Oral History of James (Jim) T. Healy

Interviewed by:
Craig Addison

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Craig Addison: Firstly, if we could start off by talking about your pre-Fairchild experience. What were you doing?

James (Jim) T. Healy: I was discharged from the Navy in 1962 and I had been an electronic technician in the Navy and I joined immediately RCA Defense Products in Cambridge, Ohio. I worked on a WS133 Minuteman system and my job there was to test transistors and burn them in. So my first job in the industry was in testing. I've been in it since then.

Addison: What year was that?

Healy: That was about 1962. I left RCA after a couple of years and went to work for Space Technology Laboratories in Redondo Beach which was acquired by TRW Systems. When I had been at RCA, they showed me a picture of an automatic tester and said this is the future. It was a picture of a Fairchild 500 transistor tester with lots of programming switches, dials and things that looked very alien to me because the way we tested things at RCA was a separate module for each type of device. So when I went to TRW Systems, I had experience with transistor testing. They hired me to be the person who would go to Palo Alto, California to Fairchild and accept the tester and I found out this was serial number two but it was the first tester that Fairchild had ever shipped. It was the first transistor tester. Fairchild shipped hundreds of these testers in subsequent years. I went through the process and during that process I got to know the Fairchild people. So one day they offered me a job as a field service engineer for the product because they liked the way I was doing things at TRW. But then upper management at Fairchild rejected hiring me because they said they didn't want to take a key person from their customer. So I was a little despondent after that and I was reading the newspaper one day and it said "jobs in Asia." I contacted them and they asked for resumes. So I sent my resume and they sent me back a ticket. So I left TRW Systems. I flew into Hawaii and I spent a couple of weeks there getting trained and then I was told I was going to Korea. I had no idea what Korea was like…I was in Korea for the next year or so. The job there was really a calibration technician training Korean soldiers, and some U.S. soldiers in how to use electronic equipment.

Addison: You jumped ahead a few steps so I want to go back and fill in some of that. I've read that that the space program was really one of the impetuses for the integrated circuit because a lot of money was being put into it. So around 1962, was that really the main thing that was driving the industry, the space program?

Healy: Yes, it was pretty much driving it. At that time, though, there were no ICs, only transistors. I don't recall any ICs during those early days. It was interesting because most of the people that worked for the places like TRW Systems had to have security clearances. Therefore they almost invariably had to be born in the United States. As a result, they would get the cream of the crop from the colleges that would go to these military industrial complexes. In Silicon Valley, as the semiconductor companies started to grow and equipment companies grew, they were able to hire non-citizens since security clearances were not required. As a result, if you looked around the Valley over time, you could see that a large majority of the engineers that were working in the non-defense products were Asians or Indians or people from other countries. They actually built up the semiconductor industry.

Addison: So the Fairchild 500 you said was actually serial number 2 but it was the first one they shipped.

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Healy: First one they shipped and my job was to accept it for TRW Systems and then put it into production.

Addison: Did you evaluate other systems at the time?

Healy: The decision had been made when I joined TRW Systems and at that time there were some other transistor testers out there. For whatever reasons, which escape me at the moment, they chose the Fairchild. I think it was because it was highly automated for a transistor tester at that time.

Addison: Do you remember what it cost?

Healy: That was about $20,000, $25,000 in those days.

Addison: I guess the crossover to ICs must have happened pretty soon after that?

Healy: It was the late 60s early 70s. TRW Systems later bought an IC tester from Fairchild called the Model 4000. I think the 4000 was introduced some time in the very early 70s and that was I think one of the first testers for testing ICs and that originated with Fairchild.

Addison: You said you were disappointed you couldn't join Fairchild. It had a reputation at that stage and everybody wanted to work with Fairchild.

Healy: I don't know if that was the case. I liked the idea of being able to travel around instead of staying in one place so it was kind of personal, plus I just liked the idea of getting into the ATE industry because I thought, and I was told it was going to be a very high growth industry. I had no idea it would be anywhere near like what it really was. So I was actually despondent, like I said, so I went and took this job in Asia. I just started working in Korea and then one day I got a telegram from Fairchild. I was on the DMZ and it was very cold. It was on a January day and it must have been below zero and this jeep pulls up where I am standing and this mittened hand comes out and says, "There is a telegram for you." So I opened the telegram and it was like sunshine because it came from California. It had been a little over a week old now and they had offered me a job, a job I actually wanted, so it was a matter of actually borrowing some money and flying back to the United States and taking the job with Fairchild and I spent the next 15 years there.

Addison: How much time expired between the time you couldn't join Fairchild the first time and the telegram?

Healy: Just a little over a year and a half.

Addison: What did LTV do?

Healy: They were a personal services contractor with the U.S. Army, a Texas company. The division I worked for was called Kentron Hawaii Ltd., and they were contracted by the Army to train soldiers and train anyone who uses electronic equipment. Oscilloscopes and things like that were relatively new in the

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field and they actually had atomic weapons in Korea at that time because I went to one of the bases where we had training and you could see that, although it was kept a very tight secret at the time.

