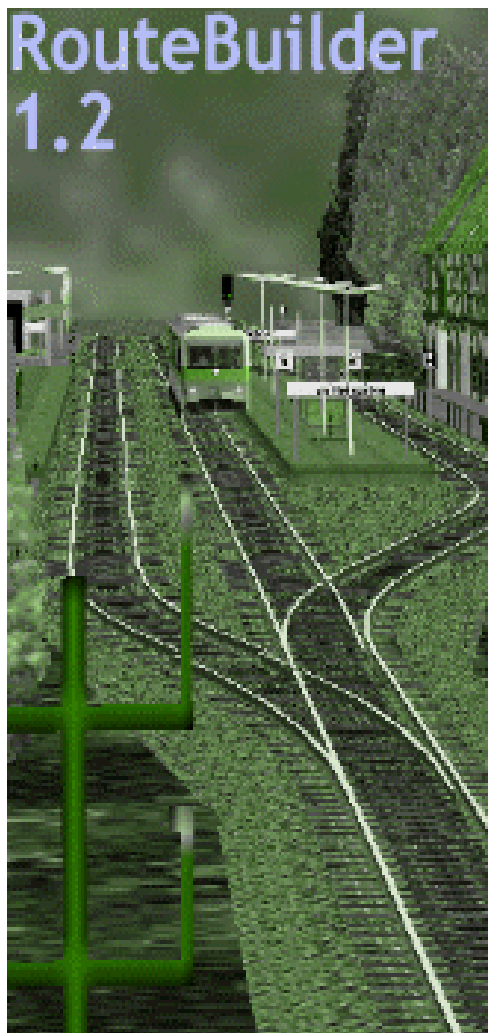
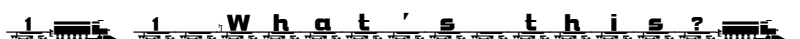


# The RouteBuilder for BVE Manual

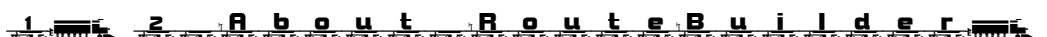
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This is the RouteBuilder manual. We welcome you. It's good that you read this, because RouteBuilder is no simple program. It would be cool if you read at least the tutorial before crying »damn, it doesn't work at all«. Of course we know that nobody will read this, but don't blame us. There are also some howto project files coming with RB. You should have a look into them to see how certain layouts are built. This manual is for version 1.2.



You don't need to read this section. It's just in case you're curious. If you feel bored, go on to the next chapter.

RouteBuilder is being developed by Uwe Post from Germany and Thomas Tschofenig from Austria. We started the project July 2002. The program has been written with Borland Delphi 6 Personal Edition.

RouteBuilder 1.0 came out in April 2003, RouteBuilder 1.1 in August 2003, Version 1.2 March 2004.

As it is very difficult to develop routes for BVE, our favorite train simulator, we planned a graphical editor. The most powerful feature RouteBuilder has is that it doesn't distinguish between primary and secondary tracks like BVE does. The track the trains runs on becomes primary in the moment a route is exported for BVE. You can create a complicated track network and export different routes, your trains running on totally different tracks. There are some limitations because BVE has restrictions – you will notice this when you try your first exported routes with BVE or TrackViewer. The RouteBuilder export process tries to make the best of your track network – but maybe you won't get what you wanted. Try to change your tracks and try again. We will give some hints how to get the best results in this manual. We are sure that the community – you! – will find out some tricks we did not find – please visit our forum to find out.

## 3 What's new in this version

Maybe you already know an older version of our program. The major improvements of version 1.2 are:

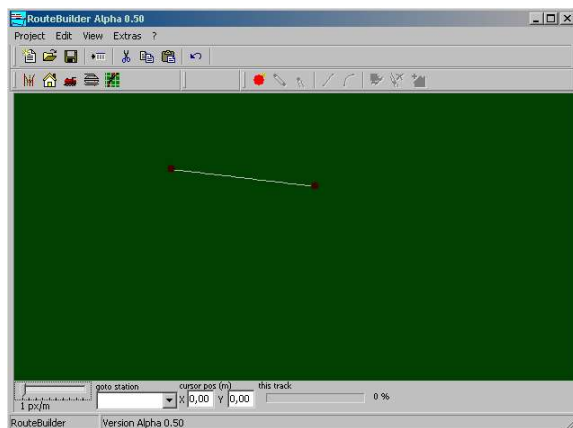
- Signals
- Import and Export of Regions with RB Trackwork Library
- csv 3D objects support (partial)

It is crucial to go through the tutorial for everybody, even if you know RB1.0 or RB1.1.x (except [2.1 Points and connections](#)). Many things changed, and route building has a whole new system with RB 1.2.

## Tutorial

### 1 Points and connections

Let's start! If you run RouteBuilder, you can select to open the last used project, load another one or create a new project. On the first start, a number of tutorials is presented. Please select tutorial1.rbp. You should see something like this now:



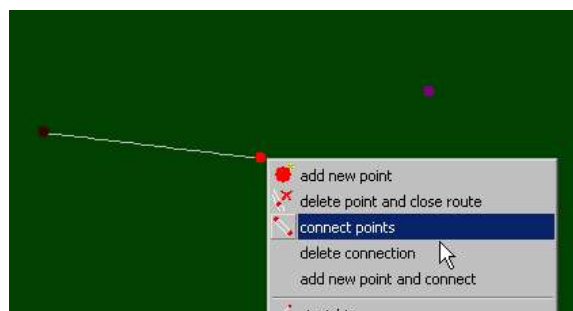
What you see is a very simple construction, but it consists of the most important RouteBuilder elements:

- Points
- Connections

Now just touch one of the points with the mouse pointer, don't click. The point will become red as long as the mouse is near it. Now click on the point and it will become magenta, it is now the *active* point.

Now try the following: Right-click somewhere and in the popup menu, select *add new point*. A new point will appear, and it is magenta, not red, because it is now the *active* point. Now right-click on one of the connected points (it will turn red when you touch it) and select *connect points*:

Congratulations. You just built your first *connection*. It is magenta like the active point because it is the *active* connection. Continue and create more connections. Note that you can create them with one right-click using *add new point and connect* or try Ctrl+Shift+Leftclick which does the same.

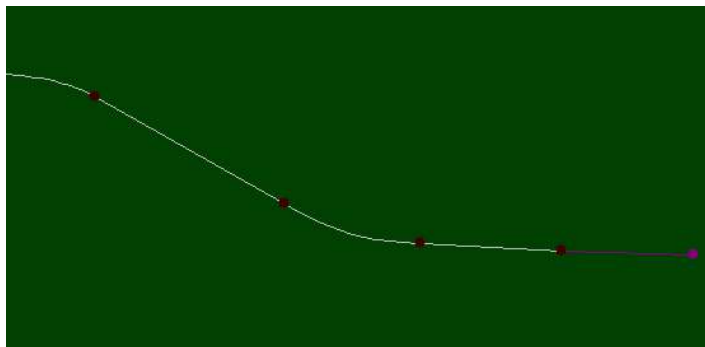


drags the active area.

