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Alternative for the bar car

Bushes from the Grasmaster
Basics for digital operation

Introduction

Holger Späing
Editor-in-chief

Dear Readers,

The bags are packed, tomorrow morning we start: The International Spur Z Weekend in Altenbeken is experiencing its 7th edition and our magazine will be there again, with people and show pieces.

When this issue appears and you read these lines, it's all behind us again. The same applies to the Intermodellbau in Dortmund. Without a doubt, the spring fairs are also the end of the modelling season.

Nevertheless, what was created over the winter in the cellars and hobby rooms should once again occupy an important place in this issue. I would like to express my thanks for the strong support we have received from our readers time and again.

What you all dream up, build and implement is the salt in the soup for our magazine. Please inform us, let us know what you have done, show us and we will gratefully cover it. I am always amazed at how much creativity and inventiveness lead to great handicrafts, which just amaze me.

Mostly we are not even aware of the changes model making has undergone in the last twenty or thirty years and how much our Z gauge has also benefited from these changes, whether it is finely printed decals, 3D printing, light cutting technology or precision mechanics and electronics.

This brings us to the topics of this issue: Torsten Scheithauer shows us how he came to the bar car for his TEE “Saphir”. The suggestion came from a construction article in this magazine, but he whistled and went about it in a completely different way.

Jochen Brüggemann has been experimenting for a long time how he could recreate wild roses and broom (the plant) on the railway embankment. A path similar to the grassing technique shown at trade fairs by the French company Microrama Model Decor led to the goal. However, our reader gets along with ordinary grass glue. Here, too, the result speaks for itself, as we may show.

I am also pleased that today we can finally start with the 2018 annual theme. Andreas Hagendorf has taken over this series as the main author and his goal is to take all those interested with him.

Therefore, our series starts with electrical basics, which are also helpful for analogue operation. This article should create a basic understanding of the characteristics of electric current and understand how information can be encoded in it. Over the next few months, everyone will gradually have the opportunity to understand digital technology, and we will also present selected products that are available on the market.

We have also not forgotten two current book recommendations. One of them refers to two brothers who have made their dream a reality and also know how to understand and use digital technology perfectly. Enjoy your reading!

Best,

Holger Späing

Editorial

Model

Prototype

Design

Technology

Literature (not translated - only in German)

News

We thank Torsten Scheithauer and Jochen Brüggemann for their article contribution.

Date of publication of the German language version of this issue: 24 April 2018

Cover photo:
When the TEE 74 "Saphir" began its journey from Dortmund to Oostende in the summer of 1957, it encounters one of the last battery railcars of the Wittfeld type in service in the Ruhr area. Due to its high capacity utilization, the "Saphir" was the first German Trans-Europe-Express to be converted to the new VT 11[5].

Same goal - different way

The transformation to a bar car

Multiple units are difficult models for the manufacturers, as it is said again and again. After all, they offer the buyer little or no possibilities for individual combinations or even shunting movements while driving. But the German VT 115 always fascinates friends of all gauges. Our reader Torsten Scheithauer, inspired by a building report four years ago, has decided to rebuild it in a different way.

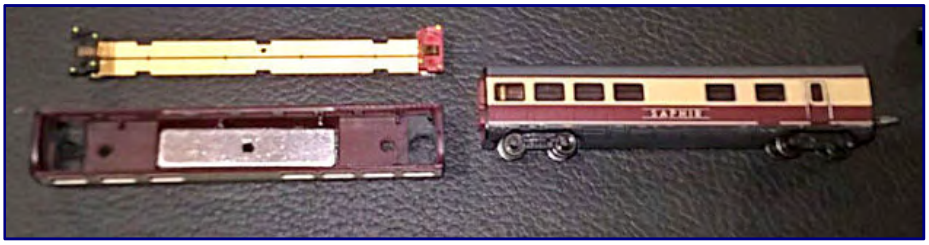
By Torsten Scheithauer. The beautiful conversion report in issue 103 (February 2014) had inspired me to equip my TEE “Saphir” with a correct bar car, as well. My train of thought stumbled upon a caption: “The VM 11 bar cars from the Märklin 8793 and 87933 packs have exactly the same paintwork”, it said.

My idea was not to visually redesign the bar wagon from the 87933 expansion pack, but to technically convert a bar wagon from the previous edition with the article number 8793 to the new coupling.

At a model train exchange I could buy an old bar car individually and so the conversion could finally begin. I recorded the conversion - which took about 45 minutes - with my mobile phone, but unfortunately not all photos are of good quality.

Figure 1 shows the two models, according to the motto “Make one out of two”, so to speak, because the disassembled components are shown in photo 2. From the car Art. No. 87933 I transferred the LED-board with the new coupling, the bogies with the dark nickel plated wheelsets and the roof.

The motto of the conversion is “Make one out of two.” In the front of the picture you can see the original car from the expansion pack 87933, behind it the bar car with the correct shape from the earlier pack 8793. Photo: Torsten Scheithauer



The individual modules are ready after dismantling both carriages (Fig. 2 above). The different coupling solutions of the two generations of TEE trainsets (Fig. 3 left) require a great deal of internal conversion work, as the old car body and the new electrical connection (Fig. 4 right) have to be brought together here. Photos: Torsten Scheithauer

From its counterpart in Art. No. 8793, the body and window inserts remained. Additionally I added an interior. Because of this, the light guide on the LED board was omitted.

On photo 3 you can see the different coupling mounts as well as the different roof elements.

In the first step I removed the tiller for the coupler and the electrical connection, so that a smooth surface was created. For the lower contact of the new coupler on the newer models there is a recess, I simply drilled through the bottom.

Left picture:
Yellow colour marks the points for the four holes so that the coupler receptacles are secured in the floor. Photo: Torsten Scheithauer

Test assembly: The board is still a little crooked, but this does not cause any problems during further assembly and subsequent operation on the layout. Photo: Torsten Scheithauer

The result of the first work can be seen on photo 4, where the circuit board of the newer model can also be seen. In order for this to fit into the old car body, holes had to be drilled for the tiller of the coupler receptacles.

I applied yellow paint to their heads and inserted it into the car body. After removing the drill bit again, yellow points remained on the landing gear, where I was able to apply the drill bit; by the way, this can be seen in Fig. 5.

The bar car from Torsten Scheithauer's conversion also has a 3D printed interior with figures. This allows the interior lighting to be displayed to its full effect.

Now only the lighting board with the coupling receptacles has to be replaced and the roof plugged on, then the conversion is completed and the wagon can be put into operation.

After drilling the holes I was able to replace the board, it was now deep enough, but slightly oblique, as can be seen in picture 6. However, this did not cause any problems during a test drive.

So it could continue with the assembly, the window inserts and the interior decoration I used first. The printed circuit board then fitted perfectly over it. The final picture shows the completely rebuilt bar car, lined up next to the two cars of the basic package of the TEE Saphir (88733) - a composition worth seeing, I think.

Manufacturer of the basic model:
http://www.maerklin.de

More photos on the next page

Picture above:
A look at the assembled bar car shows that the interior of this model is easily visible.

Picture below:
The TEE Saphir now appears correct and is properly equipped. In layout operation, it encounters a V 80 from SMZ with its conversion wagon train.

Manufaktur für Kleinserien

CMK Modellbau Klingenhöfer

Figuren Dioramen Bausätze Ätzteile

im Maßstab 1:220 - Spur Z -

für Liebhaber und Sammler

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Alternative plant models

Shrubs from the Grasmaster

Before greening his layout under construction, our reader Jochen Brüggemann tried out various materials and methods. Inspired by an exhibition demonstration of Microrama Model Decor and several publications, he not only produced grass areas, but also flowering shrubs and tall herbs with the help of a self-made grassing device. Grass fibres from various manufacturers were already sufficient for this. The Trainini readers may now examine the result for themselves.

By Jochen Brüggemann. Since it has been impossible to imagine model railway landscaping without electric grassing equipment, multiple grassing of surfaces has become standard. Mostly such multiple grassings are used to represent differently high and variedly structured wild grass areas.

Our reader Jochen Brüggemann experimented with the Grasmaster in his search for ways of producing bushes on the railway embankment and oriented himself on the working methods of the French supplier Microrama Model Decor. Photo: Jochen Brüggemann

After thinking about extended applications in tree and shrub construction in recent years, I saw a demonstration of Microrama Model Decor products and methods at Intermodellbau 2017 in Dortmund (see also **Trainini®** 2/2018).

Flowering bushes are not only found on the railway embankment, as this slope in Nettersheim (Eifel) proves. The broom proves to be a special eye-catcher which has to be implemented in the model. Photo: Guido Gerding (CC BY-SA 3.0)

The landscape elements (different vegetation areas, shrubs, bushes, etc., with and without flowers) produced in this way look excellent, but they seem too large for the nominal size Z due to the length of the plastic fibres used.

My plan: It should be possible to achieve a usable result on our scale with shorter fibres - even when using a significantly weaker grass clipper and a normal grass adhesive.

So I started with my existing grass fibres, fine foam flakes (turf), the well-known still-grass glue and a self-made grassing device (made from an electric fly swatter) to create various higher plants on separate mounting surfaces.

I have depicted matching flowers with acrylic colours. The finished tall herbs, shrubs, bushes, etc. are detached from the mounting surface and attached to the layout in the designated place with grass adhesive. Below I describe my procedures using two examples.

Example 1: broom

Of the species native to Central Europe, only the broom reaches a height of 200 cm; the other representatives of the genus clover usually only grow up to a maximum of 60 cm.

Described below is the production of broom bushes, which reach a halfway true-to-scale height of 6 to 10 mm in my model.

Example 2: Wild Roses (Hedge Roses)

Hedge roses are also native and widespread in Central Europe. They can reach a height of up to 300 cm under favourable conditions but are often much smaller.

My hedge rose models are usually 6 to 11 mm high.