Addison: The Fairchild telegram, did that come from the same person who interviewed you?

Healy: Yes, Gib Hattery.

Addison: It was in sales?

Healy: No, field service, repairing equipment in the field. I was very good at that and they could see that.

Addison: So you had to borrow money to get the ticket?

Healy: I had to borrow some money to get the ticket to come back and I had just gotten married to a Korean lady, so that was interesting because she had just gotten pregnant and I said, “I’ll send for you.” And there weren’t a lot of people that sent for the people, I guess, when they left. But after she got her visa, she came about three months later.

Addison: What were you doing in the first couple of years at Fairchild here because I know you went to Japan for Fairchild at some stage?

Healy: Right. I was working for the first year, year and a half out of the Los Angeles office and my objective was to work and repair testers, whether transistor testers, IC testers, whatever testers that Fairchild had sold at the time, to the companies in the whole Southern California area.

Addison: Can you talk a little bit about the testers at the time? Were they really clunky things?

Healy: They weren’t clunky at the time but now you look back they might be. You take the transistor tester, it had a series of digi-switches across a panel so what you would do is move these switches to program in whatever parameters you wanted for the test and then you would push a button and it would cycle through those tests. That was, of course, later replaced with the computer. The IC tests at that time all were controlled by a magnetic disk so you had a disk that ran on the tester itself and the memory was core memory and it was like 4K. We were testing very complex parts with 4K memory. Today you couldn't even begin to test the part with that. So the disk would spin around and the timing of the tests were all done based on the speed at which the disk was running and you would pick off points from that disk. In those days you programmed with paper tape readers so you would punch a paper tape, put the program in and then feed that into the tester.

Addison: And the competition at that time, was that starting to heat up?

Healy: The interesting thing is almost everyone in those days built their own testers. It’s like TI built a tester, the 553 and they started to try to sell that. The only other real company I remember competing with was Teradyne. Teradyne had started up as a tester only company, where we were still associated with Fairchild Semiconductor and the TI, of course, was from Texas Instruments, so it was the beginning of the industry, actually.

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Addison: So I guess you couldn't really call Fairchild a standalone test company like Teradyne.

Healy: No. Teradyne was the main one. There may have been smaller ones. Datatron came out not long after that and I can't remember all the names but there was a proliferation of tester companies after that.

Addison: I know you weren't involved in the sales at this stage but did you have trouble because it's a device company selling testers to other device companies?

Healy: Right, there was a certain amount of that. I mean, the competition certainly tried to use that against us saying we had to keep a division, or a wall between us and the semiconductor people. But really…in those days the technology was moving so fast and people were looking for the right technology to do the job and both us and Teradyne could do it. So it became a matter of how you sell. It's a matter of developing relationships, those kinds of things. Teradyne was back in Boston so they had a little bit of a disadvantage there. We were from Silicon Valley -- I think they used that term back then – anyway, in Northern California so we had maybe a little advantage there. They were independent, we weren't, so all those things tied in. I could leverage that by saying, "Yeah, of course, we are tied to Fairchild but that gives us a knowledge that these guys can't have." I know what's coming. I know how to develop the circuitry to test your future parts and no one else will have that information. By the time they find out, we will already be there. And that played very well.

Addison: Moving on from there, what happened after L.A.?

Healy: Right, I was based in L.A. and then there was an opportunity to go to Japan for six months. The reason they wanted somebody to go over there is we had started selling the IC testers in Japan through Tokyo Electron which had just begun then and they asked me if I would go over and help get their people trained and help with some of the installations because they were having difficulties in doing that. I jumped at the chance because, one, it got me closer to Korea so my wife could go visit her family, but the real reason I went is because I had never been to Japan. So again, I am in wanderlust. I still liked the idea of traveling. I thought that would be wonderful. I hadn't thought at the time about the industry beginning over there or anything like that, nothing profound. I just thought it would be fun. So I went to Tokyo Electron and I was badge number 50, so they were quite small then and they represented Fairchild Semiconductor as well as Fairchild Test Systems. They had some probers and things like that so they were one of the first pure distribution companies at the time and one of the first installations I got involved in was NEC. Now when we left for Japan, we put our furniture and everything in storage and we had these big pots of kimchi, which is a Korean food and they last a long time so we put those in the storage. We will be back in six months. It should be perfect. Except we didn't come back for 13 years. Believe me, it [the kimchi] was a solid rock when I got back. But I went over there and things just started to move so quickly in Japan and the growth was so great in the number of testers coming over that I actually finally had another expatriate come over to help me out and we just saw this industry just take off over there. Tokyo Electron did just a superb job of developing the right relationships so that the customer didn't fear because they said, "We'll take care of it. Don't worry." And we still had to fight Teradyne and at that time there wasn't Advantest, but I know we had the majority of the market share at that time.

