

SETTING UP YOUR LINN SONDEK LP12 AND OTHER SUSPENDED CHASSIS TURNTABLES

PART I

We will not go into cartridge alignment and VTA here as the necessity is common to all turntable designs and not peculiar to the Linn LP12. The peculiarity of the LP12 is that its sonic performance depends greatly on suspension setup. The vast majority of Linns in operation have imperfectly set up suspensions and the sound quality of the turntable is often condemned on unfair grounds as a result.

The Linn LP12 is not a high end turntable but it is a good middle-level one which is capable of producing sound reproduction of a quality beyond that which the average enthusiast has ever heard.

Various upgrades, about twenty eight in all, have been introduced over the years. The upgrades have been aimed at greater accuracy and precision. The majority have taken the form of more accurately machined main bearings and spindles, bonded and machined sub-chassis and power supplies with greater control and speed accuracy.

OFFICIAL UPGRADES

At the current state-of-play the ranking of upgrades is as follows:

Please note that, since the time of writing the Keel sub-chassis has been introduced as well as a dc motor. Before investing in these extremely expensive upgrades give thought to whether you are over-capitalizing i.e. if you try to sell the upgraded turntable will you recover a reasonable part of your investment. If not then cut your losses, sell your Linn as is and buy a better turntable.

The top upgrade until The Keel

Lingo power supply provides a total transformation of timing and provides substantial improvements in image stability, speed of transients and bass extension and control. It is expensive but a worthwhile upgrade.

The Cirkus Kit. The best value for money from Linn and second in sonic improvement. You get just about all the mechanicals of the turntable at the modest price of about R6000 (at time of writing!).

The Ekos Tonearm. Not very much better than the Ittok but an upgrade nevertheless. I would hate to think what it costs now.

The Trampolin. This is a second suspension to filter out bass feedback from the support structure it stands on. Generally the turntable sounds worse with the Trampolin than

without so, unless you have a huge problem of feedback, forget the Trampolin.

All the previous upgrades are replaced by the Lingo or Cirkus kit and therefore are of no significance.

PART II

ARM COMPATIBILITY

Linear tracking arms are not suitable for a Linn. As the arm traverses the record the centre of gravity of the suspended mass changes and, the Linn's suspension being soft, the suspension goes in and out of alignment.

The SME 309 (new series), IV and V are generally too heavy for the Linn suspension and are not considered a good match. Naturally Linn's own Ekos, Ittok and Akita are made for the table. The Naim ARO is a good match.

Excellent matches are the new SME M2-9 as well as the old 3009II model. The M2 arms will handle all cartridges including mm and mc ones. They are made like Swiss watches. The old 3009 ones are really suitable for mm cartridges only.

UNOFFICIAL UPGRADES

The LP12 is extremely sensitive to the structure it is sitting on. Linn has long recommended a light rigid table. However, the famous Mana table is heavy and dense being made of lots of steel angle-iron sub-tables, Supawood intermediate shelves and a thick glass top one. It has lots of isolation spikes, eight per sub-table. The Mana has been used very successfully with the LP12. Take your pick. The non-negotiable aspect is rigidity. This is a must for a Linn. A light table will give you an airy, bouncy sound. A heavy structure will give you a more solid sound with stronger imaging. Because it is so support structure sensitive it is infinitely tunable within its ultimate capabilities.

Play with your Linn and try all sorts of things under it provided they are rigid. You can try glass, slate, Supawood, granite, marble, etc. I made a Mana-style supporting structure. Since I had lots of cones machined by an engineering shop and several pieces of 10mm glass, I just piled more cones and glass on top of the Mana stand. With each layer the sound became more neutral. An inexpensive substitute for dedicated hi-fi spikes are 'Bullets' used in arrow shafts. They cost next to nothing and work fine.

The Linn does not like a second suspension. It does not like airbags, sand boxes or anything other than a rigid support. I have made and tried them all. It tend to wind up on a second suspension and you gets lots of 'wow' resulting in the sound going totally to pieces. But try it anyway. The main thing is to have lots of fun. Heavy turntables, like the SME and VPI ones, do not respond to this sort of tweaking because they do not know or care what they are sitting on. They are totally stable.

You could try a junction box on the back of the LP12 with RCA sockets so you can try different cables. I have tried this and do not think it worth the effort. I bought special cable and went back to the original Linn cable as it was the best for the tt anyway. You are also introducing addition socket/plug interfaces which do the sound no favors. It would be useful to try Anti-Cable as a lead out cable (from the tt to the preamplifier not the arm to the plinth) and this should resolve the sound much better than the standard cable.

