



Datapoint Oral History Panel

Henry Donzis,
Lewis Donzis,
John Murphy,
Jonathan Schmidt

Interviewed by:
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Recorded: June 3, 2004
San Antonio, Texas

CHM Reference number: X2850.2005

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Len Shustek: June 3, 2004. We are doing a Computer History Museum world interview. And you're here with John Murphy, Jonathan Schmidt, Lewis Donzis, and Henry Donzis, all at one time working for Datapoint. And we've actually done the individual histories with Jonathan and John. Maybe we should start with giving a little background, getting a little background from the Donzis brothers, find out how they got associated with these characters. In fact any of you can tell that story.

Lewis Donzis: We get younger all the time.

Henry Donzis: We get younger.

Jonathan Schmidt: Henry was four and Lewis was two.

Lewis Donzis: And I wasn't born yet.

Jonathan Schmidt: Oh he wasn't born yet. Yes, we had- Henry was recommended as a brilliant potential computer scientist by his math teacher.

Henry Donzis: Forester High School

Jonathan Schmidt: Forster.

Henry Donzis: Mr. Foster. Well I think it started out with you being- cause I used to- was using AI's basic computer.

Lewis Donzis: Wasn't that because of Gus Roache's son ?

Henry Donzis: It was Arty Roache .

Jonathan Schmidt: Forgot about that.

Lewis Donzis: Well there you go.

Henry Donzis: Well that's...

Jonathan Schmidt: Yes.

Henry Donzis: And every time I would lose a program and I called, and Randy or David or Harry or somebody would have to reload the thing. And I guess I think you start getting annoyed that I had to keep asking them to put my programs back on there.

Jonathan Schmidt: Oh yes you were annoying, but you know, anybody who is that smart when they're eight or whatever<laughs>, and anyway your math teacher recommended you also. So after school

Henry came over and helped out. And pretty soon he was doing more than most the rest of the guys. And shortly thereafter his younger brother came in.

Len Shustek: This was at Datapoint in San Antonio.

Jonathan Schmidt: Datapoint in San Antonio.

Len Shustek: About which year are we talking about?

Henry Donzis: It was 1974.

Len Shustek: 1974.

Jonathan Schmidt: And Lewis was how old?

Lewis Donzis: 13.

Jonathan Schmidt: 13. And Lewis is like Lilly Tomlin in the big rocking chair. And I said, "Henry, get that kid away from that computer." He says, "That's not a kid, that's my brother." His feet can't reach the floor and his chin is below the keyboard, you know. And he said, "No, he's programming." And I said, "Right. And get the kid away from the computer. I don't care if he is programming "

Henry Donzis: Actually being a little more selfish of the whole thing I was getting him to write my user's manuals for me. <Laughter>

Jonathan Schmidt: You also tell me he was writing a basic program so he can sell biorhythms to his class.

Henry Donzis: Oh that's true too.

Jonathan Schmidt: That's true too.

Henry Donzis: Well I mean the whole reason I brought him in was to do work for me. ...

Jonathan Schmidt: I remember when he was doing it. It is before your memory...

Henry Donzis: Sometimes, you know, played some games and stuff too.

Jonathan Schmidt: We had a lot of people coming in young, and a lot of people who were friends of the people who came in young. We had high school kids and many grew up to be long-term design engineers.

Len Shustek: The Statute of Limitations have passed, can you tell us how you compensated Lewis for his work?

Jonathan Schmidt: Well actually after they got legal they started getting paid...

Lewis Donzis: I got three bucks an hour.

Jonathan Schmidt: That was pretty good back then.

Lewis Donzis: Yes. That cost you about a \$1,000 a year.

Jonathan Schmidt: Right. And was that before or after you got Karen to decide to pay you overtime, and then you worked 96 hours...

Jonathan Schmidt: And you punched in 96 hours and you really never left.

Henry Donzis: He started me at \$5.50 an hour and I was flabbergasted.

Jonathan Schmidt: I was flabbergasted how cheap I was getting this terrific programmer. And word got out, schools. We got college kids coming down from professors who were fascinated with what we were doing. And that's really how the core of the team built up. And then we come into some fascinating project like ARCnet and word of mouth. How did we find you? <addressing John Murphy>

John Murphy: I found you.

Jonathan Schmidt: That's right.

John Murphy: From the magazine article about Vic [Poor] after I'd gotten my rejection letter from the personal department. <Laughter>I had applied months before, but they informed they had no need for anybody with my skills.

Jonathan Schmidt: Skills. Somebody could do everything. Analog, digital program, write, radio, ARCnet needs all those technologies. It was interesting. It merged them all together.

Len Shustek: Now was it a policy of yours to try to hire younger engineers rather than more experienced engineers?

Jonathan Schmidt: Oh yes, he was a baby. You can tell that. <Laughs>

John Murphy: mid thirties.

Jonathan Schmidt: Anybody who is fun. It was interesting. One of the techniques I used as a litmus test; would be to walk through the lab and show off what we had done. And I would intentionally show off mundane stupid stuff. And I'd show off some really hard to understand stuff. And if they go, uh, to the mundane stuff, yes, okay. And they need something, say, "Wait a minute, how does that work?" Then you got a job. And if you'd show off mundane stuff and they'd say, "That is so good." And I'd say, "You are so out of here." <Laughter> So that it didn't matter how old you were. There were people of all ages, just if you had- there was this energy. People like, you know, Lewis liked you or Henry liked you or John liked you, and it's like, hey that guy is pretty cool.

Len Shustek: So it sounds like you were also not always hiring to fill a position. If the right person came in you'd somehow figure out how to...

Jonathan Schmidt: I'd say 80%. John was one of the few. We're getting into this area. We need somebody who finally knows what he's doing, you know, like a professional engineer.

Henry Donzis: But you were just starting in engineering. Remember Gary didn't work for you. Just started an engineering group with Gary and Burkness.

Jonathan Schmidt: That's right.

Henry Donzis: That's the whole thing.

Jonathan Schmidt: Yes, Burkness. That's also when Joe Reynolds, you locked him in the closet cause he...

Henry Donzis: Yes.

Jonathan Schmidt: Henry Donzis was playing pranks on everybody. He didn't like you, he'd say, "Come here, I want to show you something in the telephone closet." And you'd go in there and he'd lock the door and that'd be it. You were locked in until somebody took pity on you. But that was quite a group. Gordon Peterson who wrote the software for ARCnet, and who came up with some brilliant innovations as well converting to DOS really so that you could use resources other than networking. One of his biggest things was realizing that all the shared resources had to be locked during the course of the transaction and to guarantee the bypassing of deadly embraces, and have it on a universally applied solution for all the resources, file sector, whatever you wanted. It was terrific. And Gordon came up to me at one of the Fall Joint Computer Conferences, and he walked up clutching this bag, a paper bag, a really old, brown paper bag. He walked up to me with his long hair, and he looked up and he said, "Are you Jonathan Schmidt?" I said, "Yes." He said, "Now so and so told me to come see you." I said, "Yes, what you got there?" "I have software." <Mimicking softly> And he started talking and I described what we wanted to do. And he said, "Oh yes, I've got some ideas." And then he never stopped talking. He never stopped talking until people finally said, "You know, why doesn't Gordon work at home?" But he kept on. And if you ever talk to him you'll have a grand time. He's got the theory about cars have to be eliminated from the earth. He has some grand schemes, and it all makes a lot of sense. Gordon thinks a lot. But when he thought a lot about how to make a network work, he thought about all the problems. And he really did solve them all. It was unique. So this is the kind of person. When he came up to me with this paper bag.

I couldn't say go away. Wait a minute tell me more. Then it became very interesting and he was hired. So I'd say about three quarters of the people were hired that way.

Len Shustek: And you were kind of a new class. I mean it wasn't like when you came that point you didn't come with a group. And the group kind of started then, right? These people...

Jonathan Schmidt: Yes.

Len Shustek:... that you have worked with since then.

Jonathan Schmidt: The group was a nucleus. You know, I was just the first bubble maybe.

Henry Donzis: Group, yes you probably didn't have job seeking interviews or whatever come and, you know, maybe like for your secretary or something like that.

Jonathan Schmidt: No, Les Abrahams maybe when he came in he was in an interview.

Henry Donzis: Uh-huh.

Jonathan Schmidt: Lee Greenspan. I don't know she may have come in. Her husband worked across town, and I don't know how she applied.

Lewis Donzis: Like people came and demand a job.

Jonathan Schmidt: There were about half women, half ladies and half men in 1971.

Len Shustek: But how large was the whole company around this time?

Jonathan Schmidt: When I joined, I think there were 40-some people. And then when I left there were more buildings in San Antonio, and there were people in the company when I joined. There were 12,000 at the end or at the peak I should say, the early eighties.

Henry Donzis: About 5,000 in San Antonio, think.

Jonathan Schmidt: 6,000 in San Antonio. And maybe there were 3 or 400 in the early seventies. Then it grew quite rapidly.

Len Shustek: Talk to us about the culture of the company and what as important and how many people really enjoyed their jobs.

Jonathan Schmidt: Each part of the company was different. The customer service was more military oriented. You know, I mean it's structured. You got your duty. You got your case. Yes sir, you got your

beeper. Yes sir, go. And the factory tried to be disciplined. They finally locked up the parts department because Henry had such an appetite for parts for his projects....

Henry Donzis: That was back when LED's were sort of like expensive.

Jonathan Schmidt: And Henry was building six-foot high LED clocks. And so they locked it up. We were the most notorious pilfers. And so they locked it up, and wouldn't let you out of the building with parts. So Henry took his stash of parts and went up on the roof, and lowered them down. So that was the kind of problem we were dealing with. And then of course I would get Henry reported. Somebody would report him, and I'd say, "Ha, you go tell him he's not supposed to do that."

Lewis Donzis: So he went up in the ceiling and the police came.

Henry Donzis: I remember...

Jonathan: Yeah.

Henry Donzis: They put a little guard key right outside my office door. You know, the station, they had the...

Lewis Donzis: The station...

Jonathan Schmidt: The station clock.

Henry Donzis: Yes. And I didn't want this thing right outside my door. And I took it off and hid it or something like that. And I don't remember what happened. All I remember is Dave Monroe coming and begging me to put the key back, and he had to call you. And you had to beg me to put the key back up on the wall.

Jonathan Schmidt: Yes it wasn't all roses. It was interesting. But I, I mean I know I participated too. I remember the time that the guard in the front of the building started wearing a gun, and I knew the company policy since I was a vice president in executive meetings. We weren't supposed to have a gun. So I came in, I said, "You know, take that gun out." And he said, "I will not. Cold, dead fingers, and pry it off." And said, "Get rid of that gun." And he said, "What are you a wuss?" I said, "Wuss." I said, "You know, psychological profile of those people who are gun fanatics is to make up for their innate ulterior, or alternative predilections. And he said, "Say that again." And I put my finger right near the gun. And I said, "Get rid of that gun." And then he started chasing me. Ran upstairs and I locked myself in the office, and, it's a big thick glass door, locked it. And then I gave him a moon job. And he was so mad because all he wanted to do was shoot me. And we got rid of the gun. It wasn't appropriate to have a gun in those days as a guard. But we were all a little bit prankish. We were known for that. And they put up with us because we made them rich.

