

# GPID's Ron Adams Named Tek Fellow

## Ron Directed The Creation Of The Phase Change Print Technology And The Phaser III Color Printer

Ron Adams is the newest Tektronix Fellow, the company's premier engineering designation. Manager of GPID's Phase Change Research and Development, Ron directed the creation of the company's phase change print technology and the Phaser III color printer, winner of numerous industry awards and a genuine hit with customers, as indicated by continued brisk demand.

Ron's path to Tektronix was somewhat circuitous. Hailing from Oregon, Ron received his undergraduate degree in aerospace engineering and his Ph.D in mechanical engineering from Oregon State University. In the interim, he attended the Massachusetts Institute of Technology, where he received a masters in aeronautical engineering, and served as a lieutenant in the U.S. Air Force.

Upon receiving his Ph.D, he returned to MIT, where he worked on the aerodynamics of reentry vehicles. He was subsequently named Professor of Mechanical Engineering at OSU, the position he held when Tek Labs came to call in 1982 in search of a consultant to model the fluid dynamics of ink jet devices. Since calculating the fluid dynamics of ink resembled aspects of reentry science, Ron was considered the logical choice. Through this initial exposure to color printers, Ron's rising interest led to his joining Tek Labs two years later as Hardcopy Research Manager, responsible for ink jet development.

In this interview, Ron talks of the rewards and challenges of helping develop multiple aspects of a new technology:

### Q1. Why did you choose to leave academics?

I was looking for more excitement, which GPID has supplied by virtue of the IBD's aggressive product development plans, as well as the constant changes within the color printing industry.

### Q2. Given this change, what's the primary industry direction?

High quality, high speed color on plain paper at low cost. This direction is going to be hard to reach, especially since the print quality standard has lately jumped from 300 dpi to 600 dpi.

### Q3. Why did you think phase change offered such promise?

At the time, the limited literature on the subject suggested it could provide high quality color on plain paper. Also, a black and white phase change printer had reached the market, as had the announce-



ment of a color device. Though Tek Labs started ink jet research as early as 1979, especially for water-based inks, Roy Barker felt we were headed in the wrong direction. Because of his insistence and the realization that there was no point in the Lab going in a different direction than the IBD, Hardcopy Research joined GPID to develop phase change technology, the Phaser III, and its many manufacturing processes.

### Q4. If a product was already in the market, why didn't you think that you'd been beaten to the technology?

Its implementation wasn't very good. The ink was non-transparent, which made it difficult to produce overheads. In addition, when the ink solidified on the media, it left a rough, thick surface which was visually unattractive. Also, the interface was anything but standard.

### Q5. What difficulties did you encounter in development?

The biggest problem was the print head, since prevailing heads contained only between 4 and 16 jets. For high speed, high quality printing we needed to increase the number to 96. The fluid dynamics of this was extremely complicated. We also had to develop a new printer mechanism and design and manufacture inks that had never before existed. The sum of this work led to about 60 inventions, 25 of which have so far been granted patents.

### Q6. Was there a point at which you realized the printer might work?

It was about two years before we first saw the first acceptable output and I knew we had a saleable product. It took us another two and one half years to solve additional problems that would have caused our customers problems. A printer is a collection of parts which all have to be tooled. About six months before first shipment, for example, we realized that the print head developed bubbles at high altitudes. While this seemed of little concern, it meant that customers in Denver, for example — which sits a mile high — would have had trouble. By modifying the print head design, we were able to solve the problem.

### Q7. What, finally, were Tek's significant contributions in phase change technology?

There were a number of them. The Phaser III contained the first Postscript Level II controller for either black and white or color printing. We developed a superior ink that was transparent in a solid phase. And we developed a product that would allow our customers to print on a variety of media. The ink jet head design was also superior in functionality and more manufacturable than any before it.

### Q8. What kept you up at night during development?

Lots of stuff. One was a leaky ink reservoir. I remember a group of us traveling to Chicago to work with the casting vendor, and we were running around the city to all these little garage shops trying to find a process that would plug the pores in the casting to stop the leaks.

### Q9. Have things become anticlimactic after phase change?

A little. Phase change was like a start up company. We began with very little and still beat our competitors, who had a three year jump on us. Our group developed the technology, product, manufacturing processes, and got the line up and running. Considering what we were up against, I thought we executed well and managed to continually keep up our level of excitement.

### Q10. How did you beat your competitors to market, given their overwhelming head start?

We stayed focused only on phase change development. As it turned out, our competitors were going through consolidation, and their development teams were divided between the East and West coasts, which made their work more difficult, and gave us a window of opportunity.

### Q11. Were you ever worried that the technology wouldn't live up to expectations?

There was a point that I discussed with my wife that if phase change didn't work, we might have to move. But overall, our research told us it could be done. My primary worry was that the company would lose faith over the four and a half years. But management hung in there. You can't have self doubts, otherwise what you believe in won't happen.

### Q12. What have you learned about your personal attributes?

I've learned that I have the ability to take new technologies and create businesses from them. I've also learned that I can carry lots of stuff in my head.

—By Charles Martin

