



Made In the USA



PRO-3X

Rotary Horn Amplifier

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PRO-3X

-INTRODUCTION-

The Motion Sound **PRO-3X** amplified rotary horn system, in conjunction with an existing amplifier, provides drawbar organ and organ keyboard modules with the best possible rotary sound in a portable, rugged, modern design. The PRO-3X is the worthy successor to the long running PRO-3, PRO-3T and PRO-3Tm rotary horn amplifiers. We have incorporated suggestions from many musicians and added our years of experience with rotary amplification into the new PRO-3X's performance and features.

The PRO-3X is designed to work with your existing Keyboard amplification system. The highs, above 800 Hz, are sent to the PRO-3X's 45 watt amplifier and horn driver with the real rotating horn producing the 360 degree rotary sound. Audio below 800 Hz is routed through the PRO-3X's low rotor simulator and sent out the Sim or Mix output for amplification by an external amplifier, In ear monitor, or PA system.

Although operation may seem intuitive, we suggest that you read this manual for helpful tips and/or details about the adjustable parameters, controls, and operation of the PRO-3X in various venues and environments.

-WARNING-

**The PRO-3X can produce high sound pressure levels, hearing protection is advised!
The PRO-3X must be earthed and connected to specified power for safe operation!**

-SPECIFICATIONS-

- **Input Design Range** - 1 volt to 4 volts P-P (5 volts P-P maximum).
- **Input Impedance** – 100K ohms. tip = signal, sleeve = ground or common.
- **Pre Amplifier** – Proprietary adjustable mode FET.
- **Power Amplifier** – Solid state for Horn > 800 Hz 45 watts.
- **Horn Driver** – Motion Sound modified Eminence diaphragm – model MS-1.2 80-watt, 8 ohms

Power	Voltage	Frequency	Watts	Fuse (slo-blo)
US	117 VAC	60 Hz	100	2 Amp
Europe	230 VAC	50 Hz	100	1 Amp
Japan	100 VAC	60 Hz	100	2 Amp

- **Fuse** – located in AC inlet module **CAUTION-Use correct value only!**
- **Finish** – two part Polymeric™ tough polymer finish on MDF
- **Dimensions** – 6.5" Height – 20" Width – 16.5" Depth Weight 27 lbs.

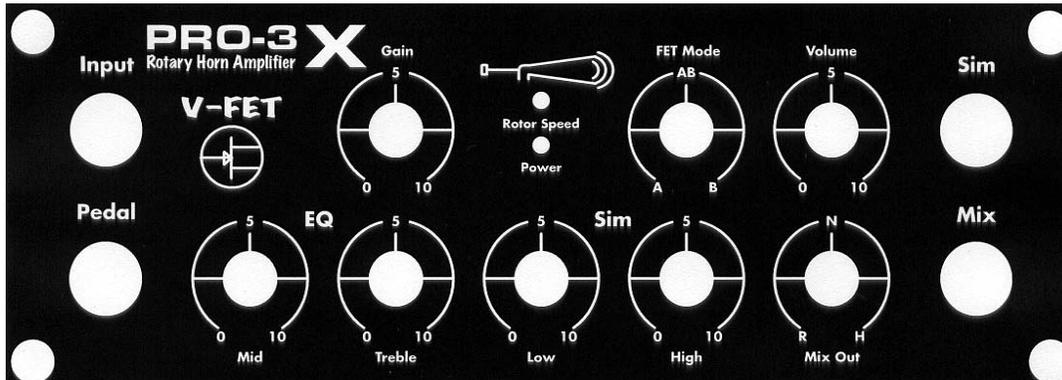
-Quick Start Setup-

1. Plug the speed control pedal in and connect the organ to the PRO-3X with a ¼” shielded cord.
2. Turn the Organ on and set it’s volume to about 50%.
3. Set PRO-3X controls straight up at the 12 o’clock position and set volume to “0”.
4. Turn on the PRO-3X.
5. Connect a ¼” shielded cord from the PRO-3X’s sim out to the low rotor amplifier.
6. Set the volume on the low rotor amplifier to zero and turn on the amplifier.
7. Advance the PRO-3X volume to about “3”.
8. Play some notes on the Organ with a full Organ sound (all drawbars out) and turn the low rotor amplifiers volume up so that it matches the horn volume of the PRO-3X.