Len Shustek: Right. But while they put up with you was there any pressure to, "Grow up," I mean kind of we want projects, we want five-year product plans? I mean from other elements in the company perhaps that...

Jonathan Schmidt: We gave them plans. Actually we were not too far off schedule.

Lewis Donzis: They did. We were insulated...

Henry Donzis: Jonathan shielded us. That was the thing though.

Lewis Donzis: Yes, he would go up to customers and promise them stuff. And then he'd come back and we'd figure out some way to make it work.

Jonathan Schmidt: Right. That was always a way.

Jonathan Schmidt: "Could you figure a way out to go from 16 users to 6,000?" That was the way the products were done. And I usually went out the Bank of Brussels or Ford of Europe and find out what they needed. And there were others like Les Staples. Les went down to the Dairy Board in New Zealand, and I think that was the beginning of the 1200 asynchronous modem and 1200 baud.

Len Shustek: What group was he part of?

Jonathan Schmidt: He was with me for a while. Then there was a communications group or something he was with, right. It moved out. They'd actually specialized in that. But we would actually find neat guys with the customers, and do a lot of dinners and hang out with them, and find out what their problems were. And they were often users of the equipment. We'd ingratiate ourselves by, "What's your biggest, little problem?" And then I'd call back, and Lewis said, "I can fix that". He'd download and then fix a little problem, "Man you guys are great." What's your biggest problem you pay a lot of money for? And then we find that out and work out the solution they really needed.

Len Shustek: That sounds very much like a product marketing type function. But you're an engineering group.

Jonathan Schmidt: R & D group.

Len Shustek: R & group.

Jonathan Schmidt: There was a separate engineering group.

Henry Donzis: We did not do anything cost effective or you know, whatever engineering was.

Jonathan Schmidt: We just did the neat stuff.

Henry Donzis: We cranked stuff out right and left.

Jonathan Schmidt: And of course the engineers had to work and work, and grind, and grind, and document, and attend meetings.

Henry Donzis: We did things that were too expensive to make or you couldn't have made more than one work or something like that.

Jonathan Schmidt: Right.

Len Shustek: But then were those transferred over to the engineering group.

Jonathan Schmidt: Sometimes. Yes. Right.

Henry Donzis: And sometimes they just died.

Lewis Donzis: Yes.

Henry Donzis: A lot of them they couldn't even figure out what to do with it. We had this mechanical guy, Stan Klein, the first light link has an iris on it, a fully open- close, so it could go to any focus. Because you needed that. That's how it would focus.

Jonathan Schmidt: And then _____.

Henry Donzis: And also for sunlight blocking too. So you got everything you wanted. It was all in the software control. Well he actually laid each individual little crescent-shaped thing with little sliders on them. When we took it over the engineering, "They don't make anything like that." So their whole answer was they made a lollipop and a servo to pull the thing back and forth. So they did focusing by actually pulling the receiver back and forth, and this lollipop to either partially block or fully block. There was a magnifying Fresnel lens on the front of the thing. And the sun could burn up the inside of the thing. So the iris would let it work. The iris was really good. I mean the thing worked really good with the iris in it, and it could close down real small and still be working. So they had to come up with this idea that if it got too bright, they pop the lollipop in front. And of course the thing shut down at that point, but it was protecting it from burning up everything inside. And those were the kind of engineering changes. I mean we made stuff that was just so elaborate and beautiful and elegant. And it wasn't like a lot of the cost effectiveness stuff. It's not like they turned it into junk, but the difference between being able to be fully creative and make stuff that was ideal, and having to make something that the company could sell.

Len Shustek: But those things that you made did you- if they were one offs, did they go to customers?

Jonathan Schmidt: A lot of times. Sometimes they went to a customer to test. If the customer really liked it, let's say like the ARCnet, then we'd go through another revision, and John would trim it down, and

we'd maybe change the level so it would go farther, whatever has to be done. And John would work on maybe with the guys making it into a chip.

Len Shustek: Tell how'd that started. The chipification.

John Murphy: The chip?

Jonathan Schmidt: Did we call it Internet originally?

John Murphy: You know, I don't remember what. I really didn't have much to do with that. Somebody decided that there ought to be a chip, and they hired several people to work on that, went through several rounds of consultants, and...

Jonathan Schmidt: That's right.

John Murphy: I don't remember how many rounds of consultants.

Jonathan Schmidt: Guys with HP calculators, right.

Henry Donzis: Well the other thing too is that, you know, perfect example between the FRIL and the RIM, I guess was the transformers between them I think. I don't remember. I guess we were hand winding transformers for the FRIL. And when we wanted to make something that was good for production, and I had no idea FCC or anything else we were possibly interested in. But you know, the RIMs used to more- I don't know whether to use the catalog, transformer or something.

John Murphy: I think we had catalog transformers from the beginning. The original one we did in the lab. We tried to be super conservative and there was an impedance matching pad between the line and the electronics. And there were current limiting resistors to make sure that no parts were ever over-stressed. And it put a very square pulse. We sent it to engineering and they decided they wanted more signal level along the line. I don't remember why.

Jonathan Schmidt: And we're respectful of the FCC. The engineers says, Eh, and they just cranked it up. And...

John Murphy: Well they came up with something very clever, they went to a center tap transformer. They got a whole lot more signal on the line. They ran into the potential problem of driving both ends of the transformer at the same time. And to avoid that they put a narrow step into the signal, so that instead of a di-pulse it was a pair of opposite direction pulses with a step in between.

Henry Donzis: Very small step, right.

John Murphy: That step created FCC problems. And so that resulted in having to have Central Florida Technical Services, who did all of our analog filter design for everything from disk drives to ARCnet,

design a filter to shape the transmit power to get the thing legal again. I wonder what started that off? All of a sudden more signal on the line and a less sensitive receiver.

Jonathan Schmidt: It was easier.

John Murphy: It may have been noise immunity. They had a test with a set of lights like you see at outdoor festivals and carnivals, the big, gross-looking, heavy wiring of a light every few feet strung all the way around the center core of this engineering building, on the floor where I'm amazed we didn't have people stepping on them, round and around the circle with ARCnet quacks woven in and out all around. This was their test system if they could— I don't know what kind of noise spikes they put on there.

Henry Donzis: A thousand feet, wasn't it? It was like a thousand feet in a single room.

Jonathan Schmidt: And the other test was they ran the electric drill through the shield.

John Murphy: Yes we did that in the early days. We would rig up an extension cord where one leg of the extension cord was the shield of the co-ax running around the building, and run a drill while we were transmitting data through the line, you know. Yes, they seemed pretty reasonably noisy, you know.

Jonathan Schmidt: There were things we hadn't thought of like I remember the ARCnet going between buildings. And I went over to go plug it in. I held on the cable for our system, and then I touched the other cable. <he jumps in his chair>

Jonathan Schmidt: And I think Henry said, "Wow, there's maybe a little voltage. There can't be enough current." I took a light bulb and it lit up bright, a 100-watt bulb. Could've killed him.

John Murphy: Between the building ground?

Jonathan Schmidt: The two building grounds, right.

John Murphy: I remember getting bit going down the other end of the building to connect something and getting hit. No, it was on a lab bench. I reached across the bench and I thought that a piece of shield had punctured my hand. And I looked. Well that all looks clean. I touch it, and, my gosh that shield is hot. I think it was a scope probe, and I pulled the scope and the trace disappeared., Click, and minus 1,500 volts on the shield. And it turned out at the other end of the building, I went down following this cable behind Doug Hilton's console down there. And as I'm walking around the console Doug said, "Careful not to touch any metal in here." You'll get bit. <Laughter>

Henry Donzis: The whole system.

John Murphy: The whole system. It turned out the third wire ground in the wall had never been connected, and there was a faulty terminal on the bench that the CRT voltage was on ground. So there

was minus 1,500 volts on this whole bench that he was working on, and he was... never bothered him. That other end of the building... <Laughter>

Lewis Donzis: Then he had the nerve severed in it.

Jonathan Schmidt: Lewis and I were given a demo of one of our power servers and backup tape systems. And the backup was in a little auxiliary box with a SCSI connector on the back. We were giving a demo. Dartek was in Denver I think, and we took the cover off to show something. And it was just fiddling around. All of a sudden Lewis flew across the room back into the double doors, bam! And I said, "Whoa, what did you do? I thought you slipped on something, but he went like 20 feet. And Lewis says, "There's something. I don't know what. Put my finger in there. There shouldn't be anything in there." I said, "There's nothing in here," and I hit it. And I went back 30 feet right across the floor into the double doors, bam. And Lewis said, "See." Yes, we've had our share of it. < Lots of laughter>

Jonathan Schmidt: Yes we've had a great deal of fun.

Len Shustek: It's remarkable that you guys have been together as an engineering team for what, 25 years?

Jonathan Schmidt: 30.

Lewis Donzis: 30

Len Shustek: 30. With differences in personality and differences in ages I can't think of another team that has lasted that long. How do you explain that?

Jonathan Schmidt: Well, you know, recently Vic Poor who is now 70-something was in it. And I'm 62 and you're 60. < looking at John>

John Murphy: 61 Saturday.

Jonathan Schmidt: Hey.

Len Shustek: Wow. What's the magic here?

Henry Donzis: Nothing else to do in this town.

Jonathan Schmidt: Right, it's a very small town. If you want, go rent Diva Max and go look at what it was like back then here.

Henry Donzis: There was a national grocer.

Jonathan Schmidt: Yes we had a good time.

Len Shustek: But are there lessons that you can export I mean to- what you would recommend to other people who are starting a company, that have build a, you know, an enduring relationship?

Jonathan Schmidt: That's a good question.

Lewis Donzis: You know, I've never even thought about why that was valuable until we got into much bigger companies, and interacted routinely with other groups that were experiencing very high turn over especially in your neck of the woods, where in the heyday there was 50% turnover in the departments. And it was just stifling, I mean the amount of work that they could get done. Nobody knew anything about the project, and not when people knew each other or what they were capable of or what their strengths and weaknesses were. How you do that again, I...

Henry Donzis: I think there was a couple of things. Numbers one it start at the beginning was, it was, not as many people who came and interviewed at Datapoint as a whole. In R&D, you start out with people that Vic knew and Jonathan knew and roommates, and cousins of roommates, and whatever to people like John Murphy and even Gordon and a few other who heard about things and thought it was interesting. So it was not people just coming looking for jobs. I'm sure there was a few of those, and you know, especially when software development got a little bit bigger with Bill Swanson. But most of the time you weren't publishing for a position. You didn't really post positions in his department. And therefore people were coming in, you know, resumes and stuff...

