Tek's first chief engineer

Arnie Frisch is still looking for 'windows of opportunity'

By DON LEIGHTON

Arnie Frisch has earned the right to lean back in his chair, stare out the window, and relax.

He was instrumental in starting two successful companies, serving as president of one and vice president of the other. He's a chief engineer, the highest rank in Tek's engineering career path. He has developed 10 patents, half of which are assigned to Tek. Through presentations of technical papers, he has gained recognition for his professional expertise among fellow engineers, both inside and outside Tek. And he's now general manager of Computer Based Instrumentation (CBI) Strategic Program Unit (SPU) which recently introduced its first products. Arnie developed the concept for these new products while working in Tek Labs and then was given the responsibility of turning the idea into a marketable product.

That's just a quick summary of his professional accomplishments. Away from the workbench, Arnie dons the guise of a fairly ordinary suburbanite. He has a wife (Francine), three children (Nicole, 3, Lisa, 12, Jennifer, 15), a large house, and a dog (Nicholas the poodle). He works in the garden, runs just about every day for exercise, and spends time hauling the kids around.

But Arnie isn't ready to rest on his laurels and retire. If you catch him sitting still long enough to stare out a window, it's probably because he's looking for another "window of opportunity."

In 1962, with a brand new M.S.E.E. from Brooklyn Polytechnic Institute, Arnie became president of Pentrix, a company that he and two other persons founded in Brooklyn, N.Y., Arnie's hometown. "When you have only three people starting a corporation, one has to be president, one has to be vice president, and the other has to be secretary," Arnie said, as a way of explaining how he started picking up management experience.

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Pentrix originated plug-in spectrum analyzers. And since they were designed especially to fit some Tek oscilloscopes, it seemed natural that Tektronix should buy Pentrix in May 1964. Pentrix became the basis for Tek's spectrum analyzer business (now known as Frequency Domain Instrumentation Division, headed by Morris Engelson, one of the other founders of Pentrix).

Arnie came to Tek along with Pentrix and served as first manager of the spectrum analyzer group. Nine years later, he left Tek to work on electron microscopes for another company. That was soon followed by another entrepreneurial plunge that resulted in Zygo, a company that builds electronic communication devices for persons unable to speak. That company is still going, but without Arnie. "I wanted to get back into technolgy," Arnie, said, so he returned to Tek in 1979.

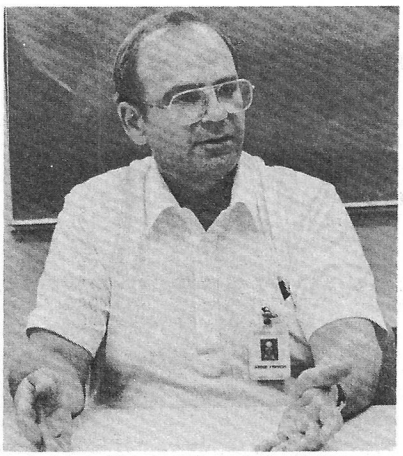
In a Tekweek interview, Arnie offered the following observations on engineering, managing, and inventing:

Does an engineer have to be able to switch into management to have a satisfying career?

It's certainly not necessary, but it can be very helpful, at least on a temporary basis. I like to be technically involved. But at the level of a chief engineer, you wind up with a lot of things that you think are good ideas. You can develop those ideas only so far with discretionary funds and resources. Beyond that point, if you want a full implementation of an idea to see how it flies in the marketplace, you've got to find a home for that idea in a product. You may need to move from the research area into a product area, possibly in a management role, in order to push your idea the whole route. Fortunately, I had been in several management positions in the past, so I had enough financial and general business training to handle it, but that isn't always going to be the case for engineers, even those at the chief level. I think we, as a company, should pay more attention to making it easier to get good ideas put into products.

Do you think engineers will ever be satisfied at the rate ideas are turned into products? Can a company function at a level that would really satisfy the technical people?

I would hope that innovative people, by the nature of their work, would never be satisfied. However, they can be as reasonable as anyone if they are given the whole picture. In the past, technical people didn't get to see the big picture. First off, the big picture includes comparing new



Arnie Frisch: "If it don't fit, don't force it."

product ideas not with what's on the market now, but with projections of what you think your competition will be. You can't pursue an idea just because it seems like a good idea. You have to have some projection of what revenues will be, what the strategic implications of the products will be, do they fit well with company strategy, how much will it cost to get there, what will the dollar volume be, how long will it last in the marketplace, what's the return on investment? All those things have to be considered—not just the fact that somebody has a good idea—and those are things that we did poorly in the past.

As we get better at projecting the big picture and letting people internally know what it is, I think there will be much less conflict over what direction we should be pursuing.

