

A Company That Keeps Its Eye on the Ball

By MARGARET SHAKESPEARE

DEER PARK
It was a beautiful night for a ballgame, and the Mets were playing the Arizona Diamondbacks at Shea Stadium. But instead of soft spring breezes ruffling their score sheets in the press box, two broadcast technicians, Dan Beard and Ron Klimkowski hunkered down at a worktable in the drab, windowless innards of a television studio. Three monitors, one beeping and scrolling down lines of numbers every few seconds, faced them.

Using PitchTrax, a system of cameras and computers coordinated with military precision, they charted Rick Reed and Armando Reynoso's every pitch. The computers told them, with an accuracy of one and a quarter inch, whether it was a ball or strike, and they also measured the trajectory, speed and spin. That information was then instantly available in a graphic format for broadcast on the Fox Sports Net.

PitchTrax is just one of several patented motion-tracking products developed by QuesTec, which occupies part of a plain-vanilla industrial building in Deer Park. Now, QuesTec has a five-year contract to provide Major League Baseball with an Umpire Information System, an even more precise virtual replay system that can track a pitch with an accuracy of half an inch.

"This is nonthreatening technology," said Edward Plumacher, who founded QuesTec eight years ago. "It doesn't change the way the game is played. We don't call what is a strike and what is not. We just supply the data. But, still, the U.I.S. is a sensitive topic. Certainly we have promised confidentiality in our agreement."

By that he meant that he cannot not discuss the accuracy of any umpire's calls with anyone — the company merely provides the raw data.

