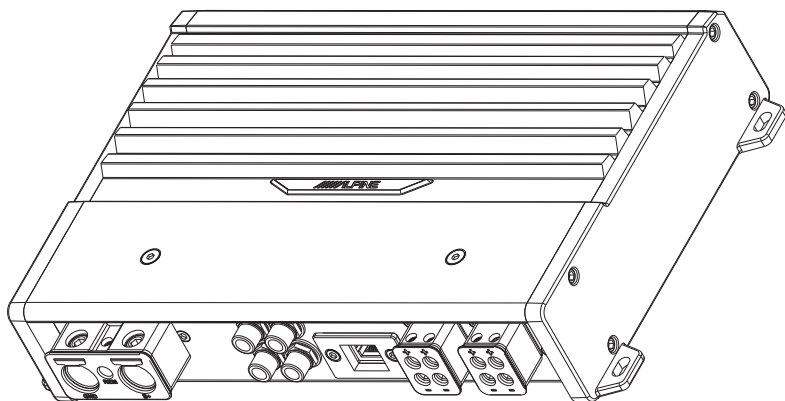




M-A60F

4 CHANNEL POWER AMPLIFIER



- **OWNER'S MANUAL**
Please read before using this equipment.
- **BEDIENUNGSANLEITUNG**
Lesen Sie diese Bedienungsanleitung bitte vor Gebrauch des Gerätes.
- **MODE D'EMPLOI**
Veuillez lire avant d'utiliser cet appareil.
- **MANUAL DE OPERACIÓN**
Léalo antes de utilizar este equipo.
- **ISTRUZIONI PER L'USO**
Si prega di leggere prima di utilizzare il attrezzatura.
- **ANVÄNDARHANDLEDNING**
Innan du använder utrustningen bör du läsa igenom denna användarhandledning.
- **РУКОВОДСТВО ПО ЭКСПЛУАТАЦИИ**
Прочтите настоящее руководство перед началом использования оборудования.
- **用户手册**
使用本设备前请先阅读。

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WARNING

Points to Observe for Safe Usage

Read this manual carefully before using the system components. They contain instructions on how to use this product in a safe and effective manner. Alpine cannot be responsible for problems resulting from failure to observe the instructions in this manual.

	WARNING This symbol means important instructions. Failure to heed them can result in serious injury or death.
--	--

DO NOT OPERATE ANY FUNCTION THAT TAKES YOUR ATTENTION AWAY FROM SAFELY DRIVING YOUR VEHICLE.

Any function that requires your prolonged attention should only be performed after coming to a complete stop. Always stop the vehicle in a safe location before performing these functions. Failure to do so may result in an accident.

KEEP THE VOLUME AT A LEVEL WHERE YOU CAN STILL HEAR OUTSIDE NOISES WHILE DRIVING.

Excessive volume levels that obscure sounds such as emergency vehicle sirens or road warning signals (train crossings, etc.) can be dangerous and may result in an accident. LISTENING AT LOUD VOLUME LEVELS IN A VEHICLE OR BOATING VESSEL MAY ALSO CAUSE HEARING DAMAGE.

DO NOT DISASSEMBLE OR ALTER.

Doing so may result in an accident, fire or electric shock.

USE THIS PRODUCT FOR MOBILE 12V APPLICATIONS.

Use for other than its designed application may result in fire, electric shock or other injury.

USE THE CORRECT AMPERE RATING WHEN REPLACING FUSES.

Failure to do so may result in fire or electric shock.

DO NOT BLOCK VENTS OR RADIATOR PANELS.

Doing so may cause heat to build up inside and may result in fire.

MAKE THE CORRECT CONNECTIONS.

Failure to make the proper connections may result in fire or product damage.

USE ONLY IN VEHICLES WITH A 12V NEGATIVE GROUND.

Check with your dealer if you are not sure. Failure to do so may result in fire, etc.

BEFORE WIRING, DISCONNECT THE CABLE FROM THE NEGATIVE BATTERY TERMINAL.

Failure to do so may result in electric shock or injury due to electrical shorts.

DO NOT ALLOW CABLES TO BECOME ENTANGLED IN SURROUNDING OBJECTS.

Arrange wiring and cables in compliance with the manual to prevent obstructions when driving. Cables or wiring that obstruct or hang up on places such as the steering wheel, gear lever, brake pedals, etc. can be extremely hazardous.

DO NOT SPLICE INTO ELECTRICAL CABLES.

Never cut away cable insulation to supply power to other equipment. Doing so will exceed the current carrying capacity of the wire and result in fire or electric shock.

DO NOT DAMAGE PIPE OR WIRING WHEN DRILLING HOLES.

When drilling holes in the chassis for installation, take precautions so as not to contact, damage or obstruct pipes, fuel lines, tanks or electrical wiring. Failure to take such precautions may result in fire.

DO NOT USE BOLTS OR NUTS IN THE BRAKE OR STEERING SYSTEMS FOR GROUND CONNECTIONS.

Bolts or nuts used for the brake or steering systems (or any other safety-related system), or tanks should NEVER be used for installations or ground connections. Using such parts could disable control of the vehicle and cause fire etc.

KEEP SMALL OBJECTS SUCH AS BATTERIES OUT OF THE REACH OF CHILDREN.

Swallowing them may result in serious injury. If swallowed, consult a physician immediately.