Jonathan Schmidt: Ted Nelson in Xanadu Group®, you know, just wandered in one day and without shoes, and without anything except ideas about hyper links. And they hung around for years. You know, and they just hung around.

Lewis Donzis: Didn't we buy some company that brought Mark Miller and...?

Jonathan Schmidt: We got Mark and Stuart Greene somehow.

Henry Donzis: I thought there was some group that...

Jonathan Schmidt: Wasn't that Charles River?

John Murphy: Charles River Data System for us.

Henry Donzis: No, no. No, no, no, no.

Jonathan Schmidt: There was something to do with Xanadu

Henry Donzis: Yes maybe it was.

Jonathan Schmidt: I think we bought Xanadu. We actually did, yes. I don't think they remembered. I bet you we really owned them. They didn't know that. They didn't care, you know. They would come and go.

John Murphy: And as it turned out we didn't either, you know.

Jonathan Schmidt: Remember my aunt used to call me ephemeral. I stepped on her toe, and my mother said, "No, that word means coming and going like the clouds." I said, "Oh." And they were very ephemeral. Whether they were there, even if they were they didn't know it, we didn't know it.

Len Shustek: Who made the decision to buy them? What was it for?

Jonathan Schmidt: Vick Poor and I.

Len Shustek: What did you expect to get out of that?

Jonathan Schmidt: Actually Mark and Stu was part of it, and we got a lot. We never heard of Windows, didn't understand. They implemented Windows on our text, the graphic subset of the text. And that was resized, having great multiple programs in the same screen. And that was like 1981 or 1980?

Henry Donzis: Uh-huh.

John Murphy: Didn't Klaus discover that originally?

Jonathan Schmidt: No, he interpreted it though.

John Murphy: Oh.

Jonathan Schmidt: He was a great interpreter for he would tell me what that really meant. And cause we had no shelf space...

Lewis Donzis: So he doesn't speak English?

Jonathan Schmidt: K-l-a-u-s < spells>? And what a wonderful guy. He ended in writing so much. He was over in Denmark.

Henry Donzis: Remember we brought him over to translate the- there was a program that the comments were all in...

Jonathan Schmidt: Danish.

Henry Donzis: Danish, and we didn't...

Jonathan Schmidt: And then we- and he said, "What you really need is your not just index, but index sequential so you could always get to the next record." And he said, "Okay," he said, "I'll write it." That's what happened, he came and wrote index sequential for the hard file system.

Henry Donzis: That what ISAM is._____.

Jonathan Schmidt: So we hired him. And we had to get work permits for him. And it was opportunistic. Whoever walked through the door they- interestingly I tell you, you asked a question. We had the freedom to hire people that ordinarily wouldn't come through the personnel department. You know, I mean now there's nothing wrong with John. John was actually over qualified for anything that the engineering department had asked for. Klaus had all strange attributes, but was brilliant. Ended up writing some of the kernel of our advanced operating system, really advanced! He was the first one I think to implement the Miller columns, the three columns shifting.

Len Shustek: Tell us about it. Where did that idea come from, who picked it up...?

Jonathan Schmidt: That was Mark Miller, and it started with part of the window thing. And he said, "You don't have any perspective where you do a directory. You can't see what's going on. You have no idea where you are.

Henry Donzis: And those screens didn't have side scrolling either. He implemented side scrolling commands.

Jonathan Schmidt: He implement side scroll, and the hardware to be able to do this. And he said, "You need three windows. The one in the middle shows you where you are, and the one over here will show you where you've been. The one over here is telling you where you can go. And then you can like zip around and you never get lost. And because we're implementing structures, networks, which are tree structures, file systems, which are tree structures, both which are tree structures integrated with each other. You need this. And when he started talking tree structure this I wasn't ready for this. But of course he'd show me. I didn't understand windows. Mark would talk about using a mouse. Huh? You know, and we had a Lisa and not understood.

Len Shustek: Did you ever have conversations about possibly patenting those sorts of notions like that?

Jonathan Schmidt: No because- well some of that. With the Miller columns we should have. That really was Mark Miller's invention. He wrote up a whole dissertation inside the company on why it was a good thing. And of course when you don't have any shelf space in your brain for a concept like that, you say, here is this kid, he doesn't wear any shoes. We had a social and a formal thing, and everybody had to wear a suit. And so Mark came in with bare feet, with a suit. Remember that, his big huge white feet sticking out. That will show you. You didn't say, "Sudan Shoes," but that was the kind of people that otherwise would not be hired I think, you know.

Henry Donzis: And the rest of the company.

Jonathan Schmidt: And the rest of the company or other companies. So you asked what was unusual. We had the freedom to hire people. As long as we were responsible for them, and we'd get rid of them if they really weren't any good.

John Murphy: Well Mark was the one that I remember when he filled out an employment application. There were things like, you know, what languages do you speak? And he put Fortran, Cobol. Do you have any vision problems? It was very shaky so that you couldn't read it, "No I don't think so". Have you ever been arrested for a felony, "no". Describe in detail, "Never been caught". It was totally irreverent. And in fact I remember Les Staples came into my office, and he laid this form down in front of me and said, "Have you seen this?" So I said, "No, I haven't seen this, but I know who this is about." He said, "Can you imagine somebody coming in here and trying to get a job like that?" And I said, "Well I can't imagine him submitting one to you since Jonathan hired him yesterday." <Laughter>

Jonathan Schmidt: But Les was very irreverent. Les had this idea, our modems go 1200 baud, but faxes go 9600 baud. Our modems take a board full of chips and a fax uses a chip. Let's make a modem out of a fax chip. So he started Data Race, and they were the world's largest supplier of modems to laptops, like the IBM 701 butterfly keyboard. It had a complete full duplex, full training audio sub system with full duplex phones. And the modem went 19-2, and it was all done in Les's company. But they started out by saying, "Gees," and so he left Datapoint started this company based on- to provide asymmetric.

Len Shustek: Let's talk about the other side of that coin. So how did you keep the team together when I guess people would have great ideas and were being asked to go...?

Jonathan Schmidt: They weren't asked to go. I mean if you wanted to go you went. But I mean for the most part there was nothing else in San Antonio. That was the secret.

Henry Donzis: Well Datapoint did want it. Inside R&D like I built so many things. We did color screens and what you call, scanners and fax, and a robot, and things that were never ever going to be- you didn't feel like you needed to go somewhere else to develop it further. I mean first of all, I think I was too young. But I didn't care whether Datapoint produced the thing or not. I didn't care whether they made light link or laser printer or any of that stuff. The first laser printer we made was this big, huge monster with belts and stuff, double sided and trays and things, and whatever. And it was just so amazing and so impractical.

Jonathan Schmidt: Wait a minute, you know, the most important- you see most engineering departments say "oh you can't do that". So the most important thing I remember is a phrase I use most is "to prove that it can't not be done". And you would prove that can't not be done, and then at least they couldn't stonewall you. Anyway we would make these products, not products. We would make these demonstration models of things to prove that it couldn't not be done.

Henry Donzis: You know, the difference between what's for a company where you have an idea and they're not interested in your idea, and that's where maybe you want to go form- Dave Rose is a perfect example when they weren't interested in his video filing system, but he was high enough in the company to want to turn that into a product. Did he actually work at Datapoint as a consultant?

Jonathan Schmidt: He even leased lab equipment to us.

Henry Donzis: Yes, but you have to have an idea and want to see it go somewhere to be a product versus having ideas. You know, I don't know a lot about Xerox Parc, but the thrill of just building stuff and trying and accomplishing and whatever.

Lewis Donzis: Well there's no problem with management.

Henry Donzis: And if you had an idea in our group to try to see something work or do or whatever you went and did it, and you showed Jonathan, and it was oh great. Well, you know, that was, you know, can we do something with that or...?

Len Shustek: How do you all feel though when that environment came to an end, all this presumed excellent, or at least financially there's a lot of support, equipment, toys, and the dream is over. Datapoint is rather (interrupting), and now you guys are all by yourselves.

<Simultaneous speech>

Henry Donzis: (Interrupting) started the same environment...

Jonathan Schmidt: ...Moved across the street.

Henry Donzis: I have to say though, I remember the meeting where Doris Bencsik was in charge of our department, and John Murphy was still there, and I was there, and a half a dozen other people. And she goes in and she says, "You know, I still want to have an R&D group, and they're going to keep doing stuff and whatever." And Jonathan knocks on the door and says, "Would you like it if I came in here to help make the transition better or something like that"? And she's like, no, get out.

Jonathan Schmidt: She said, "We have no need for you anymore Jonathan".

Henry Donzis: Yes exactly.

John Murphy: It's incredibly rude. And as I recalled that was the day that she said, "Well, we'll do it my way for six months, and if you still think that it's not the right way well we'll change things around." And don't think there was anybody in that room that still worked there six months later.

Henry Donzis: And that they knew it that day.

John Murphy: Oh yes, yes.

Henry Donzis: We already knew that day.

John Murphy: If you didn't have your resume out by the end of that day...<Laughs>

Henry Donzis: And that's really when you say what kept us together. I mean only a small portion of us stayed together. There were a lot of spinoffs.

Len Shustek: Spinoffs?

Henry Donzis: And everyone was friends with everybody else, but that is a perfect example of changing the department to something where it's still the same people and the same everything, and nobody wanted to work there anymore.

Len Shustek: So what caused that to happen? Was there a mistake that somebody made that changed the course of the company?

Jonathan Schmidt: The company was getting old and sporadic, and...

Henry Donzis: Mismanagement.

Jonathan Schmidt: They stopped working, and people who were in charge get really in a conflict of interest. For example in Nortel, I understand right now some executives were let go because they shuffled revenue in and out of reserves to emphasize the profits and the quarters from which they maximized their bonuses, and the same thing happened in Datapoint. There were stock options and profits to be forced in the quarters to maximize the revenue. And that of course was known by everybody., I didn't get rich, but a lot of people did, very, very rich. And then that...

Henry Donzis: I think it was the vision of the company too because you remember they were into this next phase, the electronic office. Everything was going to be paperless, and they were so sure they've got the whole company that this was going to be the right thing to do.

Jonathan Schmidt: And now they've got the whole company under phone exchange.

Henry Donzis: Yes. Well that's what they would...

Jonathan Schmidt: But they would have, you know, they would have executives. The compensation was wrong. We really didn't know that much about it. We were all isolated. We didn't get rich. We didn't get poor. We just had fun. And we were called the Ivory Tower. And the more that this went on, the more they really didn't want to pay attention to us.

Henry Donzis: That's exactly right.

Jonathan Schmidt: And nobody really wanted to harm us, the goose that was laying the golden eggs. But they didn't want us in their face either.

Henry Donzis: Well that's the thing. The higher up people had made some good choices in the past, and they became sure that they knew that every time they had an idea it was great idea. I remember when O'Kelley, told Vic that they didn't need him., That O'Kelley had the vision and, Vic wasn't on the same path.

