

Rick Davidson

Positioning Pioneer



Advancements in technology and the industries they serve are often attributed to the dreams and persistence of a few innovative visionaries. 3D machine control and positioning is no exception, and has long recognized Rick Davidson as one of its fundamental pioneers.

In 1980, Rick worked for Spectra Physics, then based in San Jose, California. When Spectra Physics acquired LaserPlane Corporation, Rick moved to Dayton, Ohio. LaserPlane had a long tradition of innovation, including Robert Studebaker's invention of the "LaserPlane" (another great story for another article), so the merger nurtured Rick's ideas because he was surrounded with kindred spirits.

This would be a good time to make a disclaimer of sorts. I am writing this article, as I understand the facts, based on interviews, web research and my 27 years in the business. Many others have contributed to the success of pioneers like Rick Davidson. That collateral talent has immense passion and drive for these technologies. So please forgive me if I do not mention all of those supporting

BY RANDY NOLAND

and other very significant roles. It is my intention to pay homage to the contributions and the life of Rick Davidson.

There was a common thread echoed by those I interviewed. Rick Davidson knew the technology was disruptive, but if it were to be successful, simplicity and education was key. Those rare few seem to have the capability to both design and deliver the technology so the market embraces the change.

INNOVATIONS

The Analog Mast

The Analog Mast was among Rick's first contributions after the Spectra Physics/LaserPlane merger. Traditionally, a telescoping mast was used but one of the drawbacks was forgetting about the extended mast, snapping it on a low obstruction. The Analog Mast took a different approach by addressing elevation changes with a motorized laser receiver. The Analog Mast provided 4 feet of up and down travel for the receiver, allowing it to remain within the safe confines of the mast housing.

Plane Lock

After several other successful products, Rick left Spectra Precision, returning to California to start his own company, AGTEK. In those early days, AGTEK provided tile and land leveling services to the agriculture market. This was a means to pay the bills, providing a more accurate and faster product for farmers using laser technology. But for Rick, this also served as an application proving ground for innovations to come. One such innovation was Plane Lock. Laser technology combined with the analog mast worked well but the laser tended to drift as the day heated up. Plane Lock calibrated the laser transmitter by referencing or "benching" the elevation to fixed prisms by driving the leveling motors. "Rick was always one step ahead," says Bill Painter of Topcon Positioning Systems, and former application specialist with AGTEK. "He knew how to solve problems and improve existing systems." Painter went on to say, "Rick was the driving force - very good at leading a team, providing the vision and making the vision work."

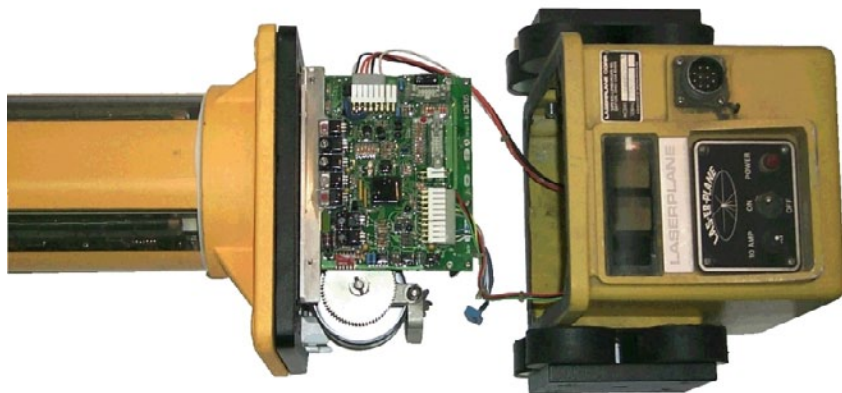
System One

Other emerging technologies stimulated Rick's vision of what was possible. For example, take off and estimating software was evolving as computer processing power increased. Rick and his AGTEK partner John Fletcher, another Spectra Physics engineer, formed a team that excelled in both hardware and software expertise, rounding out a systems approach to land leveling and grading solutions. In addition, vial liquid-based accelerometers offered cross slope monitoring, complimenting the elevation only data from a flat plane laser. At this point, AGTEK was moving beyond providing land leveling services with its eye on providing systems to the heavy highway construction market. The integration of the laser signal with the cross slope of the axial sensor became what was known as "System One."

