

Elite Course Measurer: “I’m a Real Pain for Some Race Directors”

A group of highly obsessive, perfectionist-leaning individuals spend untold hours calculating and calibrating race routes.



BY [BLANE BACHELOR](#) JUN 15, 2016



Every so often, David Katz jumps on his bicycle and cruises along the streets of New York’s Central Park in the dark, usually between 10 p.m. and 2 a.m.

But Katz, a retired middle school science teacher, isn’t going for a casual moonlight cruise. Instead he’s doing some of the most important—and often unrecognized—work in the sport of road running: course measurement.

Katz, a pioneer and authority in the field who’s measured more than 1,000 races over the past 40 years, including four at the Olympic Games, equips himself with notepads, a steel measuring tape, his trusty Casio calculator watch, a device called a Jones Counter affixed to his bike, and a reflective vest. This “nerd vest,” as he often refers to it, is especially important at night, when he’s less visible to motorists. But the decreased traffic and fewer parked cars (plus stable temperatures; more on that later) may add up to final figures that are a few inches more accurate, and for Katz, the risk is well worth it.

It's all in day's (or night's, for that matter) work for the world's elite course measurers, a distinguished group of highly obsessive, perfectionist-leaning individuals who spend untold hours calculating, calibrating, and crunching numbers. They also do demanding physical labor like putting tape on the road and pedaling for miles in the dark— extensive and unrelenting efforts that remain mostly invisible to the running world at large.

“We take incredible pride in this,” Katz, 63, who lives in Port Washington, New York, told *Runner's World*. “It's all for the runners, regardless of what level. This is where I'm a real pain for some race directors. I put the same amount of energy and detail into measuring every event, whether it's a local 5K or an Olympic marathon.”

Here's how the process works: A course measurer first lays out a “calibration course”: usually 300 to 400 meters on a straight, flat road. The calibration course is measured at least twice with a steel tape measure, taking into account the expansion of the tape due to temperature. The measurer then rides the calibration course with a bike that is outfitted with a Jones Counter mounted on the front axle, a small, box-like contraption with gears that clicks off approximately 18,000 revolutions, or counts, in industry lingo, per mile.

After several rides of the calibration course, the measurer can then crunch the numbers to determine the needed counts for the course length and intermediate split points. The course measurer then rides the course, taking all the tangents within 30 centimeters (one foot) of curbs and permanent obstacles. Afterward, the Jones Counter is recalibrated to determine any adjustments due to changes in the diameter of the tire because of air pressure and temperature.

USA Track & Field, which oversees the certification of race routes, requires a minimum of two measurements of the course, which can be achieved by two measurers or the same measurer riding the course twice. Elite measurers like Katz also prefer to do their course calibration at night, when the temperature is more stable and can minimize differences between pre- and post-calibrations.

There's the Short Course Prevention Factor to figure in, too. According to USATF and the International Association of Athletics Federations, all races must be measured one-tenth of one percent of the total distance long, which ensures that the course cannot possibly be found to come up short in case of a record.

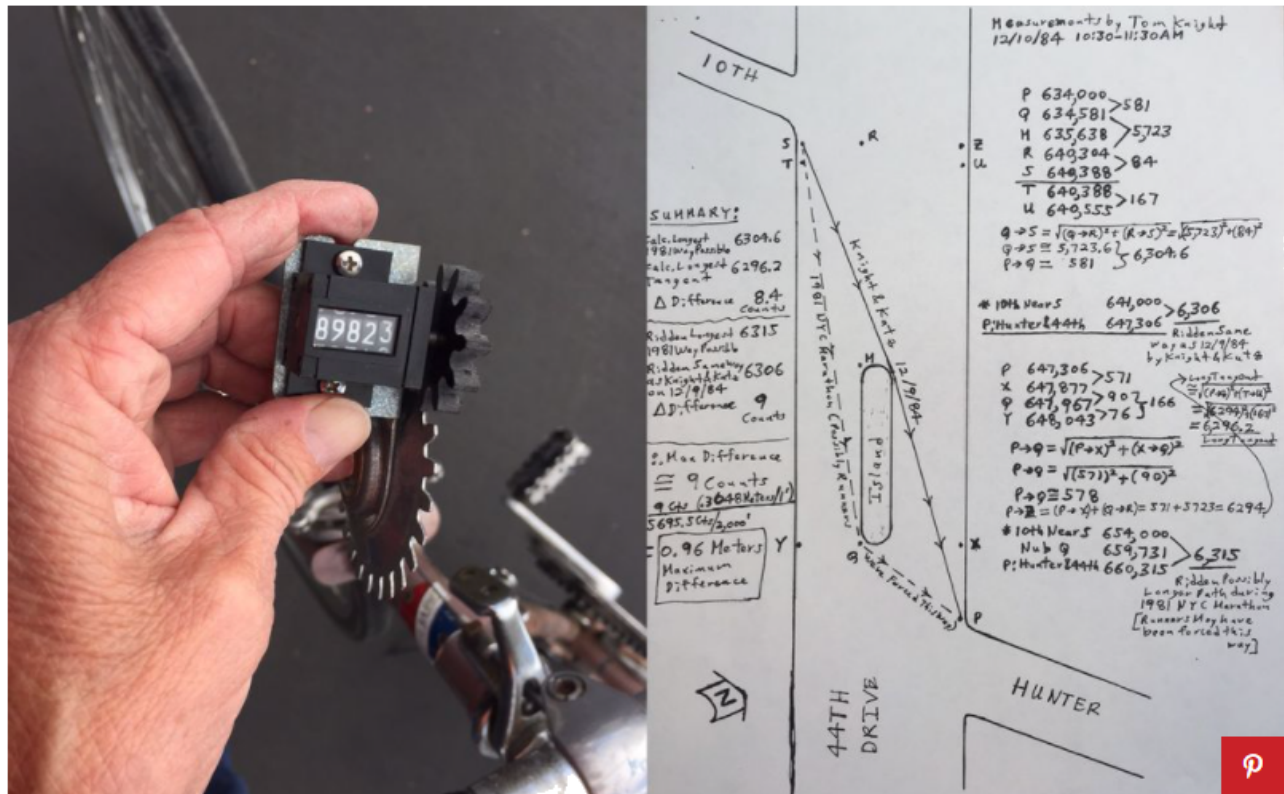
Put simply, course measurement involves a level and degree of math that would make the average runner's head spin. For their efforts, established pros like Katz, of which there are only a couple dozen in the world, can charge a few hundred dollars for a 5K to several thousand dollars for marathon routes.

