Bill Terry Interview 8, January 22, 1996

KIRBY: This is Dave Kirby. I am conducting my eighth interview with Bill Terry. Today's date is January 22, 1996 and we are in HP's offices at 1501 Page Mill Road, Palo Alto. At the end of our last interview, Bill, we were talking about some other computer companies like IBM and DEC. While you were heading the data products group, you said you didn't have much contact with these other companies. I'm curious. What about CBEMA, the computer trade association? It wasn't operating then, was it?

TERRY: It was operating, Dave, but it had a different name. In fact, it started in the Computer Business Equipment Manufacturers Association. There was a predecessor organization whose name I don't remember.

TERRY: It may have ... I'm not sure of this but it could even have gone back as far as it would be in about 1968, when a group of people tried to start it. They did start an organization called the Computer Industry Council, Computer Industry Association-CIA. The founder of this was kind of a wild-eyed guy at Xerox Data Systems in Los Angeles who had been around the industry and one of the stories about this, they asked us if we'd be interested in joining this association and this guy, Dan McGrew was his name, he wrote a letter to Dave Packard and sent me a copy, I think is the way it went, and this was about a four-page letter that announced the formation of this association and he said that the whole purpose of this association is to get a bunch of computer people together to fight IBM.

KIRBY: Oh, really?! He said that was the purpose?

TERRY: Yes, they were ganging up on IBM. And Dave Packard looked at this letter and asked me what I thought and I told him I didn't think we really wanted to be any part of about this. We had other things to do. And so Dave says, "All right, I'll write him a letter." And this was, to me, it belongs in a "good letter writing class." It was a perfect opportunity to write this guy a two or three-page letter refuting all his points. Instead, Dave Packard wrote him a letter that said, "Dear Mr. McGrew. I have received your letter about your forming this industry association. Hewlett Packard is not interested in joining. Sincerely,"

KIRBY: "Sincerely"...that was it?

TERRY: That was a typical Packard letter! I've never forgotten that. Boy! It was, you know, "Don't shoot your mouth off. Don't get all excited. Just say 'We're not interested in joining your association'."

KIRBY: That's wild!

TERRY: But anyway, back to your question, CBEMA came on-I believe it existed as some sort of an organization but it didn't enter my radar screen. That came much later. I think Paul and other people got interested in CBEMA but not me.

KIRBY: Yes, okay. Let's talk a bit about Dick Hackborn since he was to become an important manager with the company. He joined your group in the early 1970s, didn't he?

TERRY: That's right.

KIRBY: And if so, in what capacity?

TERRY: He was the engineer ... He was recruited by George Newman. I got a little bit in the act. I don't remember if Hewlett was involved or not, but he was recruited by essentially George to come down and replace Tracy Storer and become the engineering manager of the Cupertino division as it was called.

KIRBY: Where was Hackborn working?

TERRY: He was ... I believe...

KIRBY: Was it microwave?
TERRY: No, I believe he was working at corporate EDP.

TERRY: Much of his background or his degree was in operations research, kind of far-out sorts of things, and I'm almost sure he was there. I don't think he was in microwave. He might have been; I can't remember.

TERRY: But he came to replace Tracy and jumped right into the problem of getting the 3000 in better shape, the software in better shape, to get it fixed.

KIRBY: Okay. I think I've heard ... didn't Hackborn take a leave of absence, either before or while he was working for you?
TERRY: Yes. I think he ... It seemed to me he was at Cupertino for about a year or two, and then he announced he was going to take a leave of absence and he was gone for about six months or more. He sure could tell us the story better. And I believe he just went on vacation or he might have gone to the Esalen Institute in Big Sur.

KIRBY: Somehow Big Sur sticks in my mind.
TERRY: I don't know if he went down there and just rented a house or he went ... Esalen Institute has a bunch of different kinds of courses, and came back after that. And I don't remember, frankly, what he came to but these are all good questions to ask Dick about his career.

KIRBY: Well, he's a guy who marches to a different drummer a lot!
TERRY: Yes, I saw him Thursday night; we had that retirement dinner for Haynes and...

KIRBY: Oh, did you?
TERRY: Yes, so it was a chance to see everybody. Dick looks fine and told me he's enjoying himself. He's on the board of Microsoft, which he says is really very interesting.

KIRBY: I bet it is! I bet it is!
TERRY: A six-person board.

KIRBY: He's still on our board.
TERRY: He's still on the HP board. He's been doing some traveling. His wife likes to go traveling on cruises and stuff like that. So it looks like he's enjoying himself. *KIRBY: Okay, good. Now, when he replaced Tracy Storer on the 3000, what was the principle problem then with the 3000 or was there?

TERRY: Well, I talked about it before. It was a combination of ... Well I think it first of all started with the naiveté of a lot of the people involved, including me and Dick Hackborn, and George Newman, and a lot of the computer people we'd hired from other places, notably Burroughs, about the performance of an operating system. We had or there had been put together some specs on what this thing was supposed to do but not very precisely in terms of how fast it would do it or how efficiently it would do it, and so we were guilty of overselling this thing by quite a bit. We'd gotten out and talked about all these wonderful things and then when you got the machine actually turned on and the software running, even in a single mode, like in a time-sharing mode, or a batch mode, it didn't work very well and it was pretty buggy! And, again, a lot of us didn't know about bugs and didn't know ... we couldn't sense when the product was sufficiently debugged and tuned up to put it out on the market. When you invented an instrument, it either worked or it didn't work. This thing was not... this was very gray, and it still is. Some of the things worked and a few of them didn't. That's right. And it worked, you know ... how long was it supposed to work non-stop before it would "crash"? You know, was it ten minutes or ten hours or ten days or whatever. And, you know, those lessons are hard for a bunch of newcomers to learn and they're even hard for a bunch of pros to learn because it was, what, fifteen years later when the HP Spectrum was introduced, it had exactly the same problem in the first year. And I guess all computer

manufacturers struggle with that.

KIRBY: Now, it was out there and then you recalled it and did the improved version work okay?
TERRY: It did better.

KIRBY: The second one or whatever you want to call it.
TERRY: Yes, it worked better. They never were perfect but it was ... at least it worked good enough that we could get out, you know, and sell it with some degree of pride. We backed 'way down on the multi-function operations. We had said originally you could run this computer simultaneously off of different terminals, in batch mode, in real-time mode, and in time-share mode. And we completely dropped the real-time requirement or the real-time capability and said you could run it either in batch or time-share mode, that is, shared terminals, simultaneously. And it finally did that with a reasonable degree of performance such that we could collect the invoices.

KIRBY: It's kind of ironic because the 3000, then, or a machine with that nomenclature, went on and on for years.
TERRY: Yes. Yes, it did.

KIRBY: God, that's amazing!
TERRY: It's been supplanted these days by the risk architecture but one of the things that was really done well was to milk as much performance out of a 16 bit mini-computer, you know, before we got onto the 32 bit machines. The 16 bit hardware is cheaper than the 32 bit hardware and so, with clever software, we were able to get one heck of a lot of performance out of it. I don't remember the unit count of how many 3000s were sold over its lifetime before we went on to the success.

KIRBY: I heard that once; it was very impressive.
TERRY: Whatever; it made a lot of money but boy! It was a tough birthing.

KIRBY: And then at that point, who were kind of the key people on the 3000? Do you remember?
TERRY: Oh, boy! In fact, I saw one of them last week, a guy named Jim Katzman, who is here in the valley, left us and went to Amdahl and then was one of the founders of Tandem. He was a key engineering guy. A fellow named Mike Green, that Jim and I reminisced about, was the architect; he was a software guy. He was the architect of the 2000-based time-sharing system and he also worked on the 3000. A really unusual kind of a guy. He's the guy, I think I probably already told the story about getting a call from the plant maintenance people about a security problem because Mike Green was riding his bicycle in the factory.

KIRBY: Oh! Okay, yes.
TERRY: And I went back to see Mike and I convinced him without too much trouble that it was all right to wheel the bicycle in the factory but you shouldn't ride it because the floor was really slippery. Incidentally, that was kind of a breakthrough! Being able to bring your bicycle in and put it in your cubicle!

KIRBY: Terrific.
TERRY: There was a guy named Gene Stinson; he was one of the principle hardware architects. He left and went to Measurex, became a very good customer of ours. A fellow named Steve Valentine-as in "Valentine's Day"-came from Burroughs. He was a very key guy on this project. I think Roy Clay had left. Roy Clay was the software engineering manager for the 2000. I believe he had left the company then. He was not involved in the 3000. But are some of the names that come to mind.

KIRBY: That guy you mentioned, Stinson, he's the one who took you back and showed you the Omega. He's still operating it.

TERRY: Oh, yes. He had the Omega stashed away in a closet. He rescued it. He may have been the one, for all I know, that instituted the black armbands and I think I already put that story in there but as wise managers, we never told the people in the lab to take off the armbands. We just let them go. Just let it go and disappear. Just let it go and pretty soon, they stopped wearing their black armbands, and life went on.

KIRBY: While you were at data products, I assume the group was immensely profitable because of the advanced products division and the handheld calculators. But what about the computer operations? When did that begin to turn a profit?

TERRY: It was profitable in the 2116 era and it was profitable in the 2100 era but the 3000 soaked up so much R&D, that it in and of itself-of course, there was a lot of expenses in those shipments like anything-it was a big loss and then in the first year of the 3000, the whole thing combined was marginally profitable. It was about half the rate of the company, and it took about three years of increased 3000 shipments and particularly shipments of not so much handheld but desktop calculators to really get the margins up. And there were a couple of years-I may refer to in here-when the margins were higher than they were in T&M. But the real driving force behind it was getting at least some 3000 revenue in to offset all these expenses, and then the real drive with the desktop calculators. They were very profitable, very popular.

KIRBY: Perhaps you're going to talk about this. I just thought of something. What major product sort of followed the 3000?

TERRY: There were something called the Series 3000 II; they were just variations on the theme. We'd redo the hardware. We'd redo the hardware to take advantage of new memory configurations coming in. The product line was broadened. There was a baby 3000 and then there was a maxi 3000, so there were more models to choose from. They all ran the same operating systems software. So it was kind of a typical just broadening of the product line, more than anything else because you wanted to keep the idea and I'm not even sure it's true today, is that you ought to get 20 years out of your architecture. That is the basic idea and the basic operating system. You ought to get that much life out of it. It's probably shorter today. But what you just keep doing is you keep adding features to the software and you keep redoing the hardware to make it more efficient.

TERRY: And that was the kind of the name of the game.

KIRBY: Now, let's talk a bit about Paul Ely. When did he join the data products group and in what capacity?

TERRY: He came down there to replace George.

KIRBY: And that would have been as manager of the division.

TERRY: As manager of the Cupertino division. That's right.

TERRY: That was his entry point and that had to be about 1971 or '72.KIRBY: And George went over to manage advanced products division.

TERRY: He went over to APD.

KIRBY: All right. So then, Paul, I guess, he came from microwave, didn't he?

TERRY: He came from microwave. He was at one time the engineering manager and I don't recall... I think he was the engineering manager. John Young was the division manager and I don't Paul was ever the division manager of the microwave division. I could be wrong in that but his background was heavily in microwave. He came from Sperry, was a relatively experienced engineer when we hired him and he came from Sperry and he, all of his background was in microwave and communications a little bit. Did I tell the story about the new engineers dinner?

