SMARTractor©

Universal high-precision triangular positioning & alignment instrument for optimized analog phono tonearm alignment & true one-point cartridge set-up

owner's manual

A brief introduction

The SMARTractor is a versatile high-precision positioning and measuring instrument for use with phono tonearms and turntables.

It covers all areas of the geometric tonearm alignment with thehighly precise mechanical accuracy.

It allows for precise measurement of Pivot-to-Spindle (P2S) mounting distance - of any given tonearm.
SMARTractor offers true 1-point cartridge alignment to the tonearm, with a selection of 5 different tangential curves to choose from.

As the SMARTractor operates with a true tri-angular positioning, it applies to all pivot tonearms, regardless of effective length, mounting distance or specific geometry a given tonearm may ask for.

To ensure highly precise measurement, the SMARTractor comes with a special designed Vernier scale.
This SMARTractor's Vernier scale provides accuracy in read-out of 5/100 mm.

Precise analog tonearm alignment is impossible without precise centering.

The SMARTractor is supplied with the 3 spindle adapters of the UNI-Protractor to ensure precise fitting on the platter spindle and perfect centering without play.

Please check your SMARTractor package to ensure that all contents are included.
All the above parts must be included to provide perfect function under all circumstances.

Each SMARTractor was carefully checked and tested prior to shipment.

Please do get yourself familiar to the handling and use of the SMARTractor.

While it is a mechanical positioning instrument, it needs a minimum of attention to detail by the user to obtain the maximum precise results it ensures if handled correctly.

Most important: please study the step-by-step illustrated instruction to learn how to use and set-up the SMARTractor correctly.

To get access to all features of the SMARTractor it is inevitable to read this manual.

Disclaimer:

Please use all parts with care and attention!

The use of the SMARTractor is on your own risk.

Keep out of reach of children:

The SMARTractor set contains small parts that can be swallowed!!

The SMARTractor's Locator Pin has a very sharp point and could easily penetrate human skin.

The manufacturer and the designer do not take any responsibility for possible damage or injury due to operation or handling of the SMARTractor or any of its parts.

The SMARTractor is made from materials that are particulary sensible to heat and bright sunlight.

Please use the SMARTractor with the same care as with the proper handling of analog records.

Please clean the mirrored surface of the SMARTractor using only a wet soft cloth!
We find the best fabric to use is a wet Microfiber cloth like those used to clean eyeglasses.

The manufacturer precisely calibrates the SMARTractor.

DO NOT LOOSEN the screws fixing the Vernier scale on top of the black POM block guiding the measurement scale.

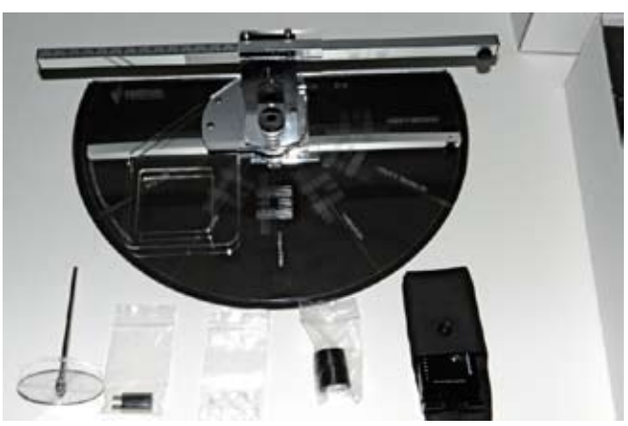
Unpacking the SMARTractor

The SMARTractor set contents the following parts:

* the SMARTractor - completely assembled and calibrated
* (3) black tt-Spindle Adapters, engraved with diameter identification lines. 7.10 (1 line), 7.15 (2 lines) and 7.20 mm (3 lines).
* (1) long stainless steel Locator Pin with round Reticule w/ white engraved crosshair guide
* (1) metal frame Glass Magnifier
* (6) small self-adhesive “feet”
* (2) M3 20 mm Distance Bolts
* (1) white plastic envelope to store printed manual

