Tutorial - Replacement of MSTS-Standardtracks into the DBTracks-Tracksystem

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DBTracks: Copyright © by Norbert Rieger, 2013

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A) Introduction

In order to replace the slightly plain MSTS-Standardtracks into more realistic shapes and textures, our already deceased colleague Norbert Rieger started to develop an entire new tracksystem for the MSTS in 2008.

Norbert Rieger has constructed a great amount of different tracksystems for german routes. Also the construction of some US-tracksystems for american routes has been started, but alas never finished.

For a lot of routes the optical appearance has been immensely improved by this tracksystem called „DBTracks“.
These tracks are OpenRails compatible and therefore are an important part in the continuity of MSTS-built routes.

Due to the early death of Norbert Rieger the entire compendium of Xtracks elements could not be completed but the standard track sortiment is fully available so that most of the Payware-Routes can be transformed into DBTracks.

Unfortunately only a couple of Payware-Routes have been equipped with DBTracks and in most cases an update has not been provided so far (and probably never will).
So in order to enjoy these wonderful tracks, the user has to do the replacement by himself.

Norbert Rieger has provided a small tutorial on his own website during his lifetime.
His tutorial and all other published information are of course still valid and should not be questioned in any way with this work.
During the year 2017 I transfered a lot of tracks by myself and as an „advanced rookie“ in this field I collected all my experiences.
There are so many specialities in existence that are not described anywhere, except in a loose form over various forums.

This tutorial is primarily aimed at beginners so that everyone can solve the task of a transformation.

Of course this tutorial can't be 100% complete but it's the result that counts.

A few words of advice:

- Using this turorial occurs at your own risk. There will be no liability for any damages on Soft- or Hardware.
- The handling and usage of the supporting programms and utillities are not part of this tutorial. These information are provided in seperate documentations.

Many thanks to Richie for the review of this manuscript.

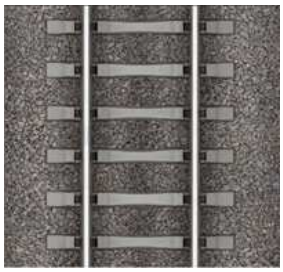
B) General DBTracks information

DBTracks are available in different sets.

A full overview of all sets is available on the webseite www.dbtracks.de .

This tutorial only introduces the most common sets.
The Prefixes „DBn...“ have a significiant role for the replacement-process.

1) DB1 (New concrete ties, gray gravel)



Important sets: 'DB1' (without catenary); 'DB1f' (with catenary)
Complete set available.

2) DB2 (Old concrete ties, brown gravel)

Important sets: 'DB2' (without catenary); 'DB2f' (with catenary)
Complete set available.

3) DB2 (Old wooden ties, brown gravel)

Important sets: 'DB3' (without catenary); 'DB3f' (with catenary)
Complete set available.

4) DB4 (Old steel ties, brown gravel)

Important sets: 'DB4' (without catenary); 'DB4f' (with catenary)
Complete set available.

5) DB1z (New concrete ties with LZB-Cable, gray gravel)

Always with catenary.
Incomplete Set.

Additional sets for the Hamburger S-Bahn, Y-Ties and various Tunneltracks are also available.

C) Requirements

For a replacement into DBTracks, the following utilities are required or recommended:

- a texteditor with a powerful „Search-Replace“-functionality (e.g. „Notepad++ or „NoteTabLight“)
- the program „Dynatrax Version 0.62“
- the program „RouteRiter“
- the OpenRails-Trackviewer from the Tools-Menue
- the current version of Goku's Trackeditor „TSRE5“ (OpenRails only)

Additional tools for the adjustment of the track-altitude:

- TSUtil
- Java

A little disclaimer:
There might be numerous other ways to perform this replacement.
But in order to keep this tutorial in an acceptable size, I limited the description to the way I had the best experience with.
Furthermore, it should be suitable for beginners.

