Chapter 7: No Longer Walking the HP Way

My new boss at Fairchild was pleased to hear HP's decision to terminate me immediately. "You can start working here tomorrow instead of waiting a month," he told me. "You can help me interview other engineers for your group."

Although I was eager to begin, my wife and I decided to take a week off. We drove to Lake Tahoe and spent a few days planning our next year. After coming home, we began to look for a house to buy. Fairchild's new plant was already under construction in Palo Alto, so we searched there and in Los Altos. Having lived in apartments my entire life, owning a house was a new concept for me. I had heard from my colleagues that homes frequently required repairs—something the apartment managers had always handled. However, being an engineer, I was confident I could do repairs myself.

The year 1970 was the busiest of my life. The Early-Bird graduate program at Santa Clara University ran courses from 7 to 9 a.m. I attended morning classes twice a week and went directly to work from there. Most of my classmates also held full-time engineering jobs in the Valley. We showed up in the classrooms sleepy-eyed and then rushed to work at the end of classes. It was not an easy schedule, but one advantage of the early start time was the ease of parking on the normally busy campus.

Our new Fairchild division employees were scattered among three temporary locations in Mountain View for several months. The building where I began work was quite spartan compared to HP's facilities—no cafeteria or library. We all looked forward to the completion of our new plant.

My first assignment in this no-frills environment was to design an inexpensive alternative to HP's thin-film hybrid cable TV amplifier. I was concerned about the low selling price targeted by the Fairchild marketing group. Generally, the price had not been an essential consideration in my former job. The strength of HP's Microwave Division lay in its production of unique, low-volume test equipment that had limited or no competition. The components' cost and manufacturing were secondary considerations because their products commanded high selling prices. Even though my HP cable TV amplifier was a high-volume product, it had no competition. So, the price could be set relatively high.

In contrast, Fairchild's expertise was high-volume, low-cost products. After seeing the mass-production semiconductor capabilities of the company, I felt confident about meeting the $25 price goal for my project. To keep the cost low, I wanted to find an inexpensive package[1] for the circuit. The mass-produced TO-3 power transistor package looked suitable for my needs, but it had only two pins available for electrical connections—two less than the four I needed.

Asking around at Fairchild, I learned that Dr. L. of the Semiconductor Division was the company's packaging expert. I decided to ask his advice and drove to his plant. I located his office but found the area deserted. After a short wait, I saw a man walking toward the office. I stepped into his path and asked, "Are you Dr. L?"

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[1] **The word "package" refers to the protective, sealed housing of the transistor chip circuitry.**

“Yes, what do you want?”

“I’m new at Fairchild and…” was all I could say before he interrupted me.

“Do you have an appointment to see me?”

“No, but all I need is…”

“I don’t talk to anyone without an appointment,” he said, cutting me off again. “See my secretary!” He stepped into his office and slammed the door behind him.

Suddenly, I remembered my HP lab manager’s warning. “*Fairchild has a different company culture. You won’t be as happy there as you are here*.” He was right! Because most of the key employees of our new **Fairchild Microwave Division** had come from HP, they still behaved the “HP Way.” We all went out of our way to help each other. However, the first time I stepped out of our division’s boundaries, I discovered that cooperation did not exist at **Fairchild Semiconductor**. Eventually, on my own, I found a vendor who agreed to modify the standard package at a reasonable price.

Pictures show the top and bottom of an inexpensive standard TO-3 power transistor package. For my amplifier, I wanted two additional leads coming through the metal case, so the package had to be altered.
Even though the package required a modification, its final cost was only a fraction of the custom-made package used by HP.

The next step was to write a CAD program to design high-frequency circuits. I added a user interface to our previously developed routine stored in Stanford’s computer and entered it into the General Electric (GE) Timeshare System. One unique feature I added was an extensive database to store the measured parameters of Fairchild’s microwave transistors. Marketing agreed to have the program available to designers to promote Fairchild’s transistors. I decided to name it SPEEDY to emphasize how fast the program operated.

In a short time, SPEEDY became popular worldwide. Circuit designers no longer had to rely on datasheets or characterize their microwave transistors as long as they used Fairchild’s devices. The company recognized the competitive advantage created by the program, and I received an additional stock option.

Finding experienced microwave circuit designers was extremely difficult. We could no longer recruit engineers from HP. Our management decided to look for bright young engineers and teach them computer-aided techniques. Two of the new hires came with interesting backgrounds.

One of them, a recent young emigrant from Romania, had no U.S. experience, but he sounded promising during the interview. We offered him a job and expected him to grab the opportunity immediately. To my surprise, he waited several weeks before accepting the offer. It took months before I finally learned why he had hesitated.

During a company dinner to celebrate the completion of our new building, he approached me carrying two glasses of wine. “Les, there is something I must confess to

you," he began after toasting me. "When you offered me a job, I knew you were a Hungarian. You knew I was from Romania. I thought you wanted to hire me only so you could give me lots of trouble."

His revelation at first surprised me. Then I realized how much ethnic hatred existed among the various Eastern European countries whose borders had changed frequently during and after the two World Wars. Fortunately, I had lived far away from those troublesome border zones. Other than disliking the Russians for imposing their political system on us, I did not have any reason to dislike other nationalities. I reassured Peter that I held no such ill feelings. He and I remain good friends to this day.

Professor Chan, Chairman of Santa Clara University's EE department, recommended the other new employee. "One of my Ph.D. candidates is a giant," he told me. "He is head and shoulders above all of my other students. Although he has no practical design experience, I'm sure he'll learn fast. His name is Chi Hsieh. Talk with him."

I called the student and arranged an interview for the next day. At the agreed time, our receptionist paged me. "Mr. Hsieh is here to see you."

Eager to see the "giant," I rushed to the entrance. The lobby was empty except for a young, small-framed boy sitting on one of the chairs. I assumed he was the son of an employee. "Where is Mr. Hsieh?" I asked the receptionist.

"Right there," she replied, pointing to the young man.

Based on the boyish appearance of the applicant, I seriously questioned Professor Chan's judgment. During the interview, however, my doubts quickly faded. Although he lacked knowledge about the latest microwave technology, the student had logical reasoning skills and a firm grasp of the basics. We hired him, and it did not take long to realize why his professor thought so highly of him. Chi picked up what had taken me months to learn at HP in mere weeks at Fairchild. He quickly became one of our most valuable design engineers.

Our new division faced unpleasant news after happily moving into our new Palo Alto facility. About a third of the new building extended into Los Altos Hills. That city, primarily a bedroom community, had strict building codes that Fairchild had violated.

Los Altos Hills did not allow manufacturing activities, and our semiconductor production facility happened to be on their side of the city line. Petitioning the city and offering to pay a fine to allow the operation to remain there did not help. A costly and time-consuming reshuffle of the work areas moved manufacturing to the Palo Alto side.

The next inspection also found that the building exceeded the Los Altos Hills' height limitation by 18 inches. This was a more complex problem to overcome because we did not want to shave off the roof. Finally, following an outside consultant's recommendation, the company ordered a large amount of soil to *raise the ground level* around the building on the Los Altos Hills side. Fortunately, our main entrance faced Palo Alto, so the front door remained unblocked.

About the same time this monumental "landscaping" project was going on, one of my colleagues asked me to coach kids' soccer. The team was part of a California-based

organization called AYSO[2]. I agreed, remembering how much I had enjoyed playing soccer. I thought it would be fun to coach and also welcomed the opportunity to get more exercise. Soccer was pretty new to the American sports scene, and his team of six- to seven-year-old boys and girls, the Panthers, had no idea how to play. In our first game, they all crowded around the ball, trying to kick it regardless of what direction the ball should go. Within a few months, they learned the basics, and the games became more enjoyable. I stayed on and coached for several years.

