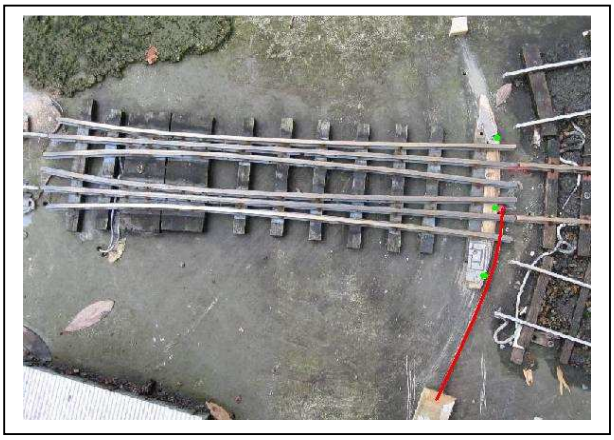
The concept and development of the KINK Turnout

We are all familiar with standard turnouts for railways.
For the model railway fraternity they comprise both;

- Sectional track type that includes an ARC of a particular Radius that diverts from the Tangent track.
- Turnout No. type, e.g. No. 4, No. 6 and No. 8 that are in common use.

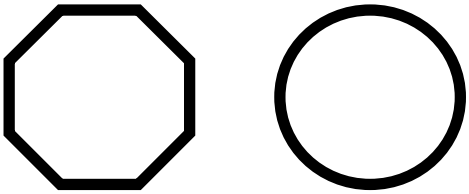
Over the years there have been numerous styles created to yield a simpler type of turnout that avoids the need for some of the complex elements of turnouts such as; the Frog, the Points and even the guard rails or stock rails.

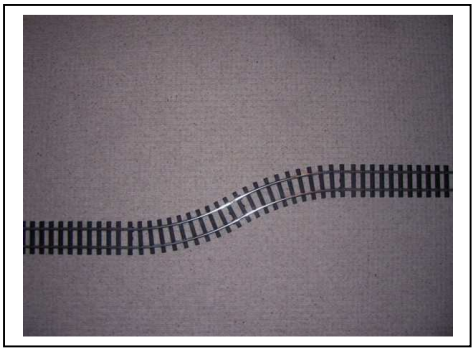
Here is an example of such efforts;



These two photos show the SWIVEL turnouts as designed and built by Greg Hunter.

The concept for the KINK Turnout is derived from the fact that curved tracks could be a thought of as a series of short straights with indiscernible kinks that approximate a curve. Taken to the extreme one could consider that an Octagon is a series of kinks that equates to a rough Circle.





Consider these photos, left photo has a 300mm straight track between opposing curves, the right photo does not. Trains negotiating that track in the right photo do so awkwardly and yet they can do so.
Most G scale modelers install siding and passing loops without the short straight between opposing curves and our G scale trains do manage to negotiate these installations.

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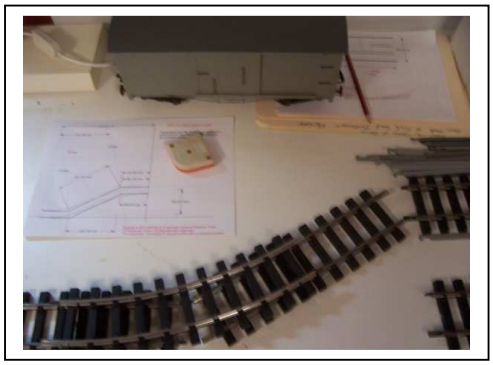
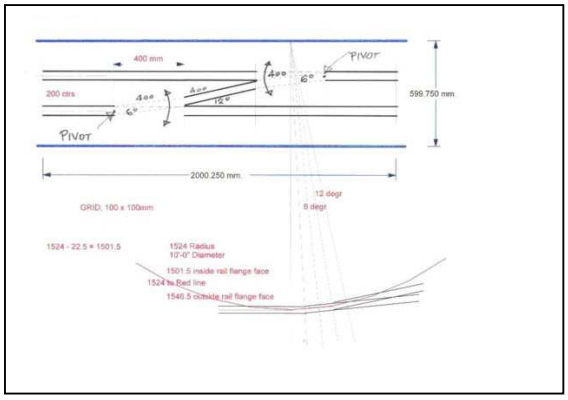
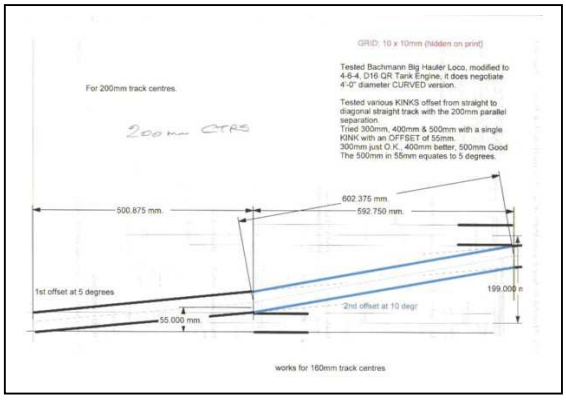
A series of loose track trials of various, kinks, angles, offsets and track lengths were developed. Trains were run through these with the longest fixed wheelbase vehicles in my model train fleet.
Hence, I was able to determine the severity of KINK offset that various vehicles could negotiate.



