

MEN'S JOURNAL

The Blind Man Who Taught Himself To See

Posted By MJ On March 1, 2011 @ 7:34 pm In *Cover Stories,Features*



Daniel Kish has been sightless since he was a year old. Yet he can mountain bike. And navigate the wilderness alone. And recognize a building as far away as 1,000 feet. How? The same way bats can see in the dark.

by Michael Finkel

The first thing Daniel Kish does, when I pull up to his tidy gray bungalow in Long Beach, California, is make fun of my driving. “You’re going to leave it that far from the curb?” he asks. He’s standing on his stoop, a good 10 paces from my car. I glance behind me as I walk up to him. I am, indeed, parked about a foot and a half from the curb.

The second thing Kish does, in his living room a few minutes later, is remove his prosthetic eyeballs. He does this casually, like a person taking off a smudged pair of glasses. The prosthetics are thin convex shells, made of acrylic plastic, with light brown irises. A couple of times a day they need to be cleaned.

“They get gummy,” he explains. Behind them is mostly scar tissue. He wipes them gently with a white cloth and places them back in.

Kish was born with an aggressive form of cancer called retinoblastoma, which attacks the retinas. To save his life, both of his eyes were removed by the time he was 13 months old. Since his infancy — Kish is now 44 — he has been adapting to his blindness in such remarkable ways that some people have wondered if he’s playing a grand practical joke. But Kish, I can confirm, is completely blind.

He knew my car was poorly parked because he produced a brief, sharp click with his tongue. The sound waves he created traveled at a speed of more than 1,000 feet per second, bounced off every object around him, and returned to his ears at the same rate, though vastly decreased in volume.

But not silent. Kish has trained himself to hear these slight echoes and to interpret their meaning. Standing on his front stoop, he could visualize, with an extraordinary degree of precision, the two pine trees on his front lawn, the curb at the edge of his street, and finally, a bit too far from that curb, my rental car. Kish has given a name to what he does — he calls it “FlashSonar” — but it’s more commonly known by its scientific term, echolocation.

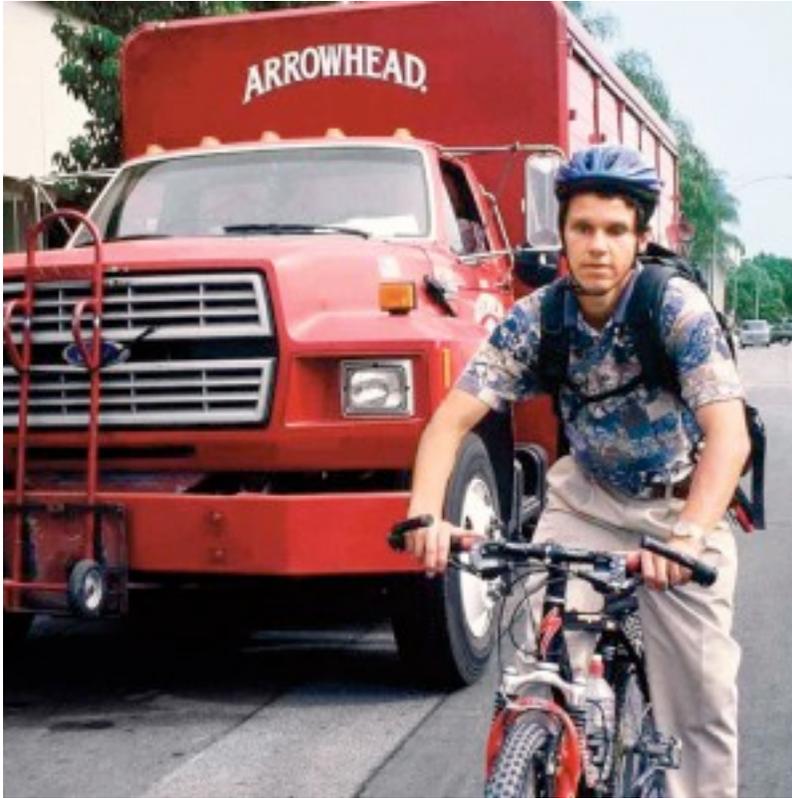
Bats, of course, use echolocation. Beluga whales too. Dolphins. And Daniel Kish. He is so accomplished at echolocation that he’s able to pedal his mountain bike through streets heavy with traffic and on precipitous dirt trails. He climbs trees. He camps out, by himself, deep in the wilderness. He’s lived for weeks at a time in a tiny cabin a two-mile hike from the nearest road. He travels around the globe. He’s a skilled cook, an avid swimmer, a fluid dance partner. Essentially, though in a way that is unfamiliar to nearly any other human being, Kish can see.

