

Chapter 12

Cupertino, GTE & ILC



Ringwood was a nice rural area but it was mostly middle class. Cupertino, on the other hand, was upper-middle-class. It was new and modern and was the home of Apple Computer. It was wealthy. We paid

\$91,000 for a six bedroom house. This was almost twice the \$53,900 we had received for our house in Ringwood. However, it had six bedrooms. Cupertino had no real business district. There were several shopping centers, sort of high class strip malls, along its main streets. Cupertino was immersed in a suburban area near San Jose, Sunnyvale, and Saratoga.

While we were pulling our kids out of school and away from their friends, one of the things I was looking for was a very superior school system. We were just one long block away from the high school shown below. It was very new, very good, and very close.

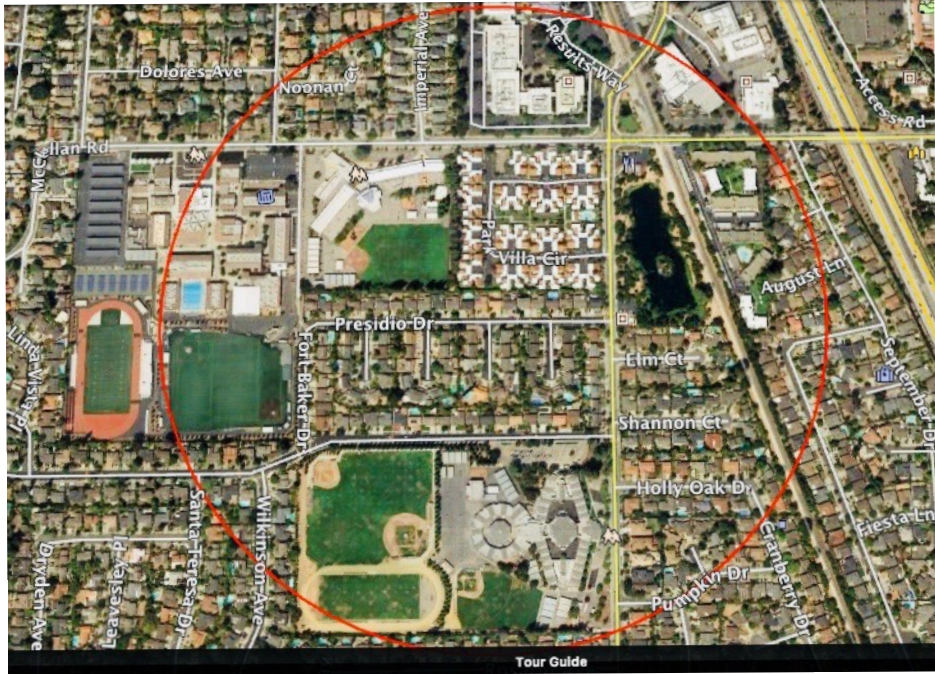
Below is an aerial view of our section of Cupertino. Our house is at the center of the red quarter mile radius circle.



To your left is Monta Vista High School where Peter and Monica attended. Lincoln grade school, where John attended, is

adjacent to the high school. Kennedy Middle school, where Mary and Sheila attended is in the bottom of the circle. The DeAnza Junior College is just across the freeway.

McClellan Road runs in front of the high school and the grade school and crosses Bubb Road near the freeway. Bubb plays a major role in my work career later on.



As you might expect, moving to a new school in a new town was not easy for the kids. This was Peter's third

school in three years and he knew no one in Cupertino. Monica had been chosen for the cheerleading squad in

Ringwood at the end of her freshman year and had to start all over in this high school. All the schools were in walking distance, but relationships were total startups for our kids.

We told the kids that there was no way we could afford to send them to four-year colleges. We told them that if they attended two years at a junior college in California, we could send them to any California Public University. I do not believe we presented this for a vote, we just indicated that this was the way it was; I do not remember any verbal complaints.

We joined a nearby local swim and tennis club a couple miles away. Anne and I were active in the tennis world, Anne much more than I. She is still friends and plays bridge with some of her close tennis players from the club. Joining it was a very good move.

We settled in and Anne organized our furniture from Ringwood, and assigned the kids their bedrooms. It was the first time everybody had a room of their own. Anne registered the kids for school, and we met our new neighbors. The immediate families all had kids. I guess you would expect that on the street that had mostly three and four and five bedroom homes. More about that later. I was off to work at my new job at a GTE/Sylvania.