 **CAUTION**

This symbol means important instructions. Failure to heed them can result in serious injury or property damages

HALT USE IMMEDIATELY IF A PROBLEM APPEARS.

Failure to do so may cause personal injury or damage to the product. Return it to your authorized Alpine dealer or the nearest Alpine Service Center for repair.

HAVE THE WIRING AND INSTALLATION DONE BY EXPERTS.

The wiring and installation of this unit requires special technical skill and experience. To ensure safety, always contact the dealer where you purchased this product to have the work done.

USE SPECIFIED ACCESSORY PARTS AND INSTALL THEM SECURELY.

Be sure to use only the specified accessory parts. Use of other than designated parts may damage this unit internally or may not securely install the unit in place. This may cause parts to become loose resulting in hazards or product failure.

ARRANGE THE WIRING SO IT IS NOT CRIMPED OR PINCHED BY A SHARP METAL EDGE.

Route the cables and wiring away from moving parts (like the seat rails) or sharp or pointed edges. This will prevent crimping and damage to the wiring. If wiring passes through a hole in metal, use a rubber grommet to prevent the wire's insulation from being cut by the metal edge of the hole.

DO NOT INSTALL IN LOCATIONS REGULARLY EXPOSED TO WATER, HIGH MOISTURE OR DUST.

Avoid installing the unit in locations with high dust, high moisture or where it may regularly come in contact with water. Although this unit is IPX6 rated for protection against water intrusion, it must not be submerged or be in continuous contact with water. If water, moisture or dust penetrates into the unit, it may result in product failure.

SERVICE CARE

◆IMPORTANT
Please record the serial number of your unit in the space provided here and keep it as a permanent record. The serial number plate is located on the bottom of the unit.

SERIAL NUMBER: _____

INSTALLATION DATE: _____

INSTALLATION TECHNICIAN: _____

PLACE OF PURCHASE: _____

- ◆For European Customers**
Should you have any questions about warranty, please consult your store of purchase.
- ◆For Customers in other Countries**

IMPORTANT NOTICE
Customers who purchase the product with which this notice is packaged, and who make this purchase in countries other than the United States of America and Canada, please contact your dealer for information regarding warranty coverage.

ABOUT THE PROTECTION CIRCUIT

If an abnormality such as an electrical short circuit occurs, power supply voltage is too high, etc., a protection circuit will be activated and stop the amplifier from outputting sound to prevent damage to the amplifier or connected speakers in most cases. If such an abnormality occurs, the Power Indicator will light up red, or will remain blue but the output will be muted or intermittent. Refer to the "About the Power Indicator" on page 8 for the potential root cause and possible solutions.

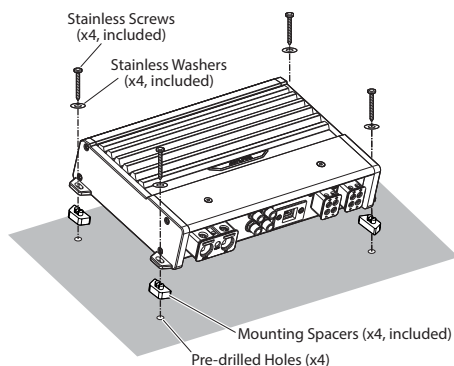
INCLUDED ACCESSORIES

- Power Supply Terminal Boot.....1
- Speaker Output Terminal Boot.....2
- Remote Controller Port Cover.....1
- 4AWG Wire Reducer Inserts.....2
- Mounting Screws and Washers.....4-sets
- Mounting Spacers.....4
- 2mm Hex Wrench (for Spk/Rem).....1
- 2.5mm Hex Wrench (for top control cover).....1
- 3 mm Hex Drive Bit (for mounting screws).....1
- 4mm Hex Wrench (for Pwr/Gnd).....1

INSTALLATION

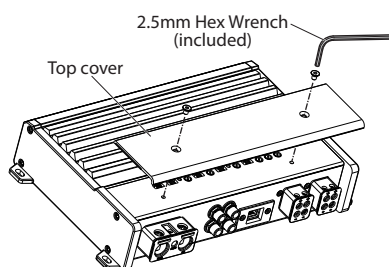
Due to the high power output of the M-A60F, considerable heat can be produced when the amplifier is in operation. For this reason, the amplifier should be mounted in an orientation that will allow convection with sufficient air space for the free circulation of air. For additional air flow and thermal isolation from the mounting surface, 4 mounting spacers are included. For alternate installation options and locations, please contact your authorized Alpine dealer.

1. Using the amplifier as a template, mark the four screw locations.
2. Make sure there are no objects underneath the surface that may be damaged during drilling.
3. Pre-drill the screw holes.
4. Position the M-A60F over the screw holes and secure with the four included stainless steel screws using the included 3mm driver bit.



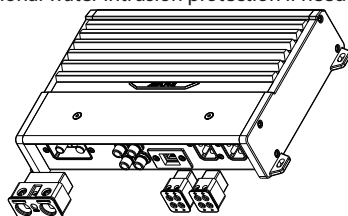
REMOVING THE TOP COVER

To access the top panel controls, remove the top cover screws and then the top cover.



