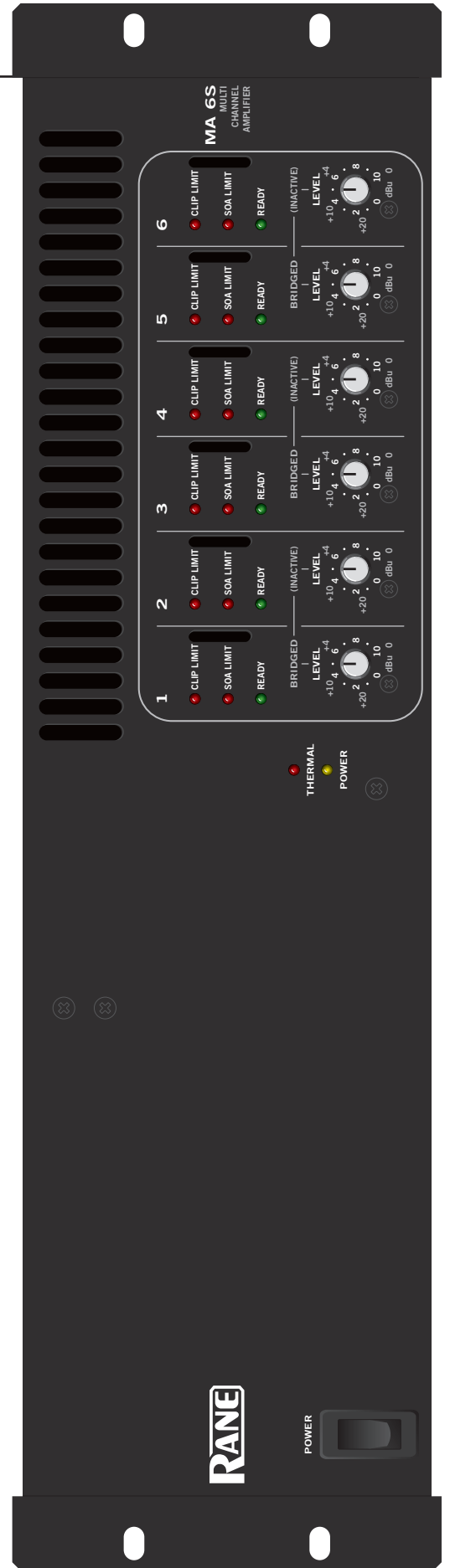




# MA 6s

MULTICHANNEL AMPLIFIER



# IMPORTANT SAFETY INSTRUCTIONS



1. Read these instructions.
  2. Keep these instructions.
  3. Heed all warnings.
  4. Follow all instructions.
  5. Do not use this apparatus near water.
  6. Clean only with a dry cloth.
  7. Do not block any ventilation openings. Install in accordance with manufacturer's instructions.
  8. Do not install near any heat sources such as radiators, registers, stoves, or other apparatus (including amplifiers) that produce heat.
  9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
  10. Protect the power cord and plug from being walked on or pinched particularly at plugs, convenience receptacles, and the point where it exits from the apparatus.
  11. Only use attachments and accessories specified by Rane.
  12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
  13. Unplug this apparatus during lightning storms or when unused for long periods of time.
  14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
  15. The plug on the power cord is the AC mains disconnect device and must remain readily operable. To completely disconnect this apparatus from the AC mains, disconnect the power supply cord plug from the AC receptacle.
  16. This apparatus shall be connected to a mains socket outlet with a protective earthing connection.
  17. When permanently connected, an all-pole mains switch with a contact separation of at least 3 mm in each pole shall be incorporated in the electrical installation of the building.
  18. If rackmounting, provide adequate ventilation. Equipment may be located above or below this apparatus, but some equipment (like large power amplifiers) may cause an unacceptable amount of hum or may generate too much heat and degrade the performance of this apparatus.
  19. This apparatus may be installed in an industry standard equipment rack. Use screws through all mounting holes to provide the best support.
- WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

