



Channel D Seta[®]

Balanced Direct-Coupled Wide Bandwidth Phono Preamplifier

Installation and Use Guide

Seta Model L for Low Output / Low Impedance Phono Cartridges

AGM Rechargeable Battery Power Supply

Seta Installation and Use Guide

Seta Model L for Low Output / Low Impedance Phono Cartridges

AGM Rechargeable Battery Power Supply

Use Guide Revision 1a

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Table of Contents

	Page
Getting Started	1
Signal Connections	
Signal Inputs	1
Signal Outputs	2
Power, Chassis Ground, RCM	2
Power-Up Configuration	3
Gain Adjustment	3
Cartridge Balance TRIM Control	4
Cartridge Loading	5
Accessing Cartridge Loading Components	5
Single Ended / Balanced Jumpers	6
Ground Bypass Jumper	6
AGM Battery Operation and Charging	7
Specifications	9

Congratulations on your purchase of a Seta phonograph preamplifier! The new, ground-breaking Seta is a low noise, fully balanced design featuring an ultra-wide frequency bandwidth of up to 5 MHz (Model L), unprecedented for a phono preamplifier. This provides you with the key to obtaining stunning, three-dimensional music reproduction from your phonograph records. The Seta is designed to be used as a front-end preamplifier for connecting to high resolution (192 kHz / 24 bit), balanced - input computer audio interfaces. In conjunction with Channel D *Pure Vinyl* software, used for applying the RIAA phono correction curve, the strengths of the latest, 21st century cutting-edge analog and digital technologies are brought together, delivering superb, high definition, transparent vinyl playback.

For those audiophiles insisting on an all-analog signal path, an optional RIAA hardware correction feature is available for a conventional, RIAA-corrected output signal. The Flat and RIAA outputs may be used simultaneously (another unique feature), to support the best of the Analog and Digital worlds.

Getting Started

Please take the time to read this Installation and Use Guide, to familiarize yourself with the installation and operation of the Seta.

Important: If the package you received from your shipper is below room temperature, please allow the sealed inner carton containing the product to acclimate at room temperature for a few hours before opening it, to avoid causing condensation on cold internal surfaces.

After unpacking, connect the provided external power supply to an AC power source and plug the barrel connector into the power jack on the rear panel of the Seta. It will take the Seta at least one hour for the internal circuitry and solid copper parts to become stabilized to normal operating temperature.

The following items are included. Please check the package and notify Channel D of any shortage:

- Seta Preamplifier, with Internal AGM Batteries Installed
- External 15 Volt, 25 watt DC power supply, 110 / 220 Volt Input
- 5/64" Allen L-key
- Cartridge Trim Adjustment Tool

The first time using your Seta, the internal battery should be fully recharged at least once before operating the preamplifier (playing music). The Seta automatically disconnects the battery charging power supply when a signal is detected. Therefore, if you would like to immediately use the Seta to play music, charging should be manually locked in for at least two hours by selecting the **Manual Charge** front panel button. This will cause the **Manual Charge** indicator to illuminate (as well as the **Batt** indicator, if the Seta wasn't already charging). The **Manual Charge** mode also is useful for component burn-in or noncritical listening.

All signal connections can safely be made to the Seta while the power supply is connected. ***Be sure to mute the Pure Vinyl application software, if running on the computer, or otherwise mute or power down your power amplifier(s) while making signal connections, to avoid generating noises which could damage loudspeakers.***