DOWNSIDE OF UPGRADES

While Linn has been upgrading the LP12 they have gain some things but lost others. Some of that original Linn musicality and 'swing' will disappear and it will be replaced by a more clinical and, most believe, more accurate sound. Take your pick.

PART III

SETTING UP THE SUSPENSION

This is a crucial setting on the Linn. Many a hi-fi dealer and enthusiast have tried to set up a Linn suspension with good intentions but a disastrous outcome

There is a fallacy that the Linn suspension needs continuous resetting. What nonsense. It was not set up properly in the first place. If your Linn has been properly set up it will not go out unless you transport it or move it around the house without removing the main platter. If you have to transport it push wedge-shaped, solid rubber (not hollow) door stoppers or folded foam under the sub-chassis. Use three pieces so that the sub-chassis does not bounce up-and-down cause the bottom end of the spindly to hammer against the thrust pad at the bottom of the bearing housing. Remove the counterweight from the tonearm stub. Put the stylus guard on the cartridge. If you transport the table with the counterweight in place it may wreck the arm bearings due to the force imparted to them in transit. Tie the arm to the arm pillar using a cable tie or something equally secure. If you do not have control of the turntable during transit pack it in a BIG box with lots of soft, crushable packing material around it. You can make cells of packing material by stuffing crumpled up newspaper into plastic packets and tying the top so the newspaper cannot get out. If you use loose newspaper in a box the balls of newspaper will migrate away from the turntable and your turntable could end up hard against one side of the box.

OBJECTIVE

One of the most important objectives of a turntable/arm combo is to provide a stable platform for the disc and stylus. It is this that you are aiming at when setting up the suspension. If the sprung subchassis/platter/arm and board assembly wobbles when excited the stylus will shake around in the groove. Secure tracking will be compromised. There must be no movement of the stylus other than that induced by the record groove. The resultant sound will be robbed of dynamics, phase accuracy, stability, imaging, bass control and everything else you are wanting to be present. Also groove and stylus wear will accelerate. The Linn suspension wobbles badly if not set up properly. Not only will it go into a vertical wobble swaying from side-to-side but it will rotate about its centre axis constantly winding up on its suspension and releasing energy as it returns to true position. It will do this constantly many times a second. Both of these effects are the death-knell of good sound.

Your aim is to confine the platter, subchassis/arm assembly to a perfectly vertical bouncing motion i.e. linearly up and down. No you will not be able to judge this accurately while watching the bounce from the side of the platter. This is, at best, a rough guide. The correct method is to watch the armboard move in its cutout in the plinth. If the gap between the sides of the cutout and the armboard closes while bouncing you have not got it right. The gaps must remain the same while the platter is bouncing. To induce bounce, tap the platter about fifty millimeters between the spindle and the arm pivot point. Most people tap the spindle. This is not the center of gravity of the assembly. It also difficult to tap it exactly the same way each time because the spindle is round on

top. A variation in the bounce may result from inconsistent tapping rather than a change in suspension setting. You can tap a flat part of the platter much more reliably than a round one therefore the spindle is not the best place to induce bounce.

Remove the board covering the underside of the table. Place a sheet of white paper under it so you can see the gap between the armboard and the cutout in the plinth.

PROCEED AS FOLLOWS

1. Do not attempt this if you are in a hurry to finish and have some other commitments the same day. Do not attempt it if you are in a bad mood. A glass of sherry makes the music sound better but does not improve your ability to set up the turntable. Do not drink liquor prior to or during setup. Relax. Work slowly. Mind you do not bump the turntable knocking it off its stilts (see below). Protect the stylus with the stylus guard or something similar.

2. Support the turntable on three or four objects(stilts) that lift it off the working surface enough for you to get your hand under it. About 250 mm is right. Secure the turntable so it does not fall off these 'stilts'. Level the turntable accurately on the 'stilts'. Accuracy will be reward. Use your level on the wooden plinth. That is you reference point. If it is not level you will never set the suspension properly. Underneath you will find three springs on downward hanging, vertical bolts. These bolts are attached to the stainless steel top cover and they secure the springs. The springs are held in place by washers and self-locking nuts at the bottom.

Observe the armboard in the plinth cutout. It must be level with the sides of the wooden plinth and top plate. By turning the locking nuts, securing the springs, up or down, adjust the armboard so that it is level with the top of the plinth all round. Place a ruler or straight edge across the wooden plinth and over the armboard to do this. Accuracy will be rewarded.

