

On30 / 009 2.5" Tiny Turntable



On30



009 / 0-9 / N

This model kit is for adults. NOT A TOY. Contains small parts

Thank you for purchasing KHM's Tiny Turntable. The On30 and 009 versions build up in the same way.

Turntable dimensions: deck diameter = 62.4mm diameter (2.45"). Rail length = 60mm (On30), 61mm (00-9/N)

Start by checking and identifying the parts and familiarize yourself with the build instructions.

Soldering

Soldering - we have already soldered the rails to the right gauge ☺. You will need to solder wires to connect the rails to the pick-up PCB, and wires to the top of the sprung contacts. Be careful when soldering the wires to the motor. It is designed for that, but too much heat will melt the plastic.

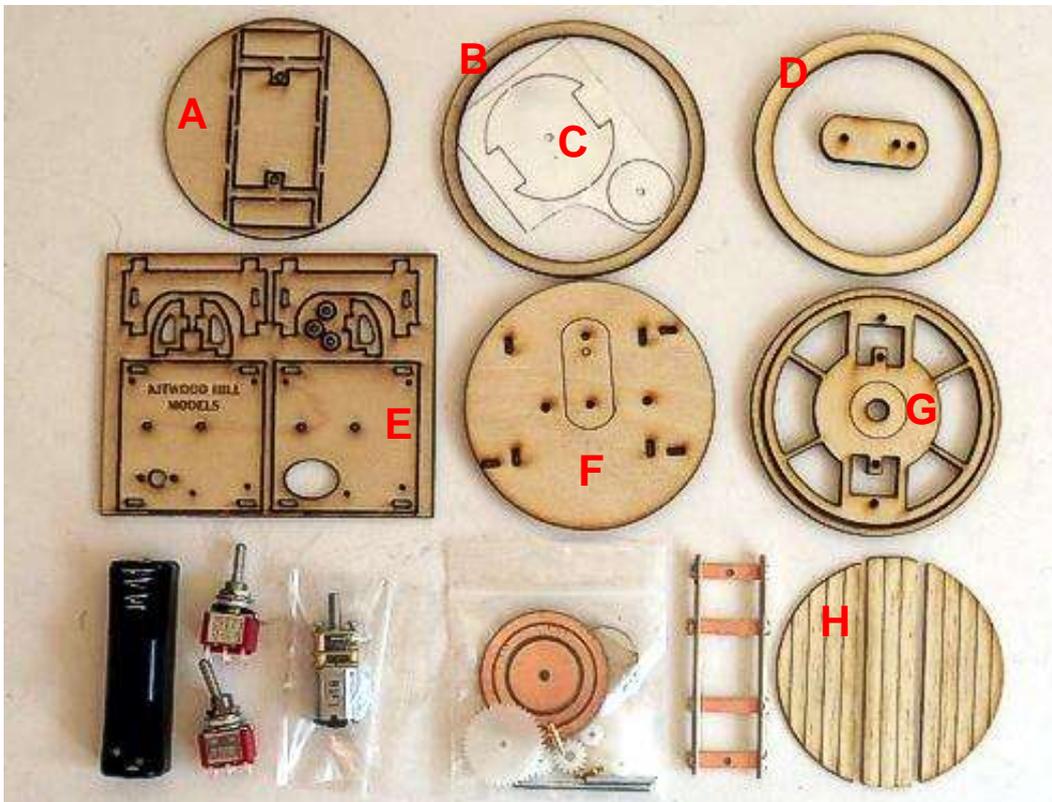
Removing parts from carriers

Use a new blade and take care. While we have part-cut through the retaining tabs, the remaining wood can still be hard. Please don't twist out any of the parts – they will get damaged. Leaving the parts in the carriers until needed will help identification and reduce chance of losing pieces.

Glue

Cyno Acrylate (Super glue) is the most suitable type to use. (particularly for the gearbox frame). Contact adhesive is good where you have flat surfaces to bond and wish a bit of positioning. Do not use white glue – it can cause warping.

Kit Parts:-



Laser cut parts:

A: deck support. **B:** Support Ring **C:** Adhesive sheet. **D:** Spider support ring and gear support **E:** Gear-frame and motor plate. **F:** Baseplate, **G:** Turntable Spider. **H:** Obechi deck planking.

Electromechanical parts: Motor with screws, 2 x 22mm nylon gears, 16mm nylon gear, 2 pinion gears, 2mm slotted axle, 2 off 2mm short axles, 4 off M1.6x3 machine screws, 2 off brass sprung plunger contact. Contact PCB, rail connection wire.