If you reach the border of the screen, hold down the left shift key, left-click and hold and move the mouse. This

If you select the *curved* special track type in the context menu, RouteBuilder creates curves for you (improved hyperbolic curves). These will be smooth curves when exporting. Two curved connections directly following each other often look ugly. You should use short straight between two curves.

You can move points just by clicking and dragging. The connections will follow automatically because they are bound to the points.



In the main popup menu which you already know you will also find *delete* options. And you can change connections from curved to straight to fit your needs. Of course one point can have more than two connections. If it has three, it becomes a switch. To build switches, you should use grid tracks. See below.

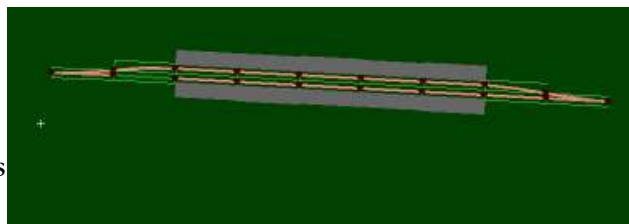
In the bottom line of the main window, you can see the x and y world coordinates measured in meters. Note that they must always be greater as 0, the less-than-zero-regions are painted black instead of green. There are more comfortable navigation options of which we will speak in the next chapter and in [3.1 how to move around](#).

## 2. R B Trackwork Library

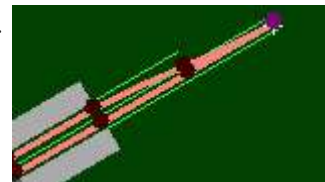
RouteBuilder 1.2 comes with a small but growing trackwork library. You can import and use track layout regions. Route building with the trackwork library is easy. We will show you how this works.

First, create an empty project using the new project wizard. Then, go to an empty region of the editor window and set the cursor where you want to build your first station.

Now select Project/Import Region from the menu. Select the Crossing Station from the list and click Load. You now have a small station. Use the Zoom control to inspect it.

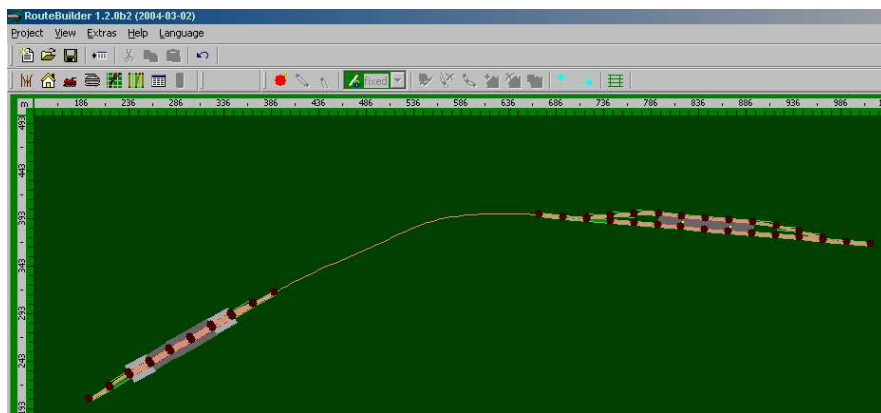


The green frames show you that the connections this station is made of are aligned in a grid. Now select View/Grids from the menu. Change the grid angle to let's say 30 degree and click apply. The grid with the whole station will rotate.



Now set the cursor somewhere northeast from the first station and import another region: Island station single. If you look close, you will find that this station already has lampstands on the platform. These are objects bound to connections. We will talk about this later. For now, just note that this sort of objects sticks to connections. Thus if you want to rotate this station, the objects will also rotate.

Next, set the zoom level so that you can see both stations, at least their end points which shall now be connected. Just click once on one end point to activate it. It becomes purple. Then right-click the near end point of the other station and from the popup menu select: connect points. Make this connection curved. Then check if you have the same result like in the screenshot. It's that simple!



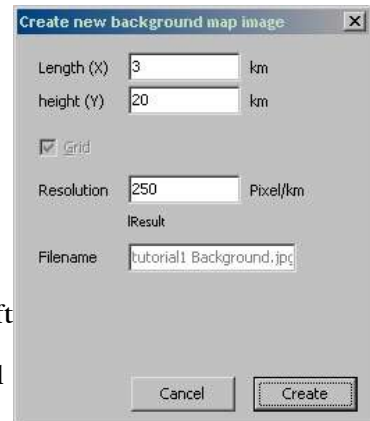
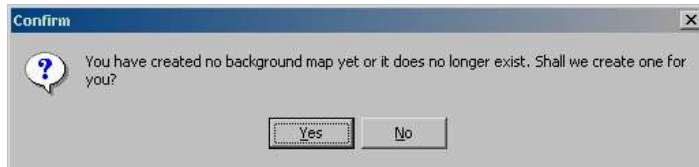
Before you can drive this route with BVE, you have to define the stations and the route which your train should run. If you are in a hurry, look at [2.4 Route Definitions](#) and [2.5 Stations](#) now.

## 2. The Map

Please click the *show map* icon:



This will happen:



Click yes.

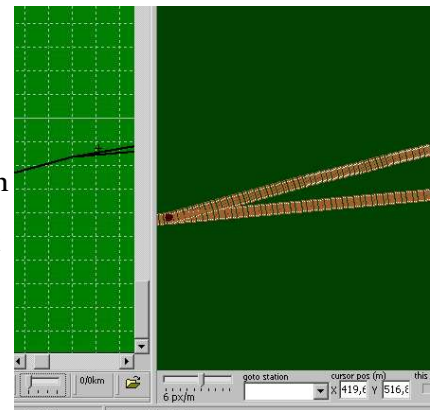
Now you can set the size of the area your track network will cover. RouteBuilder will create a pixel bitmap with a grid and save it automatically. Once the map has been created, it is displayed on the left of the main window. You can switch it on and of using the *show map* icon, but it doesn't need to be created again. The map bitmap will reside in your RouteBuilder directory. On the map, you should see a small version of your track network now, at least if you built it in an area with coordinates >0, which we told you to do somewhere above. You can click onto the map, and the main window view will jump to that point.

Now it's time to introduce the two zoom sliders. One resides beneath your new overview map. It has for zoom levels. The other one zooms the main window and has ten positions. Maybe you see something like the image on the right now. That's great. Just continue building tracks, meanwhile I'm getting me something to drink...

Okay, done?

I'm sure you want to export your tracks to see how they look in BVE. Sorry, you can't. We have to do some other things before.

Just a hint before you start building your favorite route (I'm sure that's what you want to do right now). You can exchange the green map with a real one. Or you can load it into your favorite graphics program and draw a kind of blueprint onto it. It's a cool idea to get a real map containing your route, put it onto your scanner and use it as blueprint for your route. Just click on the *open* icon beneath the map. Be sure to adjust the resolution appropriately. And note that these map files grow really big. You can use jpg or bmp images, but you should better use jpg because they are smaller.



## 2. 4 Route Definitions

As you know by now, RouteBuilder doesn't care on which track your train will run in BVE. BVE does. So you have to define where the train shall go.

