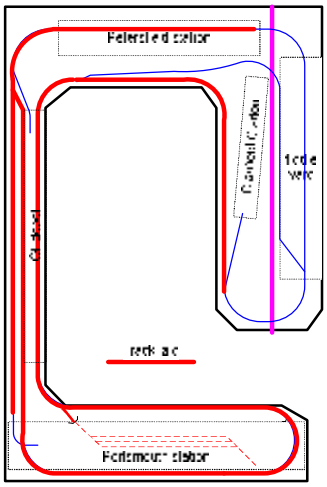
8: Track Laying and Wiring



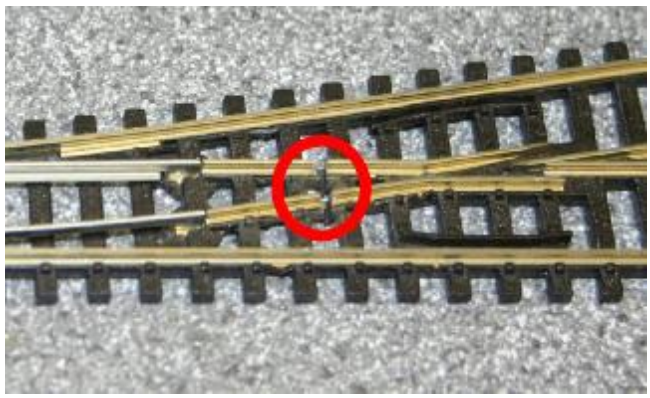
A change of emphasis this month: to disguise limited progress, we've described instead how the track is laid.

Planning and Marking

The process begins with marking the track centrelines. Straights are easy: a beginning and end point are each identified from the CAD design, and marked onto the cork sheet trackbed. A straight line is then marked between them: we used a laser to mark long lines. The corners are marked using a "trammel": essentially this is a giant compass. The centre point is moved around and the radius adjusted until the start and end of the curve intersect the straights at the ends. The curves are then marked onto the cork trackbed.

The main line track sections have a track spacing of 26.5mm, as per the Peco standard. At corners the gaps are eased up by ~2mm to avoid trains colliding as carriages cut in. As a double check, 75' carriges are placed on the curves to check they can't collide.

All of the points were "DCC modified" by cutting the rails running into the frog, and insulating with Araldite. A Dremel cutting disc was used for this.



Two 3" long wires are added to either side. The first few millimetres are soldered to the rail running into the frog, and to the outer rails. Gaps between sleepers need to be cut away for these. The remaining length is then used as a power feed "dropper" wire after installation. A third dropper wire is connected to the frog, soldering to the wire provided by Peco.

The points for the junction were laid out, and the first two points in Petersfield station were marked onto the cork. The aim here was to optimise the radii of the curves around the corner. The radii vary, with curved points and flexible track making up the corner. The exit rails from the curved point seem to have a straight section for the last 10mm or so, and that upset the planning slightly.

Once the positions of the four curved points were fixed, the dropper wire positions and holes for point motors onto tie bar ends were marked and drilled. The tiebar holes are drilled 6.5mm then elongated slightly with the drill canted, to create an oval hole at the bottom. All the point motor holes fell in convenient spaces away from timber supports: the baseboards were originally designed for that, but some small changes were made since then. Probably more luck than judgement!

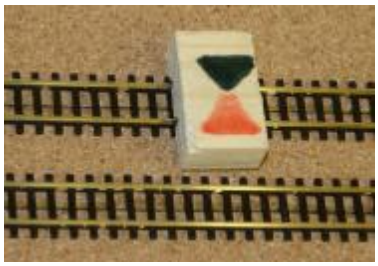
Fishplates need to be planned carefully. Some are insulating, some metal. The general rule is that the "inner" fishplates from the frog rails are always insulated; but some of the others are too. This is all on the CAD design.

