

BL: The big question is when did you start, where did you come from and fall into such wild company.

BS: I started in early July of 1960. I was at MIT and Ken Olsen interviewed. Because I had been set up for students to be interviewed with companies that were hiring and Ken also was out there interviewing and he interviewed me and I went to work for them.

BL: And that was at the end of the school year, so you had just graduated from MIT?

BS: Actually I hadn't graduated, I had the first year of college I went to Smith in Northampton and then I transferred to MIT and so I had some yet some work to finish up because all of my credits didn't transfer over from one to the other. But I was essentially a graduating senior, I had what I wound up doing was completing my thesis while I worked for Digital.

BL: Why did you want to go to MIT, what did you find there?

BS: I wanted vocational training - I really wanted vocational training, I would have taken any area that I could have gotten into. I was very fortunate that I was accepted at MIT and at MIT all the programs were open to

women I didn't realize the extend to which until later, at a lot of schools they couldn't take all of the various majors but at MIT all of the courses were open to women except physical education courses.

BL: The kind of courses you took were?

BS: Electrical engineering that's what my degree is in.

BL: You really did get the strong EE background?

BS: Oh yes, yes. But very little in computers, they were just beginning to teach computers at that time . I had had one course in computers and that was the extent of it, they were very new and that was before Digital made their first computer. At that time they were doing specialized equipment, principally the magnetic core memory testers being their big product. Then a lot of specialized systems for physicists and physicians particularly and any other research scientist, particularly high speed real time systems which at that time you could not do on a programmable system because a programmable system would be too slow.

BL: You couldn't afford the overhead of going in and out of memory for instructions. So basically the logic design was very much the same thing as amplification

programs are today except that you implemented it with hardware.

BL: When you were interviewing with Ken and he said he'd like to hire you and you fell into the company what did you first find?

BS: Well, since you are looking for stories, let's go back to the interview, I interviewed with him on a Saturday and the time that I interviewed was, MIT had this little section where people went for interviews, little offices or cubicles, and I had been told to go to this office number, say four, I went there and nobody was there. Then at the other end of the room was this person who kept sticking his head out and looking and I kept walking in and out looking and we're looking at one another and what had happened was they had had a conflict in room assignments and they changed him to another room, so he was looking for the person to come in, well I was following what everybody else did and only put down by first initial and not my first name so it didn't occur to him that he was interviewing a female. So I was walking back and forth and he was walking back and forth fortunately he was bolder than I am and he came up and asked me if I were the person on the list. I said yes and that's how I interviewed him.

BL: And he offered you a job?

BS: Actually he suggested that I come out to the plant and I went out and visited there. I had a bit of a problem with that, I called up and said that I was calling to speak to Mr. Olsen and they said which Mr. Olsen and I said, I don't know, I didn't get his first name. They said one is President of the company and one is personnel manager. So I said it must be the personnel manager of course. So I talked to Stan. So we had a lot of confusion but then they offered me a job and I got married the twenty-fifth of June and I started right after I got married, about a week honeymoon and we started working, my husband was in graduate school.

BL: What were you asked to do when you started to work?

BS: I was an applications engineer. Principally the things that I did in the beginning were writing to customers, responding to customers who had written in with questions. About how do you build this or how do you build that. How to gear modules and a lot of them were very straightforward, simple little counters and those were new to people at that time. Or how do you build a counter that divides by three. These kinds of things were very new and principally when I first started out I was writing letters and answering questions for

people.

BL: What kind of customers and applications were involved?

BS: What fields of applications? Those were the two that I tended to be involved with the most, there were a number that were being used for process control. Some by the military. But it was principally the physicists and physicians I think that seemed to have the most questions, at least they are the ones that stand out in my mind. And by physicians I am referring to researchers. Modules were not used in treatment, they were used in research applications at that time.

BL: Researches always have the most questions. What happened you kept doing that in the mill throughout '60 and '61.

BS: One of the projects that they gave me right off was - Ken wanted a book to explain how to use this, and this is a much later edition, this is the fourth edition. I am sure you've seen those and I wrote the first one through probably the 6 to 7th edition. And then it was compiled into the front of the module catalog.

BL: I have seen the module catalog.