Addison: At that stage you said there wasn't Advantest, so there weren't any Japanese competitors?

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Healy: Not really, some small ones but none that mattered. I remember one time we were selling a tester to Mitsubishi, or attempting to, and Mitsubishi's Saito-san , I'll never forget it, he said, "Both you and Teradyne do the job. We already have some Teradyne so why should we buy yours?" So we were going back and forth on why and finally Bob Fujisawa, who was our salesman at the time -- he later left TEL and was one of the founders of Innotech -- but he challenged Mr. Saito to a game of mahjong and if Fujisawa-san won then they would buy Fairchild and if he won then they would buy Teradyne. The game went to like 3:00 a.m. and Fujisawa-san won and that was how we got our first tester into Mitsubishi.

Addison: What position did Saito-san hold in Mitsubishi?

Healy: He was head of the test group. I think some of this was tongue-in-cheek, to be honest. I think if Fujisawa would have lost [the game of mahjong], they still would have bought it but it was fun.

Addison: You said your first installation was NEC.

Healy: First one I was involved with was NEC. I don't know if that was the first one Fairchild installed there but it was one of the first I was involved in.

Addison: Are there any stories to tell about that deal?

Healy: No, I don't have any particular ones. I know that it was dirty. That's all changed now, of course, but I remember there was a lot of dust around. They didn't really think much about clean rooms, at least on the test areas at that time. I'll tell you one thing that was interesting at NEC, though it's not directly related. One of the gentlemen from Fairchild Semiconductor was over there one time -- I am not going to name him -- and Fairchild was making a lot of money off the Japanese for the planar process which they had licensed to Japanese companies. And I had mentioned to him, I think it was at dinner or somewhere…I said, "Why are you giving all the technology to the Japanese? And I was talking about our company, not the country. And he said, "Oh, these guys, they'll never learn how to make these. We will always be far ahead of them. There's no way these Japanese...Look at them. They don't understand." Well, we all saw what happened. The irony of that, though, was that many years later I was at LG in Korea and there was a guy from Hitachi coming over because Hitachi licensed LG for building DRAMS. I asked him the same question that night and he told me the same answer almost. "Oh, the Koreans, they'll never learn how to make DRAMS. We are the clear leader. We have the technology." The Americans said it about the Japanese. The Japanese said it about the Koreans and I don't know who's saying it about the Indians and Chinese but I'm sure it's the same thing. You can't underestimate anyone. People learn, and people learn fast.

Addison: Did I hear you say that Fairchild was virtually giving away the technology?

Healy: No, they were selling it, or licensing the planar process to the Japanese for ICs. That was a lot of income for Fairchild because almost everybody licensed that process.

Addison: But in doing that there was a risk that Japan would develop into a strong competitor.

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Healy: It's like anything else. If anybody licenses their process to someone else, they are going to eventually compete, so the objective is to be either in that kind of business or always stay one step ahead on the technology. As soon as the United States, not Fairchild per se, but U.S. companies started falling behind in the technology, the Japanese overcame and they did that because of our own quality systems which they adopted and we didn't. As a result of that the Japanese got ahead of us in semiconductors. That changed later. It came back around.

Addison: Were there any Japanese companies making transistors or ICs before Fairchild started licensing the process? Was there an industry there?

Healy: Yes. They had other ways of doing it but the planar process apparently was somewhat revolutionary and had a good yield factor so many of the companies starting adopting it. Then what happened later is as they got into more advanced designs and LSI, the Japanese government, MITI -- Ministry of Industrial Trade in Industry -- they worked a deal with the company and said, "If you buy capital equipment to build semiconductors, we'll pay half of it." So that means if they bought tester, the government will buy another one and they did this across the industry and they actually arranged that players would cooperate on developing more advanced LSI and I think that's really how the Japanese pulled ahead because there was a large government investment in it and they worked it very well I thought.

Addison: So MITI started doing that in the 70s?

Healy: Yes, in the 70's.

Addison: Was that the five-year LSI program.

Healy: That's the one I'm talking about. I think it was the late 70s or early 80s. It had to be in the 70s because I left Japan in '74.

Addison: There are a few different things I'd like to focus in on here. You were not an employee of TEL, you were an employee of Fairchild, correct?

Healy: I was an employee of Fairchild [but] I had a TEL badge. They paid all my costs and got me a car and an office and all that but I was still an employee of Fairchild.

Addison: I've heard stories about Fairchild testers being copied by competitors. What is your experience there?

Healy: In Japan, a company called Ando, which was owned at the time by NEC, made a carbon copy of our testers and every time we would make an option change, they would copy it. Advantest was a little more, I would say, sophisticated. What they did is they took parts of our testers and parts of Teradyne and got the best of each and copied those and built their testers out of that and when I say copied it, I mean it isn't like they infringed on our patents. These things weren't patented so it's easy. The only difficulty they had is a lot of the devices that we used to build our testers were not marked and we would get special devices from Fairchild Semiconductor because we'd say we need a device that has this

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characteristic so then when they would try to duplicate it, they couldn't always duplicate it very well. They wouldn't get the same performance or the same results. So we ended up being in almost all the high-end applications that would go direct to us. But for what we called the "jellybeans" in those days, then they would use the Japanese testers. Of course, over time that changed.

