

## **Model CB Instruction Manual**

by Thrax Audio

### **Operating Manual**

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Dear Customer

Congratulations! You have purchased a unique tonearm that will allow your cartridge to faithfully transcribe every detail embedded in the groove, thus providing the most musically enjoyable reproduction from your vinyl records. The tonearm features ceramic hybrid bearings of the highest quality, reducing bearing friction to unprecedented low levels (<2mg), ensuring years of trouble free performance. To take full advantage of this inherently superior design, please take the time to study and familiarize yourself with this manual.

I hope you will enjoy mounting and adjusting the tonearm and rediscovering your record collection.

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## 1) MOUNTING THE TONEARM

Mounting the arm requires drilling a 23,5 mm (0.925 inch) to 25,4mm (1 inch) max. hole (same as a Rega mounting hole) in your plinth or armboard plus a single (tapped) hole for the mounting screw (**A.1**, non-magnetic M6, supplied with the arm).

The pivot to spindle distance for your arm measures 222mm(267,5mm for CB-L). Please study the mounting schematic for the correct placement of the teardrop shaped mounting collar (**A**) and its mounting screw. Deviations from the suggested orientation are permissible as long as the mounting collar (**A**) doesn't interfere with the arm's counterweight, while maintaining the p-s distance of 222/267,5mm.

Once you have found a suitable position and drilled/tapped the M6 hole, screw the mounting collar (**A**) to the base or plinth of your tonearm using the supplied M6 screw or, if your turntable features a wooden plinth, a suitable brass or stainless wood screw.

If you need to secure your arm (i.e. when carrying the turntable around), please use a rubber band. The arm doesn't feature a locking mechanism as these always leave marks with time AND resonate. There is no risk in omitting this feature as the arm's design doesn't allow for the cartridge to be "dropped" onto the plinth or mounting board.

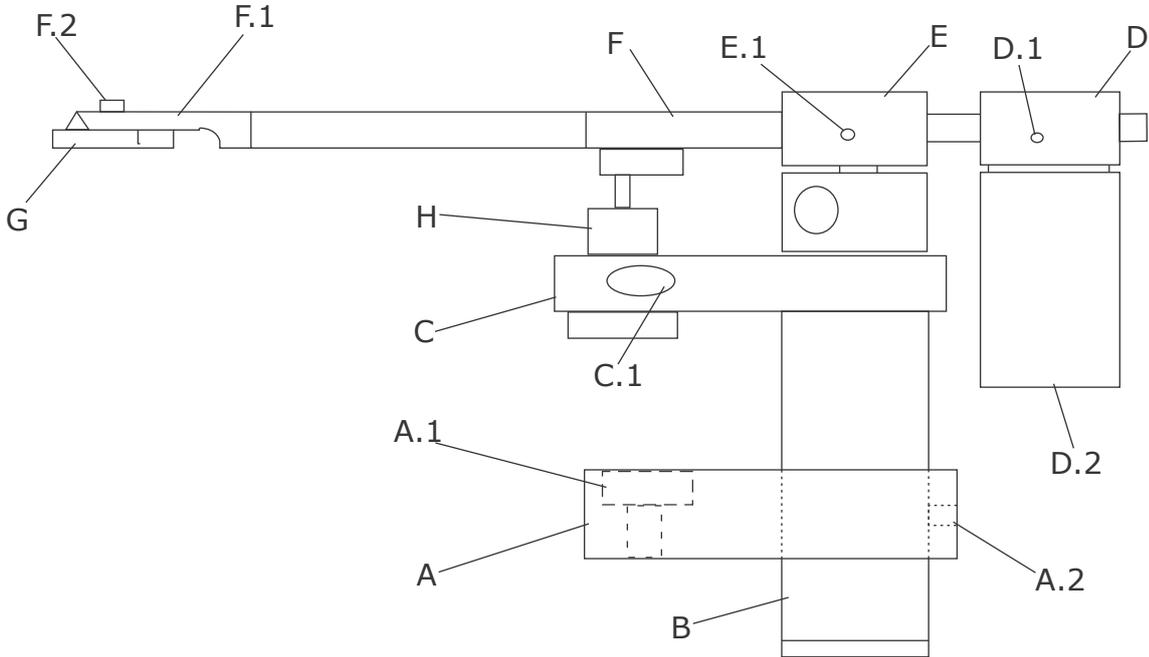
## TONARM SCHEMATICS

The following schematics will help you identify the tonearm parts including the set screws necessary to properly align your arm and cartridge:

