



**WYETECH  
LABS**

## Owner's Manual

# Ruby STD Line Stage Preamplifier



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## Introduction

Thank you for purchasing the Wyetech Labs Ruby preamplifier. You are in possession of one of the best sounding, well constructed preamplifiers on the consumer market. This unit has been completely hand crafted using precision quality components.

Our goal was to surpass the sound of the former Opal preamplifier, not an easy task. After many hours of listening by many people familiar with the Opal, we have determined that we have managed to do that. However, you should be aware that the Opal is still one of the best sounding products and would easily compete if not for it's being discontinued. The Ruby recreates more precisely the subtle nuances in the music that trained ears can appreciate. Both of these products are so good that these differences are only made aware of when doing a direct comparison using the finest sources of music and front end devices.

Some of the parts we have chosen to use in this preamplifier are indeed expensive and will not usually be found in other tube or solid state amplifiers being sold at this price level. The chassis construction is totally non-magnetic including all fastening hardware. We also use gold plated sockets for the tubes and the timing DIP integrated circuit sockets.

We would like you, the owner, to be proud of possessing this superbly crafted control amplifier. We want your enjoyment of this product to actually increase with age, as you would expect from a fine wine. We desire to re-establish that " PRIDE OF OWNERSHIP " that dominated North American products of bygone era's.

Several important steps were taken to ensure long term stability and reliable operation. Filtered DC on the filaments are turned on for 35 seconds before applying high voltage DC to extend the life of the Jan Military specification tubes used in the Ruby. We also use WECO screw terminal connections to fasten most wires to the PCB to facilitate easier replacement of parts for future reparability and long service life. All 18 RCA connectors are gold plated with Teflon insulation.

## Description

This preamplifier uses the latest development in grounded grid configurations which surpass all our previous designs. In addition to this new circuit configuration, while lab experimenting we happened to stumble upon an observation of stupendous consequences that would have seemed impossible beforehand. We have not only managed to simplify the circuit using less parts, but have allowed 3 useful and necessary functions to be performed by one passive component.

As a consequence we can with certainty state that this line stage is the fastest possible using tube circuits. While it would be possible with solid state devices to reach these speeds, very few of the ultra high end solid state line stages that we are aware of approach this extreme bandwidth in actual performance. Not only is it flat from 20 Hz to 250 KHz but extends out to 1,000,000 Hertz. As always the three stages are non-inverting maintaining absolute phase.

While the grounded grid configuration is known for its extremely wide bandwidth, this circuit has moved the bar way beyond the capabilities of any other tube configuration, including grounded grid circuits from other manufacturers. ( OK, we only know of 1 other company called Transcendent Sound ).

All stages are DC coupled and only one capacitor is used in the output stage for DC blocking and that consist of a Metalized Teflon™ Film Capacitor of the highest quality. The buffered output is capable of driving two pairs of outputs to accommodate bi-wiring or bi-amping. No feedback and mirror image circuitry is implemented in the audio section for best channel separation.

The parts quantity is the lowest count yet achieved, using our advanced Grounded Grid circuit configuration. This allowed us to use the highest quality parts while limiting cost due to the lower parts count and without resorting to using two chassis to implement this design, while at the same time, exceeding the specifications of all previous line stages in the past. No tube product could hope to compete with the Ruby STD unless they copied the circuit and parts verbatim. The circuit cannot be simplified further and the parts cannot be substituted including the tube types. We have finally achieved the criteria of Einstein's thoughts that ... " things should be as simple as possible, but no simpler "

We chose to append this Ruby with the abbreviation " STD " meaning this is the STANDARD circuit by which all other tube circuits will be compared to and for which none can duplicate it's sonic attributes without outright cloning it. This is undoubtedly fighting words for all challengers, at all price points, come what may. There are no words to describe the majestic sound when operated with appropriate legendary products.

Our primary design philosophy that LESS IS BETTER THAN MORE has been our objective and we were able to lower the parts count in the Ruby STD because of the unique way the dissimilar triodes perform together when passing the signal from one stage to the other.

## **Power Supplies**

The power supply uses a Toroid power transformer for low noise and reduced magnetic field radiation to surrounding areas. A Pi LC ( choke-capacitor ) filter is used for the 265 Volt plate supply and a dual Pi RC filter is used for the 12 Volt filament supply. These filters are designed using only passive components that allow the speed of the power supply to keep up with the analog circuitry. A high quality, large value MPP film capacitor is used as a terminating filter in the 265V high voltage section of the power supply.

