



8 John Walsh Boulevard, Suite 417
Peekskill, New York 10566

Telephone (914) 739-2885
Fax (914) 739-5204

Helios CL and OCL Moving Iron Phono Cartridge

rev1

Owner's Manual and Technical Description

Mounting Instructions

The Helios has the ability to accept long mounting screws into its body due to the unique design. You do not need to use screws of an exact required length. **You must, however, make sure that since the screws first enter the relatively soft threaded composite material before they enter the metal, that they are threaded correctly.** They should not bind, or cross thread. If you encounter initial difficulty inserting screws that you supply, or any other screw, stop **immediately** and make sure the screws are the proper 2.5mm metric thread, or that you have not started them in at the wrong angle. The screws that we supply to hold the cartridge in its box are a very high grade non-magnetic stainless 304 material type.

Also supplied with your Helios are our EZ-Mount screws made of nylon, aluminum, stainless and brass. The nylon washers – if desired to be used, are LOCKING type, and must be tightly threaded onto any screw you use. If you wish to shorten any screw, it is advisable to first install the supplied nut, and after shortening the screws, remove the nut to repair the threads.

Electrical Loading

The Helios is designed to be used with a Moving Coil Preamp at about 48-54 dB of gain. Although highly unusual, some have successfully used the Helios with a Moving Magnet preamp, assuming that there is sufficient gain in both the MM preamp stage and the line stage following it. But since the MM preamp loads at 47K Ohms, it is advisable to place a resistive load in parallel with each input to flatten the response.

The Helios should be loaded with a minimum resistive load of 1500 ohms. Bear in mind there is no harm in using a higher resistance or typical MM load, but you may experience peaked high end. Conversely, loading BELOW 1500 MAY result in rolling off the high end, depending on how low you go. Although this loading value is often done to taste, loading much below the stated values WILL result in a marked loss of high frequencies, and top end presentation of the cartridge – it WILL sound dull if you go too low.

Capacitive loading may have some effect, but will be minimal. Loading requirements will be determined by your system, and your personal listening preferences.

PLEASE NOTE AGAIN that loading **well below** 1500 Ohms will absolutely result in loss of some high frequencies and sonic performance.

Please also note; although not common, some designs of “current amplifier” phono preamp circuits will not allow loading in the range required, causing the Helios to sound very dull – basically caused by improper loading, resulting in SEVERE loss of high frequencies.

Unlike other Medium output cartridges, the Helios is a six sided fully shielded cartridge, and being such, is one of the world’s most hum-free and RF free cartridges. When properly used with shielded cable from your tone-arm, there should be absolutely no hum whatsoever.

Tracking Force

The Helios is designed to operate between 1.8 grams and 2.2 grams. Optimal force is usually 1.8 – 2.0 grams. Higher VTF may be used, but will result in the cartridge eventually “bottoming” on the record. The cartridge is designed such that no damage will occur to the record or cartridge when that happens. For best results, ALWAYS note the suggested VTF hand written on the bottom of each Helios box.

Hookup

Normal color codes are used for hookup: as viewed from the rear of the cartridge in the normal position, RED is top right, White is top left. Grounds are below them, green on the right, blue on the left.

Questions, questions, questions....

“Does the Helios require special stylus cleaning??

The answer is YES.

CLEANING:

How do I clean the stylus?? Do I use a wet cleaner each time, or often? NO!!!

A DRY soft brush is somewhere between good and “OK”, but it is far better is to use some “fun tak” – this is the blue clay-like stuff you get in the stationery department. Use it just before or after every play. Either make a “pedestal” of the jut the right height, and place a small squashed ball of fun tak on the pedestal at the right height so that you can use the

cueing mechanism to allow the stylus to drop onto the fun tak. The other good option is to squash a small ball (half the size of a dime) FLAT (the thickness of a record) onto a quarter or half dollar. You may even use a business card. Not surprisingly, a Soundsmith business card works very well.