This is not enough for him. Kish is seeking — despite a lack of support from every mainstream blind organization in America — nothing less than a profound reordering of the way the world views blind people, and the way blind people view the world. He’s tired of being told that the blind are best served by staying close to home, sticking only to memorized routes, and depending on the unreliable benevolence of the sighted to do anything beyond the most routine of tasks.

Kish preaches complete and unfettered independence, even if the result produces the occasional bloody gash or broken bone. (He once fractured the heel of his left foot after leaping from a rock and has broken a couple of teeth.) He’s regarded by some in the blind community with deep veneration. Others, like a commenter on the [National Federation of the Blind](#)’s listserv, consider him “disgraceful” for promoting behavior such as tongue clicking that could be seen as off-putting and abnormal.

Kish and a handful of coworkers run a nonprofit organization called [World Access for the Blind](#), headquartered in Kish’s home. World Access offers training on how to gracefully interact with one’s environment, using echolocation as a primary tool. So far, in the decade it has existed, the organization has introduced more than 500 students to echolocation. Kish is not the first blind person to use echolocation, but he’s the only one to meticulously document it, to break it down into its component parts, and to figure out how to teach it. His dream is to help all sight-impaired people see the world as clearly as he does.

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Kish, here biking in Long Beach, preaches total independence.

It begins with the lid of a pot. “Stand up,” Kish instructs, then guides me to the center of his living room and ties a blindfold around my head, while mentioning, in a schoolteachery tone, that I should not for an instant think that wearing a blindfold represents the experience of being blind. A blindfold almost always causes someone who can see to feel frightened, confused, and disoriented. Kish is none of these things.

“Now wait here,” he says. Though he was born and raised in Southern California, Kish has an odd, almost foreign-sounding accent — a bouillabaisse of Canadian, British, and relaxed Los Angeleno. He says it’s a result of his many travels. “I’m a natural mimic,” he explains. Kish is 5-foot-7, thin and fit, with an impressive mane of dark brown hair and a meandering winestain birthmark on his left cheek.

I hear him walk into his kitchen, his bare feet padding faintly on the hardwood floor. “I’m very particular about feeling life and air around my feet,” he once wrote in the journal he braille-typed and shared with me. I’m barefoot as well. Kish asked me to remove my shoes, which is one of his many little rules you quickly learn to adopt. Like: He’s Daniel Kish, and anyone who calls him “Dan” more than once may be struck with withering disdain. And don’t disturb him during his sleep time — lately, he’s been sleeping just two hours twice a day, usually from 5 to 7 in the morning and again from 5 to 7 in the evening. He often stays up all night dealing with World Access logistics. He lives alone and does not have a significant other. He plays a lot of Celtic hymnal music.

I listen as Kish opens a cabinet and rummages amid his pots. He returns and stands behind me. “Make a click,” he says.

It’s a terrible click, a sloppy click; what Kish calls a “clucky click.” Kish’s click is a thing of beauty — he snaps the tip of his tongue briefly and firmly against the roof of his mouth, creating a momentary vacuum that pops upon release, a sound very much like pushing the igniter on a gas stove. A team of Spanish

scientists recently studied Kish's click and deemed it acoustically ideal for capturing echoes. A machine, they wrote, could do no better.

My click will work for now. Kish tells me that he's holding a large glass lid, the top to a Crock-Pot, a few inches in front of me. "Click again," he says. There's a distinct echo, a smearing of sound as if I'm standing in my shower. "Now click," he says. The echo's gone. "I've lifted it up. Can you tell?"

I can, quite clearly. "Click again," he instructs. "Where is it?" I click; there's no echo.

"It's still lifted," I say.

"Try again," says Kish. "But move your head, listen to your environment."

