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LASER LOSES A LEGAL TEST

Finally, in one courtroom, the defense asked tough questions, and the laser-gun folks had the wrong answers.

BY PATRICK BEDARD

This started with an ordinary \$96 speeding ticket clocked by a laser gun, exceptional for only one detail: Joe Maccarone's neighbor got it.

Maccarone is 44, a lawyer in Long Valley, New Jersey. As his neighbor fretted over the four-point ticket, Maccarone remembers saying to him, "I'll go talk to the prosecutor, get it down to two points. Won't charge you."

What Maccarone didn't know was that the prosecutor had been waiting for a defendant with a lawyer to contest one of these laser-based tickets. The New Jersey State Police had only recently starting using laser guns. Now they needed a test case to get the courts to validate police use of them. When new enforcement devices are used to produce evidence in a trial, they must be proven in court to be accurate and reliable. When a judge hears enough testimony to be convinced that the device is scientifically reliable, he takes "judicial notice" of the device. From then on in that court, defendants can argue that the device was misapplied, misused, or misconstrued, but they can't argue that it doesn't work. Judi-

cial notice was taken of radar years ago.

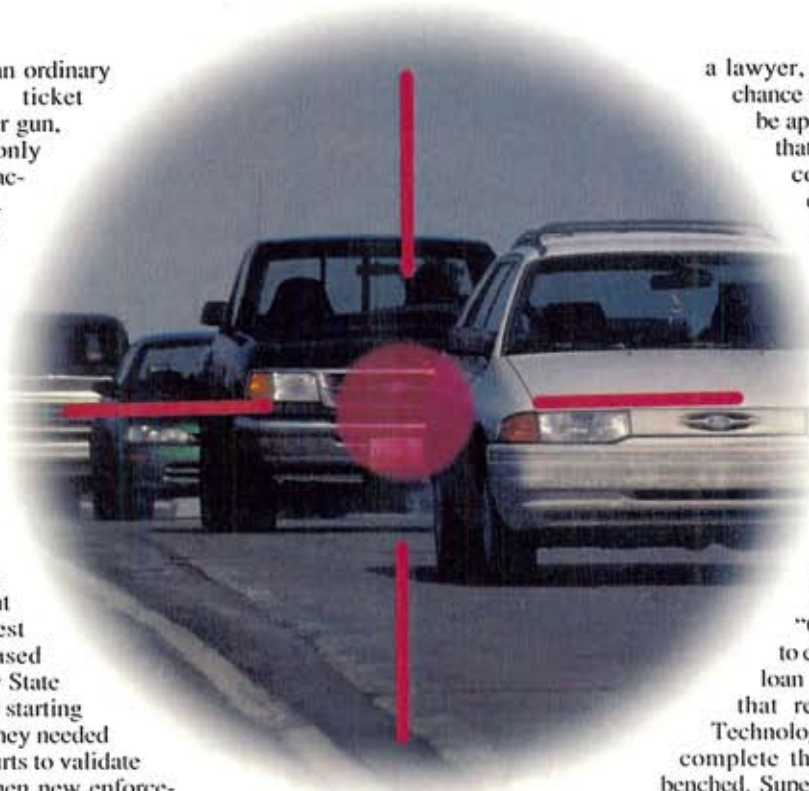
For this speeding case, the prosecutor brought in an expert witness, who received payment for his testimony from the gun's maker, Laser Technology, Inc. This witness testified that the LTI 20-20 Marksman used the same technology developed in the NASA space program. The defendant had

a lawyer, and that means there's a chance that a guilty verdict would be appealed to a higher court. If that higher court confirms the correctness of the trial court's verdict, that would establish judicial notice in all courts within that district.

When Maccarone went to see the prosecutor, he was told there would be no deals. "Just the way he treated me, it pissed me off. I thought, *He wants a fight, he'll get a fight.*"

When the courtroom slugfest was over in June 1996, all of New Jersey's "GEICO guns"—so named to commemorate the \$950,000 loan from auto-insurer GEICO that rescued cash-short Laser Technology in 1991, allowing it to complete the LTI 20-20 gun—were benched. Superior Court Judge Reginald Stanton ruled that the LTI 20-20 was inadmissible as evidence. Technically, the precedent knocks out GEICO guns only in Stanton's district, but the New Jersey State Police have stopped using laser guns all across the state while they search for a legal comeback strategy.