Editor's Note: Ely became Microwave Division Manager in 1969

KIRBY: No, I don't think so. Let me first ask you, had Paul any experience with computers?

TERRY: No. No, he did not.

KIRBY: Okay, all right. So he had to get up to speed in a hurry?

TERRY: Yes. And he's a good engineer and he's a smart guy technically, so Paul was a ... He had a bit of a habit of kind of acting like he knew more than he really did. He was nobody's fool when it came to technology; he could catch on real fast!

KIRBY: Yes, yes. Tell me about the engineers' dinner.

TERRY: This is when Paul joined the company. Now this goes back a ways, quite a ways. This would be before I went to Colorado Springs, so it would be in the mid-'60s. We used to have a new engineers dinner; it was kind of a tradition in the company and on this one occasion-I'll never forget-we had a dinner. It was here in the cafeteria at the main site in Palo Alto, and there were probably 30 engineers and their wives or girlfriends at this dinner and there was a bunch of company officials and then there was a bunch of hosts. And we had hired three or four people in marketing so I was kind of the host at a table of new marketing engineers and so forth around the room. So we had dinner here. There's no booze, no wine, no nothing. Everybody sort of stands around and wrings their fingers for a while and makes small talk and then sits down and we had a nice dinner, and Packard had a long kind of a head table setup lengthwise in the cafeteria, and he had I think all the vice presidents there and Dave stood up after dinner-and their wives. Dave stood up after dinner and he introduced each one of these people and he had them say a little bit about what their department did. So Frank Cavier would stand up and say, "I'm Frank Cavier. I'm the Chief Financial Officer" (the title wasn't quite as fancy then) "and in the accounting department, we do this and we do that." He went through each one of them- Barney, Ralph Lee, and manufacturing and so forth. And then Dave got all finished and he said, "Now, I'd like to go around the room and have each one of you new engineers stand up and tell us who you are and what school you graduated from and what are your general career ambitions." So here are all these 21-year-old engineers, you know, just kind of scared to death to stand up and some guy says, "I'm Joe Jones from Utah State and this is my wife, Cindy, and, and, and I...I...I want to be a good engineer." You know, and this is going around. Anyway, we get to Ely and he's probably ten years older than the average of all these new young engineers that we hired but he's a new engineer, too.

KIRBY: Yes, because we got him from Sperry, right?

TERRY: Right. So he introduces himself, "Paul Ely. I went to Lehigh University. I came here from Sperry. This is my wife, Barbie." Then a kind of dramatic pause and he said, "My career ambition is to be sitting at that head table!"

KIRBY: Really?!

TERRY: Yes, right!

TERRY: Everybody kind of said, "Hmmmm!! Better watch this guy!!"

KIRBY: That's marvelous.

TERRY: Paul is not one to mince words.

KIRBY: That's marvelous. That's great. Now, when he got there, he was reporting directly to you?

TERRY: Yes, he was and I was sitting in the corner; now this is the front part of the old Varian building. I was sitting over in the corner and I had about three or four people-a group manager, who I believe was Bill Nilsson; a group finance manager, who was Jack Lustino; and I think that's all-just finance and marketing. There was no personnel group person or

engineering person like that. There was a group engineering person later on, but not at that time. So we were sitting over in the corner and we were "group" and then the whole rest of the building was the Cupertino division, and Paul was down at the other end of the building, where George had previously had his desk. Paul was about there for about two or three months when he came in one day, and in a kind of a quiet, deep voice-I could tell something serious was on his mind-he announced to me that the building wasn't big enough for both of us.

KIRBY: Really?
TERRY: Yes, right. So would I mind it a great deal if I were to move myself somewhere else?

KIRBY: Really?
TERRY: Right. And I understood what he was saying. I don't think I had meddled in his affairs but just the fact that the boss is in the same building as you are is not really the best situation from an appearance standpoint. So I looked around and I found some space up here in Palo Alto, and I moved up here.

KIRBY: With the staff people?
TERRY: With these staff people, yes. We all sat over here against these windows. With Nilsson and ... Jack Lustino must have left about that time because a fellow named Hank Morgan...

KIRBY: Oh, yes, I remember Hank! He was the finance manager.
TERRY: Right. And, yes, the marketing people, they may have stayed down there or I don't remember but I got out of Paul's way, as I should have and Paul had the free reign of the building.

KIRBY: Now, then at some point, you left and Paul replaced you.
TERRY: Right.

KIRBY: Did you leave under some criticism? How did that work?
TERRY: Well, I never had any direct but I can tell just this 3000 introduction was a big disappointment. The company got a lot of bad press and nobody ever said anything directly to me one way or the other about it. In fact in 36 years, I had two performance evaluations, one by Hewlett and one by John Young, neither of which were ever put in writing.

KIRBY: Is that right?
KIRBY: Two in 36 years!
TERRY: Yes. I'll never forget Hewlett's, by the way. It was when I was in data products and he threw a few compliments out and he said-I forget exactly how he put it-but he said, "You're biggest problem," or "You're biggest challenge is you're not political enough."

TERRY: He said, "You're too easily swayed by other people and you're dealing with a bunch of people who are highly political" (he didn't name any names) "and are going to try to push you around. So you should be careful about that." And I thought that was pretty good advice!

KIRBY: Yes, yes, yes. I'll be darned. Well, that's amazing. That's amazing.
TERRY: But, yes, to answer your question, I think there was some disappointment in me and others. Me, I was the leader, about, you know, "How could you have gotten this product introduced out on the market that didn't work quite right?"

KIRBY: Uh-hmmm. But there was no ... You weren't on a probationary period or anything else. I mean, it was ...
TERRY: No, it had been six years and it was time to make some changes and there was a general sense of reorganization going on within the company. So there was a ... it was fortunate for me that if somebody-Ralph, probably-thought we should make a change and Ely was stronger and smarter than me in running the computer business, fortunately they

didn't have to find me a job. There were other things going on. John Young got promoted, so they needed a head of the test and measurement groups, so, again, I'm reading between the lines. Somebody said, "Well, let's have Terry go run the test and measurement group. He can probably do that. And this guy, Ely, who's a really forceful, hard-charging guy, he's probably going to be a lot better for the computer business." I do have to tell one story. This would be probably about '72 or '73; it would be in 1973. This was the occasion of making this change. I think they had made a change with John Young. I'm searching my memory. So the instrument job was open and nobody said anything to me about what was going to happen to me and I was busy doing a lot of things and I was involved, as I had been previously, with the Western Electronics Manufacturer Association. I think I was the San Francisco chairman or San Francisco counsel, anyway I was on the board of WEMA and we had a WEMA meeting in Seattle, and Hewlett had decided that he wanted to make a change. And he called down, well, he called over here because I was up here now. You were up here by then. I was physically up here. He went over or called over and wanted to know, "Where's Terry?" "Well, Terry's up at a WEMA meeting in Seattle." "Get a hold of him for me." So somebody called up to the WEMA thing-we were up in a big conference room-and they said that they wanted to talk to Bill Terry. Well, the person who received the message didn't get it quite right because they thought they heard Bill Perry.

KIRBY: Oh!

TERRY: This was a point in WEMA when the director, the head of WEMA's name was Ed Ferry and then there was Bill Terry and Bill Perry, and we used to check in to hotels Terry, Ferry and Perry.

TERRY: Anyway, Bill Perry gets called. Bill Perry is currently the Secretary of Defense and he was on the WEMA board and Bill Perry gets called out of this meeting and he goes to the phone.

TERRY: And Hewlett starts telling him about how he's going to make this change...

KIRBY: Honest to god?

TERRY: Because he just said, "Hello, Bill?" "Yes?"

KIRBY: And Bill launches into it?

TERRY: Bill launches into his proposal. Pretty soon, I don't know how long this went on, but Bill Perry obviously figured out that he'd got the wrong person and put the phone down and came in and got me.

KIRBY: That's funny! That's great!

TERRY: And I went out and I talked to Hewlett and he finally got the right person, but Bill essentially said, "We're going to make some changes in the company and I want you to go run the instrument business, and that's an important assignment and we're going to have Paul run the computer business, and we're going to make John a EVP, I think it was what John became, and that's it." And I said, "Fine, thank you."

KIRBY: Now, when they promoted Young, what did they make him responsible for? Do you remember?

TERRY: They made him ... They had ... The first pass, and it's in the annual report, they made John an EVP and Ralph an Executive Vice President, and this was '74, and they said they were going to be jointly responsible for operations and Bob Boniface was going to be responsible for administration. And at that time, there were six groups and I don't remember, obviously Ralph and John split them up but I'm almost positive that John had computer systems, components and instruments and Ralph had calculators. I know Ralph had calculators.

KIRBY: That's right, I remember that.

TERRY: And he had medical and analytical but I may not have that precise but that's essentially how they kind of split it up.

KIRBY: Okay. Now, this transition to Paul, was this difficult for you? Or did you leave right away? Did you leave after ...?

TERRY: Three or four months. I left physically three or four months later and then it was probably three or four months after that. So Paul and I were only together for about six months.

TERRY: And no, it wasn't difficult. Paul was ... Paul is Paul but we generally saw eye-to-eye at least on short term things that needed to be done. You know, fixing, getting the 3000 better performing, expanding the 2100, introducing what was called the 21 MX, which was a solid state version, solid state memory version of a 2100. These were all kind of, you know, plans that had been in place and Paul didn't see fit to change them and the idea was to get in there and get them implemented.

KIRBY: Now did he retain most of the management people that were there or did he bring in new people?

TERRY: He retained most of the people that were there but, of course, there were some changes and I can't really remember who changed what. I know there were a number of changes in marketing. In manufacturing, I don't think there were that many changes. I believe Bill Abbott was still the manufacturing manager and there must have been some changes in engineering but I'm not sure I can remember exactly what they were. We had a young guy working on the 2100 and then the 21MX solid state version who was also going to school at night at San Jose State getting his degree in engineering, who looked like a really sharp guy. His name was Bob Frankenburg.

TERRY: And it turned out he's had a good career at HP and now he's off running Novell.

KIRBY: Uh-hum, yes. And Newman was over running APD, so he was probably reporting to Lee, Ralph Lee.

TERRY: I believe so or to Tom Kelly. I think Tom Kelly was the head of the calculator group. And the calculator group was the hand-helds here in Cupertino and Singapore and the desktops were all over in Loveland and in Germany.

KIRBY: You may have ... You may agree with this. I heard Bill Hewlett once talking about George Newman and he said that Newman was an excellent manager when things were running all right, in other words, maintaining momentum, but if you had some big problems, maybe he wasn't as good as some other people.

TERRY: I'd agree with that, particularly if it was, what was referred to as product strategy or technology problems, because he just didn't have the background compared to a lot of other people but he could kind of see his way clear and to sell it to other people. Ely had the advantage of being a dyed-in-the-wool technologist doing his homework so when Paul stood up and said, "Look, we've got to change it from A to B" or "Here's the new direction," he just had a heck of a lot better chance of selling that idea than George did.

KIRBY: Yes, that must have been very tough for George in not having that background.

TERRY: Yes, and I think I've commented, you know, woulda-coulda-shoulda. Maybe it was unfair, unwise. Unfair to put George in that job in the beginning but it was a bit of an expedient. He needed something to do from Japan and I think it was ... he was good, you know, in those first 18 months, HP way, let's get this thing on a more even keel. But then we ran out of, you know, he ran out of talent and patience, or not patience. He ran out of talent and background when this thing started rolling along. I mean, this thing grew from 50 to 250 million in about two years!

