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Joystick instead of a steering wheel: Space Drive restores student's independent mobility

A custom vehicle conversion by Paravan in the Mercedes GLB allows Serina to drive independently to college, work, and to see friends

For Serina, mobility means one thing above all else: freedom. Today, the 23-year-old student is behind the wheel herself—five years after completing her driver's education. Her custom-modified Mercedes GLB is not controlled by a steering wheel, but via a 2-way joystick and the Space Drive electronic steering system. Although she already had her driver's license, she hadn't been behind the wheel herself for a long time. She has now been driving her own vehicle for about five months and has already covered more than 3,000 kilometers.



On the road in everyday life: Serina steers her Mercedes GLB using a 2-way joystick. The Space Drive electronic steering system enables her to drive independently and safely. Photo: PARAVAN

“My path to mobility was a long one—but I’m very happy that I’m now allowed to drive myself,” says Serina. Five years ago, she completed her practical driving training at the Paravan Driving School in Aichelau. After graduating from high school, she searched for a college spot and took the next steps toward owning her own car—from finding the right vehicle to sorting out the financing. It wasn’t until everything finally fell into place and the vehicle could be equipped with custom-adapted technology that her dream of independent mobility became a reality.

A Larger Vehicle for Greater Everyday Practicality

Practicality for everyday use also played an important role in choosing the vehicle. She deliberately chose a Mercedes GLB, which offers enough space to carry her wheelchair as well. Because even though Serina can cover shorter distances well on foot, she needs her wheelchair regularly—especially for longer trips or when her feet hurt. Using a cable pull in the trunk, she can load and

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unload the wheelchair on her own. This way, she always has it with her—for example, on longer trips or for spontaneous appointments.

The Solution: Steering via Joystick

Serina lives with epidermolysis bullosa, also known as the “butterfly disease.” Her skin is extremely sensitive and reacts to even slight friction with blisters or injuries. She therefore cannot operate a conventional steering wheel. The Space Drive electronic steering system provides a solution. Instead of a steering wheel, Serina controls her vehicle using an ergonomically positioned 2-way joystick, which allows her to execute steering movements with precision. She continues to operate the gas and brake using the pedals. A custom-fitted backrest also ensures secure support and comfortable seating while driving. “For me, mobility is also a piece of freedom,” says Serina. “I can decide for myself when I want to visit friends or where I want to go.”

Technology for Individual Mobility

Unlike in conventional vehicles, steering movements in the Space Drive System are transmitted electronically and relayed to the vehicle’s steering system. Serina controls her vehicle with a joystick in her right hand, while the steering inputs are digitally converted. At the same time, the system is designed so that the vehicle can also be driven conventionally with a steering wheel if necessary—for example, by family members or at the repair shop.

For Serina, the 2-way joystick is the ideal input device. After her first few drives, it quickly became clear that getting back behind the wheel was working out. “We’ve even driven in the rain—it actually always went quite well,” she says. She continues to operate the gas and brake using the pedals while steering with the joystick. She controls secondary functions such as turn signals, lights, the horn, or the sun visor via the PARAVAN Touch System or voice control.

A particular advantage of the technology is its flexibility: Space Drive can be combined with a wide variety of input devices and customized to the individual needs of drivers. In addition to joystick solutions, options include mini steering wheels, special hand controls, or foot steering—for example, for people who cannot use their arms or have limited arm mobility.

New Freedom in Everyday Life

Today, Serina uses her vehicle as a matter of course in her daily life. She drives to college in Ravensburg, to work, or to visit friends. Even longer trips, such as visiting her brother in Augsburg, are no longer a problem for her. This also means a noticeable relief for her family. “My parents don’t have to play taxi all the time anymore,” she says. And spontaneous decisions are possible again: “If I feel like driving to a friend’s house, I can just do it now.”

With every kilometer, Serina gains a little more independence. Sometimes that simply means spontaneously driving to a friend’s house. “If I feel like going out, I can just do it now,” she says. For her, that’s exactly where the biggest difference lies: being able to decide for herself when and where she goes.

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Serina controls her custom-modified Mercedes GLB with a 2-way joystick and Paravan's Space Drive electronic steering system. Photo: PARAVAN



Serina controls her Mercedes GLB using a 2-way joystick. She operates vehicle functions such as the turn signals or sun visor via the PARAVAN Touch System or voice control. Photo: PARAVAN



Customized driver's seat with joystick controls, the PARAVAN Touch System, and a custom-made backrest. Photo: PARAVAN



A look inside the trunk of the Mercedes GLB: Using a cable-operated loading aid, Serina can independently lift her wheelchair into and out of the vehicle. Photo: PARAVAN

PRESS RELEASE

With her custom-modified Mercedes GLB, Serina is now back on the road independently—controlled via a joystick and the Space Drive electronic steering system. Photo: PARAVAN

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About PARAVAN GmbH

PARAVAN GmbH, headquartered in Pfronstetten-Aichelau (Baden-Württemberg), is the global market leader in highly customized vehicle solutions for people with disabilities. Approximately 180 employees develop and produce innovative mobility solutions for people with physical limitations at the main location and the Heidelberg branch—ranging from vehicle conversions and electric wheelchairs to specialized driver training. With its “one-stop-shop” concept, PARAVAN supports its customers from consultation through vehicle conversion to driver training. At the technological heart of the company is Space Drive, a digital drive-by-wire driving and steering system that is the first of its kind worldwide to be approved for road use. The technology enables even people with severe disabilities to drive a vehicle independently. With over 25 years of practical use and two billion kilometers driven on public roads, Space Drive has proven itself worldwide. In addition to mobility for people with disabilities, numerous industry partners use the system as a technology platform for developments in the field of autonomous driving. www.paravan.de