D) The first steps

Should a route be prepared for a transformation, the following first steps must be taken:

1) **Backup-copies!**

   This warning may sound banal, but it is essential.
   Editing files with a Texteditor can be dangerous and it is always a good feeling to have backup-copies as a fall-back so that you can start from scratch if something goes wrong.

   It is important that all the „World“- files are secured.
   All „World“- files can be found in the sub-directory „World“ within the route-directory.
   „World“ - files have a „*.w“ at the end of the filename.

2) **What should be replaced?**

   Before the start of the replacement, some thoughts should already have been invested how the result should look like:
   Which track-sets are necessary (Concrete-, wood- or steelties)?
   Is it a route with catenary or without catenary, etc.?

   The most common sets are already introduced in chapter „B) General DBTracks information“.

3) **Transfer of all necessary files**

   In order to use the DB-Tracks in a route, some basic files must be copied into specific folders and directories.
   All necessary files are available for download on Norbert Rieger's website.

   A basic rule:
   The shape-files will always be provided from the central 'Global'-folder, which can be found in the main TrainSimulator-directory.
   The texture-files are always placed in every single Route-folder of each route, prepared for DB-Tracks.

   Shape-Files:
   The entire shape-set must be copied into the following path:

   „Train Simulator/GLOBAL/SHAPES/DB“
   The sub-folder „DB“ must be created, if not present.

   Texture-Files:
   All necessary texture-files must be copied into the „TEXTURES“-folder of the specific route-directory.
   Within the „TEXTURES“-folder is an existing sub-folder „Snow“ for the snow-textures. All snow-textures must copied into this one as well.

