

# Cool ideas to lighten the load

Lighter and smarter technology can cut a soldier's burden by a third, says defence manufacturer Singapore Technologies Engineering (STE). Its latest technologies outfit a soldier from head to toe. They are among over 100 STE exhibits on display at the Singapore Airshow this week. **Danson Cheong** and **Bryandt Lyn** take a look at some of them.

## MULE UNMANNED GROUND VEHICLE



Carries a payload of up to

# 700kg

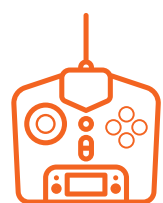
Can be used to cart around supplies or casualties



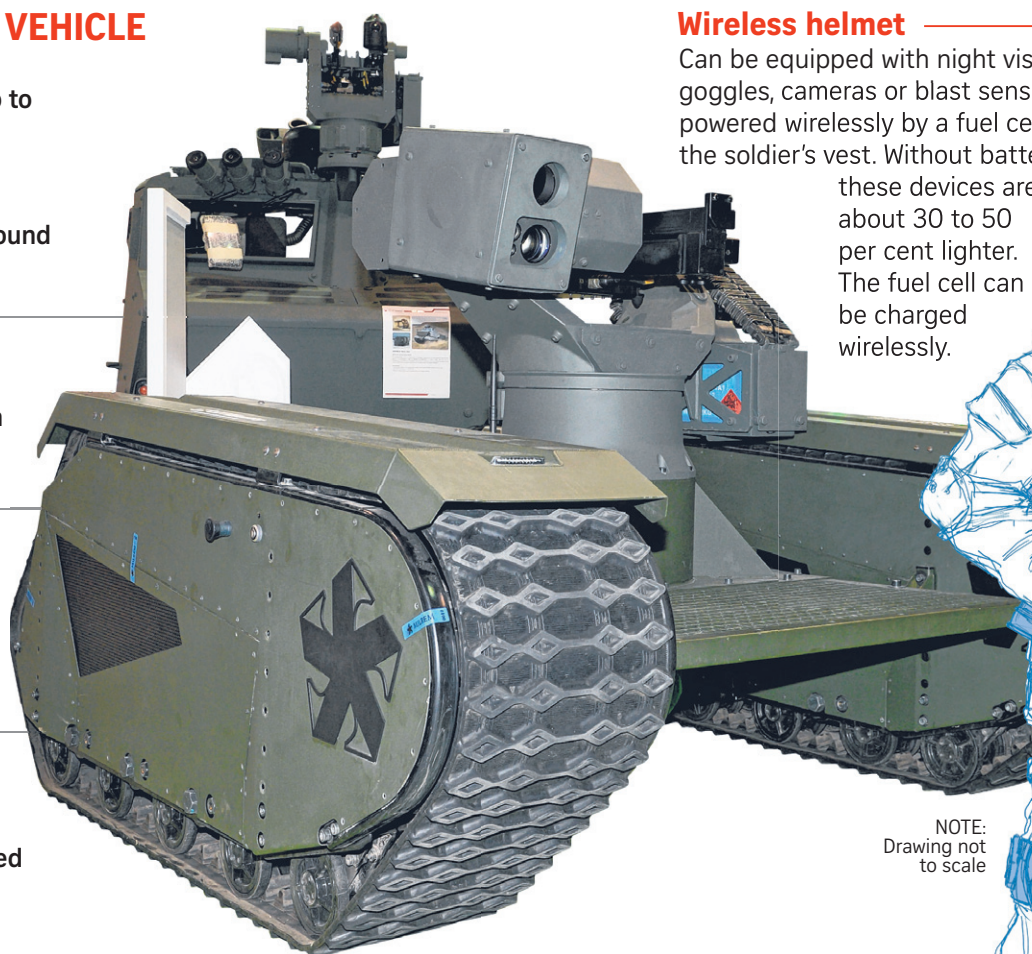
Runs for **8** hours on a single charge



Can be equipped with a remote weapon system



Can be operated remotely or programmed to follow soldiers



## Wireless helmet

Can be equipped with night vision goggles, cameras or blast sensors powered wirelessly by a fuel cell on the soldier's vest. Without batteries, these devices are about 30 to 50 per cent lighter. The fuel cell can be charged wirelessly.

