Oral History of Peter Harris

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Table of Contents

Peter Harris

Conducted by Software History Center—Oral History Project

Abstract: Peter Harris describes his educational background and his early work using computers at United Aircraft. He started a service bureau company to convert the Connecticut Motor Vehicle Department addressograph plates to punch cards and then sold this business to C-E-I-R. He started a new service bureau company in San Francisco and created the ADPAC application development system which he first sold as a product. Later, he used ADPAC for his programming contract services which could generate operating programs or could be converted into COBOL programs. He built a product which would take existing COBOL programs and produce structured system charts and supporting documentation for program maintenance. This led to substantial Y2K work in the late 1990s. He finally describes a new product which converts the old US UPC codes to the new international standard UPC codes.

Thomas Haigh: I am Thomas Haigh and this interview is with Peter Harris, the founder of the ADPAC Corporation. It is being conducted in the afternoon of November 19, 2004, at the Computer History Museum in Mountain View, California as part of the Software History Center's Oral History Project.

Now, I should also say that a brief memoir by Peter Harris has been previously published in the Annals of the History of Computing, Volume 24, No. 1, January-March, 2002, where it can be found on pages 21 to 24. It is part of a larger article called, "Recollections of Software Company Founders," collected and edited by Luanne Johnson of the Software History Center. In this interview, rather than duplicate the material already available, I'm going to basically ask you to elaborate on some of the things in the article and ask questions to fill in some gaps.

Peter Harris: Yes, and I can tell some interesting little vignettes.

Education

Haigh: Thanks for taking part in the interview. I wonder if I could start off by asking something that didn't seem to make it into the published version of your memoir. In the first paragraph in

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the draft that you just showed me, you mentioned coming into contact with the computer pioneer, Fred Gruenberger. Please discuss that.

Harris: Oh, that was very interesting. I was at the University of Wisconsin and I changed my major from psychology to mathematics because, back in the mid-1940s, you couldn't get a job in psychology unless you had a full Ph.D. and became a doctor. I switched over to mathematics because, to become a psychologist, you had to take a lot of statistics, and to take a lot of statistics, you had to take a lot of math. Not knowing what to do with it, I went down to the accounting department, which was in the basement of Bascom Hall, the main building at the University of Wisconsin. There, in the basement, was a Mr. Fred Gruenberger with a lot of "junkie" computer equipment. It was a real beginning punch card business. It was a Card Program Calculator and I asked him if he would teach me. And he said, "I won't teach you, but there's the computer. If you want to figure out how to use it, there are some manuals on the desk over there. Read the manuals and figure it out, but I'm not going to spend any time with you."

So I read the manuals and first learned how to wire a reproducer. Then I fooled around with the little computer, the CPC, and, sure enough, I could program it. After a few months, Gruenberger wanted some work done. Up until that time, I was just an outcast, just there begging time from him. Then he said, "Ah, I'll pay you a little bit if you do this." So he gave me a problem and I solved it. At the same time I started, a Chinese girl with a Ph.D. in economics came down to do the same thing I did. In two weeks, she quit. She couldn't do it and couldn't understand it. It was confusing to her, but to me, it was a takeoff. I loved every minute of it and did it well.

Haigh: When were you at the University of Wisconsin?

Harris: 1946 to 1950. I was raised on a farm and, on weekends, I'd go home and milk cows and that was my background. I was a real farm boy… although I was born in New York and was raised in downtown Manhattan on city streets. My mother thankfully got me out of there and she married a farmer from Wisconsin. And so that's where I changed from being nearly a criminal boy in New York City to a farmer in Wisconsin. Since our farm in Cottage Grove was right outside of Madison, I went to the University of Wisconsin. My two sisters also went to the University so we were all three University brats.

So that is what led me to Fred Gruenberger, who taught me about computers. When I got to my senior year, I did one semester of graduate work in mathematics and thought, well, that's too much for me. I got interviewed for a job by one of the interviewers with the United Aircraft Corporation from East Hartford in Connecticut. And they made me an offer and I accepted.

Haigh: Before you move on to discuss that, can you remember what the CPC at Wisconsin was being used for? What were the specific jobs that you were programming for Gruenberger?

Harris: They were primarily for accounting, keeping scholastic records so that a person could get some information about the scholastic history off of the computer.

Haigh: Yes. So this was data processing rather than scientific computing?

United Aircraft

Harris: Definitely, yes. But for United Aircraft, because I was a math major, I was the nearest guy to doing scientific computing. In my first job there, I wrote something that evaluated a polynomial, which is a second degree equation, and I could evaluate it on a CPC. That's what United Aircraft loved.

Haigh: United Aircraft was your first job out of college?

Harris: Yes.

Haigh: What attracted you to the company?

Harris: Well, it was United Aircraft. That was a big deal, and they were telling me they were building jet engines and wanted me to help them do that. It was exciting, and I had the choice of going to Dallas, where they were building a new bomber. And I said, no, that I'd rather go to Hartford because my father lived in Boston.

Haigh: In what year did you arrive at United Aircraft?

Harris: That would have been 1950.

Haigh: Did you immediately start working with computers?

Harris: That's what they hired me for.

Haigh: Yes. So it was your previous experience with the CPC that got you hired?

Harris: That's right.

Haigh: All right. And what computer did they have there?

Harris: They had a CPC. And that's why they brought me there. I was immediately an expert and could do some things that they couldn't do. This was a big deal for them. They wanted to get into the jet aircraft business and they assigned me to the jet compressor development to

work with the engineers at the Pratt & Whitney Division of United Aircraft. The engineers would come over and show me their data and ask me if I could reproduce it on a computer. I said, "I'll try," and I did.

Haigh: How big was the team working with the CPC at that point?

Harris: They had about four programmers in the research department. I was probably the fifth programmer in there and they were just getting started, too. Pratt & Whitney is at an airport in Hartford and the big Pratt & Whitney plant is on one end of the airport, but the research department was isolated in a hangar on the other side of the airport. They were second-class citizens, all of them.

Haigh: Yes. And was there a team of specialist operators who would take the cards and feed them through the machines?