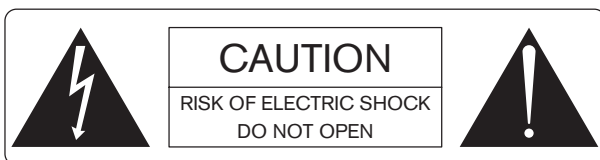
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**CAUTION:** Changes or modifications not expressly approved by Rane Corporation could void the user's authority to operate the equipment.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

## WARNING



To reduce the risk of electrical shock, do not open the unit. No user serviceable parts inside. Refer servicing to qualified service personnel.

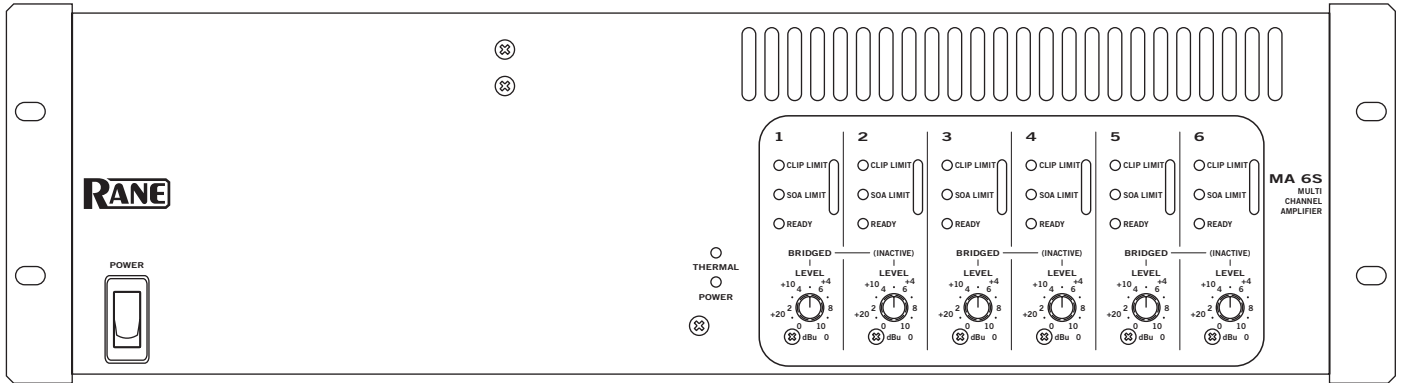
The symbols shown below are internationally accepted symbols that warn of potential hazards with electrical products.



This symbol indicates that a dangerous voltage constituting a risk of electric shock is present within this unit.



This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.



**QUICK START**

You got your good habits, and you got your bad habits. A good habit is to read at least this much of the manual. A bad habit is not to read any of this manual. Reading just this section can prevent grief worse than your worst nightmare. Grief that's hard to get rid of—harder than a bad habit.

