



the **AQUILAR**®  
10" reference tonearm

owner's manual



ORIGINAL RECORDING BY



THE DECCA RECORD CO. LTD. LONDON

**DECCA**

picture by  
Moritz Teichmann

## **A brief word from the designer**

*The AQUILAR is the result of my more than 35 years of intimate research and preoccupation with analog playback - with the specific focus on the interaction of the record groove with the cartridge and tonearm.*

*The AQUILAR is the direct 10" derivate and distillate from our 12" AXIOM tonearm introduced in 2012.*

*A truly universal tonearm, which offers all and every option of alignment – while ensuring the best possible mechanical guidance for any cartridge.*

*Taking into account the paramount importance of energy transfer in relation to effective moving mass.*

*Resulting in a level of performance only obtainable, when each and every aspect of the analog audio tracking process is attended to with utmost attention to every minute detail.*

*A level of performance, which transcends prior frontiers and opens new levels of musical realism in recorded music.*

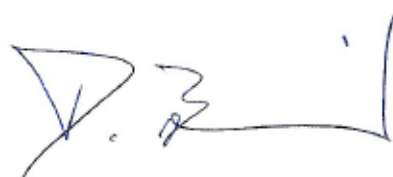
*My thanks and congratulations to you for choosing the AQUILAR.*

*We do share the real passion for music and I am confident that the AQUILAR will allow you to hear and enjoy your favorite records like never before.*

*Please get yourself accustomed with this manual. Make sure you familiarise yourself with each and every aspect of the AQUILAR's options. Your time will be rewarded with outstanding performance, to the benefit of your whole analog set-up - and ultimately your enjoyment of recorded music.*

*The AQUILAR is entirely designed, manufactured and assembled with care and dedication in Bavaria, Germany.*

*Kind regards,*



D. D. Brakemeier

**General note:**

**Technical data, minor design and specifications are subject to change without prior notice.**



**version 15.02**

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# Technical features & general design

The AQUILAR is a 10" pivot tonearm featuring a double nano-gimbal bearing architecture.

The AQUILAR is a static, full lateral balanced design.

The AQUILAR features an unique compound arm wand - a combination of surface hardened Titanium and Carbon Fiber pipes blocked together and internally damped by an all new design concept, a concept never before applied in tonearm design and first featured in the AXIOM resulting in unmatched fast energy transfer and total absence of any parasitic resonances in the tonearm.

The AQUILAR was designed to explore the possibilities of analog playback to the utmost degree. To accomplish the best possible analog playback performance, the AQUILAR offers an unique complete set of alignment features.

## Alignments

### Leveling the bearing axis

The AQUILAR can be precisely leveled by the user, independent from the turntable or mounting surface. This is essential to avoid parasitic side-forces prior to alignment and antiskating setting.

### SRA/VTA adjusted at the cartridge

In the AQUILAR the important alignment(s) of VTA / SRA can be made at the cartridge – without altering the static parameters of the tonearm, while preserving the other set alignments and leaving the arm wand always horizontal. This again is of paramount

importance in a static balanced design to avoid unwanted changes in static settings (namely tracking force) when changing tonearm height to accommodate VTA or SRA.

### Offset and Overhang adjustment

Offset is adjusted in the prolonged and slightly widened slots for the cartridge mounting screws.

Overhang can be adjusted at 2 spots, both located at the head. First of course in the prolonged 1/2" slots for the cartridge mounting screws. Here the slots allow for up to 5 mm adjustment in overhang and thus effective length. The 2nd spot is at the collar of the headshell where it is clamped to the arm wand. This is an additional spot for further overhang adjustment only IF NEEDED. The whole headshell can be moved back and forth by up to another 5 mm in this way. This should hardly ever be necessary.

### Azimuth

The headshell's collar is also the point for azimuth adjustment. By loosening the clamp screw the user may rotate the whole headshell in either direction.

Small indication marks at the rear of the headshell's collar and on top of the arm wand allow for reference and easy return to former settings.

### Dynamic anti-skating

Skating compensation – or anti-skating – adjustment in the AQUILAR is dynamic and follows the tangential geometry of the AQUILAR. If carefully operated, it can be adjusted during play. However we recommend that you do ALL adjustment or alignment at the AQUILAR ONLY with the cartridge / stylus lifted off the record.

## **Tonearm height – VTA**

Tonearm height can be adjusted on the main VTA-tower of the AQUILAR.

One full turn of the large top knob adjusts height by precisely 1 mm.

## **Tangential alignment**

It is possible to align the AQUILAR to the standard tangential curves of Baerwald, Stevenson or Loefgren in any version and standard.

The absolute best possible performance however is obtained only by aligning the AQUILAR to the new UNI-DIN tangential curve.

It's geometric design is uniquely based on the UNI-DIN, a tangential curve I formulated in 2011.

## **Step-by-step procedures**

In the next pages I would like to take you through the mounting and alignment options of the AQUILAR.

All procedures are illustrated step-by-step.

The pictures will give you most all of the information you need to perfectly mount and set-up the AQUILAR.

However, I will guide you through this with my comments too and try to give further information whenever the mere picture may not tell the whole story.

We all like to get a new tool working as fast as possible.

May I please encourage you to follow me through this mounting and set-up procedure as precisely as possible and to the very end - it will be to your advantage.

