

# gizmo

THE TETRA SOCIETY OF NORTH AMERICA: CUSTOM ASSISTIVE DEVICES



**GOING MOBILE:** MOM JESSICA EVANS OUT AND ABOUT WITH TODDLER HUDSON.

## WHEELCHAIR TODDLER SEAT ALLOWS ADVENTURES IN PARKS, TRAILS AND MALLS

**COLUMBUS:** A wheelchair infant seat allows on-the-go baby bonding—and all kinds of sleep, play and travel options.

Columbus, Ohio volunteer Russ Weir has devised a safe and secure seat that can be turned or tilted as needed so mom Jessica Evans can face toddler Hudson, turn him to look forwards to enjoy the view of parks and trails, or even tilt the seat backwards when he needs a nap.

“She uses a wheelchair and wanted a seat for her little one so she could get better bonding,” explained Russ. “I used a bicycle passenger seat as the model because it had the best harness and most structural integrity, and also a cross-bar across the front.

“I built a mechanism to hold his seat on the wheelchair so it can be turned, tilted or even pulled closer to the mother. She can even

change the seat for a baby seat when she has another child, which she will be able to bring into position for nursing.”

A baby carrier was also modified to provide this additional option.

“She’s very happy with the seat. She has visited a good range of parks and trails, travelled along sidewalks together, and even taken Hudson shopping.

“They can have face-to-face conversation, or the chair can be turned so they can both see where they are going, and if he wants to sleep she just reclines his chair.”

Russ fabricated the project in his lunch hours, using scrap materials and machining and welding equipment provided by his employers, The Ohio Willow Wood Company, which manufactures prosthetic limbs.

## Adapted trike opens new avenues for Calgary teen

**CALGARY:** Born without arms or legs, he just wanted his own bicycle like any other teen.

Ta Hay Tha, who is 16 years old and living in Kimberley, BC, is very active and enjoys longboarding and skiing, but thought he would never be able to cycle.

But then his whole life has been about overcoming the odds.

Born in a refugee camp on the Thai-Myanmar border—his family are members of persecuted hill tribes in Myanmar (Burma) targeted during the 66-year civil war—he came to Canada as a refugee with his mother in 2008.

Earlier this year the group that sponsored Ta’s escape from one of the world’s most protracted refugee situations set out to find if cycling could be a possibility. Shauna Jimenez of Friends of Burma recruited War Amps Canada to buy a recumbent trike, tracked down a bike shop to assist—Fun West Sports in Calgary—and asked Tetra Society volunteers to make the vital modifications.

“For the last three months we’ve been travelling back and forth to Calgary, trying to make it work,” Shauna said. “And they did make it work. Hearts and minds together made it work.”

Fun West was able to add an electric hub motor to the trike, explained Tetra Calgary volunteer Fritz Peyerl. He was tasked to devise a way for Ta to operate it safely.

“He’s a really nice kid,” said Fritz. “He gets about on a longboard and goes skiing, but he always wanted a bike.

“I devised a modified steering system that has linkages and is flexible enough so he can bring his arms forward and back to steer. I put a platform below the seat, and mounted two levers on it which he can push with his legs. He can push the left paddle to brake, and uses his right leg for the throttle. I added a bumper to the front.”

He said the motor is limited to 20 kmh for safety, although could be adjusted to run



**BIKE TO THE FUTURE:** TA HAY THA AT THE CONTROLS OF HIS NEW TETRA TRIKE.

faster. And it has enough power and range that Ta’s test drive ran from Kimberley to Cranbrook on the 20-kilometre “Rails 2 Trails” bike route.

Tetra Calgary chairman Jim Monk said: “It’s exciting that the project was designed to grow with Ta. It was Ta’s smile that made it all worthwhile.”



**JUMP FOR JOY:** EXERCISE AND ENTERTAINMENT WITH THIS ELASTIC-BAND-DRIVEN TETRA DEVICE.



**TRIBUTE:** DICK SIRCOM (RIGHT) WAS A HUGE RESOURCE FOR TETRA HALIFAX. HIS WORK AND MEMORY WILL LIVE ON.

## THE PRECISE ALGEBRA OF LIFE'S UPS AND DOWNS

**OTTAWA:** It took pages of mathematical calculations around the precise stretching and bouncing characteristics of exercise resistance bands to design a vertical exerciser.

Tetra's Ottawa chapter was contacted by staff at the city's Welcome Home Residence and tasked to devise the exercise device using a parachute harness and a handful of Exerband straps. It's for a 32-year-old with some limb mobility whose only other outlet for exercise is moving up and down in a pool.

