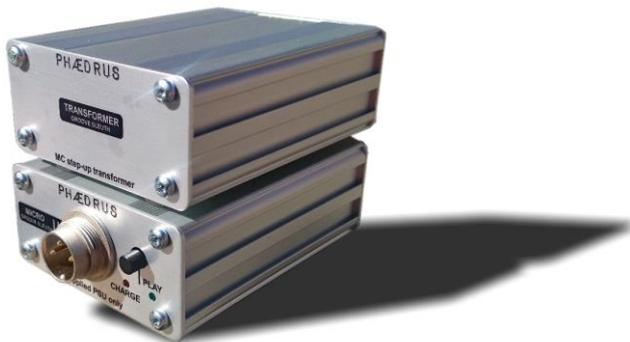


User Manual for

GROOVE SLEUTH MICRO NON-EQUALISING PHONO PREAMPLIFIER

(including **PHLUX-Bridge** version &
Groove Sleuth TRANSFORMER)



Version 2.3 (September 2020 – Groove Sleuth MICRO)



Chapter 1 - Introduction

Phædrus Audio's **Groove Sleuth MICRO** preamplifier has two roles. It may be used in conjunction with the Pspatial Audio's **Stereo Lab** Software App¹ which runs under OS X on the Apple Mac. Or it may be used as a base-station for the Phædrus Audio **PHLUX** active phono cartridges. And it can act as both.

With Stereo Lab

Stereo Lab has a wide feature set but it devotes a large part of its functionality to software digital signal processing analogue records. See <http://pspatialaudio.com/index.htm>

For **Stereo Lab** to process needle-drops¹, it needs recorded files of the "raw" signal, direct from the pickup, unfettered by analogue equalisation. And that is where the **Groove Sleuth MICRO** preamplifier comes in. It is a high-quality phono preamplifier but *without* equalisation, so that the signal fed to the computer is the closest version of the signal direct from the phono cartridge itself, but at a suitable amplitude for digitisation. See Chapter 4.

The **Groove Sleuth MICRO** preamplifier may be used with Phædrus Audio's **PHLUX-II** active cartridge range. This is a time of order option (SKU: **GS-MICRO-PHLUX OPT**).

PHLUX-Bridge version

The second role for **Groove Sleuth MICRO** is as a base station for the **PHLUX-II** active phono cartridge. The **Groove Sleuth MICRO PHLUX-Bridge version** allows the **PHLUX-II** active phono cartridge to be used in all standard hi-fi applications.

The **Groove Sleuth MICRO PHLUX-Bridge version** is a low-cost version of the **Groove Sleuth MICRO** and *has no line level output*. See Chapter 5.

Chapter 2 – Safety

General

Before using any piece of equipment manufactured by Phædrus Audio, be sure carefully to read the applicable items of these operating instructions and the safety suggestions. Keep them for future reference. Follow the warnings indicated in these operating instructions.

¹ A *needle-drop* means a version of a music album that has been transferred from a vinyl record to a digital audio medium.



THE USER SHOULD NOT ATTEMPT TO SERVICE THE UNIT. ALL SERVICING SHOULD BE REFERRED TO QUALIFIED SERVICE PERSONNEL OR FACTORY ONLY. See Chapter 10 for battery replacement.

Phædrus Audio products should NEVER be connected to the external power supply or in any other way energised when the case is opened and/or the circuit boards are accessible.

General Safety Instructions

- Do not operate this equipment near any source of water or in excessively moist environments.
- Keep this equipment away from babies, children and pets.
- Do not let objects do not fall, or liquids be spilled, onto the enclosure.
- Situate this equipment away from heat sources or other equipment that produce heat.
- Ensure this equipment has adequate ventilation. Improper ventilation will cause overheating, and can damage the equipment.
- When cleaning this equipment, remove all connections to the unit; including power and gently wipe with a clean lint-free cloth; if necessary, gently moistened with lukewarm or distilled water. Use a dry lint-free cloth to remove any remaining moisture. NEVER use aerosol sprays, solvents, or abrasives on this equipment.

