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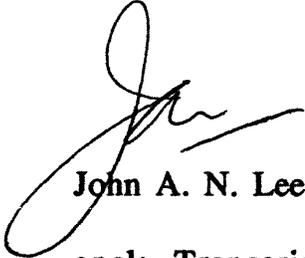
Dear GE Computer Department Alumna:

Re: Transcripts of Reunion

I am enclosing transcripts of the portions of the Scottsdale reunion in which you participated, with the hope that you will look these over, correct them, add footnotes if you feel appropriate, and return them to me as soon as possible. I have made a promise that we will have a special issue of the *Annals* in late 1995, and these may well form the basis for some of the articles in that publication.

I apologize for taking so long to complete this work, but doing transcriptions is never easy and having other more pressing administrative and teaching assignments put the work on the back burner for over 5 weeks!

Yours sincerely



John A. N. Lee

encl: Transcript

Sorry it took so long, I'll call you to see if you understand my changes



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John,

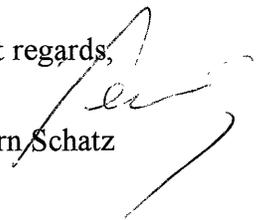
Re: Transcripts of GE Computer Department Reunion

Finally I have had an opportunity to read through the materials. I have made notes in the margins where I could and have returned the document herein. I could not do much with the Lou Rader portion of it. As you know, he rambled some and went on much longer than we had anticipated, so he wandered into areas that I was not real familiar with. I assume that you have already gone back to him for a review or that you will do so.

If you have any questions, give me a call as shown in the letterhead.

Best wishes for the holidays and a great 1995.

Best regards,


Vern Schatz

GE Computer Department Reunion
Scottsdale, Arizona
SunBurst Hotel & Conference Center
Sunday, May 29, 1994
3:00 - 5:00 PM

update file
9/5/01/31

Memory Dump

make Vern Schatz (Moderator): We do have a number of people to make brief presentations, and we'll ask them, in addition to making the presentations themselves, to prompt comments from others who may be knowledgeable on the subject. I stress brief because if this meeting over two days has caused you to revert back to your earlier days in the Computer Department, you may think of memory access in terms of one or two microseconds, but that isn't going to cover it to get all the people on the program. To start with, I would like to have John Lee introduce himself for those of you who have not yet met him; tell us what his vision is here with us, and maybe an observation ^{re} what he thinks he sees so far, and then at the end of the meeting maybe we can ask him to come back on and ask specific questions when he thinks he has not gotten the answers yet. John -

J.A.N. Lee: Thanks. I think the answer to the last point is coming back and asking questions; that will go on for the next ten years. You'll never answer all the questions.

Voice: Correctly.

Lee: Well, it depends on your point of view. It's your correctness, and my correctness, there's John's correctness, Richard's correctness, and all the rest of it. Let me explain to you a little bit of province[?], as it were. I go back to the middle 50's myself in the computer business, as a user, and then back in the late 50's into a company that had three letters instead of two letters as an [?] organizations. I've run the *Annals of the History of Computing* for the last eight years. And next year is my last year. IEEE has this rule; you can't be editor for too long. And so what I am trying to do in some respects is to create something for my successors to be publishing. *Annals* is - we're in our sixteenth volume right now. We've done a lot of organizations. We just recently published the history of computing at Cambridge University and at Manchester University, with Freddie Williams and Tom Kilburn, and those people. And one of the things I've been very interested looking is getting more of the histories of corporations and things that happened than very frankly my predecessor did, when it was mostly IBM. We did the 701, we did the 704, we did the stretch. I forget, oh, we did the 650, and so on and so forth. And all those were all nice, but there's more to computing than that. So this is one of the opportunities, and in fact, Richard Shuey got me going on this thing a couple of years ago, by bugging me, saying there's a story to be told here. We had told the story three or four times, Richard and I had - I think it was three. We had

George Snively's article; we said, "Barney's dead." [Laughter] And he got fired. Then we had Herb Grosch's story called "In Von Braun Country," which told how he ran Huntsville. I think he was also was the one who told that ASU had a spare building that you could move into. And then we had an interview with Bob Johnson that we published, and I guess that was probably the most factual of them all. Bob, is that true? [Laughter] So Richard came along and said that there is more to this story than what's been published. And - but he came down with Lou Rader to my office for a couple of days and we kind of sat around and tried to work this thing out. And I realized that I had more on my hands than could be handled easily by one person. And you've got to realize that although I do a lot of writing, I'm an editor in this situation. My job is to get somebody else to write it in here. I've got my own writing to do, guys, you know. There are other things, and this is an editorial type thing. And so I have this vision of having a special issue of the *Annals*, and I've had this since Richard came to along to me, which would be on the GE Computer Department. And I have this rough outline which has been forming over the last couple of days, a couple of years, and I visited Lou up in Charlottesville a couple of times at that other institution that we at Virginia Tech don't mention - up the hill. I have this view; Barney has in fact already given me his autobiography of the ERMA days, and he and I spent a couple of go arounds editing that - 32 pages long I think right now, Barney, that particular section?

Oldfield: Yeah, I think it's grown a bit.

Lee: See, it's growing a bit. Every time I ask him a question, it grows a bit. Though we all know people's noses are growing too much in this operation. So that's growing a bit. So that will come down to somewhere between 12 and 15 pages of the *Annals*. Then I see the possibility of an article on let's say the 200 Series as the next stage in there. And I spent some time at lunch today with Arnold saying, gee, that will be one article going. I'm going to try and wring Bob's hand a little bit, and his neck maybe, to do a 400 article. I've talked to John and to Ed about a 600 article. I spent time this morning with Don Knight on timesharing. Arnold was twisting my arm at lunch today saying process control. Then the possibility, and I look at Lou in some respects and say got to be an overarching article in here about the management process, not only the technical side, but the management side, and I think Lou may be the person to write that one. Or George is smiling. Maybe George is the one to write that one.

[?]: You said process side, not [?]

Lee: Oh, I'm sorry. That's - let me use the word, that's process in the editorial sense, all right? And then I was having a discussion with John Couleur back before this meeting, and I said well, I've got Barney for the beginning and what I need now is an ending. But after his talk yesterday afternoon, when he was

talking about the Black Canyon Computer Company. Maybe that is not an ending but a transition, the feeder for the next article that comes along, the feeder for the next issue. Maybe that's a special issue on Honeywell we do after this. I mean there are lots of options here. And I don't see - there's no competition between Barney and myself here, as a matter of fact. I've been down talking to Barney, visiting [?] Anything I get, Barney will get. I think what I have in mind is what we will do with a special issue is going to be the tease to get Barney's book. OK? This is our 50 pages. Barney's already written 200 and - whatever it is. And so if you want to hear the Paul Harvey rest of the story, then you've got to buy Barney's book. So that's where I am. Let me give you a couple of things. If you're interested in the *Annals*, we do have subscription forms in the back. For those of you who are in IEEE, it's still only \$20. There is a survey form, and I will apologize if not all of you have gotten them. If you didn't get one, there's copies in the back. Send them in to me if you would, and then we can follow up from there on some of the stories and some of the activities. My apologies also to many of you who did send them back; in the last 48 hours we have not been able to talk to everybody in detail. We will do our best to at least acknowledge you - thank you I'll do at this time. We have sat down and talked to some people for an hour - half an hour - forty minutes - whatever we can do. But in the short period of time obviously we can't talk to everybody. Richard Shuey will be talking to people at the same time and hopefully taking notes as we go along. We videotaped each of the sessions. Barney will get a copy of those. So we're in the data collection business right now. I'm in information overload, I can assure you, at this point. And so what I'll do is step aside and say, "Vern, you want to get on with it, and see what happens?" Thank you.

Schatz: You're going to find a very strange phenomenon with this group. Instead of the memories fading away, I find that they improve with time - and with alcohol. So you might keep that in mind. I also have some cynics in crowd, so I want to stress that *Annals* has two 'n's, and it's pronounced "Annals." It's not one 'n' and pronounced ... One of the primary directions of this session is to, I think, stress some of the things that GE has done so well, and didn't get enough credit for. We did a lot of things well, and a lot of things not so well, and one of the areas where at least I as a user came into the Computer Department is this whole area of timesharing. And it comes with many different descriptions, I'm sure, but if you remember prior to the time that that was developed, the way ~~it~~ you got something done in the computer room, at least at [Plyville, where I was, ~~was~~ they had a window like a bank window. And you'd take your work there, with instructions, and slide it into the window. And those guys in the inside were God Almighty, and if you didn't do the instructions just right, they wouldn't say anything. The next day you'd go back, and nothing's done. And a good programmer in those days averaged eight lines of code a day. So getting that computer power out to the people who could use it, both as programmers and users, was just paramount. I think we had a leadership position,

Technical

EVENDALE OHIO
Vern Schatz

and even in the marketplace for a short while, and I can't think of anything that describes our leadership position better than that whole area of timesharing and Datanet 30s and so forth, nor can I think of anybody better to talk to us about it than Bill Bridge.

Bill Bridge: Thank you, Vern. You know, we oldtimers really enjoy hearing about what happened after we left almost as much as we enjoy talking about what glitches [?] in the past were, and I think I have to first introduce myself by saying that timesharing happened after I left. I actually joined ~~in~~ the Computer Department back in April of 1957, working for Bob Lee on the NCR 304, one of the unit managers. I had at that time about seven years in the computer field. I had gotten started right out of college in 1950 at the Bureau of Standards, and we had one of the first early computers that worked. I fact, in the early days, many computers didn't work. One of the most famous computers was the one at the Institute of Advanced Studies in Princeton, where Von Neumann worked, and he actually is responsible for the basic concept of our stored program computer architecture today. And the fellows built a machine, but like many machines, it didn't work. And we got started in the Computer Department also making good, solid products out of machines that didn't work. The SRI one is an example, and I think the NCR 304 was another. But one of the traditions I think we have, and established in the Computer Department, was one of a good, solid, reliable engineering product, both on the ERMA system and on the 304. And I think ERMA brought to us a concept of low cost product design that evolved into, again, a very solid product that got established with our own products in the computer field. Now, after the 304 project was finished, around the end of 1960, I think it was December, we formed the Special Systems Engineering Unit, in Engineering. I was asked if I would help Marketing get some of these products or features that they wanted that our engineering groups were just too busy to handle. And so we put together this group - Paul Dodge headed up our Special Speechners [?], we had Bob Catalee [?] under Military Systems, and - well, we had actually hired a guy from Bell Labs who never showed up to head up Communications. Don Birmingham actually headed that up initially. Now, ~~then~~ - two weeks after we got this group organized, we started almost immediately, as a matter of fact, we started getting these little projects that were sitting around Engineering that had come in. Marketing would ask Engineering for something, there'd be a request there, and the guys in Engineering were very busy on the standard products. They'd had some tough priorities, and these things were just sitting there. We found out that there was a tremendous backlog of products - little things, and sometimes some big ones. One of the things that fell out of this was an order from Finance and Services operation. This was the Accounting Division of the industrial sales operation of GE. They had already a relatively large [?] management system. I think it was monthly rental was something like \$30,000 a month, a couple of GE 225s, several disk drives. They had also ordered a communication system which was - I think it was something like 75 terminals and telephone lines

Applications ?