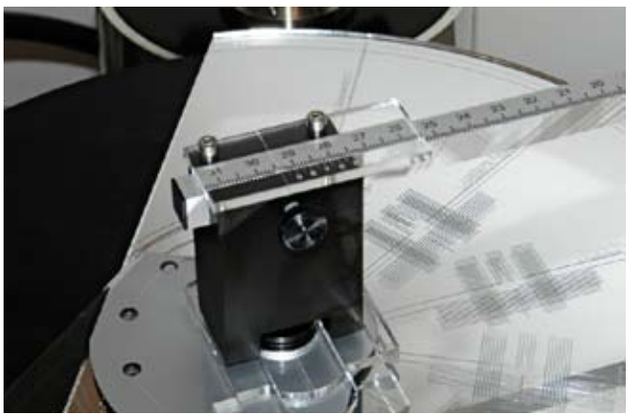
The (6) small self-adhesive feet are only needed if the turntable features an convex or concave platter.
In those rare events (Simon Yorke tt or Goldmund Studio TT or Goldmund Relief mat) do use these small feet - 3 at a time - to equalize the SMARTractor relative to the non-flat platter surface.

The (2) 20 mm M3 Distance Bolts are used ONLY when aligning a tonearm with unusual tall bearing housing. The 2 Distance Bolts will give the SMARTractor an additional 20 mm of height for the positioning arm in those instance where required. (For illustration see page 8).



Selecting the tangential curve

The SMARTractor offers a total of 5 different Tangential Curves with which to align a given cartridge and tonearm combination.



You have the option to align the cartridge using any of these five tangential curves:

- Baerwald / Loefgren A IEC
- Baerwald / Loefgren A DIN
- Loefgren B IEC
- Loefgren B DIN
- UNI-DIN

The selection of the tangential curve depends on your personal preference and on your record collection.
If the majority of your records are rather modern, with production past 1985, we suggest you align to either

- Baerwald / Loefgren A IEC or Loefgren B IEC

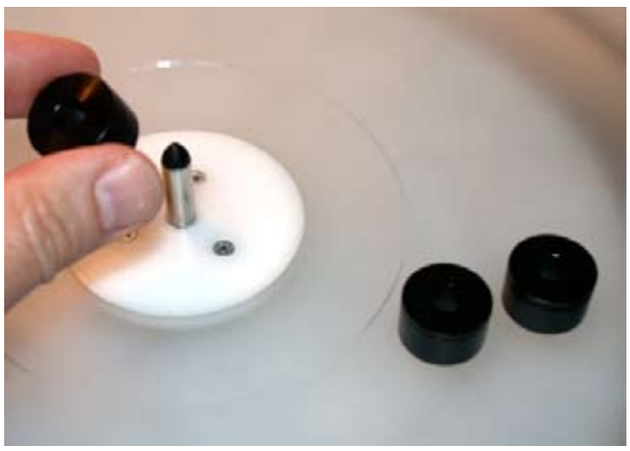
If your record collection contains a lot of older records from the beginning of the stereo era to the early 1980ies we strongly recommend aligning to

- Baerwald / Loefgren A DIN or UNI-DIN

If your collection features a majority of records with classical music and / or human voices I strongly recommend aligning to

- UNI-DIN.

Setting up the SMARTractor



Step 1

The SMARTractor is already pre-assembled with the “2-lines” Spindle Adatper (for 7.15 mm diameter) sitting in the center of the SMARTractor.

Remove the black Spindle Adaptor from the 20mm hole in the base of the SMARTractor by simply pressing it out onto your hand. Place it onto your turntable’s spindle to determine if it has a snug fit w/o any play.

If not, please select the Spindle Adapter that best fits on your turntable’s spindle WITHOUT play.

Important: the selection of the 3 different Spindle Adapters ensures that SMARTractor is accurately mounted onto your turntable without any play at the spindle. This is an essential starting point for getting really precise results.