KIRBY: So just to wrap up this one subject, did Paul, did he sort of launch any big new programs after he replaced you? Or pretty much just maintain what was going on?

TERRY: No, he maintained what was going on up until, and it's in my notes here, we'll get to it. This would be in the 19 ... in the late '70s, yes, 1977. It was introduced and he started it in probably about 1975, a whole new computer family. That was his, the one that he put his own stamp. The other things were kind of follow-ons.

SELECTION OF NEW PLANT SITES

KIRBY: Okay, all right. Now, before we leave data products temporarily, there are some items I think we should try to cover. Have we talked about the selection of Grenoble, France as the plant site? And the selection of HP products to be manufactured?

TERRY: Yes, I think I covered that, Dave.

KIRBY: I think you covered it where Hewlett said it was going to be computers and Packard wanted it to be a little more generic, so to speak. HP products.

TERRY: Right, exactly, and after the meeting, I asked Frank Cavier, I said, "You know, I'm a little confused here." And he said, "Well, you shouldn't be. You just do want Dave says. Yes, we talked about Grenoble including the fact that after we'd selected the site, when the corporate fathers in Palo Alto found out that the mayor was a communist, they got very excited! How could we possibly do something like that?! It turned out fine.

KIRBY: Yes. Now, maybe you're going to cover this, but what about the selection of Corvallis as a plant site for advanced products division?

TERRY: Yes, let me hit that in chronological order. We did that. APD was growing fast. They'd escaped out of the Cupertino building. They were across the street and they were running out of space. Singapore was up and running and we got convinced that we should find a permanent site outside of the Bay Area, and this was during an era, a long era, when we were trying to move growth outside of the Bay Area. And incidentally, in retrospect, you know, woulda-coulda-shoulda, what we should probably have done was go around and just rent some more buildings here and build a bigger base of operations in Asia-Singapore or Penang and never really have gone to Corvallis. That would have been an alternative and perhaps, in the longer run, it would have turned out all right. We'd have an engineering/marketing facility here and all the manufacturing would be in Asia, and the engineering ultimately would be in Asia, also. But we didn't; we went to Corvallis.

KIRBY: Yes, I think one of the criticisms of that move was, for APD was, it was ... it put them too far from marketing. I mean, they were stuck up there, you know.

TERRY: That's right. That's a very good comment and I feel exactly the same way. I didn't understand it or feel it at the time, you know, but fine for an esoteric instrument division. But for people who had to be connected with retailing and advertising and that sort of market, it was a difficult place to hire those, hire or develop those kind of sophisticated people with those interests and skills. You know it was another Loveland, where people were young with families, with the pickup and they liked to fish. And those weren't necessarily the kind of people you needed in retail marketing and these kinds of computers.

KIRBY: And then it was difficult to get to. I mean, it took time.

TERRY: Yes, yes.

KIRBY: You had to go to Eugene and then go another 100 miles or something.

TERRY: Right and we really wanted to be in Eugene, more than we wanted to be in Corvallis and the city fathers of Eugene very politely told us that they were not going to have us there.

KIRBY: That's right. I remember that.
TERRY: You were on that trip! You were on those trips!

KIRBY: Yes, yes, we had a meeting with them and they were sort of hemming and hawing around and I guess I finally said, "Hey, I get the impression that you're not wild about having somebody come in here." I guess the mayor sort of laughed and said, "Yes, that's right."
TERRY: Yes, because I mean, all these guys and these weren't the first ones, they were always polite and the way they'd do it, you remember Dave, "Oh, industrial! Well, we have this industrial park and it's right down here by the railroad tracks, near where the automobile dump is and we have this triangular piece of land, eight acres, that you could put your industrial plant on it." And we'd say, "No, no, no. We want to buy 100 acres, campus-like. You know, what about over there on that hill?" "Well, no, no. That's residential. You can't go over there." So they kind of finessed us out of town.

KIRBY: I remember when we were wandering around that afternoon, we saw a marvelous plant site, remember?
TERRY: Yes, I remember.

KIRBY: It was up on a hill, god!
TERRY: Right, it was to the west of town.

KIRBY: It was just gorgeous!
TERRY: Yes, I remember that, too.

KIRBY: Well, in any event...
TERRY: Anyway, there were two schools outside of the Portland area. One was in Eugene and one was in Corvallis, so Corvallis was almost a kind of default after the Eugene thing didn't work out.

KIRBY: Yes, yes and then a few years later, when the timber business really got bad, why, then they sort of changed their mind about welcoming new companies. Well, let's go back chronologically and let's take it from the time you were leaving data products. Some of this overlaps because you gave me a binder with the reports of the '70s and I just kind of went through here and made some notes, starting in 1971. This is when I was still in data products. And in fact, I've got a question for you. In the 1971 annual report, Hewlett is writing the letter and he says that David Packard is going to return to the company on December 13, 1971. And he says in here, I don't [know] what the exact words are, that Dave will not be devoting full-time attention to Hewlett Packard but we hope to have his counsel from time to time, and stuff like that. Do you remember what that was all about?
TERRY: Yes, yes. I think Packard sort of assumed, and I'm getting this I think from Ed van Bronkhorst, I think Packard assumed that when he came back, he would be chairman and he'd be CEO, chief executive. And it turned out that Hewlett told Packard Hewlett liked being CEO and he didn't want to give it up.

KIRBY: So Packard said okay, you know...
TERRY: That sounds like Dave.

KIRBY: I'll return as chairman, and, you know, we'll continue on. Now, I think...
TERRY: "Although he will not be devoting his full-time to HP activities, the time which he can devote will be of the greatest importance to the company."

KIRBY: All right. That's what it says?
TERRY: Yes.

KIRBY: Well, anyway, and I think there were quite a few people who were somewhat disappointed

because they had worked for Dave and, you know, felt that he was a stronger CEO in ... but it was interesting. So from that point on, Packard was no longer CEO of the company.

TERRY: That's right and I'm looking at the next year, 72, it's still Hewlett, President and CEO, David Packard, Chairman. And Dave always stayed chairman and then the CEO stayed with Bill until John came along.

TERRY: But as you and I can remember, Dave didn't behave very much differently as chairman than he did as CEO.

KIRBY: No, that's right! No, it didn't.

TERRY: And the partnership didn't work a heckuva lot differently than it did before.

KIRBY: No, it didn't make a great amount of difference.

TERRY: Back in the saddle. The 71 annual report also talks about data centers. This was a thing we started in data products. I think we did it for a variety of reasons, including the fact that this was the way the computer industry worked. I think the name came from IBM and others had these things called data centers. The IBM ones actually did EDP processing work. They had a thing called the IBM service bureau and it was a big deal and we didn't really want to get in the service bureau business. That was talked about and we didn't really think that was a good idea. But we established these things called data centers and there were about four or five of them in the United States and one in Europe, it was a physical facility within the large sales office of an array of computing equipment and some talented people, systems engineers they were called, who could put on demonstrations, who could get software from customers and run test sweeps and do an evaluations and things like that. So it was an extension of the factory out into the field to do technical selling and there has been a variation on this theme off and on again through the years. They go in and out of vogue about every ten years. One of the problems with them is they're immensely expensive.

KIRBY: I bet they are!

TERRY: The equipment is expensive and the depreciation but then you've got these really talented people tied up in these rooms and it came ... they sort of went in and out of vogue. They were in vogue at this time in the '70s; they probably went out in the '80s. Yes, in the late '70s they went out and then in the late '80s, they came back again, and we were building something called something else.

TERRY: With fancy windows and stuff like that, curved glass and sales offices as demonstration centers but this was the beginning of it and it's always been hard to strike this balance between, well, expense is what really kills you in these physical facilities.

KIRBY: Yes, I guess the original data centers, there would be sort of at least one in each region like the Neely region and Midwest.

TERRY: I believe that's right. Exactly, one in Los Angeles, one in Atlanta, that's exactly ... Chicago, one up in the northeast somewhere. In '71, instruments were weakened by recession. I can't remember; we'd have to look at the presidential list. This must have been Nixon time. HP only grew eight percent that year, so it was kind of a tough year and data products was down seven percent. This is before we got to the calculators. This is the waning years of the 2116.

KIRBY: Oh, yes! Okay, this was before the calculators. So this was tough times. ESCA is mentioned and you ask about that on another occasion on whether that was a contribution or not.

TERRY: That's right. That was a complicated scientific son of a gun that really didn't go anywhere. Addition of the Queensferry Plant. When we started in the United Kingdom, the first plant was in Bristol. It was on Dallas Road in Bristol, England.

KIRBY: Or Bedford?

TERRY: Bedford! I'm sorry! Bedford; the current one is in Bristol.

KIRBY: That's right. The original was in Bedford.

TERRY: Bedford, northeast, northwest of London maybe 30 or 40 or 50 miles. David Simpson was the manager. He'd come from Hughes. He was a Scotsman. John Doyle worked there, so he can tell you a lot more about the origins of this than I can. But David is a Scotsman who really wanted to get back to Scotland, personally, and so he convinced ... and we were having problems running out of space in Bedford and it was a little too close to the London metropolitan area, so he had a fairly easy sell to establish a plant in Queensferry.

KIRBY: I had forgotten that he was the guy then.

TERRY: And this isn't the first time this company or any other company, that something takes place like a physical move, that's very much at the motivation of the manager in charge. For example, we probably should have moved our components group out of the Bay Area a long time ago, but we never could because the guy that ran it wouldn't live anywhere else except in the Bay Area. It was never on the agenda. But anyway, we built an extension on the plant in Queensferry. We kind of essentially did a mirror image of the second half of it, made it twice as big. It was a two-story concrete-steel glass building. The new addition had kind of an innovation at the time in the UK. It had light-colored squares of I guess they were asphalt or vinyl tile on the floor and, because that's the way all the HP factories were and people used to "ooo!" and "ah!" about how clean they were and how the floors always shined, and there were a lot of lights on shining floors. And so we were doing the same thing in Scotland. Well it turned out that the Scottish hadn't really ever laid one of these vinyl tile floors and so in laying the floor, they mistakenly thought the building was square. And this was a big building; this was 150 by 80 feet or something like that. So they started laying the tiles at one corner going across the building, and of course, the building wasn't square so as the tiles went across the floor, you began to see a line that would curve off to the right. They didn't all line up straight. Simply because the building wasn't straight. And so this got to be pretty disconcerting as it went on. Here you're standing in this building and you look down, you know, you'd look straight ahead and you'd see this curve in the seams of the tiles and so somebody up there-it wasn't me; it might have been Peter Carmichael who replaced David Simpson-they made up a story that at the groundbreaking they had for this building, Hewlett was up there and that Hewlett had a little bit too much Scotch and he got the bulldozer out of line and the bulldozer went wandering down the path...

KIRBY: Oh, really?! Really? That's the story?

TERRY: ...during the groundbreaking and that it had a curve and that's the reason that the tiles curve!

KIRBY: I've never heard that. That's a great story.

TERRY: Yes, they made that story up. Everybody knew it wasn't true but nobody wanted to say the Scots didn't know how to lay a tile floor! And the way you lay it is you start in the middle, then you cut the tile at the edges, because the thing isn't going to come out even.