BS: So that was my project and I had a wonderful time doing it, the way I did it was I went around and I taught Digital logic to all secretaries and Ken was very patient with all this, but it worked out very well, because when you write something that is very technical like this, the problem is anticipating what people's questions will be and it is very difficult to get the kind of feedback that you need from someone who is already trained in that field because they feel inhibited and they don't want to ask a stupid question. If you go to someone who is not trained in that field, then they have no hesitation about asking stupid questions because it isn't what they are supposed to know. But the only people at Digital that didn't have an engineering background were the secretaries so by the end of the first or second year I was there I think every secretary at Digital, they all knew how to count in binary, they all knew Boolean algebra. But as a result the book came out very well. I was pleased and always felt proud of it that it seemed to answer the questions and that's what you need, because if your reader gets lost in the course of this each step builds on the next one and if your reader gets lost then they put it down and they don't read any more.

BL: Especially with such an esoteric subject.

BS: Yes.

BL: There is a strong tradition in the handbook of being the primary sales too.

BS: See this page is cut up, I used to cut the old additions to put into the new additions. Every edition was an expanded ---

BL: As opposed to a standard electronic component catalog which is not really written in English, but just continuous charts.

BS: Well this was a do-it-yourself and they didn't teach this in the colleges. So if you want to sell the do-it-yourself you've got tell people how to do it themselves. And we started by putting out a lot of little application sheets and you've seen those and then we would incorporate them into the handbook and the handbook would get bigger and bigger and then finally it was all incorporated in the module catalog, but you needed that. Today you go in and people pick out this or that circuit because they have had the logic course in college or in trade school. But they already have the educational background at that time. Even people with Ph.D. did not have that kind of a background because it had not been taught.

BL: So these worked as a textbook and a promotional tool and they were pretty successful weren't they?

BS: They were incredible. I was digging through one thing and we were talking about a printing for the analog to digital conversion handbook and we decided that the next printing had to have twenty-five thousand copies. That's a pretty small subject.

BL: You couldn't have had more than a few hundred customers.

BS: We gave them out, we handed them out at the shows and we would say to people, here take one for your technician. Nobody ever said they didn't know how to, so we'd say take one for your technician. And they say, that's good, I have two technicians, I'll take two. I was looking to see if this has a code number, some of them did that said how many were in the printing. But I don't find that.

BL: Developing these and also supporting, doing applications support you were pretty close to customers. How close did you get, did you visit them?

BS: Occasionally.

BL: I talked with Alan Kent, who being at Raytheon, with the PDP-1 remembered you coming out constantly to hold his hand or to bring him through quite a bit of problems.

BS: I had been known to climb over the wire fence around the stockroom and I had been known to climb over that at night and pull out a spare part that somebody needed and take it out to them.

BL: Do you remember some of those customers?

BS: Not offhand.

BL: Do you remember Raytheon? They were trained to do some slight simulations.

BS: They wanted a cinder generator among other things. I remember the Raytheon group.

BL: It never turned out that successful as a flight simulator but, they learned some interesting things doing it.

BS: That's what you have to do on this, you have to start by learning. You don't, it's like Neil Sore says, an expert is the one who knows all the ways not to do it.

and that is what you have to start with and that's where we were.

BL: How long did you work doing that? The customer interface?

BS: I am not sure. I would say about two years.

BL: What was the culture, the environment in the mill? It doesn't seem to me that everything was quite planned or in control.

BS: I never considered it un-businesslike. It was delightful, it was very exciting, you always felt that what you are doing is important and that people cared about it being done and being done well. It was very upbeat atmosphere. I don't feel that there was the time pressure that frequently there is in other fields, to get something done in a short time. You might have to get it done quickly but I distinguish that from an attitude of don't spend too much time on this. In terms of the quality.

BL: It was more important to do a quality job?

BS: Quality was number one. There was no question about that and you spent whatever time you had to to get it

right.

BL: You must have had to work with some of the designers of these, that's what you worked on? Your partner who was designing the new modules.

BS: No, not particularly not at first. One of the things that this evolved into as an applications engineer I was on the new product development or new product selection committee. Because one of the things is you get feedback from customers and you know what they are looking for and so you have a feeling for what would sell. So in that sense, I would say that I was involved as an applications engineer I was involved with the engineering department at the beginning and in terms of product suggestions and at the end in terms of the product description, but I did not work with them, in fact, what I did was eventually I developed a form and convinced Dick that all of the engineers should complete this form as part of the module design and from the form then we could go to the module handbook very straightforward and in fact, I taught my secretary how to pick up the form and put it in, so I wasn't involved in the module handbook at all.