This will ensure that you get the best possible performance from your AQUILAR and take advantage of all its features and capabilities.

## **Single-point mounting vs. SME slide base**

In this manual we will cover the AQUILAR mounting with the standard 1-point mounting.

In addition there is the option to mount the AQUILAR easily onto any existing 9" or 10" SME armboard.

We do offer - as a special order item - a dedicated SME-slide base for the AQUILAR. If interested, please ask your dealer for the SME-slide base for the AQUILAR.

There is no difference in performance between the 2 mounting options.

We further offer other adaptor mounting plates for existing armboards upon your request.

If you are in need of a mounting plate for other existing armboards - to take advantage of existing pre-drilled armboards - please kindly check back with your dealer who will contact us.

### **GENERAL NOTE:**

Please make sure prior to setting up the AQUILAR that your turntable's platter and armboard are dead level.



## Unpacking the AQUILAR

Please make sure that all parts are present by unpacking the AQUILAR and all its tools and accessories:

The **AQUILAR suitcase** containing the following:

- the **AQUILAR tonearm**
- the main HD18 counter weight
- (2) Lateral balance weights  
(1) stainless steel, (1) aluminum
- the **AQUILAR's accessory box**



The **AQUILAR's accessory box** containing the following:

- mirrored AQUILAR alignment template
- 2-part acrylic positioning template
- (4) black knob fingerscrews
- (4) stainless steel countersunk screws
- (1) white knob fingerscrew with sharp tip
- (1) white 20 mm POM adapter
- (1) small white 7mm spindle hood
- (1) additional 40 mm length stainless steel lateral rod for heavy cartridge counterbalancing
- plastic bag with (4) distance stands
- (4) 90° Allen wrenches -  
metric sizes 0.89, 1.27, 1.5 and 2.0
- (1) small diameter spirit level





for use on tonearm bearing pivot

- (3) special M5 mounting screws with
  - (1) 20 mm length
  - (1) 25 mm length
  - (1) 30 mm length
- (1) set of M5 nut and washer



## Mounting the AQUILAR

The AQUILAR is mounted with (1) M5 screw and (1) set of stainless steel washer and nut only.

All you need is a single 5 mm hole in your armboard to mount the AQUILAR on your turntable.

Please take the AQUILAR from its packing and place it like pictured above.

Now remove the screw in the bottom of the mounting plate.

Select (1) of the M5 screws in the accessory box suitable for your armboard. The M5 screw should be at least 8 mm (1/3") greater in length than your armboard's thickness.

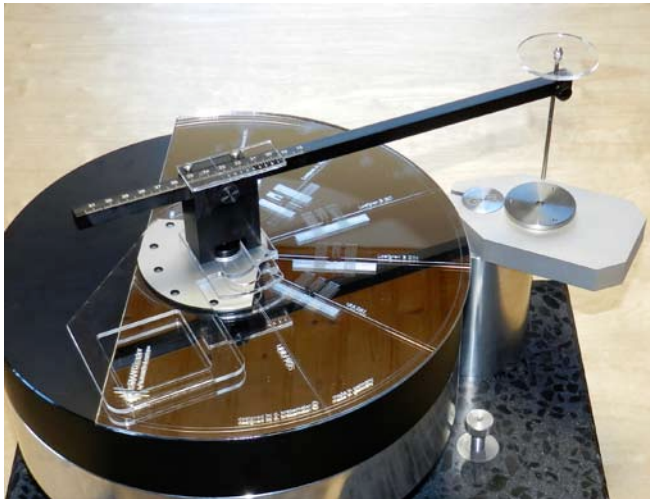
Now take the stainless steel lower mounting plate and look at it.

The 3 indents have to point upward.

Please take this 50 mm lower mounting plate and place it onto your armboard with the 3 indents pointing upwards.

The 5 mm center hole should be placed directly over the 5 mm mounting hole.





## IMPORTANT

**The 5 mm mounting hole has to have the following distance from the center of the turntable's spindle (please note: - this is NOT the P2S !):**

► 233 mm

Please use a SMARTractor or UNI-P2S to determine the exact position of the mounting hole.

Take the (1) selected 20 - 30 mm length M5 screw with nut and washer attached. Put it up through the suitable center hole on the turntable mounting board and through the center hole in the stainless steel lower mounting plate.

Place the whole AQUILAR assembly directly on top of the M5 screw and secure it in place by screwing the M5 screw upwards.

Make sure to position the lower mounting plate with the indents as pictured.

That way you can easily align the 3 levelling spikes in the upper mounting plate in the correct position towards the matching indents in the lower mounting plate.