3. Remove the platter mat. Place your level on the bare platter East/West near the spindle. Turn the level around to account for any inaccuracies in the level itself. Average the two readings. Adjust the locking nut of the third spring, on the right front side of the turntable to do this. Now place your level on the platter North/South and check the level. Level the platter using the spring adjustments above. Keep on checking the level until you have got it right. Remember that the arm cable is a fourth spring.

4. It is not necessary for the armboard to have equal spacing all round it in the cutout. In fact it is unlikely you will achieve this anyway. However, it is best for it to sit square in the cutout and you may have to slacken off the three tiny wood screws securing the armboard to the subchassis in order to do this. Do not do this before you have finished all suspension adjustments as the position of the board will change as you make these adjustments. If you have to slacken off and reposition the armboard to get it square in the cutout, check your suspension adjustments afterwards. They may need very minor tweaking.

5. Now you need to check that the arm cable does not drag on the bottom cover when it is replaced. Cut a piece of wood, about 10mm square. The length must be equal to the distance across the table North/South but so that it will fit into and slide across the table in the rebate all round the bottom of the plinth, made for the bottom cover. Slide the length of wood along the rebates and see if it comes into contact with the arm cable. If it does so will the bottom cover. There should be a small air gap of at least one millimeter so that, when the suspension bounces, the arm cable does not then hit the bottom cover.

6. If the arm cable drags on the bottom cover you will bypass the isolation of the suspension and feed vibration straight into the subchassis. In order to lift the cable away from and above the bottom cover, turn the P-clip away from the arm. If the cable is too high above the cover then the cable will pull subchassis towards the arm and will be too stiff. If it is too high above the bottom board, turn the P-clip the other way to slacken it off. The P-clip is the whitish plastic clip through which the cable runs just before is bent sharply to exit the plinth. The cable is the fourth and an essential element of the suspension along with the three springs. In cases where the P-clip cannot be rotated enough to tighten or loosen the arm cable enough, the P-clip will have to be loosed enough to reposition the cable with the clip. This should not be necessary unless some 'expert' has tampered with it.

PART IV

7. SETTING THE SUSPENSION

In order to do this you will need to bounce the platter gently by tapping it as described above.

It must bounce in such away that the movements are vertical. To ascertain this, observe the motion of the arm board within the plinth cutout while bouncing. You will see any rotation as a closing of the gap between arm board and sides of the cutout while it is bouncing. The arm board must maintain its precise position in the cutout while bouncing. Its relationship to the cutout must remain static on all four sides. If it does not then the rotary location of the springs must be changed one at a time until it does. Put your hand under the turntable and grab the whole of the front right hand spring. Turn it about one eighth of a turn. If it will not turn or squeaks loudly when turned, it is dry. Squirt a bit of silicone lubricant (not petroleum-based oil) on to the rubbers at the top and bottom of the springs. This will free them up. Having turned the front spring bounce the turntable again and see if the linearity of the bounce has improved. If not, turn it back top where it was before you started and try it again. Now turn the spring the other way and see if there is an improvement.

If the bounce becomes worse turn the spring back to where it was before your last adjustment. Do the same thing with the single left hand spring. Then repeat the exercise with the right rear spring. At this point your suspension movement should be better than when you started but may not be perfect. Return to the front spring. This time any adjustments to the spring should be much smaller than an eighth of a turn. When the suspension is bouncing perfectly stop. Resist the temptation to make further adjustments. Keep on going round the springs of the turntable adjusting until you are satisfied.

Assuming you have got the bounce right you will find that the platter will bounce, either, in short sharp movements, or, in long lazy ones. The latter is what you are aiming at. This can be determined by observing the platter from the side while it is bouncing. If the bounce is short and sharp you need to keep on adjusting until it is both perfectly vertical AND the movement is in long lazy movements. If short and sharp you will probably find that the adjustments to long and lazy will not be great and will normally be made to the rear spring. Having done this tiny adjustments may be necessary to the front and left springs to restore linearity. Do not be too pedantic. It may never be perfect but the closer you can get to the objectives the better. Remember that feedback from the table will not cause gross movements of the suspension so do not tap it too hard.

8. The final adjustment should be made very carefully with the mat and an LP on the

platter, the platter spinning and the arm about halfway over the playing area of the LP. The arm must be resting on the lift. Never bounce the platter while the stylus is in contact with the LP.

9. If you have got this right, replace the bottom cover and play music.

10. If it just will not come right pack up for the day. When you come back grab each of the three springs in turn and turn them about half a turn in any direction. This will put the suspension totally out. Then start with your alignment as above, from scratch.