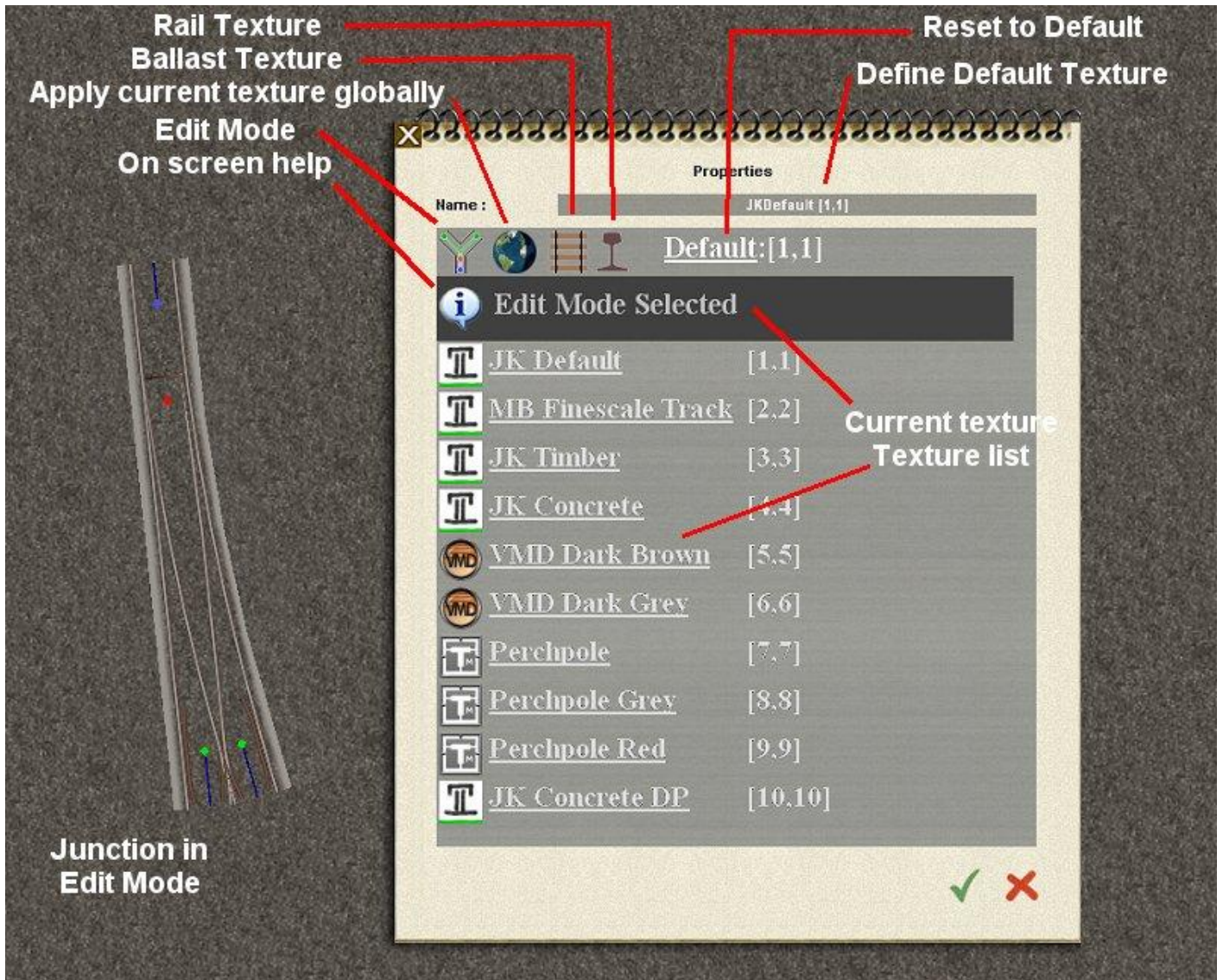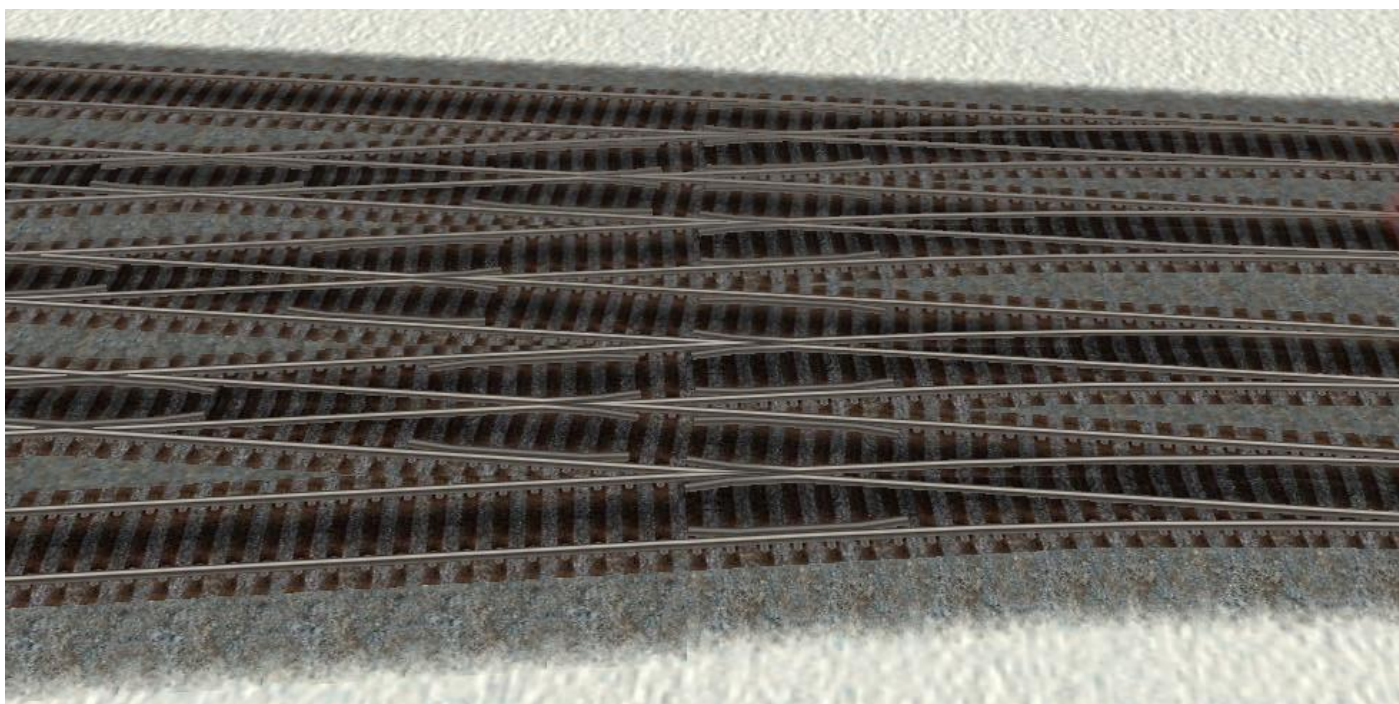ADDENDUM

