



Channel D Seta[®] Piccola Mk2

Balanced Direct-Coupled Ultra-Wide Bandwidth Ultra-Low Distortion Low Noise Battery Powered Precision Phono Preamp

Installation and Use Guide

Seta Piccola for Low Output / Low Impedance (MC) Phono Cartridges and High Output / High Impedance Phono Cartridges (MM)

AGM Rechargeable Battery Power Supply

Channel D Seta® Piccola Mk2 Installation and Use Guide

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Congratulations on your purchase of a Seta phonograph preamplifier! Your innovative Seta Piccola is a low noise, fully balanced design featuring an ultra-wide frequency bandwidth of more than 1 megahertz, unprecedented (with the exception of our flagship Seta Model L / Model H) 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 desiring 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.

Channel D Seta preamplifiers incorporate many design features contributing to their high performance:

- Ultra low impedance rechargeable battery energy storage reservoir and power supply; proprietary, exclusive charging and maintenance circuitry specially designed by Channel D and proven, refined and used exclusively in our phono preamplifiers for over 5 years
- Direct coupled circuitry and ultra-wide megahertz-class frequency bandwidth provides lifelike clarity, definition, resolution and imaging with vanishingly low distortion over the audio frequency range
- Carefully selected low noise external power supply, with additional filtering for ultra low noise
- Low impedance internal signal traces, permitting user installed cartridge load resistance as low as 1 ohm
- State of the art, premium quality milli-ohm ESR (equivalent series resistance) polymer dielectric and tantalum filter capacitors
- Ultra precision (0.1% tolerance) metal film low noise **1206** package and **MELF** (metal electrode leadless face) surface mount technology resistors are used throughout
- Metallized Polypropylene Film cartridge loading capacitors
- Ultra low distortion, low impedance output driver circuitry with more than 40 megahertz signal bandwidth preserves transparency in the output signal
- Optional RIAA Compensation Module with carefully hand matched precision components; separate signal chains for simultaneous RIAA and Flat signal outputs
- True single ended RIAA outputs obtained by differential summing of balanced signal inputs for the lowest noise and highest common mode rejection possible for a single ended signal conversion

Getting Started

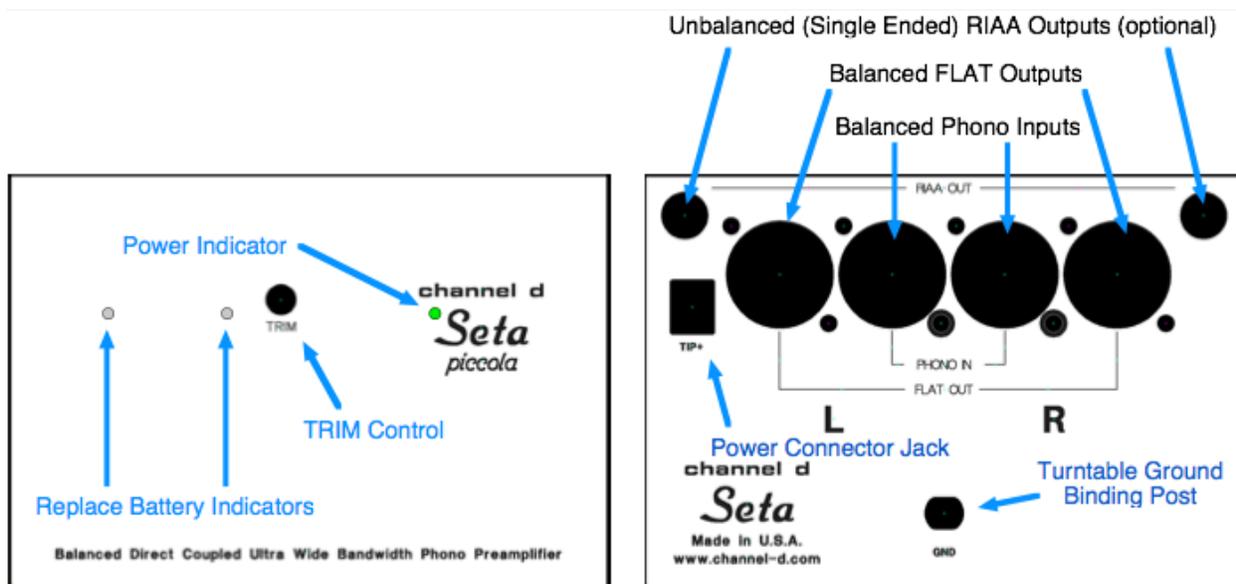
Please take the time to read this Installation and Use Guide, to familiarize yourself with the installation and operation of the Seta.