Click the *Route Definitions* icon now. It's the first in a row. You will see an empty window. Select *Add route* and type in a name like *my first route*. Then double-click it. A green bullet will be displayed in front of the route name. This means this is the active Route Definition now.



Now select a connection which shall belong to your first route, right click and select *add to current route* or *add to current route until switch*, which will add this or some connections to the active route definition. You can only use *add to current route until switch* if one of the active connections' points is active too. The connections starting at this point will also be added to the route definition and so on.

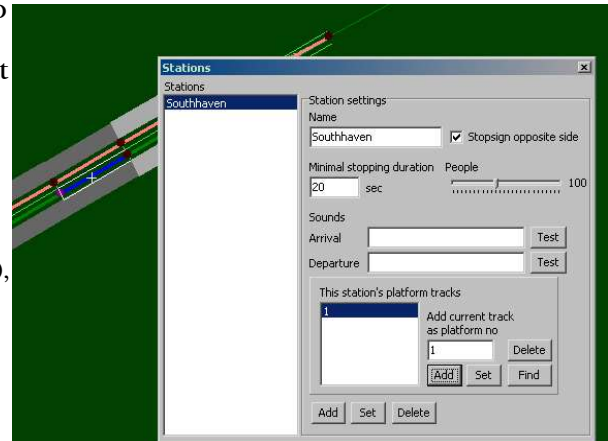
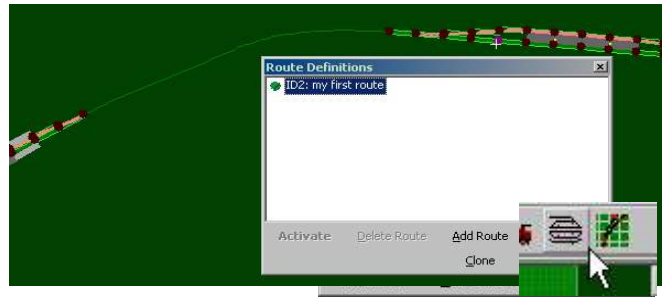
All connections belonging to the active route definition become green. Of course you can define any number of route definitions, and each connection can belong to one or more route definitions. If you

activate another route definition, the connections belonging to it turn green.



You can open tutorial2.rbp if you don't have prepared an own route with track network and at least one connection defined. This tutorial contains a layout with two simple stations. But stop, the exact station positions for BVE need still to be defined, that's up to you now. Activate the route definition »Southhaven to Middleton«. Go to the first station (Southhaven, that left one). Select the connection where your train shall start. This has to be a green track which belongs to the route definition. After you selected the connection, click the *stations* icon.

Type in the station name *Southhaven* (or whatever), click the left add. Up to now we only defined a station name, but a station can have one or more platform tracks. Use the input field *Add current track as platform no.*, type in *1* and click *Add* (the right one). The *1* will appear in the platform tracks listbox. Close the dialog. If you select a different connection you will note that your station platform track has turned blue.



Now do the same thing for the destination track in Middleton. The result should be like in tutorial3.rbp.



Maybe you already tried to double-click a connection or you selected *connection properties*. You will see the track properties dialog. Please note the difference between *connections* and *tracks*: tracks are the smallest rail units to be displayed in BVE (25m long), connections are the green or white or pink lines you drew during the last minutes. They may be longer, but shouldn't be shorter than 25m.

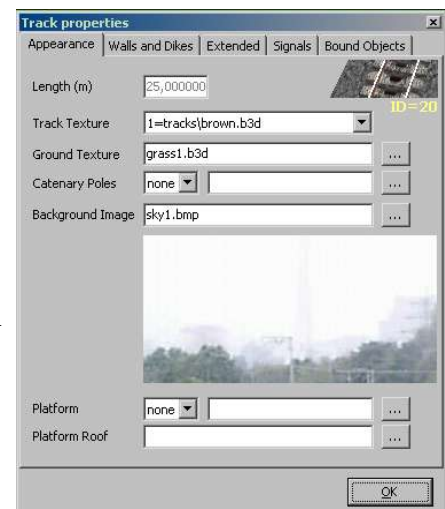
When exporting, RouteBuilder creates a couple of BVE tracks from each of your connections.

The track properties you can adjust in the track properties dialog belong to all tracks which will be made from the current connection. If the connection is fixed (as in the grids) one connection becomes exactly one track in BVE.

You can change the track texture, the ground texture, you can set catenary poles (the catenary wire is part of some track textures, so you have to select the poles *and* an *overhead* track type) and you can select a background image.

And you can add a platform to your connection. Please don't do this with a curved connection. There are also platform roofs. You can only add a platform roof if there is an platform and it is of course on the same side as the platform. About how to add your self made platforms, read [3.2 how to extend the object library](#).

On the *extended* tab you can type in speed limits, accuracy, adhesion or a sound file. Of course you can leave these as they are for the moment.





You should change the track texture, background etc. not only for one track but for two or three or fifty. You can do this by simply adjusting the properties for one track, click OK, then right-click and select *copy properties* and use the appropriate *paste properties...* feature or the Replace function in the menu (also read [3.9 how to replace objects](#) for this).

Please add platforms to the tracks where your stations shall reside. You will need at least two stations.

## 2.7 Using Track Grids

For accurate export of complex track layouts (where complex means: containing switches), we strongly recommend that you use Track Grids. We will now explain how they are working.

Each grid has a root track which is a 25 m long connection. You can add every track near the root track to the grid and it will be aligned both in the viewport and the export. First, click the grids icon to open the grids window.

Make sure you selected the track which shall become the root track of your grid. This track defines the angle of the whole grid which cannot be bent. Type in a name for the grid (i.e. the station name or an abbreviation) and click *new*. Please don't move the grid root track from now on.

Now you can use the context menu to add other tracks to the grid, or just press Ctrl+G. The track will be surrounded by a green frame. Of course you can also delete tracks from the grid. Note that they are not really deleted, they just don't belong to the grid anymore. If a track is added to the grid, it is aligned and its length is adjusted.



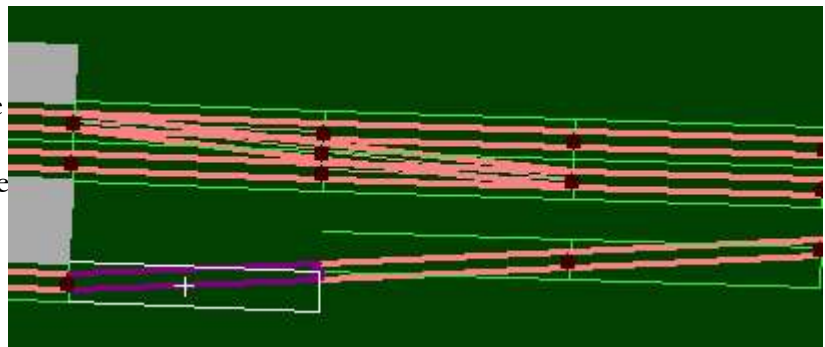
Internally, each grid frame has six magnetic points – the four corners and the center points at the short ends. Normally, a straight track extends between the last two points, but it can also run across.