This equipment should be serviced by qualified service personnel or returned to Phædrus Audio when: an object (or objects) have fallen into the enclosure; or liquid has fallen into, or been spilled into the unit; or the unit has been exposed to rain or high humidity; or the unit does not operate normally or exhibits a marked change in performance; or the unit has been dropped, or the enclosure has been damaged



Chapter 3 – Groove Sleuth MICRO preamplifier

The signal from a phonograph pickup is too small to apply to the line input of most sound-cards or audio interfaces. What is required is a dedicated phono preamplifier to bring the small signal from the cartridge up to a healthy level for input to the computer sound-card.

The **Groove Sleuth MICRO** preamplifier is suitable for high-output moving-coil and moving-magnet cartridges. It is also suitable for Phaedrus Audio **PHLUX (PHLUX II)** active phono cartridges. See Chapter 5 for more information about **PHLUX** active cartridges.)

For support for low-output moving-coil cartridges, use the Phaedrus Audio **TRANSFORMER**, see Chapter 6 and Appendix 4

The Groove Sleuth MICRO presents the cartridge with the correct impedance at the "TURNTABLE" RCA phonos and amplifies the signal. The output is presented on the 3.5mm stereo mini-jack on the rear of the Groove Sleuth MICRO unit.

All Groove Sleuth preamplifiers feature the **iLOOP** - a wide-bandwidth, low-noise, buffered signal loop-through.

Power supply

The **Groove Sleuth MICRO** unit is supplied with a universal, external mains power-supply with detachable mains-plug heads and connects to the **Groove Sleuth MICRO** via a high-quality screw-lock connector.

The **Groove Sleuth MICRO** preamplifier incorporates the very low-noise, internal battery supply. This means the preamplifier can be charged from a conventional, international-style power supply but be switched to battery supply during needle-drops to ensure the very best possible noise and aliasing performance. This delivers first-rate quality at a very reasonable price.



The amplification in the **Groove Sleuth MICRO** is accomplished with wideband, low-noise, class-A, discrete circuitry and circuit noise, distortion and frequency-response are exemplary. This level of performance is required to complement dual and quad-rate, high-resolution needle-drop recordings and for needle-drops of quadraphonic CD-4 (*Quadradisc*) carrier recordings which may be decoded in **Stereo Lab**.



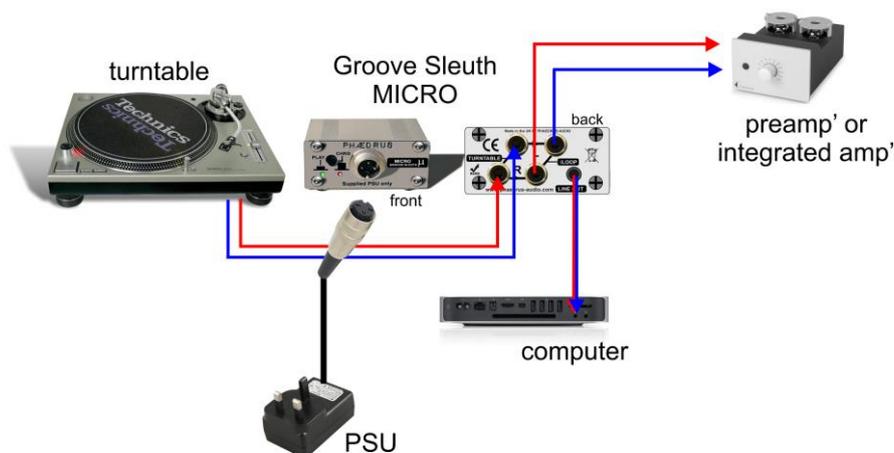
The selection of the battery supply may be accomplished using the front panel CHARGE/PLAY switch.

Alternatively, for the "ultimate" isolation from the mains electricity, the PSU may simply be unplugged, in which case the battery supply automatically engages (but this is NOT shown on the front panel indicator lights which will extinguish to keep battery life to a maximum). A remote-controlled mains socket makes for a slick solution.