Electrical parts: DPDT centre-biased toggle switch. (rotation), DPDT toggle switch.(polarity), AA battery holder.

1. Baseplate assembly

PHOTO SERIES 1A:

This is built up from a 3/16" (3.8mm) laser-ply base and 2 off 1/8" (3mm) laser-ply rings.

Sand the running side of the base (A) and the support ring (B) so that it is smooth. – use circular motion on fine, flat sandpaper. No need for super smooth – just take off the roughness.

Glue the rings in place so that it lines up perfectly around the edge of the base. Note its on the smoothed side! (good idea to tack in place with contact adhesive, check alignment then run CA glue into the joints on the outside)

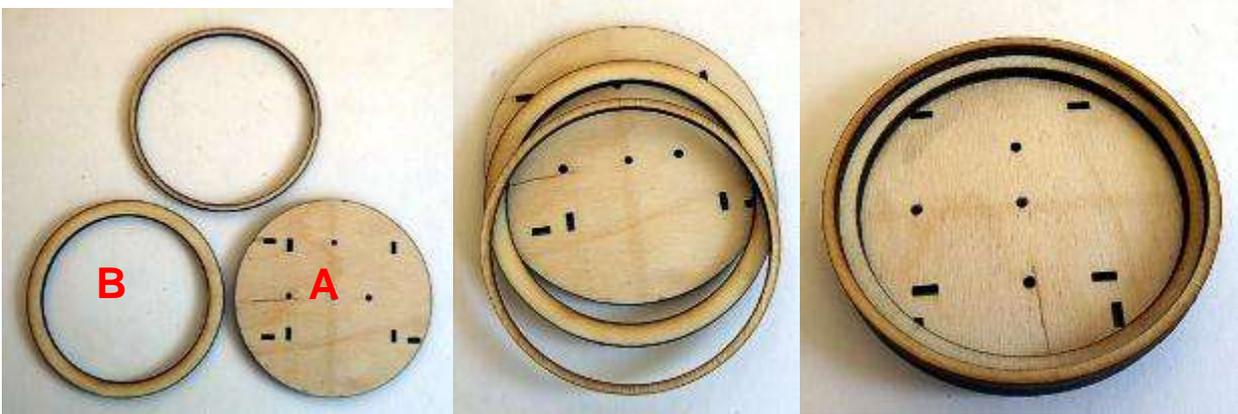
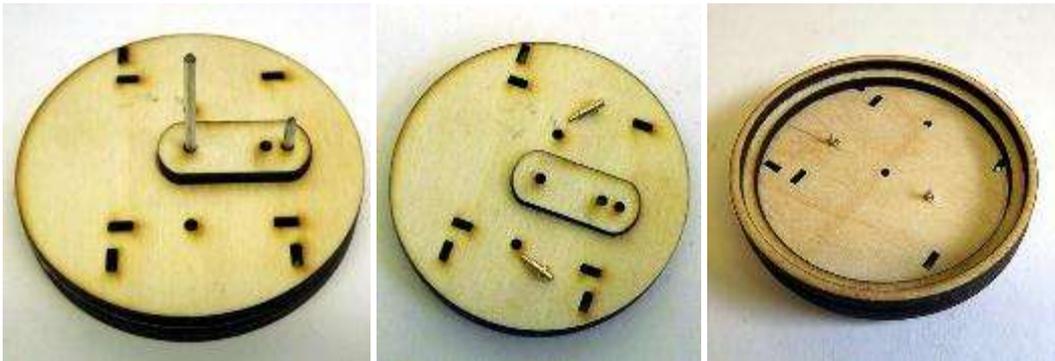


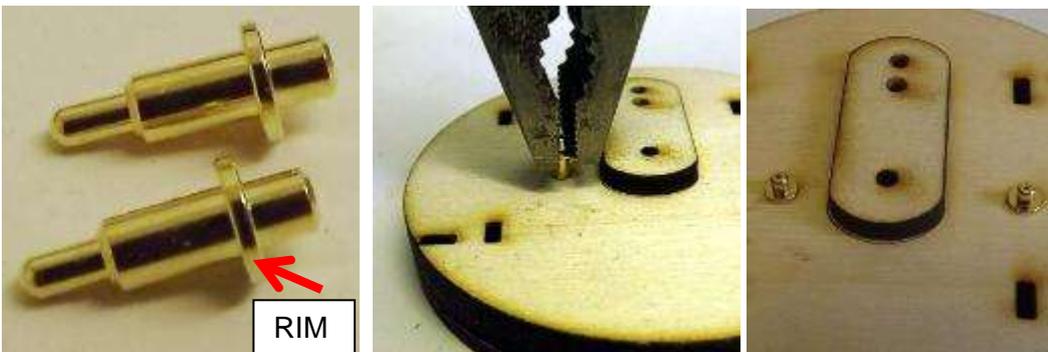
PHOTO SERIES 1B: glue the gear support and add sprung plungers to baseplate.

