An Un-Official Guide to Signalling in Rail Simulator
Part 1 – Semaphore Signals

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Issue 2

Extensively re-written from Issue 1
Changes since last version are not shown.

Introduction

The intention of this guide is to show how the "as supplied" signalling can be applied to custom routes in an operationally as realistic a manner as possible. It is not intended to deal with any programming or scripting issues as they are being described elsewhere by others more competent than myself in these aspects. This document is designed to sit between the prototype signalling system information available in various books etc. and the detailed scripting and modelling details supplied by Rail Simulator. Therefore it should be of use to most UK Route builders until they become familiar with the details of the signalling.
This is in no way an official publication and has not been sanctioned or approved in any way by Rail Simulator.

The following directions are referenced:
Normal – When the train is proceeding in the direction to which a signal applies.
Reverse – When the train is moving in the opposite direction to which a signal applies.
The following movement references are also made:
Passed – The front (in direction of travel) of a train/vehicle passes a specified point.
Cleared – The rear (in direction of travel) of a train/vehicle passes a specified point.

The testing to determine the following conclusions was undertaken in Free Play so as to demonstrate the different effects. However in both Free Play and scenarios the normal position for the semaphore signals is off (clear) unlike the real thing.

UK Semaphore Signals

For the sake of simplicity I have shortened the signal file names in the descriptions below. The file descriptions in the options panel on RS in Editor Mode all start with "B Lattice… or B Wooden… ". Below I have only used the unique part of the file name omitting the initial part. A full list, of the supplied UK signals, is shown in an Appendix A.

Signal Links

Each signal has one or more Links. There are four types of links, which for the purposes of this document are called Link 0, Route Links (Numbered links in RS Documents), "Yard Entry" and "Reverse Junction".
If a signal is passed and the train then proceeds onto a route without a marker then it is possible for the signal to become "Locked" in the on position. A train will then have to be reversed back down the route or the game will have to be restarted to get the signal to clear again. Also take care not to change the points between the Link 0 and the relevant Route Link until the train has cleared the final Link for the signal, which may be the Link 0 of the next signal. Failure to do this can also cause the signal to "lock on". It would appear that signals "count" trains passed their Link 0 and then subtract the number of trains passing the "Yard Entry" Link or the Link 0 of the next signal determined the set Route Link. If the number is zero then the signal is off (clear) and if the number is not zero then the signal is on. The Links appear to be able to respond to the front and rear of trains. It would appear that they do not look at track occupation (except at Initialisation) or count vehicles/axles. If used correctly the signals can look at the point/route settings and operate accordingly.

Link 0
Each signal has one of these links (See Fig.1). In Free Play mode this appears to perform the following functions at stop signals:-
When moving in the normal direction:

1) As front of train passes it sets the signal to on.
2) As the rear of the train clears it sets the preceding signal to off.

When moving in the reverse direction:

3) As the front of the train passes it sets the next signal in the direction of travel to on.
4) As the rear of the train clears it sets its own signal to off.

When positioning the marker make sure that the orange "arrow" head of the marker is clear of any point blades (the red triangles/rectangles), as this can lead to signalling system confusion. See Fig.1.

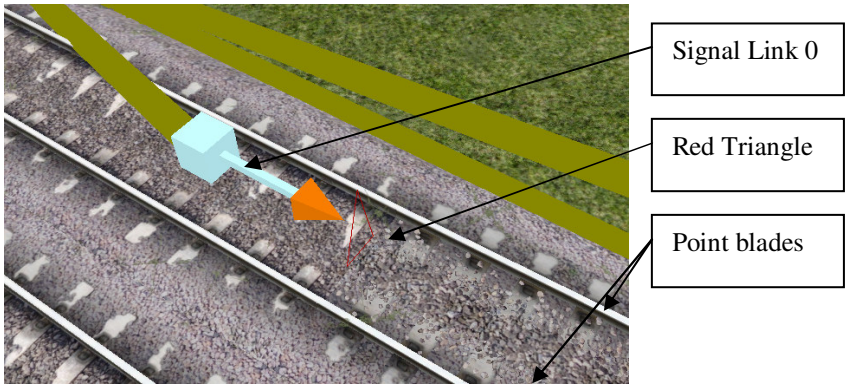

Figure 1 Marker & Red Triangle

"Route Link"

A signal may have one, or more, of these types of link (See Fig.2), see Appendix A. In most cases, it is used by the signal to determine if a relevant route is set. The signal looks at the lay of the points between the Link 0 and each of its Route Links. It would appear to look for conflicting set routes crossing the path. It does not however detect reverse routes, if the setting of the points is the same. The signal also looks to the next signal in advance via the set Route Link for its authority to display a clear indication (counter reset), except where the link is of the "Yard Entry" type (see below).

Only the first six Route Links visually display their number in the 3D model. Link numbers seven onwards do not display their numbers above them. See Fig.2.

The number of Route Links that a signal has is the figure suffixed with a "T" or "t" in its description. For multi-arm signals one or more "Route Links" will apply to each arm. See Appendix A for details.

"Yard Entry" Link

This is a form of "Route Link", but has the additional two functions:

1) When the train is moving in the normal direction, as the rear of the train passes over it, its signal is re-set to clear.
2) When the train is moving in a reverse direction and the front passes over it, its signal is set to on.

These "Yard Entry" Links are visually indistinguishable from "Route Indicator" Links. Their presence and number is indicated in the signal description. The number of them is the figure suffixed with an "E" in the description. They also form part of the total number in the "T". See Appendix A to determine which links are which type for a specific signal.

Where the number is in the form xE (e.g. 5T 3E) then the "Yard Entry" Links are the last 3 links in the order of a total of five links. If the number is xEx (e.g. 7T 2E1) then the "Yard Entry" Links are the first and last one of the seven.

"Reverse Junction" Link

These links are only fitted to signals with "Special" in their description. The links have to be detected by the signal in a specific order for them to clear (e.g. 1 - 2 -3). Refer to the signal specific instructions below of examples of their use.

These links are also capable of detecting reverse moves and when a reverse move clears one of these Links the signal is reset to clear, once the route is reset. Therefore a train can enter the section in advance of this type of signal, then reverse back into a yard. When the points are re-set back to the mainline, the signal will clear. Refer to the section below on Special Signals for more details.

The actual move has to be made over the "Reverse" Link in the opposite direction to the link arrow for the signal to reset.

The Basic Semaphore Stop Signals

This signal consists of one stop (red arm) on a post. In RS this comes in a number of versions. For now the two we are going to discuss are "sig_h" and "sig_h 1T". The other versions behave similarly, but with different numbers of links.
Signal "sig_h" is a basic stop signal and can be used where ever there is no point work that requires to be interlocked with the signal between its Link 0 and the Link 0 of the next signal in advance (e.g. advanced starting signal). This signal should have the post positioned as described in the basic RS instruction manual. Having left clicked to position the post you will be presented with a Link 0 (Fig.1) at the cursor. This should be positioned in the "four foot" of the required track in advance of the signal. I would suggest that if possible this is a least a scale 20-25m. The reason for this is that when the front of the train passes this marker the signal will go to danger.

Once the Link is roughly positioned, right click to stop the repeat copy, then left click on the post and correctly orientate and position the signal and post. When initially set the Link may point in the wrong direction, as it seems to take its orientation from which way the signal faces. So whilst the signal is highlighted and the Link visible, check and re-position it, if necessary, so that the marker arrow points in the normal direction. To reverse the direction of the arrow, just move the marker slightly by highlighting (turns yellow) and then grabbing with the mouse. If necessary the arrow will then reverse. If you can not reverse the arrow due to the track curvature, then press the Control Key and left click on the Link this should force it to reverse.

Signal "sig_h 1T" is similar to the previous one but can be used where there is one route in advance of the signal that has some point work which requires route detection, normally one or more trailing points[1] (e.g a passing loop starting signal). This signal is installed similarly to the previous one, but once the first link (Link 0) has been positioned you will be presented with a further link (Route Link 1) which looks similar, but has an orange figure one (1) above it (see Fig.2). Position this link on the far side of the point work that requires to be monitored by the signal. See Fig.3.

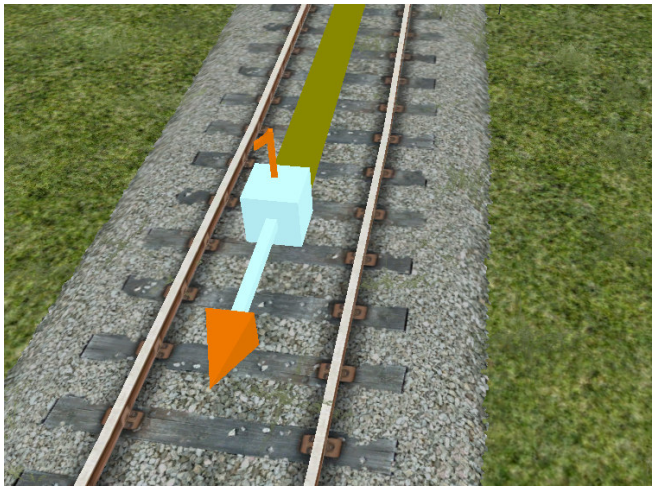

Figure 2 A Route, Yard Entry or Reverse Junction Link No.1

Links above number six do not display their numbers.

Other basic single arm stop signals with more Route Links are set up similarly. The order of the routes (Left to Right) is not important. If the signal has any "Yard Entry" Links they will normally be the highest numbered ones, except where the E code has a suffix (e.g. 3E1), see Notes on Special Signals below for other details.

[1] If there is one or more facing points in the route you will need to consider using one of signals with more than one Route Link. This is because of the risk of "locking" the signal it you inadvertently traverse a non-linked route.

