

# Adagio Vacuum Tube Phono Stage (MM / MC) Owner's Manual



TAVISH DESIGN, LLC

Made in U.S.A.

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# 1 INTRODUCTION AND QUICK START

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Thanks for buying the Adagio Phono Stage!

Tavish Design's Adagio Vacuum-Tube Phono Stage is our top-of-the-line phono preamp, but at a reasonable price, in a clean, simple package. It offers state-of-the-art specifications that rival or exceed the measured performance of solid-state phono stages, but with an all-vacuum-tube signal path.

Vacuum tubes present some unique safety considerations, so please take time to read and understand the safety considerations in Section 2 before using this equipment.

Feel free to contact Tavish Design if you have any questions ([info@tavishdesign.com](mailto:info@tavishdesign.com)).

## **Quick Start**

1. The tubes are installed before shipping, but check to be sure they are straight and fully seated. See section 3 for tube locations.
2. Connect your turntable to either the Moving Magnet (MM) or Moving Coil (MC) input and set the front panel toggle switch to the corresponding position. High impedance, high output MC cartridges should connect to the MM input.

Select the appropriate loading for your cartridge. If you don't know what loading to use, the 50 pF or 100 pF settings work well for most MM cartridges, and the "Max" setting works well for most MC cartridges. Suggested loadings for some popular cartridges are given in Section 3, but feel free to experiment.

Be sure to connect the ground post on the back of the phono stage to the ground post on your turntable.

3. Connect the power cable from the power supply to the main phono stage. The connectors are indexed and will only connect in one orientation. Turn the retaining ring on the power connectors clockwise until you feel a "click". The power supply can be placed in a convenient remote location up to 6 feet from the main phono stage, but ensure that it has adequate ventilation.
4. Turn ON the power switches at BOTH the power supply and main phono stage. The power supply can be left turned on and switched remotely from the ON-Standby switch on the main phono stage.

The phono stage takes approximately 45 seconds to warm up. Until then, the amber "Mute" LED on the front panel will be lit and the phono stage will not pass signal.

The "Mute" switch can be used to mute the output when lowering or lifting the tonearm.

Turn down your volume control the first time you play an LP, until you are familiar with the appropriate volume setting.

## 2 SAFETY

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1. **To avoid the risk of electric shock, do not operate the amplifier without the top cover in place. This amplifier uses high voltages internally which could cause an electrical shock, possibly resulting in injury or death. Lethal voltages can remain in the electronics after the unit is unplugged.** Refer servicing to Tavish Design, LLC. If the unit must be opened for servicing, unplug it and wait at least 10 minutes for internal capacitors to discharge.
2. **Do not operate the amplifier without the vacuum tubes in place.** Removal of the vacuum tubes exposes internal circuitry to contact and presents a shock hazard. This hazard is similar to removing a light bulb from its socket.
3. **Turn off the power to insert or remove vacuum tubes.**
4. **Do not allow liquids (such as from a spilled drink or flower vase) to run into the amplifier,** as this can damage the amplifier or create an electric shock hazard. Do not operate outdoors or in wet areas. Do not allow rain to enter the amplifier (by placing the unit next to an open window, for instance).
5. **A broken or improperly seated vacuum tube can cause electric shock.** Do not operate the amplifier if any vacuum tubes have broken glass shells. Align the tubes if any are leaning or not fully seated, prior to operating the amplifier. Vacuum tubes get hot, so allow them to cool before handling.
6. **To avoid electric shock, do not insert thin metal objects between the vacuum tubes and the cover, or allow children to do so.** A metal object inserted into the amplifier could possibly contact high voltages present internally. This hazard is similar to that of sticking a pin or thin screwdriver into an electrical outlet.
7. **Keep out of reach of children.** In no case is line-operated electrical equipment child-safe. Please keep children away from this product, as you would keep them away from an incandescent light bulb, even when turned off.
8. **Use with adequate ventilation and keep away from flammable materials.** This amplifier, like all vacuum tube equipment, produces heat – about 35W, or a bit less than a 40W incandescent light bulb. Do not block air flow, which would allow heat buildup, and keep flammable materials, such as draperies away. Do not operate continuously or unattended.
9. **The amplifier is designed to connect to a 3-wire grounded outlet. Never defeat the safety ground on the amplifier; doing so can create an electric shock hazard.** Please consult a qualified electrician if you are in doubt about the grounding of your electrical system.