Use the axles to align the gear support (follow the markers). Then press in the contacts. (found in the gear pack)



On the deck-side, the contacts protrude like this. They will be compressed about 1mm when in use.

The plungers are a tight fit so they hold in place without being glued. **Push** them into the holes progressively using a large pair of pliers on the rim of the component, don't bash 'em on the top! If you do have to remove them, prise them up from under the rim (arrowed) – **don't pull** them out by the top – the top will very likely break off! (been there, done that!)

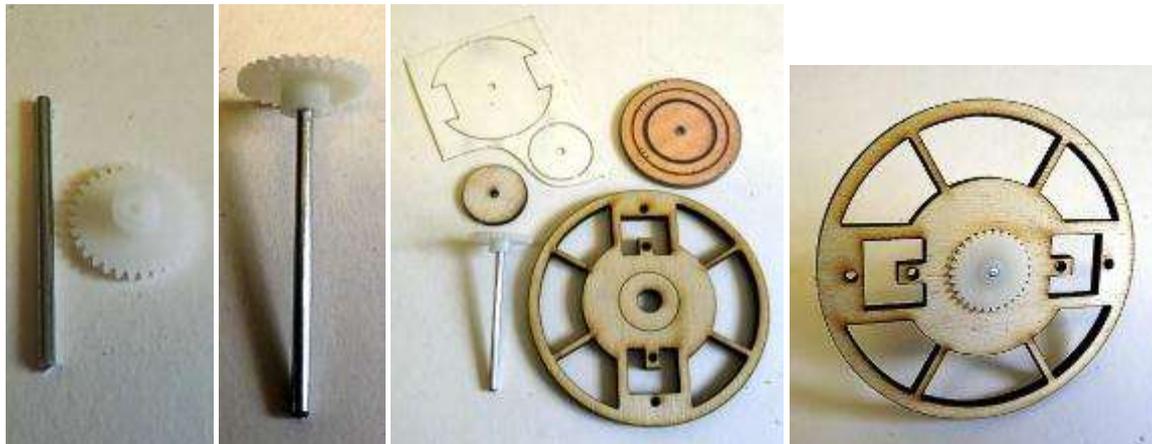


Note The contacts are not same distance from centre hole.

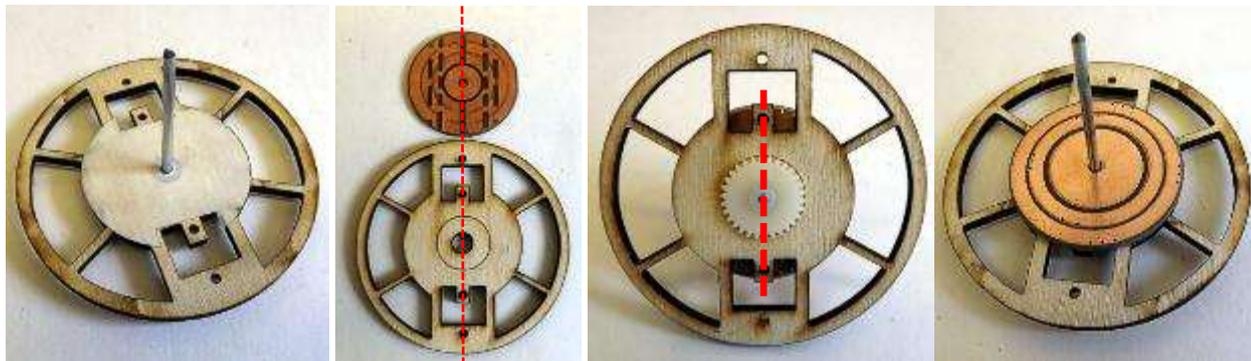
2. Spider assembly.

