

An Interview with  
NANCY GUNTHER

OH 481

Conducted by Thomas J. Misa

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By Telephone

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## Nancy Gunther Interview

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### Abstract

Nancy Gunther grew up in Mason City, Iowa, attended the local community college then majored in mathematics (including computing) at the University of Iowa. In 1966 she went to work for Sperry Rand Univac in St. Paul. She worked as a programmer initially in Advanced Tactical Systems using assembly language and Compiler Monitor System for 18 bit computers. She describes and compares working conditions and company culture in St. Paul and also, from 1967 forward, at the Navy Systems department (Eagan MN) as well as in Montreal (1984-1987). Her technical work focused on operating systems and command-and-control systems for navy ships and submarines. She describes the culture changes with the merger between Sperry and Burroughs to create Unisys.

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Misa: My name is Tom Misa. It's the 2nd of December, 2015, and I'm talking today with Nancy Gunther. We're going to do an interview for a project that the Charles Babbage Institute is doing with funding from the Sloan Foundation to try to better understand women in computing, especially in industry during the period from the 1960s through the 1990s. Nancy, I wonder if you could give a bit of background about your childhood or maybe experiences in high school years. Were there any activities or hobbies or something that might have inclined you toward a technical-oriented career?

Gunther: Well not really. Actually, when I think about my childhood and stuff I'm surprised that I ended up in a technical career. I was born during the era where when girls graduated from high school they either got married and became housewives, or if they did go on to college, they became nurses or teachers. I frankly had never heard of anyone, any woman, in a technical capacity when I was in high school. I played in band for two or three years. I was in a couple of clubs, in terms of stage productions, you know, back support type things, but [I] wasn't really terribly involved in anything and didn't have any real serious hobbies except I took up oil painting when I was, I think, 17.

Misa: Okay.

Gunther: And I was always a voracious reader. All my life I've read practically a book a day.

Misa: Any particular subjects that you recall reading about in high school?

Gunther: Primarily history, archaeology, historical romances, but I can sit down and take a plain history text book and read it for enjoyment. I had as many hours of history when I went to college as I did in mathematics, except I never did declare a double major.

Misa: Did you have math classes or science classes in high school that were notable for you?

Gunther: I think I was in eighth grade or ninth grade when the Russians launched the Sputnik satellite. And of course then there was the big rush to increase the number of people in science and technology. So by the time I was in high school I was placed in accelerated classes. I think almost all of my classes were accelerated classes, with the exception of science classes and I don't think they ever had an accelerated program. But all of my math classes were accelerated and my senior year of high school we actually had analytical geometry without the calculus. Let me tell you, once I got to the calculus I realized how much easier the analytical geometry was. [Laughs.] So I guess there was that. Plus I had an absolutely excellent ninth grade teacher for algebra; [I've] just never forgotten her. Her name was Miss Walker.

Misa: This is ninth grade?

Gunther: Yes. Is that unusual to have algebra in ninth grade?

Misa: No, I'm just trying to understand the chronology.

Gunther: Like I said, that was in ninth grade when I had algebra. That was not the accelerated classes but like I said, I respected her tremendously and she was a very good teacher. Then all the math classes in high school were accelerated.

Misa: When you were completing high school, what sort of options did you consider for either further education or some kind of training? What were the options you saw before you?

Gunther: We had to do — I don't remember whether it was in 11th grade or 12th grade — it was some kind of a unit that we had to do investigating a career, looking into it, seeing what kind of job opportunities, what the pay scales were. I looked into archaeology, which if I had had the money and the time I would've gotten a Ph.D. in archaeology and happily been digging in the sands of the Middle East or the Far East someplace for my whole life. But I couldn't afford it. Once I looked into the educational requirements: how long you had to go to school, and how little funding there was for actual archaeological expeditions, how few positions were actually available in universities, it just wasn't an option anymore. So I don't know where I first heard of computers, but by the time I got done with high school, I had made my mind up I wanted to be a computer programmer. When I started college I knew that that's what I wanted to do.

Misa: And what places to go to college did you consider?

Gunther: I didn't consider anything except the local community college. I grew up in a family where — I used to think we were lower middle class, but actually we were poor when I think back on it. And we had a very good community college in Mason City, Iowa. I think at one point in time it was considered the best in the state. I knew I could do two years at community college while I was living at home and working, and I'm not sure I ever would've been able to go to college if it hadn't been for that.

Misa: So were there computer classes at the community college then?

Gunther: No, no, no, no. The first computer class I ever had was when I was a junior at the University of Iowa. It was the first year the classes were taught, so they didn't really have much of an idea of curriculum. He did teach us how to use binary, and a few things like that, and we did some programming in ALGOL and FORTRAN, but generally speaking, they had no computer science classes at the community college. I'm not sure many of the teachers at the community college even know what a computer was, much less the fact that there were computer programmers.

Misa: Computer programming was a very new career at the time. This is the early 1960s, is that right?

Gunther: Yes. I graduated from high school in 1961 so I went to community college from 1961 to 1963. I think it was in 1964 at the University of Iowa where I took that first computer programming class, so it was very, very new at the time.

Misa: Even the idea of computer science was very new, some of the very first programs were being organized at the university level in 1965, so computing was in the air in some ways, but it sounds quite remarkable that you were already oriented to computing. When you think about it, was there anything in your background, or family, or math teachers that got you interested? You said going to college that you wanted to study computing, but for the time that was quite remarkable.

Gunther: Yes. I guess I knew there weren't; I mean I don't remember young people coming out of school with computer science degrees until, I want to say, early or mid-1970s. You know there was nobody that actually directed me or influenced me to go that way. The only thing I can figure out is I may have seen a picture of a bank of probably magnetic tape drives in a magazine and something about a computer. I wasn't much of a TV watcher. I really don't know where I first heard about computers but I knew by the time that I graduated from high school I was going to major in math because somehow or other I knew that math and engineering were the things that you were going to need to get hired. Like I said, I don't know where it all came from. I thought back about this over the years and stuff, and I must have read something or seen something and then it struck my fancy. And then, I was off and running.

Misa: Did you remember having any peers in math or in computing, either at the community college or at the University of Iowa? Peers as in students, could be men or women.

Gunther: Obviously, I suppose, the students that took that first computer science class. I don't recollect knowing anyone there that had picked that out as a career. I just can't think of anyone I knew that wanted to go into that field. Matter of fact, I'm not sure I ever talked about it much. I got the math degree, so I knew people that were taking math, and they often were going to become teachers. But I guess I don't recollect talking too awfully much about what we were going to become. Some of the women that I roomed with were going into education and things like that, so it's just something that never came up very much in terms of a discussion topic.

Misa: Were there other women that were in the computer classes at the University of Iowa?

Gunther: There may have been maybe one. I can tell you that when I was taking calculus at the University of Iowa, the lectures were held in a lecture hall and there were 400 people taking advanced calculus there, and there were four women. So they had one woman assigned to each, if you want to call it study group, smaller lecture. The four women in the class that were used to being called on quite frequently. [Laughs.] Yes, I'm thinking four women in a class of 400. It could've been maybe a class of 300; that would



be one woman to every around 75 men. But the proportion of women in any kind of math and science classes when I went to school was very, very low.

Misa: Low, yes.

Gunther: Few scattered ones, but not very many.

Misa: Did you know of any other women who were practicing in the computer field at the time? I suppose all the teachers were men [but I] don't know that.