## **Mechanical Construction**

- Machined aluminum plates (1/4" & 1/8" thick) bolted together with stainless steel machine screws is used to construct the preamplifier chassis. This provides excellent shielding from external radio frequency fields.
- Custom plated brass designer knobs with a Titanium finished look ( similar to black Nickel ) and notched indentation allow for precise settings. These knobs have dual hex set screws to secure to the shaft that insures accurate calibration and smooth reliable operation of switches
- The stepped DACT dual Volume control has 24 gold plated contacts with surface mounted 0.1% precision resistors to maintain channel balance to within +/- 0.05db
- Selector switch engages relays located near RCA jacks to switch all inputs
- Balance control uses a sealed Electros witch with silver plated contacts and 1% precision Vishay resistor networks
- NKK toggle switches for Tape monitor, Muting & Power on functions

- noiseless toroidal power transformer
- Non magnetic stainless steel and brass hardware is used throughout.
- Automotive high gloss paint finish.
- Polished Brass Handles accentuate the aesthetics of the front panel
- Engraved and ink filled brass name tag bolted to the front panel
- Tape Monitor dual function can also be used with a signal processor loop function.

## **Circuit Boards**

The components are soldered by hand on a dual layer Printed Circuit board that is masked on both sides to protect & insulate the circuit paths as well as a silk screened layer on top to label the components and their position on the board. High quality Teflon coated Silver plated OFHC copper wiring is used in all analog wiring to and from the circuit board.

## **Automatic Power Sequencing & Muting**

To allow for extended tube life a 30 second delay is applied before the high voltage plate supply is engaged. To allow circuit stabilization and quiet operation a 90 second automatic muting is activated during power up. Muting is accomplished using a 2-pole relay that shorts the preamplifier outputs. When disengaged the muting circuit is not in the signal path.

# **Installation**

## **Unpacking the preamplifier**

- Remove Owner's manual.
- Remove top foam (10"x14½"x2" )
- Remove front & rear foam strips ( 21"x3½"x2" )
- Remove side foam strips ( 9"x7"x2"
- Remove cloth covering preamplifier.
- Remove preamplifier from box by holding on to the underside of each end.

## **Repacking the preamplifier**

NOTE: When repackaging make sure bottom foam strip ( 10"x14½"x2" ) is centered in the box so the legs of preamplifier fit around it allowing the bottom of preamplifier to lay flat on the foam surface. Save all materials and box for future use. (Mandatory for warranty shipping)

## **Removing or installing tubes**

9-Pin tubes - Remove (6) screws & washers (use Phillips #2 screwdriver) holding top cover to access tubes. To install tube align guide pin with the tube socket until it falls into the socket then press down until seated.

All tubes are factory installed. You should wait 5 minutes after removing the AC power cord from the unit before attempting to remove cover to access tubes. This is to insure that the large reservoir capacitors in the 250 Volt supply have completely discharged.

All tubes have tube dampers factory installed. These merely slip on and off if tubes need replacement.

### **Input Power Selector Switch**

There is an internal AC input selector switch that can be set for 115/230 Volt 50/60 Hz operation. It will normally be set for 115 Volt 60 Hz at the factory. So if you are running on 230 Volt make sure you select the 230 V. Damage caused by incorrect setting will VOID THE WARRANTY. The switch is labeled in RED and will display the voltage it is set for in the window. To change setting use small flat screwdriver to operate slide.

### **Installing the AC Power Cable**

Place Power Switch in the "OFF" position. Next plug power cord into the preamplifier before inserting the AC plug in to the wall socket.

### **Fuse Rating**

Replace fuse with 1 amp AGC for 115 V operation or 0.5 Amp AGC for 230 Volt operation. Spare fuses are included with unit. If you have not received the correct values consult your dealer for replacement.

## **Operation**

### **Use of the Muting Switch**

The muting switch is used to completely mute the sound which can be used for many purposes. ( example: telephone call, powering off/on amplifier...) When de-activated it is completely removed from the circuit. The muting is done using a two pole relay which shorts out both channel outputs to ground.

