

# XPLN User Manual

for program version 2.3.3

Manual version 0.2.1

2015-02-07



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## Preface

My first experience with operation on a model railway was at a small local modular railway meeting in Sweden. Half a year later, with one more meeting under my belt, I volunteered in assisting the person responsible for planning the traffic for a medium sized meeting. When I received the first draft I thought the traffic was to sparse and, with permission, I added some more trains. The plan turned out to be good regarding the traffic intensity, but the time allocated at the stations to exchange cars was too short resulting in very long delays for many of the trains.

This, my first experience with planning the traffic on a model railway, was done using a locally developed web tool. The tool was very basic, but it had the minimum of functionality required to plan the traffic and generate the required documentation. Based on this experience I decided to try out XPLN for the next meeting where I planned a small introductory operation session. The planning worked well, but I also got the feeling that XPLN could do so much more than the basic parts that I were using.

I continued using XPLN to plan some more meeting, but without using any more features than the ones I used for my first plan with XPLN. Then, when I got involved in planning the traffic for the FREMO 2014 annual meeting in Rendsburg, I first really became exposed to some of the more advanced features in XPLN. At this point I decided to really learn XPLN and all its features to be able to consciously choose the ones I wanted to use in my planning. As the XPLN documentation was out of date, and spread over several documents, I decided that writing a new user manual would be a good way to force me to explore all features in XPLN. It is the effort of this decision that you are currently reading.

I have tried to make the manual useful for both novices and experts in XPLN. If you find something that is unclear, incorrect or have suggestions for improvements, don't hesitate to contact me on the e-mail below or via the fremo-fahrplan yahoo group. As the manual has not yet reach version 1.0 there are still many features in the tool that are not documented, but hopefully the information present will help you to efficiently use XPLN.

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# 1 Introduction

XPLN is a tool for planning the traffic on a model railway and for producing the paperwork required to run the trains according to the plan. The tool is mainly developed to support the needs for European style railway traffic within the FREMO modular railway club.

XPLN is not a self enclosed program, instead it is a set of macros for LibreOffice or OpenOffice. This means that XPLN can be used on the platforms where these office suites are available.

## 1.1 XPLN History

TBD

## 1.2 Reading Guide

TBD

## 1.3 Credits

The XPLN tool is currently developed and maintained by Uwe Lengler.

This manual is currently maintained by Erik Kuiper. It is based on earlier documentation written by Dirk Jahnke and Uwe Lengler.

## 1.4 Contact

The best place to discuss XPLN is in the fremo-fahrplan yahoo group. Both English and German is used in the group. Erik Kuiper can also be contacted directly at [mjmodulerik@gmail.com](mailto:mjmodulerik@gmail.com).

## 2 Installing XPLN

Before XPLN can be used it needs to be installed as an extension in LibreOffice or OpenOffice. If you already have a version of XPLN installed then it should be uninstalled before another version is installed. To uninstall XPLN select Tools->Extensions Manager..., then select the XPLN extension and click on **Remove**.

Due to differences between LibreOffice and OpenOffice there are two different XPLN instances. They are named XPLNLIB-2.3.3-LO.oxt for LibreOffice and XPLNLIB-2.3.3-OO.oxt for OpenOffice.

To install XPLN you can either double click on the correct instance, or you can select Tools->Extensions Manager... from within the office suite and then click **Add**. Find the correct file in the file browser and then click **Open** to install the tool. After the XPLN is installed the office suite needs to be restarted to activate XPLN.

## 3 XPLN Preliminaries

This section introduces the main XPLN interfaces and some XPLN concepts. The example arrangement used to illustrate the tool is also introduced in this section.

### 3.1 Notation

To clearly delineate actions referring to the XPLN interface some notational conventions are used in the manual.

Buttons, menus or menu items referred from the text are written in the **Arial** font.

Data in a field is enclosed by  $\langle \rangle$ .

### 3.2 The XPLN Interface

As XPLN is mainly used by a small group of “power” users, the priority in the development effort has generally been to prioritize useful features over a user friendly interface. As the core data of a plan is stored in a spreadsheet, the spreadsheet and its data is the most visible interface to XPLN. To support correct manipulation of the data in the spreadsheet several dialogs are available that can be activated via a drop down menu or via the toolbar.

In addition to the main interface in Calc, dialogs are also available in Draw to produce different types of graphs and Presentation to graphically connect the stations.

#### 3.2.1 Calc Dialogs

The XPLN data stored in a spreadsheet and it is in the Calc tool that most work is done to define the train timetables. The tools are either accessed in the toolbar as shown in Figure 1 or via the timetable drop down menu.



*Figure 1: Calc XPLN icons.*

<b>Tool</b>	<b>Description</b>
trainwork	Define train movements on the arrangement and assign engines and jobs to the trains.
cyclenotes	Create cycle notes for engines and for train set.
timetablebook	Create time tables for the train crews.
import PLN	Import PLN data.
Data verify	Verify that the XPLN data is consistent.
BFO menu	Create time tables for the stations and the start setup.
Version	The XPLN version.
Tools	A tool for managing trains.
Properties	A dialog for modifying the data stored in the Properties sheet. This includes defining the lines used for producing train graphs.

### 3.2.2 Draw Dialogs

Draw is used to produce train graphs, job graphs and engine graphs. The tools are either accessed in the toolbar as shown in Figure 2 or via the **timetable** drop down menu.



Figure 2: Draw XPLN icons.

<b>Tool</b>	<b>Description</b>
timetable	Create train graphs.
Jobs	Create job graphs and engine graphs.
Version	The XPLN version.

### 3.2.3 Presentation Dialogs

Presentation is used to graphically connect the different stations to each other. The tools are either accessed in the toolbar as shown in Figure 3 or via the **timetable** drop down menu.



Figure 3: Presentation XPLN icons.

<b>Tool</b>	<b>Description</b>
Arrangement	Draw the arrangement based on the data stored in the spreadsheet.
Version	The XPLN version.
Arrangement save	Save the arrangement data to the spreadsheet.



### 3.2.4 The Properties Dialog

A lot of data in XPLN is interfaced via the properties dialog. Here the general mechanisms of the dialog is explained. The fields for the specific groups are described in the relevant context later in the manual. An example of the properties dialog is provided in Figure 4.