-Sound, what to expect-

- The quality of sound will depend on a good organ sound source, the PRO-3X will provide the real rotary effect. The PRO-3X emulates a 147 type rotary speaker with both back covers removed. Sound will radiate approximately 50% front, 20% each side and 10% out the back. As you listen to the front of the cabinet remember a significant amount of sound is being “spun” around the room from the sides and back of the cabinet so the apparent volume out front may seem less than a direct facing speaker. This is very noticeable with no reflective walls or ceiling, Worse case is outside. Use reflective walls/ceiling when possible.
- Classic rotary speakers have limited frequency response and are designed to work with and compliment tone wheel organs. The PRO-3X has many adjustable parameters that work with classic and modern digital organs allowing you to fine-tune the sound to your personal preference.
- Guidelines for all adjustments are present here, but we encourage experimentation as you become familiar with each controls range of effect. Most rotary speakers sound their best at 50% volume or more. EQ settings are also dependent on volume so try to adjust each control while playing at a likely volume.

-Inputs and Outputs-



1. **Input**- Connect an Organ or a sound source with a line level output signal (see specifications) with a ¼" shielded cord.
2. **Pedal**- Connect the supplied LED dual button speed control pedal. The buttons are of push on/push off type. **Note: If "stop" is illuminated no rotors will spin.**
 - Fast – "LED on" – rotors ramp up to fast speed settings.
 - Slow – "LED off" – rotors ramp down to slow speed settings.
 - Stop – "LED on"- over-rides speeds, rotors ramp down to a complete stop and will not rotate until "Stop" is pressed again and the stop LED turns off.
 - Note if the foot switch is not plugged in the rotors will stop.
 - In an emergency you can use a standard ¼" cord in the footswitch. Fast/Slow will operate but stop is disabled without a TRS cord.
3. **Sim**- Connect this output to an amplifier to produce the low rotor sound generated by the PRO-3X's internal simulator.
4. **Mix** -Output sends an adjustable blend of the built in horn microphone and low rotor simulator to a house PA system or support amplification. A setting of "5" is a typical blend.

PA Note- If your *Keyboard amplifier* is connected to a PA system, connect the PRO-3X's Sim output to your amplifier. The simulator will be sent to the PA from your Keyboard amplifier. Turn the "Mix"control fully to "H". The horn microphone is then available alone at the Mix output connector for send to the PA. The house sound Engineer will then set the balance of the horn with the Low Rotor signal from your Keyboard amplifier.

- **R**- Position is low rotor only.
- **H**- Position is horn only.
- **N**-Is neutral or equal amounts of both. This will vary with your EQ settings and low simulator amplifier settings. A sound engineer may ask you to vary this send. Do so only after your stage "sound", volume, EQ, and low rotor parameters are set first.
- **Supplemental Amplification** If you do not send the mix output to a PA, you can use it to send both the low simulator and some of the rotary horn to your low rotor amplifier to assist the PRO-3X's horn in a very loud venue. **Caution!** To much horn may cause feedback.

