Timetable Tutorials Rev 2

Timetables represent one of the most complex aspects of the railway simulator so hopefully by working through these examples the way in which timetables work will become clearer.

This document is not intended to replace the user manual, which contains much more complete timetable information, but as a supplement to it. For more detailed information the manual should be consulted.

The associated railways should be saved in your 'Railways' folder, but it is suggested that the timetables be created manually rather than just using them from the folder because this is likely to give a much better feel for how the timetable editor is used. If you encounter problems that you are unable to solve then comparison with the saved timetables should help as a last

resort.

The tutorials work up from simple timetables to more complex ones, and all the main features are described.

Be aware that when error messages are given during attempts to validate the timetable they can often be difficult to interpret. This is because an error

in the timetable will cause a problem that the validator can't resolve, and the message given relates to the problem seen by the validator (because that's all that it sees), and that may well not clearly identify the error that caused it. Therefore when an error message is given it tells you that there is an error present, but the message itself should be regarded as a hint as to what the error may be, and the service reference given tells you that it involves either that service directly or one that is linked to it.

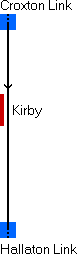
## Tutorial 1

# Enter and exit

A moving train enters the railway at Croxton Link at 06:00, travelling at a constant speed of 120km/h and leaves at Hallaton Link at 06:01.

Service data is as follows:- Headcode: 1A20, description: Croxton to Hallaton, starting speed: 120km/h, maximum speed: 120km/h, mass: 250 tonnes, braking force: 25 tonnes, power: 2500kW.

*In the tables text in italics represents buttons to click, keys to press, or text to type into the timetable editor*



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| --- | --- |
| Open *railway.exe* and load *Crox-Hall.rly* | Start the program and load the first railway |
| Click *Mode* then *Create a timetable* | This brings up the timetable screen |
| Click *Insert new entry* |  |
| Type *06:00* then Click *Save entry* | This is the timetable start time |
| Click *Insert new entry* |  |
| Type *\*Train 1A20 enters at 06:00 and leaves at 06:01 at constant speed of 120km/h* then Click *Save entry* | This is a comment and will be ignored by the timetable.  Comments must begin with an asterisk and can be placed anywhere in the timetable or omitted altogether. |
| Click *Insert new entry* |  |
| Type *1A20;Croxton to Hallaton;120;120;250;25;2500*  then *Enter* | This is the service data as above, in the same order. Remember to include semicolons between each piece of data and avoid using spaces except in the description |
| Type *06:00;Snt;3-4 3-5* then *Enter* | This is the command to create a new train. The creation time is given, followed by code 'Snt' (represents 'start new train'), followed by the track element identifiers (IDs) corresponding to the rear track element (3-4) then a space and then the front track element (3-5). To find element identifiers while compiling the timetable click *Save entry*, then *HIDE* to hide the timetable screen*,* then click *Information, Track information, Show*, and hover the mouse over the elements required and the IDs will be given. Then click *SHOW* and the timetable  screen will reappear. |
| Type *06:01;Fer;3-17* then *Enter* | This is the command to exit the railway. The exit time is given,  followed by 'Fer' (represents 'Finish exit railway'), and the track element |

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|  | ID(s) of valid exit point(s). Here there is just one valid exit but if there are more then they can all be  listed, separated by spaces. |
| Click *Save entry* |  |
| Click *Save timetable* |  |
| Name it *Crox-Hall 1.ttb* then click *Save* |  |
| Click *Validate timetable* | This should give the message *Timetable integrity OK.* If not the error message should show where the error is - probably something  mistyped. |

Note that in order to save typing and avoid typing errors there are code buttons in the editor (labelled ;*Snt;, ;Sfs;* etc - note that usinf these buttons also inserts the semicolons) and a dropdown box containing railway locations that can be used as stopping places (providing the railway has been loaded first), and these can be clicked and the relevant text will be inserted at the cursor position. For this railway the only location in the box is Kirby because that is the only location where trains can stop.

Note also that it is advisable to click *Save entry* periodically while compiling the timetable to avoid loss of a lot of information if the computer goes off for any reason, and it is also necessary before the timetable screen can be hidden to find track element IDs.

