

TRANSRAPID MONTHLY



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WELCOME AGAIN!

Thank you for choosing the April issue of Transrapid Monthly. We are extremely pleased to have you onboard our second venture into the puzzling history of the Transrapid. Our first issue was viewed by a total of 25 individuals. For an up-and-coming magazine about a niche topic, I'd say it's a moderate success! Nevertheless, the issue right before your eyes contains a brand new set of interesting Transrapid lore and trivia. The main article of this issue delves into a research paper made by the U.S Department of Transportation detailing the noise characteristics of the TR08 system. It contains a plethora of interesting facts about the Lathen test facility, as well as a couple of images.

Finding this research paper was probably one of the biggest breakthroughs ever in my Transrapid research because even though I treat my investigations rather seriously by scouring the darkest depths of the internet and plowing through saved versions of long-gone websites, I didn't realize that one giant file filled to the brim with concrete data sat in plain sight.

Anyways, I hope you'll enjoy our 2nd issue of Transrapid Monthly, which contains detailed articles presenting other interesting Transrapid trivia, such as a description of all planned Transrapid routes, a list showing in which video games can you find Transrapid-related content, and more! As always, if you have any interesting information about the Transrapid and would like to share it with a broader audience, don't hesitate to message us on Instagram profile, @transrapidmonthly.

See you in the next article!



Sincerely,

**The *Transrapid Monthly*
editorial team.**



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ALL PLANNED TRANSRAPID ROUTES: PART ONE

Learn about all planned Transrapid projects that never came to be.

by Tytus Dunin

With every new invention comes blind optimism towards the future. Every company taking center stage in developing a groundbreaking technology expects governments to line up to try their invention. Unfortunately, the reality isn't nearly as perfect. We've seen this with the Transrapid, and we're seeing it now with the Hyperloop. The difference lies mainly with the fact, that the Transrapid was backed by decades of research and multiple world records broken. In this article, I'm going to skim through most of the Transrapid routes that were planned, but sadly, never brought into existence.

The Munich Airport Link

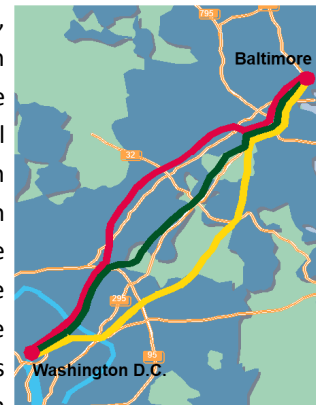


This project is possibly the closest we came to a maglev route in Europe and the one that caused the most controversy. Its planning stage created the biggest organization against the maglev technology ever – ContraRapid. This organization managed to collect 23,527 signatures under their petition against building the Munich airport link. The route was to be 37,4 km long, stretching between the Munich Main Station and the Franz Josef Strauß airport. The average travel speed was estimated to be 220 km/h. Between the two stations, 5 three-section vehicles would transport passengers between the two stations in 10 minutes, every 10 minutes. According to the planning stage of the project, the whole route with the vehicles and the stations would cost €1.85 billion. The cost of the project was consulted with experts and officials, however, the media blew the estimates out of the proportion, reporting the cost to be up to €10 billion. In 2008, Deutsche Bahn along with the GSV consortium decided to enter the in-depth design-to-cost process, which concluded that the total cost of the project would be €3.5 billion. Half of the Airport link would be built in collocation with federal highways and 8% would be built next to existing railways. The majority of the track would be built at grade, with only 14% (5,25 km)

elevated and 19% within a tunnel (7,2 km) split into three sections visible on the infographic. According to the 2002 feasibility study of the Transrapid technology in Munich, the fares would be set according to the Munich's Transport Association, although with a special surcharge. In 2007, the fares were agreed to amount €13,80 for a single journey (€16,50 in 2020), €17,50 for a 24h ticket valid for the entire network (€20,92 in 2020) and €163 for a monthly ticket (€194.85 in 2020). Because of the threat of higher fares, as well as concerns about Transrapid's noise profile and its effect on the landscape the project was unpopular with the residents. The opposition ridiculed the project, calling it „absolutely unnecessary” and swayed the public opinion by offering “more sensible” projects they would spend the money on.