Coordinator Paul Marriage explained the mathematical challenge faced by volunteer Gord Mason: "To provide a vertical device mounted from a 13-foot ceiling that would suspend a 130-plus pound person with only the toes touching the floor and allowing a slight push upwards to give a travel up of 12-24 inches.

"It's tricky to calculate the variations that determine stretch and bounce—there is a difference in elasticities for the upwards and downwards motions. Three equations had to be put together."

It was easier to devise the other elements of the project, which included a safety rope to prevent the client from spinning or tilting while aloft, and a ceiling-mounted pulley system.

The chapter has only been running one year, but has already completed four projects, with four more ongoing, and now numbers seven volunteers.

Their current challenge is to devise a lightweight portable lift which can raise a five-year-old girl to and from her wheelchair after playing on the floor.

## LONG-TIME HALIFAX VOLUNTEER PASSES; FINAL PROJECT TO BENEFIT CHILDREN

**HALIFAX:** The final project of an influential Tetra volunteer will maintain his caring legacy by aiding sick children in a Halifax hospital.

Dick Sircom, who died at age 86 in April after a brief illness, never saw the finished project, which was completed by the volunteer he mentored and inspired – but it's Dick Sircom's work through and through.

In more than 15 years as a Tetra volunteer he completed projects ranging from key holders to a hydraulic chair lift, but it was the repairs and modifications to children's mechanical toys he seemed to enjoy talking about more than anything.

His work with Tetra brought a great deal of personal satisfaction, and he would be pleased that his design concept is being used in the X-ray department of the Izaak Walton Killam Hospital for Children, or 'IWK' as it's known locally, said volunteer Carl Anderson.

"Dick Sircom was my neighbor, and I knew him a long time," said Carl. "He invited me to come down to a Tetra meeting and we would work on things together in his shop.

"The last project we were working on together was an X-ray chair for the IWK Health Centre, which is our children's hospital. The kids we were concerned with are spina bifida and scoliosis patients. Their torsos are X-rayed from both the front and side."

It needed to be on castors for easy movement, be height-adjustable and lockable so it won't move during the X-ray process. The diagnostic imaging department's existing chair was built by volunteers in the late '70s and was cumbersome, did not make the children feel safe, and the locking mechanism was known for pinching fingers.

The two volunteers had talked about possible solutions, including a stage prop which Dick had devised when he was volunteering for the Dartmouth Players community theatre group.

"It had wheels that could retract with the small movement of a lever. You could not move it when it was locked, but you could push it around like a shopping cart otherwise," said Carl.

As a result he constructed a cheerfully coloured yellow and blue seat with a removable acrylic side support which can position a child at the heights required by the imaging equipment.

Hidden away inside the seat is a De-Sta-Co hold-down clamp, operated via a foot pedal, which moves the castors up and down.

"The seat only needs to be raised a quarter-inch to become freely moveable. When immobilized, it's very hard to slide the seat - it then rests on four small rubber bumpers and is quite heavy."

Throughout the process Carl, who has been volunteering a year and a half, kept asking himself 'How would Dick Sircom have done this?' He remains in awe of Sircom's mechanical abilities.

"He had a degree in electrical engineering and was also a great mechanic. He lived to do electrical or mechanical things. He had this metal-working lathe that he had owned for 70 years on which he could make anything, plastic or metal. He was a master.

"He told me that, as a teenager during the Second World War, he couldn't get drill bits so he made his own. He heated a metal rod and banged it flat, then heated it again and twisted it."



**INGENIOUS TABLE:** TETRA'S FULLY-ADJUSTABLE, EASY-TO-OPERATE "EVERYTHING TABLE" IN OPERATION.



**SNOWBUSTERS:** PHIL PITRE GETTING SET TO CLEAR A PATH TO HIS VAN.

## Tetra turns the tables on a variety of household tasks

**VANCOUVER:** Fed up with forever having to balance household items like food and drinks in her lap, wheelchair user Patty Clarke devised a one-of-a-kind portable table.

She had an idea for an easy-to-adjust surface for day-to-day tasks like carrying food to and from the fridge, meal preparation, eating and even supporting a laptop or tablet.

Vancouver Tetra volunteer Ron Payne turned her vision into reality.

"I call it my 'everything,'" said Patty, 55. "I use it for everything. My attendants now say, 'Do you want your everything?'"

"I did research and found portable tables, but I wouldn't be able to adjust them, and they were all too big. So I asked Tetra for help."

Patty set Ron a tough challenge—the final product had to be usable with either her manual chair or her power wheelchair, be adjustable without requiring much dexterity and be able to pass over a threshold bump to her patio. It had to fit right up against her open fridge so she could slide food onto it, not knock her feet and legs when she was eating at it, and also be able to tuck conveniently out of the way under a kitchen counter for storage.