The **Groove Sleuth MICRO** has well over 100 hours' operational charge, but we recommend battery play be limited to approximately 12 hours. A full charge cycle is about 4 hours (from fully discharged cell). The unit may be kept in charge mode when listening with only a minute loss of quality.

Power consumption is very low (less than 0.2W), so leaving the unit powered is not profligate and is compatible with European Eco-Consumption directives

Chapter 4 - Connecting the Groove Sleuth MICRO to your turntable and sound card



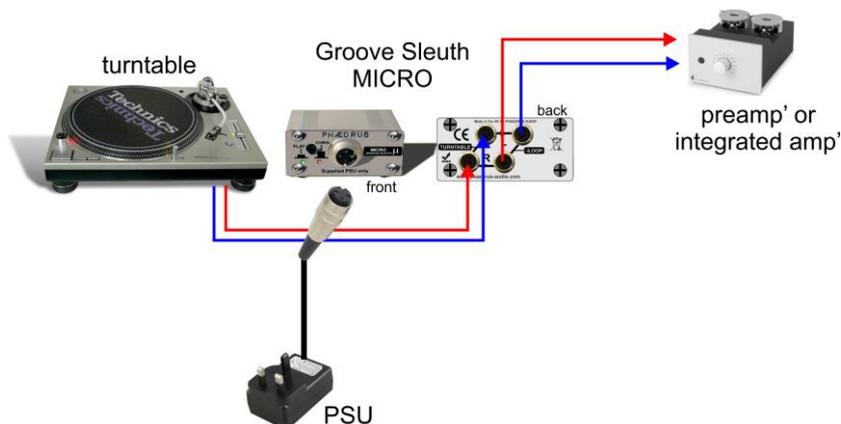
The **Groove Sleuth Micro** is connected to your turntable and the line-level inputs of your sound-card as illustrated.

Levels should be set on the interface in the normal way and you will find that the **Groove Sleuth Micro** delivers audio at a sufficiently high level for all commercial sound-cards, both internal and external.

Some turntables have a thin “ground” wire which connects to the metal components of the tonearm and to the plate which carries the main turntable bearing. If this wire is not earthed, the record-deck signal will often be noisy and “buzzy”. Appendix 2 offers suggestions as to how best to connect the turntable earth wire (if present). The best choice depends on the complexity and choice of the related equipment.

Chapter 5 – Groove Sleuth MICRO PHLUX-Bridge

The alternate role for **Groove Sleuth MICRO** is as a base-station to the **PHLUX-II** active phono cartridge. Called the **Groove Sleuth MICRO PHLUX-Bridge**, the unit allows the **PHLUX-II** active phono cartridge to be used in all standard hi-fi applications.



Connections are made as illustrated above.

The **Groove Sleuth MICRO PHLUX-Bridge** version retains all the advantages of the MICRO (rechargeable battery PSU etc.) but it has no line-level output. It may not be used with computer sound-cards for needle-drop recordings.

Some turntables have a thin “ground” wire which connects to the metal components of the tonearm and to the plate which carries the main turntable bearing. If this wire is not earthed, the record-deck signal will often be noisy and “buzzy”. Appendix 2 offers suggestions as to how best to connect the turntable earth wire (if present). The best choice depends on the complexity and choice of the related equipment.

Chapter 6 – Groove Sleuth TRANSFORMER



Housed in the same diminutive chassis as the **Groove Sleuth MICRO** preamplifier, the **Groove Sleuth TRANSFORMER** includes a pair of step-up transformers to extend the range of the **Groove Sleuth MICRO**, (or any other standard MM preamplifier) to include all moving-coil and moving-iron cartridges.

By incorporating a range of transformers (fitted as a time-of-order option), the **Groove Sleuth TRANSFORMER** can adapt even the fussiest cartridges, including very low output devices and "outlier" high-output moving-coils,

like the Denon DL-110 which rather "under-load" standard MM input stages without a transformer. See table below.

