



# Summit Audio Model TPA-200B Dual Tube Preamplifier Operating Manual



**IMPORTANT!:** CAREFULLY READ THE ENTIRE INSTRUCTION MANUAL BEFORE HOOKUP OR OPERATION OF THE TPA-200B.

**WARNING!:** HIGH VOLTAGE. THIS UNIT CONTAINS NO USER SERVICEABLE PARTS. SERVICING SHOULD ONLY BE DONE BY QUALIFIED SERVICE PERSONNEL OR FACTORY. DO NOT OPERATE THE TPA-200B WITH THE COVERS REMOVED.

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## **Product Introduction**

The Summit Audio TPA-200B uses vacuum tube and solid state technologies to produce the warm sound associated with tubes with the reliability provided by solid state devices. The TPA-200B is designed to work in a number of different applications with the different types of inputs: a microphone input, line level input, and a front panel Hi-Z input. Input connections are made by using three pin balanced XLR jacks, balanced TRS 1/4" jacks, and the front panel unbalanced 1/4" jack.

### **Features include:**

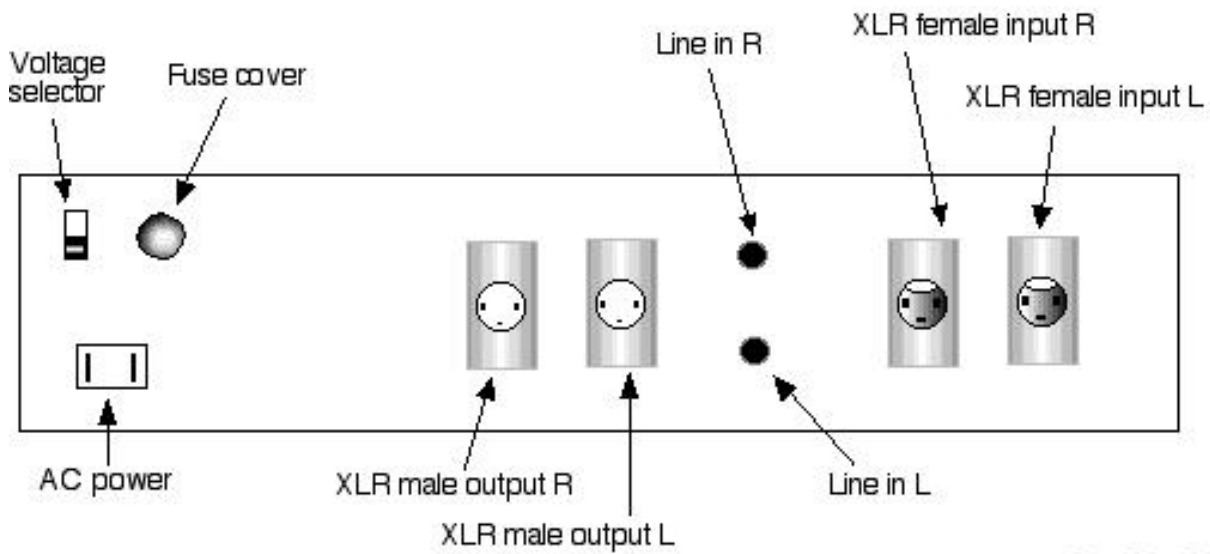
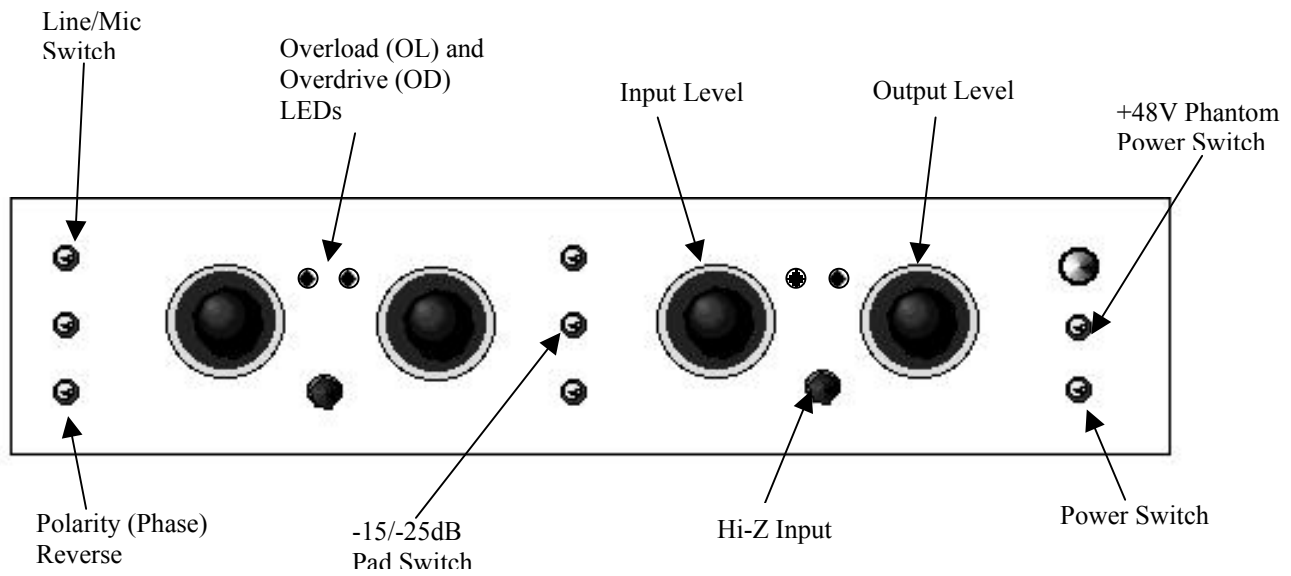
Easy operation  
Controllable sound, continuously variable from "clean" to "overdrive"  
Jensen input transformers  
Line level balanced input  
Mic level balanced input  
Phantom power  
Front panel Hi-Z input  
990 balanced output stage  
Overload and overdrive indicators  
Polarity reversal  
-15dB and -25dB pads  
Hand crafted in the USA