Harris: No, everybody did everything. They had no operators. Operators weren't invented until many years later. You programmed it, you ran it through the computer, you got the results, you printed them or you entered them by hand on a graph or whatever.

Haigh: Were you working with Ph.D. mathematicians on this job?

Harris: No, everybody [the programmers in the research department] was like me. They were all graduates of some college .Some of them weren't even in mathematics. They were psychologists or something, and they just happened to get a job there and were learning about computers.

The research department was trying to research the building of engines, particularly of airfoils, because that was just coming out, the design of airfoils. They had a model shop where they would build a propeller out of wood, and they'd build a compressor out of wood, and they'd put it on an engine and rotate it and measure what wind came off of it and that sort of thing. It was really the humble beginnings of engine design, of compressor design.

Haigh: You were at United Aircraft until 1959?

Harris: Yes.

Haigh: Were you working with the CPC the whole time?

Harris: Oh, no. A year after I was hired they got number three of the IBM 701. The 701 was the big IBM announcement of a scientific computer, and United Aircraft got the third one

delivered anywhere. I immediately switched over to that and, likewise, became a real expert because I am an expert programmer. I learn quickly and do it quickly.

I'd like to note that in this period I had met a man who became one of the senior software developers in the world. I lived in a town called Glastonbury, Connecticut, which is right outside of Hartford, and my neighbor about, oh, 10 blocks away was an unlikely fellow by the name of Roy Nutt. I said to him, "Hey, Roy, why don't you come down to United Aircraft and see if they'll give you a job?" And he did and they did. He sat at the desk next to me, and we did great things together. At one point, Roy and I went to the Hartford IBM manager and told him we wanted to start a business and he said, "Give it up. You could never succeed. You got to be a businessman. You can't be a programmer and start a business." So Roy and I went back to United Aircraft and continued to program there.

In 1958 or 1959, I can't remember, he left there and joined the Computer Sciences Corporation. They had one man. He was starting Computer Sciences and they wanted a techie. They picked Roy Nutt, and when he quit United Aircraft to join them, he said, "Pete, join me and we'll do great together." And I said, "No, I'm not ready for that yet."

Haigh: Let me ask you a few more questions about working with the 701 there. First, did it work the same way as with the CPC – where you would book machine time and then operate the machine yourself?

Harris: Yes. In the beginning, they had no programming languages. And then a fellow by the name of John Backus came along and wrote FORTRAN which was the first scientific computing language.

Haigh: So while you were at United Aircraft, did you make this transition from programming in Assembly to programming in FORTRAN?

Harris: Oh, yes. I was a hero at that, and – because Roy Nutt needed somebody to learn to program the 701 in FORTRAN – I used to go down to New York City where they had another 701. I went down there and programmed at IBM World Headquarters on their machine.

Haigh: It's obvious that fairly early on, you decided you wanted to make programming your career. What was it about programming that you liked so much?

Harris: I have no idea. You just get results, you know? You could do it. It was exciting. You could put in people's ideas and get results right away.

Before I left there, I started writing what would today be called an intelligent machine. And it started this way. Not too far from Hartford was Norden Systems right on the ocean. And I went

down there and I asked them what they were doing and they showed me an oscilloscope that they could read because they were interested in detecting submarines. That was a big deal then – to see if they could find where the submarines were -- because they were afraid submarines were going to do some harm to America. What they were showing on the screen was a bunch of little dots that formed a mechanism of something and it would float across. And I'd say, "What is that?" and they'd say, "Well, we're not sure. It could be a fish or it could be just material like seaweed." I doubted it was a submarine because there were very few submarines. I took pictures of the screen and that gave me the idea: I'm going to build an intelligent machine, something that can read that screen and see that little bunch of dots and decide what it is. Is it seaweed? Is it a fish? Or is it metal? Is it a boat? Or is it a submarine? And that was my start and I started building an intelligent machine.

Haigh: So that was a project that you were working on for United Aircraft?

Harris: I started with that. And they knew nothing about it, but I was with the research department and it was our job to invent new projects. So, when I came up with this, they were delighted. Oh, we have a guy here who is inventing something that is going to interpret sonar screens and this is going to be a great new invention. And so they let me do it. I did it for a short time. And that was the time when Roy Nutt quit United Aircraft and joined Computer Sciences and wanted me to go with him and I didn't.

Haigh: Now, looking at the memoir, one of the interesting things is it seems that the whole time you were at United Aircraft, you were working on these kinds of research and scientific computing problems. Yet, when you left to start Data Tech, you were jumping straight into data processing applications.

Harris: I'll tell you why. Also in my last two years at United Aircraft, I worked with a high-powered consulting team from Arthur D. Little in Boston.

Haigh: Yes, they were really the leading consulting firm of the era.

Harris: That's right. And I worked with Dr. George Kimball, who set up Hamilton Standard's Inventory Control Procedure. I learned from him about reorder point, reorder quantity, and all that sort of stuff. So I became an expert in operations research, but, try as I could, I could not get the research department to build an operations research department. But they let me call my job operations research, and I was a one-man activity. So that was the beginning of United Aircraft's operations research.

Haigh: All right. So that would have been about 1957, then, about two years before you left?

Harris: Yes.

Haigh: That's interesting. Apart from Kimball, did you have contact with any other operations research people or with the Operations Research Society of America?

Harris: Well, all the people from Arthur D. Little. And United Aircraft had other consultants from Arthur Andersen, so I was always meeting with that type of people.

Haigh: So then, for you, such operations research applications were a bridge from technical computing into data processing applications?

Harris: That's right. That's correct.

Haigh: How did the satisfactions and challenges of working on one of these operations research programs compare with working on something like modeling airflow?

Harris: Oh, much, much better because this was the modern science. I mean, they had guys coming out of England who were the leading scientists in this area, and they were all hip on this thing and so was I. And so I got into that and I just got carried away with it.