10. **Worn or damaged electrical cables can present a shock hazard.** Inspect electrical cables regularly and replace them when they become worn or damaged. Please contact Tavish Design for suitable replacements.

## 3 SETUP

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### 3.1 INITIAL SETUP

Setup consists of installing the tubes (if needed), connecting your turntable to the Moving Magnet (MM) or Moving Coil (MC) input, setting the cartridge loading, connecting the Adagio output to your preamplifier or integrated amplifier, and connecting the power supply.

#### **Installing the Tubes**

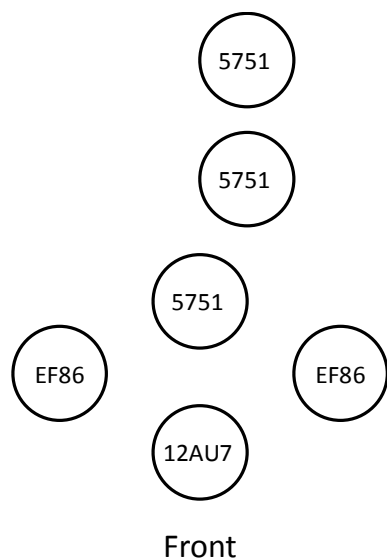


Fig. 3.1: Tube positions.

Note the tube positions above. To install the tubes, carefully align the tube pins with the socket and push down, gently rocking the tube slightly from side-to-side to ease the pins into the socket. Never twist or force the tube; the glass shell is easy to break if the pins are bent. See Section 3.3 for tube removal and replacement. JJ 12AX7 / ECC83 are sometimes supplied in place of 5751, depending on which low noise tubes we have in stock.

#### **Connecting Your Turntable**

The Adagio has separate inputs for Moving Magnet (MM) and Moving Coil (MC) cartridges. High impedance, high output MC cartridges should connect to the MM input. The MM or MC input is selected with the front panel switch. To avoid a loud transient, mute the output before adjusting the position of

the switch or connecting or disconnecting cables. Be sure to connect the ground post on the back of the phono stage to the ground post on your turntable.

The MC input on the Adagio is transformer balanced, and both XLR and RCA input connectors are provided. A few turntables provide a balanced (XLR) output, which is preferred for its superior rejection of external electromagnetic fields (such as from power lines in your house).

### **Cartridge Loading**

Table 3.1 gives suggested settings for some popular cartridges. These are only a starting point. Follow your cartridge manufacturer’s recommendations, or select the loading to suit your preference. In selecting the capacitive load for a MM cartridge, note that the cables connecting your turntable to the phono stage have approximately 30 – 35 pF per foot, so a 3 foot cable contributes 100 pF of capacitance to cartridge loading.

<b>Cartridge Type</b>	<b>Example</b>	<b>Reference Output</b>	<b>Input</b>	<b>MM Load</b>	<b>MC Load</b>
<b>MM</b>	AT95e	3.5 mV	MM	50 pF	N/A
<b>MM</b>	Ortofon 2M	5.5 mV	MM	50 pF	N/A
<b>Low-Output MC</b>	Denon DL103	0.35 mV	MC	N/A	Max (500 Ω)
<b>Low-Output MC</b>	Ortofon Quintet Red	0.5 mV	MC	N/A	300 Ω
<b>Hi-Output MC</b>	Denon DL110	1.6 mV	MM	Min (No added C)	N/A
<b>Hi-Output MC</b>	Sumiko Blue Point	2.5 mV	MM	Min (No added C)	N/A

Table 3.1: Suggested settings for popular cartridges.

### **Connecting Your Preamplifier or Integrated Amplifier**

The Adagio has a universal output which is compatible with both unbalanced RCA and balanced XLR interconnect (pin 2 positive). If your preamplifier or integrated amplifier has a true balanced input, that is the preferred input to use. Balanced XLR interconnects are used in professional equipment and can reject hum which sometimes arises from interconnected equipment.

### Connecting the Power Supply

Connect the 6 foot power cable from the power supply to the main phono stage. The connectors are indexed and will only connect in one orientation. Turn the retaining ring on the power connectors clockwise until you feel a “click”. The power supply can be placed in a convenient remote location up to 6 feet from the main phono stage, but ensure that the power supply has adequate ventilation, wherever you place it. Longer power cables are available from Tavish Design.