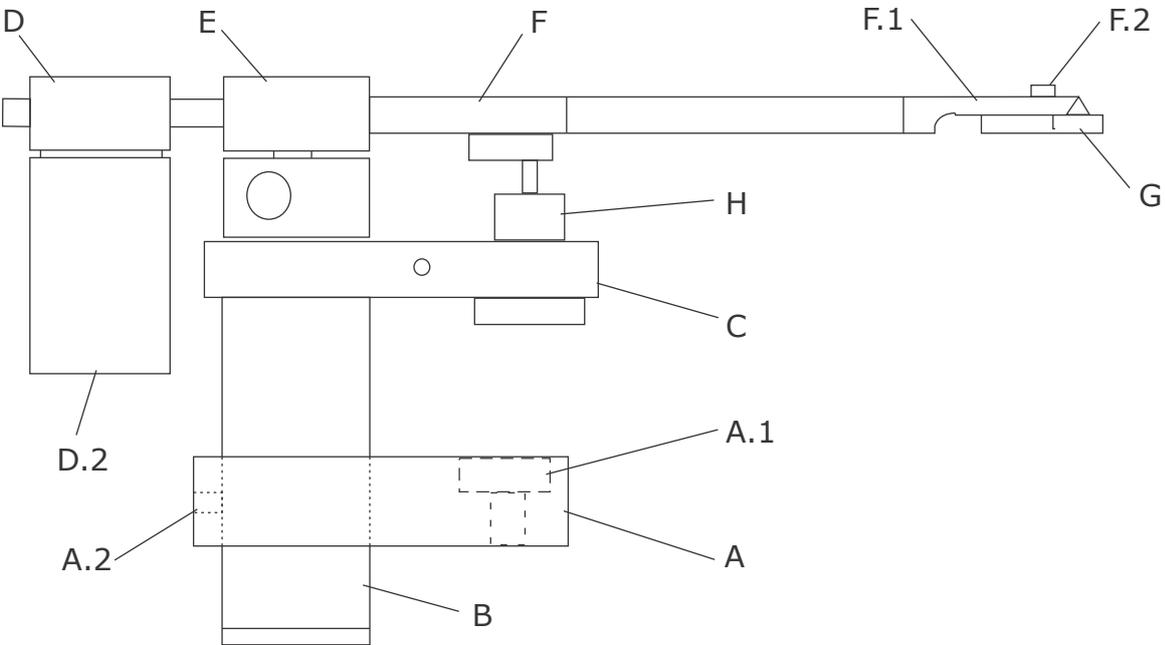
- A: Mounting collar
- A.1: Mounting screw, M6, cylinder head
- A.2: Mounting collar set screw
- B.: Arm shaft
- C: Lift holder bar
- C.1: Antiskating adjustment screw
- D, D.2: Counterweight
- D.1: Counterweight set screw
- E: Armwand receptacle
- E.1: Armwand(azimuth) set screw
- F: Armwand
- F.1: Headshell assembly
- F.2: Headshell set screw
- G: Cartridge mounting plate
- H: Arm lift
- H.1: Lift bank

# TONARM SCHEMATICS

Arm seen from left:

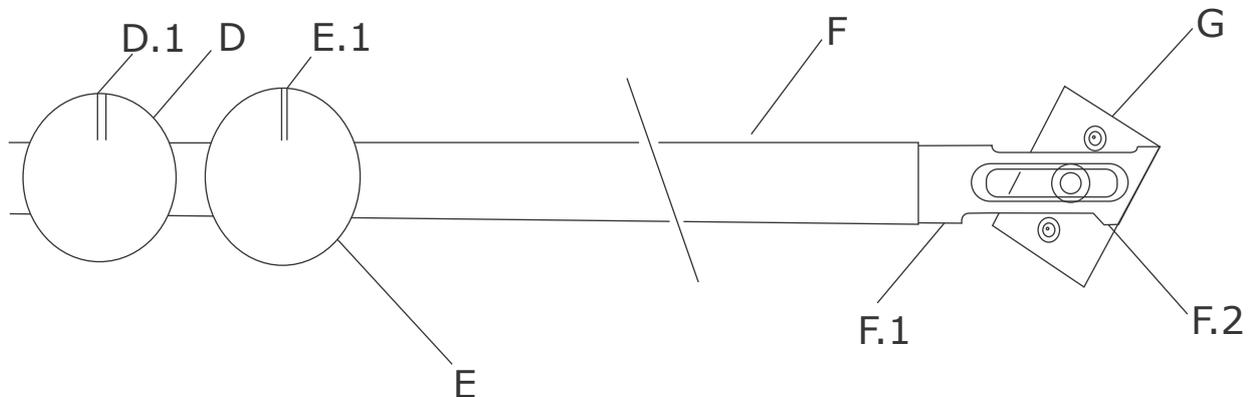


Arm seen from right:



## TONARM SCHEMATICS

Armwand/counterweight assembly, seen from above:



## 2) THE TONEARM WIRING

This tonearm comes standard with a cable that was chosen for its sonic and mechanical properties. The signal is carried in a single run from the cartridge clips to the headamp, step-up transformer or phono stage omitting additional soldered or plugged connections..

The wiring exits the tonearm shaft through a disc that acts as a strain relief. Do not loosen either of the two set screws on the lower end of the shaft or the disc at its very end, as this will disable the strain relief and may result in damage to the wiring.

## 3) ELECTRICAL CONNECTIONS, GROUNDING

The conductors/connectors are colour-coded according to the international standard:

Red = right channel, hot ; green = right channel, ground ; white = left channel, hot ; blue = left channel, ground .

RCA plugs: red = right channel ; black = left channel

The standard wiring is shielded from the arm to the RCA-plugs. The "ground" wire is to be connected to the following amplification stage's "ground". If you use a "star grounding" pattern, connect the ground wire to your "central" ground.

## 4) ADJUSTING YOUR TONEARM/CARTRIDGE

4.1)

### **Alignment of the arm relative to the turntable**

After the arm collar (**A**) has been screwed down to the arm board or plinth (excessive force is not required), first insert the wiring, then the shaft (**B**) into the collar (A) as far as it is required to end up with the armwand (**F**) roughly parallel to the platter. Then turn the shaft (**B**) so the tonearm in its resting position (armwand at rest close to the right end of the lift bank) will be parallel to the right side of the turntable plinth or so it's visually agreeable in case your turntable has an irregular or circular shape. Any position is fine as long as the armwand will be within range of the liftbank throughout the usable record radius.

4.2)

### **Mounting your cartridge**

The cartridge can be mounted to the cartridge mounting plate (**G**), using the supplied M2.5 non-magnetic stainless steel screws while the plate is "off" the tonearm. First separate the mounting plate (**G**) from the armwand by unscrewing the headshell set screw (**F.2**). Usually it is sufficient to tighten the M2.5 screws well, but not excessively so. Overtightened screws can result in tension build-up within the cartridge body, negatively affecting the sound or even damaging the internal structure. Don't forget: the next step after "REALLY tight" is "totally loose" :-).

Attaching the mounting plate (**G**) to the armwand requires re-tightening the headshell set screw (**F.2**). The applied torque should be varied from just finger tight to "reasonably" tight, excessive application of force is not recommended (see paragraph 5).

4.3)

### **Tracking force, overhang and tangency ("zenith")**

Take the counterweight (**D.2**) and slide it onto the back section of the armwand (**F**). Leave your "stylus cover" (if your cartridge features such a device) on and set the tracking force to approx. 1.5 gr. Tighten the counterweight set screw (**D.1**) just so that you can still slide and turn the counterweight without applying too much pressure.

The small fine tuning weight that extends from the end stub will allow for changing VTF within +/- 0,15gr, enough to fine tune tracking force.

## ADJUSTING YOUR TONEARM/CARTRIDGE

Using a proper template (i.e. Dennesen, Wallytractor, AccuTrak, Dr. Feickert or the one supplied with the arm), overhang (stylus exactly ON the zero/nullpoints) is now adjusted by first loosening the screw (**F.2**) just so it barely "grips", then sliding the cartridge mounting plate (**G**) towards or away from the arm's pivot.