As if the weekends weren't busy enough with soccer games, I was part of a group of other local IEEE chapter officers who decided to organize Saturday design seminars for Bay Area engineers. We managed to secure the Stanford Linear Accelerator (SLAC) auditorium for one-day courses at no cost, except for the lunch provided by their cafeteria. We charged $10 to IEEE members and $20 to non-members and planned to set up scholarships from the revenues. The first course, entitled Computer-Aided Circuit Design, was an overwhelming success. Over 300 people attended the inexpensive continuing education program. We immediately made plans for follow-up courses.

COMPUTER AIDED CIRCUIT DESIGN: THEORY AND APPLICATIONS

November 14, 1970

Main Auditorium
Stanford Linear Accelerator
2575 Sand Hill Road
Palo Alto, California

COURSE SCHEDULE

Morning:

1. Topological techniques: K-tree approach and flow graphs. Comparative analysis. Chan
2. High frequency linear circuit analysis in the frequency domain using scattering parameters. Two-port techniques, stability. Besser
3. Time domain analysis. Non-linear circuits. Utilization of mini-computers. Fazarinc

Lunch: (at SLAC's cafeteria) Cost included in registration fee.

Afternoon:

4. S-plane analysis. Pole-zero patterns. Computer graphics. LISA (Linear Systems Analysis) and GSPAN (Graphics S-Plane Analysis) programs. Johnson

Afternoon (continued)

5. Search strategies (optimization). Pattern, gradient, random, stochastic gradient, search techniques. User interaction. Hall

Break:

6. CAD workshop. On-line computer analysis and synthesis of circuits supplied by seminar participants. Hall

LECTURERS

Shu-Park Chan, Chairman, Department of Electrical Engineering, University of Santa Clara,

Les Besser, Project Manager, Fairchild Microwave and Optoelectronics Division,

Zwanko Fazarinc, Development Engineer, Hewlett Packard Laboratories,

Edward T. Johnson, CACD Project Leader, IBM Systems Development Division Laboratory,

Robert Hall, President, Dean Hall Associates

FEE

The fee for the course is $10.00 for IEEE regular members, $5.00 for student members and $20.00 for non-members. The fee also includes the lunch at SLAC and the lecture notes to be handed out.

REGISTRATION

The enrollment for this course is limited. Therefore, persons interested in taking this course are urged to enroll early by completing and mailing the registration form below. Companies may enroll for any given number of individuals, supplying names later. *To ensure enrollment, individual names must be received before Nov. 1, 1970.* For additional applications, use separate sheet giving information requested on enrollment form.

INFORMATION

For additional information concerning the program, write or call: Les Besser
Fairchild Microwave and Optoelectronics
423 National Avenue
Mountain View, Calif. 94040
Phone: (415) 962-2872

REGISTRATION FORM

(Should be received before November 1, 1970)

Mail to: **Dale Nielsen**
c/o IEEE San Francisco Section Office
Suite 2210
701 Welch Road
Palo Alto, California 94304

Enclosed is check (payable to San Francisco Circuit Theory Group) in the amount of $_____ to cover the enrollment fee.

Name: _____
(please print full name)

Home Address: _____
(Street)

_____
(City and State) (Zip)

Business Address: _____
(Street)

_____
(City and State) (Zip)

Position or Title: _____

Business Phone: _____

IEEE Affiliation (Check One) ☐ Member ☐ Student Member ☐ Non-Member

IEEE Membership No.: _____

I have a circuit problem that I would like to have optimized at the seminar ☐

NEXT SCHEDULED COURSE:

February 1971

Active Filters

Announcement of the 1970 highly successful one-day seminar on Computer Aided Circuit Design. The fee for IEEE members was $10, including lunch!

[2] American Youth Soccer Organization, a group that advocated sportsmanship above all, specified that every child must play at least one half of each game, regardless of his or her skill level. Established in Los Angeles in 1964 with nine teams, today the organization has over 50,000 teams throughout the United States.

Serving lunch to such a large number of people took far more time than we had scheduled. The cafeteria manager could not find any way to speed up the process. Later, when I expressed my frustration about the slow service to my mother-in-law, Doris Bogart, she offered a surprising idea.

“Let my service league ladies (CAC) serve lunch to your group,” she suggested. “We’ll buy sandwiches and hand them out quickly. Your engineers can sit at the outside tables and eat in a nice, peaceful environment. Pay us the same as you paid SLAC.”

I liked the idea and agreed to try it at the next seminar, knowing that any profit they made would go toward a good cause. Her service league of volunteers had been formed several years ago to help jailed inmates' families. The other IEEE officers also liked the idea.

My mother-in-law showed up with a group of ladies on the next course day. They handed out the lunch and the refreshments smoothly. The sandwiches were so large that most people took only half. Everyone was satisfied, and there were even leftovers. Mrs. Bogart’s group became the food provider for years to come. When other IEEE chapters heard about the success of our courses and formed their own, they also invited her group to serve their lunches. Thousands of engineers attended our chapter’s course series during the following years. We set up college scholarships from the revenues.

A New House

The real estate agent we had contacted earlier called us one evening. “Looks like I’ve found the perfect house for you,” she said. “Let me show it to you.”

A few days later, she drove us to the three-bedroom home on a third-acre parcel in a Los Altos cul-de-sac. The house was in good condition, with an appealing front yard. The property was listed at $33,000. After my wife saw the blossoming fruit trees and flowers in the garden, she grabbed my hand. “I love this place. Let’s buy it.”

The idea of becoming a homeowner was still somewhat scary. “Let’s wait another year,” I replied. “I’m busy at Fairchild and settling into a big house will take even more work.”

“A year is a long time. We should bring our child home to a house instead of an apartment.”

It took me a few seconds to absorb her last statement. “Are you pregnant?”

“Yes! We’ll have our baby in August.”

I hugged her with excitement. “Of course, we’ll buy this house!” We offered $30,000 to the seller and settled at $31,000[3].

Moving into the house required buying additional furniture, appliances, and maintenance equipment for the garden. A lawn mower was one machine I had never used before. I had seen other people using those noisy beasts and was eager to try one myself. Following the instructions from the Sears salesman during the first weekend of our occupancy, I began to mow our lawn.

[3] **In 2024, that house would sell for over three million dollars!**

After finishing the front yard, I went to the back of the house. About halfway through that lawn, the engine began to sound muffled. When I removed the bag, I noticed the chute clogged up. I reached down with my left hand to clear the opening.

Something hit the tip of my middle finger. Pulling it back, I noticed it was bleeding. Fortunately, the sharp rotating blade had only cut a small gash that healed in a few days. Later, I read the instructions: “Never place anything into the chute while the motor is running!”

Once we had a house, the next step was to find a pet. A neighbor’s dog had a litter, and we adopted one of their adorable male shepherd-husky puppies. For some reason, I named him Tarzan, and he soon became the center of our affection.

Left: Our first house in Los Altos. Right: Joyce holding eight-week-old Tarzan.

Becoming a Father

Five years passed since I had last seen my mother. Rather than going back to Budapest, Joyce and I decided to see if the Hungarian government would allow Mother to visit us for the arrival of our first child. Legal travel to a Western country from Hungary was not routine in those days. The Communist government carefully guarded against the possibility that someone might not return to the “workers’ paradise.” My only hope was that because my 60-year-old mother was a pensioner and had an apartment, the officials might be relieved if she did not return.

We filed the necessary paperwork from both ends to request an exit permit and a U.S. visa. A few months later, her trip was approved. Our baby was due in late August, so we planned my mother’s visit to coincide.

The *Los Altos Town Crier* had a contest for a “Good Guy” award, and I nominated my wife for it. To justify her case, I stated that instead of purchasing new furniture for our house, she had agreed to spend the money to bring my mother from Hungary to see her grandchild. The editors liked my reason and selected Joyce as the winner. We received a certificate for three people to dine in one of the Los Altos restaurants.

After her long journey, Joyce and I picked up Mother at the San Francisco airport. Although she looked tired, she was happy to see us and congratulated me on having such

a pretty wife. In the airport garage, I proudly seated her in our car, and we drove to our house.

