Now it's the premiere for DSMG's newsletter. The ambition is to come out with 4 issues per year. The content will vary, but a standing feature will be Rune's corner, where our chairman Rune Wigblad shares his thoughts. In this issue, there is an impressive compilation of various maglev trains created by our member Kenji Eiler. Read and be inspired.

The editors of the newsletter currently include David Örnberg and Jan Wogel.
We welcome contributions and comments.

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David Örnberg

Jan Wogel

Rune's corner June 2022

We have now proudly created a non-profit association (DSMG = The Scandinavian Magnetic Train Group) because it will obviously be a long battle for there to be a magnetic train to Sweden.

While Sweden is about to start a pilot project with the old technology High-speed trains on the "Eastern Link", and the election movement is only about for or against high-speed trains, Japan, USA, and China choose pilot investments in magnetic trains for high speeds (400-600 km / hrs). Recently, the new Prime Minister of Japan testified that the magnetic train still has the highest political priority (https://www.nippon.com/en/news/yjj2022052800140/?fbclid=IwAR3CWhme209jPQlTkD_tFo6AY_KQ_8450uFkqF5YNCR4HdEN9k6q5Nj0v78#.YpH3GEOxgPc.facebook) While California's high-speed rail has major difficulties (Train to nowhere: can California's high-speed rail project ever get back on track? | California | The Guardian), NorthEast Maglev (East Coast of the USA) is investing in Japanese-type magnetic trains (https://northeastmaglev.com/), to connect Washington with New York and with a pilot project between Washington DC and Baltimore in a first stage.

One difficulty that we work with in the magnetic train group (DSMG) is to assess what is happening in China. Kenji has now presented to MaglevBoard https://www.maglevboard.net/en/ an excellent overview of the development of various magnetic train carriages over the past three years. This interesting overview is attached to this newsletter. Most train carriages have been developed in China. We also know that the local / regional authorities in China are on and want to expand magnetic train tracks. At the

beginning of 2020, there were local plans for 9 magnetic train lines with a speed of 400-600 km / h in China. In addition to the Shanghai-Beijing vision, there was pressure from many provinces to get magnetic trains that appeared in various public publications. Debate posts from that time, however, overestimated the importance of these publications in a centralized state like China. In the spring of 2021, a centralized decision was made in China, which means that over the next 5 years, it invested in two pilot projects for magnetic trains, which has been emphasized in later debate posts. A year ago, a statement was made (March 2021) from LU Dongfu, the top manager of the Chinese railway company CRC, in which he points out two pilot projects over the next five years in China, ie until 2026 (https://asiatimes.com/2021/03/china-revs-new-high-speed-train-building-spree/?fbclid=IwAR0MPpsKxRxwAvMQhsdaHHrfUSeg9CIYD2Caw_nhX6CTSNHEdqmarUp-Fn0).

My assessment is that China is probably facing a so-called "ketchup effect". In about four / five years, all the projects will come out of the bottle at once.

Rune Wigblad

What has happened in the last 3 years...

Meeting The International Maglev Board (IMB)
8.4.2022

Dipl.-Ing. Kenji Eiler

The International Maglev Board

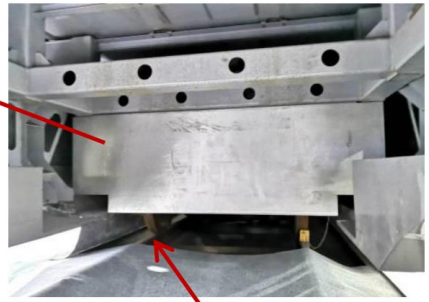
May 24, 2019: Presentation of the CF600 mockup in Qingdao