Gunther: Yes, the teachers were all men. I never had a woman teacher at the college level in any kind of a math or science course. So no, I didn't know any women practicing in the field. I did have one high school girlfriend that ended up in almost the same field. We graduated from college at the same time and she went to work for Honeywell in the Twin Cities. She ended up in the computer business. Her degree was I think a combination maybe of operations research, numerical analysis, mathematics, something like that.

Misa: There must have been something about computing that appealed to you. Do you have any sense what that might've been?

Gunther: The only thing I do remember is I might've seen something about a computer playing Tic Tac Toe, you know, very, very basic — pretty easy to program nowadays

obviously. But I think I saw a computer playing Tic Tac Toe, where somebody could walk up and they could somehow or other on a keyboard, you could make your moves, and then the computer would make it's move, and nine times out of 10 the computer won. But I think the fun part of it, the curiosity part of it, the kind of amazement part of it, the fact that a machine could do something like that, which is so simplistic nowadays that you don't relate, you know, it's just unbelievable. But back in those days, it was high tech. [Laughs.]

Misa: Right. It's hard to remember, as we look back, that was exactly high tech. It had a kind of impressive factor that's important to recall. In the two years that you were at the University of Iowa, did you have any sense about computing then becoming a career? Was that something that the faculty would talk about and what kind of work people would do, or what kinds of things did people do after graduating University of Iowa?

Gunther: I don't recollect the faculty members ever talking about careers, trades, jobs. If they had any kind of a counseling office I guess I never heard of it or saw it. The closest I can remember is when I was a senior, companies started coming to campus to do interviews, and I realized that a lot of banks and insurance companies were kind of ahead of the game using computers. Although maybe they weren't really ahead of the game, it's just the fact that people are familiar with insurance companies and bankers much more so than they are with technical companies that do real time or any kind of militarized programming. So I interviewed with quite a few banks and insurance companies and was generally pretty bored when they described what the job was.

Misa: Bored.

Gunther: Yes. I had worked as a long distance operator for Bell Telephone all the way through college and last year of high school. And I did interview with Bell Telephone for a programming position with them, which was offered, but I wasn't interested in living in Omaha so I turned it down. The Bell Telephone job was much more appealing than the, I'll call it the commercial stuff, but like I said, the geographical location wasn't quite right. But I don't remember any of the teachers or professors in college ever talking about careers, with the exception of the guy that taught that first computer science class that I took, computer programming. Occasionally somebody would ask him a question so he would start kind of rambling on and talking about some of the stuff he had done with computers, and I don't really recollect anything he might've said but we always thought it was kind of interesting, what he was talking about.

Misa: So that may have sparked your interest to do something. It's a shot in the dark but do you happen to remember this man's name? There weren't so many people teaching computing and not so many people had any sort of programming experience.

Gunther: No, I really don't. Unfortunately, I am not a hoarder, keeper of things the way some people are, and I think it was about 20 years ago [when] my parents were cleaning out the back end of their house and I ran across the last batch of stuff I had from college, those blue book exams, in there. And actually, when I looked through some of the blue

book exams at some of the math courses I had taken it was like looking at Greek. Well, it is Greek, actually. [Laughs.] And I threw away the last batch of college stuff I had so I don't even have a college transcript. I suppose if I had a college transcript from the University of Iowa I could — no, they don't have the professors' names on transcripts, do they?

Misa: No, I think they just have the course number and then just the bare bones name, but typically not the instructor. It's too bad, in a way. I just thought it was worth a shot because you were at the University of Iowa . . .

Gunther: University of Iowa in Iowa City.

Misa: . . . in Iowa City, sure.

Gunther: I suppose if somebody was really interested enough, if you went back and wanted to find out, couldn't you find out names of faculty members that were on staff like in 1964 or 1965?

Misa: Yes, there's something called a university catalog. We have those here at the University of Minnesota and sometimes you can actually go back and see in great detail. You can't necessarily get the content of the course, but oftentimes you can find the people. So in any event, we don't need to worry about that for this conversation. But you had an unusual exposure to computing early on, and some interesting opportunities

opened up. Did you go to work directly from University of Iowa to Univac or did you have another job?

Gunther: I went directly to work for Univac. I was agonizing because the last job offer I had was from Bell and it was the only one I had at the time, and I was agonizing about turning it down and worrying about getting a job. My mom says why don't you take the summer off? She said you'll get a job and it's probably the last summer you'll be able to take off until you get to be real old. I said yes, you're right. We had a newsstand in Mason City — Mason City is only 30,000 people — and there was a newsstand where you could get newspapers from larger cities around the country. Every so often I'd go down and pick up a Minneapolis Star newspaper and that was where I saw the ad for Univac, so I wrote in and got a job application form and filled it in, and that was how I got hired.

Misa: So they were advertising in Iowa?

Gunther: No, they were advertising in the Minneapolis Star, but like I said, I'd bought a copy of the newspaper.

Misa: Oh yes, okay. The newspaper just came to your local newsstand.

Gunther: Yes. And actually as it turns out, when I talked to somebody when I was interviewing, they asked how I heard of Univac, and I said through a newspaper ad. And

they said oh, that's kind of unusual, we don't advertise very often. So I guess the stars were aligned correctly.

Misa: That was in . . .

Gunther: That was in 1965.

Misa: 1965 or 1966?

Gunther: Wait a minute, let's see, 1966. I took a year off. I got married and had a son, and I took a year off from college, so I should've graduated in 1965 but I graduated in 1966 instead.

Misa: Can you say a little bit when you came to work for Univac? I think your write-up for the VIP Club says that you were on Prior Avenue. That was right next door to the old ERA plant that stretched back to 1946. But you were in that new building, kind of a big square building right next to it. Plant 5 on Prior Ave in St. Paul.

Gunther: Yes. You went down University [Avenue] and then you turned onto Prior Avenue, and — no you didn't — I'd have to drive down there and look. We worked in a two-story building that was — you just kind of walked across a parking lot to get to what was the old ERA building, it was glider factory during World War II, I think.

Misa: Yes. We've got some pictures of that. It's astonishing to see.

Gunther: Yes. As a matter of fact, we had one of the [UNIVAC] computers in there that still did payroll and I remember walking through the banks of vacuum tubes. Then I actually saw some of the parts of it when I visited the Smithsonian years later in Washington. I started laughing and said I saw that thing when it was still up and running and doing things. But yes, we worked in the building on Prior. [It] was a two-story, it was kind of an office building, and it was like I said, right across the parking lot from me. It was the ERA building.

Misa: So Prior's going north, and I think Minnehaha Ave is the boundary at the north part of that property. I can go there today and it's quite interesting. It's not in great shape. It's been abandoned for some number of years but it's interesting to think back to what it must have been like. So you were there; this was like 1966. Can you say a bit about the working group that you were hired into?

Gunther: What was the question about the working group?

Misa: You were hired in to do work, I think, as a programmer, is that correct?

Gunther: Yes, I was hired to work as a programmer. The name of the group was Advanced Tactical Systems, and I was mainly impressed — I don't know if I put that into that VIP write-up I did — but the fact that you had to ring a little buzzer and then

somebody inside had to buzz the door open for you. They were working on the original Naval Tactical Data System, NTDS, and I went to work on a program that was for the DLG-16 class of ships, which are now called cruisers, I can't remember; the numerology has been changed since I worked on it. But I was hired to work as a programmer and I remember when I went in for my interview — like I said, I'd had a lot of interviews with insurance and banking companies and the work sounded really boring. The guy that I interviewed did a great job of piquing my interest because he was telling me all about displays, with the track and target terminology, all of the weapons systems, and just the whole nine yards that went along with [it]. Stuff I just absolutely never heard of in my life, and I was just absolutely hooked. I was caught hook, line and sinker with that interview so he did a good job of selling the company to me.