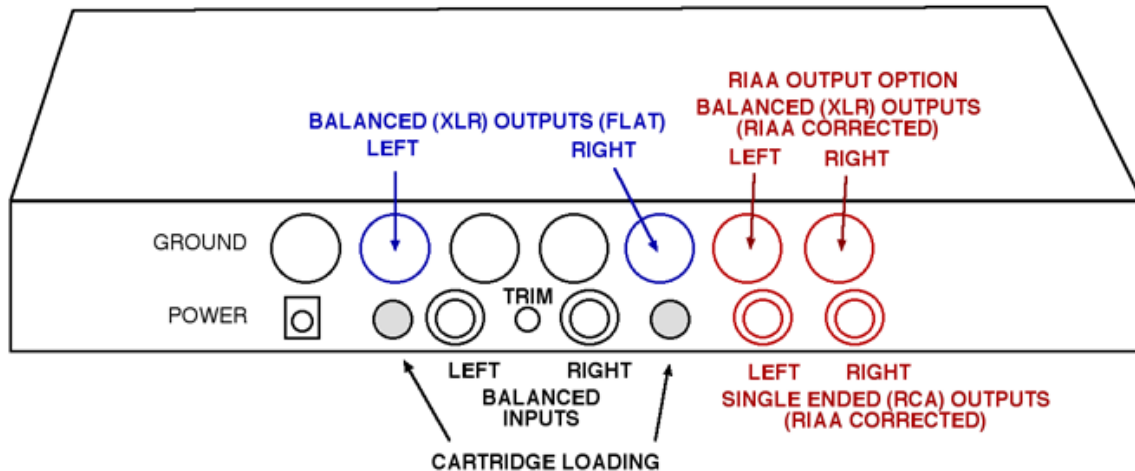
Signal Inputs

- The RCA inputs may be used with conventional shielded cable (single-ended) phono connections. They also serve as single-ended to balanced adapters (provided that the turntable ground connection is isolated). *Consult the section of this Installation Guide concerning the proper configuration of the internal single ended / balanced jumpers (Page 5). The factory setting is with the jumpers set for single-ended operation (Model H) and balanced (Model L).*

- The XLR inputs are intended for use with balanced (twisted pair or star quad) turntable connections. For optimum, low noise operation this is the preferred type of connection. Balanced wiring provides better noise immunity than conventional shielded (single conductor plus shield) cable.

Signal Outputs

- The low impedance, balanced XLR outputs are intended for connection to the **balanced** inputs of a professional audio interface, for use with Channel D's Pure Vinyl software (for Macintosh computers) for applying RIAA compensation (or other similar software on other computer platforms). (Consult the Pure Vinyl software User Guide for more information.)



If using an audio interface with single-ended, unbalanced inputs (not recommended), ***do not*** connect either XLR output pin to common/ground. The correct wiring configuration would be to use XLR Pin 2 as signal and XLR Pin 1 as ground, if using a balanced to single ended adapter.

RIAA Outputs (with Optional RIAA Output Module)

- Balanced and single ended outputs are provided. Use the connection appropriate for your other equipment.

Power

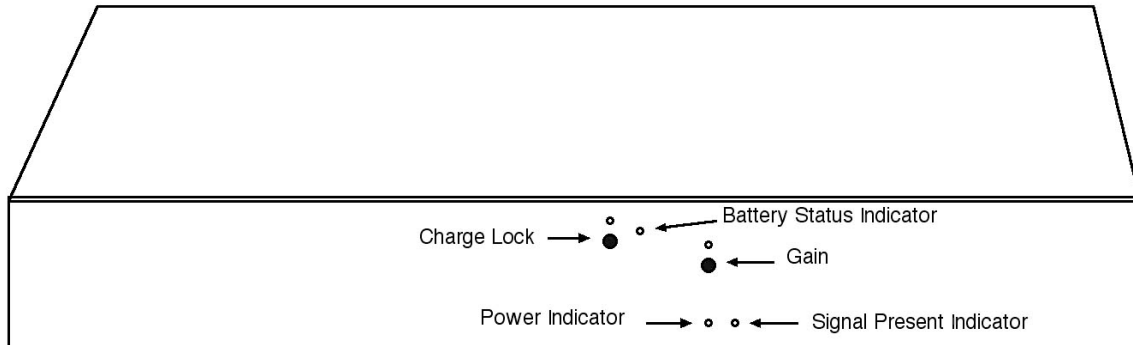
- Connect the barrel connector of the supplied power adaptor to the 15 volt (tip positive) power input jack.

