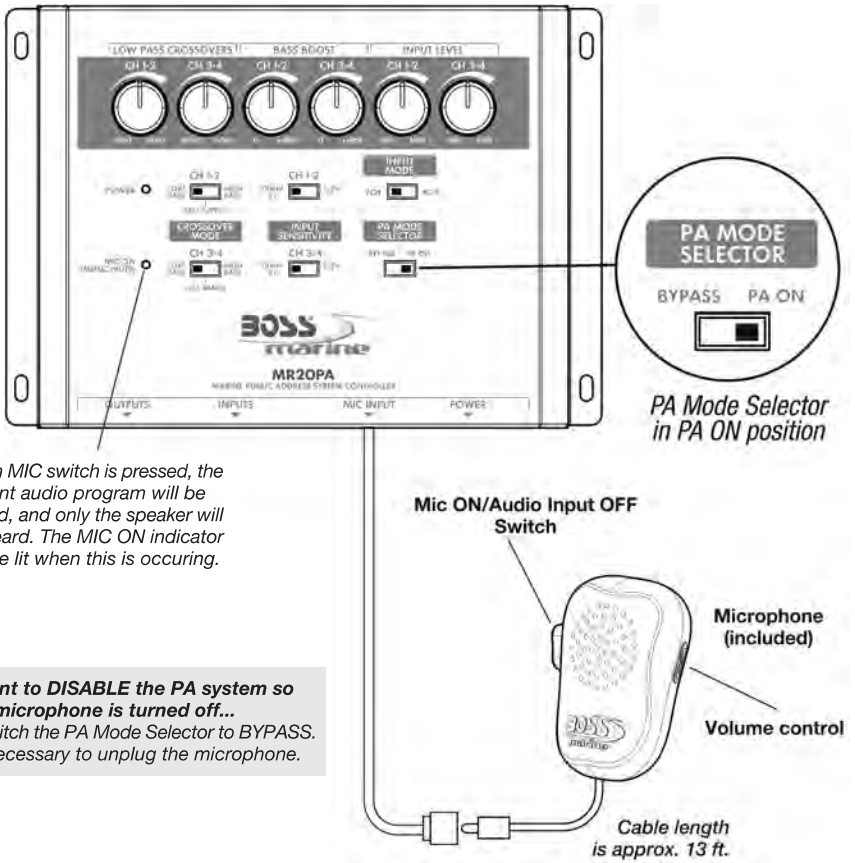
This configuration allows you to derive a 4-channel 2-way system from a 2-channel input, courtesy of the MR20PA's crossover and channel functions.

Microphone Input Wiring

If you wish to use the public address feature in the MR20PA, all you need to do is to connect the custom microphone included with the amp AND make sure that the PA Mode Selector is in the PA ON position.

When you press the button on the microphone, it automatically cuts off the input to Channels 1-4 from your audio source and presents the microphone signal to the amplifier.

You can use the microphone to supplement either 2CH or 4CH audio input from your signal source. In any case, when the mic switch is engaged, your audio input will be silenced until the switch is released.



If you want to DISABLE the PA system so that the microphone is turned off...
Simply switch the PA Mode Selector to BYPASS. It is not necessary to unplug the microphone.

Troubleshooting

If you experience operation or performance problems with this product, compare your installation with the electrical wiring diagram on the previous page. If problems persist, read the following troubleshooting tips which may help eliminate the problems.

SYMPTOM	CAUSE	REMEDY
MR20PA does not turn on.	Power connections are incorrect or faulty.	*Check that power connections are properly made and all fuses are in functioning condition.* *Check that there is +12V present on the +12V terminal.*
Sound level is very low.	Cables are loose and/or incorrectly connected.	*Check that all audio connections are properly made and securely connected.*
	Cables are faulty.	*Check all cables. If necessary, repair or replace head unit.*
Background noise is too high.	Cables are loose and/or incorrectly connected.	*Check that all audio connections are properly made and securely connected. It is especially important to check the condition of the GROUND connection.*
	Cables are faulty.	*Check all cables. If necessary, repair or replace head unit.*

Specifications

Marine Public Address System
Controller with Microphone

MR20PA

Low pass crossover frequency	80-160Hz
High pass crossover frequency	400Hz (fixed)
Crossover slope	12dB per octave
Subwoofer bass boost	0 to +18dB
Signal-to-noise Ratio	110dB
THD	less than 0.01%
Channel separation	80dB
Power supply	10-16V negative ground
Output voltage	8V max
Input impedance	20k Ohms
Output impedance	100 Ohms
Output gain	1:2 (+6dB)
Dimensions (W x D x H)	8.6” x 6.0” x 2.1”

All specifications subject to change without notice.

Notes