Instead of adding connection by connection and changing track types like described above, you should use the grid tracks window to add your tracks and switches. Click the grid tracks icon to bring up that window. To build grid tracks, just set the cursor into your grid – a white outline will mark the grid position where a track will be created. Then click the desired grid track icon and the object will be built. Please note the orientation of your grid which depends on the orientation of its root connection – if your grid is upside down, the left switch icon will produce an upside down switch.



To delete a switch, you have to delete both connections and all points.

The bent tracks at the right end of the grid tracks window fit to the switches. Look at the screenshot to see how track layouts are built using grid tracks and refer to the file tutorial7.rbp.



## 2.8 Trackside scenery objects (TSO)

You don't have to set every single tree by tree to create a forest to be crossed by your route. BVE makes use of trackside scenery objects (TSO), originally Walls and Dikes. They are often used for different objects than that, for example fences, forests, bridges or street scenarios, because it is easy to create the complete landscape using the trackside objects. You just define which TSO shall be set to the left and right side of a connection, and you can do this for many connections with just a few clicks. On either side RB can put two different objects, called TSO and wall. Set the objects on the TSO tab of the track properties dialog, then press Ctrl+C (copy properties), select another track and use the context menu to paste the properties, if you want until the next switch is reached. The trackside object setting is

illustrated by grey frames near the tracks indicating their maximal width.

If you define your own trackside objects you can easily add them to the predefined objects list. Note that you need both the left and right side version and the files have to be named appropriately, i.e. `my_wall_l.b3d` for the left side object and `my_wall_r.b3d` for the right one. Each object should be 25m long, begin at  $z=0$  and extend from about  $x=2.8\text{m}$  (left side objects at  $x=-2.8\text{m}$ ) which is the distance from the track center. Copy your trackside objects to the walls folder in your object library.

## 2.9 groundless building

As you know RB doesn't distinguish between primary and secondary track like BVE does. You can drive on any track. In BVE, there is a so called ground object which is attached to the main track. Naturally, if the ground contains for example a river running in the same direction as the track, and you want to drive on a parallel track, you cannot use the same ground object because the river would be shifted to a different position, eventually underneath a track.

Thus we invented groundless building. You just use an empty object for the ground. The ground is in fact built using TSO, the ground is `empty.b3d` for all connections. In the example on the right, you can see which TSO or wall elements are assigned to the tracks. Please note that everything here takes place in a grid but also works outside grids.

Also note that »left« and »right« here is always relative to the connections orientation. If you click onto a connection, its start point is automatically highlighted. Imagine you are standing on that point and looking along the selected connection. Then the right wall or TSO is built on the right and the left on the left of course.

You can also enter a vertical offset for the TSO. This allows to place the ground under a bridge or viaduct.

Groundless building is also important for underground lines. There are the `uground_wall` objects for this. Just place these walls to the right side of the right track and to the left side of the left track and you have a tunnel. For normal tunnels, you will find `tunnel_entr`, `tunnel_in` and `tunnel_exit` TSO.

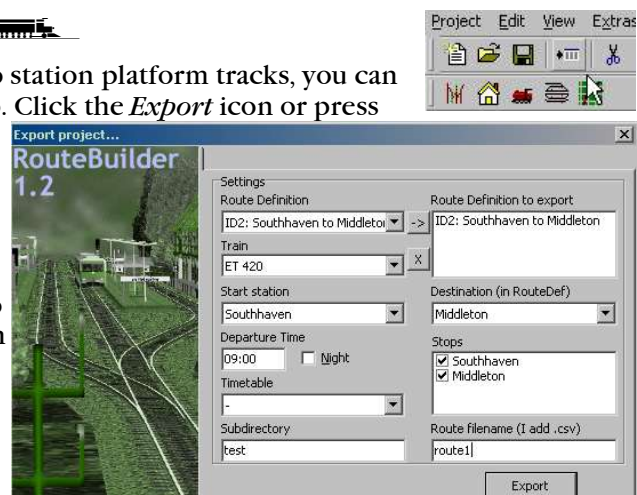
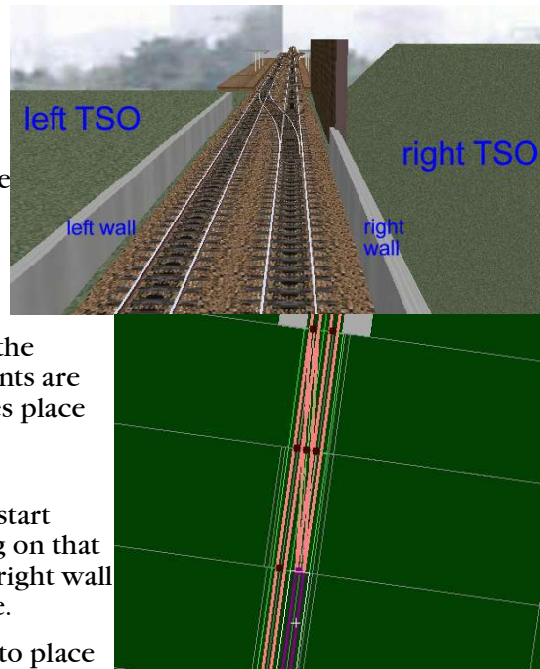
Of course for your individual needs you have to make your own TSO but you can also still use ground objects if you want. We found groundless building a nice trick especially for complex layouts.

## 2.10 Exporting

Once you have at least one route definition and two station platform tracks, you can try your first export. You can also load `tutorial3.rbp`. Click the *Export* icon or press *Ctrl+E*.

In the export dialog, you have to tell RB which Route Definition(s) you want to drive on and from which station you want to start, and where you terminate. And you have to fill the *route filename* textfield. Type in *route1*. This is sufficient if you only want to view your exported route using TrackViewer which doesn't need a train. To drive your route, select a train from the dropdown menu. All trains installed in your BVE directory will be listed. Choose what you like. Check the night mode to make a dark version of your route. RB will try to use night objects if existing (see below) and use black background and black fog to simulate night.

Or just select a predefined timetable and everything will be filled out for you (`tutorial3.rbp` has no timetables).



Then click *export*. After a few seconds RouteBuilder will tell you that it completed the export process. You can have a look at the log window (scroll down to find the number of created freeobjects. Some BVE versions don't support more than 4096), the file list or just close this dialog. Let the checkbox *copy files...* be checked, and everything what is needed is copied to your BVE folder into the subdirectory you selected before.

You can check *run BVE...*, click *Close* and go for it! Or run TrackViewer and select your route.

You see that there is still much to do, so let's start adding some free objects.