Chassis Ground

- Securely connect the chassis ground wire from your turntable / tonearm (if so equipped) to the grounding lug on the rear panel of the Seta.

Power-Up (Initial) Configuration

- **Charge Lock:** Activated (indicator illuminated)
- **Sig** indicator: initially on, extinguishing after several minutes. (*If the Sig indicator does not extinguish, be sure to check if an input connection has become loose or dislodged.*)
- **Gain:** must be initialized after connecting power, see below.



Gain Adjustment (FLAT outputs only)

Upon connecting the power supply, the gain setting must be initialized by pressing the front panel Gain button a few times, until the Low (Light Blue) indicator appears. The gain setting will be preserved as long as power is supplied (and, as indicated below, in the AGM Rechargeable Battery Operation and Charging section, the Seta should normally be kept in a powered state).

Indicator Color / Gain	Gain (Model L)
Light Blue (Low)	43 dB
Blue (Medium)	46 dB
Violet (Medium High)	49 dB
Lavender (High)	53 dB

WARNING! *Always make changes to the Gain Setting at a reduced or muted playback volume*, to keep **loud** transients (thumps) from playing through the loudspeakers. The Seta gain control isn't meant to be adjusted frequently. It's designed for ease (in contrast to having internal jumpers or switches) of setting the phono preamplifier gain, to provide the optimum input signal level for your audio interface and phono cartridge. With that purpose in mind, any circuitry for preventing "thumps" that also could compromise audio quality was omitted in the Seta design.

The *Pure Vinyl User Guide* includes complete information on setting the proper preamplifier gain. Briefly, **you should aim for "Dry" signal level peaks in Pure Vinyl between -20 and -4 dBFS, for the music that you usually play.** Provided that peaks usually reach these levels, it's not necessary to have to adjust the gain setting frequently, or at all. It's prudent to allow at least 4 to 6 dB of headroom below full scale, to accommodate unexpectedly loud modulation levels. (At the low end of the suggested signal range above, be certain that a signal peak represents music and not "pops" or "clicks," which also should remain below 0 dBFS at the high amplitude end of the signal range.)

If your audio interface permits setting nominal input signal levels to consumer or professional format (true of professional audio interfaces from Lynx, RME, etc.), **first try the consumer (“-10 dBV”) setting, in conjunction with the minimum gain setting on the Seta.**

- **If signal levels remain too high**, set the **input** of the audio interface to professional (“+4 dBu”) format.
- **If the levels are too low**, increase the gain on the Seta. (For monitoring / playback, if the **output** levels of your interface can be adjusted independently of the input levels, use the +4 dBu setting for the **output**.)

(The High gain setting on the Seta Model H is provided as a convenience for using low-output moving-coil cartridges with the Model H. The desirable audio reproduction qualities of the Seta are retained, even at high gain settings, because the Seta design insures that bandwidth is independent of gain. However, for dedicated use with low-output moving-coil cartridges, the Seta Model L is preferred, because the noise characteristics of the low impedance, high-bias-current devices used in the Model L are *specifically tailored* to offer quieter operation and wider bandwidth with low-output moving-coil cartridges than is possible with the circuitry used in the Model H. *Note*: the Model L cannot be used with high-impedance cartridges such as moving - magnet or “high output” moving coil.)

