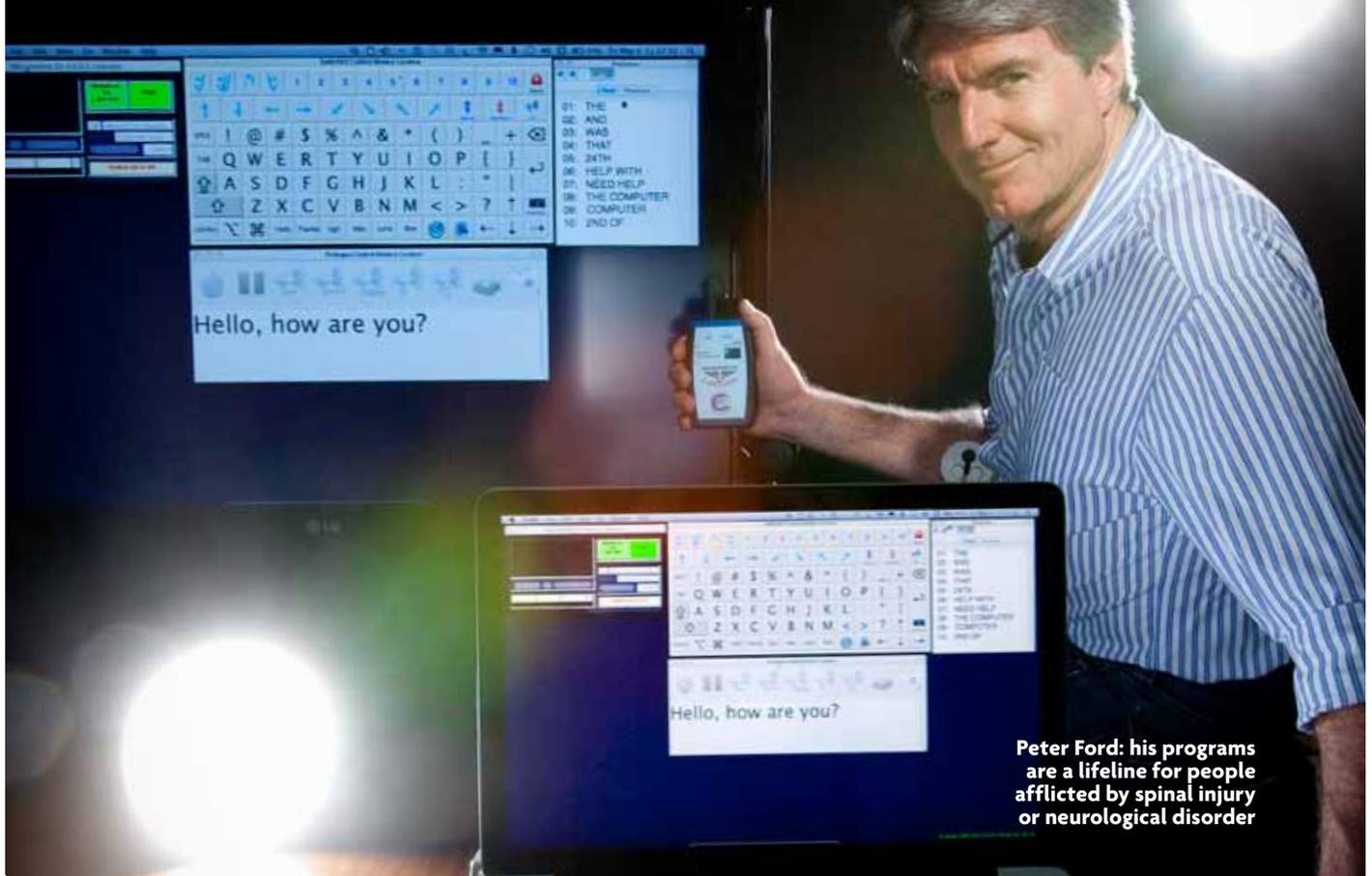


# BREAKING THE LOCK



**Peter Ford: his programs are a lifeline for people afflicted by spinal injury or neurological disorder**

A former TV anchorman has devised a way to help those with acute brain disorders communicate more readily. WORDS **DEBORAH TARRANT** PHOTOGRAPHY **NICK CUBBIN**

**PETER FORD** has always relished a new frontier. In the early 1980s, the Queenslander was one of the first Australian news anchors hired for Ted Turner's 24-hour US news network, CNN.

Another new frontier at the time was computer technology, taking hold in offices everywhere, and he quickly engaged with that, too. Amid the daily mayhem of breaking news ("We virtually lived in the studio – sent home for a bath only when we began to smell!"), Ford one day mentioned to the head of IT that he was sick of walking past the new office computer and not knowing how to use it. The IT chief sold Ford, for \$10, the Apple programmers' guide.

That transaction began a profound learning experience for Ford, who became a self-taught code writer. His creativity has, over the past 30 years, led him to invent a new technology that is transforming the lives of those who suffer from motor neurone disease (MND), stroke and cerebral palsy. Called NeuroSwitch, it's a device that allows those who literally can't lift a finger to communicate with family and friends,

to write poetry and even books, edit videos and engage in other day-to-day activities – to feel that bit more connected.

The excitement Ford gains from seeing what the device does for people effectively trapped in their own bodies is palpable, and on par with that of frontline assignments such as being sent to Afghanistan in the wake of the September 11 terrorist attacks in New York.