The Baltimore-Washington Project

As you can see to the official infographic, the track would stretch between downtown Baltimore, through the Baltimore-Washington International Airport and further onto downtown Washington DC. This route's length would be 62,8 km, it would contain three stations, and the total trip time for the entire length would be 18,5 minutes. The estimated cost of this investment was \$3.7 billion (with 7 three-section vehicles). This project was revisited in 2015, although with minor changes to the route and using the Japanese SCmaglev technology instead of the Transrapid.



The Las Vegas-Primm Project

The Las Vegas project was initially to connect Las Vegas and Los Angeles, essentially connecting the McCarran International and Los Angeles International airports, however, a shortened route (56 km) was chosen for the Maglev Deployment Program. This 11-minute route was to stretch between Las Vegas and Primm. Transrapid International estimated the investment cost to be \$1.3 billion, with 3 eight-section vehicles included in the aforementioned estimate. Although this wasn't the first maglev train project in Las Vegas, we will elaborate on this topic in the M-Bahn Section.



The Pennsylvania Project



As part of the Maglev Deployment Program, a route was devised that would transport passengers across Pittsburgh and connect the Pittsburgh International Airport with Greensburg. There would be 5 stops, called „Magports” that would serve as big transport hubs. The track would be 86,9 km in length with the trip time being 35 minutes. Transrapid International estimated the cost to be \$3.5 billion (including 8 three-section vehicles). If you would like to read more about this project, you can head to our website and read an 822-page research paper made by the Pennsylvania Department of Transportation containing all possible details regarding the Pennsylvania Project.

Project Netherlands

One of the biggest maglev projects that would be constructed in Europe. This track would have transported passengers between Amsterdam and Groningen. This 186 km long track would comprise 8 stations (with the optional expansion to the Amsterdam Schiphol

International Airport), with one of them being Drachten – yes, the same Drachten we mentioned in our Transrapid 06 article. The trip time between the Schiphol International Airport and Groningen would be an unbelievable 59 minutes.



UK Ultraspeed

UK Ultraspeed was by far the most ambitious project using the Transrapid technology, however, its demise was clearly foreseeable from the get-go. This enormous 800 km route would have run from Glasgow to London through all the major metropolises of Britain. The journey time between London and Glasgow would be a mere 2h 40m. Initially, the project was met with attention and support from the then Prime Minister Tony Blair. His enthusiasm and initial good press led to an official study into the concept. Unfortunately, the support went downhill from then. The press reported on the colossal funding such a giant project would require. With the Munich Airport, Link canceled, and the populous redacting their support for the project, the UK Ultraspeed was officially rejected by the government, ultimately deciding to build a conventional high-speed route.



TRANSRAPID 09 - THAT TIME THE MAGLEV ACHIEVED EXCELLENCE

Futureproof design. The platonic ideal of a maglev train. The Transrapid 09.

by Tytus Dunin

There is no doubt that the Transrapid 08 is a true icon of the TVE. The tragic accident which resulted in total devastation of the train also had an impact on the Transrapid brand, which foreshadowed the closure of the test track. In spite of those hurdles, Transrapid International tried to revive the superspeed maglev system for the final time, creating their best design to this day – the Transrapid 09. The new model had received major tweaks regarding its design, as well as its hardware. Let's take a closer look at what exactly has changed since 1999.

of the Transrapid for the Munich Airport Link and the Metrorapid NRW project. Initial drafts were made, however, it was decided that for the time being both projects will use modified Transrapid 07 trains. As you can see in the photographs, the TR07 presented outside the Visitor Center faithfully imitates the Transrapid TR-Regio, although not perfectly. In 2006, Transrapid International decided to design an entirely new Transrapid model, one that would be created exclusively to serve in regional transport. Their new creation, the Transrapid 09, left the factory on April 17th, 2007.