PHOTO SERIES 2A: fit the PCB and spacer bearing

Assemble the small 16mm diameter gear to the long axle. This fits quite tightly into the spider. Before complete assembly its best to glue it in place but for the next steps it's just used for alignment of the PCB and bearing.



Cut out the PCB adhesive sheet and peel away one layer. Push into place as shown. Remove the remaining layer from the P&S and stick the PCB into place as shown with the circular contact rings visible. Use the PCB split line to align it for soldering.



Add the bearing spacer. Smooth one side (lightly), use the circular P&S to stick it in place to the PCB. You can add some graphite lubrication to the underside of the bearing with a normal pencil. This is the turning surface.

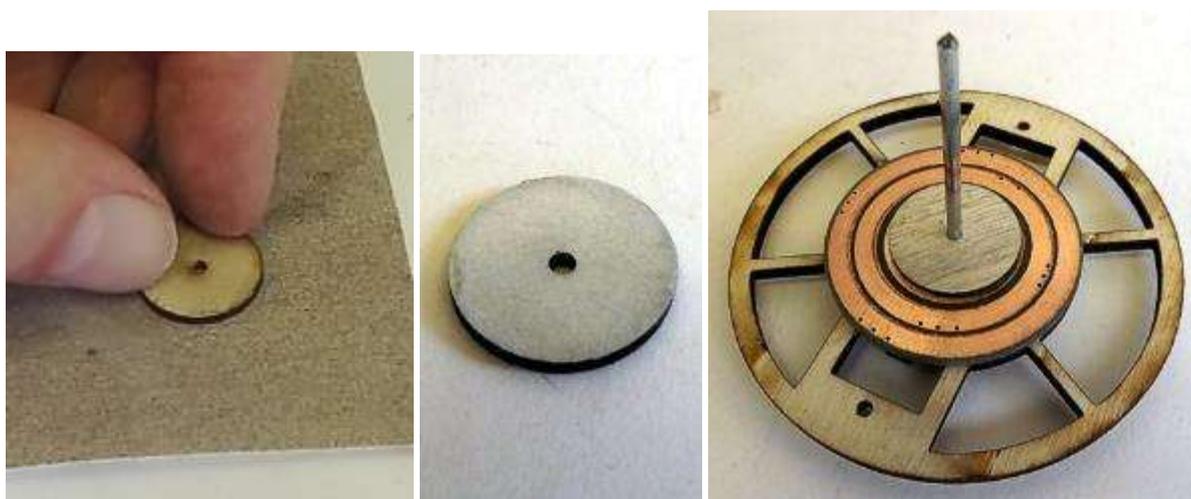
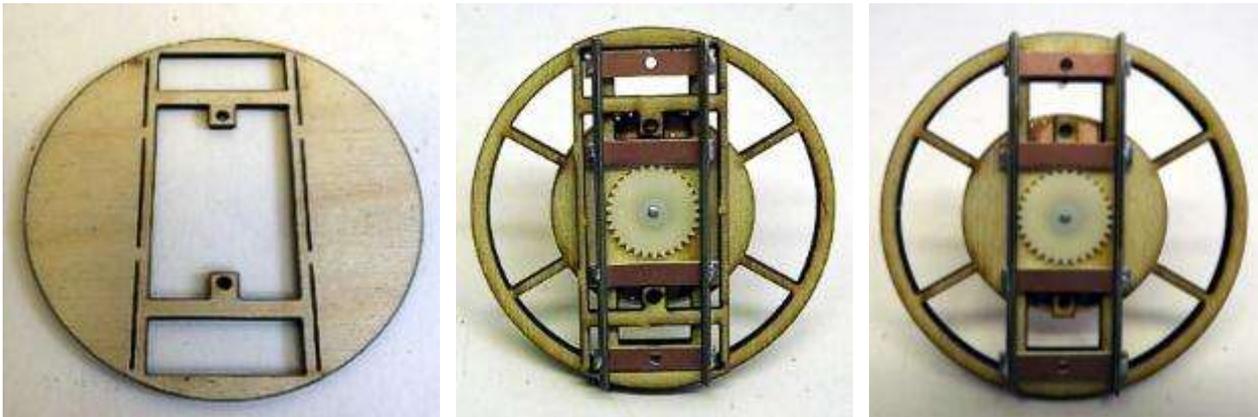
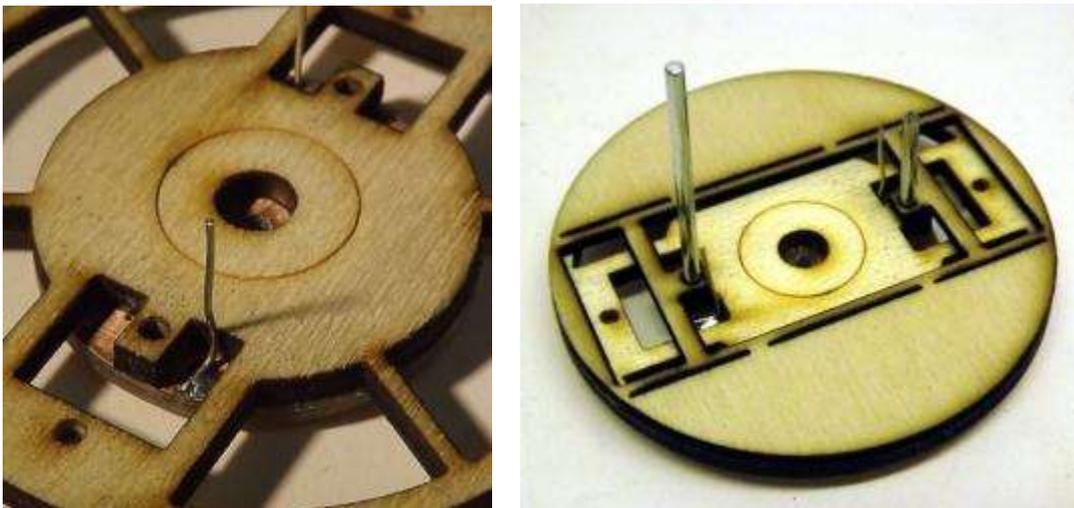


