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It's hard to believe that in the 21st century, a period of such great technological advances as a spacecraft launched to Mars and robots that can vacuum rugs, nobody has come up with an easier way to help people open a

PICKLE JAR.

Well, UB has.





Surfboard™

Originally designed for the visually impaired, the Surfboard™ could be anyone's dream come true—a voice-controlled universal television remote that does what you tell it to.

STORY BY SUSAN M. LOTEMPIO

Human element paramount in center's work
designing and developing assistive devices

Need any help with that?

PHOTOS BY DOUGLAS LEVERE, BA '89

When Robbie R. Stanfield made a meal or fixed a snack, opening a jar of pickles or peanut butter was a daunting and frustrating task. “I’d take the jar and hit it on the floor, but sometimes it broke,” says Stanfield, who was born with no left hand and has carpal tunnel syndrome in her right. “Or, I’d use one of those rubber things and try to twist the cap by holding the jar in the pit of my left arm. Sometimes it worked, sometimes it didn’t.” → It’s hard to believe that in the 21st century, a period of such great technological advances as a spacecraft launched to Mars and robots that can vacuum rugs, nobody has come up with an easier way to open a jar. → Well, someone has. And, UB—along with Robbie Stanfield—played significant roles in the development of the device marketed as the Black & Decker Lids Off Automatic Jar Opener. → UB played a role through its Rehabilitation Engineering Research Center on Technology Transfer (also known as T²RERC), which is in the business of designing and developing products that work for everyone, regardless of age or ability. →

“Kelvin” is a thermostat that both listens, responding to voice commands, and speaks, telling the time, temperature and setting when asked.





With devices that send **health data** over phone lines, like this diabetes monitor, health professionals can follow patients from a central location. Such devices can be adapted for various special needs.

Stanfield's role was to participate in local focus groups that examined several different stages of prototypes and to suggest ways to make the jar opener as close to an "ideal" product as possible.

Stanfield put the device to the test. "I was asked to show them how I could use the opener by opening several different sizes of jars," she says. What she found was that the automatic opener "helped me tremendously"—so much so that one now resides in her Buffalo kitchen.

The Black & Decker product is one of the most successful examples of the work performed by the 10-member staff of T²RERC, which to date has placed more than 40 products in the hands of consumers.

Housed in Kimball Tower on the South Campus and part of the Center for Assistive Technology in the School of Public Health and Health Professions, T²RERC began its work in 1993. It is one of 23 such facilities across the country and one of three at UB. However, with grants

from the National Institute on Disability and Rehabilitation Research, it is the premier RERC working on technology transfer nationally.

Technology transfer encompasses a wide range of activities that facilitate research and development of technology for people with disabilities and elders. It also is involved with the commercialization of the products—getting them into the hands of consumers who need them.

Like Stanfield, Ronald Kaczanowski took part in several focus groups conducted by Western New York Independent Living, a family of nonprofit agencies providing services to enhance quality of life for individuals with disabilities. One in particular focused on refrigerators, and, as a wheelchair user because of a spinal cord injury, he was especially interested to find out how easy—or difficult—the appliance was to use.

"We looked at top-mounted, side-by-side and low-mounted [freezers]," Kaczanowski says. "For me, the bottom-

mounted freezer was too low," but other wheelchair users had difficulty reaching the top-mounted freezer and even the side-by-side design. The group also checked the refrigerator door to see how easy it was to open, and whether they could reach the food shelves, change the inside light bulb and adjust the internal thermostat.

Through the focus group, Kaczanowski learned a great deal about how the appliance could be adapted for easier use. He admits that the refrigerator in his Cheektowaga, NY, home could be a lot better when it comes to access. "We've had it a long time, and I've gotten used to it; I've had to adapt to it," he says. The staff at T²RERC would rather the product be adapted to the person's needs, and U.S. companies are starting to take notice of that approach.

Stephen Bauer, T²RERC's project director and principal investigator, uses the cell phone as an example. "When [some] people retire, they aren't going to be able to use their cell phones. Their eyes aren't good enough, their hands aren't good enough," says Bauer. But, must they stop using the phones, he asks, or will the industry incorporate the needs of the aging population into the next generation of phones?

Some companies plan for "incremental refinement of their products to retain customers," Bauer says. "A wholesale redesign of a product will happen less often."

Transgenerational design, which "considers elders as people who have multiple disabilities," has been adopted by major corporations like Intel, Microsoft and Kodak, Bauer says. They are "looking at product development the same way as designing products for people with visual, hearing and physical impairments," so that anyone at any age can use them.

Such an approach can be profitable, stimulating a whole industry. "A company wouldn't develop new products unless there was a market for them," Bauer explains. T²RERC has identified those markets through its research and the work of the consumer focus groups, which consist of people of all "ages, racial and ethnic

backgrounds, and abilities," he points out. Kaczanowski's experience with those groups was "intriguing," he says, but, more importantly, it "gave me a sense that my input had value to it."