I left United Aircraft a few months after Roy Nutt did, realizing I'd made a mistake and I should have joined him because he became quite successful. But I left and I said, “Okay, I'll go to Hartford (which was only eight miles from where I lived) and I'll start a business.” I went six months without a nickel. I lived off of my separation income that I had at United Aircraft. I got an office in downtown Hartford, and I started to try to do consulting and, in six months, I never got anywhere.

Data Tech

Then I made a proposal to the State of Connecticut Motor Vehicle Department. They had a million addressograph plates they wanted to put on punch cards. Who the heck there was an expert in punch cards? Nobody was. But I knew much about punch cards because I used them all my life.

So I went there and I said**:** “Okay, I'll put your addressograph plates on punch cards but I'm going to do it my way.” So I went to a company in Alexandria, Virginia, that advertised they could convert any written material to punch paper tape. You’d give them a piece of paper and they'd read it and convert it to punch paper tape. So I went there and I said, "If I hand-stamped a million addressograph plates on a piece of white paper, would you convert it?" And they said, "No, we won't do that. That's not our line of business."

Well, they were just acquired by a company in Boston so I went to the company in Boston and I said, "How come that company that you just bought claims that they will transcribe address or

written material to punch paper tape but told me they won't do it?" And the vice-president of marketing, can't remember his name, said, "I'll take care of that." He went down to Alexandria and he talked to the president there and he said to him, "You will do it." And the guy got angry, almost punched me out, almost hit everybody. He was really angry, but he said, "All right. Bring them down and we'll do it."

Well, before I could do it – because this was for the Motor Vehicle Department and the commissioner had made me promise this thing would be done and I couldn't avoid it – I went out and had all those addressograph plates hand-stamped on paper. And I contracted with every service bureau on Long Island to keypunch them.

I used to go down to Long Island and spend the whole week there arguing with the people. They couldn't read the addressograph plate entries and said, "What is this?" I'd say, "Do the best you can, you know? It's St. Mary's, I can read that." "Well, there's an 'e' on the end of 'Saint.' Is that right?" "Read it and do it, okay?" And I used to go down there and fight with them all the time. So they finally did it, but the Motor Vehicle commissioner swore that some of them had to be done by a computer process. They could not all be done by keypunching cards because we said it was to be a computer process. So I took 150,000 addressograph-stamped papers down to the company in Alexandria, and they said they would convert them to paper tape but they'd only do 150,000. So when I came back, I had the punch paper tape that I had and I had to convert that to punch cards and then I had all the other keypunched cards and then I had to put it on a computer.

Well, by that time, I made a deal, first, with Traveler's Insurance, to put it all on their computer. I just got a contract with Traveler's and I just started to do it when Traveler's said, "Oh, no, we've decided we're not going to do it with you." And I said, "Well, where the hell am I going to put these things on a computer?" Connecticut General in West Hartford was just starting, and they just bought their first computer and so they let me on. I used the Connecticut General computer and loaded a million and a quarter punched cards and then I decided I was going to not just do it on punch cards, I was going to put it on a real computer. So we did.

Haigh: Okay. So the contract that you described was your company's job just to transfer the data or were you also coding a new system to use with the data once it was transferred?

Harris: The contract I had was primarily to convert it to punch cards, but the Motor Vehicle commissioner absolutely demanded that it go to computer tape and I'll show you why. This was my presentation to the State of Connecticut at a lunch at the Hilton Hotel in downtown Hartford. And you see it shows it going on a computer?

Haigh: Yes, you have an optical scanner and then it promises that it will go via a reel of tape onto a general purpose computer.

Harris: Right. Now, the optical scanner was the one in Alexandria, Virginia, and 150,000 was all they would do. They wouldn't do any more. And so this was my presentation to the Motor Vehicle commissioner and so, when I came back, he said, "I told everybody at all the motor vehicle departments in America we're going to have it automated with an optical reader and we're going to put it on a computer, so you're going to do it that way. And you aren't just going to hand me over a million punch cards." And so that's what I had to do and that's because I made this presentation with my partner.

Haigh: Yes.

Harris: I don't know if I ever described another part of my relationship in any of my literature because it was so weird. The thing that gave me the contract with the Motor Vehicle Department was the fact that two months earlier, I created a partnership with a fellow by the name of Larry Vineberg. I don't know if he's ever mentioned.

Haigh: Yes, you mentioned him. You say he manufactured bags.

Harris: Right. But another thing he did was to build on a contract, a spitting image of the Santa Maria, which is now down in Newport Beach. He was that kind of a guy. He was a real entrepreneur. He just didn't like to do things. Bags was one of his businesses he made money at, but he did something for everything. And he became a close personal friend of Kennedy, and the strange thing about that, Larry Vineberg was Jewish, and he said, "Kennedy will never get elected to anything because he's Catholic."

Haigh: So I imagine that, when you founded Data Tech, you'd had more in mind that you would be doing operations research, programming and consulting, but then you finished up with this big key punching and data entry job.

Harris: Oh one of the last things I worked on was numerically controlled machine tools. They were just coming on and Pratt Whitney was excited about it. And so I was just learning about numerically controlled machine tools. And so I went out to everybody who made numerically controlled machine tools. I even bought an LGP-30 to do it on that and create punch paper tapes. I couldn't get anywhere with it. I went to Bendix; I went to all those companies. I couldn't raise a nickel. I got maybe $75 consulting on it in six months' work.

And so I met this guy, Larry Vineberg. He knew the commissioner of Connecticut Motor Vehicles and he said, "Pete, come out to my house." Well, he lived across the street from a golf course in West Hartford, which is a very fashionable area. So I went there and there he was sitting, sure enough, having breakfast with the commissioner. And not only that, somebody who later became the secretary of state for America was at breakfast with him. I can't think of his name but I met him there, too. Larry just knew everybody.

Selling Data Tech to C-E-I-R

Haigh: You say in your memoir that, after a year, you sold the company to C-E-I-R. Why was that?

