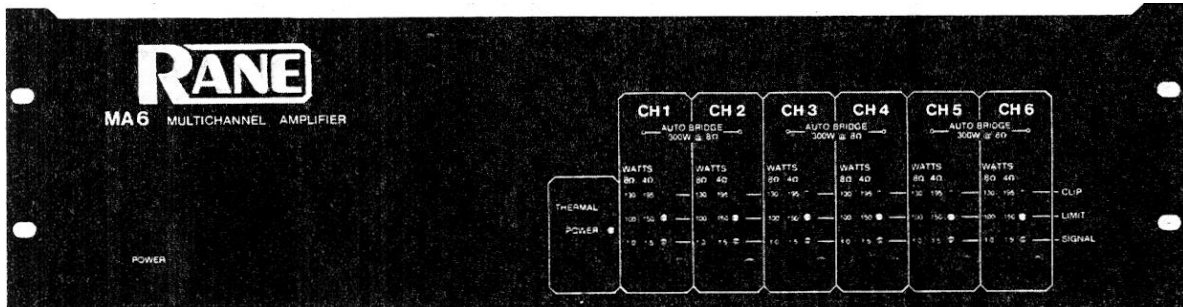


# MA 6



# OPERATING AND SERVICE MANUAL



# 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:

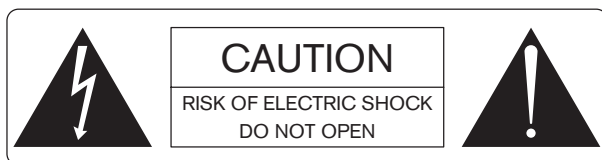
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**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.



## Rear Panel

1. INPUTS: These are 1/4" stereo (RTS) jacks, which are automatic balanced/unbalanced. Use a mono shielded patch cable for unbalanced operation. Use a two conductor shielded cable for balanced operation. with a male 1/4" stereo plug wired as follows:

- Tip: Signal Hot (Pin #2 on a three pin connector)
- Ring: Signal ground (Pin #3 on a three pin connector)
- Sleeve: Shield (Pin #1 on a three pin connector)

NOTE: The MA 6 utilizes switching input jacks to automatically make internal connections between each pair of channels: 1&2, 3&4, and 5&6. Whenever a signal is plugged into an odd numbered channel (say channel 1). the next even-numbered channel is AUTOMATICALLY driven INVERTED as long as nothing is plugged into its own input (in this case channel 2). As soon as a signal is plugged directly into the even-numbered channel, the internal connection is defeated and both channels operate independently.

See elsewhere for details on using these inputs for bridging channel pairs for increased power output into a single 8 ohm load.

2. OUTPUT TERMINALS: Connect the speaker(s) to each of the six channels by means of these screw-type connectors. Be sure to place the speakerwire UNDER the integral washer in the MA 6 terminal to avoid fraying the wire while tightening-and keep the wire insulation close to the screw and trim any excess wire to avoid shorting the outputs together.

See elsewhere for details on connecting a speaker to a bridged pair of channels.

3. AC LINE CORD: Plug this into a GROUNDED AC outlet of 120 VAC (or 240 VAC if the MA 6 is internally wired for 240V operation).

PLEASE NOTE: If you use an adapter to plug the MA 6 into a non-grounded outlet (three-to two prong adapter), BE SURE TO SCREW THE GROUND ADAPTER TO THE OUTLET BY MEANS OF THE COVER PLATE SCREW.

4. LINE FUSE: Use only a 15 amp FAST-BLOW (or NORMAL BLOW--NOTSLOW BLOW) fuse, 1.25" long. such as Littlefuse #3 AG-15, Buss #AGC-15 or equivalent

5. FAN FILTER: This washable filter may easily be removed for periodic cleaning by pressing in and twisting 1/8 turn either direction 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".

IMPORTANT: KEEP THIS FILTER CLEAN TO ENSURE PROPER COOLING AND RELIABILITY OF THE MA 6. — NEVER REMOVE FILTER WITH UNIT PLUGGED IN.

The MA 6 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.

# INSTALLATION

Diagram 1 shows three basic wiring configurations for the MA 6:

1. Direct operation.
2. Biamp operation.
3. Bridged operation.

## NOTE — AUTOMATIC INPUT COUPLING

The MA 6 uses switching input jacks to automatically make internal connections between each pair of channels: 1 & 2, 3 & 4, and 5 & 6. Whenever a signal is plugged into an odd-numbered channel (channel 1, forexample), the next even-numbered channel is automatically driven INVERTED (out of phase, so to speak) as long as no input is plugged into its own jack (in this case channel 2). As soon as a signal is plugged directly into the even-numbered channel, the internal connection is defeated and both channels operate independently.