To update a property select **Accept** after the data has been changed. To create a new property, select an existing property of the same type, make all changes required to define the new item and then select **insert**. To delete a property, select it and then select **delete**. To update the presentation in the tree view the lines needs to be hidden and then expanded in the tree view (press twice on the triangle left of the group in the tree view).

If the group does not exist for a property to be added, then a line has to be manually added in the Properties sheet. In a later version of XPLN new properties will be possible to create using the `FrameControl1` function in the Properties dialog.

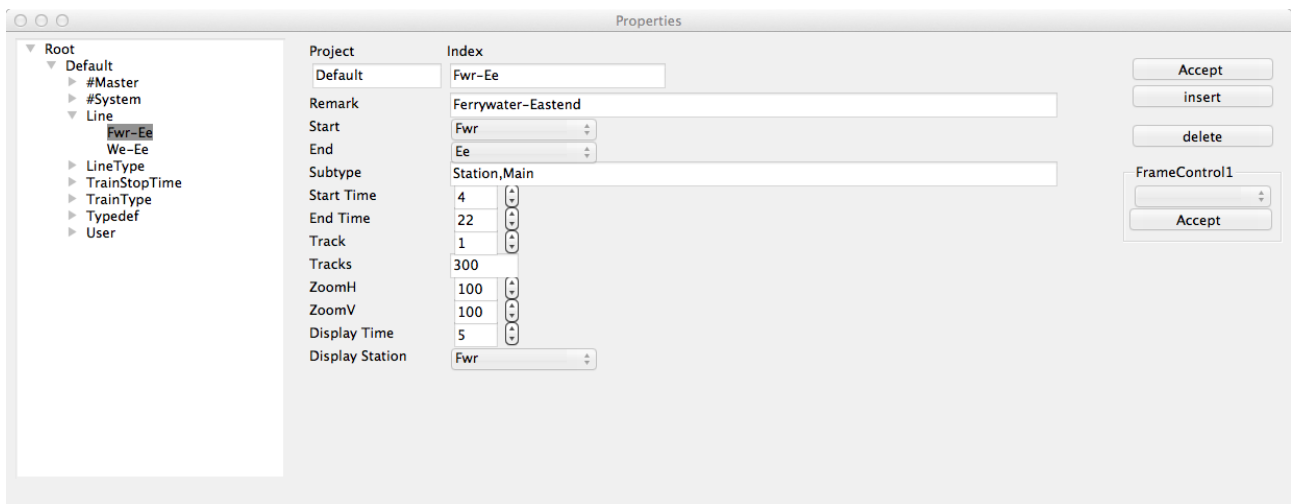


Figure 4: Line properties dialog.

### 3.3 XPLN Concepts

Table 1 define concepts that are used throughout this manual.

Table 1: XPLN concepts.

Term	Description
Engine	Locomotive that can be assigned to trains.
Job	One or more trains to be run by a train crew.
Trainset	A group of wagons in the train.
Cycle note	Small slip similar to a freight bill that describe the movements of an engine or train set.

### 3.4 Creating a New Train Plan

To get the correct data structure for XPLN a new train plan should be based on an empty XPLN template. Empty templates are provided in the templates folder. **Note: Currently all the templates contain obsolete sheets in the spreadsheet and only LeereXpln2.ods has the new properties sheet.** In most cases it is better to start with an empty template than to reuse a train plan from an earlier arrangement. This is especially the case if the earlier train plan was made with a different version of XPLN as the data structures may have changed.

### 3.5 The Example

Throughout the manual an example arrangement will be used to illustrate XPLN. The arrangement is illustrated in Figure 5 and it consists of a mainline between two fiddle yards with a branch line to a town with a train ferry. The mainline is electrified and single tracked from Westend to Midtown and double tracked from Midtown to Eastend. The branch line is not electrified and it is single tracked. On the arrangement four types of trains are run, express passenger trains (E), passenger trains (P), freight trains (F), and local freight trains (Lf).

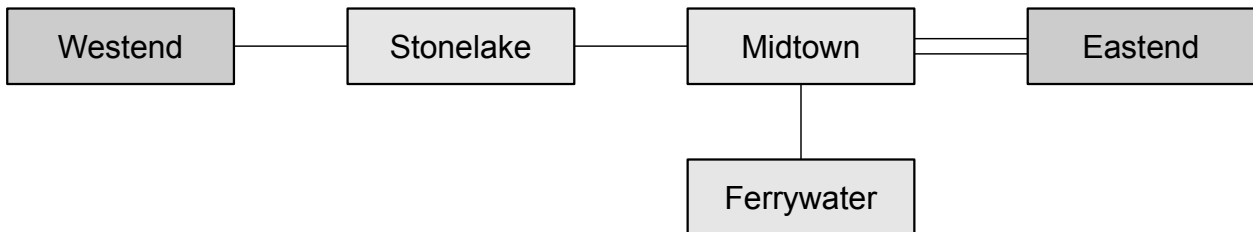


Figure 5: Example arrangement.

## 4 Defining the Arrangement

The before the trains can be defined, the stations and the lines between the stations need to be defined.

### 4.1 Defining Stations

Stations are defined in the sheet StationTrack. There are two types of rows in the sheet, stations and station tracks. An example of a station with its tracks is provided in Figure 6 and the contents of the cells are described in Table 2. The coloring of the station row is optional, but it improves the readability of the spreadsheet and it is used by the Arrangement tool.

The definition of a station does not automatically mean that it is part of the current arrangement. The implication of this is that a user can maintain one list of all stations used in different arrangements and use the complete list in all train plans.

Name	Enum	PositionX/ TrackName	PositionY/ Length	Remark	Type	SubType	Owner/Hinweise
Mtn	0	10978	1500	Midtown	Station	Station	
Mtn	11		350		Track	Main	Platform track
Mtn	22		350		Track	Main	Platform track
Mtn	33		300		Track	Main	Goods train reception/departure track
Mtn	44		300		Track	Main	Goods train reception/departure track

Figure 6: Station example.

Table 2: StationTrack columns.

Column	Type Station	Type Track
Name	Station abbreviation.	
Enum	A number used for sorting the table. The number should be unique within a station.	
PositionX/ TrackName	X position of the station on the arrangement drawing if the connections have been made using the Arrangement tool. Should not be modified manually.	The track name. Can be a string or a number.
PositionY/ Length	Y position of the station on the arrangement drawing if the connections have been made using the Arrangement tool. Should not be modified manually.	Length of the track. The data is not used by XPLN and it is for information only.
Remark	Station name.	Track description. The description can be printed in the train books.
Type	Shall either be <Station> or <Track>.	
Subtype	Shall either be <Station> or <Block>. Block is used to separate a line between two stations into independent blocks.	Type of track. The types can be defined freely, but by convention the following types are recommended, <Main>, <Siding> or <Depot>. The types are used to select the tracks shown in the train graphs.
Owner/Hinweise	Field to add comments. The comments are not used by XPLN and they are for information only.	