Misa: So it was the challenge and unexpected quality of some of these guidance system type programs that Univac was working on that appealed to you?

Gunther: Oh absolutely, the work sounded fascinating to me.

Misa: Can you describe the working group, did you join a team of other programmers? How was the work organized when you came to Univac in 1966, do you recall?

Gunther: Oh, yes. I remember a number of things like those very clearly. As a matter of fact, I still may have one of the few things I did save, I might have an organization chart yet, although maybe not. Anyway, the department that I hired into was I'm going to say,



maybe 100-120 people at the most. And it was a huge room, big long room, and then there was a smaller room going behind it with a door going into it. There were one-man cubicles for supervisors, and then there were two-, four-, and six-man cubicles — shouldn't use a word like 'man' but I'm going to — for the worker bees. We had probably, I'm going to say three managers, and one group manager, and three or four secretaries. Typically a supervisor would have, oh, I'm going to say 12-15, maybe 20 people, but I'm guessing 12 is probably a better number. And if he had — I'm going to say 'he' because there were no 'shes' at the time — typically we were organized into like four and/or six-man teams with what's called a section lead. The section leads reported to the supervisor, the supervisor reported to the manager, and then the manager reported to the group manager, and from there I suppose up to directors. Almost all of the people in this section that I was working in were programmers working on NTDS or other Navy real time systems that were being worked on. And in the other room that held the larger number of people, I never interacted with those very much, at least that first year, but I'm assuming they were test people, engineers, and probably quite a few hardware engineers. It was kind of a mixed bag back in those days in terms of hardware people. We worked in the same organization as the software people, and we didn't always know what each other were doing, obviously.

Misa: Do you recall what languages you were programming with the NTDS and related systems?

Gunther: Yes, we used a language called CMS. Well, see, when I first started working there, the group that I worked in was using Assembly language and I don't know if it was Assembly, we just called it [that]. The computer was called a 1218. And computers back in those days, either they were special purpose computers that would be built by Sperry. And they had — I'm going to call it a commercial and a military designator to them and I probably use them interchangeably. But I worked on a 1218 computer, which was an 18-bit computer and the programming was done in Assembly language and that was just called 1218 Assembly. After that, I worked in CMS-2, and the CMS-2 was compiler monitor system, and it was a specialized language for the computers that we worked on. I think the UYK-7 and UYK-20 may have been military designators. But all of the computers I worked on up until the last 10-15 years of my career were military computers that Sperry built specifically for the United States Navy. We developed the compiler and assembly languages and maintained them there, and used those also.

Misa: If you're doing programming in Assembly language, that was nothing like a high level system, or high level language like COBOL or FORTRAN or one of those.

Gunther: Oh, no. [Laughs.]

Misa: It was very detailed.

Gunther: It was like enter A-lower with this, and add A-lower and add A-upper. It was a computer that was an 18-bit computer and the instructions were 18 bits. It only had like

8,000, 4,000? It's terrible how my mind is deteriorated. [Laughs.] But it was a language where you literally were loading the registers. We defined variable names like number of tracks and things like that, but there were limitations in terms of how many characters you could use. It's not like now where you could say, put a name in like 'NUMBER OF TRACKS.' We'd have something like 'TRKNO' for track number because we were limited to say five or six characters, whatever could be held in one of the 18-bit computer words, once it was input.

Misa: Right.

Gunther: But we literally had two registers, A-upper and A-lower as I recollect, and everything was done with those two registers: Enter A-lower with this; Enter A-upper with that; then you'd say add A-upper, A-lower, and then store A into some kind of a variable. So it was pretty low level.

Misa: Yes. Everything would run very fast because everything was very low level language, or again so to say close to the machine. You were saying that the working groups were typically four, five, or six people? Were there other women that you worked with or was it an all-male crew?

Gunther: The first year to year-and-a-half that I worked there it was all male. The year I was hired in they had had a female programmer working in the group and she had left. And I'm not sure [about] that whole building. Although I don't know if there were more

Univac people in that building aside from the Navy Tactical Data System or not, but I was the only woman in the group for, I'm going to say, a year-and-a-half to two years. And then they started hiring an occasional woman here and there.

Misa: So for one to two years then you'd be the only woman programmer working on the site. I'm just curious, were there other women who were working maybe as engineers or in other technical or professional capacities?

Gunther: Not in that big room that I sat in that had 100-120 people in it. We had probably three or four secretaries and that was it. I was the only woman up there working in any kind of a technical professional capacity.

Misa: Would you have any comments about the work culture at the time, what it was like working with all the guys?

Gunther: Well you know, I guess in some respects that fact that I had spent my college career in classes with nothing but guys in there, and I got along with them well. I don't know if I put it in my VIP write-up but the first week that I worked there, I sat in a six-man cubicle with five other guys. And one of the guys was kind of outspoken and he said, 'Let's get something straight — we're not going to open doors for you, we're not going to light cigarettes for you, you're going to have to be just one of the guys if you're going to work here and get along okay.' I said, 'Okay, that's fine with me.' And that's kind of the way it was. I think after the guys got to know me, they didn't feel like they

had to tiptoe around. It was in the era when there were a lot of jokes, both written and verbal that would be completely and totally unacceptable and would probably get you fired [today]. [Laughter.] But I didn't have any problem working there and I was never subject to any kind of — like I said, if any kind of a joke was told it was never really directed at me personally and I also got to the point where I learned to give as good as I got. I will say that in the era that I lived and worked in, probably the first five to 10, maybe the first 15 years, I found out that there was no room for a woman who was a shrinking violet, you know. It's unfortunate maybe for some women, but that's the way it is. We had a couple guys who were ex-Navy chiefs and they were as loud and brash as they came. And they weren't particularly educated but they were hired for their expertise of knowing the systems in some of the submarines.

Misa: The Navy chiefs were.

Gunther: I had women who worked for me when I was in Montreal that were just terrified of a couple of these guys, and I said why? They said oh, the guy, you know. I said he's loud and he's brash but I guess I told them you just can't back down to somebody like that. I said if you don't get the answer you need, go after him and ask him again, and again. I guess I just didn't have any problem. One guy walked into my cubicle — believe it or not I still communicate with him with e-mail every so often — he asked for one of the other guys because he had some technical questions he wanted to ask about the system we were working on. I said, 'He's out onboard ship now, he won't be back for another two weeks.' He said, 'Well, who in the hell am I going to talk to?! I need some

answers just right now.’ I said, ‘Well you could talk to me.’ He said, ‘I wanna talk to Jim.’ I said, ‘Look, I’m the chief lead on this particular program right now, Jim is only partially supporting. What do you need to know?’ So he threw a question out, thinking I couldn’t answer. And so I answered the question. I just turned around and I said, ‘Now who in the hell are you and why are you in here asking me these questions?’ He told me who he was and what he was working on, and I’d never heard of it. I said well what the heck is double S sort? It’s like who cares? You know, actually he and I got along fine for the next 35 years, 30 years, whatever it was. I wasn’t particularly belligerent at the time, but I guess his line of questioning when I knew I could answer whatever question he had — he wanted to talk to one of the guys. It was like okay, wait two weeks or you can get the answer out of me.