PHOTO SERIES 2B: fit rails and deck support to spider

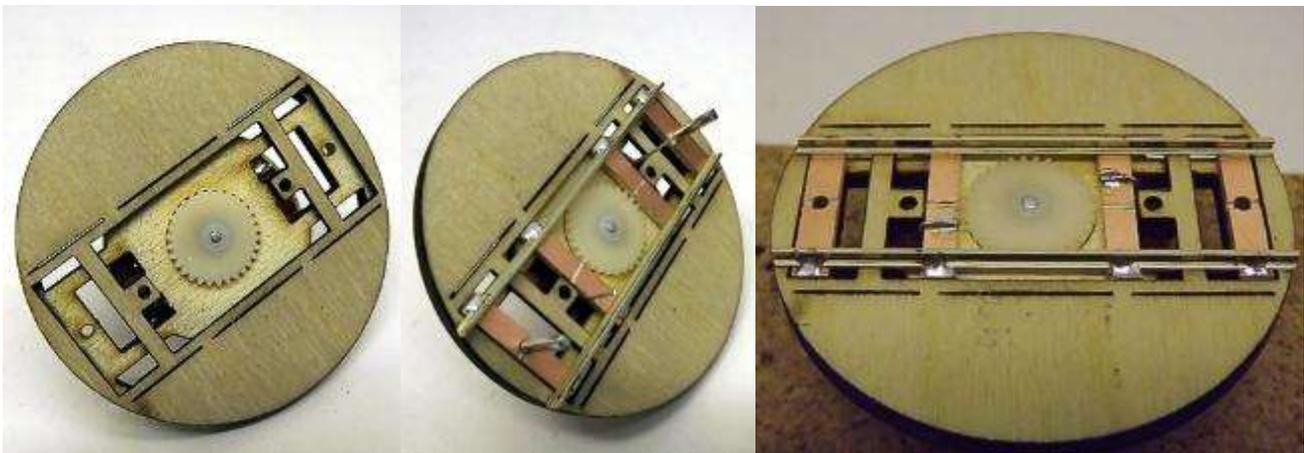
The deck support isn't needed for function, so it can be modified anyway you like, or omitted entirely for a more open industrial look. I use it if I'm fitting the deck planks so they can line up with the rails. It is the same thickness as the copper clad ties.



Use the wire supplied to solder 2 L-shaped wires (wire supplied) as shown. Then glue the deck support into place if you are using it. Use 2 axles to align it correctly to the spider. Notice I have removed the centre gear to make soldering and assembly easier.