Since writing this guide the Junction Kit has been updated.
The main change is the addition of a detailed user interface to
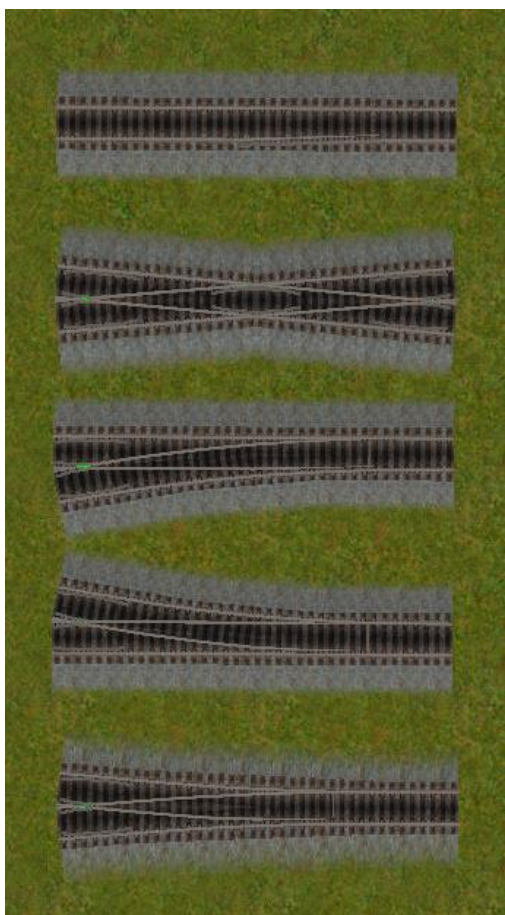control most aspects of the installation.

This can be accessed in Surveyor by way of the question mark
icon at the bottom right hand corner of the Objects menu (F3).
Select this button and then click on any Junction Kit object.
This will bring up the dialogue below.

Rail Texture
Ballast Texture
Apply current texture globally
Edit Mode
On screen help

Reset to Default
Define Default Texture

Properties

Name :   JKDefault [1,1]

Default:[1,1]

ⓘ Edit Mode Selected

Ⲧ	JK Default	[1,1]
Ⲧ	MB Finescale Track	[2,2]
Ⲧ	JK Timber	[3,3]
Ⲧ	JK Concrete	[4,4]
VMD	VMD Dark Brown	[5,5]
VMD	VMD Dark Grey	[6,6]
T	Perchpole	[7,7]
T	Perchpole Grey	[8,8]
T	Perchpole Red	[9,9]
Ⲧ	JK Concrete DP	[10,10]

Current texture
Texture list

Junction in
Edit Mode

✓ ✗

AJS Junction Kit

Finescale Track System

Included Components

### Junctions [*F3 / Scenery / Objects / AJS / Junction Kit*]

These are scenery items (actually they are of kind buildable) All of the track that you see is drawn in GMax and the functioning attached track is invisible. With the exception of crossings, which are completely functional 'out of the box', you need to do a little work to make them animate.