My Job At GTE Sylvania

It was not totally clear how the company expected me to commercialize its laser technology. GTE was a military company. They had established a division called EOO, or Electro Optics Organization. There were two major projects within the EOO when I arrived. They both related to large gas lasers. They were of a type called transverse flow where the gas flowed sideways through the laser beam. One operated in the infrared using carbon dioxide gas. The other operated in the ultraviolet using krypton fluoride discharge. I was expected to find commercial uses and customers for these products. Bud Erickson, who had recommended me to Dick Reynolds, the supervisor of EOO, was not working in gas lasers anymore and was now working at an unrelated department

We had a few contacts among the Holobeam returnees. Jim Boyden and Acle Hicks had hired on with Hewlett-Packard Corporation when they returned to California. Acle and Mary Hicks lived near our new home in Cupertino, Jim was in Palo Alto. Along with our immediate neighbors, these were our first social contacts in California.

The Electro Optics division, run by Dick Reynolds, had been in operation for quite a few years when I arrived. They had worked on multiple laser projects and had an application lab with one of the large carbon dioxide lasers in operation. I supervised the application lab and had four employees, two technicians and two secretaries. I had been employed only a few months when I was told there was to be a layoff of 25% of all people. I only supervised four people, two of whom

were secretaries. As a new manager, I was working with the existing employment arrangement until I figured out how we might find a commercial product.

GTE was a total government contract company but basically made its profits on cost-plus programs where they had to justify every expense to be reimbursed by the government. This was a totally new experience for me. I agreed to let go one of the secretaries as I had no choice. Having no long-term experience with either of them, I chose to release the one who could not type.

And then came the collection of effects that I did not know the reason for until later. The government was pressuring the company to employ a certain percentage of African American people. In the mid-70s there was, however, no requirement for a percentage of women. I think this requirement was related to cost-plus government contracts.

In any event the secretary, who could not type was black and the human resource director was also black. To my amazement, he suggested that I must be sleeping with the white secretary if I chose to keep her instead of the other one. This sort of blew my mind as I barely knew her name. I found out later that my predecessor had indeed been having noontime liaisons in a nearby camper with the white secretary. In any event, I told him he was crazy. He was totally unwilling to fire her, possibly worrying about a lawsuit, and he eventually transferred her to a different group in a different part of the company. Problem solved.

Anne remembers me as being somewhat shaken when I told her this strange experience at work. I liked the high-powered laser research that we were doing, but I certainly did not like the politics in the military contracts aspect of the company. Life went on, our technical reports were typed, and no one got sued.

Back to technology, the company had obtained a military laser contract for a high-average power carbon dioxide laser as well as a high-average power pulsed Excimer laser. The carbon dioxide laser had been completed and operated for sufficient time that it was a saleable commercial product.

I was most interested in the Excimer laser program, as the laser output in the ultraviolet spectral region seemed to offer the most opportunity for potential commercial products. This program was being run by Ted Fahlen. Ted and I were destined to work together for many years.

When I first met Ted he was attempting to optimize the performance of a large Excimer laser to meet the requirements of a government contract. This type of laser requires a very short, very high-voltage electrical pulse to be applied to the Excimer gas. In this system, this was delivered from an array of large coaxial cables charged to a very high voltage. These tended to occasionally short the ground and prevent the full performance of the laser. The laser was in a separate room from Ted's laboratory room.

Ted asked me if I would go inside the laser room and try to see if I could determine where the electrical short-circuit occurred. It was only later that I realized that Ted was in a

separate room, protected from the laser by double-pane glass window and sand bags. I was both blinded and deafened when one of the coaxial cables indeed exploded while I was peering at the system.

I asked Ted later why he did not have his technician diagnose the system instead of me. He joked that he could not have asked someone working for him to do it, but I was an independent volunteer. However, working with Ted around the Excimer laser was far more interesting than trying to figure out a commercial sales program for the CO₂ laser.

As I mentioned earlier, Ted was optimizing this large Excimer laser. This requires a supply of fluorine gas. Fluorine gas has about everything possible to make it dangerous. It is toxic, corrosive, and explosive. At GTE, the laser test laboratory was immediately adjacent to the departmental offices. Shortly after I left the company, the safety people realized this and built a concrete block house out in the neighboring field and moved the Excimer laser testing to a safer place.