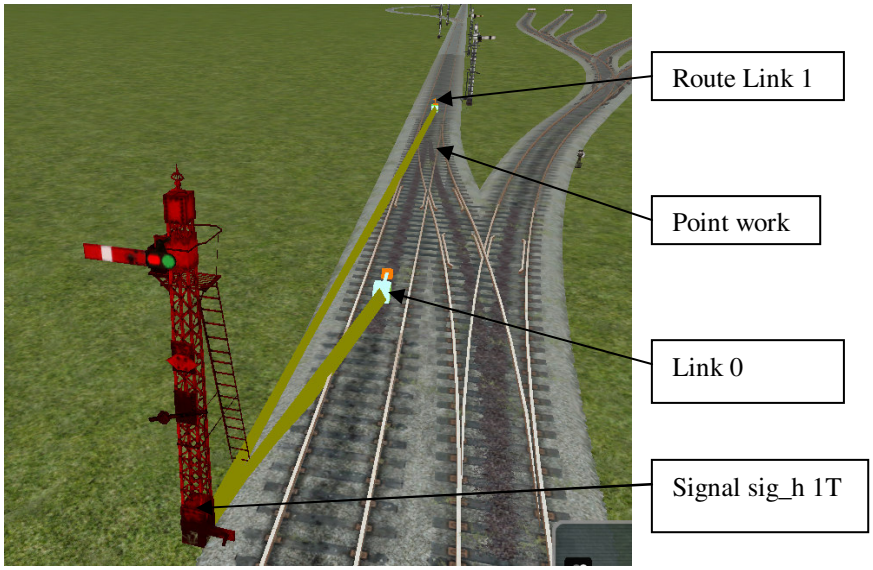

Figure 3 Typical set-up for signal "sig_h 1T"

The Basic Junction Stop Signals

These signals come in a number of forms but the basic one we are considering here is “juncsig l2_hh”. This is a bracket signal with two equal height stop arms.
Position the signal, as described in a similar manner to the other signals, to the rear of the junction points. Place the Link 0 in advance of the signal, but before the points. Then place the next link, Route Link 1 along the left-hand (primary) route so that it is ahead of the all the point work required to be monitored by the left hand arm of the signal. Having placed this link you will then have a second link Route Link 2 which should be placed along the right-hand (secondary) route, again ahead of all the point work to be detected. See Fig.4 for details.
The Link 0 and the Route Links 1 and 2 affect their respective arms as described above, however both arms share the common Link 0.
Note that the left to right order of setting out the Route Links does not apply to all multi-arm signals. Some signals set out their links right to left. Refer to Appendix A for details of a specific signal.

The Distant Signal

This signal should be positioned as required to the rear of the home signal it is protecting. It only has an Link 0 and this should be placed adjacent to the signal pointing in the normal direction. See Fig.5.
The distant signal will only repeat the indication of the next signal. Therefore, it can’t currently be used for correct indications of Home and Starting signals. Tests moving Link 0 well beyond the “home” signal, kept the distant off all the time.
I have not yet been able to make the splitting distant signals function and they remain on under all test scenarios at present.
Note that the distant signal has a “Rule 55 Exempt” Plate which is not correct for the real world.
Distant signals do not show on the 2D Map.

Combined Stop and Distant Signal

There are two basic types of this signal, “combsig_hd” and “combsig_hd 1T”. These are set up in a similar manner to their stop signal equivalents. There are no specific Links for the distant arm.

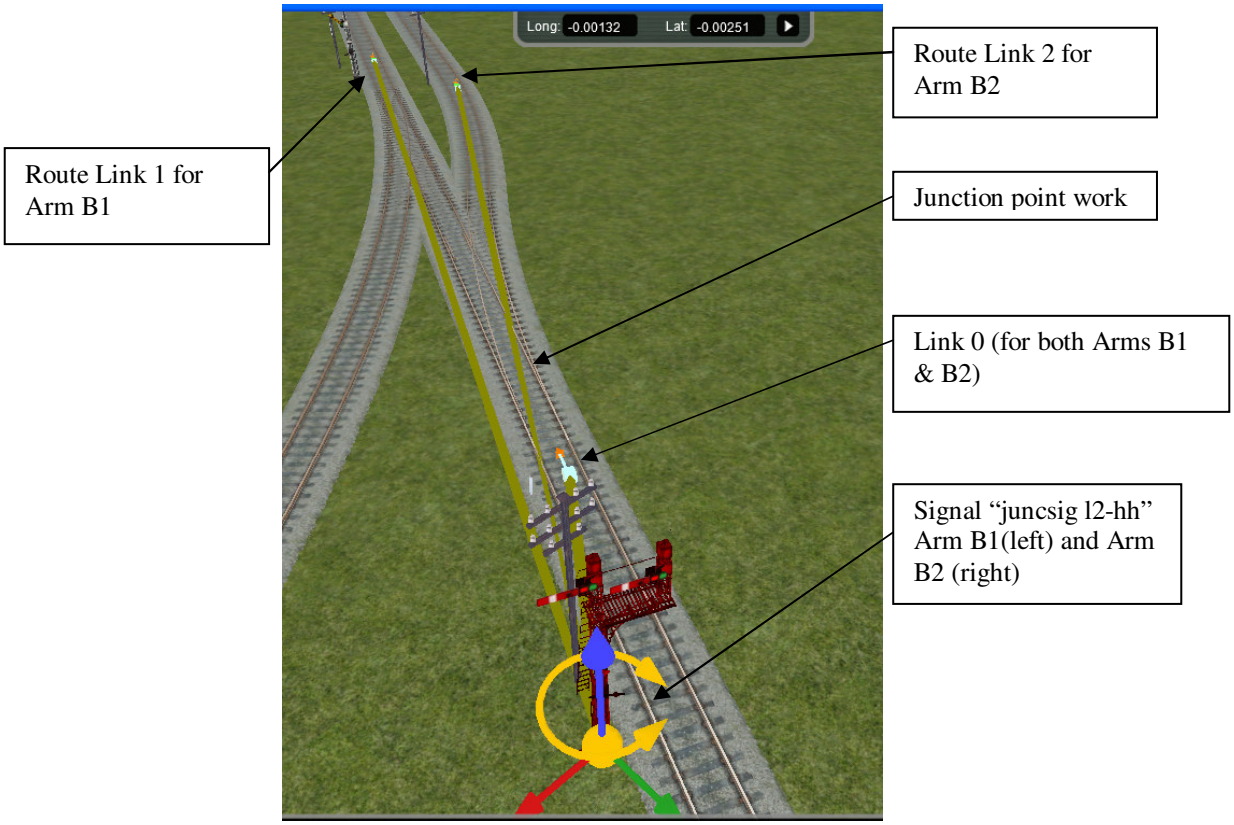

Figure 4 Set-up for "juncsig l2-hh"

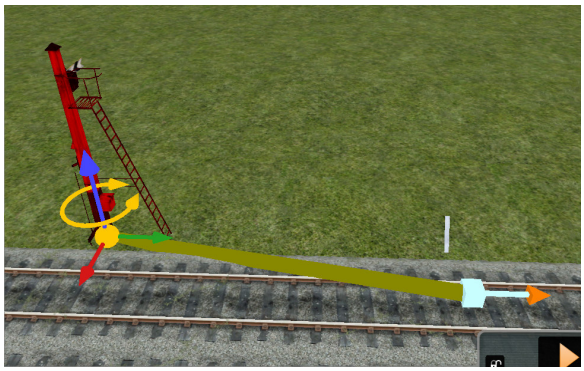

Figure 5 Typical set-up for a distant signal

Signals with “Yard Entry” Links

Signals with “Yard Entry” Links are set up similarly to junction signals, however one or more of the Route Links have the additional capability to return their signal to clear without reference to any other signals. These routes should be normally be used where trains will pass out of a “signal controlled” area e.g. a yard or group of sidings. See Appendix A for a list of signals with this facility and the marker numbers to which it applies.

Note that the signal illustrated in Figure 6 has a code “7T 3E1” which means that there seven “Route Indicator” Links of which three are of the “Yard Entry” type, but unlike the normal arrangement where these links are the highest numbered of the “Route Indicator” Links, this signal has one on the lowest numbered “Route Indicator” Link. Therefore the three “Yard Entry” Links are on links 1, 6 and 7 in this instance.

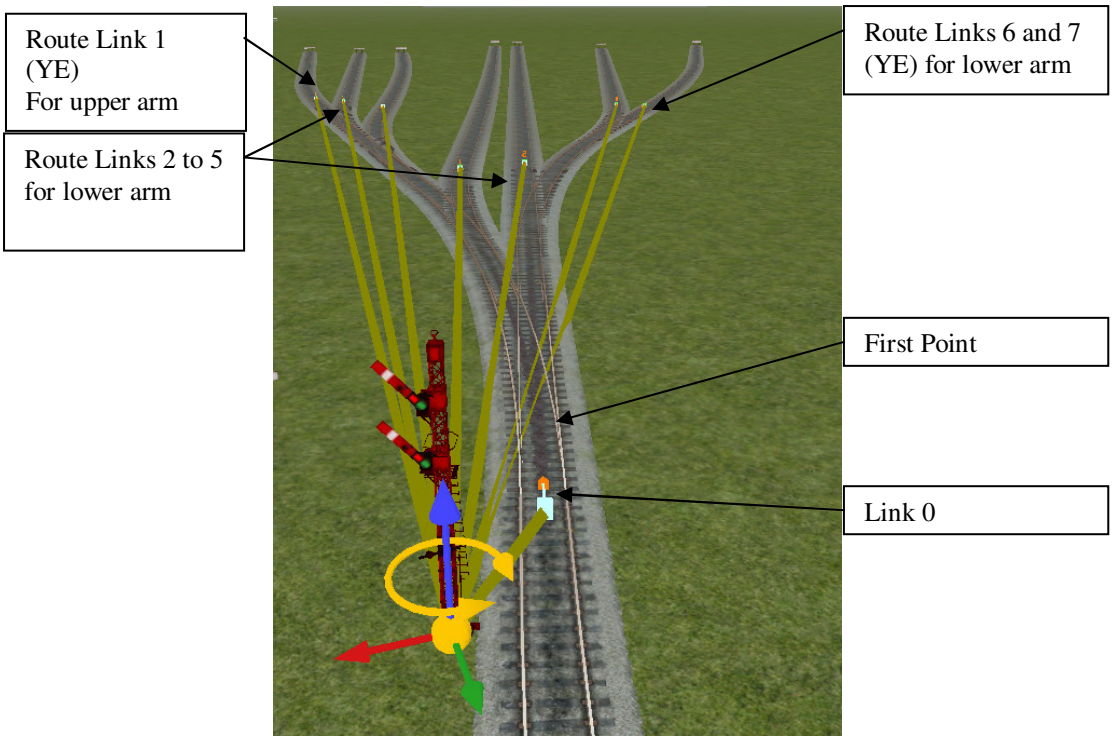

Figure 6 Set-up for combsig_hh 7T 3E1

Signals with "Reverse Junction" Links

These signals have the word "special" in their description. The single arm signals have two or more Links. The Junction signal has three Links, one common to both arms, then an additional marker for each arm. These links are visually the same as Route Links and function similarly, but also have additional functions which are described here.

In the example shown in Fig.7 the route needs to be clear from the Link 0 through Reverse Junction Links 1, 2 and 3 before the signal will clear.

If your train then stops short of the next signal, and then reverses into one of the sidings, or over the cross-over and the points reset for the mainline, the signal will then clear.

The Reverse Junction Links must be set clear of the points over which the resetting move will take place. Also remember that the train will have to clear the link before setting back into the siding.

The signal can be used in conjunction with the various types of ground signals to achieve optimum control, but it is not essential.