The power supply is designed to connect to a 3-wire grounded outlet. Never defeat the safety ground on the line cord; doing so can create an electric shock hazard. Please consult a qualified electrician if you are in doubt about the grounding of your electrical system.

The power supply is interlocked and will not turn fully on unless the main phono stage is connected.

**Worn or damaged electrical cables can present a shock hazard.** Inspect electrical cables regularly and replace them when they become worn or damaged. Please contact Tavish Design for suitable replacements.

## 3.2 OPERATION

Turn ON the power switches at BOTH the power supply and main phono stage. The power supply can be left turned on and switched remotely from the ON-Standby switch on the main phono stage.

The phono stage takes approximately 45 seconds to warm up. Until then, the amber “Mute” LED on the front panel will be lit and the phono stage will not pass signal.

The “Mute” switch can be used to mute the output when lowering or lifting the tonearm.

Turn down your volume control the first time you play an LP, until you are familiar with the appropriate volume setting.

## 3.3 TUBE REPLACEMENT AND SUBSTITUTION

Vacuum tubes last much longer than most people realize, and although the lifetime of any particular tube is impossible to predict, hopefully it should be many years before any tube replacement is necessary. Replace tubes with the same type. That is, replace the 12AU7A/ECC82 only with another 12AU7A/ECC82, not with another type. The only exception is the 5751, which can be replaced with a 12AX7A/ECC83 if you can't find a 5751, or if you prefer the 12AX7.

The tubes are much easier to remove if you first remove the cover. Turn off and unplug the power supply and wait 10 minutes for the internal high voltage capacitors to discharge. Remove the cover by



removing 4 screws on each side of the enclosure. **Replace the cover after replacing the tubes. To avoid a risk of electric shock, never operate the unit with the cover removed.**

The unit is supplied with JJ and Electro-Harmonix tubes, but tubes of other manufacturers are also OK. It is very unlikely that you will find a tube with lower noise than the JJ 5751 (if you do, please let us know). New, old-stock (NOS) tubes tend to be noisier. The noise levels in the electronics are well below the surface noise on vinyl LPs, so you may wish to choose the input tubes by other criteria as well.

Selected low noise JJ 5751s (or 12AX7 / ECC83S) are available from Tavish Design.

## 4 TECHNICAL INFORMATION

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Parameter	Specification
<b>Gain</b>	44 dB Moving Magnet 64 dB Low-Output Moving Coil (JT-44K-DX) 62 dB Low-Output Moving Coil (JT-347-AXT 1:8) 65 dB Low-Output Moving Coil (JT-347-AXT 1:12)
<b>RIAA Equalization Accuracy</b>	±0.2 dB, 20 Hz – 20 kHz
<b>Signal-to-noise ratio (A-weighted)</b>	>84 dBA ref. 5 mV @ 1kHz, Moving Magnet >82 dBA ref. 0.5 mV @ 1kHz, Moving Coil
<b>Reference Output Level</b>	750 mV RMS (0 dBu)
<b>Total Harmonic Distortion</b>	<0.008% at reference output level into 10 kΩ, 1 kHz
<b>Output Overload (defined as 1% THD level)</b>	>44 V RMS into 10 kΩ at 1 kHz (36dB overload margin)
<b>Input Impedance, Moving Magnet</b>	47.5 kΩ in parallel with fixed capacitance of approximately 20pF and adjustable capacitance of: 0pF, 50pF, 100pF, 150pF, 220pF, or 330pF
<b>Input Impedance, Moving Coil</b>	Adjustable: 500 Ω (max), 400 Ω, 300 Ω, 200 Ω, 150 Ω, or 100 Ω
<b>Output Impedance</b>	100 Ω at 1 kHz
<b>Suggested Load Impedance</b>	≥10 kΩ ≤5000 pF (up to 150 feet of coaxial cable)
<b>Tube Complement</b>	5751 (x3), 6267/EF86 (x2), 12AU7A (x1)
<b>Power</b>	35 W, 120 VAC, 60 Hz
<b>Main Phono Stage Size</b>	8.6" wide, 10.2" deep, 2.2" high (3.9" high to top of tube guard)
<b>Power Supply Size</b>	8" wide, 10.2" deep, 2.2" high
<b>Weight</b>	Phono Stage 4.6 lbs., Power Supply 3.1 lbs. (15 lbs. shipping weight)

Table 4.1: Phono stage performance. Measurements are taken with JJ 5751, JJ (or Electro-Harmonix) 6267/EF86S, and JJ ECC82 tubes, as supplied. JJ 12AX7 / ECC83 are sometimes supplied in place of 5751, depending on which low noise tubes we have in stock.