"I met Rick in 1983," says Bill Crumb, owner of MCT, Inc., and former application specialist at AGTEK. "Rick showed up on a service call to check on a System One that had issues cutting to the correct grade. Rick arrived in a station wagon loaded with service parts and camping gear. I asked Rick if he had been camping." Rick responded, "I know this system works and I'll be here until it does." Rick worked onsite, slept in his car and the system was up and working the next day. "Rick's dedication to his customers was incredible," states Crumb.

System Two

System One became System Two, which had an updated cross slope sensor that was much easier to calibrate. AGTEK was growing as more and more contractors became aware of the technology. But it was still a small company. John Dice of Topcon (and former AGTEK product manager)



From left, John Dice, Rick Fischer, Larry Fisher, Rick Davidson, Bill Painter, Frank Emmenager

says, “We would bench test the systems at our office, calibrate them, and box them to be shipped. Then we would get on a plane, flying to meet the shipment to install and train the new users.” Dice added, “There was a complexity to the system at that time and Rick knew that simplicity had to be a component of design.”

Non-Contacting Sensors

There are various stories about how the next evolution occurred, but it, too, was revolutionary. Rick had seen how Polaroid was working with autofocus mechanisms in its cameras. Ultrasonic technology could measure the distance to an object and respond by controlling the focus. With Rick’s application experience on the ground floor of grade controls, he told his team, “We are moving to non-contacting technology. We are going sonic.” Joe Brabec, CTO for Topcon and former head



of Engineering at AGTEK was hired for his expertise with digital technology. By going digital with the sensors, i.e., axial, sonic and laser, the components would work better together, providing a scalable upgrade path. Brabec says, “Rick asked me to design a digital sonic tracker. I knew the technology was there and believed in the systems direction Rick was taking. Rick then asked if I could do this in 3 weeks. I delivered what is now the basis for digital sonic sensors, an industry mainstay in 3 weeks and 2 days. Rick had incredible vision.”




System 3

The convergence of the technologies, including Rick’s innovative sonic sensor, opened a lot of doors, expanding AGTEK’s product portfolio. Graders were the first machines for the construction market, followed by asphalt pavers. Asphalt pavers had valve drivers enabling System 3 to control the elevation and cross slope by tracking and following the string-line. In an interview that appeared in *The American Surveyor*, Ray O’Connor, president and CEO of Topcon Positioning Systems, who was instrumental in Topcon’s acquisition of AGTEK in 1994, spoke highly of Rick, and credited him with the invention of the sonic non-contact tracker that later enabled stringless machine control, which led the way to stakeless construction. O’Connor said, “This was a quantum leap for road construction, both in the way roads are built and in increased efficiencies.”

After the acquisition, Rick never left the industry. He served as a consultant to Topcon, playing an important role in further technology convergence such as GPS and inertial measurement units (IMU) for both road construction and agriculture.

Rick was an innovative pioneer that would first observe traditional methods, and then designed technology that disrupted those methods in a positive and efficient manner. He would develop a process of methodology, and then develop the needed education to enable the market to embrace the change. Scott Beathard, president of GeoShack North America, formerly of Spectra Physics, says, “Rick was a solid, hard working guy, a family man—religious, trustworthy, innovative.”

Rick passed away on March 21st, 2011. I for one feel indebted to Rick as one of the pioneers that paved the way, growing opportunities for us all. AGTEK’s 30-year anniversary was June 17, 2011. No doubt there were fond recollections of Rick the man and of all of his contributions. 



» [View some of Rick’s patents here.](#)

Special thanks for helping to prepare this article go to: Joe Brabec, Murray Lodge, Bill Painter, John Dice, Scot Floyd, Bill Crumb, Roger Croft, and Scott Beathard.

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