Junction Spacers [*F3 / Scenery / Objects / AJS / Junction Kit*]

These are fixed track sections sized to match standard track spacings. There are different sets of spacers for each junction angle. They are used to connect junction components together to form compound assemblies such as crossovers or yard ladders. There is an extension spacer *10+1.0 FT* which can be used in combination with the other spacers to provide any track spacing from 3.5 metres upwards in 0.5 metre increments.

Way Gauges [*F3 / Scenery / Objects / AJS / Junction Kit*]

These are fixed track units consisting of groups of one, two or three tracks spaced at standard track spacings. They are used to clean up the ragged edges that are left over when multiple junctions are snapped together to form junction assemblies. They can
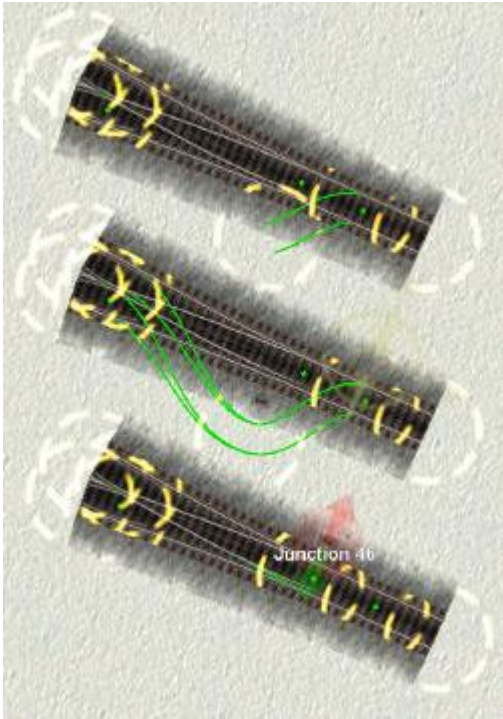
also be inserted into runs of track to control the direction and placement of curves and the twin track versions can be used to control the 'bend' on bridges and twin tracks.

Junction Wire [*F4 / Tracks / AJS / Tunnel Kit*]

This is a surveyor only invisible track which is used to 'wire up' junctions. Its visual representation in surveyor has been designed in such a way that it will disappear from view when the wiring is correctly aligned with the junction component. The track comes in two colours, green and blue. This is to help you to establish the location of the junction node.

Wiring Up - For beginners

Simple junctions have four node points shown by coloured diamonds. The diamonds appear as you zoom in. The central red diamond is the position at which the junction lever should be placed and the other three are the terminating points of the junction's internal attached track. The blue node is the input or index track, the others are coloured green. This colour coding becomes significant for junctions where more than one operating lever is required.

Using 'Junction Wiring' draw a track from the input node to a point close to the junction. From this point draw two additional tracks connecting the output and branch nodes. A junction lever will form and the animation can be tested using *F4 / Trackside / Junction direction*. Depending on the orientation of the blades you may need to click twice before you see the first animation.

Using *F4 / Track / Move* drag the junction lever node and drop it on the central diamond marker adjusting the position until most of the wiring is invisible.

The alignment isn't all that critical – you will need to get it very badly wrong before you will notice any difference in driver. Don't be tempted to use the 'straighten' tool on any of the wiring tracks as this changes the geometry of the junction and will make it impossible to align properly.
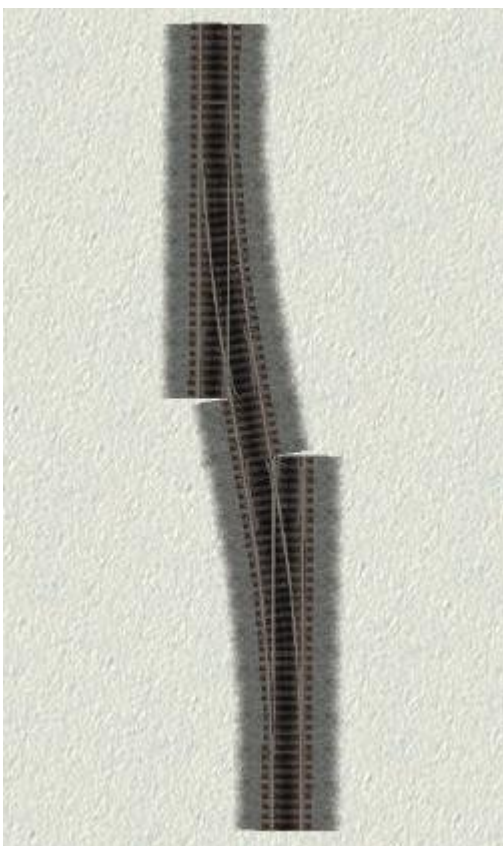
You may find it helpful to turn off spline circle rotation in Surveyor Options and to turn on Contextual Information in the same menu (this will hide any spline circles for adjacent roads and walls) Contextual Information can be toggled on or off using Control-O.

Wiring Up – For experts

You can if you wish draw the whole switch assembly directly on top of the component. You might need to hold down the shift key before Trainz will accept a click at the junction node diamond.