KIRBY: Yes, that's right.

TERRY: But that was the Queensferry addition. '72, boy, was a really strong year! Data products up 81 percent, pocket calculators mostly, and I was reminded ... you and I were reminded as we left last time, about the cash crisis which going on at about this time, and one of the bigger sumps of cash was the 3000 rental program. I had forgotten that. Van reminded me of it. This was the fashion to rent computers. IBM had led the way for doing this for a long time, made a lot of money on it, and had a lot of market control. And there were a number of customers who wanted to rent the computers. I mean, this was the folklore in the industry. And I suppose we could have sold them to somebody else who rented them, and we did some of that, but we established our own rental program and we rented quite a bit of 3000

equipment and quite a bit of 2000 equipment, 2000 time-sharing systems, for example, going into universities and high school, where many times they rented; they didn't have the cash-flow to buy it but they had the money to rent it. So that used up a heck of a lot of money in a pretty big hurry also.

KIRBY: Yes, I would think so. Now, was the situation like automobiles, where you could to buy later?

TERRY: We had almost every option known to man, all 'way too complicated. And you could kind of get it almost any way you want, but generally "yes". That's the way this thing worked out.

TERRY: A thing called full payout existed.

KIRBY: Yes, that's a tremendous inventory problem.

TERRY: We had a guy start a time-sharing service bureau in Canada, and he might have extended it to the United States. It was a franchisee operation, and he was renting mostly 2000s and maybe 3000s, and, boy, we had a rental base of maybe 50 or 60 systems with this one guy.

KIRBY: Wow!

TERRY: And there was another famous guy named Saul Steinberg, who was a genius of Wall Street. He was in the container biz and he also started a company called LeaseCo that sopped up a lot of computer equipment.

KIRBY: Oh, yes! I remember that.

TERRY: And it was a good deal. I mean, this was good for HP but it sure consumed a helluva lot of cash to build up this rental base! We, you know, we made the stuff stick and we got paid for it but it was kind of a new adventure. 72 was also the year that "Terry was named a vice president of data products and Demere was the vice president and operations manager of the electronic products group." So Ray was working for John as an operations manager and I don't remember ... Ray and I came together later on. But Ray had come back from Germany and he was in T&M electronic products as it was called, and he worked on a certain set of responsibilities that John had defined for him. 73, I'd almost forgotten about price controls. This was the era of ... This was not fun! This was the federal government controlling inflation through price controls and there's some great language in the annual report that you probably wrote, or Dave wrote, and it is what Newt Gingrich is saying today about "This is not the most proper way to fight inflation. Getting the government budget and deficit spending under control is the way to do it and not going around establishing a bunch of price controls. But we had price controls and it wasn't that we had been in the habit of raising prices willy-nilly. We had raised prices as materials, particularly, got more expensive or we mispriced the product, which was the case more often. But it was just keeping track of all this stuff and making out all these reports. I mean, we had thousands of products and to enforce these controls, you had to send in all these government reports and they had to be audited and it was a very uncomfortable time, fiddling around with price controls. I guess inflation had gotten ... let's see, I'm trying to remember when Nixon abdicated. I think it was in '74?

KIRBY: '75? I remember Gerry Ford had a terrible problem with inflation when he was president.
KIRBY: So this was sort of at the beginning of that cycle?
TERRY: Right.

KIRBY: '73.
TERRY: Also '73, there are some of the first words mentioned about energy crisis and this must have been oil shock and so energy conservation began to be preached more and more throughout the company. Frankly, we had never paid any attention to it. I can remember

asking a division manager, "What's your utility bill?" and nobody knew what their utility bill was. I went to Santa Rosa one day, and I asked them and they didn't know and I said, "Well, go get it." And I was really surprised: they had a PG&E bill, just like the one I got at home!

KIRBY: Really? Just the same? The same format?

TERRY: Exactly, the same format. I thought I was going to get a big computer readout; it was just like the one I had at home, only the numbers were a little different. The bill was $97,324.16 and they broke it into electric and water and...

KIRBY: Just the same deal?

TERRY: Yes, yes. Man, the numbers were huge! And preaching about energy conservation is a matter of patriotism fell on deaf ears but once the division managers began to realize how much money they were spending on utilities, then they began to take every other light bulb off and they turned down the thermostats, and do a whole bunch of things like that.

TERRY: I don't know when we started the Santa Rosa site; it was in the early '70s at one time or another. I was in data products at the time. There were a group of ... this was an extension of the microwave division. It was growing; it was held here in Palo Alto. So there was a team of microwave managers, including Paul and Doug Chance. I guess John was involved, but I know Paul and Doug were and they went around and they visited a number of places. I know they visited Albuquerque because my wife is from Albuquerque and they used to tell me about their visits to Albuquerque.

TERRY: And the wind was blowing and the sand was blowing and they didn't like it very well. And they selected Santa Rosa and selected a very attractive piece of land, and there was a certain negative backlash from the community up there.

TERRY: And I think it was one of the first, that I can remember, kind of community backlashes. Went we went to Colorado, we didn't get any of that at all. Well, we got it from Boulder when there was talk about going to Boulder and we got a real backlash about "Don't come to Boulder" and that's when we went to Loveland. But this was one of the first ones where the community was not welcoming us with open arms and for that reason, Dave decided to hire a different architectural firm and we had used Joel Erlich, Erlich Romanger, and Burge Clarke for the buildings here and a number of the projects around and Dave decided that we needed a little more of a big-time architectural firm. So he hired a guy named John Carl Warnecke in San Francisco and Warnecke & Associates I think it was the name of the firm, but he was the, you know, the la-dee-dah of top five in the country or something or other. And he designed this wonderful plant in Santa Rosa which cost an arm and a leg. It was really expensive and there were a whole bunch of problems with it and a big lawsuit broke out against Warnecke. Oh, yes, there was a big lawsuit and Dave was very embarrassed about the whole thing because I think He had chosen Warnecke.

TERRY: He had chosen Warnecke and for all I know, Warnecke was a big time member of the Bohemian Club or some deal like that.

TERRY: And so, you know, this was a really sticky time. Some way, somehow the lawsuit got settled and we got on with the building of the Santa Rosa facility, which is the one that, the phrase isn't original, that I've said, "This is the kind of microwave building that God would build if God had the money!

TERRY: Because it was a beautiful site and still is.

KIRBY: I think later on the Packards, did they use Warnecke to do the Monterey Aquarium?
TERRY: They may have. I'm not sure.

KIRBY: I think he did.

TERRY: I'm not sure of that.

KIRBY: At least the first building.

TERRY: And I don't remember exactly if Bruce Wholey, who has passed on, was in the middle of this whole thing or John Young may remember the details of the lawsuit but I know it was related to cost. The cost was just escalating out of sight. Well, and you know, it's interesting because that plant site was put back up behind a hill so that it was not even seen from Santa Rosa proper.

KIRBY: You know, it was interesting. It was that Fountain Grove Winery land and so it was tucked away up there. That probably helped lessen the community concern, I guess.

TERRY: Yes. Well, again, it was, you know, as I recall, a minor part of the community, not the real city fathers but it was environmental concerns and growth and so forth, and we tried to preach to them that the growth was going to come to Santa Rosa and if you guys are smart, you'll snag on the things that will really help the community. It was about three years after we were there, we kicked in $100,000 to help Santa Rosa buy the Annandale Park, which is just south of the City of Santa Rosa, and we weren't exactly trying to buy our way into the hearts of the community but we got a lot of popular press from, you know, making that kind of a contribution.

KIRBY: Oh, okay. We got even more community resistance when we put a satellite plant at Rohnert Park.

TERRY: Yes.

KIRBY: Because there were some people, especially in that little town of Cotati. Oh, boy! And you know their resistance was strong enough so that they put it on a ballot.

TERRY: I do remember that and that might even have been Vietnam time when there were a lot of people going around about almost anything and everything, but yes, I do remember that. And when we bought the Rohnert Park site, it's a large site-200 acres like-we dedicated part of it to residential housing and sold some of it off and so forth, but we're right next to Sonoma State College I think it's called and there were...

KIRBY: We got some heat from them.

TERRY: A number of people there were ... Some faculty people. And you know, we had to devote a lot of manpower to go around ringing doorbells about this. And Doug Carnahan was involved because he'd been in Santa Rosa.

KIRBY: Yes, he was the facilities manager at the time.

TERRY: And Katie Nedler in my department was involved. He was one of the spearheads along with George Bodway, and one of the, not the main road but one of the side roads in the development is called Bodway Roadway, after the famous George Bodway. Oh, and the other guy who was involved in talking to the community was Byron Anderson. He was very good.

KIRBY: Yes, he was head of the tech center.

TERRY: In '73 we bought Femcor. Femcor was a small field emission corporation. The official name of the company was Field Emission Corporation; Femcor was kind of their product name. And they had a high energy x-ray source, a tube, that they used to make inspection machines. These are cabinets that... it's kind of like a fluoroscope. You can put a printed circuit board in it, it had a Polaroid camera and you'd x-ray the thing and you could see through the various layers. It was very popular in all kinds of different things. And people use them to search for letter bombs and stuff like that. The ambition was that we could use this x-ray source to get our way into the medical x-ray business against the giants like General Electric, that there were some unique things you could do with this to produce different kinds

of x-rays for medical applications and it turned out it didn't work. There was some developmental work done on it and the thing just kept loafing along and in fact, it probably was there for 15 years before we sold it to somebody but it was a nice little operation in Lynneville, Oregon. We also bought Hupe & Busch that year.

KIRBY: In Germany?

TERRY: That was in Germany in Karlsrue, a suburb of Karlsrue, and they were in the liquid chromatography business and this was a very nice addition to our gas chromatography business for analytical.

TERRY: I don't remember but Peter Hupe is still working for HP as a consultant.

TERRY: A very high quality, really nice guy, great scientific credentials, wonderful manners and he ran it as an HP division for about two years and then announced he just didn't want to do this business kind of stuff and we kept him on as assigned as an engineer and he still is a consultant to HP and very influential in the whole European scientific community.

KIRBY: And where was that little company located at the time, do you remember?

TERRY: It was in a suburb of Karlsrue. We eventually moved-I can't remember what town it was in-but we eventually moved to Wildbran. That was the permanent site, which is near the autobahn west of Stuttgart. But the other plant was further towards Karlsrue on the other side of the freeway.

TERRY: 1974 was a good year and this is the year when there was mention about increases in inventory and we're considering debt and where we already told the stories about considering debt versus not considering debt.

TERRY: I think it was in '75 that it was reported that we hadn't borrowed any money and we'd turned the thing around and the cash position was a lot better. Boise and Corvallis plant sites were purchased and I was involved in both of those. Corvallis was, I don't know, I guess it was on the tape. We looked at Eugene; you and I were both there and we got a real cold shoulder from Eugene and we went to Corvallis and we looked around, a nice school, very good engineering school and we happened upon the horse farm owned by Mary-you've got to help me with the last name.

KIRBY: Madigan?

TERRY: No, it was a Jewish name. Her father ... Jewish or German. Her husband who had passed away. I can't remember her last name.

KIRBY: I can't remember her last name either.

KIRBY: Bill, we were talking about Corvallis.