## 4.2 Connecting the Stations

There are two ways to connect the stations. Either you use Arrangement tool, or you connect the stations manually in the sheet Routes.

XPLN is not designed to handle multiple routes between stations (loops). If there are multiple routes between two stations XPLN will select one of them for trains that travel between these stations. The route selected depend on current implementation and the sorting of data in the sheets. Avoid to create multiple routes between stations.

### 4.2.1 Manually Connecting the Stations

To manually connect the stations, create one row per connection in the Routes sheet and enter the data as described in Table 3. In the descriptions the two stations connected are named station 1 and station 2. Note that a station with subtype block is also a station in this context.

Table 3: Data in Routes.

Column	Description
Routeid	Unique identification number of the route. Only used internally by XPLN.
Enum	Sorting order of the routes.
Station/Block	Station abbreviation for station 1.
Position	Kilometer position of station 1 on the line.
Station/Block	Station abbreviation for station 2.
Position	Kilometer position of station 2 on the line.
Speed	Highest permitted speed on the line between station 1 and station 2.
Tracks	Number of tracks on the line between station 1 and station 2. Normally 1 or 2.
Time	Fast clock minutes required to travel between the two stations at highest permitted track speed.
Stationtrack	Default train departure track for station 1 for trains traveling to station 2. Default arrival track for trains terminating at station 1 when the previous station was station 2. Used when a new train is created.
Stationtrack	Default train departure track for station 2 for trains traveling to station 1. Default arrival track for trains terminating at station 2 when the previous station was station 1. Used when a new train is created.
Position1	Text field. If data is entered it replaces the Position information on the train time table when traveling from station 1 to station 2.
Speed1	Text field. If data is entered it replaces the Speed information on the train time table when traveling from station 1 to station 2.
Remark1	Text field. Additional remark provided in the train time table when traveling from station 1 to station 2.
Position2	Text field. If data is entered it replaces the Position information on the train time table when traveling from station 2 to station 1.
Speed2	Text field. If data is entered it replaces the Speed information on the train time table when traveling from station 2 to station 1.
Remark2	Text field. Additional remark provided in the train time table when traveling from station 2 to station 1.

Notes

- In the case a station has different values in the position field in different connections, one is selected when printing train graphs and train books. There is a selection logic, but no selection order is guaranteed to be maintained.
- The fields Position1/2 and Speed1/2 are not used for the train computations.

### 4.2.2 Arrangement Tool

The recommended way to start the arrangement tool is by double clicking on the Arrangement.odp file in the templates folder. It can also be started by opening an empty presentation.

To draw the current arrangement select **Arrangement** in the toolbar or **timetable** drop down menu. If the Arrangement tool is run for the first time the stations are drawn in the top left corner in the order they are described in the Station sheet.

To move a station first select it by “drawing” a selection rectangle over it. The station can then be moved using the normal drag en drop mechanism. To connect two stations first select one station. The background of the station then turns white. When a second station is selected a dialog as Figure 7 is presented and data for the connection can be entered as described in Table 4. After moving the stations and making the connections our example arrangement could look like Figure 8. When all desired updates are made, select **Arrangement save** to save all the data to the spreadsheet. The presentation need not (and should not) be saved as all information is stored in the spreadsheet.

Note that an incomplete connection entry is created in the spreadsheet in the Routes sheet if **cancel** is selected for a new connection. It is recommended to review the Routes sheet after the Arrangement tool has been used and remove unwanted connections (delete incorrect rows).

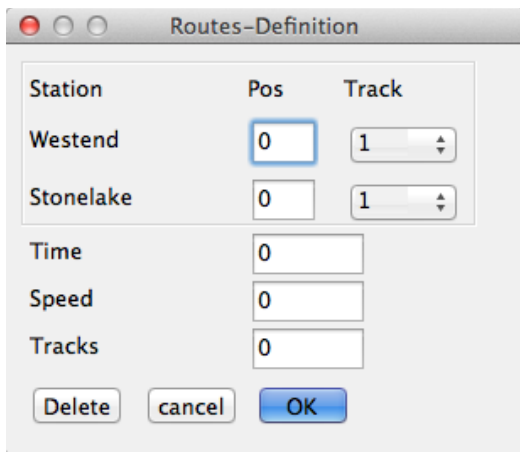


figure 7: Station connection dialog.

Table 4: Fields for the routes/connection definition.

Field	Description
Pos	Kilometer position of the station on the line. Used in the train graphs and the train time tables. In the case a station has different values in different connections, one is selected (there is a selection logic, but no selection order is guaranteed to be maintained).
Track	Default departure track when departing from this station to the other station. Default arrival track when terminating at this station when coming from the other station. Used when a new train is created.
Time	Fast clock minutes required to travel between the two stations at highest permitted track speed.
Speed	Highest permitted speed between the two stations.
Tracks	Number of tracks on the line. Normally 1 or 2.

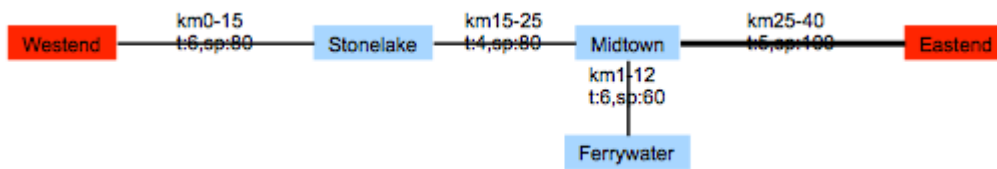


Figure 8: Example arrangement.

### 4.3 Defining Lines

Lines are used to define the stations to present in a train graph. A line is defined by two stations, and it automatically includes all stations between these two stations. The lines are defined in the Properties dialog. An example dialog is provided in Figure 9 and the fields are described in Table 5. The general principles for the properties dialog is described in Section 3.2.4.