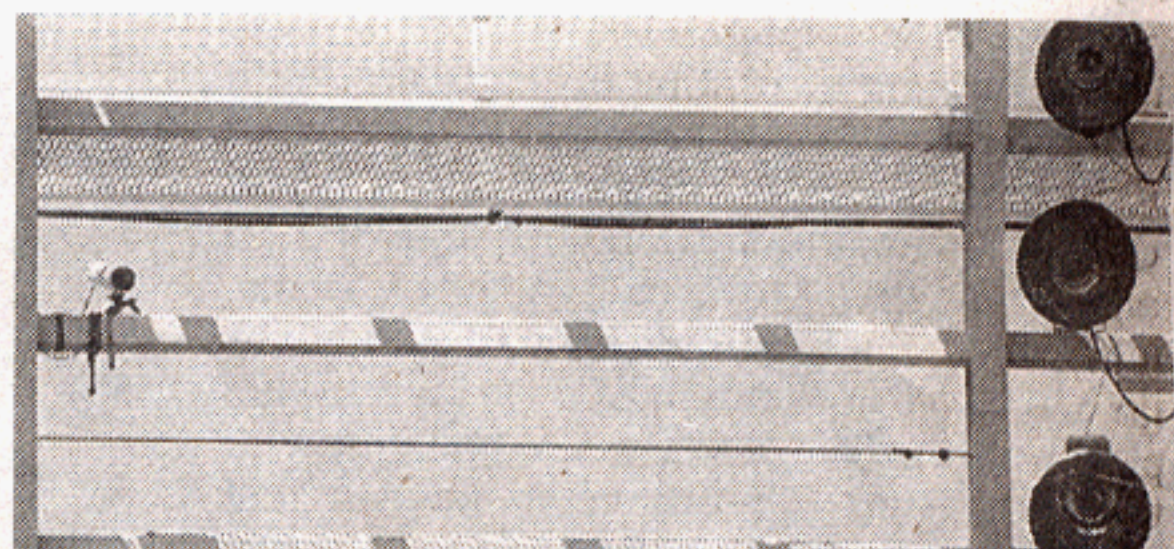
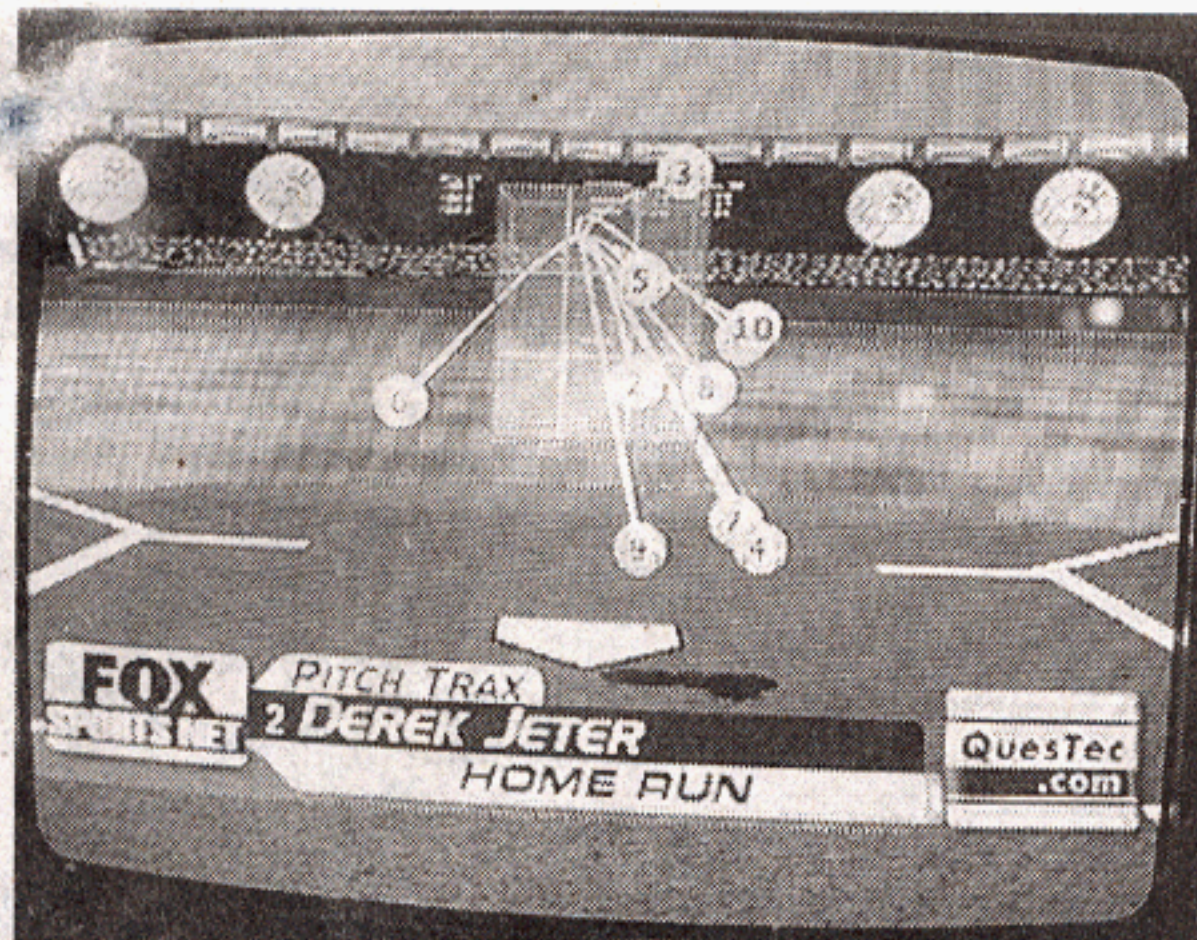
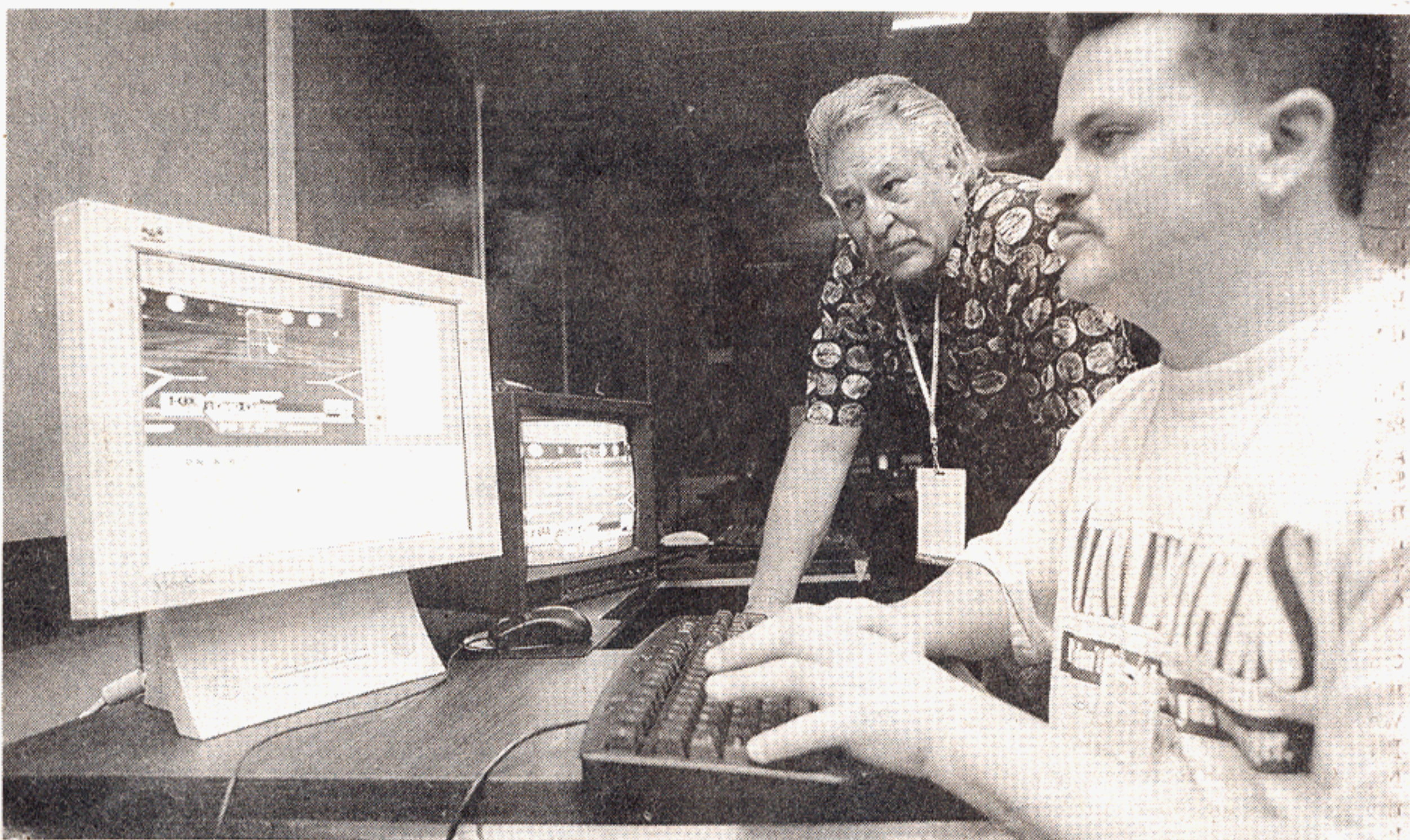
Ralph Nelson, the vice president in charge of umpiring for Major League Baseball, said that the goal was not to replace umpires with a machine. "The most crucial definition of the U.I.S. is that it is a training system, to help umpires get better at what they do," he said. "We have spent a lot of time discussing it, trying to build trust and make assurances that we aren't out to prove them wrong. It is part of our entire program to bring more consistency among umpires."

