

WALLYTRACTOR UNIVERSAL v2.2

INSTRUCTIONS

The following instructions will be made much easier to understand if you can see it in action first! Go to the WallyAnalog Tools Setup Tools YouTube channel, click on the Playlists tab and watch the WallyTractor Instructional Video Series from start to finish.

PREPARATION FOR ALIGNMENT PROCESS

Ensure your stylus remains safe by rolling back your sleeves or removing any garments with hanging sleeves. Remove hanging necklaces, lanyards, etc. from around the neck that could get caught on the tonearm or cartridge. Have plenty of lighting on the platter area. Turn off your system to protect the speakers.

Use the WallySkater to measure for any horizontal forces within the tonearm when anti-skating mechanism is set to zero. If the reading is more than 5%, call WallyTools to discuss the situation as such forces will cause misalignment of the cantilever unless certain measures are taken.

Confirm the headshell is level on the azimuth axis (left-right when looking at the front of the cartridge from record level) before using the WallyTractor. Eyeballing it may be fine but using the WallyReference provides certainty. By way of reference: azimuth that is 2 degrees off of level results in 1 degree of visual error when aligning the cantilever on most cartridges (exact figure depends upon cantilever angle). If you do not adjust for this, your cantilever will LOOK aligned with any protractor, but will actually be misaligned.

INSTRUCTIONS

1. Identify the Effective Length of your tonearm. If you do not have this information, skip to the “Measuring Spindle to Pivot Dimension” supplementary section. *Effective Length = Overhang + Spindle to Pivot*
2. Secure turntable platter with tape or small wedges so platter does not rotate
3. Disengage the anti-skating device on the tonearm (or adjust to zero)
4. Set the Vertical Tracking Force (VTF) to your desired amount. Always make this measurement AT RECORD HEIGHT and stay within the cartridge manufacturer recommended VTF range.
 - a. “At record height” means on most VTF scales (except a WallyScale) that the scale should be placed directly on the platter, not on a record.
5. Place the WallyTractor on the turntable platter and find the arcs corresponding to your tonearm’s effective length – ensuring you are using the arcs on the chosen side of the WallyTractor
 - a. For linear tracking arms, use one of straight lines
6. Choose either the Lofgren or Baerwald alignment
 - a. Lofgren gives overall lower distortion over the entire playing surface. However, if your record collection is predominantly older classical

productions – or has the innermost grooves cut closely to the record label, Baerwald may be preferable for you.

7. Identify the 0 position at the outer edge of the WallyTractor
8. With the stylus suspended over the WallyTractor – NOT touching it - spin the WallyTractor until the stylus falls into the groove of the chosen arc when the arm lift is lowered
 - a. To protect the cantilever and to ensure accurate alignment, NEVER spin the WallyTractor when the stylus is resting on it
9. Without moving the WallyTractor at all, lift the arm and place the stylus toward position 1, near the spindle. If the stylus falls outside of the arc, move the cartridge towards the tonearm pivot by the same distance that the stylus falls outside the arc. Likewise, if the stylus falls inside the arc, move the cartridge away from the tonearm pivot. See Fig. 2 & 3 for illustration of this.
10. Now move the cartridge back to the 0 position and realign the stylus in the selected Loefgren or Baerwald groove by spinning the WallyTractor so the stylus can fall into the groove of the chosen arc once again.
11. Again, position the stylus back to position 1 and check that the stylus is in the groove of the arc. Repeat from step 9 until stylus will be in the same groove at position 0 and 1. It is VERY important not to move the WallyTractor or platter after alignment at position 0
 - a. Take time to get this exact. Double-check your work by placing the stylus in the arc at several points along the arc. You are now assured that the adjusted effective length and overhang are according to the requirements for optimum geometry of your tonearm-cartridge-cantilever assembly.
12. IF YOU CANNOT ACHIEVE IDEAL HORIZONTAL STYLUS ALIGNMENT SKIP TO THE SUPPLEMENTARY SECTION TITLED “MEASURING SPINDLE TO PIVOT DIMENSION” AT THE END OF THIS DOCUMENT AND CONTACT US
13. If you know your stylus/cantilever zenith error, STOP HERE and refer to the WallyZenith Instructions to continue the alignment process.
14. Re-check your VTF and adjust as necessary
15. Practice eliminating *parallax error*. See Figure 1 for illustration of the following:
 - a. Lift the arm and place in arm rest.
 - b. Find any one of the small triple parallel line sets that intersect the line radiating from the center to the edge of the WallyTractor and spin the WallyTractor so the triple lines are pointing right at you.
 - c. Using the magnifying glass on one of these parallel triple line sets, notice the lines have reflections in the mirror. Move your head around so you can see these reflections move relative to the lines themselves. When you see ONLY 3 parallel lines (i.e., no reflections of lines which make it appear to be 6 lines) then you have the perfect location of your eye with respect to the lines (no parallax error). This will be very important in the alignment of the cantilever.
16. Move the arm/cartridge to position 2, selecting the set of 3 parallel lines which correspond to your alignment selection (Baerwald or Loefgren). Spin the WallyTractor so that the stylus falls at the groove intersection of the center line of the 3 parallel lines and the straight line running from the spindle to the edge of the WallyTractor.