The following material was used to build the shrubs:

MiniNatur	Grass fibres 2 or 4 mm (002-21, 002-22, 004-22)
Busch	Grass fibres (7114)
Woodland Scenics	Fine turf (T45)
Noch	Grass glue (61130)
various providers	Acrylic Paints

The common broom (Cytisus scoparius), contrary to its German name, does not belong to the genus of brooms but to goat clover. This illustration from "Köhler's Medizinal-Pflanzen" already showed what it looks like in 1897. Photo: Franz Eugen Köhler (in the public domain)

Hiproses (Rosa corymbifera) are widespread and beautiful to look at with their white to soft pink flowers. Therefore they are also worth a replica on the model railway. Photo: Manfred Heyde (CC BY-SA 3.0)

Old glass slides from a microscope served as separate mounting surfaces. Experiments with aluminium foil were also successful. Between the individual work steps I always let the adhesive dry sufficiently.

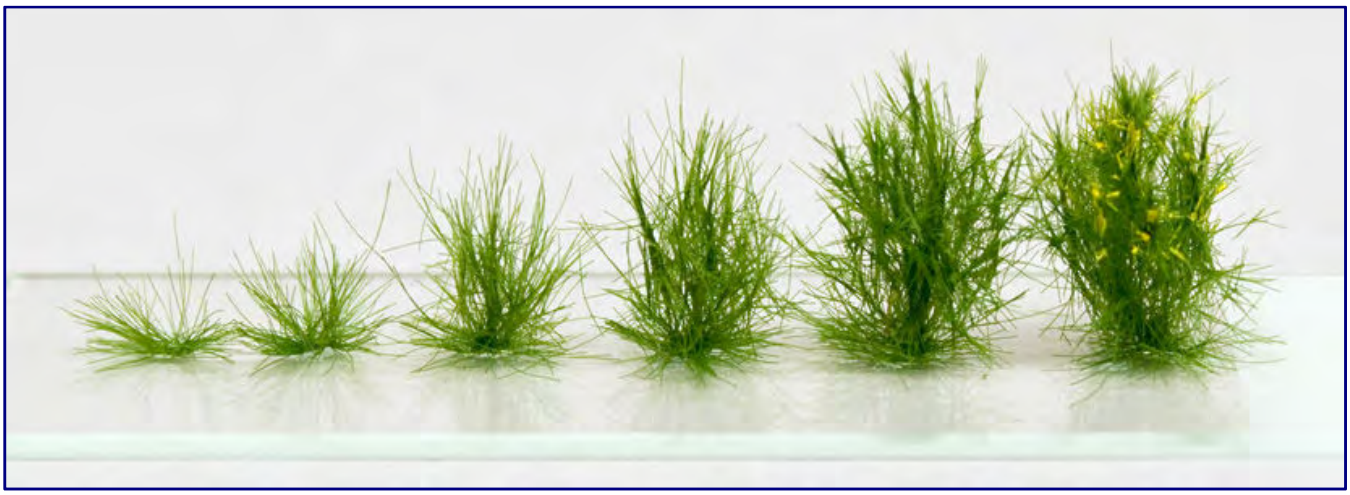
Production of broom

On the glass slide I applied undiluted grass glue with a cocktail stick (small to medium-sized dots or small areas) and grassed with miniature fibres (004-22).

Later I dabbed the tufts again with undiluted glue, grazed again with the same fibres and let them dry overnight.

In the next step, I applied diluted glue with a soft brush (on the outside of the tufts, painted from bottom to top and dabbed on top)

and applied fibres again. I carefully positioned unruly fibres with a scalpel blade or, after drying, removed them with fine tweezers or pointed scissors. If the height I reached was not enough, I repeated this step one or two more times.



The plants were produced on the slide, later lifted off and glued into the prepared landscape. Here all described steps for the production of broom are represented successively. Photo: Jochen Brüggemann

Finally, I applied diluted glue with a soft brush in the same way, but this time grassed with shorter fibres of MiniNatur (002-22). After drying and sucking off loose grass fibres, I used a fine brush to apply golden-yellow acrylic paint in small dots and spots in an irregular distribution.

Shapes of wild roses (Hedge Roses)

Once again I applied undiluted grass glue on the slide with a cocktail stick, as before in small dots. This time, however, the grass fibres from Busch (7114) were used. Later I dabbed the tufts again with the undiluted glue on top, grazed again and then put them aside to dry.

Here, too, the structure of a rose bush can be traced step by step. It is particularly clear that the quite dense thorny shrub requires a completely different approach than the yellow flowering plant in the previous section. Photo: Jochen Brüggemann

The next day I applied glue diluted with a soft brush to the individual tufts - on the outside of the tufts, painted from bottom to top, and dabbed on top. The following greening step was also carried out with the bush material. If necessary, I repeated this step once or three times after some waiting time.

As before, the final step was a diluted application of adhesive, this time followed by grassing with the shorter fibres of MiniNatur (002-21). After drying the glue I applied a soft brush diluted glue to the plants, sprinkled fine foam flakes over it and put them aside.

Our final photo shows the convincing effect of the different forms of vegetation side by side. Before the main signal showing a stop, 80 037 from a Westmodel conversion kit, which was mentioned in the last issue, waits with a short transfer. Photo: Jochen Brüggemann

On the following day I first removed the loose fibre and flock residues with the vacuum cleaner and dabbed on the top, in areas of flocking, with a fine brush, small pale pink acrylic paint dots in irregular distribution.

I removed the finished plants from the slide with pointed tweezers, if necessary also with a razor blade, and fixed them with grass adhesive in the model landscape at the designated places individually or in irregular groups. With the described method, if necessary also varied, I will produce still further, higher and herbaceous plants as well as shrubs.

Finally, a note on your own behalf: If you feel like producing taller plants with a grassing device based on the above building description, you can of course do so at your own risk.

However, I cannot guarantee the success of the work. I accept no liability or responsibility for any accidents or damage to people's health or material.

Suppliers of the material used:
http://www.busch-model.com
http://www.mininatur.de
http://www.noch.de
http://woodlandscenics.woodlandscenics.com

Digital model railway control (Part 1)

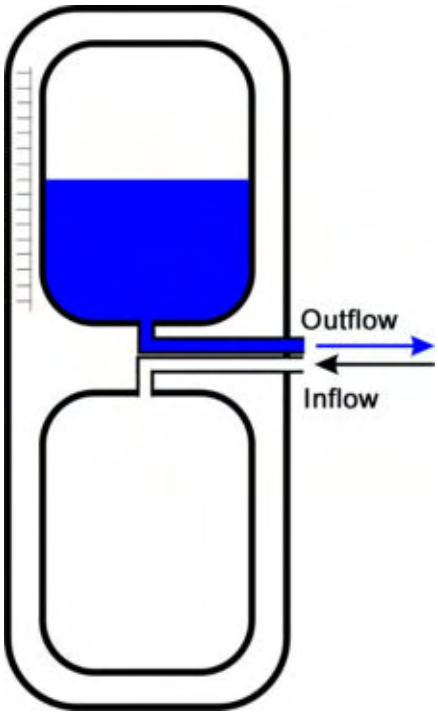
High voltage or highly exciting?

The digital control of a model railway - regardless of the track width - always has to do with electricity. Since not everyone has completed a degree in electrical engineering or electronics or works in the electrical trade, we want to shed some light on this first part of our annual focus topic and convey the basics. At the latest when setting up a digital system, errors that are difficult to correct can be avoided and any challenges that arise can be mastered.

By Andreas Hagendorf. Many readers were eagerly awaiting the start of this year's main theme. Allow me to use this attribute because it gives me a hitch to the topic we want to discuss today.

Voltage is guaranteed, we fully explain the digital technology including electrical basics. And so we also turn to the question of what voltage actually means and constitutes.

Since we would like to take all our readers with us into the world of modern model railway control and understand how it works, we have decided together to repeat or begin with important basics - depending on their individual previous knowledge. The easiest way to understand electrical processes is to imagine electrical current as flowing water.



The water model of electricity

To our picture belongs an upright tube, in which two tanks of the same size are positioned precisely one above the other. The upper tank is filled with water to a certain height and has an outlet pipe on its underside. The lower tank is empty with an inlet pipe on the top (Figure 1; left).

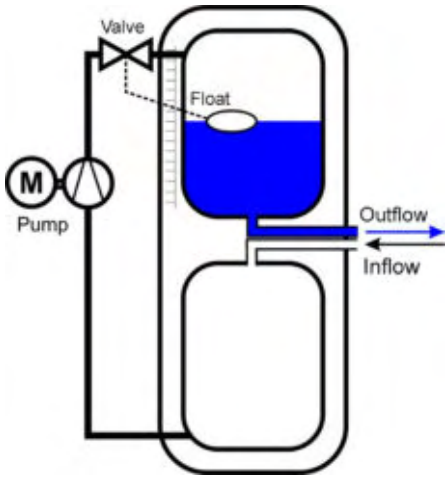
If we hold one finger to the opening of the outlet pipe, we feel a pressure. This pressure depends on the filling height of the tank: the higher the filling height, the higher the pressure at the outlet pipe. If the pressure is sufficiently high, the water bubbles out of the pipe in a high elbow. At low pressure, however, the water drips very modestly.

If we connect the outlet pipe and inlet pipe to a hose so that a circuit is created, then the water flows completely from the upper tank into the lower one. If the upper tank is empty, there is no more pressure at the outlet pipe. We know all this from experience and can observe it again and again in the household. But what does this have to do with electricity?

Voltage and current

The tube with the tank containers is an electrical energy source, for example a battery. The pressure at the outlet pipe represents the electrical voltage, the flowing water is the flowing electrical current. Just as the pressure, depending on the filling level, allows water to flow out of the outlet, so the electrical voltage drives the actual electrical charge carriers, the electrons, through a conductor and thus causes an exactly determinable electrical current.

In electrical engineering, the connection points are called poles. There is a positive pole (+) and a negative pole (-). When physicists began to study the phenomena of electricity in the 19th century, they thought that electricity always flows from the positive pole to the negative pole.