BL: That's beautiful re-engineering yourself out of a job.

BS: I loved it. Ken sent around this memo, something about a tiger parable, and it was something about the fact that you couldn't be promoted if you were too busy doing your present job. You had to get other people trained to be able to take that job over so you could go to another one. And in fact, that's what I did when I wanted to go to engineering. They said no, I wanted to transfer to the engineering department and they said no, we need you here and I said, you don't need me here anymore, I have trained my secretary, I'll do both jobs, just to show you. And I did.

BL: How did you go into the engineering group, what role did you take on?

BS: Analog to Digital converse. Largely because I think nobody else wanted them.

BL: Was there a lot of A to D work going on then?

BS: No.

BL: That's interesting because it certainly became the mainline of business in the late '60's scientific high speed A to D, D to A conversion boards for PPA, etc. So how did you go into this business? What was the mindset?

BS: I am not sure where your question is coming from and I'm not sure I remember precisely. It was a problem area at that time.

BL: For deed acquisition perhaps?

BS: Because our customers needed it and we didn't really have good stuff and it was hard to get one that was compatible. For most of our systems, for a lot of our systems, we were buying them in the higher speed area, we made them in the lower speed area. A lot of questions involving accuracy. And speed. And I think the way that I got into it if you look behind you I have a picture in my wallet and I sold that system as an applications engineer and essentially designed it for the purposes of selling it. In order to price it, you have to design it. So I designed it and so I built that. One of the problems for that was getting the analog to digital conversion fast enough. That was a multichannel. It was to connect a Digital computer with an analog computer for Government research facility. And so I designed a new method of doing the analog to digital conversion, which we eventually got a patent on. And it was thirty-two channels with control circuitry and as you can see from the size of it being three days, it was a fairly extensive system and I think that was the first project

that I did. I'd get a couple of little ones in engineering. Just in part for the experience. While I was an applications engineer. If they had a little system and again, I would be frequently designing these or at least getting a possible design. Not necessarily the one that would be eventually used, but a possible design and price them. In order to sell them the large special systems went to the special systems group. And they would design and price and I did not get involved in selling this, but this was mostly small things. And I think that's where I started.

BL: Small customization of systems and price and modules. Have we got into the PDP-1 yet?

BS: No.

BL: So these were custom configurations of different modules with some additional design? In addition to the standard modules?

BS: no, the custom configurations, are you talking about the ones that I sold as an applications engineer? This A and D converter system that we are talking about? I don't think that used any new modules that I can recall. Off the shelf components. There was one new module. That was it. And it consisted totally of resistors.

Logic design was my interest, rather than circuit design.

BL: What other kinds of projects did you work on?

BS: After I had done that we periodically needed new editions of the handbook and eventually they wanted an analog to digital conversion handbook. And they would say, okay Barbara, you should right this, and I would say, oh gee, yes, I really should, but I've got all this engineering stuff that I'm doing here and my gracious I'll do it. And this would go on for a little while and then I would come in one morning and I would find this desk outside my office and this woman sitting at the desk with a typewriter and she would say, and a transcribing machine. She'd be saying I am here to type the handbook. And I'd say well, I don't have anything written for you to type, and she'd say well, I'm here and she would just sit here. I am not sure where they got these women, but they never went off and did anything else. They would just sit there with their hands folded unless I gave them something to do. Now being a good practical engineer you can't bear to see all of this time being wasted and I would always say, well I don't have anything written so why don't you organize my files and that would usually take her about one day. And at the end of that day she'd be sitting there and I'd start dictating. And that's how they all got written, the first didn't go that fast, but

the later ones.

BL: You knew what to say. Were the engineering projects composed of large or small teams?

BS: The ones I did were composed of me. The only one that I did when Edson DeCastro designed the PDP-8 I did an A to D conversion design. But the others that I did were all single engineering projects.

BL: I wonder if that showed up in the Data General Product too?

BS: Who knows? [LAUGHTER]

BL: What other things surprised you, what big events were there? How did that effect the company direction? When did it start to become a computer company?

BS: I think it really became a computer company after I left. That doesn't mean, in '65, the PDP-1 and PDP-4 and PDP-8 had come along long before that. And they were the glamour parts, but I don't think they were the profit part at that point.

