A Beginners Guide to Track Laying.

I should first say that none of the material below is original. I have made use of many sources of information and have often copied directly from them. All I claim to have done is to try to bring together that information that is required to enable you to lay track without having to search through all the information available in manuals, videos, and the forums, much of which seems to have been written by experts for experts.

I will try to explain how most of the different track formations can be laid. More complex formations can usually be constructed using a combination of the tools to be described. I hope by the time that you have finished this guide that you will be able to lay the track for your desired route and that you will wish to explore the more advanced features available.

I assume that you have already installed the ' Installer ' and the 'Docs ' from RSDevTools in the Download page of Rail simulator. If not, download and install now.

The primary source of information is, of course, the manuals provided with Rail Simulator itself and are to be found at ' Program Files\Rail Simulator\Manuals\Developer Docs '. and the videos provided by RSDL, to be found at http://railsimulator.blip.tv/posts?view=archive&nsfw=dc

I have made much use of these videos.

I have viewed the videos produced by Nightm00ds many times. They can be found on YouTube. The videos I have made use of are to be found at

http://www.youtube.com/profile_videos?p=r&user=Nightm00ds&page=1

also pages 2,3

Track Laying Part 1 on Rail Simulator
Track Laying Part 2 on Rail Simulator
How to place a signal on Rail Simulator
How to lay a turntable on Rail Simulator

In addition to these sources I have to thank the many contributors to the forums from which I have extracted many tips.

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Opening a new Route.

Start the **Advanced Editor program (** Program Files\Rail Simulator\RailSimEditor.exe) In the window where you select the route, select **New Route**.

Under **Choose a Template** select **Bath Green Park to Templecombe**. Do not select ' Default '. By selecting this route the pictures shown here should match what you get. ' Default ' does not have point levers.

Type in a name for this test route then click on **Create**

You should now be looking at a **Free Roam Scenario** marker in a completely flat terrain.

Move away from this and move the camera up a bit.

Click on the World Editor icon

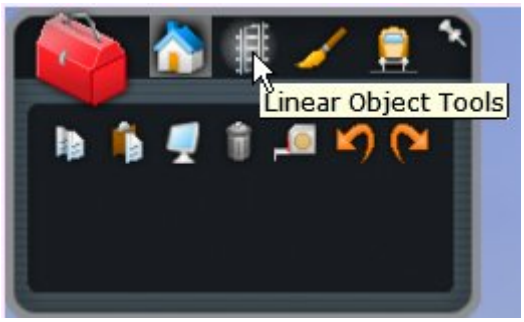
Now you are ready to lay track.

Look at the first four pages of **5.01 Route Editor User Interface.pdf** found in Program Files\Rail Simulator\Manuals\Developer Docs.

Also the ' **Editor User Guide** ' found in Program Files\Rail Simulator\Manuals\EN

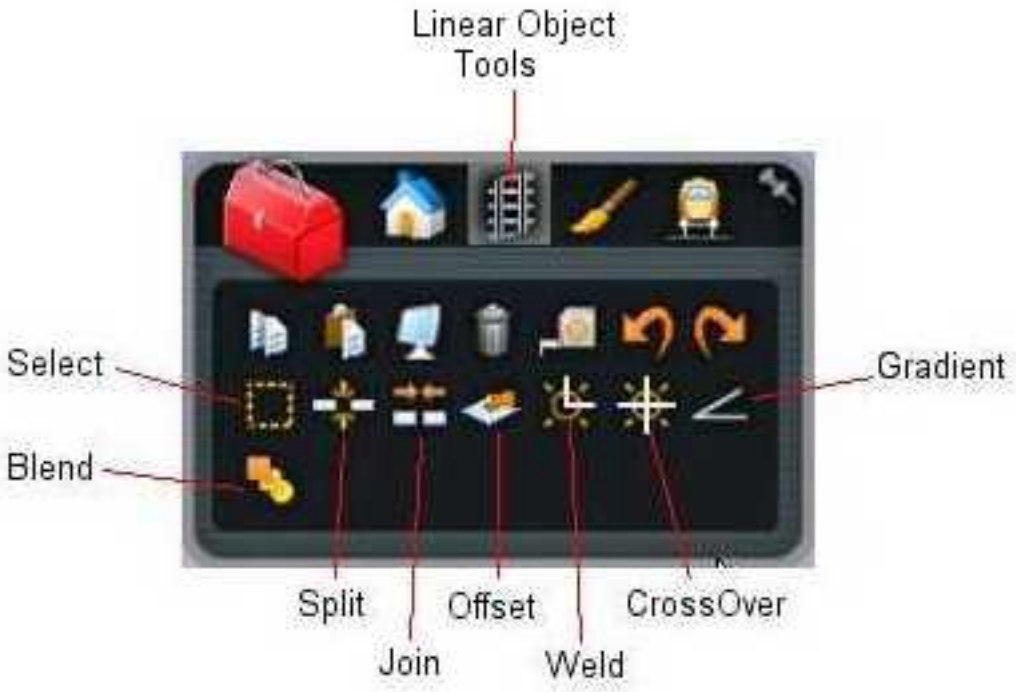
Now you need to look at the four popout panels that you will be using constantly.

In the **Main Editor Menu** select the **Linear Object Tools** icon.



The following panels will be needed frequently during track laying.

Linear Object Tools panel.



Linear Object Tools

Select Tool

Use this tool to change the properties of specific areas of linear objects (where available). Select the tool, left click on the linear object twice to select the part of the object between those two points and to open the properties panel.

Split Tool

This tool allows you to split linear objects into sections. Select the tool and place the cursor above a linear object to see a marker showing where the split will occur. Left click to complete the split.

To split a linear object into multiple lengths, place the cursor above the linear object. Hold the left mouse button and drag the mouse cursor perpendicular to the linear object. A series of indications appear of where the splits will occur. Left click again to complete the splits.

Join Tool

This tool allows you to join sections of linear objects of the same type together. Select the tool, left click on one of the linear objects you want to join, then on the other.

Offset Tool

This tool allows you to run a linear object (but not track) parallel to another linear object . Select a section of linear object using the select tool. Select the offset tool and then select a type of linear object from the browser list. Left click on the end indicator of the green offset lines on the side you want the offset to occur.

Weld Tool

This tool allows you to weld valid junctions on track linear objects. When you select the tool, black square indicators appear above all junctions that can be welded. Left click an indicator at the selected junction to weld that junction automatically.

Important Note: You must weld any separate sections of track to form a continuous line. A train will derail if run over un-welded tracks.

Cross Over Tool

This tool allows you to create cross over junctions on track linear objects. Select the tool then select rack from the browser list and move over to a section of multiple tracks. An indicator appears representing the start of the cross over junction. Left click on a track and move the mouse over to a parallel track. An indicator appears, showing where the cross over will be placed. Left click again to complete the cross over. Click on the indicator above the cross over to create a symmetrical double crossover.

Gradient Tool

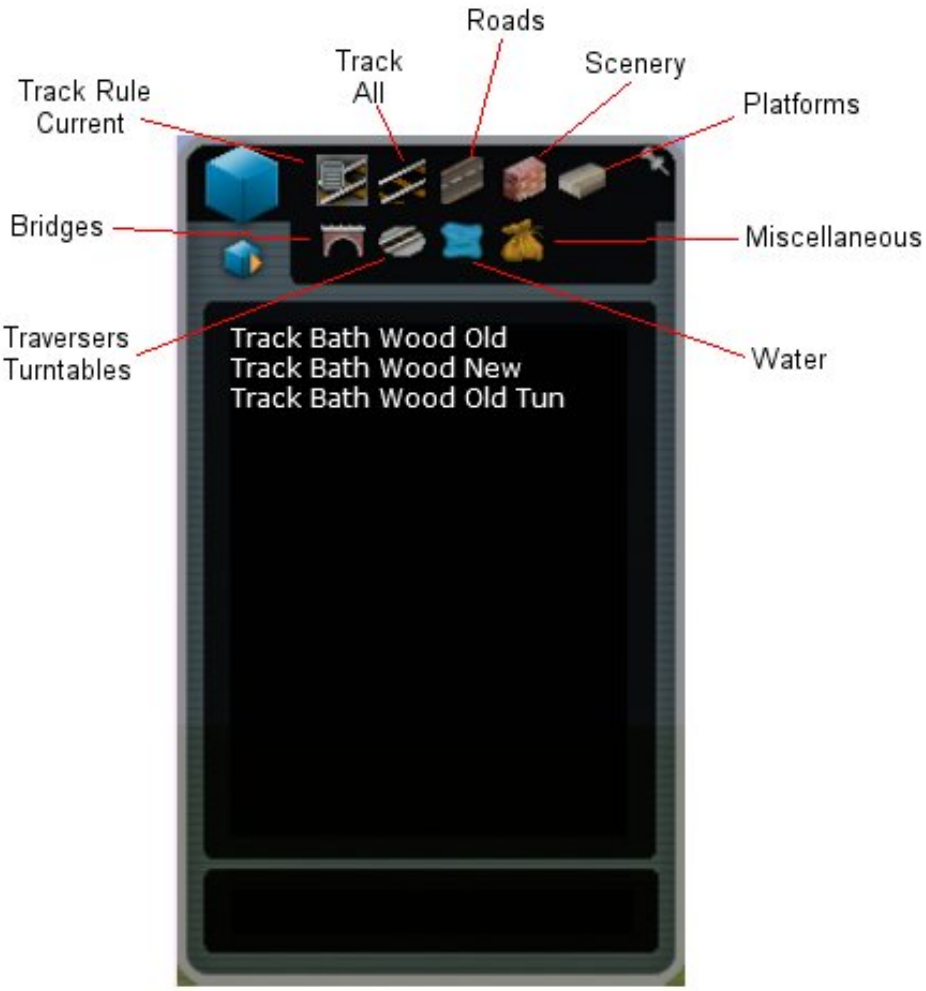
This tool allows you to edit the gradient of a linear object. Select the tool and move the mouse cursor over a linear object. A height post appears under the cursor, along with any existing height posts on the linear object. Click on the left mouse button to place a new height post; left click on an existing height post to select it ready for editing. Drag the mouse to alter the height post's vertical setting. Drag over to parallel linear objects to create multiple perpendicular height posts.

To delete a height post, left click on it and press DELETE. To snap a height post to the terrain, select it and press L.

Blend Tool

This tool allows you to create a blend between two different types of linear objects that are joined together. Select the tool, left click on the two linear objects and they are blended together automatically.

Object Selection Menu panel

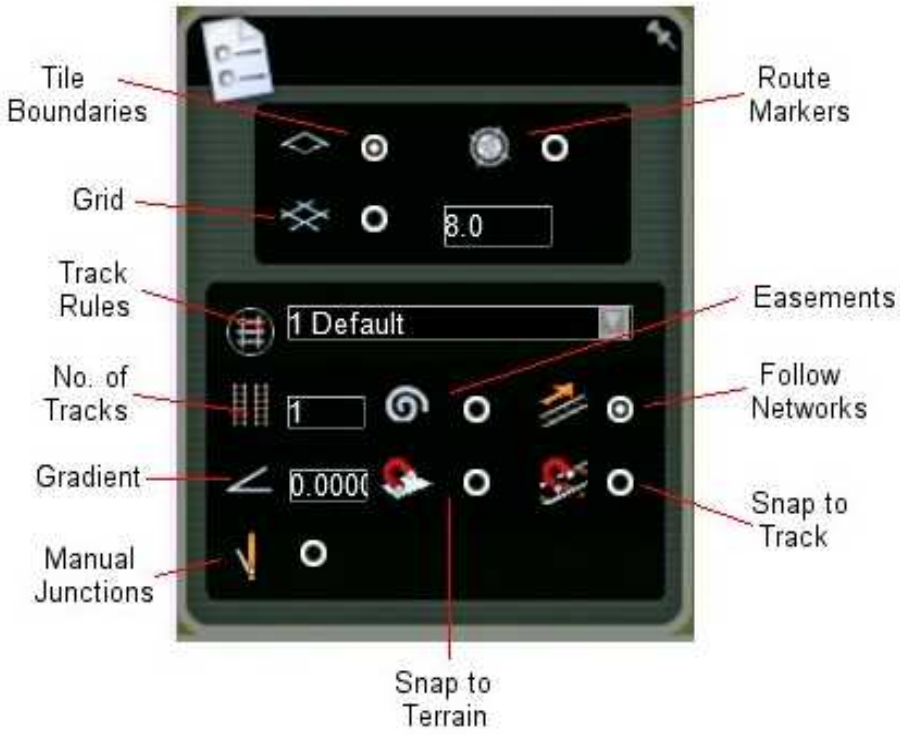


It is fairly obvious what most of these icons select.

Track Rule Current. As far as these exercises are concerned **Track Rule Current** will be used throughout.

If you wish to know what **Track Rules** are, refer to the DevDoc **Track Rules Setup**

Object Options Menu.



The following options are available for all toolboxes.

Tile Boundaries

This allows you to switch on and off the display of tile boundaries in the 3D world. The tile the camera is currently above is highlighted with a white border and its number is displayed on the status panel. Each tile is 1024 metres square.

The tile names are two strings of six numbers preceded by a plus or a minus sign (xxxxxx-zzzzzz.xml). The first six numbers relates to the North-South tile position in relation to the origin tile and the second six relate to the East-West position to the origin.

Increasing values for x means going east and increasing values for z means going north.

Route Markers

This allows you to switch on and off the display of route marker lines and flags.

Grid

This allows you to switch the grid on and off. When it's on, the centre of this grid appears underneath the mouse. You can change the spacing of the grid lines (measured in metres).

Press **O** or **P** to rotate the grid with respect to N - S axis. The grid rotates approximately 0.6 degree for each key press. Hold down key for continuous rotation.

Linear Object Options

When using the linear object toolbox the following additional options are available:

Track Rules.

Allows you to select the **Track Rule** you wish to use. See DevDoc **Track Rules Setup.**

We will use the **Temp: Main DOWN 70** and **Bath temp: Yard** rules.

Number of Tracks. Parallel.

This allows you to define the number of parallel tracks that are to be placed.

Easement

This allows the smooth transition from straight track to curved track. Without this there can be a lurch as the train changes from straight to curved lines.

Follow Networks

This allows you to decide whether the camera moves to the end of the recently placedtrack and starts placing a new section, thus allowing you to place another section immediately.

Gradient

This allows you to set the gradient of the track you are laying.

Snap to Terrain

When this tool is switched on, as you lay new track it will snap to the terrain surface, overriding the currently set **Gradient**. This can cause problem for track laying if the terrain is rapidly undulating, so will rarely be used.

Snap to Track

This determines whether track sections snap into each other. When it's on and a snap is possible, a pink outline appears around the relevant section of track. Left click to accept that location and place the linear object.

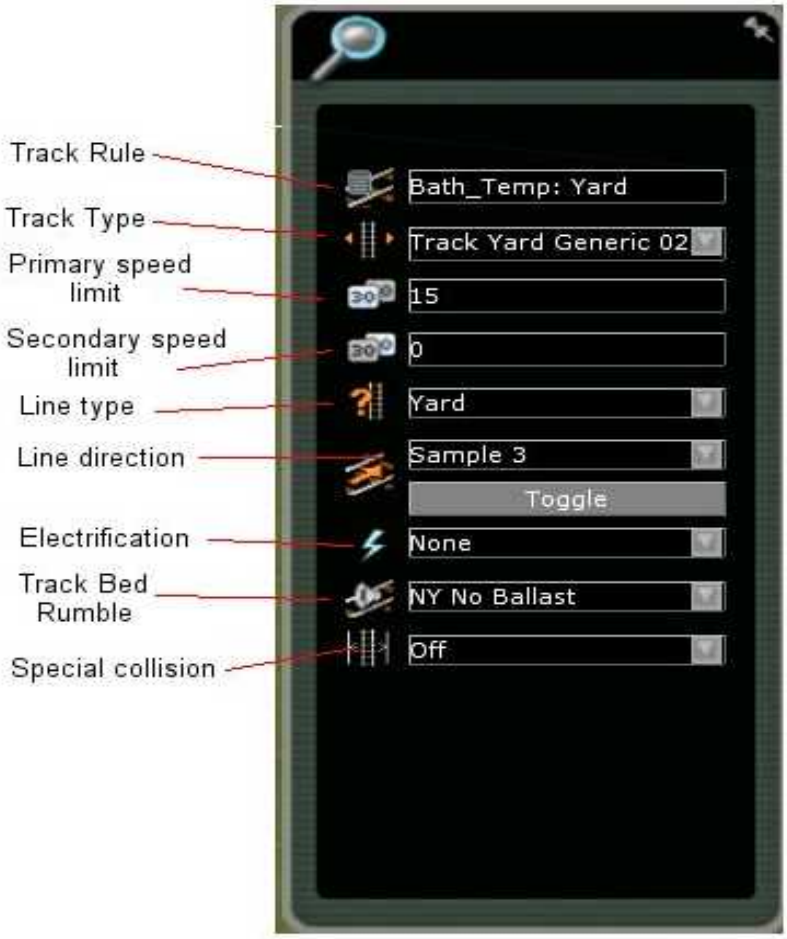
Manual Junctions

This determines whether you place a **Manual** junction or an **Automatic** junction. When it is switched on, any junction you create or weld is placed as a **Manual** junction. When this option is off, all junctions are placed as **Automatic** junctions.

