ARMS LENGTH REVIEW – THE AUDIO ORIGAMI TONEARM

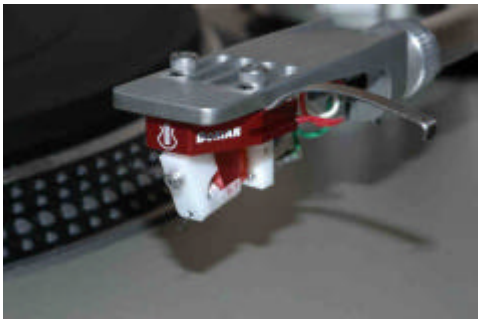
Neville Roberts

A 1970s turntable gets turbo-charged with a massively upgraded OEM Rega RB250 from Audio Origami. Neville Roberts explains how.

When the venerable Mr Price contacted me regarding a project to upgrade a Technics SL1200 Mk2 that he had been considering, I was a little surprised. After all, this is a turntable that has become the industry standard turntable for DJs, rather than for audiophile use. Since its release in 1978, the Mk2 has earned a reputation as one of the most durable and reliable turntables ever produced and it is still used extensively today. However, I began to get excited when he explained that the upgrade would involve an OEM Rega RB250 that had been completely rebuilt using state-of-the-art components by Audio Origami and fitted with a Michell TecnoWeight, and that this was to be partnered with a brand new Lyra Dorian cartridge!

The Technics before the upgrade

All this resulted in a rendezvous one evening in the car park at work where, much to the amusement of my work colleagues, a surprisingly heavy Technics turntable plus the new arm and cartridge were transferred from David's boot to mine. After a careful drive home, I wasted no time in unpacking the deck, fitting the cartridge and connecting it up to my system.



The Lyra Dorian in the original arm

Pre-Upgrade Listening Tests

Before starting the upgrade, a variety of records were played to provide a baseline standard to which the new arm could be compared. The Lyra Dorian was installed in the headshell and carefully aligned with a cartridge alignment protractor. The vertical tracking angle (VTA) was checked and the tracking force set. Although the original Technics arm has a calibrated counterweight, this was checked against a Shure Stylus Force Gauge to make the final adjustments.

The Audio Origami modified RB250

First impressions were pretty good. I really liked the sound of the Dorian. A very clean, clear and open sound with plenty of detail. Strings were incredibly crisp, but without sounding at all harsh. Bass lines were well extended, but somewhat unclear in the lower registers. My main problem was with the soundstage, however. It was all rather two-dimensional. I was very conscious of the sound coming from the left and right channels as well as the lack of depth to the image. It was also somewhat reminiscent of 1960s stereo demonstration records which were created to show off the new medium to the general public, with different sounds emanating from each channel. The music was coming from each loudspeaker, rather than evenly across the soundstage.

The Origin Live baseplate

It was time to get the tools out!

Installing the New Tonearm

After removing the counterbalance weight and the detachable headshell and having clamped the arm to the stand, I lifted the deck up at the front and lent it against a wall to expose the underside. To install the tonearm, you first of all unscrew the four feet from the base as this exposes a screw in each corner. All the screws need to be removed from the base. There are three different types: a long screw in each corner, short screws that fit into threaded holes in the cast alloy top and medium length self-tapping screws that screw into a cast resin damping block. It is fairly obvious where the screws fit so there is little point marking where they go – the short screws are arranged in two concentric circles as they clamp the rubber base to the circular turntable alloy base.

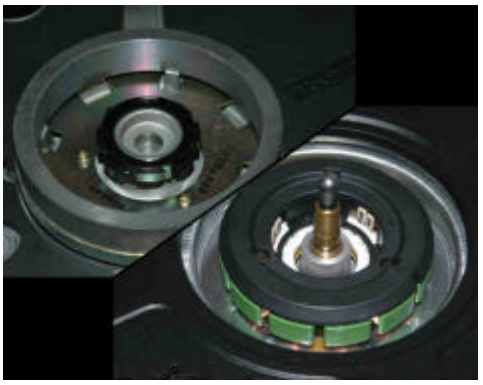
When I started to dismantle the deck, I could see why it was so heavy. It is certainly beautifully made with the dense rubber base and a cast resin damping block inside. With the base removed, there are yet more screws to remove! These are brass-coloured screws that hold the cast resin damping block. The only ones that do not need removing are the four screws at the bottom that hold the lid hinges – they can remain attached to the resin block. The resin block can now be lifted clear.

The next job is to remove the clamp on the base of the old tonearm that holds the signal cables and earth wire. The cover over the base of the tonearm can then be removed. The three screws holding the tonearm base assembly to the plinth are then removed, the earth lead disconnected and the whole tonearm unit can be withdrawn from the top of the plinth.

Once the tonearm is removed, a baseplate can be fitted to the plinth that will hold the new arm. Origin Live supply a 'DJ Armboard' which is specifically designed for the Technics SL-1200 and RB250 arms. This was fitted using three M6 nuts and bolts. At this stage, I would recommend re-fitting the turntable platter as it is possible for the cut-out on the armboard to foul the platter when in place, preventing it from turning. Spin the platter and adjust the armboard if necessary before finally tightening the M6 bolts. It is worth applying a small blob of glue to the threads of these screws to hold them in place once fully tightened.