In the future, you can bet prosecutors will be careful not to piss off Joe Maccarone. Purely as a favor to his neighbor,



he burned through \$12,000 of his own billable time, rounded up three expert witnesses who would testify against the GEICO gun, put himself through tutoring so he could understand the technology, and tried the case, which amounted to five days of testimony over two weeks. He also was able to combine his neighbor's case with almost 200 other pending laser speeding cases and get the issue tried in Superior Court, not the lower traffic court. That way, if he won, precedent would be set *barring* laser. Joe Maccarone definitely knows how to get even.

Judge Stanton ruled against the GEICO gun for the simple reason that LTI couldn't prove that it works accurately. Police all across the country, it turns out, have been buying LTI 20-20s on nothing but LTI's word that they work as advertised. When finally pressed for test data to demonstrate that the device produces accurate readings in typical traffic situations, LTI could not prove its own claims.

The company also refused to disclose the algorithm designed into the GEICO gun that it claims will reject erroneous readings, saying that to make that information public would be taken advantage of by its competitors. Early in the trial, LTI officials insisted that the gun would never produce false readings. Instead, an error message would appear on the display indicating that it was unable to complete a correct reading.

With barely constrained glee in his voice, Maccarone recalled the end of LTI's pose of infallibility. "We were waiting for the judge to come back from lunch. The prosecutor was there. Jeremy Dunne [the gun's inventor] from LTI was there. And they had the equipment sitting on a desk. So one of our experts went over, picked it up, turned it on, and pointed it at the corner of the room. Then, as he pulled the trigger, he moved the gun sharply. It showed 4 mph. The wall was moving at 4 mph.

"We showed it to the prosecutor. He turned pale white. Then our expert got 4 mph [readings] three more times."

This moving-the-gun exercise illustrated a fundamental flaw in the GEICO gun's concept. It doesn't measure speed—it measures distance. It makes rapid-fire distance measurements—43 of them in a third of a second each time the trigger is pulled—and from those changing distances between the gun and the target over time, it *calculates* speed.

But speed of what? Since the operator can't see where the beam strikes, how can he know what it's tracking? What if it isn't tracking anything? What if it merely moves from a far spot

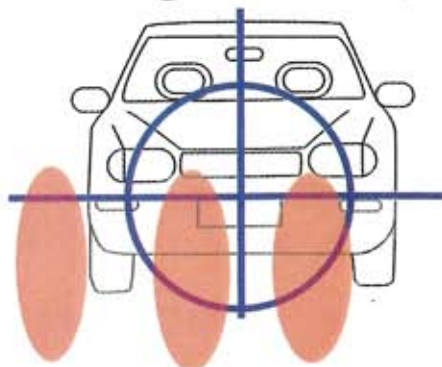


In court, attorney Joe Maccarone made the laser gun look like it was shooting blanks.

to a close spot? Radar doesn't have this shortcoming, Judge Stanton observed, because it measures speed directly, and every part of a car is going the same speed. But if the laser beam is allowed to move from the windshield to the grille, adding about four feet to the change in distance during the one-third-second measurement, then the gun would show a speed about 8 mph too high.

Stanton was open to the idea that some error-trapping program could be invented to reject these erroneous readings, but he wasn't about to accept LTI's claim that "it's in there." Since LTI wouldn't disclose the error trap, and couldn't prove that the

LTI 20-20 Aiming Accuracy



So much for rifle-shot accuracy. With three separate beams arrayed horizontally—and none of them the aiming point—the LTI 20-20 is more like a shotgun.

Source: Friedrich Alexander University, Erlangen, Germany

device produces accurate and reliable speed readings in real-world use, tough noogies for the GEICO gun.

Other findings add to doubts about the gun:

- In 1992, the Colorado State Patrol staged a shootout, two troopers side by side—one with an LTI 20-20, the other packing a Kustom Signals ProLaser, and both targeting the same car in traffic. The two guns disagreed with each other by 2 or more mph 40 times in 89 tries, by 3 or more mph 16 of 89 tries.