In the example shown in Fig.8 for the LH arm to clear the route needs to be set from the Link 0, through Reverse Junction Link 1, facing points set left, trailing points to Reverse Junction Link 3. If the trailing points are wrongly set then the signal will remain on. A train passing puts the signal on as it passes the Link 0. The signal remains on while the route through the points is un-changed. If the trailing points are changed and the train set back into the siding, when the points are restored to the "mainline" then the LH signal arm will go to clear.

If the facing points are set right then the Reverse Junction Link 2 functions similarly to that described for Link 3 when the train is reversed into the siding (where the loco is).

If no reverse move is made then the signal functions in the normal manner for a junction signal as described above.

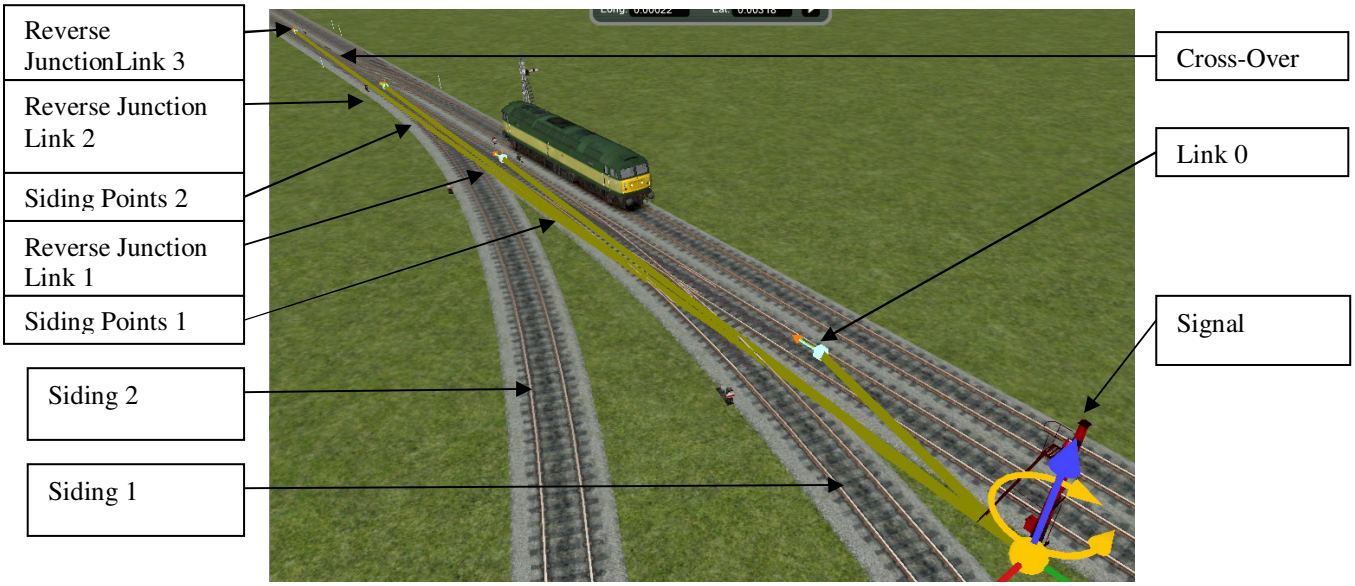

Figure 7 Typical set-up for a single arm signal with "Reverse" Links

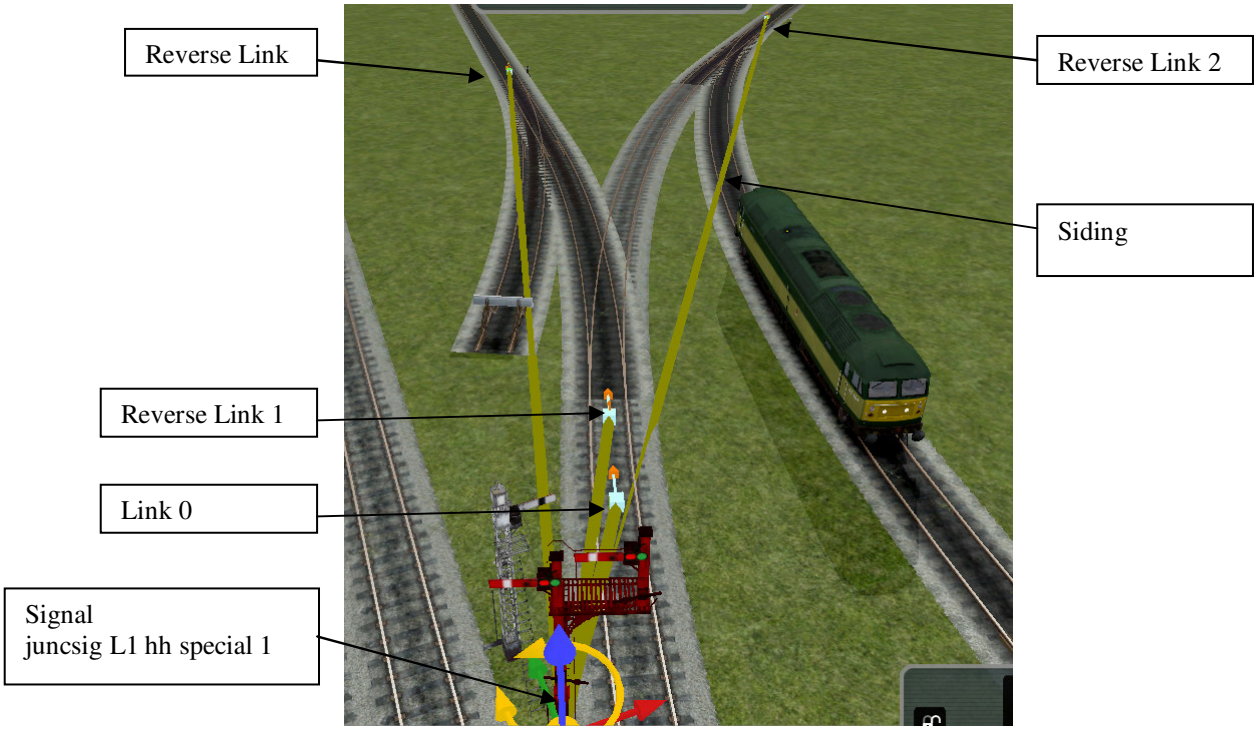

Figure 8 Typical set-up for a junction signal with "Reset" Links

Signal “Juncsig X_h”

This is another special signal, but has different functionality to those above.
This signal has only one route from the Link 0 to the Route Link, if any of the points between the Links are set to another route then the signal is on. In this aspect it is similar to “sig_h 1T”. However, the signal ignores any signal in advance and will only return to clear when the Link 0 is passed in reverse.

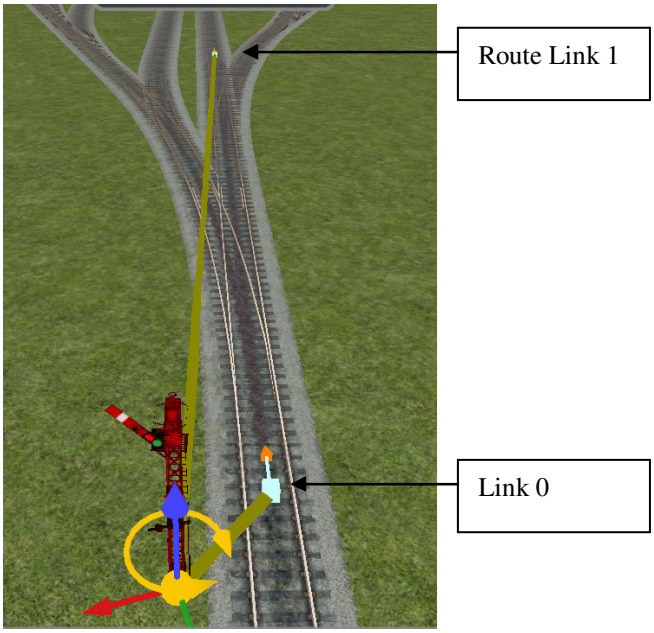

Figure 9 Typical set-up for Juncsig X_h

Ground Signals

There are four different types of Ground Signals. Visually they are all look the same.
There are two basic types “Entry” signals, with two Route Links and “Exit” signals with one Route Link. Both types of signal have a version with a suffix of “mainline” in the name.
The “Entry” type signals are not visible on the 2D map.
Signals with the “mainline” suffix should be used where one or more of the Route Links is set in a mainline (i.e. not a siding).
“Entry” signals only show off when Route (Link) 2 is set, but will allow moved past Route Link 1.
The ground signals are effectively point indicators as they do not return to on until the points are reset.
The Links for a ground signal are set in a similar manner to main signals. See Figs. 10, 11 & 12.