"When you see someone who's been told they'll be able to do nothing else but stare at the ceiling realise there's a way back to the world, something deeply human happens," says the 62-year-old.

He plugs in his Mac to show videos of Nick McLoughlin, a one-time water policeman who eventually died from MND, but who regained some autonomy in the final stages of his life by learning to "drive" his own wheelchair. And "Mike" in Tampa, Florida, incapacitated by spinal muscular atrophy, who lost all ability to communicate via other devices when a doctor inadvertently shut down the neural pathway to his thumb while taking blood. Mike shares his thrill of >



**“THE WORLD’S MOST  
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rejoining the wider world by participating in trade shows, writing a blog and playing games. He once even interviewed Steve Jobs.

NeuroSwitch uses electromyography (EMG), which monitors the electrical activity of muscle tissue, detecting faint nerve signals – as tiny as one-millionth of a volt – through sensors in patches applied to the skin. Ford favours the flexor carpal ulnaris muscle in the forearm, but other users have them applied to the forehead. The world’s most recognised MND sufferer, Cambridge-based cosmologist Stephen Hawking, who became a celebrated adviser on the project, preferred to use a muscle in his chest.

The sensors are hardwired to an EMG monitor that wirelessly connects with a MacBook Pro computer on which users, via Ford’s code, control a virtual keyboard and mouse. As the keyboard is electronically scanned, users can click the mouse at a desired letter and spell out words – or they can select commonly used words from a list – which are displayed on the screen. They can also choose a computer-generated voice to “speak”.

In spite of their disabilities, people become impressively quick at communicating, explains Ford, who says it takes most less than 15 minutes to learn. Their ability to communicate may be the revelation, but, importantly, their dependence on carers is also reduced. Those with “locked-in syndrome” previously relied on others to interpret basic communication – for example, looking up for yes and down for no, or blinking multiple times to indicate a letter of the alphabet.

**F**ORD GREW UP ON A FARM in western Queensland. His father was a dentist and his mother an organic chemistry teacher. In 1969, he dropped out of medicine, joined the Army then studied economics and law at the University of Queensland. While he had no experience of growing up knowing anyone with locked-in syndrome, he confesses to “a geek gene” and remembers thinking that someone with “an intellect like Stephen Hawking’s should be able to patch into a computer”.

He learned to write code, creating a robotics program that worked with an on/off switch. Arrows on a screen would be used to move a hand that could move objects from a shelf to the ground. Professors at Georgia Tech [Georgia Institute of Technology, US] asked for a demonstration. They were starting a research lab for rehab therapy and invited me to join them,” says Ford, who began “moonlighting” on alternative interface technology. In 1982, he wrote the JoyWriter program, which enabled computer users to write on screen, print and save using a joystick instead of a keyboard.

Away from the lab, Ford was working for NBC news in Miami and then later, in the 1990s, Washington DC. “TV is ridiculously lucrative.

I financed my own research and development until the late 1990s.”

In 1999, when asked to consult on a car accident victim who was in a vegetative state due to a spinal cord injury, he wrote a program that allowed the patient to make a computer beep using a faint nerve signal. “That was when I knew we could do almost anything on a computer for people who could previously do nothing at all.”

The technology was then known as Echidna Signal Recognition and Analysis (ESRA), in part for its spiky graphs of neural activity and also reflecting its inventor’s Australian origins.

In late 2002, following his final TV assignments in Pakistan and Afghanistan, Ford finally caught up with Stephen Hawking, whose advice proved invaluable and rigorous, “like taking your homework to the toughest professor,” says Ford. Subsequently, he replaced the shoebox-sized product with a more compact design. The New Zealand government was among the first to buy ESRA through its Accident Compensation Commission.

In 2005, Ford formed Control Bionics ([www.controlbionics.com](http://www.controlbionics.com)), raised capital via Sydney-based Phoenix Development Fund and began seeking approval from the US Food and Drug Administration (FDA). “We’re an Australian company contracting to the US,” he says.

The software is patented in 12 countries and Ford has a strategic alliance with a US hardware company. US markets are big and the need is great. An estimated 50,000 people in the US have locked-in syndrome due to motor neurone disease and stroke. About 200,000 Americans suffer quadriplegia from acute spinal cord injuries.

Until recently, Ford has kept overheads low by operating solo. The NeuroSwitch business has been built through an intense relationship between him and his laptop, on which he writes code and deals with the world, including the technology’s users and a growing band of contractors. But that’s rapidly changing. Now NeuroSwitch has been bought by the US Department of Veterans Affairs. More than 14,000 US veterans who have returned from service in Iraq and Afghanistan are afflicted by acute spinal cord injury and, for reasons not yet medically understood, a disproportionately high number have MND.

Ford is training therapists to assess people online and starting to hire. It’s a giant leap. “We’re not just selling medical equipment, but dealing with government organisations in 23 regions, each with different rules.” It is anticipated 100 sufferers will use NeuroSwitch by the year’s end. “We plan to add a zero to that every year after.”

Three decades is a long time in technology development, yet Ford retains his passion. “I eat, sleep and breathe it. You just never, ever give up. Whenever I have a doubt, I look at a patient – they are the heroes. They have highly active minds, but their bodies don’t work. If we can get them out again, that’s the best result of all.”