

## Utah Arm opens a 'whole new world'



Mark L. Elgart and Kelli Staples demonstrate using shoulder movements and muscle contractions to activate the prosthetic arm.  
Record/ROBERT REED

Picking up a Styrofoam cup seems easy enough. But imagine doing it without the advantage of being able to feel what you are doing—how hard to squeeze, or how fast, or slow to lift. Not so easy. No one knew that feeling better than 18-year-old Kelli Staples of Valdese.

Simple tasks like holding a can of soda pop, or carrying a briefcase may not appear to require any great skill and forethought. But performing these exercises with an artificial

arm changes a menial sample of life into a complex art of accuracy was not available to people like Kelli, or to anyone who had sustained the loss of an arm.

Prior to the mid-70s the most advanced technology in arm prosthesis was measured by that of a body-powered device, requiring exaggerated shoulder movements to produce certain results, not to mention a tangle of cables, harnesses, straps and hooks.

In 1974, however, University of Utah's Dr. Stephen C. Jacobsen began developing a prototype for what is now the most sophisticated artificial arm and hand on the market.

Using myoelectric signals from remnant muscles in the residual limb, the "Utah Arm" can determine the exact pinch speed and force for the most detailing tasks.

Recently, Kelli was fitted with the Utah Arm at Hickory Orthotic Prosthetic Center in Viewmont. Having worn a body powered arm from the time she was 9 months old, the difference has opened a "whole new world" to her.

"You could see when I\* was doing something before, because I would have to lean forward and really push on a cord or cable, whereas now it's all within the arm."

To that end, Certified Prosthetists Mark Elgart, offered a layman's demonstration of how the arm worked by lifting one up to a florescent light in a workshop at the Hickory center. Amazingly, the arm began to move on its own.

"It's pretty sophisticated now," he said. "It takes less than five microvolts, or a real low reading of electricity, in order for the electrode (small circular attachments on the inside of the arm) to recognize that signal and send it down into the circuits in the arm that make it work."

While Kelli's former arm did not keep her off the high school track team, running cross country, or keep her from playing the French horn in the band, she was simply looking for new and improved ways to open new doors in her future, including a college career.

“With me it was a matter of interest to see if this would work, or not,” she said. After attending an all-day seminar in Asheville in February, she was found to be a compatible match for the Utah Arm. As with anything, however, perfection is prefaced with practice. A challenging adjustment for Kelli has been learning to flex certain muscles in her right limb.

“You have to differentiate between each muscle. You can only do one at a time in order to get the arm to respond to what you want it to do. So you have to be able to control which muscle you’re doing what with. That’s the hardest part, because I\* never had an arm to begin with,” she said.

But the hurdle is one she’s mounting with rapid progress according to Elgart.

“She is pretty amazing,” he said watching her pick up a Styrofoam cup without crushing it.

“She has had this arm for a week. Most people don’t go that quickly. Sometimes it takes testing, training, or even occupational therapy. When she unlocks that arm like that,” he said pointing to her “that’s not an easy thing to do. In a year, or so you’re not going to even notice it.”

Kelli’s natural ease in embracing challenge stems from a strong support structure, she said.

“I learned how to crawl and walk with an artificial arm—I never had to say ‘no I can’t do that,’ because my parents always made me do it and I never doubted it. There’s really not much I can’t do. You can always work around the system—that’s what I’ve always done.” For more of this article, contact the *Hickory Daily Record*. Written by Geri Jones