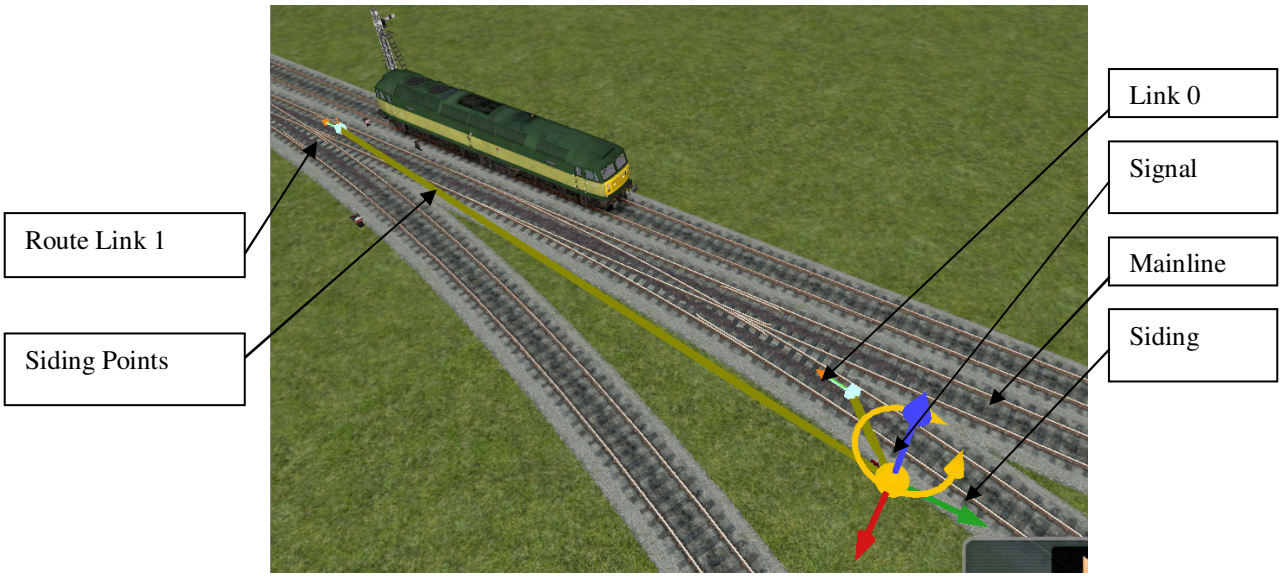

Figure 10 “exit_mainline” Ground Signal typical set-up

Figure 11 “entry” Ground Signal typical set-up

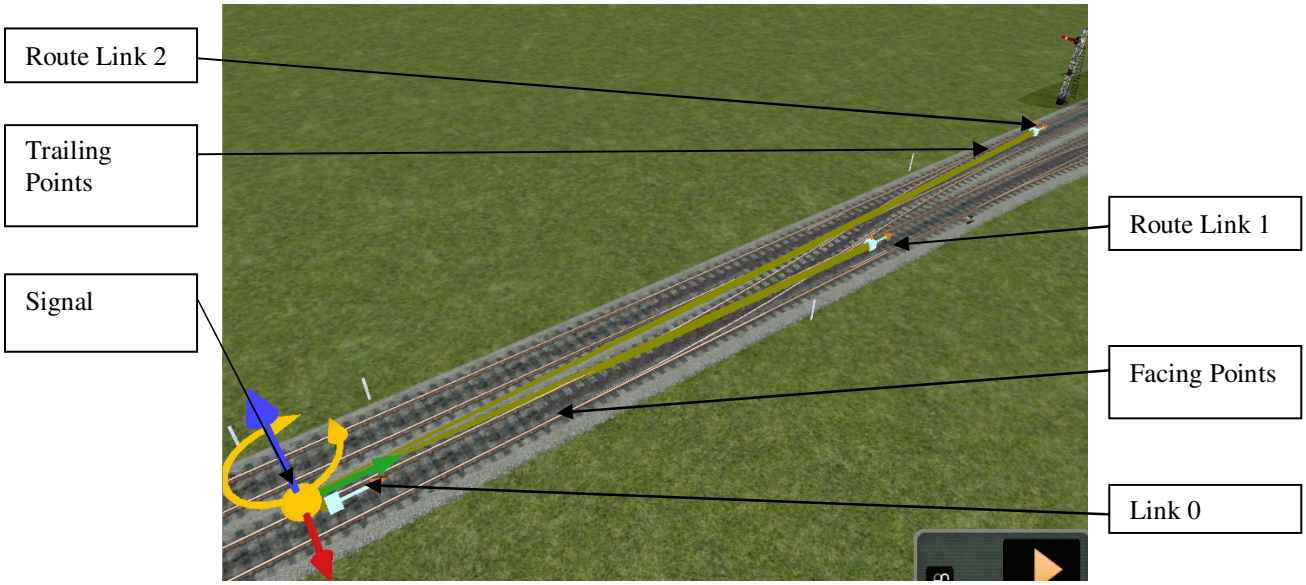

Figure 12 "entry_mainline" Ground Signal typical set-up

UK Colour Light Signals

Interaction Between Colour Light and Semaphore Signals

The interaction between the semaphore signals and the colour light signals (CLS) has been tested in two ways; semaphore to CLS and CLS to semaphore. Samples of both types of signal were used and it is assumed that other signals or the same basic type will react similarly.

Colour Light Control of a Semaphore Signal.

Refer to Part 2 of this publication for the details of how a colour light signal can control a semaphore signal.

Semaphore Signal Control of a Colour Light Signal.

This was tested using a demonstration set-up shown in Fig.14 and moving a locomotive passed the signals in the normal direction. The semaphore signal controlled the CLS as if it was a 3 aspect CLS. Details are shown in Table 1.

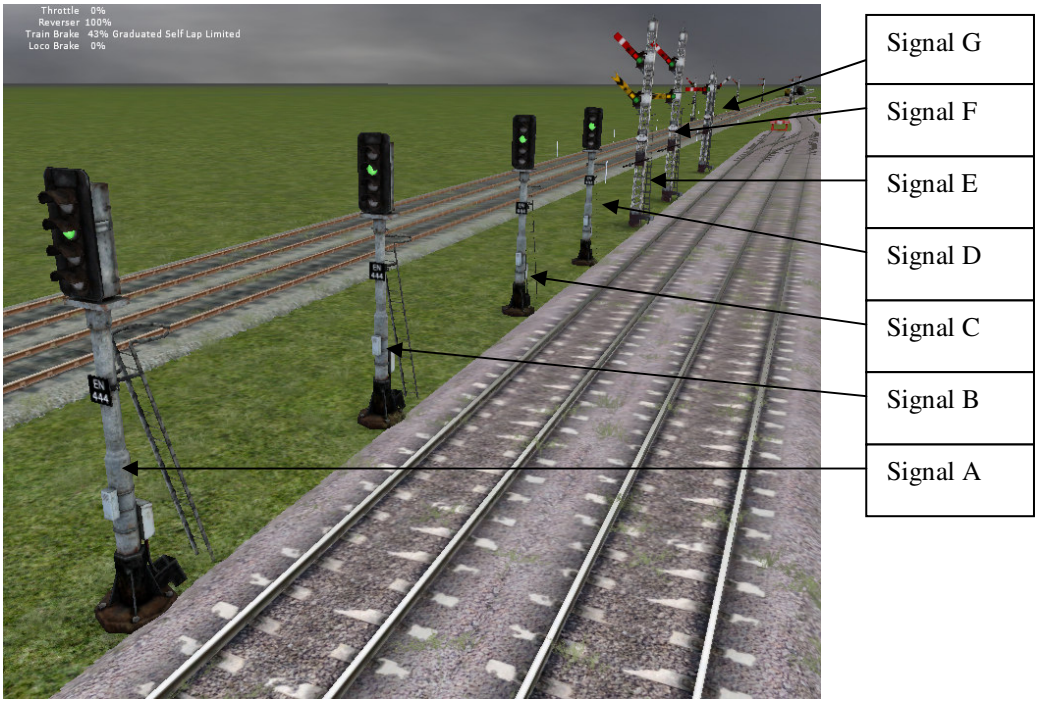

Figure 13 Set-up for testing CLS to Semaphore

Table 1 Operation of Set-up in Fig.14

Move	Signal A	Signal B	Signal C	Signal D	Signal E	Signal F	Signal G	Comment
Initial set-up	green	green	green	green	clear	clear	clear	as shown in Fig.14 but with G off
Loco passed A	red	green	green	green	clear	clear	clear	
Loco passed B	red	green	green	green	clear	clear	clear	
Loco cleared B	1 yellow	red	green	green	clear	clear	clear	
Loco passed C	1 yellow	red	red	green	clear	clear	clear	
Loco cleared C	2 yellow	1 yellow	red	green	clear	clear	clear	
Loco passed D	2 yellow	1 yellow	red	red	clear	clear	clear	
Loco cleared D	green	2 yellow	1 yellow	red	clear	clear	clear	
Loco passed E	green	2 yellow	1 yellow	red	on	clear	clear	
Loco cleared E	green	green	2 yellow	1 yellow	on	clear	clear	
Loco passed F	green	green	2 yellow	1 yellow	on	on	clear	
Loco cleared F	green	green	green	green	caution	on	clear	
Loco Passed G	green	green	green	green	caution	caution	on	
Loco cleared G	green	green	green	green	clear	caution	on	

AWS Ramps

These no not work with semaphore signals. This was tested using a suitable locomotive in expert driver mode, an AWS Ramp to the rear of a semaphore distant signal (or any other semaphore signal tested) nothing was received in the cab regardless of the signal position (ramps are not normally fitted to semaphore stop signals, unless fitted with a distant arm). It is also confirmed that the ramps do not work with the home & distant combined signals either.

TPWS Track Aerials (Grids)

These do not work with semaphore signals either.

Speed Restrictions

All the UK Routes have the same method of setting out a speed restriction, but use different signs.
To set out a speed restriction follow the following instructions in strict order, otherwise the indicators may end up showing the wrong speed.

1) In World Editor select linear objects, select tool. Then select the entire length of track over which the speed limit will apply.
It is a good idea to put down temporary scenic objects (such as a post or bush) at the side of the track to mark the start and finish of the speed restriction.
2) In the Properties Box (on right) enter the speed required in both boxes. (Fig.14 and Fig.15)
3) Click out of selection.
4) Press space bar several times until the track speed colours are displayed. Move the mouse over the relevant track and check that the correct speed has been applied.
5) Select Objects, signals. Then choose the speed restriction sign of your choice. (Fig 16).
6) Position Speed Restriction sign to the side of the track at the start of the Speed Restriction. Position and rotate the model in accordance with the methods in the RS Editor User Guide. Once positioned click out of the model. (Fig 17 and 18)
7) You will now be presented with a track link at the mouse cursor. Position this Link in the "four foot" of the track at the start of the speed restriction, but make sure that the link is fully on the limited speed track. Release the mouse and the speed limit sign should now display the relevant speed(s). (Fig. 19 & 20).