Step 2

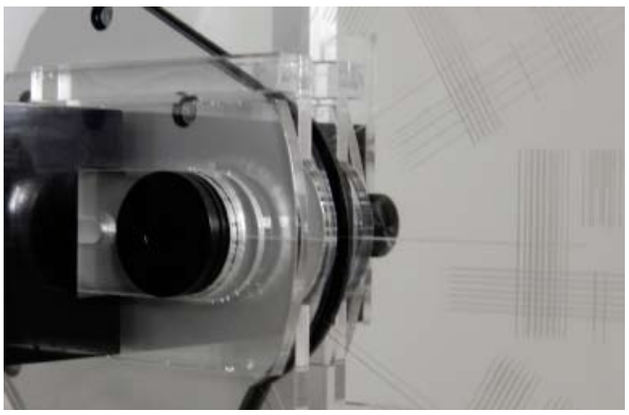
Now insert the selected tt-Spindle Adapter in the center 20mm hole of the SMARTractor. It will need a small amount of force to insert it, but this tolerance provides a firm and tight. This is wanted to ensure absolute precision. The Spindle Adapter centers the SMARTractor assembly of the sliding center block and the clear acrylic positioning arm to be used with the glass magnifier.

Step 3

Remove the thumbscrew on the back of the central POM block and rotate the complete central assembly to the desired tangential curve.

If you want to measure the arm mounting distance or P2S, rotate the central block to the “UNI-P2S” position; loosen the locking screw fixing the positioning arm in the black POM block.
Now carefully pull the positioning arm towards the pivot of the tonearm and place Locator Pin or reticule right on the pivot of your tonearm. Many tonearms have a small indentation indicating where the exact pivot point is located.
This is ideal for precise positioning of the Locator Pin on the pivot point.
You can now read out the exact value on the Vernier scale.

If unsure, please see page 6 for a short tutorial how to read the Vernier scale correctly.



Step 4.1

The engraved line on the center piece will meet the line at the tangential curve.

Step 5

Mount the long stainless steel Locator Pin with the Reticule either on top or pointing downward into the 3mm-hole at the end of the aluminum Positioning Arm. Handle with care, as the tip is quite sharp and may cause injuries.
Loosen the front screw on the POM-block.

Slide the Positioning Arm with the Locator Pin toward the center of the tonearm body.

If you can spot the tonearm pivot, put the pinpoint of the Locator Pin here. Many tonearms have a small indentation indicating where the exact pivot point is located. This is ideal for precise positioning of the Locator Pin on the pivot point.

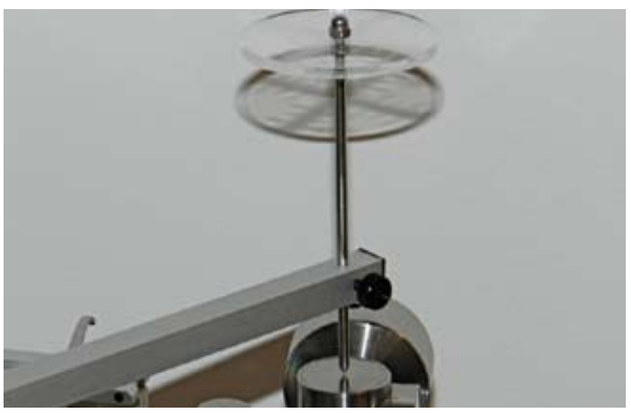
If there is no indication of the tonearm pivot point, attempt to locate pin exactly over the tonearm pivot center.

If unsure of pivot center, use the Reticule to visually determine tonearm pivot point by finding symmetrical outer lines on the tonearm body.

Step 4.2

Slide the Central Assembly back or forth so that the hole for the thumbscrew is aligned with the locking thread for the selected curve - there is only 1 possible thread hole to move to in each position.