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.

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

- Seta Piccola Preamplifier, with Internal AGM Batteries Installed
- Installation and Use Guide (this document)
- RCA female to XLR male adapters (*Important note: pin 1 is open, unlike commercial RCA to XLR adapters*)
- External 5 Volt DC power supply, 110 / 220 Volt 2-Wire Input (Do **not** substitute with a different power supply)
- Precision Screwdriver
- Performance Measurement Graph for your phono stage's RIAA output (only with optional RIAA module)



Power Indicator

Illuminates when external power is applied and the internal battery is operating normally.

TRIM Control

The TRIM control is a unique, precision trim control feature used for adjusting the cartridge inter-channel balance. All phono cartridges have some degree of channel imbalance, and this feature allows correction at the source, by making a fine adjustment to the preamplifier input gain. The range of the control is approximately ± 6 dB, adjusted with a small slotted screwdriver (provided). The neutral position is with the slot in the brass actuator oriented vertically. Adjust the cartridge balance while playing a monophonic record (or a record with the music mixed to the center).

If using Pure Vinyl, observe the RIAA Balance indicator and adjust the trim control until the value is close to zero (within ± 0.2 dB is sufficient). This adjustment should only need to be performed once, and can be left alone, unless a new cartridge is later fitted to your turntable. The TRIM setting is independent of the preamplifier gain setting (except if the Piccola is configured for the BOOST gain setting; see section regarding BOOST gain).

Replace Battery Indicators

When either Replace Battery indicator illuminates with a continuous red color, and remains in that state for an hour or more, the rechargeable batteries should be replaced. For more information, see the Battery Life / Battery Replacement section of this Installation and Use Guide. Note: in the event that the batteries ever need replacement, it is normal for an indicator to illuminate for several hours after replacing the batteries (in the event the replacement batteries were not fully charged). Typical battery life is 3 to 6 years, up to 20 years.

Power Connector Jack

Connect the barrel connector of the supplied power adaptor to the power input jack.

Turntable Ground Binding Post

Securely connect the separate chassis ground wire from your turntable / tonearm (if so equipped) to the grounding lug on the rear panel of the Seta. If your turntable doesn't have a separate grounding connection, leave this terminal disconnected. Do not connect the turntable ground binding post terminal to anything except the ground connection from a turntable / tonearm.

Signal Connections

Signal connections can safely be made to the Seta while the power supply is connected and energized. *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.*

Inputs

The Balanced 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 (coaxial, single conductor plus shield) cable.

Custom manufactured (with Pin 1 open) RCA to XLR adapters are included for RCA signal cable connections. (Important: only use the supplied adapters for this purpose; all commercially manufactured adapters short Pin 1 to Pin 3 and will cause noise and hum.)

Note: The RCA to XLR adapters introduce no signal degradation, while still permitting a direct connection to the balanced inputs. This design provides lower noise and distortion than conventional single ended (unbalanced) phono preamplifiers. However, the highest performance will be obtained by using a balanced turntable interconnect terminated with XLR connectors. Contact Channel D for assistance in fitting your turntable with balanced interconnects.

Outputs

The low impedance, balanced FLAT XLR outputs are intended for connection to the **balanced** inputs of a professional audio interface / ADC, 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.)

The optional RIAA outputs are single ended (unbalanced). These are true single ended connections derived by summing the differential inputs with dedicated circuitry, rather than taking the short-cut of only using the "positive" signal leg of the balanced circuit, which would provide inferior performance.