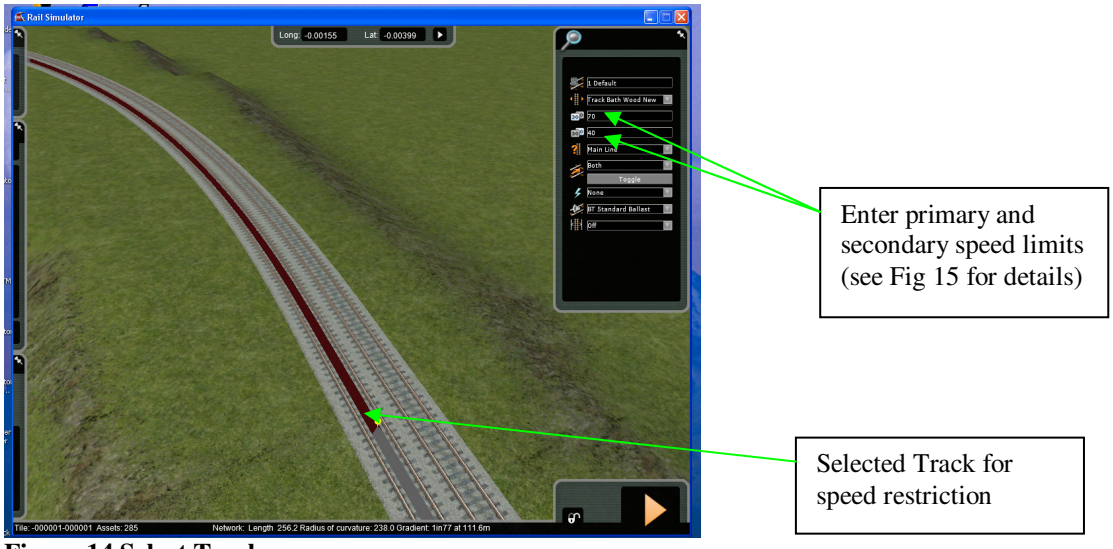

Figure 14 Select Track

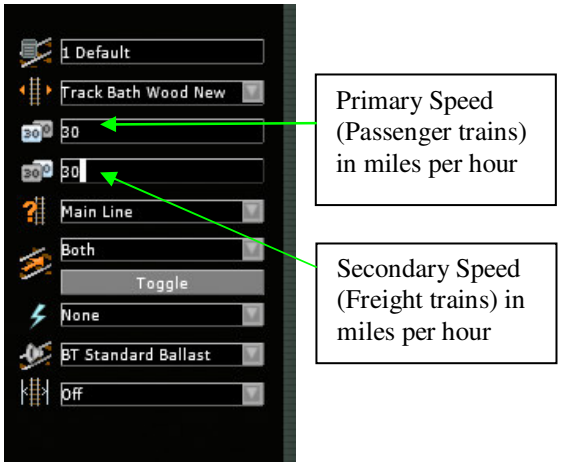

Figure 15 Detail of Properties Box

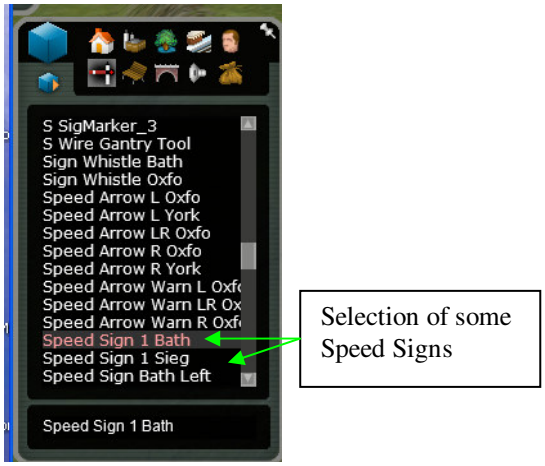

Figure 16 Details of Selection Box

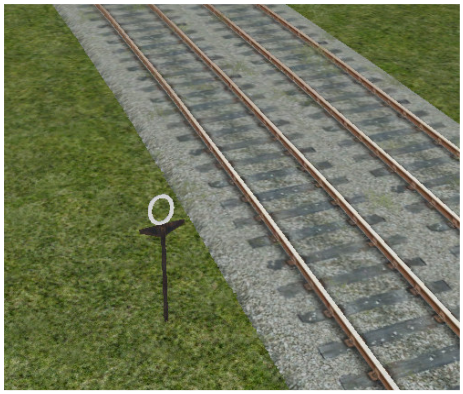

Figure 17 Placed model (Speed Sign 1 Bath)

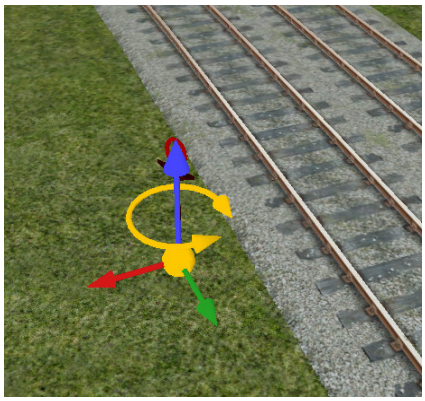

Figure 18 Model being rotated to face correct direction

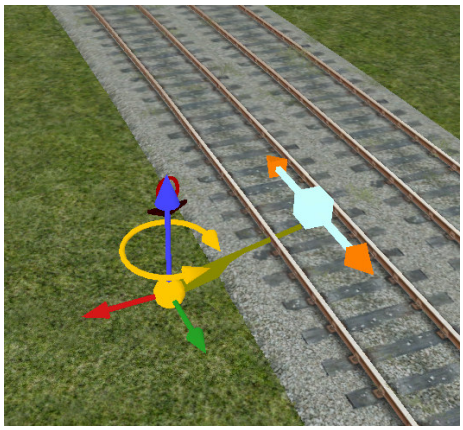

Figure 19 Track Link placement

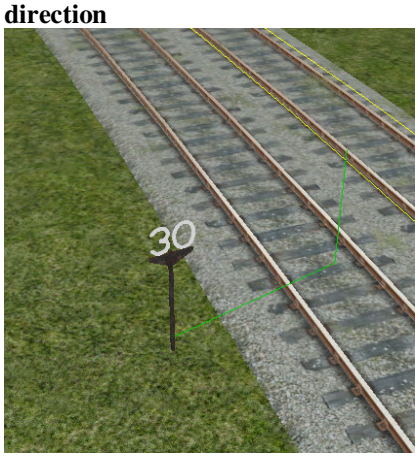

Figure 20 Speed Restriction Completed

If the primary and secondary speeds are different the sign will only display the primary speed unless it is a “double” display sign (see below).
Figure 21 shows the speed restriction applied and the track speed limit indications visible. (In Object selection, press space bar several times as per instructions in the RS Editor User Guide). The maximum track speed for any piece of track is given by a colour and can also be read by hovering the mouse cursor over the relevant piece and then a box (as shown) will display showing the maximum primary and secondary speeds. The actual speeds change where the colours change. In Fig.21 the purple stripe represents 70mph (one colour means primary and secondary speeds are the same). The Brown stripe represents the area of the 30mph restriction. The opposite track has a differential speed restriction where the primary and secondary speeds are different (hence the two colours). In this instance the primary is 70mph and the secondary 40mph.

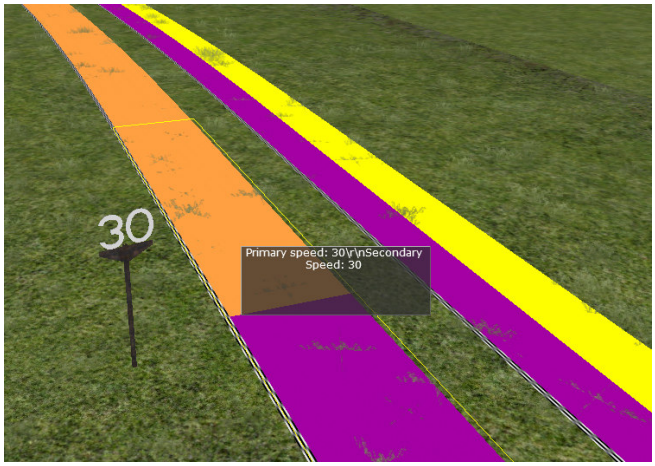

Figure 21 Track Speed Indications

Available Signs

As supplied each of the RS UK Routes have a slightly different system of indicating speed restrictions. Traditionally route speeds are not displayed and signs are only displayed where this is reduced.

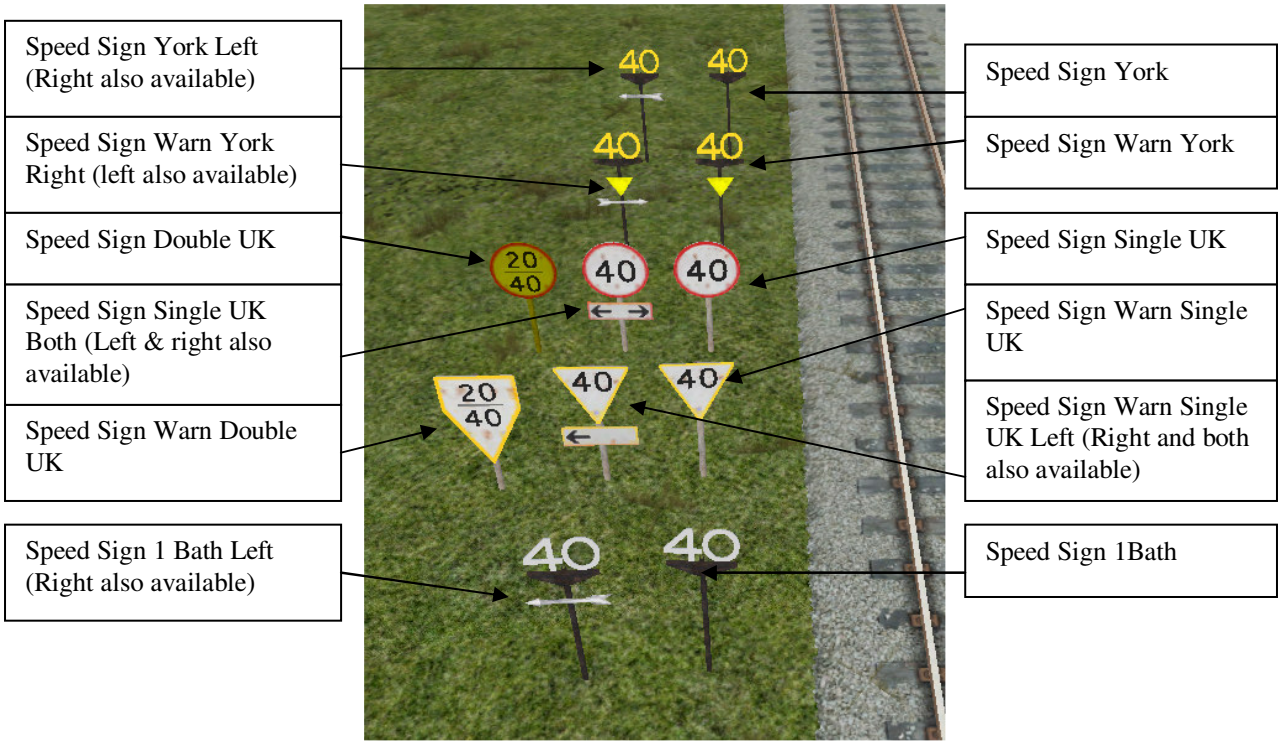

Figure 22 Speed Restriction Signs

Warning Signs

For some sign systems advance warning signs are supplied (see Fig 22). These are installed some distance to the rear of the actual speed restriction sign. The distance depends on the change of maximum speed and the braking distance required to achieve that change at that location (gradient). To install a warning sign, first install the main speed restriction and signs as described above, then at the selected location install the warning sign using the same method as that used for the main speed restriction sign. However, in this case the track link must be located on the track actually within the speed restricted area (which may be some distance away). Otherwise the warning sign will not display the correct speed.

Note: Having installed a speed restriction sign, you subsequently change the track speed in the area where the sign is it will not automatically change to the new value. Therefore it will have to be deleted and re-installed to display the correct value.

Mileposts

The three UK Routs have different mileage marker post designs. All are however installed in the same manner.

1) In Object Selection, Signals select the required design of mile post. (Fig.23 & 24)
2) Locate and position the mile post as you would a normal static model (see RS World Editor User Guide).
3) On releasing the object you will be presented with a track link which should be located in the "four-foot" of the adjacent track. (Fig. 25)
4) Double click on the actual model (avoiding the "Gizmo") to display the Object Properties Box (on the right).
5) In the Object Properties Box enter the mileage value required. (Fig.26)
6) Right click to complete.