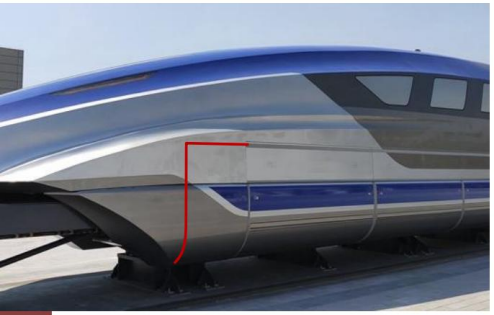
Presentation of the car body mockup

Image source: Sakura (Twitter)

The missing flap compared to the standard train is clearly visible

The mockup comes very close to the real pre-series vehicle. Nevertheless, clear differences can be seen





Mockup is pushed on railroad wheels, but only inside the Factory premises because UIC profile exceeded

Mockup has no extension of the side panels as in the serial train. These can not be retrofitted either

April 29, 2020: Qingyuan Maglev presentation

July 6, 2018: Award of the contract to CRRC Manufactured by CRRC Changchun Vmax = 120 km/h 8 poles per SG, nominal air gap 8-10 mm

August 21, 2020: Maiden voyage in the hall

8/28/2020: Start of construction on the Qingyuan Maglev line

Casting of support #0 in the night, 8/28/2019

total 38 km long
Phase 1 8.1 km 4
railway stations (Yinzhan, Changlong Avenue, Changgang and Changlong Theme Park)

2nd construction
phase Extension both to the east and to the west

1st construction phase in 2021

Construction work at Lianhu Station

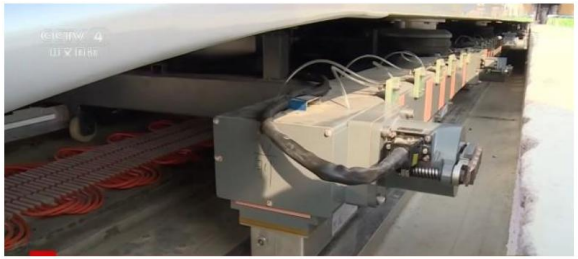
May 2020: L0-951 with inductive charging

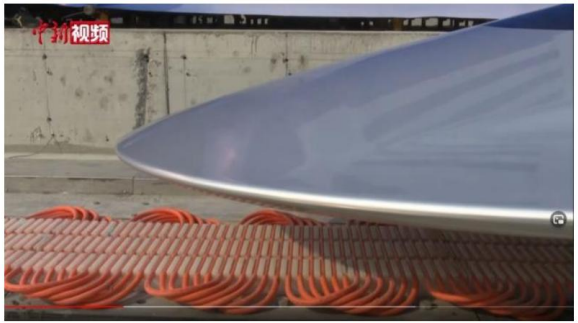
- Inductive charging instead of gas turbine
- Current collectors still available? • Improved aerodynamics at the expense of acoustics

Detailed analysis is stored in the IMB Cloud

2021-01-13: CRRC SCM-620

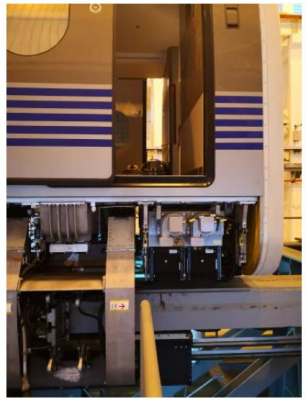
Test vehicle for a design speed of 620 km/h





Feb 2021: CF-600-001 First test rides with the middle section in Tongji

V max ~ 80km/h
Trial for 2 months
Modification of the section for 1-section driving operation



"CF-X" - presentation on May 20, 2021 in Tianjin*

*5. World Intelligence Conference

Air conditioning, possibly only space for it, since no increase to be seen

Reaction rail LIM or stator pack

Possibly stator winding?
= long stator vehicle?