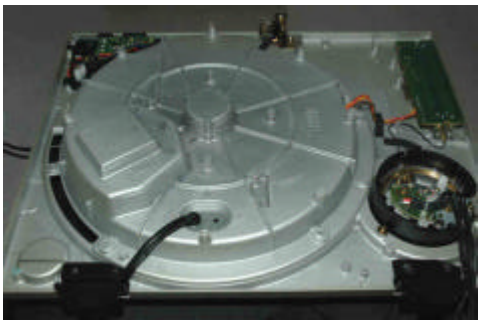
At this point, I should mention the VTA again. The RB250 arm as supplied does not have a built-in adjustment for this, but the armboard that supports the arm is clamped with two screws and locknuts on each side and spaced with washers. After much experimenting, I found that moving the washers to the bottom of the plate (and hence removing the spacing) positioned the arm at just the right height. I raise this issue here as it saves dismantling the turntable again later!

The new arm can now be introduced into the hole from the top and clamped in place with the nut on the underside.



The Technics direct drive motor

Inside with the resin damping block



The resin damping removed

Old arm base ready for removal

Applying glue to bolt threads

Ensure that the arm is parallel to the right side of the plinth and tighten the nut. Re-fit the resin damping block and connect the earth wire to the plinth base.

Before the rubber base is fitted, the hole at the base of the arm needs to be elongated to accommodate the base as it is in a slightly different position from that of the original arm. This is easily done using a Stanley knife to cut out a curved section towards the rear of the unit.

The rubber base can now be re-fitted and hopefully you don't have any screws left over! Re-fit the four feet and move the turntable to stand on them again. Fit the counterbalance weight onto the rear of the arm and install the cartridge in the headshell.

The rubber base cut-out

Fitting the New Counterweight

Fitting the Michell TecnoWeight required the delicate removal of the plastic end-stub with a pair of Mole Grip Locking Pliers! This was achieved by holding the arm tube firmly in one hand and twisting the piers with the other, being careful not to exert any force on the bearing. Once loosened, the old end-stub is easily unscrewed and the new Michell metal end-stub screwed in and firmly tightened by hand.

Removing the plastic end-stub

Two counterweights are supplied and the larger one is required to balance the Dorian. This is slid onto the end-stub and locked in place with a grub screw, tightened with the supplied Allen key. The end-stub includes a tracking force adjustment knob, calibrated in 0.1g increments. In practice, I found that this was closer to 0.05g per increment and in order to achieve the required 1.8 – 2.0g tracking force, the tracking force should be set using a stylus force gauge with the adjustment knob wound fully clockwise using the counterweight. Set the tracking weight slightly below the required amount, tighten the grub screw and make the final adjustments by unscrewing the knob.

The new counterweight fitted

At this point, I noticed a small problem when the clear Perspex lid is re-fitted onto the Technics. The TecnoWeight end-stub is slightly longer than the original one and this means that the lid catches on the back of the arm when the lid is closed. This can be overcome simply by re-positioning the hinges so that the lid is further back. To do this, the hinges are removed from the lid and a small section of plastic is cut out from the lid with a junior hacksaw to accommodate the hinge and the hinge replaced on the inside of the lid (see photograph). The beauty of this modification is that it is entirely reversible by re-fitting the hinge in its original position, if required, as the hinge covers the cut-out!

Modifying the lid

As before, the cartridge will require alignment with a cartridge alignment protractor prior to setting the tracking force and when all is well, the turntable can be re-connected to your Hi-Fi system.

Setting the tracking force

Checking the setup using a copy of the Vinyl Essentials test record showed that the cartridge can track the 70 micron test track with no problems, but starts to miss-track on the 80 micron track. This represents a good tracking ability.

Tonearm-cartridge resonance was exactly at 10Hz, which is pretty well ideal. If it is around 14Hz, this is too close to a real-world signal, such as a very low organ note. Below about 6Hz and the resonance will produce sub-sonic noise where the harmonics are likely to interfere with the audio frequencies. This boded well for the bass control!

The Final Result

The finished upgrade

The new arm is certainly a beautifully finished unit, but does it sound as good at it looks?

The changes from the old arm were immediately apparent. All the detail and crispness was still there as well as fantastic attack from the strings, with no sign of harshness. The bass was still well extended but now had a tonal clarity in the lower registers that was completely missing with the old arm. In particular, the bass had been completely cleaned up - drums now had a clear and crisp attack rather than being a little woolly as was the case with the old arm.

However, the biggest change was with the soundstage. Gone was the two-dimensional and flat imaging of the previous arm - the sound now came from across the room, rather than from the two loudspeakers. My superb recording of Vivaldi Concerto in D for violin and strings on Telefunken Das Alte Werk 6.42355 AW sprang to life, not just with amazing depth but also incredible breadth! This proves that the cartridge was being limited by the Technics tonearm which, although beautifully made, was clearly designed for ruggedness rather than for audiophile applications.

The Audio Origami modified RB250 is truly an amazing upgrade – I didn't want to give it back!

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