Misa: So you’d already been put into a position of some leadership. You said you were the principal lead on this particular project.

Gunther: I worked on the NDTs for the first year, the DLG-16 a little bit — I think I’d worked on that for a year-and-a-half, two years, maybe. And I was pretty good friends with my section lead. He got called into one of the managers’ offices one day and they said to him that we need people to work on the DLG-6, it was another ship class and the program that went on it was going to be very similar to what was on the DLG-16. I think they were going to have two people working on my part of the program, and the manager said okay, who are the three people we’ve got to pick from? And he said Nancy, Charlie, and George. And he said who’s the best one? And he said Nancy. And he [the section

lead] was asked how come not Charlie? It's like Charlie's afraid of the computer, and George never seemed to get quite caught onto things quickly or got things done quickly. Charlie, George, and I were assigned to work on the program, but everybody sort of understood that. I was never designated as a lead because it had both operational and simulation programmers, you know, in this small little group. We reported to a supervisor and if the supervisor wanted to know something about the Op program he'd come to me, and if he wanted to know Sim program he'd go to another guy. I had sort of a lead position in the sense that everybody recognized that I was the one that knew best what was going on in the whole program.

Misa: And it sounds to me like you ended up making some headway into confronting the possibly male-oriented culture. You got these guys to respect your technical talents. Do you have any insight into how your managers saw this situation, the supervisors?

Gunther: I think they respected my technical talents. I mean, in that kind of a situation where you're responsible for a designated part of a program, and it wasn't working or if it was really put together poorly, I mean, people knew it. Back in those days, I think the teams were a lot tighter and we accomplished massive amounts of work with much smaller numbers of people than are used nowadays, and part of that is because we didn't have as much of the paperwork, bureaucratic requirements. Things were much more streamlined and efficient back in those days. And everybody knew who the performers were and who the combination of slackers or people that weren't very technically capable, and the word would go up the line. It was an era where, I'm going to say

supervisors and managers probably spent too much time socializing and then probably after work at the bars, drinking and finding out. They had a lot more information at their fingertips than they were sometimes able to use in terms of who the performers were versus the non-performers. So yes, it was recognized within a couple of years that technically, I was more than capable of doing the job and that I did quite a bit better job than a lot of the guys I worked with.

Misa: Was there any expectation of there being a career in either programming or doing some type of management of programming at the time?

Gunther: You mean did I have any expectations or did other people have expectations for me?

Misa: I think both of those are relevant. Computing was so new, it's not like somebody's got a career in an established field, but was there a sense that people would do this work for maybe five years or some number of years, and then move into management? Or did people have the sense that people would work as a technically oriented computer programmer for a long period, for decades or something?

Gunther: Yes to all of those. I worked with a lot of people and a lot of the people I worked with were real wiseacres, and a lot of them wanted nothing to do with management. Their attitude was: I don't want to be a stinking manager and push paper all day long. So a lot of people had that kind of an attitude and you know that kind of an



attitude can bleed off on to you. I have to admit that it was my attitude up until about eight to 10 years with the company. But it was a given that if you wanted to advance within the company then you needed to get into management. You needed to take a supervisor's job and then move into management because in the technical path there were four different grade levels, and you pretty much maxed when you hit the top of those grade levels. I guess there was not technical path to going higher in the company for years, and when they finally got around to defining one I guess it didn't do much good for anybody except maybe three or four people. But I was offered my first supervisor's job when I had been there for five years, and wasn't interested in it. I told the manager that offered the job, I said no, I really don't want a supervisor job right now, but it would never work out anyway. He said why not. I said okay, I worked with this group of people for several years, now all of a sudden you're going to make me the supervisor and the guy that used to be my section lead is going to be reporting to me. Well yes. He didn't see any problem in that at all and I thought oh you idiot. [Laughs.] So I guess everybody that was interested in moving up the chain of command knew that there was a way to do it. That was the way that you moved upwards in the company at the point in time. You moved in the engineering ranks into the management ranks. Back in those days, the idea of somebody having a non-engineering degree or not having an engineering background that worked in the company being promoted to a higher level was just absolutely unheard of. Like hiring somebody with a bachelor's degree in business, or something like that. Or somebody that had a master's or Ph.D., maybe, in math, engineering, whatever; the idea being that at that point in time, they just weren't going to get into any kind of significant

management level unless they'd paid their dues so to speak, and done some hardcore work at the grunt level, if you will.

Misa: So most of the supervisors and managers then would be, so to speak, homegrown within Univac?

Gunther: Yes. I mean, nobody during the first 10-15 years I worked for the company, I don't recollect anyone ever being hired in, in any kind of a management level that wasn't a homegrown engineer.

Misa: Can I ask more about the computer as a profession? There's different labels that people had, and I don't know whether any of these were ones that you used or that you'd see as being helpful, but some people were programmers, some people coders, some people were systems analysts. There were lots of different words that people today look back, and the computing profession was fluid and changing, but were those different types of work that you would recognize from the 1960s into the 1970s?

Gunther: Oh, yes, I recognize all of them. When I hired into the company, I was hired as a programmer. Now one of the things that distinguished Sperry from some of the other companies (maybe IBM was one of them), there were companies then where they used the term 'coders' and they had people who were designers, and I think they had people who were systems people, and a lot of those differences persisted for years under different names. But I was hired as a programmer, that's what they called them back in

the late 1960s probably until I'm going to say the mid-1970s. People started coming out of college with computer science degrees back in those days, and then eventually they came out with software engineering degrees. But we had programmers and then when the term computer science caught on, when computers were less of a mystery to the educational and general population as a whole, we were called computer scientists, and then eventually software engineers. But one thing at Sperry — and I don't know if we were unique — but we never broke a software person's job down into being only a coder or only a designer, etc. I guess when people first started to work, you know in the late 1960s, typically coding was one of the first jobs they were assigned to. The first job that I worked on during the NTDS system development was: one of the other guys that was more experienced at design had developed some real basic flow charts, and my job was to expand the flow charts using the design that he had [developed], and to code, and then to test it. Typically you'd do that, and then after you'd been with the company for a couple years, then you moved into — I mean, once you've coded a program, and worked on it, and tested it, you've got some idea of how it was designed. And so then you could extrapolate that into working on another project where maybe somebody had already written the specs and you've got a spec for a module or a section of the software, and you were expected to design, code, and test it. And then eventually — and it didn't take very long, I mean this isn't something that took years, and years, and years — within two or three years, four years, you would be assigned to a new project. We would need to write performance specs and the experienced people would start writing on the performance specs, once you've got the basic information and the interface document. But back in those days, the software people did a lot of work that is now done by systems personnel,

and we did a lot of the work that's now done by program managers. Like I said, things were very streamlined and efficient. I don't think I even ran into the term 'program manager' until I'd been with the company for maybe, I want to say 10 years.

Misa: Ten years, so that'd be like mid-1970s, say.