Jonathan Schmidt: Yes it's...

Lewis Donzis: It happens to a lot of companies when they get ...

Jonathan Schmidt: And then there's the Bernard Baruch syndrome. If you're rich you must be smart, right. So they were successful rich executives who got rich in other places, from their options we brought in- they got rich once, they're going to get rich again, and we'll go right along with them, rising tide floats all boats. There was a very diffuse set of goals and nothing, no cohesiveness. All the companies seem to have survived, I mean to suffer from that. And they're companies you don't see anymore. There's DEC or Data General, or Wang. I mean some of them have survived in another form. Somebody picked up the pieces and had the good guys who took whatever they were experts in at the last possible moment before they drowned. And that's what they become. Univac is not the same company anymore, but...

Len Shustek: Yet there are other examples of companies that have managed to survive for a long time with maybe still good cultures. HP, here's an example. That's a company that's been around for many years.

Jonathan Schmidt: Right.

Lewis Donzis: They have a point though to entirely dismiss the PC phenomena, and spent many years trying to make everything, not just computers and all the software that ran on them, but the printers, disc drives...

John Murphy: Furniture.

Lewis Donzis: Everything. I mean all of, you know...

Len Shustek: So that's a different kind of mistake. That's a product planning mistake.

Jonathan Schmidt: But interestingly enough the company, like HP, well you know, there's Compaq and others, Dell. Again if you do things right and you focus, HP came out of a culture of some really elegant hard working engineers and their audio oscillators in the garage.

Henry Donzis: That's the thing. Think of the fact that HP spun off their test equipment. To me that's HP. HP computer company, but to say really HP is the test equipment company.

Henry Donzis: So I'd say that really that HP, it's not is not, you know...

Jonathan Schmidt: It's Compaq. But yes, most of the companies, especially the ones that shot up fast, fall fast, and who knows there wasn't enough time to build a culture. And if there was enough time to spend time to do that they might have stifled the thing that made them go up. So maybe it's just a natural phenomenon.

John Murphy: Well it seems to be there's some sort of critical mass size where the company is successful and they get so big that- who was it, Stu Green who said that "All the guys sitting around eating ham sandwiches at lunchtime trading good ideas with each other, that just won't manage the company anymore. And we'll start trying to bring in professional management. And that always seems to be the end". Engineers can't run the company over a certain size. But neither can anybody else. So, you know, it's either they don't make any big mistakes, and they coast along for a few years or they fall apart.

Jonathan Schmidt: But it's not sad, you know, it's life. The flower comes in the spring, and it dies in the fall. Another flower comes and there are lots of spinoffs from Datapoint. So of many respects, you know, only the name is gone from people understanding it's still... <inaudible>.

Len Shustek: It just seems there's been to me a consistent shift across the industry to no longer be able to afford internal R&D groups, which you guys were. Starting with Bell Labs, and you know, going across American industry.

Jonathan Schmidt: Xerox Parc.

Henry Donzis: I think the industry by the way, not to get away from your question, in San Antonio in particular benefited greatly. I mean Datapoint may have fallen, but all Datapoint wanted to do was make a Datapoint computer. That's all it did, in fact all these great things, other ideas. The number of spinoff companies that really brought about great innovation that wouldn't have happened if they had not being content staying at Datapoint. Datapoint certainly had a lot of innovation, but very focused, a lot more like Apple that they want to keep everything all together in themselves. And if it hadn't been for the downfall, and even like people that went off in California and whatever from Datapoint, and in foreign countries too.

Len Shustek: What are the blind spot? So one story, you know, my focus around the financial shenanigan's part, so that's what screwed up the company. Another story I might say, "Well it missed the PC revolution and didn't get behind that."

Jonathan Schmidt: But there's always going to be a...

Len Shustek: There is other...

Jonathan Schmidt: You know, you have a good point. There's always going to be a revolution, and if you're a PC company and you miss the server market or which Dell didn't and HP didn't, okay, then you may not be around. So there's always something, and I don't know what the magic sauce is to let you take advantage of it or be able to take advantage of it. But if you don't, then the opportunity is gone, and you wither and die. So in many respects maybe you always have to wither and die, and if you don't remake yourself into something different, even though the name is same then...

Lewis Donzis: Yes, exactly it's not just Datapoint.

Len Shustek: When were the doors closed?

Henry Donzis: Long after we left. I don't know <unintelligible>. It moved itself back to Paris as its headquarters for protection for a while. <Laughter>

Jonathan Schmidt: The corporate raider, Asher Edelman that's where he lived.

Henry Donzis: Well he got protection by moving. It wasn't the US company anymore, corporate headquarters to Paris that gave it some kind of protection. Not that I know the story exactly, but a group of original Datapoint people, original as in more recent times, Allan Weiss and I don't know who else bought back the software assets of the company and started Datapoint USA. ...

Jonathan Schmidt: There are still a few people running it. It wasn't long ago that the Bank of Brussels sent a bug in from one of our add-on Datapoint network products to John Murphy. And I suspected they're still using our products.

Henry Donzis: Y2K things and whatever.

Jonathan Schmidt: Yes, those are...

Lewis Donzis: Well none of the other many computer companies or you know, it wasn't just Datapoint. Wang was gone, DEC.

Len Shustek: Well John tell me you really come across. You made your peace with the way these things came out and so on, and seem to as you said, you know, cycle a life and move on. But when you think about Ethernet today and all those gazillion chips and devices, I mean you ever say, "Gee we could've been that. We should've been that. Why didn't we do this?"

Jonathan Schmidt: Well wait, who is that? Who is that, Netgear? Ninety-eight percent of all Ethernets probably come out of China or Taiwan or both.

Henry Donzis: Well I guess if he's talking about royalty for the chip itself <interrupting>.

Jonathan Schmidt: Right, you know...

Len Shustek: Pride of ownership. Pride of ownership as...

Jonathan Schmidt: Oh I think we're happy. I don't think anyone here doesn't think that we were blessed.

Lewis Donzis: Well I don't know. I think what probably is largely responsible for the success of Ethernet is adopting ARCnet's physical wiring. The co-ax for daisy chaining changed Ethernet because Ethernet was very fragile before that.

Jonathan Schmidt: Actually I was giving a lecture about ARCnet versus Ethernet at one of the computer conferences, and a Synoptics guy came up he was also lecturing. He says, "You know, we actually have ARCified Ethernet.

Len Shustek: Was that program that you had, not just the wiring pad it was some other features that have been adopted, totally switched around anyhow.

Jonathan Schmidt: Well I mean what you have today isn't...

Lewis Donzis: It's not collision based any more either.

Jonathan Schmidt: Right. You have a more fully switched network. You don't have a water hose in the ceiling with marks every 10 meters.

Henry Donzis: They just don't have token passing which is obviously a benefit too, and it's <unintelligible>.

Jonathan Schmidt: Right. But, they've taken what you have, the current LAN is the best of all the worlds. The foresight that Metcalfe had that made Ethernet internet compatible...

Henry Donzis: It made a major resurgence because the fact of the matter is, between ARCnet and then Token Ring, and stuff, for them to come back and make it 100 megabit and point to point, and full duplex, and switchable and everything. It's like when Pioneer made the laser disk and it was almost going out of business as RCA bought everything. But then the CD came out instead. And so the format of using a laser diode to read the disk, the laser disk made a big come back. And I think that's the thing with Ethernet too is if it hadn't been for the fact that they- I don't even know who decided wow, we need to save this thing.

Jonathan Schmidt: Well Yes. The Ethernet you have today is nothing at all, almost nothing left of what Metcalfe did. And it's probably some things that were good about token ring, some things were good about ARCnet. Some things are good about Ethernet, and stuff to accommodate Internet. And...

Henry Donzis: They did ARCnet Plus to make it faster. But it wasn't enough to save it. And then Ethernet made it, you know, from 4 to 16.

Jonathan Schmidt: I know we had no real regrets. That's the way it was.

Len Shustek: An active hub?

Jonathan Schmidt: Huh?

Len Shustek: An active hub

Jonathan Schmidt: Yes <inaudible>.

Henry Donzis: Actually, having management, that was one of the biggest thing with ARCnet when you would start getting recons, or you did something wrong and you'd get recons, well am I crazy. You try to pin down where that came from. You had no choice but to unplug cables until you find where that was coming from. At least now with managed switches and stuff, of course when we made the smart Rim I think that was one of the things you were going to be able to do.

Jonathan Schmidt: We were all solving the same problem.

Henry Donzis: But, you know...

Jonathan Schmidt: All the same problems got solved.

Lewis Donzis: I don't think it matters who owns any of that....

Jonathan Schmidt: I guess what really the deal is, if it matters then you get to write a column in *Info World*.

Henry Donzis: What I think is funny thing that he touched on about Datapoint was this company that was very focused to its detriment in the long run. And he was talking about remaking. And I was just thinking, because we have been together so long, with the second PT<Performance Technology> was the fact that we did remake ourselves over and over again.

Lewis Donzis: With the second one.

Henry Donzis: I'm sorry the first PT...,<Laughs> It's that company that we went to when we formed Performance Technology and the fact that we did stay together so long. You're talking about a company that started out making Datapoint products, got into PC networking, Internet networking, and was able to- I mean that's completely opposite. Datapoint may have added...

Len Shustek: Usually try to ride the waves of the industry. Datapoint was going to...

Henry Donzis: Yes, you're talking about going completely different. You know, give up what product line and go a whole other...

Jonathan Schmidt: No, we actually got into a room and said, "We gotta give up what we'd done. I mean we're going to ride it for another few years, but that's death. And then we figured out everybody we could find... Who was the guy that did the PCA ? < addressed to Louis>

Lewis Donzis: Oh, that wasn't PCA. It was Carbon Copy. Les Freed.

Jonathan Schmidt: Les Freed, and Frank Durfler, and Ken Kylie, and Vic Poor. We had this whole room trying to figure out what to do, and we came up with what to do. And then as soon as we did of course Henry went off and made one inside that R-6000 because he didn't have to solder anything at that point. We made a virtual one. Henry made virtual things inside that R-6000 every now and then.

Lewis Donzis: That's 'cause that was a real fast computer.

Henry Donzis: The only one in Dallas, like oh my God.

Jonathan Schmidt: And he made his thing, and then all of a sudden my PS-2 on ARCnet got on the Internet.

Henry Donzis: Oh that's right. I had in my office running on a pocket ARCnet. Do you remember the things that you'd screw it on the parallel port and you'd screw it on there. And I had a RIM driver so that I virtualized a pocket adapter into an ARCnet driver. They would run with lets say, ATA NetBios or something like that, and get you on the Internet where first of all interneting of ARCnet was virtually unheard of. I mean there is no real, you know...

Lewis Donzis: Internet on PC's was largely unheard of.

Jonathan Schmidt: Yes, this was at the- right when Lewis ordered the Sprint Internet feed. We're customer number 19. What's your handle?

Lewis Donzis: LD-9.