Addison: So this practice of copying wasn't illegal.

Healy: No. What can you do?

Addison: Did you consider it unethical?

Healy: This is business, right? I mean, how many times have large companies taken technology of a smaller company? I mean, people still do today. When I say that, I'm not saying violated a patent. That's a different issue. If you have something patented, the Japanese are very strict about honoring that, even today to a large extent. You could be fairly safe in Japan but if it's not patented, not protected somehow, or if they have a way of getting around your patent, they'll do it. But so would anybody. That's what business is all about. So I didn't see anything unethical. I mean, NEC bought one of our testers, as an example. They gave it to Ando, Ando copied it. We didn't have anything in our contract that said you can't do that.

Addison: So you left Fairchild in 1974.

Healy: Actually, I went to Hong Kong in '71 for a year but still working for Fairchild and I spent almost all of my time in Japan during that period and then one day Wilf Corrigan [CEO of Fairchild Semiconductor] called me up. I was in a hotel room in Korea, asleep, and he asked me if I would go to Europe. He said he needed me to go and fix Europe up from a test group point of view, and I said to Wilf, "How much time do I have to I have to decide? I'm in Korea on business. My wife's in Japan." He said, "You have until the morning", which is not unusual for Wilf Corrigan.

Addison: Before we go on to Europe, so by the time you had left Japan, was there serious competition in testers?

Healy: No, they were becoming serious competition. What Ando did, of course, is they started up their own memory testers. Advantest really failed with their first VLSI tester but they started focusing on the DRAM and even today they are the world leader in DRAM testers, as you know. They have never really been a factor with VLSI or LSI testers, if you look at the total market share, except in Japan. There was a lot of "buy Japan" feeling over there, not because they didn't like Americans or anything but because they could get, they felt, a better quality, better support and the documentation was all in their same language. When you really analyze it, you couldn't blame them. They weren't doing it for egotistical reasons. They were doing it because it was easier for them.

Addison: So NEC still had to buy from Fairchild for the high-end?

Healy: Right.

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Addison: You didn't really lose the account.

Healy: No. Not in those days. I would have said that happened probably in the mid to late 80s when the Japanese testers were equivalent in many of these areas to what we had so they started taking a lot of our share. But in the logic, LSI, VLSI arena, the U.S. testers pretty much dominated in Japan and probably still do. It was in the area of memory where the Japanese took it over completely.

Addison: Just before we move on to Europe, talking about TEL; it's kind of remarkable that they started off as a distributor and grew to No. 1 in equipment, though they are now No. 2 behind Applied Materials. What is your view of their success?

Healy: The company was mainly funded by TBS which is a broadcasting company. In fact, our office was in the TBS building when I went there and a Mr. Endo was the chairman. And they had the three K's. I called them the KKK which was Kubo, Kodaka and Kamo. They were kind of the three top founders of Tokyo Electron under Endo. Kubo basically worked in the area of distribution but mainly for consumer type products like the CB radios in those days. Kodaka was focused on the equipment, loosely speaking, and Kamo was basically focused on the development of the semiconductors. They distributed semiconductors. They distributed test equipment, not just testers, and they recognized early on that they needed to make changes to the equipment to meet the requirements of the Japanese customer. The Americans weren't willing to do that. One of the first products TEL distributed was Thermco furnaces and the customers wanted certain changes made and it will cost a lot of money and you can understand that. Same thing with the probers. So they started making these changes…they started adapting them to meet the needs of the Japanese customer and over time they started manufacturing. I never heard it said that their intent was to be a major manufacturer at that time but they were really trying to do what was necessary to satisfy the customer. Eventually, like for example, Thermco furnaces became superior to the technology that was in the United States at that time.

Komel-san later got out of the distribution business for semiconductors per se. Komel-san left and he founded Intel Japan and later on he was the chairman of the board of Rambus Japan, so he went on to have that kind of a career. Kodaka and Kubo stayed with Tokyo Electron through it all. There was a person working there, Larry Yoshida, who was the president for a while and then he left and formed the company called Innotech and Innotech was the fastest company ever, I think, to become a public company in Japan. But the whole focus of Tokyo Electron was to try to meet the customer requirements and that necessitated doing some adopting of equipment and later on it was a natural progression into manufacturing. They [also] bought the Cobilt patents. They took that Cobilt technology and from that they built the TEL prober and I think the TEL prober today is the largest, most successful in the world.

Addison: Were you the only non-Japanese at TEL?

Healy: Yes, at that time. And later on there were some other Americans over for short periods of time depending on the product line. There were a lot of Americans coming in and out but no one was resident there. I was the only resident. At least the time I was there, I was the only American.