The mileage entered will now be displayed on the actual milepost model and also as a symbol in the 2D map. See Fig.27.

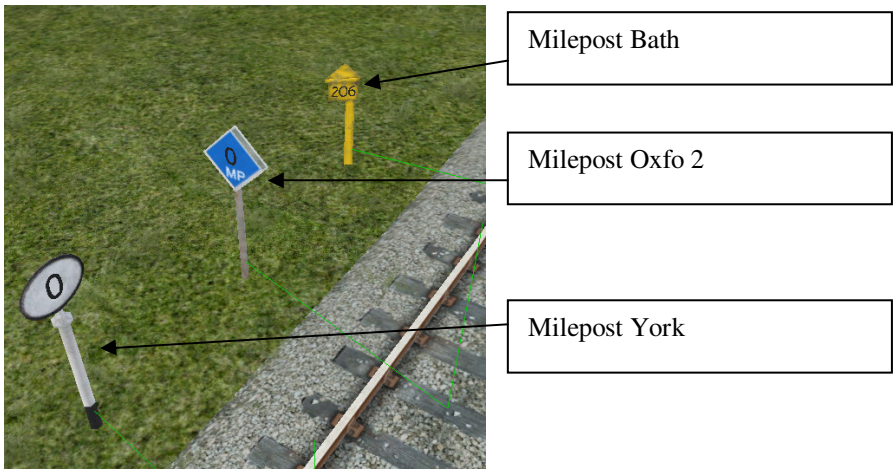

Figure 23 UK Route Designs of Mile Post

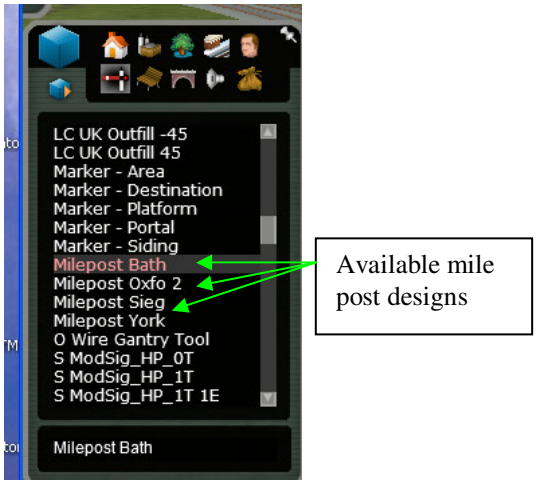

Figure 24 Details of Selection Box

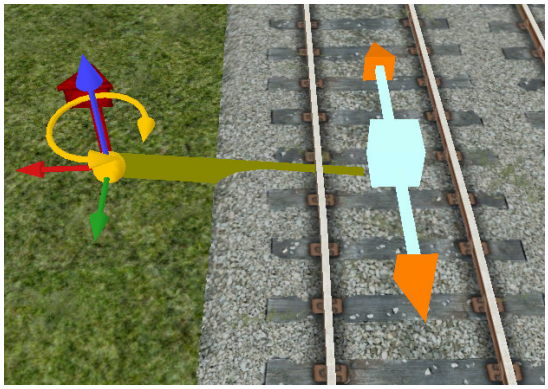

Figure 25 Milepost and track link

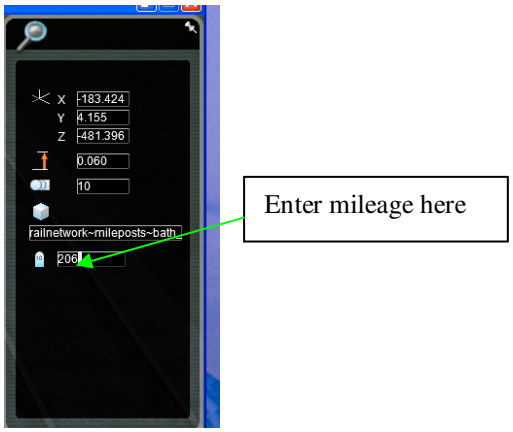

Figure 26 Details of Properties Box

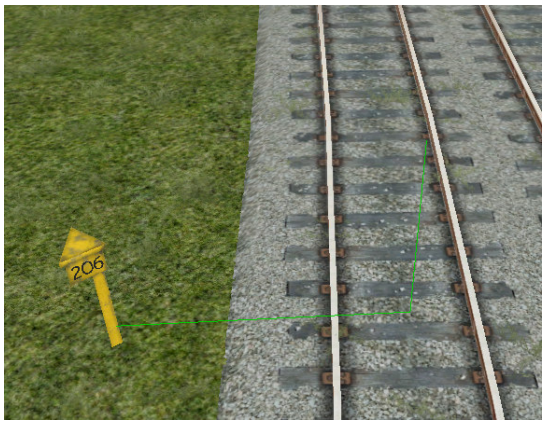

Figure 27 Mileage displayed on model

Whistle Boards

These are installed as you would any static object (model). There are no track links involved and the models should be installed in the required locations at the side of the track facing oncoming trains. Two types of whistle board are available see Fig 28. They can be found in Object Selection, Signals.

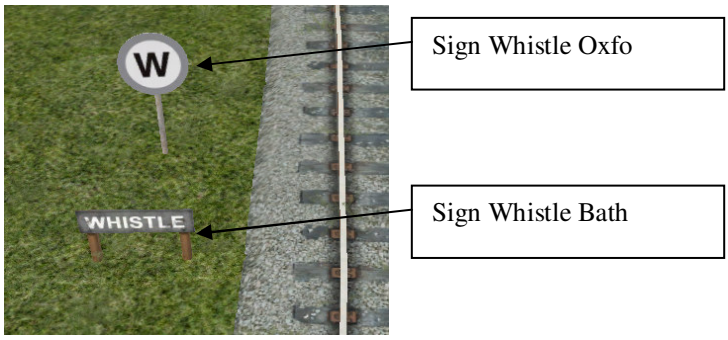

Figure 28 Whistle Board Designs

Appendix A - Signals Supplied with Rail Simulator

Semaphore Signals

Files names: “b_lattice [model name].bin” for signals with lattice posts and “b_wooden [model name].bin” for signals with wooden posts.

Description	Model Name	Lattice Post	Wooden Post	Arm	Route (only) Links	Yard Entry Links	Reverse Junction Links	Remarks
Distant signal	sig_d	yes	yes	single	no	no	no	see notes
Stop signal	sig_h	yes	yes	single	no	no	no	see notes
	sig_h 1T	yes	yes	single	1	no	no	see notes
	sig_h 2T	yes	no	single	1-2	no	no	
	sig_h 2T 1E	yes	yes	single	1	2	no	
	sig_h 3T	yes	no	single	1-2-3	no	no	
	sig_h 3T 2E	yes	no	single	1	2-3	no	
	sig_h 4T	yes	no	single	1-2-3-4	no	no	
	sig_h 5T 1E	yes	no	single	1-2-3-4	5	no	
	sig_h 6T 2E	yes	no	single	1-2-3-4	5-6	no	
	sig_h 7T	yes	no	single	1-2-3-4-5-6-7	no	no	
	sig_h 8T	yes	no	single	1-2-3-4-5-6-7-8	no	no	
	sig_h special 1	no	yes	single	no	no	1+2	
	sig_h special 2	no	yes	single	no	no	1+2+3	
	sig_h special 3	no	yes	single	no	no	1+2+3+4	see notes
Stop + Distant signal	combsig_hd	yes	yes	Double	no	no	no	
	combsig_hd 1T	yes	yes	Double	1	no	no	see notes
	combsig_hd 2T	yes	no	Double	1-2	no	no	
Stop + Stop	combsig_hh	yes	yes	upper	1	no	no	

Description	Model Name	Lattice Post	Wooden Post	Arm	Route (only) Links	Yard Entry Links	Reverse Junction Links	Remarks
signal				lower	2	no	no	
	combsig_hh 7T 3E1	yes	no	upper	no	1	no	see notes
				lower	2-3-4-5	6-7	no	see notes
	combsig_hh 2T 2E	no	yes	upper	no	1	no	
				lower	no	2	no	
Branch stop, Main stop on RH Bracket	junc L1 hh	yes	yes	left	2	no	no	
				right	1	no	no	
Branch stop, Main stop on RH Bracket	junc L1 hh special 1	no	yes	left	no	no	1+3	see notes
				right	no	no	1+2	see notes
Branch stop, Main stop on RH Bracket	junc L1_hh 2T 1E	no	yes	left	no	2	no	This link does not work correctly [2]
				right	1	no	no	
Main distant, Branch distant on RH bracket	junc L2 dd	yes	yes	left	no	no	no	Does not detect any signals in advance and remains permanently on.
				right	no	no	no	Does not detect any signals in advance and remains permanently on.
Main stop, Branch stop on RH bracket	junc L2 hh	yes	yes	left	1	no	no	
				right	2	no	no	

[2] When Links set out in the accepted manner used for other signals the RH (Link 1) route operates as a Route Link. However when the route is set for the LH arm (Link 2) the RH arm clears. It goes to danger correctly when the Link 0 is passed. However the signal remains locked on when the next signal in advance is passed. It does not return to clear until a reverse move is undertaken from Link 2 and passed the Link 0.

Description	Model Name	Lattice Post	Wooden Post	Arm	Route (only) Links	Yard Entry Links	Reverse Junction Links	Remarks
Main stop, Branch stop on LH bracket	junc R1 hh	yes	yes	left	1	no	no	
				right	2	no	no	
Main stop, Branch stop on LH bracket	junc R1 hh 2T 1E	yes	no	left	1	no	no	
				right	no	2	no	
Main stop, Branch stop on LH bracket	junc R1 hh 7T	yes	no	left	1	no	no	
				right	2-3-4-5-6-7	no	no	
Branch distant, Main distant on LH Bracket	junc R2 dd	yes	yes	left	no	no	no	Does not detect any signals in advance and remains permanently on.
				right	no	no	no	Does not detect any signals in advance and remains permanently on.
Branch stop, Main distant on LH Bracket	junc R2 hd	yes	yes	left home	1-2	no	no	No realistic application, similar in operation to combsig _hh with two routes.
				right distant	1-2	no	no	
Main stop, Main distant on T bracket	junc T hd	yes	yes	left home	1-2	no	no	No realistic application, similar in operation to combsig _hh with two routes.
				right distant	1-2	no	no	
Main stop, Main stop on T bracket	junc T hh	yes	yes	left	1	no	no	
				right	2	no	no	

Description	Model Name	Lattice Post	Wooden Post	Arm	Route (only) Links	Yard Entry Links	Reverse Junction Links	Remarks
Single arm stop	junc X h	yes	yes	single	special	no	no	Signal will only clear for specific route. See notes.