- a. Using the magnifying glass, see if the cantilever is exactly parallel and aligned to the center line. No reflections/parallax error should be visible, as per the practice step immediately above. Move your eye/magnifying glass a little left and right to assure what you are seeing is accurate. The cantilever **MUST** be located such that it appears to be an extension of the center line. See Figure 4 below.
 - b. If the cantilever is not exactly parallel with the center line, loosen one of the cartridge screws and twist the cartridge accordingly. Set the stylus back into the groove intersection at position 2 and check again with the magnifying glass. Be patient and determined for exactness at this point. The next step will give you confirmation of your work.
17. Snug down the cartridge screws.
18. Move the arm/cartridge to position 3, selecting the set of 3 parallel lines which correspond to your alignment selection (Baerwald or Loeffgren). Spin the WallyTractor so the stylus falls at the groove intersection of the center line of the triple parallel lines and the straight line running from the spindle to the edge of the WallyTractor. While adjusting your perspective to eliminate parallax error, confirm the cantilever is perfectly parallel to the center of the three lines. You now have **PERFECT** horizontal alignment for your stylus/cantilever assembly!

For your interest: you can now see the maximum “Horizontal Tracking Angular Error” (HTAE):

About 1 degree (clockwise - negative) at position 4 [Fig. 5]

About 1.8 degrees (counterclockwise - positive) at position 5 [Fig. 6]

The maximum negative and positive HTAE depends on the effective length of your tonearm and accuracy of cartridge installation.

19. Re-check Vertical Tracking Force (VTF)
20. Adjust Anti-skating using the WallySkater
21. Adjust azimuth **ELECTRONICALLY**. Both the visual inspection of cantilever alignment on vertical plane method and the phase cancelling method are **NOT** accurate and cannot confirm maximum stereo separation
22. Check the horizontal alignment of your cantilever every 3-6 months. The reason for this is the break-in of the stylus/cantilever suspension and aging of the damping polymers. Invariably, such break-in and aging cause some degree of drift in the stylus/cantilever location.

ENJOY ANALOG FOREVER!!! - *Wally Malewicz*
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SUPPLEMENTARY SECTION

MEASURING SPINDLE TO PIVOT DIMENSION

THESE INSTRUCTIONS ARE ONLY RELEVANT IF YOU CANNOT REACH YOUR TARGETED EFFECTIVE LENGTH ARC

Using the customized spindle to pivot ruler, centering jig and O-ring, measure the distance to your pivot point. See Figure 7 for proper setup. It is important that the ruler is parallel with the platter.

If you have a unipivot tonearm and are able to remove the tonearm completely to expose the bearing, it is often easier and more accurate to measure to the bearing than to the top of the arm pivot housing.

Collect the following information and email to wallyanalogtools@gmail.com for assistance:

1. Spindle to Pivot Dimension to the nearest 0.5mm
2. Tonearm brand and model
3. Effective length arc you were trying to get the stylus to follow (if this is known)
4. Your name, phone number, best time of day to reach you & your time zone

We will do our best to respond to you within 1 day.

NOTE: if your pivot to spindle distance is off, it does not necessarily spell disaster. Assuming you have enough play in your headshell slots, you can often make up for the misalignment of the pivot to spindle dimension by adjusting the cartridge within the headshell by just enough to get the stylus to fall into the arc on the WallyTractor.