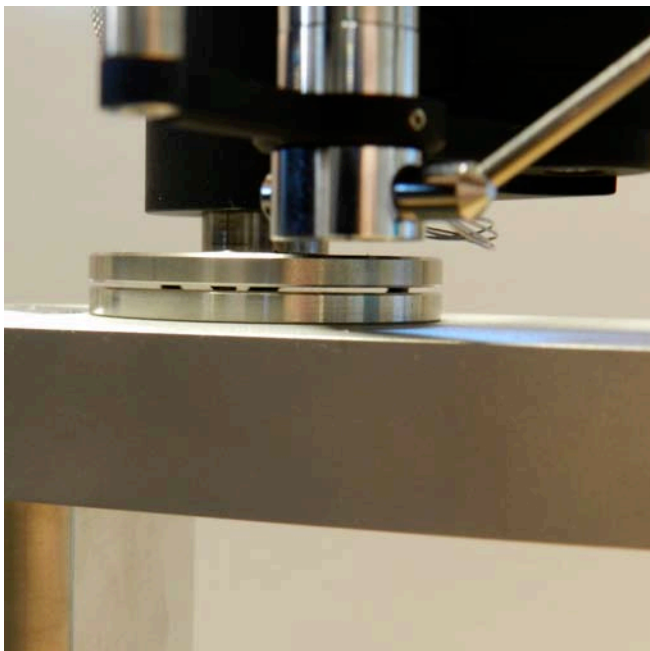
### PLEASE NOTE:

the 3 spikes **MUST** sit in the matching indentions in the lower mounting plate.

Now tighten the mounting screw **JUST A BIT** - not anywhere near maximum strength.

Do not use maximum force, just make sure it is loosely tightened so that the mounting plate can still be rotated in the horizontal plane.

The mounting screw will be fixed during levelling the pivot plane.



The AQUILAR is now sitting in place.

Now assemble the AQUILAR's dedicated alignment template.

Please see picture for reference - you will find all needed mounting gear and tools in the accessory box.

On top of the AQUILAR's bearing house is a 12 mm stainless steel plate with a small center hole. This center hole clearly marks the pivot center of the AQUILAR.

First place the AQUILAR's alignment template - with 20 mm white POM spindle ring in place in the hole in the mirrored tangential template - onto the spindle of your turntable.

In its resting position, the inside of the AQUILAR's headshell should be approximately 2" or 5 cm away from the outer rim of the turntable's platter.

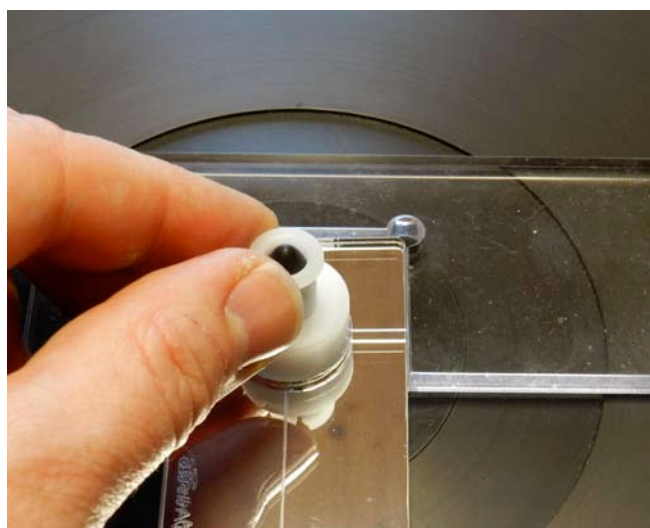
Now take the small 7 mm spindle adapter hood and SLOWLY and CAREFULLY place it on top of the spindle and ever so slightly press down.

### **IMPORTANT - be careful!!**

**DO NOT** press down the spindle adapter any more than 1-2 mm. If you press too hard, you will have a very hard time getting the white 20 mm POM ring off your spindle again.

The 7 mm spindle adapter allows the precise centering of the alignment tool on a wide range of spindle diameters.

Remember - Please be careful and do not use any excessive force. Pushing down really hard creates a VERY tight lock which you will have big problems loosening up again.

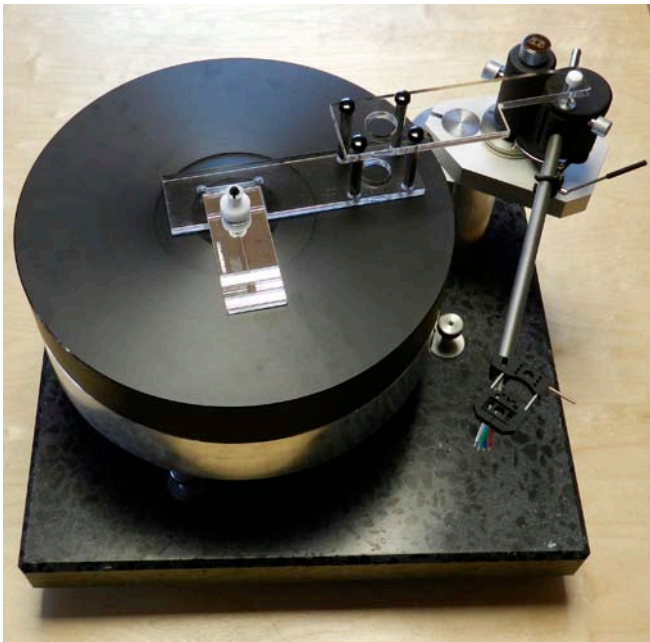




Now slide the alignment template into place with the M4 thread at the end of its outward positioning beam over the pivot locating plate on the AQUILAR.

Now take the white knob fingerscrew and screw it into the M4 thread with the tip downwards. The tip must meet the indentation in the center of the 12 mm pivot plate.

The AQUILAR should be positioned, so that the underside of the armwand is approximately 2.5 cm / 1" above the turntable's platter surface.



If you need to adjust for the above desired height by lifting the AQUILAR in height above the arm board, adjust the height using the top VTA knob.