Harris: Well, I had done the service work. And, by this time, I thought I was a big deal service bureau, ran the Motor Vehicle department, you know? I was going to die rich. I had it all made. And so I wanted to get rich. So what would you do? Well, I found the only two large corporations that were in services. One was the Rand Corporation, but that was in California, and C-E-I-R was in Washington, D.C. I knew Washington because I had to go down there; RCA was near there where I had a lot of consulting. So I went to C-E-I-R and I met their senior executives and I said, "dah, dah, dah, dah". And they said, "That's a wonderful idea and we'll give you 15 bucks a share for your company." I said, "Well, that seems quite reasonable." And, in a few months, it went up to 30 bucks a share. So I doubled my money. Wasn't that wonderful? Well, I came to California eventually. Would you believe it went to $96 a share? I was the richest man you could ever imagine.

Haigh: So you were paid for the acquisition with C-E-I-R stock?

Harris: Yes, not cash, because stock was the coin of the realm back then. I sold that stock for $2. I should have sold it at $96, but I agreed to keep it for two years and I kept my word.

Haigh: You stayed with C-E-I-R until 1962, is that correct?

Harris: Yes.

Haigh: Why did you leave? What were you doing for them? Was it the same work?

Harris: I think I was in California. They sent me to California because they wanted to have services in California and they had nothing. So I came out here, fell in love with San Francisco. They had an office in downtown San Francisco on Fremont Street. And I went over there and they had another division which was market research, and I lived with the head of the market research department. It was a nothing department, but the guy had an apartment up on Nob Hill and he let me stay with him. So I came in and I moved in with him and I was just starting to learn how to drink. I didn't ever drink up until maybe six months before. Now, I could drink. Well, Ed Caneperry could really drink so we went all over Chinatown and Broadway and he showed me all the night spots. I learned all about San Francisco then. And how did I learn about it? Going downtown to Broadway and drinking. And I'm still in San Francisco, aren't I? And Broadway is still there, isn't it? Yes.

Haigh: I would expect so.

Harris: This is San Francisco. Yes. I'm not in Hartford. No. I didn't go back.

Founding Applied Data Services

Haigh: So was it shortly after arriving in San Francisco that you quit to start Applied Data Services?

Harris: Yes. Yes, because Ed Caneperry was unhappy with C-E-I-R. They were doing bad things to him, and so I said, okay, I want to start my own business. So I quit C-E-I-R, my two years were up, I could do it and I wasn't in violation of any contract.

Haigh: And so the two of you, were you the only founders of the company?

Harris: Well, he didn't found – he still worked for a division of C-E-I-R and he didn't quit until later. But I did and I started ADSI, Applied Data Systems Inc., and I later had to change the name because there was an ADSR, Applied Data Systems Research, and my lawyer said, "You can't have that name, you have to change it."

Haigh: And how did you decide what ADSI would do?

Harris: We were going to be a national services company. By this time, I knew that the secret to services work was how quick you could program – because you could get it on the computer but you had to write a program. If it took you forever to write the program, you'd never get anywhere. So I wrote the beginnings of the language of ADPAC.

Haigh: So your original vision was that you would grow to be a large service bureau company with your own computers like C-E-I-R?

Harris: Right. And initially I would use C-E-I-R and other service companies, but all the programs would be written in ADPAC and so I did that.

Haigh: So, when you founded ADSI, you already had the idea of developing ADPAC, right from the beginning?

Harris: Oh, yes, you had to because you couldn't run a service bureau unless you could program instantly. The secret to success in running a service bureau is how quickly you could program.

Haigh: Okay. So this, then, would have been 1962. So I think, at that point, COBOL had been announced but there weren't many usable implementations of it produced yet?

Harris: It was rejected. The world thought COBOL was just terrible and nobody would program in COBOL. If you said, I'm a COBOL programmer," you might as well try to get a job doing something else. And that was the early history of COBOL– it later changed but that was the origin of it.

Creating and Selling the ADPAC Product

Haigh: So how long did it take you to get the first version of ADPAC working?

Harris: A few months. I had some of it working before I left because I was in Connecticut and wanted to do all this, so I had some versions working. And so the first thing I did was go over to Southern Pacific Railroad and I met a guy there who was with IBM. And I said, "I want to do services here. I can do it a lot quicker and faster and cheaper on my computer, "and he said, "Well, how will you program it?" I showed him, and he said, "I got a better idea. Sell that thing to Southern Pacific." And I said, "No way I'm going to sell this thing. If I sell it, then anybody can do it and I've lost my competitive edge." And so he said, "Come on over."

I went over there and they were looking at a product similar to it that they were going to pay $11,000 for. It wasn't nearly as good as ADPAC but it had the concept of it and they were ready to spend $11,000. And so this guy at IBM said, "Offer it to them. Go ahead, offer it to them." So I said, "All right. $15,000." A short time later, I had a handshake on the deal. And they had a division, Matson Navigation, and I went over there. It took me less than a month. They bought it. That's another $15,000. And they had another division. And they bought it and I had $45,000. You know, I was the richest man in North America and I didn't even know what the heck I was doing.

Haigh: Okay. So you say in the article this was about 1963 and 1964.

Harris: Yes, that's right.

Haigh: So before that, had you succeeded in finding customers for custom development work where you would code the application for them using ADPAC, following the original model?

Harris: It was terrible. I did very little business. And I had a computer but try to get somebody on it, forget it.

Haigh: So I think, at this point, selling a software license would have been rather an unfamiliar kind of business.

Harris: First of all, there was no such thing as a software license. So I had to look up an attorney. I called my attorney and he said, "Well, a young fellow just joined us. He's been with

us only two months, Warren Wertheimer, and he's not doing anything important. You can have him. You can show it to him and see if he can do it." Can you imagine a guy who had been in a law firm for two months, right out of, I think, Yale or Harvard or someplace?

So he came over and I showed it to him and I said, "I want to sell this thing." He said, "No, you can't sell it because, if you sell it, you'll lose ownership. You have to lease it." I said, "So write me a lease." So he came back in a month with 26 pages of a lease. And I said, "No way in America am I going to sign a 26-page lease. Get it down to one page." A few weeks later he came back with a one-page document and that became our standard lease. I took it to Southern Pacific. They wouldn't have signed a 26-page agreement, but they signed a one-page agreement, and Matson Navigation signed it, and their other division signed it, and I was off and running.

