



**MODEL PA II<sup>©</sup>**  
**(1995-MSRP \$399.00)**

**OWNER'S MANUAL AND  
INSTALLATION GUIDE**

**INTRODUCTION**

After countless hours of analyzing the performances of existing car audio systems, it became obvious that certain areas of the audio spectrum needed help. Even with some of the best equipment being utilized in carefully designed systems, the sonic performance usually falls short of ideal. Something was needed to fill the gap and derive optimum performance from this equipment. Enter the **Linear Power™ PA-II<sup>©</sup>**.

The **PA-II<sup>©</sup>** was engineered to optimize the impedance mismatches possible with all types of equipment, and to provide the equalization necessary to correct for the shortcomings of speakers used in the mobile environment.

The **PA-II<sup>©</sup>** is a four-band equalizer and a preamp stage with up to **32db** of gain, a preamp level clipping indicator, a patch back fader, and an amplifier turn on lead.

This unit when used in conjunction with almost any component car audio system will dramatically improve the dynamics, clarity, signal to noise ratio, and the overall performance of the whole system.

The physical size was painstakingly kept to a minimum to aid in the installation of the **PA-II<sup>©</sup>** in even the most restricted vehicles and the backlighting features makes nighttime operation safer and easier.

## TECHNICAL DESCRIPTION

In order to reach the high line level voltage desirable at the output of the **PA-II**®, and to isolate the preamp from the vehicle's electrical system in the interest of eliminating noises, a self-oscillating power supply is employed. The power supply operates at an ultrasonic frequency and provides a 30-volt split supply to power the circuitry involved.

The **PA-II**® incorporates a double-sided fiberglass epoxy circuit board to help keep the size to a minimum, to insure years of trouble free operation, and to allow us to build a preamp equalizer with incredible bandwidth without fear of oscillations or noise.

The **PA-II**® has reverse polarity protection, and can be adjusted to accept input levels from 150mV to 5V while providing up to 5V of line level output. The dynamic capability of your source is greatly affected by the loading effect presented by the input impedance of an amplifier. The input and output impedances of the **PA-II**® were carefully chosen to optimize the transfer of information from source to amplifier without sonic degradation. The load is taken off of your source and placed on the very strong output buffer preamp in the **PA-II**®. The four bands of equalization were carefully chosen to provide help in the regions of a car audio system that most often have problems.

The low bass area is the most troublesome in most installations. Even the best low frequency speakers being used in the mobile environment tend to roll off too soon, leaving a void at the low end of the spectrum. The Sub Bass control on the **PA-II**® is centered at 45 Hertz, providing the ability to boost the real low frequency information missing most often.

The Mid Bass control is fixed at 180 Hertz, and provides a chance for the removal of some of the extra information built up by the natural resonance of the average vehicle.

The Midrange control follows a curve that matches the response characteristics of the human ear. This allows the system's overall sound balance to be set to where it sounds natural.

The High frequency control is set at 16 Kilohertz. This gives you the ability to bring up the output of the tweeters at a point where most are rolling off.

## INSTRUCTIONS

Read the following instructions through completely. If they appear too complicated we recommend you have an authorized **LINEAR POWER™ Dealer** do the install.

### **GROUND:**

The black negative ground wire should be connected to a solid ground point via a bolt or self-tapping screw. This connection should be to a clean unpainted metal surface.

### **POWER:**

Since the current requirement of the **PA-II**® is only 150 milliamps, the red wire can usually be connected to the power antenna or amp turn-on lead provided by your deck. The red wire should not be connected to the source of constant power as this would eventually drain the vehicle's battery. An alternate source of +12 Volts would be from an accessory toggle switch, which was connected to a power source. This lead should be fused at **1 amp**. (Use an AGC 1A fuse)

### **12 VOLT OUTPUT:**

The red and white wire is an amplifier turn on lead and has 12V present on it when the **PA-II**® gain control is rotated from the off position. Max. load current from this lead is 300mA.

### **INPUTS:**

The RCA (Phono) jacks will accommodate either high or low level signals, ranging from 150mV to 5 volts. For low-level signals, always use shielded cable and avoid routing signal cables in the vicinity of any power wires. The center pin of the RCA plug is always the positive input connection.

### **OUTPUTS:**

In a single amplifier system (no fader used) these jacks are used for sending signal to the input jacks of your amplifier. In a two-amplifier system, where fading capability is desired, use the FADER instructions found on the following page.

### **FADER:**

The Patch back Fader is not operable until the signal is routed back into the FADER INPUT. To enable the patch back fader, run a set of RCA cables from the OUTPUT jacks to the FADER INPUT jacks. Then run a set of cables from the FRONT outputs to your front amplifier, and run a set of cables from the REAR outputs to your rear amplifier.

## **ADJUSTMENT:**

As shipped from the factory, the **PA-II**® is set for the lowest sensitivity. This will allow it to match the speaker level output of a standard deck. In order for the input of the **PA-II**® to match up to a lower level signal, the input level controls must be set. These are accessible through holes on the rear panel, and can be turned with a small flat blade screwdriver. There is a separate control for the left and right channels.

Set the volume control on the source to maximum clean output.

Set the Gain control on the front on the **PA-II**® to minimum.

Set all equalizer controls on the center position.

Rotate the input gain controls clockwise until the clip light just starts to flash.

The **PA-II**® is now matched to the output of your source.

## **CONNECTOR LAYOUT**

With the rear of the **PA-II**® facing you, and the unit right side up, the connections are as follows:

INPUT, (Left and Right); REAR output, (Left and Right); FADER INPUT, (Left and Right); FRONT output, (Left and Right); OUTPUT, (Left and Right).

## **GENERAL TROUBLESHOOTING**

### **NO SOUND**

Check all connections. Check fuses. With a meter to be sure there is +12 volts on the main power wire, but not on the ground wire. Check all signal connections to insure that they are properly configured and that there are no shorts to ground. Check by substitution or other method for proper operation of music source. Check that the **PA-II**® has been turned on.

### **BLOWS FUSE**

Check all connections to be sure all power wires do not touch ground or each other. Re-check polarity of main power wires.

**SERVICE OR REPAIR**

To obtain modification, service or repair, please contact our **ONLY Authorized LINEAR POWER™ Product Service Center:**

**T.I.P.S. INC.**

3455 Lanell lane, Pearl, MS 39208

(601) 932-8477

E-mail: [ray@tipsinc.net](mailto:ray@tipsinc.net)

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3455 LANELL LANE, PEARL, MS 39208 (601) 932-8477

## Specifications

### PA II<sup>®</sup>

<b>Output level *(max output level 7 Volts RMS)</b>	<b>0 – 5 Volts Nom.</b>
<b>Input Impedance</b>	<b>150K Ohms</b>
<b>THD @ full output 20-20KHz</b>	<b>.01%</b>
<b>Signal to Noise Ratio</b>	<b>&gt;90 dB</b>
<b>Frequency Response</b>	<b>3 Hz to 75 KHz</b>
<b>Gain (output)</b>	<b>Up to 32 dB</b>
<b>Channel separation</b>	<b>&gt;70dB</b>
<b>Current Draw</b>	<b>100 mA</b>
<b>Fuse rating</b>	<b>.5A</b>
<b>Dimensions</b>	<b>.875”x6”x3.875”</b>

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