Shunting Signals

Files names for disc signals: “b_Shunt Signal [model name].bin”

Description	Model Name	Lattice Post	Wooden Post	Arm	Route Markers	Reset Markers	Sequence Markers	Remarks
Shunt disc signal	shunt_signal_entry	NA	NA	single	1-2	no	no	
	shunt_signal_entry_mainline	NA	NA	single	1-2	no	no	
	shunt_signal_exit	NA	NA	single	1	no	no	
	shunt_signal_exit_mainline	NA	NA	single	1	no	no	
wooden	shunt_entry	no	yes					does not work and defective graphic
	shunt_ exit	no	yes					does not work and defective graphic

Appendix B – List of Signal Files

The information contained in the table below shows how the various files are interlinked for a signal. This information has been sourced from the signal model *.bin files.

Signal Name	Bin file[3]	Script file[4]	Post File[5]	Arm files[6]	No. of links	Remarks
B_Lattice CombSig-hd 1T	B_Lattice CombSig-hd 1T	Sem_Comb_hd	[00]pt_lat_comb01	Uq_Arm_home01 Uq_Arm_dist01	2	
B_Lattice CombSig-hd 2T	B_Lattice CombSig-hd 2T	Sem_Comb_hd	[00]pt_lat_comb01	Uq_Arm_home01 Uq_Arm_dist01	3	
B_Lattice CombSig-hd	B_Lattice CombSig-hd	Sem_Comb_hd	[00]pt_lat_comb01	Uq_Arm_home01 Uq_Arm_dist01	1	
B_Lattice CombSig-hh 7T 3E1	B_Lattice CombSig-hh 7T 3E1	Sem_DvgeRte_hh 3E1	[00]pt_lat_comb01	Uq_Arm_home01 Uq_Arm_home02	8	
B_Lattice CombSig-hh	B_Lattice CombSig-hh	Sem_DvgeRte_hh	[00]pt_lat_comb01	Uq_Arm_home01 Uq_Arm_home02	3	
B_Lattice JuncSig L1_hh	B_Lattice JuncSig L1_hh	Sem_DvgeRte_hh	[00]pt_lat_Split_L01	Uq_Arm_home01 Uq_Arm_home02	3	
B_Lattice JuncSig L2_dd	B_Lattice JuncSig L2_dd	Sem_DvgeRte_dd	[00]pt_lat_Split_L02	Uq_Arm_dist01 Uq_Arm_dist02	1	
B_Lattice JuncSig L2_hh	B_Lattice JuncSig L2_hh	Sem_DvgeRte_hh	[00]pt_lat_Split_L02	Uq_Arm_home01 Uq_Arm_home02	3	
B_Lattice JuncSig R1_hh 2T 1E	B_Lattice JuncSig R1_hh 2T 1E	Sem_DvgeRte_hh 1E	[00]pt_lat_Split_R01	Uq_Arm_home01 Uq_Arm_home02	3	
B_Lattice JuncSig R1_hh 7T	B_Lattice JuncSig R1_hh 7T	Sem_DvgeRte_hh	[00]pt_lat_Split_R01	Uq_Arm_home01 Uq_Arm_home02	8	
B_Lattice JuncSig R1_hh	B_Lattice JuncSig R1_hh 2	Sem_DvgeRte_hh	[00]pt_lat_Split_R01	Uq_Arm_home01 Uq_Arm_home02	3	
B_Lattice JuncSig R2_dd	B_Lattice JuncSig R2_dd	Sem_DvgeRte_dd	[00]pt_lat_Split_R02	Uq_Arm_dist01 Uq_Arm_dist02	1	
B_Lattice JuncSig R2_hd	B_Lattice JuncSig R2_hd	Sem_Comb_hd	[00]pt_lat_Split_R02	Uq_Arm_dist01 Uq_Arm_home01	3	

[3] These files are found in C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore\... \Lattice Posts Or \Wooden Posts and have a *.bin suffix.
[4] These files are found in C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore with *.lua suffix
[5] These files are found in C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\ UK Semaphore\Lattice Posts or \Wooden Posts and have *.GeoPcDx suffix
[6] These files are found in C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore\UpQuad_Arms and have a *.bin suffix

Signal Name	Bin file[3]	Script file[4]	Post File[5]	Arm files[6]	No. of links	Remarks
B_Lattice JuncSig T_hd	B_Lattice JuncSig T_hd	Sem_Comb_hd	[00]pt_lat_Twin01	Uq_Arm_home01 Uq_Arm_dist01	3	
B_Lattice JuncSig T_hh	B_Lattice JuncSig T_hh	Sem_DvgeRte_hh	[00]pt_lat_Split_R01	Uq_Arm_home01 Uq_Arm_home02	3	
B_Lattice JuncSig X_h	B_Lattice JuncSig X_h	Sem_HomeSig	[00]pt_lat_Single01	Uq_Arm_home01	2	
B_Lattice Sig_d	B_Lattice Sig_d	Sem_DistantSig	[00]pt_lat_Single01	Uq_Arm_dist01	1	
B_Lattice Sig_h 1T	B_Lattice Sig_h 1T	Sem_HomeSig	[00]pt_lat_Single01	Uq_Arm_home01	2	
B_Lattice Sig_h 2T	B_Lattice Sig_h 2T	Sem_HomeSig	[00]pt_lat_Single01	Uq_Arm_home01	3	
B_Lattice Sig_h 2T 1E	B_Lattice Sig_h 3T 1E[7]	Sem_HomeSig_1E	[00]pt_lat_Single01	Uq_Arm_home01	3	
B_Lattice Sig_h 3T 2E	B_Lattice Sig_h 3T 2E	Sem_HomeSig_2E	[00]pt_lat_Single01	Uq_Arm_home01	4	
B_Lattice Sig_h 3T	B_Lattice Sig_h 3T	Sem_HomeSig	[00]pt_lat_Single01	Uq_Arm_home01	4	
B_Lattice Sig_h 4T	B_Lattice Sig_h 4T	Sem_HomeSig	[00]pt_lat_Single01	Uq_Arm_home01	5	
B_Lattice Sig_h 5T 1E	B_Lattice Sig_h 5T 1E	Sem_HomeSig_1E	[00]pt_lat_Single01	Uq_Arm_home01	6	
B_Lattice Sig_h 6T 2E	B_Lattice Sig_h 6T 2E	Sem_HomeSig_2E	[00]pt_lat_Single01	Uq_Arm_home01	7	
B_Lattice Sig_h 7T	B_Lattice Sig_h 7T	Sem_HomeSig	[00]pt_lat_Single01	Uq_Arm_home01	8	
B_Lattice Sig_h 8T	B_Lattice Sig_h 8T	Sem_HomeSig	[00]pt_lat_Single01	Uq_Arm_home01	9	
B_Lattice Sig_h	B_Lattice Sig_h	Sem_HomeSig	[00]pt_lat_Single01	Uq_Arm_home01	1	
B_Wooden CombSig_hd 1T	B_Wooden CombSig_hd 1T	Sem_Comb_hd	[00]pt_wd_Combo01	Uq_Arm_home01 Uq_Arm_dist01	2	
B_Wooden CombSig_hd	B_Wooden CombSig_hd	Sem_Comb_hd	[00]pt_wd_Combo01	Uq_Arm_home01 Uq_Arm_dist01	1	
B_Wooden CombSig_hh 2T 2E	B_Wooden CombSig_hh 2T 2E	Sem_DvgeRte_hh 2E	[00]pt_wd_Combo01	Uq_Arm_home01 Uq_Arm_home02	3	
B_Wooden CombSig_hh	B_Wooden CombSig_hh	Sem_DvgeRte_hh	[00]pt_wd_Combo01	Uq_Arm_home01 Uq_Arm_home02	3	
B_Wooden JuncSig L1_hh 2T 1E	B_Wooden JuncSig L1_hh 2T 1E	Sem_DvgeRte_hh 1E	[00]pt_wd_Split L01	Uq_Arm_home01 Uq_Arm_home02	3	
B_Wooden JuncSig L1 Special 1	B_Wooden JuncSig L1 Special 1	Sem_DvgeRte_hh Special 1	[00]pt_wd_Split L01	Uq_Arm_home01 Uq_Arm_home02	4	
B_Wooden JuncSig L1_hh	B_Wooden JuncSig L1_hh	Sem_DvgeRte_hh	[00]pt_wd_Split L01	Uq_Arm_home01 Uq_Arm_home02	3	
B_Wooden JuncSig L2_dd	B_Wooden JuncSig L2_dd	Sem_DvgeRte_dd	[00]pt_wd_Split L02	Uq_Arm_dist01 Uq_Arm_dist02	1	
B_Wooden JuncSig L2_hh	B_Wooden JuncSig L2_hh	Sem_DvgeRte_hh	[00]pt_wd_Split L02	Uq_Arm_home01 Uq_Arm_home02	3	
B_Wooden JuncSig R1_hh	B_Wooden JuncSig R1_hh	Sem_DvgeRte_hh	[00]pt_wd_Split R01	Uq_Arm_home01 Uq_Arm_home02	3	

[7] Note: difference between signal name and *.bin file name.

Signal Name	Bin file[3]	Script file[4]	Post File[5]	Arm files[6]	No. of links	Remarks
B_Wooden JuncSig R2_dd	B_Wooden JuncSig R2_dd	Sem_DvgeRte_dd	[00]pt_wd_Split R02	Uq_Arm_dist01 Uq_Arm_dist02	1	
B_Wooden JuncSig R2_hd	B_Wooden JuncSig R2_hd	Sem_CombSig_hd	[00]pt_wd_Split R02	Uq_Arm_dist01 Uq_Arm_home01	3	
B_Wooden JuncSig T_hd	B_Wooden JuncSig T_hd	Sem_CombSig_hd	[00]pt_wd_Split Twin01	Uq_Arm_home01 Uq_Arm_dist01	3	
B_Wooden JuncSig T_hh	B_Wooden JuncSig T_hh	Sem_DvgeRte_hh	[00]pt_wd_Split Twin01	Uq_Arm_home01 Uq_Arm_home02	3	
B_Wooden JuncSig X_h	B_Wooden JuncSig X_h	Sem_HomeSig	[00]pt_wd_Single01	Uq_Arm_home01	2	
B_Wooden Shunt Entry	B_Wooden Shunt Entry	Sem_Shunt_Entry	[00]pt_wd_Single01	Uq_Arm_home01	2	
B_Wooden Shunt Exit	B_Wooden Shunt Exit	Sem_Shunt_Exit	[00]pt_wd_Single01	Uq_Arm_home01	2	
B_Wooden Sig_d	B_Wooden Sig_d	Sem_DistantSig	[00]pt_wd_Single01	Uq_Arm_dist01	1	
B_Wooden Sig_h 1T	B_Wooden Sig_h 1T	Sem_HomeSig	[00]pt_wd_Single01	Uq_Arm_home01	2	
B_Wooden Sig_h 2T 1E	B_Wooden Sig_h 2T 1E	Sem_HomeSig 1E	[00]pt_wd_Single01	Uq_Arm_home01	3	
B_Wooden Sig_h Special 1	B_Wooden Sig_h Special 1	Sem_HomeSig Special 1	[00]pt_wd_Single01	Uq_Arm_home01	3	
B_Wooden Sig_h Special 2	B_Wooden Sig_h Special 2	Sem_ HomeSig Special 2	[00]pt_wd_Single01	Uq_Arm_home01	4	
B_Wooden Sig_h Special 3	B_Wooden Sig_h Special 3	Sem_HomeSig Special 3	[00]pt_wd_Single01	Uq_Arm_home01	5	
B_Wooden Sig_h	B_Wooden Sig_h	Sem_ HomeSig	[00]pt_wd_Single01	Uq_Arm_home01	1	