LEVEL	TRANSFORMER 1	TRANSFORMER 2	TRANSFORMER 3	GROOVE SLEUTH MICRO	Input Z
0.2 to 0.5mV	•			•	100Ω
0.4 to 1.0mV		•		•	500Ω
0.8 to 2.0mV			•	•	1500Ω
2.0 to 6.5mV				•	47kΩ

All the very high-quality transformers in the **Groove Sleuth TRANSFORMER** have cores of a high permeability, nickel-iron alloy and incorporate a Faraday shield between primary and secondary to keep out radio-frequency garbage. The transformers are fitted in tight-fitting mu-metal cans and are thus magnetically screened. The large primary inductance of the transformers ensures an extended low-frequency response (-3dB at <3Hz with a 10Ω source).

TRANSFORMER 1 has a step-up ratio sufficient for the lowest output, moving-coil cartridges.

TRANSFORMER 2 covers mid-output MC and MI cartridges which prefer a slightly higher load.

TRANSFORMER 3 is mostly intended for "high-output" moving-coil cartridges which could do with a little more level into a standard MM phono input.

See **Appendix 4** for a (near complete) range of contemporary cartridges and the best choice of Groove Sleuth TRANSFORMER.

Groove Sleuth TRANSFORMER (1)

Size: 80 x 64 x 32mm (aluminium chassis)

Power: Passive, no PSU required

Sensitivity: 400μV RMS (-66dBu) nominal @ 5cm/s

Gain (to computer output with G.S. MICRO): 52dB (× 400)

Gain (to iLOOP output): 22dB

Frequency response: <10Hz to 22kHz (-1dB, Bessel response at HF)

Distortion: 0.1% THD nominal output level

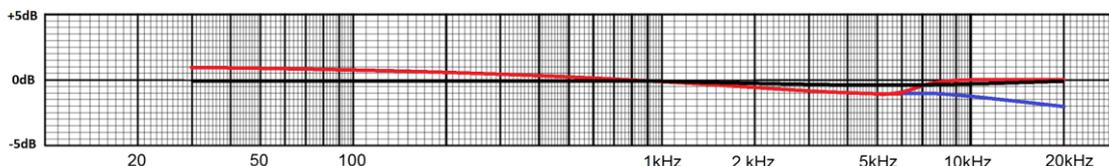
Equivalent input noise (EIN): 50nV (-144dBu), A-weighted in 20kHz. 10Ω source



Phaedrus Audio reserves the right to change specification without notice.

Chapter 7 – PHLUX with Stereo Lab

The **PHLUX-II** cartridge has a very level frequency response. Variation is confined to ± 1 dB. It is, nevertheless possible to correct this very slight response anomaly in **Stereo Lab** software. The combination of **PHLUX-II**, **Groove Sleuth MICRO** and **Stereo Lab** offers a solution with which to extract the information captured on the original record with forensic accuracy.



PHLUX-II Lateral frequency response (JVC TRS-1007): blue is inner radius

Black trace is corrected response at all recorded diameters using Stereo Lab (Ver. 3.1) PHLUX-II & wavelength-loss correction

Chapter 8 - Specifications

Size: 80 x 64 x 32mm (aluminium chassis)

Power: 12V DC, Universal plug top PSU included with detachable mains connection heads

Power consumption: <0.2W; compatible with European Eco-Consumption directives. The unit is intended to remain energised all the time.

Sensitivity: 5mV RMS (-44dBu) nominal @ 5cm/s: or PHLUX-II active cartridge

Gain (to computer output): 30dB [not available in PHLUX-Bridge version]

Gain (to iLOOP output): 0dB

Frequency response: 2Hz to 300kHz (-3dB)

Distortion: 0.01% THD nominal output level

Equivalent input noise (EIN): 700nV (-120dBu), A-weighted in 20kHz. Input shorted

Max input: 70mV RMS (23dB above nominal level)

Phædrus Audio reserves the right to change specifications without notice.

Chapter 9 - Warranty and service

If you experience a problem with a Phædrus Audio product, contact support@phaedrus-audio.com. We will diagnose the problem remotely and advise you of the warranty status. If a repair or replacement is required, we will issue a Return Merchandise Authorization (RMA) number and tell you where to send the unit to be repaired. You **MUST** have an RMA number before you return the equipment to Phædrus Audio's support service.