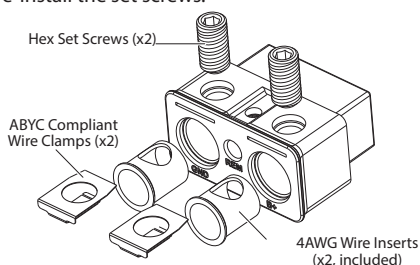
REMOVING THE TERMINAL PLUGS

Prior to making the power supply and speaker output terminal wiring connections, unplug the detachable terminals. This will provide easier access to the set screws for wiring connections, and is necessary to install the optional terminal boots for additional water intrusion protection if needed.



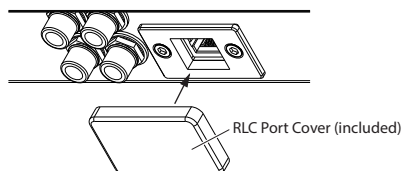
REDUCING POWER TERMINAL WIRE GAUGE

For applications where 4AWG power and ground cable is sufficient, install the included 4AWG Wire Inserts. To install into the power supply terminal, remove the set screws with the included 4mm hex wrench, then the ABYC compliant wire clamps. Insert the reducers, re-insert the wire clamps, and re-install the set screws.



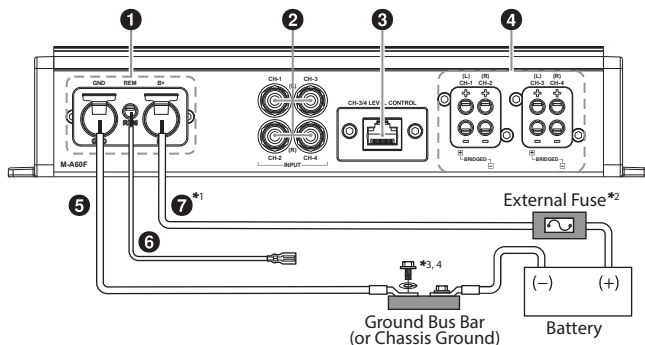
INSTALLING THE REMOTE PORT COVER

If the Remote Level Control port will not be used for the optional RUX-M-UNIV and the amplifier will be installed in a marine application, it is recommended to install the included Remote Controller Port Cover for additional protection from water intrusion.



CONNECTIONS

Before making connections, be sure to turn the power off to all audio components.



- *1 For details on the wire size to be used, refer to the supplied "Cautions on Power Supply Wire Connections" on page-10, and then use the wire of the specified size.
- *2 An External Fuse (e.g. Fuse Block, Circuit Breaker) must be installed in-line with the battery lead as close as possible to the battery's positive (+) terminal but within 45cm (18"). If more than one amplifier is installed, add an external fuse as close as possible to each amplifier's power terminal for it's rated capacity, and a main fuse at the battery with the same or slightly larger capacity of the sum total of the fuse capacities of the amplifiers. For details on fuse rating, see "Battery Lead" (7) on page-5
- *3 Connect all equipment to the same ground point while keeping wire length as short as possible.
- *4 Terminate the ground lead with ground specific or ring terminal and securely bolt it to the boating vessel's ground buss bar or vehicle's chassis ground with a star or lock washer to prevent it from coming loose.

To prevent external noise from entering the audio system

- Locate the unit and route the leads at least 10 cm (4") away from the vehicle harnesses.
- Keep the battery power leads as far away from other leads as possible.
- Connect the ground lead securely to a bare metal spot connected with the vehicle's battery chassis ground, removing any paint or grease.
- Consult your Alpine dealer for further information about noise prevention measure.

1 Power Supply Terminal

Connect the Ground Lead (5), Remote Turn-on Lead (6), and Battery Lead (7) using the hex set screw of the Power Supply Terminal (1).

- For details on how to connect, see "Cautions on wire lead connections" on page-5.

2 RCA Input Jacks

Connect these jacks to the line-out leads on your head unit using RCA cables or Speaker-to-RCA Wire Adapter (sold separately). Be sure to observe correct channel connections (left vs. right) and polarity (+ vs -).

3 Remote CH-3/4 Level Control (optional)

Connect the Remote Level Controller RUX-M-UNIV (sold separately) to adjust CH-3/4's output level remotely. This is not to replace appropriate gain level setting between the amplifier and head unit.

4 Speaker Output Terminals

Connect the Speaker Output Leads (+)/(-) using the hex set screw of the Speaker Output Terminals.

- For details on how to connect, see "Cautions on wire lead connections on page-5.

- Be sure to observe correct speaker output connections and polarity. Connect the positive output to the positive speaker terminal and the negative to negative.
- Reversing polarity (swapping positive and negative connections) may be desirable in some installations for optimum bass performance.
- Do not connect the speaker (-) terminal to the vehicle's chassis.

5 Ground Lead (sold separately)

For marine applications without a chassis ground, this connection should be made to the battery's negative (-) terminal or an appropriate ground bus bar positioned near the battery. All audio component grounds should be connected to the same grounding point to prevent ground loops. For vehicle installations with a chassis ground, make the ground wire length as short as possible.

- For details on wire size to be used, refer to "Cautions on Power Supply Wire Connections" on page-10 and use the wire of the specified size.

6 Remote Turn-on Lead (sold separately)

Connect this lead to the remote turn-on (switched B+ output) lead of your head unit. If a remote turn-on lead is not available, see "Turn-on Check List" section on page-9 for an alternative method.