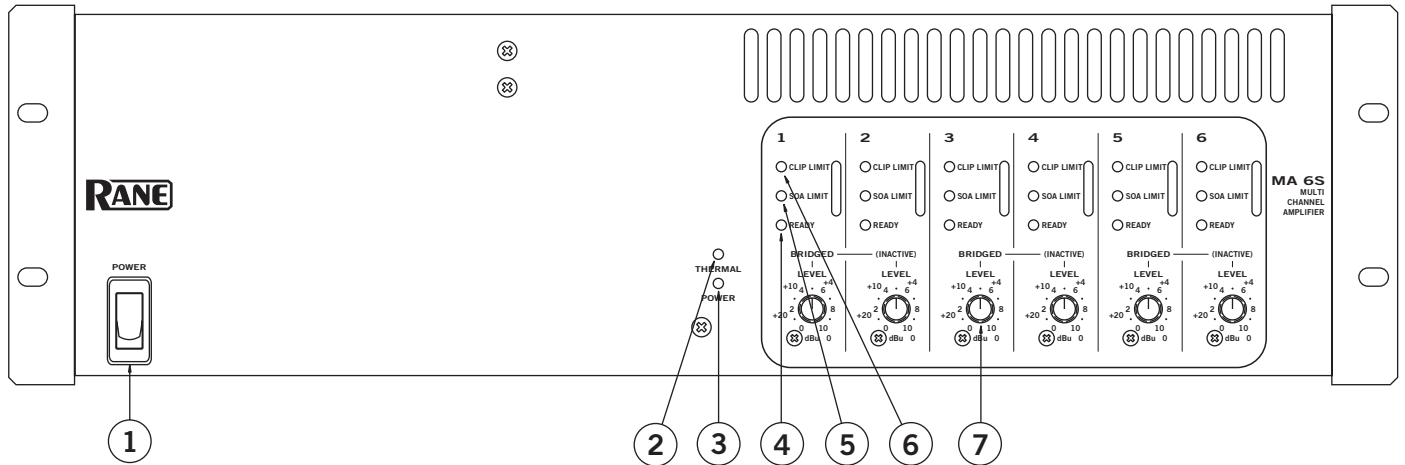
Be sure the amplifier is *off* before making any connections. Euroblocks make connecting and unconnecting the amplifier easy. They are just like little snap-on terminal blocks. The balanced Input blocks are green, and the speaker Output blocks are black. Driving the MA 6S from a balanced source is recommended. If you just *have* to drive the MA 6S Input with an unbalanced source, we recommend using cable that has two conductors with a shield. Connect the source's positive or “hot” to the MA 6S's +, the negative or ground to the MA 6S's -, and connect the shield to the MA 6S's **SHIELD** (center of Euroblock connector). Do *not* connect the shield at the source end. Keep your input cable lengths as short as possible. See the RaneNote, “Sound System Interconnection” for more information regarding this issue.

Speaker loads should be no less than 4 Ω per output. If you are running multiple speakers per channel in series or parallel, *check your impedances*, and consider the KTM 6 Transformer Kit as an option (see Data Sheet). If you use 100V, 70.7V or 25V output transformers, you need to engage the 80 Hz High-Pass Filter jumpers as described on page Manual-6.

If you are running six separate channels (unbridged), be sure all the **BRIDGED** switches on the rear panel are *depressed*. If you are running any channels bridged, you are obviously a power user and we highly recommend you read further into the manual regarding this issue.

With Input and Output connections completed, be sure all front panel **LEVEL** controls are all the way counterclockwise. Now flip the **POWER** switch and after hearing the relays click in after a second, notice that the **READY** lights come on. Slowly turn up each channel's **LEVEL** control to the desired gain and if all is well you should hear something pleasant. If not, re-check connections, put on a better CD, and read more of the manual.