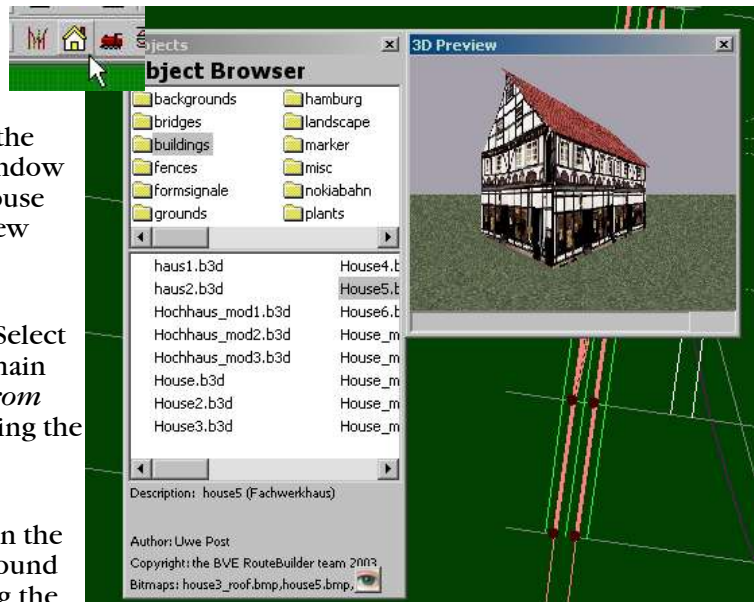
## 2.1.1 Free Objects

Just add some objects to your route. Open the *Objects*-Window. They are organized in categories or folders.

Just click the icon with the eye to preview the object. You can navigate in the preview window very much like in structure viewer with mouse and cursor keys. Please note that this preview cannot display all b3d objects completely accurate and no csv objects at all.

Now insert a free object into your project. Select it from the list, point somewhere into the main window, right click and select *add object from browser*. A yellow frame will appear, marking the area the object covers.

Double click the frame and the *object properties* window pops up. You can type in the vertical offset here and rotate the object around the vertical axis. And of course you can drag the object with your mouse. If you hold down the ALT key, you can rotate the object visually. If you place an object appropriately and export the project, you should see it with TrackViewer or BVE itself.



Remember that the exported BVE route is an approximation to what you create in the RouteBuilder editor. Object positioning is therefore not always exact. Just try.

During export, you can activate the night export mode. If you do this, RB will search for night versions of objects and replace the original ones with them. Night versions have a *\_night* postfix in their name. This means that you have i.e. *lamp.b3d* and *lamp\_night.b3d*. During night, RB uses the last one. Of course it should contain a turned on lamp.

In RB1.2, you can bind objects to connections. This is especially important for signs, lamps and so on. Just activate a connection, double-click an object and click *bind*. Instead of the normal coordinates, you have to type in coordinates relative to point A of the bound connection (point A is the point which becomes pink when you activate a connection). If the track is not fixed and longer than 25m, the object maybe displayed repeatedly in BVE.

Bound objects cannot be edited anymore using mouse clicks. You have to go to the track properties dialog. There you find a bound objects tab where you can edit or unbind the bound objects.

**Important note.** The objects in the base library distributed with RouteBuilder are provided by the RouteBuilder community. You need not ask for permission to use them. Credits with the authors names are automatically created when exporting routes. Never delete their credits or you will be flamed. Of course you need to build your own objects for unique routes. RouteBuilder doesn't help you with that. Get yourself some instructions from the internet, have a close look into the b3d files in our object library and try it. It's not so hard.

## 2.1.2 3D Preview

You will meanwhile certainly have noticed the eye button which is installed in many dialogs. It is always associated to a 3D object. Click the eye and a 3D preview window will show up where you can view the object.



There is a small issue: The 3D engine currently does not handle compressed bitmaps, so object using compressed BMP files won't be displayed correctly. Additionally, a warning is shown.



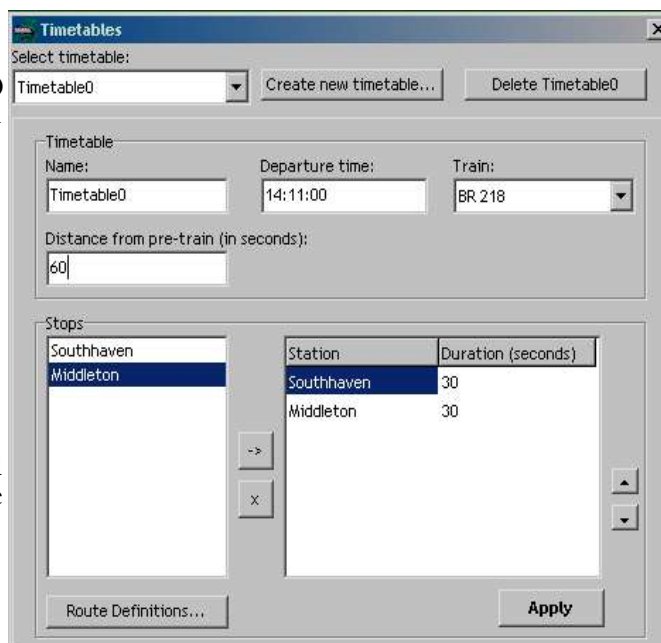
You can move the object in the preview window if you hold down the right mouse button and drag. Do the same with the left button and the camera moves up and down.

You can also use the arrow keys on your keyboard. The left and right key turns the object around its vertical axis, the up and down keys move the camera towards the object and away.



RB allows you to define Timetables for your routes. For example, you can create one timetable called RB31225 (which is a German train number) for one direction of your route, another one called RB31226 for the retour, a RB31227 starting at a different time, and a RE31008 running the same route but with less stops. During export, you just select a timetable and RB does the rest. Of course you have to define the timetables as the first step, and we will now show you how to do this.

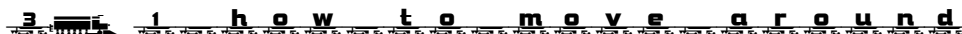
First, bring up the Timetables window (using the main menu or pressing Ctrl+A). First, click *Create new timetable...* to add an empty timetable which will be called Timetable0 initially. Change its name, type in the departure time (the seconds will currently be ignored during export) and select the BVE train from the list.



Now you have to add the stations where the train should stop. Select a Route Definition from the combobox and doubleclick (or use the right arrow) to add a station to the stops list. By default, each stop will be 30 seconds. You can simply change this.

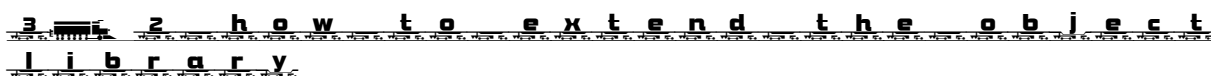
To export a certain timetable, just use the timetable combobox in the export window. That's all! The file tutorial7.rbp has some predefined timetables as examples.

Now you learned the basics. Play around with the program, have a nice day :-)



You already know that you can drag the viewport if you hold down Shift and move the mouse. Another possibility is to click into the overview map (if you have one). Note that the center of the viewport is displayed as a black cross in the overview map. Or you use the scrollbars.

You can also use the stations box in the bottom control bar. Just select a station name and the viewport will jump to it.



When you built your own b3d objects, you have to put them into the object library because only objects

from the library can be added to your route.

Just copy the b3d file and needed bmps to an appropriate subfolder in the object library. RB does not support sub-subfolders currently. Of course you can add subfolders, for example one for each project. Please use reasonable file names for your b3d files. Avoid special characters and spaces. Please consider sending objects of general interest to us to be included in the next edition or update of RB or the object library. By sending those objects to us, you agree to the RB base object library licence which comes along with RB, just have a look into the »About RouteBuilder« dialog. You can also create simple ZIP packages with your objects and make them available for download. On the RB homepage we have a sorted link list for such packages. If you want, we can add a link to your objects package.