TERRY: Looking around town, we knew that the river flooded so we were sensitized to that. It looked like a nice place; the town was not too big. We looked at Salem kind of briefly but that didn't look very good. It was remote from the University and there wasn't much going on there except the state capitol, and we weren't very interested in the Portland area, so we kept looking in Corvallis and we found a very nice piece of land that had been a farm for raising thoroughbred horses and it included a racetrack and a kind of a clubhouse. And we met the lady who owned this land. Mary, and I can't remember her last name-it'll come to me-charming old lady and she was in her seventies. She was a widow and she had a son who did not live there; he lived somewhere else. And she was in the mind of selling off the cherished family horse farm. It had been in their family a long time, and she would regale us with stories about all the wonderful she'd raised and she had a whole collection of trophies and pictures and memorabilia of horses at this site. So we decided to buy the site and we negotiated with her, really her son, for the site and in the process of negotiations, as we were getting down to the final, we got Frank Cavier involved and he met Mary and she took a real

shine to Frank. She thought he was really a charming guy and he is a very charming guy, and that kind of helped seal the deal. The son was being a little bristling about a few of the terms and conditions. That's right. Frank got it all smoothed over. So we bought the site and we went up there to, in fact there were two trips. One trip we went up there to close and Frank had a check and we took Frank with us because we didn't want anything to go wrong and we had the corporate jet at that time, and Frank had a cashier's check in his pocket for about a million bucks I think spent on this; it could be less. Well, let me think about it. It's about 50 acres. Oh, yes, it was a lot less than that. It was probably $500 or $600,000. Anyway, Frank has the check in his pocket and Frank does not like to fly on any kind of airplanes, much less small jets. That's right. The corporate planes were a real problem for Frank.

TERRY: The corporate planes so we went up there in the morning and Frank was all right. Frank made it all right. We went up there and we talked to Mary and we did the closing and passed the check and so forth and it's about 4 o'clock in the afternoon and it's time to go home and I can tell that Frank isn't feeling real good about getting back on this airplane and as we go to the airport and we start walking out to the HP jet, one of the pilots, Matt Matthews...

KIRBY: I remember Matt Matthews.
TERRY: He knew about all of this and I don't know that we ... I didn't prompt him. Maybe somebody prompted him. Anyway he got a glass that must have held 16 ounces. It was like a giant beer mug and he mixes about six ounces of Scotch, whiskey and ice and soda in this glass and he had it perched right on the wing of the airplane. And good old Cavier comes waltzing along and he didn't even miss a beat, he just reached out and grabbed his glass and jumped on the airplane!

TERRY: And we had a nice ride home. Were you on that flight?

KIRBY: I don't think I was on that one, but I do remember when we were looking in Eugene and Salem, we also, late in the day, we stopped at Medford...
TERRY: Oh, yes!

KIRBY: ... and it was raining and it was ... I'd never seen rain so hard.
TERRY: That's when we had the wind-shear. It scared the hell out of the pilots!

KIRBY: Oh, boy!
TERRY: The rest of us were kind of wondering what the hell was going on but later on I remember the pilots said, "Man, that scared the pants off of us!"

KIRBY: Oh, man, was that a ... I don't know whether we even got off the plane, is was raining so hard! I guess we decided that Medford wasn't the spot. Anyway...
TERRY: We went back to Corvallis. I went back to Corvallis probably three months later when the community sponsored a "Welcome to Corvallis" lunch and I think I was by myself with the APD managers, and I met Mary, Mary Goldblatt- Goldblatt was her name!

KIRBY: Goldblatt, okay.
TERRY: I met Mary Goldblatt and she was welcoming us and she was so happy we were going to be there and she had this clubhouse that was part of the racetrack and we were planning on trying to save the clubhouse to make it into a recreation area or something or other. It turned out we weren't able to do that, but I asked her about the history of the farm and if she would donate some of the memorabilia to us and she did generously, and that forms a real nice exhibit in the Corvallis conference room on the whole history of the site. But it was also on that occasion when I met her that she kind of reached over and put her hand on my arm and she said, "Oh, you nice engineers forgot to tell me how much of a tax bite Mr. Nixon was going to take out of that check you gave me!"

KIRBY: Out of that big check she got, yes. I don't know what her cost basis of that land was.

TERRY: That's right, that's right. Boise was a fairly easy buy. I think you got involved. The sites were nice. The one we selected was out near the river. The big controversy was the sewer and what we were going to do with the sewer and this community had agreed to extend the sewer line and build a new sewer plant. And I also remember-I can't remember his name-there was a guy from the Idaho power authority, the purveyor of public utilities, who was really very, very helpful. This happened on a number of sites. Yes, I can't remember who it was.

TERRY: There would be somebody, either from the chamber of commerce or the industry or education or public utilities, who would kind of be our champion and kind of run interference for us through all the bureaucracy around but that one went fairly smooth.

KIRBY: I wonder, Bill, do you remember the head of Boise Cascade joined our board? John Fery?

TERRY: John Fery is on our board today. In fact, I saw him.

KIRBY: Still on our board?

TERRY: Yes, but I don't remember...

KIRBY: But he didn't, he probably wasn't in that position.

TERRY: I don't remember. Boise ... before John Fery got to Boise Cascade, the company had a really checkered history. It was up and down and sideways. And I remember when we went to Boise, we visited Morrison Knudsen. I remember being in that building. And I don't remember visiting Boise or meeting John Fery, Boise Cascade. It might have been just an oversight or we were kind of rolling along on our own agenda. '70 ... where am I?

KIRBY: '74.

TERRY: '74, the organization got changed from four groups to six groups at the end of the year, and the six new groups were instruments, components, computer systems, calculator products group, medical and analytical. And John was appointed an EVP along with Ralph, and that was when they were called jointly responsible for the operations...

KIRBY: For the operations.

TERRY: And Bob Boniface was later to become an EVP, was in charge of administration, and that's the one I speculated before. I'm not sure how John and Ralph divided things up, but I'm pretty sure John got very heavily involved in computers with Paul and I'm not sure what else, frankly, probably computers.

KIRBY: Yes, but you were heading the instrument group.

TERRY: I was the instrument group manager.

KIRBY: And you can remember reporting to John?

TERRY: I believe I reported to John.

KIRBY: Yes, I think you did, too.

TERRY: 75, another difficult year. Oh, maybe this is more of Nixon: 11 percent growth in sales, earnings down. I don't know how many times in the company's history, we've had a down year in earnings.

KIRBY: Not very often.

TERRY: It went from 308 to 302, so this was a tough year because there weren't very many like that, and this was the first year of orders over a billion dollars. So and we had some things in the annual report on how quickly we had gotten from $200 million to a billion, heavily driven by the data products but also pretty good growth elsewhere. We had some pretty flowery things to say about buying a plant site in Campenas, Brazil and the Brazilian market.

TERRY: A large, large manufacturing plant was referred to, and that was the intention. The ambitions were there but once we got on the ground in Campenas, we were making pocket calculators among other things in a small rented building, we found out really how complicated and bureaucratic and general screwed up the whole Brazilian economy was!

TERRY: And that didn't really ever go anywhere. And we got out of Campenas ten years later. We just folded up and went.

KIRBY: I guess we just abandoned it.

TERRY: We folded up our tent and left. We moved some of the products. They were computer products-PCs, I think-over to a joint venture but we took all our own employees out of there and probably are never going back in. '75 was the first time I saw in these annual reports a pretty prominent mention of affirmative action. It had been around for a long time but just cruising through these seventies, in the mid-'70s it got to be a much bigger deal. In fact, I think this was the beginning of a series in the annual reports that you wrote having to do with the public concerns.

KIRBY: That's right. We had some things. We had South Africa and we had affirmative action, right and the environment.

TERRY: Health and safety came along.

KIRBY: Right, health and safety, so we devoted a section.

TERRY: And I think American industry at the time was getting a lot more sensitized to something other than creating jobs and making a profit.

TERRY: There statements about things like that. Affirmative action had been around the company a long time and I think it first really came in when Dave Packard worked on a commission in the Kennedy administration having to do with the whole subject of affirmative action. This is Martin Luther King days, and I can't remember the name of the commission but I know Dave was back working on some kind of commission.

TERRY: And Dave would come back-this would probably be in the early 70s, late '60s-and he'd tell us about these meetings in Washington and he would announce is this very room that, "Gentlemen, this is an important matter for the country and it's going to be an important matter for our company." And I can remember two specific occasions where I saw Dave Packard get truly angry. I mean ANGRY, upset. One of them was also in this room when he was making these same statements-it would be in the '60s-when we were buying the reps and he made these statements about affirmative action, "It's a national goal. We're going to have to start working on this, training, recruiting." And we had a representative by the name of Earl Lipscomb from Dallas, Texas, kind of a crotchety old guy and he made some comments. I'm not sure he used the "N-word" but he said something about "Those people are never going to be acceptable in my company" or something like that, and Dave got really upset! He got very upset! And he said ... Dave doesn't tend to use swear words but it was pretty close; he said made it real clear, real loud that he didn't want to hear any more talk like ever again from anybody in this room, "Is that clear, gentlemen?" You know, on and on. Boy! You know, I can see Lipscomb doing that. I mean, that's the guy of he was. He was an old Texan, you know, a Texas A&M boy.

TERRY: Yes, oh yes, and he's the guy I told the story before that had the two pictures in his office, one of the cattle with the oil wells and the other one is a picture of "colored" we called then, Afro-Americans picking cotton, and he'd tell the salespeople, "You do a good job, you're going to be with those cattle in the oil wells; you do a bad job, you're going to be with those people picking cotton!"

KIRBY: Is that right? That's very interesting that Dave got so furious.

TERRY: The other time I saw him get not quite so furious in public and a smaller one, I was in Colorado Springs. Affirmative action was on the agenda, reporting was on the agenda. Stan Selby was able to trace his relatives back a couple of generations and find some Cherokee blood. And so he put himself down on some report as a minority.

KIRBY: Selby did?

TERRY: Selby did, and that thing came out here to Palo Alto and Packard found out about it and Packard got very upset because it didn't really meet the technical definition but to him it was an indication that people were not taking this seriously. They were trying to cut corners. They were just sort of playing games with this and making jokes about this. So he landed on Selby and Stan got fairly mollified and changed the report because Dave didn't want to hear anything having to do with jokes or innuendos about affirmative action. It was an important goal and it appeared in the '75 report.

TERRY: We had a new terminal. That was the cathode ray tube terminal for the computer business and that got started when I was still ... '75 , one was out of data products. It got started in about '73 and that was a tough product line to get started but we were making this multi-terminal computer and a helluva lot of the value was in these terminals and we were buying them from certain OEMs. God, they were unreliable and hard to get so we started our own development program in Cupertino. But it was hard to get started. People didn't, for some reason, want to work on it but we finally did get it started and got a line of terminals out on the market that were fairly successful. Built the building in Grenoble, first permanent building; we'd had a temporary building. 1976, a good year. Expansion of the 3000 Series II. This was a hardware rollover of the 3000, so the first 3000 that lasted about five years, this was a rollover. Okay and then the Series II. Another set of hardware. Hewlett Packard interface bus got introduced. I personally didn't have a lot to do with that. It was going on and I certainly endorsed it and thought it was a good idea but it was a heck of a lot better idea than even I thought.

KIRBY: Why don't you try to describe that a little bit?