That's how it got started. Then I said to myself, "Okay, now you're going to run a software company. You can't run a software company in one city. It can only be all over America. So where else are you going to sell the product?" Well, there wasn't a Silicon Valley. You couldn't talk to anybody down in the peninsula. So I went to the next best place: Portland, Oregon. And I showed it to a number of companies there. It was beautiful but none of them would buy it. I finally went up there one night when they were having their DPMA meeting in a bar in downtown Portland and I said, "Why the hell aren't you buying this? I've shown you how good it is and you agree how good it is." And you know what they said? "We don't buy anything that Techtronix doesn't buy first. If Techtronix doesn't have it, we aren't going to have it."

Finally, after two months, I scheduled a meeting in Beaverton, Oregon, the home office of Techtronix. They didn't want to see me but I finally talked my way in. I went there and I spent two hours. They almost threw a rock at me. They hated it so much. They hated the concept of ADPAC. They hated me. There's nothing I could do to convince them otherwise. They were considering PL/I but were willing to settle for an Assembly language on the 360 or whatever it was then.

Haigh: So what year was this?

Harris: 1967. Somewhere in that period. I don't remember exactly but around that period. And so I went there, 1966 or 1967, and I went there and it was hateful. And I left. But I went back in a month to the guy who let me come there and I said, "What the hell is going on here? You can't be so smart that you're going to program everything in Assembly language which will take you five times longer." And PL/I had hardly been invented. They were just thinking about it, you know, they had PL/S, which was IBM's language, which they hadn't even started to market it yet. And I said, "You guys are crazy. Let me try." So they said, "Okay, we'll give you a try."

Well, I went there and I tried it and they loved it. And they wrote many programs, many programs. And then the big employer in beautiful, downtown Portland, was Georgia Pacific. So I went over there and I met the financial officer of Georgia Pacific and I said to him, "Well, I finally got Techtronix to use it and you know what that means now. You guys said if Techtronix does it, you'd do it." So they did it, and over the next years everything they wrote was in ADPAC. They wrote multi-thousand line programs in ADPAC. They were a big user and, after starting that, I got every other data processing company in Portland, 16 altogether, the banks, every insurance company, every manufacturer, anybody that had a computer, all bought ADPAC.

Haigh: Okay. So, in that period, Portland emerged, then, as your biggest market?

Harris: Then I moved on to Seattle and got– what's the big company up in Seattle? The big one?

Haigh: Boeing?

Harris: No. Well, I got Boeing but there's another one in downtown Seattle. Can't think of it now but I got it, too; it was a big insurance company. Anyhow, I was just moving all over there. And so I said, "Okay, now, if you're going to really do this, you got to spread out nationwide."

Haigh: Before you talk about that, let me ask you a few questions about ADPAC itself.

Harris: Yes.

Haigh: What platform did it run on? Did you need an IBM 1401?

Harris: Yes, it ran on a 1401. I'm trying to think of what else it ran on. It...

Haigh: Was the 1401 the first version?

Harris: I think so. Yes. And then I built it to run on their first version of the 360. When it first came out, COBOL was horrible, and I put ADPAC on the 360 and it was wonderful. It could do everything. That really launched us.

Haigh: Okay. So the initial version, you think, was for the 1401?

Harris: Yes.

Haigh: But by the time the product really took off, it was as a 360 application?

Harris: 360, Yes.

Haigh: You mentioned in the article that you originally charged $15,000 and then there was $100 a year renewal.

Harris: Right.

Haigh: Did you stick with that model?

Harris: No. My accountant came over and he said, "That $100 a year is ridiculous." So we immediately upped it to $1,000 and then we discovered that the license price should be 15% of the first year price, so we upped it to further.

Haigh: And what did they get in return for that?

Harris: Continuous maintenance. We upgraded it. As the hardware changed and got upgraded, we'd upgrade the product. If there were any errors in it, they got corrections and all those things that are associated with what was just starting out as the software industry.

Haigh: Yes. What would they receive in terms of documentation?

Harris: Manuals, we had good manuals.

Haigh: Did you have them right from the beginning?

Harris: Not real good ones, but we had them. And they got better and better as we went along. And the product did more and more, and we made it more efficient, had more op codes, and it could do more things. And it just got to be a better and better language.

Haigh: Did you offer training?

Harris: Oh, yes. We did all the training. We got paid for training. At first we didn't, then my business people said, "You got to charge for training if you're going to do training." So we went and charged them for training and they were delighted with that.

Haigh: Did you provide any library routines?

Harris: No. We did none of that.

Haigh: So they got the language compiler and that was it?

Harris: Period. When they asked we told them, "Well, that's all right, you can use the IBM source libraries," but then they told us, "Well, but we don't use the IBM source library. We use Panvalet or Librarian." So I had to interface it to both Librarian and Panvalet.

Haigh: Right. I think those products would have come in maybe in 1969 or early1970s?

Harris: Yes, as we went along, yes.

Haigh: With the later versions. Now, with the first version, can you remember how long it would take to compile a reasonable size program?

ADPAC versus COBOL

Harris: Oh, that was the beauty of it. The real magnificence was this. The IBM COBOL compiler took two hours to compile. The ADPAC compiler took two minutes. It was lightning fast.

Haigh: Why was it so fast?

Harris: Because it did it all in one pass. When it read the last card, bang, it did a little calculation and that was it. It took more time to read the cards, they were programmed on cards, and it took more time to read the cards than it did to do the compile.

Haigh: So you managed to squeeze the whole compiler into memory?

Harris: Yes.

Haigh: How did you do that?

Harris: I'm trying to remember. The first version was on punch cards and I later went to tape and could download it from tape.

Haigh: Now, in terms of the features that the language provided, you've said that you'd clearly consider it to be superior to COBOL.

Harris: Oh, wildly.

Haigh: What were the main areas where it did a better job than COBOL?