After arriving home, I parked the car in front of our house. “This is where we live,” I announced to my mother, expecting a favorable response.

Until then, she had been impressed with everything: my wife, our car, and my maneuverability in busy traffic. After looking around at our street, however, she became subdued. “But there are no sidewalks on this street,” she said quietly.

At first, her comment surprised me. Then I remembered how the city people in Hungary looked down on those who lived in the country. They felt that civilization ended where the sidewalks ended. It took quite some time for my mother to accept that her college-graduate son lived in a country-like environment.

Mother unpacked her luggage inside the house and proudly gave us the presents she had brought. First, she placed several Hungarian Herend porcelain figurines on the carpeted floor of the living room. Then she reached into her carry-on bag and pulled out a large bowl. When she removed the lid of the bowl, Joyce and I saw a large, cooked goose liver sitting in the middle of hardened goose fat. She had smuggled the liver through customs! When the aroma reached me, I excitedly jumped over the figurines for a closer look. Unfortunately, I did not raise my feet high enough and kicked off the head of my favorite figurine, *Ludas Matyi* (Goose-Tender Matty). Mother was horrified and began to cry. Throughout her long trip, she had carefully hand-carried and guarded the precious gift, and I had carelessly broken it.

My clumsy action dampened her cheerful mood. She stopped crying when I assured her I knew about a unique store that handled China restoration. They could reattach the head. She fully recovered when I asked to eat some of the goose liver. With a beaming face, she served the liver and spread the goose fat on bread. I know how unhealthy that meal was, but in 1971, I was not concerned about a proper diet.

Joyce’s due date approached and passed, but our baby did not show any desire to appear. We packed a suitcase, and I was on standby to rush her to the hospital at a moment’s notice. Nearly a month later, she called me at work one afternoon, “The time is here!”

The Goose-Tender *Matyi* statue, made by the famous Herend porcelain factory. Only a very close observation reveals the repair on the neck.

I arrived home within ten minutes. After passing the news to Mother, I led Joyce to the car, tossed the suitcase into the back seat, and rushed to Good Samaritan Hospital in Los Gatos. A nurse led us into a small room and notified Joyce’s obstetrician, Dr. Trueblood.

He soon showed up in a grumpy mood because he had had to leave his daughter's birthday party.

"You still have a way to go," he announced after his examination. He instructed the nurse to notify him immediately of any change and returned to his daughter's party. Joyce and I were left in the room to practice the Lamaze[4] technique. Our baby, however, was not in a hurry to join us.

Dr. Trueblood appeared again. This time, he was eager to speed up the process. "I'll give you a shot that will help," he told my wife.

I went out to call my in-laws and my mother with the latest news. When I returned to the room, it was empty. I ran out into the hall.

"The shot sped up the process," a nurse told me. "She is delivering right now." I raced to the delivery room.

Our son George was born early on September 24, 1971. The staff allowed me to hold him close to my heart in my hands. He had blue eyes, long dark hair, and a loud cry. The noise he made sounded better than any music I'd ever heard. I was the happiest man in the world. I had become a father!

When I returned home from the hospital, my mother was eagerly waiting for me at the door. "Hello, Grandma," I greeted her.

"Is it a boy?" she asked nervously.

"Yes."

Her face suddenly relaxed. She ran over and hugged me. "I'm so happy." Only then did she ask me how my wife and son were doing.

Like most traditional Hungarians, it was important to her that the first child was a boy to carry on the family name and responsibilities. Later, she told me she would love a granddaughter just as much. However, she was happier about having a grandson.

After Joyce came home from the hospital, I learned quickly that babies do not have the same sleeping habits as adults. Waking up in the middle of the night to help George became part of my life. What amazed me was that I did it without any resentment. I enjoyed becoming a parent and carried out my duties faithfully. Even changing messy diapers did not bother me. I will always feel sorry for people who go through life missing the experience of holding and comforting their helpless little child.

While Joyce was recovering, my mother took over the household duties. I appreciated her help, but covering up her disapproval of my young wife's housekeeping was difficult. I found myself in the middle. Fortunately, I was the translator.

Mother noticed that a picture frame on the living room wall was dusty. "*Miért nem tartja tisztán a feleséged a képeket*?" she asked me. (Why doesn't your wife keep the pictures clean?)

Joyce was sitting in the same room feeding George. "What did your mother say?" she asked me.

"She likes the nice pictures we have," I replied.

Then, I turned to Mother. "*Jövő héten megfogja csinálni*," (She'll do it next week.)

[4] A breathing technique to make childbirth easier.

Left: The photo in the Los Altos newspaper article, dated August 18, 1971, shows my nine-month pregnant wife with my mother. Right top: Assembling a crib for our baby. Right bottom: My wife was coming home from the hospital with two-day-old George in her arms.

The two women smiled at each other. I had managed to keep the peace.

Mother was also very unhappy when she found out that George was circumcised after birth. In Hungary, that was only done to Jewish boys. I explained that it was a routine procedure in the United States, but she disapproved of her grandson having to endure such pain.

Because George was born so late, the original three-week visit we planned for my mother was extended to two months. Toward the end of Mother's visit, we discussed her future. I knew she and my wife could never live peacefully under the same roof. Having an apartment nearby for my mother would isolate her. She also realized that at her age and without English language skills, it would be difficult for her to fit into American suburbia. I promised to visit her frequently and make her life in Budapest as comfortable as possible. We parted sadly, and she returned to her familiar Hungarian lifestyle.

Raising our son was far more joyful than I had anticipated. Seeing the various phases of his development—turning over in the crib, learning to crawl and walk, and eventually starting to speak—was an amazing experience for me. The first time he had a cold and was congested, I felt helpless for not being able to make him more comfortable. When I took him to receive his first set of immunizations and the doctor poked his tiny arm, he cried bitterly, and I wished I could take the pain instead.



Left: ”Nagymama” (Grandmother) adores her grandson. Center: Holding the three-day-old George. Right: I'm taking an afternoon nap with my son.

After his first birthday, George said “Daddy” for the first time. I was more proud hearing that than I had been after any of my past athletic or technical achievements. As the old saying goes, “Any man can be a father, but it takes someone special to be a daddy.” I became part of that special group.

A few months later, some of the ladies who worked in the company’s clean-room[5] saw George's pictures all over my desk and wanted to see him. I drove them to our house one day during lunch hour. To my surprise, as soon as George saw them, he began to cry. When they came closer to him, his cries intensified, and he ran to my protection. It took me a while to realize the reason. The ladies wore white lab coats, and George thought they were doctors, ready to administer more shots. Only when they removed their coats was I able to calm him. His fear of doctors remained with him for some time. Ironically, when he grew up, he decided to become a physician.

Second Visit to Hungary

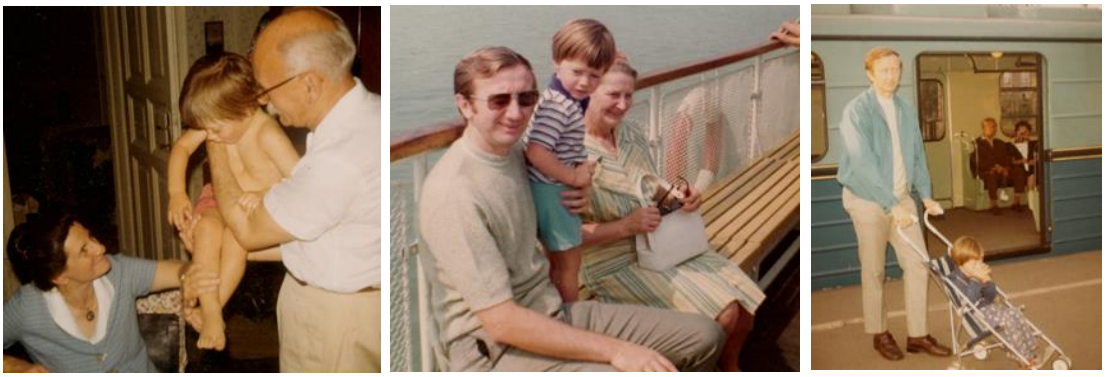
My mother still lived in the same apartment we had had before I escaped from Hungary. It lacked central heating, hot water, and any place to take a bath or shower. The building had no elevator, and climbing the stairs to the third floor became more challenging for her as the years passed. Her efforts to upgrade to a better apartment had been fruitless. I decided to visit her in the summer of 1973 to see if I could help her find a more comfortable place for her later years. Joyce had never been to Europe, so she was eager to come along. George was nearly two years old, so we took him with us. The airlines provided bassinets next to the bulkheads of the planes, making the long flight quite comfortable for small children.