BL: so the company was learning about computers while learning to move into full systems?

BS: That would be my impression. That the things that were the profit items at the time I was there were the core memory testers and that was primarily done by the special systems department. Which I was not very involved with. But they would also occasionally do other kinds of special systems. And then sometimes I would be a little involved. The modules, which we sold directly to people who were going to build it themselves. The computers were as I say, glamour and for the future although I think they were more----

[END OF TAPE]

[THIS IS THE MISSING PORTION OF THE BARBARA STEPHENSON
TRANSCRIPT -- SIDE 2]

BS: Coming in at the end of the time. I was there until let's see, it must have been the summer of '64 or the summer of '65, I'm not sure which. And then I went to Los Angeles and Santa Cruz. I have great admiration for salespeople, but I am not one. From the California office we covered everything west of the Mississippi that wasn't covered by any other office, which meant a lot of travelling. That was the only assignment that I had that I wasn't crazy about. And I went back to writing some more stuff for them. I wrote the Digital Object Laboratory Workbook. You haven't seen that? That's terrible.

BL: I'm sure it's in the archives.

BS: Well, that was a lot of fun. And this was to begin to introduce people to our modules at a lower level. And I did that in California, and I worked with two schools, one was Wentworth, which is a vocational school in Boston. And the other one was the U.S. Naval Post Graduate School in Monterey. What Ken wanted was a book that would cover everything from the very elementary student to the very sophisticated student. And my first response was, that's impossible. What we did finally was

we cut it down from being a textbook to being a workbook. And the way it's structured is you have a series of experiments and the experiments have a series of questions or experiments if you will, projects. And each one has probably 10, 12, 14 projects. And the students at the trade school can do the projects 1, 2, 3 and 4 sort of thing, and the students at the graduate school can do projects 11, 12, 13 sort of thing.

BL: I get it. So it actually could cover both audiences.

BS: Yes. Then in the back we have a correlation here with what were the leading textbooks at the time. And showing what chapters of the workbook correspond with what chapters of the textbook. So the instructor can assign... and these are designed so that you can take them in any one of these orders. They were written principally in the order of the one that was listed here, which was the best selling one at the time we thought. Bartey, "Digital Computer Fundamentals" by McGraw-Hill. And that was the primary one that it followed. But we also tried to include in the text with respect to the experiment I tried to include enough material that if you were taking it out of sequence you would have what you needed. You obviously can't take it completely out of sequence. The first one and two have to come almost at

the beginning. They're basically an introduction to the laboratory and how to use it and what the symbols are and how the symbols are read. And they're designed to go with that part of the textbook. The textbook would start off with a little history of computers. Well, how do you do an experiment with the history of computers? So that's a nice place to put a little introduction. When they're doing the history in class you do a little introduction. Here are the symbols, and if you connect this to this to this you can see binary numbers. And that's the kind of thing, the first two you have to do first. And then after that you can begin to pick them up in most any order and shuffle them around depending on the textbook that you were using to go with it.

BL: Besides Wentworth and the Naval Institute did this go to other schools and did it go to customers?

BS: Oh yes, we sold it. It was a product.

BL: That was the point?

BS: Yes. We had a Digital Logic Laboratory Kit and all of this used the modules. Here's a picture of the kit. That's what the kit looked like.

BL: So it went along with the Kit.

BS: And we sold the kit. And one of the ideas behind this is to get your kit into the schools and once your kit is in the schools then when people graduate they know how to use that, so when they go to select modules you have an advantage over anybody else. Because it's easier to use yours because they already know how.

BL: Great concept.

BS: These were basically all standard modules except the thing that was specially designed for it. This was an A to D converter panel. And that was only used for the one experiment. You only had to get it for that. And this was an input panel, as you can see. There's a telephone dial and a couple of push buttons and a switch. And a few of those things that you could line up. And the last experiment is you build your own mini computer. And it's very mini because it isn't a very big kit. But it is your own computer. And I did have a wonderful time about three or four years after I had left Digital I was working as a civilian for the Department of Defense. And I taught a course to Navy mathematicians and they were all people who had at least a bachelor's degree. Most of them had a master's degree. But they were all mathematicians and not engineers. And they used computers a lot in their work. So they wanted a course

on not just the use of computers but how computers are built. So my boss and I taught it, and we used this logic laboratory, and we used the workbook and just had a wonderful time. Had very bright students, which always makes things interesting and challenging. And did all these projects at the end, and they built their computer at the end, and they said, you've got to be kidding. And I said, this doesn't have hardly any hint so you know how to do it. And I said, oh, you figure it out. You'll do it. And they did. They did, all of them, it was great.

