An Interview with

ROBERT E. MCDONALD

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Conducted by James Ross

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The Center for the History of Information Processing
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Robert E. McDonald Interview
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Abstract

McDonald discusses the early years of Remington Rand in the computer business, including the management of Engineering Research Associates and Eckert-Mauchly Computer Company (acquisitions of Remington Rand), the rivalry between the two, their competition for funds, and their relations to the parent company. Other topics include the departure of ERA personnel to form Control Data Corporation; successful products; financial structure of Sperry Rand; collaboration with Bell Laboratories, Western Electric, and MIT on defense projects; Sperry's role in the 1969 IBM anti-trust case; and UNIVAC's involvement in the international market.

ROBERT E. MCDONALD INTERVIEW

DATE: 4 May 1983 INTERVIEWER: James Ross

LOCATION: Charles Babbage Institute (Minneapolis, MN)

ROSS: This is an interview conducted with Robert McDonald, at the Charles Babbage Institute on May 4, 1983. Let's talk a little bit more about product lines and management philosophies. You told me off tape that the Remington Rand management took a different view or understood better Eckert-Mauchly's products and customers than the Remington Rand management understood or appreciated ERA's products and customers. Can you expand on that a little bit?

MCDONALD: Yes. The mission that Eckert-Mauchly had in the company; as far as marketplace was concerned, was to develop products that would be used in the commercial data processing market and the industrial data processing market, really in that area of paper handling and control systems, financial records, and financial reports, where punched card techniques had been used in the past. Remington Rand's marketing people were very competent in that field, very knowledgeable; they knew the customer and the marketplace. Eckert-Mauchly people were reasonably knowledgeable (when I speak reasonably knowledgeable I'm talking about the engineering people who were involved in product planning, market thinking, and so on) in coming up with their commercial products proposals. Now, the marketplace that ERA was addressing was more in the scientific community--that was number crunching, data reduction, intelligent systems applications, and things of that nature. And these tended to be quite scientific or technical in the application. That was a field that the Remington people had not really addressed in their past history.

ROSS: What about Remington Rand's association with government agencies?

MCDONALD: Remington Rand had an excellent market penetration for its pro=- ducts, all of its products, in the government agencies in the so-called data processing applications, the commercial systems, the tremendous punched card installations, file cabinets, adding machines, and things of that general nature.

ROSS: So that again would work toward Eckert-Mauchly's favor rather than ERA, because ERA was concentrating on military contracts.

MCDONALD: Sure, sure.

ROSS: Who were some of the people associated with the Eckert-Mauchly organization that Remington Rand installed as managers, the buffers between a Mauchly and an Eckert and the top management?

MCDONALD: I remember two of the men who were brought in by Remington Rand to assist in integrating Eckert-Mauchly into the organization. One of them was Art Draper who had a varied background in technical types of business although I don't think he would have been considered as a technical engineering type himself, but he was able to communicate with the technical people and also he had a personality that would lend itself to working with Pres Eckert and the people at Eckert-Mauchly, where he was dealing with some very highly motivated people. Some of them were impatient people, people who were impatient with non-technical management, and he interfaced effectively with them. But Draper also had the management knowledge and the financial knowledge so that he was able to interface effectively with the Remington Rand management and then, of course, he had the confidence of the Remington Rand management. Art Draper was actually the operations manager or the general manager of the Eckert-Mauchly organization as it fit in to the daily operations and the planning activities of Remington Rand. Another man who came in a somewhat similar fashion was a gentleman by the name of Phil Vincent who was also rather broadly knowledgeable in technical types of activities, but he had a tendency to be involved in service activities, service work, and was deeply involved in managing the servicing function for the Eckert-Mauchly products.

ROSS: By servicing function do you mean customer...?

MCDONALD: Customer service, of a non-software type. And he was well respected by the people in the Eckert-Mauchly group and knew how to deal with those people. Vincent wasn't quite the general management caliber

that Mr. Draper was so Phil was at a lower level during the early phases of the company than Art Draper and worked for Art in many cases. Those are the two key people.

ROSS: Where did those two people go? Did they stick it out or stay with Remington Rand?

MCDONALD: Yes. Art Draper, as time went on, moved into the marketing organization and handled some branch activities in Bridgeport, Connecticut, and the Philadelphia area. Draper was basically an Eastern man, I think, an Ivy League type, he liked the social atmosphere of Philadelphia society. Moved well and easily in that area and was quite happy to be in that general part of the country. And he retired eventually, I think because of 65, from a marketing position in Univac. Phil Vincent continued on in the Univac organization in the field service or customer engineering divisions, and continued on up the line as Univac grew and was in charge of that function until perhaps five years before his retirement at which time he had various functions and upon retirement he was so well thought of and his knowledge was considered so valuable, that he was continued on in a consulting basis for two, three, four, five years. And both of these gentlemen I referred to are still alive.