Having found this manual, carefully unpack the TPA-200B and its power cord. Save the carton and packing material should it be needed for future shipping. Before powering the unit, read this manual. Please observe the cautions for HIGH VOLTAGE. Proceed by doing the following:

1. Set the line voltage switch to the proper position
2. Determine the proper fuse size by referring to the specifications
3. Check for pilot illumination when powered up.

## THE CONTROLS

- 1. LINE/MIC:** Selects between the balanced XLR mic input and the balanced ¼" TRS line input on the back of the TPA-200B.
- 2. PAD:** Switches the pad between off, -15dB and -25dB if the output gain of the microphone or line input has too much gain and is overdriving the input of the TPA-200B.
- 3. PHASE REVERSE:** This switches the polarity or phase on the microphone input and line input from normal to 180 degrees out of phase.
- 4. INPUT GAIN:** This completely variable potentiometer changes the input gain for the TPA-200B. Use in conjunction with the output gain to get the desired amount of tube saturation in the signal. Turning the output gain down and the input gain up increases the amount of tube distortion.
- 5. OUTPUT GAIN:** This completely variable potentiometer changes the output gain for the TPA-200B. Use in conjunction with the input gain to get the desired amount of tube saturation in the signal. Turning the output gain up and the input gain down decreases the amount of tube and will give you the cleanest possible sound.
- 6. OL/OD INDICATORS:** .These LEDs will light to indicate overdrive (OD, amber light) when the tube is working at it's optimum level and overload (OL, red light) when the tube is being distorted.
- 7. HI-Z INPUT:** This is an unbalanced, high impedance input for musical instruments such as guitar, bass, and keyboards. (Try plugging in an electric guitar, turning the output gain low and the input gain high to get a great tube distortion.)
- 8. PHANTOM POWER:** Switches on +48V phantom power for BOTH microphone inputs for use with condenser microphones.
- 9. POWER:** Switches the TPA-200B on and off, indicated by the red light above the phantom power switch.



TPA-200B

## Use Scenarios and set up

**Getting a clean microphone signal:** Plug the microphone into the mic input on the back of the TPA-200B and set the input switch to mic (and the phantom switch on for condenser mics needing 48v phantom power). Turn the output gain up very high, then slowly turn up the input gain to the desired recording/ monitoring level.

**Getting tube guitar distortion:** Plug the output of the guitar into one of the Hi-Z inputs on the front of the TPA-200B. Turn the output gain low. Turn the preamp input gain up high (start at about 7) and play the guitar. The OD light should be blinking or steady yellow. Then slowly turn up the output until you reach the desired recording/ monitoring level. Slowly increase the input gain and decrease the output gain to get the perfect tube distortion while keeping the overall level under control.

