KBR-M

-WARNING-

The KBR-M can produce high sound pressure levels. Hearing protection is advised.
The KBR-M must be earthed and connected to a correct power source.

-SPECIFICATIONS-

Design Range:

Rotary Channel	input 1	375 mV RMS	100K ohms
Hi-Fi Channel	all inputs	175 mV RMS	100K ohms
XLR output		70 mV RMS	600 ohms

Tube: 12AX7EH – 7025 – 5751

Power Amplifiers: 130-watt RMS main full range amplifiers
45-watt RMS >800 Hz horn amplifier

Frequency Response: Full range speakers 50-15 kHz
Horn driver 600 hZ-8kHz

Speakers: One 12" Eminence Beta 250-watt speaker, 8 ohms
One 3.5X3.5 Ferro cooled dynamic horn, 80-watt, 8 ohms
One MS 1.2 proprietary diaphragm, 80-watt, 8 ohms **(You must use a Motion Sound MS-1.2)**

Dimensions: 19.5" W 21.5" H 17" D Weight 58 lbs.

Finish: Two-part Polymaric on MDF (proprietary polymer)

					Fuse (Slo-Blo)
Power:	US	117 VAC	50/60 Hz	200 watt	2.5amp
	Europe	230 VAC	50/60 Hz	200 watt	1 amp
	Japan	100 VAC	50/60 Hz	200 watt	2.5 amp

Fuse: The fuse is located in the power inlet module on the rear panel. Use only the recommended size of fuse as stated above.

-DESCRIPTION-

The Motion Sound KBR-M is a state-of-the-art amplifier for keyboard providing all of the features necessary to reproduce hi-fi and rotary sound independently. The two channels employ technology that is specifically targeted to reproduce and enhance the sound of instruments normally associated with each channel. Hi-fidelity = piano, strings and synth. Rotary = organ. If your keyboard has multiple outputs, you can send piano and strings, etc., to the hi-fi channels from the standard left or right outputs of your keyboard. Organ sounds (be sure to turn off the rotary simulator in your keyboard) may be assigned to an auxiliary output and plugged into the KBR-M's rotary channel. The rear panel has an XLR output and a mixer for the rotary channel horn microphone. A rear panel switch turns off channel one line output to allow monitor operation. The high efficiency 12" driver, 3.5X3.5 Ferro cooled dynamic horn and 130-watt RMS amplifier provide stunning transient response and clarity. A 12AX7EH tube pre-amp and 45 watt amplifier driving a proprietary MS-1.2 diaphragm for the rotary channel in conjunction with the enhanced low rotor simulator provide rich, liquid, **REAL** rotary sound.

-QUICK START-

1. Set all controls to the default number indicated on each control.

2. Set keyboard to 50% volume; plug into the KBR-M's appropriate channel.

3. Fine tune volume and tone controls to suit your taste.

-ROTARY CHANNEL-

The KBR-M employs Motion Sound's acclaimed PRO-3T rotating horn technology, including the 12AX7EH pre-amp circuit and the proprietary MS 1.2 diaphragm. The low rotor simulator is specifically designed for the KBR-M's speaker cabinet and provides rich, liquid simulation.

The rotary input is designed for use with a single keyboard or organ module.

Speed Control: Connect the supplied dual button foot switch here. This is a TRS connector where the sleeve is common or ground, the "tip" controls fast/slow operation and the "ring" determines whether slow or stop is enabled.

Fast overrides all! When the fast speed is on (yellow fast indicator on the KBR-M is lit), the stop button does not have effect. When the fast button is pressed again (yellow indicator off) then slow speed or stop is enabled depending on the position of the stop switch button. (This is similar to a 147-type speaker with a brake kit.) This enables the horn motor and low rotor simulator to cycle between fast to slow, fast to stop and slow to stop. The rotors will follow the acceleration times as set internally.

Disable Stop: If the stop function is not desired, a single contact switch can be used with a mono ¼" jack. The stop is disables by the sleeve of the ¼" connector and the switch button then control fast/slow only.

Pre-Gain: Input is fed to this control before reaching the 12AX7EH tube circuit. The pre-gain is actually an attenuator allowing input levels to be virtually unlimited.