Don't know either

financial information ?

throughout the country. In fact, half of the cost of the system was in communications. And we had a product with the 225 called the Datanet 15. The Datanet 15 was a controller that you hooked a teletype to and it had some registers and you could put teletype data into a computer, you could connect them over a phone line. But one of the difficulties with this kind of a product was that every time you sent a character in the computer you would interrupt your program and you had to service that interrupt and put your job away, call up another subroutine, and read in one byte, and then pull back to what you were doing. Well, this happens ten times a second with one teletype line, and you couldn't get much else done. You could hook 15 terminals to this, but it would only look at one terminal at a time. So what we needed was some way of collecting all this information from the teletypes, and when you had something worth talking to a computer about, worth pulling up a new subroutine, then give it to them. And Arnold had hired Don Birmingham from RCA to work on this project, and you know, if anything, we kind of protected our guys. We didn't let our guys go anywhere else. But when we set out this thing [?], and that should have been a key right there that we were taking on a big job. And it turned out to be quite a challenge. But we came up with the architecture which was a very simple computer design. It was, in a way it was similar to the way the microprocessor developed today as far as the I/O was handled. We simply had registers that we hooked on as external devices and addressed with the software. And to keep the complexity down, on the modified line, which went very slow, we just had a single bit buffering. We would interrupt our program or scan all of our lines at a regular rate, and feed in from any teletype lines one bit at a time. We'd scan them all, put in another bit, we'd assemble a character, and then after we had a few characters we'd finally say, "Well, here we've got a message for you, computer."

Now as we moved ahead on this project, we got the hardware going, we got the software going, in the meantime our applications people and those who paid were working very hard on the system. They got their 225 system working, got the inventory management part working very nicely, and about the time we had our prototype ready for them, they said, "Well, you know, we really don't want this thing right now. We've got this inventory system going so well that, you know, we just don't think we want to spend the money on the communication processor." We had a, you know, here we had a product, we had a team of guys, and I learned one of those hard lessons that us engineers never realize, and that is, nothing happens 'til you get an order. As a matter of fact, the reason the computer department was there at all was because we'd already got an order. And Barney can tell you when we got that order an awful lot happened. And so when you loose an order in engineering, and you're funded by orders, that's kind of a disaster.

Well, anyway, that was probably the best thing that could have ever happened to the Datanet 30 because our first system was simply a little box that leaned up against the main computer in a way, and only talked to the computer itself. What happened to us

Modem ?
Paid is ok
That's the
customer

—
?

Clint
De Gabrielle

was that we went to Gabriel[?] and Chrysler and Vic Casebolt all got together and decided that maybe you ought to talk to the fellows in engineering about doing teletype message switching. Chrysler was looking at replacing their torn tape system. Now torn tape teletype is a thing where you have on several teletype lines coming into a big room and the line comes in and it's punched out on paper tape and an operator tears the tape off and somebody takes it to another teletype line and puts in on there and sends it out. It's a manual type thing. Lots of paper, lots of confusion. And kind of expensive as far as equipment goes. And we looked at this thing and said it's just a natural, but we really didn't have a system that could handle that level of equipment. So what we did was we went down town and bought three audio tape decks from a hi-fi store, and hooked them on as storage devices that the Datanet 30 read. We actually put them on the teletype [?]s. And we got the customer [?] we had three teletype [?] we had three tape drives and we ran it in from one teletype and we played it out on another. The thing worked and then the fun really began. It didn't take us long to realize that you can't use a bunch of audio tapes and really put a good system together. What we really needed was a random access disk. And of course our big disk drive was a lot bigger than a Datanet 30, and a lot more expensive. But anyway, we hooked the disk drive on, and we estimated I think we needed like fourteen months to redo this project, so they promised about seven months, and about ten months later we seemed to have got to the point where we had the hardware going. We needed a little more time on the software. So, we told Clint, and Clint told Vic, and Vic called up Chrysler, and no response. About a week later, we get this message. George Love, who was chairman of Chrysler, and ~~of~~ the GE board had met with Cordiner, and suggested that we better work for this thing. We - had our budget problems ended, we had all the help we needed, but - let's see, this would have been about Memorial Day, 1963 - we sent a team of guys to Detroit with the Datanet 30, and I think some of the fellows on that team - let's see, it was - I think Bill Hill, Bud Cline, Dana McGee, Jerry Olson, John Shore, I think Hal Becker was there a few times. I don't know if we sent him Memorial Day. Well, these guys worked on getting that software going and getting the system in, and they didn't all get home 'til Thanksgiving. But it was a successful system, we had a nice writeup in *Business Week*, and we had a number of other orders for teletype message switching systems. We made one for General Electric, we did some ~~[?] ones~~ for Clark Equipment in Corning, and of course there ~~was~~ were many other big systems followed on - Weyerhaeuser. And in February of - sometime in the fall of '63 - I think that's when it was, that's the year that I remember -but I think it was in the fall of '63 that Dartmouth ordered a 225 and a Datanet 30, and they'd have it hooked into the 225. Now at that time we had a different kind of architecture. We had a Datanet 30, which supported a disk drive as a freestanding device. And so that when the interconnection was made into the 225, the Datanet 30 really just received messages and stored them on disk. And then it would have a line that would tell the 225 that hey, there's a message for you. And the 225 would then access the disk drive - we had a dual

access disk drive - and the 225 would read this message in. Now this configuration worked very well. The Datanet 30 was designed to be, oh, I think it was about two-and-a-half times as fast as the 225 in terms of single instruction execution time. Those were really dumb, simple instructions. And this meant that we could collect up a full line of code, or a message, if you will, and then when we had something complete, the 225 could pick it up, in turn, whenever it wanted to, and execute that line of code, compile it, and send the answer back to the disk. And that meant the 225 could work in its normal mode, only interrupted when it had something useful to do. When it got it, it got it ~~it~~ from the disk, and when it got rid of it, it dumped it back. It was this architecture that came out of this evolutionary process that made timesharing with the 225 a very effective tool.

Now I left GE, I think it was a week after we shipped the hardware to Dartmouth, and really didn't get to participate in the timesharing experience, but it's been fun to watch what happened. And I know when I left, product planning forecast that we would sell about twenty systems. I figured I'd really done my job, and I thought I'd go on and do something else. And that's kind of the story of how the Datanet 30 got started, and the rest of you folks really made something happen, and I appreciate it. Thank you.

Schatz: When I left GE to take over the data processing offices for a company in Chicago, when you take over a job like that, IBM compiles a dossier on a guy, so they know how to attack him. Later on, the salesman, when I got to know him well, showed me a bit of what they wrote about me. There was one line in there says, "He's a front-end guy." I didn't even know what in the hell it meant. But these are the guys who gave me that reputation, because the argument then was whether you steal cycles from the computer, or whether you have a front end to handle ^{it} before it gets to the computer.

~~Vicster~~ - Vic Casebolt - yeah, there he is. Vic, did you want to say anything about the impact of the Datanet 30 in timesharing in Europe when you were over there?

Vic Casebolt: Don talked a little bit about how timesharing blossomed in the States, and so Vern asked me to say a little bit about how this followed on in Europe. I might start by pointing out that when the company bought Bull, or actually fifty-and-a-half percent of Bull, and renamed it Bull General Electric, ~~I came from~~ coming along with that transaction was a small company that marketed computers in the UK, and that was known as De La Rue Bull Machines, Ltd. It was owned fifty percent by Bull General Electric, twenty-five percent by General Electric, and the other twenty-five percent by a company that printed banknotes, and they were called De La Rue. The company was mired in the red, and it was trying to sell one of the early 600s. Having just come from Phoenix, I realized that we were having a lot of trouble making the 600s work in the States at that particular time and we needed a little more time. So I told the folks in England that we were going to stop selling the 600. And all the people that were assigned to that, and of course, it usually happens the best guys

tended to gravitate to the biggest machines, and they all said they would quit. And I said no, you're not going to quit, we're going to start a timesharing business over here, having them ~~serve~~ work with Don and the folks ~~[2]~~ in the States. So we did, and we ordered one. We inaugurated it in the summer of '67. I don't remember how many months it took to sell it out, but I remember soon after we fired it up, and the prices were 10% higher than they had been in the States, scientifically arrived at, it began to just sell out. So we quickly - grossed~~[2]~~ about a million dollars a copy - so we quickly floated an appropriation request for the second. And the following year, Bull had twenty affiliate companies located in twenty countries in Europe and Latin America. They were ripe for the same thing, it appeared, and so the following year we installed six systems in continental Europe in the six largest countries, and connected four smaller countries to the six centers. So in a short period of time we had timesharing going in eleven different European countries. I would point out that in 1968 these twenty affiliated companies in total were profitable, and in 1969 the parent Bull was profitable. And I would give timesharing an important part in turning these operations around. Thank you. *ok*

Schatz: Now if you think that system was hard to sell externally, I heard a story one time, that maybe somebody in manufacturing can verify or deny, that it was also hard to sell internally. Now I don't know the year that I heard that during one of the planning sessions when they were setting up the manufacturing for the next year, somebody was trying to kill the Datanet 30. And Cy Statt in his innocence raised his hand and said, "Well, gee, this is the biggest backlog position I have in manufacturing." The Datanet 30. I don't know whether that's a true story or not.