- In 1995, three German engineers at the university in Erlangen tested the LTI 20-20 and two European laser guns. They found that the LTI had three beams side by side instead of a single beam, which raises doubts about what spot on the car is actually being tracked. Moreover, the beam strike did not correspond to the targeted area, raising the possibility of hitting "other vehicles than the targeted one. In this way, the real advantage of the laser devices over radar is lost, namely, pinpointing a vehicle in moving traffic," their report concluded.

Comparing laser with radar is revealing in another way. Paul Greenberg, one of Maccarone's expert witnesses and himself a NASA laser scientist, points out that a radar unit sitting atop a dashboard can measure speeds all by itself, with no input from a human operator. But a GEICO gun cannot operate by itself—it must be aimed by someone, and it must track a moving target for the one-third of a second it takes to produce a reading. In effect, it's a hand tool, and its output can never be independent of its operator.

Greenberg also questions the ability of human operators to accurately aim a gun that weighs 5.6 pounds. The handgun-marksmanship standard for military police in stand-and-shoot situations is this: The shooter is given 50 rounds, and the target is a 21-inch-wide silhouette placed 50 yards away; to pass, the shooter needs a 60-percent hit rate. With a GEICO gun at 1000 feet, that translates to a 60-percent chance of hitting a 12-foot-wide space. Yet cars are only about six feet wide. So the chance of hitting something other than the intended target—other vehicles close by—is very good. And this chance is amplified by the way laser gunners operate. They position themselves for an end view of traffic, or as near to it as possible. And that stacks all vehicles close together in the view. How does the operator know that his invisible beam hit the target and not one of the bystander vehicles?

The usual description of the laser beam—four feet in diameter at 1000 feet—overstates its precision in actual use, too, Henry Roberts, a retired Bell

Labs scientist and another of Maccarone's expert witnesses, pointed out the "slice of bologna" problem. Laser gunners don't stand in the road, they stand alongside it, and therefore see a slight side view of traffic. What happens when the invisible beam sweeps down the side of a string of vehicles? Imagine bologna cut at a small angle. With a beam angle of two degrees to traffic, he calculates the active end of the beam to be an ellipse about 115 feet long. From what does it produce its reading?

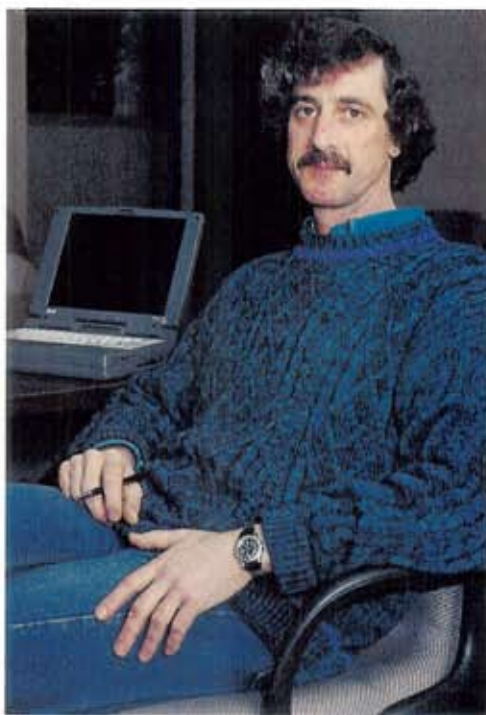
Laser accuracy and reliability can never be separated from the question "What did it hit?"

One of the National Highway Traffic Safety Administration's gambits to give credibility to laser guns was, in effect, laughed out of the courtroom. NHTSA had requested the National Institute of Standards and Technology to come up with minimum performance standards for laser guns, and a standard test by which to measure them. The results were published in 1995, and to no one's surprise, both guns offered by U.S. makers passed the test. But the test procedure is wildly different from the way police use lasers. The test requires the gun to be steadied by a tripod and that reflectors be attached to the target car. "I always attach reflectors to my car," said Greenberg sarcastically. Judge Stanton dismissed the test as "largely meaningless."

This trial was one of the rare traffic cases in which vigorous advocates for the prosecution faced equally vigorous advocates for the defense. For normal speeding trials, "You have a lopsided playing field," Maccarone says. "A \$96 ticket—who's gonna spend thousands to present scientific evidence that the device doesn't work? So the state puts in its case with next to nothing, and it wins every time."

To even the playing field this time, the four lawyers and three expert witnesses for the defense all worked for free. Laser had never before faced such a vigorous defense.