Train data can be displayed during operation by clicking *Information*, then *Train information,* then *Show status*, and hovering the mouse over the train. Hovering the mouse over a continuation (entry or exit link) shows the next expected train if there is one.

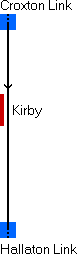
If the starting speed had been set to zero instead of 120km/h then the train would immediately begin to accelerate and therefore enter slightly later. It would continue to accelerate up to the maximum speed of 120km/h because there are no lower line speed restrictions and no stopping places - try it by editing and resaving the timetable and see how it affects train behaviour.

## Tutorial 1a

# Enter, exit and repeat

This is similar to tutorial 1 except that some new features are included - a 'Pass' time is included for Kirby, and a command is given to repeat the service every minute

Service data is as before



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| Open *railway.exe* and load *Crox-Hall.rly* | Load railway |
| Click *Mode* then *Create a timetable* | As for Tutorial 1 |
| Click *Insert new entry* | - - - " - - - |
| Type *06:00* then Click *Save entry* | - - - " - - - |
| Click *Insert new entry* | - - - " - - - |
| Type *\*Train 1A20 enters at 06:00 and leaves at 06:01 at constant speed of 120km/h, followed by a total of 20 repeating trains at 1 minute intervals, with headcodes that increase by one digit at each repeat.* then Click *Save*  *entry* | Comment |
| Click *Insert new entry* | As for tutorial 1 |
| Type *1A20;*Croxton to Hallaton*;120;120;250;25;2500*  then *Enter* | - - - " - - - |
| Type *06:00;Snt;3-4 3-5* then *Enter* | Start command |
| Type *06:00;pas;Kirby* then *Enter* | This is the 'Pass' command. No action is taken by the timetable other than to record the passing time in the performance log |
| Type *06:01;Fer;3-17* | As for tutorial 1 |
| Type *R;1;1;20* then *Enter* | This is the 'repeat service' command. The 'R' identifies it as a repeat command, the first '1' is for 1 minute between each repeat (the minimum is 1 minute), the next '1' is the number by which the headcode is to be incremented for each repeat (this may be 0 if the same headcode is to be used), and 20 is for a total of 20 repeats, i.e. 21 trains in all including the first one.  The general form of this command is 'R;mins;digits;repeats', and it must be the last command in the list. |
| Click *Save entry* |  |
| Click *Save timetable* |  |
| Name it *Crox-Hall 2.ttb* then click *Save* |  |
| Click *Validate timetable* | As before |

Repeats are ideal as here when trains exit the railway, because then there is no interference with existing trains (unless they have been delayed and are still present and in the way when later ones appear). If trains don't exit the railway then repeats will still

work, but the number of trains on the railway will increase as time goes on and may well interfere with the new trains that are created or enter.

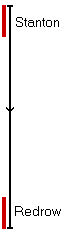
Hopefully this example shows how easy it is to create repeating services - it can save a very great deal of time during timetable creation!

## Tutorial 2

# Point to point

A stopped train 1A30 is created at 06:00 at Stanton station, leaves at 06:01 and travels to Redrow, arriving at 06:02.

Service data:- Headcode: 1A30, description: Stanton to Redrow, starting speed: 0km/h, maximum speed: 120km/h, mass: 250 tonnes, braking force: 25 tonnes, power: 2500kW.



|  |  |
| --- | --- |
| Open *railway.exe* and load *Stan-Red.rly* | Load the railway |
| Click *Mode* then *Create a timetable* |  |
| Click *Insert new entry* |  |
| Type *06:00* then Click *Save entry* | This is the timetable start time |
| Click *Insert new entry* |  |
| Type *\*Train 1A30 created at Stanton at 06:00 and leaves for Redrow at 06:01. The train*  *terminates at Redrow.* then Click *Save entry* | Comment |
| Click *Insert new entry* |  |
| Type *1A30;Stanton to Redrow;0;120;250;25;2500*  then *Enter* | Service data. Note that the starting speed is zero in this case. |
| Type *06:00;Snt;3-4 3-5* then *Enter* | This is the command to create a new train. Note that it is identical to tutorial 1, but because the track ends in a buffer rather than a continuation the program knows that the train must appear on screen immediately, and because the starting speed is zero and the departure time is later than the creation time the program knows  not to allow the train to move. |
| Type *06:01;Stanton,* then E*nter* | This is the departure from Stanton. The program knows it represents a departure because the train is already stopped at Stanton. Watch during operation as the time approaches 06:01. At 10 seconds prior to departure the train background colour changes from light green to pink, indicating 'train ready to depart', and at 06:01 the colour changes to light grey indicating a moving train, and the train status display (if selected) will show the acceleration when the  mouse hovers over the train. |
| Type *06:02;Redrow,* then *Enter* | This is the arrival at Redrow. The program knows it represents an arrival because after it has executed the earlier departure command it knows that the train is  moving and that therefore the next |