Jonathan Schmidt: LD-9, right. So I mean that's Lewis Donzis 9. So this is when this was all happening. Go ahead Henry. You made...

Henry Donzis: But there was Datapoint and most companies are willing to come out with newer and newer. It's like HP getting into the PC business and making a whole PC business out of it and taking that office out of the company. That's remaking yourself. And Performance Technology until we became Bay Networks and become only interested in the Internet, we could remake ourselves to start another company. But as Performance Technology when something dried up we used technology from what we'd learned to the next product...

Jonathan Schmidt: But, you know, the kept remaking the product. There was the Novell gateway through...

Lewis Donzis: To a net router, to a VP...

Jonathan Schmidt: Switch.

Lewis Donzis: Devise that...

Jonathan Schmidt: It was the largest dollar volume of the entire VPN. More than 50% of all the connectivity switch division and VPN switch division for enterprise, which more than half the dollar volume was this device. And it looked and smelled like the device that Henry virtualized in 1994 inside the R-6000. But it was really reinvention of that device to meet the opportunistic or the opportunities...

Lewis Donzis: Well the change was in 1994 when we made the first gateway. The biggest difficulty in selling it was convincing anyone why on earth they would want to connect to the Internet and what would I do with that.

Jonathan Schmidt: We were so excited. You just don't understand.

Lewis Donzis: We got the weather from the University of Michigan.

Henry Donzis: A Novell ARCnet solution. We thought we had the world in our hand.

Lewis Donzis: The best of two worlds.

Henry Donzis: There was no way for all these Novell ARCnet LANs to get on the Internet, and we made a part that was for Novell and for ARCnet. We sold nine I think ARCnet units in all. We bought new ARCnet boards which were starting to go out of business at that time. We made a deal with I don't remember. I know Thomas Conrad at the end had about like 900 boards because they were getting ready to go out of business. We bought 900 boards, whatever, and we sold nine units.

Jonathan Schmidt: And we had like four little sales guys, and we sold like 2,500 of these things for \$2,500 a pop in nine months.

Lewis Donzis: 3,500.

Jonathan Schmidt: 3,500 in nine months. And that was like getting to be real money all of a sudden. I mean that was "ooh we got something by the horn here." But it was like 2,491 Ethernets and 9 ARCnets.

Lewis Donzis: Exactly. To your point about remaking them, when we sold that company to Bay Networks anything we had done prior to that product was a liability. I mean there was no value in the company for years and years of LANs and all these other products. But all those things allowed us to make that product in the first place, the libraries of code that had been built up and...

Henry Donzis: That's the thing, we didn't get to be in Bay and become the next thing that Bay could've used from what we knew. In the first place they just wanted us to make this router.

Len Shustek: So is that a culture clash issue would you say?

Lewis Donzis: Oh we were largely left alone.

Jonathan Schmidt: It's the same thing, same thing all over again.

Henry Donzis: We were a little disappointed not to be working on new things. But you know, it was still kind of fun and...

John Murphy: We were left alone, but there was no sense that if we came up with something new they'd take it.

Henry Donzis: That was for real. That's right.

Lewis Donzis: It could still been a small percentage of the product development.

Henry Donzis: If we had still been PerfTech we would've gone on to the next. We would've been more gone to something else.

Jonathan Schmidt: These things took a long time to sell. For example, Lewis started working with Sabre the travel agency to get these units and to be the Internet Gateway for 30,000 Sabre travel agencies. It took like three years and major overhauls including putting IP stack and all sorts of stuff in . When we left Nortel in the summer of 2001 those Sabre 30,000 units were cranked up to go, ship out to Sabre, 30,000.

Henry Donzis: That took what, three years of porting...

Jonathan Schmidt: Three years, and Lewis started out. And we had left, and here's 30,000 of these boxes going out. And it was like a miracle, but it would've nice to have it happen to us. But we did change on a dime.

Len Shustek: How come the Datapoint days when you were doing the R&D projects, did you have to go through any justification process for starting out something like- the laser printer is a big deal. It's a big project. Did you have to see your way clear to making that into a commercial project?

Jonathan Schmidt: Yes. Vic Poor actually took that and created another division , And took a young fellow Dave Monroe who was recommended by a professor up in Kansas, right.

Lewis Donzis: KU.

Jonathan Schmidt: KU, and who had recommended many people for several years to us. And we in turn equipped his computer lab with our computer. And Dave came down. He was I think 16 years old, and he was flying a plane with his girlfriend and his mother. And I said, "Gees they got a lot of guts." He ran the plane. His voice hadn't changed yet. And I said, "This kid," he was interesting. He started telling me he had a high school project to demonstrate lasers and...

Lewis Donzis: He liked lasers.

Jonathan Schmidt: He loved lasers. And he described to me, he said it was kind of sad. He said the kid next to me has spent like months making this cardboard tube, wrapping it with tin foil, putting a red Christmas tree lamp and Fresnel lens in the other end, showing how it worked right. And he said “he was kind of blown away when Dad and I came in with this one-foot ruby. And we sat down this one-foot long ruby, and we brought in our strobe, and we got all the capacitors. We had it all hooked up. We started destroying razor blades”. And I said, “If I had my mailing tube wrapped in tin foil I’d be blown away too. As a matter of fact I’ve never seen one do that. I had heard about it. What does it cost for a one-foot long ruby”. Well, you know, he grew up in that environment, nothing. But he had done all this. So Dave has made science fair projects into a huge business.

We all left Datapoint. We got financial backing for our company, Performance Technology, because Vic Poor said, “I will invest in your company, but only if neither of you guys is president.” Make Karen. Karen was the Chief Financial Officer for the division. Make Karen president. And Karen was married to Dave Monroe. And Dave said, “That’s good idea.” And we moved into the top floor of Lincoln Center, brand new green glass high rise. Dave moved into the floor below where Fudruckers had moved out. And he’s still there. And...

Henry Donzis: He got the whole floor?

Jonathan Schmidt: He makes exotic. He said, “Come here this is so cool.” Lewis and I were up there. He says, “Here, this is so cool.” He said, “We made this for somebody who I can’t tell you, but if it was pitch dark and there were so much overcast you couldn’t even detect a full ton of light, this would read a license plate at one mile.” And I said, “Wow, let me see.” He said, “Don’t take that cap off. If you take that lens cap off a million dollar CC deal will be destroyed.” You could only take it off when it’s pitch black.

John Murphy: That’s a serialized unit that has to go back to, we can’t say where.

Jonathan Schmidt: Right. So anyway there are wonderful things. He’s the one that collects things. He has the original Captain Nemo submarine that was in the *20,000 Leagues Under the Sea* Movie and these James Bond cases, which he made for the movie. And he makes a lot of exotic stuff. And whenever, I remember there was trouble in Honduras or some place back in the eighties. There are a lot of guys with stripes and looking like they’re right out of *Dr. Strangelove*. Would be riding up and down the elevators, and stopping at his floor. So strange, but anyway he has a lot of fun. And his whole life has been science fair projects that people really wanted.

John Murphy: His love of lasers, I don’t remember the names, but tell the story about the laser and hitting the cars in the parking lot.

Jonathan Schmidt: Oh my God, oh. Go ahead Henry.

Henry Donzis: No, no, no, please.

John Murphy: Well if somebody would tell me the names. I don't remember who the people were.

Jonathan Schmidt: Well Phil used to shoot cars down near State 35 with his laser from the top of his house hill. And there was reports of UFO's descending out of Interstate 35. People were saying red UFO's were dancing around in their car. And of course the refraction and everything was happening. And this is back in the early eighties. Yes people would play sometimes pranks that were dangerous.

John Murphy: Phil Ray and...

Jonathan Schmidt: Uh-huh.

John Murphy: Well what I remember is...

John Murphy: I don't remember who the secretary was. There was some rather inquisitive secretary. And they were playing with the laser in an office at work, and later in the afternoon, the evening. And they're, oh look you can see the car down there on the highway. And they suddenly became aware that this woman was standing by the door, very curious. Look, they were aiming out the window, and you know, so and I don't remember which one. I think it was Phil that said it finally. Looked up and knew she was still there, and looked and he said, "Death ray hell, doesn't even stun them".

Jonathan Schmidt: He said, "All he did was swerve." And she went ah. <Laughter>

Jonathan Schmidt: That was... that thing was...

John Murphy: That was the culture we were in.

Jonathan Schmidt: That was the culture.

Henry Donzis: By the way your particular question, printer, the laser printer and the Light Link weren't exactly R&D projects because they were things that Datapoint wanted to make. So that's a little bit different way around. As I recalled Datapoint wanted a laser printer, and they contracted with Harris to make the laser printer for them. I don't know, contracted to start working with them or whatever, and I don't remember exactly what happened but they...

Jonathan Schmidt: It didn't work.

Henry Donzis: They did or they said no, or they didn't want to give it up or whatever.

Jonathan Schmidt: Dave said he could do it. And he went over there and got a Japanese copier company to make...

Henry Donzis: But he hired all the people from Harris too.

Jonathan Schmidt: Right. And then they took over the whole floor, and they made this incredible laser printer. And the Light Link was also, you know, a...

Henry Donzis: So they were R&D from the sense of, yes we didn't necessarily have to make something that was engineered, started by engineering. But it wasn't R&D in the sense of lets just see what happens. More can we or what if or, what could we do with this. Dave Monroe's department, which was called Lectro Optics was more that he had to tell what projects that he wanted to do. They were more, defined by Datapoint what...

Len Shustek: Did the laser printer become a shipping product?

Henry Donzis: It did, and sold three of them or something.

Jonathan Schmidt: No, no probably sold 100. But it was, you know, it's interesting.

Lewis Donzis: Link Light that stood on a tripod. It wasn't on this 300lb steel fixture, and the same with the first laser printer. We took a copier and ripped out the scanners.

Henry Donzis: I started the electronics.

Lewis Donzis: Put some guts in there and made a printer out of it.

Jonathan Schmidt: You've seen the mirror?

Henry Donzis: Yep.

Jonathan Schmidt: Multi-centered mirror.

Henry Donzis: Yes.

Jonathan Schmidt: Scanning of it.

Lewis Donzis: It's just a commercial copier.

Jonathan Schmidt: This is what lasers got you.

John Murphy: You know, one of the interesting things we were talking about bringing people in who really worked out. I may have a faulty memory. I don't remember us ever bringing anybody in to R&D that didn't work out. You know, there were people that left. Mike Green decided he was going to go be a doctor, and became a medical doctor, and...

Jonathan Schmidt: He didn't want to do that, but he was getting macular degeneration. And he said, "If I study to become a doctor and I read real hard right now, then I won't have to use my eyes as much." So then he did.

John Murphy: But I mean there were people who left. You know, not everybody stayed forever. But I don't ever remember a case of somebody just not working out, and saying, "You know, we just can't work with this guy. You know, he's going to have to go." Somehow the selection process, whatever it was worked amazingly well.

