Carrera track diorama

Construction time End of February until end of April 2023 - approx. 70-80 working hours

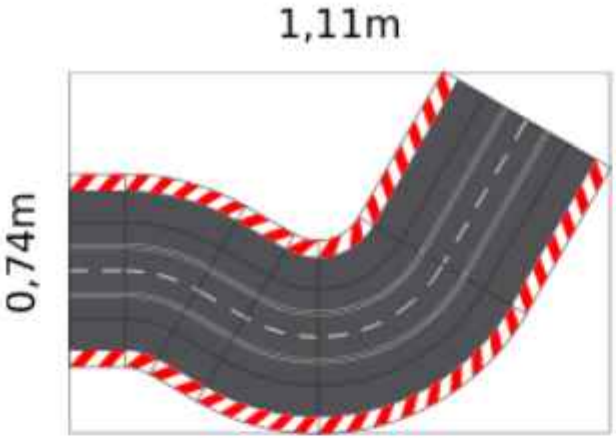
Task:

Creating a module of a carrera track with landscape in the size of about 1 m² so that it can be carried by one person in terms of size and weight.

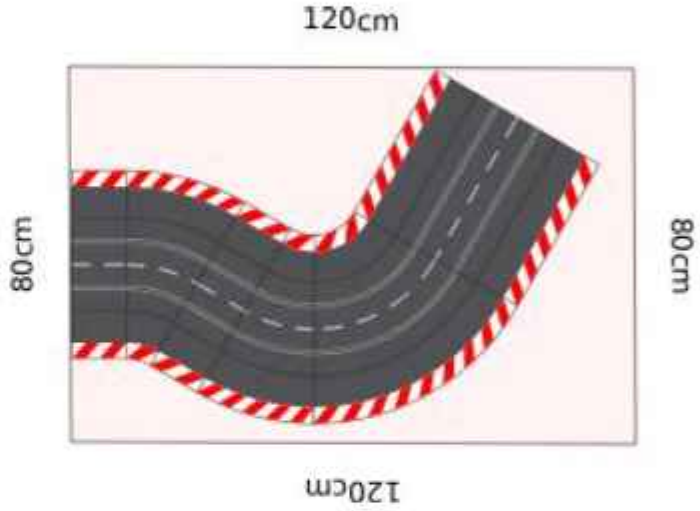
Individual topics:

- *Track surface* should contain realistic light grey with colour nuances and darker ruts (tyre wear) as well as white side stripes for bordering.
- Curbs should be raised and painted red/white and have weathering marks.
- *Guard rails* should be made of metal with as realistic a profile as possible. The associated posts should preferably be made of metal and have an H-profile.
- *Rocks* should be rich in structure and variety and show nuances of colour and surface.
- *Soil* off the runway is to resemble natural soil and *revegetation* is to be done with electrostatically applied artificial grass of varying heights and colours. Weeds and woody plants are to provide additional diversity.

Rail outer dimensions:



External dimensions of the multiplex board (with border at the bottom and on the right for more space for landscaping):



Carrera tracks and edge strips:

2x 1/3 Straight, 11,5cm

2x Curve K1, Radius 39.6cm, 30°

1x Curve K1, radius 39.6cm, 60°

1x standard straight, 34.5cm

1x edge strip K1 outside, 60

2x edge trim K1 outside, 30°

4x edge strips 1/3 straight

2x edge strip K1 inside, 30

1x edge strip K1 inside, 60

2x edge strips standard straight (replaced here by 8 mm Styrofoam panels)

Building the curbs:

I was inspired to create the curbs by Sascha Burge (http://burge.de/curbs.html), who first introduced me to the possibilities of acrylic modelling and has great instructions on his website. However, since I couldn't achieve good results with freehand modelling, I cut a template out of a plastic card (similar to an EC card) and used it to peel off the acrylic. Here are the individual steps.

The lane locks on the Carrera edge strips are fixed to the underside with the hot glue gun.