In the meantime, the processes are also known at the atomic level, which is why we have known for a long time that it is exactly the other way around. But for traditional and understanding reasons it has stuck to its original direction. Between the two poles there is the electrical voltage, the assignment with plus and minus we call polarity.

Back to the water model: The water pressure depends only on the fill level in the tank. We also know this from our own experience. The pressure in 2 m water depth is the same all over the world, in the swimming pool, in the bathing lake or in the Mediterranean Sea. And just as the water pressure decreases as the filling level drops, it also happens with a battery.

The more current is taken from the battery, the more the voltage drops. The amount of water in the tank is equivalent to the capacity of a battery. If the tank is larger, it takes longer to run out. It also takes longer for a size C battery (baby cell) to run down compared to an AAA battery (microcell).

Electrical energy sources, which are connected to the household network and continuously supply voltage and current, we can imagine according to the water model that the upper tank has a float-switched inlet, which keeps the filling level of the tank constant. The water from the lower tank is pumped up again (Figure 2; page 16 bottom).

The voltage has the formula sign U (from lat. urgere; urge, rush) and the unit V (volt). The current, better the current strength, has the formula I (from lat. inductus; drive) and is indicated in A (amperes).

An important electronic component is the diode. It can be thought of as a non-return valve, the current flows only in one direction through the diode, the opposite direction is blocked. A nice, detailed description of other electronic components using the water model can be found in diagram [1].

The electrical power

As long as no more water (electric current) is drawn than can be drawn again, the water pressure (the electric voltage) remains constant. This can also be observed on power supply units: if they are loaded with more current than intended, the voltage drops accordingly.

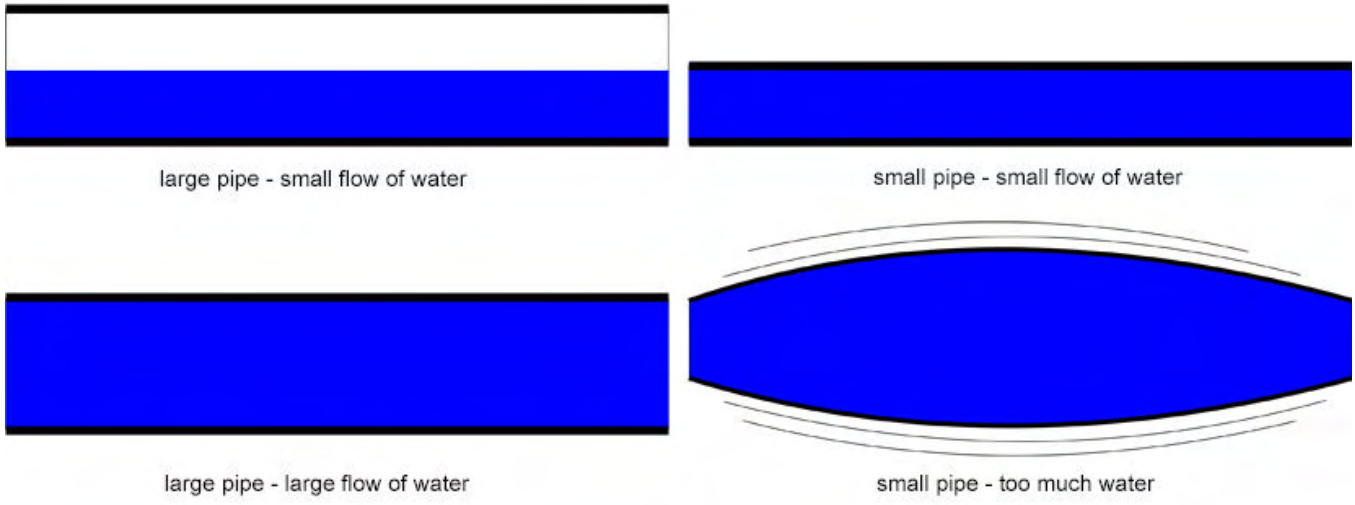
This relationship between voltage and current is called power. The power has the formula symbol P (power; power, force) and the unit W (watts). Power is the product of voltage and current:

$$P = U \cdot I$$

If the voltage rises at constant power, the current must decrease and vice versa.

Electrical resistance

In order to use the electricity, pipes, i.e. electrical lines, must be connected. These feed the electricity to the consumers, where it can then do its work. Then it must be able to flow back to the power source.



Water rubs against the inside of pipes as they flow through, the pipe hinders the flow. This resistance depends on the one hand on the length and cross-section of the pipe and on the other hand on the amount of water driven through the pipe. Each tube allows only a certain maximum amount through (Figure 3; page 17 below).

Electrical conductors - for example wires, strands and tracks on printed circuit boards - behave in the same way, and the conductor material itself also plays a role here. There are very good conductors like the metal copper and there are very bad conductors like distilled water.

The resistance has the formula sign R (from lat. resistentia; resistance) and the unit Ohm (Ω, Greek capital letter).

Ohm's law

The resistance is therefore a measure of the voltage required to allow a certain current to flow through a conductor. If a resistor with the value 1 Ω is connected to a voltage of 1 V, a current of 1 A flows.

The first to calculate these relationships between voltage, current and resistance was Georg Simon Ohm (1789 - 1854) in 1826. This fundamentally important law of electrical engineering is named after him, Ohm's Law:

$$\text{Electric current} = \frac{(\text{Electrical Voltage})}{(\text{Electrical resistance})}$$ and in equation $$I = \frac{V}{R}$$

Each resistor leads to a voltage drop for a constant current. If the sum of all resistors is large enough, the consumer may no longer receive sufficient voltage to operate.

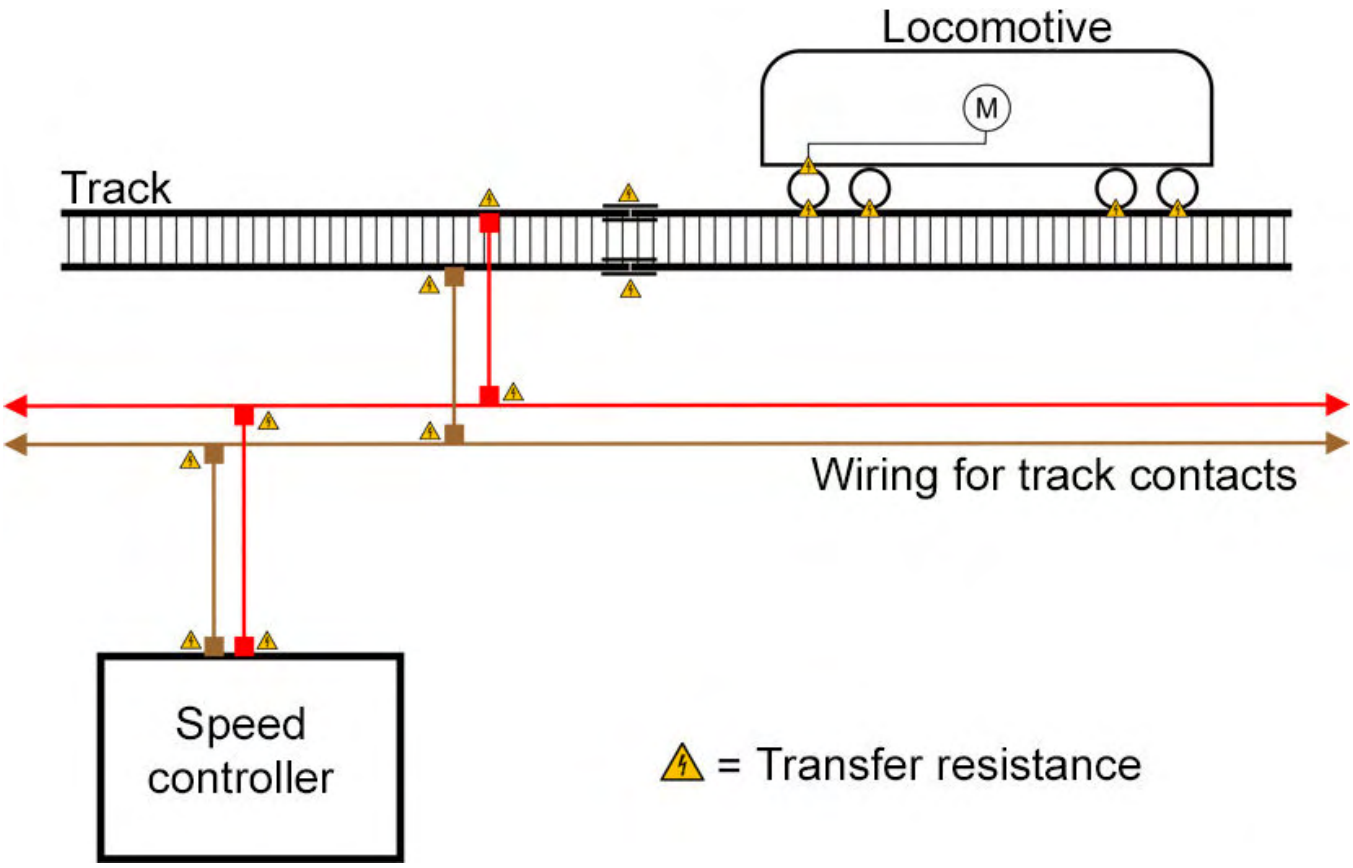
Unfortunately, current-carrying conductors heat up due to the voltage drop. The resistance is also temperature-dependent and rises further with increasing temperature, the conductor then heats up even more and so on and so forth.

Too much current can therefore lead to melting of the insulation and destruction of the cable, in extreme cases even to fire. For this reason, electrical cables must always be designed for use and must also be protected by appropriate measures (see also box "Current carrying capacity of copper cables" and [7]).

But not only the conductor resistance hinders the current flow, transition resistances are just as bad. Every bare metal surface reacts more or less quickly with the oxygen in the air - it oxidizes. Oxidized metal surfaces conduct current many times worse than the actual metal.

If two metal surfaces are joined, the current must pass through two bad, oxidized areas. Contact resistances often occur in model railways. Every plug or screw connection, every track connector and of course dirty tracks and vehicle wheels throw more or less large sticks between the legs of the current flow (Figure 4; page 19 above).