-Pre Amp Controls-

1. **Gain** – adjusts the drive to the proprietary V-FET pre-amplifier. Lower settings provide clean transparent sound while higher settings produce overdrive distortion. The gain control works in conjunction with your keyboards volume control and volume control pedal (if used). A typical setting would be fairly clean at normal volume with increasing distortion as the Organ volume is turned up.
 - **If you use an analog volume pedal** made for guitars, the impedance of the pedal may cause a large loss in volume and overdrive capability. (no harm is done)

2. **FET Mode** – Classic tube circuits have resistive or inductive plate loads that add different coloration to overdrive to sound. The adjustable V-FET circuit simulates a range of different tube amplifier types providing various overdrive harmonics and limiting. A gain decrease is normal as the “Mode” control is turned towards “B” and the FET’s bias changes.
 - “A” Position- Low bias setting, clipping occurs first in the off state of the circuit. It is typical of most pre-amplifier designs, the smoothest sounding with more even harmonics.
 - “AB” Clipping occurs on both sides of a waveform, most like output stage clipping, harsher sounding with odd and even harmonics.
 - “B” hard biased on setting, clipping occurs first in the full on state. This is a harder sound with more abrupt limiting. This setting is not generally associated with overdrive but can produce a usable and interesting “rougher” overdrive tone.

- **Volume Control** – After the pre-amp mode and gain are adjusted, the overall volume of the PRO-3X can be set to match the venue. Quietest operation is achieved with lower volume settings. Set the volume close to what you will use when playing as you fine-tune the Gain and Mode controls.

-EQ Controls-

The PRO-3X EQ controls are of 100% attenuation design. If the middle, or treble controls are set to zero, no sound will pass through the Mid and Treble EQ section. Both EQ controls set to “5” provides flat response. Numbers above “5” increase amplitude within the controls bandwidth.

1. **Bass** –(Not a control on the PRO-3X) The PRO-3X’s horn crossover is 18 dB/Oct at 800 Hz. Frequencies at 800 Hz and below are routed through the low rotor simulator to the Sim and Mix outputs. EQ adjustments below 800 Hz are via the PRO-3X’s Mid control and your low rotor amplifier’s EQ. *Bass uses a lot of power.*, to match the PRO-3X at full volume an amplifier of 150 watts or more is recommended. Smaller amplifiers can be used at reduced volume.

2. **Mid** – Covers a range from 300Hz to 3kHz. Middle frequencies are fundamental to the classic 147/122 type sound. Start with a setting of “5” and then experiment.

3. **Treble** – Frequencies above 3kHz are adjusted. Treble affects “key click” and “percussion” as well as overall brightness. A classic 147/122 speaker’s sound is not very bright, use the treble control to “mellow” some digital organs when seeking that “classic” sound.

4. **Horn Balance-** (not a control on the PRO-3X), the balance between the low rotor and horn volume is adjusted with the Mid control and the low rotor amplifier's volume and EQ settings.

-Simulator (Sim) controls-

The PRO-3X low rotor simulator speed is controlled by the LED footswitch. The ramp times and terminal speeds are internally adjustable. The sound of the simulator is separated into two bands. The "Low" setting is similar to a close microphone sound such as you may hear on a recorded rotary speaker. The "High" setting adds more texture and room type reflections to the sound, similar to standing in a room with the rotary speaker. Both settings can be adjusted to preference.

- **Low-** primarily adds "Throb" to the sound and operates > below 300 Hz.
- **High-** primarily adds richness and complexity to the sound, operating above 300Hz

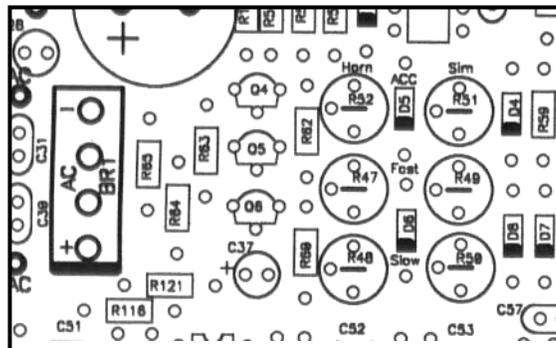
Speed LED – pulsates with the low rotor simulator's speed.