Last night you heard Bob Johnson say that he had a little something on ERMA that he would like to show us, and I think we're all cranked up, Bob, and ready to go here. If not, I'll find you an engineer.

to
Bob Johnson: All right, I want to say something about the Datanet 30 and its relevance/today's issues. AT&T is suing MCI for a two-billion dollar patent infringement of a patent called the Weber patent that was issued in 1984 - issued then. And what that patent - what that claims to patent - is stuff that Bill and the guys were doing on the Datanet 30 twenty years before that. What I'm looking for - I happen to be - have been retained by MCI to try and find some prior art - if any of you know of any prior art that can be documented - like a program listing that shows how the Datanet 30 in any customer application or anywhere - how the Datanet 30 did outdialing, for example of one number to another number, not just dial out through the dial number, but two links - if you can find any documentation of that, that'll invalidate the AT&T patent, and that - this ~~[2]~~^{is} a tremendous thing. And I'll say we were doing that twenty years before AT&T even got around to thinking it was patentable. So it's relevant to what you were doing and it's relevant in a huge dollar sense today. And that's just AT&T suing MCI. There are several other guys around that

Together

will sue if MCI collapses on it.

OK, this is a videotape that the Bank of America put together for their commemoration of the ERMA program and its impact on Bank of America and on banking. This was done - well anyhow, we had an ERMA team [?] with the bank people like [?] in February of last year, and the bank put this video together, and it's part of a set of things that I have. John Hogg has a copy of the photograph book if anybody wants to see it. The first ERMA machine is in the lobby of the new BofA headquarters in Concord, California, in Al Zipf's building [?] and that shows pictures of that ERMA machine. If you are ever in Concord, the bank invites you to come by and see their own demonstration in the main lobby. I've got a photograph here - composite photograph of pictures that I made at the engineering party that shows Harold Strickland here, and [?] and Henry Herold, and I think all the guys were there. And I have a personal photograph album collection here of pictures. I was sharing some with Vern showing the OMEI meeting at Ricky's, and - I forget - 1955, maybe '56 - at which it was agreed upon to go for what we now call the E13B5. And George and Angelo were there and John Hogg was there and the ABA guys on [?] - it's interesting. I've got some interesting memorabilia. The thing that's most interesting now about this video is that the marketing introduction by the GE was keynoted by Ronald Reagan.

Note - GE Corp Hq's were at 570 Lexington Ave in N.Y. - GE people tended to refer to it as 570 LEX

[Bank of America Video] [Note to J.A.N. - compare with IBM tape]

Johnson: It's been a lot of years since I've looked at this thing and it may have been that - let me make a comment about the role of the chief executive in these kinds of endeavors. About February of 1961 I was part of the business management that went to New York to review our annual plan with the executive office. The way these things were done then, there was a little theater smaller than this, and five-seventy, and the team under review was on stage, and spotlights and such on us, and the management executive officer, whoever was out there, sat out in the dark and we couldn't see who was there, and we could hear voices, but that's the only thing you could tell about who was asking what. And so we were under review, and in my remarks, I made the comment that in ten years I thought half of the computers that we had made - were making - would be talking to each other by telephone. And Cordiner's voice loomed out of the dark and said, "On what basis do you make such a preposterous statement?" And I made some feeble attempts to defend it, for example, like all the trouble the bank had in trucking checks around. They had - in California we were then - we had some years of experience with the BofA. It was real money to the bank which they didn't have to truck those checks around. And I just didn't - I failed to persuade them that this was an important subject - data communications. And today there's hardly a computer that isn't connected by telephone - any significant computers. Of course, multiple [?] connected by telephone.
Computer

BT

But coming back now to this meeting with the bank. This big celebration a year ago, I happened to be sitting at lunch at the table with the then - and still is the president - current

>

president of the Bank of America. And after all this hoopla about how great Clark Beise had been in 1950, and here we were in 1993 celebrating his great vision and how it had changed the BofA and the industry, I asked the then president of BofA, who's still chairman, president, and I said, "Well, what's your view of how banking's going to be in thirty years from now?" Well, this was just a complete conversation stopper. [Laughter] Who, me? And he sat there, and you could see he was fumbling with what to say, and he finally blurted out said, "Marty," to his executive vice president, he said, "Why don't you answer this question?" (More laughter) So Marty had the presence of mind in the moment that his chairman had given him to think about this to think of what he was going to say, but he still fumbled around for twenty or thirty seconds trying to articulate what he was going to say, and he finally said, "Well, it's going to be more of the same."

You know, the chief executive has a role to play. And we saw here - see here the role that Clark Beise had, and we've all seen the role that other chief executives have had, positive or negative. And if there's one thing that really makes a difference, it isn't just the team of people that you have, and that's critical. But I think the most critical thing is the vision and the courage - the leadership - the ability to articulate what's important and to show the direction of your chief executive.

Voice: None of them talked about the potential of the checkless society? I can remember making presentations at a bank in Chicago, talking about the eventually of the checkless society.

Johnson: It's embarrassing to me to - I could talk more at length, I then pursued this, and I volunteered finally to say, well, let's us GE guys form an advisory team to help the Bank of America figure out what to do about the future. And you know, the bank just wasn't interested. It's actually worse than that.

There's a dozen major directions of things. Banking is so different today than it was in 1950, than it was with this kind of apparatus, these leaders of today - today leaders of the BofA are -[makes negative gestures]

Voice: What would happen if you'd asked them what was going to happen in thirty minutes?

Johnson: More of the same.

Schatz: Thank you, Bob. You know, I personally had no association with that ERMA system at Bank of America at all, and knew nobody there, but once upon a time my friend [?] and I were responsible for used equipment. Somebody at Bank of America whose name I don't remember called ~~over~~ and they referred him to me. And he wouldn't quite say what he wanted, but it was pretty obvious he had a couple of old machines sitting around, and the state wanted to charge tax on them, and he wanted me to put a value on them, like five dollars or something, but he gave me

Note

enough time to think through this thing, so he started asking me whether it would work, and I started building the case that we couldn't get parts for them anymore, and that they were becoming very, very valuable. [Laughter] We had the value up at something past \$500,000. (More laughter) And one thing I knew, that they were ordering competitors' equipment to replace this. And so ~~we~~ ^{he} finally found out what was going on, and he said, "Come on now, Vern, we're going to buy equipment from GE again someday." I'm still waiting.

I ~~was~~ ^{am} asking Bob on the MCI-AT&T ~~thing~~ ^{SUIT}. You of course have a personal interest. But how the hell do the rest of us pick a sentimental favorite between those two! (Much laughter and applause)

Johnson: If somebody has some data here, I'm sure we can establish some value for it. (Even more laughter)

Schatz: You know, as you go through the different stages of business, and you've had a lot of experience in the computer industry, I think it's been pretty well established that you need a different style of management. And as time goes on and you develop problems, and the market changes, it requires a different kind of general manager. Now those of us in the ranks had no problem at all. When big problems arose, we just blamed it on the general manager. But sooner or later we found out some of the guys weren't so bad after all. So we've asked Lou Rader if he would come up and say just a few words about what he saw when he came to the computer department, and what his [?]s were, and then what his experiences were.

Lou Rader: I have a tremendous amount of data here, which could keep you for hours almost, but I also realize from listening the last couple of days that I could answer most of the questions that are bothering you, such as why Finney left the General Electric company and went to Dunn & Bradstreet, but I don't think we've got time for that. [Laughter]

Vern would like me to talk primarily about general managers (more laughter), and I could do that, too. First of all I'd like to calibrate myself in your eyes a little bit. I'm mostly a name to you, and I was really quite horrified the last couple of days that you thought that I'm at a point that Wengart and Coe and Maier could be deputies. I'm absolutely horrified, and then I realized that nobody had ever told you that I had no part in it, and so today at least I can tell you a little bit about that.

First of all, it has been a real pleasure for me to meet so many of you I'd just heard of by name, and who I knew to be so remarkable competent. I have enjoyed it from that point of view. I was persuaded to come to this meeting by Shuey and a couple of others on the basis that you were writing a history, and of course we have our friend over there in the corner [J.A.N.], who [?] writes history, even if he has people dying before they do, and things like that. [Laughter] On the other hand, I feel almost like a verse that I learned a long time ago, and I don't even remember who wrote it, which goes, "Only a man harrowing clods in

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a slow, silent plot[?] and an old horse that stumbles and nods, half asleep as they stalk[?]." That's the way I've been feeling. But I'm here now, and I'll try to give you the benefit of [?].

There are very few stories about engineers, but the one I like is the one where in France three people are accused of treason, and sentenced to die in the guillotine, and one was a priest, one was a politician, and one was an engineer. And this story almost is relevant to some of the things I've been hearing the last couple of days here. First of all, they said to the priest, "Father, you go first. You only have one choice, you either have your head looking up or down." He said, "I'd rather look up to the heavens." So he looked up, and the executioner pulled the arm over, and the blade came down and stopped about a foot from his neck. And the executioner said, well, in effect, "I'll be damned. Father, you go free. ^{I have no} choice." So then the politician. They said to him, "How would you like to look?" He said, "I'll look up. It worked for the priest." So they pulled it, and again it stopped. And then he said to the engineer. He said, "Well, you're next." And the engineer said, "I think I see your trouble." [Laughter] My wife thinks that's a true story! [Laughter again]

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Well, anyway, I've got a couple of others, but we don't have time for them. First of all, I came to General Electric in '37. It seems like a long time ago. And then after a couple of years my friends from Chicago came and said we need a chairman of electrical in Chicago at Illinois Tech. So I went to Illinois Tech for a couple of years, and realized I was too young to be a chairman, and went back to GE, who wanted me back.