Important note about the Balanced Outputs: If using an audio interface / ADC with single-ended, unbalanced inputs (not recommended - high quality ADCs usually provide balanced inputs), **do not** connect either XLR output pin to common/ground. This will result in high levels of distortion. Here, the correct wiring configuration would be to use XLR Pin 2 as signal, XLR Pin 3 open, and XLR Pin 1 as common/ground, if using a balanced to single ended adapter. *Note: this is not the way commercially available prewired RCA to XLR adapters are typically configured.*

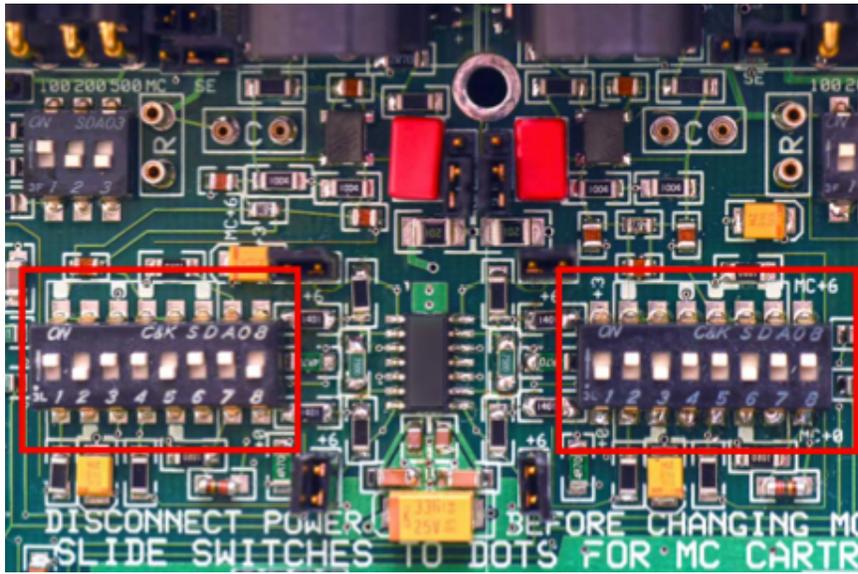
Internal Switch and Jumper Configuration

The Seta Piccola functions as either a moving coil or moving magnet phono preamplifier, configured accordingly using internal DIP switches. Each configuration provides adjustable gain and loading settings. Remove the four Philips head screws that fasten the the cover to access the configuration switches and jumpers.

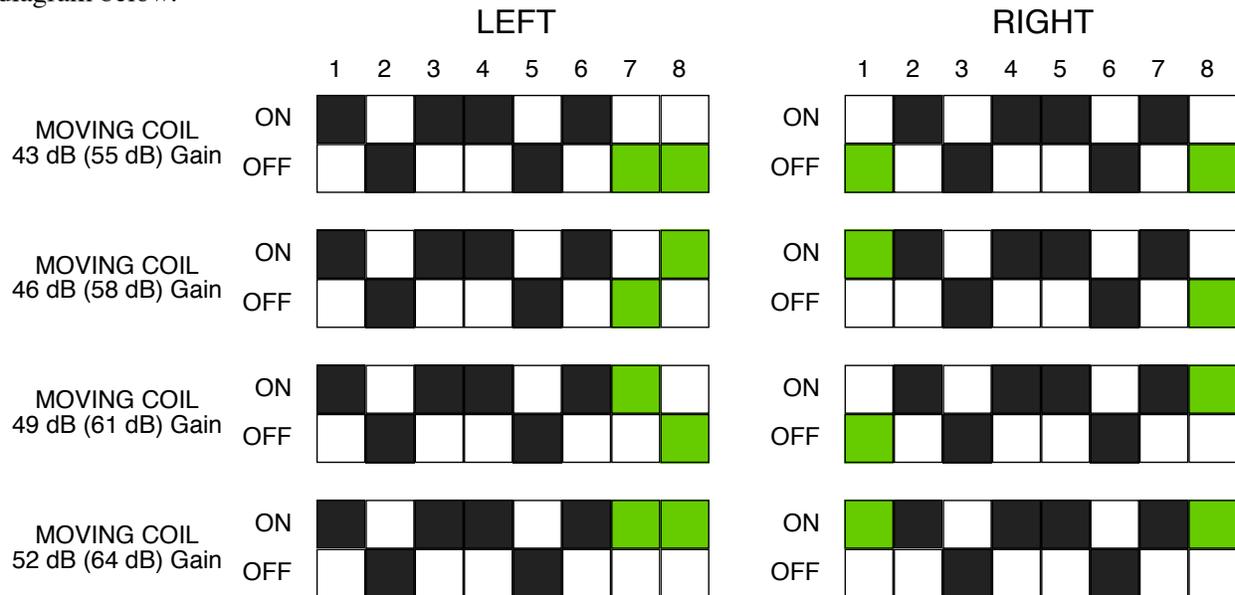
Very Important: Disconnect the power supply before making any configuration change (MM to MM or vice versa, or if changing the BOOST gain setting).

