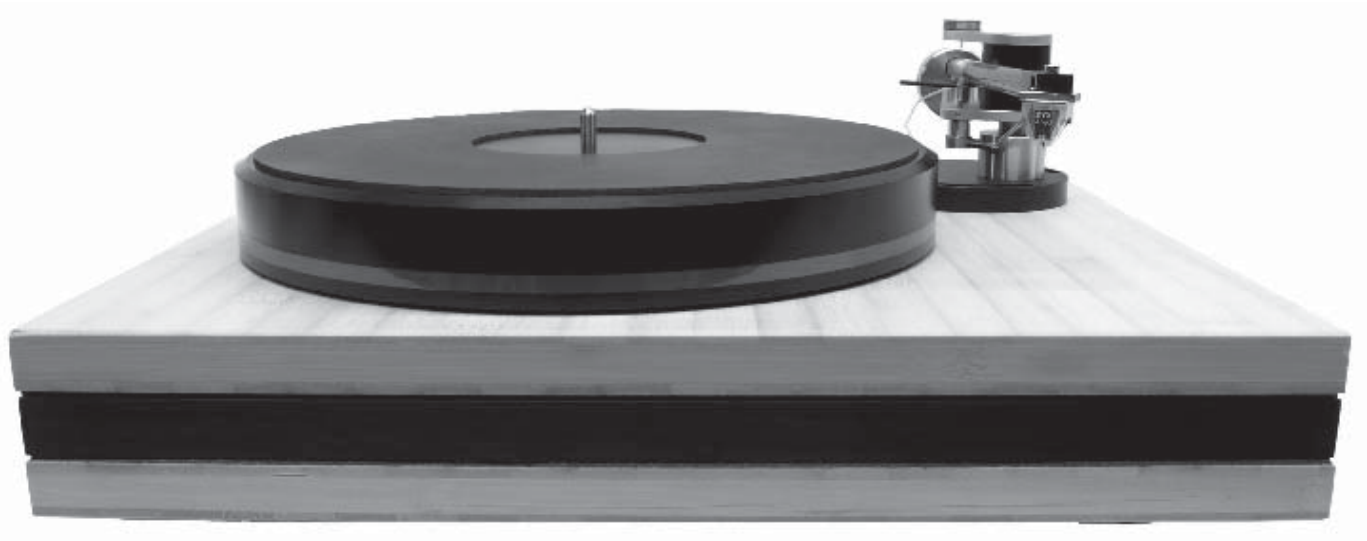
Artemis Labs SA-1

Turntable



Set-Up & Operating Manual

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers).
9. Do not defeat the safety purpose of the grounding-type plug. A grounding-type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Unplug this apparatus during lightning storms or when unused for long periods of time.
13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as if the power-supply cord or plug is damaged, liquid has been spilled inside the appliance or it has been exposed to moisture, the appliance does not operate normally, or has been dropped.
14. WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

Explanation of Safety Symbols:

CAUTION: To reduce the risk of electric shock, do not remove the covers. No user-serviceable parts inside. Refer Servicing to qualified service personnel.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instruction in the literature accompanying the appliance.

INTRODUCTION & SPECIFICATIONS

The Artemis Labs SA-1 Turntable puts a sonically excellent design into an attractive and compact package. It was designed by Frank Schröder, of Berlin, based on years of experience in the field of reproduction of vinyl records. The motor controller was designed by John Atwood. This manual will help you set-up and get the most out of your SA-1 turntable.

BILL OF MATERIALS

The following items are shipped with each SA-1 turntable:

1 - Plinth with bearing and motor installed
1 - Platter
1 - Paper/felt inlay mat
1 - Acrylic mat
1 - Bubble foam mat
2 - Belts
1 - Tension roller
1 - Conical aluminum alloy foot
2 - Conical Delrin™ feet
1 - Motor Controller
1 - 50 Hz strobe disk or 60 Hz strobe disk
1 - Screwdriver (for speed adjustment)
1 - Instruction manual
1 - Warranty card

ACCESSORIES

The following items are available for purchase from your dealer:

- Graphite mat
- Additional belts
- Acrylic lid
- Extra arm board
- Set of three Stillpoint™ feet (customized for SA-1 turntable)

SPECIFICATIONS:

Permissible Arm Lengths: 220mm to 260mm (8.7" to 10¼")

Platter Speeds: 33 1/3 and 45 rpm, trimmable, variable from approx. 25 to 60 rpm.