You can switch **Manual** junctions while you are driving a train. You cannot switch **Automatic** junctions during a scenario. They are controlled by the internal dispatcher. However, in **Free Play** mode all junctions can be controlled manually.

Track Properties panel.

When you select a track type the **Track Properties** panel opens to allow the setting of the properties for the section of track to be laid.



For trains to run over the whole network effectively, the following track properties need to be set up correctly:

Track Type
This allows you to choose which track type you laid. You can only use track types that have previously been specified in the track rules. Select track for placement and then change the track type in the properties panel before laying track.

Primary Speed Limit
This allows you to change the primary speed limit to the correct speed limit for a specific area of track. Select track for placement and then change the track primary speed in the properties panel before laying track.

Secondary Speed Limit
This allows you to change the secondary speed limit to the correct speed limit for a specific area of track. Select track for placement and then change the track secondary speed in the properties panel before laying track.

Line Type
This allows you to change the line type. There are four pre-defined line types to choose from:
- Main Line
- Yard
- Passenger
- Freight

Select track for placement and then change the track line type in the properties panel before laying track.

Dependant on which **Line Type** is selected other properties are automatically changed. For instance, when using the ' **Bath Track Wood New** ' track, if the **Line Type** is set to **Main** the minimum radius that is allowed is 200 metres. However if **Line Type** is set to **Yard** then the minimum radius allowed is 100metres.

Line Direction
This allows you to change the line direction. There are two predefined line directions to choose from:
- Both
- Up / Down Toggle

Select track for placement and then change the track direction in the properties panel before laying track.

Electrification
This allows you to change the electrification. There are four predefined electrification types to choose from:
- None
- Overhead Wires
- Third Rail
- Fourth Rail

Select track for placement and then change the track electrification in the properties panel before laying track.

When you select the overhead wires property, overhead wires are visibly added to the track. However, when you add third and fourth rails, these elements are not currently represented visually.

Track Sound. Track bed Rumble
This allows you to change the track bed rumble, assigning a specific sound to the track. Select track for placement and then change the track bed rumble in the properties panel before laying track.

Setting Track Parameters

We will now create the track elements shown in the **Track Laying** videos produced by **RSDL** They are found at

http://railsimulator.blip.tv/posts?view=archive&nsfw=dc

The following settings will be used to start with.

Object Options Menu.

Track Rules

One track selected

Follow network selected

Object Selection Menu panel.

Click on **Track Rule Current**. Select **Track Bath Wood New.**

Track Bath Wood New selected

Track Properties panel opens.

Track Properties panel**.**

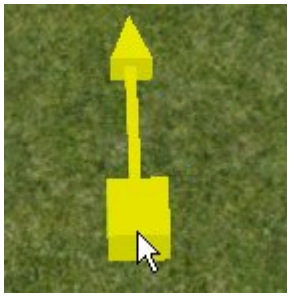
For the time being keep all at default values.

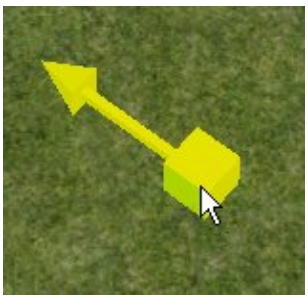
The screen should now be as below when all panels are pinned out.

Laying simple track.

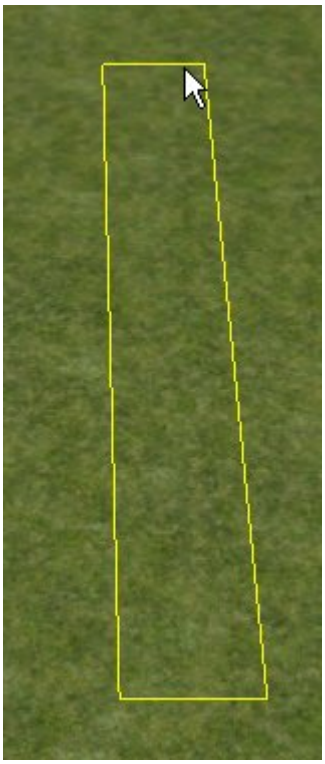
The videos ' **01 Follow Track Tool** ' should be viewed

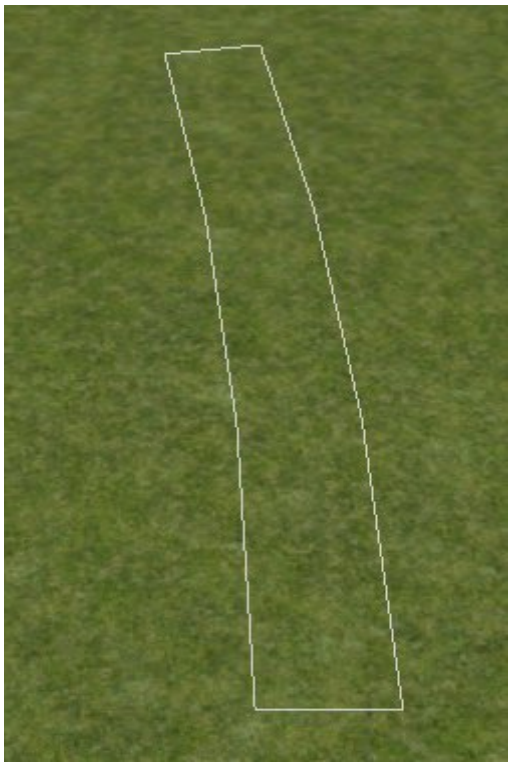
The yellow marker should be positioned at the required track start and the direction of the track to be laid changed by moving the mouse cursor left and right.





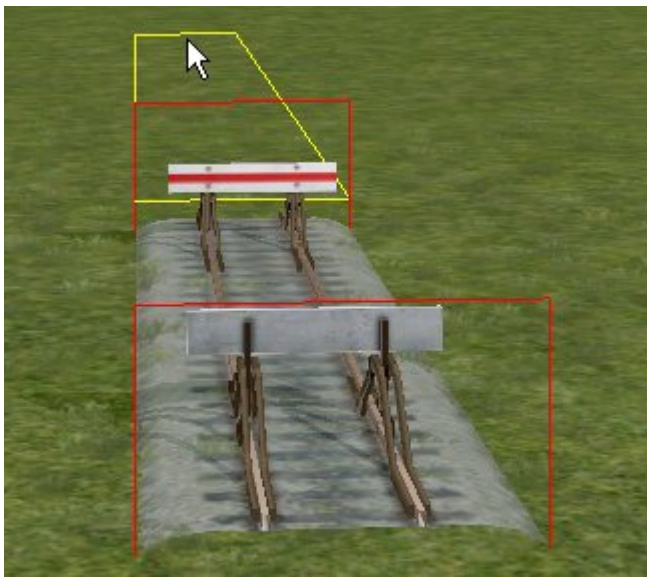
Once position and direction is as required, left click. Now move the cursor away and an outline of the track is shown.





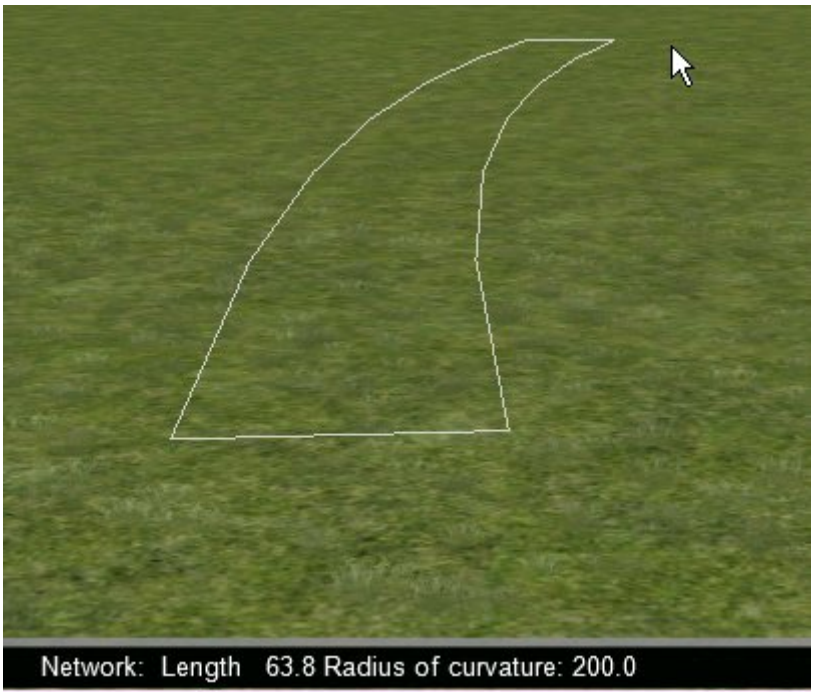
The yellow outline of the track indicates that the track is straight. If the cursor is moved to the left or right the outline will change to white and the track will no longer be straight.

Left click on the screen and the track is laid (rendered). A further outline length of track is shown because the **Follow Network** radio button is selected.

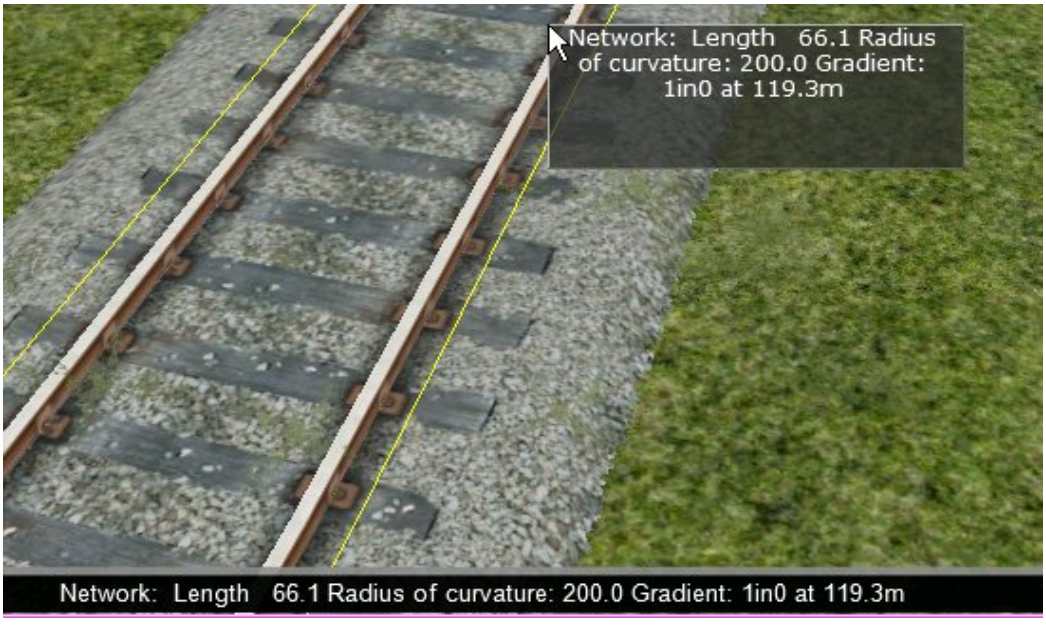


Status Bar.

While the track is being laid, the length of track laid and its radius is shown in the **Status Bar** at the bottom of the screen



Moving the cursor over a length of track already laid will show the track length and radius of curvature in the Status bar. A small pop-up panel next to the cursor also give these details.



Also shown is the gradient which will be used later. The distance of the cursor from the start of the length of track is given.

At the left end of the **Status Bar** the number of the **Tile** that is vertically below the present camera position is given. Also given is the number of assets that are present on this tile

Continue laying track both straight and curved.

When no more track is to be laid, right click. The length of track is finished with a buffer. Another marker is shown to allow another length of track to be laid elsewhere. When all track is laid, double right click to exit track laying.

If the **Follow Network** radio button is not selected the track will not follow on.

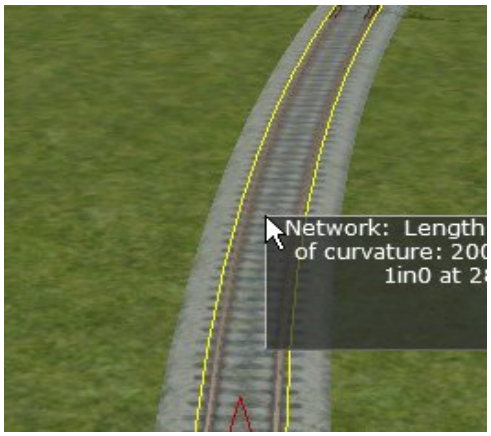
Try difference.

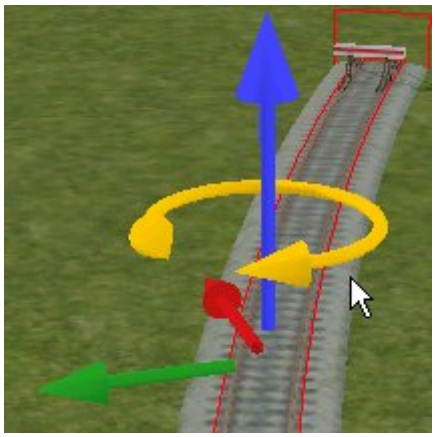
Delete track just laid.

To delete track laid the undo icon can be used in the **Linear Objects Tools** panel.

Delete track.

Move the cursor over the track to be deleted. The track gets a yellow outline. If the correct track has been highlighted, left click and the outline will turn Red and a **Gizmo** will show.





Press the **Delete** key.

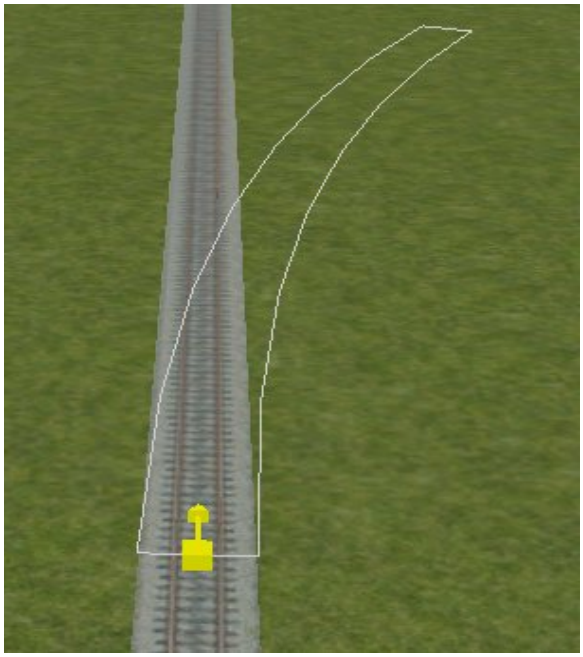
Now delete all track laid or move to a new section of terrain.

Diverging Junction – Automatic

The video **' 5a Diverging Junction '** should be viewed

The **Manual Junctions** radio button should not be selected.

Lay a straight length of track and right click. Position the marker where you want the diverging junction to start.