“It's one of those things that people don't even think about,” Jim Heim, senior vice president of event development and production and technical director of the New York City Marathon, told *Runner's World*. “Participants assume a course is measured perfect—you're never going to have

someone say, 'Man, that course was measured really well.' It's like being an offensive lineman. No one talks about it unless they screw up."

The whole process can take several hours for simple races like an out-and-back 5K to months and longer for world-class events. Katz, for example, spent about a year working on the men's U.S. Olympic Marathon Trials course in New York in 2007. He also assisted with measuring the route for the marathon at the 2012 London Olympics, a notoriously convoluted course with more than 90 turns, including several hairpins. According to Katz, he and the lead measurer, a Brit named Hugh Jones, came within 1.4 meters on their final numbers.

For the Runners



A Jones Counter (left) is essential to course measurement; Tom Knight's sketch of part of the 1984 Olympic Marathon route.

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The task demands a knack for number-crunching, patience in spades, and a perfectionist mindset. Tom Knight, an independent measurer based in San Carlos, California, and a physicist and computer analyst by trade, became interested in course measurement nearly 40 years ago, when he noticed that the distances in races he ran seemed to vary wildly. So he started doing his own measurements after running races, going as far as to check his calibration against the Stanford Linear Accelerator Center, where he worked.

The SLAC houses the world's longest linear accelerator, a two-mile-long, highly technical piece of equipment used by physicists that speeds up particles in a linear tube (in layman's terms, an atom smasher). Knight obtained building plans and rode his bike along the outside of the

building, which had some distance measurements marked on it, to make sure that his calibration was accurate. The final figures came out “extremely close,” he says.

Knight, 73, soon became reputable enough that race directors started to take notice when he notified them about his plans to remeasure their courses. For example, Knight told the race director for the Nike OTC Marathon, a race put on by Nike and the Oregon Track Club between 1978 and 1984 that drew some of the top names in running, that he was going to run the 1982 race and then remeasure the course. He recalls that race organizers then did their own calibration and ended up lengthening the course. That year, Joan Benoit set a new American women’s marathon record of 2:26.11.

Knight recalls that a similar scenario unfolded for another prominent race in the Pacific Northwest around that time. “Just because somebody has something stamped and it says it’s certified doesn’t mean that it’s accurate,” he says. “I wasn’t trying to make a name for myself. But I just thought that races that were advertised as certified should be the right distance. These were big important races, and a lot of top stars ran them. So I knew if any course was to be accurate, these should be.”

Accuracy errors have made several headlines as of late, such as the recent dilemma at the inaugural Chattanooga Marathon in March. A volunteer placed a cone marking a turnaround point 0.14 mile too short, resulting in an 0.28-mile shortage that put the race’s official marathon distance in jeopardy, as well as runners’ qualifying times for big events like Boston. Meanwhile, for the past three years, the Manchester Marathon course has been deemed short, sparking similar outrage.

Both Katz and Knight are all too familiar with such controversy. After meeting for the first time as part of the pioneering group chosen to measure the marathon course at the 1984 Olympics in Los Angeles—“probably one of the greatest measurements done on a road course,” Katz says—the pair soon found themselves involved in one of the most longstanding disputes in road running: the length of the 1981 New York City Marathon course, and, more specifically, the non-records that resulted.

In the race, Alberto Salazar and Allison Roe apparently ran the world’s fastest times, in 2:08.13 and 2:25.29, respectively. But the point-to-point course was eventually found to be short, and after much debate, Knight was called in by the National Running Data Center, the records clearinghouse, to remeasure it, assisted by Katz. They both took two independent measurements—one 0.1 meter from the curb, the other 0.3—and their final figures were both within four meters of each other. The verdict from the NRDC? The course was short, and the record-winning times were scratched.

Katz acknowledges that “Alberto got screwed” (as did Roe and a handful of other runners whose records were voided). He notes that, in addition to a misunderstanding about the available road space in the route, the industry’s changing rules and regulations at that time caused confusion.

But he and Knight both still stand firmly by their numbers, as does the NRDC. When the issue flares up on online running sites, Katz isn't afraid to jump into the fray under his real name, explaining in layman's terms how the process works and why the course came up short.

For now, though, Katz is looking ahead to August for the 2016 Olympics in Rio de Janeiro, where he will help set up the course and ride on the lead vehicle to help validate that the course that was measured is the course that was run—an IAAF rule he helped put in place to reduce costly errors like the one that happened in Chattanooga. Millions of spectators around the world will be watching the results of his exacting efforts without even realizing it, and that's just how Katz prefers it.

"I love what I do," Katz says. "There are few things as rewarding for me. Athletes give so much at any level, especially the world-class level, and we as officials, as surveyors, have to work just as hard for them."