By comparing the Transrapid 09 and the Transrapid TR-Regio, we can see striking similarities. In contrary to the intercity design of the earlier Transrapid models, the TR09's cabin was expanded by 150mm, and the 3+3 vis-à-vis seating pattern was reduced to a 2+2 one to allow for a wider aisle, that would provide more standing room, which is crucial in short-journey transport. To shorten the train dwell time, which is a key factor in reducing journey time, the Transrapid TR-Regio introduced a double-leaf swinging-sliding door,



Bildquelle: Deutsche Bahn AG

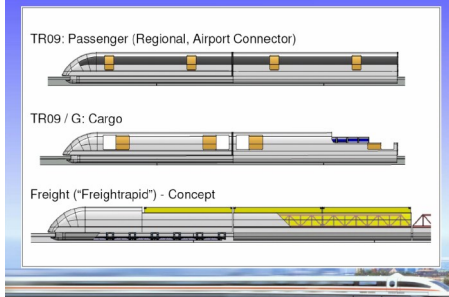
The story of the TR09 might have started with the Transrapid TR-Regio project. Deutsche Bahn inclined toward an entirely new model

which is approximately two times wider than the Transrapid 07's single-leaf door. The engineers at Transrapid International took note of that and implemented 1580 mm single-leaf swinging-sliding air-tight doors, which are 680 mm wider than the doors implemented in the TR08. The TR09's doors also incorporate two layers of heat insulation and sound-proofing foil, one on each side of the door. The door wings in the latest Transrapid model are 50 kg heavier than those mounted in the TR08, and their displacement time equals 6 seconds, whilst the door wings in the TR08 take 4 seconds to open. The new Transrapid cold and hot air ducts, the former installed as part of the ceiling paneling and the latter situated under the seats, integrated with the double floor. Regarding the new lighting concept, the official design document states: „*In order to optically increase the room height of the TR 09, the side lights integrated into the luggage racks will be supplemented by a light duct in the middle of the ceiling. The duct will be laterally illuminated by a row of lamps, the light being uniformly radiated downwards by a fine-structured aluminium plate. The duct is covered by a partly frosted glass completing the ceiling contour to form a uniform arc. The depth of the duct remains sensible and makes the room look higher*”. You can read up on more interesting details by downloading an official design document, which you can find on our official website.

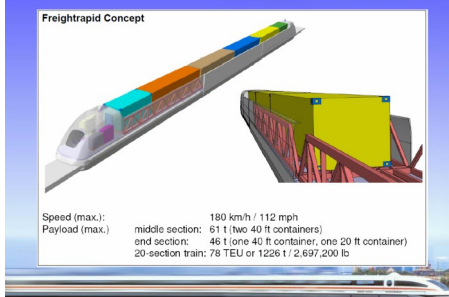
However, the most groundbreaking feature of the Transrapid 09 is the fact that it is completely driverless. The windows, which usually are the weakest point of a high-speed train, were substituted by a CCD camera system, which is integrated into the front lights of the train. One camera is fitted with a panoramic lens, and the other with a telephoto one. This allows the vehicle to be directed entirely from the control tower. This solution was met with an intense backlash from the ContraRapid supporters. The protesters tried to make a point, that not having a driver on board was a major safety issue. Of course, they didn't take into account that since the track acts as a motor for the train, the whole system was powered and directed from the control tower since the beginning.



Transrapid Freight & Cargo Current Vehicle Options



Transrapid Freight & Cargo Seaborne Containers / Heavy Cargo



The other variant of the TR09 was called „Freightrapid”. Because of its much less aerodynamic form, due to the lack of the top half, the maximum speed of the train is 180km/h.

Lastly, I would like to talk about the interior of the “cabin” of the TR09. As explained before, the latest Transrapid is completely driverless, however, what can we find in place of the driver's seat? We can spot some objects in the front of the Freightrapid presented on the 2nd excerpt, but how does it look in real life? Fortunately, the endlessly talented photographer Bernhard Ludewig, who managed to photograph nearly every place related to the Transrapid, recently expanded his Transrapid gallery with a fresh set of photographs documenting the Transrapid 09 currently stationed in Nortrup. In the fresh set of photographs, we can spot a truly stellar one, showing for the first time the bow room of the TR09. If you would like to see the gallery for yourself, don't hesitate to visit Bernhard Ludewig's website, <http://bernhard-ludewig.de/gallery/transrapid#>



RESEARCH CLEARLY CONCLUDES: THE TRANSRAPID IS THE QUIETEST FORM OF HIGH-SPEED TRANSPORT

The ultimate proof against the claims of the Transrapid being loud.