Contour: this knob controls the high frequency response of the rotary channel. The 147 position approximately 5 kHz role off is similar to many older rotating speakers. If you would like a brighter sound, choose the PRO-3 (approximately 7kHz roll off) setting. The control also provides positions in between to allow for today's keyboards and personal taste in high frequency response.

12AX7EH Pre-Amp: There are no solid state devices in this unique tube circuit which utilizes a 12AX7EH (or any of its derivatives) in a self-biased symmetrical clipping topology that behaves like a 147 output stage when overdriven. This design provides silky-smooth sound until pushed into slipping, at first crunchy and at extremes provides a gnarly massive tube grind! A combination of keyboard volume X volume pedal X pre-gain settings determines the overall drive of the 12AX7EH.

Post-Gain: This control allows silky-smooth, clean tube sound with settings of 8-10 and utilizes the full output range of the 45 watt RMS horn power amplifier. When turned down and used in conjunction with the pre-gain and keyboard volume controls, the post-gain allows all levels of overdrive to be played at any volume below the 40 watt amplifier's clipping point and can provide tube only overdrive at loud to very soft levels.

Many users like to set a level or "ceiling" with the pre-gain around 5 and about 50% volume on their keyboard, a point where the 12AX7EH runs fairly clean and then be able to push the tube into clipping by conveniently raising the volume on the keyboard. Again, overall volume can be changed with the post-gain without affecting this "ceiling" level.

	pre-gain	post-gain
Clean Sound	1-5	8-9
Crunch	5-8	3-7
Gnarl	8-10	1-7

Settings depend on a signal source level of approximately 300 mV RMS fed into the KBR-M rotary input.

Low Rotor Volume: The balance between sound from the rotating horn (>800 Hz) and that of the low rotor simulator (<800 Hz) as reproduced through the 100 -watt amplifier and 12" speaker is adjusted here. Set the balance to match your favorite classic rotating speaker or personal taste.

Bass: The control effects frequencies below approximately 150 Hz. Generally set to "0", this is also a personal taste control. If you play with a bass player, leave the control between 0 to -5. If you play solo and use pedals, try a setting of 0 to +5. Bass reproduction uses a great deal of power-use only what seems needed in each situation.

Low Rotor Effect: This controls the amount of low rotor simulator effect. Typical settings of 7-9 are best. This is also a personal preference control.

Overall Rotary Tone: This is a combination of contour, low rotor level and bass settings. If overdrive distortion is part of your sound, set that first with the pre-gain and post-gain

controls and then set the low rotor volume, contour and bass. The personal preference settings of these controls provide a wide range of overall sound, covering many styles of music past and present.

-HI-FI CHANNELS-

The KBR-M's Hi-Fi section employs high fidelity design throughout, from the low noise pre-amp to the 100-watt power amplifier. The high efficiency 12" driver and 3.5X3.5 Ferro cooled dynamic horn provide excellent transient response and clarity for instructions and vocal monitoring.

Monitor Channel 1: these input routes keyboard sounds to a separate volume bass and treble circuit to the Hi-Fi power amplifier. The line output of channel one can be turned off (rear panel) so that a "line level" vocal feed can be used. The use of a ground isolator box is recommended if ground loop hum is introduced in the KBR-M or the PA system. Do Not use speaker level inputs for a vocal feed signal.

Normal Channel 2: This input has separate volume bass and treble and a direct feed to the power amplifier and line output XLR. The line output of channel 2 is not switchable.

Bass: The bass control operates from <150 Hz down. Bass generally uses a lot of power and should be adjusted carefully to match the playing venue and instrument complement. If you have a bass player, try settings of 2-5. This is a personal preference control.

Treble: This controls frequencies from 3 kHz to 20 kHz. The high-sizzle and clarity are set here. Treble can be very piercing and because of the "spongy" nature of air is quickly absorbed. Don't fry your ears on stage with treble-heavy sound that may never reach the audience. A typical setting would be 4-8.

-REAR PANEL CONNECTIONS-

XLR Line Output: signals from the low rotor simulator and the full range hi-fi channels are set here. The horn level, as set by the microphone mixer, is also present (Z out approximately 600 ohms; 70 mV RMS nominal). Channel 1 line output on off is located near the XRL connector.

