A no-frills helix

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It seems helixes, or helices, are all the go. [I'm with you Roger, I prefer helixes – Ed.] The need for a helix on my layout can be traced back to Rod Warren, when I was on the 2013 Convention committee. I was planning a layout for the newly constructed train room in our new home. Rod was encouraging, but kept saying one thing – allow for operation. I had always liked watching trains running, so a continuous run was important to me, but Rod's words stuck. He said that over time you will want your layout to allow for operations, not just watching trains go by. So my track plan was revised: I needed more length to have a couple of extra stations or sidings for a train to run from or to. Another thing I learned from seeing John Faye and Rod's layouts was that they modelled beautiful scenery on very narrow baseboards, so I realised that 500 or 600 mm deep baseboards are not essential.

So a second level was added to my layout plan, one on narrow shelves, with an exposed (scenicked) fiddle yard, and on my layout plan I drew an area about 700 x 1000 mm with the word "Helix" on it—with no idea how to build it. However all things in due course.

We moved in, and eventually moved most of the boxes from the train room and I thought I'd better see if I can build this thing, otherwise the plan was a waste of time. So I set about investigating helixes on the internet. There appeared to be several options. The most common was a version where several threaded rods were used to hold the rising levels in place and adjust the rise of each level. I did not think this suited what I wanted, as I planned to put a top on my helix to accommodate a small branch terminus. The method I opted for was to cut pieces of timber to set the rise – although it won't be adjustable, it will be easier to put a lid on.

I used an online helix calculator (**Photo 1**) to determine the height of each first rise. The calculator allowed for straight sections of track, not just the circular part. Most helixes I have seen are circular, but allowing space for that was going to take up too much room on the lower level of my layout, so I opted for one which was narrower and longer. I calculated the rise for one circuit of the helix at a grade of 1 in 50 (or 2%). Remember to allow for the thickness of the baseboard material and deduct this from the length of the riser timber to be cut. So if the calculator outcome is for a 30mm rise, and your "baseboard" material is 5 mm, then cut your riser at 25 mm. From then on it is relatively simple. If the rise for one complete circuit is 30 mm, then half way around will be half that, 15 mm. A quarter of the distance around the helix will need a riser of 7.5 mm, three-quarters around will need 22.5 mm and so on. You do also need to ensure that there is sufficient clearance for your tallest rollingstock and also to enable access for cleaning if required.

Quick Helix Calculator

Enter Your Measurements In the Yellow Boxes Only

Radius (metres)	0.3150				
Length of Straight (metres)	1.0000				
Circumference (metres)	2.98				
Gradient and Height Priorities	**Gradient**	**Height (mm)**	**Rise per Circuit (mm)**	**Number of Circuits**	**Amount of Track Required (ft)**
	2.0%	260	59.58	4.36	42.65
					Amount of Track Required (m)
					13.01
					13
Number of Circuits and Height	**Number of Circuits**	**Height (mm)**	**Gradient (%)**	**Rise per Circuit (mm)**	**Amount of Track Required (ft)**
	4	260	2.2%	65.00	39.10
					Amount of Track Required (m)
					11.92

Photo 1

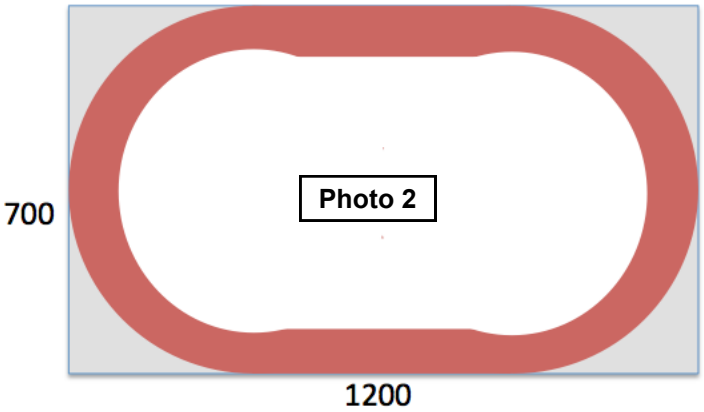

Photo 2

I constructed a frame for the base of the helix similar to an AusTrak module, using 19 x 40 mm pine with a 12 mm ply top. In hindsight this is over -engineered, but it works. I then cut the track base oval from a single piece of 700 x 1200 mm MDF, 6mm thick (**Photo 2**). This is approximately 100 mm wide, sufficient for a single track and also for a piece of riser timber on either side of the track to support the next level. I then used this as a template to cut three more the same for the levels above. Each section started and finished halfway along one of the straights. Next I attached the starting point and test fitted the pieces of riser timbers I had cut. The number of risers will depend

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on the size of your helix and the type and thickness of the material you use. For me I have about ten pairs of supports per circuit which gives a very rigid structure. Once happy with everything, I glued the supports in place. At the very beginning of the rise, where the gap is small, I used ice-cream sticks (single thickness and then double) rather than trying to cut very small risers (**Photo 3**).