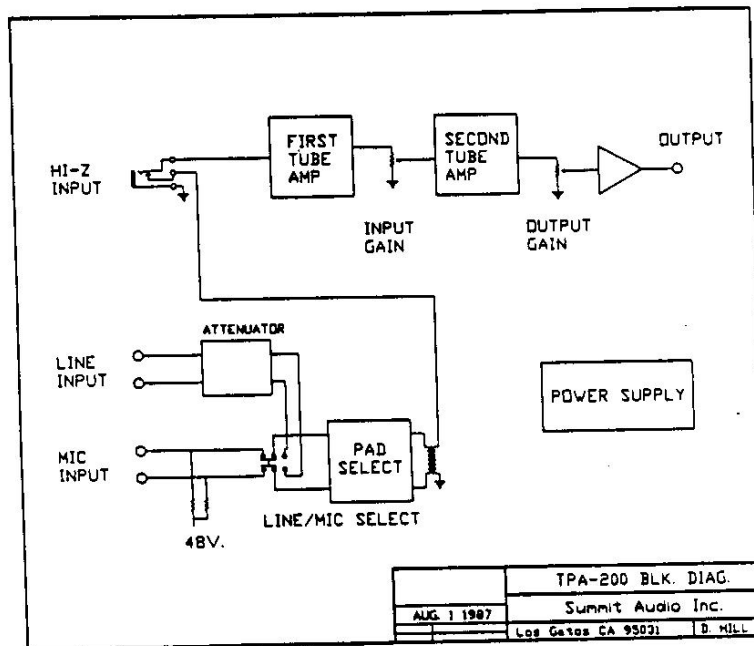
**Getting a warm bass tone:** Plug the bass directly into the Hi-Z input. Turn the output gain knob very low. Turn the input gain up until the OD light just starts to flash while the bass is being played (the flashing light indicates soft clipping). Turn the output gain knob until you get the desired recording/ monitoring level. This can also be done if the bass is plugged into a direct box. Just take the XLR out of the DI into the mic input on the TPA-200B and set the input switch to Mic.

**Using the TPA-200B as an effect:** The TPA-200B is a very versatile preamp and can be used as a warming or distortion effect during mixing. Using the line level inputs, plug your auxiliary sends and returns from your mixer to the TPA-200B's inputs and outputs. Adjust the input and output levels on the TPA-200B to get the perfect amount of warmth or distortion for instruments in your mix.

## Circuit Explanation

The TPA-200B is two independent tube preamps with all signal gain occurring in the tube portion of the circuit. The 990 op amp used for the low impedance output stage is made of discrete components and then potted for stability. The line and mic inputs are transformer coupled and are wired for balanced operation. A ¼" unbalanced plug inserted into the Hi-Z input disconnects the line and mic inputs and feeds the grid of the tube directly. The input gain control is between the first and second tube stages. The second stage amplifier has a cathode follower for lower output impedance. The output gain control is between the cathode follower and the 990 output stage. The tubes are operated class A with no negative feedback. This design was chosen because it works best in the "overdrive" mode, and sounds most like tube microphones in the clean mode. The power supply is all solid state and regulated and the tubes heaters are D.C. operated.

The overload indicator circuit is made of a Hi-Z amplifier that is used for signal pick off from the first tube stage. The amplifier is designed so it does not affect the operation of the tube circuit. The sampled signal is then fed to a comparator circuit that turns the LED on when the signal is -5dBm with respect to clipping. The overdrive indicator works the same way, but instead of picking up the signal on the plate of the first tube, it picks up the signal on the cathode of the last tube.



## **A Word About Tubes**

The tubes that are used in the TPA-200B are selected to give the best possible performance in the position that they are in on the printed circuit board. Switching them to different positions will cause performance deterioration on the audio path. Replacing them with “gold” or high end tube types may not be desirable. In cases that we have measured, these tubes have shown higher distortion and noise as compared to the tubes we have selected. In some cases, the so called “gold” or high end tubes have made the unit unusable. The reason for this is some of the “gold type” tubes are selected for high distortion in guitar amplifiers. Using gold tubes is no guarantee of better performance. All of these so called “Brand X” types are selected with 6.3 volts AC on the heaters, whereas Summit Audio uses 5 volts DC on the heaters for longer tube life and lower noise. The reduced gain can raise the noise floor, increase distortion, and reduce headroom.

For proper performance from a tube, the replacements must be selected using 5 volts DC on the filaments. The tubes we use are selected in the circuits that they are used in to ensure proper operation, long life, and low distortion and noise.

In at least 50% of the cases we have tested, gear that has been used for several years actually have lower noise and distortion levels than when new. This makes the question of when to replace tubes difficult to answer. If a tube turns micro-phonic, the distortion will be obvious and the tube must be replaced. However, tube life will most likely be greater than 10,000 hours of operation. Tubes are generally very reliable; don't replace them just because they are old. In the TPA-200B there are gain adjustments that will need to be checked when the tubes are replaced, or else the metering could become inaccurate and the noise floor could change. Replacement should be done on the bench with a distortion analyzer attached to ensure that the distortion levels are proper and it is comprised of second order harmonics.