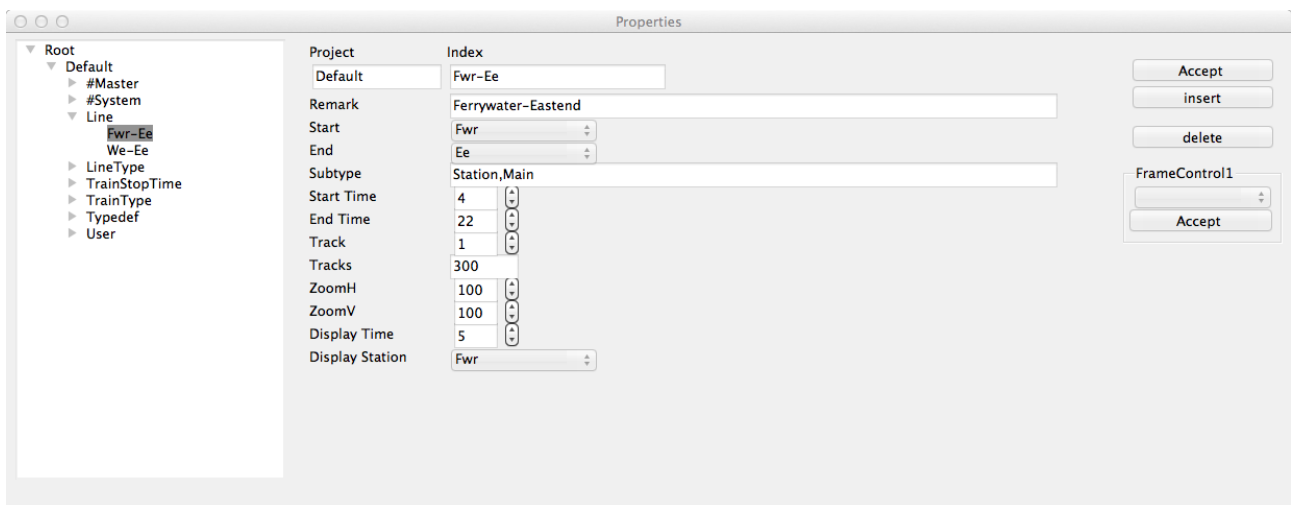


Figure 9: Line dialog.

Table 5: Line fields.

<b>Field</b>	<b>Description</b>
Project	Advanced topic. Should normally be set to <Default>. The use of projects is described in Section 7.5.
Index	Name of the line presented in the Timetable dialog.
Remark	Long description of the line. Will be used as a heading on the train graph.
Start	Abbreviated station name for the start station.
End	Abbreviated station name for the end station.
Subtype	The elements presented in the train graph. This is a comma separated list where the elements can have the values used in the Subtype column in the StationTrack sheet. A good default value is <Station,Main>.
Start Time	The default start hour for the train graph.
End Time	The default end hour for the train graph.
Track	1 if the individual station tracks shall be presented for the stations in the train graph and 0 if the station shall be represented by one line
Tracks	Distance in pixels between the station tracks in the train graph. 300 is a good default value.
ZoomH	Default horizontal zoom for the train graph in the trainwork dialog.
ZoomV	Default vertical zoom for the train graph in the trainwork dialog.
Display Time	Default start time for the train graph in the trainwork dialog.
Display Station	Default start station for the train graph in the trainwork dialog.



## 5 Basic Train Planning

This section describes how to perform train planning to a level that is sufficient for most meetings. More advanced train planning features are described in Section 7.

### 5.1 Defining Train Types

Train types are defined to conveniently enter data used for a train type only once. The train types are defined in the Properties dialog. An example of a dialog is provided in Figure 10 and the fields are described in Table 6. The general principles for the properties dialog is described in Section 3.2.4.

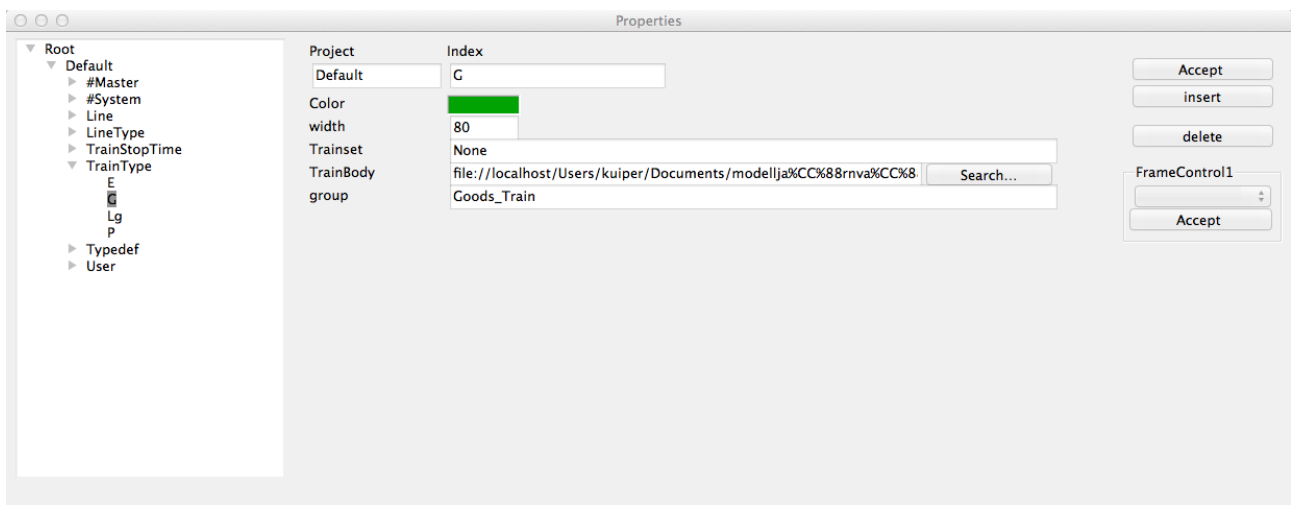


Figure 10: Train type dialog.

Table 6: Train type fields.

Field	Description
Project	Advanced topic. Should normally be set to <Default>. The use of projects is described in Section 7.5.
Index	The prefix used in the train name. For more on train names see Section 5.3. Note that spaces are significant characters in the prefix.
Color	The color of the lines in the train graphs for this train type.
width	The width of the lines in the train graphs for this train type. Values between 40 and 80 are recommended.
Trainset	Advanced topic. Should be set to <None> if trainsets are not used. For more on trainsets see Section 7.2.
TrainBody	The relationship between this value and the User property TemplateBody?
group	A higher order grouping of trains. Used to filter the trains displayed in the train graphs. The group names can be set freely, but names like <Passenger_Train> and <Goods_Train> are good examples.