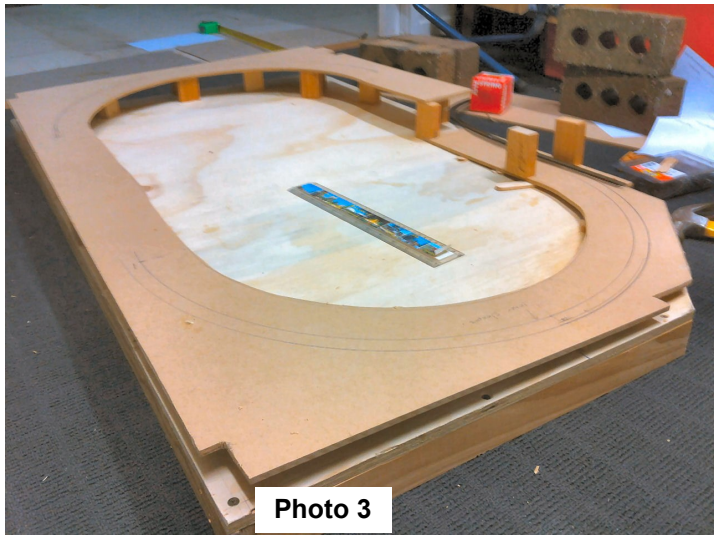

Photo 3

Once the glue dried, then came the track. I soldered two pieces of flextrack together and glued this around the curve using contact adhesive, directly onto the MDF, using bricks to hold the track in place until the glue dried. I did not use cork as anything that raises the overall track height also reduces the access. The next day, once dry, I cut the track ends parallel (not staggered as I had done in past track laying) and soldered the next length of track to the piece that was glued down. I did this with the track sitting straight and flat (ie: before trying to curve it into place) so the