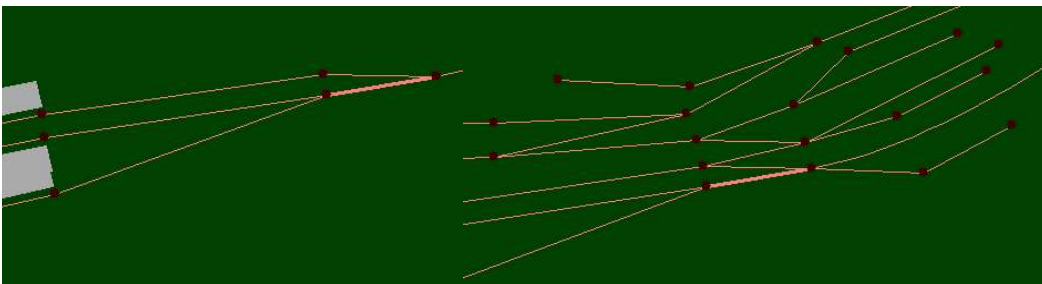
If you want to add your own walls/dikes, tracks, grounds, backgrounds, poles, platforms and roofs, you have to put them into the appropriately named folder so that RB can find them.

You can also use multiple objects. Just input a comma separated list. Currently, the RB GUI hasn't a button for this, so you have to type the list in. Omit the .b3d file extension. Multiple objects use a shuffle mode. This means that, during export, one object of the list is selected by random each 25 m section. This creates more naturally looking landscape.

### h o w t o b u i l d c o m p l e x t r a c k w o r k

Regrettably, routes won't exactly look as you expected when you export them. In most cases you can optimize your layout. Here are some rules and examples.

- simplify your layout. Look at these examples:



They won't work. Use grids for these kind of layout. Load stations from the library and edit them for your needs.

- trackwork needs lot of space:

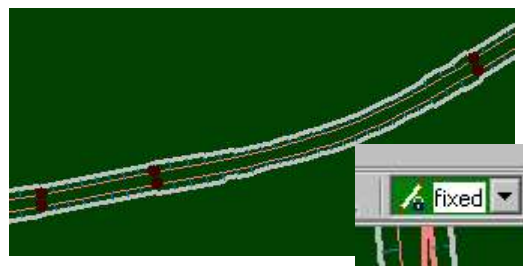


This example is from the RBDemo1, Dahsen main station. It uses grid track layout.

- use the snap-feature: The parallel track distance should be 4m. You can switch on snapping in the options dialog. When you build routes with two or more parallel tracks, create pairs of points.

- when you build a branch-line, the divergence of the secondary track should be not more than 4m on a 25m long connection. Otherwise RB sometimes does not fit the tracks together.

- use »fixed« connections and switch types to force positioning at 25m-borders. Maybe you know that BVE has internal sections of 25m length. All tracks are 25m long in BVE, which is also true for curved tracks. This causes some problems because most of your connections won't be 25m long. Somewhere between two stations this is not a big problem, it is very helpful instead that you don't need to take care. But if you want to build a bridge crossing a river you should define this as fixed track, it also helps when building platforms. Fixed tracks often help when exported routes do not look as expected. Internally, when exporting, RB interpolates straight and curved connections to 5 m long small parts and packs each 5 of them together to make one 25m long BVE track. This can be difficult especially if you have parallel tracks, i.e. beginning walls on one side of each track. When exporting non-fixed connections, this may result in an offset, so in BVE the walls don't begin at the same point. Obviously, fixed tracks are easier to export, because they are always exported as 25, 50, 75... m tracks. Switch connections are always 25m long. By default, all new connections are fixed. You can change that in the editor options dialog.

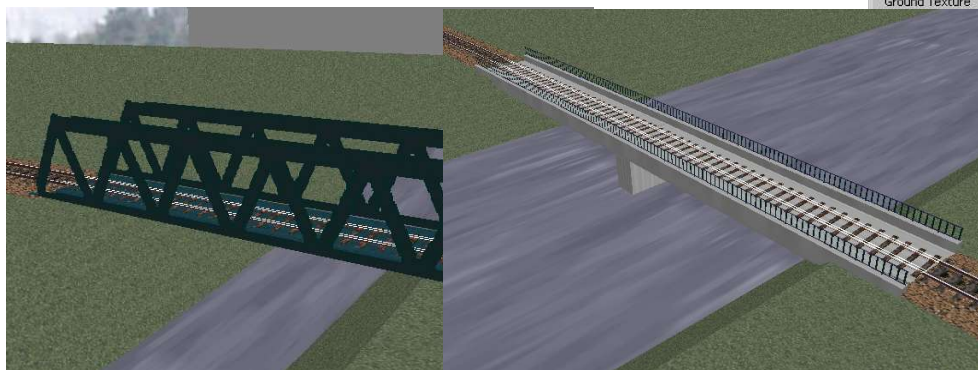
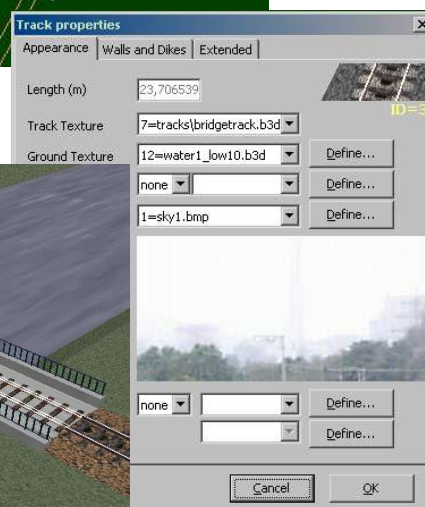
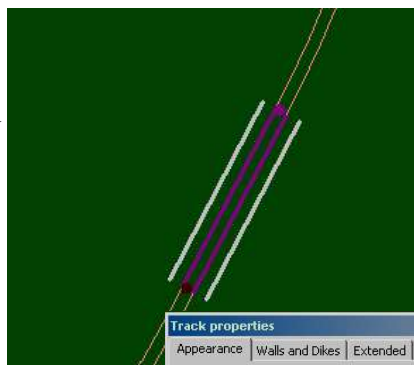


### 3 how to cross a river

You want your route to cross a river?

Of course you can do that with RB. The base library contains some objects for this purpose. As track texture, select the bridge track and *water1\_low10* for the ground (or appropriate lowered TSO with groundless building). *water1\_low10* is a plain water texture which lies beneath the default surface at  $y=-10m$ . This means that the tracks cross 10m above the water. Fix the track and assure that it is 25m long. You can use the »make 25m« feature in the context menu.

The bridge is actually made with walls. You can use the *bridge\_steel* or *bridge\_concrete* walls. Please note that our steel bridges have no pillar, if you need one, create and use a free object or copy and change the wall objects.



You can use the ground *grass3*. It has a built-in dike along the x-axis which normally cannot be seen. These become the river shores.

If your bridge shall be longer than 25m, just extend the fixed bridge track. Also try the *water1\_low5* ground and the *bridge\_concrete1\_fence* walls. You can see on the right how this will look like.

