I M A G I N E being able to analyse exactly how your body is responding to any kind of exertion without being wired up to a machine. And not just a heart-rate sensor with rough estimates; think a bit of kit that accurately measures your core body temperature, pulse, oxygen consumption and the speed, distance and rhythm that you are moving at. It may sound like the stuff of science fiction but this technology has become reality in the shape of the Bodytrak earpiece.

Unveiled by Inova Design Solutions at the Consumer Electronics Show in Las Vegas, the British-made device captures precise data about an individual’s physiological wellbeing while they are in action.

So it is no surprise that there is already a long line of elite performers from sport and industry waiting to make use of it.

The Army is also trialling the 18-gram gizmo and some of the first troops to get their hands on it are the Servicewomen aiming to enter the record books by skiing coast-to-coast across Antarctica on Exercise Ice Maiden in November.

"We responded to a call from the Centre of Defence Enterprise for technology to address soldiers sustaining heat injury in the field," said Leon Marsh, Inova’s founder and CEO.

"The Bodytrak earpiece is the first and only unobtrusive body monitoring platform to accurately measure multiple physiological factors in real-time and via one device – that makes it unique.

"It exploits the only part of your body from which all vital signs can be measured."

From the single in-ear device, whole body biometrics and activity data are sent wirelessly to the user by means of a smartphone, smart watch or internet hub.

The technology also provides two-way communications, music playback and what is known as ambient sound transparency, which allows the wearer to maintain their situational awareness - vital for a soldier on the battlefield.

By measuring the body’s responses to heat and other stressors the groundbreaking kit also enables third parties to monitor the individual’s performance remotely.

At the moment the only way to obtain accurate core temperature readings from troops is by getting them to swallow a telemetric pill that can only be used once.

Alec Creighton, Bodytrak’s business development manager, explained that this level of information could help prevent heat injury while highlighting the problem of premature fatigue.

"Elite soldiers and athletes have a mindset and focus that means they can push themselves to collapse," he said. "We saw that recently with the Brownlee brothers in the sport of triathlon."

"The Bodytrak platform will flag up if a Serviceman or woman is suffering”
It will flag up if a soldier is suffering.
The Defence Science and Technology Laboratory has invested in Inova to develop the novel device and tests have already been carried out using the earpiece with MoD architecture. The Army is due to begin field tests in the coming months.

“It is essentially a body monitoring system,” added Marsh, the brains behind the innovative sensor.

“This is focused on high performance areas where the data needs to be wholly reliable and is not comparable to the likes of a general wellness device.

“The concept is to transfer the idea of having sensors on vehicles to humans. In Formula 1 racing, for example, the car has more than 200 sensors while the driver only has one – we want to change that.”

“There are monitors on ammunition, fuel, vehicles and weapons and we are very passionate that the health of individuals should be looked at in the same way.

“We see this as something that all troops have as part of their kit, just like boots and a helmet.

“If a soldier goes down in the field you can use his data to find out what has happened.

“At the moment a medic may have some sort of commentary on to find out more details.

“If the medic has data from the outset they have a far better picture of how to treat them.”

The product still needs to pass through the stringent trial phase with the Army before being taken on by the MoD, but according to its creators its many benefits include improving physical performance, reducing the risk of injury, improving recovery time and even being able to detect signs of illness.

“Put simply, it’s an early heads-up,” commented Marsh.