Tavish Design phono stages are designed to implement the traditional RIAA replay curve. We do not implement the 1976 IEC Amendment which rolls off the replay response at 6dB/octave below 20Hz, and we do not implement the occasionally discussed “Neumann pole” at 50 kHz. The 50 kHz pole is not part of the RIAA standard.

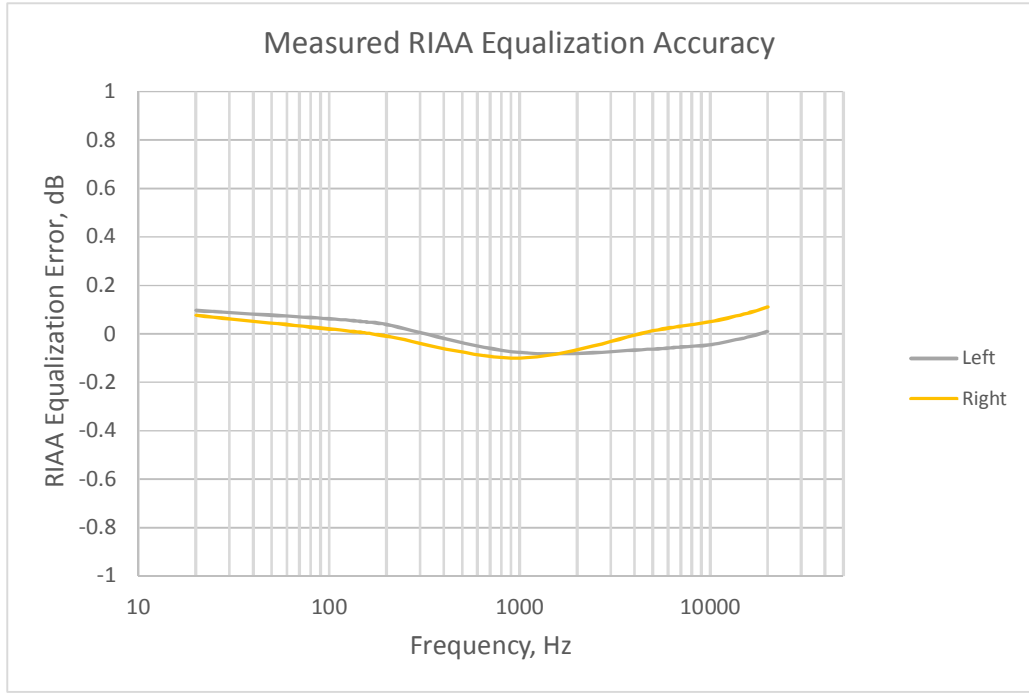


Fig. 4.1: Typical measured RIAA equalization error, left and right channels. These are very small equalization errors, and measurement error due to the test equipment itself is  $\pm 0.1$  dB.