- When using speaker level outputs from the head unit or factory radio for signal input to the amplifier via wire-to-RCA adapter cables (sold separately), and a remote turn-on lead is not available, select "DC" via the Turn-On Mode switch (see ① on page-6) to activate the amplifier's DC-offset detection function.
- If no DC-offset signal is present in the source's speaker output leads, you will need to select REM at the turn-on switch and run a turn-on lead to a switched B+ source such as an ignition wire that receives accessory (ACC) power when the key or start button is in the accessory position.

7 Battery Lead (sold separately)

Be sure to add an External Fuse (e.g. in-line fuse, fuse block or circuit breaker) with the battery's positive (+) terminal. This fuse will protect your vehicle's electrical system in case of a short circuit. See below for appropriate fuse value requirement:

- For details on wire size to be used, refer to "Cautions on Power Supply Wire Connections" on page-10, and use the wire of the specified size.
- The required fuse rating for the M-A60F is 60A.

USE THE CORRECT AMPERE RATING

WHEN REPLACING FUSES. Failure to do so may result in fire or electric shock.

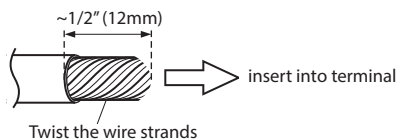
Cautions on wire lead connections

Refer to the descriptions below for the proper procedure for making wire connections. If you are in doubt about how to make these connections, consult your qualified Alpine dealer.

1. Check the wire size.

- For details on the wire size to be used, refer to the supplied "Cautions on Power Supply Wire Connections" on page-10. Be sure to use stranded wire of the of the specified size.
- If the available wire gauge used is unknown, consult your qualified Alpine dealer.

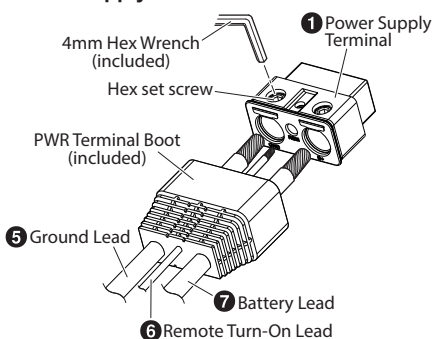
2. Remove the insulation from the ends of the wire to expose the strands by about 1/2" (12mm)



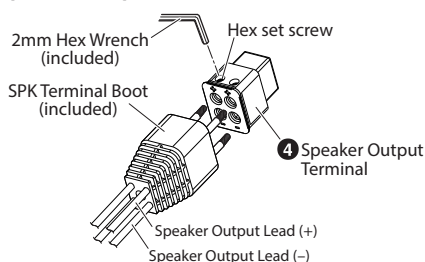
3. Insert the exposed strands into the correct terminal and tighten the hex set screw with the supplied hex wrench to secure the lead.

- Use the included terminal boots for locations where the amplifier may be exposed to water spray or moisture. The wires must be inserted through the boot first, before the terminal.
- If the terminal/wire cover's hole size is too small for the cable jacket diameter, carefully cut off a section of the cover's strain relief to expose the next larger hole size segment inside. See "Terminal Boot Wire Opening Size Segments" on page-6. The opening size should fit snug enough to the cable's jacket to provide a sufficient watertight seal while still allowing the cable to be pushed through.

Power Supply Terminal



Speaker Output Terminal

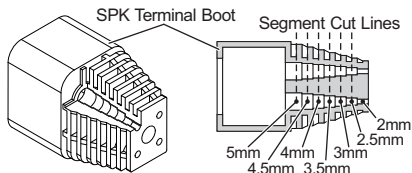
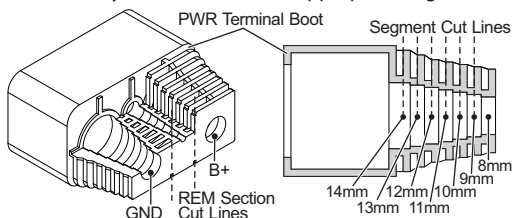


Notes:

- Only use the hex set screws in the Power Supply Terminal (①) or Speaker Output Terminal (④).
- For safety reasons, make all other connections first and always connect the battery lead last.
- The detachable terminals are indexed so can only be fully inserted one way, but observe correct orientation and ensure they are fully seated.
- **TO PREVENT DISCONNECTION OF THE TERMINALS OR LEADS, ALWAYS SECURE THE CABLING WITH WIRE CLAMPS OR ZIP TIES FOR STRAIN RELIEF CLOSE TO THE AMPLIFIER, PARTICULARLY WHEN MOUNTED VERTICALLY.**

Terminal Boot Wire Opening Size Segments

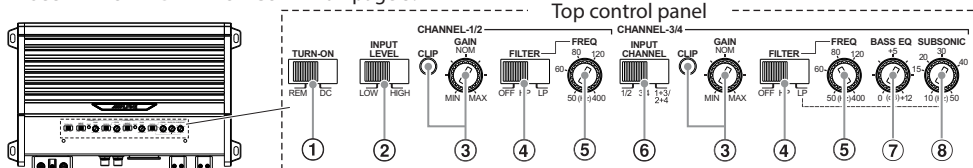
Each boot's wire openings have seven diameter segments inside. Measure the wire's outer jacket diameter and carefully cut the boot at the appropriate segment cut line of the next smaller opening size for a snug fit.