I turn my head to the right and click. Nothing. Then I click to the left. Bingo. "It's over here," I say, tilting my head in the direction of the lid.

"Exactly," says Kish. "Now let's try it with a pillow."

There are two reasons echolocation works. The first is that our ears, conveniently, are located on both sides of our head. When there's a noise off to one side, the sound reaches the closer ear about a millisecond — a thousandth of a second — before it reaches the farther ear. That's enough of a gap for the auditory cortex of our brain to process the information. It's rare that we turn the wrong way when someone calls our name. In fact, we're able to process, with phenomenal accuracy, sounds just a few degrees off-center. Having two ears, like having two eyes, also gives us the auditory equivalent of depth perception. We hear in stereo 3-D. This allows us, using only our ears, to build a detailed map of our surroundings.

The second reason echolocation works is that humans, on average, have excellent hearing. We hear better than we see. Much better. On the light spectrum, human eyes can perceive only a small sliver of all the varieties of light — no ultraviolet, no infrared. Converting this to sound terminology, we can see less than one octave of frequency. We hear a range of 10 octaves.

We can also hear behind us; we can hear around corners. Sight can't do this. Human hearing is so good that if you have decent hearing, you will never once in your life experience true silence. Even if you sit completely still in a soundproof room, you will detect the beating of your own heart.

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Kish does not go around clicking like a madman. He uses his click sparingly and, depending on his location, varies the volume. When he's outside, he'll throw a loud click. In good conditions, he can hear a building 1,000 feet away, a tree from 30 feet, a person from six feet. Up close, he can echolocate a one-inch diameter pole. He can tell the difference between a pickup truck, a passenger car, and an SUV. He can locate trail signs in the forest, then run his finger across the engraved letters and determine which path to take. Every house, he explains, has its own acoustic signature.

He can hear the variation between a wall and a bush and a chain-link fence. Bounce a tennis ball off a wall, Kish says, then off a bush. Different response. So too with sound. Given a bit of time, he can echolocate something as small as a golf ball. Sometimes, in a parking garage, he can echolocate the exit faster than a sighted person can find it.

I accompanied Kish on several occasions as he cruised the busy streets of Long Beach. The outside world is an absolute cacophony. Every car, person, dog, stroller, and bicycle makes a sound. So do gusts of

wind, bits of blowing garbage, and rustling leaves. Doors open and close. Change jangles. People talk. Then there are the silent obstacles — what Kish calls urban furniture: benches, traffic signs, telephone poles, postal boxes, fire hydrants, light posts, parked vehicles. Kish hears the sonic reflections from his click even in a place teeming with ambient noise. “It’s like recognizing a familiar voice in a crowd,” he says. The load upon his mind is undoubtedly immense. Yet he casually processes everything, constructing and memorizing a mental map of his route, all while maintaining an intricate conversation with me. It’s so extraordinary that it seems to border on the magical.

When we walk into a restaurant — never a simple choice with Kish, since he’s a strict vegan — he makes a much quieter click. Kish describes the images he receives as akin to a brief flick of the lights in a dark room; you get enough essential information — tables here, stairway there, support pillars here — to navigate your way through. “It becomes as ridiculous for blind people to run into a wall as it is for sighted people,” he once wrote in his FlashSonar manual. He strolls casually across the restaurant, making one or two more clicks as we approach our table, then sits down. It’s both smooth and subtle. Kish says that it is rare a sighted person even notices he’s making an unusual noise. Almost all blind people instantly do.

What people do notice about Kish is his long white cane. His blind person’s cane. Using echolocation, Kish could get around without one. For most of his youth, in fact, he never carried a cane, seeking to avoid the stigma attached to it. Now, as he approaches middle age, he’s come to believe that whatever can conveniently provide him with more information about his environment he will use. Echolocation’s chief liability is that it is not good at detecting holes in the ground, or small dropoffs, which a cane can do. There are also some figure-ground issues with echolocation — a park bench can “disappear” when it’s directly in front of a stone wall — and a cane, in essence, increases the length of your arm by as much as five feet.

Kish also keeps aware, during the day, of where the sun is striking him — a good way to determine direction — and how the cracks between sidewalk blocks line up; if you remain steadily perpendicular to them, you’re not veering.