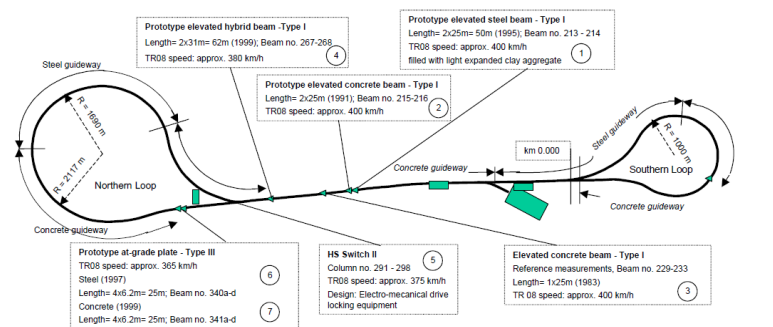
by Tytus Dunin

Today, the high-speed rail is cornered by just a few companies manufacturing conventional trains. The Transrapid was very close to sparking a true revolution, however, wavering political support and general unpopularity in the most promising areas where a Transrapid-track was to be built decided upon its demise into obscurity. Each subsequent protest and petition delayed planning stages. ContraRapid supporters employed scare tactics in order to turn the common folk against the Transrapid. Eventually, their scare-mongering worked – not one of the planned routes saw the light of day in Germany or anywhere in Europe. Partly, their success was achieved thanks to basic media principles – it’s easier to be scared of something than try to understand it, and that’s why ContraRapid’s arguments, despite being utterly uninformed, reached worldwide recognition. After all, we know very well that information about disasters, pandemics, and shootings are immensely eye-catching. In this article, I’m going to once and for all disprove ContraRapid’s 2nd favourite argument against the Transrapid – „The Transrapid is vastly louder than regular high-speed rail“.



Thankfully, we don’t have to buy expensive microphone arrays and revive the Transrapid Test Center in Lathen, because the work has been already done for us. By whom? The U.S. Department of Transportation – as part of their Maglev Deployment Program, parts of which we described in the first article of this issue. This 338-page research paper goes into every detail of 2002’s research into the noise made by the Transrapid 08.

Strating off with something simple, the researchers provided a very detailed graph showing different track types present on the TVE:



As you can deduct from the diagram, the researchers were really thorough, because they conducted measurements not only on the steel and concrete tracks, but also the 62m prototype hybrid track

present on the Emsland route. They tested the elevated track as well as the at-grade one. To be extra meticulous, they also tested the decibel levels near the swich opening the northern loop.

Now that we checked that the researchers were meticulous enough, we can finally look at the results of the study. I’ll spare you the details, because the audible differences between different types of track aren’t really noticeable, and show a really neat table that compiles all results of the research.

Speed [km/h (mph)]	SEL (dBA) at 30.5 m (100 ft)*						
	Maglev Technology				Wheel-on-Rail Technology		
	TR08				TR07	Acela	TGV
	reference concrete guideway	prototype concrete guideway	prototype steel guideway	hybrid beam	reference concrete guideway		
100 (62)	83	86	85	85	(NA)	(NA)	
150 (93)	81	82	84	85	80	87	
200 (124)	86	87	88	85	83	92	
240 (150)	(NA)	(NA)	(NA)	(NA)	85	94	
300 (186)	93	94	95	92	90	(NA)	
400 (249)	99	99	100	98	93	(NA)	

This table clearly shows that both the TR08 and the TR07 are quieter than regular high-speed rail, which really isn’t suprising, because the no-contact railway eliminates all sounds originating from the friction between the rails and the wheels that are present in conventional trains. The only sounds left are the sound of the Transrapid splitting the air and the noise the track makes when it is electrified. Also, based on this data, we can estimate that the TR09 would be even quieter because of its lack of front windows and more areodynamic design.

In conclusion, the results oscilating between 70 and 90 dB might seem worrying, until you take two factors into account: these decibel levels are comparable to a regular, household lawnmower, and the fact that the microphone array was placed 30,5m from the center of the track, which is inachievable even in a densely populated urban area – the Transrapid would have to be too close to the buildings for the planners to approve such a route to be constructed.



