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Brain wave technology might lead to therapy advances

By Lenita Powers • lpowers@rgj.com • September 14, 2008



Using just his brainwaves, John LeMay attempts to guide a polymer balloon to his hands in partner George Green's Cerebotix office in Reno on Thursday, Sept. 11. LeMay and Green hope their work will someday aid paraplegics and victims of spinal cord injuries.

On the web

*To see a video of the **Cerebotix**
brain wave technology, visit:
www.cerebotix.com/media.html*

Two Reno biofeedback therapists have developed technology that they said allows clients to use their brain waves to move a remote-controlled object, a therapeutic technique that can help people overcome chronic pain, anxiety and behavioral problems.

George H. Green and John LeMay said that as people learn to use their brain waves to move a specially designed helium-filled polymer balloon, they learn to develop optimal mental states they can access when they need to control their emotions or deal with chronic pain.

It is a form of biofeedback that uses a real object as reinforcement whenever a person successfully moves the balloon where he or she wants it to go.

Here is how they said it works:

- To control the balloon, the therapists place five electrodes on a person's head to measure brain waves.
- The brain wave pulses are sent to a computer that processes them into three live data streams.
- Those data streams are converted into radio frequency signals that are transmitted to a wireless receiver mounted on the balloon.
- Then, using brain waves, a person can activate the balloon's propeller to make it move in different directions.

Unique technique

Green, 60, said the technique developed by him and LeMay, 40, is unique because "ours stands alone in that it is not through motor control, but emotional control."

And the balloon doesn't move because the person hooked up to the computer is thinking "go up" or "move right," Green said.

"No, that won't work because it is trying too hard," he said. "Some people just picture where they want the balloon to go, and it goes there."

It's similar to how a baby gradually learns to become better at using its hands as its brain tells the hands where to move and how to grasp, Green said.

Moving the balloon is like turning on a light switch, said LeMay, who recently gave a demonstration in sending the polymer balloon around a small room in Green's Reno office.

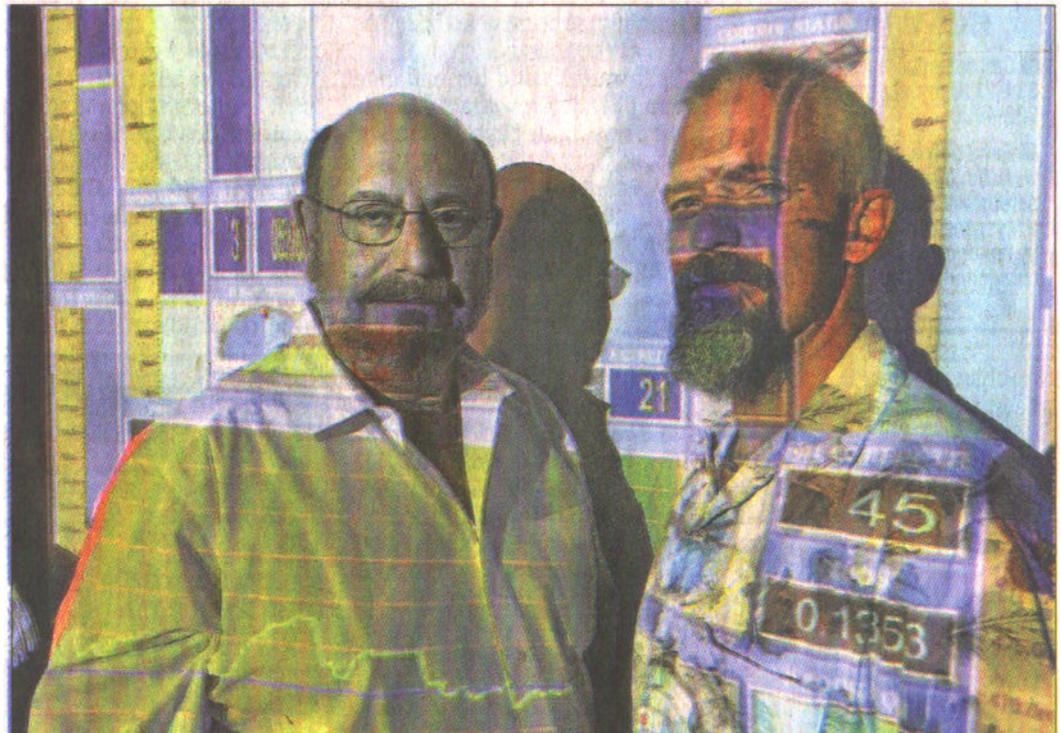
"It's a little bit like I have a relationship with the balloon like I have a relationship with my arm," LeMay said. "I can turn on the light switch because I want to turn on the light switch."

"The balloon moves because if I want it to go over to a certain target in the room, I focus on the target a little bit, and the balloon starts adjusting and moves over to it."

Skeptics

The therapists acknowledge that some people might be skeptical about their claim to have developed the first technology that allows brain waves alone to move a remote-controlled object.

"Nobody had done it before," Green said. "The reason is brain waves are much too variable. They move around too much. They don't have smooth shifts to them, so it's very difficult to harness that. We figured out how to harness that so you have smooth changes that are relevant."



LeMay said he and Green have been in their professions for many years and would not risk their reputations on something that was faked.

"I'm in this because I'm a clinician," LeMay said. "I love to help people, and the last thing I want to do is sham biofeedback."

Green said if a group of university professors would like to see their brain wave remote controlled technology, he would welcome it.

"I'd be thrilled to do it," he said.

Research group

Last year, Green and LeMay formed a Nevada-based research and development corporation they named Cerebotix, a combination of the words "cerebral" and "robotic." The cerebotix process they developed has a U.S. patent pending.

Although their work in the field of brain waves is aimed at providing therapy for people who need help to deal with chronic pain or emotional and behavioral problems, one University of Nevada, Reno researcher said it could have applications to help the handicapped, including those with spinal cord injuries.

Future help for the disabled

Stephan Fuelling, a research assistant professor in UNR's physics department, said Green and LeMay's technology could be developed to aid the handicapped.

"I think it is a breakthrough that probably will help handicapped people and quadriplegics by using mind control to activate devices or maybe move a wheelchair," Fuelling said.

"It think it opens up a new avenue for control beyond manual. We have a mouse and a keyboard and voice command, so this is another channel where the brain can be linked together with a computer or another device," he said.

Fuelling, who has known Green for five years, attended a press conference held Sept. 4 in Reno to demonstrate the use of brain waves to move a helium-filled polymer balloon.

"People will remember this day because it will open this new channel of communication," Fuelling said.