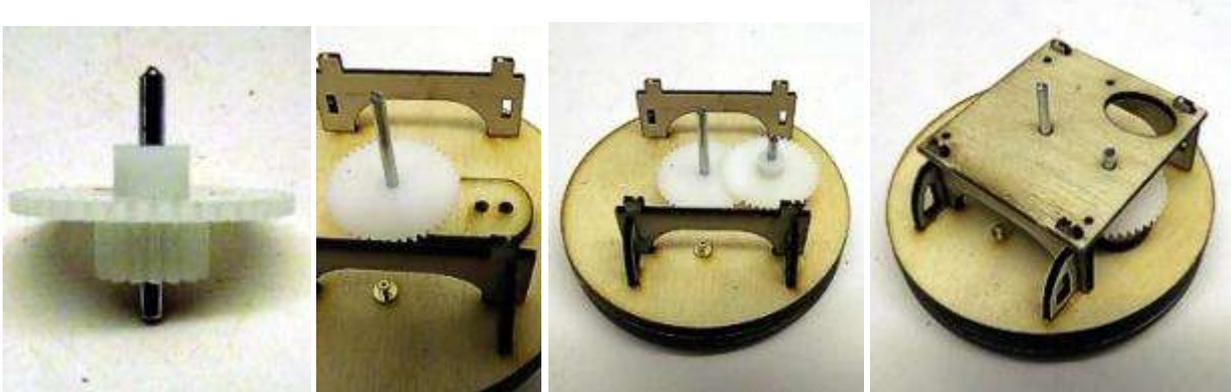
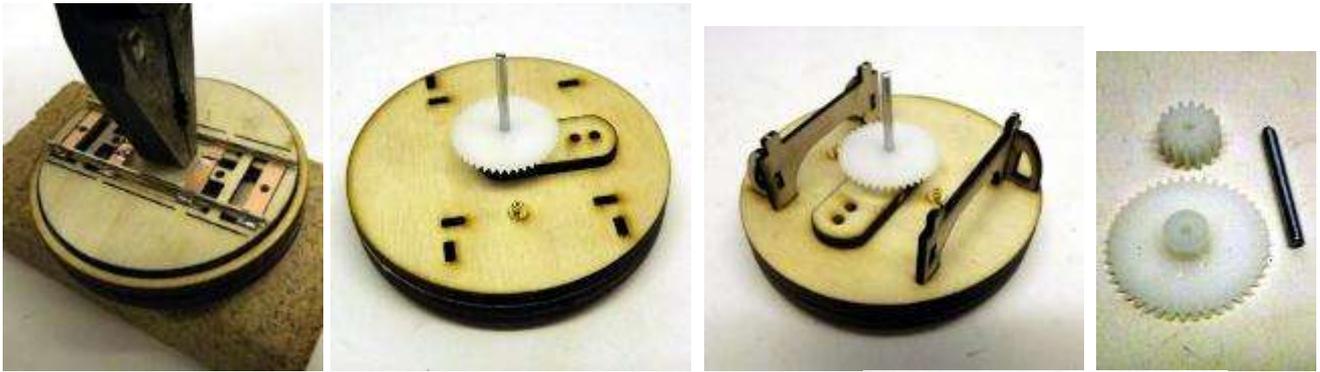
Refit the centre gear (glueing into place is best – ensure the axle is perpendicular) and glue the rail assembly using the 2 short axles as guides to get it perfectly central to the turning point. (I use a similar jig to make the rail assembly). Then solder the wires in place as in the picture. I support the spider in a cork block while soldering.



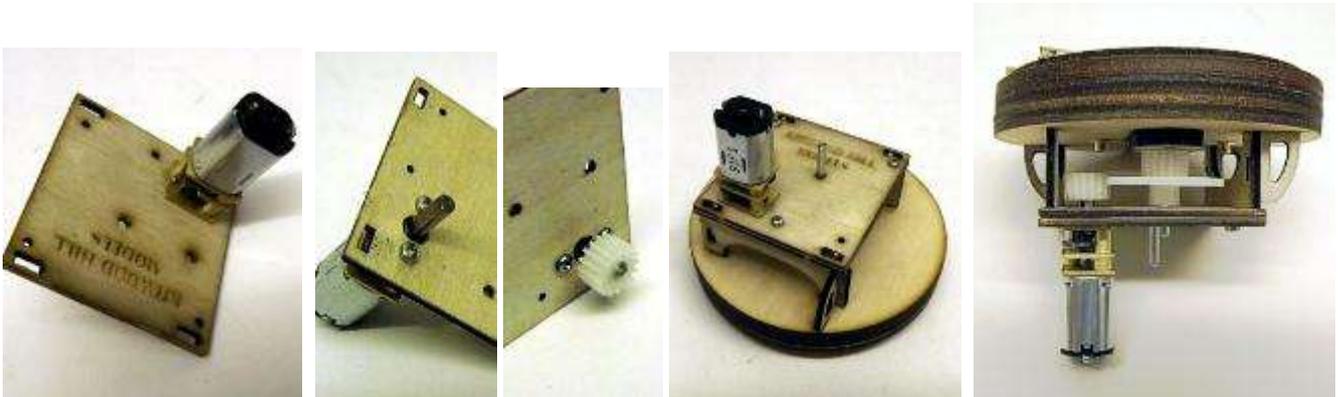
3. Gearbox and motor assembly.