- Manufacturer: CRRC Tangshan
- Approx. 10 meters long, 2.1 meters wide (corresponds to Berlin subway small profile), possibly Vmax 200 km/h
- 5 SG per car body, possibly permanent magnets for field support according to source

• Each SG via Z-support and 4 air bags

• Designed for low traffic (1 door per side/car, few windows)

• Design optimized for small curve radii and low overall height

• Carrying and guiding corresponds to the combined "U" pole arrangement of type KM (e.g. TR02, Linimo, EcoBee)

• The drive is not arranged on both sides above the poles, but in the middle of the track

- Possibly long stator drive, analogous to the development of the SWJTU

View from door Ri.
In front

inverted
"U" profile

cheap
plastic bucket seats

bow section off carbon fiber

8 poles per SG (4 each vehicle side)

No LIM`, since the drive is mounted in the middle

Preview: Exact analysis will follow as soon as more image material, time and motivation is available!

July 2021: CRRC Maglev 3.0 "Green" in action in Changsha

The use of the train was not yet clear

Implementation by the CRRC Zhuzhou

• April 27, 2021: Speed record 160.7 km/h

Doors are narrower than the standard train.
Also, the distances are not identical.

Repainting of the train

• Since July 1, 2021: Use in Changsha as an express train

• Increase Vmax to 140 km/h

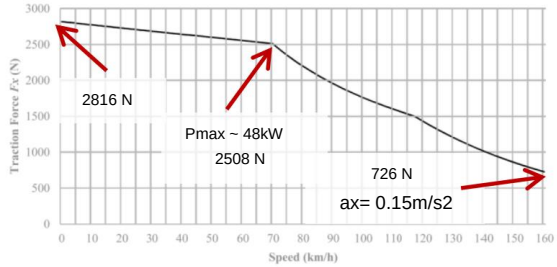
• Changsha series train: increase from 100 to 110 km/h (designed for 120 km/h)

• Travel time saving 3 min from 19:40 to 17:00 min for 18.55 km with one intermediate stop

• Disadvantage: The position of the doors does not exactly match the Changsha 1.0 series train ÿ Not all doors can be used to board the train

Fengyuan Maglev: vehicle

LIM type "JX-130" with aluminum conductor for
weight reduction, length 2020 mm,
String voltage 220 VAC



~ 2.5 kN/LIM gives 75kN traction for 3 sections at v=0
Linear motor in Changsha has more thrust initially, but the thrust curve flattens out faster (708 vs. 726 kN).

It should be noted here that the thrust characteristic has nothing to do with the electr. efficiency.

- VVVF Inverter conforms to 2.0 series
- 1500 VDC via power rail
- New magnetic poles type "TMC-35"
- 8 poles per SG. total 40 per vehicle section
- Compared to TMC-33 (Changsha): Lifting power +6% with +12.5% larger hovering gap (required for fast travel with larger deflection)
- Possibly higher number of turns per pole

July 20, 2021: CF-600-001 "Rollout"

Manufactured by CRRC Qingdao

• Aerodynamic and control engineering design Vmax 600 km/h • Underfloor area corresponds to TR design • Suspension magnets and cantilever arms correspond to TR09 design • Aluminum car body is completely different from TR: • Center section M1 tested for 2 months in Tongji

- Li-Ti battery pack

9/30/2021 Fengyuan Maglev – Construction and commissioning of the 1st construction phase

August 2019: Start of 1st construction phase 9.121 km, vmax 100 km/h, 4 intermediate stations

July 11, 2021 Months of the 1st turnout segment (of 6)

9/20/2021 Laying of the last 12.5 m long rail

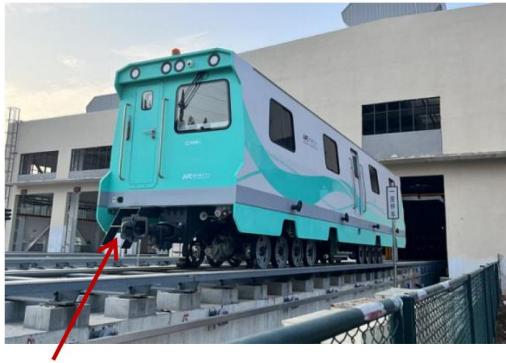
September 30, 2021 Rollout on track L1

1.12.2021 Commissioning of inspection and towing vehicles

12/24/2021 maiden voyage

Track will be built in 3 phases:

1. Zhangjihuai High-Speed Railway Station - Folk Custom Park Tunnel
2. Folk Custom Park Tunnel - Chengdong Tourist Center
3. Chengdong Tourist Center - Zhangjihuai High-Speed Railway Station



Scharfenberg coupling for towing

- Conceived for tourism operation
- Route connected to Zhangjihuai high-speed railway
- 4. Application range in China

Vehicle Manufacturer CRRC ZELC (Zhuzhou Electric Company)
3 sections, design speed 100 km/h

Max 5.1% gradient, rmin = 75 m

Bidirectional inverter with regenerative feedback

Cover of the conductor rail ÿ weather protection

Since the track is designed for Maglev-typical distributed loads, the vehicle weight has to be distributed over a total of 16 rubberized wheels

Preview: Exact analysis will follow as soon as more image material, time and motivation is available!

http://www.hngdkg.com

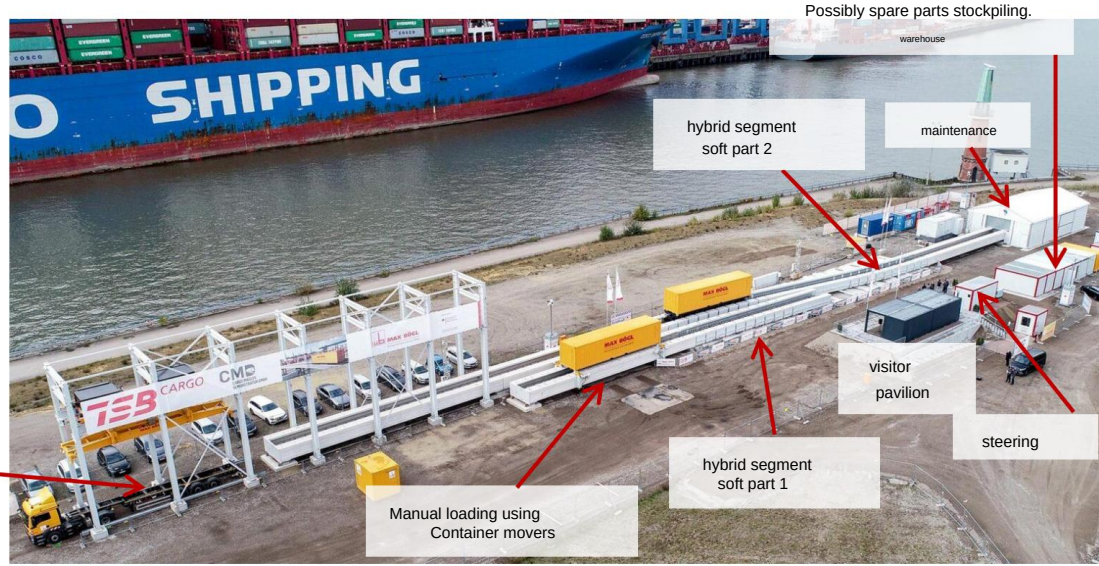
February 9, 2021: TSB drives 169 km/h

Ride with 3 sections

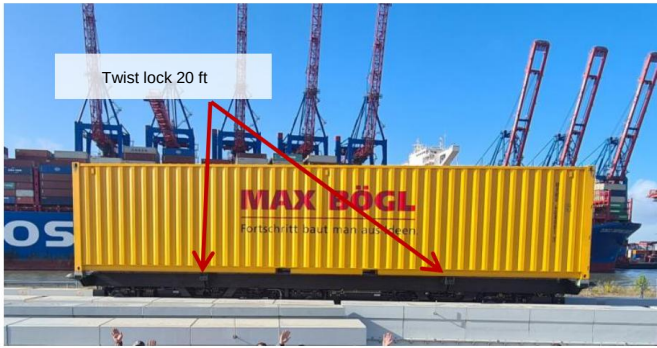
Distance 3.55 km

Previous world record: 307.8 km/h (1978, HSST)