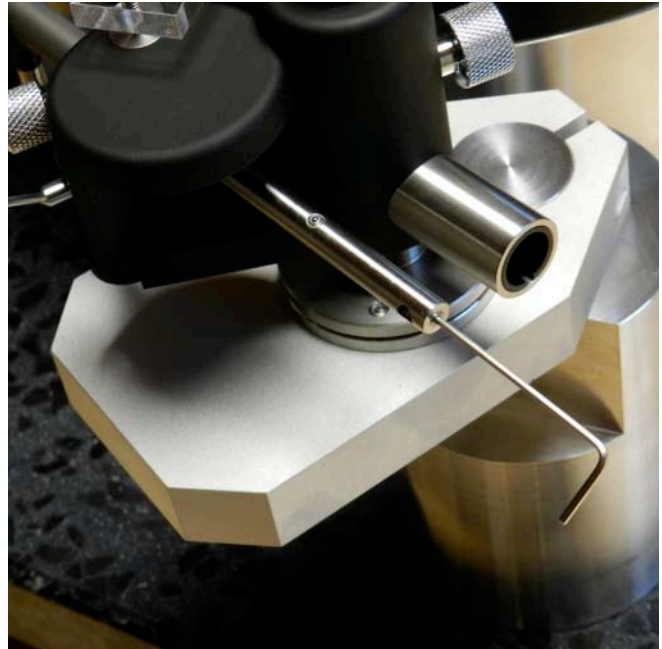
First you have to unlock the knob screw at the inward side of the VTA tower by turning it ONLY 1/4 revolutions anti-clockwise.

Before you proceed to mount the cartridge of your choice, you first have to attach the main counterweight and the lateral weight assembly to the AQUILAR.

Please remove the lateral weight assembly as well as the airplane-nose shaped HD18 counterweight from the AQUILAR's box.



Next take the small and short silver colored Allen key and slightly turn the screw in the counterbar's end anti-clockwise - only about 1-2 revolutions.



Now please take the HD18 counterweight and slide it - narrow head to the front - onto the stainless steel counterbar till it reaches the ball head in the top of the counterbar.

Now carefully rotate the counterweight till the entrance of the black inner isolation tube meets the ball head in the counterbar.

Next please move the counterweight by slow clockwise rotation further onto the counterbar - feeling the guidance of the ball head in a spiral movement.





Consider a preliminary position like pictured.

In the next step please loosen both lateral weights from the 4 mm diameter stainless steel rod.



Select (1) of the 2 lateral weights:

For a cartridge weight of **14 grams or less**, please use the aluminium cylinder (matt silver in color and light weight).

For a cartridge body weight of **15 to 25 grams** please select the stainless steel lateral weight (higher weight).

For a cartridge weight of **26 to 31 grams**, please select the extra long rod from the accessory box and use both lateral weights. Such a weight is unlikely, nevertheless it can be accommodated as described in detail later in this manual.



Fix the aluminum (or stainless steel) cylinder again at the end of the rod.

Now slide the rod into the inward pointing side of the through hole in the end of the counterbar.

This position ensures perfect lateral balance with the geometry of the AQUILAR.

Please fix the rod - with the end just meeting the opening of the through hole - by attending again to the M3 grub screw at the end.

Now please mount your cartridge of choice.

Here are just some standard recommendations:

For mounting your cartridge, please use NON-magnetic M2.5 screws and plastic washers under the screws head. Best sonic results can be obtained with either brass screws or titanium screws.

Aluminum is too soft and does not give enough coupling for perfect energy transfer.

Stainless steel screws have a minimum of magnetism - do not use them. You will lose sound quality.

Do use, if possible, a torque driver with precisely adjustable settings.

For M2.5 cartridge screws please use torque settings according to 80-90% of maximum as recommended by German engineering norm for DIN 912.

This ensures perfect energy transfer - and thus gives you the most dynamic and detailed, uncolored sound from your cartridge.

Detailed recommendations regarding mounting screws, settings and special tools are available from acoustical-systems upon your request.

Now look at the counterweight again. Rotate it back or forth to balance the cartridge in free levitation.

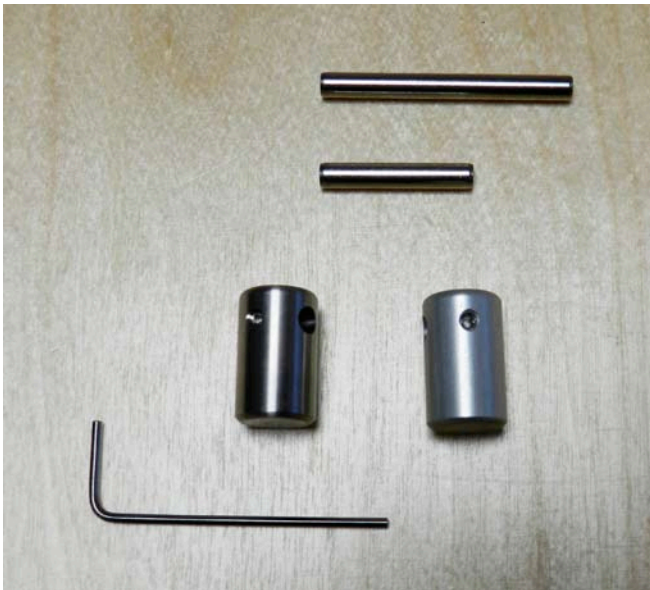
Now set the black VTF scale at the counterweight's end with "0" to 12 o'clock position.