The gears are tight on the axles. Don't worry - these gears are designed to go onto the axle supplied. They have to be tight so they don't slip in use, so please don't be tempted to "open up the hole a bit". You'll need to support the deck end of the main axle while pressing on the main gear. I use pliers as shown and bear down with progressive pressure while supporting the main gear on a cork block. **Don't use force on the edges of the main gear or the nylon will fracture – apply force to the boss of the gear to get it on the axle. File the end of the axle to create a lead-in if you are struggling to fit the gear.** The photos tell the rest of the assembly story. You may wish to solder the contacts wires on before gluing the top gear plate. It is a little tricky if left to later. Test to make sure the spider turns without jamming by turning the idler gear with your finger.



When happy that all turns smoothly as it should, fit the motor to the motor plate using M1.6 x 3mm machine screws supplied with the motor. Be careful not to cross-thread them. Push the pinion gear with the larger bore onto the motor shaft. Screw the motor plate into place with 3off M1.6x3 machine screws.



4. Finishing off the deck.

Add the keeper ring. This gives you a ledge to fit the turntable into the layout without falling through the hole ☺ and supports incoming rails at the right height. Tack in place with glue in just a few places so it is central to the deck with an even gap around the deck. When happy that the deck still turns cleanly within the ring, run some CA along the rest of the outside joint. (not too much or you'll glue the spider in place!)



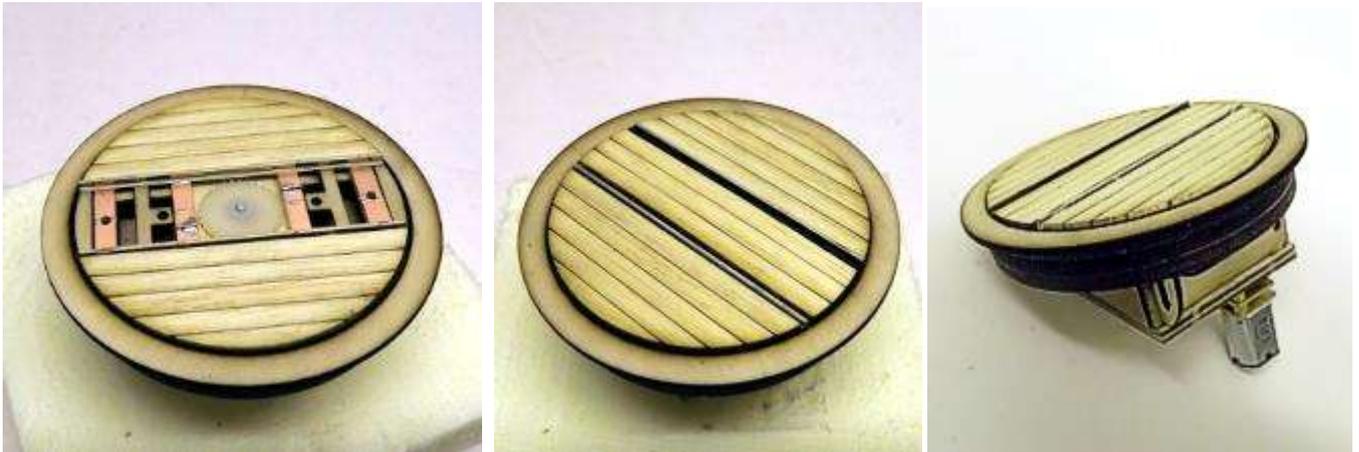
The surface of the keeper ring is at the right height to support the incoming rail – that would be a reason to choose code 100 if you are using Peco O-16 (On30) track.