The points were glued down quite quickly, and pinned in place overnight. Filling the gaps with

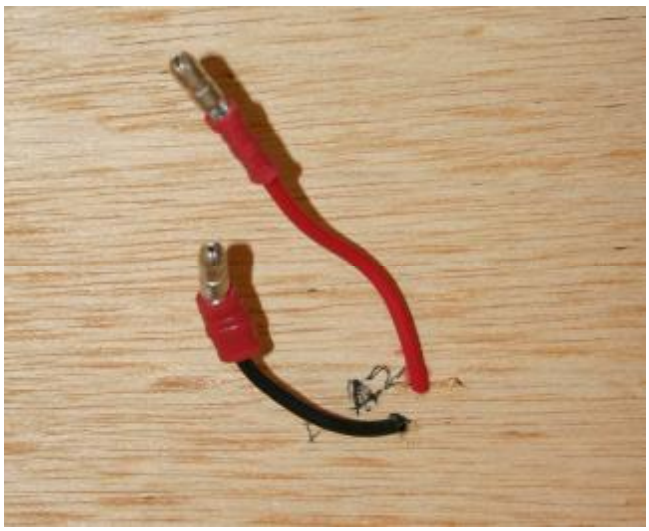
flexible track took a while longer. Each piece of track has its dropper wires attached first; some pieces have as many as 4 dropper wires, with three separate block detector zones.

Wiring Progress

That turns out to be somewhere between a third and half the total effort! The dropper wires are all marked as red or black depending on which rail they feed. A small piece of wood with a “power feed” marked onto it is useful for this.



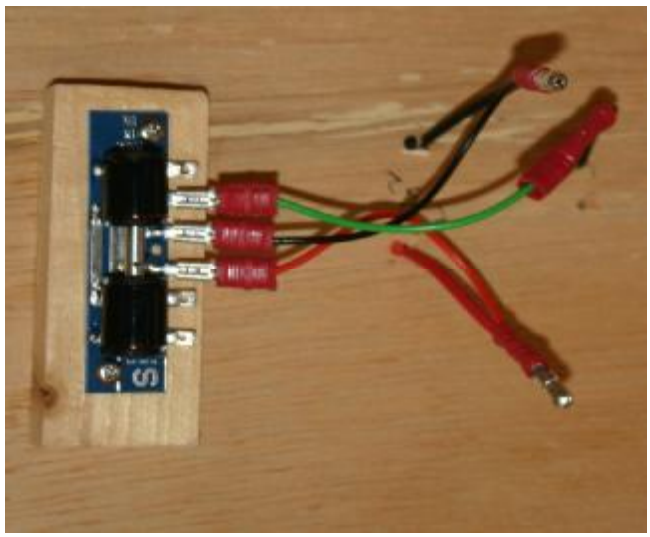
Insulation is added, followed by male “bullet” connectors crimped to the wire. The droppers on the points also have an insulated wired crimped into the same connector that terminates in a 2.8mm spade connector, ready to power the point frog via the point motor's switch.



The point motors themselves have 2.8x0.8mm terminals soldered onto their 6 pads, ready for push-on connectors. Lately I've been installing these by drilling 1mm holes in the pads, and “interference fitting” the terminals into the holes.

Pieces of 32x12mm timber, cut into approx 3” lengths and with a 10mm hole drilled in the middle, are glued under the point motor holes.

After cutting the Seep motor spindles to length. they are offered up and tested. For that we have a small box with a toggle switch and a capacitor discharge unit: an assistant operates the point while the installed lies underneath and checks it is operating over its full travel. It is secured using no.4 self tapping screws, and the wires to the frog are attached.



Where there are block sections that need to be isolated, a Dremel cutting disc is used to cut the “red” rail. The gap is then filled with araldite: I’ve been advised to do that to prevent the gap closing later e.g. because of thermal expansion. Excess araldite is removed using a scalpel.

Home straight now: feeder wires are run to all the dropper wires. We use 24/0.2mm ($0.75mm^2$) stranded wire. Each wire is numbered and marked; the returns are also marked.

Testing

Finally the wiring is tested: a short test with a coin to check that the power managers trip on every single piece of track, followed by a check of the DCC messages to make sure the block detectors are correctly wired. This means they generate the correct sensor message (and only one message).

So that's why it takes so long!