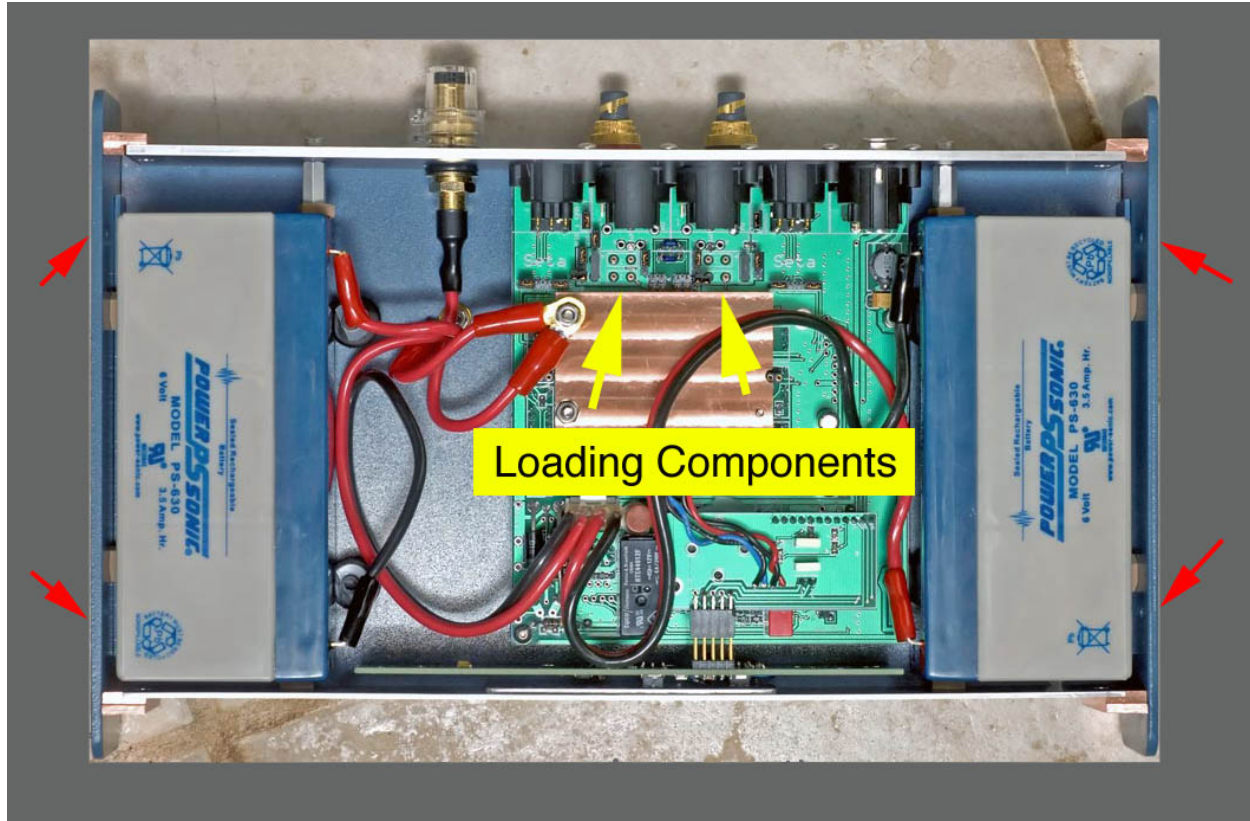
If you’re accustomed to using conventional phonograph preamplifiers, the available Seta gain settings may seem somewhat lower than usual. However, they are tailored to using the Seta with Channel D Pure Vinyl’s digital vinyl compensation curve. The required gain is about 10 to 12 dB less than needed in a conventional phono preamplifier, because the signal is provided to Pure Vinyl with treble emphasis (boost) intact. (*Note for the technically knowledgeable: this turns out to be somewhat less than the maximum 20 dB boost of the RIAA compensation curve at 20 kHz, due to the frequency balance of most music.*) For example, if you would normally use a preamplifier gain of 58 dB for your moving-coil cartridge, then the proper setting on the Seta would be 46 dB. (The Seta with the optional RIAA hardware compensation module has an overall gain 12 dB higher than the settings listed in the table.)