You can use this feature a couple of ways:

1. **AUTOMATIC BRIDGING** Plug into any odd-numbered channel, but **DO NOT** plug an input into the next even-numbered channel. Then connect a single 8 ohm or greater speaker cabinet between the two HOT terminals of the above two channels of the MA 6—you are now running bridged power (300 watts into 8 ohms) into the speaker cabinet.

2. **RUN TWO CHANNELS MONO FROM A SINGLE INPUT:** You can run any pair of channels with a single input, thereby driving two speaker cabinets with the same signal. Run the input into the odd-numbered channel **ONLY**-do not plug anything into the next even-numbered channel. Then connect one speaker normally to the odd-numbered output terminals, but connect the second speaker **IN REVERSE**: speaker positive to MA 6 ground (-), amplifier positive to speaker ground. This way both speakers will be in phase and you will have saved yourself a cable and two connectors.

## FAN INFORMATION

The cooling fan in the MA 6 requires a bit of special attention during installation. There should be adequate room between the fan filter and whatever may be located behind the amplifier for sufficient cooling air to enter the unit. This is normally quite easy to accomplish in most rack installations.

This fan is of the two speed variety, which means that under most operations the fan will run at a very low speed, switching to high gear only during extended high power demands. The amplifier will deliver a full 100 watts into six discrete eight or four ohm loads for several minutes before switching to high speed. Once the high power demand has been reduced or removed the fan will return to low speed in a matter of a minute or two.