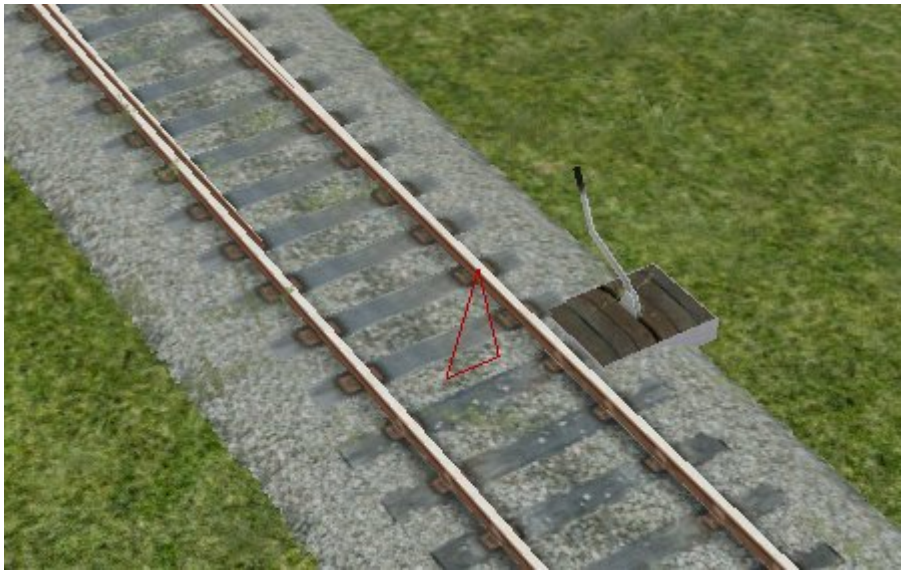
Create track either to left or right and left click. Carry on laying track or right click twice to end. The point will have been formed.

As the **Manual Junctions** radio button is not selected an automatic junction will have been created which can only be changed by the dispatcher in a scenario.

Diverging Junction – Manual

Select the **Manual Junctions** radio button and create another diverging junction.

This time there is a point lever and the point can be changed manually during a scenario



Converging Junction.

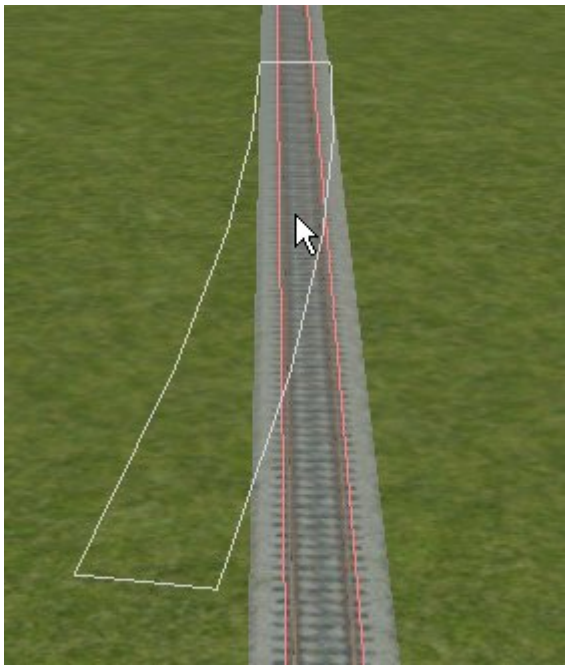
Converging Junction – Automatic

The **Manual Junctions** radio button should not be selected.

The video **' 5a Converging Junction '** should be viewed

Lay a straight length of track and right click.

Select the ' **Snap to Track** ' radio button on the bottom panel



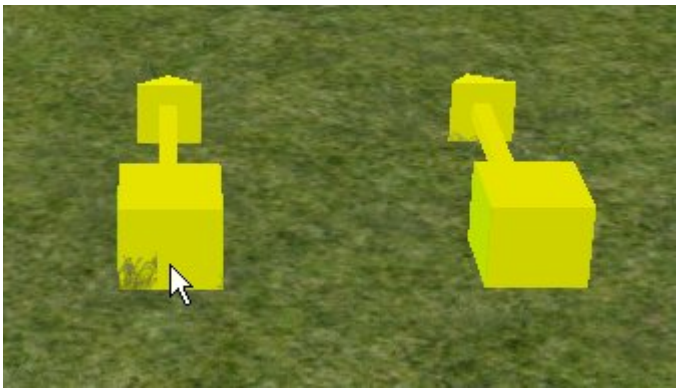
Position the marker to start a new section of track. Left click and lay track that connects into the existing track. If you have the correct starting angle the track will be highlighted as above. Left click to form junction.
I find difficulty to get the correct starting angle for the track. I have to **undo** and try again several time to create a satisfactory junction. No doubt it will improve with practice.

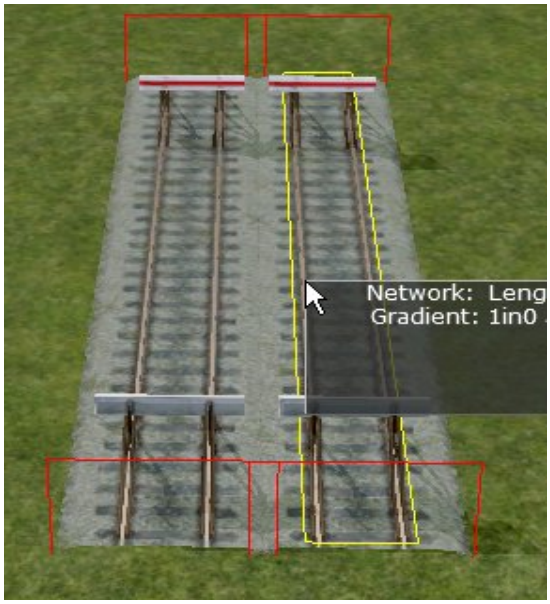
Laying Multiple tracks.

In the **Object Options Menu** select the number of parallel tracks you want. Select 2.

Now start to lay the track as previous. Two markers are shown and a double track is laid.

The video ' **06 Multiple Tracks** ' should be viewed





A Crossover.

The video **' 8 Crossover Junctions '** should be viewed.

Lay a long length of double track.

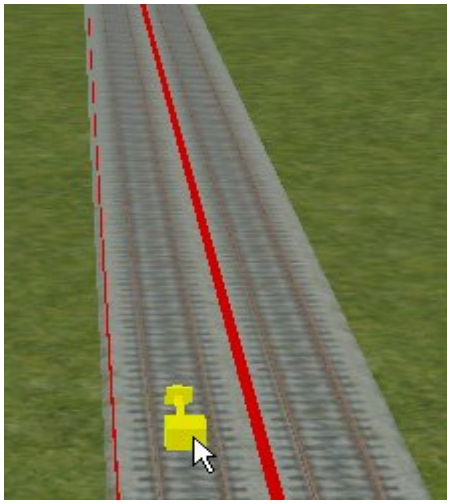
Select the **Cross Over** tool

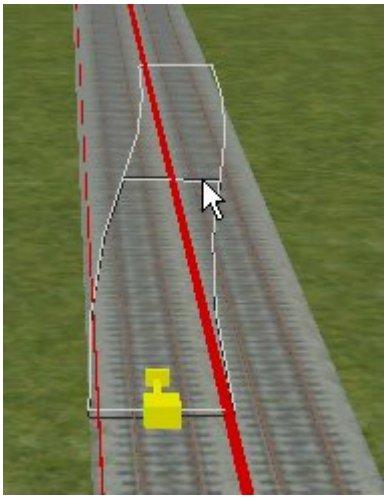
then select track from the browser list.

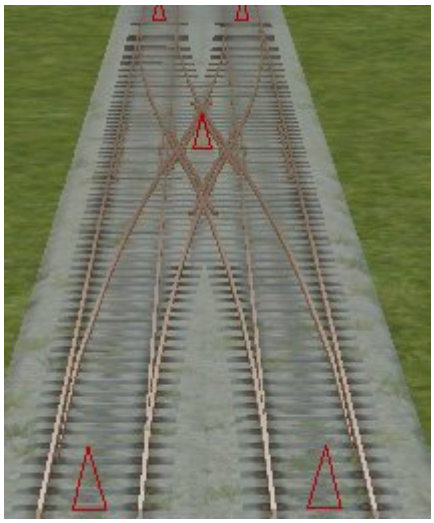
Adjust all properties as necessary.

Move the cursor over to a section of multiple tracks. An indicator appears representing the start of the **cross over junction**. Left click on a track and move the mouse over to the parallel track.
An indicator appears, showing where the cross over will be placed. Move the cursor along the track to change the length of the **Cross Over.** Left click again to complete the cross over.

Click on the grey cube above the crossover to create a **Symmetrical Double Crossover**.

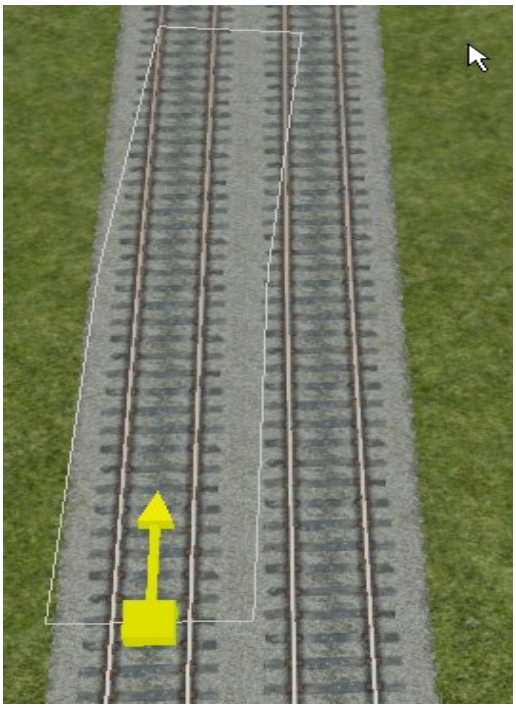




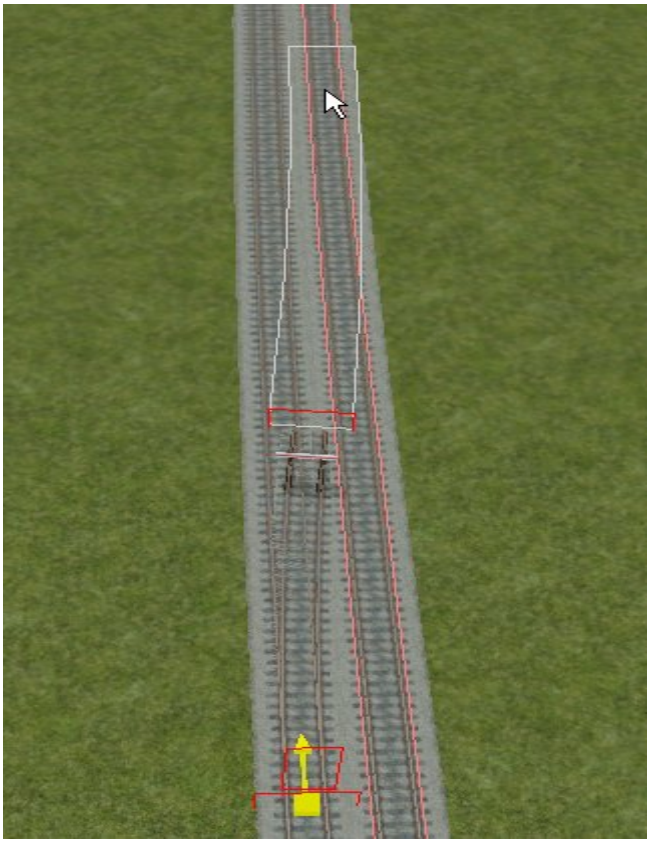


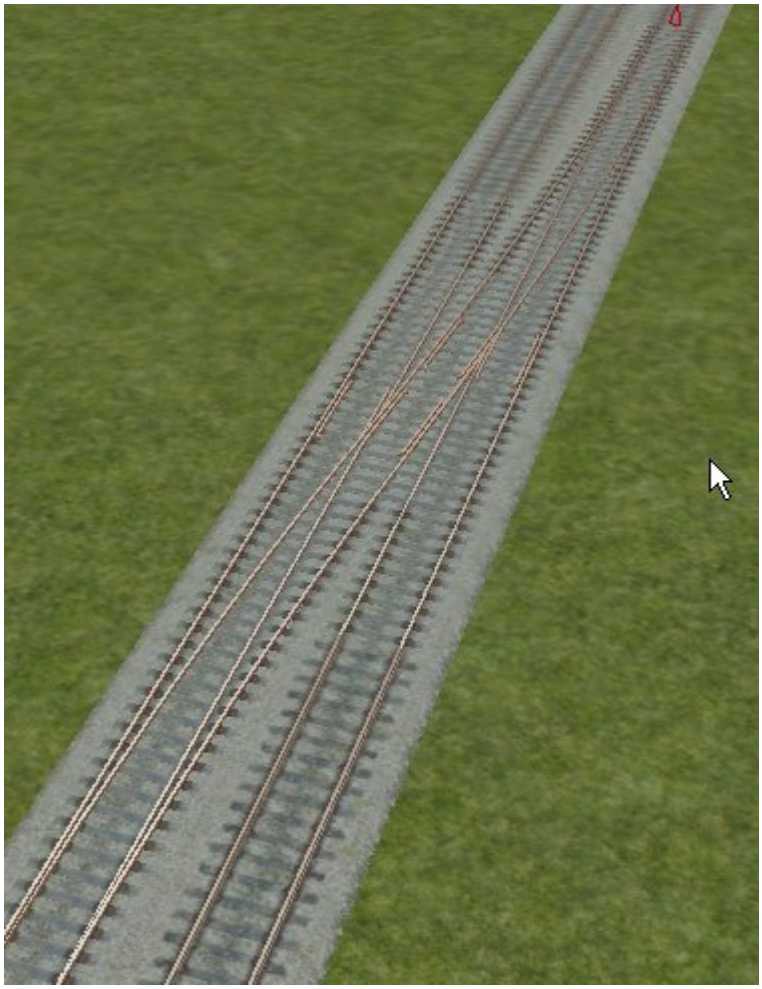
This function can only create a **Crossover Junction** on straight track.

However **Crossover Junctions** can be made on curved tracks using the **Snap to Track** function. There are limitations concerned with the radius of curvature of the twin track and the junctions.

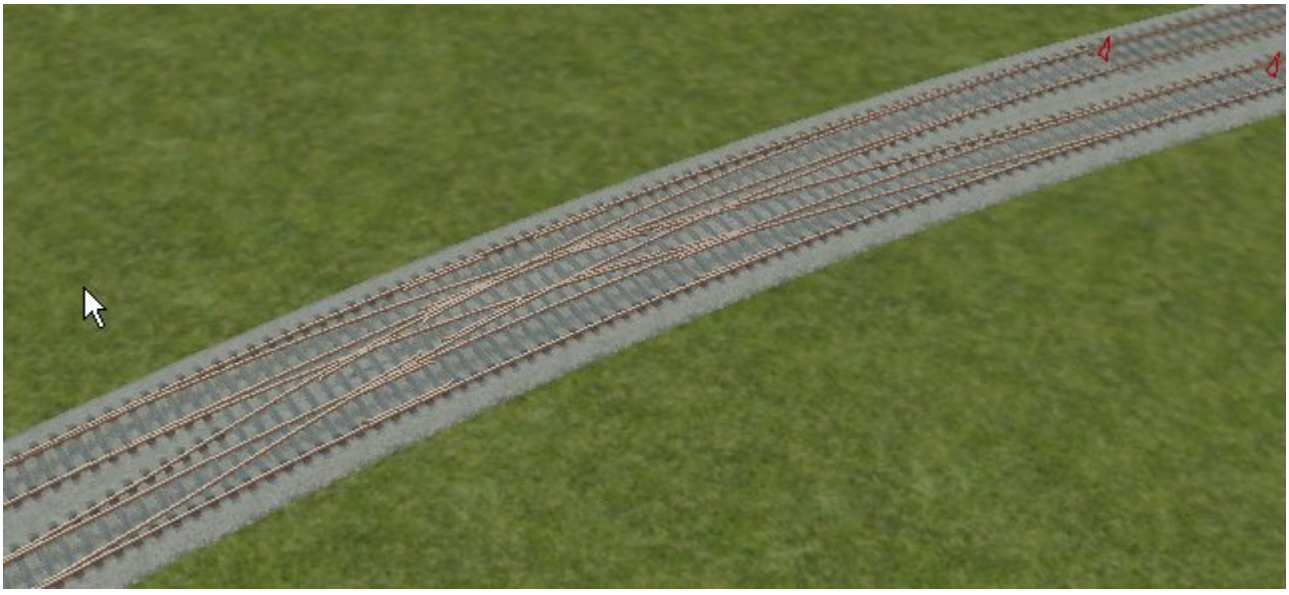


Create the diverging junction. Have the **Snap to Track** selected. Create the converging junction





Finished Crossover Junction on a curved line.



