

# PRO-3Tm

## -INTRODUCTION-

Thank you for purchasing the new **PRO-3Tm** hybrid tube rotating horn speaker system. All aspects of the PRO-3Tm's design emphasize zero maintenance, reliability and performance. We have incorporated many suggestions from PRO-3 users into the new PRO-3Tm. The result is a small, powerful, lightweight system that actually provides the "sound" of a tube 147-type rotary speaker.

## -Features-

- 12AX7EH pre-amp with pre and post-gain controls
- Tone control 147 contour or PRO-3Tm (4-10 kHz)
- 45-watt power amplifier
- Super-life zero maintenance PYRATHANE anti-static belt
- Horn ball bearings
- Enhanced low rotor simulator with front panel AM modulation control
- Fast speed indicator LED
- Speed control: fast, slow or stop
- Rear panel signal output connector for "low pro"
- Rear panel ¼" horn microphone output

## WARNING

**Failure to use the proper fuse and/or to connect the PRO-3Tm to rated power can cause severe damage! See rear panel for power requirements. The fuse is located in the AC power inlet module.**

**The PRO-3Tm can product high sound pressure levels, hearing protection is advised! The PRO-3Tm must be earthed for safe operation!**

	<u>Voltage</u>	<u>Fuse</u>	<u>Power</u>
<u>U.S.</u>	117 VAC 50/60 Hz	2 amp	100 watts
<u>Europe</u>	230 VAC 50.60 Hz	1 amp	100 watts
<u>Japan</u>	100 VAC 50/60 Hz	2 amp	100 watts

## **-FRONT PANEL CONTROLS-**

### Input and Pre-amp

Input impedance 100 K, signal design level 300 mV RMS, maximum is unlimited. No solid state devices are used in the 12AX7EH pre-amp. The pre-amp is specifically designed to provide symmetrical clipping harmonics similar to that of a type 147-output stage.

### Clean Sound Operation

Set the POST-GAIN at 8-10 and your keyboard volume control to  $\frac{3}{4}$  full. Turn up the PRE-GAIN until the desired volume is achieved. The solid-state FET power amplifier will be the first to clip under full power conditions.

### 12AX7EH Distortion Operation

Set the POST-GAIN at 1-2. Set your keyboard volume control to at least  $\frac{3}{4}$  full. Bring up the PRE-GAIN until the desired distortion is heard. Higher PRE-GAIN and/or signal source = more distortion. Increase the POST-GAIN to obtain the desired volume level. With the POST-GAIN set at approximately 6-7, there will be no solid state distortion. Full power may not be reached, however, unless the POST-GAIN is increased or the tube is driven hard by the input signal. Different levels of distortion at various volumes can be achieved with these controls.

### Contour Control

This simulates the high frequency response of a type 147 cabinet (4-5 kHz) or that of a PRO-3T (7-10 kHz). Set the contour control anywhere in between to suit personal taste.

### Separation/AM

A typical setting for mono (right/mono out only) operation is 6-8. This is another personal taste adjustment and will depend on whether you play bass and the type of amplification equipment that is used. In stereo (both left and right outputs), left-right channel separation is controlled. The Amplitude Modulation controlled effect is predominately on the right channel only.

Pseudo stereo tip: If you are using a mono “PA”, feed the “right/mono out” to a mono PA system and the left out to your keyboard amp. This provides an interesting “spacial” effect for the low rotor simulator. (The microphone output is also fed to the PA.)