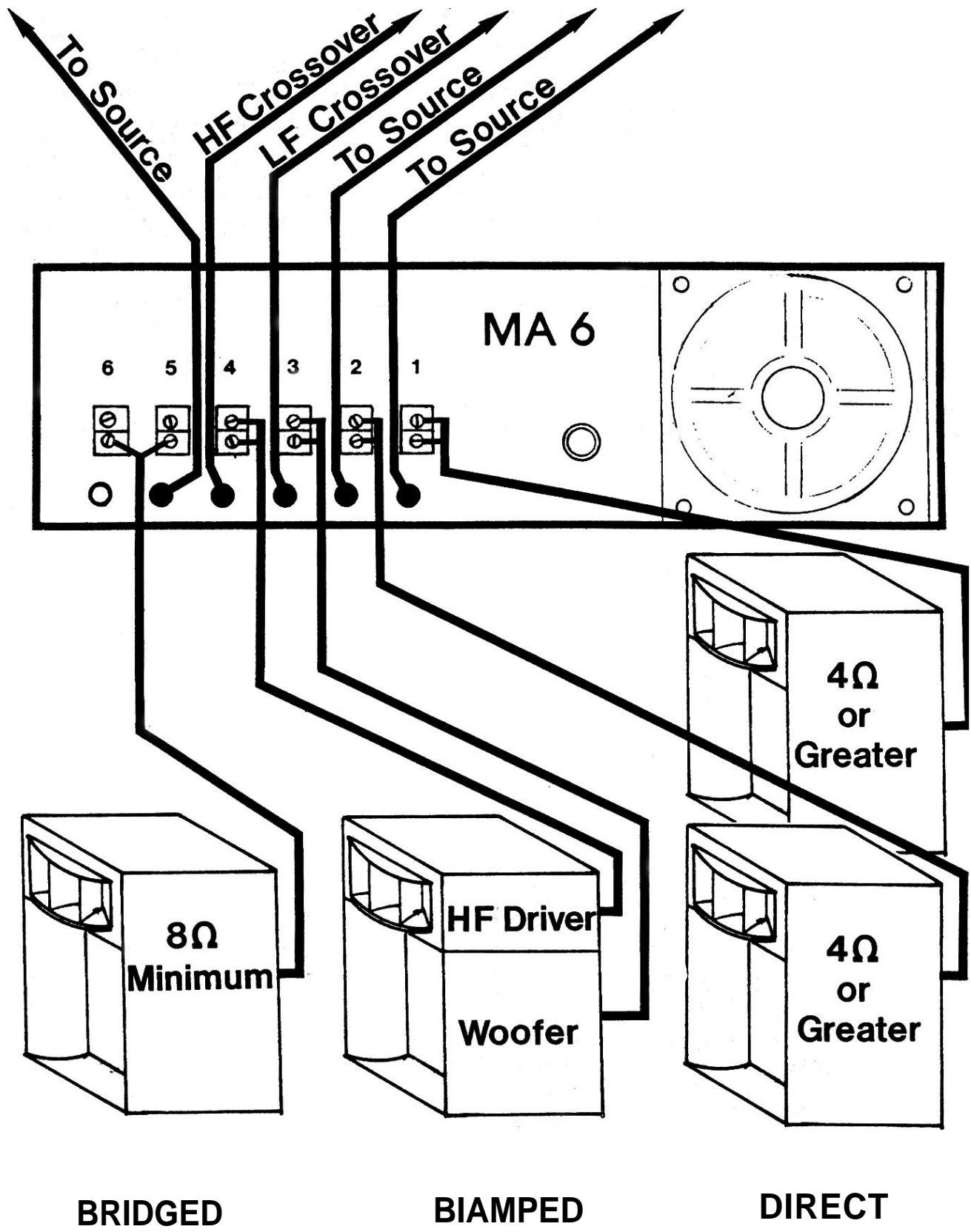
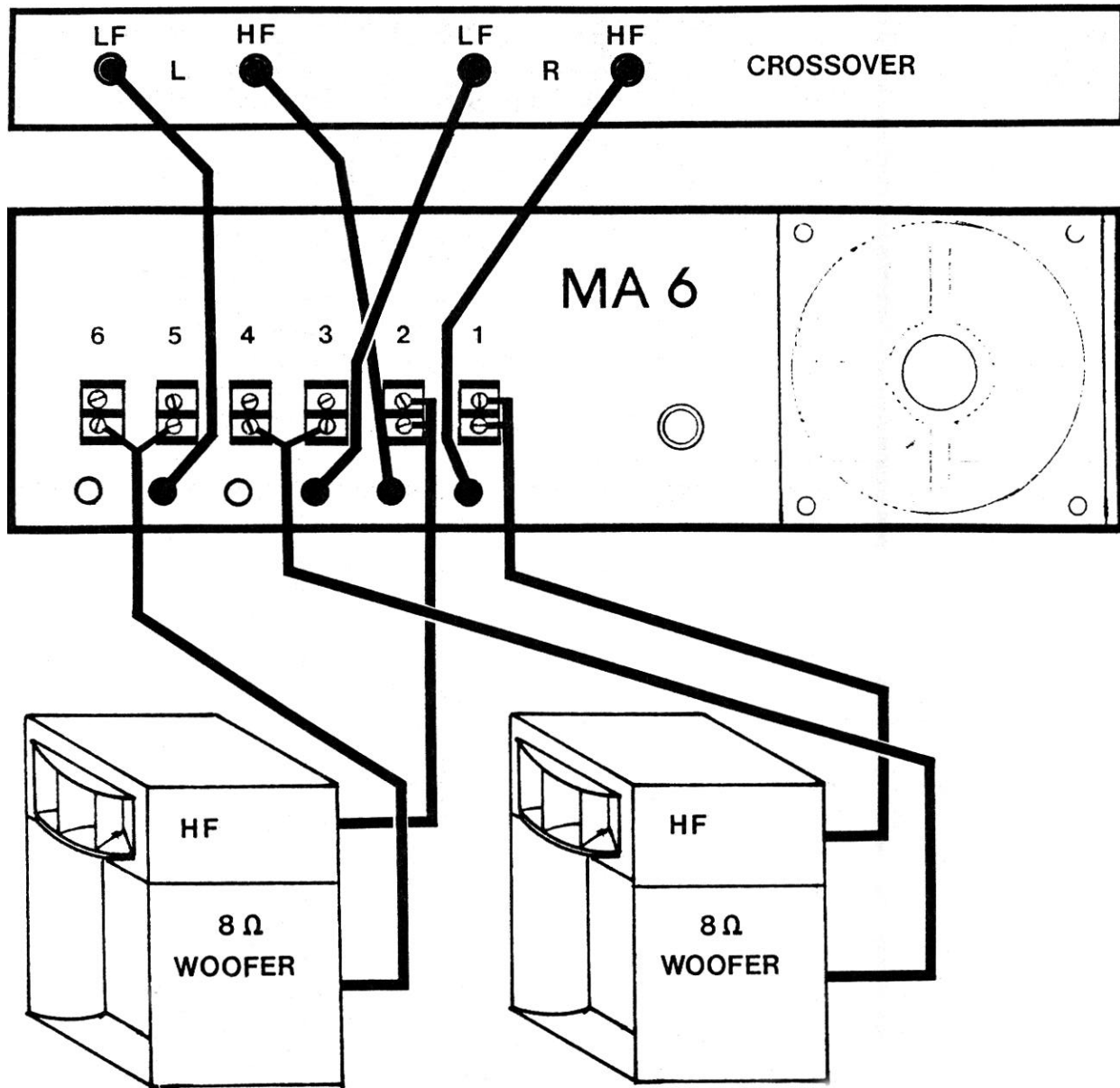


Diagram 1. Direct, biamp and bridged operation.