Most of the tenants in the apartment building still remembered me. They all wanted to meet my American wife and child. The fact that neither Joyce nor George understood

[5] Semiconductor and microcircuit production required ultra-clean facilities. In those areas, the operators had to cover their clothing and shoes to minimize dust carried from the outside.

Hungarian made the meetings somewhat awkward, but I did my best to translate their conversations. Mother, of course, was always present to show off her son's family.

We met Pista's family, who still shared an apartment with his wife's parents. Joyce was amazed that four adults and three children shared one bathroom. I explained to her that it was not unusual. Although World War II had ended nearly 30 years before, obtaining an apartment in Budapest was still difficult. The socialist government had placed a higher priority on developing heavy industry. Rebuilding the war-torn city without foreign investment was going slowly.



Left: George is taking a bath at Józsi bácsi's apartment, using the same tub I had my first bath when I was three years old. Center: Cruising with Mother on the Danube. Right: Leaving the Budapest metro. George is sucking his thumb—his favorite way to relax.

Pista helped me find a couple interested in trading their small, nearly new one-bedroom apartment located on the outskirts of Budapest for Mother's larger place that was centrally located. The other apartment was on the sixth floor of a panel house[6], but the building had central heating and an elevator. The apartment had a small bathroom equipped with a gas water heater. A bus stop located only a block away offered convenient transportation to the inner parts of the city.

The couple agreed to the trade—if we would provide an additional one-time payment "under the table." We used up most of our traveler's checks to satisfy their demand. The government owned every apartment building in Budapest, so the trade still had to be approved by the housing bureau. Paying a small bribe to the official helped to speed up the process. The moves were scheduled to take place about a month later. Pista and his friends promised to help Mother when the time came.

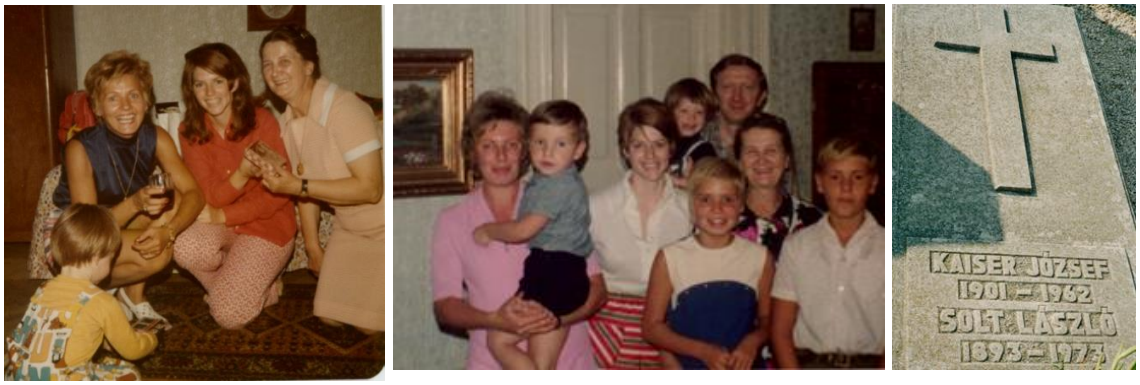
Although Mother was eager to cook for us every day, we all went to a restaurant on the first Sunday. Before leaving California, we heard Hungarian restaurants did not have highchairs, so we took a special harness to keep George on a chair.

When we tried using the harness for the first time in a restaurant, George did not like it and made his displeasure known. All the other customers stared at us. They also made unflattering comments about "tying a poor defenseless child to his chair." Finally, the

[6] Many of the newly constructed government-owned buildings were built with large prefabricated steel-reinforced cement panels.

waiter came and asked us to untie our son or leave. Not wanting to be thrown out, I placed George on my lap and ate dinner together. After that day, we always ate at home.

Mother told me that my father had passed away earlier that year. She wanted to show me his gravesite in a cemetery on the Buda side. I was not interested in going. Even though he was my biological father, he was never a dad to me. However, to please her, I agreed to go. At his gravesite, I said a prayer for his soul and forgave him for not being a caring father to me.



Left: My sister, Eva, visited Budapest at the same time. Mother and Joyce are holding a new toy for George. Center: Pista's wife, Kuki, was holding their younger son. Their other two children are standing at the front. Right: My father's gravestone, covering the grave he shared with his father-in-law.

Our two-week stay went by quickly, and we returned to the United States. After settling back into our comfortable house, I thanked God for leading me to California. I had enjoyed visiting Budapest, but I had become used to living in this country. This was now my home.

During George's routine health checkup at age three, his pediatrician pulled me aside. "I detected a strange noise in his heartbeat. He may have a hole in his heart. It would be best if you took him to see a specialist," she told me.

Alarmed by this news, we took him to Stanford Hospital's Pediatric Cardiology Department. After a series of exhaustive tests, the doctors assured us that there was nothing serious. "His heart has a murmur that's not uncommon in children," said the department head. "Most likely, he'll outgrow it, but we'll monitor his condition regularly."

Joyce and I were still concerned. I had already noticed that after any strenuous activity, George's face became flushed, while his playmates did not show the same effect. We watched him closely and had him take frequent rests after playing. Thankfully, as he grew older, these symptoms went away.

Another job change

During the spring of 1972, the semiconductor industry experienced one of its cyclical slowdowns. Although our division's sales increased, we received an order from Fairchild corporate to lay off 10 percent of our staff. Our division manager refused to comply. He called a staff meeting in his office to discuss how we would pass through the difficult times. During the meeting, his secretary stuck her head into the room. "Excuse me, Dr. Attala, but Dr. Hogan would like to see you," she said apologetically.

"Continue our discussion. I'll be back shortly," John told us as he left the office.

Suspecting nothing, we kept on with our planning. An hour passed, but our leader had not returned. Finally, his secretary showed up. "Please go back to your workplaces. Dr. Attala was fired," she announced in a tearful voice. "Dr. Van Poppelen will be our new division head."

The news shocked all of us. The Microwave Division had already developed a unique product line. Our **Ga**llium **Ar**s**e**nide **F**ield **E**ffect **T**ransistors (GaAs FET) and low-noise microwave transistors had no competition worldwide, and the defense industry had already booked our entire production capability. We could not understand why Fairchild's management did not see the bright future of our division. They had made a drastic cost-cutting decision for the entire corporation, ignoring how much our division contributed to the company.

At that point, I had had enough of Fairchild and began to look for another company that cared more about its employees. A friend recommended a medium-sized firm located in San Carlos. "Farinon is like a mini-HP," he told me. "I know several people who work there, and they're all very happy."

The physical appearance of Farinon's plant was not very impressive; it looked like a large warehouse. Both HP and the sparkling new Fairchild facility in Palo Alto spoiled me. However, the Farinon employees I met during my first interview impressed me so much that I quickly decided to work there. Their open and friendly attitudes, combined with their enthusiasm for the company, convinced me that I would be happy.