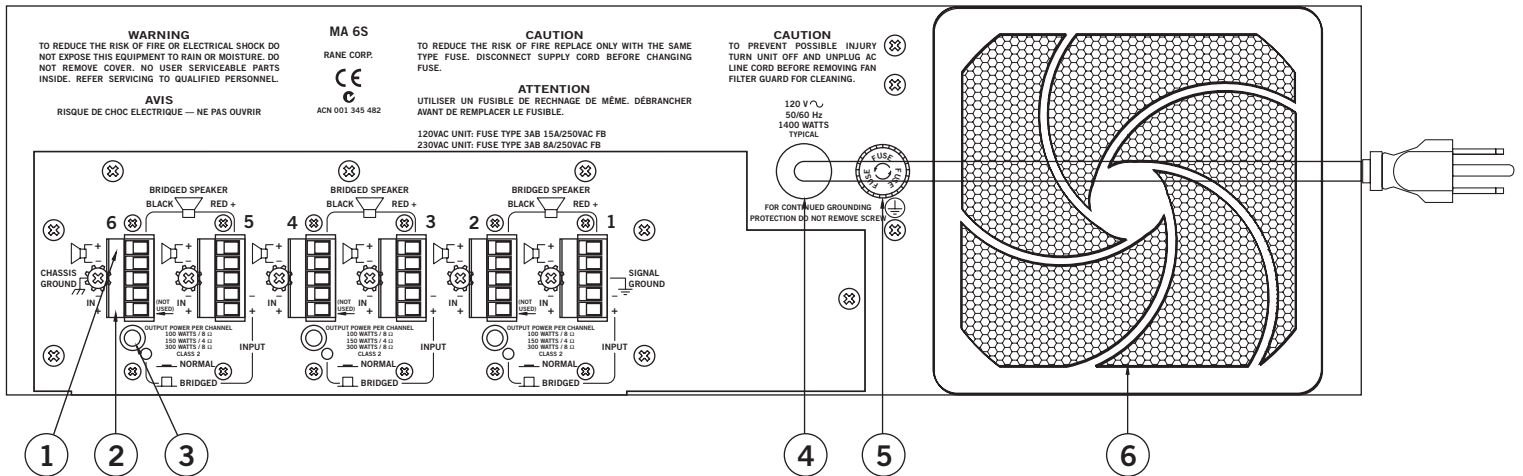
# FRONT PANEL DESCRIPTION



- ① **POWER switch:** Obediently turns the MA 6S on and off every time you poke it with your finger (or other suitable object). All six channels have delayed turn-on/instant turn-off relays to eliminate any switching transients.
- ② **THERMAL Overload indicator:** Lights red if the MA 6S becomes too hot, indicating that power has been removed from all six channels. Be sure to check the fan filter and actual speaker impedances if this lights up.
- ③ **POWER indicator:** Lights yellow whenever the MA 6S POWER switch (①) is turned on.
- ④ **READY indicators:** Light green whenever the mute relay is passing the signal through to the speaker. Normal operation is the *on* status.
- ⑤ **SOA LIMIT indicators:** Light red whenever a channel leaves the Safe Operating Area (SOA). This means the amplifier turned down the Input level quickly and automatically, avoiding over-dissipation. Input signals 30 dB over a safe limit will cause the READY indicator and mute relay to turn off until the amplifier has been turned off and the problem corrected. Normal operation is the *off* status.
- ⑥ **CLIP LIMIT indicators:** Light red whenever a channel's Output cannot follow its Input. The amplifier has turned down the Input level quickly and automatically, avoiding audible distortion. Normal operation is the *off* status.
- ⑦ **LEVEL controls:** Determine the Input sensitivity of each respective amplifier channel. At its full clockwise position, an Input signal of 0 dBu (.775 vrms) drives the amplifier to full power. As the controls are rotated counterclockwise, more Input signal level will be needed to achieve full power. If the calibrations in gray appear backwards with respect to most level controls, it is because they are Input sensitivity markings, not attenuation indications.

*NOTE: To install the MA 6S security covers, which have been supplied with the amplifier in the form of six small black plastic caps, set the six LEVEL controls to the desired position and then pull the knobs off. Insert the plastic covers in the now vacant holes. You may then sleep soundly knowing that your amplifier installation cannot be mindlessly violated.*