When it’s all put together, says Kish, he has very rich, very detailed pictures in his head.

“In color?” I ask.

“No,” he says. “I’ve never seen color, so there’s no color. It’s more like a sonar, like on the Titanic.”

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At his high school graduation in 1984, Kish was voted "most likely to succeed."

Kish can hardly remember a time when he didn't click. He came to it on his own, intuitively, at age two, about a year after his second eye was removed. Many blind children make noises in order to get feedback — foot stomping, finger snapping, hand clapping, tongue clicking. These behaviors are the beginnings of echolocation, but they're almost invariably deemed asocial by parents or caretakers and swiftly extinguished. Kish was fortunate that his mother never tried to dissuade him from clicking. "That tongue click was everything to me," he says.

He has a vivid recollection of sneaking out his bedroom window in the middle of the night, at age two and a half, and climbing over a fence into his neighbor's yard. "I was in the habit of exploring whatever I sensed around me," he writes in his journal. He soon wondered what was in the yard of the next house. And the one after that. "I was on the other side of the block before someone discovered me prowling around their backyard and had the police return me home to completely flummoxed parents."

Kish was born in Montebello, California, into a difficult family situation. His younger brother, Keith, was also born with retinoblastoma — it's genetic, though neither of Kish's parents had the disease. Doctors managed to save enough of Keith's eyesight so that he doesn't need echolocation. He's now a middle school English teacher. Kish's father, who worked as an automobile mechanic, was a physically abusive alcoholic, and his mother left him when Kish was six.

"I was a violent kid," says Kish. He frequently got into fistfights. "I rarely lost. My strategy consisted of immobilizing opponents before they could hit me too often." He went to mainstream schools and relied almost exclusively on echolocation to orient himself, though at the time neither he nor his mom had any concept of what he was doing. "There was no one to explain it, there was no one to help me enhance it, and we all just kind of took it for granted," he says. "My family and friends were like, 'Yeah, he does this funny click thing and he gets around.'" They called it his radar. Navigating new places, he says, was like solving a puzzle.

He rode his bike with wild abandon. “I used to go to the top of a hill and scream ‘Dive bomb!’ and ride down as fast as I could,” he says. This is when he was eight. The neighborhood kids would scatter. “One day I lost control of the bicycle, crashed through these trash cans, and smashed into a metal light pole. It was a violent collision. I had blood all over my face. I picked myself up and went home.”

He was raised with almost no dispensation for his blindness. “My upbringing was all about total self-reliance,” he writes, “of being able to go after anything I desired.” His career interests, as a boy, included policeman, fireman, pilot, and doctor. He was a celebrated singer and voracious consumer of braille books. He could take anything apart and put it back together — a skill he retains. Once, when I was driving Kish to an appointment with a student, the GPS unit in my car stopped working. Kish examined the unit with his hands, instructed me from the passenger seat how to get to the nearest Radio Shack, and told me which part to buy (the jack on the power cord was faulty). He was named “best brain” in middle school and graduated high school with a GPA close to 4.0. He was voted “most likely to succeed.”

He attended the University of California Riverside, then earned two master’s degrees — one in developmental psychology, one in special education. He wrote a thesis on the history and science of human echolocation, and as part of that devised one of the first echolocation training programs. The ability of some blind individuals to perceive objects well before they could touch them was noted as early as 1749 by French philosopher Denis Diderot. He theorized it had something to do with vibrations against the skin of the face. In the early 1800s, a blind man from England named James Holman journeyed around the world — he may have been the most prolific traveler in history up to that point, Magellan and Marco Polo included — relying on the echoes from the click of his cane. Not until the 1940s, in Karl Dallenbach’s lab at Cornell University, was it irrefutably proven that humans could echolocate.

The thesis was the first time Kish really studied what he’d been doing all his life; it was the beginning, as he put it, of “unlocking my own brain.” He then became the first totally blind person in the United States (and likely the world) to be fully certified as an orientation and mobility specialist — that is, someone hired by the visually impaired to learn how to get around.

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Kish teaching echolocation.