Problem Junctions

Sometimes a junction animation will fail to operate or will work once or twice and then fail. This usually results from the way that Trainz places levers at the node rather than adjacent to it. To fix this you need to move the lever to a position half way between the red junction node and the input track blue or green node. It can help to move the junction itself while you do this but it is some-

times difficult to persuade Trainz to allow the move. You can delete and replace the lever if you need to.

Wiring Slips

There are diagrams at the end of this document showing the easiest way to wire single and double slips.

Coding Junctions

Any junction object CAN be coded. Any junction object with more than one lever or any junction object which has a trackside component attached within the confines of the object MUST be coded. You can also code any junction which persistently refuses to work automatically. To do this:

Make sure that each of the junction levers concerned is named in the same way. Only the last word in the name should differ. Examples are:

Junction 1
West Ham South, West Ham North
Farnham Up, Farnham Down
Victoria 1, Victoria 2, Victoria 3, Victoria 4

Go into the Object Properties dialogue for the junction object itself and give it a name consisting of all of the words in the lever name excluding the last word, followed by a comma separated list of all the last words enclosed in square brackets in the correct order:

Junction [1]
West Ham [South,North]
Farnham [Up,Down]
Victoria [1,2,3,4]

When compiling the list for a multi lever object start at the blue node and work clockwise around the junction.

Once coded the various animations will fire in the correct sequence.

Compound Junction Templates

The junctions themselves will not attach one to another. This is where the spacers and gauges come in. You should use the spacer which corresponds to your regional track spacing and the angle of the points which you are using to connect junctions together to form one piece templates.

Each junction of a particular angle shares geometrical similarities with all the other junctions of the same angle and the dimensions of the pieces have been arranged so that if you join them together (using a 3.5 spacer for instance) you will get a fixed relationship between the exposed nodes. There are three principal uses for this although you will also find more subtle relationships as you build up compound junctions.

Crossover Junctions: If you fix two left or right hand junctions together branch to branch using a 3.5 spacer the input/output
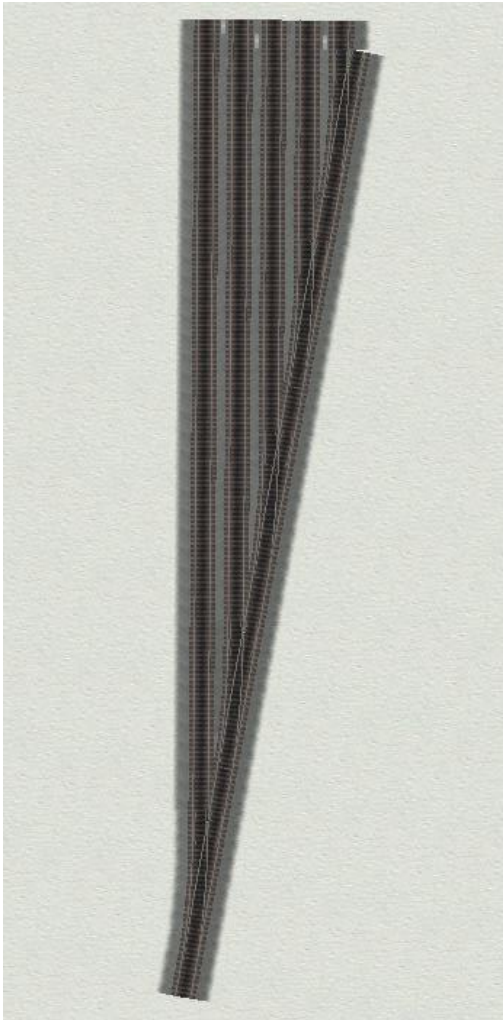
track pairs will lie parallel to each other and spaced 3.5 metres apart. The same is true for the other track spacings.

Double Junctions: If you take the crossover assembly, substitute a crossing for one of the points and add another set of points spaced off with a 3.5 spacer along the main line you will have a double junction with 3.5 spacing for the main line and for the branch. You can extend this to multiple main lines simply by alternating between points and spacers as you lay track.

Yard Ladders: If you lay a sequence of left or right hand points end to end with each pair separated by a 3.5 spacer the branch tracks will lie parallel to each other at 3.5 metre intervals. You have a yard template.

The 'way gauges' are used to 'tidy up' the ragged ends. When this has been done the compound template will control the tangent direction and spacing of any attached tracks and will enable you to maintain parallel trackwork regardless of changes in the direction or position of the junctions.