Note: The REM Section of the PWR Terminal Boot and SPK Terminal Boot have the same segment diameters.

SETTINGS

- To access the top control panel to make changes or adjustments to the settings, remove the top cover. See "REMOVING THE TOP COVER" on page 3.



① Turn-on Mode Select



- a) For low level sources or speaker level sources without DC offset present, set this switch to "REM" (default) and connect the Remote Turn-On Lead to a switched B+ source, such as the remote output lead from the head unit, or an ignition wire that is activated when in the ACC position.



- b) If the connected source has speaker level outputs with DC offset present on the leads, select the "DC" input setting for automatic turn-on, eliminating the need for a separate remote trigger.

Notes:

- The DC offset auto turn-on circuit is only designed to work with speaker level signals with DC offset present on the positive (+) and/or negative (-) leads.
- Not all speaker level sources have DC offset, such as factory Class-D or high voltage amplifiers. In such cases a switched remote trigger must be supplied. For details on turning on the unit with a switched trigger, see "Remote Turn-On Lead" (Ⓢ) on page 5.

② Input Level Select



- a) If the input is from a low level source such as an aftermarket head unit, set the input level to "LOW".



- b) If the input is from a high level source such as a factory radio's speaker outputs, set the switch to "HIGH". Note that a Wire-to-RCA Adapter will be required.

③ Gain Adjustments with Clip LED

The input gain adjustments for CHANNEL-1/2 and CHANNEL-3/4 are for matching the source's maximum output signal to the amplifier's input sensitivity while achieving desired relative output volume. The clip LED will illuminate when the associated channel pair's output approaches maximum power at approximately 1% THD+N. Follow these basic steps for setting gains:

- Starting at the minimum gain position (default), play a dynamic music source and increase the head unit's volume until the output distorts. If it does not distort at max volume, move to step-3.
- Then slightly reduce the source volume to just below the onset of distortion point.
- Next, increase the amplifier's gain until the sound from the speakers becomes distorted, they reach maximum output, or the clip LED illuminates.
- Reduce the gain slightly so the sound is no longer distorted or the clip LED only occasionally illuminates on music peaks.

④ Filter Mode Select



- a) Set to "OFF" for full-range speakers or when using an external crossover. The full frequency bandwidth will be output to the speakers without filters.



- b) Set to the "HP" position to apply the high-pass filter for speakers not capable of reproducing lower frequencies, such as a midrange/tweeter system. The associated FREQ adjustment knob (⑤) sets the cut-off frequency between 50Hz to 400Hz, below which the signal will be attenuated at -12dB per octave.



C) Set to the “LP” position to apply the low-pass filter for speakers not capable of reproducing higher frequencies, such as a subwoofer or midbass speaker. The associated FREQ adjustment knob (⑤) sets the cut-off frequency between 50Hz to 400Hz, above which the signal will be attenuated at -12dB per octave.

⑤ Crossover Frequency Adjustments

These FREQ adjustment dials for CHANNEL-1/2 and CHANNEL-3/4 set the high-pass (“HP”) or low-pass (“LP”) cut-off frequency as selected by the each channel pair’s FILTER MODE SELECT switch (④).

⑥ Input Channel Select

This switch selects which RCA input channels feed CHANNEL-3/4’s input stage. For a 2-channel source, set the switch to “1/2” to copy signal from CH-1/2 inputs. For a 4-channel source, set the switch to “3/4” for direct CH-3/4 input. If using Channel-3/4’s outputs for subwoofer(s), but the source only has front/rear outputs available, it may be desirable to

select to “1+3/2+4” to sum front+rear left channels and right channels from CH-1/2 and CH3/4 inputs. This will minimize subwoofer output level changes when the fader is adjusted.

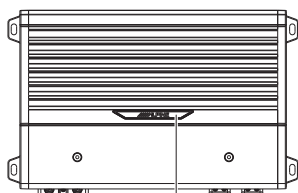
⑦ Bass EQ Boost Adjustment

This adjustment provides boost control of the bass equalizer for CHANNEL-3/4, from 0dB up to +12dB. The EQ band is centered at 45Hz with a Q of 3.

⑧ Subsonic Filter Adjustment

The subsonic filter of CHANNEL-3/4 is for cutting out very low frequencies before being amplified. Frequencies will be attenuated by at least -12dB per octave below the chosen setting from 10Hz to 50Hz. This is desirable for several reasons:

- To protect speakers too small or not capable of reproducing very low frequencies.
- To minimize power wasted from reproducing inaudible sound.
- To protect subwoofers in vented enclosures from over-excitation below the tuning frequency.



Power Indicator LED

About the Power Indicator

The top panel LED indicates both the operating condition and some protection faults with the amplifier by illuminating blue (normal operation) or red (protection fault). Consult the table below for the potential indications and protection fault clearance solutions.