Mains Voltage: Wired at factory for one of the following voltage ranges: 100V to 130V or 200V to 260V, 50 to 60Hz.

Power Consumption (rms) : TBD Watts nominal, TBD Watts maximum.

Size: Motor Controller: 3¾" (95 mm) Width, 10" (254 mm) Depth, 4½" (114 mm) Height
Turntable (including feet): 17¾" (450 mm) Width, 13¾" (350 mm) Depth, 5½" (140 mm) Height

Mass: Motor Controller: 4 lbs. 6 oz. (2.0Kg)
Turntable: 40 lbs. (18.2Kg)
Total shipping weight: 48 lbs. (21.8Kg)

Note: These specifications are subject to change at any time.

DESCRIPTION

Some of the features that set this turntable apart from other designs past and present are:

THE PLATTER

The 15 pound platter is made from anodized aircraft grade aluminum alloy, turned to an extremely tight tolerance (± 5 microns) in all directions.

The platter's thickness is maintained from center to the outer rim to avoid variations in the mechanical impedance "seen" by the cartridge.

The platter is damped with a proprietary paper/felt inlay, allowing for the use of three different platter-record interfaces:

- Foam bubble mat for efficient decoupling of the record if so desired
- Acrylic plastic for excellent mechanical impedance match with the vinyl record
- Graphite mat for rigid coupling and fast energy transfer

Each of these will be optimal for specific applications and allow the user to "fine-tune" the overall tonal balance of the system without sacrificing detail resolution.

The acrylic and the foam mat come standard with the table, the graphite mat can be ordered separately and all are easily interchangeable.

THE BEARING

The massive, 3 pound bearing is of the non-inverted type, utilizing a large diameter, case hardened spindle and unusually long self lubricating phosphor bronze bushings. The clearance is kept very small, but the defined surface "roughness" of the spindle maintains an extremely stable oil film and creates drag at the same time.

The bearing is sealed and will maintain its super low noise performance for many years without the need for cleaning or re-oiling.

The centering pin is formed center each record perfectly when "dropped" onto the platter, but doesn't make contact with the record once on the mat. This lowers the noise floor even further and allows the user to "re-true" records with an off-center hole, a frequently encountered sign of lack of quality control on the part of today's record pressing plants.

If the user wishes to opt for a record weight or clamp, he may do so, but few are recommended if the above advantage is not to be sacrificed. Artemis Labs will soon be able to provide a small record weight perfectly suited for this turntable.

THE PLINTH

The plinth is constructed from three layers of bamboo ply and ebony, each bamboo layer made up of three layers of different grain orientation. Medium mass and very high internal damping in conjunction with a rigid coupling to the supporting platform provide an effective mechanical ground. Vibrations generated by the table are dissipated in the plinth, footfall is well controlled despite the lack of a suspension (a can of worms in itself).

The plinth rests on three cones, one made from Dural and two of a hard polymer. Stillpoints™ component feet are available as an option. See *www.stillpoints.us/the_design_.html* for more information.

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While the plinth is non-resonant and doesn't store (and release) energy, it is still worth placing the turntable on a dedicated platform. Among others we recommend Stillpoints vibration management components for non suspended or Minus K for suspended platforms.

THE ARMBASE

The armbase is precision turned and milled from the same aircraft grade aluminum as the platter. It allows mounting nearly all tonearms with an effective length between 220mm and 260mm.

The pivot to spindle distance can be altered by turning the base after loosening all three mounting screws. This way, a single mounting hole can be used for several tonearms. Tonearms that do not have any provision to adjust overhang (like old Ortofon tonearm/SPU cartridge combinations) can now be adjusted precisely by changing the pivot to spindle distance as required.