The 'way gauges' can be used on their own to fix the position or direction of track in the middle of a long run. They can be clipped together in the same way that you would build a brick wall to produce multiple track gauges. (see the note on fixed track height behaviour though)

The twin track 'way gauges' contain a third pair of nodes in the centre between the tracks. This enables them to control the tangents of matching twin tracks, bridges and tunnels.
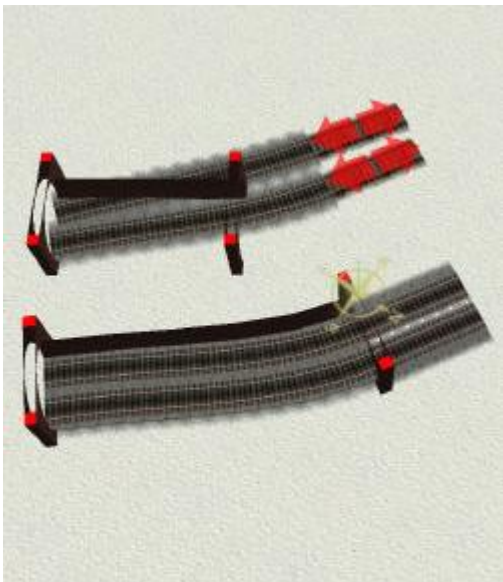
A twin track bridge consists of three splines, two for the tracks and one for the bridge itself. If you connect standard fixed track to the tracks on a bridge and then move the fixed track the 'bridge' track will be dragged off the bridge and an orphan spline point will be left behind. This is the bridge spline itself. This orphan spline node can cause endless problems.

The addition of the third spline on the way gauges prevents this from happening and allows you to control the 'bend' of a bridge and to avoid leaving these stray nodes lying around.

When to Wire Up

The junctions will not work until they are wired up. There will be no animation, no junction lever, Alastair will keep well away and any train driven manually over the junction will derail.

However there are certain advantages in not wiring up straight away.

Once a junction is wired up it can be safely rotated (except for a multi-switch junction), but it cannot be moved without affecting alignment. The junction and the lever are separate components and moving one will not move the other.

Where you are building compound assemblies it can be a lot easier to manipulate the junction and spacer components without wiring until such time as the whole assembly has been constructed and positioned.
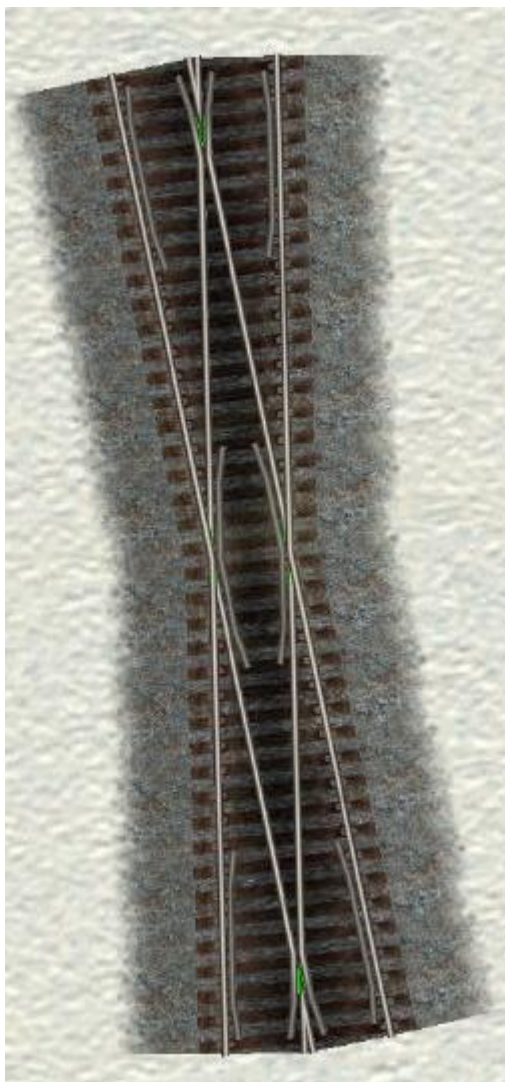
Replacing Levers

Levers can be rotated or deleted and replaced. They can also be moved a short distance from the junction itself. If you move them too far the lever will be above the fixed track in the scenery object and both arrows will turn red. To fix this move the lever back towards the junction.

Trackside Objects

Unless tha junction has been name coded the script for the system depends on the junction being able to detect the presence of the scenery item. The functions used for this detection also detect signals and other trackside objects and if any of these items are found between the junction lever and the track piece the script will fail. Wherever it is possible to do so you should locate such items outside the track piece itself, but certainly outside the area occupied by junction wiring.

Third Rail Electrification.

The system makes no allowance for ground level electrification at present although this may be possible in the future. If you add electrification components as trackside objects please ensure that they are not placed within the central area of the junctions as this will prevent the script from operating correctly.

Testing Alignment

The alignment of the rails in the GMax models is based on circular arcs between spline points. The geometry used by Auran is unknown but does not appear to be circular. With the distances and angles involved discrepancies between the two are negligible but they do exist.

With models of this type it is inevitable that users will pay close attention to the visual tracking of trains across the junction. When doing so please bear in mind that the bogey algorithm used by Trainz is approximate and that not all trains track correctly even on simple track. This is especially true of the large driving wheels of steam locomotives which often leave the track completely on small radius curves.

Please play fair and limit this sort of scrutiny to four or eight wheel vehicles that do not have any invisible bogies in their configuration and to junctions where the alignment between the scenery object and the invisible track is 100% correct.