Further example. A double Crossover on curved track.

Creating a double line Diverging Junction – Automatic points

The **Manual Junctions** radio button should not be selected.

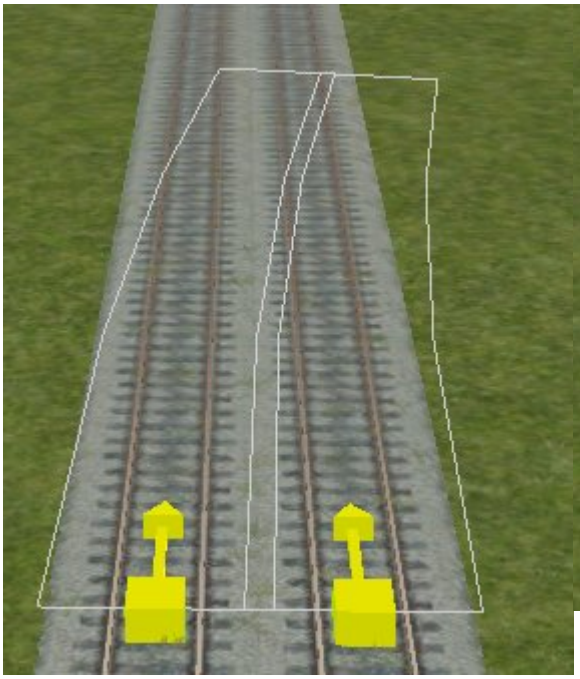
Place a long straight length of double track.

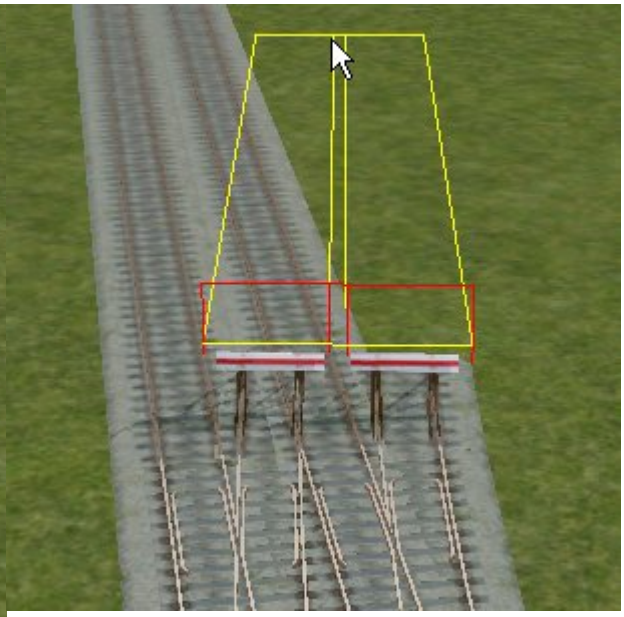
Pace the markers at the start position for the junction.

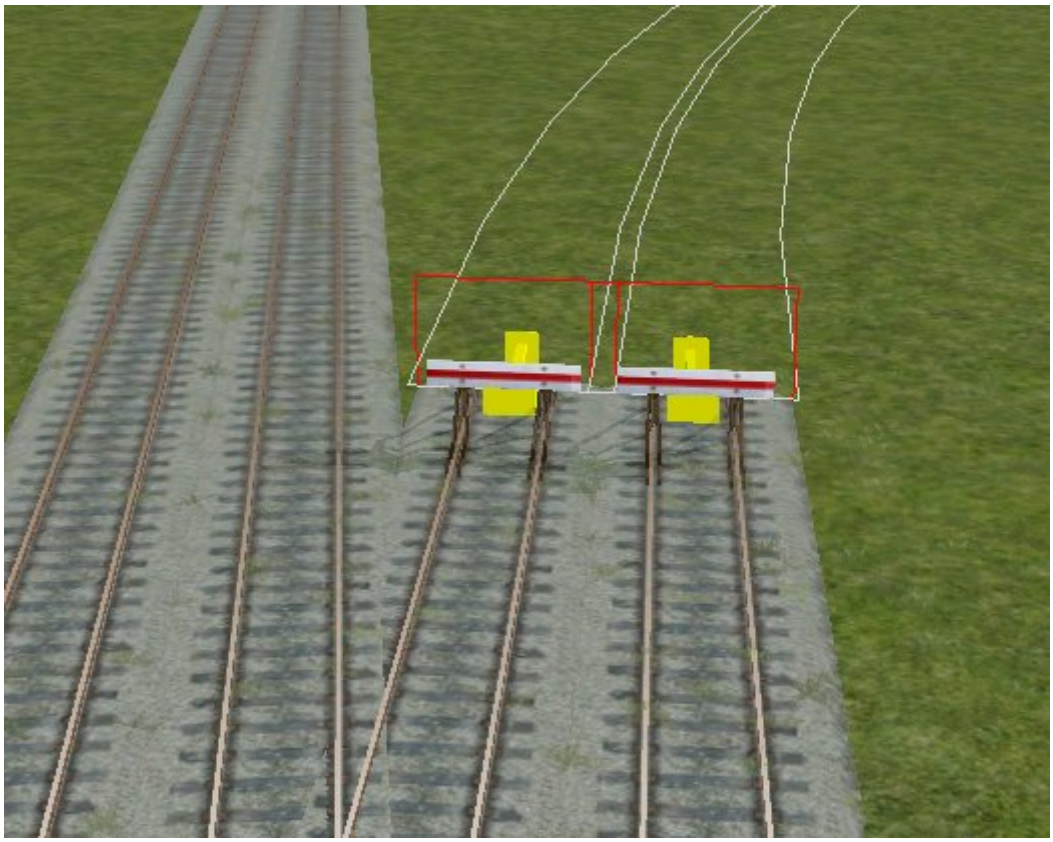
Move the track outline forward until approximately in the position shown below (the top left corner of the white outline touching the right rail). Left click

Move forward with a straight track as shown below. Left click.

Move forward as you wish. Left click.

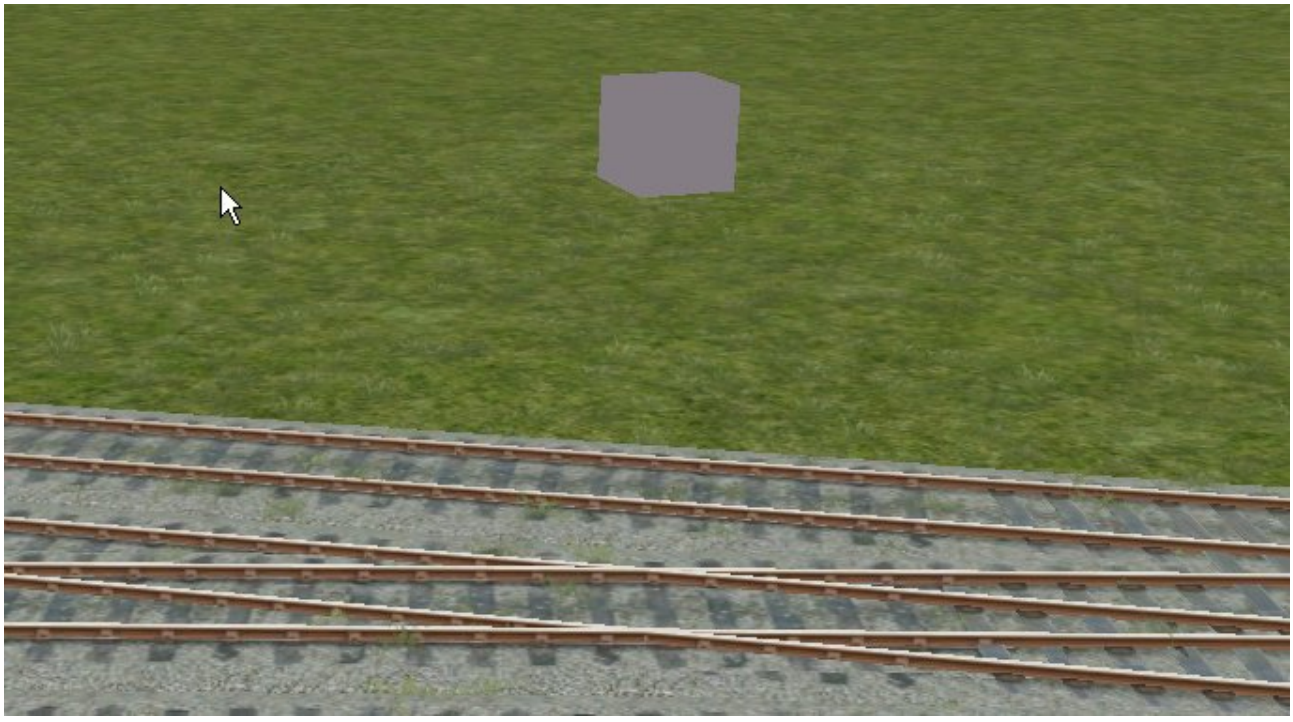




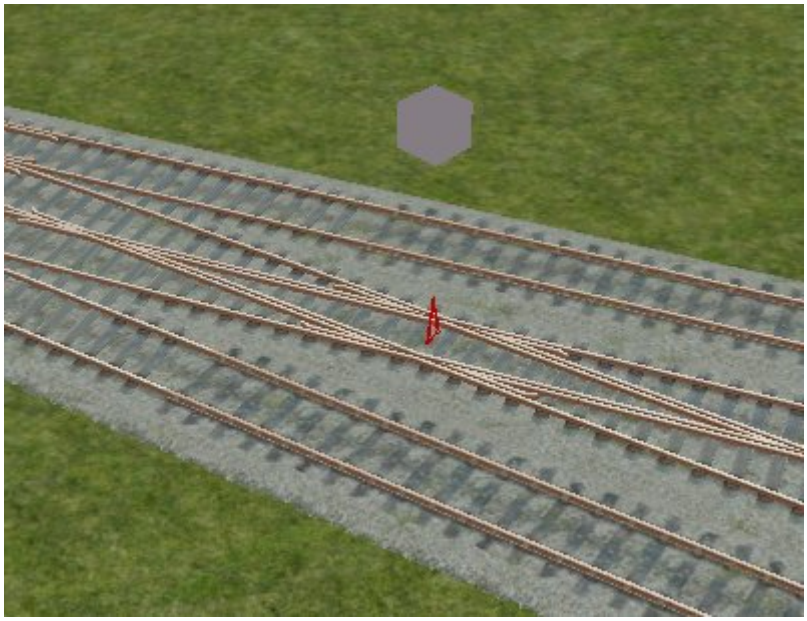


The points have been created but the crossover now needs to be formed

Click on the ' **Weld Tool** '. Top left panel.



If the crossing is satisfactory then a grey cube shows above the crossing. Click on that and the crossing is finished.



With this particular crossing another cube shows after the main crossing is made. This is because a single slip crossing can be formed if needed. Right click on background to remove this if not needed.

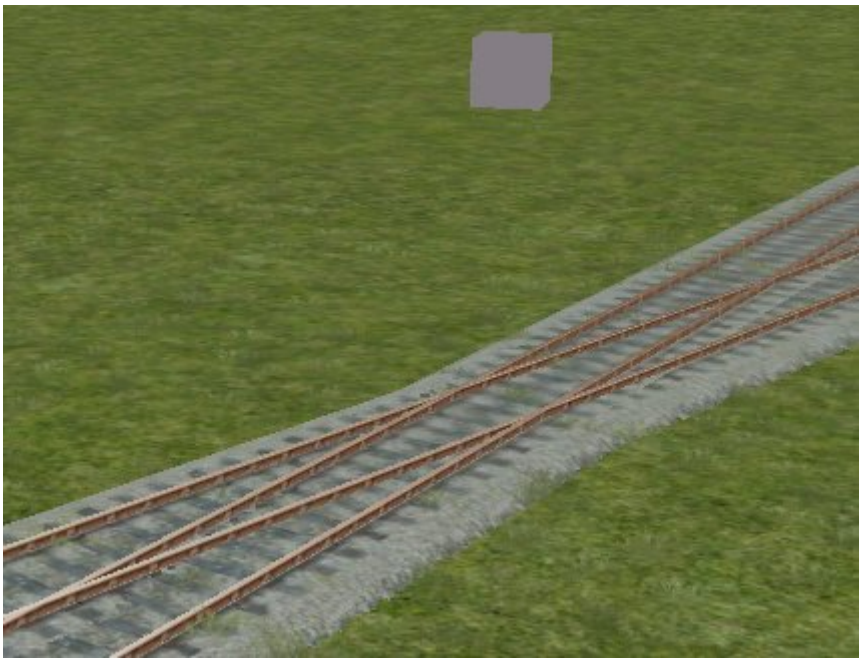
There are occasions when a grey cube does not appear on clicking the ' Weld Tool '. I find that this is generally because I have taken the first section of track for the crossing too far. Undo the attempted crossing and try again.

A Crossing Track

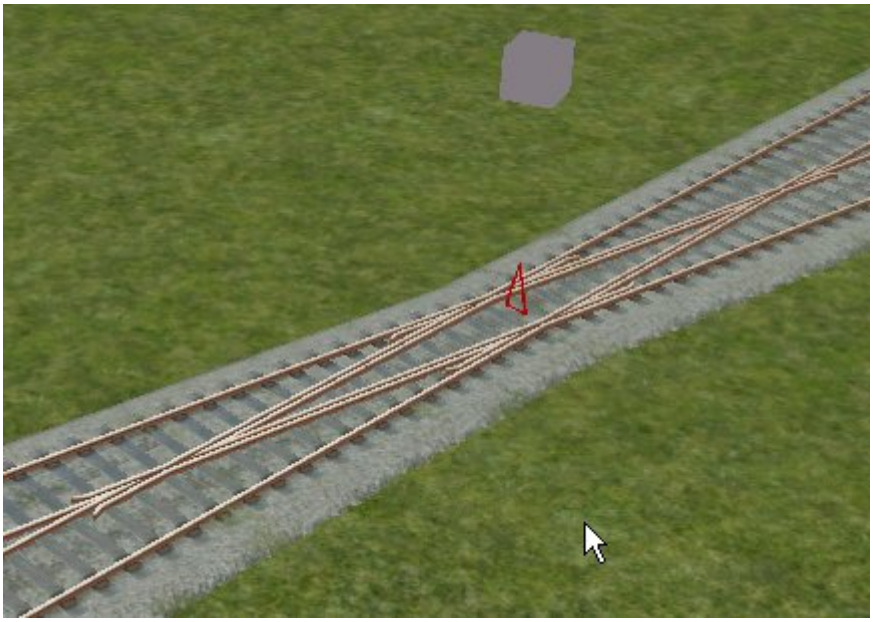
The video **' 10 Crossing Track '** should be viewed

This is very similar to the crossing section of the above.

Place one length of single track and then place another at a shallow angle



Click on the ' **Weld Tool** ' and then on the grey cube shown.
The crossing is formed.



Single and Double slips

The video **' 11 Slipped Junctions '** should be viewed

Because the crossing angle of the crossing track above is shallow another grey cube shows which will allow the formation of double and single slips. If the angle had not been so shallow a double slip could not be made and the second grey cube would not show.

Just clicking on the grey cube will form a double slip.

By dragging roughly at right angles to the direction of travel on the second cube, single slips can be made dependant on the direction the cursor is dragged.

This crossing track cannot be made into slips.