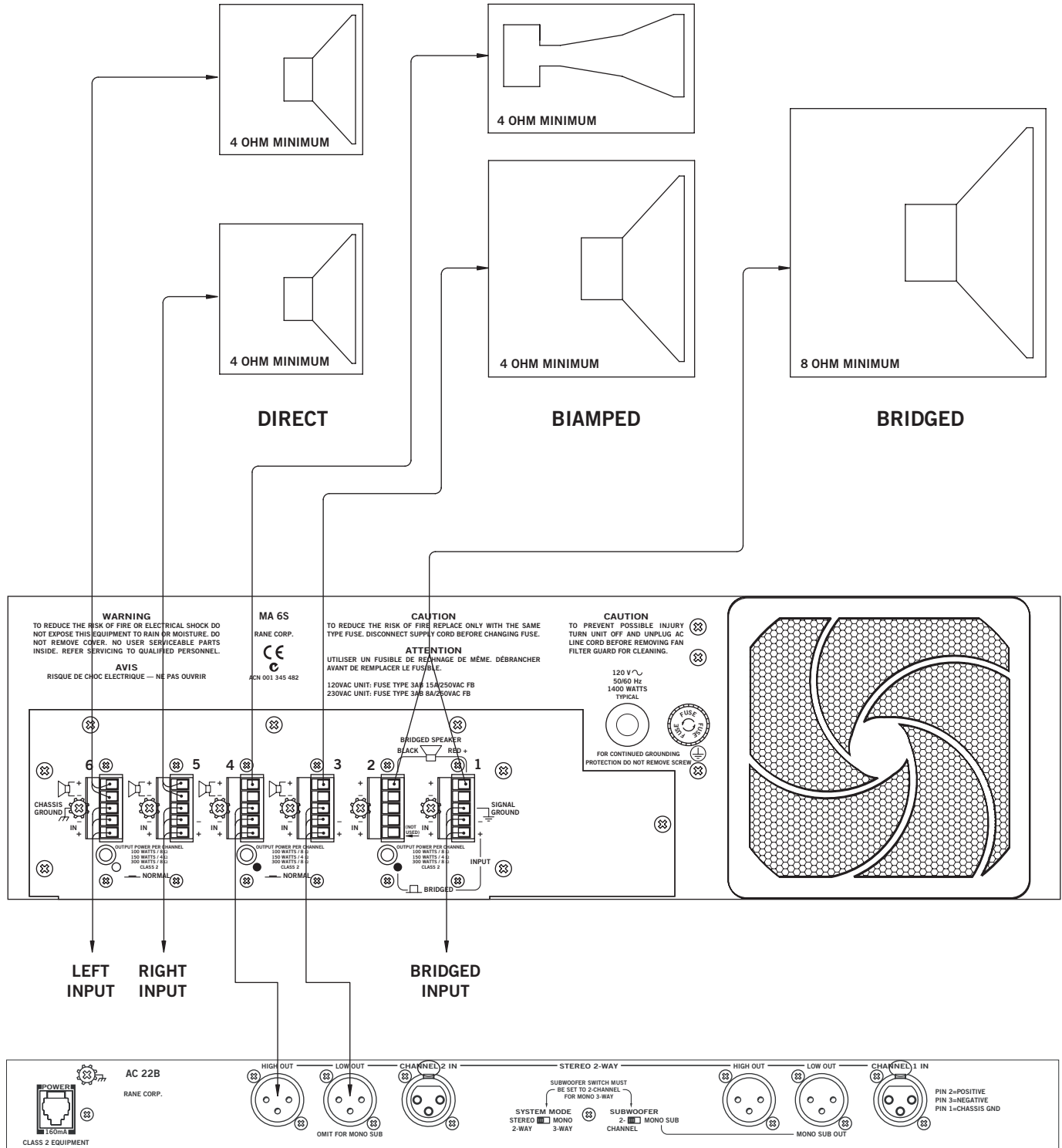
## REAR PANEL DESCRIPTION



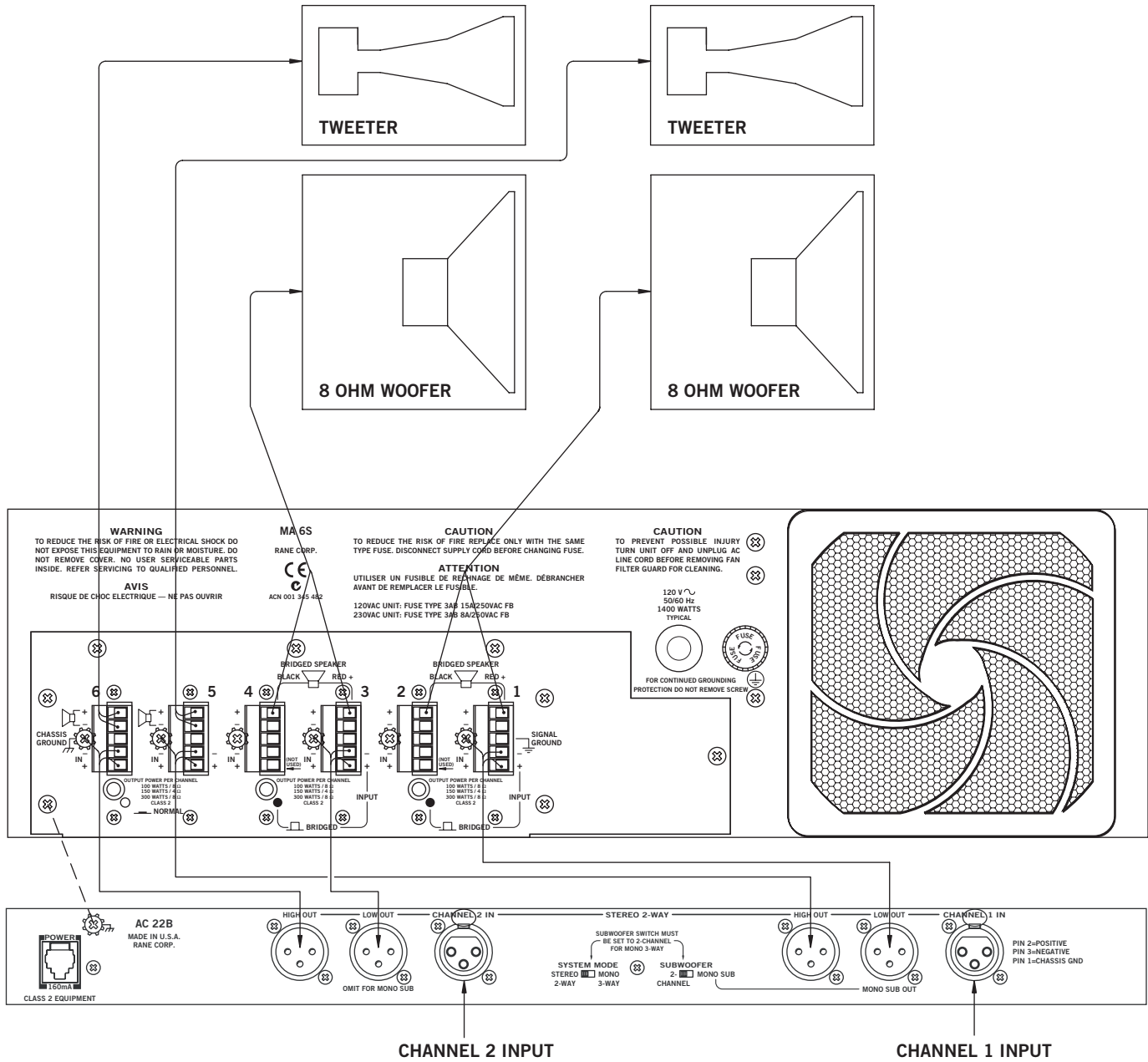
- ① **INPUTS:** These are balanced Euroblock connectors. Cable should include two wires with shield. Euroblocks accept up to 12 AWG wire. The shield may be attached to either chassis or signal ground. For unbalanced sources consult the included RaneNote, “Sound System Interconnection.”
- ② **OUTPUTS:** Connect the speaker(s) to each of the six channels by means of the Euroblock connectors with 18 to 12 AWG wire (See ③ for Bridged operation).
- ③ **NORMAL/BRIDGED switch:** With the switch in the *out* position and the red BRIDGED indicator *on*, the MA 6S is operating in BRIDGED mode. The MA 6S utilizes the BRIDGE switch to make internal connections between each pair of channels: 1&2, 3&4, and 5&6. Whenever a signal is connected to an odd numbered channel (say channel 1), the next even-numbered channel is driven *inverted* when the BRIDGE switch is activated. Connect Inputs to *odd* amplifier channels only (1,3,5), and connect speakers to the “+” terminals of each channel pair as shown in gray on the chassis silk-screen. When the BRIDGE switch is inactive, the internal connection is defeated and both channels operate independently.
- ④ **AC line cord:** Plug this into a *grounded* 120 VAC AC outlet (or 230 VAC if the MA 6S is internally wired for 230 V operation).
- ⑤ **Line FUSE:** For 120 volt operation, use only a 15 amp 250 volt *Fast-blow* (or Normal blow—*not Slow blow*) fuse, 1.25" long, such as Buss ABC-15 or equivalent. For 230 volt operation use Buss AGC-8 or equivalent.
- ⑥ **Fan filter:** This washable filter may easily be removed for periodic cleaning by gently pulling on the black plastic housing and then lifting it away—perform this feat with the fan *off*; of course. Once the filter is removed, rinse it under hot tap water; use dish soap to cut through particularly stubborn “tav sludge.” The MA 6S draws a tremendous amount of air to ensure proper cooling and resultant long term reliability. Check and clean the filter as often as necessary, especially if the THERMAL overload indicator ever comes on.  
*IMPORTANT: Keep this filter clean to ensure proper cooling and reliability. Never remove the filter with the unit plugged in.*