THE LID

There is no lid since its use during replay would compromise the sound. A high quality, non hinged acrylic dust cover is available on request.

THE DRIVE SYSTEM

This turntable is driven by an extremely high quality Swiss DC Motor for a combination of high torque and smooth rotation, transferring power via 1/4" magnetic tape to the outer rim of the platter. Unlike other turntables featuring a form of tape (or just belt) drive, the tape is routed past a tensioning lever/pulley to reduce slippage to zero and minimize the side thrust on the platter greatly. Residual motor vibrations cannot reach the platter directly, but are absorbed by the suspended pulley.

Through the use of a non-compliant "belt", namely polyester magnetic tape, the motor is coupled much more directly to the platter compared to conventional, elastic belt driven turntables, without an increase in transmitted noise.

Wow and flutter is well below audibility, certainly on par with the best direct drive designs.

The motor works against a defined drag, comprised of the frictional losses in the bearing and further losses caused by a magnetic eddy current brake, situated below the platter. Friction losses due to stylus drag are minimal compared to the above "built in" system losses and won't cause smeared dynamics, "congested" reproduction of complex signals, or low frequency speed variations (wow).

THE MOTOR CONTROLLER

The turntable motor is driven by a special regulated motor controller that compensates for losses in the motor, thus stabilizing the turntable speed against changes in loading, such as occurs when loud and soft passages are played on a record. The power supply in the controller is fully regulated, making it immune to power line variations. It also has built-in short-circuit protection in case the wiring or motor develops a short-circuit.

An ideal DC motor, with no internal losses, if fed from a perfect voltage source will keep its speed constant with varying mechanical load. Resistive losses in real-world motors cause the speed to drop as the load increases. By sensing the motor current and applying a precise amount of positive current feedback (i.e. making the drive voltage increase as the current increases), the losses can be cancelled, resulting in much better speed stability of the motor under different load conditions. This motor controller design was

DESCRIPTION

inspired by the work of Mark Kelly. For more on the theory and Mark's designs, see: *http://www.members.iinet.net.au/~quiddity/audio/DCbrushed.html*

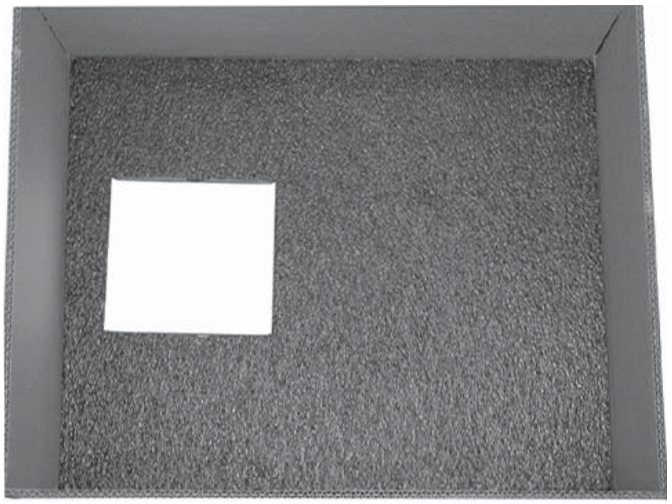
If the positive current feedback exceeds that needed to stabilize the motor, the feedback system starts to go unstable and soon begins to oscillate. Because of this, the current feedback is adjusted at the factory for the motor shipped with the turntable to just below the optimum point. If the motor is changed, the optimum feedback setting will change. In this case, both the turntable and motor controller should be returned to the factory or a qualified technician for readjustment.

The turntable can be set to either 33 rpm and 45 rpm, both individually adjustable via trim pots on the front panel of the controller. If variable speeds are desired, such as matching the pitch of the recorded music to an instrument, the "Variable" potentiometer on the motor controller can be used. A 78 rpm motor controller is available on special order.

An "umbilical" cord allows the user to place the power supply in a convenient location. Even when placed fairly close to the turntable, an interference with the arm/cartridge is unlikely, but certain moving iron cartridges mandate a minimum distance of one foot (30cm) between the motor controller and cartridge to avoid hum.