Usually, there's no defense. Consider the recent case in Mentor, Ohio, in which



NASA's Paul Greenberg questioned whether the 5.6-pound gun could be aimed accurately.

prosecutor Ron Graham brought in an LTI-paid expert to testify against a local social worker defending himself against a speeding charge of 73 mph in a 60 zone. Guilty, the judge decided, and took judicial notice of the LTI 20-20. But in the same court before the same judge a year before, Paul Greenberg appeared as the defense expert against the same LTI expert and foiled the prosecutor's attempt at judicial notice. I asked prosecutor Graham how he selected that most recent case. "I wanted to make sure [laser] got accepted, so that's what we did," he answered. At the social worker's case, the LTI expert introduced into evidence the same NHTSA test that Judge Stanton said was "largely meaningless." In the absence of anyone on the defense to raise doubts, Municipal Judge Richard Swain bought the LTI argument.

Mark Gardner, an attorney in nearby Cleveland, told *C/D*, "There's something

un-American about waiting until you find a helpless defendant, then trying to establish [judicial notice] in that case. It's immoral."

It's also very easy for the prosecution to win these cases. Although at least 49 Ohio municipal courts have taken judicial notice, in none of these cases did an expert witness testify on behalf of the defense. One of Ohio's 12 judicial districts has taken notice, also based on a case without a defense expert. Technically, the defendant doesn't have to prove that a device *doesn't* work; the prosecution has to prove that it does. But who will hold the prosecution to high standards of proof if the defense is weak? No one. Greenberg says he's appeared against laser seven times, defeating it each time.

LTI's goal is to establish judicial notice of the GEICO gun nationwide. The national scoreboard shows that Maryland's highest appeals court has approved the general admissibility of laser evidence, but it did not rule on the accuracy and reliability of any specific laser device, leaving that question open.

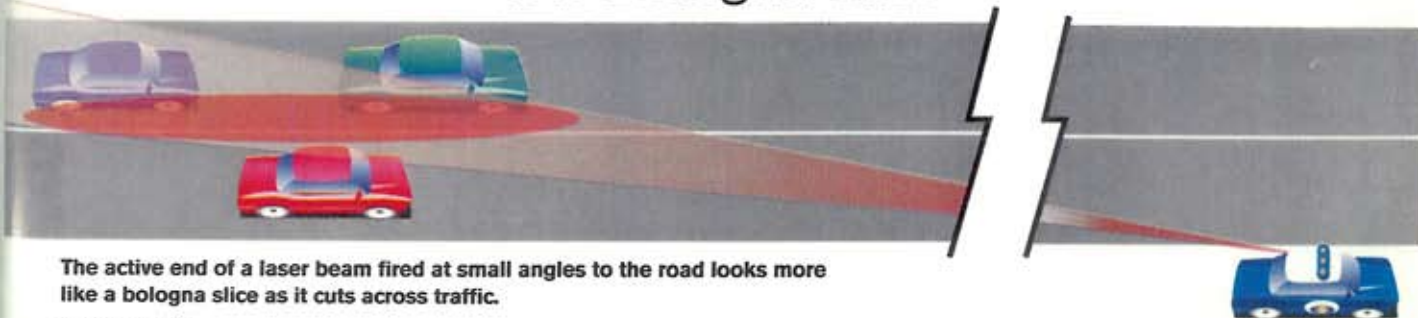
A circuit court in Little Rock has recently taken notice of the LTI 20-20, a decision that amounts to a moderately influential precedent in that state. Again, it was a trial with no expert witness for the defense.

Will laser guns eventually be accepted by all the courts in the land? Casey Raskob III, a New York lawyer and National Motorists Association (NMA) activist, believes it's only a matter of time. "Prosecutors have the upper hand. If they see that you're really prepared, they can jerk you around."

That's what happened to Luke Ball, an NMA coordinator in Texas. After he appeared nine different times in two different courts over an 18-month span, the prosecution finally dropped the speeding charge against him.

"Eventually," Raskob says, "laser will be judicially accepted. Not on its merit. There will be enough cases that are poorly defended. Moving radar didn't go through right away, but it finally did." ●

The Bologna Slice



The active end of a laser beam fired at small angles to the road looks more like a bologna slice as it cuts across traffic.

Source: Henry Roberts