Next rotate the counterweight clockwise till the desired tracking force in grams shows at the 12 o'clock position.

This indication of VTF is only an estimate - always check the actual tracking force with precise electronic VTF-scales.



In case you are working with an unusually heavy cartridge weighing in at more than 25 grams, you may need to use both lateral weights to counterbalance that cartridge.

It is unlikely, that such a cartridge is used - however we never know what the future brings and your AQUILAR is able to counterbalance a wider range of cartridge weights than most other tonearms.



There is a 2nd - longer - 4 mm stainless steel rod provided in the tubular plastic tube inside the accessory box.

If you use a cartridge with weight exceeding 25 grams, please use this 40 mm rod and position it in the cross-through hole at the end of the counterbar.

Fix it lightly in place like pictured.



Now position the aluminum lateral weight left (outward) of the counterbar and the stainless steel lateral weight right (inward) onto the 4 mm rod.

The aluminum lateral weight has to be positioned as pictured, otherwise there is no perfect lateral balance possible.

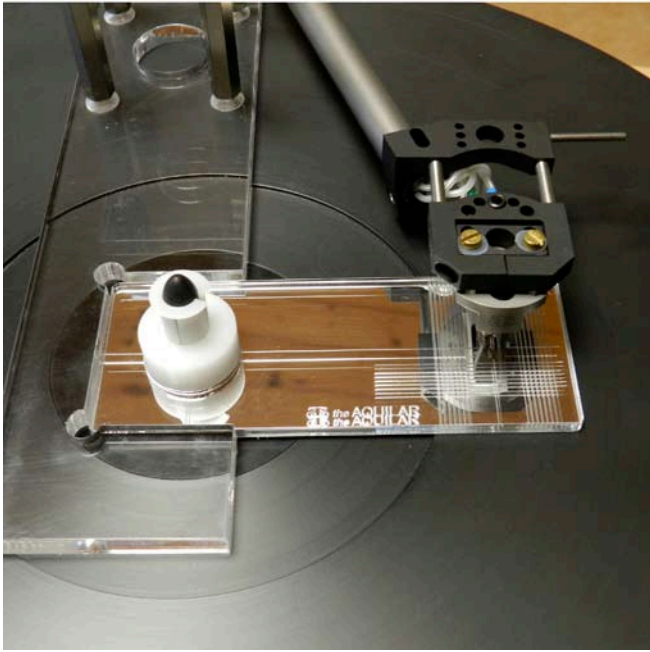
The following pictures illustrate the setting from different angles.



As you have already mounted your cartridge, it is now time to align it and to get accustomed to the alignment options your AQUILAR has to offer.

This will give you insight into the unparalleled complete set of alignment settings needed to extract the last bit of possible performance from your cartridge.



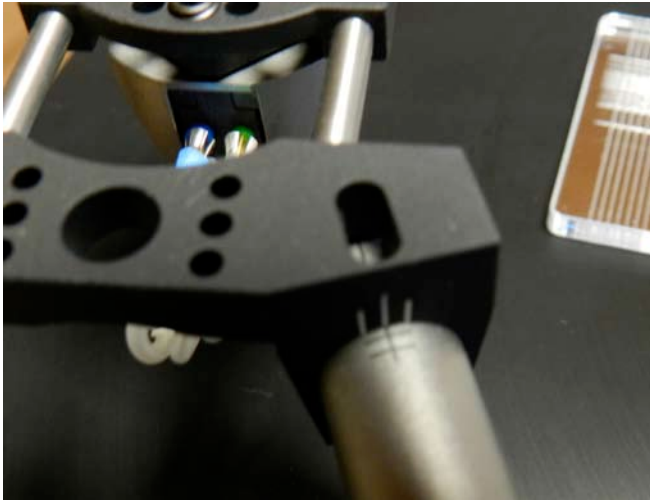


The AQUILAR's mirrored alignment template ensures a super precise 1-point alignment to the UNI-DIN tangential curve.

The AQUILAR's geometry is tailored to the UNI-DIN geometry designed and introduced by acoustical-systems in 2011.

If you are interested in the background of this all-new tangential alignment - please check back on acoustical-systems.com website for an essay I have written about UNI-DIN and its unique features.

Make sure that the stylus meets the single point sweet spot in the mirrored template while your cartridge's cantilever is in line with the center line behind the sweet spot.



The template features the same precision and construction as our SMARTractor universal alignment tool.

Should you need to adjust azimuth, please look at the rear collar of the AQUILAR's headshell.

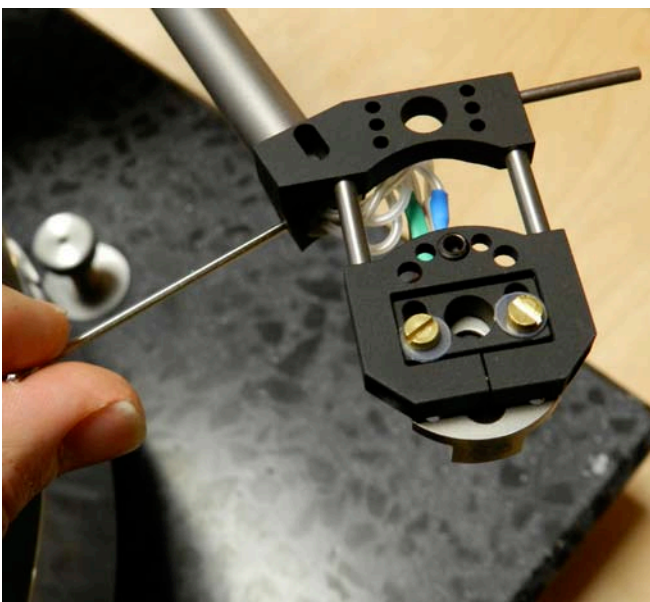
The markings will allow easy return to former settings and give you a good indication of direction and position.