A few days later, I returned for a second interview to see Ed Nolan, Farinon's VP of Engineering. Like the engineers I talked with earlier, he was open-minded and personable. He wanted to know more about my computer-aided design experience. I told him about the design program I wrote for my Master's thesis on the small IBM computer at the University of Santa Clara. It was more advanced than SPEEDY because it also included circuit optimization[7]. "Our engineers are still doing manual calculations instead of using computers. You could help them become more efficient designers," he said, offering me an attractive job.

After being with Fairchild for two years, I decided to give up my stock option and resigned. They did not walk me out the door like HP had. Two weeks later, after passing my responsibilities on to another engineer, I began to work at Farinon. Three others from Fairchild also decided to follow me. One of them was Chi Hsieh, the "Giant," who had become an expert in computer-aided circuit design by then. The other engineer, Bob Griffith, played a vital role in setting up Farinon's microcircuit facility. The third person helped to train newly hired production assemblers in the microcircuit lab.

My first assignment at Farinon was to rewrite my thesis program to operate on a commercial timeshare system called NCSS that used an IBM 370 computer. My company paid for the computer time required for the conversion. Based on an agreement with Ed Nolan, I retained ownership of the software, and all Farinon employees could use the program without paying royalties.

[7] An iterative technique to find the best values of circuit components for optimum performance.

I transferred the program from the university into NCSS's computer via punched cards[8]. It required quite an effort from me to convert from standard FORTRAN to the proprietary language of NCSS. When the program finally ran on the timeshare system, I asked the engineers to propose a suitable name or acronym to describe its function. One came up with **C**omputerized **O**ptimization of **M**icrowave **P**assive and **A**ctive **C**omponen**T**s (COMPACT). I rewarded him with a dinner in a Hungarian restaurant and began to train my colleagues on the computerized approach. Most of them were eager to learn, although a few still preferred to use the hand-held calculators.

A few weeks later, a salesman from a competing timeshare company, United Computing Services (UCS), stopped by to demonstrate their microwave circuit design program. After hearing that we had been using my program that could even optimize circuits, he asked if he could come back with their technical experts to see how it worked. I agreed, and he returned the next day with two other men. They were impressed to see how quickly COMPACT found the best component values for optimum circuit performance. My program was user-friendly, with intuitive abbreviated names for the components, such as RES for a resistor and CAP for a capacitor. Their software used numerical codes that required memorization by the users. I also wrote a user manual for COMPACT that included typical examples of various microwave designs.

"Why don't you put this program on our system and collect royalties for its usage?" asked the salesman when he heard I owned it. "We'll do the conversion to our system at our expense and reprint the manual for our users," he offered.

That idea had never occurred to me, but I liked it. "Let me ask my boss," I replied. "Come back tomorrow."

I knew that the founder of our company, Bill Farinon, had always advocated entrepreneurship. Whenever anyone approached him with an idea of leaving Farinon to start a new business, he was even willing to help finance it—as long as the other person put up a significant part of his own money. However, I did not plan to leave my job, so I knew my case would differ.

My manager did not object to the idea but wanted to discuss it with Ed Nolan. Later that day, they called me in for a conference. "COMPACT is your property, and you can do whatever you want with it on your own time," said Ed. "I don't like the idea that our competitors might also use it, but at least they have to pay for it, and we don't. Go ahead and try it!"

Encouraged by the enthusiasm of the UCS salesman and blessed with the green light from my bosses, in late 1972, I formed the company Compact Engineering. In a few weeks, COMPACT was running on UCS. After testing it during the weekend, I gave them the go-ahead signal. I received a royalty check for over $1,000 a month later, nearly equal to my monthly salary at HP. The long hours spent writing and converting COMPACT were beginning to pay off significantly.

[8] Stiff paper cards that contained digital information by the presence or absence of punched holes in predefined positions. Nowadays, the same information is stored in digital format.

Visiting Japan

During the spring of 1975, my father-in-law called with good news. “You and Joyce are going with us to Japan!” He told me Mitsubishi had been building huge oil tankers for Standard Oil. Whenever a new ship was ready, an entire family of a Standard Oil executive was invited to the launching ceremonies. My father-in-law was selected for that honor that year. His wife was to cut the rope that symbolically tied the ship to the pier. The extended Bogart family included 20 people: parents, children, siblings, and cousins. Mitsubishi paid for all the expenses of the two-week trip.

Because our son would have been the only youngster in the group, we left him with his best friend’s parents. Both of the boys were four years old, and they spent a lot of time together. The father, a friendly but hot-tempered Turkish-American man, was the proud owner of a new Datsun 240 Z sports car. He washed and waxed the car frequently to keep it spotless. When not used, the vehicle was always parked in their garage for protection. We heard their large, unruly dog once stood against the car door and scratched the paint. The man wanted to put the dog down. Only his wife’s desperate plea managed to save the pooch—his sentence was commuted to being put up for adoption.

The couple loved George almost as much as their son. I felt comfortable leaving our son with them, but Joyce felt two weeks would be too long. We decided to stay in Japan for only one week.

The trip was marvelous, and we received royal treatment all the way. After a first-class flight from San Francisco to Tokyo, our group was whisked through Japanese customs and immigration. Mr. Yoshida, the head of our host committee from Mitsubishi, welcomed us at the airport. He handed everyone in the group a detailed schedule for our visit. A small caravan of limousines took us to a five-star hotel in Tokyo, where we spent the first three days.

Our hotel was located next to the American Embassy. From the window of our room on the 25th floor, we could look down and see groups of people demonstrating against the U.S. involvement in Vietnam. Police carrying large shields protected the building and hauled away some of the protesters. I felt like I was watching a silent movie because we could not open the window to hear the noise.

Each day had been meticulously planned for us from morning through late evening. In addition to visiting museums and historical sites, attending sporting events, and shopping, Mrs. Bogart had an additional task on her schedule. She had to practice the cutting of the rope. An ancient superstition stated that the ship would only be protected from evil spirits if the rope were cut in a single chop. Every day, Mr. Yoshida and a white-gloved assistant called on her. They carried a chopping block, several pieces of a two-inch diameter rope, and the razor-sharp hatchet.

I witnessed her first practice session, where it took her five or six strikes to cut through the rope. Although, like most Japanese men, Mr. Yoshida did his best to hide his emotions, we could see that he was pretty concerned. By the third day, however, she had almost succeeded once with the first blow.

We found real bargains while shopping. The exchange rate of the U.S. dollar was 400 Yen. I bought a Nikon camera with an F1.2 lens for about half the price compared to California. Inexpensive silk kimonos and genuine pearl and coral jewelry were extremely popular with the ladies in our group.

Another memorable experience was the integrity of the shopkeepers. When I bought the camera, I gave the salesman on the other side of the counter a 100,000 Yen bill. He courteously bowed while accepting the money from me. Then, he took several smaller bills from the cash register and handed me the change on a small tray. After counting the amount, I placed the money in my pocket.

When we left the store, someone in our group who had previously spent time in Japan told me I should not have checked the amount the salesman gave me. “To him, it indicated that you didn’t trust him,” he explained. “Japanese people are sincere. You never have to count the money they return.”

I followed his recommendation, although I checked the amount initially outside the store. It was always correct, so eventually, I stopped checking.

On the evening of the third day, we flew to Nagasaki, the city where the second atomic bomb had been dropped during World War II. Besides a large memorial, there was little to remind us of the once-devastated area. The busy modern city had been completely rebuilt. The next day, we visited the hill overlooking the harbor where the story of *Madame Butterfly* was set. We saw the new supertanker being prepared for its launching ceremony.

Instead of the Western-style hotel where we had stayed in Tokyo, our Nagasaki residence was traditional Japanese. We enjoyed the new quarters that included Japanese baths with steaming hot water. My only negative experience took place during the first night. After drinking lots of beer and sake at dinner, I had to go to the bathroom in the middle of the night. I forgot that the door openings were about five feet eight inches high. As I walked in the darkness, I banged my head on the upper part of the door frame and developed a large bump.