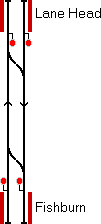
|  |  |
| --- | --- |
|  | action must be an arrival. |
| Type *Frh* then *Enter* | This is the simplest command, representing 'Finish remain here'. The train will remain here indefinitely when this command is  executed. |
| Click *Save entry* |  |
| Click *Save timetable* |  |
| Name it *Stan-Red.ttb* then click *Save* |  |
| Click *Validate timetable* | As before |

Note that for this railway the dropdown box shows two locations because both can be (and are) used as stopping places.

## Tutorial 3

# Point to point, reverse and return to starting location

A stopped train 1A40 is created at 06:00 at Lane Head station, leaves at 06:01 and travels to Fishburn, arriving at 06:02. There it changes direction at 06:03, and at 06:04 departs to return to Lane Head, arriving 06:05 where it remains.

Service data:- Headcode: 1A40, description: Lane head to Fishburn and back, starting speed: 0km/h, maximum speed: 120km/h, mass: 250 tonnes, braking force: 25 tonnes, power: 2500kW.

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| --- | --- |
| Open *railway.exe* and load *Lane-Fish.rly* | Load railway |
| Click *Mode* then *Create a timetable* |  |
| Click *Insert new entry* |  |
| Type *06:00* then Click *Save entry* | Timetable start time. |
| Click *Insert new entry* |  |
| Type *\*Train 1A40 leaves Lane Head at 06:00 for Fishburn, where it changes direction then returns to Lane Head where*  *it terminates.* then Click *Save entry* | Comment |
| Click *Insert new entry* |  |
| Type *1A40;Lane Head to Fishburn and back;0;120;250;25;2500*  then *Enter* | Service data. |
| Type *06:00;Snt;4-4 4-5* then *Enter* | Start command |
| Type *06:01;Lane Head* then E*nter* | Departure from Lane Head |
| Type *06:02;Fishburn* then *Enter* | Arrival at Fishburn |
| Type *06:03;cdt* then *Enter* | This is the 'change direction' command. |
| Type *06:04;Fishburn* then *Enter* | Fishburn departure |
| Type *06:05;Lane Head* then *Enter* | Lane head arrival |
| Type *Frh* then *Enter* | Finish remain here |
| Click *Save entry* |  |
| Click *Save timetable* |  |
| Name it *Lane-Fish 1.ttb* then click *Save* |  |
| Click *Validate timetable* | As before |

Here the track is more complex. Signals are required and routes need to be set during operation, but note that the timetable has no interest in signals or routes. All it insists on is that the locations used are valid stopping points. It doesn't even care whether or not it is possible to get from Stanton to Redrow, or whether the times are realistic, though successive events must be at the same or later times, a timetable will complain if a train tries to arrive at the next station before it departs from this one!

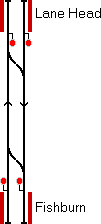
**Tutorial 4**

# Point to point, reverse, change to a new service, then return to starting location

A stopped train 1A50 is created at 06:00 at Lane Head station, leaves at 06:01 and travels to Fishburn, arriving at 06:02. There it changes direction at 06:03, and at 06:04 becomes new service 1A51, which departs at 06:05 to return to Lane Head, arriving 06:06 where it remains.

Outward service data is as follows:- Headcode: 1A50, description: Lane Head to Fishburn, starting speed 0km/h, maximum speed: 120km/h, mass: 250 tonnes, braking force: 25 tonnes, power: 2500kW.