Gunther: Mid-1970s, yes, that'd be about right. I remember I was introduced to this guy in a meeting, and we got out of the meeting and I asked my boss, I said hey who was that guy? And I said, what's a program manager? Oh, he said, don't worry about it, they assign one to every program but they don't do anything. [Laughter.] The software people did a lot, you know, we did interface definition. You'd start out with just very miniscule interface definitions. But see, one of the things when I say Sperry is unique, I think some of the other companies kept that segregation of people who write performance requirements from people that design, from people who code and test, for a number of years longer than we did. And some of them still had the way they did software costing set up that way. Sometimes you'd get Navy or government people in there and they'd say why is your cost for doing the performance spec so much higher than IBM's cost, for example? And we'd say well because our cost included the analysis and the development of the spec whereas IBM's, what they called performance requirements, just included their writing, whereas some other entity would define the requirements and stuff. So some of that segregation continued to exist, but people weren't known as coders, or as designers, or as spec writers. Software people did all the software and then you had a test organization that, once the debugging was done, got involved with it.

Misa: So there was less segmentation of the work. Maybe less specialization on the one hand, but less segmentation of these different functions. So you, as a computer programmer, would do several of these tasks even though maybe at IBM or another place that would be separate work that it sounds like three or four different work groups would do. Is that a fair summary of what you were describing?

Gunther: Yes, I think so. By the time I'd been with the company for five or six years, if you had a good sized project, it was going to take — a good size back in those days was it was going to take six, to eight, to 10 software people — literally almost all of those, except the newbies, would be involved in writing the performance requirements, and would be involved in the design, and I'm sure it was much more segregated. I remember specifically one difference out of the years when I was working for the company, where the government wanted to run our cost estimates for a proposal we were working on, using IBM's system. And I just looked at them like they had rocks in their head, and I had to give them a kind of tutorial in terms of what the differences were, in terms of why you couldn't do that. So like I said, yes, I guess I'm getting off the subject there a little bit, but I was thinking IBM was one of those companies that did have more of a segmented approach to doing the software.

Misa: Yes.

Gunther: Ours was truly integrated, in the sense that the software people did a little bit of everything.

Misa: Can I ask you about the term ‘software engineering?’

Gunther: Yes.

Misa: That was a specific concept, some people say that was invented about 1968 and became quite a buzzword within some parts of computer science. Did you see that as a helpful development, or how did you experience software engineering?

Gunther: Well, if it was available in the late 1960s, I guess I wasn’t aware of it. I’m not sure just exactly when I ran into the term. But, in some respects, I thought it was a little bit on the hokey side. To me, you know, the people that have the tendency to be the inventors of terminology, and new techniques, and processes, and procedures, it was like they were trying to legitimize the software industry and take it out of the black magic, art, voodoo category into a pure engineering discipline. It’s like hardware engineering, in some respects, is — they all take a certain amount of creativity. It was like they were trying to take some of the magic out of software and make it more of a scientific discipline.

Misa: Yes, I think so.

Gunther: And that's fine and dandy. I used the term to describe myself but I'm always a little uneasy because I was not an engineer by education. I guess I was a computer programmer. Maybe a software engineer is a good term because I did analysis, I did development, I did testing, so I guess maybe I was a software engineer, but it's just that there's always that part of me that's a little uneasy because I did not have an engineering degree, so to speak. I'm sort of a purist sometimes when it comes to language.

Misa: Nancy, you said that in the mid-1970s there was a shift toward a bit more formal structure. That was when the idea of a program manager came in for the first time. Were there still the same small number of women working for Sperry Univac, or had the numbers increased by, say, the mid-1970s?

Gunther: Well, they didn't increase by the mid-1970s but I remember they hired a couple of women in the early 1970s and they didn't last more than a year or year-and-a-half. They kind of came and went. By the time we had moved out to our facility in Eagan, in the Navy Systems Department, which was probably a couple hundred strong at one point in time, we may have had maybe a half a dozen women. We never had a lot. I had probably one of the highest proportions of women when I worked in [Montreal]. I was a manager in Montreal, Canada, for three-and-a-half years, and I had 60 people in my organization, and 15 of them I think were women — 13, 14, 15, something like that. I guess I didn't hire women on purpose. I certainly don't have any kind of discrimination against men. I mean I didn't say okay, I'm going to show what's it's like to have an all-female organization, but I don't have any bias against hiring well qualified women,

either. So I had like say, 15 out of 60 people working for me, which is 25 percent women, which is probably one of the higher percentages you'd ever find. And when I worked out in California for 3-1/2 years, I had about 40 people working for me. And I think I probably had 10 women working for me out here. I guess once again, we're running at the 25 percent range. But I would suppose back in Navy Systems, when there were 200 people, might've had maybe five, six women working as software people or testers. The numbers never actually got very high. By the time I retired they were somewhat higher.

Misa: When was it that you were in Montreal, Nancy? Do you remember the years?

Gunther: I was there I think from April of 1984 until September of 1987.

Misa: So that's skipping into the 1980s.

Gunther: Yes.

Misa: And you went from the facility along Prior Avenue there, and then you transferred to the Eagan facility?

Gunther: I started working for the company in September of 1966, [and] I think it was about September of 1967 when we moved out to Eagan. I worked in the Eagan facility from September of 1967 until I moved to Canada in 1984.



Misa: 1984.

Gunther: Yes, it was April of 1984 until September of 1987. Yes, I'm sure that was it, 1984.

Misa: So your experience from 1967 onward, that was a big block of time then at the Eagan facility. Can you describe what the working environment there was like? Did you have the same kind of cubicles or was the office space any different? Working space or working culture any different at Eagan?

Gunther: No, we had the same kind of setup. We had four-man and six-man cubicles for the worker bees, and supervisors had one-man cubicles. Managers probably had offices with doors and walls. I guess that was the physical environment. Ask me some more specific questions, I guess. [Laughs.] I don't know what you're looking for in terms of — I mean the work environment and the way we were organized stayed pretty much the same until I moved to Canada. And then while I was in Canada there were some definite organizational changes that were made. But during the time that I worked in the Eagan facility I worked on these Naval Tactical Data System programs. I think I could pull out a copy of my PSDS if you wanted it for the breakdown. I got involved in the programming for the Los Angeles class attack submarines. I worked on that for several years, and then I worked on a project called Over the Horizon Targeting for several years before I went to Montreal. Do you want me to pull out a PSDS, you know, with a more detailed breakdown? It is one of the few things I saved.

Misa: Well, if you would find that be helpful in terms of jogging your memory. You know this isn't a memory test or anything, Nancy, I'm just trying to get a sense of — you know the Eagan plant was new and modern, and a fancier facility, it always appeared to me.

Gunther: Oh yes, it was very nice compared to the Prior [Ave.] facility; the fact that it had windows and stuff. Ever since I spent a little over a year working at the Prior facility, it's never bothered me to work in facilities without windows. When I was working out here in California it was a very secure building, and I worked with people that just absolutely went crazy when they didn't have access to windows and the sunlight. But the general organizational structure stayed pretty much the same for years. Of course since I still worked in, it wasn't called Advanced Tactical Systems anymore, NTDS, I think it was called Navy Systems after that for years. And in the Eagan facility, in addition to Navy Systems they had a major organization that did Air Traffic Control, a major organization that did compiler and operating system work, and I think by that point in time most of the hardware engineers had been collected into a hardware engineering organization. And then they had an education department. Is this all new to you? The organization as a whole, of Eagan.

Misa: I followed air traffic control with some interest. That was such a big, important project that the company did, but I don't know so much about the compiler and operating system work. That would be much more software oriented.

Gunther: Almost entirely software oriented.