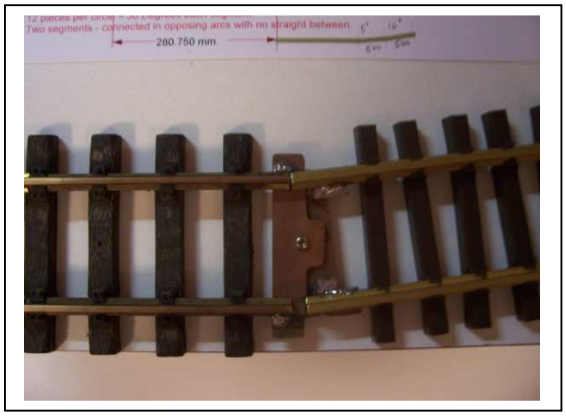
These photos show some of the track KINK offset negotiation trials that were undertaken.

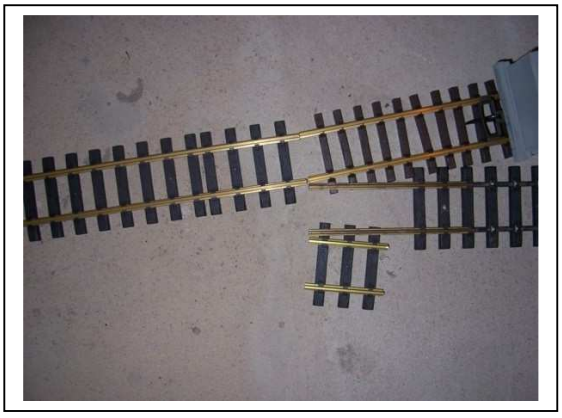




A series of drawings were developed, to scale of curves, kinks, angles, offsets and track lengths. Then over-lays were done of the longest fixed wheelbase vehicle in the model train fleet.

Next I tried a 'swing track' which is just that, a plain piece of track. The sleepers all slide in an arc.





This photo shows the PIVOT point in Detail. Train vehicle wheels 'jump' the 8mm gap and take the KINK surprisingly well. The angle here is 5 degrees (55mm off set for a 480mm long 'swing track').
My longest fixed wheelbase loco negotiates this easily.

This photo shows frog end of a 'swing track' 480mm long. There is no frog, just rail ends that are close and just touch each other. The 'swing track' slides through an off set of 55mm (45 + 10) to align tracks. So that means we have now deviated 5 + 5 = 10 degrees in 480mm 'run' of straight and two KINKS.

No 'points', no stock rails, no Frog, no guard rails, just straight track.

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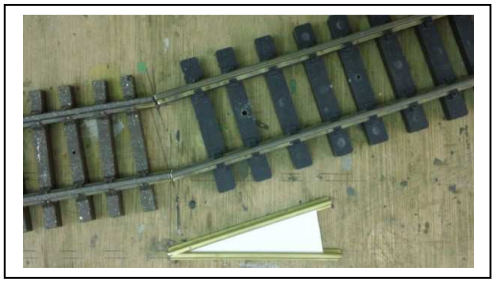
Below is a similar test, however it has a more severe kink using a 300mm long ‘swing track’.
Further, I have tapered the back of the frog rails to yield a 3 - 4mm wide ‘nose’.
That means there is a 49mm off set ARC (45mm + 4mm nose).
The ‘swing track’ is just that, a plain piece of track. The sleepers all slide in an arc.

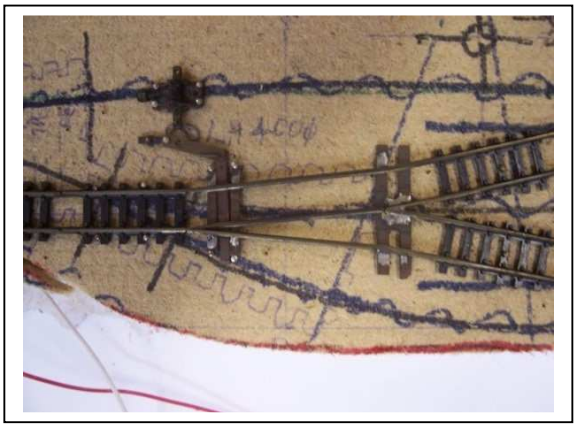
In this case, a nominal 10 degree ‘kink’ deviation from straight track, the ‘frog’ (white template) yields an additional 10 degree kink, a total of 20 degrees deviation from the straight track in 300mm run.

This is the ‘point’ end of the ‘swing track’.



This is the ‘frog’ end of the ‘swing track’.

Here is another variation in which the same FROG detail is used but where there is a ***single*** ‘swing rail’.



Here there is a pivot 5mm to the left of the nose of the frog. The frog does not come to a sharp point but has a 3mm – 4mm nose to better align with the rail head of the ‘swing rail’ for either turnout track.

The single ‘swing rail’ slides in an arc across plain sleepers that have no fixings for the ‘swing rail’.