The joints on the top are fused with the soldering gun .

The burrs are ground flat with the Dremel.

The transitions are filled (e.g. with Airo UNIPOL Universal Polyester Filler) and then sanded with wet sandpaper.

Tape the shape of the curbs according to the size of the template. Determine the length of the curbs according to the size of the later white/red surfaces. I have already marked these areas with a curve ruler.

Apply the acrylic evenly with the gun. Apply a little higher than the height of the later curbs, otherwise you will still see the transitions between the individual acrylic sausages after removing them with the stencil. Then remove the acrylic with the stencil.

When peeling off the acrylic, flatten both ends of the curbs a little and then apply white paint directly with a brush (e.g. full and tinting paint Alpina COLOR) and thus smooth out any transitions. This paint partially cracks as it dries, creating a natural weathering effect. If you do not want this, you can let the acrylic dry first and then paint it with a white acrylic paint or leave the acrylic untreated.

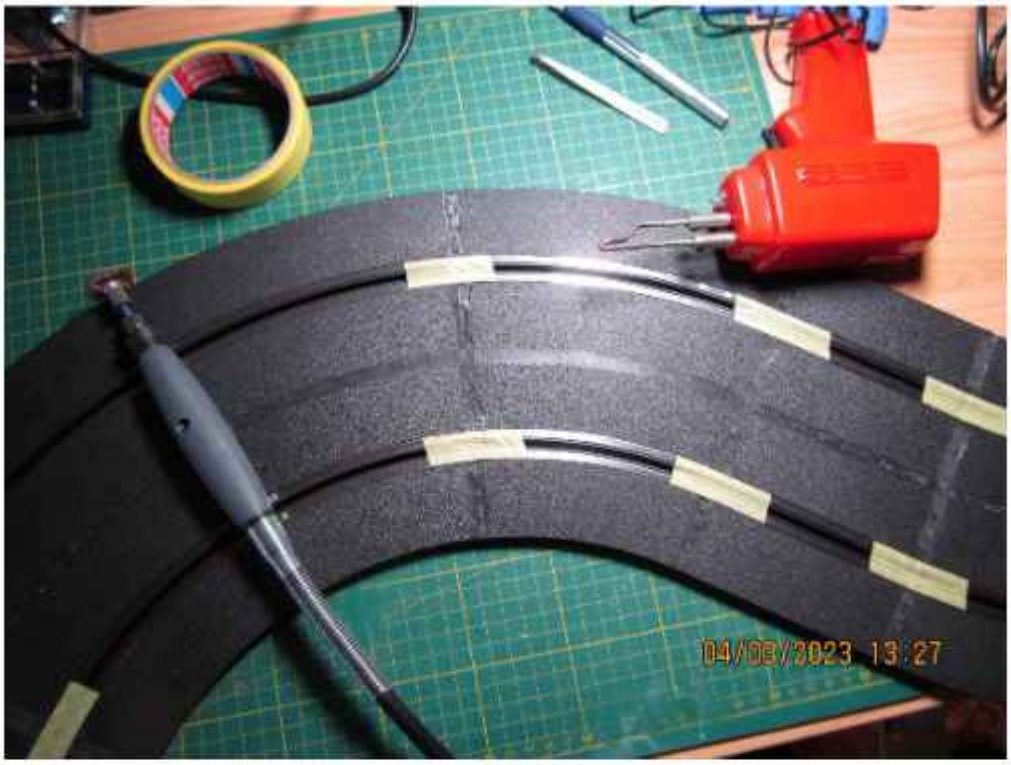
The fields for the red colour are taped off. Red and white fields should be about the same size. The desired cracking in the white colour can be seen here.

Apply red paint to the squares with a brush (e.g. Alpina COLOR full and tinting paint).

The fine hairline cracks are traced in black with a very fine permanent marker. Apply a diluted water-based black paint (e.g. Vallejo Model Air 71.057 black diluted with water) over the surface, smudge and partially dab off again. Repeat this process until the desired weathering effect is achieved. Less can be more here.