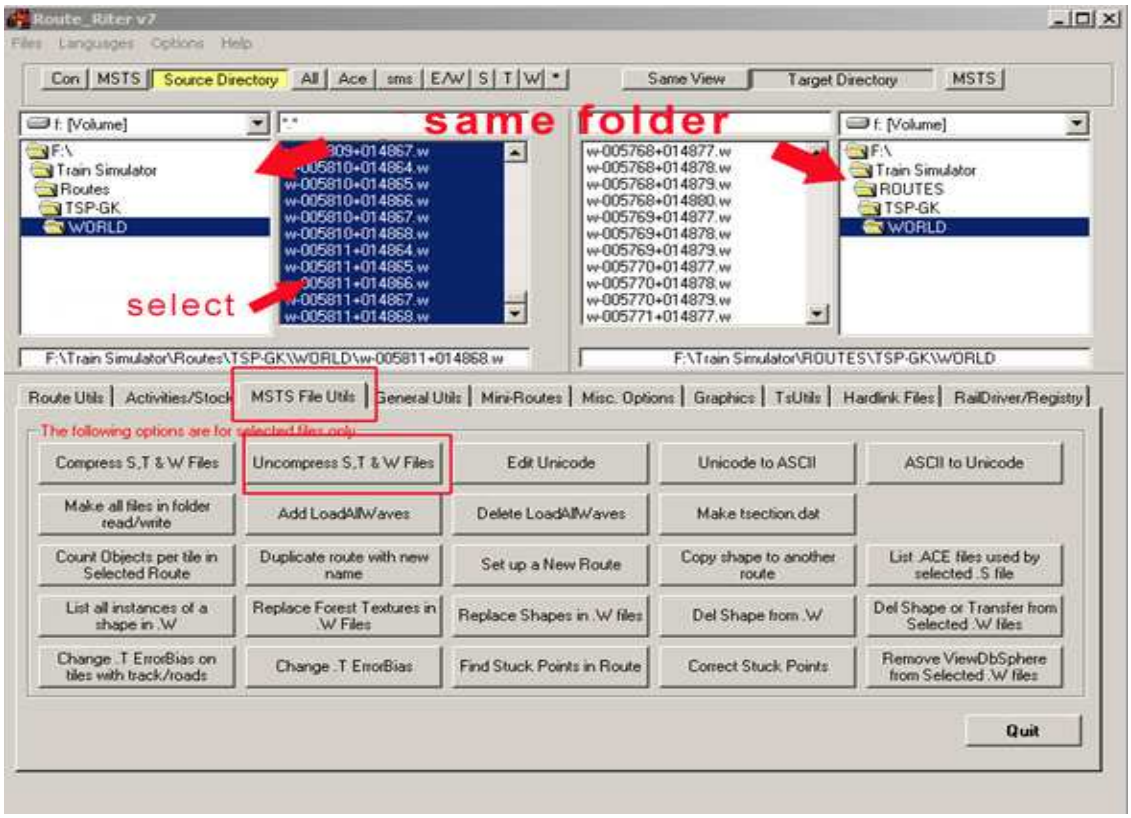
4) Decompression of World-files

Usually all world-files within a route are data compressed. In order to read and alter them with a texteditor, the files must be decompressed.
The program of choice for that process is „RouteRiter“.

Proceedure in RouteRiter:

1. Select Route
2. Confirm Route-selection
3. Disable write-protection
4. Double-click on world-folder
5. Click on the „W“-button. Now only the *.w-files are shown
6. Mark all *.w-files by pressing the keys „Strg-Shift-End“
7. Activate the button „Same View“. The Source Directory will be copied into the Target Directory on the right side.
8. Open the program-folder „MSTS File Utils“.
9. Activate the process with a click on the „Uncompress S,T &.W Files“ button.
10. After confirmation of the noticfication, the decompression will be initiated. This process may take a couple of minutes.

The decompression was successful when all the w-files now have a larger file-size and are readable when opened in a texteditor.



5) General information: Track-entries within the world-files

Basically all track-entries are found within the world-files in the sections named „TrackObj“. The structure of these sections is build as follows:

```
TrackObj (
        UiD ( 2169 )
        SectionIdx ( 3 )
        Elevation ( 0 )
        CollideFlags ( 551 )
        FileName ( A1t250mstrt.s )
        StaticFlags ( 00200180 )
        Position ( -517.498 167.315 -703.27 )
        QDirection ( 0 0.920493 0 0.390759 )
        VDbId ( 4294967294 )
        StaticDetailLevel ( 0 )
```

The type of the used track is specified by the entry „FileName“. This entry always refers to the specific shape-file (file names ending with '*.s')

Caution: „TrackObj“ also defines street-elements as shown below. But these are irrelevant for the replacement.

```
TrackObj (
        UiD ( 2377 )
        SectionIdx ( 133 )
        Elevation ( 0 )
        CollideFlags ( 551 )
        FileName ( Road2L45deg.s )
        StaticFlags ( 00200100 )
        Position ( -32.9279 163.629 -235.057 )
        QDirection ( 0 0.966507 0 0.256639 )
        VDbId ( 4294967294 )
        StaticDetailLevel ( 7 )
```

The entry „UiD“ is a unique identification of the track and plays an important role in the manual replacement of tracks (see chapter „H) Mixed tracks“).

E) Replacement of the regular tracks

There are three questions to be answered before the start of any replacement activities:

1) Does the route contain any tunnels?

2) Does the route has shape-files instead of tracks (a common issue with ProTrain-routes)?

3) Are there different track sets within one tile?

Re. 1): If there are tunnels built in a route, things might get a bit complicated.

To verify if there are any tunnels built in your route it is recommended to load all world-files in your texteditor and start a search for file-elements which contain the fragment „Tun“ (using the „Search“-function of your editor). All hits must be in the section „TrackObj/FileName“ again:

```
FileName ( A2t10mstrtTunBw.s )
```

Tunnel elements must not be changed or replaced.

Re. 2): Especially routes desigend by ProTrain are characterized by the use of „Track-Shapes“ instead of the standard tracks.
Nobody knows the deeper meaning of this „feature“ but it causes an additional step during the transformation into DBTracks.