-Internal Speed/Ramp Controls-

The PRO-3X uses electronic speed control for all dynamics of the horn and low rotor simulator. A Precision low noise DC motor and ball bearing horn rotor are utilized providing a zero maintenance, modern rotary horn system. Factory settings are to a well used but maintained 147 type speaker. ***Do not oil motor or horn bearings.*** A range of adjustment is provided to allow for personal preference. Take note of the original settings in case you want to return to stock calibration.

- **Accel** – (R52 horn) (R51 Sim) Trims the ramp up/down time the horn and simulator.
- **Fast** – (R47 horn) (R49 sim) Sets the terminal fast speed of the horn and simulator
- **Slow** – (R48 horn) (R50) sim) Sets the terminal slow speed of the horn and low rotor. The range of adjustment includes stop.

*Re-trimming of fast/slow may be necessary after large acceleration adjustments.



Power amplifier/motor drive PC board. See internal access instructions.

-Microphone & Rotor Output-

*The PRO-3X is a mechanical device, background/wind noise will increase on fast speed.

Play the PRO-3X at 50% volume or more for best signal to noise ratio and to minimize bleeding of adjacent instruments into the horn microphone.

-PA systems and Recording-

PA Note- If your *Keyboard amplifier* is connected to a PA system, connect the PRO-3X's Sim output to your amplifier. The simulator will be sent to the PA from your Keyboard amplifier. Turn the "Mix" control fully to "H". The horn microphone is then available alone at the Mix output connector for send to the PA. The house sound Engineer will then set the balance of the horn with the Low Rotor signal from your Keyboard amplifier

- **Built in microphone** The PRO-3X contains a dynamic microphone element for convenient connection to a PA system. The microphone is adequate for most live performance venues.
- **Critical recording** should always be done with external microphones in stereo.
- **Mono PA with internal microphone** – Adjust the mix output for balance of horn and low rotor send to a mono PA system or recording channel.
- **Mono PA with external microphone** Place the microphone by a front opening on the PRO-3X. Sound will vary with distance and location. Start with a distance of about 1" from the grill cloth and try different positions. Connect the microphone to a channel strip and the low rotor simulator output to a second channel strip. Pan both to center.
- **Stereo PA and studio recording-** Use external microphones in stereo, one on the front left and front right grill openings of the PRO-3X. Connect each microphone to a channels strip and pan hard left and hard right respectively. Connect the low rotor simulator output to a channel strip and pan center. Mix the volumes to preference at the PA mixer.

-Recording and PA EQ-

- The crossover of the horn/low rotor is at 800 HZ 18Db/oct. Best signal to noise is obtained by playing the PRO-3X at least 50% volume or more. The horn channel strip(s) should be cut below at about 400 Hz. The Low Rotor output should be cut above 1.5 KHz If your channel strip does not have full capability, try turning down the Bass on the Horn and Treble on the Low Rotor simulator. Listen carefully while making EQ adjustments, preferably done at performance volume levels.

-Maintenance-

Polymaric™ Finish – This rugged polymer finish is very durable and will withstand most bumps and nicks. Clean with mild soap and water. Avoid getting water on the grill cloth.

Rotor and Motor – No maintenance required, ***do not oil motor or horn bearings***

Use a Motion Sound belt for replacement or damage may occur to motor/electronics

Horn Diaphragm – **Replace with a Motion Sound MS-1.2 diaphragm.** Stock Eminence diaphragms will quickly fail.

1. Remove the four screws from the wood plate in the bottom center of the PRO-3X.
2. Follow instructions with replacement diaphragm.

Internal Access-

1. Remove the three screws from the top plastic axle support and pull the support out.
2. Remove the screws around the outside bottom of the cabinet.
3. Facing the PRO-3X from the front, lift the top off carefully rotating the top to the left. There is a ribbon cable connecting the front panel to the power amplifier that can be removed, ***note connector orientation.***
4. You can make adjustments with the PRO-3X running and the top off. The sound will be different but you can hear speed and acceleration changes.

-Caution! Spinning horn can be dangerous-