Jonathan Schmidt: If they were more structured they would, without any hard feelings, move over to the engineering department or something or what suited their style. But yes, we were very accommodating. Nobody really disliked us. The engineers would rather have an environment where they could do everything that was fun and didn't have to take any responsibility for anything they did, which is the way they thought we worked. But it wasn't. It wasn't quite that.

Henry Donzis: Well that's the thing. The only person we ever had come over because of the difference in the environment philosophy was Russell Herring, who wanted to work in R&D I guess in the first place, but ended up in engineering. And then when he thought they should be doing things more engineering ways or whatever, you know, they... to bring him over R&D.

Jonathan Schmidt: We were blessed. And actually Vic Poor was not a social butterfly. And because he was so strong in terms of what he had done for the company. He even got me to jump in and fix the marketing model number problem, big green sheets only. We had no model numbers. And once that was done he realized in 1971 the marketing department was in shambles. So he took over the marketing department, left engineering, and he ran the marketing department for a year, and got that straightened out. So the force of his personality actually was the ultimate shield for us.

Len Shustek: Did you use any non Datapoint systems for development? Did you use Unix systems or was everything...?

Jonathan Schmidt: Well the HP 3000 at the beginning.

Henry Donzis: 2000.

Jonathan Schmidt: 3000.

Henry Donzis: 2000.

Jonathan Schmidt: Was it 2000?

Henry Donzis: Yes, 2114.

Jonathan Schmidt: HP 2000, pardon me. And then the Charles River Data Systems, we got in bed with them.

Henry Donzis: You're talking about 20 years difference, but...

Jonathan Schmidt: No, no that was the late seventies.

Henry Donzis: Okay.

Jonathan Schmidt: Lewis did the ARCnet Interface.

Henry Donzis: Yes.

Jonathan Schmidt: You did the ARCnet Interface.

Lewis Donzis: Yes.

Jonathan Schmidt: For that.

Len Shustek: It was what?

Lewis Donzis: 68000 UNIX machines, yes.

Len Shustek: But did you use that development afterwards? You guys actually used them internally?

Jonathan Schmidt: No, I don't even remember...

Len Shustek: Why do you develop on them? In business systems...

Jonathan Schmidt: Well they were using the Charles River for something, and some of the other parts...

Henry Donzis: Datapoint...

Jonathan Schmidt: They wanted to move on. They were thinking of using that ultimately as a server and moving off of our operating system. There's a part for engineering that says, what you need is Unix. You don't need the operating system you've got. So they started experimenting with that, and then Lewis got the ARCnet driver working in it. ...

Henry Donzis: He's talking about- you're talking about projects that we did. I'll give you an example...

Len Shustek: Internal tools...

Henry Donzis: Internals.

Lewis Donzis: In Datapoint the powers, everything was all developed with us.

Henry Donzis: Everything, right everything. When we finally got word processors...

Lewis Donzis: Running on our systems.

Henry Donzis: Our own systems, and at some point you finally got the secretaries and everything. And the biggest change was when we came out with the Vista products. It was like the difference between going from MS DOS to Windows. Where the secretaries lived inside the WP. We made a fully integrated office product that, I don't remember what you could do, not being a secretary. You would be in word processing and you would switch to mail maybe. It was like in a menu. But you stayed in this environment where there was no command line. You didn't type commands or anything like that because the...

Lewis Donzis: It was talking to management.

Henry Donzis: Exactly. The RMS and the DOS file systems or operating systems were all command driven. You want to compile something, or edit, you typed in, edit. But this was a fully integrated management system. They would do the normal clerical kind of stuff. And the only thing they ever saw was when they first turned on the computer in the morning that the operating system would come up for a second and their startup script would immediately launch it. And they didn't even know that there was an operating system. You can bring Windows down by saying, "Exit," and go back to DOS, and you say, "Hey, there's something besides Windows here."

Len Shustek: As the PCs came out what did you guys have at home? I mean the world I came from, which actually was IBM. When that happened people started buying Apples, you mentioned IBMs. What about...?

Lewis Donzis: That's probably the most NIH place that I can think of. In retrospect, I never thought about it before. Everything was developed in house. We didn't even use a regular programming language. Jean Hughes invented Basil, the name of the program .

Henry Donzis: Datapoint <inaudible>.

Lewis Donzis: Everything.

Jonathan Schmidt: It was its own language.

Jonathan Schmidt: Actually...

Henry Donzis: Which was called Babble at the beginning.

Jonathan Schmidt: ...<inaudible> at the beginning, remember.

Henry Donzis: Was it called Babble?

Jonathan Schmidt: <inaudible>

Lewis Donzis: Did he?

Jonathan Schmidt: Mm hm.

Lewis Donzis: It was kind of reminiscent of C but more strict. And this was way back when C was young and wasn't strict at all.

Henry Donzis: Of course, Jean himself liked Smalltalk.

Lewis Donzis: Well, <inaudible> I guess.

Henry Donzis: Yes.

Jonathan Schmidt: Yes.

John Murphy: When I...

Len Shustek: So you were using your own tools, using your own systems at the office?

Henry Donzis: Yes.

Len Shustek: And the question I was asking was what about after work, at your home...

Lewis Donzis: Well, this was before home computers.

Len Shustek: ...your toys-- so we're starting to get into that time.

Jonathan Schmidt: Okay. Multi...

Len Shustek: What happened when you saw PCs at, you know, early PCs...

Jonathan Schmidt: Well, first Datapoint had a multi user operating system. Let's say it's like Unix with data BT 100 but it had Datapoint terminals. It had an asynchronous 1200 baud down, trigger baud up modem. So we would take terminals home, log on, and get our email and...

Henry Donzis: <inaudible> typing was up. There was...

Jonathan Schmidt: Yes, it worked very well. So we enjoyed that...

Len Shustek: So each of you had a terminal at home?

Jonathan Schmidt: We enjoyed that for four or five years, up until '83, you know? And then we had...

Lewis Donzis: We didn't have email 'til about '82.

Jonathan Schmidt: Well, we had dial in at home.

Henry Donzis: Oh, yes, it was nice. You could work at home.

Jonathan Schmidt: Yes. And had a Z-80 based machine for awhile we made and then we brought CP...

Lewis Donzis: And that was only \$15,000...

Len Shustek: This is fine <inaudible>...

Jonathan Schmidt: We brought...

Len Shustek: When you're talking about '83, this is five years after the introduction of machines like the first Apple IIs and so on?

Jonathan Schmidt: Right. And then...

Len Shustek: I guess my...

Henry Donzis: Well, you had...

Len Shustek: You guys are, like, avid ham radio operators and so on and I'm just trying to understand, when the nearby ComputerLand sends...

Henry Donzis: They can't remember...

Lewis Donzis: Well, when the Lisa came out, I remember we bought one and brought it to the office and we were just completely amazed by it. It was, like, how you could you actually draw things on the screen...

Henry Donzis: Had square pixels. That was...

Jonathan Schmidt: Yes.

Lewis Donzis: Yes. That was great, too. But I don't think-- the Mac didn't come out until about '80...

Henry Donzis: I traded my Lisa in for a Mac so...

Jonathan Schmidt: We had the Lisa and Steve Jobs invited me out for an interview at Apple.

Lewis Donzis: They were interested in ARCnet or something weren't they?

Jonathan Schmidt: He said was charged with making a network for the Apple. And he invited me out and I came in a suit and a tie and he was standing dressed in jeans and a shirt like I am and a leather jacket and his motorcycle out in the parking lot and he was very abusive. It was clear he was charged with bringing a network in and he wanted me in there to give him the necessary meat to prove that he didn't need a network. And I didn't understand why I was being treated that way. He was very brusque and he said, well, tell me about-- and I told him about a network and how everybody could share the resources. And then he gave me his philosophy: everybody can have their own computer. It shouldn't be tied to anything else. Time sharing is a thing of the past. And I said, no, I'm not talking about time sharing. Everybody gets their own computer but you can't carry a laser printer or a data products line printer around and you need to be able to use it. Everybody doesn't need a printer. You have your own computer. You can carry it and love it and it was-- and he-- why would you ever want wire? Why did you call me up if I was going to tell you about using wire if you don't want wire? And I left. I was devastated. I mean, it was clear that he hated everything I stood for. He hated me. I dressed like him normally and I didn't dress like him that day, you know, there was no way I could tell him that but I really wanted to tell him that-- why am I going to tell him that? You know, so that was-- I walked out and I said uh-uh, this is not for me. <laughs>

Henry Donzis: Think how long it took for Macintosh to get an Ethernet interface in it, anyway.

Jonathan Schmidt: But they had AppleTalk.

Henry Donzis: They had AppleTalk serial. That's like commbus.

Jonathan Schmidt: It was exactly like a commbus.

Henry Donzis: But 20 years later. <laughter>

Jonathan Schmidt: Anyway, so, yes, we would-- we brought CPM up on our model 1500, right?

Lewis Donzis: Mm hm.

Henry Donzis: That's right.

Jonathan Schmidt: And...

Henry Donzis: But we could run a-- there was a DOS we could run on it, too, wasn't there?

Jonathan Schmidt: We had an 8080 version of something.

Henry Donzis: I thought we ran a DR DOS or it was something that worked on the 1500 just to play with.

Jonathan Schmidt: Yes.

Henry Donzis: It was called CPM. Right, CPM.

Lewis Donzis: Sometime we brought in to look at competitive or pseudo-competitively. When Heathkit came out with that little robot, somebody bought one and the industrial guys made all sorts of extra parts for it. <laughter>. It kind of took on a life of its own. Everybody took turns writing code for the robot to make it do some things. I don't know what good it was. <laughter>

Len Shustek: There's not much ARCnet left in the world but you could argue that the existence of ARCnet changed Ethernet for the better.

Jonathan Schmidt: I think they all changed each other. ARCnet finally got rid of the requirement for a hub and you could, like, put passive hubs on ARCnet, just like Ethernet. It had certain virtues which were good and the rest were not and the good parts are in labs and the bad parts are not.

Henry Donzis: You know, they still make something like a million ARCnet chips a year.

John Murphy: You know, it's amazing how much ARCnet is still being sold. I couldn't believe it, the last time somebody came in and told us they'd met with somebody at SMC that was into whatever that branch of SMC is now called, was in charge of ARCnet and that there are places overseas where this is the latest technology and they're starting to buy into it and they're selling enough chips that they're still making them, which amazes me.

Jonathan Schmidt: While I was up at Johnson Controls, when they started to want to put our instant Internet in building control systems so that they'd be able to VPN and look around inside the building on a network and they were still using ARCnet. We heard space station had ARCnet on it? The shuttle or something?