Addison: What about the cultural differences. For example, did they speak English very well?

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Healy: That's interesting. When I went to Japan, of course, there was no McDonald's and no Dunkin Donuts and everybody was Japanese. Everybody spoke Japanese and everybody ate Japanese food so it was a cultural shock for me because I couldn't even get my peanut butter, so I had a real problem. Kinokuniya was the only store where you could buy any kind of foreign foods but it was expensive. Cantaloupe, for example, which you would buy in the U.S for 30 cents or so would cost you $30 in Japan. I'm not exaggerating. So it was a cultural shock, to me it was, and I came from Pittsburgh, Pennsylvania. We ate meat and potatoes and peanut butter and jelly and I go over there and see all this raw fish and stuff and I say, "There's no way I'm not going to make it." And living in Korea, I didn't have the same issue with Korea because the food, although spicy, was a little closer to what we eat here. So I didn't have sushi or anything for about six months. Now I have to have it at least once a week since I crave it, so it took about six months for me to get into the mode where I felt comfortable with the food…and I started learning some Japanese and I started to speak it a little.

The interesting thing is I found that the Japanese people, at least in those days, they could read and write English very well, they could speak it OK to get by but they had difficulty understanding it. So I used to give little lessons in English and then I started doing write-ups on how tests work. This is how it works. This is how this works and how to do the testing, and they could read English with no problem. That was very helpful, whereas if I tried to explain it to them in English, it was difficult for them to comprehend. In fact, that's how I wrote my first book. Someone told me one day, "You have all these written up. Put it together and make it a book," which I did, a book on testers. But that's how I interfaced with the Japanese. The only funny part was that all of the people I worked with at Tokyo Electron, the service group, they got very used to my English, how I speak, my accent, everything. So other Americans would come over and speak English, and they didn't understand them so I had to translate English to English, their English to my English because their ear was tuned to my voice and inflections that at the time. Remember this is back in the late 60s and early 70s. None of this would be true today, but it was very interesting.

Addison: Were transistor radios being made in Japan at that time?

Healy: Yes, by Sony. The big companies in Japan, like Hitachi, Mitsubishi, they were very proud public companies. Sony was like…"Who cares about Sony?" It was like they are never going to make it. Well, we saw what happened there. Sony kind of became the image of Japan on the outside world. Sony at that time was considered a Western-style company, so was Tokyo Electron. They were considered a Western company because of the way they operated.

Addison: I've heard that Fairchild and Bob Noyce and Gordon Moore were sort of revered in Japan. Did you get that feeling?

Healy: Absolutely. No question. The Japanese always revered people that knew the technology. That was very important for them. They learned from it. Deming was a person who went over and created their modern way of manufacturing. He's probably the most revered person in all of Japan because [his work] is going across all industries.

Addison: Maybe we'll move on to Europe. You got the phone call from Wilf Corrigan and off you go to Europe, so what were you doing there?

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Healy: Actually, Fairchild had a factory in Wiesbaden [Germany], a semiconductor factory, and I was based out of there. The sales for the Fairchild tester products at that time were about minus $500,000. They had some cancellations from SGS and there was no business really. They had put a lot of money into Europe over the years but they were not successful getting the sales. And we had a very bad reputation in many of the companies. So my job was to turn it around, to find ways to overcome these situations with our reputation and find ways of selling our product.

Addison: Why did you have the bad reputation?

Healy: Mostly for lack of support. Like if you take the Germans as an example, you go in and you say, "These are our specs," and you bring it in and it doesn't meet those specs, you are in trouble. The U.S. attitude is "That's OK" and we'll work around it. The Germans wouldn't do that. So they would resent the fact that they bought something and it didn't do what it was supposed to do and they would want more things. Then in other places it was strictly a matter of not having proper support for the product itself, or shipping something before its time and that kind of thing. Europe wasn't considered a major strategic [market] at that time for Fairchild. With Japan and all of Asia building up, Europe was like secondary and the feeling was there wouldn't probably be a lot of business there anyway. But what I found out when I got there is that most of the companies had plans at least to develop VLSI and the LSI beyond the typical. Typically in those days they had about 48, 60 pins and they had plans to go beyond that to the 100 pin area and we had the only tester on the market that had 128 pins. Now, nobody had a device that was 128 pins. No one had a device that was probably over 60 pins in there but they all planned to have them in the future. So I used that as a reason and that's how I got into most of these companies by going in against the competition saying, "Hey, look, you can go ahead and buy this tester from, let's say, Teradyne but you are limited to the 48 or 64 pins. What happens when new devices come out?" And that got a lot of business for us and that kind of turned the market around. Of course, I put a lot of money into service and application people to teach the customers how to do it. I created a user group which was the first user group I recall anywhere in our industry at the time to get people to talk to one another because unlike the U.S. where semiconductor companies here were all very heavy in competition, over there it wasn't quite the same. There was competition but not quite the same and a lot of those were end-user related anyway.