BL: Build your own personal mini-computer in 1965. I guess it took a while for that idea to catch on.

BS: But as far as I know people that were using it made it to the end of the workbook.

BL: Personal computers. That's before it's time. You left Digital after the sales job? For what reason were you persuaded to go to Los Angeles to go into sales?

BS: It was not a matter of choice. My husband received his Ph.D. His advisor said to him, you should go to CalTech. We said, but Barbara has a job in Massachusetts. And in those days everyone said, so what? And my husband and I thought about it for a long time and we decided well we'd invested a lot of money in his

getting a Ph.D. and his advisor was not going to assist him in getting a job anyplace else. His advisor had determined that CalTech was the place that he had to go. And so we went. The only office that Digital had there at that time was a sales office. And so I took a job in the sales office. And was not a happy sales person as I say. And that was just when they were ready to -- they had been talking about bringing this out. And so I said, well, how about I write this for you and I'll write it from my house. So we had a little branch of Digital in my spare room.

BL: That was _____.

BS: It was. It was. But it was also a lonesome way to work. It's not -- you can't do that for a long time.

BL: So then you split and found another job.

BS: Mmm-hmm.

BL: Have you followed the company since then? You've done so many interesting things. You worked for the Department of Defense, and somehow you got a legal degree.

BS: I worked in California for a company there that did

Defense work. And then I went back east and worked for, in Washington, the people who had purchased that system that I had the patent on. And then I went to work for private industry for another private manufacturing, in fact, I would say hoping it would be like Digital, and it was not. So then I decided to freelance and I did some writing. I wrote for Preon (?) Capitol Radio Engineering Institute, which is a division of McGraw-Hill, they have home study things. And you've heard the expression, a glass ceiling, my feeling was, we didn't call it that then, but that's where I was. I had run into it. So I stopped and took some time off to raise my son. And then decided that I needed to go back to school if I was going to go back to work. And the question is once you go back to school what field are you going into? And I decided I would like to work for myself and that's part of what appealed to me about lawyering. And the other thing that appealed to me, it's very much the same thing that I enjoyed the application work for Digital just tremendously. And the thing I enjoyed about it is that you learned something new everyday. Because you are always off to the customers learning about new applications, you're learning about a new process, a new experiment, a new type of research. Every customer that you're dealing with, the first thing you have to do is learn what their problem is. And so you're learning something new every day. The law is very much like that.

Every client that comes into to see you, I do business law, I learn about their business. I learn about what their problems are. And so everyday in the law I'm learning something new. And that to me is what's most exciting in any job, in any work, is to be able to keep learning something new.

BL: What do you think Digital's contribution was to the development of information technology?

BS: I'm not sure. There were a lot of specific things that they did. To me the biggest thing about their product was the quality. The reliability. When you put it together it worked. People used to come out to the plant and they were interested in this but they didn't really trust it. So I would take out the modules, and they had these modules that had the pictures on the front, you know. And that's what we used initially for teaching, it was used in schools. And I would show them how to wire up a counter, and I would wire up a couple stages of the counter and then I would say, well, why don't you try it? And they would say no. I mean like I said before, people don't want to make a mistake when it's in their field. So I would say excuse me, and I'd find some excuse to leave the room. And when I came back they were busy wiring and they had two or three more stages and it always worked. I mean that's... that to me

is the biggest thing, is that you put their stuff together and it worked. And it gave you a sense of trust in it. Now I think there's no question in the mini-computers, they led the way. The PDP-5, in my mind is the first mini-computer. In using computers for real time processing they led the way. But to me the biggest single thing is the quality, because if the quality and the reliability is not there it's not going to go anyplace, people aren't going to trust it. And after people had had a little experience with this they trusted it. The other thing I used to do with customers just to stun them was there were these little wires that we used that ran between equipment, I used to cut them open. I used to cut one for demonstration. And they were multi-strand, I can't remember how many strands. But the point is that if you have a single strand wire and that wire breaks you lose your connection. And you start packing these up in boxes and carrying them from place to place and plugging them in and taking them out, and after a while they aren't going to work. And that never happened. I mean I also have a bunch of modules, I had a huge purse, and I used to take the modules with me in the purse. I had it set up so you could take it in and take it out for demonstration. I used to try to _____ carry this thing, it weighed a ton. But anyway you could plug it up and it would always work. And that to me is the biggest thing. I just don't think that a field can

get off the ground until they have something that is reliable enough that it will develop a sense of confidence. And they were rugged. They would work in the heat. They would work in humidity. And I think that to me is the biggest contribution.