Design of the track surface:

The surface of the track should be a light grey, not too even, abrasion-resistant and have good grip. Lanes should be indicated. White side stripes to the lane boundary should also be present and resistant to abrasion.



The joints on the top side are fused with the soldering gun. The ridges as well as the white centre strip are ground smooth with the Dremel.

The transitions are filled and sanded with wet sandpaper.

Then I masked off the ladder (not shown here) (e.g. with tesa Professional precision masking tape - for a sharp clean edge) and cut off the protruding painter's tape along the ladder with a scalpel. Then I applied black acrylic paint (e.g. TALENS AMSTERDAM) evenly with a roller as a primer.

Then I attached all the edge strips to the rails. On the underside I fixed the lane locks with the hot glue gun and glued them with the soldering gun in the places where the locks did not fit.

Then I glued the joints on the top side with the soldering gun and afterwards (not shown here) deburred, filled and sanded and painted with black acrylic paint and paint roller.

Here, the edge of the actual roadway, which will later be painted grey, is masked off. For narrow curves, 5 mm narrow painter's tape has proven itself. There are great differences in the price and quality of painter's tape. For a clean edge, you should not be stingy. I used tesa Professional precision masking tape in various widths (5 - 30 mm) for a good price/performance ratio.

Scalpel and tweezers help to cut the tape precisely along the ladder.

The actual acrylic base colour, which was applied here with the roller, I mixed from more TALENS AMSTERDAM neutral grey (710) and less KREUL el Greco titanium white (28501). With titan white, the manufacturer is perhaps secondary. For neutral grey I like the colour of TALENS AMSTERDAM better than others because you get a rather warm grey tone with not too much blue. To get shades of colour, irregular blobs of TALENS AMSTERDAM neutral grey (710) and TALENS AMSTERDAM warm grey (718) were applied and worked in wet-on-wet with a roller.

Here, dabs of colour are placed partly irregularly and partly along the ideal line with Vallejo Model Air 71.057 black and also worked in wet in wet with the paint roller. When rolling in all the aforementioned dabs of colour, do not roll too much, otherwise the desired streaks of colour will disappear into a uniform grey.

Here is the finished result for the time being. Because of the strong lighting, the colour nuances do not come across as well in the photo as they do in real life.

The white lane borders on both sides of the lane are brushed on with white acrylic paint after the areas for the side stripes have been masked off beforehand.

Finished white lane boundaries left and right.

The ladders are masked off again and thin traces are applied with water-diluted black acrylic paint and a brush, after the brush has been smoothed out a little on a sheet of paper and the strength of the pigmentation has been tested. It is better to be careful here and not apply too thick traces that are difficult to wipe away afterwards.

Mixtures of grey and black acrylic paint are applied to the tyres.

scale rear axles (1/32) and tested the tyre patterns on a sheet of paper. For this I bought replacement rear axles with different tyre profiles from Scalextric via https://www.pendleslotracing.co.uk/.

Here is the finished result. Next time I would apply a little less tyre tracks and try to trace more of a curvy ideal line, which is not so easy because the axles always want to run straight ahead.

The finished road surface is then sealed (e.g. with KREUL water-based acrylic matt varnish). Simply apply with a wide brush.

Guard rails:

Here I used the crash barriers made by the model plumbing company Mirko Pommerenke https://www.modellklempnerei.de/modell-leitplanken. These are incredibly detailed. They are made of formed tinplate with extra formed end pieces. The posts are made of tinned brass H-profile.

I had previously tried to imitate real crash barriers using various materials (thin corrugated aluminium sheet, web line in combination with H-profiles made of wood, plastic and brass), but was never completely satisfied with the results. That's why I commissioned these double crash barriers and haven't regretted it for a second. Many thanks to Mirko Pommerenke. In this step, only the holes for the crash barriers are drilled. The guard rails themselves are not glued down until a later stage, when the earth has been applied.

