

# CONSUMMATE PHONO STAGE

## OWNER'S MANUAL

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### Introduction

Congratulations on your purchase of the Jeff Rowland Design Group Consummate Phono Stage.

Please take a few moments to read this owner's manual. (Contrary to popular belief, there is actually quite a bit of useful information in an owner's manual!) The Consummate Phono Stage offers a high degree of flexibility, such that maximum performance with a wide range of phono cartridges can be obtained.

The Consummate Phono Stage is the first phono preamplifier from Jeff Rowland Design Group to offer fully balanced (differential mode) operation directly from all types of moving magnet and moving coil cartridges. There are many sonic and performance advantages with differential operation, especially at the extremely low signal levels generated by phono transducers. With the Consummate Phono Stage, these delicate signals are no longer compromised by externally-produced electromagnetic fields or noisy system grounds. Fully differential operation is maintained throughout all signal

amplification stages. All RIAA equalization is also accomplished differentially. Collectively, these features result in very low noise, distortion and equalization errors.

Regardless of which input (differential or single-ended) you choose, differential amplification and equalization are maintained throughout. And even if you are using the single-ended inputs, we advise that you use the differential outputs of your Phono Stage for better sonic performance.

## Features

- Two phono input configurations: one standard, single-ended (RCA- type connector) and one fully balanced (XLR-type connector)
- Balanced (differential) outputs, with both RCA and XLR-type connectors provided
- User-adjustable, variable cartridge loading via external "calibrated indicator dial" or internal discrete resistor plug-in sockets
- User-adjustable output impedance
- Ten discrete, low impedance power supply regulators provide extremely high noise rejection and isolation
- Discrete, FET, high-current amplifier stages
- All critical circuitry is encapsulated in a thermally-conductive epoxy to ensure excellent thermal stability, mechanical integrity and to facilitate ease of service
- Mil-spec circuit board material, with oxygen-free copper traces and high-temperature mask provides superior electrical characteristics.

## Unpacking Instructions

In the shipping box you will find:

- DC power supply cable
- Two XLR-type male connectors
- 10-100 ohm loading resistor pack
- warranty card (**This form must be completed and returned to JEFF ROWLAND DESIGN GROUP [or its authorized distributor if outside the U.S.A.] within 14 days**)

**of purchase. Not only will your Phono Stage be registered, but you will, in the future, be informed of new products and services.)**

We strongly suggest that you save all packing materials

The Consummate Phono Stage can be lifted out of its box while still wrapped in the plastic bag and foam pieces, which can then be removed.

## **Installation**

The Consummate Phono Stage is designed to be used only with the Power Supply of the Consummate Preamplifier. The Consummate Power Supply provides the correct DC voltages and voltage regulation necessary for proper operation. The use of other power supplies or sources may cause serious damage to your Phono Stage and will also void its warranty.

The supplied DC power supply cable attaches to the rear of your Consummate Power Supply. Please make sure that the AC cord to the Power Supply is disconnected from the wall socket before you attach this Phono Stage DC power supply cable. Double check to make sure that the Power Supply AC switch on its back panel is in the "off" position before re-connecting the AC cord to the Power Supply. Otherwise, damage to your Phono Stage can occur.

Locate the Phono Stage as close as possible to its final installation point. Allow access to the back panel for making connections. You can stack the components of the Consummate system; the suggested arrangement is to have the Consummate Power Supply on the bottom, the Preamplifier in the middle and the Phono Stage on top. You can also position the Phono Stage close to your turntable. Due to extensive local power supply regulation within the Phono Stage, as well as its high-current, impedance-matched, differential mode output capability, it can be located up to 20 meters away from the Preamplifier and Power Supply with no performance degradation. If you have a situation like this and need a custom length DC power supply cable, please contact your Jeff Rowland Design Group dealer.

## Operating Instructions

### Single-Ended Input Connections:

The Consummate Phono Stage can be operated in a conventional, single-ended input mode. Located on the rear panel are 3 input jacks per channel in the **Phono Input** group. Note also that a small toggle switch marked **Input Select** is located between the RCA and XLR input jacks. For single-ended operation, simply plug your turntable interconnects into the **Normal** RCA jacks and set the **Input Select** switches to **Normal**. If your turntable is equipped with a separate ground wire, connect it under the **Ground** thumbscrew.

### Balanced Input Connections:

The Consummate Phono Stage can also be operated in a balanced (differential mode) input configuration. Two different input connector options are provided: XLR inputs in which each channel connector carries the normal and inverting (positive and negative) input signals; or separate RCA connectors by which the normal and inverting signals are carried (via the center pin of each connector). In either case, a signal common (ground) is not used (pin 1 in each XLR connector or the shell of each RCA connector). When using either XLR or RCA balanced inputs, set the **Input Select** switches to **Balanced**.