BL: Have you been back to the Mill?

BS: No.

BL: It's a little cleaner, the windows are patched.

BS: It was very pleasant when we were there. It was always very pleasant. And to me it was the ideal place for a young company to start. Whenever we wanted more space they just said, we want more space. And took over. They would rent them more. The biggest expense in renting the space and I'm sure many people you've talked to about this have said it is the lanolin seeping up.

BL: They would say that there would be old lanolin there.

BS: OK, they had stored wool there. The wool has lanolin in it. It seeps into the floors and the minute the weather got hot the lanolin would start to come up from the floors, and it would be slippery. Well, they

tried everything. They tried putting cedar over it, they tried everything. But the only thing that would stop it was to cover it with linoleum, tile squares. Well, this was fairly expensive, I gather, relative to the rent that was being paid. And putting the tile down was the big project. The one big system that I keep pointing to, 90 percent of my stories were around then, it was wonderful, at that time, we kept expanding out, and at one stage, I remember we expanded out and I had a window that overlooked the pond. And that was the most delightful office that I've ever had in my life, bar none, I've never had one that was better. The breezes would come in the window and everything else. And then they took over -- I don't remember if it was the floor above, or two floors above. But anyway, it was a floor above. And they didn't have the money to put down the tile again. So that is where I debugged that particular piece of A to D equipment. And we got behind schedule and I thought we need to work around the clock to get done, or at least more than one shift to get done. But if the technicians worked overtime you had to pay them overtime and my budget couldn't really afford that. So I let the technicians work during the day and I went in at night. And it had another benefit, my husband finished his thesis on one of the computers at Digital. They let him use the computer at night. And the computer at MIT, one of the things that had been... if you're a lowly graduate

student is that the senior faculty members come and keep kicking you off. So it was getting difficult and he was anxious to be done. And so he would come out with me at night. And he would run on one of the computers next to me while I was debugging and they could not afford the linoleum for the floor, so the floor was covered with sawdust to keep the lanolin down, and the windows were open and the bats used to fly in and out. And we used to just sit there and laugh. You know here we are developing the state of the art high tech equipment with sawdust on the floor and the bats flying in and out. But we did have a wonderful time and we have much to thank them for, including the use of their computer for my husband so that he could get his Ph.D. The computer that he worked on, I'm sure you heard about this computer too, it must have been famous. It fell out of an airplane. You did hear about the one that fell out of an airplane? We had the only computer that fell out of an airplane... the only computer that was hit by a parachutist and still worked. That was actually two different computers, but it makes a better story if you let it sound like one. One computer fell from the airplane, fortunately the airplane was on the ground at the time it fell. But still the loading bays of the airplanes are fairly high up, so it had a good size fall. And it always leaned after that. It worked fine, but it leaned. So you couldn't sell it to anybody. So it stayed there as a

research computer and that is the one that my husband did his thesis on.

BL: What model was that?

BS: It was a PDP-4. It had 4K of memory. As my husband says, my pocket calculator has more memory now than the big computer I did my thesis on. The computer that was hit by the parachutist was I think a PDP... no, I'm not sure. It was somewhere 1 through 8. Anyway, they had international parachute jumping competition in Orange, Massachusetts. And we donated a computer to be used for the purposes of scoring this competition. And the computer was in a little A frame type building with glass at either end, and it was sitting near one end. And one of the parachutists didn't do so well, didn't hit her mark and came down through the glass and hit the PDP. But it didn't hurt the PDP. It didn't hurt her. Everybody was fine. But it made a good story.

BL: Well, I sure wish I had participated in those heady times.

BS: It was a lot of fun. It was a lot of fun, because it was a very great bright group. And Ken Olsen is one of the most brilliant people I know. And I will always quote him to my business clients.