You need to completely loosen the inward pointing lock screw on the left hand lower side of the headshell's collar, using the long silver Allen key.

The question will come - thus I will answer it right here: Why is the headshell lock screw located left side for left hand operation and not right (outward) side?

Well, why not? - Actually half the world's population is left handed .... as is the majority of our staff!

Do lock the screw again after finding the right azimuth.

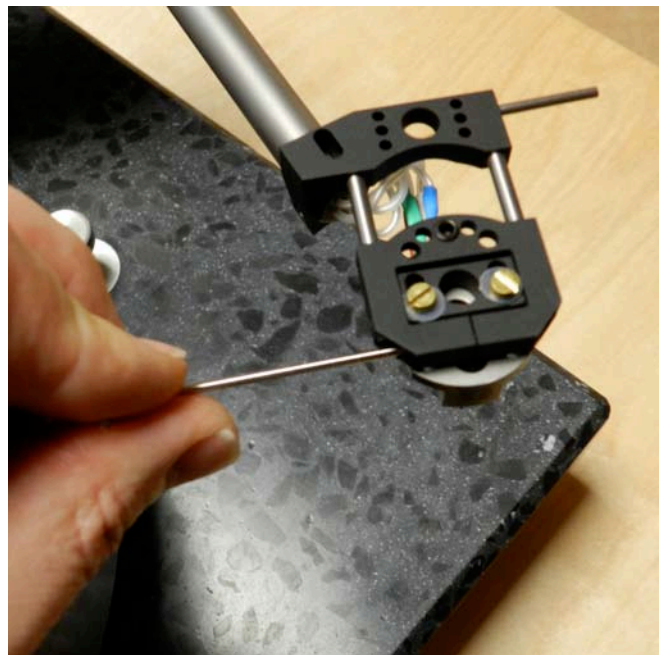


The AQUILAR is one of only two tonearms on the market - the other being its "brother" the AXIOM - allowing you to set SRA and VTA at the cartridge without altering static settings.

If you need to adjust SRA / VTA, first loosen the hidden screw on the left front side in the AQUILAR's headshell.

This screw actually tightens a clamp fixing the mounting plate in place.

Untighten this clamp by turning the screw anti-clockwise for half a revolution - 180° turn of the Allen wrench.

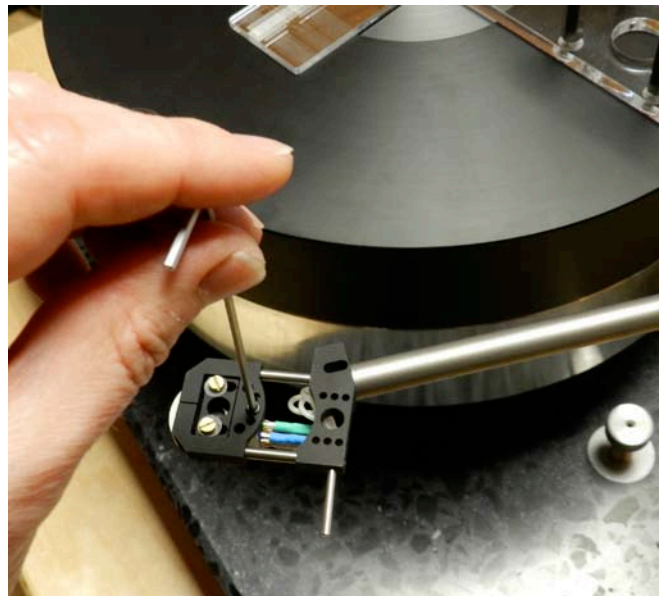


Now take the largest black Allen key in the accessory box for adjusting the grub screw at the rear top end of the headshell.

Clockwise rotation will turn down the tail of the cartridge and thus will decrease the SRA°.

The total mounting plate angle allows for freely changing SRA for most all cartridges from 97° down to 84°.

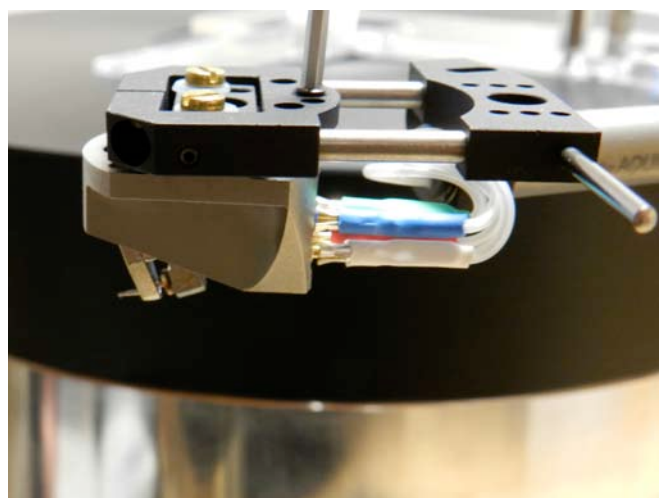
To accomplish this for other 10" tonearms you would need to move them up and down their towers by more than 2.5" up and 2.5" down - practically impossible.