TERRY: We had hooked up computers and instruments with a variety of relatively standard computer interfaces, and they were called serial buses and they were something called the RS232 Serial Interface Bus and it didn't work very well. It was really designed to hook a terminal up to a computer or a teletype or something else, and it was really not designed for instrumentation. So some people in Santa Clara, Dave Rickey of the Santa Clara division, and was headed by John Blocker I believe at the time; Bagley had moved on to other things-developed a whole new bus interface standard, a whole different way: instead of a single wire, you had 16 wires and you could get a lot more data moving back and forth, and it wasn't real high speed but it was high enough. And they developed this technique and then they very wisely really went on the bandwagon to make it a standard, an IEEE standard. We got it out on the market and so it was sort of becoming a de facto standard but rather than jam it down the rest of the industry's throat, people went out wisely and they signed up all our competitors. We gave them a license to use the patents for a dollar or something like that or $50 so we really promoted it in the industry, and it was wildly successful. It's still here today, and it really made it a lot easier to hook up instruments and computers, particularly desktop computers into small automated systems. It also heated up the thing called the "gray area" because now we had instrument guys selling the instruments, this bus, desktop calculator and the computer guys were selling the desktop calculators and so, the HPIB, while it was successful, kind of heated that challenge up.

KIRBY: Along that line, about 75, how was the field sales force organized during that period?

TERRY: Oh, boy, you're really testing my memory.

KIRBY: Yes, I know. That's hard.

TERRY: It was organized around group lines. There was a separate sales force for instruments, for components, for computer systems, for calculators. There was a desktop calculator sales force, for medical and analytical. So they were all lined up along the group lines and then that's when these conflicts between calculators and computers, calculators and instruments, computers and instruments, got all boiled around. VPs: Chognard became a VP. John Doyle, who was in charge of personnel, became a VP and Paul Ely became a VP in 1976, general manager of the computer systems group. Frank Cavier retired. Ed Porter died very unexpectedly. He had been back trying to get Avondale shaped up. We had bought Avondale from three entrepreneurs. Frank Martinéz, F&M Scientific. Frank Martinéz - that's what the "F" and "M" stood for-and two other guys, Gene Bennett and I'd have to search my memory for the third guy's name. They were a couple of engineers. Frank Martinéz was a technician in DuPont. He was a glassblower. He did blown glass and these guys had gotten this idea about a gas chromatograph and went off and started their own business, and HP bought them. It looked like a good entry into the analytical business; it was our first. And it was going not too well. This was a small company in kind of a strange part of the world, mushroom country, Pennsylvania, Delaware. And there were problems with it. One of the things Porter decided was, part of looking after this, that Frank Martinez should learn more about how you run an HP division so he sent him to Colorado Springs, among other places. He came out there and spent a couple of days, and Frank Martinez, I liked the guy. I mean, he really knew the value of a dollar! I mean, he grew up poor and this small company was struggling but he walks in the door of the Colorado Springs division and the first thing out of the bat he says to me, he says, "How much is that flagpole?" And I looked out the window and I said, it was one of those nice stainless steel flagpoles... I think he was a glassblower. ... and I said, "Beat the heck outta me, Frank!" And he said, "You're the division manager! You don't even know how much a flagpole costs?!" I don't know how much a flagpole costs, and he says, "I'm not sure you should be having something as expensive like that."

KIRBY: That's pretty good.

TERRY: So we got off on the saving money kick. But Ed Porter, I was on Porter, he was given the assignment by I guess Bill and Dave to get the Avondale thing shaped up and he went back and he lived in Avondale, physically moved back there.

KIRBY: Yes, that's right, he did. He got a little apartment or something.

TERRY: Right and he spent an awful lot of time and energy on trying to develop these managers or substitute other people in there and get this thing kind of on an HP track and he was doing that when he died. I think he was in Chicago at a trade association or something. '76 was the year of the introduction of the logic analyzer. This was a real breakthrough product. We had had families of oscilloscopes and so did Tektronix, that showed people, computer designers, their signals in multiple channels: you could get two wiggly green lines on the scope or they could get four and I think we or Tektronix or both invented an 8-channel oscilloscope so on a relatively small screen, you got eight traces going across and, of course, the digital designers, what they were really interested in, is the timing relationship between these various channels, how one pulse goes up as the other one goes down, and how these things all line up. I mean, you could do that but it was really tough. Talk about eye strain looking at all these eight little green, wiggly green lines! And so, you know, somebody said, "Well, it's time to make a 16-channel oscilloscope and somebody else by the name of Chuck House who was in the Colorado Springs division, a really interesting, innovative guy, hard to manage, big mouth, he'd gotten an idea that, well, we really didn't need to show the analog, that is the wiggly green lines. What we needed to do was just to show whether the pulse was up or down, a digital map, zeroes and ones. And he invented this thing or discovered, invented it, I guess is the right word, this thing called the logic analyzer. And when he first got it kind of prototyped, all of us and others who were used to the wiggly green lines, we weren't

sure this was a good idea or not. But he prevailed and we got a product out on the market and it was hugely successful, 'way before Tektronix. It was just exactly what digital designers needed. It was very profitable. It begat a whole line of logic analyzers that are still a big deal in the industry today, growing much faster traditionally than oscilloscopes but Chuck was the guy behind that.

KIRBY: Was that the product that had been killed?

TERRY: No, the product that's in the book is a different kind of product. It wasn't killed but the story as I remember is a little slightly different than the book. We had, somebody, it was Chuck House, again, we were making cathode ray tubes and we could expand the cathode ray tube image by a lens, a mesh lens, and that was really helping get the sensitivity of the tube up or you could make a big picture. So Chuck decided, "Well, why don't we make a display oscilloscope" that was the size of a TV tube, and we could do that without too much trouble because TV glass was very accessible and cheap, as long as you stayed in the standard TV sizes. And so we got some TV glass and they designed a gun and we could make it was about a 12 or 14 inch diagonal, big, bright picture of an analog display or anything you wanted to do with it. Well, after they got some prototypes built, there was a lot of fussing and hollering in the Colorado Springs division about "What a dumb idea this is. Who wants to buy it? We shouldn't be screwing around with our resources. We should fight Tektronix, you know, blow by blow in the scope business." And Chuck was a little discouraged but he had one guy who also thought it was a very good project, and that was me!

TERRY: Because I thought it would be a lot of fun to do and it would kind of show off and it was fun to look at and you could use it in an educational applications, where you were trying to show somebody something and you could use it in other applications. We sold a lot of them in medical applications, where you wanted to put eight EKGs across a big screen in an operating room, and the competition was TV Rasterscan, the standard television set, but it was slow and it was jaggy. You got a ... it's made up of dots, essentially, and you got a really jaggy picture. This had a so-called directed beam, you moved the beam and later on, as technology improved, solid state, the TV raster got good enough that it obsoleted this product but I remember Chuck and I figured out if we could sell 20 a month of these things-and we priced it pretty generously-it was about $3,000 a piece-we could probably make this thing justified, so it went and we sold quite a few of them. Chuck was a real contributor to HP. He was an idea-a-minute kind of a guy. We tried to make a businessman out of him; that was modestly successful.

KIRBY: He used to remind me that he and I joined Hewlett Packard on the very same day.

TERRY: I didn't realize that.

KIRBY: Yes, July 2, 1962.

TERRY: He came on later to be the head of what was called the micro-processor development division or operations within Colorado Springs. This was another of Chuck's ideas. Designers using micro-processors needed better hardware/ software tools and so he invented a kind of a dedicated computer hardware/ software thing. It was fairly expensive but it was also immensely popular. It went from zero to $100 million in about three years, and still is around today. Let's see. International theme in 1976 in the annual report including Wildbraun had moved to the Wildbraun site, liquid chromatography. There's a picture in there selling 3000s to the Iraqis in 1976.

KIRBY: Tell us about that.

TERRY: Well, I only remembered it vaguely but I was out of data products but it was a big deal. The Iraqi government bought 20 or 30 3000s that were used by the government in kind of the basic core administration of the government: tax collection, and a whole bunch of things like

that. And we had a bunch of Iraqis here in Palo Alto or Cupertino for training on these 3000s. I've often wondered what ever happened to these things, whether they're still running or not.

KIRBY: Really, really. That reminds me, Bill. We had an office in Iran.
TERRY: Vaguely, yes.

KIRBY: Do you remember that? Everybody was very enthusiastic.
TERRY: Right. KIRBY: They viewed this as a huge potential market.

TERRY: I remember John Young and Dave Packard took a trip to Iran.

KIRBY: That's exactly right! And that was before the Shah got bounced.
TERRY: That's right and people were enthusiastic. We were selling products to and servicing them there in support of American contractors, Hughes and people like that, who had pretty big deals in Iran.

TERRY: And we were right behind them with test equipment but I guess we had some of our own employees but we didn't get very far before the whole thing came crashing down.

KIRBY: Then the coup occurred and the Shah was out and the whole thing, I think, we rapidly left, as I remember.
TERRY: In '76, we had a nice picture in there of Butterstone Lock. After we established the plant in Queensferry, kind of following HP tradition, in fact we used to kid-you probably heard me used to kid on plant sites selection: the first thing you do is you go buy a recreation area, then you find a plant site reasonably close by.

TERRY: Peter Carmichael, who's now the division manager, he was an avid fisherman and he was a dyed-in-the-wool Scotsman, came up from the engineering ranks, and he proposed that we buy this piece of land approximately an hour due north of Queensferry called Butterstone Lock. It's in the nature conservancy district of the Scottish National Authority or something or other. It's a beautiful piece of land. I think we paid $75,000 for it. He had a plan of developing chalets or cottages around the edge of this thing and that never did happen. The conservancy people ... it's right next to something called the Locke of the Lowes, which is a big bird sanctuary and the conservancy people really got up on their high horse about doing any development there and it turned out we never did. We built some rain shelters but it's still a very popular recreation site for fishermen, particularly from Scotland! '77, we established a supplemental pension program. There's a bunch of calculations about the adequacy of the pension plan, and it was felt not to be adequate so the thing called supplemental pension was initiated, $12 million hit the earnings.

KIRBY: I remember that came up at a management meeting once, maybe it was Brunner who raised the question.
TERRY: It could have been.

KIRBY: It was about the adequacy of the pension plan.
TERRY: I vaguely remember that. There was some stirring around. And in typical style, Wilbur or somebody put a task force together or Van and started doing some calculations. Slow year in medical. Legislation on medical cost containment. 1977, really! Eighteen years ago! New construction in Cupertino; it was probably the second building in Cupertino. San Jose, that would be the first components building on the San Jose site.

TERRY: Santa Rosa, that probably would be the second building in Santa Rosa. Fort Collins, first building there. Another building in Boise, another building, probably a first building in Wildbraun. There's some language in the annual report that sounds like Dave Packard with Dave Kirby cleaning it up about SEC requirements on replacement costs. There was some SEC requirement on calculating the replacement costs of your assets. We had to do that but

in the President's letter or the Chairman's letter, the Chairman says, "This makes no damn sense so don't pay a lot of attention to it." Blah, blah, blah. '77, John was named President and Chief Operating Officer, COO.

KIRBY: Hewlett was still CEO, right?
TERRY: Hewlett was still CEO.

KIRBY: And Packard was Chairman?
TERRY: Right and Dean was made an executive vice president. He was responsible for T&M, medical and analytical. So I worked for Dean at that point, and Ralph was in charge of computers, components and calculators, and that was ... that might have been the beginning of an era with Ralph and Ely, where before it was pretty much Ralph and John.