Cartridge Balance TRIM Control

The Seta rear panel (optionally front panel mounted) features a unique, precision trim control for adjusting the inter-channel cartridge balance. The range of the control is 2 dB. The neutral position is with the slot in the brass actuator oriented vertically. To properly adjust the cartridge balance, use the supplied tool (or small slotted screwdriver) while playing a monophonic record (or a record with the music mixed to the center). Observe the RIAA Balance indicator in the Pure Vinyl application, and adjust the trim control until the value is close to zero (within ± 0.1 dB is sufficient). This adjustment should only need to be performed once, and can be left alone, unless or until a new cartridge is later fitted to your turntable. The setting is not affected by the overall Seta gain.

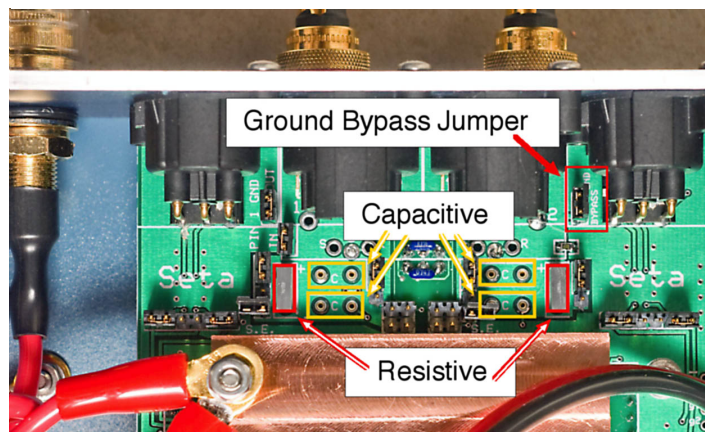
Cartridge Loading (User Configurable)

Besides external selector switches, the Seta also has user-replaceable internal components, allowing customization of the load. The sockets are premium, machined gold-fingered, high reliability type. The sockets are on 0.3 inch centers, and will accommodate the leads of typical passive resistors, and capacitors with this lead spacing. ("Flat" Seta model shown; external RIAA Correction Module optional)



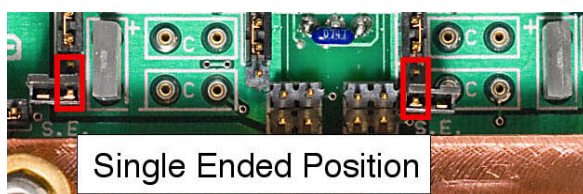
To access the cartridge loading components:

Unplug the external power supply. Remove four hex screws from the locations indicated (two on each side) in the above illustration using the supplied 5/64" Allen key L-wrench, and remove the top cover.



There are two component locations for capacitive load (marked **C** on the circuit board) for each channel, and one resistive (marked **R**). The components for each channel are connected in parallel; therefore, capacitor values should be summed (if using more than one capacitor *per channel*). The *minimum* capacitive load (this includes the internal wiring) is 10 pF (by removing all plug-in capacitors).

Be sure components are securely seated in the internal sockets after installing.



Single Ended Position



Balanced ("Parking" Location Shown

Single Ended / Balanced Operation Jumpers

Two internal, gold contact jumpers (marked on the circuit board as S.E.) are used to configure the Seta for single ended or balanced operation. In single ended operation, the negative cartridge terminals are connected to circuit common. This connection should be used if noise (hum) is detected, and the connecting cable between the cartridge / turntable is the standard, consumer type shielded RCA cable (a single shielded conductor).

See the photo above illustrating the jumper position for single ended operation. **The single ended setting is the jumper "bridging" position.** Both jumpers *must* be configured the same way for proper operation. For balanced operation, simply place the jumpers in the "Parking" position (with one jumper pin open), or remove and store them in the polyethylene zip-lock bag attached to the inside of the lid.