Note about "Flat" preamplifier gain settings: the RIAA compensated gain will be 12 dB higher than the physical gain of the preamplifier "flat" outputs. The additional gain comes from the RIAA compensation filter in Pure Vinyl or the optional RIAA hardware module.

Moving Coil / Moving Magnet Configuration, Gain and Load Settings

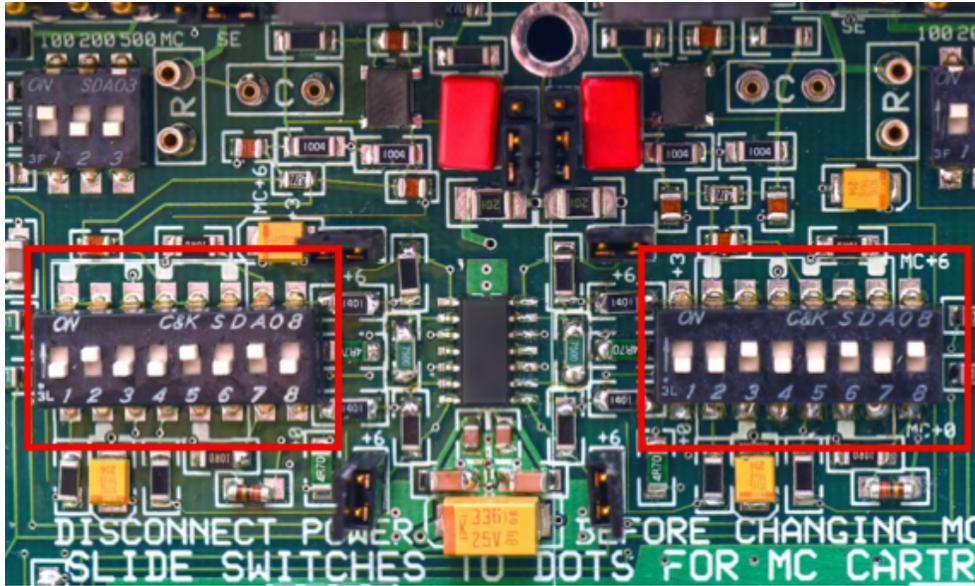


Moving Coil Configuration: Slide the switches *toward* the white dots on the circuit board, as shown in above photograph. The Left (as facing circuit board) DIP switch should be set so positions 1, 3, 4 and 6 are on (and 2 and 5 are off); the Right so that positions 2, 4, 5 and 7 are on (and 3 and 6 are off). See diagram below.



