The Wand Turntable™ Design Q & A

Q & A from Simon Brown the designer

Why belt rather than direct or rim drive?

While I own a classic Technics SP10 and a Lenco, both of these drive methods have some inherent fishhooks in their methods so seemed a hard task for a 'first' turntable. However from my experience with these I do see that to maintain the dynamics of music there is a need to have the drive considerably more rigid than most belt drive turntables. So much of the design of The Wand Turntable is focused on maintaining a solid drive while not allowing motor noise to get to critical points.

This starts with the belt, which is custom made for The Wand Turntable to have very little stretch. Motor mounting, plinth and platter construction also influence this and are covered below.

Why the big diameter platter?

If you make a platter 20% thicker, you get ~20% more inertia. But if you make it 20% bigger in diameter, you get 40% more inertia, for a given weight. The bigger platter also allows drive pulley to be bigger which gives less dynamic slip. The pulley itself has the biggest flywheel we could fit on it, to combat motor induced flutter.

Why is the platter made up of layers?

The top layer is made of acrylic for good coupling of vibrations out of the record vinyl. The remaining Aluminium-Acrylic sandwich produces an acoustically inert unit which resists the transfer of vibration from the belt to stylus.

Does the turntable speed change due to belt aging or motor drift?

Our *DC motor has a speed servo control referencing the platter. So that variations of belt / bearing / motor / power supply won't affect its long term speed stability. Yet the servo is configured to operate below the audio band (unlike many DD turntables).The inertia of the platter is used to maintain stability at audio frequencies.*

Is the motor isolated in any way from plinth? *After quite a few motor mounting experiments I settled on a laser cut stainless steel 'labyrinth' plate that won't let the motor rotate at about its main axis, yet can yaw in other planes. This keeps the robust drive while adding some isolation with a long path length for vibration. Incidentally I feel placing the motor outside a suspension system compromises the function of both the suspension and the motor.*

So tell me about the bearing?

When you reflect about what actually matters in turntable bearings, it seems that many turntable bearings are crazily big, these may work against the need to let the platter rotate smoothly without generating noise. The bearing design in The Wand Turntable has a focus on not generating or transmitting noise.

Why did you choose a ply plinth and then riddle it with holes?

Baltic plywood is a good acoustic material (and looks nice) with ability to make a stable plinth. (MDF isn't any of these!). The plinth is thus machined very accurately in one part using a computerised router.

The holes serve a number of purposes. They disperse and scatter vibrations while creating a more of a difficult path for vibration from the motor mount. Finally they help to move the centre of gravity to the centre of suspension (see below)

Why is the back corner cut off the plinth?

The main reason is to help push the centre gravity to be in the same place as the centre of suspension of the three sprung feet. This is aimed to be close as possible to the stylus playing arc, as that is the stillest point of the suspension (hence my punny name Zentroidal, TM of course...)