Likewise this change in SRA will of course also influence the VTA angle of your cantilever.

To raise the SRA° make some "room" first by turning the set screw up to the desired position. Now with 1 finger carefully press the rear bottom of your cartridge upwards.

When done, please tighten the headshell clamp again by turning the screw clockwise.





## Levelling the AQUILAR's pivot

Another very important feature in the AQUILAR which is rarely found in tonearm designs - The AQUILAR allows the precise levelling of the horizontal pivot plane - independent from the armboard or turntable plinth.

This is where the 3 spikes in the upper mounting plate come into action.



Please take the long sliver ball-head Allen key and position the small blue precision spirit level on top of the 12 mm pivot plate.

Adjust the position of the spikes so that the spirit level bubble is centered. The 3 spikes in 120° on a circle to each other allow for precise levelling. Adjusting the top of the spike clockwise makes it go down, thus lifting up that part of the upper mounting plate and results in the bubble moving towards that spike.



After a few moments you will get used to this procedure and will have no problems getting perfect level of your pivot in just 1-2 minutes.

Peek at the spirit level from directly above the pivot by using only your dominant eye while closing the other.

This is to make sure you have no parallax error in your sight during this setting.

When perfect pivot level is achieved, please fix the central M5 mounting screw, as mounting is now complete.

## Raising or lowering the AQUILAR's pivot plane

Unscrew the lock screw on the inward side of the VTA tower by turning it 90° anti-clockwise.



Just a quarter of a revolution of the lock screw - 90° - is enough.

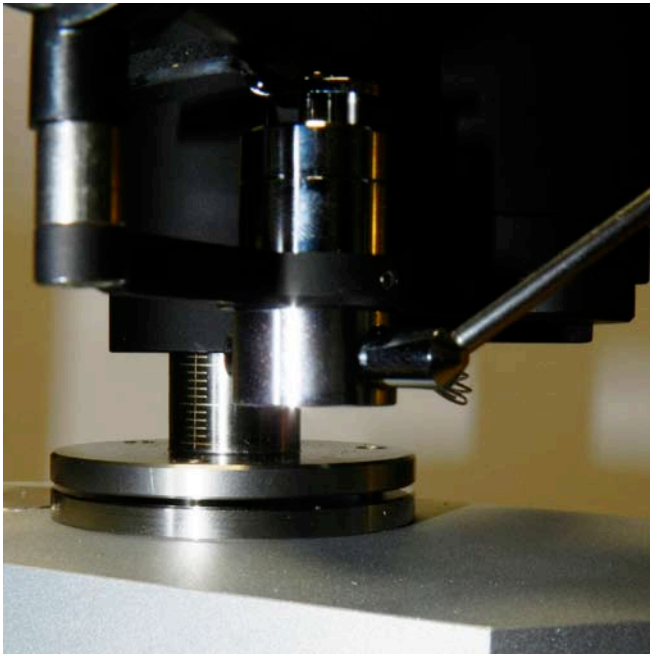
Now you can lower or lift the AQUILAR by turning the top screw.

### **IMPORTANT - PLEASE NOTE:**

We always recommend doing all adjustments requiring hand action **ONLY** while the stylus is lifted off the groove.

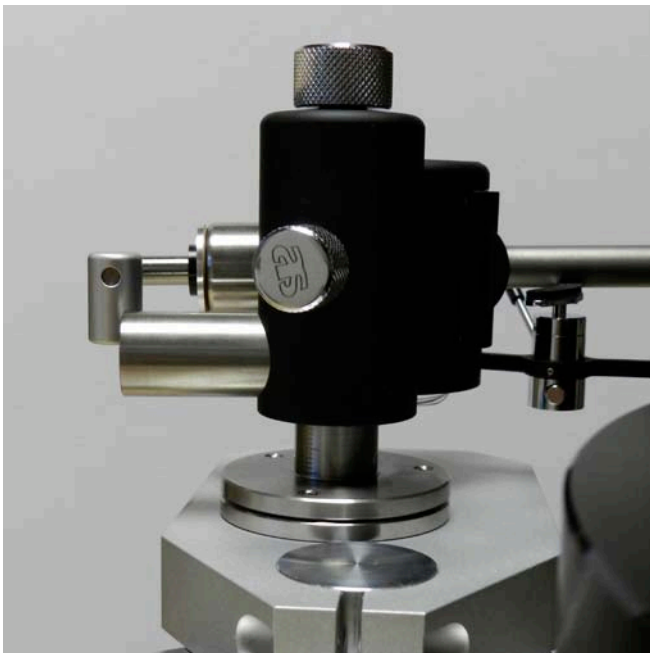


After you have reached the desired height, please fasten the side lock screw again.



The AQUILAR features (2) laser engraved height scales in its inner stainless steel pillar.

One height scale is visible from the front and the other is visible from the inward side.