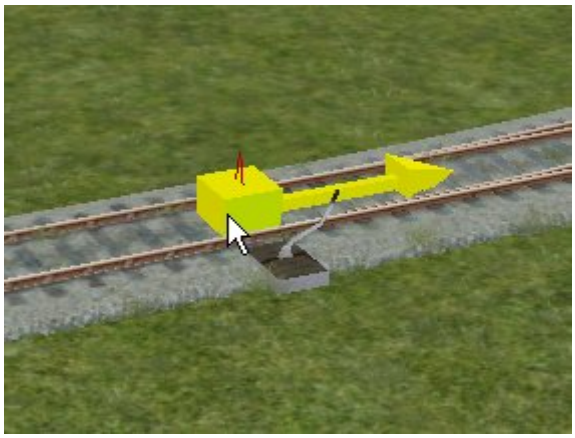
3 Way Junctions.

The video **' 09 3Way Junctions '** should be viewed

As the junction is likely to be in a yard, in the **Track Properties** Panel I have entered a speed of 15 mph and ' Yard ' in **Line Type**. This gives a minimum radius of 100 metres against the main line setting which has a minimum radius of 200 metres

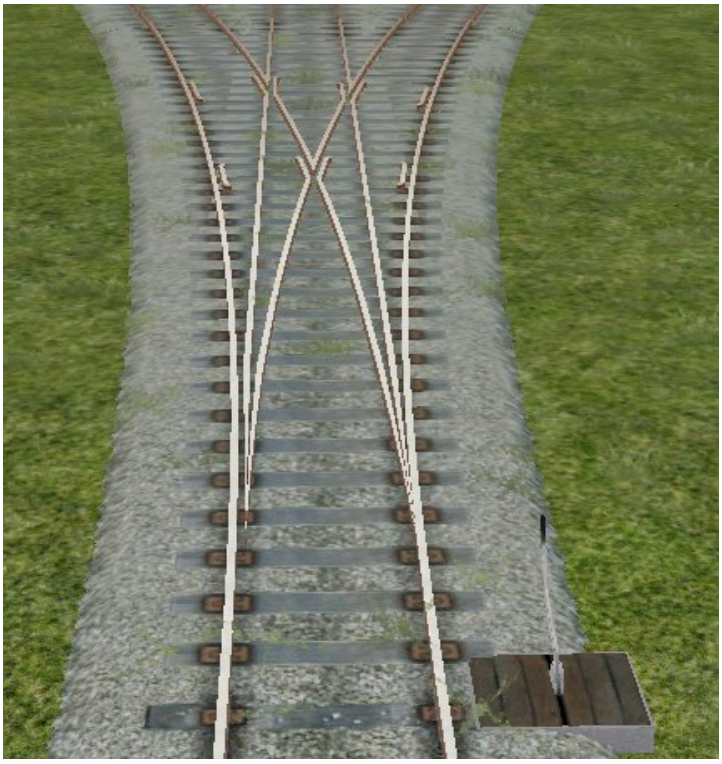
Lay a piece of track and make a normal diverging junction. .

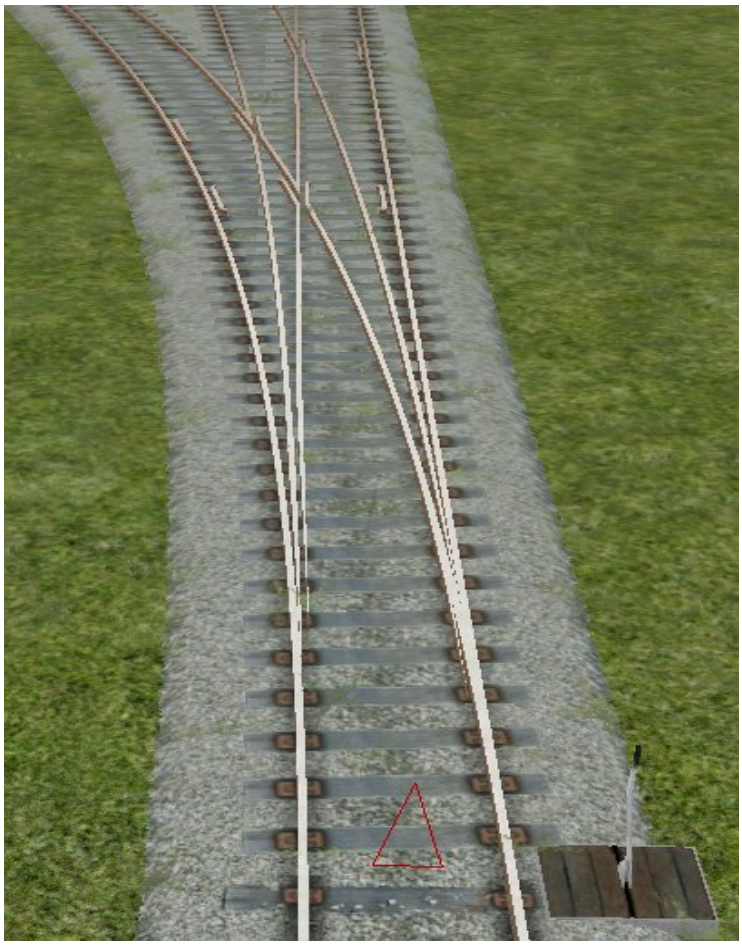
For the second way, position the marker as below. This is critical. If the marker is slightly ahead or behind the red triangle the point will not form correctly. Moving the cursor behind the red triangle to get the arrow pointing in the direction of the point. The arrow must point in the direction of the point. Now lay the next section of track.



The pictures below show possible 3 way junctions.

The point lever has three positions. If you exit the **Editor** you can test the point lever and watch the point blades move.

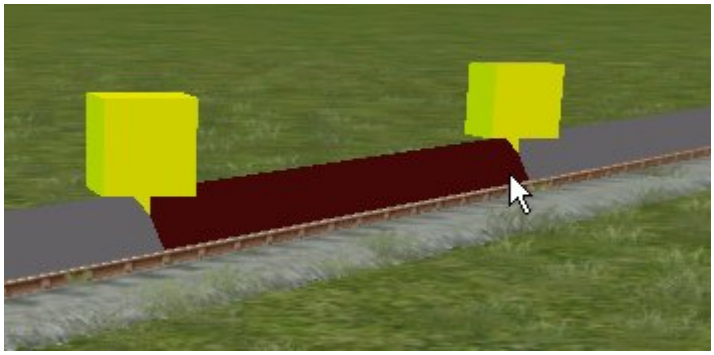




Select tool.

The **Select** tool is located in the **Linear Object Tools** panel.

Click on the **Select** tool. Place the cursor on the section of track that you wish to extend, left click and drag.

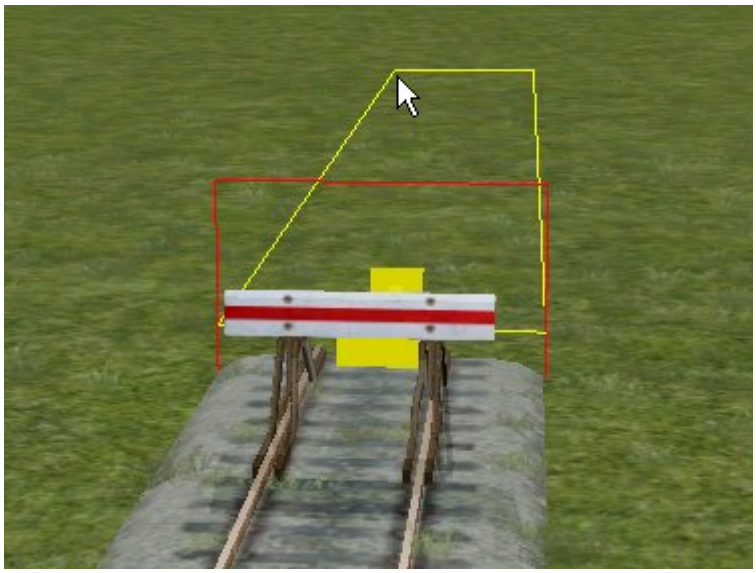


The **Track Properties** panel for that section of track opens.

The **Track Properties** of that section of track can now be viewed or altered. Only that section of the track that was selected will be altered.

Extending existing track.

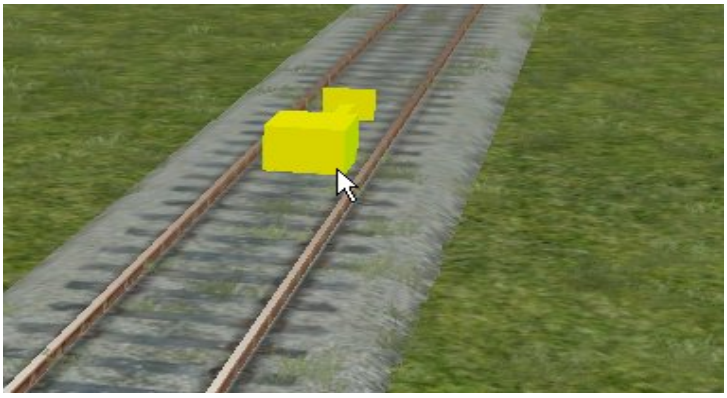
Normally the same track type would be selected so use the **Select** tool to find the track properties of the existing track. Select the track to be laid and enter the details in the **Track Properties** panel. Fill in the **Object Options Menu** as required. Place the marker at the end of the track. As it is moved there will be one position where it is ' sticky ' right at the end of the existing track Left click and lay more track.

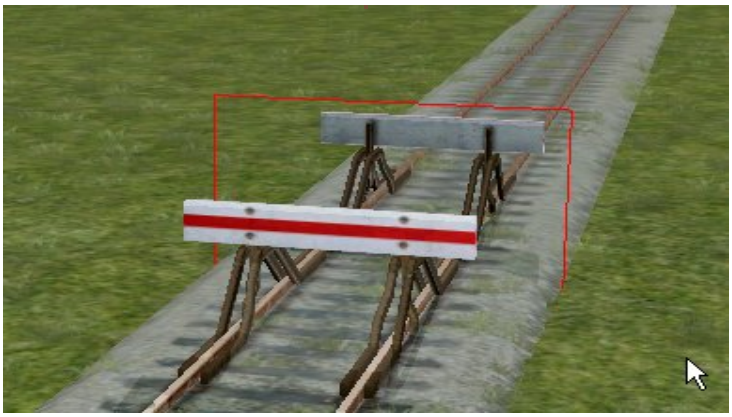


Split Tool

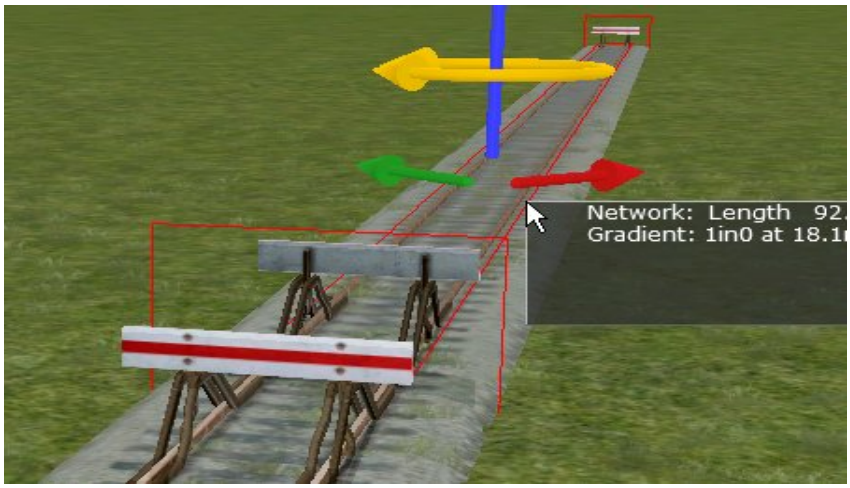
The video **' 13 Splitting Track '** should be viewed

This tool allows you to split track into sections. Select the **Split** tool and place the cursor above a track to see a marker showing where the split will occur. Left click to complete the split. A set of buffers will appear on both ends of the split.





The two sections of track can now be selected separately. One use is to cut sidings to length.

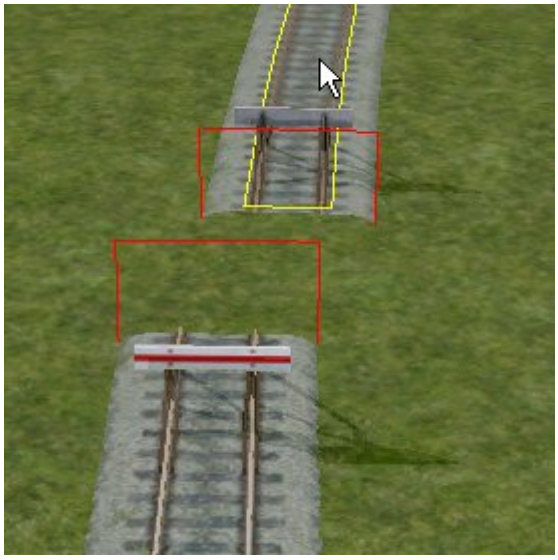


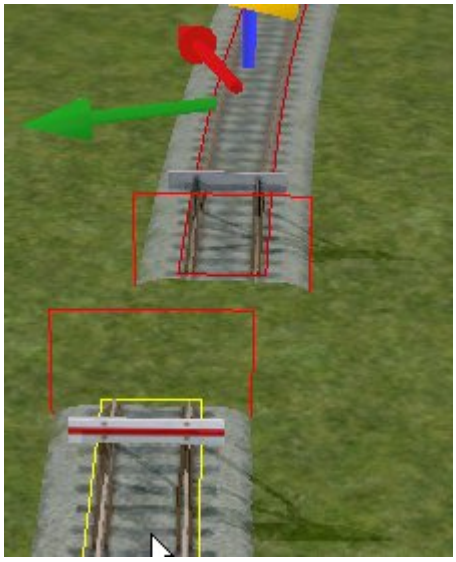
Join Tool.

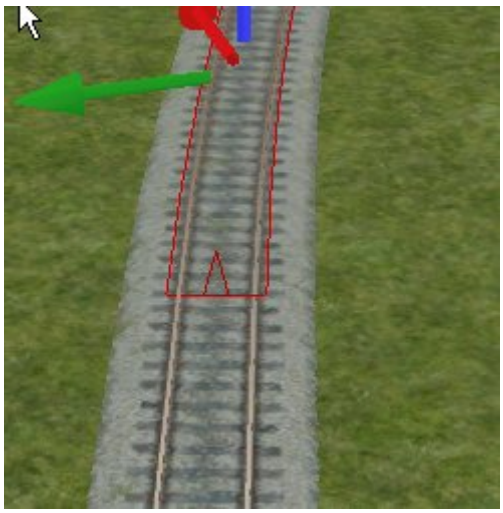
The video **' 12c JoiningTrack '** should be viewed

This tool allows you to join sections of track of the same type together.

Select the **Join** tool, left click on one of the linear objects you want to join, then on the other.







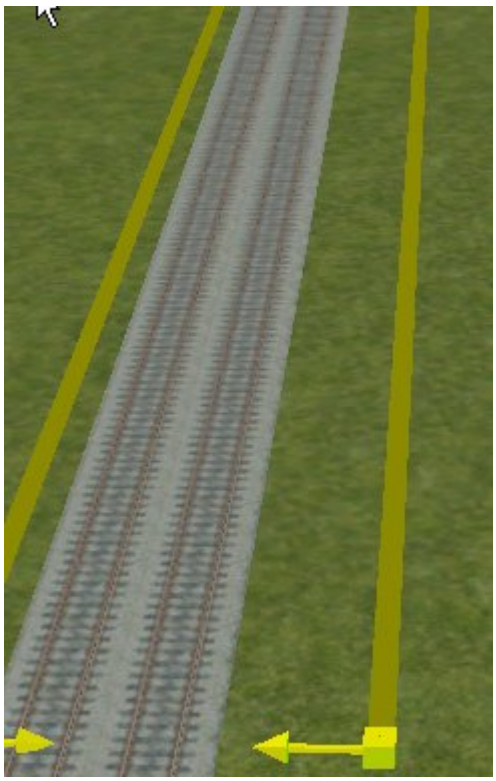
The far end of the track also moves. I have yet to find an application for this in track laying.