BL: It's funny, you talk about him speaking parables and sending memos, which he still does.

BS: I'm not surprised. But I like the one about the tiger.

BL: That's great.

BS: I probably have it someplace. You probably have it someplace.

BL: Well, we don't have all that much that's really _____ collecting, there being no formalized processes for doing almost anything. It's all informal archives that we're starting to try to put together because there's a general perception that learning from history is a very useful thing, especially for people in the company. But also it makes great tales for articles.

BS: Yes, it does.

BL: Well, let me do this. Let me take back this. And I'm sure I can think of four or five quips and anecdotes I'd love to use them in your projects. We would -- any drafts of things we do using your stories we'll send to you for review, and then you can ponder about _____

and see if you think they would work.

BS: Well, let me tell you a couple of more. One of things that you had said to me over the phone was the fact that I was the first woman that worked for Digital and that was correct. One of the interesting things that happened is, I had been there not too long. And Ken announced that engineers were engineers, and all engineers, the same things were expected of them. There was this great debate at that time, all engineers did booth duty at the shows. The electronics shows. And this was very awkward to all of a sudden have a woman in the midst of this group. It was all these men, they would travel and they would go places. And they wouldn't sign them up in advance, they'd just reserve a block of rooms. And assign them two to a room when they got there. And all of a sudden they had this woman and they just [LAUGHS] they really weren't sure what to do about it. And not only that, I mean she was a young woman, in addition, right out of school. But Ken said, everybody's supposed to be doing booth duty, and she's an engineer so she should do booth duty. So at first they tried to give me local booth duty so that I wouldn't have to travel and there wouldn't be any inconvenience. And I always did booth duty when there was any show in Boston. And New York was pretty good because they could send me down for one day and back. One day I went down and I was supposed

to be there for a day and go back, and got out to the airport and all the flights had been cancelled, the weather was bad. And we went running back to the train station and just missed the last train. And so wound up having to spend the night in New York. Well that seemed to everybody like a very awkward situation at best. Didn't want to have that happen again. So the next time I went down to New York for a show there had been a snowstorm the night before in Boston and I had taken my wallet out of my purse and put it in my pocket to walk down to a little spa to get something, I don't know, milk or something, and forgot to put it back in my purse. So my husband took me to the airport and dropped me off and I'm sitting there waiting for the plane and I realize that I have my ticket but I don't have my wallet. I don't have any money at all except about 50 cents loose change in my pocket. And I said, well, I've got my ticket back tonight, I'm no worse off in New York than I am here, so I guess I'll go. So I went down to New York and I called Stan from the airport, and Stan said, well take a taxi out and somebody will meet you and pay the taxi. So I did and I went and I did my booth duty at the show, but all day people kept bringing me up and loaning me money. They wanted to lend me. They said, just in case you have problems, because they were all scared I was going to get stuck and have to spend the night. So they all wanted to be assured that I had plenty of money

to come home. And every one of them, bless him, they kept, no, no, I want to be sure you have plenty of money. Well, this was about the last day of the show. And they had all been down there and they were giving me the last of their money. So they had no money so they were all calling back the plant saying, send money. Send money with the next person that comes down. Well, unfortunately, all the people that were authorized to sign checks were also down at the show. So the company could not sign a check. And so the production manager made a loan to the company to send money down...
[LAUGHING] all because of my lost wallet.

[END OF SIDE 2]

BS: We began to have a lot of fun with it because it was clear that some people had never seen a woman engineer before. There were a lot of models there to hand things out and they would assume I was a model or a secretary or something. They are doing booth duty and standing people up and saying 'say something in engineeringism. I remember he came in and he pulls up one of the modules and he looks at me and he says, tell me, little lady, what kind of a capacitor is this? and I said, well that's not a capacitor at all, actually that's a pulse transformer and we make them at our factory, we make our own pulse transformers. He says, what are you an engineer or something and I said, yes. And he went running off and ten minutes later he was back with his friend. Meet this person - she's an engineer. But we did have a lot of fun then. Of course by the time that I was travelling a travelling sales person four years down the line people were a little more accustomed to a woman travelling but at that time it was not done. At that time, women did not travel, nice women didn't go to nice restaurants by themselves and that was what irritated me, how many people were just [INAUDIBLE] and when I wanted a nice meal I had to go to the airport. Because that was one place where women alone were allowed to be served. Every once in a while when my husband is out of town I go out and have dinner by myself and I enjoy it. I enjoy every minute of it. The other thing that was a big