Harris: Well, first of all, it could do a table lookup, and there wasn't any such thing in COBOL. They put some recent stuff in, but they didn't have it back in those days. We had a fantastic table lookup routine. You could create a table and then, in your program, you could look up anything you wanted to in the table and it was instantaneous.

Haigh: Yes.

Harris: That was a main feature of it. And then it had scanning routines. It could read a record, punch card or tape, 200-character record, do a left-to-right scan or a right-to-left scan looking for a character. Is there a 9 in that card? Bang, Yes. It's in position 32. Oh, and it had a do-loop. Do-loops weren't invented, because I got the do-loop out of FORTRAN. And so it had a do-loop. COBOL didn't have a do-loop until much later. So it had all these things that were really exotic things.

I don't know if you knew Roy Nutt moved to San Francisco and, for many years, only lived about 20 blocks from my house. So I could still communicate with him. I could still go there to his house. He'd talk to me and tell me, "No, Pete, that's not right. You got to do it this way."

Haigh: All right. And that's while he was working at Computer Sciences?

Harris: Yes.

Haigh: Now, I imagine that the first version would have been oriented towards punch cards and tapes. Can you remember at what point support for random access and disc files would have been added and if that was a hard thing to do?

Harris: That was much later. I wasn't very hot on disc files, random access disc files. I was very poor at databases. Always have been and still am and so much better at sequential. I could read a tape file but I barely know how to read a disc file and, back in those days, disc processing was a laborious, tedious thing.

Haigh: Do you think that was because you just didn't like that kind of programming or do you think that there was no demand for it from your customers?

Harris: Well, the first versions were all address-oriented. You had to calculate the address of the record, and I mean a hexadecimal address. You couldn't just go in and read account number 2204. You took that number and you converted it to an address and that's how you looked it up. It was a pain in the ass to program on disc. And so I wasn't good at it.

Haigh: And from what you said, I understand that at the time that you sold the first ADPAC license, you were the one and only person in the company, is that correct?

Harris: Yes, that's correct.

Growing the Company

Haigh: So, can you say a little bit about how the company grew from that point in 1963 through the rest of the 1960s.

Harris: Well, let's see. I was in the building that Dole Pineapple is in now and then I moved over to Pine and California. I took an office, which is now a 34-story building on the corner of Pine and California. It was a two-story building then. I took the building. I was the only one in it. They had a penthouse on top but I moved in there and I was realizing that, to maintain the compiler, I just couldn't do it all by myself. So I hired a guy. In fact, the first guy I hired was the IBM guy at Southern Pacific.

Haigh: And what was his name?

Harris: The guy who I hired was – can't think of it. Isn't that terrible? And he later started his own business. I'll think of it but I can't think of it now.

Haigh: What do you remember most about the people that you hired as the company grew?

Harris: They were very gifted Assembly language programmers and I had to teach them ADPAC. They wanted to write the ADPAC compiler in Assembly language, which I didn't want, but I let them do it. And they came to my office and, inch by inch, they started writing programs. And one of the people who I hired was a woman by the name of Gail Kessler and she still works for ADPAC. She's at work this afternoon.

Haigh: Did your own role change as the company grew? Did you move away from personally doing the programming to a more managerial role?

Harris: Yes. I clearly went into management. My first effort was to get into sales and I then developed what I thought was a national marketing organization. We opened 12 branch offices throughout America: Chicago, Atlanta, Dallas, New York, Boston, you name it, we had an office. And to support that, we had to advertise. So I raised some money – and that was a story. Let me tell you that story. In order to do the advertising, I knew I needed money, half a million bucks. So I went out to borrow a half a million bucks.

Haigh: Yes. And you say in your memoir that was in 1969.

Harris: Yes.

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Haigh: Now, was the company profitable at that point?

Harris: Barely. We were just making enough to squeeze by. But we were profitable and I had a good business plan, but I had a better one if we had some marketing money. I was banking at Crocker. So I went to my bank and who do you think the branch manager sent me to meet? Charlie Crocker. So that's when I met Charlie Crocker and I explained to him what I was doing and he said, "Well, the bank won't lend you any money, but I will." I said, "What?" "Yes. The bank can't lend you any money because you're just a mini, mini corporation. And banks have to have big corporations to lend money to. But I like your idea. If I can have a piece of it, I'll personally lend you the money." He was in an investment banking company that had the money.

A month later, we were all sitting around in the office, and I said, "I'm going up to get the check." I went over to the Crocker Bank, went up to the ninth floor, I think it was, there was Charlie Crocker sitting in the conference room. I said, "Well?" He takes the check out, I had to sign a disclaimer and all that and he gave me the check. And, oh, I should explain. The hard part was that I was $250,000 overdrawn at Crocker Bank. They just let me overdraw money there. And so I went there and he was happy to give me the money, and then he also arranged for me to get some money from a Wall Street investment banking firm. So actually I was able to raise a lot of money then. We were profitable but, more than that, I had bucks in the bank to do the advertising. And so that's when I did my first advertising. And that's when this came out. Computerworld was just starting. Volume 1, Issue 1.

Harris: In order to get this, I put a full-page ad in Computerworld and that was their first ad. I mean, that was their first software ad.

[The inaugural edition of Computerworld 6/21/67 had a headline on page 1 that read, “COBOL, RPG Bested by New Language?” The new language was ADPAC.]

Haigh: Right. So what you're showing me there, that's not the advertisement, that's a glowing editorial piece they wrote in return for the advertisement?

Harris: Yes, yes. But I had an ad in there. I started what, to me, was strange – a national advertising program. Let me explain that, too. That was a little weird. I was in the Y Indian Guides in Greenbrae, CA. You know where Greenbrae is? I was in the Y Indian Guides program and had my son there and this other guy had his son there and we became good friends. He was in an advertising agency but he had just quit and he started his own advertising agency. So he said, "Do you want to do some advertising? Let me help you." So he came into the office and I thought he would do it in three weeks. It took him six months because he's one of these guys who had to learn everything that he was doing. He had to understand it. I had to teach him programming. I had to teach him about the industry. I had to do all this. And he finally came up with a national advertising program. He said, "It's going to be expensive. Have

you got the money?" I said, "I got the money." I had just raised the money. I still had money in the bank. This was one of his ads.