And then eventually, at GE, Cordiner came along, with Smiddy as his battering ram, to wake GE up, and he did that, and in the course of a unique set of circumstances, showed up in the old control department. We had about 600 in engineering and control in those days, and Smiddy came and they had a logical assignment for us. Quite a bit of it was a bunch of trash, kind of left over, including Industrial Electronics, and we suggested to Smiddy that they call that a department, and we even gave him a name, specialty ~~control~~ Control, about a twenty billion business. And so they said, "OK, you're a department." And out of the six managers, five of us had never had such jobs before. I went from manager of engineering to general manager myself. And so we had to find a location, and we found Waynesboro, Virginia. We moved 145 families out of Schenectady into Virginia, and you'd be interested in what their number one requirement was. And that was that we have a place that had good schools. And we looked at Charlottesville, for example, at the end and compared it to Waynesboro, and decided Waynesboro had much better schools, largely due to the fact that DuPont had moved there some years before. And so we moved into Waynesboro, and the people were happy. And I don't want to spend too much time on that either, I guess.

One of the businesses which was at a loss originally, which Jimmy Goss tried to kill because it was losing money - and in those days we had primarily managers who only wanted products that made money almost from the day they were born. Having newborn

infants, for example, run the hundred yard dash in ten seconds. That was about the attitude they had. We got around some of that, anyway.

But in any case, numerical control went quite well. When I left GE, we had 79% of the American market. And today, GE's got about 8%. And I know why that happened, and all the rest of it. And I just wish to hell that I had the general management when the Japanese came to town. GE would not have lost that business. It only takes a few people.

But anyway, then one day Le Pierre called me up and said, "You have a new boss." Oh, I reported to Baker - Dr. Baker for a while, and he was a true entrepreneur, a real wonderful person. And he just gave me one bit of advice. I went up to Syracuse to talk to him, and he said, "Rader, the only thing you have to do in this GE business is make your budget. So be sure when you make it, that's it's something you can make no matter what in hell happens. He said, "If you don't make it, hell won't contain the number of people that will come out of headquarters to help you." [Laughter]

And then, people have asked me why did I leave GE then, because I went to ITT with Geneen in New York. And the reason was, they kept calling me up and saying, "We have a job for you. It's in Scranton." I said, "I'm not interested. "We have a job for you. It's X[?] and Billy[?], in Milwaukee." I said, "I'm not interested." [?] finally said, "Rader, you can't keep turning down jobs." I said, "Why not?" He didn't know.

So when Geneen called and offered me double my GE salary and many times over everything, including a membership on the board of directors of ITT, I said, "What the hell. GE's going to move me someday anyway. The other one, they had a motor plant in a town in New Jersey - I can't even think of the town - which horrified me, so anyway, I went to ITT, and I was vice president of U.S. Commercial - that is everything in the United States that did not include - except military. I had nineteen departments reporting to me, and seventeen of them were loss leaders. So that's where we started. And we worked pretty hard. And there's a very good book out on Geneen by a fellow named Schoenfeld, and it gives the complete detail of how he got people like me to come work for him. And I've also told several of you that I was very familiar - good friend of the fellow who headed up Psychological Corporation of America - Dick Fear - and I went to see him and I said, "Do you think I can handle this job? I've been running an eighty-million dollar business. And [?] could I run this thing in New York?" And he said, "Yes, provided you realize the fact that everybody Geneen hires is in fact a mercenary - works for money only - has no loyalty to anything - whereas in the GE company, you always expected your people to be loyal to the company, and that what was good for the company was good for you, and vice versa." He said, "You won't find that in New York." And he was so right. But that didn't make a difference. We made [?] and so had a lot of problems. Incidentally, Geneen has been maligned very badly in the press over the years. Geneen is - he was when I knew him, he may have changed since I first knew him, I don't know, of course leopards change - but anyway, he was a very active, hard-working

guy, he did as much as any three General Electric vice presidents, he took an active interest in the stuff that was going on, he traveled and saw things, and if this situation with the computer department, with the present people and all, I think it would have flown. On the other hand, Geneen had had a very bad experience at Raytheon, and that was a joint development that he had with - who the hell the Raytheon -

Shuey: Honeywell.

Rader: What? Honeywell - that's right - and Geneen figured it was a sink for money - just a bottomless pit - and so he killed it, and I knew how he did it. He put together a fake corporation in New York to buy it, and all that kind of stuff, but he got around Honeywell that way.

So we wanted to use the PDP1 for some of the switching we were doing at ITT, but we couldn't call it a computer and we promised our marketing people if anybody called the PDP1 - the Digital Equipment thing - a computer, he would lose his job. Because Geneen would have fired him anyway if he found out. Geneen actually had a man on his staff to go around the whole company to kill any development having to do with computers. That's how allergic he was to the things.

But anyway, I learned a lot of things at ITT and if we have time, I'll tell you about them. I learned how you have ex-FBI people working for you who can solve a great number of problems. We had about eighteen ex-FBI. I learned how there was a strike in Paramus once, and it was going on, it was getting on into the winter and they were starting to run out of fuel oil, and they didn't want to ruin the whole damn thing, so they called union up, ITT did, and they said, "Next Saturday we're going to bring oil into Paramus." And they knew what the union would do, and they knew what they would do. They flew twenty-five truck drivers from Texas up to Paramus, had twenty-five trucks loaded with oil, got the biggest bulldozer there was in the district, and they knew what the union would do was just put a whole gob of cars in the road, block it off so you couldn't get in, and the bulldozers pushed the cars away, took the twenty-five tanks of oil in, and then flew the truckers back to Texas so the union couldn't get at them, and that was the way business was done. It was a tough environment. There were other things where the FBI - well, I'll give you one example. They said first of all, "We know where every ex-FBI person works, and we have an informal relationship between the acting FBI and ex-FBI, and if you ever need - and they interchange information without telling anybody. And one day, I was at Univac now, and we got a phone call from a fellow in the State Department, and he said, "Univac's going to be visited by the French next week, and we would like you to put a man with them to listen to the kind of questions they ask, because they are looking for a computer for their new aircraft, and we know that the Russians are listening. And all we want to know is what questions do they ask. I called on my friend at ITT, who was the FBI, and I said, "Can you tell me if I have anybody in my organization at Univac who's an FBI - ex-FBI?" And he said,

"Sure." He called me back in an hour and he said, "Fred Scott is." So I called Fred Scott and I said, "Next week, the French are coming to negotiate for a computer for their plane, and I'll talk to McDonald, and we'd like for you to go around with them and just listen to the questions they ask. They'll ask questions about how many channel, what speed, and all that kind of stuff." And he said, "Fine." And I called McDonald and I said, "Tell Scott that he's with the thing for next week." Then I told Scott, "When you get the information, don't call me, call this guy in the State Department. I don't even want to know."

But anyway, that was the way this system works - the underground system. Geneen hired a guy once and he came from Ling-Temco-Vought and the FBI got the whole data on him before he got to the place. And we knew a lot about that guy, and Geneen was madder than hell that anybody had a communication system better than his. But anyway, that's - those are the kinds of things you learn as you get around.

Then after a couple of years with Geneen, a friend of mine came and said, "I've got the ideal job for you." "What is it?" Well, he said, "You're your own boss. You don't have Geneen. And also it's highly [?], and I think you ought to take it." I was getting a little nervous about ITT about then, because I was skating so close to the legal line, you might say, so I said, "OK, what is the job?" "Well, it's the president of Univac." So I went to Univac, and they told me that they were losing - that they were going to lose about six million bucks or so in the next year, and the financial man the day I got there, Lyconester[?], said Dr. Rader, "I don't know what they told you, but all my figures say we going to lose forty million bucks next year, on a revenue of three-hundred million." And I said that wouldn't change my opinion anyway, and within two years, Univac would break even. And the main point is, I know how it was done, with no question about it, and so on. And I know they've had ups and downs since then, of course. So that was Univac. The thing that worked so well at Univac is that Mr. Vickers let me do what I wanted to do, or what had to be done. And for example, the first thing I did when I got there is I wanted each of the people reporting to me - [?] I said I want you to write out what you think Univac's problems are. If you have a solution, suggest it, but I'm not asking for a solution at this time, just a listing. One of the marketing men said he had a customer who had two solid-state machines for two-and-a-half years, and about a year ago, a year earlier, he started to use them on second shift without advising the company and had bribed the service men to service them, and had it gone on for so long that they even had a strike by the service men who were working illegally to begin with, and so on. And I said, "Well, why didn't you bring it to managements' attention?" And he said that "This was such an important customer, that I was afraid my own job would be jeopardized if I turned them in." "Well, what kind of a customer is that?" So we looked at the facts and verified them as they were, and then I said, "You go to Hagert" - who was the marketing vice president - "Hagert, you go see the customer and tell him he's got three choices. Either he pays us for all the back time for the year or

so he'd been running this thing surreptitiously" - for two machines, that ran over six thousand dollars a month, each - day shift, four thousand night shift - "or, he buys both machines, or we're going to pull them in thirty days." And I knew when he told me that the machines were printing labels, and I knew nobody could get two more in there and print labels, full time. So he said, "You mean it?" And I said, "Of course I mean it." He said, "If he goes to Vickers - the president of Sperry-Rand. What will you do?" And I said, "If he goes to Vickers, we'll just decide who the hell's going to run the computer department, Vickers or me. So he said, as he left the room - I'll never forget - he said, "This is the happiest day of my life." And he came back three weeks later and he laid a check for \$850,000 on my desk. And who was the customer? Reader's Digest! [Laughter] You're damn right they were scared. But they were all ex-IBM and they were brought up in an environment where you were supposed to be scared to hold your job.

And of course, we had other incidents like that, but Vickers never did bother me. And I was away from GE six years, and I didn't think to research GE. I thought it was the still same GE I had left. But in the meantime Cordiner had gone, and Borch had come in, and a few other things, and also Art Vinson had died, and then we got a guy named Prost. So anyway, at Univac, there was no blood bath, there was no interference from Vickers. I'll tell you how Vickers worked. First of all, he was a non-college man, and he had Univac reporting to him. I ran into him one day and I said, "We have a proposal for a job for the Army for administration for the Air Force, and we have a machine that we happen to have developed that's ideal for it, we need maybe half-a million dollars or so to do some more software, but it's a fifty-million dollar job and we think it's going to sell, but on the other hand if it doesn't be an outright purchase, it's going to be on lease, and we're going to need some money to support it until it pays off." And I said, "We have to quote it next Thursday." And this was Tuesday, and Vickers listened to me and he said, "Rader, I neither approve nor disapprove." I said, "That's wonderful. We're going to quote it on Thursday, and thanks for backing me up this way."