Microphone Volume: This control mixes the rotary channel horn microphone >600 Hz into the XLR output. The level should be set after all parameters on the rotary channel pre-amp are adjusted. The microphone mixer can be set to zero if external miking is preferred.

Power Supply: The KBR-M contains a 130-watt power amplifier for the full range Hi-Fi amplifier and a 45-watt amplifier to drive the horn from >800 Hz. The power supply is capable of 130 watts RMS that is shared between the two amplifiers. Music is almost always transient in nature and tests have verified the cost/weight effectiveness of this supply in the KBR-M. Use a PA feed, both for hearing protection and for a generally better sound when volume levels require sustained 130-watt performance.

Speakers: The KBR-M utilizes a high efficiency 12" Eminence Beta 250-watt driver and 3.5X3.5 Ferro cooled horn. Reproduction of piano was of primary concern during speaker selection. The transient nature of piano is one of the best indicators of an amplifier's performance.

Rotary Horn: The horn driver of the rotary channel utilizes a proprietary 80-watt diaphragm specifically designed to reproduce organ sounds from modern and classical keyboards. These instruments rarely needed response above 7 kHz. The driver provides rich, "musical" response from 600 Hz to 7 kHz. **YOU MUST USE A MOTION SOUND MS-1.2 DIAPHRAGM.**

-INTERNAL ADJUSTMENTS AND MAINTENANCE-

Cabinet Finish

The new Polymaric (proprietary polymer) finish is similar to a "truck bed liner" coating. Wiping the finish with a damp cloth should be all that is needed.

Speaker Replacement/Removal

The 12" speaker and 3.5X3.5 Ferro cooled horns are accessible after removal of the grill cloth frame. The frame is fitted into a surrounding MDF wood valence and secured with screws into steel inserts. Use a screwdriver to remove the frame. Carefully remove the speaker mounting screws and remove the speaker from the front. Disconnect the two crossover wires to the horn (note polarity) to allow removal from cabinet.

Amplifier, Tube, Belt, Diaphragm Removal/Access

1. Remove the 4 screws on grill cover and remove the cover.
2. Carefully remove the 12" speaker and disconnect the spade lugs (note connection polarity when removing the wires), then remove the tweeter.
3. Remove the 3 screws on the round black plastic axle support on the top center of the cabinet and lift up and out the support. (This is the last part to e replaced on re-assembly).
4. Inside each speaker cabinet there are phillip screws that go up into the metal chassis, remove them. (6 screws)
5. Remove 4 screws on the back of the chassis.
6. Slide the chassis out the rear, be careful to feed the speaker wires through as the chassis moves out.

Additional Horn Diaphragm Replacement Instructions

7. The diaphragm is located through the bottom access hole of the chassis. Remove the spade lugs.
8. Remove the diaphragm, it may be a tight fit so a little force is okay. Make sure you note orientation.
9. Diaphragm Replacement Instructions will be sent when you order your MS-1.2 diaphragm from Motion Sound. (801-265-0917) **You must only use a Motion Sound proprietary MS-1.2 diaphragm.**

Tube

Motion Sound currently uses an Electroharmonix 12AX7EH tube. These are the most reliable available and will provide the longest period of service possible. In the unlikely event of failure, Motion Sound recommends replacement with a 12AX7EH, 5751, or 7025. If this is not possible, a 12AX7 can be used if the gain is adequate.

Belt

The medical grade "pyrathane" anti-static belt is custom manufactured for motion Sound and will provide years of service. **DO NOT USE** other belts as they will damage the servo motor drive system. Belts are available from Motion Sound.

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Horn Diaphragm

DO NOT USE other diaphragms. The MS-1.2 is especially manufactured to work with all Motion Sound products. The MS-1.2 is available from Motion Sound.

-Internal User Adjustments-

The dynamics and speeds of the KBR-M's horn motor and low rotor simulator are calibrated at the factory to simulate a 147 type speaker that is well used but maintained. Three parameters of the horn and low rotor simulator may be adjusted to user preference as follows (note original position of potentiometers before turning). The controls for the horn and simulator are labeled>

S = Slow Speed
F = Fast Speed
A = Acceleration

The adjustments are labeled on the PC board. To access the adjustments see amplifier removal information.