Shunt Signals

Signal Name	Bin file[8]	Script file[9]	Post File[10]	Arm files[11]	No. of links	Remarks
B_Shunt Signal Entry Mainline	B_Shunt Signal Entry Mainline	Sem_Shunt_Entry_Mainline	[00]pt_shunt	pt_shunt_ToGo pt_shunt_ToStop	3	
B_Shunt Signal Entry	B_Shunt Signal Entry	Sem_Shunt_Entry	[00]pt_shunt	pt_shunt_ToGo pt_shunt_ToStop	3	
B_Shunt Signal Exit	B_Shunt Signal Exit Mainline	Sem_Shunt_Exit_Mainline	[00]pt_shunt	pt_shunt_ToGo	2	

[8] These files are found in C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore\Sem_Shunt and have a *.bin suffix
[9] These files are found in C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore with *.lua suffix
[10] These files are found in C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\ UK Semaphore\Sem_Shunt and have *.GeoPcDx suffix
[11] These files are found in C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore\ Sem_Shunt and have a *.ban suffix

Signal Name	Bin file[8]	Script file[9]	Post File[10]	Arm files[11]	No. of links	Remarks
Mainline				pt_shunt_ToStop		
B_Shunt Signal Exit	B_Shunt Signal Exit	Sem_Shunt_Exit	[00]pt_shunt	pt_shunt_ToGo pt_shunt_ToStop	2	

Appendix B – List of Signal Control Files

The lua files are normally referred to as the signal script files and control how the individual arms operate and the signals interact with each other.
The bin files are the xml files converted for Rail Simulator and contain the signal type design specific information (e.g. number and type of arms, position etc.).
The pcdx files would appear to be some sort of graphic file specifically for Rail Simulator.
The ban files would appear to be the animation control files.
Below is a list of principle signalling files and where they can be found with the default Rail Simulator set-up

C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore
Sem_Comb_hd.lua
Sem_DistantSig.lua
Sem_DvgeRte_dd.lua
Sem_DvgeRte_hh 1E.lua
Sem_DvgeRte_hh 2E.lua
Sem_DvgeRte_hh 3E1.lua
Sem_DvgeRte_hh Special 1.lua
Sem_DvgeRte_hh.lua
Sem_HomeSig 1E.lua
Sem_HomeSig 2E.lua
Sem_HomeSig Special 1.lua
Sem_HomeSig Special 2.lua
Sem_HomeSig Special 3.lua
Sem_HomeSig.lua
Sem_Shunt_Entry.lua
Sem_Shunt_Entry_Mainline.lua
Sem_Shunt_Exit.lua
Sem_Shunt_Exit_Mainline.lua

C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore\Lattice_Posts
B Lattice CombSig_hd 1T.bin
B Lattice CombSig_hd 2T.bin
B Lattice CombSig_hd.bin
B Lattice CombSig_hh 7T 3E1.bin
B Lattice CombSig_hh.bin
B Lattice JuncSig L1_hh.bin
B Lattice JuncSig L2_dd.bin
B Lattice JuncSig L2_hh.bin
B Lattice JuncSig R1_hh 2T 1E.bin
B Lattice JuncSig R1_hh 7T.bin
B Lattice JuncSig R1_hh.bin
B Lattice JuncSig R2_dd.bin
B Lattice JuncSig R2_hd.bin
B LAttice JuncSig T_hd.bin
B Lattice JuncSig T_hh.bin
B Lattice JuncSig X_h.bin
B Lattice Sig_d.bin
B Lattice Sig_h 1T.bin
B Lattice Sig_h 2T.bin
B Lattice Sig_h 3T 1E.bin
B Lattice Sig_h 3T 2E.bin
B Lattice Sig_h 3T.bin
B Lattice Sig_h 4T.bin
B Lattice Sig_h 5T 1E.bin
B Lattice Sig_h 6T 2E.bin
B Lattice Sig_h 7T.bin
B Lattice Sig_h 8T.bin

B Lattice Sig_h.bin
pt_lat_Comb01.GeoPcDx
pt_lat_Single01.GeoPcDx
pt_lat_Split_L01.GeoPcDx
pt_lat_Split_L02.GeoPcDx
pt_lat_Split_R01.GeoPcDx
pt_lat_Split_R02.GeoPcDx
pt_lat_Twin01.GeoPcDx

C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore\UpQuad_Arms
UqArm_dist01.bin
UqArm_dist02.bin
UqArm_dist.bin
UqArm_home01.bin
UqArm_home02.bin
UqArm_home.bin
uqArm_anim_clr.ban
uqArm_anim_stp.ban
UqArm_dist.GeoPcDx
UqArm_home.GeoPcDx

C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore\Wooden_Posts
B Wooden CombSig_hd 1T.bin
B Wooden CombSig_hd.bin
B Wooden CombSig_hh 2T 2E.bin
B Wooden CombSig_hh.bin
B Wooden JuncSig L1_hh 2T 1E.bin
B Wooden JuncSig L1_hh Special 1.bin
B Wooden JuncSig L1_hh.bin
B Wooden JuncSig L2_dd.bin
B Wooden JuncSig L2_hh.bin
B Wooden JuncSig R1_hh.bin
B Wooden JuncSig R2_dd.bin
B Wooden JuncSig R2_hd.bin
B Wooden JuncSig T_hd.bin
B Wooden JuncSig T_hh.bin
B Wooden JuncSig X_h.bin
B Wooden Shunt Entry.bin
B Wooden Shunt Exit.bin
B Wooden Sig_d.bin
B Wooden Sig_h 1T.bin
B Wooden Sig_h 2T 1E.bin
B Wooden Sig_h Special 1.bin
B Wooden Sig_h Special 2.bin
B Wooden Sig_h Special 3.bin
B Wooden Sig_h.bin
pt_wd_Comb01.GeoPcDx
pt_wd_single01.GeoPcDx
pt_wd_Split_L01.GeoPcDx
pt_wd_Split_L02.GeoPcDx
pt_wd_Split_R01.GeoPcDx
pt_wd_Split_R02.GeoPcDx
pt_wd_Twin01.GeoPcDx

C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore\Sem_Shunt
B Shunt Signal Entry Mainline.bin
B Shunt Signal Entry.bin

B Shunt Signal Exit Mainline.bin
B Shunt Signal Exit.bin
pt_shunt.GeoPcDx
pt_shunt_ToGo.ban
pt_shunt_ToStop.ban

C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\signals\UK Semaphore\CommonScripts
Common UK Semaphore Script.lua
Common UK Semaphore Yard Entry Script.lua

C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\Speedsigns Textures
Bath_Temp_Single_Value_Speed_Sign.bin
Bath_Temp_Single_Value_Speed_Sign.GeoPcDx
Bath_Temp_Single_Value_Speed_Sign_Left.bin
Bath_Temp_Single_Value_Speed_Sign_Right.bin
Bath_Temp_Whistle_Sign.bin
Bath_Temp_Whistle_Sign.GeoPcDx
Oxfo_Padd_Arrow_Speed_L.bin
Oxfo_Padd_Arrow_Speed_L.GeoPcDx
Oxfo_Padd_Arrow_Speed_LR.bin
Oxfo_Padd_Arrow_Speed_LR.GeoPcDx
Oxfo_Padd_Arrow_Speed_R.bin
Oxfo_Padd_Arrow_Speed_R.GeoPcDx
Oxfo_Padd_Arrow_Warn_L.bin
Oxfo_Padd_Arrow_Warn_L.GeoPcDx
Oxfo_Padd_Arrow_Warn_LR.bin
Oxfo_Padd_Arrow_Warn_LR.GeoPcDx
Oxfo_Padd_Arrow_Warn_R.bin
Oxfo_Padd_Arrow_Warn_R.GeoPcDx
Oxfo_Padd_Double_Value_Speed_Sign.bin
Oxfo_Padd_Double_Value_Speed_Sign.GeoPcDx
Oxfo_Padd_Double_Value_Speed_Warn_Sign.bin
Oxfo_Padd_Double_Value_Speed_Warn_Sign.GeoPcDx
Oxfo_Padd_Single_Value_Speed_Sign.bin
Oxfo_Padd_Single_Value_Speed_Sign.GeoPcDx
Oxfo_Padd_Single_Value_Speed_Sign_Both.bin
oxfo_Padd_Single_Value_Speed_Sign_Left.bin
Oxfo_Padd_Single_Value_Speed_Sign_Right.bin
Oxfo_Padd_Single_Value_Speed_Warn_Both.bin
Oxfo_Padd_Single_Value_Speed_Warn_Left.bin
Oxfo_Padd_Single_Value_Speed_Warn_Right.bin
Oxfo_Padd_Single_Value_Speed_Warn_Sign.bin
Oxfo_Padd_Single_Value_Speed_Warn_Sign.GeoPcDx
Oxfo_Padd_Whistle_Sign.bin
Oxfo_Padd_Whistle_Sign.GeoPcDx
York_Newc_Arrow_Speed_L.bin
York_Newc_Arrow_Speed_L.GeoPcDx
York_Newc_Arrow_Speed_R.bin
York_Newc_Arrow_Speed_R.GeoPcDx
York_Newc_Single_Value_Speed_Sign.bin
York_Newc_Single_Value_Speed_Sign_Left.bin
York_Newc_Single_Value_Speed_Sign_Right.bin
York_Newc_Single_Value_Speed_Warn_Left.bin
York_Newc_Single_Value_Speed_Warn_Right.bin
York_Newc_Single_Value_Speed_Warn_Sign.bin
York_Newc_Single_Value_Speed_Warn_Sign.GeoPcDx

C:\Program Files\Rail Simulator\Assets\Kuju\RailSimulator\RailNetwork\Mileposts
textures
Bath_Temp_Milepost01.bin
Bath_Temp_Milepost01.GeoPcDx
oxfo_padd_milepost02.bin
oxfo_padd_milepost02.GeoPcDx
York_Newc_milepost01.bin
York_Newc_milepost01.GeoPcDx