What the hell. He had a computer operation on his hands, and he was a non-college man to be ~~ing~~ with, and he was a wonderful mechanic - invented power steering you know, and stuff like that. And I could tell you more stories about Vickers and General Motors, but I shan't.

OK, then one day when I was at Univac - incidentally at Univac I had working for me or with me wonderful people - people like Nofrey and Croyle and Lonergan. I used to say in those days there was no problem that Univac has that the sudden death of IBM would not cure. [Laughter]

One more example of how you can handle things. We had sold, or they had sold a computer system to the D.C. Transit, headed up by a guy named Chalk. And as part of it - it was a UNIVAC-3 I think, a fairly high-speed data processing sort of thing for business - as part of it they had promised that they would do the software for it. Later on with General Electric we had the

internal operation - automation - IAO - internal automation operation and we took a job in Boston on scheduling [?] a busing system. But anyway, we sold this thing, and we had two software people working for almost a year, working on the software for this transit system, and that was turned in as one of the major problems [?]. So I looked at it and we studied it to make sure we had the facts right, and then I said, "Go and tell the guy we're going to pull the two software people off the job." They said, "We have a contract with them. They'll sue us." I said, "Let the son-of-a-bitch sue us if he wants to, but go tell him." You know what he said? "I wonder how long you'd be suckers."

So we cleared a whole bunch of problems up, and I still have the book that they handed me with all those problems. In fact, it might make a good story of how you really work when you follow up on IBM people. They were mostly ex-IBM. They'd lost their jobs for various reasons, I suppose.

OK. Then one day I got a phone call from Marian Kellog at GE. She said, "Lou, did GE - has anybody from GE talked to you recently?" And I said, "No." She said, "If somebody from GE calls you about the possibility of coming back to GE would you talk to them?" I said, "Of course. I'll talk to anybody." So the next day the phone rang and it was Cross, and he set up a meeting for me with Borch and Phillippi. And so I spent three hours with them and I wanted to get back to Virginia because my wife was very unhappy out in Darien, Connecticut. She'd lived in the bush, both boys had gone off to college, and we had to get back to Virginia, and I think that's perhaps why I didn't research GE the way I should have. Very honestly, if I had researched GE, I don't think I'd have come back to GE. But anyway - so then when Phillippi said - Phillippi unfortunately, all he talked about is how GE stock was going to go up, and if you had a stock option, you were going to go with this and this and this, and all the rest of it, and I started to think to hell with that. I said, "I have some specifications now." He said, "What are they?" I said, "First of all, I have to have an office in Virginia. He said, "Pick a city." So I picked Charlottesville, and then decided to live in Waynesboro. I said, "I don't like the consulting you get out of [?], I want my own consultant. I'd been using Pierre Rinfret both at ITT and Univac. They said, "Fine." I said, "I don't like the lawyer you have." That was Birdzell. They said, "Well, find your own." I did find a wonderful one, that was Lurie. I said, "I don't like the people that do the recruiting for me." Everything I could think of I asked for, and they gave it to me. What I didn't ask for was an airplane. But by damn, they gave me a King Aire with two pilots, too. I didn't ask for that. But it didn't matter.

So I got back to GE. And I had said that - I was coming back and I was going to have the computers, because the word that I had turned Univac around had gotten to them, I guess. I said that I had to have communications, also - Lynchburg - because that was the coming world. I knew that much, anyway. And so they said, "Sure." And I said, "I need Waynesboro" and they said, "Sure." And I don't know why I needed Waynesboro, except it was my old plant, I guess. And so I had Phoenix, Ok City, Lynchburg, Salem -

at home

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[?] control, that is - I had Lynn, Massachusetts, the instrument [?] - I had that whole package. And then about a week or so after that they said, "We're going to finalize with Bull. You want to go to France?" And so I went to France. They bought 50% of Bull for thirty million bucks or something, based on the recommendation of our [?]

So then a month or so later - so then I inherited ten thousand Frenchmen, who hated Americans. They were aided and abetted by De Gaulle in disliking Americans. So I told them I'm not really an American, I'm a Canadian. And they thought Canadians chased Indians on horseback. [?] So it didn't make any difference. They bought Olivetti a month later, and I had no trouble with the Italians because I was Italian by descent. Both my father and my mother had come over from Italy. So that was all right. And then we had a marketing organization in Germany, and that was OK. As far as the Germans were concerned, they just said, "Give us the drawing, and we'll make it that way." No matter [?] or whatever. Whereas if we gave it to the French, they said, "There must be a better way." The Italians, they said, "Christ, if it works for the Americans, it'll work for us." So we had no problem.

And then I didn't realize what I'd gotten into at all, at all. What was the reason I felt that way? Well, first of all, about three months after I went back, Cross called me up and he said, "Most of the problems we have are in Phoenix, aren't they?" I said, "I guess so." He said, "I think you ought to move to Phoenix, and we'll bring Wengart to run all the stuff in the east." I said that wasn't the basis on which I came back to GE. That whole conversation lasted for three hours, and I knew damn well that right then and there that guy was out to get me, and he did. What he did first of all was to appoint three deputies. GE had a procedure that was one over one. I was supposed to appoint them, and he had to approve them. Didn't even do that. Didn't even ask me if I approved of those three names. They were all people who had worked for him on a study he had made for marketing a few months earlier. All three of them - Wengart, Coe and Maier. Maier as you know had a Ph.D. from MIT - a questionable character[?] in some respects. Coe was a chemical engineer - and we had bought a piece of - sometime along there we had bought the hospital operation of Mass General which was run by a small group [?] headed up by Jordan Baruch, a really brilliant individual. Well, unfortunately I had to assign Baruch to work for Coe because Coe had a bunch of stuff and he couldn't stand it very long, so we lost him very soon. The point is that those three deputies were put in - OK, let me jump to the chief point now, and this is something you should all read. [?] April 1, '67. *Forbes Magazine* ran an article on GE which they call "GE's Edsel?" Here it is. It's an old one, and it's very significant. In fact, Bernie Oliver called up or wrote to Van Aken a here month - a year ago and said, "Can I talk to you about what's been going on in the computer, and Van Aken said, "No, that's a world that's past. Read the article "GE's Edsel" and you'll get essentially all I'll be able to tell you."

Well the "GE's Edsel?" - oh, the fellow that wrote it is a

guy named Flaherty [?] - and I was quite nervous. I'd just been kicked out of the job of running the computer department, or trying to run it, and I was supposed to be an assistant to Prost in New York, and I was very nervous when I heard that *Forbes* was doing it, because my reputation was at stake. If they wrote a very derogatory article about GE in the computer business, and I was the head of it, it would spill over on me. But it came out however; it completely excused me for the problems. And I don't know how many of you have read this thing at some time in the past - just a few. OK - but anyway, it was full of a lot of very interesting things. It says, "Deeply involved is the nature of GE's decentralization. In theory, the computer operation should have been given it's head." This is *Forbes* talking. "In fact, it was constantly being restricted by its charter and second-guessed by a top management that apparently failed to understand the importance to GE's future of having a strong place in EDP." Then he said later on "GE has hypnotized itself into believing that anyone well-trained in the business arena can run any business." [Laughter] [?]

But then it goes on - I love the part the phrase [?] anyway, *Forbes* says, "But it isn't true of a new, rapidly-changing, irrational one..." like computers. That's for you, Robert. Irrational. OK. And then "By contrast, the decision-makers at the very top of GE did not fully grasp either the opportunities or the problems..." Now you see, they were talking then about Borch and Prost, primarily. And they were so right. The second half of the article is, "GE [Computer] Troubles - How They Happened." And this is very, very good, too. And one part that - as I said, I took Flaherty to dinner, after this article came out, and he liked martinis, so we had lots of martinis, and he told me how he wanted to be a short-story writer, and all that stuff, and that was all right, but he also said that when he started this study he went to see Phillippi. He said, "*Forbes* wants to write an article about GE and the computer business. Will you help us?" Phillippi said, "No way." He said, "We have talked to about thirty people, ex-GE employees, competitors, and customers, and we have quite a story. Will you at least listen to the tape recordings and tell us if there's any major errors in them." Phillippi said, "No way." So Stan Smith had just been made manager, and Stan was a marketing man, and Stan would never say "no" to a reporter under any basis and he saw Stan and he [?] as well as he could, but he still came up with the truth. [Laughter]

They do say here that GE people are competent. "The dimensions of the outflow of talent - people that left - course they were symptoms of trouble [?] then it goes on to say, "Critics among the company's departed executives attribute this to an inherent attitude at the top that grew out of GE's great size." And they're making money and everything else, you see. "And then the managers first put GE heavily into sophisticated electronics after World War II with the late Dr. Baker - " Everything in here - and then they give a big plus to the ERMA project, and so on. But then they say, "The top management then headed by the now-retired Chairman Ralph Cordiner, is less enthusiastic." Less enthusiastic. And that explains why we couldn't sell GE equipment

- your computers - or our computers - to the GE company. I remember one case where we were trying to get customers from Europe to look at the system that was in Pittsfield that Oveti^{tr} had put together, and he wouldn't let them in. So I called the general manager up, and I said, "Why won't you let them in? Is this customer - this potential customer a competitor of yours?" He said, "No." [?] He said, "No." I said, "By chance did you spend your own money putting the system in?" And the son-of-a-bitch hung up on me. [Laughter] He never did get the customer into that GE plant to look at a system where we were sure we could have sold the computer. That was the kind of thing. And some good data just showed up recently - [?] - Mr. Metcalf's report. And this book just came out a while ago, and it says *Making Waves in the Information and Space Age*. And there's just two exhibits in it that are significant reports. He says, "In late '49 I received a personal telephone call from Cordiner, my big boss, chief executor at GE, telling me that Watson, then chairman of the board, wished to see me in his New York office at 10:00 the next day." So he said he went there, they didn't even ask him to sit down, he just stood in front of the desk, and Watson said, "Young man, you've been calling on my customers - " even though it was a computer up in Syracuse, I don't know what it was called or anything -

Voice: OARAC.