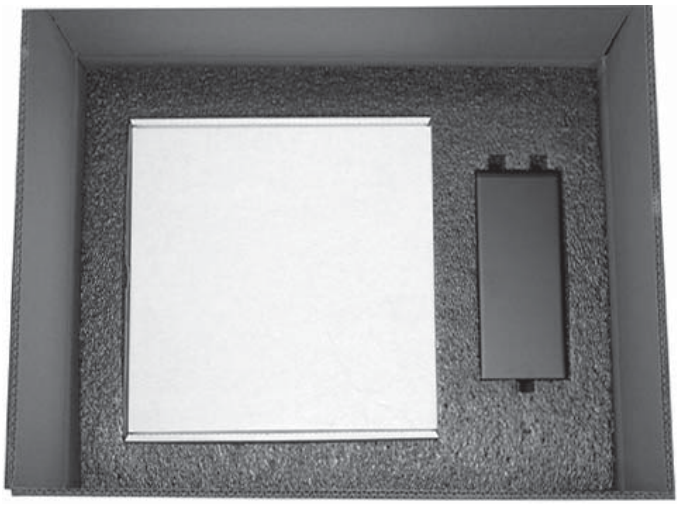
ASSEMBLY

The following is a step-by-step procedure for assembling your Artemis Labs SA-1 turntable. The only areas not covered here are the tone-arm and cartridge mounting procedures; these should be assembled according to their manufacturer's instructions. Please save all packing boxes and materials in case you need to ship your turntable. Turntables returned for repair in unauthorized shipping boxes will not be covered under warranty if any damage occurs.

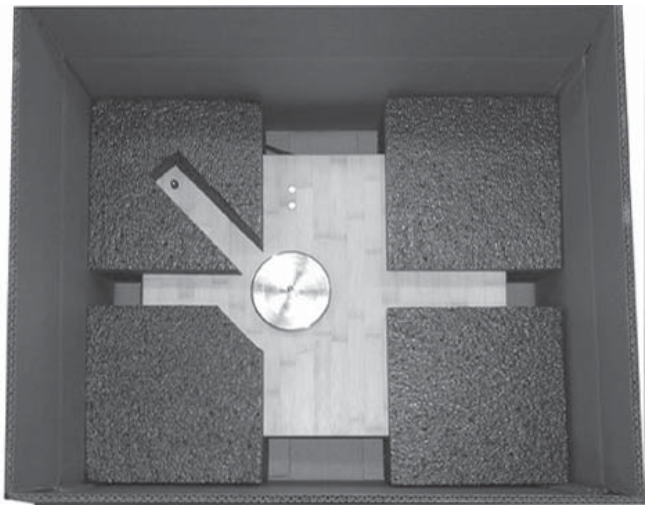


1. Open shipping box. Remove the small white box and plastic foam. The box contains the belts and other small components.