It is necessary to verify if Track-Shapes are included in the route.
Using the „Search“-function of the texteditor, all world-files should be scanned for elements which look similar like this:

```
TrackObj (
        UiD ( 739 )
        SectionIdx ( 218 )
        Elevation ( 0 )
        CollideFlags ( 551 )
        FileName ( "..\\..\\routes\\pt-fuw\\shapes\\A1tPnt10dLftMnl.s" )
        StaticFlags ( 00200180 )
        Position ( -907.861 179.9 -741.988 )
        QDirection ( 0 -0.857203 0 0.514979 )
        VDbId ( 4294967294 )
        StaticDetailLevel ( 0 )
```

Again these elements could be found in the section „TrackObj/FileName“ and have additional path-information, depending on the used route (in this case „pt-fuw“ is the ProTrain route 'Fulda-Würzburg').

If any tunnel and/or shape-elements are present, please refer to chapter „F) Special Features: Shapes and Tunnelshapes“ first !

Re. 3): Some routes have different track sets within one tile.
For example there are tracks with and without a catenary, normal tracks and LZB-tracks, etc.

A highly recommended tool is the Trackviewer which can be found in the OpenRails -Toolbox.

Here you can check the relevant 'mixed tiles' and decide which track-set is the dominant one.
The most common track-set will be transferred with the method introduced in this chapter, the remaining track(s) later in the chapter „Mixed tracks“.

An example: there is a large station with normal concrete tracks within a tile and a one tracked line with wooden ties and no caternary branches off into the country.
In this case it is recommended to transfer the entire tile with the normal concrete tracks and to alter the „country-line“ afterwards.

The actual transformation can start as soon as the above mentioned points are all settled.

Basically the transformation is quite easy but it still can produce some serious faulty results by an inaccurate handling during the replacement issues.

Therefore the famous question again:
Are there back-up copies of all world-files?

For the transformation an extended file-description in the line „FileName“ must be generated, which refers to the DBTracks Shape-files within the global folder.
For example:

```
TrackObj (
        UiD ( 2169 )
        SectionIdx ( 3 )
        Elevation ( 0 )
        CollideFlags ( 551 )
        FileName ( A1t250mstrt.s )
        StaticFlags ( 00200180 )
        Position ( -517.498 167.315 -703.27 )
        QDirection ( 0 0.920493 0 0.390759 )
        VDbId ( 4294967294 )
        StaticDetailLevel ( 0 )
```

As an example the standard entry

'FileName (A1t250mstrt.s)'

will be converted into the DBTrack-set with old concrete ties and catenary.

'FileName (DB/DB2f_A1t250mstrt.s)'

The result can be reached fast and quite comfortable with the 'Search-Replace' feature of the Texteditor.
All world-files can be loaded into the editor in one go and treated with the replace feature.

But whilst working with the 'Search-Replace' feature of the texteditor, a couple of very important rules must be considered:

- Only distinct entries should be replaced. Sometimes that is quite tricky. But replacing the tracks with the following text-string (for example the concrete track with catenary...'DB2f') proved to be successful:

Replacement of

FileName (A1t

into

FileName (DB/DB2f_A1t

This step must be repeated with all track-elements ('A2t', 'A3t' and 'A4t').

- Careful with spaces. Between the brackets and the text is always a 'space'-charakter. If this is removed out of carelessness, problems will later arise for sure.

Don't forget to save the files and the first step is done.

Important advice:
While using this method, all the tunnel-elements will be extended with this string either. Since not all variants are equipped with a complete tunnel track-set, the shapes will be missing during the game.

If the following variants of the new DBTracks 'DB1', 'DB1f', DB1s', 'DB10', 'DB2', 'DB2f', 'DB20' DB20f', 'DR2' or 'DR2f', are **not** affected, the additional extension must be manually removed from the tunnel-elements again.

The string „Tun“ must be searched and the above mentioned extensions must be manually removed on every hit again.
So far I have not discovered a proper way of doing this with the 'replacement'-function.

F) Special features: Shapes and Tunnelshapes

Especially routes desigend by ProTrain are characterized by the occasional use of shapes instead of the standard tracks.
But it is quite easy to solve this problem by using the 'Replace'-feature in the text editor again.
This time two steps are necessary:

Deletion of the existing path entry by using the Replacement feature.