**NOTE:** For balanced operation, it is necessary that the tonearm/turntable wiring maintain total electrical isolation between right and left channel coils of the phono cartridge, as well as the tonearm/turntable ground returns. Most configurations are wired as such, but some systems join the right and left channel commons together to make a "three wire" system (right hot, left hot, common ground). Other systems combine the tonearm or turntable ground return with one channel of the signal ground. This system can be identified by the lack of a separate system ground wire(s) separate from the signal interconnects. Although the Consummate will operate with these systems, balanced operation and its benefits cannot be achieved, since balanced operation should not have a common ground to which the signal is referenced.

Any magnetic cartridge is inherently a balanced device and electrically acts as an isolated coil, much like a transformer winding. Being an independent, two terminal device, a differential signal is present and, as such, can be amplified differentially. By eliminating a ground reference, a reduction of ground-induced hum, noise and distortion can be achieved.

### Turntable/Preamp Interconnections:

For balanced input operation, the only electrical requirement for the turntable/preamp interconnection is a single "twisted pair" length of small gauge wires. (NOTE: At the time of this writing, balanced phono interconnects are not commercially available. The

information given here can be used for the custom assembly of phono interconnects by a professional technician, or to order these interconnects through a cable company.) The simplest form would be an extension of the existing tonearm wires. For each channel, we recommend that these wires be 28 AWG or smaller diameter; use either solid core high purity copper, stranded or solid core pure silver, twisted together tightly and evenly. An electromagnetic shield surrounding the twisted pair is not required, due to the high common-mode rejection ratio of the phono stage. However, one or two layers of heat shrink tubing can add mechanical durability and rigidity. We have included a set of XLR male plugs for the assembly of the turntable/preamp interconnects.

Two standard turntable/tonearm interconnect interfaces exist on most high quality phono playback systems. One is a standard 5 pin DIN plug/RCA interconnect in which the DIN plug inserts into the base of the tonearm. In the other system type, the small-diameter tonearm wires are terminated into a "junction box," usually integrating a pair of RCA jacks. This latter system offers the user a choice of RCA to RCA interconnects to be used.

If the DIN plug system is used, then we recommend that the appropriate DIN connector be obtained. The twisted pair combination (described above) should be soldered on to the appropriate DIN plug pins; the other end of the twisted pair should be soldered on to pins 2 and 3 of the XLR male plugs.

If the RCA connector (junction box) system is used, then one end of the twisted pair combination would be soldered to the RCA male plugs; the other end would be soldered on to pins 2 and 3 of the XLR male plugs.

In either case, the proper wiring convention and electrical continuity would be as follows:

<b>Cartridge/Tonearm Wire Color:</b>	<b>Consummate Phono Stage Input Connector:</b>	
	Balanced XLR (pin 1 not used)	RCA shells (grounds) not used
Red--(R+)--RCA tip	R channel-pin 3	Normal
Green-(R-)-- RCA shell	R channel-pin 2	Invert
White--(L+) -- RCA tip	L channel-pin 3	Normal
Blue-- L- --RCA shell	L channel-- in 2	Invert

There are usually one or more ground wires for either the tonearm and/or the turntable assembly. Some tonearms with the DIN plug configuration use one of the five pins for this function. In all cases, all ground returns should be isolated from any signal paths and should run on separate wires directly to the **Ground** thumbscrew on the Phono Stage rear panel.

## Phono Cartridge Loading:

Phono cartridge loading can be accomplished externally via calibrated loading dials, labeled **Variable Loading Adjust (Ohms)**, if the **Load Select** switch is set to **Variable**. The 3 digit value shown in the window of each dial indicates the loading value in ohms. This value is accurate  $\pm 5\%$  over a range of 80 ohms to 1000 ohms. By using the loading dials during record play, you can quickly find the optimum loading value empirically. Once this value is found, or if you know your cartridge needs to be loaded at a value other than one in the given range, a fixed resistor should be installed internally.

To install loading resistors, you will need to remove the 7 top cover retaining screws and take off the lid of the Phono Stage. The two (one per channel) 14 pin dual in-line sockets, located near the back panel, can then be accessed. Resistors with leads cut approximately 6mm (0.25 inches) from the resistor bodies, and bent at right angles to the bodies, can be inserted into any of the seven socket pins. The value of the installed resistor will then load the cartridge if the **Load Select** switch is set in the **Fixed** position. We recommend only high-quality, 1%, metal film, 100 PPM or less temperature coefficient, non-magnetic leaded resistors for loading resistors. Jeff Rowland Design Group has provided a selection of resistors with values of 10 to 100 ohms.