It was never Kish’s goal to run a foundation dedicated to the blind. He planned to be a psychologist. But he could not ignore the fact that few blind people enjoyed anything close to his freedom of movement, and he had grown weary of society’s attitude toward the blind. “I am belittled, patronized, disrespected, invaded, restricted, and presumed weak, vulnerable, or otherwise incapacitated,” he wrote in his journal. It still drives him crazy when he’s congratulated for simply crossing the street or preparing dinner.

In a letter he posted on his website a few years ago, Kish responded to a public school program in New Jersey called Kindness Beats Blindness, in which hundreds of middle school students were blindfolded while others led them around, to develop sympathy for the blind. “I have felt beaten and pummeled by many things,” he wrote, “misplaced kindness foremost among them.” When I asked Kish about the letter he said, “I have a reputation for being a pain in the ass.” One of his closest friends sometimes refers to him as “the bridge burner.”

Young people, says Kish, are especially hard-hit. “Most blind kids hear a lot of negative talk. ‘Don’t do this, don’t do that, don’t move. No, here, let me help you.’ The message you get, if you’re blind, is you’re intellectually deficient, you’re emotionally deficient, you’re in all ways deficient.” A few sighted people have commented to Kish that they’d rather be dead than blind.

So in 2001 he started World Access for the Blind. One of its missions is to counter every no that blind people hear. Blindness, Kish says, should be understood — by both the blind and the sighted — as nothing more than an inconvenience. “Most of my life,” he writes, “I never even thought of myself as blind. In fact, I saw myself as smarter, more agile, stronger, and generally more capable than most other boys my age.”

World Access operates on what Kish calls “an annual budget of silliness” — less than \$200,000 a year. (Kish himself makes only “a survival wage.”) He depends on the “blind vine,” the chattering network of the

visually impaired, to spread the word. When a potential student, or a parent of a student, agrees to hire World Access, either Kish or one of three other World Access teachers — all blind or visually impaired — will pay a visit, whether it's on the other side of Los Angeles or the other side of the world.

Lessons can consist of private meetings a few times a month, or an intensive week of training for students farther afield. He's visited a group of blind students in northern Mexico three times and traveled to Scotland eight times. In all, Kish has taught in 14 countries, including Armenia, South Africa, Switzerland, and Ukraine. Blind students or organizations in more than a dozen other nations, from Afghanistan to Guatemala, are now on his waiting list. The chief focus of World Access classes is setting students on the path to complete autonomy. Echolocation is an essential element of what Kish terms "a holistic approach" that also includes lessons on comfortable social interactions, confident self-image, and nonvisual conversational cues (a head turn can be noted by the sound of hair swishing; arm gestures by the whisper of skin brushing against clothing; the shift of someone's body by the creaking of furniture).

World Access doesn't turn anyone away for lack of resources. But there are a couple of reasons why the organization hasn't trained more students. The first is Kish's general ethos about how blind children should be raised. "Running into a pole is a drag, but never being allowed to run into a pole is a disaster," he writes. "Pain is part of the price of freedom." This attitude is not wildly popular, especially in a safety-first nation like the United States. Also, echolocation is not easy to master. Kish compares it with piano lessons — anyone can learn basics; very few will make it to Carnegie Hall. Only about 10 percent of the people who learn echolocation, he admits, find their abilities immediately enriched.

And then there is resistance from mainstream organizations. The National Federation of the Blind, the largest blind organization in America, does not endorse Kish's work. "Let's just say he's unique," says John Paré, the federation's executive director for strategic initiatives, clearly straining to be polite. Paré believes that for most people, echolocation is not worth the tremendous effort required to grasp it. "We urge people to learn how to use a long white cane," he says. According to Kish, a colleague once overheard members of the federation refer to him as Clicker Boy. "The blindness field is firmly based in tradition and dogma and is very slow to evolve," says Kish. "It's been traditionally dominated by sighted people who feel the need to tell blind people what to do."

The same afternoon I first visit Kish, I also meet Brian Bushway and Juan Ruiz. Bushway became blind at age 14 due to a genetic condition known as optic nerve atrophy and was introduced to Kish soon after. Ruiz was born blind and was one of Kish's first students; Kish began working with him while preparing his echolocation thesis. They both told me, individually, that Kish's teaching transformed them, allowing them to feel at peace with their blindness and at one with the world.