Place THAT on the platter. Then cue DOWN and up on the fun-tak several times. Be VERY care full not to DRAG the coin or card or turn the platter when the stylus is down on the fun-tak or you risk damaging the stylus or cartridge.

Do this several times, each time moving the fun tak to a new spot when the stylus is raised, so that when it comes down it hits a new spot. If you use the business card method, when you cue up, the card/Blue tak may lift, but it will drop off soon.

Using this method every record should eliminate the need to wet clean ever, BUT if this doesn't cure a distortion problem due to debris build up, THEN either use the supplied brush and some RUBBING alcohol (70%, water 30% NO COLORING OR FRAGRANCE) and gently stroke the stylus back to front only. Only wet clean when the dry clean doesn't work.

DO NOT WET CLEAN OFTEN - TO DO SO WILL POTENTIALLY CASUE SEVERE DAMAGE TO THE STYLUS MOUNTING AND CAUSE THE DIAMOND TO COME OFF.

PLEASE USE THE ABOVE BLUE-TAK METHOD.

If you don't have a good VERY SOFT brush, purchase a WATERCOLOR brush with non-synthetic fibers, one that has bristles that are about 1/8" in cross section. CUT the bristles straight across with a small scissors, making them about 1/8" long. Break or cut off the wood handle so the brush is VERY SHORT, and has very little wood handle. This will minimize accidents and reduce jitter when handling and using.

How long will my Helios last?

All diamond styli last approximately 1000 hours when aligned and used correctly. Soundsmith can re-tip your Helios when the warranty expires, as the Helios is fully warranted against manufacturing defect and stylus WEAR for a period of TEN YEARS to the original owner. **Unlike many other manufacturers of fine cartridges, you will find that The Soundsmith is very interested in protecting your investment over the long term. If the Helios suffers a non-warranty failure due to severe mishandling, unlike MC cartrdiges, it can ALWAYS be fully rebuilt at this time for \$850 maximum charge.**

In order that the ten year warranty can be honored, please fill out the warranty form at the end of this manual, and return it to us.

Adjustments

One of the advantages of the Helios is its ability to provide perform extremely well with critical alignment, so we strongly advise you do attempt to do so, just as you would balance the tires on your car before expecting performance from them. It is strongly advisable therefore, to perform cartridge alignments to the best of your ability. One must therefore align an advanced stylus design carefully and correctly to enjoy its benefits. While some expensive cartridge designs employ lower cost, less aggressive styli shapes and therefore enjoy the benefit of ease of alignment, they can also suffer at times from less than optimal performance. We made the decision to use one of the best stylus shapes available, to allow those who demand the best performance possible to realize such if careful alignment and record care are employed.

Azimuth

An approximate azimuth setting can be viewed by looking at the front of the cartridge, while it is playing mid-point on a record. By looking at the gap between the metal bottom of the cartridge and the record surface, one should attempt to make this gap even. Back-lighting this can help to visualize this gap. Small adjustments from this relatively front viewed gap parallel-to-record position will improve performance.

Stylus Rake Angle – (or VTA)

Normal SRA is achieved when the cartridge, as viewed from the side, should have the top FLAT of the body (headshell) and tone arm parallel with the surface of the record. Adjustment up or down from that point will affect the high frequency performance and channel separation.

Some thoughts about the Helios

What happens to the energy that is “Stored”?? The energy that goes up the cantilever moves the generating element. If that element can be made small enough, good things happen in cartridge designs. We have done that - but what happens to the energy that goes into the cartridge body?? The Helios employs a very unique “Energy Distribution System” to insure that the energy gets into the cartridge body properly, and into the waiting tone arm to be damped. It is one of the features of the Helios, and one of the major contributing design efforts towards perfection.

But there is always some energy that is “stored” in the moving mass of the internal generating element, due to inertia. We have lowered the moving mass to a very large degree which is achievable in a moving iron design such as those Soundsmith manufactures. The Helios employs our most advanced design in the effort to reduce moving mass, which results in less stored energy – less inertia. Less stored energy means that less damping can be used, resulting in a more accurate cartridge.