Haigh: And where would these advertisements be run?

Harris: *Time* and *US News & World Report*.

Haigh: So you were targeting business managers rather than technical people?

Harris: Yes. Yes. Because he said this, "Don't be in technical journals because they don't buy anything. You want to get in *Time* magazine," which we did. *U.S. News and World Report*. We went into the big leagues. I had the money for it.

Haigh: Yes. Did you think that strategy was working?

Harris: Oh, it worked magnificently. We made multi-millions. That is, everybody in America seemed to have bought the damn thing.

Haigh: So it looks, from your articles, that this would have been quite a short period because you say that, in 1969, you received the money.

Harris: Yes.

Cutting Back the Company

Haigh: And then, in 1970, with the recession in the IT industry, you had to cut the company back from 120 employees to 13.

Harris: Yes. When was it that Nixon came on as president?

Haigh: Nixon was elected in 1968 and I think he would have been sworn in January 1969.

Harris: Yes, well that's what caused the depression. Everybody was happy in 1969 but, by 1970 and 1971 there was a slump. And Nixon took the fall for it.

Haigh: Actually this *U.S. News and World Report* has the date September 9th, 1974.

Harris: So we were still advertising, but we were doing it real carefully.

Haigh: All right. Now, when you cut the company back, did you have to close all those newly opened regional offices?

Harris: Absolutely. And I had to terminate the people. Many of them had back pay coming. I had to figure out how to pay them, but the interesting part is, today, I have a list of their names and I could hire any one of them. They loved it and they loved ADPAC, they liked me and I still keep in touch with many of them.

Haigh: When you were forced to abandon this strategy of opening regional offices and cut the company back, what was your new strategy?

Harris: Stay alive! Figure out how to stay alive. So I started mail order and that type of thing, and we mailed stuff out, follow-up by phone. I hired people who were experts at phone and that type of thing.

Haigh: Okay. So you moved away from this direct trade and personal sales and towards telesales and mail order?

Harris: Right. But every account that got close, I personally went and closed. You can't close it over the phone. You got to go there. You got to stand up for four hours, show it to them, demonstrate it, and what you got was a trial usage. And, if it succeeded, you made the sale. So I went out to get trial usages and that's what I was good at.

Haigh: So, by this point in the early 1970s, do you have a sense for how many installations you had at that point?

Harris: At least 50. I don't know if it was up to 100.

Haigh: Once you sold a copy, did it stay sold and you got the annual renewals, or were there cases where customers lapsed?

Harris: Let me tell you this. The company still receives annual renewals for companies that signed in the 1960s and 1970s. They're still there.

Haigh: So you think they're pretty loyal. Now, actually, with the intellectual property, would it be the case that, because ADPAC had been used to compile a program, that, if they wanted to continue using a program that's been compiled with it, they would have to renew their license?

Harris: Yes. There were things built into it. The I/O routines were our I/O routines so if they wanted to continue to use those programs they had to renew ADPAC. And what we did to help sell it, which was a crazy thing, unbelievable, we wrote an ADPAC to COBOL translator. Would

you believe as hard as I tried to sell it -- because we had a few hundred accounts, if I could sell it, it was millions of dollars, but nobody bought it. Nobody bought an ADPAC to COBOL translator. They said, "We're happy with ADPAC." So nobody bought it. And so that was one of my software failures.

Haigh: Now, did you remain exclusively focused on the IBM 360 platform or did you diversify?

Harris: No, we never diversified. I went to Honeywell. I tried to get started with them but they went out of business. And then I went to National Cash Register, same thing. They went out of business. They were going to be a big computer company and they quit. I was going to do a big deal with RCA. They quit. They all quit. So the only computer company left and still true today is IBM.

Haigh: So you were negotiating with the other computer vendors to try and get them to sponsor a conversion of ADPAC?

Harris: But there weren't any other computer vendors. There was only IBM through the 1990s.

Using ADPAC to Write COBOL Programs

Haigh: Now, what you say in the memoir is that the ADPAC to COBOL converter led to a resurgence in the contract programming work that you had originally imagined the company would be doing.

Harris: Yes, because I could write it in ADPAC, convert it to COBOL and deliver the COBOL. And the company never knew how I got the COBOL. As far as they knew I sat down and hand-wrote it in COBOL.

But it was very sophisticated, and we came in at the time that Ed Yourdon came on with a thing called structured programming. You couldn't touch a program unless it was a structured program. Well, Ed Yourdon got the word "structured" from ADPAC. ADPAC had always called itself a structured programming language because of the structure of the program. It had the initialization section, it had the mainline section, it had the I/O section, and it had the “endofjob” functions. ADPAC always had those features. That's why it was such a powerful compiler. That's why you could write so quickly – because I recognized that all programs have that. And so that was built into it. And so, when I wrote a program, I'd write them all in ADPAC, which was high speed, you know? I could do that in four hours or in two days, whatever it was, but then crank, crank, turn it out in COBOL and it looked magnificent.

Haigh: So you were personally writing these application programs for customers?

Harris: Yes. I can go to a company and I had employees who would go to a company. We'd write it all in ADPAC, zing, zing, turn it over in COBOL and deliver it in COBOL.

Haigh: Yes. Now, did you have your own computer in the 1960s or 1970s?

Harris: No. No, at that time, we started buying computer time from everybody who would sell it to us and we'd go after the lowest rate, the cheaper the better. And so, by that time, we were telemarketing so I could get on a computer in Chicago or in St. Louis and it cost almost nothing, just a telephone call.

Haigh: So, instead of installing your own computer, you relied on timesharing service?

Harris: Absolutely.

Haigh: And do you remember any significant changes to ADPAC itself during the 1960s or 1970s?

Harris: Only minor enhancements to make it a little more efficient, add a new op code. People want to do this. I would add another instruction and so forth. One of our biggest early customers was Wells Fargo Bank. They had a major application that they were about to give to somebody else, and I said, "Wait a minute. Let me show you what a good, well-written, structured program looks like." So I went over there and they said, "Well, we'll take a chance on you."