Changing Height

The height of trackwork can be changed by altering the height of the ground on which the track is laid. If you use the scenery height tools all components including the junctions, fixed track spacers, wiring and junction levers will adjust correctly to suit.

Any spline track laid in one piece between templates or junctions of differing heights will adjust evenly to the required gradient and will ease itself flat at the point where it connects to the junction.
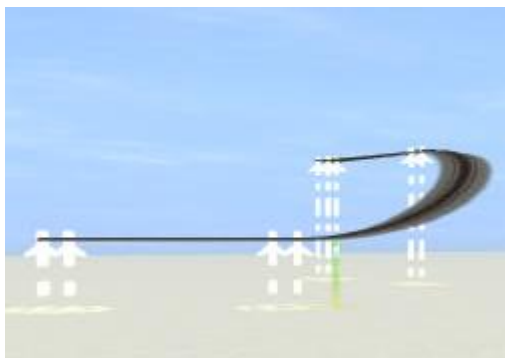
If you want to get a bit more ambitious, placing a junction on a bridge for instance, this is also possible but requires an understanding of the way that the various components cope with changes in height.

Junctions: The height of the junction objects can be adjusted using *Scenery / Objects / Adjust height.* All of the attached track and markers and the visible mesh will adjust correctly to the new level. The readout on the adjust height tool is relative to the ground which isn't always terribly helpful.
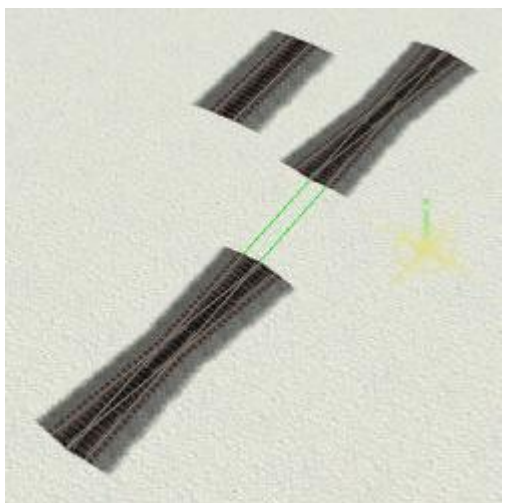
Wiring: The height of the wiring can be amended by using *Track / Apply Vertex Height* or *Track / Adjust Spline Height* on the red junction node. The other nodes are controlled by the junction object.

Fixed Track: Now it gets interesting! The gauges and spacers consist of attached track and a separate and wholly independent attached mesh. The attached mesh can be adjusted using *Scenery / Objects / Adjust Height.* When you move the mesh the attached track will show up as junction wiring.

The spline height of the attached track can only be adjusted in two ways. Firstly by altering the ground height and secondly by altering the height of any junction component to which it is attached. It follows from this that you CANNOT change fixed track spline height where fixed track is attached to another piece of fixed track or to spline track. Blame Auran not me! The implication is that on bridges for instance any fixed track spacers that you use must be attached to junction objects at both ends.

Texture Replacement

The meshes for all components have been newly drawn. The default textures for the various objects are Mike10's original components with some very minor modifications to allow for variations in mapping.
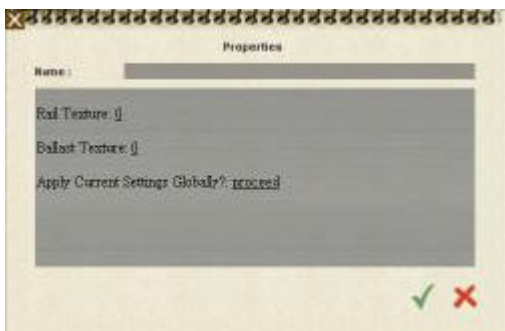
The track based components, both junctions and fixed track, have a texture replacement system built in. This can be accessed via *Scenery / Objects / Object Properties.*

The texture for the rails and for ballast and sleepers can be adjusted separately to provide a wide range of options. Textures can be set singly for each component or can be applied globally to all components on the current layout.

At the time of writing the system has not been completely developed and is included as a rudimentary demonstration only. Full documentation will be added at a later date.