The solder stiffens the ends of the strands and can lead to breakage. The soft solder begins to flow under the pressure of the screw connection, the screw connection loosens in a very short time. Flux residues cause copper to corrode.



However, we can remedy the situation. For stationary cabling, solid conductor wires with sufficient cross-section are used, which are directly soldered or screwed to the connections. For moving connections, strands are used in which the contact ends are provided with ferrules which are attached by screws to the wire ends.

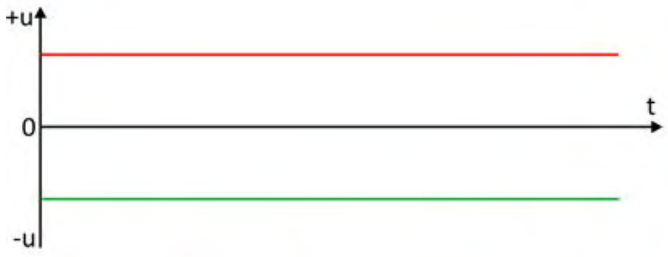
The track voltage is distributed under the system via sufficiently dimensioned cables and fed into the track via stubs every 1 m to 1.5 m. Otherwise, keeping the tracks and all vehicles meticulously clean helps.

Direct (DC) and Alternating (AC) Current

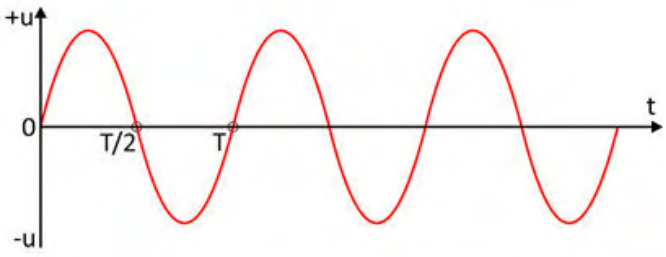
If there is a voltage at the poles of an energy source which does not change its polarity from switch-on to switch-off, it is called DC voltage (Figure 5 left; page 20 above). So your sign is always the same.

For example, 12 V is a DC voltage, also -12 V. Sometimes you will find an equals sign as marking: =12 V. With negative voltages, however, this looks strange: =-12 V. Therefore, we may omit the equals sign here. If DC voltage is applied, only DC current flows.

And so we can guess: There is also a voltage that changes its polarity. This is called AC voltage. However, the polarity must be changed strictly periodically. This means that the mode of oscillation of the voltage always passes through 0 at the same time interval (Figure 5 right; page 20 top).



Direct current (positive / negative)



Alternating current (T = period)

A frequency can be specified for each periodic oscillation. The frequency is a physical quantity with the formula symbol f (lat. frequentia; frequency) and the unit Hz (Hertz), where 1 Hz = 1/s. The day/night change is repeated, for example, with a frequency of 1/24 h ≈ 0.000012 Hz.

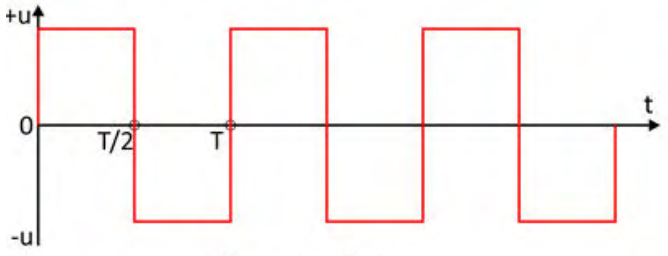
The human heart has a pulse rate of approx. 50 - 90 beats per minute (this corresponds to 0.83 - 1.5 Hz) in the resting body, the breathing rate is 12 to 15 breaths per minute (0.2 - 0.25 Hz). In music, the standard chamber tone a1 with a frequency of 440 Hz is known.

Our household mains supply a sinusoidal alternating voltage of 230 V with a frequency of 50 Hz. The sinusoidal shape is caused by the generators used to generate energy. AC voltage is preferred in power engineering, as it can be converted very easily with transformers.

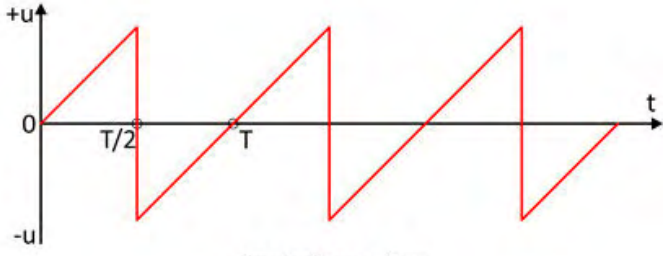
As we have already learned above, the line resistance increases as the current increases and so do the losses. In order to get the energy generated in the power plant into our company with as little loss as possible, the voltage is highly transformed.

This keeps the current low and allows thinner and thus cheaper cables to be used on the overhead line masts and for the underground lines. For this reason, one does not speak of a high voltage grid for nothing. The majority of the traction current in Germany has an alternating voltage of 15 kV with a frequency of 16.7 Hz.

The oscillation can take other forms than the sinusoidal one (Figure 6; below). If AC voltage is applied, only AC current can flow.



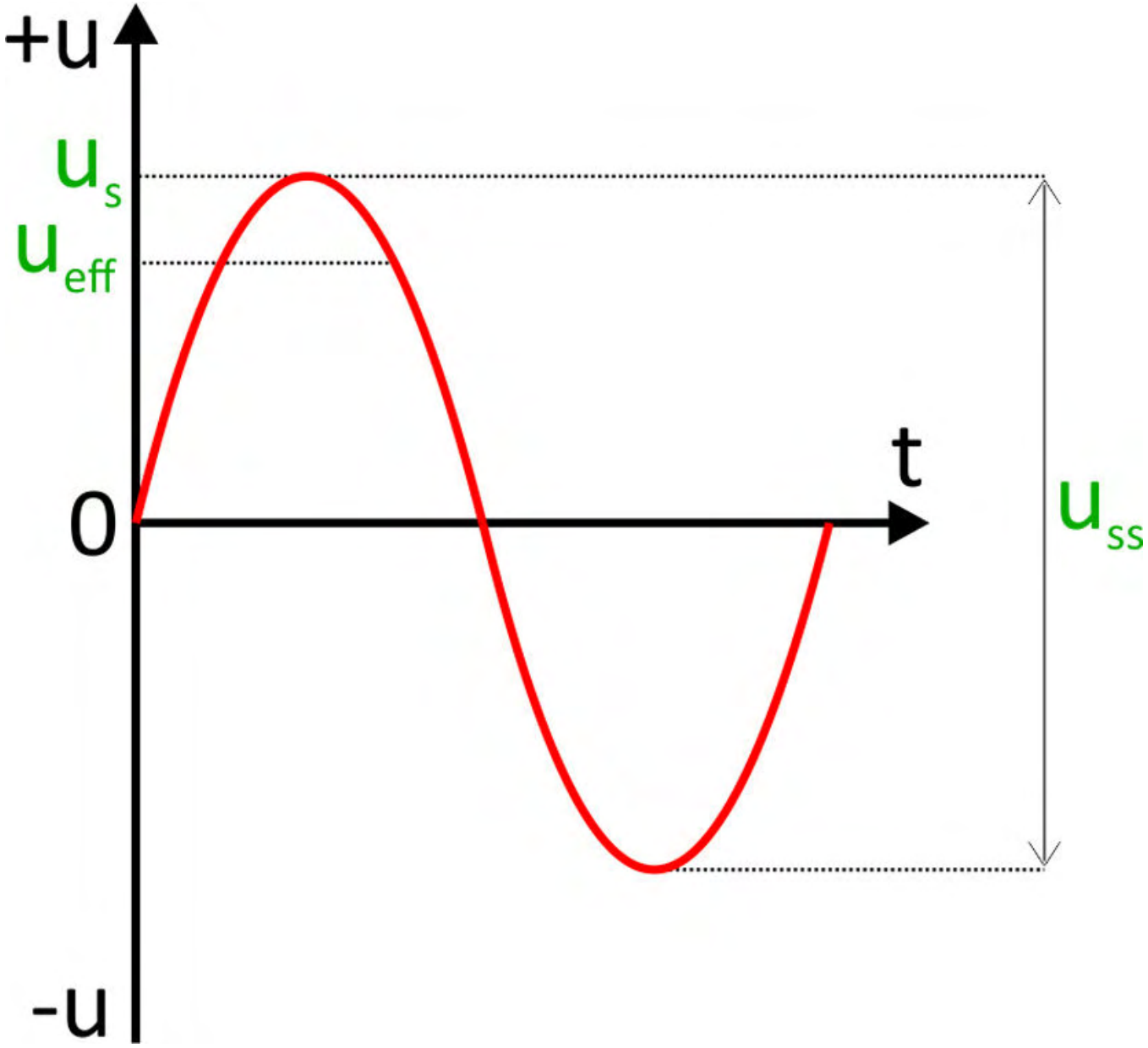
Square wave form



Saw tooth wave form

Effective Value

The nominal value of 230 V for our household network indicates the so-called RMS value U_{eff}, not the peak value U_s (amplitude: Figure 7; page 20 above). The RMS value is the quadratic mean value of the alternating voltage and is thus comparable to a corresponding direct current voltage.



With a sinusoidal alternating voltage as it occurs in the household grid, the effective value is about 70.7 % of the peak value. So it's a deal:

Peak value	U_s 325 V
RMS value	U_{eff} 230 V
Peak-to-peak voltage	U_{ss} 650 V

The effective value is called RMS (Root Mean Square). As already indicated, the RMS value also depends on the waveform. For other forms of vibration there are suitable form factors [8].