Substructure for the module:

To build the track with landscape, you need a slab as a base. Here:

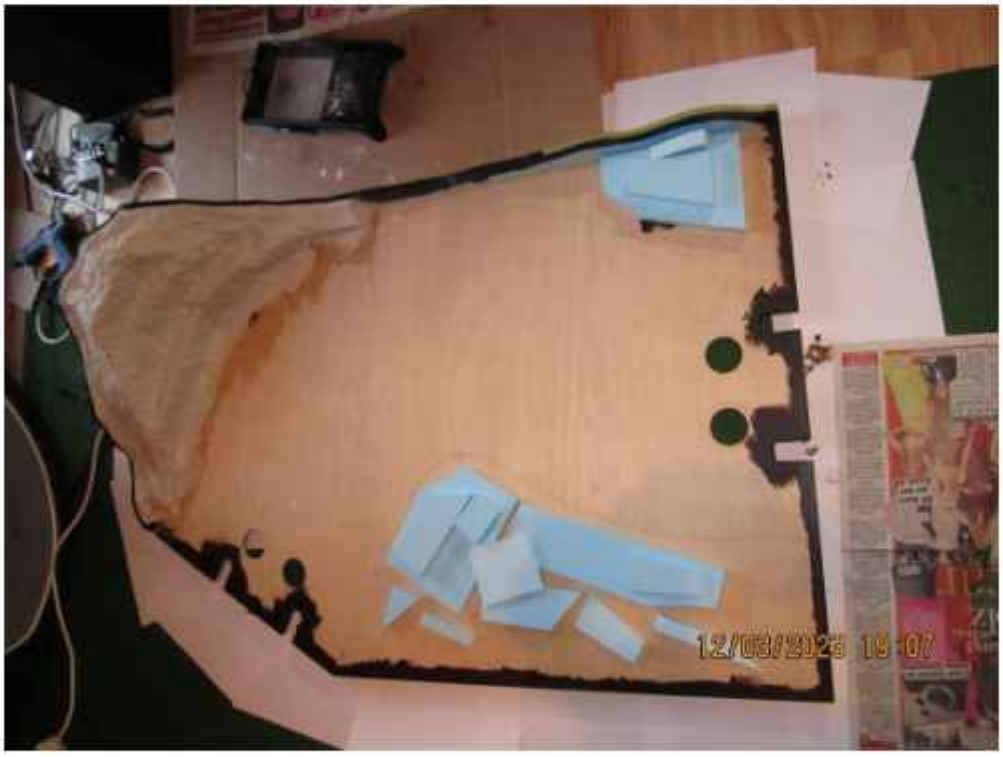
Multiplex board birch, thickness 6.5 mm, with the dimensions 120 x 80 cm

The elongated recesses are there so that you can get to the track locks of the Carrera tracks. The round holes are used to connect any additional power supplies.

Here the border is made on two sides from 2 cm thick styrofoam sheets and fixed with the hot glue gun. With the hot wire cutter the later course of the terrain is cut out. The roadway is only loosely laid here.

The stepped terrain substructure for the rocks is made with 2 cm Styrofoam sheets. The edge of the module is painted with brown acrylic paint. This gives a nice finish later - like a picture frame.

Plaster bandages are laid on the styrofoam sheets in several layers and the terrain is roughly modelled. I fastened the plaster bandages additionally to the Styrofoam sheets at the edge with a stapler.



Further substructure with styrofoam panels.

The work with plaster bandages is finished.

Rocks and soil:

Rocks are cast in moulds. More structural than other moulds are those from Woodland Scenics. Before filling the moulds with creamy plaster (e.g. Knauf filling putty inside), spray them with water whose surface tension has been reduced with a drop of washing-up liquid. At the earliest after one day - for larger rocks only after several days - of drying, the rocks are pressed out of the moulds. To achieve a lot of variety, you need several different moulds.