Bushway and Ruiz are now in their late 20s and have become instructors with World Access. They often hang out at Kish's home, forming a foul-mouthed and funny little gang. (Bushway: "You know why echolocators get all the girls? 'Cause they're skilled with their tongues and comfortable in the dark.") They've become so adept at echolocation that, in many ways, they have surpassed their teacher — at least in terms of fearlessness, sociability, and willingness to run into poles. They're the next generation of echolocators, ready to take Kish's work and see how far they can push it.

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If you happen to be blind and want to live a bold, stereotype-smashing life, there will be blood. I witness this firsthand when I spend a day mountain biking with Bushway and Ruiz. (Kish, acceding to the realities of near-middle age, stays home.) We ride on a roller-coastery ridgetop trail in the Santa Ana Mountains, above the town of Mission Viejo. Clipped to the rear fork of each of our bikes is a plastic zip tie, attached so that the end flicks through our spokes, creating a constant snapping sound that lets

Bushway and Ruiz know where the other bikes are. But to determine where the trail is going, and where the bushes and rocks and fence posts and trees are, the boys rely on echolocation.

Bushway is a fearless biker. He often flies down the dirt trail in aerodynamic form, hands off the brakes, clicking as fast and as loud as he can. “Your brain is on overload,” he says to me during a water break. “You feel like you can hear every bush, every tree. Your body is hyperaware.” I try and warn them when the trail presents a serious consequence, like a long drop-off on one side or a cactus jutting out. But mostly I’m just along for the ride. It’s difficult to believe, even though it’s happening right in front of me. It’s incredible.

And then, suddenly, it’s not. When I look behind me and see that Ruiz has drifted back, I stop and wait for him. I’m just standing there, silently, and before I realize what’s happening, he is bearing down on me. I shout, and he pulls the brakes, but it’s too late. He smashes into me and crushes his left hand between his handlebar and the back of my seat post. He falls off his bike and rolls about in pain, clutching his hand. There’s a trickle of blood, though nothing seems broken. I feel terrible, but Ruiz says it’s his fault — he should have echolocated my bike, even if I wasn’t moving. We finish the ride, with Ruiz using only one hand.

The next day I join Kish and Bushway as they teach Sebastian Mancipe, who is 15 and has been working with World Access for three years. When he started, he rarely came out of his bedroom. He had little interaction with the outside world. He developed infant glaucoma and was blind by age three months. His parents moved from Colombia to the United States to give him a chance at a better life. His mother, Viviana, saw a brief appearance by Kish on the Ripley’s Believe It or Not television show, and soon hired World Access to work with Sebastian.

He now rides a skateboard. He ice-skates. He’s popular at school, stocked with friends and a busy social life. I follow as Kish and Bushway stroll around Sebastian’s neighborhood, in a busy section of Burbank. He’d obviously mastered the echolocation basics — the pot lid, the pillow, general shapes. Kish and Bushway encourage him to push his skills further. “A tree,” says Kish, clicking a couple of times, “is like a bush on a pole.” They walk on. “A tree without a bush on top is probably a telephone pole.” They pass a parking lot. “A large object that starts out low at one end, rises in the middle, and drops off again at the other end — that’s a parked car.”

Back at home, I ask Sebastian’s mother about the impact World Access has had on her son. “It was an awakening,” she says. “He believes he can do anything. To see Sebastian as a normal child...” She can’t complete the sentence before the tears come.

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The longer the waiting list for his services grows, the more conflicted Kish feels. He knows what he’s doing is important. But what he really wants, as more people clamor for his time, as the frequent-flier miles add up, is to hand over the reins of World Access and run away from it all.

He’s essentially a loner. “My constitution,” he says, “is that of Grizzly Adams.” In 2003 he purchased a 12-foot by 12-foot cabin deep in the Angeles National Forest. It was built in 1916; he paid \$10,000 for it. To get there he’d take a taxi to the end of the road and hike in. “My only company,” he wrote in his journal at the time, “is a small family of mice.” He explored the wilderness. “I taught myself how to negotiate tricky, winding trails with sharp switchbacks, how to cross rushing streams on slippery stones. I’ve gone for miles and days without meeting another soul.”