TERRY: I'm not real sure of that. '77 was the year...

KIRBY: Tell me while I'm thinking about calculators, Ray King became division manager but prior to that, wasn't...
KIRBY: We were talking about the manager of the division. George Newman did not want to move to Corvallis so Ray King?
TERRY: Ray King was the manufacturing manager and that was a big deal, of course, and I think Tom Whitney was probably the engineering manager. Ray just had a lot more experience and background. Alex had gone off to Loveland.

KIRBY: Alex Sozonoff?
TERRY: Right. Ray became the obvious choice and we asked him to be the division manager.

TERRY: 1977 was the annual report that jogged my memory on the introduction of the HP Amigo 250, in fact, I guess I should back up. 1977 talked about the development of a new integrated circuit technology called Silicon on Sapphire, and the development of an microprocessor called the MC2-MCC-I forget what it stood for but Microprocessor for Computers and Calculators or something like that-and that was to become a very, very expensive semiconductor specialty that a lot of us participated in. Paul Ely was really the driving force behind developing an integrated circuit capability as part of the computer group. And as it turned out, it was 'way too specialized, 'way too expensive and it didn't fit very well. The voltage interfaces did not fit very well with Silicon on Sapphire. We wasted a fair amount of time and money on SOS as it was called and generated a few product embarrassments along the way that took us a while to bail out of. '77 had a lot in there about 3000 as a business tool or expanding the 3000. It always was a non-scientific computer but we were getting it much more into industries that were very new to us: food processing, and banking, and insurance, and that was the era, too, that we really began to learn some important lessons regarding application software and how you work with application developers and we couldn't develop it all ourselves or we shouldn't even try, then we had to work out all kinds of arrangements with sales forces and licensing and cross-selling and teamwork among the computer people in the field because a customer wanted to buy the hardware, the software, the applications and the support, and we just couldn't do it all. We had to learn to work with other people. Introduced a handheld calculator with a printer. It was a nice little thermal printer, used special paper. It was fast, it was quiet. We learned a fair amount about printing. It wasn't really a super successful product. It was a convenience added onto a pocket calculator.

KIRBY: I'm trying to remember. How big was it?
TERRY: It was about the same size as a regular pocket calculator. A little bit longer. It had a little thing that sat on the top of it but it was an okay product. The watch was introduced in 77, the 01, we talked about that. The 9830 calculator that had the basic language built into it was

introduced. That was a very popular, very important product. And a four-color plotter. We had taken the Moseley plotter and made a digital plotter out of it in order to produce graphs from the output of a desktop calculator and to annotate the graphs, to put the numbers and the labels around the graphs and in this year, we put four pens in four different colors and it was a mechanical marvel to watch these four pens going around, in four different colors. I remember that. It really was. It was great fun. Oh, yes. We'd draw these fancy sort of computer art diagrams and stuff like that but it also had some very useful applications, particularly in scientific applications. 1978 reported disappointing calculator shipments due to shortages of parts. And I frankly can't remember who held us up, whether it was ourselves; it was not Muster. We had moved on to other vendors of calculator parts and some way, somehow, we got hung up and given the growth rate and profitability, this impacted the whole company. It was not too happy an annual report but computer sales were up 37 percent, T&M sales were up 25, the profits were okay. We bought the plant site in Roseville and you and I got involved in that one. That was a day we had done a bunch of preliminary work, going off and looking at plant sites and that was the day we were getting ... a day arrived when we wanted final approval from Dave and you and I and, I believe Bruce, and Dave got in the corporate jet and we went to Vancouver first and looked at the Vancouver site.

KIRBY: Probably. I remember the Vancouver trip.
TERRY: That seemed to be all right.

KIRBY: Yes, walking around by the edge of the river, in the mud.
TERRY: Right, walking around by the river in the mud, and we went to Roseville and the Roseville site was very large, had a particular problem in that access to the site was blocked by a main line of the Southern Pacific Railroad and we were all wringing our hands about how we could get across this railroad, and of course, what they did was build a bridge over the railroad. Somebody, I think it was Bruce Wholey, made a comment about "Boy, it really is barren around here." It was typical San Joaquin Valley, where there's a tree about every three quarters of a mile.

TERRY: And Packard made some crack about "Well, don't worry about that. You can plant more trees." That was considered to be all right that it didn't have too many trees and, of course, the Vancouver site we'd just come from had so damn many trees, you couldn't see three feet into it!

KIRBY: That's right. You could barely turn around.
TERRY: We bought the Spokane site that year, and I was involved in that. It was a T&M site.

TERRY: And I did some work up there. I met a number of very nice people. The community was very supportive of what we wanted to do. There was a problem with the sewer and extending the sewer line. We were going to have to discharge our sewer into a small sewer called the Liberty Lake Sewerage District, and they weren't really able to handle the load but there was going to be an extension built out in the valley which eventually happened, so there was a little prickliness, in terms of getting in there. There was a little bit of questioning by the corporate fathers about Spokane. We had a meeting in Loveland. We must have been having a division review and at the conclusion of this, I stood and gave the group a report on the Spokane site and what I thought we ought to do, and before I got more than a half a dozen words out of my mouth, Packard says, "Spo-kane?? Spo-kane?? Spo-kane, Washington??" He says, "Hell! That's on the other side of the moon!!" And we were sitting in Loveland, Colorado, which is not exactly a metropolis of Colorado!

KIRBY: That's wonderful-you were sitting in Loveland and he's talking about Spokane.
TERRY: That's right, he's talking about Spokane being on the other side of the moon. And he

pronounced it "Spo-cane". So Dave finally came around and he agreed that this looked like a pretty good place to start a plant. We hired 1,600 engineers that year.

KIRBY: That must have been one of the really big years.

TERRY: Wow, wow! 1,800 was, I think, the peak. It comes along a couple of years later, but it was a big deal. That year was the introduction of the Amigo, the HP250 Amigo system, and Amigo was mentioned in the annual report. We didn't usually bring the code names forward into the public but it was called Amigo because it was supposed to be friendly. Paul felt in some ways that he was in competition with the calculator division, the calculator group, and the calculator group prided themselves on the friendliness of their machines. The 9830 particularly was very friendly because it had all the software built in. You just turned it on like an instrument, it woke up, had prompts on the screen, told you how to use it and this was very different from the computers of the day which were a lot harder to learn how to use and to turn on and you had to be kind of a software guru. So Paul went around preaching the "Gospel of Simplicity and Friendliness" and that was the HP Amigo and it was not a successful product. It was totally new, radical in many cases, in terms of operating systems, software. The hardware was totally unique: it had this SOS chip in the middle of it. And it never did really go very far. We probably sold ... we sold Ampex some, I remember, and really caught a lot of flak from that. I'll bet maybe we sold 100 to 150 of these machines, just enough to be a problem.

KIRBY: And that's all?

TERRY: And that's all, before we took it off the market.

TERRY: Bob Watson was named the head of the calculator products group. Tom Kelly probably retired. I don't remember exactly; Bob had been the engineering manager.

TERRY: Yes, and a real fine guy and a real engineering guru. There was a question about developing skills and marketing. Ralph was trying to give him a fair amount of coaching but Bob came in to head calculators. And the name was changed from the calculator products division, within the calculator products group, was changed to the desktop computer division. And I remember that really pissed off Ely!

TERRY: Ely felt he was in charge of computers and here's this other group, the desktop computer division, and I told the story about the division review, when they took one of their desktop computers and put a modem on it and hooked it up to a phone line so it would act like a computer running over a network. That really got Paul excited!

KIRBY: And he was there.

TERRY: And he was there and he was going to be damn sure that the Amigo was going to put a stop to that! It didn't quite work out that way. And there's a funny picture of Bill Terry in 1978 with long sideburns, which was the vogue at that time.

TERRY: I think John is in there, too, with long sideburns.

KIRBY: I remember the picture, yes.

TERRY: Dave Weindorf was the general manager of the components. He had grown up in components. It was now in San Jose and Dave was an example of a guy who didn't want to leave the Bay Area, so the components group was going to grow in San Jose on a piece of property that we bought down there, Bruce Wholey was in charge of medical and Lou Platt would have been working in medical at the time. Dean was back here in Palo Alto. And Emory Rogers was in charge of analytical. I don't really remember ... well, let's see. Emory had worked at Varian. TERRY: ...when Porter was trying to fix Avondale. It was pretty obvious that Gene Bennett, and Frank Martinez and Aron Martin-and incidentally, it was never Martinez. He wanted to make sure it was Martinez.

KIRBY: He pronounced it Martinez.

TERRY: And he was probably right, because he could trace his origins to Spain, not to Mexico. They weren't going to make it and they were bailing out, and it must have been Porter, or Bill and Dave, that recruited Emory Rogers from Varian.

KIRBY: That's right. He had been a vice president at Varian and he came in, and then they put him onto the analytical operations.

TERRY: In '78, I'm sure it was the beginning day, but the one I really noticed of this section on "Public Concern"...

TERRY: ...where we, along with a lot of American businesses, are getting kind of concerned about our obligations in things other than making a profit, and it also has some really interesting statements-I'll see if I can find them quickly about-I think it's back under "Public Concerns"-about the need for the federal government to balance their budget.

KIRBY: Oh, oh, really?

TERRY: Yes, "The inflationary spiral: national problem. President Carter's recently announced voluntary wage and price controls. Hewlett Packard will cooperate with the President, but the Company strongly believes that wages and prices are not the primary causes of inflation. Controls in these areas, therefore, will be largely ineffective in halting inflation. There must be a concerted effort on the part of the federal government to reduce spending, to reduce the money supply, and to review carefully the excess of cost to industry and government of ever-expanding federal regulation and reporting requirements. The real reductions in the rate of inflation can only be achieved through a determined and effective effort to eliminate deficit spending and regain a balanced budget." And that was nearly 20 years ago.

KIRBY: 1978.

TERRY: I guess, Newt Gingrich must have been born. Maybe he was in high school when he read these words!

TERRY: We stuck with our principles. Yes, and we had the voluntary wage and price controls, and in good conscientious HP manner, we took those just about as seriously as the mandatory controls. So we still had all the same techniques of collecting information to make darn sure we could tell anybody at any given moment how much we were raising our prices and there were some numbers in here, we were raising our prices one or two percent per year because we had decreases in computers and modest increases in instruments. 1979, $2.4 billion, 36 percent growth. Fortieth anniversary. We added 10,000 people in 1979! We must have been hiring like crazy all over the world. Computers were up 42 percent, T&M was up 35 percent... What a year! Voluntary controls were in place. We announced that our prices had gone up only 1.5 percent. More words about energy shortage, concerns for oil, conservation, alternate sources. The annual report was organized around the objectives, featured "Why HP? Quality Circles" We had gotten onto "Why HP?" in quality before 1979. I can't ... it was certainly during the desktop calculator era, probably in the early '70s, that we ... YHP had a tough time getting started. We had to send products in from HP labs and other divisions. But after a while, we began to get an inkling that there was something going on there that was really unique in terms of producing quality. We also got very interested in quality in a lot of different ways. Within the instrument operation, we ran a campaign-in '76, we actually ran it-of the improved quality. We did a lot of audits. We found products that couldn't be moved down the roller skate lines because they'd go out of calibration. Oh, okay, that's a clue! Yes, a whole bunch of things like that. We started going to quality class. Deming came. Deming put on presentations in Cupertino. We read Deming's book. We weren't not sure this crotchety old man knew what he was talking about but there seemed to be something here and, of course, the Japanese were cutting a wide swath: Sony, the cameras, in quality. And YHP began to report numbers on warranty failure rate and scrap for

products that were made there that were also made in the United States, transferred products: desktop calculators was one of them. I remember vividly. And when we first saw these numbers, we thought these guys were either lying or they didn't ... they had a totally different way of counting, because the results were significantly better than they were here. So we started sending people over there to go look at what they were doing. And these people had gone to Japan before, and they'd gone to the Toyota factory and they'd gone to the Canon camera factory, and, of course, they came home very impressed but they said, "It's different. That's not us." But when they went to YHP, there were no excuses because they were making exactly the same product.