Before the rocks are glued down with plaster (e.g. Ardex A 828 - suggestion from Miniatur Wunderland Hamburg), I arranged them loosely to achieve a coherent overall picture with as few gaps as possible. Immediately after gluing, the rocks are grouted. It is helpful to use very narrow spatulas (5 mm) to be able to model narrow crevices.

The track is fixed in place with push-fit pegs for track bolting.

Since I don't have any suitable edge strips at hand, I use 8 mm Styrofoam plates here as connecting pieces on the left and right. The Carrera track has a height of 8.4 mm. The height adjustment is done later with earth.

The rails and the curbs are masked with painter's masking film containing adhesive tape on one side. The raised parts of the landscape are modelled with plaster (e.g. Knauf Perlfix Ansetzgips). I apply the plaster with a spatula and smooth it out with a broad brush. The result does not have to be too smooth. It looks more natural later with a little structure.

Small stones are to be placed on some parts of the rock walls. The spots are coated with grass flock glue (e.g. from RTS Greenkeeper). Wood glue will certainly also work.

A nice mixture of fine sand and coarser pieces can be found at War World Scenics. Here is the Army Coarse Sand.

Drip 99 % isopropanol (alcohol) onto the sand/stone mixture with a pipette. This causes the mixture to settle a little and bond well with the glue. We use the same principle later when applying the soil.

With the pipette, we drip some more acrylic emulsion onto the sand/stone mixture to fix it.

All surfaces on which the earth is to be applied later are first painted with brown acrylic paint (e.g. TALENS AMSTERDAM Vandyck brown (403)). The edge of the module is sealed with matt clear lacquer.

Here, various aqueous colour solutions are mixed together from different acrylic colours such as ochre, sienna, umber, grey, brown.

If you want, you can leave the rocks as they are. Here another problem becomes apparent. I had previously applied a white liquid acrylic paint to the sand/stone mixture as a primer. Unfortunately, the red/yellow/brown colours of the rocks did not stick properly to this. So next time I would do without the primer with the white liquid acrylic paint or test another colour on a sample beforehand.

Here we prepare the soil with which we will further shape the rocks and later need for the soil structure. The soil "fine earth" (77030) from RTS Greenkeeper has a great base colour and fine-grained consistency. To prevent the earth from darkening when applied later due to the glue and alcohol, we first mix white colour pigments into the earth (e.g. KREMER Pigments Titanium White (46200)). I cannot give an exact mixing ratio here - except very roughly up to 20 or 25 % titanium white. It is better to use a little less white at the beginning. The mixture is still crushed with a mortar and stirred with a spoon to better mix in the somewhat clumping white pigments. Before applying the prepared earth to the model, it is essential to make different colour samples (with different amounts of white in the earth) with glue/alcohol on a small plate made of wood or cardboard, for example. Only after drying (1-2 hours) will the final colour appear.

For the design of the rocks, we mix several (here 3) earth mixtures with different proportions of white and fill some of them into small dosing bottles for spraying the rocks.

The soil for the later ground design can be kept in one shade, as most of the soil will be covered by the greenery anyway.

In the following, the rocks are built up in several layers with the different shades of the earth mixtures. First we spray on acrylic emulsion as an adhesive. Different parts are then covered to varying degrees with a sieve and dosing bottle. Partial areas are also left free at first. We vacuum off too much of the applied substrate. Then we spray alcohol (99 % isopropanol) on. Then we spray on acrylic emulsion and apply the soil mixtures. Repeat until the desired result is achieved.

After a few layers of soil have dried, we use a small brush on the suction tube when vacuuming. By running the brush over the rocks, the white colour pigments are rubbed in a little and great natural-looking colour transitions from lighter to darker areas are created.

The finished rock landscape is then sealed with matt clear lacquer from the spray can.

Soil:

The roadway area is protected with foil. The free areas outside the rock landscape are painted with wood glue.

The previously prepared soil mixture is applied with a fine-mesh sieve

Then alcohol (99 % isopropanol) is sprayed on. Here I direct the spray away from the roadway and outwards. This causes loose crumbs of soil to fly towards the rocks and you get smaller clumps of soil that resemble loose rubble and look good. You can leave the surface as it is and let it dry.