You don't have to convince Douglas J. Usiak of the importance of consumer input on the development of assistive devices and other products. As executive director of the local Independent Living Center and facilitator of "a couple of hundred" focus groups in his role as coprincipal investigator at T²RERC, Usiak says that "people [with disabilities] know what they want and how they want it. They are willing to work together to get everyone to use it."

In fact, Usiak says that he noticed participants "without disabilities ... arguing for inclusion."

There is no detail too small to ponder during focus group sessions. Explains Usiak, "We look at effectiveness [of the product], safety, learnability, portability, durability and reliability."

Consumers also are asked to consider cost—which brings us back to the Black & Decker automatic jar opener, which was introduced in 2003. Initially, it was priced at \$49.99, according to James Leahy, BS '74, coprincipal investigator and director of development at T²RERC, which finishes its third round of five-year grant cycles September 30, 2008.

"But it didn't sell well at that price." So the cost of the product when it entered the market was reduced to the recommended \$39.99. "[It was] marketed as a gift device, and it sold so well they had to pull the ads because they ran out," Leahy says. It wasn't just people with disabilities snatching them off the shelves. It was also the "adult children of aging parents who bought them," he says.

Bauer considers the Black & Decker project "revolutionary and the first major success of T²RERC's Fortune 500 program, which assists top companies in developing products and improving the functional design of existing ones, according to Leahy.

Indeed, T²RERC provides market research on the needs of people with disabilities and elders, analysis of existing products and competitors' products, and suggestions for design improvements and innovations. UB graduate students from the School of Public Health and Health Professions and MBA students from the School of Management do much of the research.

"When you have a **good design**, you not only make mainstream products easier for the elderly and people with disabilities to use, you make them easier for everyone to use."

JAMES LEAHY, BS '74, coprincipal investigator and director of development at T²RERC

T²RERC has collaborated on the development and commercialization of a wide array of products. Several are mentioned in the main story; here are a few more.

VisiPrint → A software program that works in conjunction with MS Office programs to assist in the preparation of reading materials for users with visual impairments. The program's database stores an unlimited number of users' preferences for font, point size and contrast enhancement. The user simply selects the names of each individual who requires a printout, and the program automatically formats each printout according to the individual's specifications.

PointSmart → Enhanced Mouse Driver from Infogrip: Makes any mouse, trackball, touchpad, joystick or other pointing device accessible for computer users who have a wide range of physical limitations. Screen wrapping, automatic direction control and a speed inhibitor are just a few of the features offered.

PowerCheq Battery String Equalizer → A microprocessor-controlled "battery string equalizer" for power wheelchairs that extends battery life up to 300 percent and significantly extends the average range between battery charges, which improves the safety and functional independence of power wheelchair users. Also distributed through Broadened Horizons LLC.

Digital Advantage Countertop Toaster Oven from Black & Decker → Combination toaster and convection oven is designed to make the task of preparing meals simpler and less time-consuming. The company incorporated 15 design and functional features that T²RERC provided for improved consumer usability and accessibility.

Source: <http://t2rerc.buffalo.edu/products>

Persons with movement disorders sometimes fail to hang up the telephone successfully. The **Line Butler** automatically reconnects a telephone that has been left off the hook.





Strong Arm™

providing better support and control than the classic cane by shifting the load from the user's wrist to the stronger, more stable forearm.

Over the years, in fact, T²RERC has enriched the academic experience of many UB students. In particular, students pursuing graduate degrees in electrical, mechanical and industrial engineering, and law have gained valuable real-world experience helping to design, create, test, license and market assistive devices. Some of the products were built in the Fabrication Services Shop, associated with the Center for Assistive Technology and the School of Public Health and Health Professions.

With the Fortune 500 program, companies might send employees to Buffalo to directly observe focus groups; others may watch in real time via a special hook-up between Buffalo and corporate headquarters. Either way, the companies get valuable consumer input.

George E. Rohe took part in a focus group on a new type of thermostat designed to meet the needs of people with visual impairments, among others. It can be operated by pushing a large button or by speaking to the device.

Rohe had a particular interest in the product because he is legally blind and has arthritis in his hand. In the focus group, Rohe pointed out that "the buttons were too small." He then took the thermostat home "for four months or so" to test it further.

"It worked very well," says the Cheektowaga, NY, resident. "It had a feature that when you clapped, it would tell you the temperature. My grandson loved it!"

That product—the Kelvin voice-controlled thermostat—has been endorsed by the National Federation of the Blind and is now in the marketplace.

T²RERC worked on another thermostat through its Fortune 500 program. The White-Rodgers (a division of Emerson Electric Co.) thermostat features large characters, red and blue temperature keys, audio programming, and a reminder alert to change the furnace filter, all fitted on a 12-square-inch touch-tone screen.

"When you have a good design, you not only make mainstream products easier for the elderly and people with disabilities to use, you make them easier for everyone to use," says Leahy, who is project administrator and principal investigator for the Fortune 500 program. "I think that's an eye-opener for some companies and helps them see the bottom-line value of what we can offer them."