Inward service data is as follows:- Headcode: 1A51, description: Fishburn to Lane Head (no other data is required)



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| Open *railway.exe* and load *Lane-Fish.rly* | Load railway |
| Click *Mode* then *Create a timetable* |  |
| Click *Insert new entry* |  |
| Type *06:00* then Click *Save entry* | Timetable start time. |
| Click *Insert new entry* |  |
| Type *\*Train 1A50 leaves Lane Head at 06:00 for Fishburn, where it changes direction and forms a new service 1A51, which returns to Lane Head and terminates.* then Click *Save*  *entry* | Comment |
| Click *Insert new entry* |  |
| Type *1A50;Lane Head to Fishburn;0;120;250;25;2500*  then *Enter* | Service data. |
| Type *06:00;Snt;4-4 4-5* then *Enter* | Start command |
| Type *06:01;Lane Head* then *Enter* | Departure from Lane Head |
| Type *06:02;Fishburn* then *Enter* | Arrival at Fishburn |
| Type *06:03;cdt* then *Enter* | Change direction |
| Type *06:04;Fns;1A51* then *Enter* | This is the command to finish and hand over to a new service, in this case 1A51 (Fns represents 'Finish new service'). The new service 1A51 must have its own entry in the timetable and begin at the same  time as this one finishes, i.e. 06:04. |
| Click *Save entry* |  |
| Click *Insert new entry* |  |
| Type *1A51;Fishburn to Lane Head* then *Enter* | This is the new service that carries on from 1A50. Since this is a new service the Service data is not repeated because it is the same as before. A new description can be given, as here, but this too can be omitted if required in which case  the earlier description will be |

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|  | displayed in the train's status  information during operation. |
| Type *06:04;Sns;1A50* then *Enter* | This is the starting command - 'Sns' represents 'Start new service'.  Note that the start time must be 06:04 to correspond to the finish time of the earlier linking service. The headcode of the earlier service 1A50 is also necessary so that the timetable knows which service to link back to. |
| Type *06:05;Fishburn* then *Enter* | Fishburn departure |
| Type *06:06;Lane Head* then *Enter* | Lane Head arrival |
| Type *Frh* then *Enter* | Finish remain here |
| Click *Save entry* |  |
| Click *Save timetable* |  |
| Name it *Lane-Fish 2.ttb* then click *Save* |  |
| Click *Validate timetable* | As before |

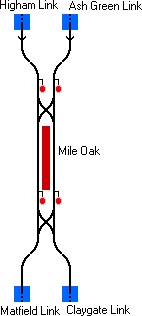
This is slightly more complex and shows how to make a service change with a new headcode.

## Tutorial 5

# Two separate trains enter and then join

Two trains, 1A60 and 1A62 enter from Higham and Ash Green respectively, one minute apart, and meet at Mile Oak where 1A62 joins 1A60 at 06:03. 1A60 then continues on to Claygate.

Data for first service:- Headcode: 1A60, description: Higham to Claygate; starting speed: 120km/h, maximum speed: 120km/h, mass: 250 tonnes, braking force: 25 tonnes, power: 2500kW.

Data for second service:- Headcode: 1A62, description: Ash Green to Claygate; starting speed: 120km/h, maximum speed: 120km/h, mass: 250 tonnes, braking force: 25 tonnes, power: 2500kW.

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| Open *railway.exe* and load *Mile Oak.rly* | Load railway |
| Click *Mode* then *Create a timetable* |  |
| Click *Insert new entry* |  |
| Type *06:00* then Click *Save entry* | Timetable start time. |
| Click *Insert new entry* |  |
| Type *\*Separate trains enter from Higham and Ash Green, join at Mile Oak, then continue on*  *to Claygate.* | Comment |
| Click *Insert new entry* |  |
| Type *1A60;Higham to Claygate;120;120;250;25;2500*  then *Enter* | First service data. |
| Type *06:00;Snt;1-2 1-3* then *Enter* | Start command |
| Type *06:01;Mile Oak* then *Enter* | Arrival at Mile Oak |
| Type *06:03;jbo;1A62* then *Enter* | This is the 'joined by other train' command. This train is joined by another train whose headcode is 1A62 and then continues on. The other train finishes when it joins this one. |
| Type *06:04;Mile Oak* then *Enter* | Depart from Mile Oak |
| Type *06:05;Fer;4-19* then *Enter* | Exit railway at 06:05 |
| Click *Save entry* |  |
| Click *Insert new entry* |  |
| Type *1A62;Ash Green to Claygate;120;120;250;25;2500* then *Enter* | This is the other service that enters one minute later than the first |
| Type *06:01;Snt;4-2 4-3* then *Enter* | This train enters at the Ash Green  Link |
| Type *06:02;Mile Oak* then *Enter* | Arrival at Mile Oak - remember during operation to bring it into the same platform as the first, they have to be touching to join!  Normally a call-on will be required to allow a joining train to join another train, but remember to set the points correctly for the second |