### **-KEYBOARDS-**

The simplest and most common use of the PRO-3Tm is to place the PRO-3Tm on top of a keyboard amplifier and plug in the speed control (foot switch) and power cords. The two rails on the bottom of the PRO-3Tm are made to straddle the top handle of most keyboard amplifiers. The ‘right output’ (this contains the best mono ‘low rotor’ simulation signal) is then fed into one of the channels of the keyboard amplifier. Plug your keyboard or organ into the PRO-3Tm input jack. Set the keyboard volume to mid-range and turn up the PRO-3Tm to an appropriate volume (see Distortion Sound, Clean Sound, page 2). At this point, you will only hear sound from the horn speaker of the PRO-3Tm. Advance the volume of your keyboard amp until the desired ‘balance’ of high rotor (PRO-3Tm horn) and ‘low rotor’ (keyboard amp) are obtained. Once done, the PRO-3Tm volume control will then control overall volume of the high and low rotor sound.

All rotary effects should be moved from an organ keyboard patch. Since the PRO-3Tm is actually a processor, it must be sent a ‘dry’ organ signal for best results.

### **-OTHER INSTRUMENTS-**

Guitars and some other instruments may require a “booster box” if their output does not provide the 300 mV RMS design range of the PRO-3Tm. This will be more of an issue if overdriving the 12AX7EH is mandatory. An extra channel or a second amplifier must be available to amplify the low rotor signal. The gain of this second channel or amplifier is then set for best balance between the PRO-3Tm’s horn and low rotor signal. The PRO-3Tm will then be used to control “overall” volume.

#### Setting Low Rotor Simulation Volume Level

The crossover point in the PRO-3Tm is at 800Hz; this corresponds to note F5. A single note F5 (fundamental only) should be “equally” shared between the PRO-3Tm’s horn and your low rotor amplification system. Higher notes are shifted to the horn, while lower notes are shifted to the low rotor simulator. As always, volume levels and tone controls can be adjusted to suit personal preference.

### Speed Control (1/4" TRS Connection)

With the provided foot switch: Fast/slow and stop operations are available. When the "fast" button is on, the rotors move toward their fast terminal speeds. When the fast button is off, the rotors will move from fast to slow or stop depending on the position of the slow/stop button. The fast speed always "overrides" the slow/stop switch.

Note: A single foot switch with a 'mono' plug may be used if the stop function is not desired (the shank of the mono 1/4" plug disables the stop function).

### Top Rotor Assembly and Electronics

The signal is routed through a 12AX7EH pre-amp to an 800 Hz active crossover (18 DB octave). 800 Hz and above signals are fed to a 45 watt RMS power amplifier driving a 80 watt horn driver. A proprietary aerodynamic horn (quiet) is mounted to the driver on isolated sealed ball bearings. The horn is coupled via pulley and superlife anti-static PYRATHANE belt to a DC servo motor.

### Low Rotor Simulator Outputs

Signals 800 Hz and below are routed to low rotor simulation electronics which are controlled by the speed switch. Processing includes doppler shift, amplitude modulation, cabinet rotor proximity effects and left-right dual mike imaging. These signals are sent to left and right outputs on the front panel.

The left and right out signals are 1/4" 150 mV RMS outputs containing the electronically processed 'low rotor' simulation signal. The simulator is synchronized with the 'speed control' so that speed up and slow down dynamics are maintained. Keep in mind that the speed up (5-7 sec) and slow down (3-4 sec) are very desirable traits of a '147' and are purposefully part of the simulation in the PRO-3Tm.

### Sound Reinforcement and Built in Horn Microphone

In large venues it will be desirable to connect the PRO-3Tm to a PA system. In a mono system connect the built-in microphone on the rear of the cabinet to a PA channel. Connect the low rotor right/mono output to a second channel and mix as needed. If the low simulator is amplified by an on stage amp, and the amplifier is fed to the PA for other keyboards, it will also carry the low rotor signal.

If a stereo mix is used you can use the internal microphone for the right channel or two external microphones. The microphones and right/left channels are then panned hard left and right and mixed at the PA board as needed.