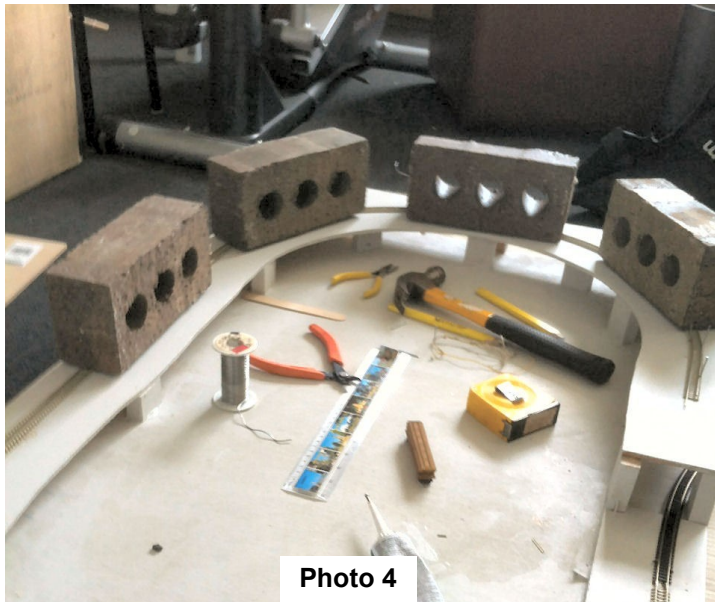

Photo 4

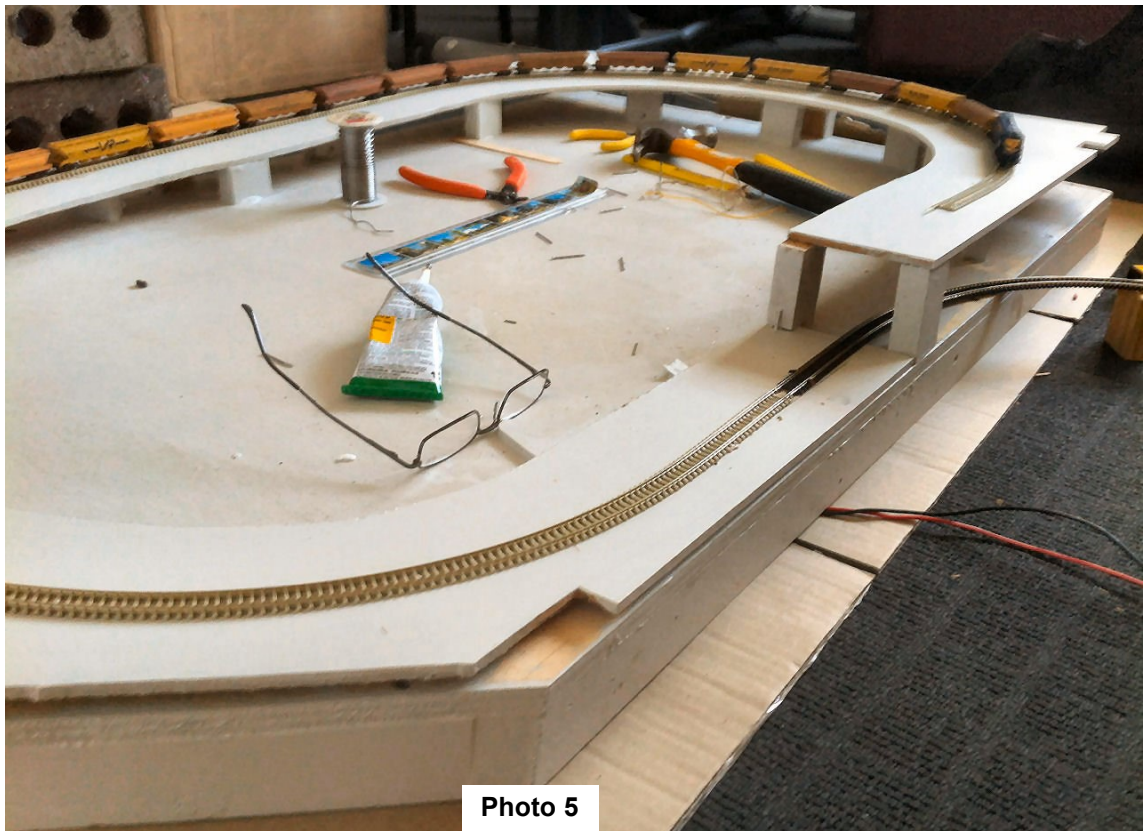

Photo 5

join was not stressed while soldering it. Once soldered, this piece was curved and glued in place, with bricks put on it whilst it dried (**Photo 4**). Three lengths was about one circuit, so I cleaned the track and tried pushing various pieces of rolling-stock up and down the helix. I then attached another piece of track at the bottom and connected track power with a couple of alligator clips and ran trains up and down the section of track using various locos and rollingstock (**Photo 5**).

So far so good. My track laying has never been great, and it never mattered that much, but this was different—once the next level goes on the track underneath can never be worked on again. When I was happy it was all satisfactory I put the next MDF piece in place. From then on it was easy, because the rise was set by all the work done getting a smooth transition on the first level. From here the timber risers would all be the same height so I set the length on my cheap Ozito saw and cut lots more pieces (**Photo 6**, next page).

As I kept laying and joining track I left one expansion joint per circuit—I'm not sure it's needed, but as everything else was soldered I thought it might be. I also added a pair of droppers for each circuit for track

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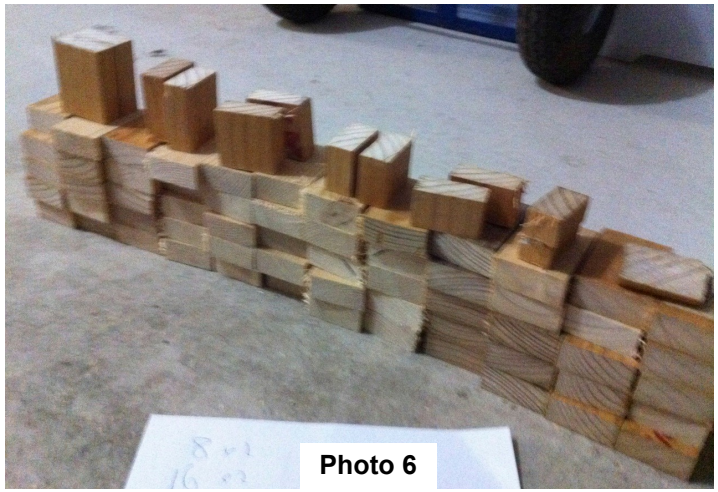