The Seta will function noiselessly (no detectable hum) even in single ended mode with most tonearm / turntable setups, including those with the tonearm "ground" connected to the cartridge (such as Rega tonearms), using the RCA input connectors. However, for optimum low-noise operation, it is strongly advised that balanced (shielded twisted pair) cable be used to connect the turntable to the Seta. This may entail rewiring the turntable. For low impedance (low output cartridges, such as moving coil, with an internal resistance of 100 ohms or less, and nominal output voltage around 0.6 mV or less) shielded twisted pair microphone / standard audio signal cable can be used. For high impedance / high output cartridges (such as moving-magnet with standard output of about 4 mV or more), "star quad" type shielded twisted quad audio cable will provide superior immunity to noise (hum) pickup. To use the star quad cable, the conductors of the same color should be connected together at each end of the cable. While extremely effective at rejecting electronic interference, the disadvantage of star quad is high capacitance, 40 pF per foot, or more (consult the manufacturer's specifications), and this must be taken into account when setting the cartridge loading.

The shield should be connected to the XLR connector pin 1; positive cartridge connection to pin 2, and negative to pin 3. For more information, see the *Pure Vinyl User Guide*.

Take care to confirm that your turntable / tonearm / cartridge doesn't connect the chassis ground or common to any of the cartridge signal leads. Examples of this are Rega tonearms. The internal circuit connector has the tonearm ground connected to the left channel negative signal lead. This will cause excessive hum with the Seta. The tonearm output connector must be carefully disassembled and the negative signal lead disconnected from the circuit connector. The tonearm ground then should be provided with a separate connection to attach to the Seta external grounding lug. Another example includes cartridges having a connection or lug that connects the cartridge housing to one of the signal leads (usually the left channel "negative" lead). This should be disconnected or removed by gently bending or tugging with fine tip pliers or other such tool.

Ground Bypass Jumper

The internal ground jumper (located above the RIGHT channel load resistor, see illustration) may be used to bypass (in the bridging position) the 100 ohm local ground isolation resistor directly to common. This may provide more, or less, "hum" immunity, depending on your other equipment.

AGM Rechargeable Battery Operation and Charging

The Seta should always be kept powered, to maintain both a stable circuit temperature and the condition of the AGM battery. The power consumption (no signal) when the battery is fully charged is low, less than 5 watts. If necessary, the Seta may be disconnected from the power supply for up to a few months without adversely affecting the battery life. *Do not store the Seta at elevated temperatures*, such as in an attic or garage.

The Seta *must* be connected to the external power supply for operation. This design insures that the battery isn't accidentally over-discharged, which could shorten its life. The power supply is used to activate two normally-open relays, connecting the battery to the Seta circuitry, and the charging supply to the battery. When a signal is detected, the second relay is deactivated, disconnecting the charging supply from the battery (and the Seta preamplifier circuitry). The battery voltage monitoring and power management are automatic.

The 2.3 ampere hour battery, when fully charged, is capable of supplying power for well over 24 hours of continuous operation. The AGM type lead/acid battery is superior to *all* other battery types used in high-end audio applications (see <http://www.channld.com/seta.html>, under the Rechargeable Battery section). The Seta will automatically activate Charge mode under either of the following two normal conditions:

- A signal resulting in an *output* level of less than -40 dBV isn't detected for a few minutes.
- The AGM battery has exhausted its charge.

The switching to Charge mode (or from Charge to Battery mode) will be unnoticeable, even while playing music. A faint, mechanical click may be heard (from an internal relay) if holding an ear close to the preamplifier.

If you want to use the Seta to burn in another component, or use it for noncritical listening, the Charge Lock selector switch is provided to lock the Seta in Charge mode, overriding the signal level detector.

Battery Life / Battery Replacement

The battery life is determined by two factors: operating environment temperature (temperatures above 80 F should be avoided, as this will degrade battery life) and the number of deep discharges (defined as continuous operation for more than 24 hours without activating the Charge or Manual Charge mode). Typical battery life will be between 3 and 6 years; up to 20 years is possible. The battery life will be extended by keeping the Seta continuously connected to a power source (the idle power consumption is less than 5 watts) and the battery fully charged.

The battery capacity also typically will increase slightly (by a few percent) during the first few deep discharge / recharge cycles.

