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## **SOTTO VOCE ES MOVING IRON PHONO CARTRIDGE Owner's Manual and Technical Description**

rev 2

Mounting Instructions - PLEASE ALSO READ THE "ES" ADDENDUM – important!

The SOTTO Voce ES is a medium output version of The Voice" design. It 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. If you encounter difficulty inserting the screws while turning, stop immediately and make sure the screws are the proper 2.5mm metric thread, and that you have not started them in at an improper angle.

If desired, to add mass to the headshell, you may obtain SoundSmith made EZ-Mount screws – 4 types, made of both nylon and metal, all non-magnetic screws. The nylon washers are LOCKING type, and must be threaded onto any screw you use. If you wish to shorten any screw, it is advisable to first install a supplied nut, and after shortening the screws, remove the nut to repair the threads.

### *Electrical Gain and Loading*

The SOTTO VOCE is designed to be used with a Moving Magnet or Moving Coil Preamp at about 48-52dB of gain. Some have successfully used the SOTTO VOCE with a Moving Magnet preamp, assuming that there is sufficient gain in the MM preamp stage. Using a MC design with more than 55dB of gain MAY result in distortion on peaks, depending on the design of the preamp.

The SOTTO VOCE requires a MINIMUM RESISTIVE LOAD of 1500 Ohms, with best loading determined by your system and your listening preferences. Usually, this is between 1500 and 2000 Ohms. There is no harm in using a 47K typical MM load, but you may experience a peaked high end. Capacitive loading may reduce that effect somewhat to a satisfactory degree. Again, loading requirements will be determined by your system, and your personal listening preferences. PLEASE NOTE that loading well below 1500 Ohms will result in loss of high frequencies.

Please also note that designs of "current amplifier" or Transconductance preamps will not allow loading in the range required, causing the SOTTO VOCE to sound very dull – caused by improper loading, resulting in loss of high frequencies.

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

### Tracking Force

The SOTTO VOCE is designed to operate between 1.4 grams and 1.6 grams. Optimal force is usually 1.5 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.

### Hookup

Sotto Voce color codes are used for hookup: as viewed from the rear of the cartridge in the Sotto Voce 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 SOTTO VOCE require special stylus cleaning??

The answer is YES.

### CLEANING:

**The OCL stylus has a raked back which can collect debris more easily than other designs. It is therefore highly advisable to dry clean each time before playing, as described below.**

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 “Blue Stik”** – this is the blue clay-like stuff you get in the hardware store stationery department that is used to stick papers and light things to the wall without damaging the wall surface. Use it just before or after every play. Squash a small ball flat onto a heavy coin – such as a quarter. Then place THAT coin on the platter. Then cue DOWN and up on the Blue-Stik several times. Be VERY care full not to DRAG the coin or turn the platter when the stylus is down on the Blue-Stik or you risk damaging the stylus or cartridge.

Do this several times, each time slightly moving the Blue Stik to a new spot when the stylus is raised, so that when it comes down it hits a new spot.

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 (minimum 70% - 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 CAUSE SEVERE DAMAGE TO THE STYLUS MOUNTING AND CAUSE THE DIAMOND TO COME OFF. USE THE ABOVE BLUE-STIK 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.

#### RECORD CLEANING:

DO NOT TALK towards your records. They are neither listening, nor do they need a talking to. You need to listen to them. The reason is this: when you talk, you spit. Yes, even you. Fine drops. You cannot see them because the record is textured with grooves. When the stylus hits the dried spit, this GLUE then sticks to all the dirt and dust in the grooves. It only takes a few revolutions for this to happen, and so much debris can build up on the stylus, **you will have worse than distortion** – The stylus may not even track the record...as below.....



< BEFORE .... AFTER >>



What do I suggest?? A record cleaner – It's a MUST HAVE item for any record enthusiast. How much do you invest in one?? As much as you are able – the return will be many times its cost.

Cleaning your records well is the BEST investment you can make in protecting that great sound of your analog system.

How long will my SOTTO VOCE stylus last?

All diamond styli last approximately 1000 hours when aligned and used correctly. Soundsmith can re-tip your SOTTO VOCE in or out of warranty. The SOTTO VOCE is fully warranted against manufacturing defect for a period of TWO 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**

**SOTTO VOCE suffers a non-warranty failure due to severe mishandling, it can be fully rebuilt at this time for \$450 maximum charge.**

How long will my SOTTO VOCE last?

All diamond styli last approximately 1000 hours when aligned and used correctly. Soundsmith can re-tip your SOTTO VOCE for a fee of \$450 at this time, restoring the diamond to new condition. If the Ruby cantilever is snapped, we can still rebuild the cartridge. **Unlike many other manufacturers of fine cartridges, you will find that The Soundsmith is very interested in protecting your investment over the long term.**

**Due to the raked BACK nature of the upper shaft of the stylus, cleaning the stylus is especially critical with the SOTTO VOCE OCL design. Do it EVERY time you play, using Blu-Stik (from DAP) obtainable at a hardware store. Directions for how to do this are VERY important, and will also be found in the alignment instructions.**

### Adjustments

We have quite a bit of information on this USB stick on cartridge alignment with your SOTTO VOCE, which you are strongly encouraged to read and follow. You may also find lots of information on our website. Although the SOTTO VOCE will perform satisfactorily without extremely critical alignment, we strongly advise you do attempt to do so, just as you would balance the tires on your car before expecting the best 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. Best azimuth is obtained by obtaining equal channel separation via a test record – NOT far off from this position. A fozgometer or other types of azimuth testing gear will likely NOT work with Soundsmith cartridges due to their extreme separation capability.

### Stylus Rake Angle – (or VTA)

Sotto Voce SRA is achieved when the cartridge, as viewed from the side, has its top FLAT of the body (underneath the headshell) parallel with the surface of the record. This may also

correspond with a non-tapered arm being parallel with the record surface. Adjustment up or down from that point will affect the high frequency performance and imaging. There are many suggestions as how to tweak this – far too many to cover here.

### **Some thoughts about the SOTTO VOCE**

What happens to the energy that is “Stored”?? The energy that goes up the cantilever moves the generating element. If that can be made small enough, good things happen. But what happens to the energy that goes into the cartridge body?? The SOTTO VOCE 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 SOTTO VOCE, and one of the major contributing design efforts towards perfection.

### **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 SOTTO VOCE (moving iron) due to manufacturing tolerances or aging does not affect the separation at all. Furthermore, unlike moving coil cartridges, our Moving Iron designs CANNOT rotate out of position, maintaining the critical azimuth position for the life of the cartridge.

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

Peter Ledermann  
President