If you want to see onther pitcules that didn't make it into this article, check out our Instagram page: [@transrapidmonthly](https://www.instagram.com/transrapidmonthly)

THE M-BAHN CORNER

The mini-Transrapid that made a big difference.

by Tytus Dunin

Even though this magazine is clearly themed around the Transrapid, that doesn't mean that we cannot diverge into other interesting topics connected with the high-speed maglev. Albeit it might not seem that way, the Transrapid has a lot in common with the M-Bahn. For the most part, its technology evolved from the same research as the Transrapid. However, what happened to the M-Bahn after those projects separated? Let's find out.

The M-Bahn was the only other successful maglev technology developed in Germany. The division between the Transrapid and the M-Bahn happened after testing of the HMB 2, the second long stator maglev vehicle, after the HMB 1. The M-Bahn test facility was erected on the grounds of the Brunswick University of Technology and developed by Götz Heidelberg. The track consisted of two loops, one of which incorporated tunnels. You can see all of this in this promotional video:



The M-Bahn technology was acquired by AEG-Telefunken in 1978, as part of the acquisition of Heidelberg's Citybahn GmbH. The acquired venture was renamed to „Magnetbahn GmbH“. In 1982, Magnetbahn GmbH received an order to build a demonstration route in West Berlin. A year after that, the Federal Ministry of Research approved the final notice and the construction of the route could begin. After collecting funding for the project, 75% of which was provided by the federal government and the rest by the Berlin senate, the construction started. It lasted from 1983 to 1986. In 1986, the topping-out ceremony celebrating the end of the construction of the Gleisdreieck-Bernburger Straße-Kemperplatz line took place. However, despite the construction being finished, the train legally could not begin tests with people on board, because the supervisory authority required the M-Bahn to complete 100.000 km without any passengers. During those tests, two major setbacks occurred. In



1987, two M-Bahn vehicles and a part of the track suffered damages due to an arson attack in early morning hours. A second attack would have nearly occurred at the Kemperplatz station when the operation center was doused in

about 200 liters of gasoline. Luckily, the security was able to interrupt

the arsonists just before the operation center was to be detonated.

The second setback occurred in 1988 when during a noise test one of the vehicles failed to reduce speed when entering the station and smashed through a glass plane and stopped on the edge of the track. Since the test took place before passenger service was allowed, no one suffered any injuries.

Finally, in 1989, the M-Bahn completed the required 100.000 km mark and the free-of-charge passenger test service was approved. The M80/2 driverless vehicles with 80-passenger capacity made by Waggon Union transported Berliners between Gleisdreieck and Kemperplatz at speeds up to 55 km/h. On July 18, 1991, the supervisory authority approved the transport system and the M-Bahn transformed into scheduled operation with the BVG tariff.

Despite the initial success of the M-Bahn, which led to plans for lines in Frankfurt and Las Vegas (for which purpose this blue version of the M-Bahn was constructed), M-Bahn's operation was ceased on July 31, 1991, to make way for an extension of the U2 line.



© Carsten Lau - www.berliner-verkehrsseiten.de



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ALL M-BAHN VEHICLE TYPES



Model 401 Prototype



Model 401



Model M70/2



Model M80/2 (the one used in Berlin)

Big thanks for Berliner Verkehrsseiten for providing detailed information about the M-Bahn

<http://www.berliner-verkehrsseiten.de/m-bahn/>

THE TRANSRAPID IN VIDEO GAMES

Discover how the Transrapid is represented in electronic entertainment.

CITIES: SKYLINES



This city-building game made by Colossal Order, a game studio based in Finland, was touted by various critics as the best city-building game to date. I, myself amassed a total of 54 hours in-game over a period of about a year. For me, the most entertaining thing in this game is its advanced system of public transport planning. There's something intrinsically fascinating about finishing a city and moving on to linking different suburbs with an intricate public transport network. In 2017, the game received a DLC called „Mass Transit”, which introduced, apart from a bunch of other features, an option