## SHADES (Shielded Advanced Eyewear System)



**Weight: 60g**  
Heads-up display for soldiers. The device can record information, and mark out targets. It can synchronise with unmanned turret systems and instruct them to fire on targets.

## ARCTIC body cooler (Adaptive Real Time Core Temperature Intelligent Cooler)

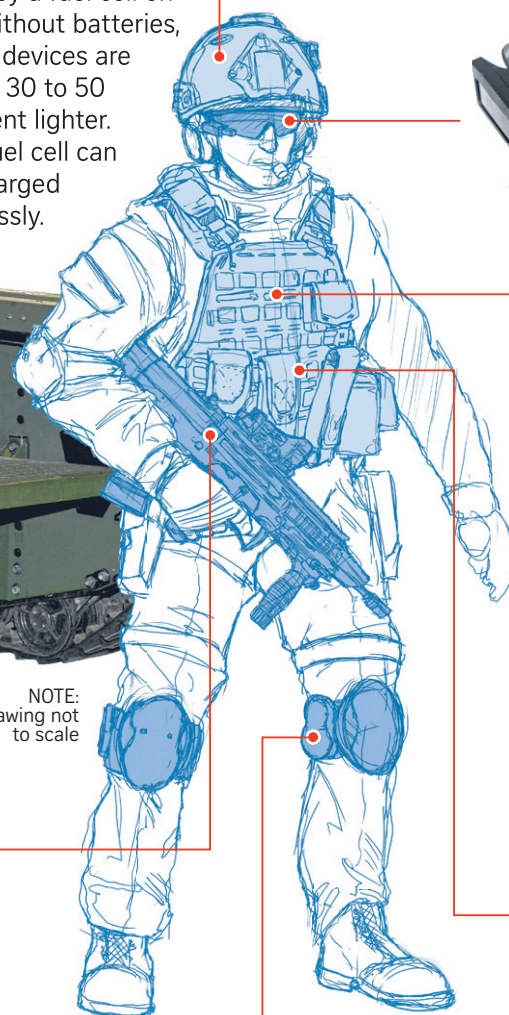
**Weight: Up to 1kg**  
A cooling device on the vest can be switched on when needed. Chemicals are also impregnated onto the soldier's uniform to draw away heat. ARCTIC can reduce core body temperature by 0.2 deg C.

## PROTEC vest (Personal Reinforced Outer Tactical Equipment Carrier)

**Weight: About 1kg to 1.5kg unloaded**

- Made of a patented composite material, this next-generation combat vest is half the weight of the load-bearing vest used by the Singapore Armed Forces (SAF).
- It comprises a semi-rigid frame that transfers the weight on the soldier's shoulders to his upper back. The idea for this came from wearable baby carriers.
- An adjustable belt keeps the weight snugly on the soldier's core.

NOTE: Drawing not to scale



## BMCR (Bullpup Multi-role Combat Rifle)

**Weight: 2.9kg**

600g lighter than the SAR-21 rifle used by the SAF. This ambidextrous rifle contains a battery pack at the back that can power devices such as sights or scopes. The battery can be charged wirelessly.



## BRACE energy harvester (Bionic Regenerative Active Energy System)

**Weight: About 800g**  
Integrated into the soldier's kneeguards, the device captures and stores kinetic energy produced while walking. It can be used to charge devices like smartphones.

## Other exhibits at the STE display



### The Sky Archer Counter Micro-UAV System

Comprises a visual detection module and an electronic jammer. It can detect and track unmanned aerial vehicles or recreational drones. The system can neutralise drones within a 1km radius.



### The Smart Cooler

An "air-conditioner on steroids", it can bring down the ambient temperature of an area the size of a badminton court by 7 deg C. The energy-efficient device costs about \$2.50 a day to power.



### UHV (Unmanned Hybrid Vehicle)

It is a drone that flies and dives. It can be launched on land or from a ship to conduct aerial or underwater surveillance, clear underwater mines, or conduct search-and-rescue operations.