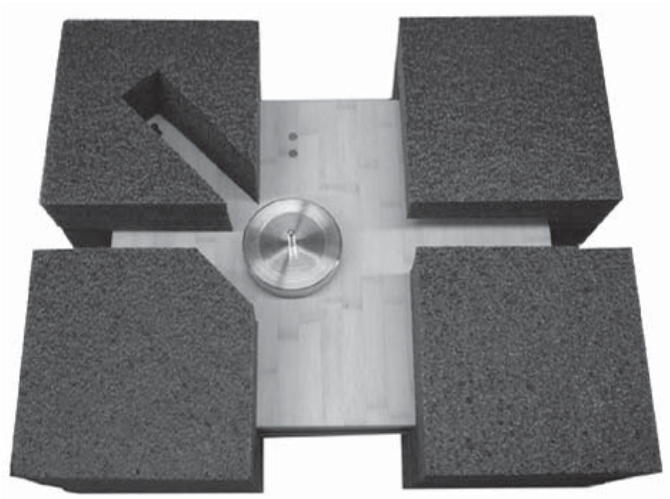
ASSEMBLY



2. Remove the large white box containing the platter. Remove the motor controller and plastic foam.

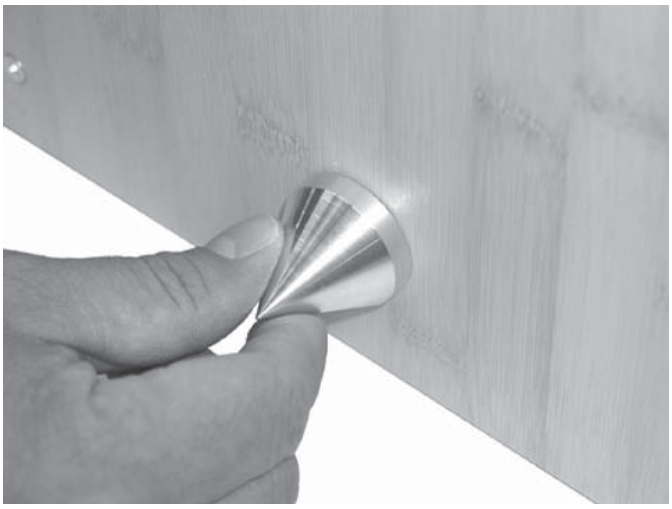


3. Carefully remove the plinth and its associated plastic foam packing material. If the turntable is to be re-packed, note that the notched corner piece must be placed around the motor pulley.

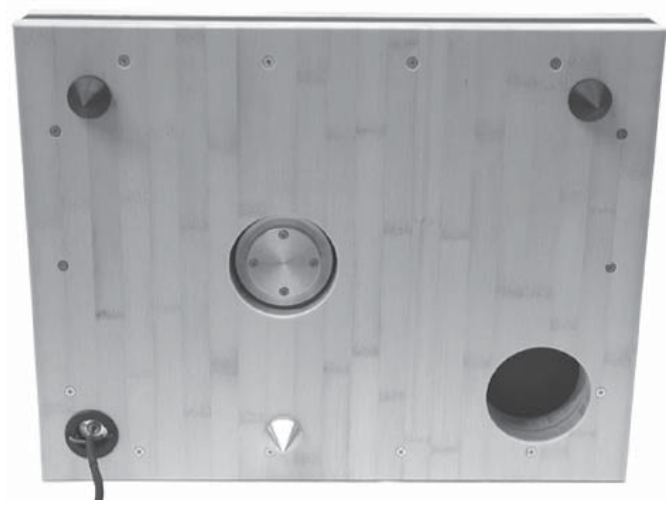


4. Carefully remove the plastic foam corner pieces from the plinth.

ASSEMBLY



5. Set the plinth vertically onto its rear edge. Locate the conical feet and screw them onto the bottom of the plinth.



6. Note that the two plastic feet are mounted near the front edge of the turntable while the single aluminum foot is mounted near the rear of the turntable.