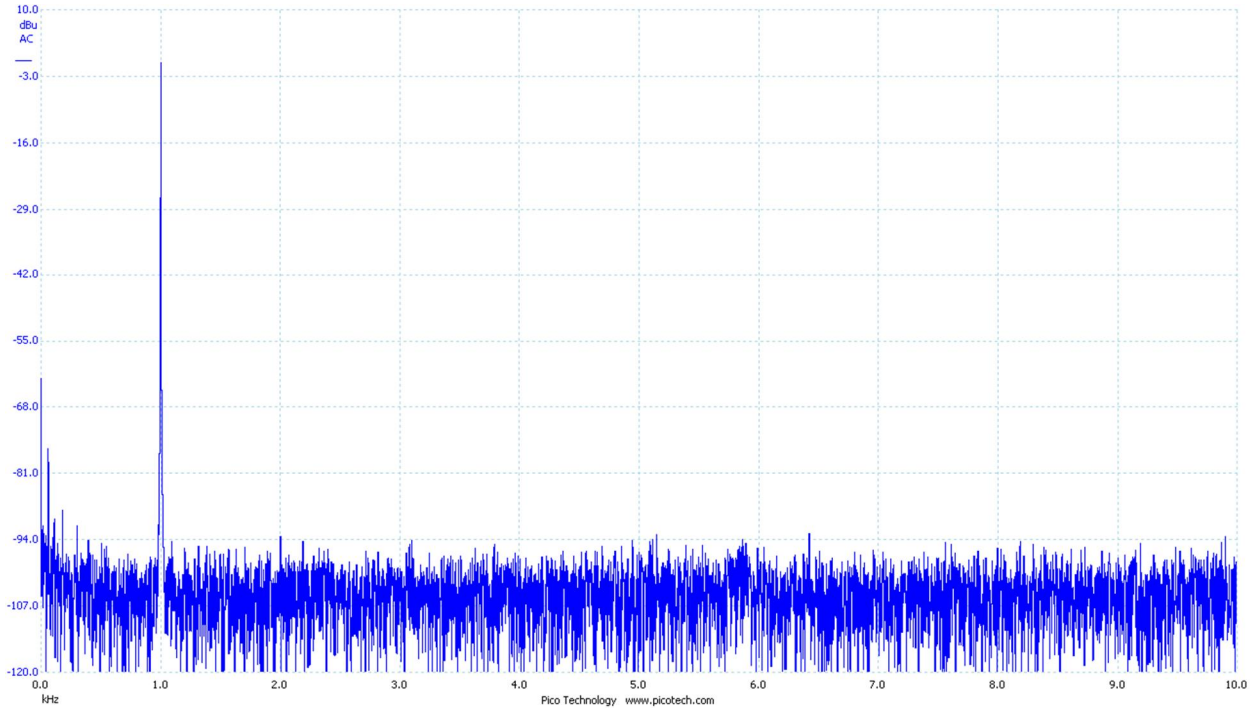


Fig. 4.2: Distortion spectrum, approximately 750 mV RMS output level at 1 kHz into 10 k $\Omega$ . This is  $\leq 0.004\%$  THD.

## 5 WARRANTY AND SERVICE

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### 5.1 WARRANTY

With the exception of tubes, Tavish Design, LLC (hereinafter “Tavish Design”) warrants to the consumer this product to be free of defects in materials or workmanship for a period of six (6) years from the date of purchase (6 months on tubes). If you discover a defect, Tavish Design will (at its option) repair or replace the product at no cost to you (excluding return shipping and handling outside the 48 continental United States) provided that you send it prepaid to Tavish Design (see Section 5.2).

Proof of purchase in the form of a dated bill of sale which indicates that the product is within the warranty period may be required to obtain warranty service, if the date of sale is not in our records.

This warranty does not cover cosmetic damage or any damage that results from product misuse, product abuse, installation error, connection to an incorrect voltage supply, accident, improper maintenance, alterations, repairs or modifications not authorized in writing by Tavish Design, lightening, power surges, or acts of God. Use of parts not obtained from Tavish Design may void this warranty.

This warranty is limited to the replacement or repair of this product and not to damage to equipment of other manufacturers. Any applicable implied warranties, including warranty of merchantability, are limited in duration to a period of the express warranty as provided herein beginning with the original date of purchase and no warranties, whether express or implied shall apply to the product thereafter. Under no circumstances shall Tavish Design be liable for any loss, direct, indirect, incidental, special, or consequential damage arising out of or in connection with the use of this product. Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow exclusion or limitation of incidental or consequential damages, so some of the above limitations or exclusions may not apply to you.

This warranty does not cover the cost of parts and labor which would be otherwise provided without charge under this warranty, obtained from any source other than Tavish Design.

This warranty applies only to the consumer use of this product. The product is not warranted for use in public address, sound reinforcement, in any trade or business, or in an industrial or commercial application.

The warranty applies only to the original owner and is not transferrable.

This warranty is only valid in the United States of America. Units shipped outside the United States must be returned to Tavish Design in the United States for warranty service.

## 5.2 SERVICE

Please contact Tavish Design for service (in or out of warranty) if you believe your amplifier needs repair. Most technical issues can be resolved by email or phone. If your unit does require repair, we'll issue a return merchandise authorization (RMA) number, along with packing and shipping instructions and a street address for delivery.

### **Tavish Design, LLC**

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Amawalk, New York 10501

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## **6 COPYRIGHT, TRADEMARK, AND DISCLAIMERS**

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