If you muse to mount the AQUILAR as a “secondary” tonearm on a turntable featuring 2 or more arms, know that we have specially catered for this by providing this additional feature of the 2nd scale on the inward pointing side.

## Removing the fingerlift

The AQUILAR allows for the easy removal of the fingerlift.

Please select the smallest black Allen key from the accessory box.

Undo the rear M2 grub screw at the upper left of the headshell's rear.

It fixes the fingerlift in place.

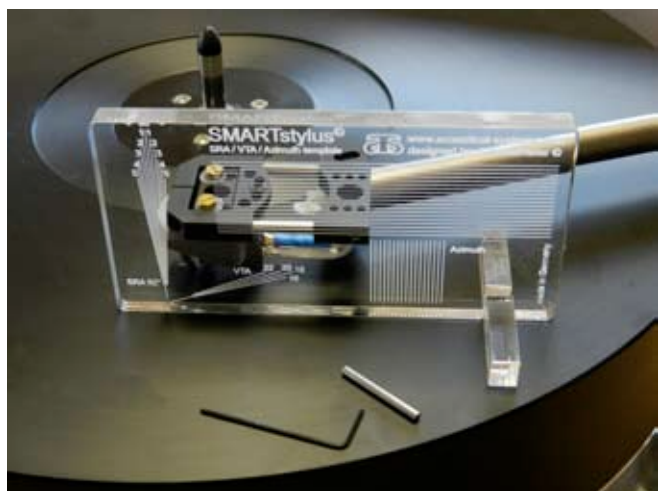
Undo the screw and remove the fingerlift.

You can easily restore the fitting by reversing this routine.

This feature was incorporated for 2 reasons - first to offer the purist the option to eliminate another “not necessary” feature.

But also to allow for perfect close use of the SMARTstylus - thus paving the way for easy and fast fine-tuning of SRA and VTA - to a level hardly possible otherwise.

Don't underestimate the fundamental positive effect of this additional alignment option of the SMARTstylus - especially when made possible in this close perspective! - It can enable you to achieve the ultimate level of performance from your analog set-up.





## Exchanging the cartridge mounting plate

Should you ever need or want to exchange the mounting plate, you can easily do so by turning the 2 small black ball plunger grub screws on each side of the headshell.

Undo them by 1-2 revolutions anti-clockwise.

Now undo the front clamp lock screw - just 1 revolution anti-clockwise - and you can remove the mounting plate (press down to remove) and insert another mounting plate. If interested in additional mounting plate(s), please ask your dealer for details.

Turn back the M2 ball plunger grub screws on each side and tighten the lock screw to close the headshell's clamp again.



## Setting antiskating

It is best to set antiskating last - after lateral balance, cartridge alignment and precise levelling of the pivot plane have been achieved.

Otherwise the antiskating would further have to battle with uncertain and parasitic side forces due to the pivot plane not being dead level - and/or the inevitable breakdown torque force in all pivot tonearms not being compensated by lateral balance and thus applying additional force on the inward groove wall, directly resulting in extra skating force.

The antiskating is applied by turning the knob screw on the side of the top right of the bearing housing inward i.e. clockwise rotation.

On its tip is a magnet which interacts with 3 magnets on the inner vertical bearing house.



Thus compensating skating force is achieved without friction and in dynamic mode - in correspondence to the tangential curve.

After lateral compensation and pivot balance having been achieved, the skating force depends to a considerable degree on applied tracking force and stylus shape. This is also the reason why you do not find an “antiskating” scale here. It would - in most all cases - be misleading.

For best results, I strongly recommend not just trusting a “skating force track test record”, but use a good, pure - and demanding in its dynamic scale - acoustical recording of a single voice with guitar to perfect the fine tuning of the antiskating setting.

Opus3 and similar audiophile purist labels do offer many such well suited recordings.

Now you are done with mounting and initial set-up.

Thank you for your care and patience while following me through this manual.

For the dedication and precision you have applied to mounting and aligning your AQUILAR, you will be rewarded with endless hours of the most detailed, colorful, dynamic and distortion-free sound from your favourite records.

We did our best to provide as complete a manual as possible. Should you have any comment or constructive criticism to share, we would very much appreciate to hear from you and your experiences. Feedback for us is very important and helps us to further improve our designs - by tuning them to your needs and demands.

Please do contact us - we highly value direct feedback from the experienced users of our components.

After all - the AQUILAR was designed for you.

## Specifications

- Geometry: UNI-DIN
- Effective length w/Loefgren A: 254 mm
- Pivot to Spindle: 238 mm
- Offset angle: variable approx. 17° - 25°
- Overhang: variable approx. 5 to 16 mm
- Effective moving mass net: 11.4 grams
- Inner wiring: soft aged pure silver litz wire
- Resistance inner wiring: 0.9 Ohms/m
- Capacitance inner wiring: 25 pF/m
- Cartridge weight balanced: 5.2 to 30 grams

Adjustment ranges:

- Pivot plane adjustment: +/- 6° horizontal
- Arm wand height adjustment: 15 mm
- Offset angle adjustment: +/- 4°
- Overhang adjustment: max. 11 mm
- Azimuth adjustment: +/- 8°
- SRA angle adjustment: 97° to 84°
- VTA angle adjustment 28° to 14°

***Now enjoy your records!***

Distribution of Presents; Band 4—No. 5. Scene  
and Grandfather's Dance

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