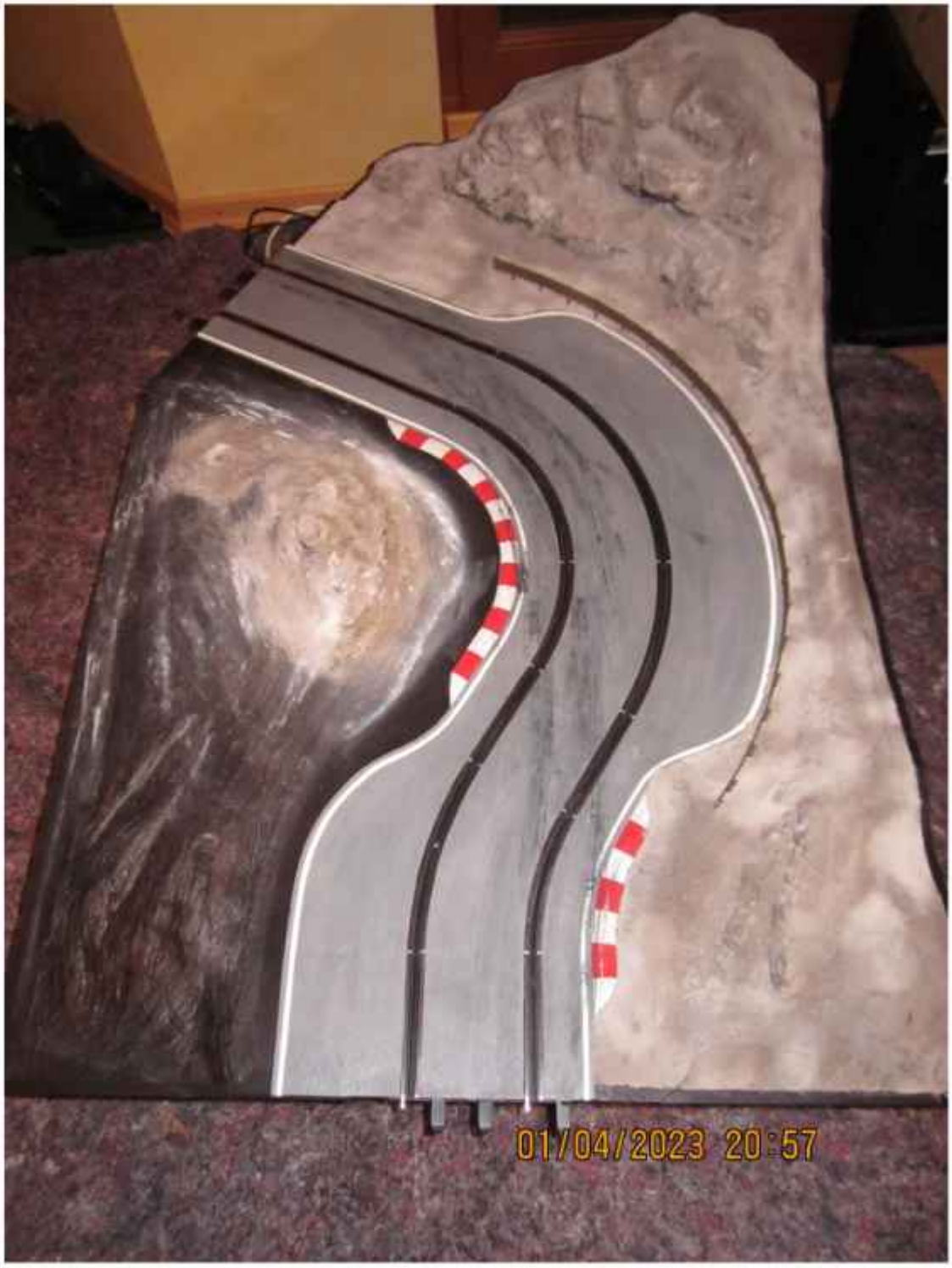
However, I apply another layer of soil. To do this, I spray acrylic emulsion on the soil and apply another layer of soil with the sieve. Then alcohol is sprayed on again and the whole thing is left to dry.