# MA 6S CONNECTIONS

## Direct, Biamp, and Bridged Wiring



# Stereo Biamped Wiring



The MA 6S will drive an active two-way stereo system when wired as shown. The high frequency drivers run direct from channels 5 and 6. The low frequency drivers, requiring much more power, are run from two bridged pairs: Channels 1 and 2 are bridged to one woofer, and channels 3 and 4 are bridged to the second woofer.

*CAUTION: 8 ohms is the lowest impedance that can be driven by the MA 6S in BRIDGED mode. If there are two woofers in each bass cabinet, be sure they are wired in series if they have an individual impedance of less than 16 ohms each.*

## Chassis Grounding

Whenever connecting any device to the MA 6S Inputs, be aware of signal grounding paths. Connect the shield to MA 6S Chassis Ground for proper cable shielding. Some installations may permit ground connection to Signal Ground on the Euroblock, but the best ground is directly to the Chassis.

In addition, since the AC 22B does not get its ground through the line cord, its chassis should be grounded through either the rack rails or a jumper wire connecting the chassis' of both units.

See the included RaneNote, "Sound System Interconnection" for a full explanation and proper wiring techniques.



# OPERATION

## Voltage Controlled Attenuators

The voltage controlled attenuators (VCAs) in the MA 6S allow a significant increase in usable volume levels without excessive clipping or interference from conventional distortion causing muting circuits. The VCAs *do not* affect dynamic response, distortion or noise levels of any material within the rated output specifications of the amplifier. They simply monitor the difference between Input and Output signals, and the power dissipated in the output devices. In the event of clipping or excessive dissipation in the output devices, the VCAs “jump in” (out of hiding, as it were) and turn down the Input level to correct the overdrive condition.

This means that whenever a CLIP LIMIT flashes, a musical peak has been quickly turned down to avoid excessive clipping. This allows you to run the amplifier at a higher continuous level, typically about 4 dB SPL higher than without VCAs. And that 4 dB of increased SPL is the equivalent of a 250 watt amplifier without VCAs.

If an SOA LIMIT flashes, the Input level has been quickly turned down to prevent over-dissipation in the output devices due to excess phase shift or abnormally low impedances which may occur at some frequencies. This protection occurs without distorting or interrupting the program.

Keep an eye on the LEDs on the MA 6S front panel. Occasional flashing of a CLIP LIMIT and/or occasional flashing of a SOA LIMIT means you are getting the most SPL out of the amplifier. Continual lighting of either LED indicates excessive input overdrive, or too low impedance of load. If a green READY goes *off*, a load has been encountered that could not be corrected by the VCAs, or the amplifier has offset. If this occurs, the amplifier must be turned *off* and the problem corrected before the channel can be operated. If the READY LED will not light with the load disconnected, then an internal fault has occurred and the amplifier is in need of repair.