### Noise Hum and Ground Loops

The PRO-3Tm design eliminates all possible internal ground loops and 50/60 Hz related noise; however, when two or more devices are connected together and each is grounded (such as a

keyboard, a PRO-3Tm and an amplifier), ground loops and resulting ‘hum’ can be created. **WARNING:** “floating” grounds can be dangerous—use caution and check ground leakage current or have a qualified technician do it for you. The PRO-3Tm transformer is located at the left rear corner of the cabinet. **DO NOT** route cables under the PRO-3Tm near this area—it can cause inducted “hum”.

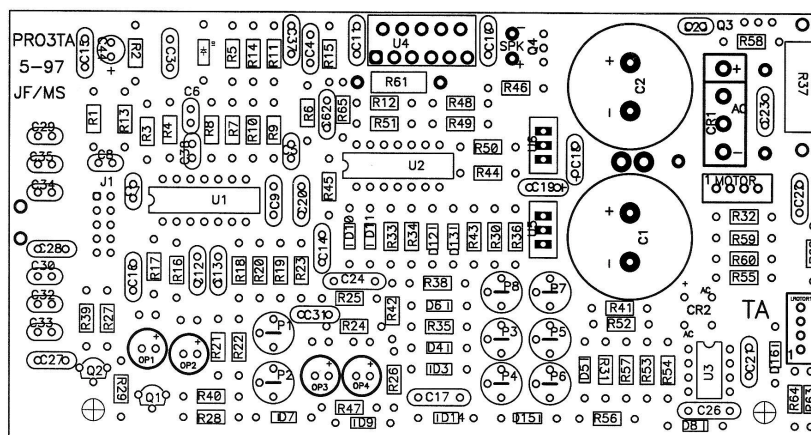
### **Internal Access for 12AX7EH Replacement and Parameter Adjustments**

- Locate and remove the axle support. It is the plastic disc on the top of the PRO-3Tm.
- Remove the four bottom mounting screws.
- Remove the two lower knobs from the front panel. Then lift the front of the cabinet until the front lip is against the lower set of knob shafts.
- Now lift the back of the cabinet all of the way up and remove the cabinet top.

### **The PRO-3Tm default settings simulate a model 147 open-back speaker.**

Make note of the original adjustments before making changes.

Horn-speed adjustment (Fig. 6). Pot P6 sets slow horn speed: Pot P5 sets fast speed: Pot P7 sets horn acceleration-deceleration time.



**FIGURE 6**

Low Rotor Simulator Adjustment: Pot P4 sets slow speed: P3 sets fast speed. P8 sets low rotor acceleration, deceleration time.

Simulator Pot P1 sets FM modulation frequency center; Pot P2 sets left/right amplitude balance.

### **Rear Panel**

The rear panel houses the AC inlet power switch, fuse and “LOW PRO” control connector. The LOW PRO (LP-120) connector is a standard 5-pin DIN and utilizes a midi 5-wire cable. It does NOT send or receive midi data.

### **Horn Driver Diaphragm Replacement**

1. Turn the PRO-3Tm upside down and remove the four screws from the square plate in the center. Remove the plate, disconnect the two push-on connectors from the diaphragm and undo the three screws that mount it to the drive frame (note orientation).
2. Lift out the diaphragm and carefully clean all debris from the driver gap.
3. Follow replacement diaphragm instructions that will be send with your new MS 1.2 diaphragm.

**You MUST us a Motion Sound MS 1.2 replacement diaphragm.**

### **-Specifications-**

Input Impedance: 100K  
 Signal Design Range: 300 mV RMS  
 Crossover: 800Hz 19dB  
 Power Amplifier: 45-watts RMS  
 Frequency Response: 40-10 kHz  
 Pre-Amp: 12AX7EH  
 Output: Low rotor stereo 150 mV RMS

Belt: Pro-3Tm Pyranthane-antistatic  
 Weight: 27 lbs.  
 Dimensions: H 6.5”, W 20”, D 16.4”  
 Construction: MDF with a Polymaric Finish  
 Power: U.S. 117 VAC 50/60 Hz  
 Europe 230 VAC 50/60 Hz  
 Japan 100VAC 50/60 Hz