7. Note that the tensioning arm is shipped without the roller (bearing) attached.

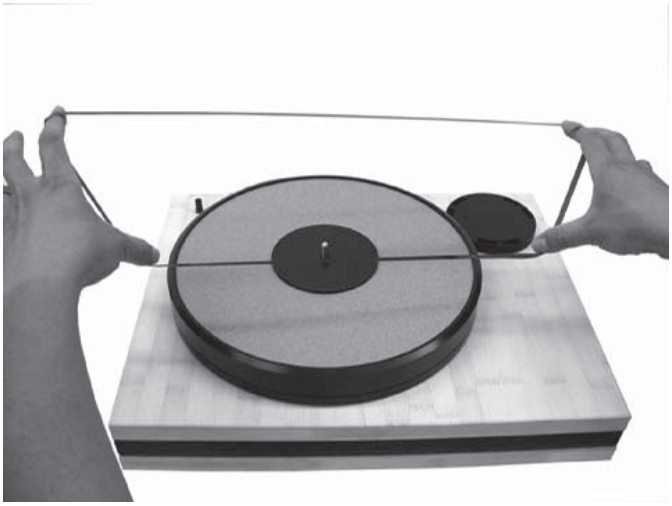
ASSEMBLY

8. Locate the tension roller and screw it onto the tensioning arm snugly but not over finger-tight.

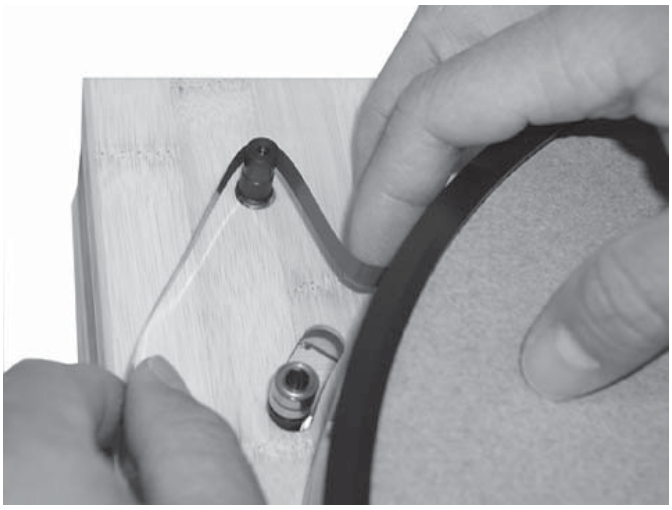
9. The plinth is now ready to accept the platter. Note that the two eddy-current magnets are above (to the rear of) the bearing.

10. Remove the platter from its packing box and carefully set it onto the bearing. It is a snug fit, but no tools should be used to force it on.

ASSEMBLY



11. Hold a belt in both hands in preparation for installing it on the platter. In most cases the dull oxide side should face inwards towards the platter, but in humid environments you may want the oxide on the outside.



12. Loop the belt around the platter and the motor pulley.

13. Pull the tensioning arm all the way back and slip the belt over it.

ASSEMBLY

14. With the belt properly installed, the tensioning arm should be approximately in the center of its travel and the belt should fit in the grooves in the motor pulley and tensioning roller.

15. Mount your tone arm onto the arm mounting plate and align it according to the arm manufacturer's instructions. Note that the arm position can be adjusted by rotating the mounting plate. Once the correct position has been determined, tighten the screws holding the arm plate to the plinth.

16. Fit the grey paper/felt mat onto the platter. Then place the desired turntable mat (acrylic, foam bubble, or graphite) on top of the paper/felt mat.

17. Connect the cable from the motor to the rear of the motor controller. Note the locating slots in the connectors - they should mate without excessive force. Plug the power cord into the IEC connector. If the power plug does not match the power sockets at your location, get the correct cord from your dealer. The motor controller is internally set to either 100-130V or 200-260V. Make sure that you use the correct voltage for your location.

18. The strobe disc can be used to exactly adjust the turntable speed to either 33 1/3 or 45 rpm. If you use light pulsating at your power line frequency (from either a neon lamp or a conventional (non-electronic ballast) fluorescent lamp), then use the strobe disk corresponding to your local line frequency: 50 or 60Hz. If you use a self-contained strobe light source, use the disk frequency recommended by the strobe light manufacturer.

19. Once the correct strobe disk has been established, place the disk on the platter, turn on the motor and shine your light source on the disk. With the motor controller speed switch set to "33" adjust the trimpot marked "33" on the front panel so that the outer line pattern on the strobe disk is not moving. Similarly, adjust the "45" trimpot when the speed switch is set to "45" for a stable inner pattern.

MAINTENANCE

The turntable doesn't require regular maintenance. If you wipe off dust with a soft cloth (and some furniture polish) every once in a while, it's beauty will last many years. Do not attempt to "play around" with different bearing oils. The one chosen by the designer is optimal for the interplay with load, motor torque and bearing clearance.

The turntable comes with two tape belts. Additional belts can be ordered or fabricated from 1/4" magnetic tape, using a tape splicer and extra flexible splicing tape. Make sure that the splicing tape runs on the OUTSIDE of the motor pulley. Normally is recommended that the oxide side is facing the pulley, but in high humidity environments, the glossy side facing the pulley may yield a faster speed up time.