Misa: Yes. A lot of ATC was software, as well of course, getting computers to track airplanes. But you ended up working yourself — that's really the focus of this interview — you ended up continuing to work in the software field.

Gunther: Yes, I stayed in software, and it was operational software. We had simulation and operational software. I had started out in operational software and that was what I preferred doing so I stayed working in operational software during my entire career. I worked in the DLG-6 program from 1968. 1969 I started working on the *Los Angeles* class SSN-688 attack submarine. We had developed the operating system software for the computers that were being used, and we were developing another layer around the software that interfaced with some of the equipment onboard the ship. It was like the command and control system. So we did the operating system and the command and control system parts of it. I guess in 1971 I worked on the CGN-9 system for a while, doing the systems manual. I'd worked on the CGN-9 system earlier. I'm sitting here looking at things and [laughing] I'm having difficulty recalling what they were.

Misa: You ended up working on a really quite large number of projects, it's not surprising it's hard to keep them all straight. Can I ask you a slightly different line of questions?

Gunther: Yes.

Misa: In the 1970s there was a lot of interest in computing by women, but of course in the 1970s, it was also the era of the women's movement in the country, writ large. Did you have any particular experiences or thoughts about that wider women's movement in the 1970s?

Gunther: Oh yes. [Laughs.] I thought there was an awful lot of rhetoric and an awful lot of, if you will, bra burning. And I guess I'm a relatively conservative kind of person, and maybe it was needed and maybe it accomplished something, but I've often thought that maybe my contribution and the contribution of women like myself was done on a much quieter scale, and made much more of an impression in terms of yes, women can do the same kind of work that men do and do it equally well in most fields. I was just never an avid supporter of the way they went about it and unfortunately, I think some of the mentality that has derived, carried through, existed to this day. I don't know, I find it bothersome. It's like I had women working for me in Canada and I'll tell you, some of them I think had a chip on their shoulder. If somebody looked at them the wrong way or cross-eyed, they were in complaining and wanting to file a charge against someone.

Misa: Yes.

Gunther: I don't buy that kind of behavior. It's like people are human and they make mistakes and errors, and they have different upbringings and backgrounds, and cultural

mores and concepts, and I just find it mindboggling that there is so little tolerance these days. Sometimes people say things that pop out of their mouths without thinking. Lord knows I'm certainly guilty enough of that, then you say [gasp] I didn't mean that the way it sounded, please don't file charges against me. [Laughs.]

Misa: Yes, right.

Gunther: Like I said, I probably looked at it and shook my head because of the fact that I was working in an entirely male-dominated field and never particularly felt discriminated against, or that people looked down on me. And it's kind of like if you've got to demonstrate that hard to get a job, maybe you ought to think about what your job goals are and what your backgrounds were. Oh boy, that will go over big with some of these women. [Laughs.]

Misa: Well you had quite an unusual career for a woman, and obviously you worked on a number of really interesting and stimulating projects. Can I ask you a question about the 1980s because there were several changes in the corporate organization at Sperry and Univac with the Unisys and Burroughs business? Did you experience any changes in the work patterns or work culture during the 1980s, mid-1980s particularly?

Gunther: Oh yes. I was hoping you'd ask me that question. We were bought by Burroughs in the mid-1980s and I was in Canada at the time and we were pretty much left alone. There wasn't much of an impact, although I do remember being called back to

St. Paul for some meetings when the new management and so forth was being introduced. But I remember after Burroughs bought us out — I don't know if you're familiar with this — but it seems like [I] read once that the combined total for the two companies was around 150,000 people, and a couple years later we were back down to 75,000 people, or 95,000, whatever it was. The fact they'd laid off between the two companies, maybe 40 percent of the people that had worked there, or at least they had done that much attrition. I guess what I noticed is when Burroughs took over, so to speak, Univac and Sperry had been companies that were run by engineers. And as far as I can figure, all the way up the line to vice president and maybe even the president level, the people in those positions had an engineering background and had worked their way up the chain of command. I used to comment back in those days because I could see our business eroding, and I said you know, we need to hire some people from IBM and some of these other companies that know how to go out and get contracts, that are maybe better business people, because engineers aren't notoriously famous for being great business people. Anyways, when Burroughs took us over, I guess they must of had lots of what they considered good business people, but I definitely saw a change. Actually it was someone who worked for Burroughs, a woman, and she had a fairly high position, she was at the director level, and I was in the restroom and I heard her talking to one of her cohorts in there. She said, 'By God, we're going to change the culture of this company if it's the last thing we do.'

Misa: Wow.

Gunther: They did come in and they changed the culture. And at the point in time that Burroughs bought Sperry, I would say pretty universal in all departments, people would work whatever hours were necessary to get a job done and I saw a lot of them work to the detriment of their families, in terms of divorces and drinking. But we thought nothing whatsoever of working 60 or 70 hour work weeks. And we weren't doing it on overtime, we weren't getting compensated, it was just the way the work ethic was. It was also understood that if at some point in time you needed to take a few hours off or even a few days, that was no big deal because you know you'd broken your rear ends trying to get something done for the company. People were treated as people back in those days, and management was really understanding of when people were having difficulties and problems. They were also very receptive to being told 'no, you're wrong.' I remember when I was still a grunt level programmer, talking about managers and group managers, that when they asked my opinion on something I gave it to them honestly. We actually had a discussion — they told me what they wanted done, or what they thought ought to be done, and where I would tell them no, that's wrong. And there was never any kind of a repercussion from doing that. It was the kind of thing that once Burroughs took over, you know if you valued keeping your job [you weren't that open]. I would say communication got less and less open because people perceived that they were — ever heard the term meatware?

Misa: What's the term?

Gunther: Meatware.

Misa: No.

Gunther: I heard that term years before Burroughs took us over. You know, first there was hardware, then there was software, then there was firmware, and then there was meatware. And meatware is where one programmer, one software person, one engineer, it's like interchangeable parts. You know, get one, put another one in there, no big deal. I guess this is my opinion, Burroughs started treating people like meatware. There wasn't perceived to be any big value in any specific people that worked there. It was kind of like they thought any software person could do the job.

Misa: Oh, okay.

Gunther: I'm pretty opinionated on this subject, but I watched over a year or two where people who formerly would stay and work the extra hours, it's like well, when you're making me track every damned hour I work and be accountable for this, and slow people working on that; it's like okay, treat me like a piece of meat and that's what you'll get in response. You'll get a 40-hour week out of me, and it's like no I'm sorry, I can't stay tonight. No I'm sorry I can't work this weekend. I think it took Burroughs about two to three years and I think they put something out in writing — wish I had a copy of it — they probably didn't put it out in writing. But I had heard about it via the rumor mill. Lot of people that were in management at that point in time wanted to change the culture back to what it was. I just snickered and said obviously people don't understand how



culture is developed in the first place. So yes, I saw big changes in terms of the work ethic. As far as I'm concerned, from when Burroughs bought Sperry, they destroyed the ethic that they had there and they never did regain it through all the different transactions and sales thereafter. People's attitudes changed a lot, you know, they'd put in extra hours but if you wanted a lot of extra hours over a long period of time, you'd better be prepared to compensate the people. And even then, you know, people reach the point and say no, I've got two young kids at home, I can't work another 80-hour week this week.

Misa: So it was a much more formal, bureaucratic managerial style.

