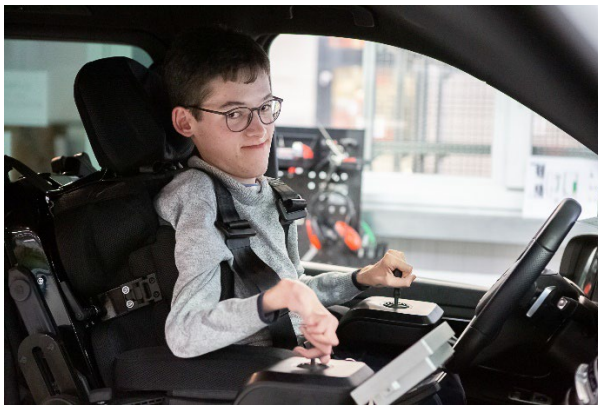


Pfronstetten-Aichelau, 12 July 2023

**25 years Paravan, 20 years Drive-by-Wire, 15 years wheelchair construction
Three anniversaries, one conviction - Accessible mobility as a driving force**

How Roland Arnold's idea of an accessible vehicle with electric steering became a game changer for mobility for the disabled and the entire vehicle industry - from the garage workshop in Pfronstetten-Aichelau to the world market leader



In 1998, Roland Arnold built his first barrier-free vehicle, which became a vehicle revolution. Not only can people with physical disabilities once again drive a car independently and participate in life, with the Space Drive digital driving and steering system Roland Arnold has developed a technology that is already an important basis for autonomous driving. Photos: PARAVAN

"Not being disabled is truly not a merit, but a gift that can be taken away from any of us at any time," said Federal President Richard von Weizsäcker in 1987, underlining the importance of the right to equal participation in social life. Roland Arnold experienced that many of these barriers still stand in the way at a motorway service station in 1997, when the trained car mechanic from the Swabian Alb helped a woman transfer her husband from the wheelchair into the car. He did not want and should not be transported like a piece of luggage in the boot. The attempt failed at first in the pouring rain. Dripping wet, Roland Arnold got into conversation with the woman and - driven by the idea that there must be a better solution - drove back to the workshop at home. Since then, he has been tirelessly tinkering with technical solutions and assuming entrepreneurial responsibility for them.

The idea of the barrier-free vehicle

That was the birth of PARAVAN. The company name was created from the artificial word paraplegia - "PARA" and "VAN" - the optimal vehicle for such a type of conversion. From then on, in his workshop on his parents' farm, he worked on a solution for the barrier-free car that would give people back a bit of independence and quality of life. The result was the first barrier-free Chrysler Voyager in 1998, with a lowered vehicle floor from the A to the C pillar for more headroom for wheelchair users and a side ramp on the passenger side. Now a wheelchair user could drive in front of the steering wheel and steer a vehicle on his own, or be placed in the passenger seat. He was also able to convince the TÜV in the end. In 1998, he

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was awarded the Innovation Prize of the Reutlingen Chamber of Commerce for his commitment. The inventive spirit of the resourceful Swabian soon got around. At that time, many of his customers were already controlling their power wheelchairs with joysticks - for Roland Arnold, the next challenge was obvious: It must be possible to do the same in a car!

Space Drive: What works with a wheelchair must also work in a car

At that time, there was no road-approved solution for this. Roland Arnold did some research and found what he was looking for. A drive-by-wire system was needed with which one could operate the accelerator, brake and steering of a car with individual input devices (joystick, mini-steering wheel or accelerator-brake slider) - adapted to the respective disability. Via the input devices, electrical signals are transmitted by cable via a redundant control unit to corresponding electric motors (actuators), which convert the signals into steering movements or accelerator or brake signals. In this way, a car can be steered with minimal effort. Until then, there was no road-legal system in Germany and also no regulations on how such a system could be approved. Roland Arnold took up the challenge and brought the first drive-by-wire system onto the road in 2003 - exactly 20 years ago. In 2005, the final TÜV approval was granted for the first generation Space Drive. From then on, people with significant movement and strength limitations were once again able to drive a vehicle independently and participate in life - a clear gain in quality of life.

Power wheelchair as driver's seat - crash-tested of course

In the following years, the technology and the product portfolio were constantly developed further. In addition, there were further products that paved the way into the vehicle, such as the PARAVAN cassette lift or the transfer console, which makes it possible to transfer into the vehicle; input aids for the secondary functions of a vehicle via button or switch and, in 2008, the development of a power wheelchair that is securely connected to the car via a docking station and is approved as a driver's seat - crash tested. A power wheelchair that was explicitly developed for this purpose was not available on the market at that time - the margin was too small - and for Roland Arnold it was an incentive to take the development into his own hands. This ensured a much safer and also comfortable ride. The PR 50 has an integrated three- or four-point harness system, adapted to the individual needs of the driver. All other advantages, such as tilt, height adjustment, R-Net control or individual adjustment by a medical supply store, do not have to be dispensed with either. In the meantime, the PARAVAN electric wheelchair portfolio has grown to eight models: from the children's model, the all-rounder PR 30/II, standing wheelchairs for children and adults to the heavy-duty application for overweight people. In addition, the company pursues a 360-degree approach: everything from a single source, from the initial consultation, to the PARAVAN driving school, to the delivery of the individually adapted vehicle. PARAVAN GmbH maintains a branch in Heidelberg with a similar range of services, including a driving school for the disabled, as well as partner operations in North Rhine-Westphalia, Hamburg and eastern Germany, and licensed partners in over 20 countries in and outside Europe.