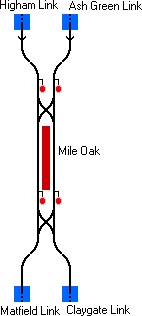
|  |  |
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|  | train to enter the same platform as the first or the call-on won't be  offered. |
| Type *06:03;Fjo;1A60* then *Enter* | The 'Finish join other train' command. The join time must be the same as the 'jbo' command for the train that is to be joined, and that train's headcode must be given  - 1A60 |
| Click *Save entry* |  |
| Click *Save timetable* |  |
| Name it *Mile Oak 1.ttb* then click *Save* |  |
| Click *Validate timetable* | As before |

**Tutorial 6**

# A trains splits from the rear, and the two trains continue to separate destinations. A warning is given when the train enters.

Train 1A70 enters from Higham, splits from the rear at Mile Oak forming a new service 1A72. 1A70 continues to Matfield and 1A72 continues to Claygate.

Service data for the train that splits:- Headcode: 1A70, description Higham to Matfield and Claygate; starting speed: 120km/h, maximum speed: 120km/h, mass: 250 tonnes, braking force: 25 tonnes, power: 2500kW.

Data for train that splits from the first:- Headcode: 1A72, description: Higham to Claygate (no other data is required)

|  |  |
| --- | --- |
| Open *railway.exe* and load *Mile Oak.rly* | Load railway |
| Click *Mode* then *Create a timetable* |  |
| Click *Insert new entry* |  |
| Type *06:00* then Click *Save entry* | Timetable start time. |
| Click *Insert new entry* |  |
| Type *\*Train 1A70 enters from Higham, splits from the rear at Mile Oak forming a new*  *service 1A72. 1A70 continues to Matfield and 1A72 continues to Claygate.* | Comment |
| Click *Insert new entry* |  |
| Type *1A70;Higham to Matfield and Claygate;120;120;250;25;2500*  then *Enter* | First service data. |
| Type W*06:00;Snt;1-2 1-3* then *Enter* | Start command including a warning. Any service event (except 'Frh' and 'Fjo') may be preceded by 'W' to represent a warning, and when the service reaches this point during operation a message is given in red at the top of the display area. Warnings are useful for example to indicate when a route will need to be set in the near future, say when a train is approaching a junction at the end  of a route controlled by automatic signals. |
| Type *06:01;Mile Oak* then *Enter* | Arrival at Mile Oak |
| Type *06:01;rsp;1A72* then *Enter* | This is the 'rear split' command. The train splits at 06:01, creating a new train at the rear, whose  headcode is 1A72. |
| Type *06:02;Mile Oak* then *Enter* | 1A70 departs from Mile Oak |
| Type *06:03;Fer;1-19* then *Enter* | Exit railway at 06:03 at the Matfield  Link |
| Click *Save entry* |  |
| Click *Insert new entry* |  |
| Type *1A72;Higham to Claygate* then *Enter* | This is the new train that is created |

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|  | from the first |
| Type *06:01;Sfs;1A70* then *Enter* | This is the start command for a train created by a split, i.e. 'Start from split'. The headcode of the train that it splits from must be given to tell the timetable which train it splits from and the split time  must be the same for both trains. |
| Type *06:03;Mile Oak* then *Enter* | Departure from Mile Oak |
| Type *06:04;Fer;4-19* then *Enter* | The new train exits the railway at  the Claygate Link |
| Click *Save entry* |  |
| Click *Save timetable* |  |
| Name it *Mile Oak 2.ttb* then click *Save* |  |
| Click *Validate timetable* | As before |

Front splits are very similar, but instead of 'rsp' the command is 'fsp' for 'front split'. Try changing the above command '06:01;rsp;1A72' to '06:01;fsp;1A72', but remember that now 1A72 should depart before 1A70 because it's in front.