Fix the assembly in place by re-installing and tightening the thumbscrew. The thumbscrew need only be very snug by hand tension



Step 6

When the has pivot point determined and is directly underneath the pin-point of the Locator Pin, tighten thumb screw holding the Positioning Arm in place. Take care to NOT move the SMARTractor in any way until the alignment of the cartridge to the tangential curve is finished. The pinpoint has to be located precisely over the pivot at all times during alignment.

You can fix the SMARTractor in place with clear or painters blue tape by placing tape from the SMARTractor to the side of the platter.

You can now align your mounted cartridge to the selected tangential curve. Make sure the tracking force on your tonearm is set to an appropriate value for the mounted cartridge.

Important Note: Disengage the anti-skating on your tonearm while aligning the cartridge.

Side-kicks:

Reading the vernier scale

The SMARTractor features a Vernier scale to allow precise read-out of the P2S with an accuracy of 5/100 mm.

This Vernier scale runs right to left - as does the metric scale with increasing distance of P2S.

If you are unfamiliar with a Vernier scale, please get accustomed to its operation.

The white numbers 1- 9 over the black background are 1/10 of a mm each. The white lines between numbers are 0.5/10 mm each - or 5/100 mm each.

Whenever any of the white lines is absolutely inline with a black line on the aluminum scale, then it denominates the 5/100 value which has to be added to the full mm value given between the

2 white “leaves” centered by the full vertical white line on the left of the scale just before the half-circle end.

To illustrate the read-out procedure, here are a few examples of mounting distances for common tonearms.

One will become accustom quite quickly to this way of

reading the scale.

The Vernier scale is an international standard in industrial precision analog measuring.

This is 295,00 mm P2S - suitable for a FR-66s.

231.5 mm P2S - the white “5” being in line. Perfect mounting distance for the FR-64s.

The magnifier

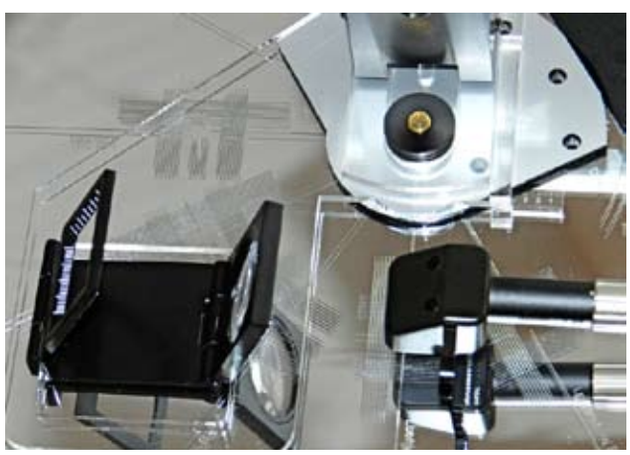
Using the Glass Magnifier greatly increases the visibility of the stylus when trying to align on the single spot. It further also allows with most modern cartridges to get a fairly good view of the cantilever.

Place the magnifier in the cut-out frame on the clear acrylic positioning arm and pull it all the way forward so that it seats squarely against the clear acrylic.

It is automatically in a position to optimize focus when viewing through the glass lens on the

alignment spot for the selected tangential curve.

The cutout for the Glass Magnifier in the acrylic positioning arm allows for adjusting the side-to-side position of the Glass Magnifier to accommodate all different positions of the 5 tangential curves on the SMARTractor.

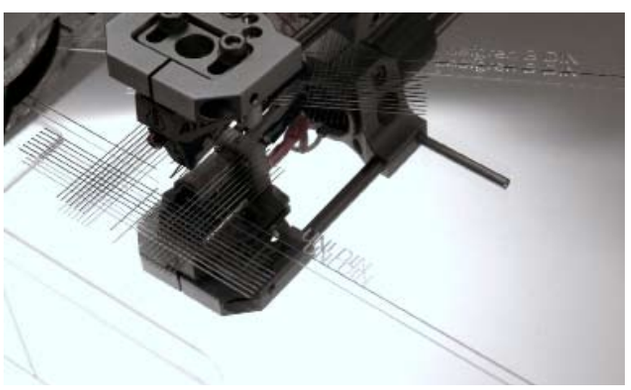


Aligning the tonearm and cartridge

Step 7

Make sure your tonearm parallel to the platter surface.
Slide the tonearm with the mounted cartridge towards the single alignment spot of the selected tangential curve.