Known Issues

**Script Failure:** At the time of writing this for the initial beta issue it has not been tested 'in anger'. The main reasons for failure will be poor junction lever location (by Trainz auto-placement not by the user) or the presence of trackside objects between the points lever and the internal connection to the junction object, any signal or speedboard in this position and the script will fail to operate. It
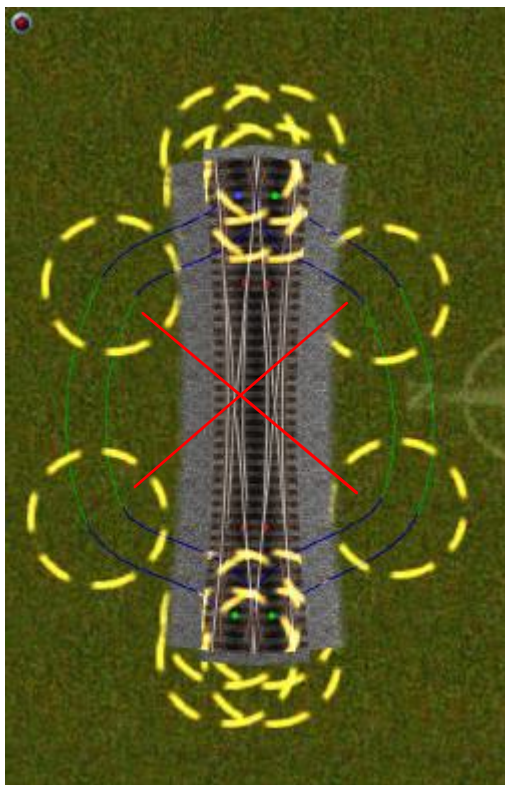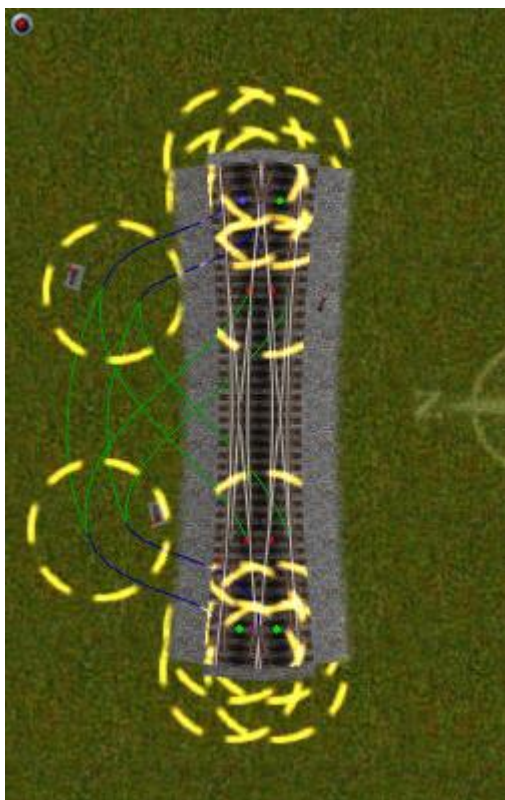
is normally safe to use Trackside objects outside the area occupied by the junction wiring.

The script does not interfere with the AI in any way. It simply reacts to the toggling of the junction lever and updates the animation to match. Failure of the script therefore will prevent the points animation from working but should not interfere with the operation of the railway. The junctions will still be set and trains will travel in the direction assigned by the junction lever.

Junctions which fail to operate can usually be resurrected by removing any offending trackside objects, deleting and replacing the lever or deleting and reinstalling the wiring. As a last resort the junction can be coded (see above) coding the junction will make it independent of lever placement and will allow the use of trackside objects, it can just be a little tedious to do.

Spacing of Parallel Tracks: Trainz does not use circular arcs to draw tracks so that if the track laid between two templates is curved the distance between the tracks will reduce between templates. This applies equally to the default components.

Spline Gaps: If you go a long way between templates you will find that, although the spline gap issue has been tightened up considerably, it does still exist and long distances between templates will result in gaps at the joints.

Compatibility: Although this track system may use aspects of the software in ways that have not been envisaged or documented by its authors I am not aware of any areas in which it breaks specification or uses code loopholes. I would be pleased to be advised of any areas where the authors or users may hold a different opinion.

Having said that its precursor issued by Mike Banfield was held to be unsupported in code and ceased to function following a software update.
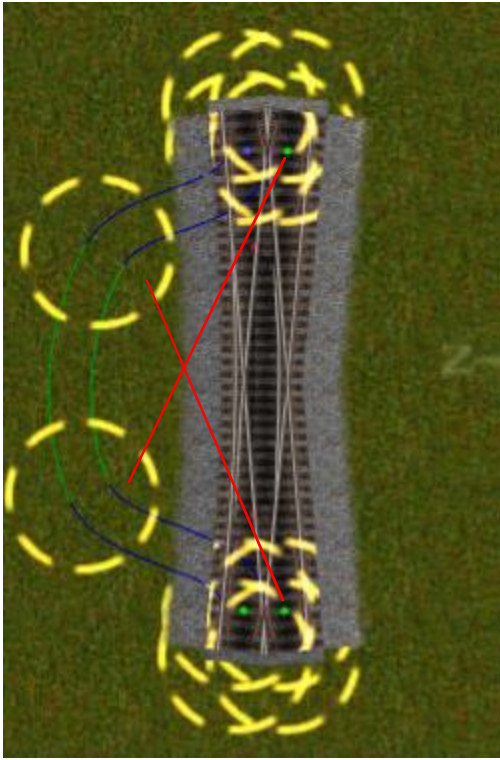
I would obviously prefer it if this situation were not to be repeated but I can offer no guarantees in that direction.

License: The system and all of its components are offered free for personal use and may be included in routes and maps made available on similar terms. Scripts are open source and the software is not encrypted in any way. Completed source code (as opposed to code under development) will be made available on request.