LED	Condition	Protection	Root Cause	Solution
Off	Does not power on, no audio output	Under-Voltage Lock-out	Power supply voltage is too low for initial startup or to release output mute at startup.	Check the DC voltage at the B+ terminal. If it is below 10.5V, the amplifier will not power on or release mute. Charge or replace the battery.
	Normal	-	-	-
Blue	Distorted audio output	Under-Voltage	Power supply voltage is too low to provide enough power at the current playback volume. This may also happen briefly during starter cranking voltage drop.	Check the DC voltage at the B+ terminal during playback. If it dips very low during music peaks, either the supplied current or wire capacity is insufficient, or the battery needs replacement.
	No audio output suddenly or at startup	Short Circuit	Speaker output wires are shorted, touching ground, or the voice coil is shorted or shorts intermittently during playback.	Check the speaker output wires for a short circuit. The amplifier will automatically un-mute the output once the fault is cleared.
	Reduced audio output after continuous high volume playback	Thermal Rollback	Chassis temperature is high. There are two levels of automatic power reduction to prevent thermal shutdown. If the output volume is audibly reduced, the amplifier has reduced power temporarily to cool down.	The amplifier will automatically return to full power once the chassis temperature drops below the first rollback threshold. Make sure there is sufficient air circulation around the amplifier and add fan cooling if necessary.
	Audio cuts out briefly on music peaks at high volume	Over-Current	The connected speaker load impedance is too low for full output operation.	Check the connected load impedance and speaker condition. The nominal load per channel must be $\geq 2\Omega$, or $\geq 4\Omega$ for bridged connections to prevent over-current protection.
Red	No audio output after continuous high volume playback	Over-Temp	Chassis temperature is too high even for operation under thermal rollback.	The amplifier will automatically recover and return to step-2 rollback power once the temperature decreases enough. Reduce playback volume until it recovers from rollback to full power.
	No audio output suddenly or at startup	Over-Voltage	Power supply voltage is too high.	If the DC voltage at the B+ terminal is over 16.5V, the amplifier will stay in protection until it is disconnected or voltage is reduced.
		Output DC-offset	Internal circuit damage or failure.	Amplifier requires repair, contact dealer.

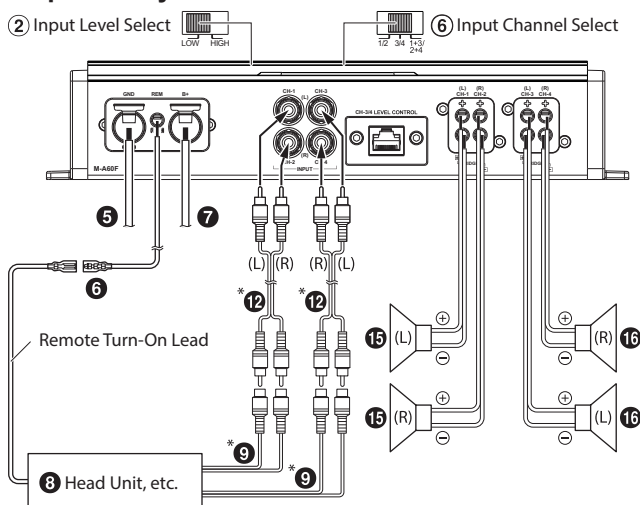
SYSTEM DIAGRAMS

Before making final connections, check the total load impedance at each speaker output terminal to ensure proper connection and at least 2Ω nominal load impedance per channel, or 4Ω for bridged connections.

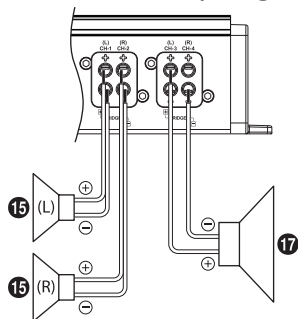
Basic Connection Diagrams for M-A60F

- | | | |
|---|---|------------------|
| ① Power Supply Terminal | ⑧ Head Unit, etc. | ⑮ Front Speakers |
| ② RCA Input Jacks | ⑨ Front RCA Pre-out | ⑯ Rear Speakers |
| ③ Remote Bass Control (optional) | ⑩ Rear RCA Pre-out | ⑰ Subwoofer |
| ④ Speaker Output Terminals | ⑪ Subwoofer RCA Pre-out | |
| ⑤ Ground Lead (sold separately) | ⑫ RCA Extension Cable (sold separately) | |
| ⑥ Remote Turn-On Lead (sold separately) | ⑬ Wire-to-RCA Adapter (sold separately) | |
| ⑦ Battery Lead (sold separately) | ⑭ Y-Adapter (sold separately) | |

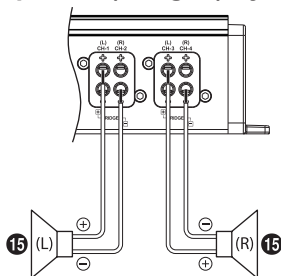
4 Speaker System



2 Speaker + Subwoofer (bridged) System



2 Speaker (bridged) System

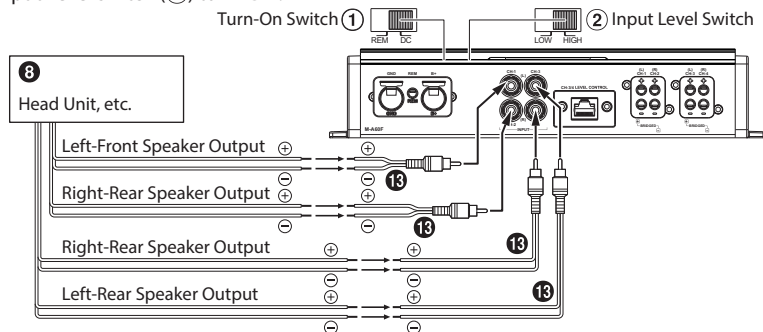


* If the head unit does not have an RCA pre-out so an RCA Extension Cable (⑫) cannot be used, use a Speaker-to-RCA Adapter Cable (⑬). For details on how to make this connection, see "About Connecting to a Speaker Level Source" on page-9.