Rader: Is that right? OK. "I will not tolerate this." This is -this is - I mean Watson talking. "You will stop immediately, or we will withdraw our substantial annual purchases from GE company. Thank you for responding. [?] good day." I reported this to Mr. Cordiner before I left New York. He emphatically replied, "You must comply with Mr. Watson's request." And so Metcalf says he waited until both people had died, Cordiner and Watson, otherwise if he had brought this out they could both go to jail, and that's all right too, you see. [Laughter]

So in retrospect, several years later, we begin to find why it was so damn hard to sell GE computers to GE people, which was too bad. But anyway, a few other things - Mr. Borch was the president of General Electric, I reported to a guy named Cross who had an MBA from Harvard. I was poisoned against Harvard long before I met Cross, [laughter] but it was the truth, he finished the job, because he was a no-good - I'd better watch my language, because we've got people here who might not've heard the words before - so in two years that I was in charge of the computer, I had one meeting with Borch. One. And Cross saw to it that I never got to see him, and Hal Miller, a wonderful person who was vice president of manufacturing, in fact retired during Phoenix; he called a meeting specifically on some pretext or other so I could get to see Borch. And that shows you the amount of attention that Mr. Borch, the president, paid to the computer company.

I had twelve - roughly a dozen good computer people at Univac that wanted to come to GE with me, and they were knowledgeable people. The manager of manufacturing was one, and St. Paul[?] who

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had been a professor at the University of Minnesota - industrial management - and was a good man all around. And I couldn't get an agreement from Cross to bring any of them except Curry[?], and even then, we had quite a problem. So I could have brought good people in, well John [?] came, but without any help from me, and he did a good job here.

Oh, yes. Then - this is answering things that have come up - I happened to have been in by chance on a session at an executive office two or three weeks before Lyndon B. Johnson left the presidency. And a fellow from Dartmouth - not Dartmouth, but Wharton School called and he said, "The Justice Department is having a session with knowledgeable people to see whether or not the government should sue IBM to break them up." And this guy said, "I think there ought to be at least one person there that's been in the business of computers, so will you come? It'll be on a Saturday morning in Washington, won't be any pay, but it would be good to have you." So I went for about four or five sessions. Saturday mornings I drove to Washington and listened in. And Ruth Davis, who was in the Defense Department at that time - a very fine gal. One day one of the lawyers of the Justice Department said, "What's the difference between hardware and software?" And at the coffee break, Ruth said, "Honestly, Doc," she said, "I feel like Alice in Wonderland."

But anyway, that was the kind of thing. They asked each of us to write up a session, or something on if IBM were to be broken up, how would you do it? With minimum damage to the country as a whole. And I still have my handwritten notes on that; they're quite interesting. Couldn't even give it to the secretary, because it was a pretty hot subject. After the lawsuit was going on a year or so, a guy from IBM who used to be in Richmond called me up and he said, "I understand you talked to the Justice Department before this [?] I said, "That's right." He said, "Can I and one of my lawyers to come to see you." I said, "Sure." So I spent the whole day telling him what went on. Couple of weeks later I get a phone call from a government lawyer. "Did you talk to the IBM people about what went on before this? I said, "Course." "Why?" I said, "I didn't get paid for it, it's in the public domain, I spent all day with them." He said, "Can we come and talk to you?" "Sure. No cost to them." I picked them up at the airport, too.

Well anyway, unfortunately, as part of that lawsuit they called on Borch, and if you read the testimony^{now} oh, part of it - my quid pro quo was "give me the testimony of any GE people for that lawsuit." So I got Jones and Borch and Weil, your John Weil. And I just looked at some of it here. And the one question they said, this is what withdrawal from business of the 600 - Weil said, "Yes, we had difficulties satisfying some of the early customers because of the reliability" and so on, and they said, "All right. Do you believe that the withdrawal of the 600 series was a mistake on the part of General Electric?" And he said, "I believe it was a mistake." John Weil talking. "And why was that?" "Primarily because it undercut marketing confidence in General Electric's commitment to the information systems business." [?] "Does that mean, in part, mean that the confidence of the customers was in

part shaken?" And Weil said, "Yes!" He said, "Information systems then were frequently difficult during their early product lifetime. That's true for the products of all manufacturers. It was necessary that a customer have an unshakable faith that the manufacturers of a higher risk[?] system would fix whatever went wrong." And goes on like that. And he said, "I think one of the consequences of putting the 600 into hibernation, which then the term that was used at that time, was that it undercut that kind of faith." He was educating uneducated people, of course. "Now when we say the 600 series was put in hibernation, that includes the 625 and the 635." He said, "That's right." "And 645 was - " He said, "That's right." "Do you believe that putting the 600 series into hibernation demonstrates a lack of commitment of the part of GE?" And then they objected to that question and so on and so on. And then they said, "Who did it?" And they said, "Mr. Cross." So anything you think that Wengart did that was bad, you're wrong. Mr. Cross told them, or he asked Cross first. There's no question about that at all. And then he canceled the APL [?] and it's just a bunch of stuff in here. [?] But the point is that, as far as I was concerned, and as far as all of you know so well, and I knew so well - I'd left by then - Cross killed all that stuff. He took them all to Crotonville, and he had no conception of what you do with that stuff - the development of something that you already owned.

OK. Get back to my script now. All right, that's essentially the story, except for one thing. Cross told me that I was finished. You know, I felt so happy I could have lit candles. [Laughter] I had never been in a situation where you knew what to do and you couldn't do it because - really an aberration in the GE structure - if honest people were involved, it wouldn't have happened that way. But unfortunately, we got those two in a series, Borch and Cross. And incidentally, you can quote me on any of this if you want at any time to anybody, because I feel very strongly about this.

^{Schätz}
Voice: We have to wind down now.

Rader: Yes, I know. Let me tell you one more story. When I was at Univac, I had to go to Cincinnati [?] started, to kill an advanced development, and the guy I was talking to said, "How do you like your job as president of Univac?" And I said, "Well, I don't know any words to describe it, except it's quite a challenge." He said, "That reminds me of a story." And he said, "It's a true story." He said, "My mother brought me up on the proposition there are no problems in this world; there are just challenges. And she said, 'Son, that's not a problem; it's a challenge. Son, you're not looking at it correctly. Son, your mental image is all wrong. That's not a problem.'" So he said he was flying back from a bombing raid on Germany in World War II, and he got shot down over the Baltic Sea. He said he looked down, and there wasn't a ship in sight. Nothing but the cold, gray Baltic Sea. He said he managed to scramble out of the plane, pull the rip cord, his parachute was opened, still no ships down below. He said, "You know, Rader, at times like this some people have

been known to pray. Others have their whole life passing in review before them. He said, "Instead, all I could think of was another of mother's God-damned challenges." [Laughter and applause]

Schatz: Now you know how [?] problems. We're next going to challenge John Couleur. He's been telling me for all the time since I left the computer department that there's more to the 600 story than we know about. We're going to ask him to wind up as fast as he can and talk a little bit about what went on after he [?] came out of computers. [?]

John Couleur: I really thought all we were going to talk about was

Voice: Whatever you want.

Couleur: You can't do that to me. I get in trouble when I speak a capella. Ad hoc. No. What we - some of you who own personal computers, and were here back in the days when we built 225s, we built 600s, and so forth, may have noticed there has been a somewhat significant change in the cost and the performance of the computer. This has been due largely to technology, basically semiconductor technology, and we are very fortunate to have with us this afternoon the guy who has developed the circuits - designed and developed the circuits - for all the GE 600 computers, starting with day one, with the 236, and ending about - what - a year ago? When we put the whole stupid thing on what, four chips?

Robert Sullivan: One board.

Couleur: One board. And I'm going to let Bob give you a slight history of the technology that has fueled the computer business, specifically the 600, but actually it is typical - always happens in the computer business - I think you'll find in there a kind of chronology of a technology actually going wild. So Bob, I'll let you -

Robert Sullivan: Gee, you're still here. I really appreciate that. Normally, when somebody announces me to give a speech, everybody heads for the door. I'm very pleased to be here for this weekend, and I just want you to know that I started working for General Electric in 1957. I started in the first part of the computer business with John in about 1960, and I ended this -computer product as far as my participation about a year ago.

I thank all of you people for starting it; it's given me a lot of fun, a lot of excellent good times. I think from my perspective, some of the people that were really responsible for keeping it - getting it started and keeping it alive - in addition to all you people - were John Couleur and Walker Dix. [Applause]

So now I have to give you a little review of where we ended it - where we are right now, I should say - not where we ended, but where we are right now with the GECOS-8 systems. Of course, there've been great improvements - they were the 225, I mean the 236 and the 600. Now they talk about them in much larger numbers.

There's the DBS9000/500, the DBS9000/800. And that's good because you can now charge more for them.

I want to start out with - this is the technology that you all have seen in the back of the 236. [Shows board] The thing that you ought to know about this, it has about twenty transistors on it. There's probably three or four gates on this type of board. This was outstanding in 1960. And the thing about it, it had ~~s[?]~~ technology, which at that time was just starting to be used in computers.

Also there's also a little story about this board. Lou kind of reminded me when he started talking about management, but we built these in Syracuse, and of course John Couleur always ran kind of a seamless organization. I had a problem with this board. This little transistor's got three leads coming out of it, and it's kind of hard to get it onto the board. And if you don't do it just right, you can break the seal, and the transistor's not good. So I said to myself, "Gad. What a problem. Here I am all wrapped up in the physics of this thing." So I go to the machine shop which is right next door, and this guy says, "Oh, I can fix that for you. All it needs is a little plastic spreader." And then manufacturing just put it in there. And I said, "Good."

And I find myself about two-and-a-half years later, I'm in Phoenix, and I come to work one day, and this was after we had shipped a few 600s. And everybody in the place was looking for me, and I've got to go down to the general manager's conference room. Well, I get down there - oh, and bring my patent notebook. They want to know where the patent is on the spreader. [Laughter] And I said I [?] about that. "You mean you didn't patent it?" I said, "No." "You mean you didn't patent it?" Well, they went around the table. I mean there was the lawyer, there was - and I won't tell you how many people were in that conference room - all of them taking a little bit of my hind end - this spreader. Well, as we were just about to finish the meeting, the top guy in the meeting says, "Well, what are we going to do about it?" And the lawyer says, "I don't think we've got a damn thing we can do about it." This guy was trying to sue General Electric because he'd got a patent on this spreader. He says [?] small company [?] And the guy who represented manufacturing says, "Hey, this isn't going to be a problem. We can get rid of the spreader. We don't have to use it." And so then [?] looked at me and said, "Now, young man, have you learned something from this meeting?" And I said, "Yes sir, but I can't find the correct words to put it in." [Laughter] Then I went home and told my wife, I said, "I think I have a problem in my new job."