## 5.2 Defining Train Stop Times

When a new train is defined it is possible to insert default stop times for the train at the stations it pass. These stop times are defined per station and per train type. The stop times can either be defined via the Properties dialog or directly in the Properties sheet.

Description TBD.

## 5.3 Defining Trains

New trains are created using the trainwork tool. To create a new train, open the trainworks tool and select Trains in the tree view (see Figure 11). Over the tree view there will be a set of buttons when Trains is selected. Select the leftmost to open the New train dialog. The New Train dialog is shown in Figure 12 and its fields are described in Table 7. When the desired data has been entered select OK to create the new train. All the data except the start and end stations<sup>1</sup> and train speed can be edited later. The created trains can be viewed on a train graph in the right part of the window. For more on the train graph in the trainworks tool see Section 5.4.

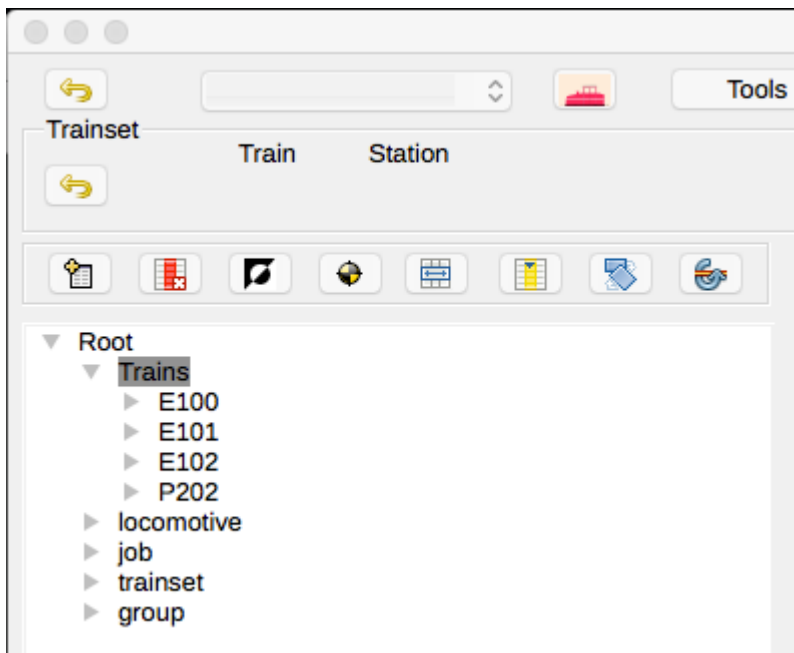


Figure 11: Trainworks - New train.

<sup>1</sup> The start and end stations can be changed if you know what you do, but for most users it is easier to create a new train than to change these properties.

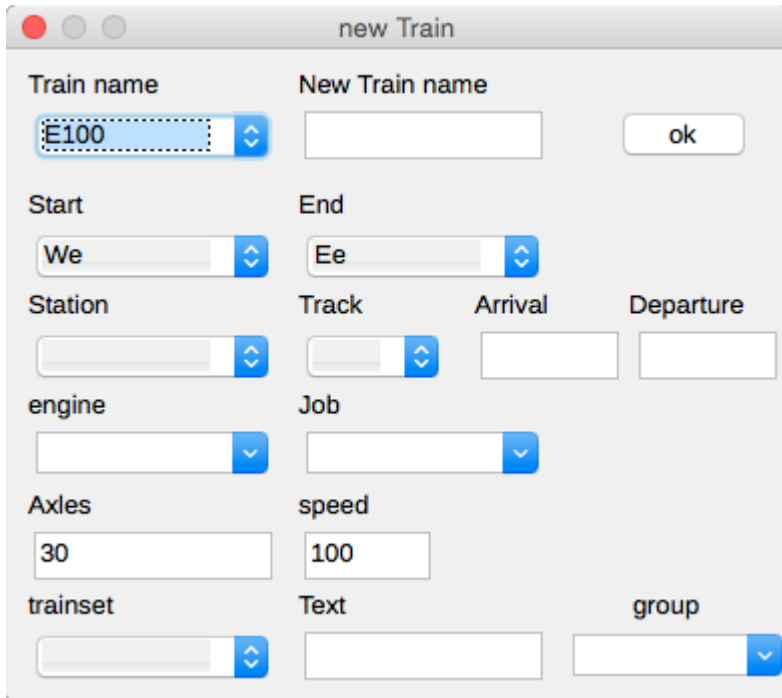


Figure 12: New Train dialog.

Table 7: New train fields.

Field	Description
Train name	A list of currently used train names. Can be used to help in the selection of the new train name.
New train name	The name of the new train. A name is normally a Train type (see 5.1) followed by the train number.
Start	The start station for the train.
End	The end station for the train.
Station	The station for which you want to set the arrival and departure time. The station needs be a station the train passes through (including the start and the end stations).
Track	The track the train occupies at the selected station.
Arrival	Arrival time at the selected station.
Departure	Departure time at the selected station.
Engine	The engine the train us pulled by. For more on engines see Section 5.6. Can be left empty.
Job	The job that will run the train. For more on jobs see Section 5.7. Can be left empty.
Axles	The maximum number of axels in the train.
Speed	The highest permitted speed for the train.

Field	Description
Trainset	Advanced topic. Should be set to <None> if trainsets are not used. For more on trainsets see Section 7.2.
Text	A description of the train. Optional information.
Group	The group the train belongs to. Can be used to filter out the trains to draw on a train graph.

In addition to creating a new train from scratch, a new train can be created based on an existing one. A new train can be created as a copy of an existing one, or as a copy but running in the reverse direction. The copy will initially have the same properties as the original except the train name and the scheduled time. To create a copy, select a train in the tree view and press the copy or the copy and turn button (see Figure 13). The data for the new train is then entered in the Copy train dialog as illustrated in Figure 14 and described in Table 8.



Figure 13: Trainworks icons. New train, delete train, rename train, verify, merge, copy, turn, copy and turn.