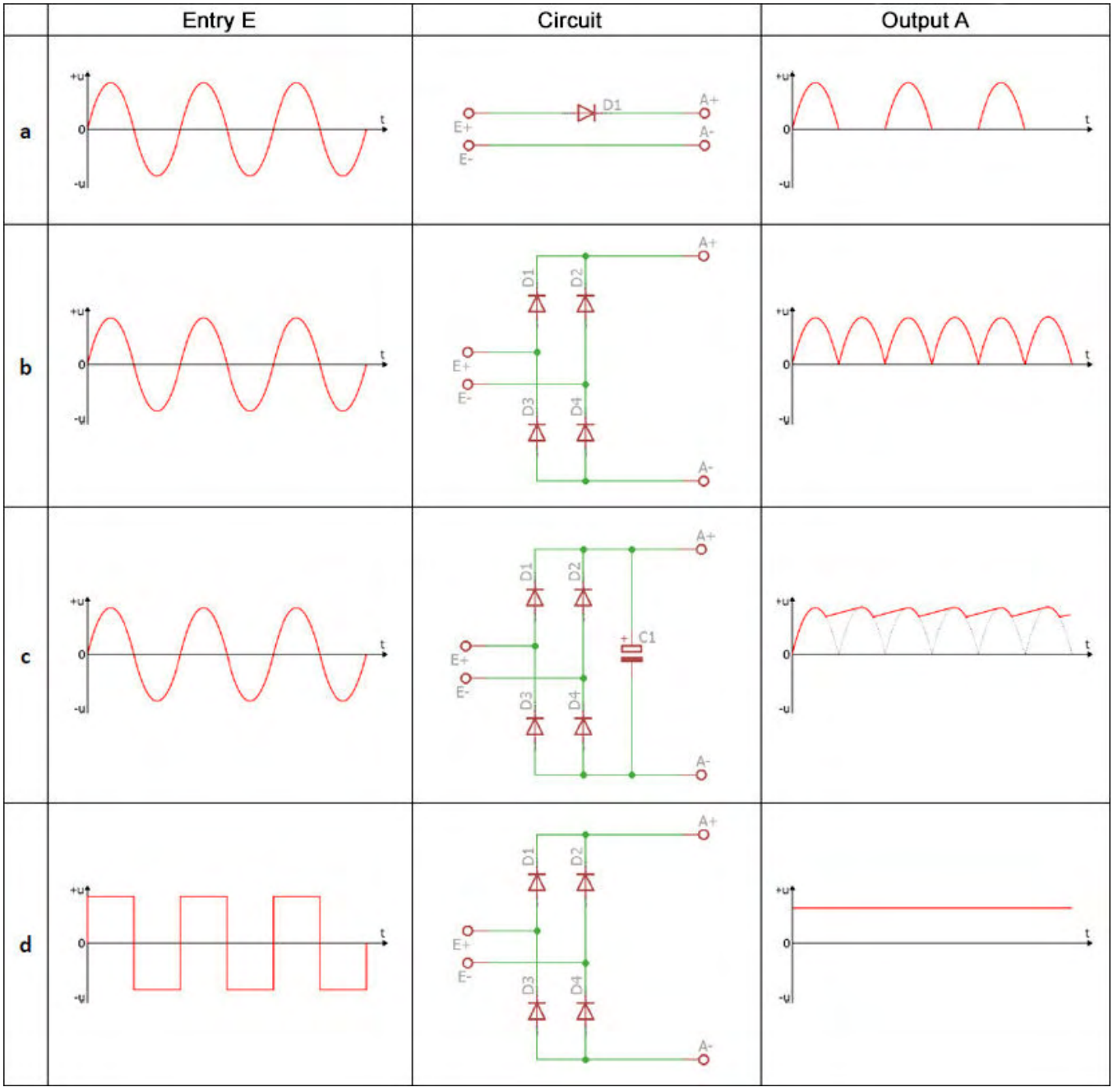
Measuring instruments that take these form factors into account during measurement are marked with “TrueRMS.” Further on, however, we will see that we cannot really measure a digital voltage with it either.

Rectification

The majority of all electrical and electronic devices and components require DC voltage for operation. An AC voltage must therefore be converted into a DC voltage with the aid of a rectifier.

In the simplest case you use a single diode, then you keep the positive part of the vibration, the negative part is omitted. This type of rectification has a poor efficiency and we only get a strongly pulsating DC voltage (Figure 8a; below).

Better is the rectification with four diodes, in which the negative part of the oscillation is “folded” into the positive range (Figure 8b; below). This special circuit is called bridge rectifier or Graetzbrücke - named after its inventor, the physicist Leo Graetz.



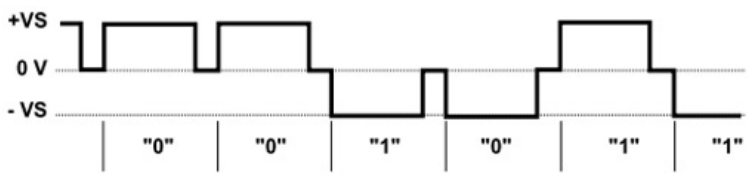
The whole thing has a much better efficiency and produces a still pulsating DC voltage, but its residual ripple can be further reduced by using a smoothing capacitor (Figure 8c; page 22 below). Our digital square wave signal can also be converted, but smoothing is not necessary (Figure 8d; page 22 below).

Analogue and digital

In technology, "analogue" means step less and without interruptions. Hand instruments, for example in cars or watches with hands, are analogue display systems. If you turn the speed controller of an analogue model railway, the driving voltage is continuously variable and the locomotive becomes faster or slower.

This DC voltage can assume any fine value between no voltage and the maximum driving voltage. Each locomotive on the track receives the same voltage and runs accordingly.

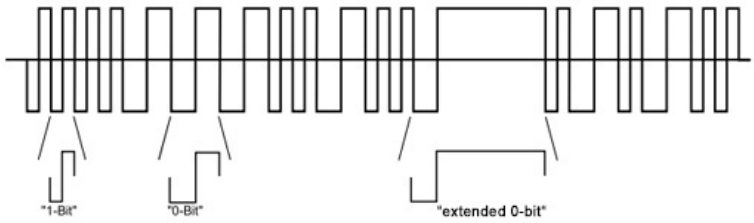
By reversing polarity (change of polarity) we change the direction of travel. If we want to control two trains independently, an overhead line can help. If additional trains are required, a division into track sections with the corresponding extensive cabling is required.



Selectrix-Signal (Source: MOROP)

The term “digital” comes from the Latin expression “digitus,” which means finger and here means counting with the finger. This means that there is only one delimited and stepped value range using the ten fingers plus level 0 (no finger): 0, 1, 2, 3 and so on up to 10.

The well-known single-digit LED displays are digital displays, which can only display the numbers 0 to 9. Even a single LED is basically a digital display; in the simplest case it can only assume one of two states: on or off, 0 or 1.



DCC-Signal (Source MOROP)

In a digital model railway, electrical energy and command data are transmitted to the consumers (locomotives, wagons with lighting, switches, signals, etc.) as a square-wave signal. The digital aspect here is the sending of zeros and ones as part of a protocol for command transmission.

The advantage is that the full track voltage is always available and each load can be addressed individually by the type of command transmission. Each locomotive moves independently of the others in its own direction and at its own speed, even extremely slow manoeuvring is possible. In addition, many special functions are offered, such as light and sound effects.

Exciting question: Is the digital track signal a DC voltage or an AC voltage?

Answer: some kind of alternating voltage. Since the polarity of the track signal changes with high frequency, it is clearly not a DC voltage. However, since the polarity change is not strictly periodic, it is not an AC voltage according to the strict definition.

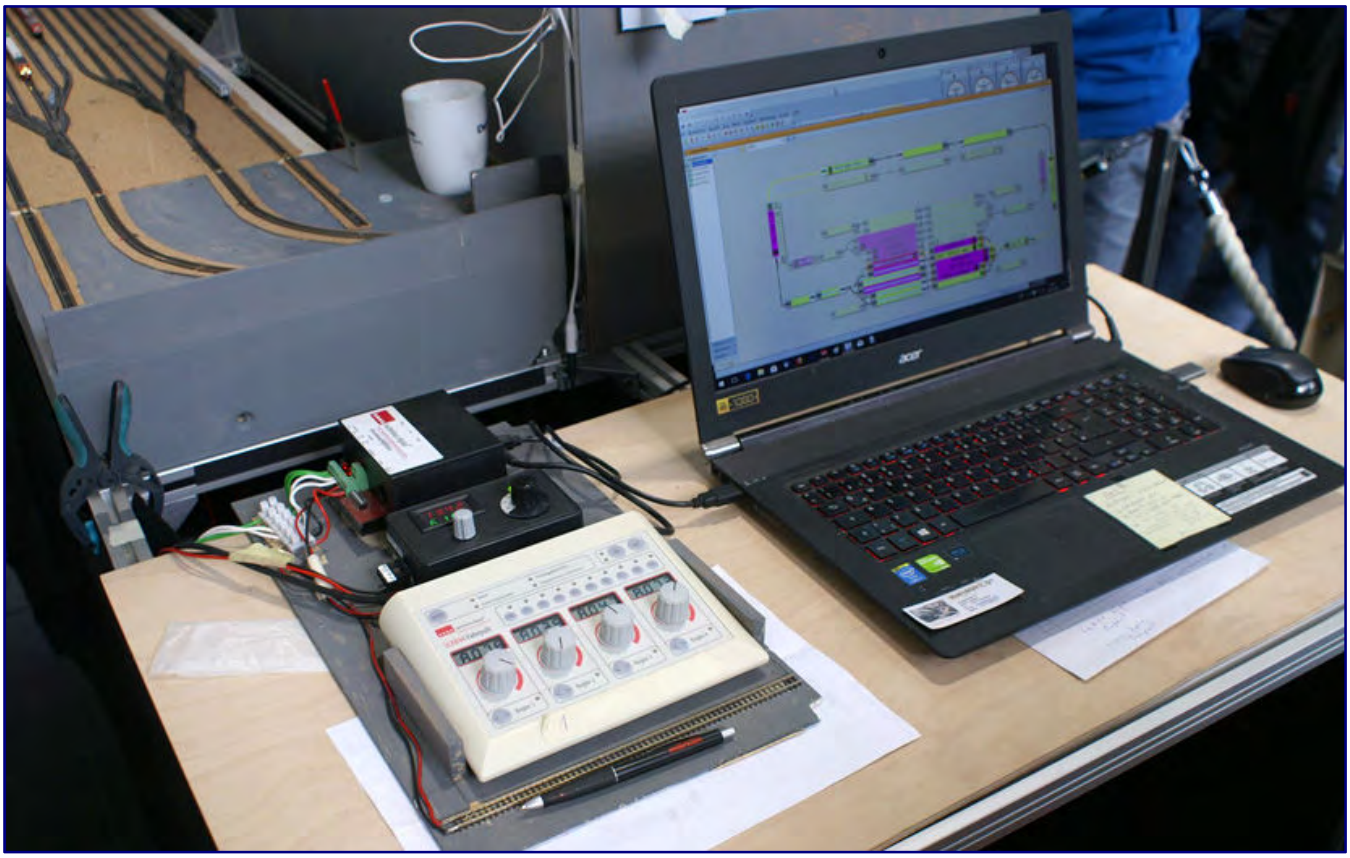
It is a frequency-modulated alternating voltage signal (Figures 9 and 10; page 23). Since neither DC voltage nor AC voltage (according to strict definition) is applied to the track, all classic measurement methods must also fail accordingly ("TrueRMS", see above). We therefore need special measuring equipment or an oscilloscope.