### 3 how to build switches

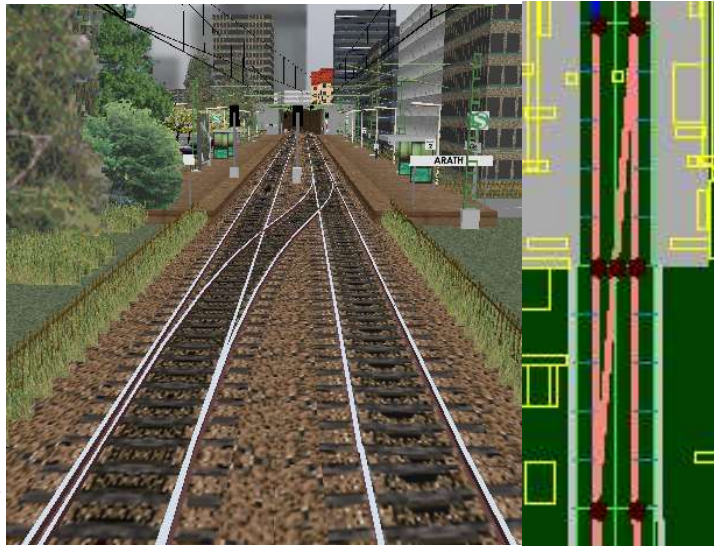
Please use grid tracks to create switches. RB supports fine switches and builds them automatically.



Use the grid tracks as described in [2.6 Using Track Grids](#) to set switches and tracks. This uses the 25 m section layout system of BVE and creates accurate exports. We recommend that you use grid tracks everywhere where switches are needed.

Because of the alignment advantages, grids are also a must at stations with no switches to align platforms and objects properly or sometimes at bridges.

The picture on the right is from the RBDemo1 route and shows how the switches will look.

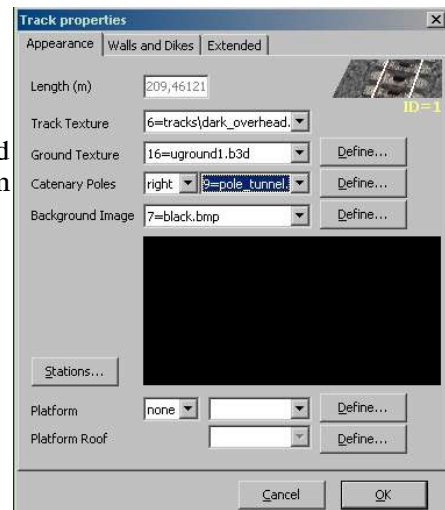
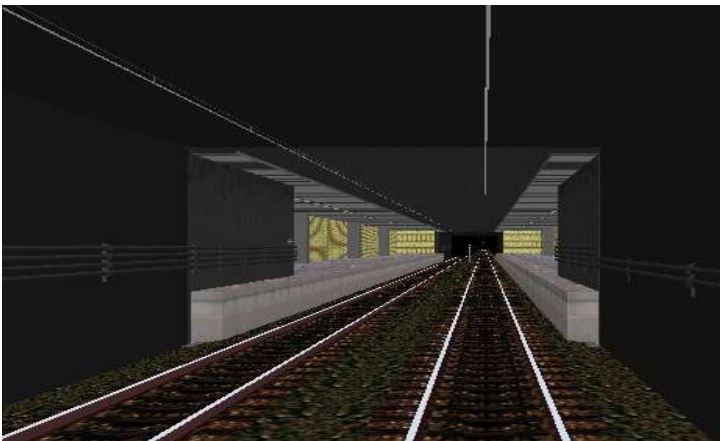


In grid regions, all tracks should belong to grids, even straight parallel tracks some meters away. The areas where grids begin or end can be complicated, additional adjustment may be useful to obtain best results.

### 3.6 how to build an underground

The RB base object library comes with material needed to build underground tracks. First, set the properties of all your connection as seen in this screenshot:

Set the track texture to *dark\_overhead*, it has built-in catenary wire 4.8m above the track. For the ground texture, use *empty.b3d* for groundless building. Get the underground station region from the trackwork library, and get another one, then connect the stations with two tracks. Set *uground.b3d* as walls. Then change the catenary poles to *pole\_tunnel* and the background image to *black.bmp*. This will result in the following scenery:



The file *howto underground.rbp* shows you an example. Like normal routes, you will have to create your own objects to make an interesting underground route, too.

### 3.7 how to use different track types

Maybe you want to use your own track types, for example with third rail or different textures. First, create appropriate *b3d* objects, at least one, containing a straight track from *z=0* to *z=25m* (extend it to about 26m to avoid gaps). The topmost part of the rails should be at *y=0*, crack and crossies beneath.



Save your b3d and textures belonging to it in the tracks-folder of the object library.

Next, bring up the Track Types window from RB's view menu. Note that the Track Types are configured globally for all your projects. You should not change the predefined track types 0 (invisible) through 8 (bridge with overhead).

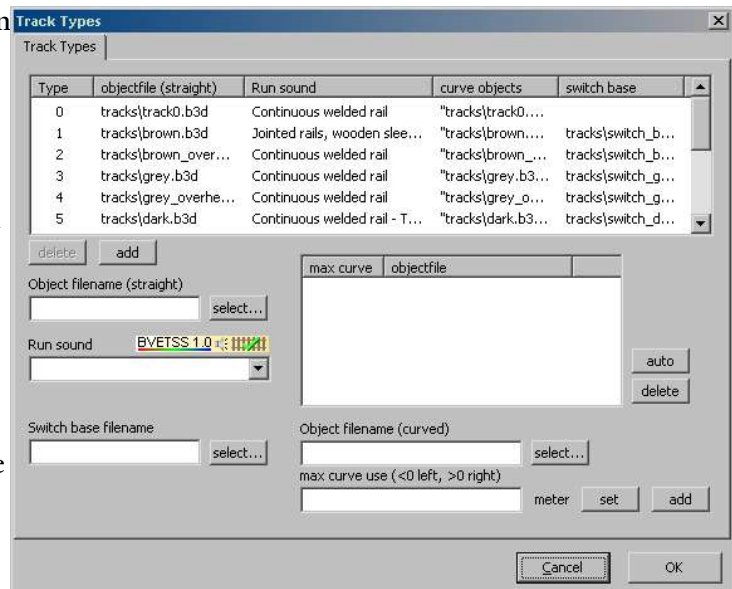
Set the Object filename of the straight track you just created and select an appropriate run sound, then click »add«. Now you can select your new track type for any of your connections in the track properties dialog.

If you want to have smooth curves, you have more work to do. First, create smooth curved track objects using a tool like *Switch* (the RB plugin currently doesn't create curves). Create left (curve use less than 0)

and right curves (bigger than 0), for example for curve radii like 150, 500 and 1000 m (this is the case for the base library tracks). When exporting, RB uses one of these objects as needed: for radii up to 150m, the 150m-curved track will be used, for radii from 151 up to 500m the 500m-version will be used, from 501 to 1000m the 1000m-version and above 1000m the straight track will be exported.