Gunther: Yes. I supposed I shouldn't entirely point a finger at Burroughs because I think it's something that's happened in almost all industries. I've compared notes. I had a brother-in-law that was a lineman for an electrical power company and my brother was a foreman for the railroads, and I worked in a software engineering company. Over the years we'd get together at holidays and so forth, family get-togethers, and chew the fat. [I] found out that all three types of companies were essentially being managed the same. So it's like some of the things that I'd think were trifling, bureaucratic, ridiculous types of activities weren't just in my company, it's the culture of management nowadays.

Misa: Companies look to successful companies and business schools had something to do with that, so maybe there was something of a convergence and these engineer-run companies were a lot less prominent, for sure, than they had been in the 1950s and 1960s.

Gunther: I have to admit a lot of the things I'd seen come out of business schools in terms of management approaches; [laughs] I've seen them come and I've seen them go, and I've seen very little impact except negative as a result of what they've done.

Misa: Do you have any thought on the evolution of the company through 1990s? How did your work go in the 1990s?

Gunther: I've been very lucky. I enjoyed my work. I worked for 35 years for the company and I only had two job assignments that I hated. One was when I was borrowed for three months to work on a systems manual and I hated every day of the three months. And I had a calendar where I marked the days off. And I think one other time I was borrowed for a couple of weeks to do something. Generally speaking, I have liked my job, even though I probably sounded very negative during this interview, but I guess on the positive side I actually loved my job. I worked with really good people most of the time. As at any job, there's people you don't care for but there were good people to work with. Like I said, the first 25 years, when it was an engineer-run company, were absolutely great years. Might not have been good business, but we sure had fun in a very challenging field. I think I kind of diverted off from your original question, but back to the 1980s, your question was?

Misa: Well the 1980s was really a question about the change in corporate culture, and I think you spoke to that very directly and in a very interesting way. I was just curious about your experiences in the succeeding decade of the 1990s.

Gunther: Okay, I got a little sidetracked. I guess it was in the mid-1980s that I was in Canada for the first time, and that was where we went to matrix management for the first time and it's like what?! When it was first explained to me — and it never impacted me very much because we still pretty much had a hierarchical management while I was in Canada. But I guess that was one of the first major changes that came out of, I don't know if it was business schools or corporate culture elsewhere. And it's like, you know, when I first heard what I was going to be expected to do, it was like, excuse me? We're going to have like double managers on all jobs and double supervisors? And I do all the work, and I manage the people, and I take care of the job technically, and I do performance reviews and salary planning. But oh, I don't really do performance reviews and salary planning, I just do all the work and hand it over to another supervisor, and then he calls the people in and gives them their performance review and gives them their salary increases. And it's like oh, you want me to send status reports to them as well as to my own management? I just thought it was completely and utterly messed up. So they had two, or three, or four years of that. We had one group manager vice president and it seems like every time he read a new book on business or how to manage a corporation he tried to put it into play. So I was less than pleased. [Laughs.] It must be the old conservative part of my soul, and mind, and person, but I've never seen any organizational structure that works better than a hierarchical top down one, just like the military. People need to know who they report to and they need to know who they take their orders from, in terms of direction for their jobs. I actually talked to a guy a few years ago on the phone, and he's working for a company out here in California. He used

to work for me when I was out here in the early 1990s and he's probably the best person I ever had working for me in my life, both from a technical and communication perspective. Anyway, he was telling what his current job assignments were and how many people he was taking direction from, and here is a person who is a humongous asset — he'd be an asset to any company that he ever worked for — ripping his hair out over trying to keep things straight in terms of who he was supposed to keep happy today, tomorrow, or this afternoon.

Misa: Wow.

Gunther: Anyway, like I said, I watched the company flail through the 1980s and 1990s with various management approaches, and I guess they'd got back to a hierarchical management by the time I retired in the late 1990s back in Eagan [Minnesota]. But I guess I wasn't impressed with it, it was like they essentially tried to go back to what they had wiped out 15 years before. Like okey dokey. [Hmph.]

Misa: That's about the hardest thing to do is recreate something that you've spent 15 years taking apart.

Gunther: It's virtually impossible.

Misa: Yes, it's really hard.

Gunther: But I guess during the 1980s, mid-1980s when I was in Canada, that was my first job as a manager with supervisors reporting to me, and I thoroughly enjoyed working up there. We started a new office from scratch, and it was exceedingly interesting to watch. There were engineers that came from a division in Long Island, New York, and they started one office. And then we had engineers that came from St. Paul, Minnesota, and we started a different office because, you know, same company but different branches that reported into. It was very interesting to see how the engineers that were hired — because most of them were Canadians, you know, we had some Americans in both offices. But it was interesting to see how the attitudes and the culture of each office reflected the attitudes and the culture of — I think that's not surprising when you think about it — but the people from the Midwest versus the people from the East Coast. But it was an interesting thing to see just in terms of work ethic, and your approach to doing things, how you interface with people.

Misa: What would be some of the differences that you would identify as notable?

Gunther: Well [laughing] alright, there you go. People from New York are kind of brash. I had one engineer that worked for me and went to a meeting out there, and we broke for lunch. We were having a real basic disagreement and we were yelling at each other. And the engineer that worked for me, he said, 'Nancy, how am I going to go back to work in Montreal and have to talk to Joel after this meeting?' Joel is his contact, a younger guy, they were both younger guys. I just looked at him and I said, 'You don't have anything to worry about [it].' He said, 'What do you mean? People are sitting in there yelling and

screaming at each other.’ He said, ‘I’ve never been in a meeting like that.’ I said, ‘It’s very typical of the way we interface with this branch of the company. If you don’t stand up to them,’ I said, ‘they’ll walk all over you.’ It’s interesting, this one senior engineer and I that had been yelling at each other, because like I said, if you disagree with one of them, they raise their voice and so if you don’t raise your voice back they think they’ve won the day. We ended up in front of his boss — and I had worked with this guy 10, 12 years before — but ‘Nance, how are you?! Hey, been a long time since I’ve seen you!’ And this other senior engineer just kind of looked at me. You know, the other senior engineer that worked for him started babbling. He said, ‘Okay, wait a minute. Take your turn, you’ve got three minutes.’ So he [the senior engineer] outlined his side of the story. He says, ‘Okay, that’s enough,’ and then he looked at me and said, ‘Give me your side of the story.’ And I gave him my three minutes. He just looked at the engineer that worked for him and said, ‘Are you out of your ever-loving effing mind?’ He says, ‘You got rocks in your head.’ He says, ‘Nobody in their right mind is going to do that onboard ship.’ He said, ‘Forget about it, let them do what they planned on doing.’

Misa: Wow.

Gunther: But we had been screaming in this conference room for two, three hours that morning. So that’s an example of the difference. I mean I never sat in a meeting that I can recollect in Eagan with people where we screamed and yelled at each other. Voices might get raised a little bit, you know, and you could get real argumentative, but it was just difference in the way. I guess it’s me, I’m stereotyping and probably not all people from

the East Coast are like that, but a lot of the ones I dealt with from the New York area were. One woman that had a management position, from New York, she was one of the ones we got along with. Unfortunately she was not in very good grace with the company because of something she had done with the union, but she was going back to New York. And I found out she was leaving so I went over to see her and told her I would miss her. She said, 'Well gee, that's nice to hear. I don't think anybody else around here is going to miss me.' Like I said, sometimes the old mouth is way ahead of the mind, I said, 'Well, I hate to see you go, you're one of the few normal people working here.' [Laughs.] She looked at me, she said, 'I don't know whether I should be complimented or insulted by that.' I said, 'It was meant as a compliment.' [Laughs.]