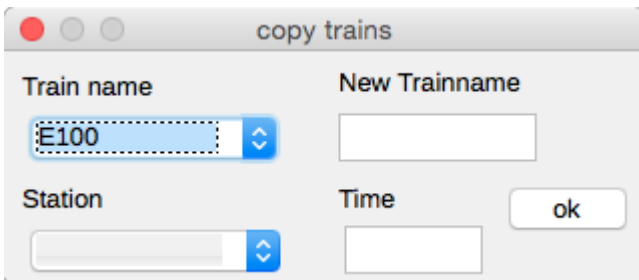


Figure 14: Copy train dialog

Field	Description
Train name	The train to copy.
New train name	The name of the new train. A name is normally a Train type (see 5.1) followed by the train number.
Station	The station to set the time for.
Time	The arrival time of the train at the selected station.

Table 8: Copy train fields

## 5.4 The Train Graph in the Trainwork Tool

TBD

## 5.5 Modifying Trains

A large part of the effort in creating a working time table is to adjust the train times. This is done in the trainwork tool. The section below describe the most common train modifications.

### 5.5.1 Change time and track information

To change arrival time, departure time and/or the track information for a train at a station, select the station entry for the train in the trainworks dialog. The station track and the arrival and departure times for the train can then be changed in the timetable box in the trainworks dialog (see Figure 15). To accept the changes press the OK button. The update takes some time so do not perform any actions until the data in the tree view has been updated.

When the arrival and/or departure times are changed the times at the other stations are changed accordingly.

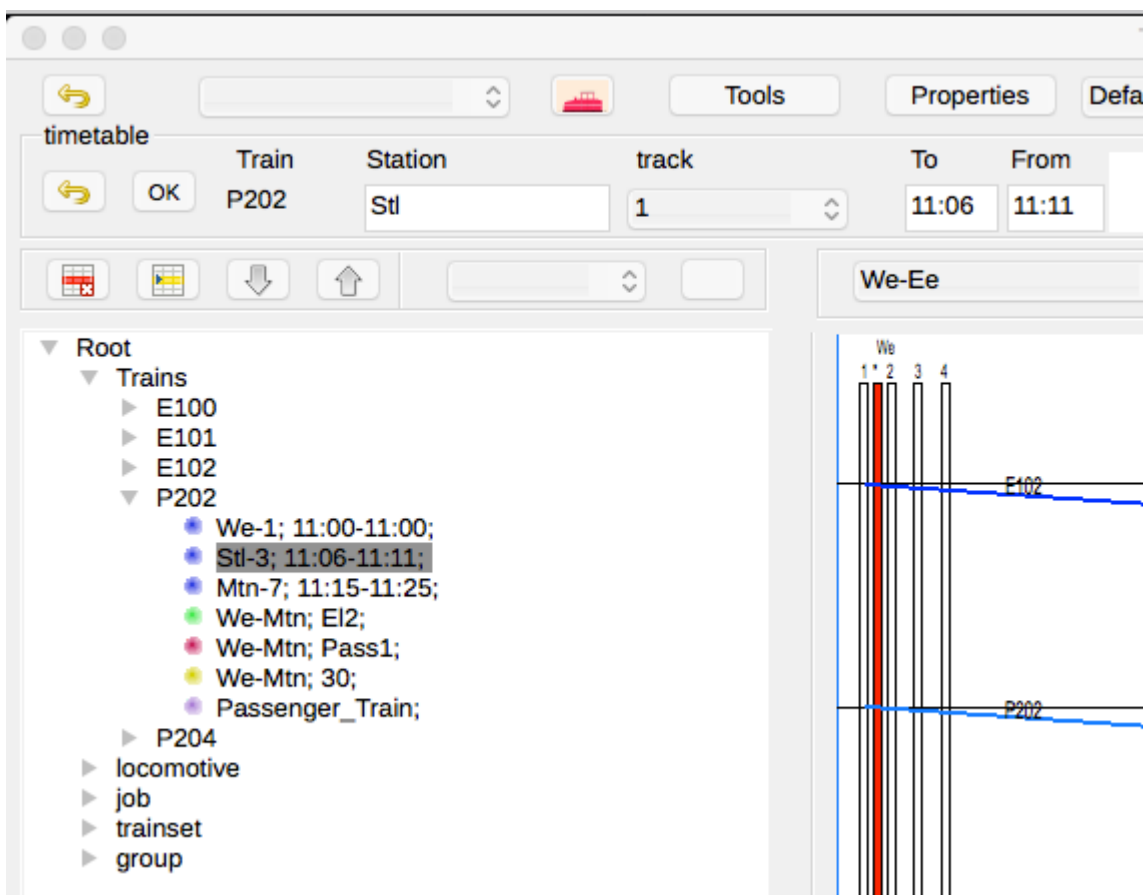


Figure 15: Trainworks - Update train station information.

### 5.5.2 Adding Descriptions to Station Stops

To help the train crews and station crews to know what a train should do at a station a free text description can be added for each station stop for at train. The text can be added using the trainworks dialog. Select the station entry for a train and enter the text in the box to the right of the departure (from) time. Press the OK button to accept the changes. This text can also be entered directly in the Remarks column in the Train sheet.

### **5.5.3 Changing Other Station Stop Information**

TBD.

### **5.5.4 Changing Other Train Information**

Changing other train information (engine, job, axels and group) can be done by selecting the corresponding row for the train in the trainworks dialog and updating it in the box in the upper part of the trainworks dialog. To accept the changes press the OK button.

These changes can also safely (and often more quickly) be done directly in the Trains sheet.

For information on trainsets see Section 7.2.

## **5.6 Engines**

Each train can be assigned one or more engines. The assignment is optional, but XPLN will help in the verification that an engine is available when expected for a train. In XPLN an engine is identified by a string in an engine entry. How engines are assigned to trains is described in Sections 5.3 and 5.5.4. How to create an engine cycle graph is described in Section 6.5. For information on assigning different engines to different parts of a train's schedule see Section 7.4.

## **5.7 Jobs**

A job is an assignment to run one or more trains. In XPLN a job is identified by a string, and all job entries for trains with the same string will be allocated to the same job. Assigning a train to one or more jobs is required to be able to generate job descriptions with train timetables (see Section 6.4). How jobs are connected to a train is described in Sections 5.3 and 5.5.4. For information on assigning different jobs to different parts of a train's schedule see Section 7.3.

## 6 Creating Documentation

The sections below describe how generate documentation for a train plan.

### 6.1 Train Graph

Train graphs can be easily generated using the Timetable tool in Draw. Open an empty drawing, format the page as desired (size, orientation and margins) and start the Timetable tool. The tool is shown in Figure 16 and the fields are described in Table 9.