Before replacing the tubes in your TPA-200B, please talk to your dealer, call Summit Audio, or find a technician who has experience working with tubes and high end audio equipment.

## Electrical Connections:

*(This TPA-200B is wired as a pin 2 hot device. Units made before March 1<sup>st</sup> 2003 come factory wired with pin 3 hot.)*

### Input:

Unbalanced:	3 pin XLR Connector	Balanced:	3 pin XLR Connector
	Pin 1 – Ground		Pin 1 – Ground
	Pin 2 – (+) Signal		Pin 2 – (+) Signal
	Pin 3 – Connect to Pin 1		Pin 3 – (-) Signal

### Output:

Unbalanced:	3 pin XLR Connector	Balanced:	3 pin XLR Connector
	Pin 1 – Ground		Pin 1 – Ground
	Pin 2 – (+) Signal		Pin 2 – (+) Signal
	Pin 3 – Connect to Pin 1		Pin 3 – (-) Signal

Note: When running an unbalanced output it is best to connect pin 3 to pin 1 in the connector that plugs into the TPA-200B.

Allow the TPA-200B to warm up for at least 15 minutes before using it in your processing chain. The tubes and other circuitry need time to reach an electronic equilibrium before they will operate at optimal specifications. For the longest life, it is recommended that you turn off the unit when it is not in use.

Please mount the unit in your rack, making sure that there is sufficient ventilation, especially on the right and left side of the chassis. The TPA-200B will generate a significant amount of heat; therefore, it is necessary to have good air flow to prevent damage to your TPA-200B or any other pieces of gear housed in the rack with it.

The tubes in your Summit Audio TPA-200B have been intensely screened for desired distortion and gain characteristics. We recommend that you do not replace the tubes with “guitar amp” tubes. Please consult your dealer about availability of appropriate replacement tubes. These can also be ordered directly from Summit Audio. Please fill out the enclosed warranty card. If you have any questions about the operation of your TPA-200B, please do not hesitate to call our customer service department at 775-782-8838 or contact us on the internet at: [sound@summitaudio.com](mailto:sound@summitaudio.com).



*Note on specifications: Summit Audio is uncompromisingly committed to excellence. All of our specifications are made with the latest technology and are UNWEIGHTED measurements. What does this mean? When measurements are “weighted” (e.g. “A” weighted, dB (B), dB C weighted, etc.), the measurement devices are basically EQed or filtered before the measurement is taken. This filtering was developed so that sound pressure level (SPL) measurements can more nearly match human’s non-linear hearing characteristics. However, when used in noise, frequency response, and distortion measurements, weighting will alter the results. Completely flat frequency measurements are key to giving accurate specifications. Summit Audio devices are the highest quality professional audio gear and the specifications below are made with the flattest possible unweighted measurements, giving the most accurate results.*

Specifications:

- Output: +4dBm corresponds to 0 VU. The output is balanced or unbalanced using 990 operational amplifiers. Output impedance is 75  $\Omega$ . The recommended output load is 600  $\Omega$  or more. Maximum output approaches +25 dBm.
- Input: The input is transformer balanced. The mic input impedance is 1500  $\Omega$ , the line level input impedance is 40K  $\Omega$  and the Hi-Z input impedance is 1M $\Omega$ . The mic and line inputs are balanced and the Hi-Z input is unbalanced.
- Overload (red LED) lights when the input stage is driven to 5dBm below clipping.
- Overdrive (amber LED) lights when the second stage is driven to 5dBm below clipping.
- Components include 3 selected 12AX7A vacuum tubes, 4 high reliability 990 operational amplifiers, 12 integrated circuits and 9 transistors
- Panel Size: Standard 19” by 3.5” (2 units of rack space)
- Depth: 10.5”
- Power: 35 watts, 115 or 230 volts, 50 or 60 Hz
- Fuse Size: 0.5 Amp for 115 VAC, 0.25 Amp for 230 VAC
- Shipping Weight: 16 lbs.

To operate this unit on 115 volts, unplug the unit, switch the line voltage selector on the back of the unit to read 115 volts and confirm that the external fuse (mounted in chassis) is a [3 AG ½ Amp slow blow]. To operate this unit on 230 volts, switch the line voltage selector on the back of the unit to read 230 volts and confirm that the external fuse (mounted in chassis) is a [3 AG ¼ Amp slow blow].