Try adding repeat commands at the end of each train's service entry. All that is needed is to add *R;3;4;20* on a separate line after the first train's finish command *06:03;Fer;1-19,* and also after the second train's finish command *06:04;Fer;4-19.* This tells the timetable to repeat the same pattern every three minutes, with a 4 digit increase in headcode for each repeat, for a total of 20 repeats. Note that whenever linked train services repeat, as here, the repeat command must be identical for each. Try to operate this repeating service without any delays - it can be done!

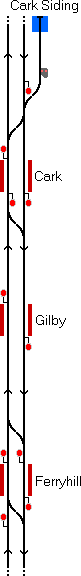
## Tutorial 7

# A simple shuttle service operates between two locations

A quick review of shuttles:-

A shuttle service is a service that runs from A to B, then forms a new service that runs back from B to A and forms a new service that links to the first repeat of the original service. **Shuttles are the only way for a service to link back to a service whose first train starts at an earlier time, all other links are forward links to later services.** The pattern must repeat at least once, and may repeat as many times as required. This is a very simple description, in practice shuttles can be as complex as required, including splits and joins and many service changes - see the manual for a more detailed explanation. **The essential feature of a shuttle service is that it represents a loop, with the same start and end locations, and a final service that links back to the starting service.**

Here train 1A80 is created at Cark as a shuttle service that runs between Cark and Ferryhill. The first shuttle service leaves at 06:01, stopping at all stations to Ferryhill. There it changes direction and becomes new service 1A82. 1A82 returns to Cark where it becomes the next shuttle service, with headcode 1A84 (i.e. each repeating shuttle increases the headcode digits by 4). There are three shuttles in all, the final shuttle terminating at Cark.

Outward service data:- Headcode: 1A80, description: Cark to Ferryhill, starting speed: 0km/h, maximum speed: 120km/h, mass: 250 tonnes, braking force: 25 tonnes, power: 2500kW.

Inward service data:- Headcode: 1A82, description: Ferryhill to Cark (no other data required).

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| --- | --- |
| Open *railway.exe* and load *Cark-Ferry.rly* | Load railway |
| Click *Mode* then *Create a timetable* |  |
| Click *Insert new entry* |  |
| Type *06:00* then Click *Save entry* | Timetable start time. |
| Click *Insert new entry* |  |
| Type *\*Train 1A80 created at Cark as a shuttle service that runs between Cark and Ferryhill. The first shuttle service leaves at 06:01, stopping at all stations to Ferryhill. There it changes direction and becomes new service 1A82. 1A82 returns to Cark where it becomes the next shuttle service, with headcode 1A84 (i.e. each repeating shuttle increases the headcode digits by 4). There are three shuttles in all, the final shuttle terminating at*  *Cark.* | Comment |
| Click *Insert new entry* |  |
| Type *1A80;Cark to Ferryhill;0;120;250;25;2500*  then *Enter* | First service data. Note starting  speed zero as it's stopped at Cark. |
| Type *06:00;Snt-sh;3-11 3-12;1A82* then *Enter* | This is the shuttle start command. 'Snt-sh' tells the timetable that it is a shuttle, and that therefore there will  be a matching entry later that links |