Photo 6

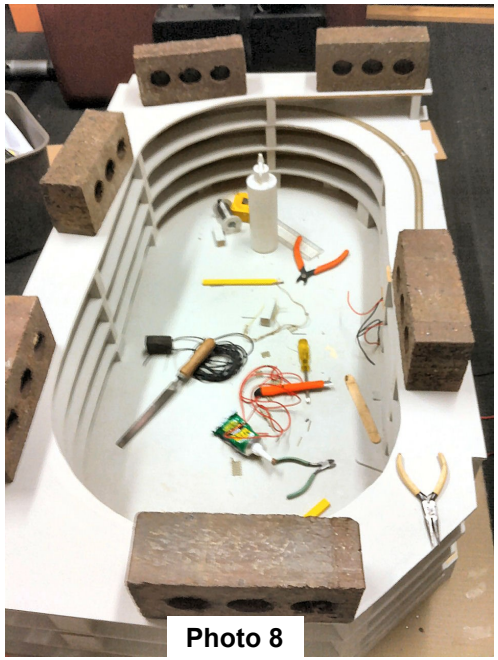

Photo 8

power (**Photo 7**). I continually tested the setup by running trains as each level was added—ran them slowly, and quickly, remembering Marcus would visit one day and might take a 30 wagon grain train down the helix backwards at full speed! Actually Marcus was just an excuse, I really wanted to watch it myself. The next two levels were added the same way (**Photo 8**).

The helix will be in a corner of my layout room, so I need to put only two sides on it. I was going to cover it in totally, but it is quite fascinating to look at and several people (including Debra) have said it should be viewable, so one side will have a perspex cover to enable the audience to see the trains going round. I still believe I am a less-than-perfect track layer so there will be an access hatch in the bottom, and the station on top will lift off for further access. The helix module is now in place, with a top made from 6 mm MDF and aluminium angle, ready for the branch station (**Photo 9**). The remaining baseboards are nearing completion, so onto some more track laying soon.

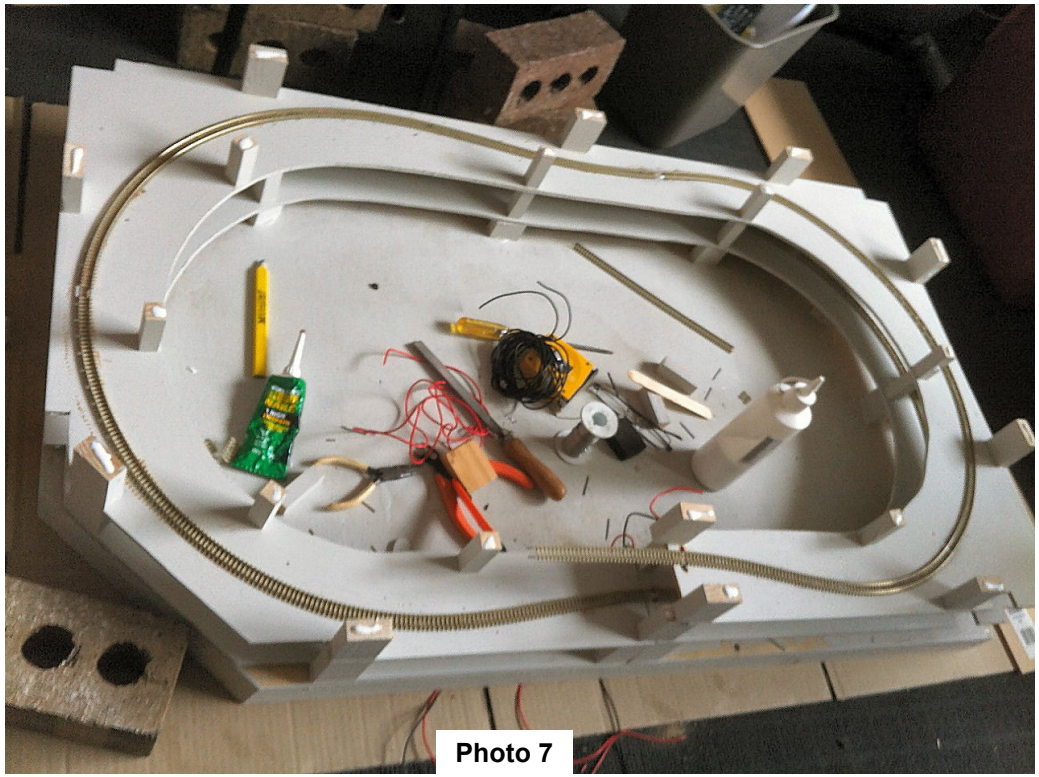

Photo 7

Photo 9