The Offset tool

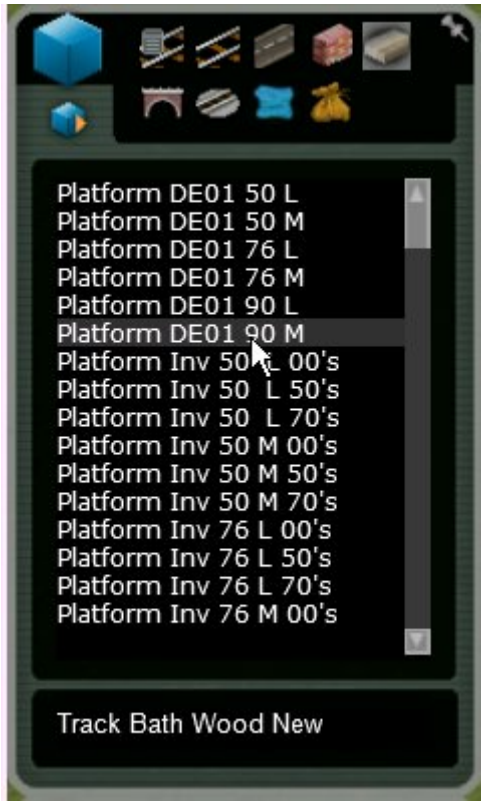
The video **' 41 The Offset Tool '** should be viewed

This tool allows you to run a linear object e.g. a platform (but not track), parallel to another linear object (e.g. track). Select a section of track using the **Select** tool. Select the **Offset** tool

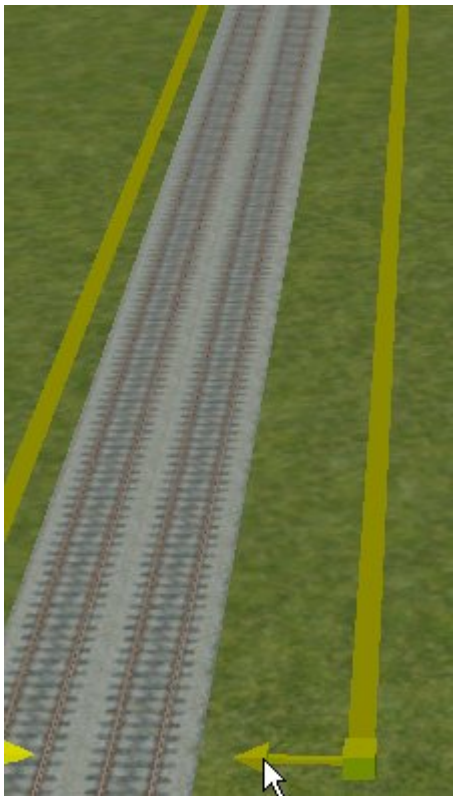
I have set the offset to 6.5 metres which is about correct for the platform to be used

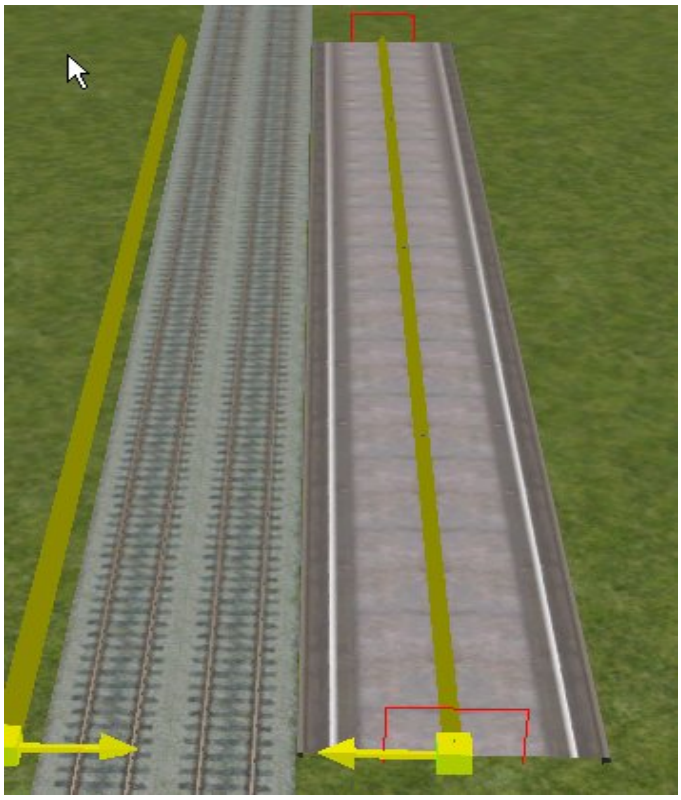


and then select a platform from the browser list.



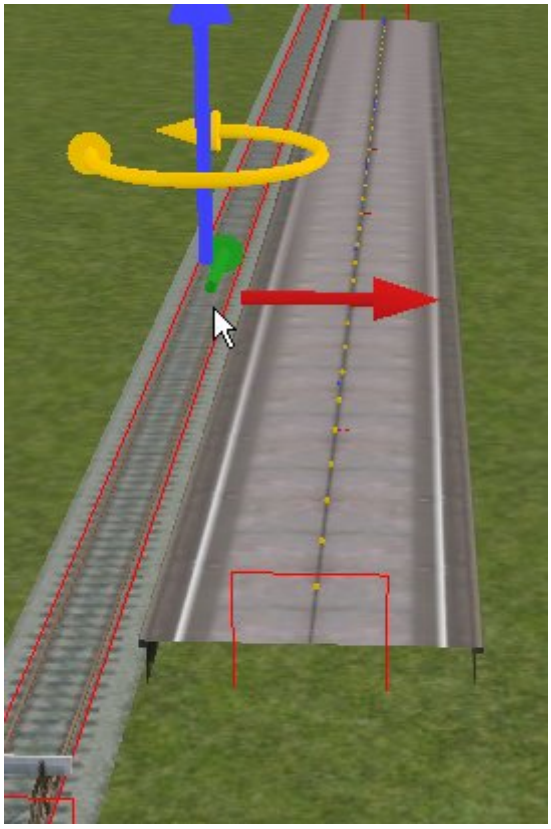
Left click on the end indicator of the offset lines on the side you want the offset to occur.





This has positioned the platform.

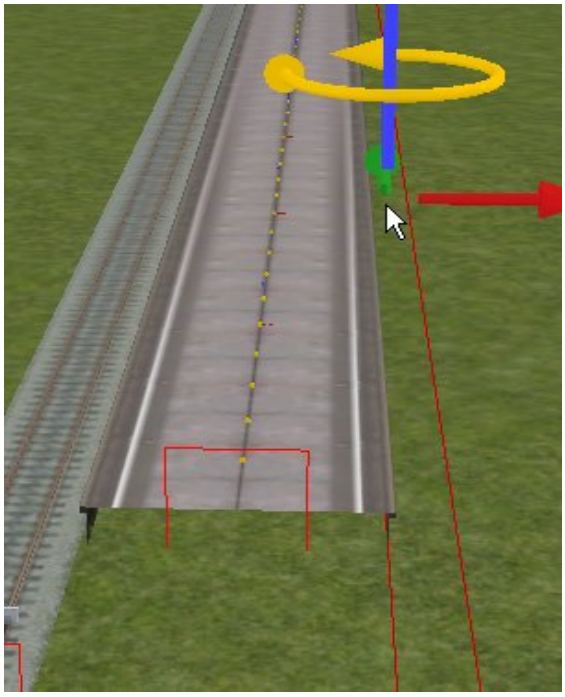
Laying Track Parallel to Platform



Click on existing track by platform to highlight track.

Click on **Copy** icon.

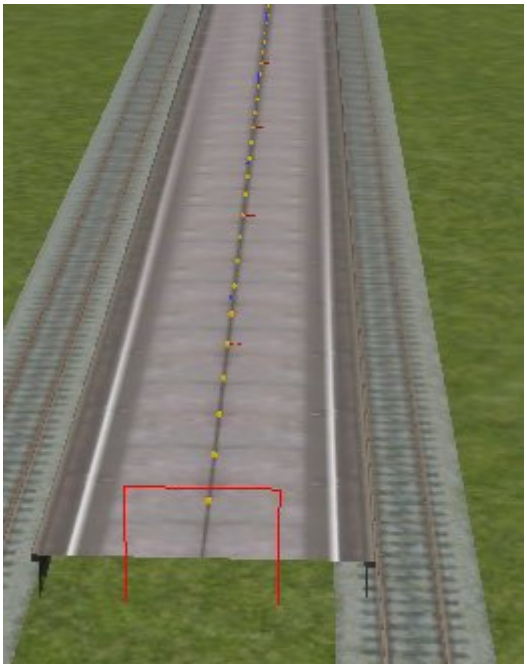
Click on **Paste** icon



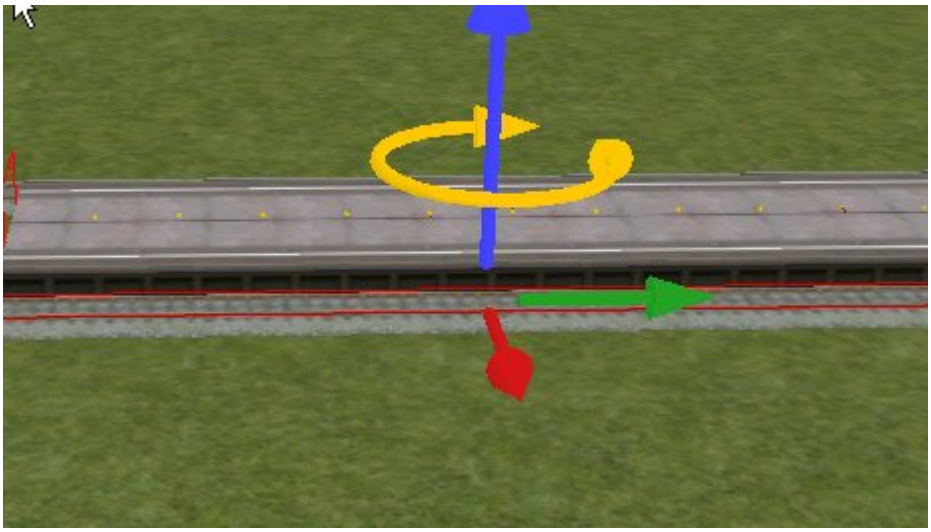
.

Position track. Left click

Track placed.



Adjust position using **N** and **C** keys. As these move the selected object towards and away from the camera, the camera has to be repositioned

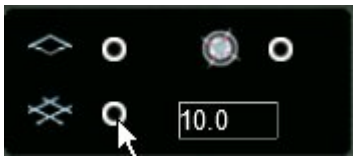


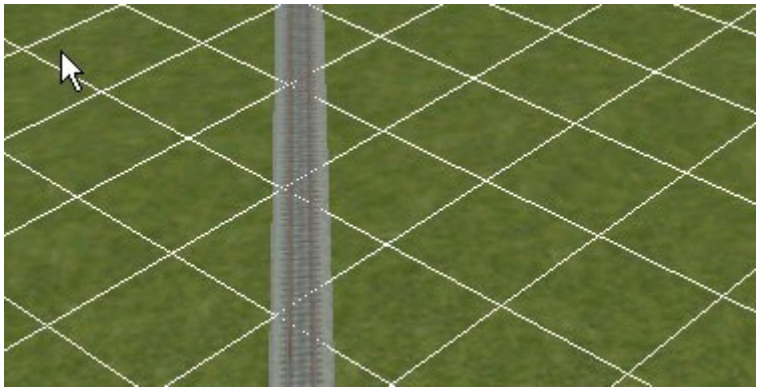
Once positioned use the **Split** tool to cut new track at required length and delete track not wanted.

Laying Track Parallel to other Track.

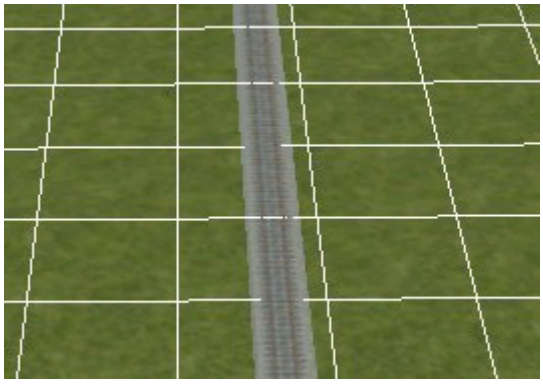
In railway yards it is often desirable to lay track parallel to other track but with several metres separation. The **Offset** tool does not work on track. Use the same method of **Copying** and **Pasting** as above.

Lay a length of track. Select the **Grid** radio button. Set the grid spacing to 10 metres.

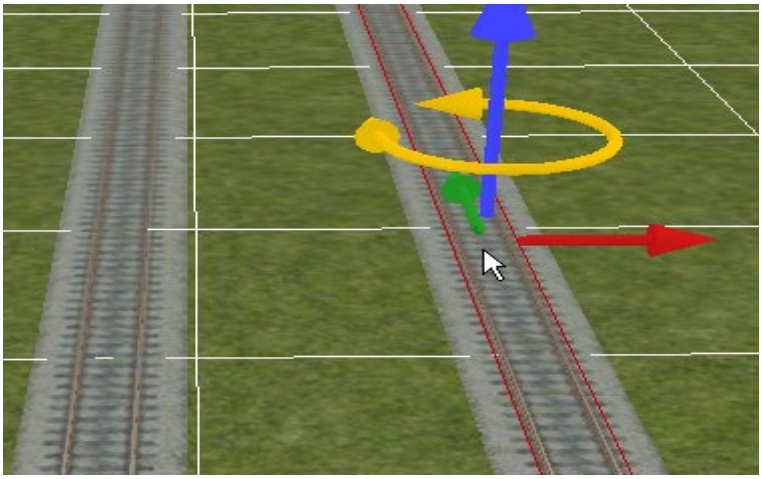


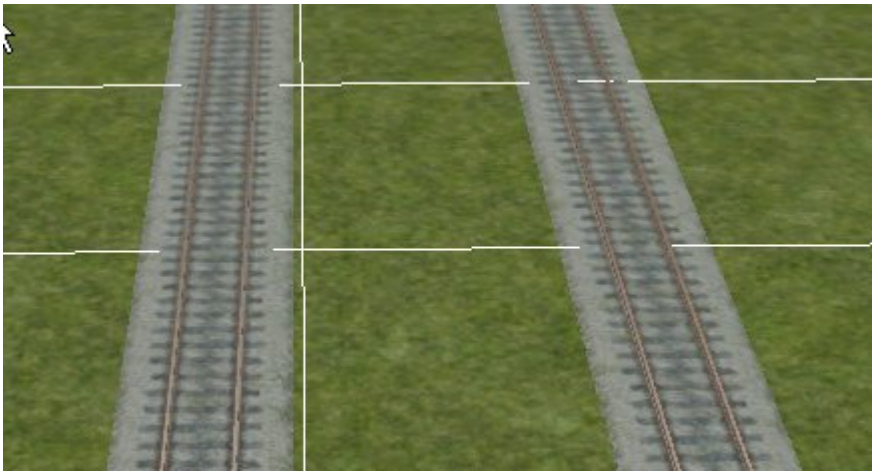


Rotate the grid using the **P** and **O** keys so that the grid lines are parallel to the track



Copy the existing track and paste it into position using the grid lines to locate



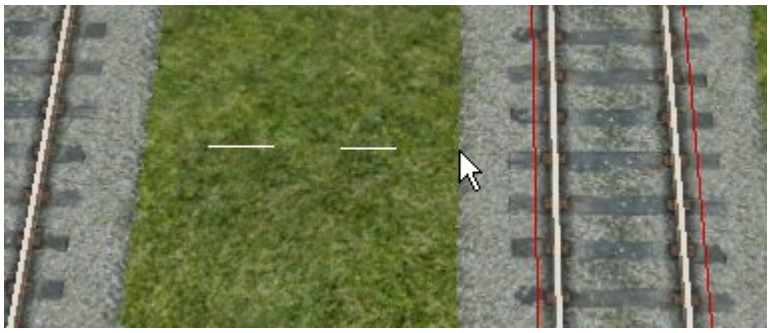


Finished track.

Measure tool.