For example the original entry looks like this:

```
FileName ( "..\\..\\routes\\pt-fuw\\shapes\\A1tPnt10dLftMnl.s" )
```

Replacement of

```
FileName ( "..\\..\\routes\\pt-fuw\\shapes\\A
```

into

```
FileName ( A
```

But there is still the problem that there is a quotation mark following the „.s“.
This will be solved again with an replacement.

Replacement of

```
.s" )
```

into

```
.s )
```

Caution:
Between the 's' and the bracket is always a space. This must not be deleted.

And another caution:
Unfortunately ProTrain released some routes where tunnels are built as shape-elements as well.
Tunnel-elements with such an entry as shown below must not be altered. Again, these must be corrected manually after the above replacement.
Tunnel-elements carry the additional string „...Tun...“ in the file name.

```
TrackObj (
        UiD ( 8 )
        SectionIdx ( 123 )
        Elevation ( -0.008 )
        CollideFlags ( 527 )
        FileName ( "..\\..\\routes\\pt-fuw\\shapes\\A2t10mstrtTunBw.s" )
        StaticFlags ( 00200180 )
        Position ( -310.448 213.712 144.377 )
        QDirection ( 0.003538 0.434067 0.001705 0.900872 )
        VDbId ( 4294967294 )
        StaticDetailLevel ( 0 )
```

Here I have not discovered a way of doing this with the 'replacement'-function either.

G) Transformation of the Dynamic Tracks (DynaTrax)

Various routes contain the so called 'DynaTrax'.
These are individually shaped track parts which do not belong to the standard set and must be transformed into DBTracks as well.

To do this, the program „Dynatrax“ is required.
This program transforms DynaTrax into Shape-files, so that these can adapt the new DBTracks-Textures.

The following steps must now be performed.
It is expected that only one track set is used within the route.
In case of mixed tracks only the prevalent track set will be transformed in the first step.

1) Select route in DropDown-menue „Route“

2) In the DropDown-menue „Package“ the DBTracks named „NR DB Track Basic“ must be selected

3) The favoured DB-Track must be selected in the DropDown-menue „Track Profile“.

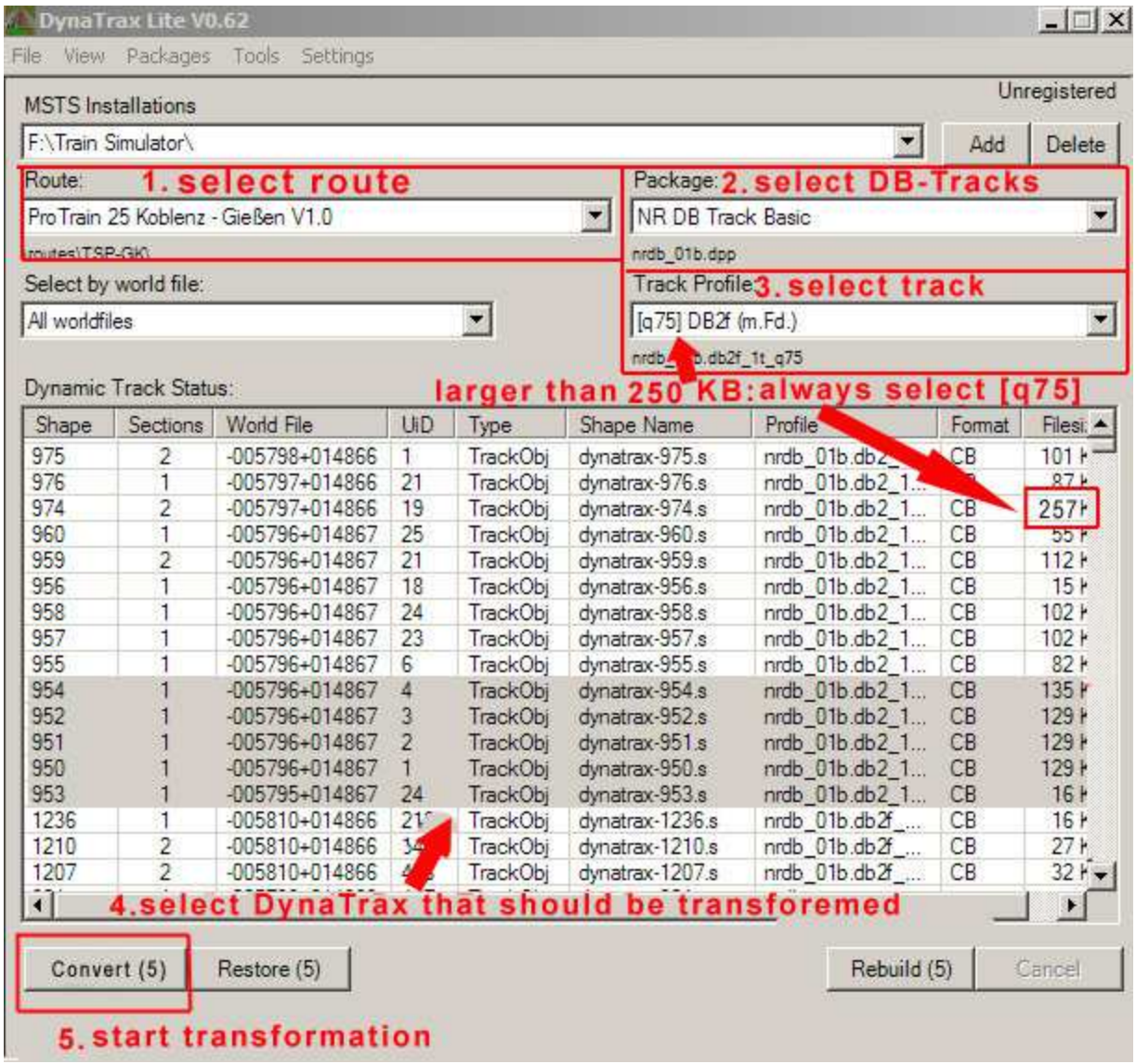
4) Select / mark all DynaTrax that should be transformed.