The other thing that was interesting is all of our competitors at that time had testers with knobs and switches and dials so the engineer could sit down and switch all the knobs. Even though they had computers, they still liked that. And we didn't. So we had a blank panel and a monitor. The Europeans weren't used to that. They didn't understand software. They had the hardware. So we had problems against companies like Megatest or even Teradyne over the fact that we didn't have any knobs or dials to turn. I remember a situation with a company that was called Kongsberg in Norway and they were in the process of selling a tester, or trying to, and we were losing. I was in the show at Electronica in Munich and I was told that the decision was made to go with our competitor instead of us, so I left the show and flew up there immediately to try to understand the situation and I found out this was the reason. They didn't feel comfortable with the tester that didn't have any knobs and switches on it. That's why they weren't comfortable with it so we started thinking, "What are we going to do now?" And we found out that the CEO of Kongsberg had brought a person in from IBM to modernize the company and his job was…how do we make it more modern? How do we get involved in computer technology? How do we computerize our systems? So I located him and I told the story. I said, "Here's an example. This is the old way, and here's the new way," and through his influence, let's say, the competitors order was stopped

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and we got the business. So we helped convert the industry from the old ways to the new ways in terms of using computers. We were one of the first to have those.

Addison: So that company in Norway was a device maker?

Healy: Not really, but they did incoming inspection. A big market in Europe at that time was incoming inspection. That's when you would work on an AQL basis and the customer would have to test their parts to ensure that the parts going into their end product were good. That market years later dried up totally.

Addison: I guess Siemens and SGS and Philips were the main integrated device makers in Europe at the time.

Healy: It's interesting. If you go to Europe or Japan, almost everybody is somewhat vertically integrated. So having a pure semiconductor only company in those days, the U.S. is the only place you would find it. Fairchild was a semiconductor company, right? Motorola was a semiconductor company in those days. If you go to Europe, Siemens, Philips, they are the end product. The same thing in Japan. So in some respects it's easier to sell to somebody who's vertically integrated because most of the benefit derived from test is by the end user. Less field returns, as an example. If you are dealing with a company who has control of the total supply chain, then they can recognize the value you may bring. If you don't have a total supply chain control, then they may be looking at it from a different point of view. Like price may be very important to somebody who has strictly a semiconductor company whereas one will pay a premium to get some kind of capability to assure themselves that the field returns aren't there.

Addison: What about the competition in Europe? Were there any other test companies?

Healy: In Europe, no. Very small ones. There was nothing. The only competition we had was all U.S. competition. The main competitors at that time when I was there were Megatest, a company subsequently purchased by Teradyne, and Teradyne. Also, Tektronix was there and was subsequently purchased by Credence so at that time our major competitor was Megatest and Tektronix.

Addison: How long did you end up staying in Europe?

Healy: About four years. I left there in '78, almost '79.

Addison: What's the story of how you ended up leaving Europe?

Healy: Just promotion, transfer back to the United States to run international sales for Fairchild. It was about time. I had been gone about, I don't know, '67 to '78 so that's quite a while. My kids were getting older. I wanted to put the kids in one place. But it was the promotion. I would have stayed there. I got promoted to run all the international sales and I thought that was a good opportunity and I took it.

Addison: That's when you found the Kimchi as solid as a rock?

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Healy: That was funny. It was amazing. It was like a time capsule because you open these things up and there are all these clothes we hadn't seen for 13, 14 years, and all kinds of things that we had forgotten even existed. The refrigerator still worked. So did the TV but it was black and white.

Addison: So you came back to Silicon Valley

Healy: Yes, to San Jose.

Addison: And still in the test group.

Healy: Right, test group.

Addison: How long did you stay in that job?

Healy: I think I left Fairchild the end of '79 so about a year and a half, just after the time that Schlumberger acquired Fairchild is when I left.

Addison: Like a lot of others.

Healy: My reason maybe was a little different. I didn't have any umbrage with Schlumberger. They had a healthy respect for the technology and they were a testing company too, because they did the oil well testing. I think people say the mistake they made is coming into semiconductors with oil well people in charge and they didn't quite understand the business so there was some friction but I left before all that happened.

Addison: What is the story behind your leaving?

Healy: Schlumberger had just taken over. At the time I could see that there would be some major changes and I could have probably stayed there and still be there if I wanted to but I thought well, I think there's better opportunity on the outside. I like the idea of stock options and I didn't see that being a possibility with Schlumberger at all. It was kind of taking off at the time, so I started looking for companies where I could create wealth and have a good time. I like working but I always wanted to have fun. I've been married for almost 40 years now. I've got grandkids and kids and I'm taking care of my family and I'm taking care of my job. I have to have fun. If I'm unhappy, I'm not going to stay.

Addison: Where did you end up going after Fairchild?

Healy: To GenRad which was a start-up. We started a division. We funded some people from Fairchild and some other places, mainly Fairchild, to build a tester called the GR16.

Addison: So GenRad, I think, was board testing.

Healy: That's correct. They had board testers.