Next, check the tangency of the cantilever (at the zero-points) as seen from above/front – hold the armlift so that the stylus is not quite touching the alignment gauge – and if necessary, raise it again and turn the headshell mounting plate – without sliding it forward or backward again –, making sure the cantilever (not the cartridge body) is tangential to the record. Finally, tighten screw (**F.2**) again. Using the supplied template will result in achieving a proper (according to Baerwald) "outer" zero-point (120.9mm) alignment once you have managed to get the "inner" zero-point (66.04mm) alignment right. Other methods to achieve the alignment of your choice (i.e. Loefgren, Stevenson – not recommended unless your collection consists mostly of 7 inch records) can be applied.

If the cantilever of your cartridge is aligned perfectly parallel with the sides of the cartridge body (rarely the case!), you'll find the front of the headshell plate to be perfectly parallel with the front of the headshell (**F.1**). The cartridge mounting plate (**G**) has bevelled/polished edges to make it easier to see slight deviations from parallel alignment relative to the front of the headshell (**F.1**).

A "non-parallel" cartridge mounting plate alignment is therefore required if the cantilever isn't perfectly aligned (parallel) relative to the cart body.

Now set the tracking force to the value recommended by the cartridge manufacturer by sliding the counterweight (**D**) again forward or backward on the end stub of the armwand. It is recommendable to use a high quality digital gauge, but even the venerable Shure "see-saw" gauge will yield dependable, if only low resolution measurements. This is because the CB arm is a neutral balance design, so changes in VTA, record thickness or measuring "height" of your VTF gauge will not change VTF setting.

4.4)

### **VTA/SRA (Vertical Tracking Angle/Stylus Rake Angle)-adjustment**

As a starting point you should raise or lower the tonearm until the armwand (F) appears to be parallel to the record surface with the needle resting in the groove. Just unscrew the VTA-set screw (A.2), then slide the shaft (B) up or down until this has been achieved. The fine adjustment has to be carried out using your ears and/or

## ADJUSTING YOUR TONEARM/CARTRIDGE

a software based analysis of the intermodulation distortion. Raise or lower the arm by small increments (1mm at first, then 0,5mm) until you have reached a position that combines precise placement of images with an effortless delivery of dynamic contrasts. Sibilants should come from the same position in space as the singer's head, not from a point in front of it!

4.5)

### **Antiskating**

To compensate for the skating force turn the antiskating-adjustment screw (**C.1**) clockwise to increase force and counter-clockwise to reduce it. Skating compensation will always be a compromise because the required compensation force for a given VTF depends up stylus geometry, the quality of the polished contact zone, the vinyl formulation, the modulation level, arm bearing friction, etc. The skating force compensation of the Schröder CB is sufficient for a tracking force up to 2,3 gr. Upon request higher tracking forces can be compensated for by exchanging the antiskating screw (please contact your dealer). In any case a slight under-compensation is always to be preferred over even the slightest overcompensation. The use of most test records and their "torture tracks" ( $>80\mu$ ) will yield too high a compensation because there are no continuous signals of this magnitude on any record. As a start, just put the

diamond on the space between the leadout grooves (or use a "blank" record, i.e. Cardas sweeper record) and adjust antiskating until the arm/cartridge combo wanders slowly towards the center of the record.

From then on, use your ears...

## 5) FINE TUNING

Everyone who has to mount cartridges frequently understands the importance of precisely adjusting an arm/cartridge combination to realize its full potential. The not so technically minded consumer should likewise realize that his hard earned money is wasted if the arm cartridge combination is aligned "just so"...

Overhang, azimuth, VTA, tracking force and, if featured, variable damping of the arm movement are all important parameters.

The overhang adjustment was described already. Nevertheless, let me add that a single "perfect" overhang setting does not exist. Should you own a lot of records that are cut close to the inner groove you might consider using 63mm instead of 66mm as your inner "zero point" – many crescendo finales of symphonic works could be tracked with lower distortion this way.

On the other hand there are a lot of "Pop-records" with no modulation, but an earlier leadout groove where the "inner" zero point is located. In such cases, one doesn't even benefit from this second distortion minimum.

For an arm of 239,3mm eff. l. (like the CB arm) a "correct" overhang adjustment (after Baerwald) results in average tracing-error-related tracking distortion barely higher than 0.4%.