|  |  |
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|  | back. The service that links back  has headcode 1A82. |
| Type *06:01;Cark* then *Enter* | Departure from Cark |
| Type *06:02;06:03;Gilby* then *Enter* | Arrival and departure from Gilby. If two times are given, as here, the first represent the arrival time and the second the departure time. The same time can be given for each, in which case the train will depart 30 seconds after arrival, because there are always at least 30 seconds between any two timetable  actions. |
| Type *06:04;Ferryhill* then *Enter* | Arrival at Ferryhill |
| Type *06:04;cdt* then *Enter* | Change direction at Ferryhill |
| Type *06:05;Fns;1A82* then *Enter* | Finish and become new service 1A82 |
| Type *R;11;4;3* then *Enter* | This is the repeat entry for the shuttle service - shuttles must always have at least one repeat. Here there are 11 minutes between repeats, the headcode increases by 4 for each repeat, and there are 3 repeats in all (i.e. 4 services  including the first one). Note that the repeat time of 11 minutes must correspond to the shuttle loop time, i.e. the time that the outward shuttle starts (Snt-sh time) which is 06:00, until the time at which the return shuttle finishes (Frh-sh time - see below) which is 06:11. |
| Click *Save entry* |  |
| Click *Insert new entry* |  |
| Type *1A82;Ferryhill to Cark* then *Enter* | This is the new service 1A82 |
| Type *06:05;Sns;1A80* then *Enter* | Start new service command - make sure the start time is the same as the finishing time of the linking service 1A80 |
| Type *06:06;Ferryhill* then *Enter* | Ferryhill departure |
| Type *06:07;06:08;Gilby* then *Enter* | Arrive and depart from Gilby |
| Type *06:09;Cark* then *Enter* | Arrival back at Cark |
| Type *06:10;cdt* then *Enter* | Change direction at Cark |
| Type *06:11;Frh-sh;1A80* then *Enter* | This is the shuttle finishing command 'Frh-sh', telling the timetable that it links back to shuttle service 1A80, and that when all the  repeats are finished the train should remain here. |
| Type *R;11;4;3* then *Enter* | The final repeat command as before |
| Click *Save entry* |  |
| Click *Save timetable* |  |
| Name it *Cark-Ferry 1.ttb* then click *Save* |  |
| Click *Validate timetable* | As before |

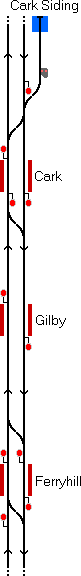
**Tutorial 8**

# A more complex shuttle service including both feeder and finishing services

It is often useful to have a non-repeating shuttle feeder service, to allow a train to leave a depot and arrive at a station, there to begin the shuttle to and from another location. At the end of all the shuttles a non-repeating finishing service can be included to allow the train to return to the depot.

Here train 1X80 is created at Cark Sidings and leaves at 06:01 for Cark as a feeder service for a new shuttle that runs between Cark and Ferryhill. The first shuttle service has headcode 1A80, and leaves at 06:02, stopping at all stations to Ferryhill. There it changes direction and becomes new service 1A82. 1A82 returns to Cark where it becomes the next shuttle service, with headcode 1A84 (i.e. each repeating shuttle increases the headcode digits by 4). At the end a finishing service 1X82 is included to return the train to Cark Siding.

Feeder service data:- Headcode: 1X80, description: Feeder service to Cark, starting speed: 0km/h, maximum speed: 120km/h, mass: 250 tonnes, braking force: 25 tonnes, power: 2500kW.

Outward service data:- Headcode: 1A80, description: Cark to Ferryhill (no other data required).

Inward service data:- Headcode: 1A82, description: Ferryhill to Cark (no other data required).

Finishing service data:- Headcode: 1X82, description: Shuttle finishing service to sidings (no other data required).

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| Open *railway.exe* and load *Cark-Ferry.rly* | Load railway |
| Click *Mode* then *Create a timetable* |  |
| Click *Insert new entry* |  |
| Type *06:00* then Click *Save entry* | Timetable start time. |
| Click *Insert new entry* |  |
| Type *\*Train 1X80 created at Cark Sidings and leaves at 06:01 for Cark as a feeder service for a new shuttle that runs between Cark and Ferryhill. The first shuttle service has headcode 1A80, and leaves at 06:02, stopping at all stations to Ferryhill. There it changes direction and becomes new service 1A82.*  *1A82 returns to Cark where it becomes the next shuttle service, with headcode 1A84 (i.e. each repeating shuttle increases the headcode digits by 4). At the end a finishing service 1X82 is included to return the train to Cark Siding.* | Comment |
| Type *1X80;Feeder service to Cark;0;120;25;25000;25* then *Enter* | Feeder service data. Note that feeder and finishing services can't  repeat. |
| Type *06:00;Snt;4-2 4-3* then *Enter* | Start command |
| Type *06:01;Cark Siding* then *Enter* | Departure from Cark Siding |
| Type *06:02;Cark* then *Enter* | Arrival at Cark |