## Adapting the MA 6S to Your Changing Needs

With six channels to choose from and built-in Bridging, there are a number of different combinations available to suit your present and growing needs. The nice thing about the MA 6S is that you can re-configure it instead of losing money on an obsolete, used piece of gear you no longer need.

You can start out with 6 channels at 100 watts or three channels at 300 watts. When the time comes, you can step up to six channels at 300 watts by obtaining another MA 6S and keeping the original. Upgrading to biamped monitors or tri-amped mains becomes easy as well, by simply adding a second MA 6S, both taking up only 10.5" rack space.

## The MA 6S and Circuit Breakers

The MA6S will easily deliver over 900 watts of audio power, requiring as much as 15 amps of current from the AC outlet. 15 amps is not an uncommon value for household and some institutional circuitbreakers, though 20 amp versions are becoming more common. The bottom line is that the MA 6S is capable of tripping a 15 amp circuit breaker *under normal operation*. An amp that delivers a lot of power, drinks a lot of power to do so.

It is not likely that you will trip a breaker, but it is wise to be aware of the possibility so you don't panic if it happens.

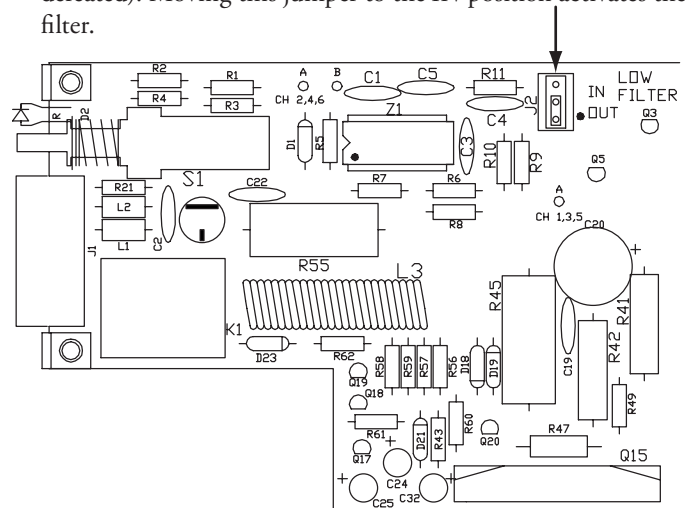
## INTERNAL JUMPERS

Each amplifier card contains a jumper block that gives the option of inserting an 80 Hz High-Pass Filter into the Input signal. This is *required* in 70 or 100 volt systems when excessive bass can saturate the transformers, reduce the output, and possibly blow a fuse at high output levels.

The MA 6S is shipped with these jumpers in the *out* position (filters defeated). Moving this jumper to the *in* position activates the filter.

**CAUTION: WAIT ABOUT 15 MINUTES AFTER THE AMPLIFIER HAS BEEN POWERED DOWN BEFORE BEGINNING DISASSEMBLY, TO ALLOW THE POWER SUPPLY CAPACITORS TO DISCHARGE.**

- 1. Remove the bottom cover:** 4 each #6 x 3/8" phillips screws on the bottom of the side rails and 12 each #6 x 1/4" phillips screws on the bottom cover.
- 2. 80 Hz High-Pass Internal Jumpers:** To access the jumper on each amplifier card, locate J2 (LOW FILTER). The MA 6S is shipped with these jumpers in the *OUT* position (filters defeated). Moving this jumper to the *IN* position activates the filter.



In the event that 80 Hz is not a high enough cutoff frequency, values may be changed to replace 3 resistors on each amplifier card. This operation requires disassembly and soldering as outlined in the MA 6S SERVICE INFORMATION section, *and should only be performed by qualified service personnel.*