• For bridged configurations, make sure to provide input signal to both left and right channels of the bridged channel pair. For more details, see "Important Tips on Input Connections for Bridged Channels" on page-9.

About Connecting to a Speaker Level Source

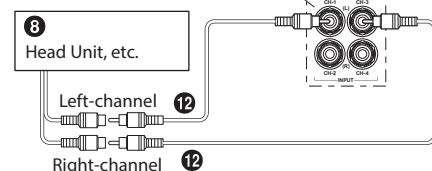
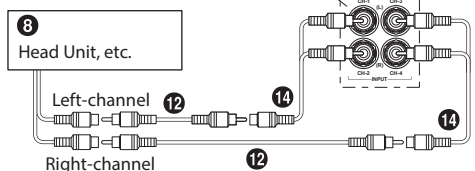
When connecting to a speaker level source with Wire-to-RCA Adapters (13) (sold separately), switch the Input Level switch (2) to "HIGH".



- For a speaker level source, connecting the Remote Turn-On Lead (9) may not be necessary. Select "DC" at the Turn-On Switch (1) after all inputs, power and ground connections have been made, and if DC-offset is present on the source's speaker output leads, the amplifier will automatically turn on/off with the source.

Important Tips on Input Connections for Bridged Channels

For bridged channel pairs, low output will result if only one channel of input is used. A Y-adaptor is required if the head unit, etc. only has 1-channel of signal output for each bridged channel pair's inputs. To preserve left/right channel separation in a 2 speaker bridged system with the M-A60F, use Y-adapters for bridged channels as shown below, where CH-1/2 is the left bridged channel and CH3/4 is the right bridged channel.



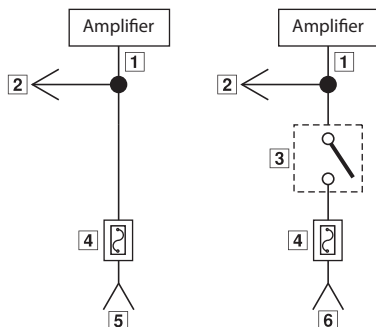
TURN-ON CHECK LIST

Please check your head unit for these conditions:

- The head unit does not have a remote turn-on output lead.
- The head unit is connected to the amplifier via its speaker outputs but does not have DC-offset present on the + or - leads.

- If either of the above conditions exist, the remote turn-on lead of your M-A60F must be connected to a switched B+ source (e.g. ignition) in the vehicle. Be sure to use a 2A fuse as close as possible to this wire tap. Using this method, the M-A60F will turn on and stay on as long as the ignition is on.
- If a switched source is unavailable, a physical switch with a 2A fuse may be installed to manually trigger the M-A60F's turn-on lead from a constant B+ source. Mount the switch near the driver for easy access for turning on and off, and make sure to turn it off when the vehicle is not in use to avoid draining the battery.

- REM in terminal
- REM out to other units
- SPST Switch
- 2A Fuse
- Switched B+ Source
- Constant B+ Source



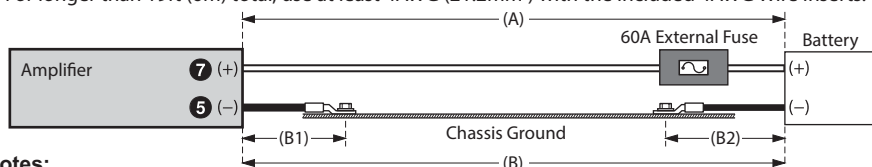
■ Cautions on Power Supply Wire Connections

Use the specified wire size according to the total fuse capacity of the amplifier to be installed and the wire length. For details on the wire size and external fuse rating to be used, refer to the following connection examples and Specifications on page-11.

Connection example when installing one amplifier alone

Measure the power wire length (A) plus the ground return wire length (B) from the amplifier to the vehicle's battery terminals for the total wire length. If there is a chassis ground, measure the connection wire lengths (B1+B2) for the ground wire length. The following specified wire gauges are required with a 60A external in-line fuse (not included) for the M-A60F according to the total wire length ranges listed. Make sure the fuse is installed as close as possible to but within 18"(45cm) from the battery terminal.

- For 13ft (4m) total or less, use 8AWG (8.37mm²) power/ground cable may be used. Use the included 4AWG Wire Inserts for reducing the terminal opening size for improved wire surface contact and clamping.
- For 13ft (4m) to 19ft (6m) total, use at least 6AWG (13.3mm²) with the included 4AWG Wire Inserts.
- For longer than 19ft (6m) total, use at least 4AWG (21.2mm²) with the included 4AWG Wire Inserts.