problem when I started was that people would call up and ask to speak to an applications engineer and the switchboard operator which reminds me of another story, the switchboard operator got sick one day or something and someone apparently called the factory and said they wanted to place an order and they were told there was no one there who could take their order and one of those memos went out from Ken after that, as you can well imagine, saying anyone here can take an order, you get your pencils and you write down as best you can and be sure you get the phone number and someone will call them back, but you never tell a person we can't take the order. But they would ask for an application engineer and they would be switched over to me and then they'd say, I want to speak with an engineer, and I'd say I'm an engineer and they'd say, no I want to speak to a real engineer. Well, so I developed this patter and I'd say 'certainly sir, I understand, but tell me a little about the application that you have in mind it would help me to get an idea of what type of information you need, for example we have three lines of modules and they ----- maximum frequencies and five hundred megacycles and ten megacycles and sometimes you need a particular line of modules for some applications like a counter, you can use a combination because with a counter your first stages are much higher frequency than your later stages, which operate at a lower frequency so that kind of situation

where you use all three kinds of modules. And at that time you would know and you'd hear 'hey Joe, guess what, I've got - a woman engineer on the line'. Then they'd yell at everyone in their office that they had a woman engineer on their line and after things calmed down then they'd come back on and then we'd start all over again, because, it had quickly gone out of their mind.

INT: So women weren't very common?

BS: I was the first woman engineer that most people had seen, when I met them. they hadn't seen or talked to a woman, and there was only one at that time who refused to talk to me and I was very upset and I went to see Stan and he said, tough luck, that was it. The answer was yes, it was very unusual.

INT: It must have been fun anyway.

BS: Yes, it was a lot of fun. It was startling because I get used to it. And it's hard to remember that for other people it was the first time that they had seen a woman engineer.

INT: I can only imagine.

BS: Ken had no hesitations, Stan had no hesitations,

just delightful. Wonderful people to work for.

INT: IT must have been interesting in that product direction figuring out what new products to develop that would be the applications that customers wanted.

BS: It was also interesting for me because I learned a lot about the company and the various viewpoints. It was a terrific experience to sit on that committee and to meet everyone else and of course we had the same situation on the committee, I was the only woman on the committee and so when somebody came in who was not on the committee, they assumed I was a secretary here to take notes or get coffee. And once I opened my mouth and said something in engineering, they would let their mouth fall open.

INT: Was it clear to you that there were huge growth potential?

BS: No, I had never worked for anybody before, I had never had a job. So I had nothing to compare it with. I did know that I enjoyed by work. I did know that I was very well paid compared to any of my friends. Women at that time earned peanuts and particularly around universities. The graduate student wives who took jobs right around the University were paid next to nothing.

And it was clear to me, I loved to work there, I would have loved to stay and work there.

INT: Was there much discrimination. It seems it's mostly men.

BS: Most people didn't hire women engineers, it wasn't illegal and they told you. There was one place I interviewed with that they decided to hire a woman engineer but I wasn't it. A woman engineer but my class at MIT had twenty women, freshman woman and graduated about ten. And the bulk were in science. So we would have maybe one or two or three a year in engineering and most of the schools that I am aware of did not allow women in engineering so the women that wanted to be engineers had to go into chemistry or physics or a science, so the answer is yes, it was very unusual.

INT: Were you paid equitably?

BS: I felt that I was paid very generously. I was told by someone that when I started my salary was somewhat lower than a man's because they didn't know how I would work out and now they were raising it to be the same as a man's. I didn't do a lot of solid comparison with other engineers their, but I did do salary comparison with other women, and I was making three times what other

women were earning so I was very pleased. The one in particular that comes to mind, I did solid comparisons, had graduated top in her class in chemistry. From a good school. The other thing I think impressed me tremendously about Ken and about the general atmosphere at Digital, was they give you a job to do and then they give you a lot of space to do it in. If you understand what I mean by that. They didn't prescribe here is how you should do the job, they let you find your own way to do it.

INT: You mentioned the time wasn't as important as finding the best quality solution.

BS: That's right, it's like the business of going around and teaching all of the secretaries Boolean algebra.

[END OF TAPE 3 -- NOTHING ON SIDE 4]