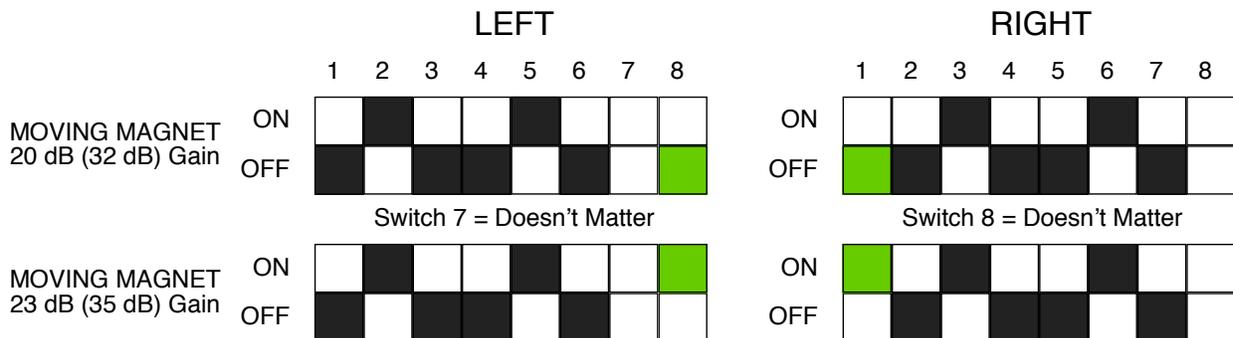
Moving Coil Gain: The gain is adjustable to 43, 46, 49 and 52 dB. Switch 8 (Left) and 1 (Right) boosts the gain by 0 or 3 dB (green, above). Switch 7 (Left) and 8 (Right) boosts the gain by 0 or 6 dB (green).

Flat / RIAA Gain	Left DIP switch	Right DIP switch
43 dB / 55 dB	7 & 8 Off	1 & 8 Off
46 dB / 58 dB	7 Off; 8 On	1 On; 8 Off
49 dB / 61 dB	7 On; 8 Off	1 Off; 8 On
52 dB / 64 dB	7 On; 8 On	1 On; 8 On



Moving Magnet Configuration: Slide the switches *away from* the dots on the circuit board, as shown in above photograph.

The Left (as facing circuit board) DIP switches should be set so positions 1, 3, 4 and 6 are off (and 2 and 5 are on); the Right switches so that positions 2, 4, 5 and 7 are off (and 3 and 6 are on). See diagram below.

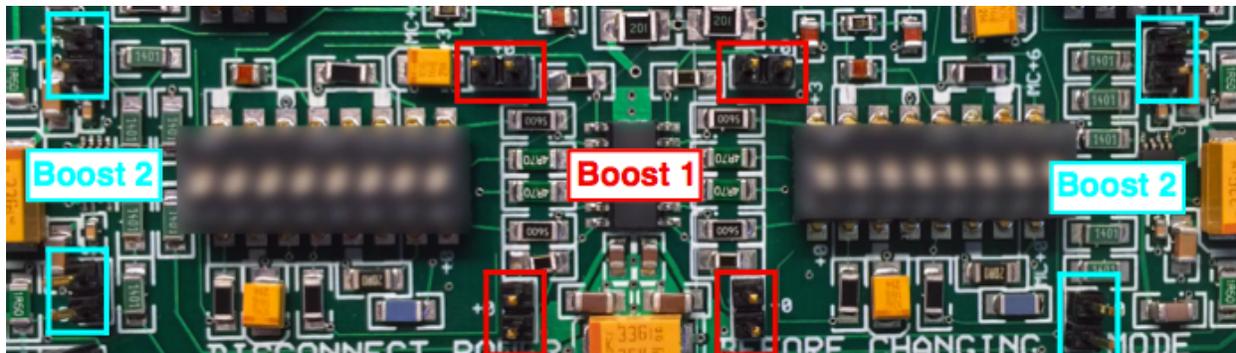


Moving Magnet Gain: The gain is adjustable to 20 or 23 dB. Switch 8 (Left) and 1 (Right) boosts the gain by 0 or 3 dB (green, above). Switch 7 (Left) and 8 (Right) has no effect in Moving Magnet mode.