The rope-cutting practice sessions continued. By the fourth day, Mrs. Bogart managed to cut through with a single hit most of the time—but not always. There was only one more day left to practice until the launch.

Finally, the highlight of our trip arrived. On the morning of the sixth day, our hosts took us to tour the giant oil tanker. The top deck exceeded the length of two football fields. The sophisticated control system ensured a balanced configuration of the cargo. Two monstrous diesel engines provided the power to carry 40 million gallons of oil at 10 knots.

Although she complained about a sore wrist, my mother-in-law agreed to Mr. Yoshida’s request for a final rehearsal. The results were not promising; she failed twice to sever the rope with the first strike. Everyone was tense during lunch and avoided talking about the rope cutting.

In the early afternoon, the sharply dressed crew stood at the side of the top deck. Our group and the Japanese dignitaries were seated under a large canopy on the shore. A band played first, followed by speeches from Mitsubishi's executives and the ship's captain. Language interpreters were seated behind us to translate the Japanese speeches. Then, the band played again, and Mr. Yoshida led my mother-in-law to the

designated place where the rope was stretched. He handed her the hatchet and stepped aside. I was close enough to see that her hand was shaking. The music stopped, followed by silence as Mrs. Bogart raised the hatchet. She lowered the sharp instrument until it touched the rope, establishing her aim. Then, with one self-assured swift strike, she sliced through the rope.


Left: Watching the entertainment in a Japanese geisha house. Center: Part of the Bogart family. Next to me, from left to right: Joyce, Joyce's brother, Mrs. and Mr. Bogart, Mrs. Bogart's sister and brother-in-law. Right: Mrs. Bogart's last practice of the rope cutting under the watchful eyes of "Yoshida-san."

The crowd erupted with joy; everyone clapped and yelled. She looked relieved as the giant ship slowly slid into the water. At the banquet that followed, the president of Mitsubishi expressed his thanks by presenting her with a beautiful pearl necklace.

The rest of our traveling group was to continue the tour, but Joyce and I were flying back home at the end of the first week. On the way to Nagasaki airport, we had a great idea: downgrade our first-class tickets to tourist class and use the refund for a trip to Hawaii sometime later. The airline complied with our request and placed us back into the coach section of the plane. It was a different experience than our first-class trip, but we told ourselves that tolerating the cramped quarters would be worth the extra vacation later. However, our scheme backfired on us! Instead of sending us a check for the difference, the airline refunded Standard Oil because a corporate credit card paid for the tickets! Big mistake!!!

Upon our return, we phoned our babysitting friends to find out when we could pick George up. The wife told us what a fantastic week they had had. Her husband had taken time off work to spend several days with the family and George in their condo at Bear Lake. When we asked her about the trip, she said everything had gone smoothly, except that George had upchucked when her husband drove the Datsun too fast on the curvy mountain road.

Joyce and I stared at each other for a moment. Visualizing the mess our son must have made in the new car and knowing what had almost happened to his dog for a lesser offense, we were afraid to ask what her husband had done to George. Our friend at the other end of the line sensed our apprehension and assured us that her husband did not hold any grudge against George. After cleaning up the car, however, he drove more slowly for the rest of the trip.

Expanding My Programming Side Business

Shortly after COMPACT became available at UCS, other timeshare companies wanted the program on their computers. Fortunately, my agreement with UCS was not exclusive. By early 1975, COMPACT was running on five international timeshare services worldwide, without any competition. Although the University of California at Berkeley had also developed a large circuit simulator called SPICE, it did not have the input and output capabilities needed for microwave circuit design. Some larger companies, like HP and Texas Instruments, had their in-house programs. However, most firms focused on hardware product development and used COMPACT. By a stroke of luck, I had a global monopoly of the commercial computerized microwave circuit design.

The intensity of the Cold War was increasing, and the demand for new telecommunication, spyware, and Electronic Warfare (EW) products was high. The defense industry was busy providing for the needs of the Defense Department. Money was no object. The government was willing to pay the price for performance.

My royalties were increasing, but so was the demand for product training and support. My wife already helped to answer telephone calls, but most users wanted immediate help. Farinon's management was extraordinarily understanding and allowed me to take a limited number of COMPACT-related phone calls at work—as long as I continued to fulfill my job requirements. As a result, I spent long days at the plant. At home, I worked on program enhancements and looked for solutions to the customers' problems. I was not sleeping much.

Early one morning, while I was still at home, an East Coast user named Bob phoned and asked for help with his circuit. During our conversation, he had to step away for some reason, but he promised to call back soon. Ten minutes later, the phone rang. When I picked up the receiver, I could tell by the hissing noise that it was a long-distance call[9].

"Hi Bob," I said, assuming it was my customer again.

"How…how did you know who I am?"

"I have ESP," I answered, trying to be funny.

"That's incredible…" the man mumbled. "I must meet you one day in person."

As it turned out, the second caller's name was also Bob, but he was not the same man who had phoned earlier. I told him the truth only when we met at an IEEE conference years later. Until then, he believed that I had a special gift.

A caller from a Canadian defense organization named Communications Research Centre (CRC) told me that their engineers wanted to use COMPACT. Their security requirements, however, would not allow them to pass circuit information through outside telephone lines. "Would you sell the program so we could install it on our secure in-house computer?" he asked me.

That question had never arisen before, but I did not want to turn business away. "Yes," I replied.

"How much does it cost?"

[9] This was decades before Caller ID became available.

I had no idea what the program would sell for. “Fifteen hundred U.S. dollars,” I said meekly, ready to negotiate.

“I’ll send you a purchase order later today,” was his instant reply. I wish I had asked for a higher price.

One of the ladies in Farinon’s sales department tutored me on how to handle an international transaction. She said I should ask for an Irrevocable Letter of Credit for the purchase price. After CRC sent me the documents, I dumped the program from the NCSS computer on punched cards and shipped the box to CRC. Joyce and I used the money for a down payment for a Volvo station wagon.

A week later, an angry programmer phoned from CRC. “We’re having trouble installing this program on our IBM computer,” he began. “There are no comments[10] in the program, no flowcharts, and no code documentation. Who wrote this mess?” he asked, not knowing he was dealing with a one-person operation.

My ego was hurt, but we had already spent the $1,500, so I had to accommodate him. “I’m sorry, he is not available. Perhaps I could help you,” I offered.

“We cannot solve this through the phone. We’ll need someone up here,” he barked at me.

After I calmed him down, CRC agreed to pay the expenses to fly me to Ottawa for the weekend. Without revealing that I wrote the program, I was able to help iron out the problems in one day. Only years later, after I hired professional programmers, did I learn the proper ways of documenting the source code of a large computer program.

Once the engineers at Farinon became proficient with computer-aided design, I took on new project responsibilities. I developed several components for a new microwave repeater[11]. When they were completed, I wanted to learn about the entire system. I had always worked on communication system components but knew little about the operation.

My manager agreed that I could take a one-week short course on microwave radio system design at the continuing education division of UCLA. I flew to Los Angeles for the class.

Shortly after the course began, I realized that most other students already knew what I wanted to learn in the course. They were military defense experts from Hughes, TRW, and Aerospace. Their interest was in communicating between rapidly moving objects, such as two fighter planes. I only wanted to know how to send and receive signals between two stationary antennas on Earth.

Fortunately, the teachers reviewed the basics at the beginning. The next day was spent on microwave filters, which interested me. After the second day, however, I was lost. Most of the material went over my head for the next three days. By the end of the week, I had developed the utmost respect for those who designed our nation’s military electronics defense systems.

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[10] Non-executable statements placed in the program’s code to explain the functions of key sections.

[11] Microwave signals propagate in straight lines and do not follow the curvature of the Earth. Receiver-transmitter combinations are required at 25-30 mile intervals of a long-haul communication system to pick up and retransmit the signals at slightly different angles.

