1: The Birth of a Railway

I had wanted a model railway for some time; unfortunately I was sidetracked by DCC and designing railway electronics for a long period and the railway itself never started.

Then in 2003 we moved home. From having little space – other than an already full garage – available, I now found myself with a 15'x15' shed available. (Was that why we chose the house? Of course it had no bearing on the decision…)

Year 1: Redecorate the new house

Year 2: Make the shed secure, safe and watertight. This was easier said than done, and took a lot of time effort and money. During this phase, I could have learned that carrying large quantities of timber is challenging, even with a large estate car available! Also a minor distraction happens, that will reappear later[1].

Year 3: We now have a shed with:

- Safe power feed;
- No water leaks;
- Insulation (it now regulates its temperature well, in all seasons);
- Attractive internal appearance.

By the time I'd allowed for a workbench and some essential storage, the space available for the railway was around 15'x10'. I'd already decided it would be N gauge, and this should allow a decent size railway. I wanted a continuous run, and I also wanted a "walk-in" arrangement with no hinged flaps. I wanted modern image, but not representative of any "real" railway.

A friend had an OO gauge railway with approx. twice these linear dimensions, so I could just scale that down – right? Lesson 1: as the gauge gets smaller the railway get smaller, but the human operators are still the same size. Lesson 2: an 8'x4' second railway constrains how to use the space available.

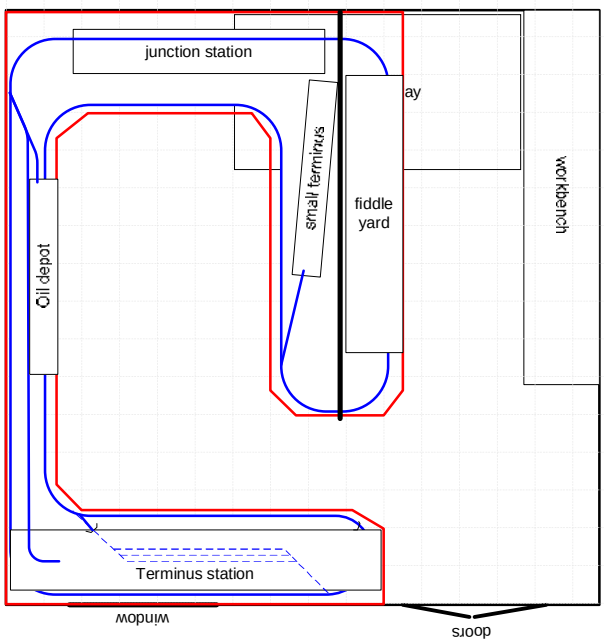
Another lesson learned from a friend's railway: make all track accessible.

Outline Design

OK I have a space envelope, some constraints and a few ideas. What next? By profession I work with CAD designs in computers; that was the natural way to proceed. But my experience with CAD has been that detailed CAD designs are great to capture a design, but not necessarily to capture fluid ideas. So I began with a PC drawing package and sketched out how the space could be used.

My childrens' railway needs to fit into the 15'x10' space, and needed space for the humans…. Quite quickly I concluded that it couldn't all be done at once; but that I might be able to accommodate the other railway, partly pushed under the new one.

The arrangement I ended up with is commonly known as a "folded dog bone". The track is a long thin loop, arranged around the edges of the space available; it will be multilevel, so some of it will be covered by other sections.



Suggestion: don't skimp on this stage. By using a "user friendly" drawing program (in my case Visio) I was able to consider a lot of

[1] Year 2½: the Children get a ready-made OO gauge railway, around 8'x4'

alternatives quite quickly (a radical redesign might take 20 minutes). The working area, windows and doors all appear in the design as constraints (you can see the childrens' railway tucked underneath in a possible storage location).

Detailed Design

Drawing packages are great for ideas, but without an accurate set of stencils for Peco trackwork, not much use for detailed design.. While I considered creating that stencil, Malcolm Alberry demonstrated to me a freeware CAD program called XTRKCAD. This had all the common ranges of track already available, supported multiple layers and appeared to do everything I needed.

Quite quickly I was able to draw out the shed outline, then the baseboard outline, then add some track. The program was very quick to learn: it has some user interface quirks (to do with panning, zooming and selection) but once learned it worked well. Soon I had a detailed plan of the track.

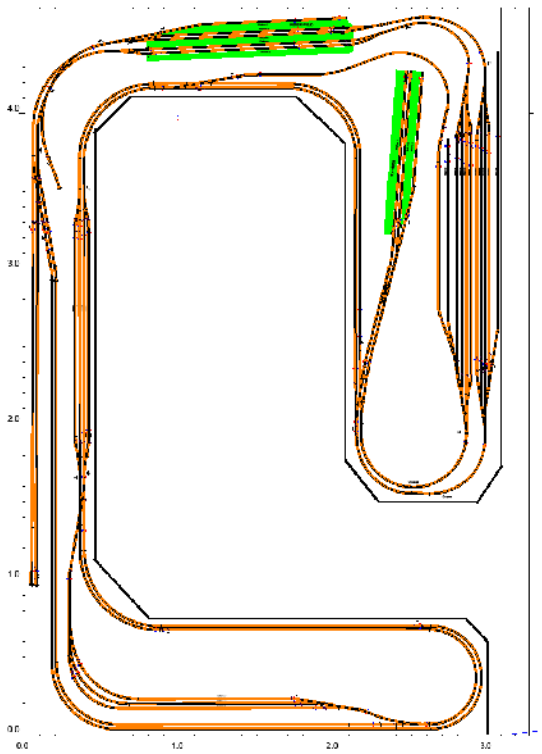
Lesson 4: plan the design. To be able to move around the design, it needs multiple layers, but can become cluttered. In the end I put baseboard, track and wiring on different layers for each of the main areas (track loop and stations etc each have their own layer).

I have, ultimately, found some limitations with XTRKCAD. Unfortunately it is not been evolved any further; I'd be happy to pay for the functionality it has, and pay more for a few upgrades.

- XTRKCAD understands trackwork, but not wiring. There are no symbols for track power feeds, for example. I have created my own, but it has no association to the track – it is just a graphic.
- XTRKCAD can be persuaded to capture track breaks into its design. However they don't print out: consequently the hard copy is of little use. Again, I have used a graphic.
- There is no way to mark or colour different "zones" in the track plan. To mark what areas need different power supplies, I have had to fall back onto Visio. On reflection it may be possible to import a "bitmap" representation into Visio and overlay that.

One of the virtues of a CAD design is that the baseboards can be designed to fit the trackwork. To avoid framework underneath a point, simply don't put it there. By seeing the two side by side, it's easy to put the framing timber in "safe" locations.

Lesson 5: don't change the track plan after freezing the baseboard design. I have made a number of changes subsequently, some of which put points where point motors won't fit directly underneath. This may yet come back to haunt.



I now have an outline design, with a detailed design built from that. I'm able to print out lists of the materials I'll need to construct it (including telling me how much timber I'll need).

Excuses were running thin by mid-Spring 2006: it was time to start construction.