Protocols

The digital track signal transmits electrical energy and command data. In order for all components to understand the transmitted commands and react accordingly, a kind of language is needed that all participants can speak.

These are the protocols that give meaning to the sequence of zeros and ones (bits). And just as there are many different languages on earth, there are also various protocols for digital model railway control.

Selectrix (SX) was developed by Doehler & Haass for Trix in the early eighties. The required decoder components could be kept very small, so the protocol was widely used in the small gauges N and Z.



Rautenhaus is a provider that specializes in the Selectrix protocol, one of the oldest digital formats used in the model railway sector. For Selectrix there were also the first digital decoders, which were sufficiently tiny to be installed in selected Z-scale models.

A now standardized protocol [2][3] is used both for the track signal and for communication between the devices (central unit, booster, etc.). There are two variants, SX1 and SX2, which differ in the address range. The data packets for all participants are repeated 13 times per second, so command changes are guaranteed after 1/13 second at the receiver. This makes Selectrix real-time capable.

DCC (Digital Command Control) was developed by Lenz for Märklin and Arnold in the mid-1980s. This protocol is also standardized [4][5][6], but contains only the communication to the decoders, but not the communication between the devices themselves.

In contrast to SX, the protocol is packet-oriented, i.e. a data packet is generated for each subscriber and fed into the transmission loop, whose length increases more and more as a result. The send loop then repeats all data packages in sequence. If there are a large number of participants, reception delays may occur.

MM (Märklin-Motorola) and MFX are Märklin in-house developments for the H0 AC range. Due to the shortcomings of MM (unidirectional communication, i.e. communication only from the central station to the decoders without a return channel), MFX was created as an extension, but was no longer able to establish itself generally due to the DCC system that had emerged in the meantime.

The DCC system is the most widely used system in the world today; Selectrix still plays a role, especially for the small track gauges N and Z. Outside Europe and thus outside the core markets of Märklin and Trix, DCC is the primary system in use.

Current carrying capacity of copper cables
Ambient temperature +30 °C

Cross section	AWG*	Current carrying capacity
mm²	(approximate)	A
0,5	20	3
0,75	18	6
1,0	17	10
1,5	15	16
2,5	13	25
4,0	11	32
6,0	9	40
10,0	7	63

***: American Wire Gauge**
Quelle: [9] - Tabelle T12 und T13

What happens next?

We see this introduction to the electro-technical basics as an important basis for understanding and understanding all the following parts. They are the tools for every model railroader.

The first excursion into the digital control of model railways, which we have completed here, also provides the important basics that are the key to understanding this technology. Familiarize yourself extensively with it, read the article several times if necessary, until you are sure that you have understood the explanations.

In the next part of this series we will then deal in more detail with the components required for digital operation and their interaction.

Internet pages on the topics of this article (link numbers in the text in square brackets):
[1]: http://www.brucewilles.de/grundlagen.html
[2]: MOROP NEM 680 - http://www.morop.org/downloads/nem/de/nem680_d.pdf
[3]: MOROP NEM 681 - http://www.morop.org/downloads/nem/de/nem681_d.pdf
[4]: MOROP NEM 670 - http://www.morop.org/downloads/nem/de/nem670_d.pdf
[5]: MOROP NEM 671 - http://www.morop.org/downloads/nem/de/nem671_d.pdf
[6]: MOROP NEM 672 - http://www.morop.org/downloads/nem/de/nem672_d.pdf
[7]: https://www.vis.bayern.de/produktsicherheit/produktgruppen/computer_elektrowaren/leitungsquerschnitt.htm
[8]: https://de.wikipedia.org/wiki/Formfaktor_(Elektrotechnik)
[9]: https://www.lappkabel.de/produkte/online-kataloge-shop/anhang/technische-tabellen.html

We are currently looking for

a translator (m/f)

on a voluntary basis.

Trainini is a free, non-commercial magazine for all friends of Z gauge model railways and their big role model. Beginning with the year 2018 Trainini will also be published in an English edition. It is produced by a volunteer editorial staff and many volunteers who work regularly or on projects. Our motivation is the common hobby, our motivation the satisfaction of our readers, good contacts with model railroaders and manufacturers as well as a friendly solidarity of the whole team. Become a part of it!

You should have these skills:

- be able to translate articles in German in their sense
- a basic technical understanding
- confident language and spelling skills (German and English, English preferred as native language)

- Collegiality and good teamwork skills due to active coordination with the editorial staff and your translator colleague

Our editorial staff consists of three persons, one translator for the translation of the "International Edition" is currently assisting us. You will have decide for yourself how much time you wish to invest here. It is important that you fit in with us and we fit in with you. If we have aroused your interest, if you would like to spend your free time in a meaningful and enjoyable way, then write to us or ask us what else you would like to know: Editorial Office Trainini, Mr. Holger Späing, Am Rondell 119, 44319 Dortmund; E-Mail: redaktion[at]trainini.de. We are looking forward to hearing from you.

Trainini
Praxismagazin für Spurweite Z

Note for English readers: The literature section that follows is not translated into English because the original text of the books involved are in the German language. The original German is left here for information purposes only.

History(-ies) behind the Wunderland

A life's dream come true

Die kürzeste Verbindung zwischen zwei Punkten ist eine Gerade. Genau die nimmt das Leben wohl in keinem Fall. Auf Höhen folgen Tiefen, unser Ziel finden wir alle meist nur auf Umwegen. So ähnlich war es auch bei Frederik und Gerrit Braun. Die Gründer des Miniatur-Wunderlands erzählen zum 50. Geburtstag ihren Lebensweg mit einer eindrucksvollen Biographie, die wir nur jedem Leser wärmstens ans Herz legen können.

Frederik und Gerrit Braun
Kleine Welt, großer Traum
Die Erfolgsgeschichte der Gründer des Miniatur Wunderlandes

Hoffmann und Campe Verlag
Hamburg 2017

Taschenbuch mit Klebebindung
Format 21,0 x 13,5 cm
240 Seiten mit 25 S/W-Fotos

ISBN 978-3-455-00167-9
Preis 15,00 EUR (Deutschland)

Erhältlich direkt ab Verlag
oder im Fach- und Buchhandel

Seit Jahren gehört das Miniatur-Wunderland in der Speicherstadt zu Hamburgs größten Attraktionen. Nach Besucherzahlen ist es inzwischen die größte und, glauben wir verschiedenen Umfragen, zugleich auch die beliebteste. Diese Schauanlage beweist, dass Modellbahnen auch heute attraktiv sein können und Anziehungspunkte darstellen.

Geschaffen haben diese kleine oder vielmehr große Wunderwelt die Zwillingsbrüder Frederik und Gerrit Braun. In ihrer Biographie erlauben sie nun einen Blick hinter die Kulissen, beschreiben ihren langen Weg bis zur Erfüllung eines Kindheitstraumes und Begründen eines Welterfolgs.

Erstmals steht also nicht die Anlage selbst mit ihren zahlreichen Abschnitten und Länderthemen im Vordergrund, sondern das private Leben der Gebrüder Braun – gezeichnet mit allen Höhen und Tiefen, die das Leben mitbringt.

Die frühe Trennung der Eltern war eine Bürde und brachte Besonderheiten wie das Leben in einer WG mit sich. Die Kindheit war dennoch glücklich, gleichfalls aber auch außergewöhnlich. Schon früh wurden Talente und Charakterzüge sichtbar, die entscheidend für das werden sollten, was wir alle heute bestens kennen und durch die Reihe sicher fast ohne Ausnahmen auch schon besucht haben.

Beide Elternteile gründeten neue Familien, die Mutter starb früh. Auch das hatte entscheidende Wendungen zur Folge, die für den Erfolg der beiden Brüder zu zentralen Pfeilern wurden: Früh auf sich

selbst gestellt, verliefen ihre Wege nicht immer geradlinig und doch bewiesen sie, dass alle Kinder irgendwie ihren Weg finden.

Der Halbbruder aus zweiter Ehe der Mutter nimmt heute auch eine wichtige Rolle im Miniatur-Wunderland ein und auch der Schreiber dieser Rezension hat häufig Kontakt zu ihm, ohne zuvor vom Verwandtschaftsgrad zu wissen.

Auch der Kontakt zum Vater fand sich wieder und verbesserte sich über die Jahre. Heute zählt auch er zu den Stützen seiner beiden Zwillingssöhne und kommt folgerichtig auch in der Biographie mit eigenem Kapitel zu Wort. Ansonsten wechseln sich Frederik und Gerrit Braun beim Schreiben ab. Es ist schön zu verfolgen, wie das Buch so Kapitel auf Kapitel entstand und wuchs.