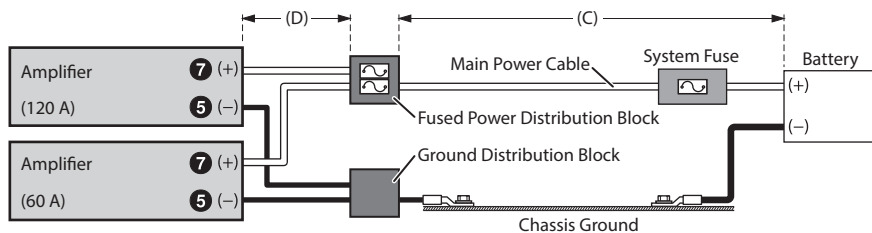
Notes:

- For installations such as marine without a conductive vehicle chassis ground where the ground cable must be run directly to the battery or battery ground buss bar, the entire length of the ground return cable (B) to the battery should be included in the total wire length measurement.
- For installations using the vehicle's chassis for most of the ground return as shown above, the wire length from the amplifier to chassis (B1) and battery to chassis ground (B2) should be as short as possible, and included in the total wire length measurement.

Connection example when installing two amplifiers

In this example, a system with two amplifiers is considered where one amplifier requires a 60A external fuse while the other requires a 120A fuse. A fused power distribution block allows a single larger gauge wire from the battery and shorter smaller gauge wires from the block to the amplifiers. A main system fuse must be installed in line with the main power cable at the battery, while the fused distribution block has two individual fuses of the appropriate ratings mounted close to each amplifier.

- For the amplifier that requires a 60A fuse, considering the wire length (D) from the block to the amplifiers is short, such as 6ft (2m), 8AWG, 6AWG or 4AWG power/ground cable may be used. Similarly for the amplifier that needs a 120A fuse, 4AWG power/ground cable would be sufficient.
- For the main power cable from the battery to the fused distribution block, the main system fuse rating should be close to or more than the sum of the amplifier fuse ratings. In this case, 60A + 120A = 180A, so a commonly available 180A fuse should be used with appropriate wire gauge for length (C).



Notes:

- Required fuse ratings for each amplifier is based upon full continuous power into the minimum rated load impedance. Therefore, when connecting lighter loads, smaller fuse values and the appropriate power/ground cable gauges for the necessary lengths may be used accordingly.
- Always ground the amplifiers to the same point on the chassis ground. If chassis ground is not available such as in marine installations, then a ground distribution block with appropriate gauge needs to be connected directly to the battery's negative terminal or ground point. Include this in the total wire length.

SPECIFICATIONS

Performance				
Power Output	14.4V, <1% THD+N	4Ω	150W RMS x 4	
		2Ω	150W RMS x 4	
		4Ω BTL	300W RMS x 2	
THD+N	4Ω	Ref: 10W	≤0.06%	
		Ref: Rated Power	≤0.1%	
	2Ω	Ref: 10W	≤0.06%	
		Ref: Rated Power	≤0.08%	
	4Ω BTL	Ref: 10W, 1kHz/50Hz	≤0.6% / ≤0.06%	
		Ref: Rated Power, 1kHz/50Hz	≤0.3% / ≤0.08%	
S/N Ratio	IHF A-wtd + AES-17	Ref: 1W into 4Ω	-90dBA	
		Ref: Rated Power into 4Ω	-112dBA	
Frequency Response	+0/-3dB	Ref: 1W into 4Ω	<10Hz to 36KHz	
	+0/-1dB	Ref: 1W into 4Ω	<10Hz to 20KHz	
Control			CH-1/2	CH-3/4
Input Sensitivity	Max-Min Gain	Low Range	200mV - 4V	200mV - 4V
		High Range	500mV - 10V	500mV - 10V
Crossover	LPF/HPF	Frequency	50-400Hz	50-400Hz
		Slope	-12dB/oct.	-12dB/oct.
	Subsonic	Frequency	-	10-50Hz
		Slope	-	up to -18dB/oct.
Bass EQ	Boost	Min-Max	-	0dB to +12dB
	Q		-	3.3
	Frequency		-	45Hz
Remote Level	w/optional RUX-M-UNIV	Attenuation Range	-	0dB to -30dB
Electro-Mechanical				
Input Impedance			>17KΩ	
Turn-On	Remote Trigger	via REM	>2.4V	
	DC-offset Detect	via RCA +/-	>2.4V	
Power Supply	Current Draw	Sleep Current	≤0.1mA	
		Idle Current	≤1.7A	
	Fuse Rating (external, not included)		60A	
	Operating Voltage	Battery / DC Supply	7V - 16.5V	
		Under-Voltage Lock-Out	<10.5V	
Protection Circuit	Under-Voltage		Auto-Recover	
	Over-Current		Auto-Recover	
	Short Circuit		Auto-Recover	
	Thermal (2-stage Rollback)		Auto-Recover	
Water Ingress Protection			IEC 60529 IP Rating	
Terminals	RCA Input		Panel Mount	
	Power Supply	Gauge	0AWG (4AWG w/reducer)	
		Type	Insert, ABYC compliant	
	Speaker Output	Gauge	10AWG	
		Type	Insert, ABYC compliant	
Dimensions	Chassis (WxLxH)	Chassis Only	9.69"x6.5"x2.15"	
			246x165x54.5mm	
		Inc. terminals, mounting tabs	10.55"x6.87x2.15"	
			268x174.5x54.5mm	
	Mounting Screw Pattern (center-to-center, WxL)		10.12"x5.1"	
			257x129.6mm	
Mounting Foot Spacers (Height)		adds 0.3" (7.5mm)		

Note: Specifications and design are subject to change without notice.



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