Flat / RIAA Gain	Left DIP switch	Right DIP switch
20 dB / 32 dB	8 Off	1 Off
23 dB / 35 dB	8 On	1 On

“BOOST 1” Gain Setting

An additional gain of 6 dB can be realized by removing all four jumpers indicated in the illustration below. The jumpers can be removed entirely or placed in a “parking” position. To minimize noise pickup, “park” the jumpers on the pin which is farthest from the center of the board, for each pair of pins. *The factory setting is with the jumpers bridged.*



The BOOST 1 setting is intended for exceptional cartridges that have extremely low output - most notably, ultra low impedance moving coil cartridges with ultra low (0.05 millivolts) output. For typical operation, the jumpers should be kept in the factory supplied bridged position. *Note: the TRIM setting depends on whether or not BOOST 1 mode is used. The TRIM control range will approximately double in BOOST 1 mode. If you change the BOOST 1 setting after adjusting TRIM, the TRIM will need to be readjusted accordingly.*

“BOOST 2” Gain Setting

An additional gain of 6 dB can be realized by removing all four jumpers indicated in the illustration above. The jumpers can be removed entirely or placed in a “parking” position. *The factory setting is with the jumpers bridged.* The BOOST 2 setting does not affect the TRIM control setting.

Gain Adjustment Advice (Recording to Digital)

The *Pure Vinyl User Guide* includes complete information on setting the proper preamplifier gain for digital transfers when using the RIAA compensation curve in Pure Vinyl. With Pure Vinyl’s RIAA compensation curve, the optimum signal gain becomes much less critical than if the transfer was performed with a conventional (analog RIAA) preamplifier.

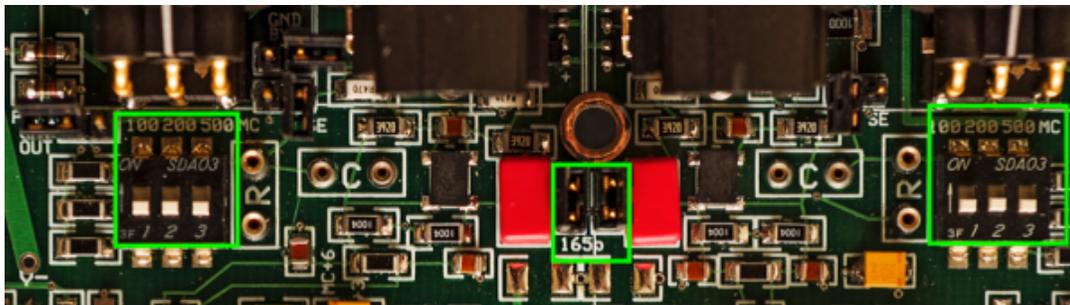
Briefly, you should aim for “Flat” signal level peaks in Pure Vinyl between **-12 and -6 dBFS**, for the **music that you usually play**. Provided that peaks usually reach these levels, it’s not necessary to have to adjust the gain setting frequently, or at all. It’s prudent to allow at least 4 to 6 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.”)

If your audio interface / ADC 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**.)

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 output of the optional RIAA hardware compensation module has an overall gain 12 dB higher than the settings listed.

Cartridge Loading: Five standard load values are available: four for moving-coil and one for moving-magnet (plus intermediate parallel combinations for moving coil). *Other values can be obtained by inserting resistors and capacitors (with 5 mm lead spacing) into the provided circuit board R, C sockets.*



Important: If using a moving magnet cartridge, be sure to place all of the MC Load DIP switches in the Off position. The MC load values only should be used with the MC switch mode configuration.

MC Load (Balanced)	Left LOAD DIP switch	Right LOAD DIP switch
100 Ohms	1 On	1 On
200 Ohms	2 On	2 On
500 Ohms	3 On	3 On
2000 Ohms	All Off	All Off
140 Ohms	2, 3 On	2, 3 On
70 Ohms	1, 2 On	1, 2 On
60 Ohms	All On	All On