We will also issue instructions as to how the equipment must be marked to avoid unnecessary customs charges. Where these instructions are ignored, Phædrus Audio will re-charge these taxes or refuse to accept delivery of the goods.

Phædrus Audio will not accept responsibility for loss or damage in shipping or for equipment returned without valid paperwork and/or a valid RMA number. Remember,

warranty is void if product serial numbers have been removed or altered, or if the product has been damaged by abuse, accident or unauthorized modification and/or repair (see Phædrus Audio Limited Warranty for details). There are no user serviceable parts inside.

PLEASE RETAIN YOUR SALES RECEIPT. IT IS YOUR PROOF OF PURCHASE COVERING YOUR LIMITED WARRANTY. LIMITED WARRANTY IS VOID WITHOUT SUCH PROOF OF PURCHASE.

Phædrus Audio's Limited Warranty

Warranty service conditions are subject to change without notice. For the latest warranty terms and conditions and additional information regarding Phædrus Audio limited warranty, please see complete details online at www.phaedrus-audio.com.

Chapter 10 - Battery and battery replacement

The internal battery in the **Groove Sleuth MICRO** is an 8.7V NiMH (nickel-metal hydride) E-block type battery. It may be replaced with a battery of a similar type and specification. The position of the battery in the unit is illustrated in the blue block in the illustration opposite.

NiMH batteries are not tolerant to being overcharged which can reduce their life. The **Groove Sleuth MICRO** preamplifier uses an intelligent NiMH charger circuit such that the external PSU provides an initial fast charge but applies charging current reductions as the charge progresses. This scheme continues until the battery is fully charged. This method of charging is known as the *differential charge* method and ensures the best life from the internal battery.

However, no battery has an infinite life. NiMH types can be expected to give about 3 years' service. So, a battery replacement will probably be necessary in the service lifetime of the **Groove Sleuth MICRO** preamplifier unit.

Battery replacement

In the following description, the *rear* of the **Groove Sleuth MICRO** unit is taken to be the panel with the four RCA phono connectors.

Remove all signal and power connections to the unit and undo the four panel screws at each corner of both panels of the unit. When these are removed, the whole assembly may be withdrawn rearwards from the case. Feed the front panel carefully through the enclosure as the PCB is withdrawn. Note the internal runner on which the assembly is mounted. It's second from the bottom (see illustration).

Appendices

Appendix 1 - Model Codes

The model/order codes for **Groove Sleuth MICRO** preamplifier are:

GS-MICRO - Groove Sleuth MICRO preamplifier

GS-MICRO-PHLUX OPT – Time of order option for PHLUX-II support*

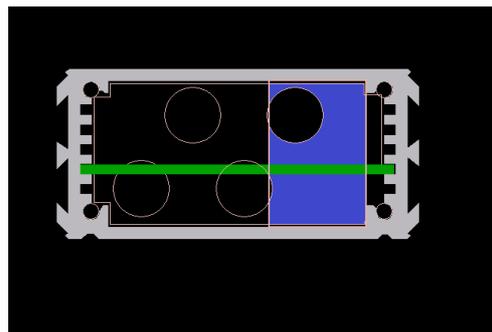
GS-MICRO-PHLUX-Bridge - PHLUX Bridge version of Groove Sleuth MICRO (no line-level output)

GS-TRANSFORMER 1 - Moving-coil step-up transformer (Input range 200 μ V to 500 μ V, 100 Ω load)

GS-TRANSFORMER 2 - Moving-coil step-up transformer (Input range 400 μ V to 1mV, 500 Ω load)

GS-TRANSFORMER 3 - Moving-coil step-up transformer (Input range 800 μ V to 2mV, 1.5k Ω load)

* Only free of charge at time of order. No retro-fit. Contact sales@phaedrus-audio.com for more details.



