

THE STAIR-CLIMBING WHEELCHAIR

'Go anywhere' vehicle project promises to give users greater independence. By Joseph Flaig

INNOVATION

Climbing stairs or enjoying an impromptu walk in the countryside are taken for granted by able-bodied people, but for some disabled people these everyday necessities and recreational activities are more difficult.

Former nuclear engineer John Ross hopes to change that with Igan. Standing for I Go Anywhere Now, the company has developed a new type of electric wheelchair with tank-style tracks.

It is narrow enough to fit through household doors and small enough to load into cars. Its main feature, however, is enabled by the tracks and a few other engineering innovations – it is a truly 'go anywhere' vehicle, capable of safely climbing and descending stairs or traversing hilly terrain.

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"significantly sloping" terrain while keeping the user in a vertical position at all times. It manages this with an adjustable seat, which can also be raised or lowered during use to better enable conversations with others. It is controlled by a joystick, with two speed options – fast for general movement, and slow for climbing and manoeuvring.

The unique combination of features means the wheelchair could restore a great deal of independence to elderly users, or grant it for the first time to younger disabled people. A user might find they can comfortably enter a previously inaccessible garden, for example, or travel further afield for domestic errands. Igan hopes the wheelchair could be registered for use on the road.

Engineering experience

Ross started work on the vehicle four years ago, after an old friend asked him if he could build a go-anywhere chair for his wife. The initial ideas were so impressive that Alan Sykes – the founder of spherical tokamak firm Tokamak Energy, where Ross worked on the ST 40 reactor – and colleagues invested in Igan.

Throughout the project, Ross has drawn on half a century of engineering experience, including his development of the first space-based large superconducting magnet, which was to be installed on the International Space Station.

Innovative features include a hinged plate on the underside of the chassis, which is lowered at the top of stairs to support the vehicle and prevent it quickly tipping



forwards. The seat is pivoted as close to the ground as possible, to keep the centre of gravity of the device and user inside the vehicle, while linear actuators keep the seat horizontal.

The next stage

Other projects have built climbing wheelchairs, but Ross says they each have limitations – some can only tackle kerbs, for example, while others cannot fit indoors. Another can climb stairs but only when the user is facing backwards, something Igan was determined to avoid.

The team, which has spent thousands of hours on the project without pay, continues to make improvements to the device. They are in discussions with their motor supplier about doubling the prototype's speed, and have installed damper units for smooth operation of the seat position actuators.

They now hope to sell the project to a company or individual interested in making the concept commercially successful. For more information, visit igan.co.uk.