### **Indicator Lamps**

There is a large wide angle red and green LED status indicator. The red LED indicates muting is in effect either because the muting switch is engaged or the 90 seconds power up cycle is not yet complete. The green LED shows ready status and is on from power up unless the muting switch is engaged.

### **WARNING**

**Do not remove cover with AC line cord attached and do not operate with cover removed.**

**Remember >> HIGH VOLTAGE IS DANGEROUS! <<**

**Power off unit and wait for at least 5 minutes for power supply high voltage to drain and tubes to cool before attempting to change tubes with cover removed.**

## **Power-Up**

To power up place power switch in up position and wait for automatic sequence to complete. The green and red LED's should immediately turn on. After 90 seconds the red LED (mute ) will turn off allowing the music to play. Remember if you left the muting switch in the on position the green LED will not come on even though the power up sequence completes.

## **Caution**

You can connect or disconnect the interconnect cables ( except for the preamplifier output ) while the preamplifier is on, providing the muting switch is engaged. Otherwise you may cause loud noises or speaker damage.

## **Automatic Muting**

Muting of the output on powering up prevents any noises or thumps from reaching the speakers and it is disengaged after a 90 second time-out. The preamplifier remains quiet at all times. Muting is accomplished using a DPDT relay to short the two outputs. Muting OFF removes the short from the signal path and is disconnected from the circuit.

## **Master Volume Control & Channel Balance**

The Volume control is a dual ganged stepped 24 position switch that allows level control in 2 dB increments over most of its range. It uses gold-plated contacts and SMD resistors that give it a channel balance accuracy of +/- 0.05 dB. Another rotary switch allows for fine balance control in 1 dB steps. (+ 0 - 5db range)

# **Periodic Maintenance**

NOTE: A piece of cotton flannel is best used for cleaning and dusting.

## **Cleaning The Surfaces**

A soft lint free 100% cotton flannel should only be used to wipe off surfaces. For finger prints or grease use only a soft cloth with a mild liquid hand soap and water. Rinse with water soaked cloth followed by a soft cloth to dry.

## **Tubes (9-pin)**

To remove tubes pull straight up while wiggling somewhat. Contact enhancers can be used on tube pins if necessary but should not be applied to tube sockets. To replace tubes line up and wiggle somewhat while applying pressure in a downward manner until tube is fully seated and touching socket.

## **Diagnosing Problems With Signal Tubes**

Your unit is supplied with military grade tubes of exceptional quality. A life span of up to about 10,000 hours is expected from these tubes. Normally a faulty tube will cause problems in only one channel but it is possible that it could affect both channels. It is wise to have a spare set of

tubes to trouble-shoot a problem with. Any problem will most likely be a tube, so replacing the tubes one at a time should allow you to find the faulty tube. If you replaced all four tubes but still have a problem you should contact the factory for advice.



## Technical Specifications

|                                 |  |
|---------------------------------|--|
| <b>Tube Complement</b>          | (2) 12B4A NOS JAN military spec. triode<br>(2) - 5687WB NOS JAN military spec. dual Triodes<br>JAN = Joint Army Navy |
| <b>Frequency Response:</b>      | ( reference to a sine wave at 2 Vrms output )<br>+/- 1 dB - 9 Hz to 1 MHz  |
| <b>Input Impedance:</b>         | 45K ohms minimum   |
| <b>Absolute Phase:</b>          | non-inverting  |
| <b>Channel Balance Control:</b> | 11 position for +/- 5 dB adjustment in 1 dB steps  |
| <b>Attenuation:</b>             | 24 position stepped volume control ( -60 dB to 0 dB )  |
| <b>Output Impedance:</b>        | 150 Ohms   |
| <b>Rated Output:</b>            | 3.5 Vrms ( maximum = 7.5 Vrms )  |
| <b>Gain:</b>                    | 12 db  |
| <b>Outputs:</b>                 | 2 preamp outputs, 1 tape output, 1 line level output.  |
| <b>Inputs:</b>                  | 4 line level inputs, 1 tape input.   |
| <b>Function:</b>                | A processor loop can also be used using the tape in/out connection   |
| <b>Power Requirements:</b>      | Switch selectable 115/230 Volt 50/60 Hz 51 Watts 64 VA   |
| <b>Net Weight:</b>              | 16 LBS ( 7.3 KG)   |
| <b>Dimensions:</b>              | 15" W x 10 7/8" D x 3 3/4" H   |