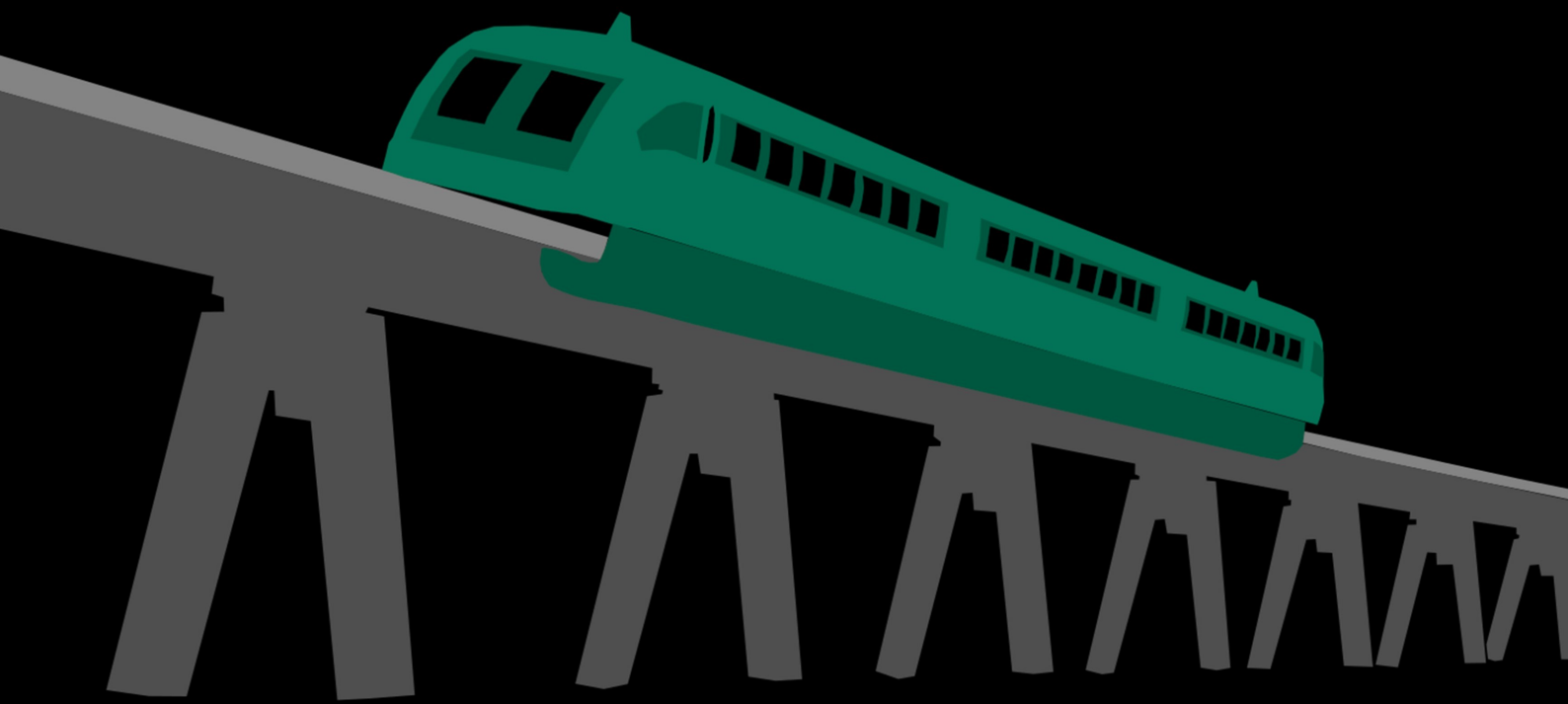
to spice up your public transit network with monorails. What's even better, a talented modder for the game, REVO, created three amazing mods that let you create a city with a Transrapid route. These mods are: a Transrapid vehicle based on the Transrapid SMT, a second vehicle modeled after the Transrapid 07, and a set of the Transrapid-type track, which seems to be modeled after the hybrid track. These three mods let you confront a true and immersive Transrapid route-planning and building experience. Heck, there is a map of Munich in the Steam Workshop, you can try to finally create a Transrapid link to the airport!

TRAIN SIMULATOR 2020



This is a game geared strictly towards people interested in railways. The game is infamous for having a bunch of expensive DLCs, and this one is no exception. The Shanghai Maglev DLC is notorious for being extremely low effort. Despite the train's interior and the driver's cabin being faithfully reproduced (apart from the chairs and the fact that the SMT logo is missing), the stations and the landscapes the Transrapid whizzes past seem to be made in an afternoon. Although fun for a Transrapid fan, it surely isn't something I would pay €20 for.

K n p c r m a n k c g r f c l c v r g q q s c



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