KIRBY: That's right, the same product.

TERRY: So there was no way of explaining this away. So people here got motivated into digging in and really finding out all the techniques, the quality circles, the TQC as it's called today, and that was a significant contribution of YHP to the entire Hewlett Packard company because I think without that and the ability to look at the same product and talk to your fellow employees, even though they were Japanese, without that, we may have never gotten onto the quality thing like we did or it would have taken us five or ten more years of a lot of problems, but that was a big contribution of YHP.

KIRBY: Was Shozo still there?

TERRY: Shozo was certainly there but by 79, Ken Sasaoko was pretty well running the place. Shozo was the kind of the father figure. Talking about asset management, and continuous emphasis on cash because with these kinds of growth rates in this year, I'm sure the cash was getting a little squishy. Introduction of the microprocessor development system I mentioned was a Chuck House innovation, a really good idea-big demand in the marketplace. Introduced the first board tester. We'd never made one of these before; it was a fairly complicated, expensive product, that used computer technology and instrumentation to test the fixture-it was called a "bed of nails" fixture-that's up under the printed circuit board to test all the functions of the PC board and went into direct competition with GenRad, Teradyne and a couple of Japanese firms in the systems business, Larry Potter, became the division manager of this along the way, established I think a really good kind of a culture. When you're in the systems business, you can't lose any orders. You've got to watch the ethics and legal and moral behavior, but you can't lose any orders because there aren't that many orders. I mean, there's like 50 a year you're going to sell of these things, which was different in terms of attitude of managers compared to the instruments sales force, because you had 4,000 products. So if you lost a scope order to Tektronix, well, that's fine. You come back next day and you get a spectrum analyzer order. You know, we had 80 percent of the budget anyway, so it might not have been healthy but it was easy to make an excuse. But when you got in this systems business, no excuses! You've got to do everything legal and moral and ethical to get that order! And Larry did a real good job of getting that instilled into that and made the board test business pretty darn successful. Plant site in Greeley. I did not get involved in that one.

KIRBY: I did not get involved in that either. Bought a plant site in Raleigh, North Carolina, I had forgotten about.

TERRY: That's right, we did. We were going to move in... I was back there. You were there, too. We were going to move the analytical group to Raleigh and this was in the vicinity of the triangle but not quite. The triangle? On that day, we talked to the manager of IBM about the area.

KIRBY: I remember that.

TERRY: Right. Bought the plant site in Puerto Rico. I did not get involved...

KIRBY: I was not involved in that either.

TERRY: ... and we bought the one in Lake Stevens, Everett, Washington, which I was involved in. This was another one in the northwest and we wanted to get another spin-off from the Santa Clara division making Fourier analyzers, out of the Bay Area, get some growth out of here and get it into another location.

KIRBY: Did Bill Kay run that?

TERRY: And selected Bill Kay to come from Loveland to run the what was called the Lake Stevens division. John Blokker was the division manager in Santa Clara at the time when we split the Fourier analyzers off, and then later on in the story here, Blokker goes over to replace Weindorf as the head of the components group. 1980 was another good year, back-to-back, 31 percent growth.

TERRY: Calculators, more hiring, "slowing at the end of the year" were the words. I don't know which recession was about to hit us but we were watching expenses and assets and putting in some hiring controls. This might have been the first time that we really had the hiring control numbers and to make a long story short, we used to get these forecasts up until I retired, where, you know, we'd preach conservatism. Everybody would agree, "Yes, there are tough times ahead, and we want to really watch hiring" and people would send in these forecasts and the expense growth was a little higher than we'd like but not out of line, but they had these huge hiring numbers. I mean, in response to preaching conservatism, we'd get a budget, a forecast that would come together from the company that had, you know, five percent growth in expenses and a 20 percent growth in people, and net of attrition-which people didn't pay much attention to-we were going to hire 20,000 people in the next 12 months! And we'd look at these forecasts and say, you know, "Something is wrong here!" And we'd go around and around and around and around and send them back, and we never did really get them very straight because there was no, there was a little bit of sloppiness and it was kind of a tyranny in the numbers. People were not quite paying enough attention to it and everybody would be on the high side a little bit but when you added the whole thing up, it was just totally wrong.

KIRBY: That's right and I can remember those of us who were not in on this, we used to wonder, "Well, they talk about hiring controls. What the hell is going on here?"

TERRY: Yes, and that's what we ultimately ended up with. We just, we were so afraid that we just didn't have control, that we instituted a hiring controls and there was a lot of debate about that, because that very non-HP. You know, whatever happened to management by objectives? Well, what is that? Well, that's that cloak I can wrap myself with and do anything I damn well please. No, it isn't! And so we had ... and this is before e-mail. We had a helluva lot of paper floating around the company and we had endless arguments on even how to count heads, because there are different heads for different reasons. There are finance heads, and there are personnel heads, and what do you do about temps? And the leave of absence and it went around and around and around. But I guess I'm kind of glad we did because we really got the message down to the hiring decision-makers that this was a very, very important proposition and we weren't going to get out on a limb just to, you know, accidentally with too many people, too much expense and risk of layoff.

I RETURN TO ELECTRONIC PRODUCTS GROUP

KIRBY: Let's see, where am I? Conservation and hiring; Ralph retired in '80. Terry and Ely were named executive vice presidents. Which at that point, only Morton was an executive vice president?

TERRY: I guess he must have been, right, and "Terry was in charge of instrument groups" (plural) "and Ely of computer groups" and I just can't quite remember how that went but I

think Paul, at that point, became responsible for calculators- desktops, pockets and computers. And I think maybe I became responsible for instruments and components. I'm pretty sure of that. But not medical and analytical, because about a week after I became responsible for components, John Blokker, who had only been there about six months and he'd gotten recruited away from me because he was a Santa Clara manager, he announces to me that he isn't really interested in working anymore. His wife has a lot of money and he'd really like to go off and concentrate on managing his wife's money. And I said, "Well," and I was disappointed, you know, and I needed that like a hole in the head. Here's one week out of this thing, I've got to go find a new group manager. And so I got out my long laundry list and I worked it and I worked it, and I selected Bill Craven, who had been the personnel manager and I had a really tough sell in the components group. The first reaction I got from the components people was, "We don't have any personnel problems down here! What the hell are you doing sending us a personnel manager for?" And I had to explain this guy had an MS in EE and had worked at HP labs and McMinnville and a couple of other places.

KIRBY: Yes, that's right. I can remember him up north at McMinnville. He came from McMinnville to personnel and then from personnel to components.

TERRY: Right, right and of all things, at least in the recent history that I'm proud of is the job he's done at the components group. He's done a helluva good job at moral, at products. The people before him, including Blokker particularly, they didn't really like the components business. Their attitude was "Real men don't make components. They make instruments and systems." And Blokker had them heading off into some really risky directions, abandoning the components business, and when Craven got there, I convinced him and myself that what we were going to do was be the best damn components manufacturer of a series of niche components and we weren't going to be in the systems business. We were just going to be good at it and there was a lot of talk at the components business about "We want to be part of HP!" And I used to go around and preach, and I think I convinced them, "Look, you're going to be part of HP if you have good quality, growth, and you make a profit, and not because you make the instruments and systems, but you're really good at what your assignment is." And Bill did a really great job at turning the place around. He got everybody back on the track and... I remember this. There was a campaign about this at the components group.

KIRBY: Yes, yes. But he made a number of changes.

TERRY: There were some weak people there-Dick Soshea and a few others-and he knocked some things in the head that we shouldn't be doing and he got rid of these systems adventures and he got back to the LED business, and then later on the microwave components business via the acquisition of Avantek. That really ... on that one, we were in the microwave components business. We did $30 million; we barely made a profit. It had been $30 million for ten years and I told Bill one day that we were either going to get totally out of this or we were going to make something out of it, that this middle stagnant position was absolutely terrible. And he got it going again and then when we bought Avantek, it really souped the thing up and it's been great the last three years especially. More about 3000s, more expansions in the product line. The HP85, we took the ideas of the pocket calculator into some mini-desktop machines. I don't know if you remember them. They were about 10 x 14 inches. The 85 actually had a cathode ray tube on it.

TERRY: It was called the HP85 Personal Computer, and of course, it was really late and missed the mark in terms of what the personal computer was at the time but we were sort of futzing around the edges, not successfully. We had a lot of fans of that product who thought it was great, but we didn't really sell very many in the marketplace. A little too little too late. Automatic scope was a product I was involved in. It was not successful. We sold a handful of them on production line applications but it didn't really meet the mark very good. It was

probably a good lesson in not listening to your customers. Put LEDs in automobiles. We had a picture of a Cadillac with the light-emitting dials in the dashboard. But that hasn't really fulfilled its potential yet. I'd have to check with Craven.

KIRBY: I don't think it has.

TERRY: You see more of them but it's a tough damn automotive business. Oh, boy! The quality, delivery, all the demands of it. Yes, I sense it's never met perhaps the expectations, although all of us were pretty damn skeptical about, you know, how big a deal was this going to be? Also, in that case, there was a fair amount of market development but we didn't do a lot of product development. We kind of adapted the products we had and put different lenses on them and got it there to see what we could do with it. Ultrasound was in the annual report. That was a big contribution in medical. It spawned a multi-million, $100 million, business. South Africa got mentioned several times in this '79-80...

KIRBY: I was going to ask you when that came along. It was in this era.

TERRY: That's right. It went on for years. And we were justifying our position very carefully.
    KIRBY: Teeny Stein was probably the manager of HP-South Africa at the time.

TERRY: Originally, yes, he was.

KIRBY: Marius Furst came along after him.

TERRY: No, there was another guy in between.

KIRBY: Oh, was there?

TERRY: Teeny Stein was a South African, and I don't think he was particularly interested in promoting non-whites to anything. No, no, I couldn't really tell but he didn't seem to be biased or bigoted about black people, but he, you know, "I'm not going out of my way..." He wasn't going to do anything for them. No, he wasn't. "I'm not going out of my way. I'm just going to run the business here."

KIRBY: That's right, that's right. Then... Who was the next guy?

TERRY: Chuck Bonza.

KIRBY: Chuck Bonza was an American.

TERRY: Right and I visited South Africa. The only time I was there was when Chuck Bonza was there. That's ... So did I. Dean Morton and I were there in 1983, to see what was going on and you were probably there ahead of that.

KIRBY: Yes, I was. I was there probably in '77, '78.

TERRY: Yes, okay. Anyway, as you know, American companies were, there were many present there and as time went on, there was an increasing visibility of the issue and American companies were being urged to leave and HP listened.