5) The button „Convert“ starts the transformation. The transformation can take a couple of minutes.

Note to 3): **(the following infos are not necessary while using the route in OpenRails)**

The value in the brackets represents the shape-quality of the standard tracks.The highest possible value is [q200].

DynaTrax-elements larger than 250KB (as shown in the column „Filesize“ on the right), must not exceed the quality-level of [q75] during transformation. Otherwise some graphical gaps within the tracks will occur when used in the MSTS.
Personally I transfer all tracks using the value [q75]. In my opinion there is no visible quality loss during gameplay.



The „Restore“-Button re-converts all marked elements into the original DynaTrax format. The „Rebuild“-Button allows a convertion from an existing DynaTrax into another DynaTrax-profile.

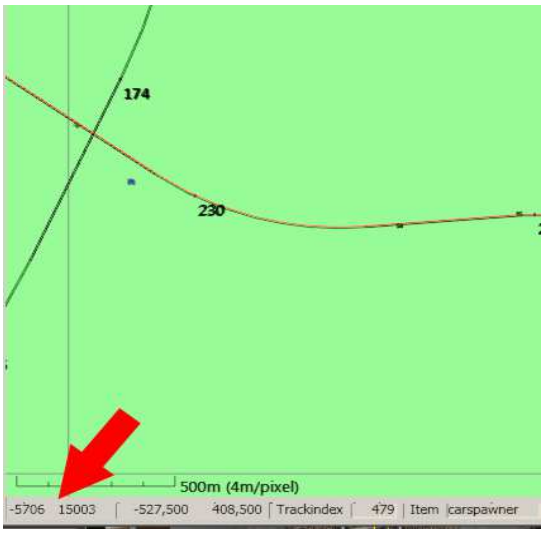
H) Mixed tracks

Some tracks may contain different track sets within a single tile...tracks with and without a catenary, LZB-tracks, standard tracks, etc.