Misa: Yes, well it's interesting to get your insights about the company and also about your career and the different kind of work that you did. Nancy, I sent you these recruitment advertisements. Did you have a chance to look at those, possibly?

Gunther: Oh yes, I read them with fascinating interest. [Laughs.]

Misa: Just curious, because I got those from the trade journal *Datamation* in 1967, and you were in the job market in 1966. Just wondering if you had responses or thoughts about [them]. I think there's five different ones there.

Gunther: Well two of them were real obvious in terms of "Look into RCA, you're our kind of a man." Let's see, there was another one here. There were two of them that had

the distinct — let's see, the RCA one and what was the other one now? I love it because both of the ones that said, we're looking for men indicated that they were an equal opportunity employer and I thought well that's kind of interesting, you know, looking at it in this day and age. Oh yes, it was the *Datamation* 1967, which one was this? Cornell Aeronautical Laboratory Incorporated "Wanted: men with a yen for exploring the computer sciences." So yes, those two are real obvious.

Misa: I'm looking at this, the Lockheed one says Lockheed is an Equal Opportunity Employer, that's the last line, but the tagline across the top says something a little bit different. It says "Where can man go in scientific programming?" so I don't know whether that's really equal opportunity for women.

Gunther: Yes. [Laughs.] See, I didn't realize it at the time, I suppose it was during the era where you know, the women's movement was agitating for equal opportunities/equal pay, and stuff. And I ran across something that indicated what year the federal bill relative to equal opportunity was passed. And when I saw the date on it I said oh, that was about a year before I was hired in, and it made me stop to think that like gee, I wonder if I was hired because I was a women. I probably was, you know? I mean anybody that did any kind of work for the military, which is obviously government employment, for years they — and I'm sure they still do — kept track of the number of females, the number of minorities, the number of veterans, and so forth. So I guess when I think back on it, I mean I had a degree in mathematics, and I think a B, like a 3.04 grade average. So I certainly wasn't any raving genius and my resume was not heavily laden



with science courses, I mean standard chemistry and things. But I guess when I think back on it, I suppose I probably was hired because I was a woman. Because they'd lost the last one they had and they needed their token female in the department. [Laughs.] Although I was never a token.

Misa: Well you ended up confronting this male culture in a way that was maybe not exactly what men may have expected, but that worked out very effectively for you.

Gunther: I can't imagine walking into my boss' office, crying on his shoulder, and telling him I felt like I wasn't being taken seriously. I guess the thing is I was given a workload to do and if my work wasn't up to par or something was really messed up, I heard about it from the people I worked with. Maybe the men were a little bit blunter than a woman would've been, but I did the same thing. When you worked together doing the kind of software that we did, you know you are completely and utterly dependent on the people that you work with for the whole thing to work together, integrated in tandem. So if you've got somebody whose software is messed up, it's like hey, you've got a problem here [and] you need to fix it because I need to get my part of the program tested and I can't go on until you're done. But going in and crying to a boss about being harassed for something like that, it's just an alien way of thinking, to me. It's like do your job, suck it up and do the best job you can, and if you can't hack it then maybe you shouldn't be in that kind of business.

Misa: Nancy, this has just been a really interesting conversation. Thank you so much for taking time today. Are there any other questions I might've asked, or observation that you would like to make a part of this recording?

Gunther: Oh, it's been kind of a stroll through old home week. I'm looking at my professional staff data sheet here, and it goes on and on and on forever. So it's kind of hard to give you a summary of everything I did work on. But I guess generally speaking during the 1980s I had two big projects I worked on. One was the Over the Horizon Targeting job, [where] we took a Lockheed Martin program that was developed out in Sunnyvale. And we literally had to figure out from what they'd done, we had to figure out everything to do to turn it into a militarized program. That was my first supervising job and I guess that was another one, I think I had 13 people working for me, and I had four women working. So I guess I always had a pretty good proportion of women working for me. Then I went to Montreal for 3-1/2 years until 1987. I came back and worked for a couple years working on proposals. Oh, you talk about management plans. SEI type stuff. And then I went to California from late 1989 until April of 1993 working on a black project, and came back. That's one of the things the company was kind of weak at, people would come back from temporary assignment and if you didn't find a job on your own, nobody was going to assign you to one.

Misa: A black project would be a secret project that you're not at liberty to discuss.

Gunther: Well, that was a black program and about the best I could say about it is — I know chunks of it have been declassified — it was a tri-service program for Army, Navy, and Air Force and yes, I can't say much more about it.

Misa: That's fine.

Gunther: I took the job without knowing what it was. The job was offered to me but they couldn't tell me anything about it, and then you had to be completely cleared into the program before you knew what it was. Especially once you get cleared into a black project, you're on the list of anybody back in Eagan that was working anything at all with the black. It's kind of like it's easy to get sucked into the black hole of black projects. But that was interesting out there, we essentially started another office.

Misa: Did you get a special clearance?

Gunther: Yes. I suppose we were about 60 to 75 strong. I think I had 40 software people working for me. And it's one of the reasons I'm here in California, because I love the area and the weather. Then I came back to St. Paul the last four years I worked on it. There was another program for the *Sea Wolf* class of submarines, which is the follow-on to the attack submarines. It uses elements of the Over the Horizon Targeting stuff that we did back in the 1980s, and a lot of other things. It was primarily a communications program where we were doing the work to set up a communications system for essentially both a classified and unclassified internet onboard the subs. Probably

shouldn't talk to you much more about that either. [Laughs.] Anyway, like I said, I've worked on some really interesting projects. And I loved my job, I loved the people I worked with — generally speaking — and glad I had the opportunity to work and do it when I did when computers were truly in their infancy. I guess maybe they were in their toddler steps. But I honestly look at the way software is put together nowadays, with the proliferation of PCs, and some of these theories about the fact that memory is cheap and I'll just integrate a whole bunch of software developed by a whole bunch of people, and I see web design that reflects the attitude of the way software is developed nowadays and I'm not very impressed with it.

Misa: Yes, well when memory is essentially free, then your attention gets put away from performance, or efficiency, or anything like that so the environment for developing software is just entirely different. Nobody [today] could imagine an 18-bit instruction, like you were talking about in the early part of your career. That would be quite a challenge.

Gunther: You can't imagine, like if the 18-bit computer had 4,000 words in there — that's not 4,000 bytes but 4,000 18-bit words — and then we had an 8,000-word bigger computer, and those two computers between them controlled all the radar and tracking onboard a ship, and all the weapons systems and data extraction reduction. If people understood the massive amount of things that were controlled onboard that ship by essentially 12,000 words, that's kind of unbelievable.

Misa: Sometimes people point back and say well computers were so primitive, but I think that misses the essential point that with relatively small system resources they still did amazing things.

Gunther: And they weren't really primitive. It was the software that made them do what they did and in some respects, yes they were more primitive because they were vacuum tubes, and semiconductors, and stuff like that, nothing like the microminiaturization that exists nowadays. But is today's better? Well, [laughs] maybe, maybe not.

Misa: Nancy, this has just been a wonderful conversation. I've learned so much. I'll go ahead and e-mail you the oral history agreement. Thank you so much for your time today, appreciate it a lot.

Gunther: A real pleasure talking to you as well. Like I said, it was kind of a little walk down memory lane.