King engineers setting their sights on Mars

By Mark Pavilons

A small, rather unimpressive looking device may very well hold the key to some new frontiers.

The vestibulator doesn't roll off the tongue and won't garner any design aesthetic awards. It's a functional product, capable of furthering humankind's efforts in the final frontier.

Engineers don't tend to be superheroes, but they are definitely invaluable as hero support. Many engineers love using circuit boards similar to what you can find at Gumstix.com. Astronauts may take the glory, but it's the network of engineers who put them in space and keep them there, who deserve credit.

Laskay's Sherry Draisey and Mayes Mullins have been nurturing their ?little box? for decades. Basically, the vestibulator administers small electrical impulses behind the ears to alter a person's sense of motion. It mitigates motion sickness, which goes a long way to assisting pilots and astronauts.

The concept behind the vestibulator isn't new, in fact it dates back to the 1700s, and the work of the father of bioelectricity, Luigi Galvani. It revolves around Galvanic vestibular stimulation, the process of sending specific electric messages to a nerve in the ear that maintains balance.

The practical applications for the wireless device came after the couple's work at SPAR?Aerospace, during development of the Canadarm robotic arm used on the space shuttles. When controlling the arm itself, there was no way of ?feeling??the force it exerted on objects, as human touch would. Engineers like Draisey and Mullins are working to give it a sense of motion through six degrees of freedom. Using an audio system to signal direction and force proved ingenious. This simplifies the human-machine interface, Draisey observed.

They worked at SPAR from 1981 through 1992 and it was ?a glorious time for a young engineer.??Draisey even gets a little teary-eyed when she recalls this ?exciting time??of her career.

They were asked to create a wireless version and so work began, along with some limited funding from the federal Industrial Research Assistance Program (IRAP). The duo set up Good Vibrations Engineering Ltd. to continue their research and applications for the vestibulator, as well as offering consulting services for private companies.

The vestibulator was found to be an ideal instrument for flight simulators, particularly for helicopter pilot training. Canada's Department of National?Defence wasn't interested, but the Americans were, and still are.

The vestibulator found a home at York University where scientists are using for brain research studies.

The renowned Mayo Clinic obtained a device and grew an entire laboratory around it and the study of bioelectricity. They have since patented their own Galvanic Vestibular Stimulation (GVS) technology specifically for use in virtual reality and augmented reality.

Universities in British Columbia are using the vestibulator for Parkinson's disease research.

Engineers tend to be problem-solvers and they don't always foresee the different applications of their work.

The vestibulator is also being sought after for its virtual reality features, ideal for the massive video gaming industry. They have been approached by a large manufacturer.

The device is also being used by psychologists studying the human decision-making process. Others have found a weight loss application.

The vestibulator has received a mountain of supportive papers attesting to its efficacy and safety, bolstering its credibility. Draisey admits they had to ?wimp it down??a bit because the technology could be altered to become quite dangerous.

Aside from this ?little thing,??Good Vibrations is working on a force motion sensor, which may be used on missions to Mars. The Curiosity Rover follow-on, Mars 2020 will be armed with a drill, and such a sensor would be beneficial to duties the rover would perform.

As well, this duo has laid the groundwork for a ?flying saucer,? also destined for Mars. Draisey explained the saucer is designed to map the subsurface of the red planet, using electromagnetic induction sounding to locate briny water.

The Martian atmosphere is much thinner than Earth's, so flying while carry any significant payload is problematic. This small saucer is more like a rocket. It compresses Martian CO2 atmosphere to form propellant. This propellant is enough to let the vehicle make a 15-metre ?hop??every day or two.

Draisey is passionate about the work and their efforts to help propel our contribution to the space program.
Canada's funding has, unfortunately, not kept up the pace. The Province doesn't support the space program, which is a shame, given the talent pool in this province. Draisey observed that Ontarians produced the historic Avro Arrow and Canadians have contributed greatly to the U.S. space program and NASA.
Talented individuals, and small, private companies will continue to carry the weight when it comes to innovative technologies and applications.
Good Vibrations hopes to be the only commercial producer of the vestibulator and related technologies. For more on their work, visit www.goodvibrationsengineer.com or contact Draisey by email, sherry@gve.on.ca or by calling 905-833-0417.