Space Drive 2 - A new era in the automotive industry

Early on, the Aichelau mobility tinkerers realise that Space Drive is not only an innovative driving and steering system for mobility for the disabled, but also has a broad application potential outside of handicap solutions, from transport and logistics, to agriculture and mining, to autonomous driving. The first enquiries from industry were not long in coming. If vehicles in the future are controlled via an automated driving system, sensors or AI, a steering column in the vehicle will no longer be necessary. Driven by this idea, Roland Arnold continues to develop the technology. In 2013, Space Drive 2, with its unique safety architecture, received road approval. The triple redundant system was developed according to the highest safety standards. To get the technology ready for series production, Roland Arnold enters into partnerships and cooperations with other companies and tests the technology under extreme conditions. In 2019, he ventures into motorsport and brings the world's first racing car without a mechanical connection between the steering unit and the steering gear onto the race track. The goal: to generate data that is important for the further development of new technologies in this field. Entries in the 24-hour race at the Nürburgring, in the DTM, ADAC GT Masters and in the GTC Race follow.

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Challenges of New Mobility

Against the background of the profound change in the automotive industry, the challenges for mobility tinkerers are not getting any smaller. Vehicle model changes are happening much faster than in the past, and electromobility poses additional technical challenges (permissible gross vehicle weight). Many of the popular models are no longer available as combustion engines, and new vehicle alternatives are needed, such as the Hyundai Staria. Future autonomous vehicles must be barrier-free, not only in terms of access to the vehicle, but also in terms of intelligent and adaptable input devices. Only in this way can increasing automation, for example through driver assistance systems, also benefit people with disabilities and further expand the circle of users. This is the future focus of development at PARAVAN GmbH.

Triple anniversary at PARAVAN

An exciting day for the whole family will be offered at the open day on Sunday, 16 July from 10 am at the PARAVAN Mobility Park Aichelau. Celebrate 25 years of vehicle conversions, 20 years of drive-by-wire and 15 years of electric wheelchairs. An eventful day full of activities around the topic of mobility awaits the visitors and offers the opportunity to take a look behind the scenes of PARAVAN GmbH. A varied programme will be on offer, with something for everyone: From an early morning pint with the Albdorfmusikanten, guided tours of the PARAVAN mobility manufactory, wheelchair course, e-kart action with Space Drive, show performances by the rapper and PARAVAN customer "Drive-By", a colourful children's programme, classic car exhibition, drift show with Guinness Book record holder Alex Gräff, musical entertainment by the Hayingen town band in the afternoon, PARAVAN Tornado to touch, drive-by-wire demonstration drives and autograph session with our Space Drive pilots. Food and drink will also be provided with coffee, cakes, food trucks and a drinks stand.



This is what the Space Drive cockpit of the first generation looked like. At that time, the secondary functions were still operated with many individual buttons. Photo: PARAVAN



The second generation Space Drive Cockpit was already much more comfortable and also safer. With the introduction of PARAVAN Touch or voice control, up to 99 secondary functions of the vehicle can now be controlled. Photo: PARAVAN



The PARAVAN wheelchair family comprises eight models ranging from the PR 25 with which you can reach the floor, the compact PR 35/ PR 35 S children's wheelchair, the solutions for adults with PR 30/II, the PR 40 standing wheelchair, PR 50 as a driver's seat, PR Biolution as a standing and therapy wheelchair and the Heavy Duty, Photo: PARAVAN



With the Hyundai Staria, PARAVAN GmbH presents a new platform for vehicle conversions for the disabled, for drivers and passengers, optionally equipped with the Space Drive driving and steering system and completely customisable. Photo: PARAVAN

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About Paravan GmbH:

PARAVAN GmbH is the world market leader for highly individual vehicle solutions for the disabled. Around 180 employees develop and produce individually adapted automobile conversions, electric wheelchairs and even specially specialized driver training. PARAVAN pursues a holistic approach with its "one-stop concept". The technological highlight is Space Drive, an intelligent digital control system based on the drive-by-wire principle. Thanks to the active redundancy of the servo motors, it is completely fail-safe and the first to be approved for road use. With the help of this innovation, severely disabled people, some without arms or legs, can drive independently and safely. It is not possible for these drivers to simply intervene in the steering wheel. Worldwide, Space Drive has proven itself on over one billion road kilometers in the last 20 years and is used by numerous industrial customers for test vehicles in the field of autonomous driving. The system is available as a retrofit kit with an open interface for all known vehicle types. <http://www.paravan.com>