Next, the azimuth should be adjusted so that crosstalk is the same for both channels. With a "perfect" cartridge (equal output on both channels, perfectly assembled generator/cantilever/stylusassembly), this can be done by using a mono record played back via an X-adaptor or through your preamp switched to mono.

Reverse the headshell clips on one channel only (switch red and green i.e.) and adjust for the weakest signal coming from your speakers.

It's better to adjust for equal crosstalk using a proper test record or, better yet, use Dr. Feickert's Adjust Plus software.

Caveat: This method will only yield a perfect setup if the stylus is mounted at +/- 45° relative to the coil assembly. For a perfectly perpendicular alignment of the stylus in the groove (important for all cartridges featuring styli with contact radii of 5µ or smaller) it may be required to sacrifice perfect crosstalk symmetry for a symmetrical positioning of the stylus relative to the groove walls!

## FINE TUNING

Azimuth on the CB arm is altered by loosening the armwand set screw (**E.1**) enough to allow turning the armwand (**F**) clock- or counter-clockwise until the headshell plate appears to be parallel with the record surface (as a starting point). If the resulting image stability leaves something to be desired, turn the armwand in small increments clock- or counter-clockwise. This will allow you to compensate for minor misalignments of the stylus/cantilever assembly. Once you've "hit the nail on the head", a centrally recorded female voice should be precisely located in space with no difference in the decay characteristics between channels. Starting with the armwand parallel to the record surface, VTA adjustment should be carried out in small steps until the best separation between individual instruments in space, the least amount of "grain" audible and the best integration of fundamentals and upper harmonics is achieved (see above). There is no "perfect" position - varying record thickness and a different cutting angle used for most records made before 1965 necessitate a new setting for every other record (if you want to get the absolute "best" out of each record). Stylus shapes are also more or less susceptible to changes in the VTA - generally speaking, the "sharper" the stylus (smaller radius, longer contact zone), the more sensitive it is to changes. The more time you spend on adjusting the VTA, the less you'll get to actually enjoy your records.

The tracking force determines the tracking ability and also the position of the coils in the magnetic generator. Follow the manufacturer's recommendations and try increasing or lowering the tracking force by increments of 0.05gr. Low frequency tracking ability shouldn't be (much) lower than 70my. Soundwise the high frequency tracking ability is more relevant. The appropriate tracks on the Shure TT115 test record are helpful to get closer to the optimal tracking force.

Again, being able to "sail" through every torture test doesn't mean your setting is perfect. Too high a tracking force will help cope with demanding test records, but a proper load on the cantilever/damper assembly is much more important to ensure maximum dynamics.

The counterweight (**D**) features a bottom element (**D.2**) that can be screwed to its upper counterpart more or less tightly (a polymer element gets compressed up to a point where finally "hard" contact is made. The level of tightness will affect bass performance(energy and tightness) and should be experimented with.

The amount of tightening of any of the arm's screws has an influence on the energy transmission and dissipation and should be experimented with. Generally speaking, only screws **A.1** and **A.2** should be tightened well. Screws **D.1** (tightest), **E.1** (less tight) and **F.2** (seldom more than finger tight) require some experimentation.

## GENERAL INFO

Should you have any questions regarding mounting/adjusting or technical details of this tonearm, feel free to contact us via phone or email.

Equally welcome is any sort of criticism or suggestions for improvements.

Yours truly

Frank Schröder

General info:

Eff. Length: 239,3/282mm

Pivot to spindle distance: 222mm/267,5mm

Offset Angle: 23°, 19,35°

Eff. mass with supplied cartridge mounting plate: 14gr – (19gr with optional heavy cartridge mounting plate, 12,5gr. with ultralight cmp), regular CB-L models are 3gr heavier

Shaft diameter: 23mm

Distance between mounting surface and platter level: ~25-60mm, best:~30-35mm

Ceramic hybrid bearings with unprecedented low friction: <2mg vertically, <3,5mg horizontally

Internal magnetic damping for the horizontal movement

Frictionless, resonance free magnetic antiskating

Cryogenically treated, low loss, high purity copper wiring (single run from cartridge clips to

RCAs), 1m from arm to RCAs, featuring a very low capacitance(<40pF total)