During the course, I met the chairman of the Electrical Engineering Department, Gábor Temes, another 1956 Hungarian refugee. I told him about my involvement in computer-aided design. “Why don’t you create a short course on that subject and teach it at UCLA?” he asked me.

“I don’t have a Ph.D.,” I replied.

“That’s not a problem. The man who taught the filter section in your course doesn’t have one either,” he said. “But both of you have much practical experience in the subjects. You could teach the course together.”

I thanked him for the advice and talked with the filter expert, Bob Wenzel. We had dinner that night and agreed to develop a course. He would cover two days on microwave filter synthesis[12], and I would follow with three days on microwave amplifier design. Both of us would emphasize the computer-aided approach.

I also realized that such a course could serve as a hidden advertisement for COMPACT, so I was eager to pursue it. My manager shook his head in disbelief when I told him about my idea. “Perhaps you should cut back to work only half-time at Farinon instead of killing yourself,” he suggested. “You already work more than anyone I know. Why would you want to take on more?”

Later that day, Bill Farinon called me into his office. “I am concerned about your well-being,” he began. “Why don’t you take a three-month leave of absence? See if your program business has a future. If it does, go at it full-time. If it doesn’t, return to work here and forget the rest.”

He was right. My heavily packed schedule couldn’t bear the addition of even one more project. I needed to make a decision—one way or the other.

My father-in-law was unhappy to hear that I was considering leaving a steady job with a good company. Because Joyce was expecting our second child, he was concerned about my medical insurance. “This may not be a good time to be on your own,” he told me. “Don’t be so impatient. Frankly, I don’t see how anyone can make a living by selling a computer program!”

This time, I did not take his advice. At the beginning of 1976, after adding another room to our house, I incorporated Compact Engineering and began to work full-time at home. I was the president and treasurer of the company, and Joyce was the secretary. Perhaps my father-in-law agreed to become a board member to ensure I would not go broke.

I applied for medical insurance at one of the major companies. Their questionnaire asked about my family’s medical history, and I entered the information about the tests George had undergone at Stanford two years earlier. A few weeks later, the company accepted Joyce and me but rejected our son.

The news hit us hard. *Perhaps the Stanford physicians had not told us everything. What if George has a severe heart disease?* I immediately went to Stanford to inquire. “Please tell me the truth,” I pleaded with the doctor.

[12] A closed-form mathematical procedure to find the exact component values of circuits that pass and reject specified frequencies.

After reviewing the initial test results and the follow-up examination records, the doctor again assured me that George had no heart defect. “Would you write a letter to the insurance company and tell them that?” I asked him.

The doctor’s letter did not change the insurance company’s decision. I applied to a different company; this time, I did not mention George’s tests. All three of us were accepted, but we feared the company might recheck our initial information if we made a significant claim. Fortunately, none of us had any serious health problems.

On the home front, I tried to spend as much time with the family as possible. We frequently took weekend trips to the Bear Lake region with the family that cared for George while Joyce and I visited Japan. The two boys had been after me for some time to take them fishing. Finally, before one of our trips, I purchased fishing poles and promised to show them how to catch big fish. I remembered how Cousin Pista’s father hooked fish from the Danube, so I was confident about our success.

The locals at Bear Lake told me that the best time to catch large fish was early morning. I headed to the lake at 6 a.m. with the two nine-year-olds in tow. The sky was still cloudy. Rainfall the night before had brought the worms to the surface, making it easy for us to collect them for bait. I carried the fishing gear, and the boys brought buckets to carry all the fish home.

None of the locals had warned me about the mosquitoes. Those little pests also woke up early, and they converged on us as soon as we reached the shore. We wore only T-shirts and shorts that left lots of skin exposed. In a short time, all three of us were covered with bites. That, however, was the lesser problem.

The fish showed no interest in our bait. We moved around to different spots without success. After an hour of enduring the mosquito attacks, we gave up and walked dejectedly back to the cabin. Two small boys crossed our path, carrying primitive fishing poles and a pail with two large fish. “What did you catch, Mister?” one asked me.

Holding our fancy fishing rods, I was too embarrassed to find the right words. “Nothing,” George quietly replied, admiring the other kids’ fish. My son and his friend never asked me to go fishing again. I left the poles behind in the cabin, hoping someone else would have better luck with them.

Becoming a UCLA Instructor

In 1976, the IEEE’s Microwave Society (MTT) held its annual symposium in Palo Alto. For the first time, the event included exhibits, and I rented a booth there to publicize COMPACT. My booth did not have large fancy signs and displays. Instead, I offered a drawing for a Polaroid camera as a prize to attract potential customers.

My booth was located in the middle of one of the aisles. I stood in the booth next to a small sign and planned to hand out the lottery sign-up sheets to everyone passing by. The idea was good, but I had overlooked the importance of sex appeal.

Facing the direction of traffic flow, at the end of the aisle in the wide booth of “Company X,” three provocatively dressed young ladies were handing out shopping bags with the company’s logo. The men I had planned to attract to my booth never noticed me. They

passed by, rushing to have a closer look at those ladies. My great promotional plan ended with only a handful of new contacts.

After my disappointment at the symposium, I decided to advertise in the trade magazines, but it was expensive. Finally, it became apparent that teaching short courses would be the better form of promotion. Instead of paying for advertising, I would be paid as an instructor, and all the students would be exposed to COMPACT. If they learned how to design microwave circuits with my program, most likely, they would want to use it again after returning to work. I asked Bob Wenzel to put full-time effort into developing the material for his portion of the UCLA course. I began to do the same.

Bob and I agreed on having the "Microwave Circuit Design" title for the five-day course. Preparing the overhead transparencies for my three-day course portion took considerable time. In the pre-Microsoft Office era, all text and illustrations of the artwork first had to be created manually. I also inserted the results of COMPACT's runs on some pages. Using a copy machine, I made the overhead transparencies I would use in the presentation. After rehearsing my talk, I settled on showing about 80 pages each day.

UCLA promoted the course heavily by direct mail to companies and individuals. The response was overwhelming. It was fully booked six weeks before the start date, and the school scheduled additional sessions. Their East Coast educational partner, the University of Maryland, also asked to present the seminars at their locations. Companies began to ask for in-house presentations. Creating the short course was a highly profitable investment of my time.

Bob and I recognized that maintaining students' interest in a five-day microwave design course would be difficult. Microwave theory is abstract and mathematical, so we agreed to focus on the practical applications as much as possible. In addition, we planned to make the course lively by occasionally telling anecdotes about our careers. One described my first experience submitting an article to *IEEE Transactions*.

A year earlier, Professor Newcomb and I had written an article for the trade magazine *Microwave Journal* to describe COMPACT's structure and capabilities. The subscribers to that popular periodical had a wide range of technical backgrounds. We included several sidebars with detailed explanations to the novice to clarify new concepts without boring the more experienced readers. We also used plain language throughout the article.

Just as we prepared to submit it to the magazine, we learned that a prestigious IEEE publication planned to release a special issue on computer-aided design techniques. Being published in that professional engineering society would be a status symbol. Though I had never written anything for them, we changed our plan and sent the article to its editor. In a short time, a rejection letter arrived. "No significant technical contribution" was the reason given.

I was crushed. My co-author, who had significant IEEE publishing experience, tried to console me. "The article is too straightforward," he said. "We'll have to make it more complex. Let's rewrite it!"

We did just that. First, we removed all the sidebars. Next, we replaced some short words with longer, more impressive-sounding ones. Finally, we changed the variables "a"

and “b” in the equations to the Greek symbols α and β. When it was resubmitted in all its convoluted glory, the article was accepted and published!

Left: The top part of my home-made magazine advertisement of COMPACT. Right: Low-budget signs in my booth at the IEEE MTT Symposium’s Exhibits. In addition to COMPACT, I also sold design programs written by others.

I frequently used that example to amuse my students. Then, I showed them a couple of slides to illustrate my story. The primary material came from an unknown source. I added the parts about the IEEE.