But anyway, it was fun. After that board, and also, you know, the 400 had the same type of technology - and here's the 225 we started. It was kind of the technology. Here's the artist conception of the first 600, and you can see - here's the man, and here's this big cabinet which is the processor, and here's another big cabinet which is the memory, and then here's the I/O. So that's kind of the model that the business started in. Of course, you put a lot of peripherals with this, and you've got a room of equipment. Of course the silicon technology kept moving, and we

started to use T²L and we made large boards - large wire-wrapped boards - and we put T²L [?] on them - and that was kind of the hardware business for a long, long time. But then, computers had to go faster and faster. So along came what the world now calls a multichip module, or a micropad. And is a technology that came from General Electric. The thick film - the sub[?] is made out of thick film - and that thick film was developed in Schenectady. This type of process was moved to Syracuse, and when General Electric finally went out of business, we moved that technology to Phoenix, and from Phoenix it went to France, and was used in [?], and also from Phoenix it went to Japan. So there was some technology that started with General Electric - R&D - and I don't think they ever benefitted anything from it. But the rest of the world made a lot of money from this kind of technology. Also the circuit set that was used here was one that was developed in Phoenix, and moved to Syracuse, and then developed by Honeywell. So it was an air - it was a water cooled machine - and we called it the DBS88. This was the last really large, large machine that we made out of this product line. Jim Renier, who was the president of Honeywell in those days, said that "This should be made in Japan." So this technology is still being made in Japan. Japan still makes a GECOS-8 machine. They call it - they sell it in the United States to us - through Bull, now - as a DBS9000/800. They sell the same basic machine to people in Japan; they call it the ACOS-4/6. It still uses the multichip technology, and of course the chip technology has changed, and so instead of having eighty or a hundred chips on here, you have maybe four or five. Instead of running on an order of eighty nanoseconds, they are now running on the order of four nanoseconds. It's a real, real large computer. [?] Then the next thing, or kind of along the same lines, we wanted to make a higher performance T²L machines. And we kept making them run faster, and finally T²L ran out of gas[?], so we decided to go to a ECL or CML type of technology. But now Honeywell didn't want to make a large R&D investment, so the way we sold this program was that we were going to use a software mapper - I think [?] I understand that sort of thing. I said to him, "What's a software mapper?" He said, "Well, Bob, we're going to take one of these big T²L boards, and we take this cookie cutter - what the mapper is - and goes through it and - bang - it lands there, and says, OK, that much logic now goes inside a chip. I said, "Golly, guys, that's nice, but how many pins go on the chip?" They said, "Pins?" [Laughter] I said, "How will you get it [?] Oh, they had forgotten about that, so [?] and we were one of the first people that designed a package like that. And of course now, it's all over the universe. There's a little tiny chip in here and something like three hundred [?].

Well anyway, it did the job. The machine came out faster, and we were able to continue the product line. Well, then at this time, Honeywell's getting squeamish about this business, so we needed a third venture capitalist, like Canyon Engineering. And that turned out to be Bull. The same company that we bought their computer business from, GE bought their computer business from. They reversed themselves. Called getting even. [Laughter] And

all the things that Lou said about the French in those days are still true today. [Laughter] [?]

Now to get into - the French had a product that they called GECOS-7. And GECOS-7 - they were always developing GECOS-7 systems to sell in the United States. And the only problem is, nobody in the United States was buying any. [Laughter] So they were able to sell some in France. Meanwhile, this GECOS-8 machine had a great deal of success. So when we went through the movement from Honeywell into Bull, the French were saying now, "Why can't we have a common machine? Why can't GECOS-7 or GECOS-8 be the same machine?" Well, you know, there's the operating system, there's the fact that they're 32 bits and we're 36 bits. But it became clear that if we were going to get R&D to do this job, and we wanted to make a CMOS machine, by God we had better have something [?] than GECOS-7.

So what we did was - I have some pictures that I can show you people later - but it was - we came up with a cabinet - the cabinet was about one of these sections - well, the cabinet was about as big as this [podium]. And in that cabinet we put our CPU. And there was a back panel in this cabinet - it held our CPU, our memory, our I/OC. And there a back panel in there, and there were six CPU slots. And we designed the SCU in the backplane. So you could have this backplane, and you could put in there, believe it or not, a board that was called the GECOS-8 - it was a CPU board like this, and it ran the GECOS-8 operating system. If you didn't like that, you could plug in a board and run the GECOS-7. And it ran GECOS-7. So we were able to keep the back panel the same, the power system the same, the cabinet the same, everything the same, but the I/O had to be different. But the I/OC was the same, the I/O cabinet.

So what we ended up doing was putting the whole GECOS-8 CPU on this one board. It was made out of CMOS technology, and now, where this first board I showed you has something like twenty transistors on it, the chips in here have five hundred - a thousand transistors. And that was about a hundred thousand gates per chip. And on this little board is a CPU that has over a million transistors in it, and in addition to that, it has a 64K cache.

So that's where development is, and this machine started to ship about 18 months ago. It's a very reliable machine; it's doing quite well. The shop cost of this board, by the way, is about \$10,000. So yes, it's a very big machine. Yes, it's GECOS-8, but as John said, it doesn't cost very much.

And the next step, which now what is happening is the next venture capitalist is probably going to be at NEC. It's my guess.

Couleur: You see why you call it the Black Canyon Computer Company - management running through the thing.

Sullivan: An interesting thing about it now - and NEC still makes the large machine - they still make the 9000/800 - they have seen the value of this board, because what we did to them was this machine is fast enough so that it takes the low end of their high-end machine, so what they're going to do is take this board and

put it on a chip. You know they're really great in s[?] technology. And then low and behold, they'll start to hook these chips together, and they'll make a large machine. And they'll have this one product line, and it will be totally CMOS. So I think that's what's going to happen over the next five years.

So what's amazing to me is this little thing that got started in the late 60's is still going strong, and the revenue - even though I know mainframe revenue is going down, but this system is still growing - it's not growing, but it's still grossing over a billion dollars a year in revenue. So guys, you know, you really started something. [Applause]

Schatz: We had several other items on the program, but I would like to narrow it down to just one.

Roger Rosburg: Vern, could I have thirty seconds? He just brought up something.

Schatz: I'm going to bring you up here right now. Roger Rosburg probably is as good a salesman as we had in the computer department, and one of the things he had was a unique decision to come over to Honeywell when they acquired the business. I'd like to have him share part of that with you, plus whatever comment he wants to make.

Rosburg: Well, you've mentioned GECOS several times over the last couple of days. Last February I was in our headquarters - I work for Storage Technology - we were at a restaurant in Boulder, Colorado, and one of my colleagues had been over to France recently - working with the French, and one thing or another - he brought up the name GECOS and [?] and so on and so forth, so I was kind of involved in that a long time ago, and so on and so forth. They had a new name for what the acronym GECOS means - God's Chosen Operating System. [Laughter]

Anyhow, the story about the acquisition, I had kind of an unusual position. I think I was the first nobody who had a very good idea that General Electric was selling the computer business. The reason for that is it's the policy of General Electric having their informational meeting in the fall in a city and then the shareholders' meeting the following spring. This happened in Minneapolis. And in the fall I was responsible for the transportation of the entire board of directors. Mr. Cross was there, by the way, and a whole bunch of other people - I couldn't even tell you all - Borch, and [?] So the following spring, a guy named Van Voohries asked me if I would be responsible for the whole thing. I mean this was arranging for lunches and breakfast and cocktail parties, and so on and so forth. I guess it's really kind of an interesting experience. Borch and Jones and Estes and Bob Parker and a few other people from the nuclear power plant business came, because this was Earth Day in 1970 - the original Earth Day. And there were a lot of environmentalists that were going to be parading around Minneapolis while it was going on, and so on.

Anyhow, Mr. Jones asked me - he and Bob Penigan had some work

to do - they needed some space where they could put out some big papers. So I bring them out to this room where we were going to have a cocktail that evening, and we have some tables in it, and they said, "This is great." And I gave them the key, and let them alone, and I had ordered a compliment of liquor and ice and mix, and so on and so forth. At hotels you have to check on those people - they don't always do what you'd asked them to - so about 3:00 I came by there to see if the liquor had been delivered. Mr. Jones didn't want to let me in. Now he knew what I did for a living - this is my room, not his - and I went in anyhow, but I was really wondering why he would be bothered by me going in to look at this liquor. For whatever it was worth, I kind of enjoyed Mr. Borch, and he drinks Canadian Club and soda. A known fact, I guess.

Anyhow, I was wondering about that. The party went just fine. The next morning we were doing breakfast, and I rode to the annual meeting with Mr. Borch, and this was kind of a treat for me. And they had told me that Borch was going in his room after the luncheon, and they didn't know how long they were going to be there, but the attendees would be Borch, Jones, Estes and Parker. And I said, "Fine." So I keep a couple of limousines. Borch opened that meeting, by the way, by saying, "Good morning ladies and gentlemen. Good morning, Mrs. Sause." Now I don't know whether you've heard of Wilma Sause, but she's a corporate gadfly who went to annual meetings on a regular basis, and one of the things I did was ship her off to the airport in one of our limousines. We were paying for them by the hour, and we were not going to use them for a while, and she asked me to pass on to Fred that she had never been so royally treated in any stockholders meeting.