A major step forward in cartridge design has been also been realized with the Helios in

using a specially treated and hand prepared cactus “thorn” for the cantilever material which holds the diamond stylus. This allows - for the first time in cartridge design - a cantilever structure that is both rigid and damped along its length, resulting in superlative transient performance and a resultant listening experience unlike that of any other magnetic cartridge made. The cactus cantilever does most of its magic by serving as a mechanical “filter”; turning ultra- high frequency energy into heat as it travels up the cantilever so that it is not stored in the moving mass, as during the return of resonant frequencies, when they attempt to come back down the cantilever into the stylus. The end result is exceptional groove tracing, unlike that of any other cartridge.

Moving mass

Magnetic cartridges have three elements necessary to generate a voltage; a magnet, coil assemblies, and an “iron” or ferrous component of some shape. The performance of any magnetic cartridge is largely dependent on how little “moving mass” it has; this is both the mass of the stylus at the end of the cantilever, as well as the total mass of the voltage generating parts that the stylus must move. While there are some advantages to specific designs, both moving magnet and moving coil cartridges are at a distinct disadvantage in regard to moving mass as they are required to move either a relatively large magnet, or a “coil assembly”. The coil assembly in reality is a series of wire windings often on a metal core, more properly labeled as an “armature”.

In a moving iron design, one has the potential to reduce the moving mass to a very small value by virtue of the having the required two relatively massive elements (coils and magnet) held in fixed position.

It is important to understand that while it is true that all designs have trade-offs, a designer must arrange the order of trade-offs carefully. Reducing moving mass is at the top of the list for SoundSmith; less inertia in the generating elements means faster starts and faster stops. It also means a much easier job of damping the unwanted “ringing” of the moving system, a system that must make sudden, accurate and controlled directional changes to follow the grooves of a record.

In order to obtain accurate vinyl reproduction, the stylus must remain in near constant contact with the groove walls. The larger the moving mass, the greater the jittering of the stylus, meaning that it is in reality taking “samples” of the groove walls from moment to moment, and averaging or guessing at what is taking place in between those samples. A “digital” sort of rendering, if you will. Lower mass? Less jitter. Less jitter means more time in contact with the groove, which means detail and micro detail. If a cartridge can’t stay in contact with the groove walls, you can’t hear everything that is on the record. In a very real sense, it’s that simple.

The obvious question, “Why doesn’t everyone make cartridges this way, if reducing the moving mass is an absolute requirement for accuracy?” the answer to that is simple as well. It’s very hard to do so. A properly designed Moving Iron cartridge requires an ultra-high level of precision in manufacturing, and potentially low product yield. It is not the best path

for profitability, only sonic ability.

Another advantage of this design is the inherent high level of channel separation. Unlike MC cartridges, a rotation of the generating element in The Helios (moving iron) due to manufacturing tolerances has far less effect on the separation performance. Furthermore, unlike moving coil cartridges, our Moving Iron designs CANNOT rotate out of position, maintaining the critical azimuth alignment position you have achieved stable for the duration of the cartridge mounting.

It is our hope that your carefully crafted, hand-made Soundsmith Helios cartridge will bring you many years of listening pleasure. The simple fact is, when we sit at a microscope for many days making each one, that is primary in our thoughts.....we hope that each one will bring some joy to the listener.

Peter Ledermann
President



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HELIOS WARRANTY FORM

Your Name _____

Your Address _____

Purchase Date ____/____/____

Your Dealers Name _____

Dealers Address _____

Please provide a copy of your purchase invoice – Proof of Purchase

Serial Number (Found on the bottom of the box, or, by magnification on the bottom of the cartridge, starting with HE100.....)

Please go to our website to obtain a REPAIR AUTHORIZATION number –

Our website is www.sound-smith.com

Please go to the section marked “Retipping” and follow the instructions to obtain an RA number. Please include a copy of this form.

Your Signature _____

Today's Date ____/____/____