Das Eigenbild des einen ergänzt sich nahezu perfekt um das Fremdbild des anderen. Oder ist es einfach nur eine weitere Perspektive? Gleich, wie die Antwort lauten mag: Selten war eine Autobiographie so unterhaltsam und gleichzeitig spannend wie diese.

Kindheit, Pubertät, das Ende der Schule, Wehrpflicht, Sturm-und-Drang-Zeit, der Ernst des Lebens. Rasant geht es durch das Leben zweier Brüder, die im Dezember 2017 – mit dem Erscheinen ihres ersten eigenen Buches – das halbe Jahrhundert voll gemacht haben. Etappenweise erfährt der Leser, was die beiden auf dieser Reise für ihr heutiges Leben mitgenommen haben.

Als wichtige und prägende Phase erweist sich das Eintauchen ins Hamburger Nachtleben, in dem sie selbst zu Partykönigen und Diskothekenbesitzern wachsen. Einer ihrer heute besten Freunde erweist sich als Stütze in der Geschäfts- und Unternehmensführung. Wer weiß, dass das Duo hinter dem Miniatur-Wunderland eigentlich ein Trio ist, der erfährt bei der Lektüre die Antworten auf viele Fragen, die sich immer schon gestellt haben.

Doch irgendwann haben Menschen doch von (fast) allem genug. Das wilde Partyleben findet ein Ende, die Braun-Zwillinge werden sesshaft. Ein Urlaub in den Bergen soll schließlich die Wende bringen, die zu dem führt, was heute allgemein mit diesem prominenten Geschwisterpaar verbunden wird.

Gleichzeitig ist es wohl auch der Anstoß, eigene Familien zu gründen und damit vielleicht auch den Grundstein zu legen, dass ihr Erfolg in der Zukunft eine Fortsetzung in zweiter Generation erfährt. Doch das wird schon wieder eine andere Geschichte sein.

Zuvor geben sie preis, wie sie ihre Schauanlage überhaupt finanzieren konnten und zentrale Mitstreiter rekrutiert haben. Auch der Blick hinter die Kulissen des heutigen Betriebs fehlt nicht. Für Modellbahnfreunde ist dies natürlich der erwartete Abschnitt höchster Spannung, dem entsprechend viel Raum gegeben wird. Auch Fehlschläge und Anlaufprobleme werden dabei nicht ausgeklammert.

So findet sich bei der Lektüre für nahezu jeder Lesergruppe etwas: Für den einen ist das Buch ein Mutmacher, immer wieder aufzustehen und fest an sich selbst zu glauben, für den nächsten nur ein wahr gewordenes Märchen und wieder andere finden hier endlich das Rezept, welcher Faktoren es braucht, um die ganze Welt mit dem schönsten Hobby der Welt begeistern zu können!

The standard steam locomotive
Epoch of the Reichsbahn

Die Stückzahlen deutscher Einheitslokomotiven blieben in den meisten Fällen oder über längere Zeit gering und überschaubar. Und doch waren es wegweisende Konstruktionen. Während bei den Siegermächten des Ersten Weltkriegs Hochleistungsmaschinen entwickelt wurden, schaute die DRG nur auf die Kosten und forderte höchstmögliche Wirtschaftlichkeit. Auch dieses Konzept fand große Beachtung und wird nun in einem neuen Transpress-Buch übersichtlich vorgestellt.

Klaus-Jürgen Kühne
Einheitsdampfloks der Deutschen Reichsbahn

Transpress Verlag
Stuttgart 2018

Gebundenes Buch
Format 26,5 x 23,0 cm
144 Seiten mit 109 S/W-Bildern & 23 Zeichnungen

ISBN 978-3-613-71561-5
Titel-Nr. 71561
Preis 24,90 EUR (Deutschland)

Erhältlich direkt ab Verlag
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Der vorliegende Band ist laut Vorwort eine Ergänzung und Erweiterung des 2010 im selben Verlag erschienenen Titels „Alles über Einheits-Dampfloks“, was als wichtige Information für Besitzer dieses Buches dienen mag – wir selbst haben es nicht gelesen oder gegenlegen können.

Struktur und Aufbau des heute zu besprechenden Buches haben uns auf Anhieb gut gefallen. Der Autor erläutert gleich im Vorwort das Dilemma, in dem sich die Deutsche Reichsbahn nach ihrer Gründung befand: Nach dem Ersten Weltkrieg musste Deutschland 8.000 von 40.000 Lokomotiven an die Siegermächte abgeben.

Was übrig blieb, war bunt zusammengewürfelt, teilweise überaltert, technisch in schlechtem Zustand und nicht wirtschaftlich zu unterhalten. Entwickelte zuvor jede Länderbahn ihre eigenen Dampfloktypen, musste diese Vielfalt nun vereinheitlicht werden. Ebenso galt es, durch ein einheitliches Bezeichnungssystem Strukturen und Übersicht zu schaffen.

Der Weg zur Einheitslok, auf den sich die junge Bahngesellschaft machte, wird in den ersten Kapiteln gut beschrieben: kurzer Abriss zur Deutschen Reichsbahn zwischen 1920 und 1945, der Umgang mit Grundsatzfragen und einer erforderlichen Normung und dazu auch Portraits der Väter der Einheitslokomotiven.

Den meisten Eisenbahnfreunden dürfte Paul Richard Wagner in dieser Rolle bekannt sein, doch er war nicht allein unterwegs. Was sie gemeinsam schufen, war dem Diktat höchstmöglicher Wirtschaftlichkeit unterworfen, nicht der Forderung nach Höchstleistung, wie es etwa in Frankreich der Fall war. Wie sehr Wunsch und Wirklichkeit aber auseinanderklafften, arbeitet der Folgeabschnitt heraus, der sich den Beschaffungen bis 1945 widmet.

Nur wenigen ist es bewusst, dass Einheitsdampflokomotiven bis in die dreißiger Jahre – mit Ausnahme des Schnellzugdienstes - kaum betriebliche Bedeutung besaßen, weil bewährte Länderbahnmaschinen

wie die P 8 oder S 3/6 übergangsweise noch nachbeschafft worden waren und die finanziellen Mittel der DRG gerade zur Weltwirtschaftskrise äußerst knapp waren.

Klaus-Jürgen Kühne beschreibt im Buch nicht nur alle Einheitslokbaureihen, sondern erläutert auch Sonderwege, die über Versuche mit Maschinen der Baureihen 24 oder 43 eingeschlagen wurden. Nicht vergessen wurden auch die Konstruktionen für Schmalspurstrecken, die zu einem großen Teil auch von Einheitslokomotiven abgeleitet worden waren. Immer wieder gut herausgestellt und veranschaulicht wird der Begriff der „Muttertype“. In dessen Zusammenhang wird auch die Gesamtzahl an Zeichnungen für eine neue Baureihe genannt wird und die Zahl an neu zu erstellenden davon abgesetzt. Besser lässt sich dem Leser dieses frühe Baukastenprinzip wohl nicht vermitteln.

Rund wird das Werk durch Maschinen, die eigentlich gar keine Einheitslokomotiven mehr sind – wohl aber deren logische Nachfolger oder Weiterentwicklung. Dabei denken wir an die Kriegslok der Baureihe 52, die nahtlos aus der Einheitslok der Baureihe 50 hervorging, aber auch an die schwerere Baureihe 42.

Damit wird auch sukzessive deutlich, wie das starre Konzept von der Wirklichkeit überholt wurde und dazu führte, dass die Einheitslok im technischen Zustand von 1925 spätestens gegen Ende der dreißiger Jahre längst überholt war, obwohl ihre Väter bis zuletzt daran festhalten wollten.

Sehr gut arbeitet der Autor diese Spannungsfelder heraus und schafft damit einen Standardband zu einem entscheidenden Kapitel deutscher Eisenbahngeschichte. In vergleichbarer Weise und Anschaulichkeit haben wir das zuvor noch nicht gefunden.

Veranschaulicht mit gut ausgesuchten Bildern und deren hervorragender Wiedergabe sowie einem Abkürzungsverzeichnis am Ende des Titels wird dieses Buch zu einem wahren Meisterwerk. Auch das Preis-Leistungsverhältnis ist hier als sehr gut zu werten. Wir nominieren „Einheitsdampfloks der Deutschen Reichsbahn“ deshalb für die Neuerscheinungen des Jahres 2018 in der Kategorie Literatur.

Readers' letters and messages

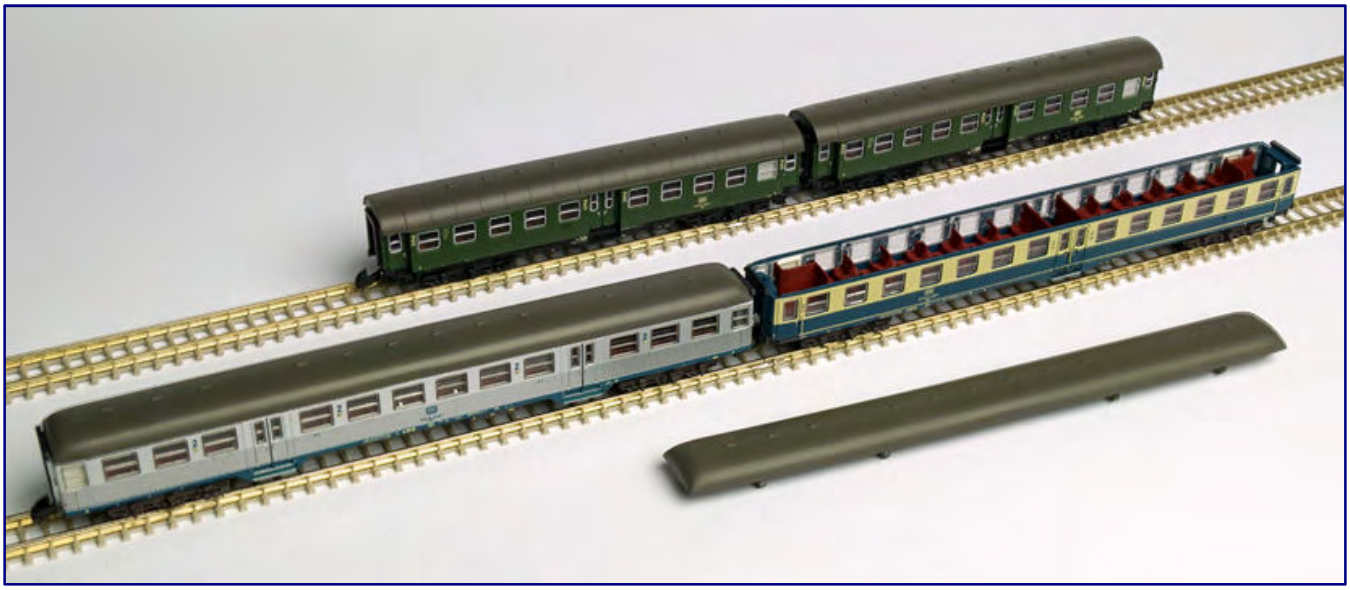
Zetties and Trainini in Dialogue

Thank you for each letter to the editor and all the feedback that reaches us. Write us (contact details see imprint) - Trainini® lives from dialogue with you! Of course, this also applies to all suppliers in Z gauge, who would like to introduce innovations here. A representative image is our goal. Likewise, here we note any events or meetings with a significance to Z gauge reference, if we are informed in time.

