

## Turntable BARDO – some technical information

### History

After long years of interest, research and development, Helmut Brinkmann constructed the magnetic direct drive turntable Oasis. Since this project was well received by music lovers all over the world, we decided to release a second model that features the magnetic direct drive motor and is inspired by the design of our top-of-the-line models Balance and LaGrange.



*BARDO turntable with 10.5 tonearm*

### Interesting details and upgrades

The picture shows the standard model BARDO with the magnetic motor drive and platter of the Oasis turntable, with acrylic platter top and standard small metal housed power supply. It can also be purchased in 3 possible upgrade stages.

Upgrade stage 1 features the metal cased power supply that is used for the Balance and LaGrange turntables instead of the standard power supply. The result is a more defined bass response and a wider room imaging.

Upgrade stage 2 features a glass platter mat and a record clamp instead of the black acrylic platter mat that is shown in the picture. This results in a finely extended dynamic resolution.

Upgrade stage 3 is the combination of upgrade stages 1 and 2, giving the BARDO nearly the bandwidth and dynamic resolution of our big turntables.

The tonearm base of the BARDO can be rotated and fixed without play to allow a simple and precise tonearm adjustment for all tonearms between 9" and 10.5". We drill the base according to the tonearm that the customer chooses.

The output sockets can be found on the back of the turntable, they can be equipped with RCA or XLR sockets, and it is also possible to install tonearms with DIN connectors or fixed cables.

The two possible speeds, 33 1/3 and 45 rpm, are selectable by a switch at the front of the turntable and can be fine adjusted via two screwdriver holes that are located next to the switch.

## Magnetic drive

The BARDO has a magnetic direct drive motor that was developed by Helmut Brinkmann and is produced in our factory. There is only one bearing for the motor and the platter, a circular magnet is mounted into the bearing of the platter and is concentrically driven into rotation via coils on the circuit board under the magnet. An electronic circuit drives the coils via two magnetic sensitive resistors that react to the magnetic fields into a highly constant and slow circular movement.

Many of the known direct drive turntables were constructed for studios and radio stations where it was necessary to have very quick start-up times of less than a second which was achieved with high torque motors that speed up and stop the motor very rapidly. This caused heavy cogging effects accompanied by high wow & flutter numbers. To avoid this, we worked long on a proprietary motor control that transfers just enough energy to the motor for it to remain at constant speed. The motor's stator consists of four specially designed field coils, which are mounted concentrically with high precision around the platter bearing. Based on listening sessions we decided to forgo the typical 90-degree mounting angle in favor of a non-standard 22.5-degree roster, which, due to the magnetic fields overlapping, further reduced cogging. The motor's rotor also acts as the sub-platter and carries a magnetic ring with eight poles on its underside. Inside the motor, the rpm of a speedometer disc is measured and turned into variable voltage that is fed into a control circuit where the rpm is compared to the reference voltage that is adjustable via the trim pots. A separate heater for the bearing, as included with the LaGrange and Balance bearings, is not necessary. The motor circuit is kept under current all the time, just the speed is switched to zero or 33 resp. 45. In this way, the bearing is kept warm by the quiescent current of the motor drive.

For those who are interested, there is more information about the magnetic direct drive motor of our turntables OASIS and BARDO on our website: [www.brinkmann-audio.com](http://www.brinkmann-audio.com) in a white paper about the OASIS.

## Attributes and technical specifications

<b>Drive:</b>	Platter driven directly by magnetic field; soft proportional control
<b>Power supply:</b>	External power supply in solid state technology
<b>Bearing:</b>	Lubricated precision (hydrodynamic) journal bearing, quiet and maintenance-free
<b>Platter:</b>	Resonance-optimized special aluminum alloy; surface-black acrylic platter mat
<b>Chassis:</b>	15 mm Duralumin with resonance-optimized geometry
<b>Arm board:</b>	Movable (rotating) without play for simple and precise tonearm adjustment, with quick release. Accepts all tonearms between 9 and 10.5" as well as several linear tracking tonearms
<b>Connectors:</b>	RCA, XLR or feed-through for tonearms with 5-pin DIN connectors; DIN connector (3 pin) for umbilical cord of external power supply; 2 mm connector for ground wire
<b>RPM:</b>	33 1/3 and 45, selectable by a switch; LED indicator for speed (33 1/3 = green, 45 = red) Deviation from nominal speed: 0.0% (adjustable) Fine adjustment of speed: ± 10% with trim pot
<b>Wow &amp; Flutter:</b>	0.07% linear, 0.035% weighted DIN 45507
<b>Speed-up time:</b>	12 / 16 seconds (33 1/3 / 45 rpm)
<b>Rumble (noise):</b>	-64 dB (test record DIN 45544); -68 dB (measuring adapter)
<b>Dimensions:</b>	420 x 320 x 100 mm (w x d x h)
<b>Weight:</b>	Total 14.8 kg (Chassis 5 kg, Platter 9.8 kg); Power Supply 0.5 kg
<b>Accessories :</b>	Granite platform 440 x 310 x 30 mm, HRS platform