Anyhow, I gave it up[?] all these other little duties, and I saw these guys going into Borch's room from the rear, and all I knew was that they knew each other - fine - and I was sitting with my limousine drivers waiting for this thing to end, and late that afternoon - and finally out they come - and I looked at this one guy - very distinguished-looking fellow - I think that's Jim Binger, I'd seen his picture. And I start looking at these other guys, and the other's a good-looking gray-haired guy, I didn't know who he was, but I got a good look at all these fellows, and I help Parker with his luggage, and so on, and finally, Jones and I were standing out in front of the hotel, waiting for Mr. Estes to show up - I decided to throw a question at him. I said, "Next week, Honeywell's going to have a little more trouble with their annual meeting than we did today." This was the Vietnam protesters. I looked at him very carefully, and he didn't even blink. He just said, "Yeah, I expect they will." And the next question I wanted to ask was, "I wonder if you guys are trying to sell me, because that looked like the Honeywell crowd to me." And I've been kicking myself ever since, because I think I've gotten the point by now." And at the airport I had another opportunity. Mr. Borch was nice enough to come off the plane - and thanked me very much for the visit to Minneapolis, and I was tempted to say, "Fred, I don't think I'm going to see you anymore, either."

So a couple of years - several years later, I'm on a sales

call with Jim Binger, and we flew from Minneapolis to Houston and did the call, and came back, and on the way down he was quite busy, but on the way back, he'd finished all his work. We had a couple of scotches and started talking about this meeting, and he went into some detail about it, and how it all started. Fred Borch calls Jim Binger and said, "You know, we're both in the computer business, and so on and so forth, and neither one of us has been quite as profitable as we'd like to be, and so on and so forth, and I think there's some potential for some way to change all this. Do you happen to come to New York ever on business?" Jim said, "Sure. Next time I'm heading to New York I'll be sure to call you." Well, he calls his guys together and says, "We are going to New York." And they get there and they have a lunch. And Fred talks - or a meeting, I don't know - anyhow, I think it was a lunch. Anyhow, for a long time, this philosophical stuff about the computer business, and the fact that it hasn't turned out exactly the way he'd like it to be, and so on and so forth - there's this problem and that problem - and he went on for a while, and finally, he paused and Binger looked at him and he said, "Fred, are you buying or selling?" And he said, "I'm selling." And that's - that was about the first of February in 1970. I used to remember precisely, but - it went on from there. The next day, by the way, after the stockholders' meeting, I did go get a Honeywell annual report, and all four of these guys that were pictured were at this meeting. They were Finniger, Keating, Spencer, and Chief Davis. And I was consequently quite sure that this was going to happen. My friend Dick [?] and I - a week or two later I tell him about it - and we told Bill Maronni - we tried to tell Kim Fisher about all this, but Kim wasn't interested in listening to it. I mean he didn't even return the call. So he never did get this call. And I think was Kim one of the people very surprised on May 20th when this whole thing became public. Anyhow, that's my old background. [Applause]

Schatz: Thanks, Roger. We had a couple of other things we were going to do - Nate and I - regarding our experiences with Honeywell, but with Nate's permission, we'll cancel those out, since we're running over. Now we wax ironical about GE's computer business sometimes - and nobody is more guilty of that than I am - but I believed then, and I believe now, that it's one of the best managed companies in America. And you can see that in the profitability, whether you agree with all the - how they get there or. But the success that's been alluded to a couple of different times, most of what we did somehow came into what is now called the GE capital. And that was - quoting *Forbes* again, 'cause they were writing about it a few months ago - called the GE's money machine. And you know they made so much money, you just can't counter that with that group. So we can at least feel pretty good, those of you that kept your GE stock or ~~Alpha~~ [?] stock, that you had a real significant part in that. We've now run over, so shut up and I'm sure a lot people will have questions. If you want to ask any specific [?] but as far as the official program is concerned, I think we ought to call it a day.

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Questions

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Anyhow, the story about the acquisition, I had kind of an unusual position. I think I was the first nobody who had a very good idea that General Electric was selling the computer business. The reason for that is it's the policy of General Electric *TO HAVE* their informational meeting in the fall in a city and then the shareholders' meeting the following spring. This happened in Minneapolis. And in the fall I was responsible for the transportation of the entire board of directors. Mr. Cross was there, by the way, and a whole bunch of other people *EXCEPT* I couldn't even tell you all - Borch, and *JONES* So the following spring, a guy named Van Voohries asked me if I would be responsible for the whole thing. I mean this was arranging for lunches and breakfasts and cocktail parties, and so on and so forth. *I GUESS IT WAS* kind of an interesting experience. Borch and Jones and Estes and Bob Parker and a few other people from the nuclear power plant business came, because this was Earth Day in 1970 - the original Earth Day. And there were a lot of environmentalists that were going to be parading around Minneapolis while it was going on, and so on. *PFENNING? THE CONTROLLE*

Anyhow, Mr. Jones asked me - he and Bob Penigan had some work

to do - they needed some space where they could put out ^{LOTS OF} some big papers. So I bring them out to this room where we were going to have a cocktail ^{PARTY} that evening, and we have some tables in it, and they said, "This is great." ~~And~~ I gave them the key, and let them alone, ~~and~~ I had ordered a compliment of liquor ~~and~~ ice, and mix, and so on and so forth. At hotels you have to check on those people - they don't always do what you'd asked them to - so about 3:00 I came by there to see if the liquor had been delivered. Mr. Jones didn't want to let me in. Now he knew what I did for a living - this is my room, not his - and I went in anyhow, but I was really wondering why he would be bothered by me going in to look at this liquor. For whatever it was worth, I kind of enjoyed Mr. Borch, and he drinks Canadian Club and soda. A known fact, I guess.

Anyhow, I was wondering about that. The party went just fine. The next morning we were doing breakfast, and I rode to the annual meeting with Mr. Borch, and this was kind of a treat for me. ~~And~~ they had told me that Borch was ^{HAD TO GO TO MEETING} going in his room after the luncheon, and they didn't know how long they were going to be there, but the attendees would be Borch, Jones, Estes and Parker. And I said, "Fine." So I keep a couple of limousines. Borch opened that ^{MEETING} meeting, by the way, by saying, "Good morning ladies and gentlemen. Good morning, Mrs. Sauss!" Now I don't know whether you've heard of Wilma Sauss, but she's a corporate gadfly who went to annual meetings on a regular basis, and one of the things I did was ship her off to the airport in one of our limousines. We were paying for them by the hour, and we were not going to use them for a while, and she asked me to pass on to Fred that she had never been so royally treated in any stockholders meeting.

^{THE PREVIOUS DAY} Anyhow, I gave it up[?] ~~all these other little duties,~~ and I saw these guys going into Borch's room from the rear, and all I knew was that they knew each other. ~~fine.~~ ^{SEVERAL HOURS LATER} and I was sitting with my limousine drivers waiting for this thing to end, and late that afternoon - and finally out they come - and I looked at this one guy - very distinguished-looking fellow - I think that's Jim Binger, I'd seen his picture. ~~And~~ I start looking at these other guys, and the other's a good-looking gray-haired guy, I didn't know who he was, but I got a good look at all these fellows, and I help Parker with his luggage, and so on, and finally, Jones and I were standing out in front of the hotel, waiting for Mr. Estes to show up - I decided to throw a question at him. I said, "Next week, Honeywell's going to have a little more trouble with their annual meeting than we did today." This was the Vietnam protesters. I looked at him very carefully, and he didn't even blink. He just said, "Yeah, I expect they will." And the next question I wanted to ask was, "I wonder if you guys are trying to sell me, because that looked like the Honeywell crowd to me." And I've been kicking myself ever since, ~~because I think I've gotten the point by now.~~ And at the airport I had another opportunity. Mr. Borch was nice enough to come off the plane - and thanked me very much for the visit to Minneapolis, and I was tempted to say, "Fred, I don't think I'm going to see you anymore, either."

So a couple of years - several years later, I'm on a sales

call with Jim Binger, and we flew from Minneapolis to Houston and did the call, and came back, and on the way down he was quite busy, but on the way back, he'd finished all his work. We had a couple of scotches and started talking about this meeting, and he went into some detail about it, and how it all started. Fred Borch calls Jim Binger and said, "You know, we're both in the computer business, and so on and so forth, and neither one of us has been quite as profitable as we'd like to be, and so on and so forth, and I think there's some potential for some way to change all this. Do you happen to come to New York ever on business?" Jim said, "Sure. Next time I'm heading to New York I'll be sure to call you." Well, he calls his guys together and says, "We are going to New York." And they get there and they have a lunch. And Fred talks - or a meeting, I don't know - anyhow, I think it was a lunch. Anyhow, ^{HE TALKS} for a long time, this philosophical stuff about the computer business, and the fact that it hasn't turned out exactly the way he'd like it to be, and so on and so forth - there's this problem and that problem - and he went on for a while, and finally, he paused and Binger looked at him and ~~he~~ said, "Fred, are you buying or selling?" And he said, "I'm selling." And that's - that was ~~about the first of February in~~ ^{OF} 1970. ~~I used to remember precisely, but it went on from there.~~ The next day, by the way, after the stockholders' meeting, I did go get a Honeywell annual report, and all four of these guys that were pictured ^{BINGER} were at this meeting. They were Finniger, Keating, Spencer, and ^{CHIEF} Davis. And I was consequently quite sure that this was going to happen. My friend Dick ^[?] and I - a week or two later I tell him about it - and we told Bill Marohni ^{MAROHNI} we tried to tell ~~him~~ ^{him} Fisher about all this, but ~~him~~ ^{him} wasn't interested in listening to it. I mean he didn't even return the call. So he never did get this call. And I think was ~~him~~ ^{him} one of the people very surprised on May 20th when this whole thing became public. Anyhow, that's my old background ^{STORY} [Applause]

Schatz: Thanks, Roger. We had a couple of other things we were going to do - Nate and I - regarding our experiences with Honeywell, but with Nate's permission, we'll cancel those out, since we're running over. Now we wax ironical about GE's computer business sometimes - and nobody is more guilty of that than I am -but I believed then, and I believe now, that it's one of the best managed companies in America. And you can see that in the profitability, whether you agree with all the - how they get there or. But the success that's been alluded to a couple of different times, most of what we did somehow came into what is now called the GE capital. And that was - quoting *Forbes* again, 'cause they were writing about it a few months ago - called the GE's money machine. And you know they made so much money, you just can't counter that with that group. So we can at least feel pretty good, those of you that kept your GE stock or Alpha[?] stock, that you had a real significant part in that. We've now run over, so shut up and I'm sure a lot people will have questions. If you want to ask any specific [?] but as far as the official program is concerned, I think we ought to call it a day.