Not surprisingly, perhaps, umpires have not rushed to embrace the new technology. Randy Marsh, who has been a major league umpire

10 years and who serves on a committee working to bring more uniformity to plate umpires' calls, has observed the Umpire Information System first-hand. "There will be more acceptance if they can get the glitches out on extreme pitches," he said. "For example, on a curve ball breaking down, the catcher turns to the side and scoops the ball — and the computer calls it a strike. But a ballplayer will hit the roof if you call that a strike."

The first Umpire Information System was up and running at Fenway Park in Boston by the end of May. By the end of the season, five more ballparks will be outfitted, but under QuesTec's contract, Mr. Plumacher is not allowed to say which ones.

The first step in installing the system is to mount two pairs of off-the-shelf Sony cameras. "It will be hard to find them in the stadium," Mr.



Photographs by Philip Greenberg for The New York Times

Ron Klimkowski, top left, and Eric Imeidopf using the PitchTrax system at Yankee Stadium. What Fox viewers see on their home screens, left, and what most gamegoers don't see at all: a PitchTrax camera, above left, lost amid the lights, at right.

Plumacher said. After some modification to the cameras, one pair is installed on the stadium roof to follow the ball as it leaves the pitcher's hands. The other pair — one placed low on the first-base side of the stadium and the other near third base — will plot the strike zone for each batter.

The rule book defines the zone as a three-dimensional area across home plate measured vertically from the letters on the batter's uniform down to his kneecaps.

Images from each of the cameras

One QuesTec system can track a pitch with half-inch accuracy.

will be fed to a computer, which translates each pitch into data. A second computer then renders the data graphically as a strike-zone box that changes color — usually from blue to red — when the ball enters it. It takes less than a second from the live pitch to the graphic reinterpretation.

"These cameras look only for a moving baseball and won't follow a pigeon or windblown trash," Mr. Plumacher said. "The system can also give details such as the pitcher's release point and speeds. Fox now uses our pitch speeds instead of a radar gun, which is subject to human error."

Because a computer program stores all the information, it can cre-

ate a CD-ROM, available 30 minutes after the game, that a plate umpire can view on his own laptop and compare his calls to the machine's. A second CD-ROM will go to Mr. Nelson's office at Major League Baseball and a third to the umpire's crew chief.

Mr. Marsh, the umpire, takes a somewhat dim view of this. "They say it's a tool for self-critiquing," he said. "Our immediate concern is that it not be used for evaluation."

Player reaction has been varied, said Mr. Plumacher, who had conferred with the Atlanta Braves' formidable pitching staff when he was perfecting PitchTrax in the mid-1990's. "It's been everything from 'Wow! Really cool!' to 'Babe Ruth didn't have this,'" he said. Nonetheless, in 1998, Fox hired QuesTec to supply graphics for some of its Major League Baseball broadcasts, and in June, Oral Health America signed on as QuesTec's on-air sponsor.

In a large back room at the sparsely furnished QuesTec office in Deer Park, 30 identical sets of equipment — an I.B.M. computer for tracking, a Dell for graphics, two monitors, two keyboards and a network hub for the computers — sit on metal shelves labeled with the names of major league teams. When needed for broadcasts, the hardware is packed up and shipped by air freight to the team's home field.

"That's gotten easier for us since Southwest Air came into Islip just down the L.I.E.," said Mr. Plumacher, who is frequently on the road himself, marketing QuesTec products, working the broadcasts, even dragging heavy cable.

At QuesTec's first broadcast in April from Camden Yards in Baltimore, Mr. Plumacher's team discov-

ered that this stadium, not yet 10 years old, wasn't up to speed in its wiring. "It took about three miles of cable and a whole crew of us several hours to get it installed," Mr. Plumacher said. Newer parks, like those in Detroit and Milwaukee, are already completely wired.

Passions for baseball run deep at QuesTec: a framed action shot of Mr. Klimkowski, the company's sports marketing and remote event coordinator who once pitched for the Yankees, hangs next to one of Babe Ruth lofting three bats. But QuesTec is already looking to greener grasses on the other side of stadium fences.

"We are a business-to-business company, and we build on our core technology, which is video systems that track moving objects," Mr. Plumacher said. During the players' strike in 1994, when no baseballs, bats or any other parts of the game moved, QuesTec set its sights on golf balls. Its GolfProView has been seen on broadcasts of major tournaments as far away as South Africa. With the Live Motion Company of Wiesbaden, Germany, QuesTec developed the TennisProView, which has been used in some 50 international tournament broadcasts.

"Skiing has been about the hardest sport to work on," Mr. Plumacher said. "And our next big international project — cricket — is a technical challenge because the camera angles have to be so low in the small stadiums, and it's following a red ball on a green background."

A little farther down the pipeline are Internet applications and interactive television, which may be available on home screens before the score sheets for the 2001 World Series are filled in.