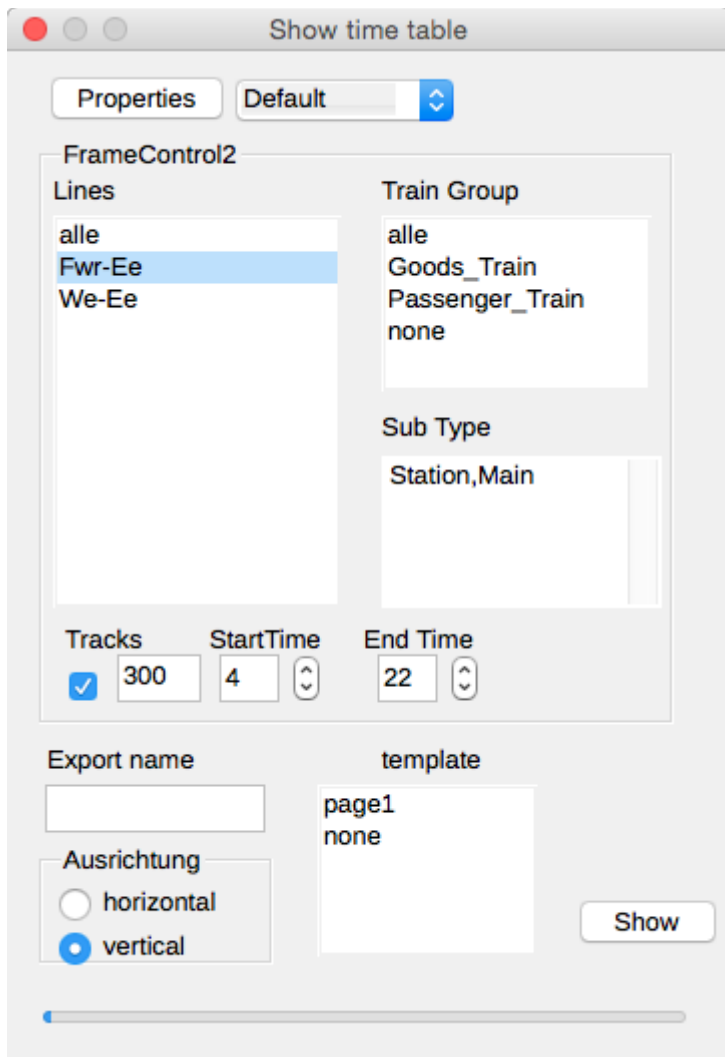


Figure 16: Generate train graph dialog.

Table 9: Generate train graph fields.

Field	Description
Properties	Starts the properties dialog. See Section 3.2.4.
Drop down field	Active project. Advanced topic. For most users it should be set to Default. For more information see Section 7.5.

Field	Description
Lines	The line to generate a graph for. If <b>alle</b> is selected then graphs for all lines will be generated.
Train Group	The train groups to include in the graph. If <b>alle</b> is chosen, all trains will be included and if <b>none</b> is selected then no trains will be drawn.
Sub Type	The types of station tracks to include in the graph. The selectable option presented here are those defined when the line was defined. See Section 4.3.
Tracks	Controls if individual station tracks shall be drawn at each station or if a station is represented by just one line. Check the box to draw individual station tracks. The text box defines the distance between the station lines. A good default value is 300.
Start Time	The time the graph starts.
End Time	The time the graph ends.
Export name	TBD. It is safe to leave this field empty.
template	The template to use for the graph. This is an advanced topic and covered in Section 7.6. For normal use, no template needs to be selected.
Ausrichtung	The direction of the graph. horizontal    The time is drawn from left to right and the stations from top to bottom. Used in Sweden. vertical        The time is drawn from top to bottom and the stations from left to right. Used in Germany.
Show	Starts to draw the train graph.

## 6.2 Station Time Table

To generate the station time tables the BFO tool (Bahnhofsfahrordnung) is used. To control the layout of the station time tables the BFO tool uses a document template. Example templates are available in the XPLN templates directory. The easiest way to create your own layout is to start from one of the examples, modify it as desired and then to save it as a new template.

The generation of the station time tables is a two step process. First, a BFO table needs to be generated before the station time tables can be generated. To generate the BFO table press the **create** button located in the left BFO table box in the BFO dialog (see Figure 17). The creation of the BFO table takes some time. Take no actions until there is no progress bar showing in the main spreadsheet window.

After the BFO table is generated select BFO in the right BFO table box, and then the template and destination directory in the BFO files box. The file type(s) of the generated documentation can be selected by checkboxes. After all configuration has been done, press the **create** button in the lower right corner to create the documentation.



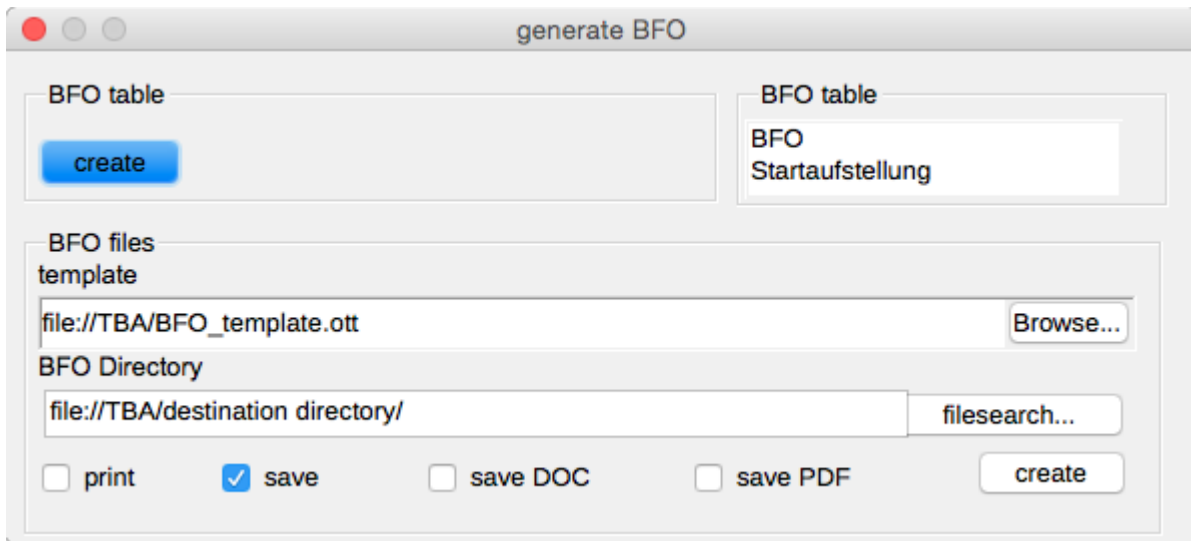


Figure 17: BFO dialog.