When the Battery indicator illuminates with a continuous violet color after several hours of charging (the normal indication while charging is a blue color), or the preamplifier automatically switches into Charge mode in less than about 6 hours (while continuously playing records), it's necessary to replace the internal rechargeable batteries.

The AGM lead/acid battery is a widely available type, commonly used for security alarm systems. Any sealed type rechargeable 6 volt lead-acid battery with dimensions of 2.4 x 5.3 x 1.3 inches and capacity of approximately 2.3 ampere-hours is acceptable. For example, McMaster-Carr part number 7448K13 or Digi-Key part number 522-1001-ND (either can be ordered via the Internet).

- The batteries ***must*** be replaced in pairs, and only sealed lead-acid type batteries can be used. **All** other battery types are incompatible with the internal battery monitoring and maintenance circuitry and Seta power and voltage requirements.
- It's best to obtain a "fresh" replacement when needed, rather than keeping spares on hand, because degradation will begin to occur if stored for more than a few months without charging. (The Seta may be operated continuously, even with degraded batteries, by using the Manual Charge button, so waiting for replacements to ship shouldn't be a problem.)
- Replacement batteries should be at ambient room temperature before installing.

The included AGM Battery Replacement Instructions document provides instructions for replacing the batteries.

If you don't wish to perform the battery replacement yourself, the Seta can be shipped to Channel D for battery replacement. *Please contact Channel D for shipping information and pricing, and a Return Material Authorization.*

Specifications - Seta Model L, for Low Output/Low Impedance (Moving Coil) Cartridges

- **Voltage Gain:** 43, 46, 49, 53 dB
- **Input Load Resistance:** maximum 2 k Ω ; user adjustable
- **Frequency Response (-3 dB):** DC to > 5 MHz, at any gain setting; slew rate greater than 500 volts per microsecond (5 volts peak to peak output, 25 to 75%)
- **Phase Shift:** ultralinear, less than 1 degree, DC to 100 kHz, at any gain setting
- **Signal Propagation Delay:** less than 60 nanoseconds, input to output
- **Distortion:** less than 0.001%, 10 Hz to 40 kHz, at any gain setting, 0 dBV (3 Volts) output level
- **Circuit Topology:** Fully balanced, direct-coupled (no capacitors in the signal path)
- **Cartridge Fine Balance Trim:** 2 dB range, not affected by Voltage Gain setting
- **Inputs:** Neutrik, Premium Gold Pin XLR Balanced; WBT, premium wide bandwidth helical gold pin RCA (RCA inputs function as single-ended to balanced adapters)
- **Outputs:** Neutrik, Premium Gold Pin XLR Balanced
- **Output Impedance:** less than 40 ohms
- **Output Drive Capability:** Balanced cable, up to 33 feet (10 meters), 600 ohms or greater load impedance
- **Storage Temperature (with charged AGM batteries):** 0 to 78 degrees F
- **Operating temperature:** 40 to 78 degrees F; battery life will be diminished at higher temperatures
- **Power Consumption:** less than 5 watts idle / maintenance AGM float; less than 15 watts while operating or with AGM recharging

Optional RIAA Correction Module

- **Circuit Topology:** Fully balanced, direct coupled; second order DC servo (primary time constant 10.3 seconds). Passive high frequency correction, premium, low distortion wide bandwidth FET based gain stage for active low frequency correction. Independent single ended (RCA) ground referenced and balanced outputs; low noise 4-layer circuit boards and surface mount component technology
- **Gain:** adds 12 dB
- **Channel Separation:** \geq 80 dB, 20 Hz - 20 kHz (> 100 dB at 1 kHz)
- **Frequency Response (-3 dB):** DC to 12 MHz, balanced or single-ended outputs
- **Channel Match:** better than \pm 0.02 dB, 10 Hz - 50 kHz
- **Deviation from RIAA Standard:** less than \pm 0.1 dB, 10 Hz - 50 kHz
- **Harmonic Distortion (20 Hz - 20 kHz):** less than 0.001%
- **RIAA Overload Margin:** 26 dB at 1 kHz, 15 dB at 20 kHz
- **High-pass filter:** -12 dB / octave at 10 Hz (can be disabled with internal jumpers)
- **"Neumann" setting:** 50 kHz RIAA modification, can be enabled with internal jumpers
- **Outputs:** Neutrik, Premium Gold Pin XLR Balanced; WBT, premium wide bandwidth helical gold pin RCA
- **Output Impedance:** less than 40 ohms
- **Output Drive Capability:** Balanced cable, up to 33 feet (10 meters), 600 ohms or greater load impedance
- **Components:** Precision (0.1 percent) metal film resistors; ultra low dissipation factor sprayed metal film polypropylene and polystyrene capacitors, hand selected to match design within 0.1 percent tolerance; ultra low ESR power supply decoupling capacitors