The battery is held in place by the PCB and the wall of the enclosure. It will free itself as the assembly is withdrawn from the enclosure. The battery is connected by a terminal clip connector. Remove this and replace the battery with a new NiMH type (8.7V 200mA/H capacity). Be sure to fit the connector to the battery in the correct sense. Do not experiment to do this, **the circuitry is not protected against the battery being connected in the wrong polarity.**

Once the battery has been changed, the assembly and new battery may be slid back into the housing on the same set of internal runners in the case. Fit the front panel first but don't tighten the screws so that the panel's position can "float" a little.

Be careful not to force the assembly so that the rear of the PCB sits flush with the back of the housing. If there is some resistance of this kind, it is almost certainly because one or both LEDs or the switch is fouling the front panel. If the assembly is slid into the correct slot, gentle wiggling should help the LEDs find the correct register with the holes in the faceplate.

Refit the four screws in the rear panel and tighten the screws retaining the front panel and rewire the unit.

Appendix 2 – Turntable ground-wire



Some turntables have a thin “ground” wire alongside the phono cables. This wire normally connects to the metal components of the tonearm and to the plate which carries the main turntable bearing.

A ground connection to these components is advantageous for a whole range of reasons. Not only does it help with electrostatic screening from interfering AC radiation, it also helps control static electricity build-up on the plastic disc as it plays. If this wire is not earthed (grounded), the record-deck signal will often be noisy and “buzzy”.

Here is how to connect the turntable earth (ground) wire - if present. The best choice depends on the complexity and choice of the related equipment.

- If the installation includes a preamplifier (or integrated amplifier) for monitoring/ listening as illustrated in Chapter 4 and 5, there may well be a suitable connection for the ground wire on the pre/amplifier itself, perhaps even a dedicated earth (ground) terminal. Use this.
- If the computer is stand-alone, the turntable ground wire may be connected to the 0V reference of the **Groove Sleuth MICRO**. This is NOT an earth connection but it will tie the turntable ground to signal ground. A dedicated cable “tail” is provided as part of the power-supply connector to the preamplifier as illustrated above. This connects directly to the 0V signal reference point. The 0V reference cable is held to the main cable by heat-shrink sleeving. If you need to use this connection, ease the “tail” from the sleeving and connect this to the turntable ground wire.

Appendix 3 - Declaration of Conformity

The Manufacturer of the Products covered by this Declaration is

Phædrus Audio
Maidstone
Kent
UK

The directives covered by this declaration are:

2014/30/EU Electromagnetic Compatibility directive
2014/35/EU Low Voltage Equipment directive

The products covered by this declaration are:

Groove Sleuth MICRO non-equalising phono preamplifier

The basis on which conformity is being declared: The manufacturer hereby declares that the products identified above comply with the protection requirements of the EMC directive and with the principal elements of the safety objectives of the Low Voltage Equipment directive, and that the following standards have been applied:

IEC INTERNATIONAL STANDARD 60065: 2005. - Audio, video and similar electronic apparatus – Safety requirements

The technical documentation required to demonstrate that the products meet the requirements of the Low Voltage Equipment directive has been compiled and is available for inspection by the relevant enforcement authorities. The CE mark was first applied in 2020.

Signed:

Richard Brice, Technical Director Date: May 2020



Disposal - meaning of the dustbin symbol

Protect our environment: do not dispose of electrical equipment in domestic waste. Please return any electrical equipment that you will no longer use to the collection points provided for their disposal. This helps the potential effects of incorrect disposal on the environment and human health. This will contribute to

the recycling and reutilisation of electrical and electronic equipment.

Information where the equipment can be disposed of can be obtained from your local authority.

Batteries/ rechargeable batteries must not be disposed of in domestic waste.

Appendix 4 - Recommended hardware and moving-coil cartridge combinations

The cartridge listed are recommended with the following hardware solutions based on output levels and load impedance requirements. Cartridges appear more than once where they work equally well with different hardware.