Addison: This was their entry into semiconductor?

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Healy: That's correct.

Addison: So you were on the start-up team?

Healy: I came about half a year, six to eight months later.

Addison: Was there anything revolutionary about the GR16, was it different?

Healy: Yeah, it was different. It was a tester that had a test head approach with lots of parallelism so the net result is you could get a lot more throughput faster, and you could do it quite accurately and we immediately targeted at that time the military and aerospace where quality was important. Westinghouse was our first customer.

Addison: What happened to that division and that product line?

Healy: I didn't stay too long. I don't want to get involved with all the details but suffice to say that myself and six other people there decided to leave and we formed our own company called Trillium which was basically funded by LTX. And we developed a tester that we had our hearts set on developing, a CMOS tester, and it was very successful. Eventually we were totally acquired by LTX officially. All of the [Intel] 386 and most of the 486 microprocessors that were shipped were tested on Trilliums.

Addison: So Trillium was an independent company founded by LTX and purchased by LTX.

Healy: Right.

Addison: Is there anything memorable from that period?

Healy: I was really amazed because one of the things I was doing in addition to marketing is that I was responsible for setting up the manufacturing and making agreements…so I went out to see if I could get some credit lines and I went to places like Avnet and all these different distributors and I had no problem. I was getting big credit lines. This is great. Then one day I was talking with, I think it was Motorola who we had a contract agreement with, and I found out that these guys were thinking that we are Trilogy, not Trillium. Trilogy, as you recall, was the computer company. So that was like the big name, right, and we were unknown. We had these beautiful credit lines and great pricing. Then the distributors realized instead of getting 50,000 parts, they were going to get 500 but fortunately most of them they honored our agreement. It helped us out a lot in the cost area.

Addison: Did you make any dent in the market with the Trillium machine?

Healy: The Trillium machine was unique because it had a very physically small test head which means it easily adapted to a probe or a handler and it was the first liquid cold test set that I am aware of, so it was physically very small. It looked very different as a tester and, therefore, we could do very high speeds and we could cool the components internally very rapidly so that we didn't run into the laws of physics. I mean, you get so far from the device and you are going to have a problem and that's what happened with a lot of the other testers. So by making this small, we were able to do that. And then our first customer was

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National Semiconductor and our second customer was Motorola and about the fourth or fifth customer was Intel and we were able to take the 386 device and we completely tested it and no one else had been able to do that. The incumbent at that time was Teradyne. They had lots of testers in Intel and Megatest also had a big tester in there so we were kind of like a dark horse. No one expected us to have a chance but it's like anything else. If you can prove you can test a part but nobody else can test it, all these loyalties go away and the customer will come to you. And we were able to totally test that 386 the way it should have been tested because of the way we architected the system and the net result was we got the business. We made the headlines in "Electronic News" that the dark horse came in and got it and we sold a lot of testers over the years to Intel.

Addison: What about the 486 microprocessor?

Healy: We tested the 486 as well, and towards the end of the 486 is when they switched over to the Schlumberger testers, NP test, called Schlumberger back then.

Addison: When Trillium was folded into LTX you were still there?

Healy: Yes. I ran the LTX engineering and marketing group as well as Trillium at the time.

Addison: By this stage, didn't the Japanese competition start to heat up in the testing area?

Healy: In Japan, yes. In the United States they didn't have much of an opportunity except in memory and we weren't much in memory.

Addison: So you were still competing against other U.S. companies.

Healy: Right. It was the time when HP started up and then it became Agilent.

Addison: With Trillium LTX did you try to get into the Japan market?

Healy: Oh yes. We were successful. We got a lot of business out of Japan and Taiwan. Taiwan foundry and test and assembly business was just maturing then as well.

Addison: Can you talk about Credence.

Healy: When I left LTX, I joined Credence as their VP of marketing and Credence at that time was a small company and they had made a clone basically of the old Fairchild testers. It was a large worldwide installed base but Fairchild decided to discontinue that tester but a majority of the customers still wanted to buy more so SCS was created which then became Credence to fulfill the need to supply testers that were equivalent, compatible with the old Sentry testers. And that became a big market for them. And then just as I joined, we acquired a Tektronix group which gave us the higher end tester because Tektronix wanted to get out of the ATE business. We also acquired a company earlier than that called ASIX which was a very small low-end digital tester designed with CMOS and had a revolutionary for that time object oriented test language. And then we bought a company later on in Billerica, Massachusetts for mixed signal testing and between all of those testers we developed a pretty good business.

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Addison: How long were you at Credence?

Healy: I think six years.

Addison: That was like a true start-up?

Healy: It had already been in business. It had sales of about $16 or $17 million when I joined and they were losing money at that time, so we turned it around without raising any capital until we went public.

Addison: So all those acquisitions you mentioned were done when Credence was private?

Healy: Yes.

Addison: After all those acquisitions, was Credence a pretty big player?