If 47 k ohm loading is needed, then no resistor should be installed and the **Load Select** switch should be set in the **Fixed** position.

Each of the options just described provide proper loading for both normal (single-ended) and balanced (differential) input configurations.

## Line Output Connections:

Both XLR male **Balanced** output connectors and RCA **Inverting** and **Normal** connectors are provided on the Consummate Phono Stage, permitting the use of a wide variety of interconnect schemes. Both phases of output signals, normal and inverting, are always present on all output connectors, regardless of what configuration you utilize. We recommend that the **Balanced** connections be utilized not just from your Phono Stage to your Preamplifier, but throughout your audio system. If you desire to run the output of your Phono Stage to a line preamplifier/control center *other* than your Consummate Preamplifier, you will need to check and see if it has fully balanced inputs. If in the likelihood that it does not, you will need to use the **Normal** RCA outputs.

**(NOTE:** Some audio companies use different standards for XLR pin connections. All Jeff Rowland Design Group equipment adheres to the pin 3-hot standard. Other companies' products may have pin 2 as hot. Pin 1 is always ground/common in all XLR connectors. If you use a mix of Jeff Rowland Design Group products and others, and there is a difference in the pin standards, then a phase reversal needs to take place in your system in order to maintain correct absolute phase. All of our preamplifiers perform absolute

phase reversal via a front panel function switch.)

#### Output Impedance Selection:

You can choose between two different values of output impedance on your Consummate Phono Stage: 150 ohms and 300 ohms. The output impedance can be adjusted via two sets of D.I.P. switches, located inside of the Phono Stage near the output connectors. The standard setting from the factory is 300 ohms, which corresponds to switches 1 and 3 in the "ON" position (switches 2 and 4 "OFF") on both sets of D.I.P. switches.

If the output impedance of the Phono Stage is set for 300 ohms and the input impedance of your Consummate (or other line) preamplifier is also set for 300 ohms, then the interface between the two components will be optimized or "impedance matched." This condition will yield the most accurate performance by reducing degradations caused by interconnect cables, regardless of their length. The advantages of impedance matching occur in both balanced and single-ended applications, although the balanced configuration will yield the greatest sonic and performance benefits.

If the input of the line preamplifier is other than 300 ohms or is not known, then the 150 ohm output impedance should be selected. The D.I.P. switch settings would be 2 and 4 in the "ON" position and 1 and 3 "OFF."

#### **Adjustable Gain**

The overall gain structure of your Consummate Phono Stage can be adjusted to one of two different values, either 47.5 dB or 62.5 dB. It can thus be used with a wide variety of moving magnet and both high and low- output moving coil cartridges. The Phono Stage comes set from the factory in the high gain (62.5 dB setting) for use with most low-output moving coil cartridges.

The gain switches are located on the underside of the plug-in modules and should only be adjusted by your Jeff Rowland Design Group dealer. Incorrect installation of these modules will result in damage to the preamplifier circuitry which cannot be covered under warranty.

Technical Specifications

**CONSUMMATE PHONO STAGE**

<b>Gain</b>	<b>Selectable 47.5 or 62.5 dB</b>
<b>IHF Input Sensitivity For 500 MV Output</b>	<b>0.5 MV (high gain setting)</b>
<b>Main Outputs (Per Channel)</b>	<b>1 Inverting, 1 Non-inverting, 1 XLR balanced</b>
<b>Input Impedance</b>	<b>Adjustable: 80 to 1000 ohms via calibrated dials; 0-47 k ohms via user-installed fixed resistors</b>
<b>RIAA Accuracy</b>	<b>20 Hz to 50 kHz, <math>\pm 0.10</math> dB</b>
<b>Frequency Response</b>	<b>5.0 Hz to 220 kHz, -3 dB</b>
<b>IHF Signal to Noise (S/N) Ratio, A Wtd., Ref. 500 MV</b>	<b>80 dB (high gain setting)</b>
<b>THD Distortion, Ref. 2.5 V RMS</b>	<b>&lt;0.02%</b>
<b>Max Output Level</b>	<b>10 V RMS</b>
<b>Output Impedance Selectable</b>	<b>Unbalanced            150 or 300 ohms Balanced                300 or 600 ohms</b>
<b>Dimensions (LxWxH) inches/centimeters</b>	<b>13.75 x 15 x 2.65 /35 x 38 x 6.7</b>
<b>Weight</b>	<b>10 lbs., 4.5 kg</b>