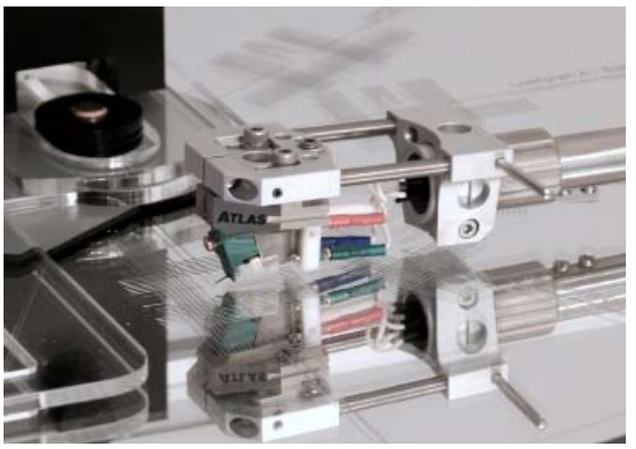
It is surrounded by lines to ease adjustment and precise view.



Step 9

When the stylus is precisely sitting on the single spot, use the helping lines to ensure that the cantilever is perpendicular to the SMARTractor surface when viewed from the front. Adjust the tonearm accordingly until it is visually in this position. If you have a Uni-Pivot design tonearm, it is critical that the table is level to carry out this step.

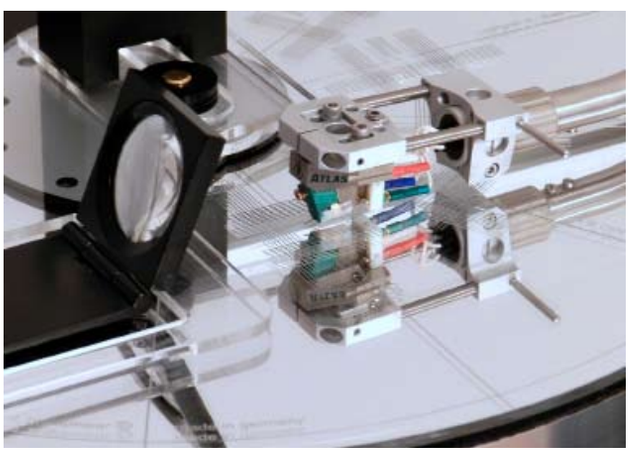
Using the Glass Magnifier will dramatically increase visibility of the alignment.



Step 8

You may need to carefully shift the cartridge in the mounting area of your tonearm / headshell to meet the single point with the stylus.

Don't forget to re-tighten the mounting screws when final position is obtained.



Step 10

Make sure that the stylus is precisely located on the spot with the helping lines straight with the cantilever – making sure that the Locator Pin is still exactly positioned over the pivot.

Now the tangential alignment to the selected tangential curve is finished.

Carefully remove the SMARTractor and carefully place it back in its package.

Engage anti-skating again and continue with aligning azimuth, tracking force and SRA / VTA.

When you are sure that the stylus is precisely located on the spot with the helping lines in line with the cantilever the tangential alignment to the selected tangential curve is finished.

Please demount the SMARTractor and carefully place it back in it's package.

Do engage antiskating again and continue with aligning azimuth, tracking force and SRA / VTA.

In the rare event that you have to align a tonearm featuring by design an unusual height of the tonearm body, you can add 20 mm of clearance to the SMARTractor.

Simply use the (2) M3 Distance Bolts supplied with the SMARTractor and mount them between the POM block and the clear acrylic sliding plate.

You won't need any additional tools for this and it is just a 1- minute routine, which is reversible at any time.

General note:

Technical data and specifications are subject to change without prior notice.

Manufactured and assembled in Germany

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