October 2021: Cargo TSB is officially presented



- Groundbreaking on August 4th, 2021 in Hamburg at the lighthouse Ellerholzhafen
- Open to the public 11.10 – 15.10 / 900 trade visitors
- Continued operation until November
- The route is only 120 meters long including the loading crane
- Y route with hybrid segment switch
- Demonstration of an autonomous vehicle with two 40 foot container



This is just a brief summary. Exact analysis will follow as soon as more interest and a lot of motivation is available!

TSB goes into licensed production - initially only a single prototype

- Built-in structure including suspension frames were largely made by Max Bögl made
- The car body corresponds to the structure gauge of the TSB
- The panel construction of the car body is identical to that of the TSB, the front of the vehicle was adapted to a Chinese design

- Presumably better aerodynamics than Bögl's TSB design
- Interior differs significantly from ingenuity design
- Bucket seats instead of TSB's fabric-covered benches
- Corners of the magnetic poles have a different color (brown instead of red) than at TSB

My opinion:

- Bögl entered into the joint venture primarily for strategic reasons in order to be able to sell the vehicle system better in China "Made in China".
- Bögls TSB will be a flash in the pan as there are already many other Urban Maglev systems exist. I don't see many chances there because the system doesn't offer anything special that other systems don't have
- An operator of a future TSB is the monopoly of Max Bögl and his cooperation partner in China. You cannot simply fall back on another manufacturer.

"CF-Y" - not yet officially presented

- Manufacturer: CRRC in Tangsha
- Year of construction 2021
- Probably 2000 mm gauge
- Factory test track: 1560 m long
- Approx. 12 meters long per section
- 5 SG per car body
- Constructed for medium traffic (1 double door per side/car)

- Carrying and guiding corresponds to the combined "U" pole arrangement of type KM (e.g. TR02, Linimo, EcoBee)
- Drive probably conventionally on both sides
- Power supply probably 1500 or 750 V DC

Z-support for roll axis similar to other models

Preview: Exact analysis will follow as soon as more image material, time and motivation* is available!

*@Johannes: A cold beer helps ;-)

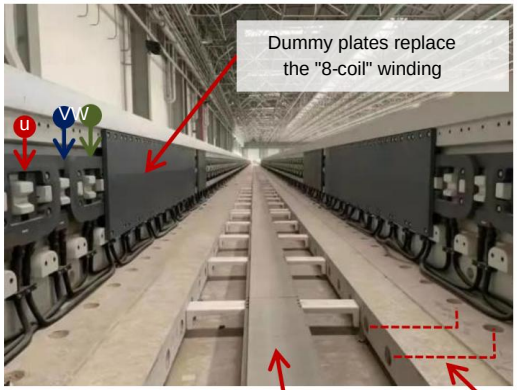
November 2, 2021: SCM-600: Research on the EDS system

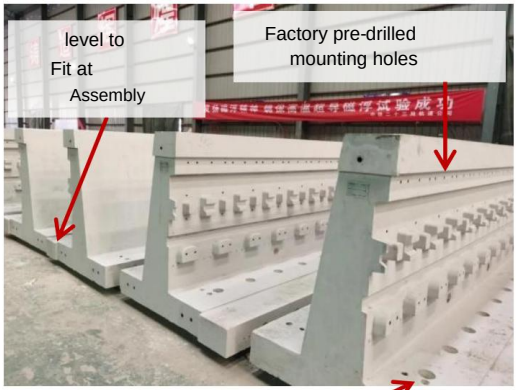
- Comparable with Japanese MLX, design 600 km/h
- Other pole pitch and gauge ÿ Not compatible with JR system
- Shanghai Superconductor Technology Co.,Ltd. supplies the high-temperature superconductor coils (conductor tape) to CRRC Chanke of the type "ST-6-L"