Select the **Measure tool.**

Click on the original rail and drag the mouse to the other rail. The distance apart is given in the **Status Bar**



Adjust spacing as necessary.

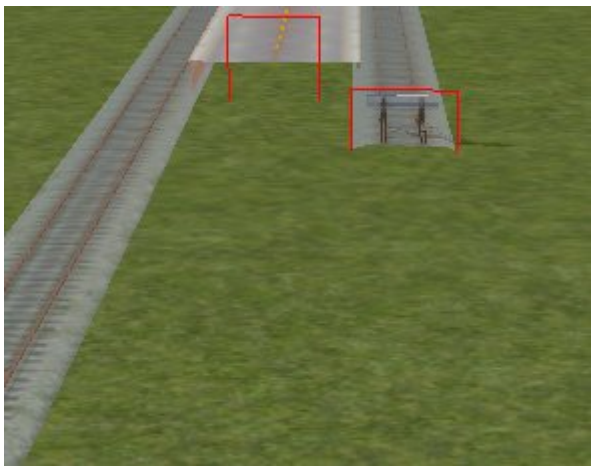
Connecting Platform track to main track.

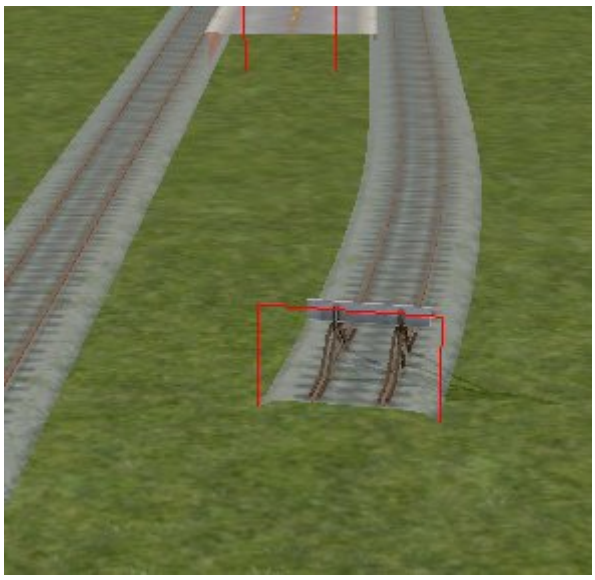
Laying lines away from an existing line is easy. Laying a line to connect two existing lines together, as with a platform line to a main line, I find is more difficult.

The conventional way is probably to use the **Snap to Track** tool

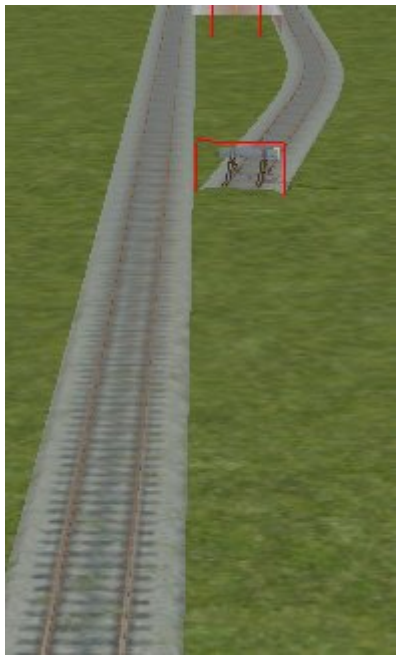
Start. Track at platform

Now add short curve.





Followed by a short length of straight track.



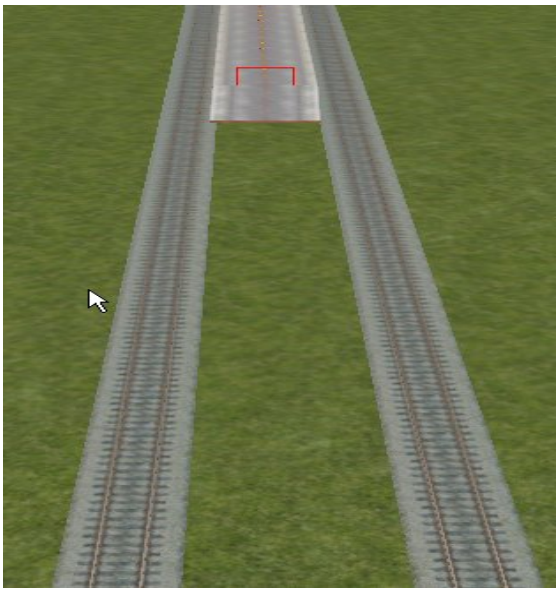
Now a short length of track with the **Snap to Track** selected. Blend into main line track.

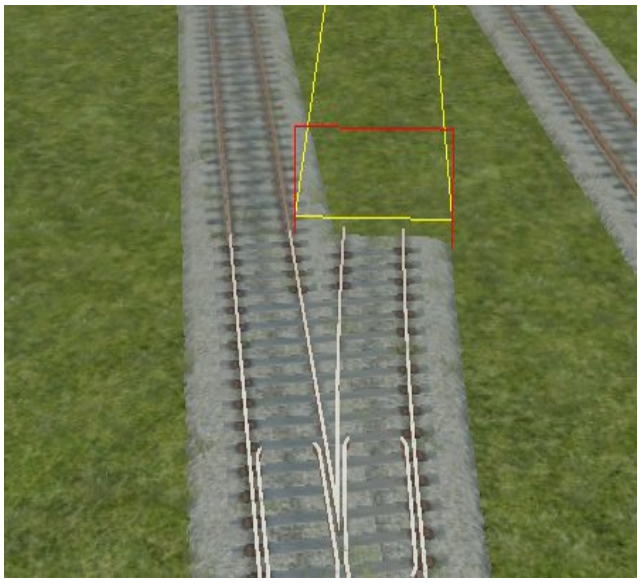
If your judgement is good a junction will be formed.

Good judgement is required for the first curved section and the straight section to enable the **Snap** to be possible when the third section is laid.

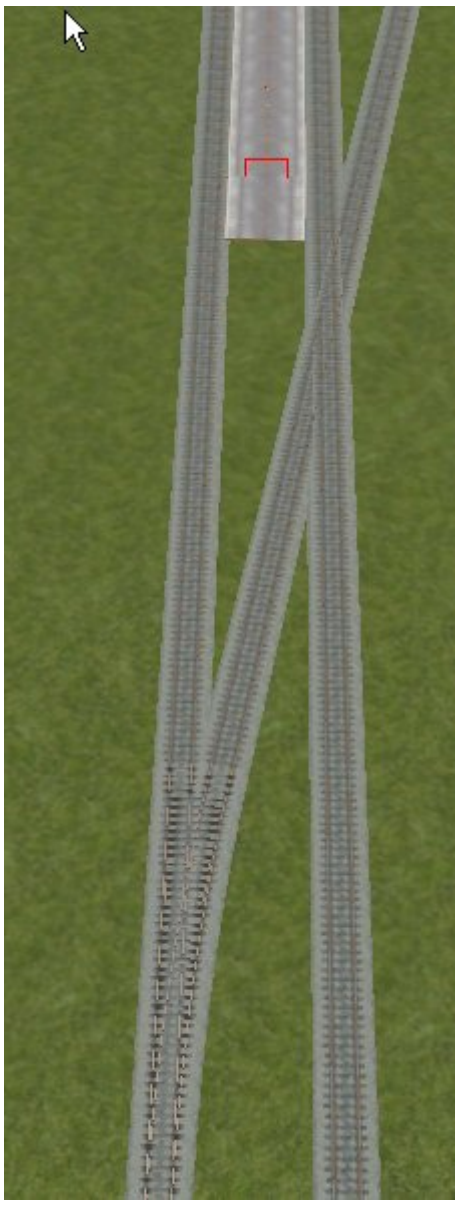
Connecting Platform track to main track. **Alternative method**.

An alternative method that I use involves more steps but there is less guesswork required in positioning the tracks

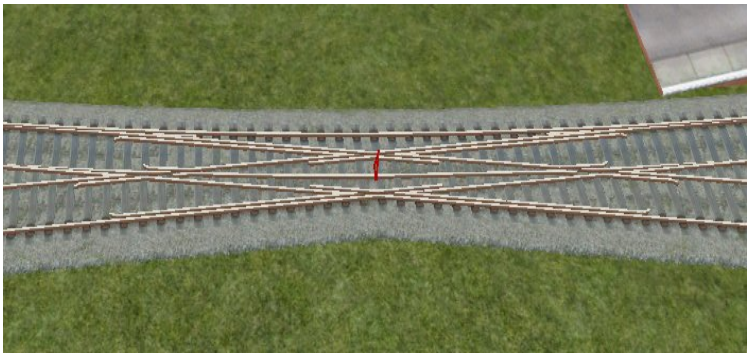




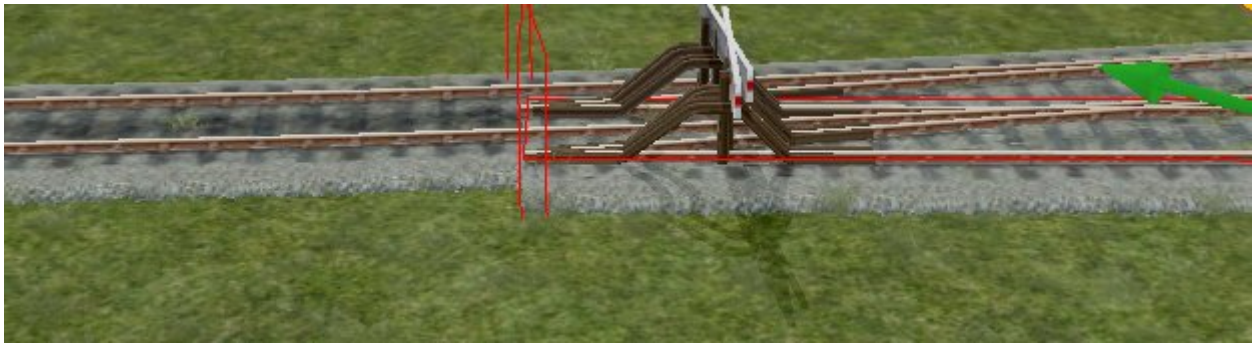
Start a diverging junction some way from the platform. Very shortly after the junction has been formed, lay a section of straight track. Providing it crosses the platform track the length is not important. If the location of the Crossover formed is not correct undo and re-position the start of the diverging junction until you get something similar to the picture below

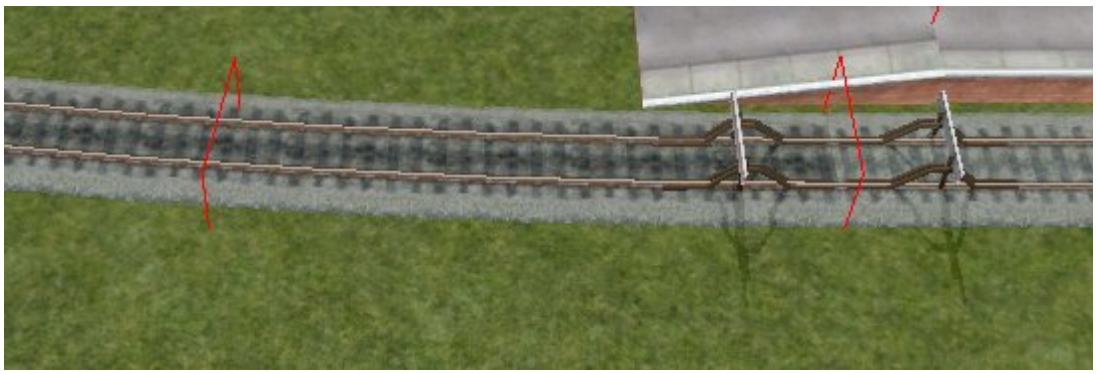


Using the **Weld** tool at the Crossover to create a singe slip junction.

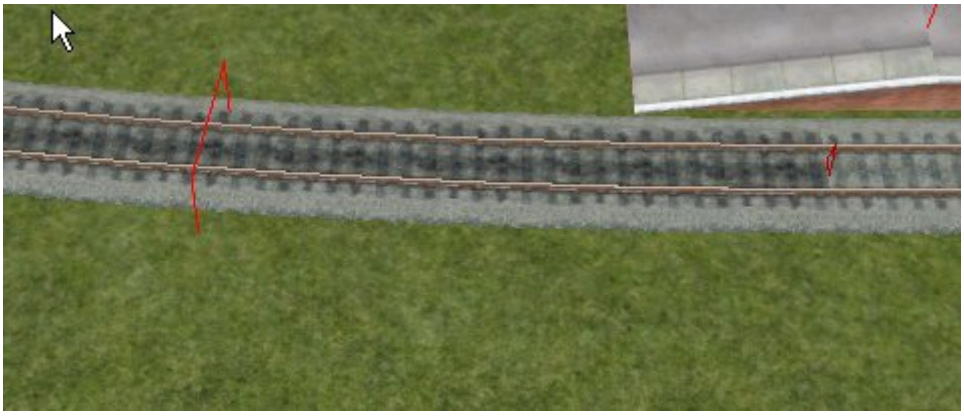


Click on each of the unwanted sections of track and delete





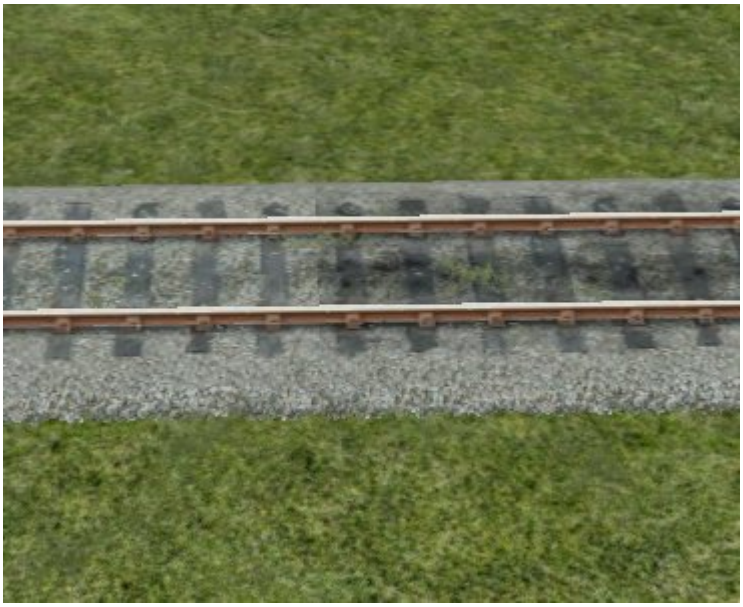
Sometimes a pair of buffers are left. Click on the **weld tool** and then click on the grey box.



Finished result.

Blend tool.

The video **' 14 Blending Track Together '** should be viewed



Two type of track have been used and the join is obvious.
This situation occurs when creating a yard off the main line.

This tool allows you to create a blend between two different types of linear objects (track in this case) that are joined together. Select the tool, left click on one of the two track sections and they are blended together automatically. The place where the blend takes place is dependant on the position of the left click.

The section of track that is modified is the section that is clicked on.

It appears that each section has to be about 60 metres for the blend tool to work

Gradients.

Pre-defined Gradient.

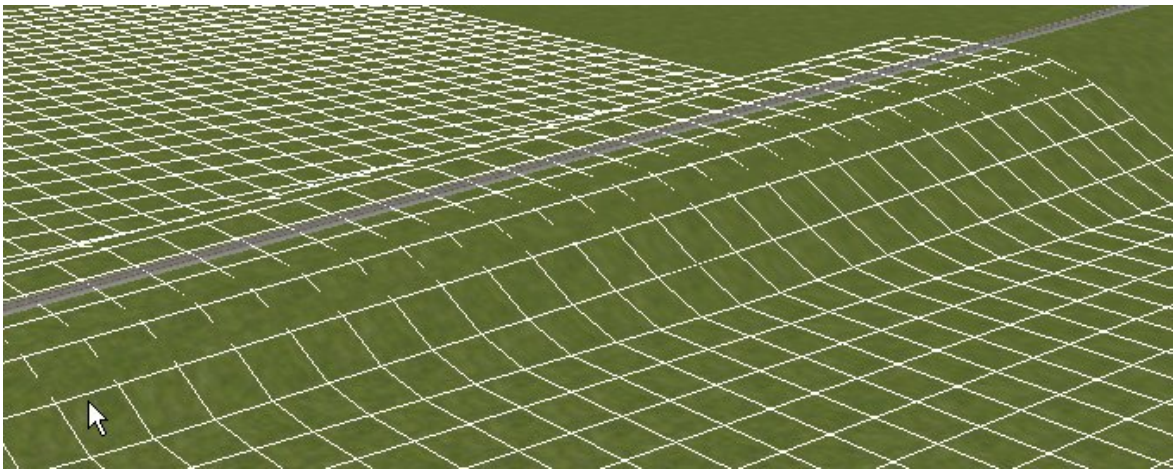
The video ' **3 Pre-defined Gradients** ' should be viewed

Before laying track enter the gradient required

This will give a gradient of 1 in 100.