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| Type *06:02;F-nshs;1A80* then *Enter* | Finishing command - 'F-nshs' tells the timetable that as it finishes it links to a new shuttle service,  whose headcode is 1A80. |
| Click *Save entry* |  |
| Click *Insert new entry* |  |
| Type *1A80;Cark to Ferryhill* then *Enter* | Outward service data. Because it's linked to a feeder service only a description is given (and even this is optional). All other data is taken from the feeder service. |
| Type *06:02;Sns-sh;1A82;1X80* then *Enter* | This is the shuttle start command where a feeder is included. 'Sns- sh' tells the timetable that it is a shuttle, and that therefore there will be a matching entry that links back. The service that links back has headcode 1A82. It also tells the timetable that it starts from a feeder service whose headcode is 1X80. Note that here two headcodes are required, the first for the shuttle link, and the second for the feeder link. |
| Type *06:03;Cark* then *Enter* | Departure from Cark |
| Type *06:04;06:05;Gilby* then *Enter* | Arrival and departure from Gilby. |
| Type *06:06;Ferryhill* then *Enter* | Arrival at Ferryhill |
| Type *06:07;cdt* then *Enter* | Change direction at Ferryhill |
| Type *06:08;Fns;1A82* then *Enter* | Finish and become new service 1A82 |
| Type *R;12;4;3* then *Enter* | This is the repeat entry for the shuttle service - in this case allowing 12 minutes between  repeats. Note that the repeat time of 12 minutes must correspond to the shuttle loop time, i.e. the time that the outward shuttle starts (Sns-sh time) which is 06:02, until the time at which the return shuttle finishes (Fns-sh time - see below) which is 06:14. |
| Click *Save entry* |  |
| Click *Insert new entry* |  |
| Type *1A82;Ferryhill to Cark* then *Enter* | This is the new service 1A82 |
| Type *06:08;Sns;1A80* then *Enter* | Start new service command - make sure the start time is the same as the finishing time of the linking service 1A80 |
| Type *06:09;Ferryhill* then *Enter* | Ferryhill departure |
| Type *06:10;06:11;Gilby* then *Enter* | Arrive and depart from Gilby |
| Type *06:12;Cark* then *Enter* | Arrival back at Cark |
| Type *06:13;cdt* then *Enter* | Change direction at Cark |
| Type *06:14;Fns-sh;1A80;1X82* then *Enter* | This is the shuttle finishing command 'Fns-sh', telling the timetable that it links back to shuttle service 1A80, and that when all the repeats are finished the train links  to a finishing service whose headcode is 1X82. |
| Type *R;12;4;3* then *Enter* | The final repeat command as  before |

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| Click *Save entry* |  |
| Click *Insert new entry* |  |
| Type *1X82;Shuttle finishing service to sidings*  then *Enter* | Service data for the finishing  service |
| Type *06:50;Sns-fsh;1A82* then *Enter* | This the finishing service start command. 'Sns-fsh' tells the timetable to start a new finishing service from a shuttle, and the shuttle headcode 1A82 tells it which shuttle it links to. Note the time - 06:50. This has to correspond to the time that the last shuttle finishes, which can be calculated from the time the first shuttle (1A82) finishes, which is 06:14 (from the above command 06:14;Fns-sh;1A80;1X82), plus the number of shuttles (3) times the repeat time between each shuttle (12 minutes), giving 36 minutes to add. Hence 06:14 + 36 minutes = 06:50. |
| Type *06:50;cdt* then *Enter* | Here the finishing service must change direction because after the last shuttle service the train is facing the wrong way. The same time as the start time is used so  that the direction change will occur after 30 seconds. |
| Type *06:51;Cark* then *Enter* | Cark departure |
| Type *06:52;Cark Siding* then *Enter* | Cark Siding arrival |
| Type *Frh* then *Enter* | Finish and remain here |
| Click *Save timetable* |  |
| Name it *Cark-Ferry 2.ttb* then click *Save* |  |
| Click *Validate timetable* | As before. This is a much more complex timetable so there may well be errors to be fixed. |