上海超导™
SHANGHAI SUPERCONDUCTOR

- Inductive charging system in the middle of the route
- Reduced indoor prototype of the track with LIM winding in 2 levels (front/back), phase U+, V+, W+
- No "8" coil winding and the cross line to be seen ÿ possibly only the drive is tested here because the speed is not sufficient for dynamic hovering

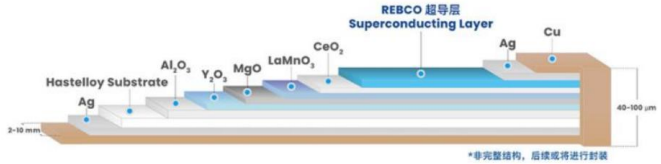
- Assembly of the winding directly in the concrete body through pre-cast Concrete forms, segments about 5-7 meters long
- Pre-drilled and face ground straight from the factory





Inductive power supply (Dummy)

Prepared drilling for cross line



Crack temperature ~ 77°K

December 15, 2021 Hanging "Maglev train" with LIM

Car body corresponds to the conventional CRRC monorail
Roof is reinforced to accommodate the additional VVVF WR

Length 2 sections 10 m, width 2.3 m, height 3.6 m

32 seats, 88 people, in total 120 people
V max = 120 km/h

4 SG with 2 LIM each ÿ less thrust than other magnetic tracks

Hover function not clearly comprehensible, since no large roles can be seen.

Possibly PM. SCM rather unlikely due to the lack of cooling peripherals

4 suspension frames for the 2-section vehicle

pantograph
750 or 1500 VDC and ground

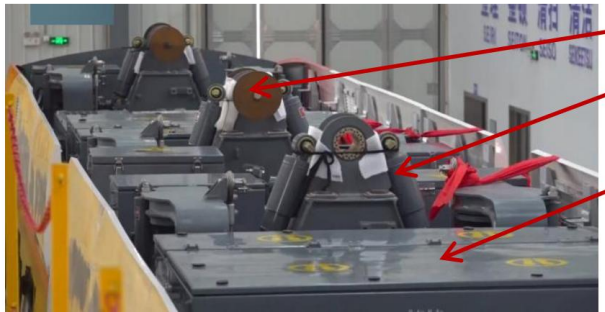
mechanical
shoe brakes

LIM

PM?
SCM?

Lateral guidance is
provided by wheels

emergency castors
carrying function



Recording joint SG

Roll axis damper

pneumatics and
car control.
No VVVF!

CRRC CF250

M1 car body: The almost identical construction to the
TR08 car body recognizable.

Design was first presented in Shanghai in 2018 with a model at a trade fair
2 sections with a system width of 12.384 m (2 instead of 4 SG per section)
2 WSB per section = 4 times the braking force, but at vmax 200 km/h
Air conditioning on the roof instead of inside the car (TR08, SMT)

Detailed analysis is in progress and will be timely
IMB sent internally

March 2022: Changsha CF101-01 pre-series train undergoes major revision for the first time

• Pre-series train will be taken out of service on March 29, 2022
• In use since May 2016

• Overhaul of the entire vehicle • "Balanced Frame Repair Operation" / frame repair ÿ Cracks in the car body? • Dismantling of all attachments. Inspection of all components • Body and suspension repair and maintenance Some parts/ components are rebuilt to improve downtime and ride comfort

• Comprehensive revision required every 7 years or 1.4 million km • Corresponds to around 75,500 journeys (one way) • After frame repair, 1.2 million km interval • For comparison: Beijing subway: 600,000 km

• Repair to be completed in July 2022