**Diagram 2. Stereo Biamped Operation**

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

**CAUTION:** 8 OHMS IS THE LOWEST IMPEDANCE THAT CAN BE DRIVEN BY THE MA 6 IN THE BRIDGED MODE. IF THERE ARE TWO WOOFERS IN EACH BASS CABINET, BE SURE THAT THEY ARE WIRED IN SERIES IF THEY HAVE AN INDIVIDUAL IMPEDANCE OF LESS THAN 16 OHMS EACH.

# OPERATION

## USING THE BUILT-IN LIMITERS

The built-in limiters in the MA 6 allow a significant increase in usable volume levels without clipping. The limiters DO NOT effect dynamic response, distortion or noise level of any material below about 90 watts output level. They simply “watch” the input level of each channel, and whenever the input tries to go beyond .775V, (which is the input level required for 100 watts output power), the limiter ‘jumps in’ (out of hiding as it were) and literally turns down the input level to prevent clipping. It does this very quickly (in about 1/100th of a second) so that only the peaks of the music are affected.

What this means is that when ever a yellow LED flashes, a musical peak has been quickly turned down to avoid clipping. This allows you to run the amplifier at a higher continuous level, typically about 4dB SPL higher than without a limiter. And that 4dB of increased SPL is the equivalent of a 250 watt amplifier without a limiter.

Keep an eye on the LEDs on the MA 6 front panel. Consistent flashing of the YELLOW LEDs without any of the RED ones lighting up means that you are getting the most SPL out of the amplifier. If a RED LED flashes on, however, it means that the input signal was so great that it has gone beyond the 15dB limiting capability and the MA 6 is near or actually clipping. Consistent flashing of any red LED is NOT recommended: both the clipping and the limiting can become audible and undesirable, AND there is a danger of damaging compression driver voice coils with excessive and prolonged clipping as is the case with ANY amplifier.

Ask your dealer, or write to us at the factory, for RAN E NOTE 103, which gives a very detailed discussion of the workings of the MA 6 limiters.

## ADAPTING THE MA 6 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 MA6 is that you can reconnect it and keep using it instead of losing money on an obsolete, used piece of gear you no longer need.

Basically, 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 6 and keeping the original. Upgrading to biamped monitors or tri-amped mains becomes easy as well, by simply adding another MA 6 and keeping the original, both taking up only 10.5" rack space.

## ABOUT THE MA 6 AND CIRCUIT BREAKERS...

The MA 6 will easily deliver over 900 watts of audio power, which requires 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 of all this is that the MA 6 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 blow many breakers at all, if any, but it is wise to be aware of the possibility so that you don't panic if it happens.



# SPECIFICATIONS

## MA 6 SPECIFICATIONS

POWER OUTPUT all channels driven, 20-20kHz:

-100 watts minimum RMS per channel into 8 ohms

-150 watts minimum RMS per channel into 4 ohms

-300 watts minimum RMS per two-channel bridged operation into 8 ohms

FREQUENCY RESPONSE: 5Hz - 80 kHz. +0/ -3 dB

TOTAL HARMONIC DISTORTION: less than 0.2 % (1 kHz)

INTERMODULATION DISTORTION (60 Hz : 7 kHz @ 4:1): less than 0.1%

SIGNAL-TO-NOISE RATIO: better than 96 dB (EIA A-weighted)

SENSITIVITY: +0 dBm (.775V<sub>3</sub> for rated power output

INPUT IMPEDANCE: greater than 9k ohms

DAMPING FACTOR: 300:1 at 1000 Hz

INPUTS: "A" RTS phone jacks, automatic balanced/unbalanced

OUTPUTS: Terminal blocks

CROSSTALK: better than -60 dB at 1 kHz, any channel to any channel

DIMENSIONS: 5 1/4" H x 19" W x 11 1/2" rack depth, rear support mount holes provided

LIMITER PERFORMANCE:

Range: 15 dB

Maximum input level at clipping: +15 dB (4.4v)

Attack time constant: 10 ms

Decay time constant: 10 ms

Detection method: full-wave peak

SPEAKER IMPEDANCE:

No less than 4 ohms for single channel operation

No less than 8 ohms for bridged operation

LED THRESHOLDS.:

Signal present: -20 dBm (78mV.)