After drying (the next day), the earth is finally fixed and sealed with matt clear lacquer from the spray can. The spraying strokes are again directed outwards away from the edge of the road. Do not get the spray can too close to the soil, otherwise too much paint will be applied to one spot and the whole thing will have an unnatural shine after drying.

On the right side of the module, the earthworks are now (almost) finished.

The guardrail is fixed with mounting glue in the holes that we previously drilled a few mm deeper (than the existing hole in the edge strip) in the multiplex board. This gives additional support. The base of the posts in the area of the mounting adhesive is sprinkled a little with soil and dripped with alcohol (pipette). If necessary, touch up with acrylic emulsion and a fresh layer of soil and more alcohol until the posts blend in with the surrounding soil.

If you wish, you can also seal this layer of earth with fixative or spray adhesive, but you should mask the road and crash barriers beforehand.



Greening:

Electrostatic grassing with synthetic fibres of 2, 4 and 6 mm length and different shades - beige, beige with red, light green, dark green, etc. - (all from RTS Greenkeeper) is done with the RTS Greenkeeper 55 kV device. A certain variety of grass fibres of different lengths and colours is very important for a later natural look of the landscape.

There are grassing machines from different manufacturers. One advantage of the Greenkeeper is the interchangeable containers for quickly switching between grass fibres, as well as different sieve sizes and the practical inserts with holes of different sizes.

Also, Turf is used in 3 different shades from Woodland Scenics:

- Woodland Scenics WT45 - Turf Ground Flakes fine, medium green
- Woodland Scenics WT44 - Turf ground flakes fine, grass dried up
- Woodland Scenics WT42 - Fine Turf, Earth Fine

Finally, bushes from different manufacturers are used, e.g. from:

- Silhouette
- Lars op't Hof Scenery
- Martin Welberg Scenic Studios

I don't want to write too much about greening here, as there are very good tutorials on the internet, such as:

- Episode 110 - Tutorial -Grassing with the bFlock 50 from Microrama 1/87 - (German/German) - H0e

  https://www.youtube.com/watch?app=desktop&v=-rtHA_nG_ZQ

- H0 Modellbahn - Tutorial: Greening of an embankment part 1

  https://www.youtube.com/watch?v=MwkJkofRYcw

- H0 Modellbahn - Tutorial greening of a slope part 2

  https://www.youtube.com/watch?app=desktop&v=ubts2r7juu4

I would like to explain just a few general steps.

Special grass glue that stays open longer than pure wood glue so that the grass fibres can penetrate better (e.g. RTS Greenkeeper Grass Flock Glue - creamy) as well as acrylic emulsion and fixative (matt clear varnish also works, but can tend to stick to the grass) are suitable as glue.

Start the greening with the shorter structures such as turf and 2 mm grass and then progress through 4 mm and 6 mm grass to the shrubs, which work well when they are at least partly in smaller groups of different structures together.

Additional variety is also obtained by applying Turf, which is shot on with the dosing bottle or finely sprinkled on with the thumb/forefinger, to rocks and existing grass. Suitable adhesives are acrylic emulsion for rocks or fixative for grass.

In the following, I'll just let a few photos do the talking: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The work required a long preparation with the study of many helpful instructions from experienced model makers, the search for the right materials and trying out different techniques on small sample plates. In between, there were always setbacks. After a few days, the solutions became easier again.

I am aware that there is still a lot of room for improvement. But I am happy if this "making of" can help one or the other hobbyist to reach his goal faster and better.

A landscape as true to nature as possible for his favourite slot track...

Dirk von Ehr, Erdesbach, Germany, 03.05.2023