Do you want to be an IEEE author? Suppose you want to publish something as simple as:

1 + 1 = 2 **Eq. (1)**

This form is not very impressive. IEEE reviewers like complex formats and will probably reject your work.

You can complicate the left-hand side of the expression by replacing each number “1” with commonly used mathematical equalities:

1 = ln(*e*), and

1 = $\sin^2 x + \cos^2 x$

You can complicate the right-hand side. Replace the number “2” with this expression:

$$2 = \sum_{n=0}^{\infty} \frac{1}{2^n}$$

Now, 1 + 1 = 2 can be rewritten “more scientifically” as:

$$\ln(e) + (\sin^2 x + \cos^2 x) = \sum_{n=0}^{\infty} \frac{1}{2^n} \qquad \textbf{Eq. (2)}$$

This is already more impressive. But don't stop here. You can further complicate Eq. (2)! Substitute for "1" and "*e*" two other complex formulas:

$$1 = \cosh(y)\sqrt{1-\tanh^2(y)} \qquad \text{and} \qquad e = \lim_{z\to 0}\left(1+\frac{1}{z}\right)^z$$

Now, Eq. (2) may be rewritten as:

$$\ln\left[\lim_{z\to 0}\left(1+\frac{1}{z}\right)^z\right] + (\sin^2 x + \cos^2 x) = \sum_{n=0}^{\infty}\frac{\cosh(y)\sqrt{1-\tanh^2(y)}}{2^n} \qquad \textbf{Eq. (3)}$$

Mathematically, Eq. (3) still states that 1 + 1 = 2, but in a far more impressive form!

I was right. The students were highly amused.

The first Microwave Circuit Design course we presented at UCLA was also a learning experience for me. Bob taught the first two days, and I followed him for three more days. The students looked exhausted by Thursday afternoon, and I sensed a problem. We struggled through the last day.

After the course ended, Bob and I looked through the written evaluations from the students. They liked the material but felt we had packed too much into five days. "This course should be two weeks long," said one. "I wish we had practice sessions to apply what we've learned," stated another. "You advocate computer-aided design, but we did not have the opportunity to use a computer," he added.

Based on the feedback, we reduced the amount of material covered. UCLA agreed to let us use their computer classroom for one afternoon of each course. They installed COMPACT on their system for the next course. The students learned how to use it and had the opportunity to design circuits with it. At the end of that course, Bob and I received outstanding reviews.

UCLA was happy with the success of the course. Bob and I received 25% of their tuition revenues, amounting to more than $2,000 for each day of instruction! In addition, they also paid for our travel, hotel, and incidental expenses. On top of that, several students began to use COMPACT through timesharing, which increased the royalties. Lastly, the thousands of brochures UCLA mailed out served as an indirect promotion for the program. Even if the school had not paid me a dime, I would have benefited from the teaching.

My mother was impressed that her son taught at such prestigious American universities. Teachers were highly respected in Hungary. On my next visit to Budapest, she introduced me to her friends as a professor rather than an engineer. I did not want to take her joy away and just smiled.

Our Second Child

On June 4, 1976, my wife gave birth to a beautiful, healthy daughter, Nanci Ann. That time, I was in the delivery room and had the opportunity to hold the tiny baby immediately. The photo one of the nurses took of the two of us shows my happiness on the occasion.

Joyce and I had been warned before Nanci's arrival about the possibility that George might resent losing his status as the only child at home. "He has been the undivided center of attention for five years. He may be jealous of the newborn child," said one of the neighbors. "Be careful how you treat them."

As it turned out, George was delighted to have a little sister. He spent hours caressing and talking to her. It was no accident that Nanci's first word was "Geoooooorge," instead of Mommy or Daddy.

Joyce had her hands full, taking care of the two children. To replace her function in the business, I hired a neighbor's daughter to become Compact Engineering's first employee. I also found a microwave engineer who was interested in programming. I hired him, and he helped me write code for new features added to COMPACT.

The two extra people working in our house made it crowded. However, finding an outside office did not appeal to me. I enjoyed working at home, next to my family. In the spring of 1977, we looked around and found a solution — a 4,000-square-foot, three-level house being constructed on a slope in Los Altos Hills. The rear side of the house overlooked a peaceful valley. Its 1,200-square-foot basement would be an ideal office. I could maintain a short commute to work—20 steps downstairs.

The beautiful house was nearly finished, and the contractor told us we could select the interior finishes and appliances. George was ecstatic when he spotted the large closet under one of the stairways. "Let's move here," he pleaded. "This could be my fort!"

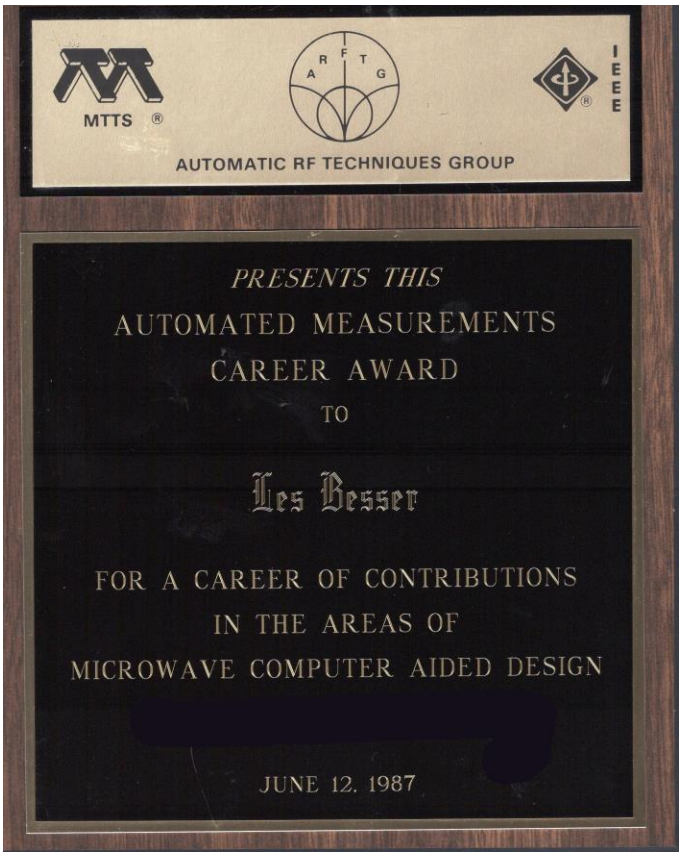
We sold our first house with a 200 percent capital gain and purchased the home in the hills for $200,000 (worth over four million in 2021). I had to make more money to pay for our fancy new place.

In a few months, our spacious new house was constructed. We moved in just before Nanci's first birthday. George immediately discovered some new favorite playthings—the large appliance boxes. I cut door and window openings in them. The kids had more fun with the make-believe buildings than their sophisticated toys.

Designed to take full advantage of the hill's slope, all three stories of the back of the house faced a small valley. Our living quarters sprawled across the top two floors, and we set up a nearly self-contained office on the lower level. The employees could use the ground-level door when they came to work. If they wanted to relax, they could go upstairs to the living room or step outside and lie down on a lounge chair on the large deck.

Maintaining COMPACT on five timeshare systems, all using different types of mainframe computers (IBM, CDC, Xerox, etc.), required significant time. Fortunately, one of the timeshare companies wanted to relocate their local technical support employee to the East Coast, and the man did not want to move. After hearing his problem, I offered him to work for us, and he agreed. Having a computer expert on our staff to coordinate the program updates and bug fixes proved to be a wise investment.

Left top: A proud father with his newborn daughter. Left bottom: Big brother George expresses his happiness for having Nanci. Right: Our new mega-home in Los Altos Hills before the landscaping was completed. The lowest level became Compact's "headquarters."



An award is given to me by a a Chapter of IEEE's Microwave Society in recognition of COMPACT.