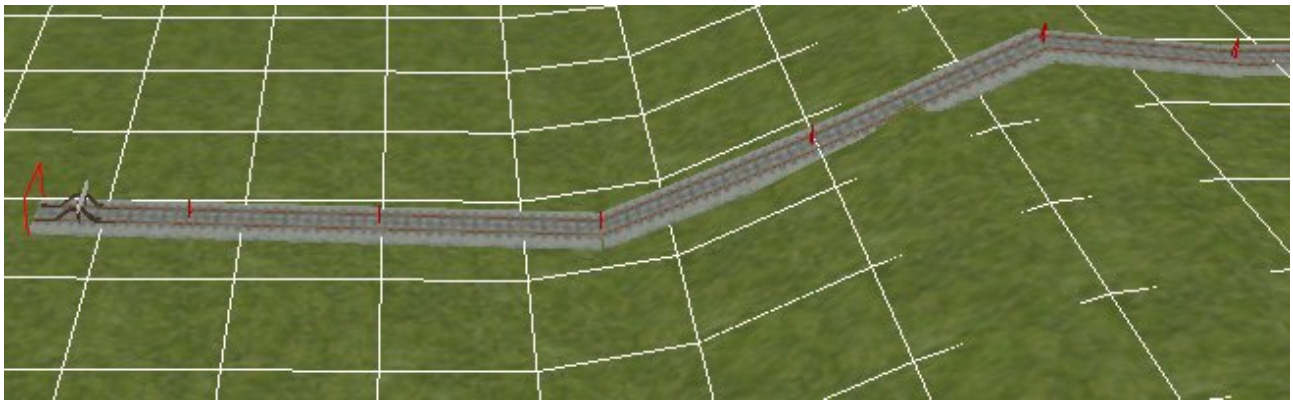
The **Snap to Terrain** radio button is **not** selected.

Now lay track as normal. All track laid will have this gradient until changed in this box.



The **Snap** tool in the **Painting tools** has been used to show the gradient of the track

Snap to Terrain radio button selected



Track has attempted to follow the contour of ground in a most unrealistic way. Not normally used for track.

Post defined gradient.

The video ' **3 Post-edited Gradients** ' should be viewed.

Easements.

This allows the smooth transition from straight track to curved track. Without this there can be a lurch as the train changes from straight to curved lines.

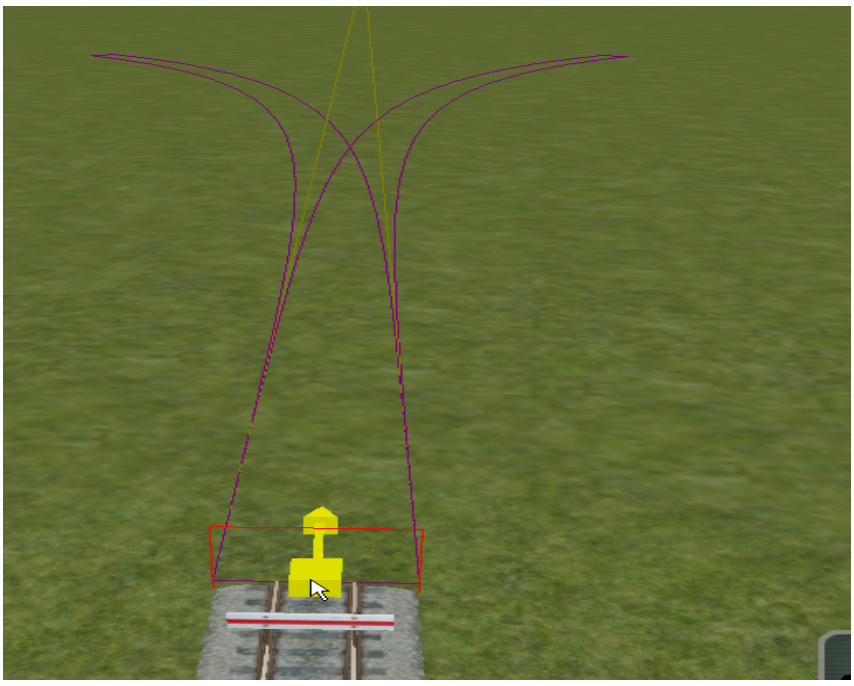
The Easement function can be used to create a transition curve from a straight track to a curved track or to create a transition curve from curved track to a straight track.

N.B. I can only get the Easement function to work if ' 1 Default ' is selected in the Options panel.

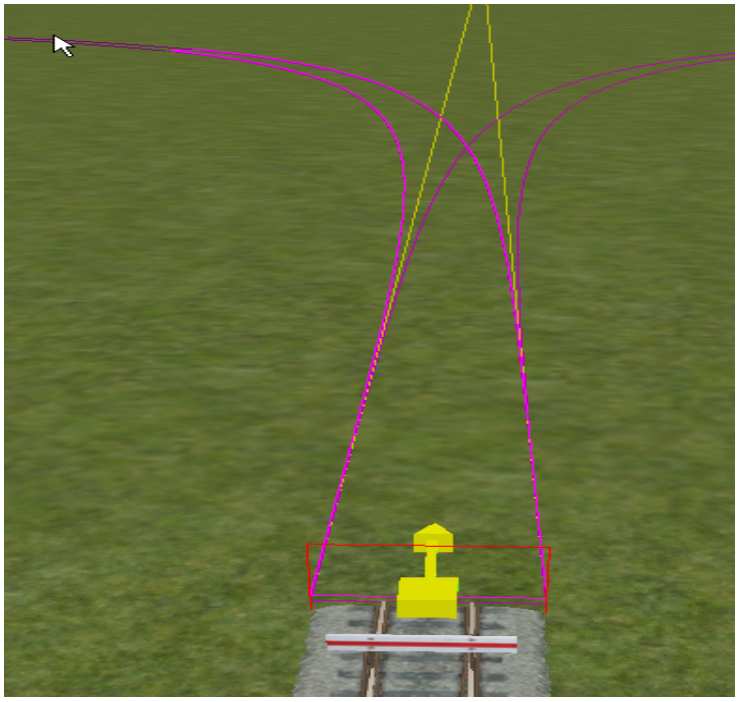
Click on the Easement icon

From straight track.

Position the marker at the end of the the straight track.



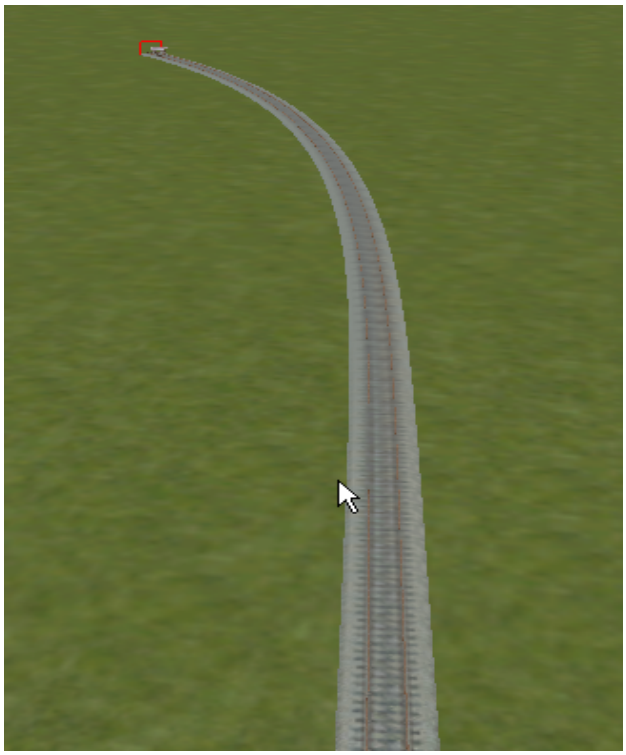
The outlines of the transition curves can be seen in purple.



Click on marker and follow the outline and the purple outline intensifies.

As the purple outline is followed, the radius of curvature at the cursor, which is shown in the **Status Bar** changes. Stop when the value reaches the radius that is to be used on the following curve.

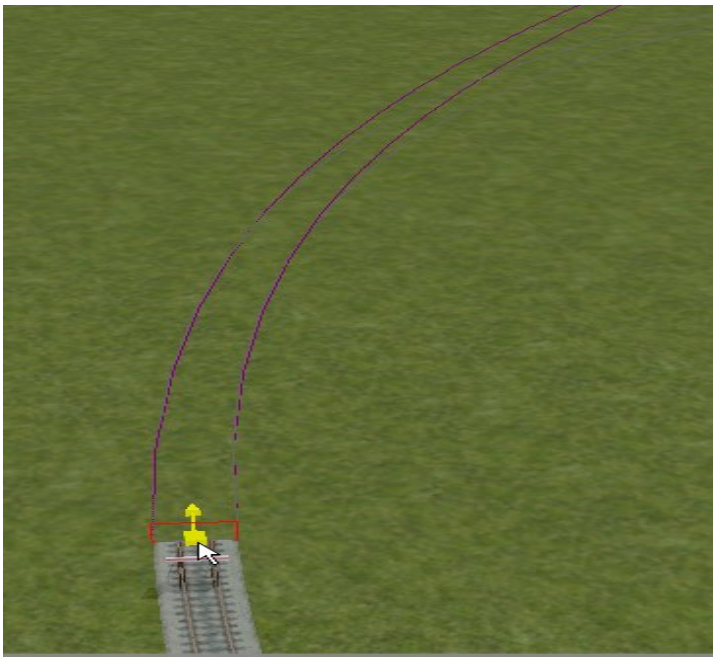
Left click to create track.



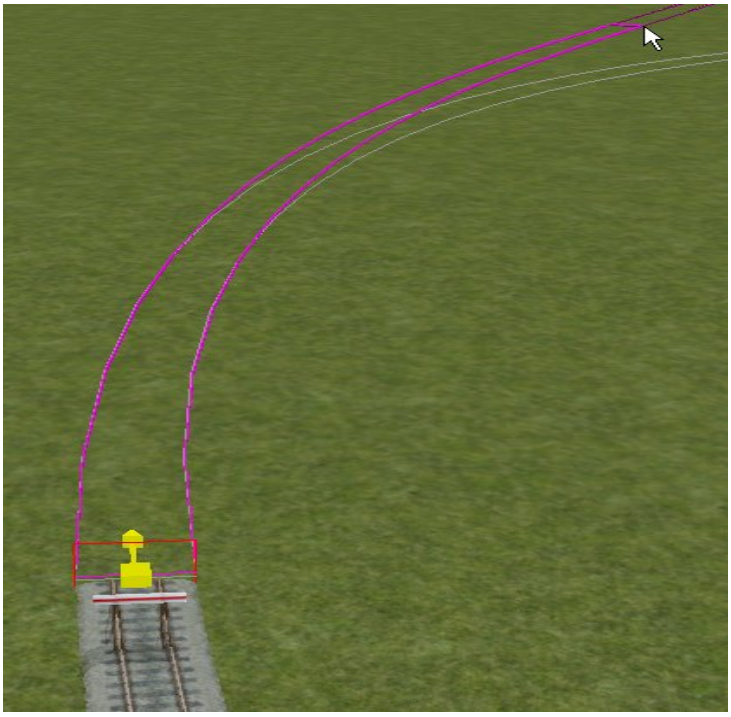
To check that a transition curve has been formed split the track at a number of places and place the cursor over the separated tracks . You will see that the radius gradually reduces as you go away from the straight track.

Undo all the splits before proceeding.

From Curved track.



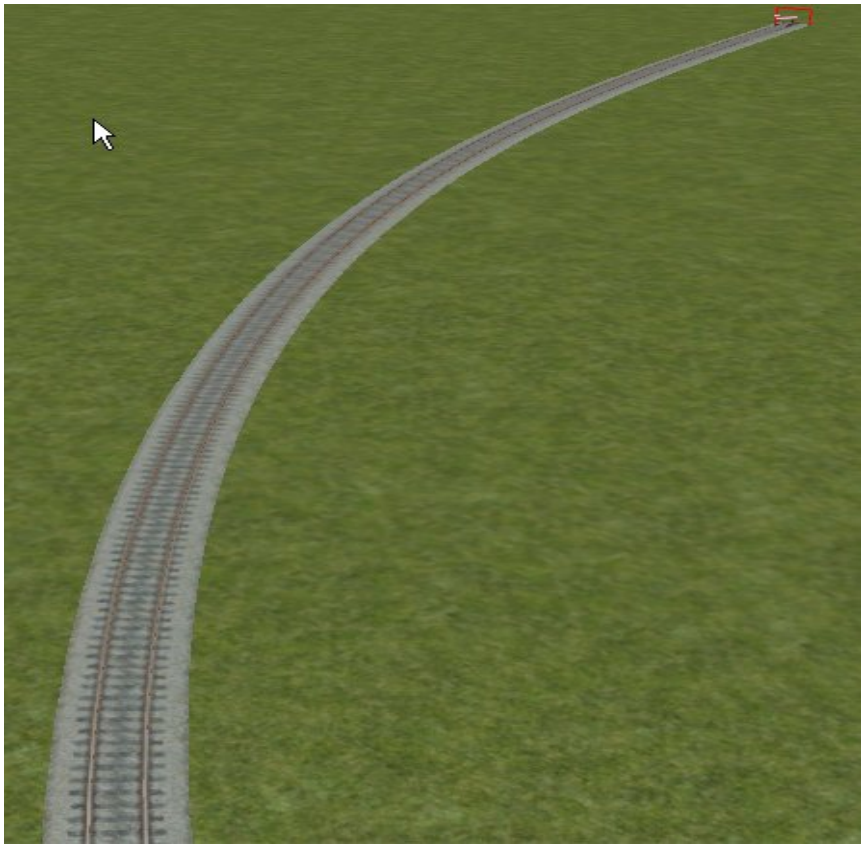
The outlines of the transition curves can be seen in purple.



Click on marker and follow the outline and the purple outline intensifies.

As the purple outline is followed to its end the radius of curvature at the cursor, which is shown in the Status Bar, changes to infinite.

Click on the end of the purple outline to create track.



This function can also be used to create a transition curve between two curves. Proceed as above but stop when at the radius of the next curve to be laid.

Object Movement.

When an object has been selected by Left Clicking on it a **Gizmo** appears.

The object can be rotated about a Vertical axis by positioning the cursor on the yellow arrow and dragging the mouse with the left button held down.

Similarly the object can be moved vertically using the Blue arrow.

The Red arrow moves the object **E – W** , the green arrow moves the object **N – S** .

If the **Grid** is showing, the centre of the selected object moves along a grid line when the object is moved with either the Red or Yellow arrow, rather than N-S, E-W.

However the movement is rather coarse and can cause the object to become disorientated. Double clicking on the yellow ball resets the object.

Pressing **J** resets object to ground level.

Object Fine Movement

Finer movements of the selected object can be made using the Keyboard. Click

G to rotate Clockwise
F to rotate Anticlockwise

V to go Up
B to go Down

N to Move Towards camera
C to Move Away from camera

J to set object at ground level

Grid.

When the grid is selected the centre of the grid is vertically below the camera position. The grid stays in this position until turned off. When next turned on it will be vertically below the then camera position.

The keys **O** & **P** rotate grid with respect to the Tile boundaries (which are N – S, E – W).
The grid rotates about centre of the grid.

The grid rotates approximately 0.6 degree per key press. Holding the key down will give continuous rotation.