Groove Sleuth MICRO with TRANSFORMER 1

Audio Technica AT-ART9, AT-33Sa, AT-OC9XSL, AT-OC9XSH, AT-OC9XML, AT-OC9XEN, AT-OC9XEB, AT-33PTG/II, AT-33EV, AT-ART1000

Benz Micro ACE S Low (Red Body), MC Gold

Clearaudio Talisman V2 Gold, Essence

Denon DL103, DL103 R EM

Dynavector DV XX2 MKII, DV-20 X2 (low-output), DR XV1-S, DRT XV-1T, Karat 17DX, Te Kaitora Rua

Gold Note Tuscany Gold

Goldring Ethos, Elite

Koetsu Urushi Gold, Urushi Sky Gold, Urushi Tsugaru, Urushi Black, Red T, Black K, Azure Platinum, Blood Stone Platinum, Blue Onyx Platinum, Burma Jade Platinum, Rhodonite Platinum, Jade Platinum, Signature Rosewood

Lyra Kleos, Atlas Lambda SL, Etna Lambda SL, Kleos SL

Ortofon Cadenza: Blue, Red, Bronze, Black: Quintet Blue, Red, Bronze, Black: MC Anna (Diamond), SPU, MC Windfeld Ti

Rega Aphelion 2, Ania Pro, Ania

Roksan Shiraz

Shelter Harmony, Accord, Model 901 III, Model 5000, Model 501 II, Model 301 II

Shun Mook Reference

Sumiko Palo Santos Clebration, Pearwood Clebration, Starling, Blue Point Special EVO III

Groove Sleuth MICRO and TRANSFORMER 2

Audio Technica AT-ART9, AT-33Sa, AT-OC9XSL, AT-OC9XSH, AT-OC9XML

Benz Micro ACE S Medium (clear body), Gulwing SHR, ACE S Low (red Body), MC Gold

Clearaudio Goldfinger Statement, Titanium V2, Da Vinci V2, Stradivari, Concerto V2, Talisman V2 Gold, Essence

Gold Note Donaltello Gold, Machiavelli Gold Mk 2

Goldring Ethos, Elite

Koetsu Red K, Urushi Gold, Urushi Sky Gold, Urushi Tsugaru, Urushi Black, Red T, Black K

Lyra Delos, Atlas Lambda, Etna Lambda, Kleos

Ortofon Cadenza Red, Cadenza Blue, Cadenza Bronze, Quintet Blue, Quintet Red

Shelter Model 9000, Model 7000, Harmony, Accord, Model 901 III, Model 5000, Model 501 II, Model 301 II

Shun Mook Reference

Sumiko Blackbird Low, Palo Santos Clebration, Pearwood Clebration, Starling, Blue Point Special EVO III

Van den Hul White Beauty Special X, The Crimson, The Frog (standard & Gold), MC-One Special, MC-10 Special, Grasshopper III (GLA), Grasshopper III (SLA), The Canary, Black Beauty GPX, Condor Gold high out, Condor (standard and high out)

Groove Sleuth MICRO and TRANSFORMER 3

Denon DL110

Benz Micro ACE S Medium (clear body), ACE S High (blue body), Ebony S (high)

EMT HSD006, JSD 5, JSD 6, JSD P 6.0 Platinum, JSD Pure Black, JSD Pure Lime, JSD S 75, EMT JSD VM

Grado Statement 3, Opus 3 (Low), Sonata 3 (Low), Platinum 3 (Low), Reference 3, Master 3 (Low)†

[Groove Sleuth MICRO \(direct - no transformers\)](#)

Benz Micro ACE S High (blue body), Ebony S (high), MC Silver

Dynavector DV-10X5 MK11 (high-output), DV-20 X2 (high-output)

Gold Note Donatello Red

Goldring Eroica H (high out)

Ortofon MC-1 Turbo & MC-3 Turbo

Sumiko Blackbird High, Songbird High, Amethyst, Blue Point Special EVO III, Blue Point No. 2 High Out

Van den Hul White Beauty Special XO, Grasshopper III (high out), The Frog (High output), MC-Two Special, Black Beauty GPX (High)

† The low output Gradors (not MCs at all in fact), are specified for a higher input impedance, but they have been tested and work well with TRANSFORMER 3: primary inductance is sufficient to give a bass response which is -3dB at 5Hz.