The United States Atomic Energy Commission was experimenting to see if they could separate the components of radioactive waste products from nuclear energy plants by using this type of laser. The preliminary experiments worked, but a full-scale laser isotope separation plant was never built.

Our commercial application lab demonstrated that our high-power carbon dioxide laser could be used to heat treat various metal surfaces and a successful demonstration was made on the cylinder liners for diesel locomotives. General

Motors Diesel Corporation in the Midwest purchased a laser system.

The senior technician from our laser assembly operation was to go and supervise the installation. This was viewed as a plum job and was assigned to the most senior technician. It was with some dismay that I discovered the technician who was assigned this job was a 6 foot 2 inch, 240 pound transgender. The assembly floor, which was mainly female, had long since accommodated to him. I was pretty sure that we would never get the system accepted if this was our installation technician. In this case, the HR department came to my rescue and arranged a promotion to another department for this technician. Crisis averted. The installation was successful. In those days things were different.

Sometime nearing the end of my second year at GTE, I realized that a military contractor is not going to make the necessary financial investment needed to develop a real commercial product. I started looking for a job back in the commercial laser industry. I looked at Spectra Physics and Coherent, the two largest laser companies in the area and did not find an opening that I liked.

While at GTE, I really enjoyed the long lunchtime bridge games that we had in the office backing on Ted's laboratory. It was only one table and I only got to play when one of the regular players was not there. One of the regular players was named Paul Titterton. When he was playing a hand, he regularly tried to lead from the dummy when it would've been advantageous to him. We called this the "Titterton Transfer."

ILC Technology

ILC technology was a small Santa Clara California company that manufactured the optical sources that I had used first at RCA Labs and then extensively later at Holobeam. Over the years, I had fairly extensive interactions with Jack Moffat, the ILC company president, over how to possibly improve their lamps and increase their operating lifetime. I'm not sure any of my suggestions were implemented, but I got to know Jack quite well. The ILC technology plant was only a few miles down the road from GTE Sylvania. He immediately offered me a job when he heard that I was looking to leave GTE.

Ted Fahlen recently reminded me that he stayed with GTE Sylvania for several years after I left. During that time the EO division was barely holding its own and was later sold. Probably they had decided not to expand the laser technology operation into the commercial world even before I got there. Art Kraemer, one of the GTE managers, joined me later at XMR after the EO operation closed. Several of the engineers I knew at GTE Sylvania formed their own company also after the EO division was closed. They were never really successful.

ILC was mainly a lamp technology and ceramic seal technology company but had some interest in lasers. They had developed a dye laser, but never commercialized it. They were not only a supplier of the small-diameter krypton and argon gas lamps that were used in our Holobeam lasers, but they manufactured large diameter xenon lamps for use at Lawrence Livermore Labs. These lamps were about 1 inch in diameter and 1m long. This type of lamp is still being used at

Lawrence Livermore by the thousands. ILC also sold assemblies of these lamps and supportive wiring harnesses to other laser research laboratories around the world.

ILC was always interested in expanding their lamp business. One possibility was in the movie business. The other was in Excimer lasers. After I had worked for them for about a year, I presented my ideas on going forward with Excimer lasers. They decided there was much more immediate and profitable business in the studio arc lamp area. I was not really interested in studio arc lamps.

Jack and I agreed to amicably part. They agreed that I could have ownership to any and all Excimer laser technology that they possessed. Actually they did not possess any. It was at ILC that I met Paul Lavoie. Paul was to become a continuing participant in my technology and business world.

This was not quite the end of my interaction with ILC. It turns out that each of the large arc lamps and the laser systems they were selling required a fuse in the connecting wires. There were thousands of these and the fuses arrived without any wire clips on the ends to enable installation. ILC wanted to subcontract the job of putting the clips on the fuses to some other company. Somehow I found out what the bid price was from their supplier and underbid it by a penny a clip. This was XMR's first contract. It was profitable because I did the work at our house and my kids operated the air compressor machine that fastened the clips onto the wires. (inside information, child labor). We were paid \$10,000 for the job. Such a start to a company.

Self-Employment

The family was settled in Cupertino. All five kids were in school, ranging from junior college to junior high school. Anne and I were in our mid-40s. I felt that I could always get a job in one of the high-technology laser companies in the area if a start-up failed. “Such an ego!” The next chapter will cover the start of my first company.

“ XMR ”