There was one of their accounting systems that they wanted written in COBOL. Let me do it. So they gave me the contract, and I did it for a fixed price and I invented a new concept. I'll deliver it in 60 days and pay you $1,000 a day for every day late. Ah! That was magnificent. And so I did. And the first application I delivered to Wells Fargo was nine days early. So it went on from there. That was the reputation I could build on now because I could go to other companies in San Francisco and say, "Call Wells Fargo."

Haigh: And that was in the early 1970s?

Harris: Yes.

Haigh: When you were reviving the contract programming business?

Harris: Yes.

Haigh: By the 1970s, what proportion of the company's revenues do you think was coming from this contract programming and what proportion from selling ADPAC as a software product?

Harris: Well, it was a fewer number of contracts but a greater dollar volume. That is, we didn't have many companies doing business with us but, when they did business, it was a quarter of a million dollars or a half a million dollars to do it and that overwhelmed our licensed software. In the early 1980s, would you believe James Martin was the guru of the world? If you didn't have a database developed by James Martin, you could hardly be alive. He was the guru in data processing.

Haigh: Yes. Now, I know he had a consulting business and he wrote an enormous number of books, about a book a year for 30 years.

Harris: And so we took off on that and, because ADPAC was a structured language and what James Martin was selling was structured programming -- that was his key to fame -- we were very successful.

Haigh: Yes. Now, I'm wondering, did you introduce any products apart from ADPAC?

Harris: No.

Haigh: So ADPAC was the only piece of software that you ever actually packaged and licensed and sold to the outside world?

Harris: That's all I ever had an interest in and POLYPAC which translated ADPAC to COBOL. But we have since done some other things.

Haigh: Yes. And, also, we kind of talked through this period where you had to downsize from 120 employees to 13 in 1970.

Harris: Yes.

Haigh: Now, I'm wondering, did the company grow again or did it stay small.

Harris: We stayed relatively small.

Haigh: And you've stayed based in the San Francisco area?

Structured Charts for COBOL Programmers

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Harris: Always here. And we changed our mode of operation in that we did business through services companies. We let our partners sell our products, so they got revenue but we got the revenue, too. So I didn't have a staff. I didn't want another big staff. That was a pain in the neck, having employees.

Haigh: You mention, in the memoir, that you had some software that you called SS-80.

Harris: Yes. What that was was a big systems documenter, Structured Systems for the 1980's. It would go in and draw a structure chart of a system or a program.

Haigh: Yes. So you'd feed it some source code and it would draw a chart?

Harris: Yes, you'd feed it a program and it would draw a flow chart.

Haigh: Was that something that you sold as a package or did you use it for these contract programming assignments?

Harris: No, we sold it as a package and that changed our whole approach. We would take a sample program. Mainline and end of job and housekeeping and then the mainline went into match the files and do this and do that. This was part of our documentation so we could go into a COBOL program, any old COBOL program and draw this diagram. And then we got even more sophisticated and drew more and more sophisticated diagrams of COBOL programs.

Haigh: So that became a second main product?

Harris: Yes.

Haigh: And was that successful in the marketplace?

Harris: Terribly successful because everybody had COBOL programs but no documentation. And we still sell it today. A company bought a big corporation, all the employees left; nobody knows what those programs do. Oh, that's nothing; we'll draw a structure chart of them.

Haigh: And were you involved with the computer industry trade group, ADAPSO?

Harris: Yes, for many years I was a member, and then they charged $1,500 a year and I quit. I couldn't afford it in the year that it went up.

Haigh: During the time you were a member, do you remember learning anything from ADAPSO that was useful in running the business?

Harris: No. No.

Haigh: No?

Harris: They were a nothing organization and still are. And they held meetings periodically like the one we had today but you can get those anywhere. And so ADAPSO was a nothing for me. Well, that may not be so for everybody.

Haigh: Well, moving then to conclude, given the time pressures, I wonder if you look back on your career, do you think there's a specific accomplishment that you're most proud of?

Harris: Well, the real fact that I've sold the language and it's still used by many companies. I mean, that has to make you feel good when a major corporation still has their major applications written in ADPAC. And we maintain it for them. And they send us an annual renewal. So that's one thing. Another thing which we did that was very successful; we were the leading company to do Y2K conversion. We made a license agreement with Platinum and we sold it in 35 countries. It got sold in Beijing, China, in major cities of Japan, in South America, England, Germany, France, Russia, you name it. Our system for doing date conversion was the most widely accepted system for doing that and that has to make you feel good.

New UPC/GTIN Conversion Product

Haigh: Yes.

Harris: And you know what we're doing now? It's called GTIN (Global Trade Item Number). It's the upgrade to the European 14- character UPC code. Up until now, most American companies had 8, 10 or 12 characters. So every major manufacturing corporation or retail store has got to upgrade their data processing to 14 characters.

Haigh: So this is a similar thing where it will help to automatically convert legacy code to handle the larger data field?

Harris: Yes. And not only do we get paid for the conversion, we also get paid for the documentation.

Haigh: Yes. And I wonder, also, as you look back on your career, with the benefit of hindsight, are there any decisions that you regret or opportunities that you think you missed or could have approached differently?

Harris: Yes. It is only theoretical now, that I will be successful enough to sell the company. I could have done it 20 or 30 years ago. If I have any regrets, that's my regret.

Haigh: Okay. So, on the one hand, you're proud of having ploughed the same furrow doggedly for a long time but, on the other hand, you think that may have deprived you of other opportunities?

Harris: Yes. And if I had sold it and got millions of bucks, God only knows what I could have done 20 years ago.

Haigh: Right.

Harris: So that's something I look back at and say to myself, "If you'd only thought of it when you were with C-E-I-R and they offered to buy your stock back for cash." I should have done it. Or CDC, which bought C-E-I-R. "No, no, no, I'm going to go it alone and I'm going to get rich." But I'm getting very old, too.

Haigh: Well, thank you very much for taking part in the interview then. And I think that would conclude things.

Harris: All right. Thank you.

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