If engineers are interested in status and recognition, can they get it as engineers, or do they have to go into management?

I suppose it depends on the individuals and what kind of fame they are looking for. Most people don't get enough recognition, whether they are managers or engineers or whatever. Within the electronics industry, I know many people because of their engineering or scientific accomplishments, but I don't know who their managers are. Did Einstein have a manager?

I think the areas where the greatest advances are likely to be made are in the quasi-soft areas.

Tek's engineering career path, which tops out at chief engineer/scientist (engineer VI), is a good program that helps encourage engineers and scientists to continue their technical careers. But there probably needs to be some further way of recognizing outstanding contribution even beyond that final level. I can say that somewhat objectively now that I'm working as a general manager rather than as a chief engineer.

You've been able to do a variety of things in technical areas over a number of years. How do you keep up with technology?

There's no easy way. But it helps to have some goals in mind. From that, you can figure out how much you have to know in specific areas. In some areas, for example, you will have to know only what kind of general work is going on and how important the area is. In other areas, you may need very detailed knowledge. Then you can budget your learning time to gain the specific depth of knowledge needed to address your goals. Fortunately, there are some basic skills and knowledge that are relatively easily translated from one area of electronics to another. For example, my first experience in emitter coupled logic (ECL) design was accomplished primarily using my background in microwave and transmission line theory.

Can you describe your creative process?

What happens is that I'll have a general thought about a specific problem area. But instead of trying to come up with an immediate solution, I start collecting as much information as I can about the problem and what might resolve it. Without giving the problem a lot of conscious thought, I keep collecting knowledge. At some point, the light bulb will finally turn on in my mind. Maybe then I'll do some active work on the problem, but my first efforts typically are not a complete solution. Eventually I will have accumulated a large enough database and a large enough series of trials to know what the proper direction is. Sometimes the answer comes on the first try, and sometimes those are very elegant solutions.

What do you do now, as a general manager, if you get a good technical idea?

I don't have the time now to pursue very many technical ideas. So if something looks like a good idea, I'll validate it to some degree myself and then try to pass it along to somebody else with the suggestion of how it should be used.

If you were speaking to some electrical engineering majors in college, what area of work would you recommend as offering the greatest opportunities and excitement?

I think the areas where the greatest advances are likely to be made are in the quasi-soft areas. Not pure software, not pure hardware, but in those areas relating to architectures and algorithms (mathematical formulas for solving problems) and how they relate to how software works and the way hardware works. I think you have to understand both hardware and software before trying to successfully integrate them into a working machine or system. That's an area where major advances are going to be, and it's an area sparsely staffed at present.

There are a lot of people who think of themselves as hardware engineers, and there are a lot who think of themselves as software engineers. They build hardware and write software, but when it comes to putting the two together, there are a lot of problems. There would be fewer problems if the

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Introducing Tek's chief engineers and scientists

Tek's eight chief engineers and scientists are are a diverse group in some ways: born in places as far apart as Portland, Oregon, and Cesis, Latvia; educated in places like Brooklyn, N.Y., and Brisbane, Australia; with hobbies ranging from singing in a church choir to flying.

But they all have two important things in common: 1) they've contributed greatly to Tek's past success through their technological prowess, and 2) in the face of rapidly changing technology, they've kept their minds keenly honed and are leaders in projects intended to keep Tektronix on the leading edge of technology and a step ahead in the marketplace.

Chief engineers/scientists also serve as the technological and product conscience of the company by consulting with top management on research and product development.

The chief engineer/scientist designation is the top level in a career path established to encourage outstanding engineers and scientists to continue in their technical careers. Preceding steps are principal engineer/scientist, senior engineer/scientist, and engineer/scientist III, II and I.

Chief engineers/scientists are recognized as experts in their fields who have made outstanding contributions to both the company and the electronics industry. Among other selection critieria are significant inventions, new designs or techniques, publication in major journals, presentations at major conferences, leadership positions on industry committees, and peer recognition. Chief engineers/scientists are chosen by the Engineering/Scientific Approval Committee on the basis of nominations from managers and senior engineers.

A series of interviews with Tek's chief engineers and scientists begins in this issue of *Tekweek* with Arnie Frisch (Computer Based Instrumentation general manager) who became Tek's first chief engineer in 1981.

Others to be profiled in coming issues are Val Garuts (Tek Labs), Thomas Reeder (TriQuint Semiconductor), Gene Andrews (Lab Instruments Division), Bob Holmes (Hybrid Circuits Operation), Phil Crosby (Tek Labs), Mayer Schwartz (Tek Labs), and Linley Gumm (Frequency Domain Instrumentation Division).□