If you want to use fine switches created by the Switch Addin for RB, type in the Switch base filename. Have a look at the existing switch objects to find out how the files have to be called: first, the string »\_overhead« is attached if there is catenary above the track. Next, the letter L or R is attached for the direction of the switch (left or right), then another L or R is appended depending if the train runs left or right.

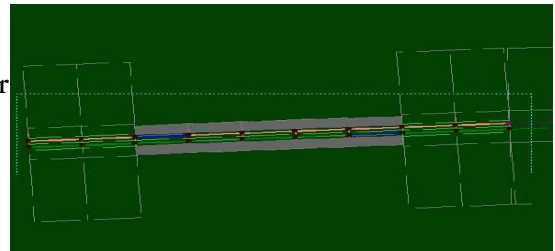
The auto button assigns appropriate radii to all curves in the object list resulting from their filenames.



### how to use the area tool

On the toolbar, you can see two light blue buttons which help you define a working area. Just set the cursor somewhere and click one of the buttons, then set the cursor to the opposite area point and click the other button. By this means, you define an area for object replacement or other features of RB.

Check out the replace, move everything and change property dialogs. You find them all in the extras menu.



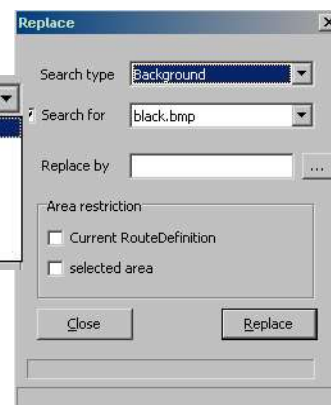
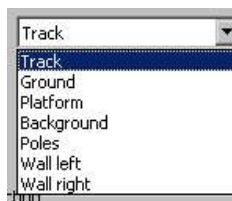
### how to set signals

RB 1.2 supports BVE standard signals. Signals are always bound to a connection. To set a signal, open the track properties dialog for a connection. You can set signals in both directions. Right click on a signal image and select *new signal*. You can choose between block signals, exit signals (at the end of a platform) and home signals (when approaching a station). If you want non Japanese signals, use a program like BRR (<http://koti.mbnet.fi/lopomo/trainsoft>) to exchange BVEs signals by custom signals. RB makes use of them automatically. Signals in BVE are a quite complicated topic. We recommend that you use exit signals with 3 aspects and block signals with 2 aspects. You also need a signal at the destination station. This is because the last signal is always red. If the last one is before the station, you won't be able to enter it.

### 3.10 how to replace objects

You can replace object types like brown tracks by different one, i.e. grey tracks. First, select the search type: Track, Ground, Platform... then, select which objects shall be replaced and by which other ones. By this means, you can change ground, background etc. for the complete project.

You can restrict the replacing mechanism on the selected area or on the currently selected route definition.



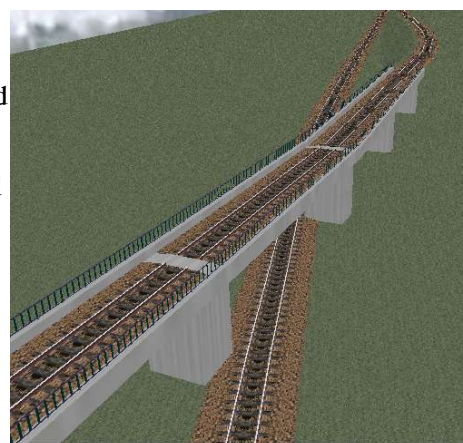
### 3.11 how to go up and down

You can create tracks at different heights using RB. However, this system is not perfect yet and maybe changed in the future.

Main problem are secondary tracks which often have steps instead of pitch. But you can build one track gradients. Change the height on the track dialog's extended tab about 0.1m per 25m section. Use groundless building because a pitched secondary track would be covered by a ground object.

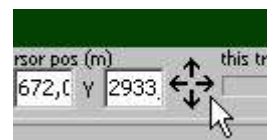
Regrettably, due to restrictions of BVE, secondary track objects cannot have pitch, which makes this feature nearly unusable. We hope that BVE3 will allow pitched freeobjects.

As I said, you will notice that exporting tracks with different heights does not work very well yet. You will have to try different layouts until it fits your needs.



### 3.12 how to fine tune

You may have noticed four arrow controls in the bottom bar. When a point or a freeobject is active, you can move it by small amounts using the arrows. The value for the steps normally is 25cm and can be configured in the options dialog.



### 3.13 how to make an addon

RB currently features an addon interface version 1.1 which is not compatible to version 1.0. It's quite simple to develop your own addon, but there are not so many things the addon can do with RB yet. This is mainly due to the fact that we for ourselves don't know what could make sense. If you have any idea, just tell us.

You can make your own addon if you have some basic programming knowledge and an development environment capable of producing a native windows DLL like Visual C++ or Delphi. You just need to make a DLL with certain function exports and put the DLL in the *addons* directory in the RB folder. RB will notice the DLL at startup and make it accessible in the addons menu.

A simple SDK (software development kit) can be found on the RB developer homepage. You need SDK version 1.1. It contains a Delphi unit *RBAddonInterface* with some basic definitions. You can easily translate it into C if you want. The SDK also contains a small example.

Your DLL has to export and implement two functions:

```
function RBAddonInit(_addonIn: PRBAddonIn; _addonOut: PRBAddonOut): boolean; stdcall;
```

```
function RBAddonRun(): boolean; stdcall;
```

In C this would look as follows:

```
BOOL RBAddonInit(PRBAddonIn _addoIn, PRBAddonOut _addonOut);
```

BOOL RBAddonRun();

On startup, RB calls RBAddonInit for each addon found. While \_addonIn points to a structure with some information about RB, the addon has to fill the \_addonOut structure before returning true. If something went wrong (i.e. RB addon interface version too small), return false, and the addon will be unloaded.

When the user starts the addon, RBAddonRun is called.

The addon can call a support function within RB using a pointer in the \_addonIn structure. Depending on the function parameter, the support function returns some information, for example the object directory path or the project name. This will be extended in the future.

## 3 - 1 4 h o w t o m a k e R B s p e a k y o u r l a n g u a g e

RB has built in multi-language support. This is not completed yet. Most of the visible controls can be translated, but currently most popup windows can't. We are working on it. Currently, RB supports English as native language and German (translation).

You can translate RB resource strings quite easily. Find the file english.lng, save it as yourlanguage.lng and translate everything what is written on the right side of the = signs. One exception: don't change the line lObjectpath=)objectpath(.

You should also add the lines

Author=your name

and

Email=your@mail

to the Language section so you are shown in the credits window on each RB where your language file is installed.

When you restart RB, you will be able to select your language using the language menu.

If you think that your translation is complete please send the lng file to us so we can add it to the next RB update.

## L i n k s

RouteBuilder Homepage, check out for news and updates:

<http://routebuilder.bve-routes.com/>

Technical information, routebuilding and support forums:

<http://routebuilder.bve-tools.com/>

BVE homepage:

<http://mackoy.cool.ne.jp/>

BVE Route database (you can submit your route information when it is finished and published):

<http://bve-routes.com/>

German railsim forum including route building with RB:

<http://loksimulatoren.de>

Have fun!

Thomas

Uwe