Neither the system as a whole nor any of its constituent components may be included as part of any item made available for sale without the prior written consent of its authors.

Support: No support is offered. The authors do however provide advice and fixes wherever necessary and possible. Please post any queries in the Animated Fixed Junctions forum thread rather than emailing as this makes it easier for others to track down solutions. Please search this thread before posting queries as it can be a pain answering the same question over and over.

Wiring a Double Slip
1. Connect the outer nodes diamond markers as shown above.
2. Connect each node point with the one diagonally opposite. (red lines)
3. Make sure that all the point levers are placed outside the track.
4. Drag each track node to its nearest red diamond marker and check the alignment.
5. Double slips must be coded before they will work.

Component List - Pack 1
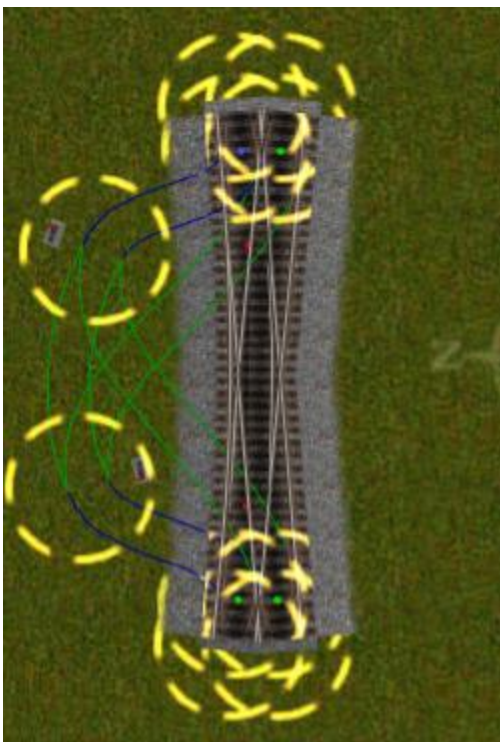
Points & Crossings	Point Angle	Type	Track Spacing	Object Kind (if not buildable)	kuid	Description
JK Point	10	-LH			122285:4030	Left hand point
JK Point	10	-RH			122285:4031	Right hand point
JK Point	10	-YP			122285:4032	Y point
JK Point	10	-XX			122285:4033	Crossing
JK Point	10	-3W			122285:4034	Three way point
JK Point	00	-CP			122285:4035	Catch Point
JK Point	10	-SD			122285:4036	Double slip
JK Point	10	-SS			122285:4037	Single slip
JK Point	20	-XX		-FT	122285:4042	Short Crossing for 5.0 m track spacing
JK Point	10	-LC			122285:4043	Left hand curved point
JK Point	10	-RC			122285:4044	Right hand curved point
Spacers						
JK Spacer	10	+1.0	-FT		122285:4019	Spacer / Joint (1.0 metre Extension)
JK Spacer	10	-3.5	-FT		122285:4020	Spacer / Joint
JK Spacer	10	-4.0	-FT		122285:4021	Spacer / Joint
JK Spacer	10	-5.0	-FT		122285:5022	Spacer / Joint
Way Gauges						
JK Way Gauge		1T	-0.0	-FT	122285:4023	Single track way gauge
JK Way Gauge		2T	-3.5	-FT	122285:4025	Twin track way gauge
JK Way Gauge		2T	-4.0	-FT	122285:4026	Twin track way gauge
JK Way Gauge		2T	-5.0	-FT	122285:4027	Twin track way gauge
JK Way Gauge		3T	-3.5	-FT	122285:4024	Triple track way gauge
JK Way Gauge		3T	-4.0	-FT	122285:4028	Triple track way gauge
JK Way Gauge		3T	-5.0	-FT	122285:4029	Triple track way gauge

Wiring	Colour					
JK Wiring	Blue				122285:4001	Junction wiring track, Blue
JK Wiring	Green				122285:4004	Junction wiring track, Green

Track	Ballast/Sleeper Texture	Rail Texture	Segment Length			
JK Track	00	-00	-2		122285:4100	MB Type Track 2m
JK Track	00	-00	-8		122285:4101	MB Type Track 8m
JK Track	00	-00	-2		122285:4102	Dark Timber/Light Ballast 2m
JK Track	00	-00	-8		122285:4103	Dark Timber/Light Ballast 8m
JK Track	02	-01	-2		122285:4104	Concrete/Light Ballast 2m
JK Track	02	-01	-8		122285:4105	Concrete/Light Ballast 8m

Meshes					
JK Track	Track node			122285:4000	
JK Track	Index Node			122285:4003	
JK Track	Junction Node			122285:4002	

Texture Libraries					
JK Track	Track textures			122285:4010	
JK Track	Ballast textures			122285:4011	
JK Track	Sleeper Textures			122285:4012	

Wiring a Single Slip

1. Connect the outer node diamond markers on one side only as shown above.
2. Connect each node point with the green diamond diagonally opposite. (red lines)
3. Make sure that all the point levers are placed outside the track.
4. Drag each track node to its nearest red diamond marker and check the alignment.
5. Single slips must be coded before they will work.