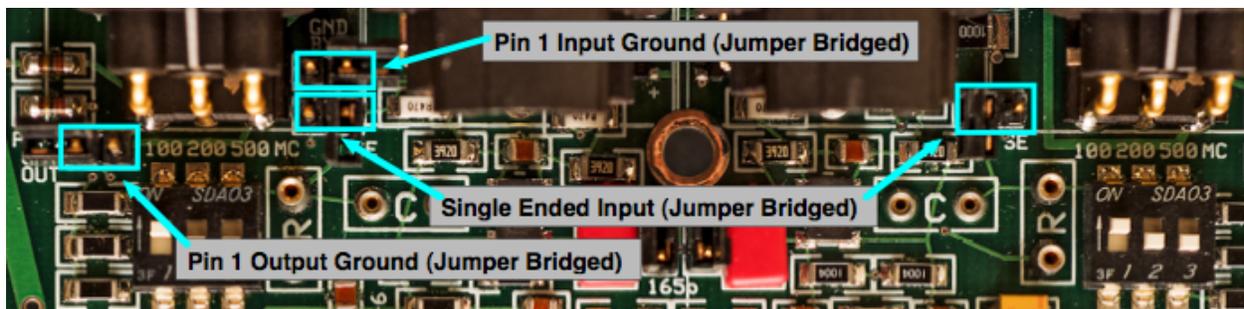
MM Load (Bal. or S.E.)	Center Left Jumper	Center Right Jumper
47k Ohms and 150 pF	Bridged	Bridged
47k Ohms and 125 pF	Open	Open

Capacitive Loading with Optional Capacitive Loading Kit for Moving Magnet (Nominal Values)

Capacitor	150 pf Jumper Open	150 pf Jumper Bridged
33 pF	158 pF	191 pF
47 pF	172 pF	205 pF
68 pF	193 pF	226 pF
100 pF	225 pF	258 pF
150 pF	275 pF	308 pF
220 pF	345 pF	378 pF
330 pF	455 pF	488 pF
None	125 pF	150 pF

Single Ended / Balanced 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).



The photo above illustrates the jumpers used for true 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). ***The factory setting is jumpers open (balanced).*** *This is usually the optimum setting even if not using balanced signal cables.*

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 adapters. 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 0.8 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 2 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 (about 40 pF per foot) 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 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 balanced input. 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 connection. 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. If these wiring issues aren't corrected, an alternative would be to bridge the single ended input jumpers on the Seta.

Pin 1 Input Ground Bypass Jumper

The input ground bypass jumper bypasses (in the bridging position) the 100 ohm local input ground isolation resistors for the XLR Pin 1 inputs directly to common. This may provide more, or less, "hum" immunity, depending on your other equipment. *The factory setting is jumper bridged.*

Pin 1 Output Ground Jumper

The Pin 1 output bypasses (in the bridging position) the 100 ohm output ground isolation resistor for the XLR Pin 1 output directly to common. This may provide more, or less, "hum" immunity, depending on your other equipment. *The factory setting is jumper bridged.*

Neumann RIAA Curve Modification (RIAA module)

The Seta is configured from the factory for the standard RIAA curve. The Neumann modification introduces an additional 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 on the RIAA module (or placing them in the "parking" position, with one pin open). *The factory setting is jumper bridged.*

Rechargeable Battery Information

The AGM rechargeable batteries used in the Seta are ideal for audio applications. Their ultra low internal impedance (on the order of micro-ohms) insures that adequate power reserves and resilient supply rails are always available for any circuit demands. In fact, the batteries are capable of supplying over 50 amperes continuously for several seconds - something not possible with utility power connections or even huge banks of filter capacitors. This permits using relatively minimal final supply filtering and finessing using premium (relatively expensive, high performance) polymer dielectric tantalum and polymer dielectric aluminum capacitors.

Lithium ion batteries are an alternative rechargeable battery technology which can exhibit desirable low impedance and high current output. However due to safety concerns (cell over-discharge and reversal leading to fire / explosion) battery charging and maintenance requirements must be strictly observed, and implemented at the individual cell level. This requires complex circuitry, best realized via third party microprocessor application specific integrated circuits. However, such solutions are not geared toward the overriding requirements for low noise for audio.