John Murphy: It's astonishing how many places-- lots of places where they don't mention that there's a network. It's used like we originally used it. It's an internal part of the thing. They're not selling a network. They're selling a service, they're just selling a product. When I went down to NASA several years ago, for a group that was working on a project for the space station and they asked me to come down and, stand

up and wave. Much like I did for the Nestar product introduced many years ago and these people were standing out there talking about why they picked ARCnet to put in space. And they were using phrases and an energy that none of us would have ever dared. And I'm looking around the room and, you know, name tags were all JPL and the people are all nodding and going, yes, yes. And I'm thinking where were these customers when we needed them? This is just astonishing and these people were zealots to the nth degree and I'm thinking, oh, my gosh, I would never make a claim like that and they're going on like this is the only thing they could use, you know? And...

Lewis Donzis: You know what was ironic? A lot of the applications we ran into to for why they're still making all these chips is because you don't need a hub with just an ARCnet pair. <laughter> You know, you can just daisy chain the wires or twist them together. It's really come full circle. They're using it because it's cheaper because you can cable it like you used to cable...

Henry Donzis: Yes, there's

Lewis Donzis: ...ether net

Len Shustek: Now there's kind of bus wired ARCnet.

Lewis Donzis: Right. Exactly.

Len Shustek: And it's an active hub.

Jonathan Schmidt: Lucent phone systems use ARCnet.

John Murphy: The what?

Jonathan Schmidt: Lucent phone systems.

John Murphy: Yes. Well, you know, I have been told-- I have no way to verify, I've been told that every cell phone tower has got an ARCnet system at its base. That's a bunch of chips right there, you know?

Len Shustek: The other technology that's changed the world and had a lasting impact is the-- what has become the X86 architecture derived from Datapoint. To what extent do you feel pride of ownership, responsibility, for what every desktop runs?

Jonathan Schmidt: Well, no and I, you know...

Lewis Donzis: Like any of us...

Jonathan Schmidt: As we go through life watching all sorts of people we've known even casually take credit for this stuff we did <laughs>, you know, I say, well, you know, I'm wondering whether I really am

like they are and taking credit for something I really didn't do and who cares? <laughs> That was-- as Bob Shelter has in his...

Henry Donzis: I'm sure he's proud of his X86 in the first place, you know. It's something that when they made the 286 and it's, like, oh, you can't even get into protected mode very well and then the 386. They kept carrying all this old baggage. The first one that only had a one meg memory space.

Lewis Donzis: It was a lot more than that.

Henry Donzis: I know. And we may have liked Intel a lot at the beginning, especially the 8080 versus the 8008 and so on and then we liked the Z80 but when it came to 16-bit processors, I think we liked the 16000-- certainly, the National 16000 much better. So I think it was more the technology. The 8008 that Intel started with us, was as elegant as the Datapoint computer was.

Jonathan Schmidt: Just exactly primitive enough to be made on a chip.

Henry Donzis: I think we look at the elegance versus whether it was what we designed or didn't design, I thought the 16000 was...

Jonathan Schmidt: That's a good point. And we would sometimes jump on a technology and it was the wrong one. Datapoint said we're going to jump on the 16-bit chip and we all voted and the best one was a National Semiconductor 16000.

Henry Donzis: Yes.

Jonathan Schmidt: Drive a long way.

Henry Donzis: The fact that there are CPUs at all and that Intel did that and TI, I guess, we've never really went that far.

Lewis Donzis: That's probably more relevant. I mean, who cares?

Henry Donzis: I could be proud of what Intel turned it into. I mean, I thought the Z80 was much better. It had repeat, block move and stuff and things. It was a lot nicer that way and...

Lewis Donzis: Yes, but today, other than that Intel sells a whole lot of chips and Microsoft has a lot of code that runs on them, we're agnostic. What do we care when we have to write assembly code, they're all processors. You can write instructions on any of them or you can write the code in the high level language and it doesn't make any difference. They all work pretty well.

Henry Donzis: And now we had a lot of toys. You know, back what you were asking about earlier about even way back when, Vic had a little HP thing, you had a little Apple, what did you used to have that you ran up in your attic? You know, a little Apple or something?

Jonathan Schmidt: Bunch of Macintoshes.

Henry Donzis: But you had something that integrated into your...

Jonathan Schmidt: Home power system.

Henry Donzis: Yes, or something.

Jonathan Schmidt: I don't remember that.

John Murphy: Yes, because you had, like, some X10 stuff,

Jonathan Schmidt: I had an Atari 400.

Henry Donzis: I had an Atari 400.

Lewis Donzis: You know, it might be interesting because I don't know that anyone in our whole department or group, when the, like, the Altars' and, well, we had some southwest Texas...

Henry Donzis: Yes.

Lewis Donzis: ...boxes around. There wasn't really a huge-- it didn't spark anything to have access to that kind of a...

Len Shustek: You did it all day long.

Lewis Donzis: Yes.

Jonathan Schmidt: Yes.

Lewis Donzis: It wasn't like that was something revolutionary.

John Murphy: We had all the toys we could handle at work.

Len Shustek: You don't need to do it at home.

Jonathan Schmidt: We had much bigger, better computers, as many as you could haul home.

Henry Donzis: Well, you couldn't use a Datapoint at home for doing-- I mean, I used one for my Atari download thing but, you know, it was loud and hot and whatever.

Jonathan Schmidt: Your poor kids. They grew up in that bedroom with that... <laughter>

Lewis Donzis: Jet engine sound.

Jonathan Schmidt: Geez. A French disk drive whirring away.

Henry Donzis: Yes. But, yes, I think...

Jonathan Schmidt: You couldn't hear yourself think and his kids were sleeping away in this little hot room in this thing is going <makes wrrrrring sound> and then something would download a game, it would go <makes noises> chunk, chunk, chunk, and these little kids are so sweet <makes snoring sound>. <laughter>

Henry Donzis: We were just enamored of having an Apple II or something like that to use. I remember Harry, in particular, and David used to like to integrate things into anything that could-- in fact, the only project I can think of that-- I just realized, that used Datapoint stuff was that synthesizer thing.

Lewis Donzis: Oh, yes.

Henry Donzis: David built this thing very early on.

Jonathan Schmidt: Music synthesizer. It was a rack about this big and we had...

Lewis Donzis: That was, like, in '75 or...

Jonathan Schmidt: Had big, big, DynCorp amplifiers and Bose 901s from Dave and they really made a <laughter> and this music synthesizer, which was how many voices did we end up in it? Four, six voices? And each voice was a board and this was, like, a nothing project. It was a lot of work. And we'd play Baroque music where they were able to tailor the voices to sound like a recorder and a harpsichord and, if you can imagine back, what was it, 1976?

Henry Donzis: Oh, before that.

John Murphy: Before that.

Henry Donzis: Well before that.

Jonathan Schmidt: Yes.

Henry Donzis: '72.

Jonathan Schmidt: Yes, if you can just imagine having a completely electronic synthesized-- before any of this stuff, you know? Maybe a Hammond organ, you know, if it could play itself. <laughter> It was amazing. It...

Henry Donzis: I can remember what it did.

John Murphy: It occurs to me-- you're asking about what kind of computer toys did the people of R&D have at home? Well, to have an interest in that sort of thing, you have to spend some time at home. <laughter> We were in the office most of the waking hours. And we heard about it from our families.

Lewis Donzis: Yes, this was back when people smoked at the office. <laughter>

Henry Donzis: You know, we were never satisfied. I remember Vic has this HP whatever little mini computer thing and it had something to do with baudot. And it had a ROM inside. , And it didn't do some sequence that it sent out, it didn't do it correctly. It didn't escape properly or whatever it was it was supposed to do and he brought it to me. And he said, "Here is the sequence it's sending, the escape sequence it's sending and, here's what it should send. Can you find that in the ROM?" I took the ROM out of the thing and I read it into a file and built a disassembler for it because I had a disassembler for the Atari and for Radio Shack <laughter> Okay. I'll try to disassemble it for his HP whatever it was. And I disassembled the whole thing and I found the string in there and I changed the escape sequence to what he wanted and recompiled it and blew a new ROM for him and put it in there and that-- and then that made the HP was, you know, exactly what he wanted. <laughter> It worked perfectly. He went on his first trip and said, oh, yes, it works exactly right.

Jonathan Schmidt: We took it on his boat.

Henry Donzis: Took it on his boat.

Jonathan Schmidt: It was his boat. Yes.

John Murphy: What was the machine? There was some computer. There was some computer we bought for evaluation. Vic was going to evaluate. And he took it home and he came back the next morning <laughs> there was no "P" on the keyboard, you know? This started off with put in your name or something and it came up wrong. There was no "P" on the keyboard. It was, like, how do you ship something like that out? <laughter>

Jonathan Schmidt: By the way, in 1984-- when did the first Mac 64s or 16s come out?

Len Shustek: 1984.

Jonathan Schmidt: Yes, I got one from work to play with and evaluate. I took it home and my son, Edward, was, like, 13 years old and he started using it and I got another one and gave it to him. He started wanting to, like, mow the lawn and work real hard around the house. I said, gee, just because I gave you this rack. It turned out that he had gotten on Genie, which is GE's online service, and he got

into chat rooms and he was saving money to fly a girl <laughter> from Pittsburgh to San Antonio that he'd met, he was 13, on the internet and he was saving up to go buy a ticket. <laughter> Nothing's changed. <laughter> It was a real girl. He had her picture.

Lewis Donzis: So back then, it was real girls. <laughter>

Jonathan Schmidt: It was a real girl. It was a real girl and she was really 13. <laughter>

Len Shustek: Despite the fact that you guys seem to spend all of your time at the office and not much time at home, you have family lives and other lives.

Jonathan Schmidt: Sure. I had this kid but, within a year, he was making \$35 an hour in San Antonio Shoe Company doing their brochures on the Macintosh. Making \$15 an hour at Database. This is 1985. And then he came to work for us for awhile.

Henry Donzis: I think, you know, probably...

Henry Donzis: We took a lot of vacation. You spend time with the family.

Len Shustek: Would you encourage your children to follow your footsteps?

Jonathan Schmidt: Well, whatever the equivalent is.

Len Shustek: To enjoy and have a love for what you do?

John Murphy: That's something that still astonishes people that I associate with is, can you go to such and such? Yes, they say, well, can you get off work? And I kind of smile and say, that's not a problem.

Henry Donzis: I take my kids to all the doctor's appointments...

Henry Donzis: My wife is a school counselor. She can't leave school very easily or take a whole half day and get a substitute and whatever so I take the kids to appointments during the day or I have to go pick them up and drop them off at school or car pool or whatever and stuff. So, actually, in a way, it gives you a flexibility that you wouldn't have otherwise, at least during the daytime. It may put a dent in, you know, your free time.

John Murphy: Well, we're also not in here at 8:00 at night near as much as we used to be a few years ago.

Jonathan Schmidt: I'm here more at night. He's in here at six in the morning but when I was a kid, would you go into radio? You know, engineering and radio, radio station? Well who knows what the next technology is going to be? Everything morphs and is it computers, the Internet, or is it a website or are you artistic and you do web design or what is computers? I mean, it's whatever is new and fun. Yes, I

would say that but computers, it doesn't mean today what it meant 10 years ago. What does it mean? Does it mean RFID chips? That's certainly a really neat place to go.