The keeper ring is 1.6mm (1/16") thick so its about the same as ME track, the same thickness as PCB and commonly used plywood ties, but thinner than Peco On30 sleepers. A bit of packing out will be required to get the turntable height to match Peco On30 sleeper height.

Apply the top deck.

Firstly paint the parts of the rails and the gap that will be visible. I simply used matt black but grimey, dark brown works well.

The obechi wood for the top deck can be painted/stained before or after fitting. The thickness are correct so the rail tops are always a little proud of the deck. The rail edge will lift up the outer semicircles – I sand the corner off the wood so that the planks sit flat. I glue them in place with contact adhesive.



The 009 / 0-9 variant is the same construction method – only the gauge is different. Note the 009 version is available with code 75 and code 55 rails... will make a small N turntable too ☺



5. Rail wiring and installation

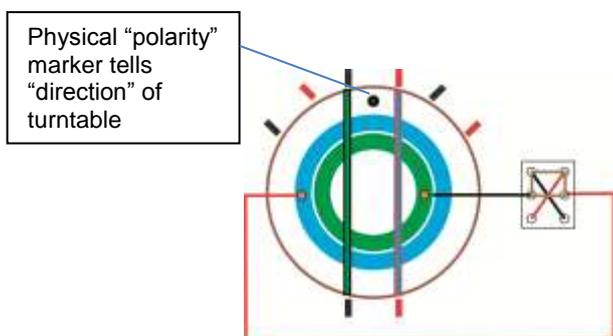
Wiring diagram: rail contacts.

The rails are permanently powered as they turn, no matter what direction. Unlike split ring designs, each rail is connected to the same contact, no matter what direction the turntable is facing. The advantage of not having a split ring is that DCC decoders will not reset as the loco is turned through 180 degrees. If there is sound on board it will be continuous. The other advantage is that entry and exit tracks can be put anywhere – there is no dead zone created by a split (which in a tiny turntable would be considerably limiting)

The polarity of the rails will be incorrect once turned through 180 degrees. There are 2 ways to fix this.

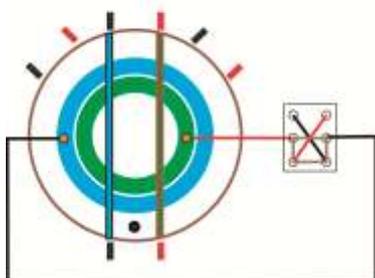
If using DC (or DCC) then a DPDT switch can be toggled to change deck polarity, and a toggle switch is included to do this. In practice this means you are going to have to have a physical means to tell which way round the turntable is so you know which direction to throw the switch – just needs an “oil spill” or similar feature stained/painted at one end. Depending on the DCC decoders you use, the momentary loss of power may cause the decoder to reset. Some decoders have enough on-board capacitance to handle this power loss, but most don't.

The true “DCC way” is to connect the turntable deck through a DCC reversing module. This will automatically detect if the polarity has changed, and will set the turntable deck polarity correctly as soon as the loco moves off and a DCC phase change is detected. Follow the instructions with the module. Reversing modules aren't complicated – just a lot more expensive than the DPDT switch that comes with the kit ☺



Rail power:-

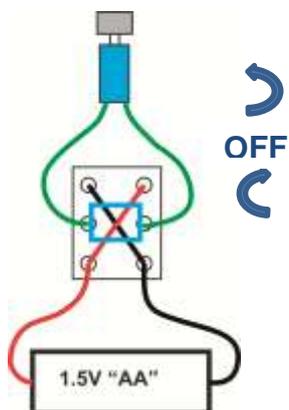
As the turntable turns through 180 degrees the DPDT switch has to be thrown to keep polarity correct.



Motor power:-

Centre biased OFF DPDT switch selects direction. With a single 1.5V battery, turntable makes one full revolution in about 30 seconds. Fastest way to speed that up...use 2 AA batteries ☺

Can also be powered with a DCC loco decoder by adding a 27ohm - 33ohm resistor in series with the motor. (stops it being damaged if set to max voltage)



MAX MOTOR VOLTAGE = 6V

DO NOT CONNECT MOTOR DIRECT TO TRACK POWER

The turntable baseplate diameter is 68mm. The keeper ring outer diameter is 75mm. A round hole needs to be cut into your baseboard, with a diameter somewhere around 70mm. (2 3/4")

Thank you for purchasing the kit. If you have any trouble during the build, or have constructive feedback, suggested improvements etc, then please contact me at sales@kitwoodhillmodels.com.

Happy modeling! Simon Cox