The Seta's unique battery charging and maintenance circuit is proprietary to our line of preamplifiers and is based on extensive academic and industrial experience in electrochemistry and AGM battery research and development. Off the shelf or commercially designed battery maintenance circuits aren't used because they are simply not designed with the ultra low noise requirements of preamplifiers in mind. The Channel D Seta design is fully analog and ultra low noise.

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. 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. Elevated temperatures will diminish battery life or cause battery failure.

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. Battery management is automatic.

Battery Life / Battery Replacement

Battery life will be significantly extended by keeping the Seta Piccola continuously powered. The idle power consumption of the Seta Piccola and power adapter combined is only 3 watts. Typical battery life is 3 to 6 years; up to 20 years is possible. Environmental operating temperatures above 80° F will degrade the batteries and must be avoided! Do not site the Seta in a location where it may be exposed to a source of heat or direct sunlight.

The batteries are user replaceable. When either of the Replace Battery indicators illuminates with a continuous red color, and remains in that state for more than an hour, both of the rechargeable batteries require replacement. The battery is a widely available type commonly used for security alarm systems, and also available from the industrial supply company McMaster-Carr (mcmaster.com). The part number is 7448K57 (about \$25 each plus shipping, at the time of this writing). Important: the batteries should only be ordered when needed, rather than procuring and storing replacements ahead of time, and only replaced in pairs. The factory direct battery replacement is Power-Sonic part number PS-445 (and also as supplied by McMaster-Carr with the above part number). This battery is rated 4 volt, 4.5 ampere hours (AH) with dimensions (millimeters) 48 L x 53 W x 94 H and quick-disconnect 6.35 mm (0.25") size tab terminals. **Power-Sonic website:** http://www.power-sonic.com/ps_psg_series.php

Specifications - Seta Piccola for Moving Coil and Moving Magnet Cartridges

- **Voltage Gain, Phono Outputs:** 32, 35, 38, 41, 44, 47 dB (moving magnet) 55, 58, 61, 64, 67, 70, 73, 76 dB (moving coil); **Voltage Gain (Flat Outputs):** 20, 23, 26, 29, 32, 35 dB (moving magnet) 43, 46, 49, 52, 55, 58, 61, 64 dB (moving coil)
- **Input Load Resistance (balanced):** maximum 2 k Ω (moving coil, balanced); maximum 47 k Ω (moving magnet); user adjustable
- **Input Load Capacitance (balanced):** 125 pF; 150 pF with load jumper bridged; user adjustable with optional plug-in components
- **Frequency Response (-3 dB):** DC to greater than 1 MHz, at any gain setting, moving coil or moving magnet configuration
- **Harmonic Distortion:** less than 0.0003% from 20 Hz to 20 kHz, at any gain setting, moving coil or moving magnet configuration
- **Intermodulation Distortion (19 kHz / 20 kHz 1:1):** less than 0.003% at any gain setting, moving coil or moving magnet configuration
- **Circuit Topology:** Fully balanced, direct-coupled (no capacitors in the signal path)
- **Inputs:** Neutrik, Premium Gold Pin XLR Balanced
- **Outputs:** Neutrik, Premium Gold Pin XLR Balanced
- **Output Impedance:** 22 ohms
- **Output Drive Capability:** Balanced cable, up to 33 feet (10 meters), 600 ohms or greater load impedance

Specifications - RIAA compensation module

- **Harmonic Distortion:** less than 0.003% from 20 Hz to 20 kHz at any gain setting, 1 volt output, moving coil or moving magnet configuration
- **Intermodulation Distortion (19 kHz / 20 kHz 1:1):** less than 0.001% at any gain setting, 1 volt output, moving coil or moving magnet configuration
- **Output Impedance:** 22 ohms
- **RIAA Accuracy:** ± 0.07 dB or better, 20 Hz to 20 kHz
- **RIAA Channel Match:** ± 0.02 dB or better, 20 Hz to 20 kHz

General

- **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 3 watts idle / maintenance AGM float; less than 5 watts while operating

Dimensions

- 5" x 3.7" x 5.5" (W x H x D)
- Weight 4.5 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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