Ron sourced a promising table at his local Wal-Mart and then set about rebuilding it from the ground up.

He got new casters with rubberized wheels to better handle the kitchen's linoleum floor and then rebuilt the metal frame.

He remodelled the table legs, which when new, were in an H-shaped configuration with cross-pieces of metal at either end. It's now T-shaped.

A greater challenge was finding a way for Patty to raise and lower the table-top as she could not lift it into place. He put a hand-wheel on the table top, with the mechanism tucked away down the side of the metal frame, and built a new locking mechanism for the tilting table top.



"The handle that makes it go up and down was part of an old table saw that I threw out years ago," said Ron. "There was a tilting top that she can use for a laptop, but she could not use the mechanism. So I modified the tilting mechanism, which also made it more stable.

"It was one of the simpler projects, really, but it still took some figuring out to find something that Patty could operate. The completed project doesn't look anything like the table she bought."

The completed table meets her needs so perfectly that she uses it every day, said Patty.

"It's large enough for food preparation because it holds lots of bowls," she continued. "You can put a lot on it."

"When guests come over I can sit them in the living room, make coffees on it and roll it out to them. We then use it as a coffee table."

Ron, who has completed 27 projects—and helped out with many more—in his four years as a Tetra volunteer, said he loves problem-solving. But then he did design and build his own car, from scratch.

"I feel good because Patty gave me a demo when I delivered the completed table, and she showed me getting food out of the fridge. It looked like it would do what she wanted of it."

## BLASTING AWAY WINTER

**LETHBRIDGE:** Snow makes sidewalks impassable for wheelchair users—and it also makes it tough to access a car and clear the windshield.

Tetra chapter coordinator Chris Schamber, who as a wheelchair-user himself, is no fan of winter extremes, was keen to come up with a wheelchair snow blower for 47-year-old Phil Pitre.

"Some years it's very cold here from the end of October through to March," said Chris. "Last winter we got up to eight inches of snow around seven or eight times—it can snow at any time during the winter."

"The closer the temperature is to zero the heavier the snow is—when it's minus-20 it's light and fluffy and not so hard to shovel," Chris said.

"It's hard to get out in the winter. If you are in a wheelchair it's near impossible to get to the bus stop because not everybody clears their sidewalk. I have an accessible van and drive everywhere."

Chris worked with chapter volunteers to construct a removable metal frame with pivoting attachment point to attach a high-powered leaf blower to a wheelchair. This will allow Phil to blast a route along the pathway from his front door to van, and clear the windshield while he's at it.

"I haven't had chance to test it yet—although that might change any time now," said Phil.

"It's difficult enough getting around in a wheelchair. Sidewalks are not completely impassible, but it's worse when vehicles have driven over them and left big ruts where you could get stuck—and you don't want to end up stuck when there aren't people around because you could end up freezing."

The chapter's latest project is also vehicle-related, for a lady who can stand but is not able to walk far. She would like a lightweight ramp so she can load her scooter in her van.



BRUSH-UP: RILEY MCLEAN'S MORNING ROUTINE.

## A BRUSH WITH TETRA

**VERNON:** Sometimes complex problems have simple solutions, as this telescopic portable shaver/toothbrush holder shows.

Coordinator Randy Schellenberg was asked to enable 15-year-old Vernon Paralympic swimmer Riley McLean to brush and shave both at home and when travelling for competitions. Riley has arthrogyriposis, which causes joint contractures—a shortening of muscle and tendon—and has limited mobility in his arms and legs.

The completed project uses a Ram Mount, a range of holders for cameras and tablets.

“There are more and more product lines like these clamps coming out,” said Randy. “I think Tetra volunteers will find them very useful off-the-shelf products.”

## Tetra *thanks!*

- BC Rehab Foundation
- Cadillac Fairview Corporation
- Carleton University
- City of Medicine Hat
- Community Foundation of Mississauga
- Face the World Foundation
- George Lunan Foundation
- The Guelph Community Foundation
- Inter Pipeline
- J.W. McConnell Family Foundation
- Regina Engineering Students Society
- Servus Credit Union
- SurreyCares
- The Stollery Charitable Foundation
- United Way of Niagara Falls & Greater Fort Erie

“The Tetra Society of North America would like to thank the above groups for their recent support, and extend our sincere appreciation to all supporters for helping our caring, dedicated volunteers to create custom assistive devices for people with a disability,” said executive director Duane Geddes. “Your generosity is truly appreciated.”

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## TETRA SOCIETY OF NORTH AMERICA

DEDICATED TO ASSISTING PEOPLE WITH DISABILITIES TO ACHIEVE AN INDEPENDENT AND FULFILLING LIFE, ONE ASSISTIVE DEVICE AT A TIME

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