Surprising delivery at Märklin:
The four-part "Heckeneilzug" (Art. No. 87549) for Era IV, which Märklin announced as an accompanying set to the ocean blue and ivory-coloured 220 series, is now available on the retailer's shelves. It consists of a silver car, an ocean blue-ivory coloured middle entrance car and two chrome oxide green conversion cars.

All four 2nd class cars now have outfitted interior, which mean that the first two cars have now also received product improvements. Silberling and conversion cars show pictograms to identify the smoking and non-smoking areas, as do the then new class numbers.

On the middle entrance car, however, there are still written out signs and old numbers. Compared to the two previous editions of centre entry carriages of the same colouring, the positioning of the marking on the narrow window bar differs directly next to a door. Later, as can be seen on the other Märklin models, they migrated further inwards to use the larger area available there.



With the package "Heckeneilzug" (Art. No. 87549), which consists only of 2nd class carriages, two further types of wagon have interior fittings out, including the middle entry wagon, where we opened to allow a view into the interior.

While the Silberling is free of criticism and only the outfitting with Minden-Deutz bogies can be seen as a restriction on the conversion car, the middle entry car already traditionally brings some bigger compromises: a roof of the Silberling with an unsuitable fan arrangement and incorrect transition doors at the ends of the car.

Unfortunately, the lacquering and printing on this model has not progressed noticeably either, because the beige window tape is still printed on the long sides, but not lacquered around the corners, as otherwise established as a very pleasant standard.

A big surprise is the delivery of the Kittel steam railcar CidT 8 of the Deutsche Bundesbahn in purple (88145), as it was recently announced in the delivery date list only for the 4th quarter 2018.

This new design shows on the leading side an extremely finely detailed buffer plank at small series level, on the opposite end there is a system coupling for hauling a freight car.

The model is driven by a bell-shaped armature motor; the two top lights are illuminated in warm white with LEDs depending on the direction of travel. The model does not show a tail light. We are planning a detailed test for the June issue.

Surprisingly, the Kittel steam railcar (88145) in Bundesbahn paint was also delivered, which will be reported upon in detail in the June issue.

The Series 143 in traffic red paint by Deutsche Bahn AG (88437) has also arrived at dealers. It has the older of the two head shapes of this series and bears the NVR serial number 91 80 6 143 274-9 D-DB. The drive has not been overhauled, so the model continues to run for the time being with a five-pole motor.

Two new Rokuhan tracks:

Rokuhan has announced two new track sections without ballast simulation, as Noch currently states. They are designed for the new Shortys, because the selected cornering radius is probably also not passable by other vehicles and cannot be integrated into realistically shaped systems. They are included in the range as 55 mm long straight (Art. No. R092; still 7297092) and as curved 180˚ track section with only 45 mm radius (R091; still 7297091).

The latest news from American Z Line:

The ES44AC from General Electric has recently been delivered in a very attractive but rather unknown paint scheme to many readers. It is labeled for Citirail (Art.-No. 62410-1 / -2). In black-red-white paint she drives for the Iowa Interstate, but it is the nostalgia painting of the Rock Island (62412-1).

The Budd RDC railbus is on its way this month for Amtrak (62213-1 to -3). The 40’ long, covered freight wagons with external box frame carry the usual brown, they are labelled for the Reading and available as single wagons (903107-1), double (903177-1) and quad packs (913107-1).

There is also news about 89' flat wagons, two of which are now brown (911023-5O / 911023-5S) and a yellow version (911024-5S) can be delivered, each with two models of the main battle tank M109 and one loaded with the armoured ammunition transporter M992.

89-foot flat wagon (Art. no. 911023-5S), loaded with armoured vehicles of the Types M109 and M992. photos (also page 32 below): AZL /*Ztrack*

Each of these is a new Z-armour design produced exclusively for AZL. The article number extension again indicates the armoured colour olive green (O) or sand-coloured (S).

Further manufacturer photos of the current deliveries can be found at http://www.americanzline.com.

Special exhibition car of the Dortmunder Eisenbahn:

The special Märklin car for Intermodellbau (Art. No. 80728) continues an earlier series based on models of the Dortmunder Eisenbahn. This year, a green painted, open freight car of the type Eaos of the DE with yellow addresses was selected.

This year's special exhibition car for Intermodellbau (Art. No. 80728) has an open freight car of type Eaos loaded with scrap in the former green paint finish of the Dortmunder Eisenbahn.

The prototype of the very attractive model was once used in coal and steel transport between the steelworks of the city and therefore had a scrap load as a model. Since the original also had a licence for the Federal railway lines, it could also be seen outside the city limits and provided a pleasant splash of colour there.

Make a note of the date - Herpa Summer Festival:

Every year Herpa invites you to its summer party in Dietenhofen. There are a lot of show vehicles, the factory museum, interesting dioramas and model exhibits as well as a tour of the factory. Events and demonstrations as well as special sales round off the day. Admission is free.

The date for this year's event has now been established: If you would like to visit the car and aircraft model manufacturer, the event will occur on 7 July 2018. The event runs from 09:00 until 17:00 (last factory tour at 16:00). Further information can be found on the Herpa pages (http://www.herpa.de).

Film launch of a classic book:
On March 29, 2018, the real film version of “Jim Knopf und Lukas der Lokomotivführer” based on the famous book by Michael Ende was released in German cinemas. According to the production company, with a cost of 25 million EUR, it is the most expensive German film of all time, of which there is also an English version (“Jim Button and Luke the Engine Driver”).

The sequel “Jim Knopf and the Wild 13" will be released in German cinemas at Easter 2020. A script is currently being written for this. We were delighted to discover during our visit to the cinema that not only the mid-forties, who grew up with the puppet play of the Augsburger Puppenkiste, flocked into the film halls.

Children and young people, partly accompanied by their parents, were also well represented in the screening rooms. This is all the more important because Märklin has licensed the product related rights to the film and will try to take it into the children's room with suitable starting pack material. Jim Button should also actively contribute to the renewed growth of our hobby.

The waiting time until the start of the film with suitable model railway demonstrations and a product presentation in the cinema foyers will hopefully prove to be a good idea to inspire children about Jim, Luke and Emma for a creative hobby.

In Dortmund's big cinema, the operators proved to be smart, but there were certainly other cities as well: The local dealer Modellbahn-Union (DM-Toys) was invited to present and demonstrate starter and expansion packs. Hopefully, during the time preceding the beginning of the film Modelbahn-Union was able to recruit some newcomers to the hobby.

In view of the adventures that Emma the steam locomotive experiences with the two actors, especially off the rails, the new Märklin model has a spur gear that also forgives active pushing and will be most

welcomed by children (and their parents). Here the designers have ensured that model railway fun close to the film doesn't suddenly become frustrating.

New Herpa products for July and August:
From the current aircraft innovations for the summer months of July and August 2018, we have once again selected those on a scale of 1:200 which do not exceed a length of 30.5 cm and were or are to be found at Europe's airports:

After a long time a model of the ATR-42-500 is offered in the Herpa wings program, painted and labeled this time it is for CSA Czech Airlines (Art. No. 559256). Photo: Herpa

CSA Czech Airlines ATR-42-500 – OK-KFN “Lizina” (Art. No. 559256),
A380 Catering Truck (559270),
CSA Czech Airlines Airbus A330-300 – OK-YBA (609845-001),
Lufthansa Boeing 747-8 Intercontinental - D-ABYA “Brandenburg” (new livery 2018; 611930),
Joon Airbus A320 – F-GKXN (611954),
TUI fly Belgium Boeing 737 MAX 8 – OO-MAX (611961) und
Lufthansa Boeing 747-8 Intercontinental „Starhansa“ – D-ABYM „Bayern“ (611978).

The frame and cab of the new catering vehicle for the Airbus A380 (559270) can certainly also serve as a conversion base for Z-gauge road vehicles. Photos: Herpa

The article numbers starting with a six identify simpler Snapfit models for simply plugging together. Due to the smaller scale of 1:250, the two Boeing 747s can perhaps still be accommodated in the Z-gauge range.

Open day in Györ:
Märklin invites the friends of the house to Györ for the open day on 8 - 9 June 2018. The plant, which was expanded and modernized a few years ago, has now been a part of Märklin for 25 years.

In June, interested Märklin friends have the opportunity to visit the factory in Györ, Hungary, on the occasion of 25 years as a model railway market leader.

This is particularly interesting for fans of Z gauge because most of the products for this scale are manufactured in Hungary. This is perhaps a unique opportunity to experience this up close and in person. Information about the open day will be posted on Märklin's website.

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