Len Shustek: You say this is in the future. I mean, so you're not, for example, suggesting oh, go into biotechnology? I mean, this is still...

Jonathan Schmidt: Oh, that, too.

Len Shustek: ...fertile and exciting field for you guys?

Jonathan Schmidt: That's too. There's not that much. Stan Klein, who did the cassette deck and the iris for the Light Link. He bought a house four houses away from my house and it was previously owned by a biotechnology engineer who had a biotechnology lab in the back. And there's still plenty of stuff growing around in there <laughs> and that is not something you can do at home, you know? Learn genetic engineering for fun and profit <laughter> in your own spare time on a matchbook, right? But you could become a web designer, you know, and do it at your home. And there's a lot-- you see the ads for this guy who is-- you know, trade 10,000 shares of this, do this, do this, blah, blah, blah, okay, we're done for the day, bang. See his door open, "Hi, Daddy. Daddy's home" <kids voice>and he was really in the den. Right? Well, there's lots of things like that. But what does computers mean?

Henry Donzis: Well, that's the thing. You say should they go into our field. I don't know what our field is because it's whatever was interesting at the time.

John Murphy: Well, I think that's important. If that's what would you advise people to do. Do what interests them. I saw a great title on a book, I think it was freshman year when I took my daughter up to college and a kid was sitting in the library reading a book and all you saw was the title of the book. It said, "Do what you love, the money will follow" and, you know, I'm not sure how true that is but certainly the satisfaction will. People who say "I was advised to go into computers because, boy, it's such a great career." No, that's the wrong reason. Go into it because you enjoy it. I can't think of anything worse than the people I know who say, "I became an engineer because my dad said that's what I ought to do because they make a lot of money". No, those aren't the guys that make a lot of money. Those aren't the guys that have any fun. I think career days at schools are great. I think they ought to have them at least once a month instead of once a year. The problem with education is kids don't know what the possibilities are. It's, like, well, I can be a teacher or I can be an engineer or I could be a doctor or I could be a lawyer. Well, there's lots of possibilities and...

Lewis Donzis: And lots of sub-possibilities.

John Murphy: The number of kids who change their majors four times in their freshman year and never do really figure out what they want to be, I would never advise anybody to do anything other than find out what you love to do.

Henry Donzis: I don't even think we're so much in computers as we are in computer peripherals and computer enhancements.

Jonathan Schmidt: Who knows what we're in, Henry? <laughter>

John Murphy: When was the last time we decided to backplane?

Lewis Donzis: I don't remember any that stuck around going into any of those fields because they thought it was going to be the thing to be doing.

Jonathan Schmidt: We end up fixing our friends' computers or our friends' networks or our friends' companies' networks.

Henry Donzis: They think we know a lot about it because of this...

Lewis Donzis: But we didn't know it was going to be a...

Len Shustek: I guess what I was curious about is whether-- not that you would discourage other fields but you still feel that there is an exciting future...

Jonathan Schmidt: There is...

Len Shustek: Whatever you call it, you know, whatever you guys did, is that something that you could see your kids doing? There's still a lot to be done?

John Murphy: I think if we were kids today, this is what we want to do again. I mean, you know, given the future, it's there.

Henry Donzis: Without a Datapoint I don't know how we would get together.

Jonathan Schmidt: There's set top boxes, you know, and video on demand and RFID chips and general global positioning systems and cell phones that are going to be nothing like you've ever seen before.

Lewis Donzis: Micro machine tuning fork motion sensors...

Jonathan Schmidt: That was a wonderful thing. Lewis played out some sort of a-- it's a replacement for a gyroscope but it was a tuning fork gyroscope.

Lewis Donzis: Yes.

Jonathan Schmidt: So it was like put on a chip and it would sense your inertia. Replace the laser gyro. Wonderful things that are happening and we were blessed. You know, it reminds me back when I was real sick as a kid and I had to go to the doctor's office twice a week to some huge nurse and she'd stick her knee in my back and put her hand on my chest and crack my scoliosis. I paid for the bus to go down and see her! And I'd sit in the office and I'd wait for her and I'd read *The New Yorker* and I remember this

guy who does the cartoons with the old tycoons with the monocle and a top hat and a cane and walking down Madison Avenue and there was a beggar and, you know, "please, put five cents in my cup" and he says, "Don't just sit there, get up and make something of yourself." You know, you can't tell people that. We were blessed to be able to do what we wanted, you know? We didn't just get up and make something of ourselves because, for a lot of people, they try and they can't or they're ill or they're impoverished or they're in some country where just the opportunity isn't. So it was wonderful that we had this opportunity. We just didn't make something of ourselves. It was given.

Henry Donzis: I think we grew up in a generation, too, where doing things with your roommates and starting in a garage, whatever you talk about, you know, Hewlett Packard and Apple and Woz and, I don't know, Microsoft. All these places they got together and did something and they can have this kind of-- there was something for us all to find each other in the first place. While our kids can grow up and have the availability to have these things to do, I'm not sure what there is to bring a group together the same way nowadays. I'm not sure whether it would happen.

Jonathan Schmidt: You find each other. I think they'd find each other in all walks of life, you know? And, you know, people find each other and they make the best real estate office in town, they have a cancer client and they get really good at it. When everything clicks and everybody's together and you like what you're doing and the fertilizer and the sun and the rain, everything's there and you're lucky, you're lucky if it really happens.

Len Shustek: What's your planning horizon at PerfTech? Do you know what you're going to do over the next year? Do you have a five-year plan or...

Jonathan Schmidt: Yes.

Len Shustek: ...do you just want to be nimble and react to...

Jonathan Schmidt: Speaking out of turn here for everybody but yes. It's a whole new area that there is nobody doing anything in and you can see a whole lot of opportunities for different products in this area based on the technology we've come up with. So as fast as we can get legitimized and get product in and have people accept the fact, even if it's in one major company, then, yes, there's a lot to add to it.

Henry Donzis: And we're a lot smaller now so we'll be able to do a lot of different things.

Lewis Donzis: Actually, there's probably some satisfaction in each rendition of a company. It's, like, once you get into a niche, that takes on a life of its own. You kind of live that product, so to speak, for whatever its lifetime is. And, each time we've been through that cycle, I think the quality of the result has gotten better. And there's a lot of-- you know, the product that we built this time, I think, is the best one that we've ever done and the one before that was also. If I step back and look at it, it's, like, well, that was a lot of fun. That actually is a pretty good product as well.

Len Shustek: Are you looking to grow? To add more people?

Jonathan Schmidt: We will have to if it works. If it does, I mean, this is all or nothing. This is-- that's it, you know? If this doesn't work...

Lewis Donzis: We'll do something else.

Jonathan Schmidt: Yes. <laughter> And now, folks, for something completely different. <laughter>

Henry Donzis: Well, when we started the first PT, we had five people working on five different things that all kind of went together but...

Lewis Donzis: Well, that's actually an interesting aspect as well. I don't know in our history that we've ever been involved in a project where 20 people were working on a thing. There's largely been a one-person, one module or one piece.

Jonathan Schmidt: Actually, this is a very good point. This is a story which deserves one minute. When we reacted to the pathology of the bigness of Datapoint, we're thrown out on our butts, really, unceremoniously. Just out, humiliated, basically, and idiots taking over.

Lewis Donzis: Well, you were humiliated but <laughter> the rest were thrown out.

Jonathan Schmidt: <laughter> I was humiliated. They were just thrown.

John Murphy: We were humiliated like you were.

Jonathan Schmidt: Oh well, thank you, John, I appreciate that. <laughter> And, yes, as a matter of fact, when that lady threw me out, shut the door and she said the king is dead, long live the king.

Henry Donzis: That's exactly what she said.

Jonathan Schmidt: And then Stu Graves stood up and said, "Balls to the queen. If I'd had two, I'd be king."

Henry Donzis: Oh, that's right, too. <laughter>

Jonathan Schmidt: In that meeting. And that was reported by everybody. You come and see what she said after you left. She threw your ass out. And so that was fun. So we formed a new company. And we needed a completely new company. We're going to make a company where you don't have any of that stuff. We're going to make a company where everybody has their own project...

Henry Donzis: Very knee jerk.

Jonathan Schmidt: And everybody was their own coder and documenter and product manager. Everybody gets 20% of the revenue of the product. And all of a sudden in, like, eight months, we're coming in a million dollars a month and the checks were really going up. People were really taking-- the money was, like, really coming in. But then people said, geez, the more I code, the more money I can make. Well, wait, Henry, you've got to document your code. Well, let's hire a documenter. We need a documenter. Well, we'll hire Kim, she can be the tester. I can write code like crazy but I don't document and I don't test. We need a tester and a documenter. We need the sales guy. And we need somebody to answer the phone for support because I don't support any more. And pretty soon, we had a regular company but, for the first couple of years, the checks were real big and then-- it was an interesting experiment.

Lewis Donzis: That it was. An experiment.

Jonathan Schmidt: It was an interesting experiment. Henry worked on 20%, Gene worked on 80% and Henry got me arguing with Karen for over an hour because the division had to break a penny. Remember that? And you were arguing...

John Murphy: I remember that.

Jonathan Schmidt: Remember that? Arguing with us for an hour over how could we fairly break up that last penny. That's-- oh. <laughter> But that was really interesting. The money really flowed.

Henry Donzis: But the end of us was to become a company that, you know, we got source safe and, you know, checking things in and out and turning, you know, into a project and...

Lewis Donzis: Real busy. I never even heard of product management before we joined a big company. What are you talking about? All these new words we had to learn and...

John Murphy: Well my daughter went to work for Motorola as a software engineer and she has since retired and decided to start a family but, while she was there she'd talk about their project management and all of these phrases that just made me-- I felt so sorry for her trapped in this environment. Well, no wonder she didn't last long there. And it was the process and this and that and the endless meetings and it's like, do you ever produce any product? Well, yes, there's a group that does. I can't imagine working in a big operation and I can't imagine how they ever build something like a space craft or an airplane or something that requires the cooperation of hundreds of people.

Jonathan Schmidt: Thousands. Tens of thousands.

John Murphy: I mean, well, this is the first time that I think we have ever done a product where we actually have four or maybe five people that have to work on different aspects of the same product. And it's, like, well, we've divided up real well but it's, like, oh, my gosh, you know, we've become a huge committee. This is awful, you know? Hey, we're still the lucky ones. You know, it's an enormous difference.

Jonathan Schmidt: And it flows down to the kids. My son, you know, went to Hungary to start the first Internet company there and he sold it to a Dutch company on NASDAQ and then he decided, well, he's a mathematician so he would become a hedge fund analyst. Oh, start a hedge fund. Well, first I'll go to Vindigo. I got a friend starting this Vindigo up. So he went with Vindigo. But he'll never be in a big company. He's just enamored with the enjoyment of more instant and powerful gratification from some major self-effort.

End of Interview