But by using the above mentioned replace-method in chapter E), all tracks will have the same texture.
Therefore it is necessary to replace the differing tracks 'by hand'.
By looking into the world-files you can not identify the position of the different tracks, so the specific tile must be opened and checked with a route-editor.
To do this, Goku's route-editor „TSRE5“ is highly recommended (OpenRails only).
This program is available for download from the following webside: „http://koniec.org/tsre5/“.

The following proceedure is recommended:

1) **Open the track-Viewer in the OpenRails-tools**
   Once the route is loaded, move the mouse into the desired tile. The tile-identification is shown on the below left side. This identification-number is also the name of the world-file.



2) **Open the Route-editor „TSRE5“**
   You can move directly into the tile by entering the tile-identification in the Navi Window and using the button „Jump“. Now you are in the tile and you must search the tracks (look around for the yellow lines). The tile borders itself are identified with red lines.

3) Identify tracks

The button „Select“ is activated in the track-editor and the specific track is selected by a click on it with the left mouse button. The unique identification-number is displayed within the field „UID“ in the upper left corner. In the field „FileName“ it is visible, if this track is a regular track or a DynaTrax-element.

A normal track-segment can be changed immediately in the texteditor by searching the UID in the specific world-file and by changing the entry „FileName“ in the section „TrackObj“ to the desired DB-Track (as shown on page 11).

In case of a DynaTrax-element the UID should be seprately noted and changed later with the programm „Dynatrax“ (as described in chapter „Transformation of the DynaTrax).

It is a bit of work but it is worth it..

I) Adjustment of track altitude

It may be possible that after the transformation into DBTracks all the new tracks are either floating or dug deep into the ground.
In this case the altitude of the tracks should be corrected.

Important: this adjustment must only be initiated when all transformation processes up to chapter H) are executed.

The easiest way for an adjustment is the use of a selfmade Batch-File.

To do this, the following lines must be copied in a new texteditor sheet:

```
@echo off
C:
cd "F:\"

"C:\Program Files (x86)\Java\jre1.8.0_151\bin\java.exe" -Xmx256m TSUtil -le:\_mveobj.log mveobj -t -w "F:\Train Simulator\ROUTES\PT-FU" 0 +0.15 0

ECHO ----------------------------------------
PAUSE
```

The following colored entries must be individually amended:

= Drive with the installed route

= Path leading to Java-installation (must be changed after a Java-Update)

= Path leading to the route-installation

= Altitude in centimeters (+/-). After the first transformation the value of „+0.15“ is recommended.

After these amendments the file must be saved as a Batch-file with a „.bat“ at the end of the file.

Furthermore the programm TSUtil must be installed. It is essential that the existing „classes“-folder is copied into the Java-directory.

The following steps are necessary for the actual adjustment:

1) **Use of the correct „tsection.dat“**
   During the adjustment of the track altitude, the original „tsection.dat“ must be present in the folder „TrainSimulator\Global“. It can be identified on the basis of its filesize being 156 KB. (Applies only for routes with MSTS-standard-tracks!
   Otherwise the tsection.dat which has been used to build the route must be referenced.)

2) **Execution of the Batch-file**

3) **Copy of the new files in the correct directory**
   After the adjustment-process the folder „NewRoute“ will be automatically created in the basic route-directory. All the included files must be moved/copied to the correct places in the route-directory. The existing files will be overwritten:
   - new world-files (to be copied into the world-folder)

- new path-files (to be copied into the path-folder)
- new files (to be copied into the main route folder)
- new Lo_Tiles-files (to be copied into the Lo_Tiles-folder)

After that, the original „tsection.dat“ can again be replaced with a newer version.

J) The last steps

Just three final steps to do and the transformation is complete:

1) Correction of point-animation
   Sometimes the points/switches within a route are not animated. This can be corrected with the program RouteRiter using the button „Correct Stuck Points“ in the „MSTS File Utils“ sheet.

2) Re-compression of the world-files
   All world-files should be compressed again. The proceedure is similar to the decompression as described in chapter „First steps, No. 4)“. Only this time the button „Compress S, T & W Files“ must be selected.

3) WS-files can be moved in the world-folder again, in case they have been removed during step one.

And now you can enjoy the new optical sensation !