Dimensions

- 12"X 2"X 7" (W x H x D)
- Weight 6.5 pounds

Warranty

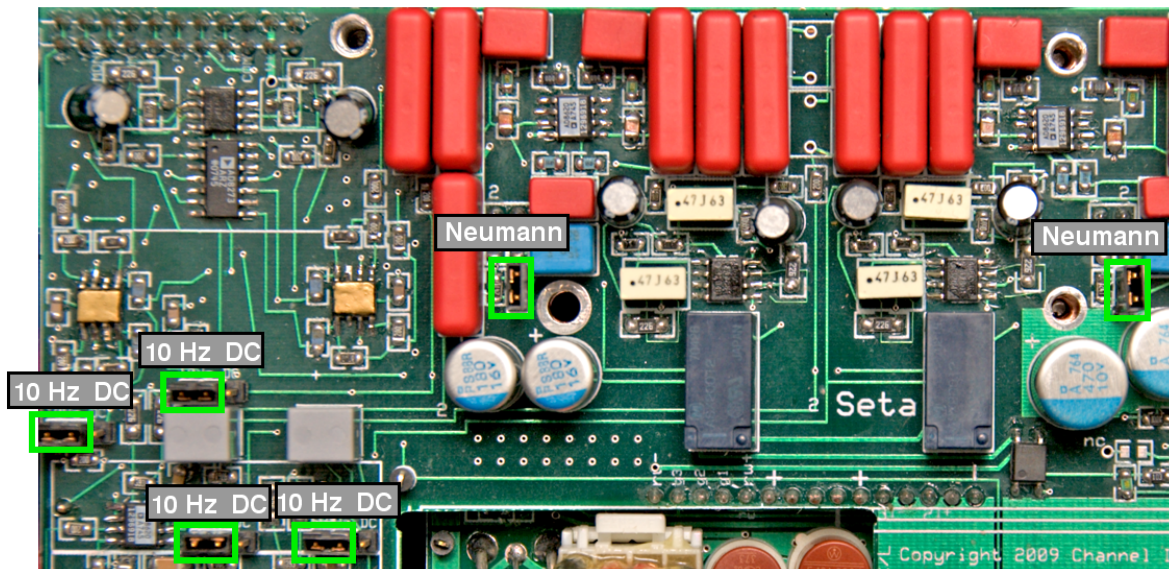
- One year parts and labor, limited warranty. In the unlikely event your Seta must be returned to Channel D for repair, contact Channel D in advance for a return material authorization number and shipping instructions.

In keeping with our continuing efforts to enhance and improve our products, we reserve the right to change specifications without notice.

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Appendix - Jumpers on optional Internal RIAA Module



Low Pass Filter

As configured from the factory, the low pass “rumble” filter is set at the 10 Hz position. To disable the filter (not recommended), move **all four** jumpers indicated into the DC position.

Neumann RIAA Curve Modification

The Seta is configured from the factory for the standard RIAA curve. The Neumann modification introduces an extra high frequency time constant to compensate for the putative roll-off of the mastering lathe cutting head. The Neumann setting can be enabled by removing the two jumpers indicated (or placing them in the “parking” position, with one pin open).