ILLUSTRATIONS

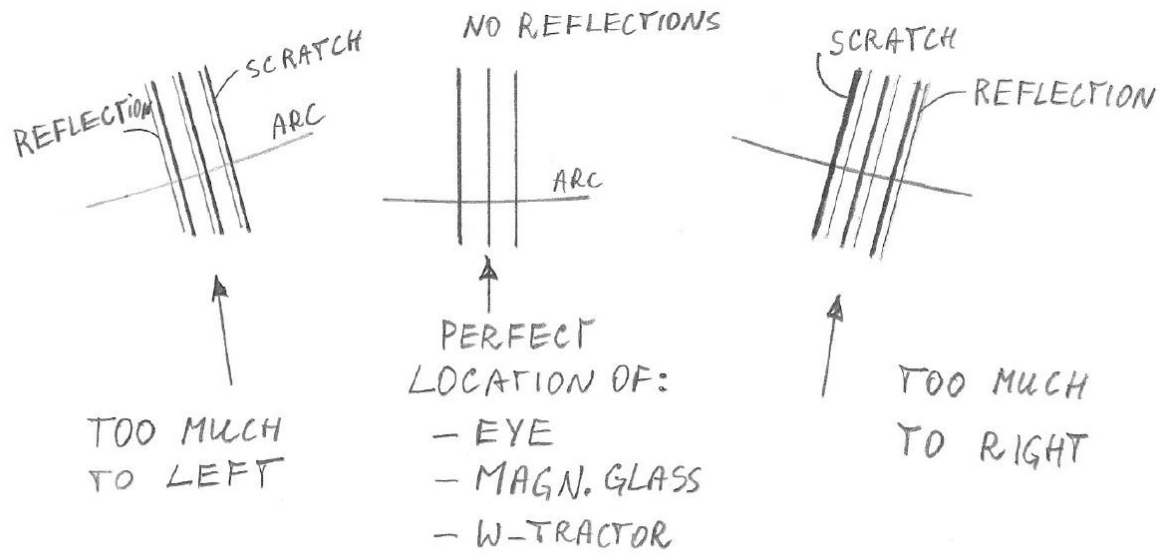


Fig. 1

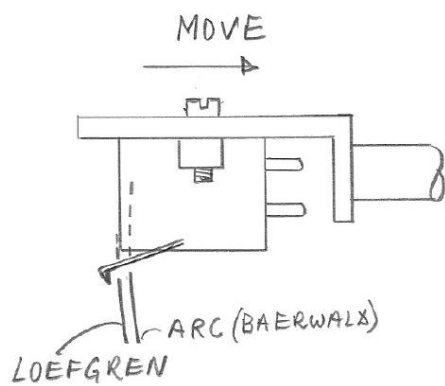


Fig. 2

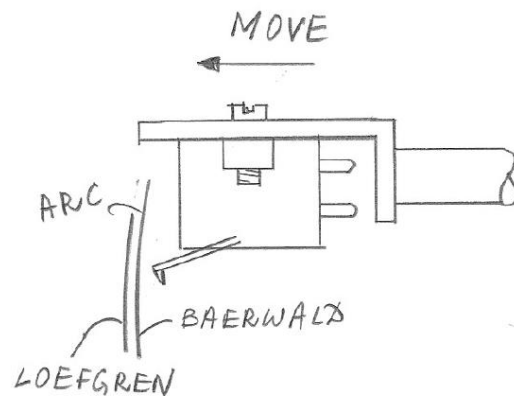
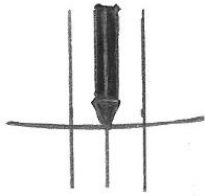
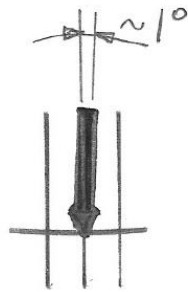


Fig. 3



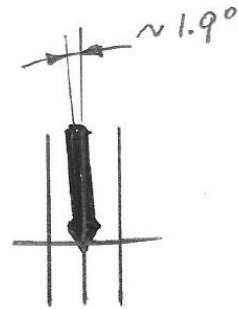
POSITION:
2 & 3

Fig. 4



POSITION: 4

Fig. 5



POSITION: 5

Fig. 6

Figure 7