Healy: It was a big player. The marketing strategy I used with them was that there was a new emerging market in Asia called the foundry market and the test and assembly houses and they were being ignored by the big guys. Teradyne had no time for them, nobody else had any time for them, so we went in there and through a distributor called Spirox, who is still the distributor for Credence, we started working those test assembly houses. For example, we'd go in and find out that ASE, for example, their major customer looks like it was LSI Logic. We'd go to LSI Logic and try to convince them. So we targeted the companies that were using the test houses. And we were able to develop a business based on that so that we were the dominant player for years in the test and assembly market.

To give a war story, we were having a little difficulty on whether we were going to make payroll or not and we needed some orders. So I was in Hong Kong because I had heard that ASAT was interested in potentially buying one of our testers. I had heard that through LSI Logic. So I went over there and met with T.L. Lee who was the chairman and he made all the purchasing decisions basically from a commercial perspective, and he wanted a certain price. After some back and forth, I said, "If you were buying 10 testers, I could give you that price but I can't give it to you for one tester." He says, "I'll buy 10." Well, I left money on the table right there. I knew that. But anyway, he did. He gave us an order for 10 testers. I sent that information back to the United States and they didn't believe me. How could this be? And it worked out very fine because I negotiated an agreement that he would give us some money upfront so we could make payroll and after that it was all down hill. That was a very interesting experience.

Addison: Not being able to make the payroll, was this during a downturn in the industry?

JH: I don't think we were in a downturn. I think we had acquired a Tektronix company and we were trying to make ends meet with that so it was just a matter of getting it all working together. It was getting pretty tight and we were starting to run out of cash so we had to make some drastic changes and this order saved us.

Addison: What year was this roughly?

Healy: It was probably about '91, maybe '92.

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Addison: So after Credence, what happened?

Healy: I left Credence and joined Genus which is a front-end company that did ion implanters and chemical vapor deposition systems. I spent about a year and a half there as the CEO where I undertook a turnaround situation. Over 90 percent of the revenue came from Korea and 80 percent from one company, Samsung. When the "Asian flu" hit in 1997, I was faced with significantly reduced revenues even though I had started expanding our business beyond Korea, I was about to run out of cash and faced bankruptcy. To save the company I sold off the high-energy ion implanter line to Varian and then had cash to develop a new product on the drawing boards, atomic level deposition system. With the cash, they were able to bring the product to market and eventually Genus was sold to a German company.

Towards the end of my tenure at Genus, I was being heavily recruited by a FormFactor board member Tom Kamo, a founder of TEL and later the founder of Intel Japan, whom I had worked with when I was at Fairchild. As Genus no longer really needed me since it had become an R&D operation, I decided to take the FormFactor offer. Formfactor needed some one to lead the development on a tester-on-a-probe card and develop wafer level probing. Based on my background they asked me to head this effort as well as develop the market and strategy for selling the probe cards they had developed. I did this successfully but FormFactor was not at that time able to come up with the funding for the tester product. I could have stayed but felt I was not really needed except in a sales/marketing capacity. To be truthful the 1.5-hour one-way commute was also starting to wear on me. I left with their blessing.

Addison: Where did you go next?

Healy: I was later recruited by T.L. Li, the CEO and founder of ASAT Hong Kong, to head up their marketing and sales worldwide and to run the U.S. operations. That was going fine until Chase took a major stake in the company, fired the CEO and brought in their person. That is the saga so far. I guess I could write another book.

Addison: You also worked for Spirox before your current role at Logic Vision. How did that come about?

Healy: Since I really did not need to work, after ASAT I decided to retire again and consult. I was then contacted by David Sheu, chairman of Spirox Taiwan to help him find new lines to sell and he wanted to acquire a U.S. company to get into manufacturing. David wanted me as a full time employee. I agreed, joined Spirox and accomplished what he asked me to do. One of the companies I recruited as a Spirox principal was LogicVision. LogicVision was facing difficult times and their founder and CEO asked me to join as the CEO to turn it around. I did this with the blessing of Spirox and am still on the Spirox/Tanisys board. I am now in the process of turning LogicVision around. My management team and I feel we are poised to deliver growth and profits by 2007.

Addison: It seems that you don't really want to retire.

Healy: The reason I am not retired yet is when I tried it I got bored. I could only travel so much and playing golf every day became a burden. I guess I like working as long as I am challenged and can have fun doing it. So instead of retiring I continue to work but I also I joined the Tempus Clinic in Los Gatos, California about two years ago. Their mission is to train their clients to achieve a quality life by being

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healthy as opposed to just being fit. This is how they differentiate themselves from the numerous fitness centers. You can be fit but without being healthy. They train you through nutrition, body function monitoring, effective exercise and relaxation techniques to be healthy and, if not reverse, certainly slow down the aging process. I believe this type of health center is the wave of the future. So not only am I extending my time working but I am getting healthier doing it so when I do finally retire I will live the rest of my days healthier, wealthier and hopefully wiser.

END OF INTERVIEW

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