### 6.3 Start Setup

XPLN can generate start setup documentation for engines and trainsets in the BFO tool. This is done in the same way as for the station time tables (see Section 6.2), with the exception that Startaufstellung needs to be selected and that a different template needs to be selected. The example template is named BFO\_Body\_Object.ott.

### 6.4 Job Timetable and Instructions

To create timetables and instructions to the train crews, the timetablebook tool is used. To control the layout of the instructions, the timetablebook tool uses document templates. Separate templates are used for the first page (prefix), main part (body), and the optional last page (suffix). Example templates are provided in the XPLN templates folder. The easiest way to create your own layout is to start from one of the examples, modify it as desired and then save it as a new template.

In addition to printing the remarks information for each station entry, XPLN can add information on engines, trainsets and job in the remarks column in the timetable. If this information is printed or not, and how it is printed, is controlled by the Typedef properties. The properties and their values are described in Table 10. The properties are set in the Properties dialog (see 3.2.4).

Table 10: Typedef properties description (rows refer to attribute rows in the properties dialog).

Property	Row 1 Prefix string for	Row 2 Prefix string for	Row 3 Printing active
timetable	N/A	N/A	<y> or <n>. Controls if remarks are printed.
locomotive	engine start for train	engine end for train	<y> or <n>
nexttrain	engine assigned to previous train	engine assigned to next train	N/A. Controlled by locomotive property.
trainset	trainset attached to train	trainset decoupled from train	<y> or <n>

Property	Row 1 Prefix string for	Row 2 Prefix string for	Row 3 Printing active
job	job start	job end	<y> or <n>

In the timetablebook dialog (see Figure 18) you specify the templates to use, the folder to store the generated timetables, and select what to generate. If no print or save option is selected in the check boxes, then the timetables will be created as open text documents. The use of a suffix is optional.

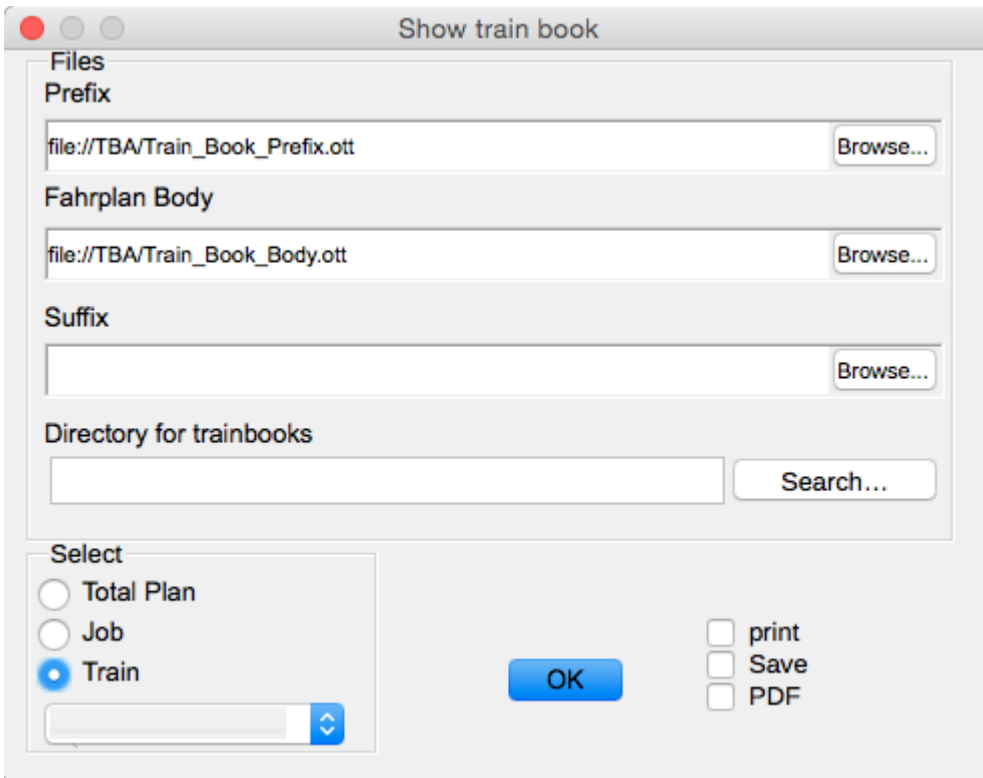


Figure 18: Timetablebook dialog

## 6.5 Schedule Graphs

Schedule graphs for jobs, engines (locomotives), trainsets and trains (traindef) can easily be generated using the Job tool in Draw. Open an empty drawing, format the page as desired (size, orientation and margins) and start the Job tool. The tool is shown in Figure 19. Select the type of graph from the list and the start and stop times in the two time fields and then press Show.

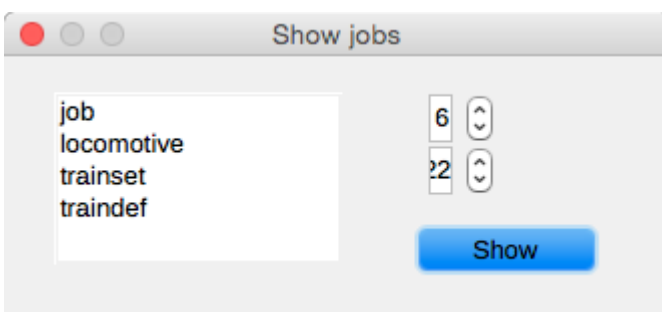


Figure 19: Schedule graphs dialog.

## **7 Advanced Train Planning**

### **7.1 Managing Groups of Trains**

TBD

### **7.2 Using Trainsets**

TBD

### **7.3 Splitting a Train into Several Jobs**

It is possible to assign different train crews to different parts of a train's journey.

TBD

### **7.4 Assigning Different Engines to a Train**

In some cases a train needs to change an engine.

TBD

### **7.5 Using Projects**

TBD

### **7.6 Train Graph Templates**

TBD