Limit: 90W output into 8 ohms (26.8 VRMS) single operation

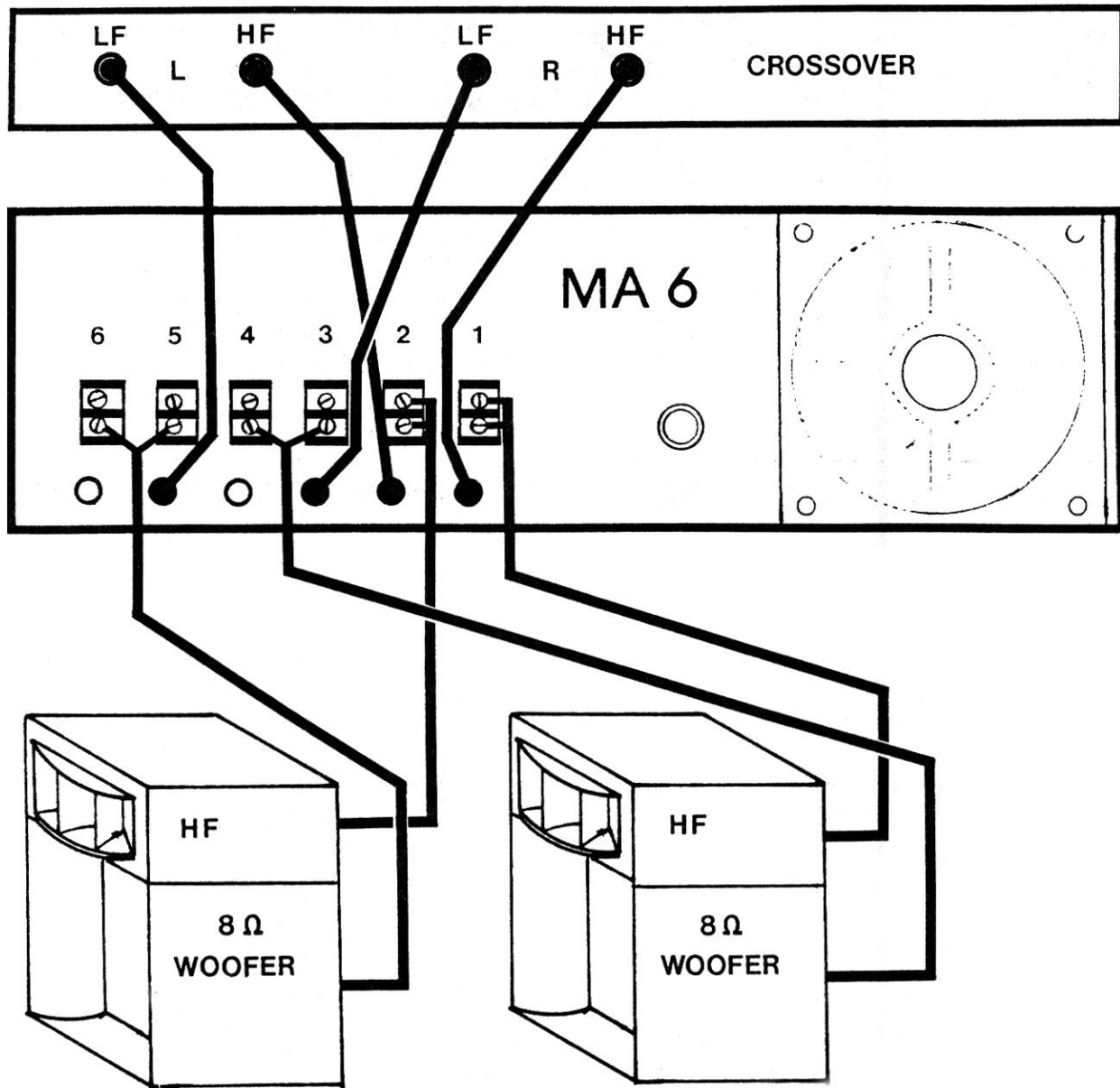
270W output into 8 ohms (46.5VRMS) bridged

Clip: 3 dB before actual clipping.

OUTPUT RELAY: Activates approximately 10 seconds after power is applied; drops out immediately after turn-off; drops out any time there is DC output voltage or high level subsonic signals.

WEIGHT: 44 lb dry

Features and specifications subject to change without notice.



**Diagram 2. Stereo Biamped Operation**

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