He was once asked by a colleague what he thought the biggest problem was with being blind. “My biggest barrier is people,” he answered. “Especially sighted people.” He has never once in his life had a

girlfriend or, for that matter, a boyfriend. When I ask him, via e-mail, to explain why, his response is three words: “Lack of interest.”

Two tragedies, nearly 20 years apart, have bookended his adult life. The first was the death of his dog, a black lab named Whiska. This was in 1990. She was run over by a car while Kish was walking with her. Kish has always blamed himself for the accident. “I loved Whiska with an intensity that completely distorted my better judgment,” he wrote. “I spoiled her rotten and took over her job. She forgot to watch for traffic, because I’d always done that for her.” He had nightmares for a year after the accident. “The chain’s just dangling and there’s no dog. I’ll never forget that moment.” Not long after, he got another dog, but soon started traveling and gave him away. That was his last pet.

The second tragedy occurred in January 2007 when his cabin burned down. He’d had a wood-burning stove installed, and the wrong materials were used for the chimney. The fire was fast-moving and horrific — “my last memories of my cabin are the ominous crackle and rumble of advancing flames” — and Kish had no idea if it would engulf the entire canyon, incinerating him as well. The disaster haunts him; he keeps a chunk of melted glass from the cabin in his home in Long Beach. “A piece of my own heart has gone up in flames,” he wrote. He plans to one day return to the woods, perhaps permanently. “I find people,” he says, “to be incredibly draining.”

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Kish has an idea. Beyond the pot lid and the pillow, beyond the mission of World Access, there is something he has been quietly working on for more than a decade. If his wish is fulfilled — if someone else takes over World Access and he’s able to escape from life’s perpetual rush hour — it may prove to be his true legacy. What Kish envisions is the next leap in human echolocation. His idea is to become more like a bat.

Bats are the best. Some can fly in complete darkness, navigating around thousands of other bats while nabbing insects one millimeter wide. Bats have evolved, over millions of years, to possess the ideal mouth shape and the perfect ear rotation for echolocation. They can perceive high-frequency sound waves, beyond the range of human hearing — waves that are densely packed together, whose echoes give precise detail.

There is evidence that humans could be that good. Bats have tiny brains. Just the auditory cortex of a human brain is many times larger than the entire brain of a bat. This means that humans can likely process more complex auditory information than bats. What we’ll require, to make up for bats’ evolutionary head start, is a little artificial boost.

Actually, two boosts. We need a way to create batlike sound waves, and we need to be able to hear those waves. In pursuit of these goals, Kish has spent time in New Zealand with Leslie Kay, who worked on underwater sonar for the British Navy during the Cold War. For nearly 50 years, Kay tinkered with ideas for helping the blind to see with sound. He eventually introduced, after many weeks of consultation with Kish, a product called the K-Sonar, a flashlight-size machine that attaches to a blind person’s cane and emits ultrasonic pulses. The pulses are then digitally translated into tones humans can hear, through earphones. “Flowers actually sound soft,” says Kish. “Stones sound hard and crisp. It pretty much represents the physical environment as music.” The problem is range: The K-Sonar can detect a postage stamp from 15 feet, but not the side of a barn from 30 feet.

If money were no object, Kish believes that blind people could essentially mimic bats within five years. A next generation of K-Sonar, using the input from a global consortium of scientists that Kish has been corresponding with, should have a nearly limitless range. Our hearing, Kish says, can be increased tenfold through surgical augmentation — basically, inner-ear microphone implants. Combine the two and it’s

possible that the blind will be able to take up tennis. Kish figures it would require \$15 million to prove whether or not his idea is feasible. He fears he'll never get the opportunity.

“It’s virtually impossible to gather funding for experimental devices for the blind,” he says. “The blind population is seen as a lost cause.” Kish’s patience is running thin. He is still reaching out to scientists and studying scholarly journals and pondering ways to conjure the money. But more and more these days, he finds himself daydreaming about rebuilding his cabin and devoting himself to playing music, to writing. Let the new crop of echolocators take over the research and the networking and the panhandling. So for the foreseeable future, at least, Kish will continue to click in his usual way. And the sighted world will continue to not notice.

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This article originally appeared in the March 2011 issue of Men’s Journal.

URL to article: <http://archive.mensjournal.com/the-blind-man-who-taught-himself-to-see>