Other projects being developed by the Fortune 500 program include an interactive device for Whirlpool that would allow remote operation and interaction with appliances. Also, Michelin evaluated new wheels/tires for wheelchairs and Eastman Kodak developed T²RERC's EasyShare Photo Printer and Printer Dock, both with new user-friendly features.

In the washer-dryer focus group, says Stanfield, "they asked us questions on how to make [the remote to control the appliances] better for everyone's use." She wanted to see the numbers enlarged. And after studying several different sizes of the remote, she opted for the largest one. "The bigger the better for me," she says.

Where do the ideas for these independent-living products come from? Apparently from just about everywhere: inventors, companies, consumers, and T²RERC staff, who hunt for ideas all around the country, if not the world. Not all products make it to market, but many do. And most make an important contribution to the lives of the people who use them.

The StrongArm cane is one such product. Many people—old, young, disabled or not—will use a cane or forearm crutches at some point in their lives (broken leg, post-surgery, sprains), and they will likely experience the strain a traditional cane puts on the hand, arm and especially the wrist.

Canes require "strong finger grip and strong hand grip" and a strong wrist, says Bauer. But due to injury, disabling condition or age, that strength may be compromised.

The new cane, designed as a direct extension of the arm, has a handgrip and bracing element in the handle that shifts the load from wrist to forearm, providing better support. "It reduces stress from finger to elbow, and you don't need a strong wrist or finger grip," Bauer says, adding, "it's a very enabling product."

Well-designed assistive products can enable people with disabilities and elders to succeed in all aspects of their lives. In this advanced technological age, there is growing recognition that these products constitute important markets with immense business potential. The work at T²RERC, along with the consumer groups, has played an important role in hastening this recognition.

Susan M. LoTempio is an assistant managing editor at the Buffalo News. She has been a wheelchair-user most of her life.

in my opinion

ALUMNI SHARE THEIR THOUGHTS

What are your thoughts on reading magazines, newspapers and books online?*



Christopher B. Clark, BS '06
Albany, NY

As a recent UB graduate, I find myself checking *the Spectrum's* official Web site every now and then to keep current with campus news. Still, I think it's essential to keep the paper copies of publications around, because there's something special about being able to hold a publication in your hands. It's relaxing to lean back in a chair, crack open a book or paper and just pass the time reading.

Susan Mund, MBA '05
Amherst, NY

I like to read at breakfast but only have a few minutes. It's easy to grab a magazine to read. If I had to use my computer, it would have to be moved to the dining room table. Also, food and electronics are a bad combination.

Tom Trinchera, MLS '96 & BA '94
Poughkeepsie, NY

I would like to cut down on the amount of paper used, but I'm always more inclined to read a paper copy of any magazine when it arrives in the mail. The physical form of the publication is more of a reminder to read it, and I've never been very good at setting electronic reminders for myself. For all the talk these days of a "paperless" society and going green, the amount of junk mail I receive (and shred) still amazes me. So, in the interest of preserving trees, I'll happily sign up for the online edition of *UB Today*.

Greg Gattuso, BA '91
New York, NY

The online option is an opportunity to incorporate audio and video into the mix. I hope that's the direction *UB Today* is headed.

Cheryl Baer, BS '89 & BA '79
Lancaster, NY

When I go online to check my e-mail, I have no interest in sitting here and clicking link after link. With hard copy, I can put it down and pick it up whenever I want, and not be chained to the computer.

Mary McHugh Dickerson,
PhD '79 & MS '73
Buffalo, NY

I prefer the green option. Paper magazines use up trees, add to the waste problem, and use energy for production and delivery.

Tien D. Nguyen, MS '77
Arlington, VA

Hard-copy publications are no longer essential except for public transit riders who want to read during their commute. I believe that more and more people will choose to read online.

Kim Gerard Santos, BA '75
Arlington, VA

For archival and historical purposes, there is no substitute for hard-copy publications, if there is any intention to convey with certainty such information to future generations in a medium that we can be confident will truly "stand the test of time." Please consider the history of the electronic alternative, which is neither green nor reliable: Electronic records of 30 years ago cannot be accessed using today's technology in terms of hardware or modern software. The National Archives maintains an inventory of "obsolete" hardware just to provide access to electronic source material in its collections. Can the individual consumer of information be expected to do that?

Perhaps our current flash memory drives will be as quaint to a future generation, as Edison wax cylinders are to us today. Hard copy—from cuneiform clay tablets to acid-free clay composite paper stock—has proved to be reliable media for the historical preservation and conveyance of information from one generation to the next; dependable, to date, through at least 175 generational cycles of 25 years each.

Mary Cole, BA '69
Norwell, MA

It's a great idea to distribute alumni communications over the Internet. Save a tree. Save some money for the university. Everybody wins. Plus you can provide links to related information. You can't do that on paper!

*Question posed in "In My Opinion," a feature of the monthly electronic newsletter @UB, a portion of which also appears regularly in *UB Today*. To subscribe, go to the UB Link menu at www.alumni.buffalo.edu.