ROSS: Do you think that the ERA organization lacked that kind of liaison between top management and the engineering people? Or were there comparable personalities in the ERA organization?

MCDONALD: Well, the ERA organization was very able to communicate with the technical people because generally of the top management, with exception to the financial people in ERA, had spent their military service years, whether you were in the service or a civilian capacity, dealing with high-technology that were related to the computer industry as it evolved. However, they did not have the same rapport, easy rapport, with the Remington Rand management that Draper and his group would have for a variety of reasons. Very quickly one would be the acquisition of Eckert-Mauchly by Remington Rand preceded the acquisition of ERA by a year or two so the top Remington Rand management was getting closer to the Eckert-Mauchly people earlier. And geographically they were very close so that communication was very easy. By train they were an hour and a half from New York City, you could drive down. By contrast to that John Parker, who really was the gentleman that spearheaded the handling

the acquisition of ERA by Remington Rand, moved to New York and became a key member of their top management staff in the marketing organization, and that meant that, just because of the geographical aspects I think, there was less easy communications and rapport with the people in the second level of management in ERA out here in St. Paul.

ROSS: Did Parker's move to New York create any rubs within the ERA organization that you remember?

MCDONALD: I really don't know because that had preceded my joining the company.

ROSS: Okay.

MCDONALD: I never heard anything about Parker when I was in ERA that was of a derogatory nature particularly. His strengths were quite often mentioned as a great promoter and very capable outgoing person.

ROSS: That was a terrible leading question.

MCDONALD: Oh, that's alright.

ROSS: Because I wanted you to talk about the exodus to CDC next.

MCDONALD: Oh, sure.

ROSS: In your opinion, what rubbed Norris and Drake and others the wrong way? Why were they dissatisfied with the Remington Rand organization and decided to move on?

MCDONALD: I'm probably not the one to try and answer that question but let me answer in saying that these were perhaps my perceptions. First I think I have to go back and say that ERA had not met its committed milestones in

terms of profitability. Now, parenthetically, Eckert-Mauchly had not either.

ROSS: Exclamation point!

MCDONALD: That was characteristic of the whole industry at that time.

ROSS: Certainly it was.

MCDONALD: Under those circumstances I think Remington Rand management was putting more and more pressure on ERA. However, I think Remington Rand management recognized that they had the best potential general manager and leader of Remington Rand's computer activities in Bill Norris. So Bill Norris was selected by the corporation to head-up and form the so-called Univac Division with everything else being put under his direction. And one more comment to set this in a perspective. There was a great deal of locational rivalry between Eckert-Mauchly and ERA for attention on the part of Remington Rand management and for funds, allocation of funds, for research and development. And so you had a gentleman in Norris who was powerful and strong but coming from a geographical location that was one of the factions that caused a lot of friction. Who knows what might have happened if Bill Norris had not been a member of either of those organizations and had come in from the outside to be on top. After a short time Norris of course would be considered to be responsible for both the Eckert-Mauchly missed dates as well as the ERA missed dates. I think probably Norris found it difficult to get acceptance for many of his programs or plans for the Univac Division, perhaps more in the area of marketing than probably in the area of finance because there were powerful people in the Remington Rand marketing organization who did not want to lose their influence and who wanted to have their organization participate in this explosive potential computer industry that was developing. I think Norris could see that it might be easier for him if he were able to start afresh perhaps with no one from the Remington Rand Marketing Organization staffing the marketing organization for the new Univac Division. These are perceptions, whether they're accurate or not I don't know. I would hear situations where there were desires expressed by the top marketing executives in Remington Rand to help this new division in their marketing. And as a matter of fact, before Norris left a key executive in the Remington Rand marketing organization was assigned to

Norris, and I use that term assigned only because I don't know the detail of whether it was a real solid line with no other communications to management in the old Remington Rand organization or not, but was assigned to bring the power and capability of existing U.S. marketing organization and punched card and tabulating equipment to bear upon the Univac computer activities.

ROSS: Who was this man?

MCDONALD: His name was George Campbell. He was a man who was very capable and who worked very well with all of the Univac people that he interfaced with. He was an outstanding man in that regard.

ROSS: So there was this factionalism. Do you think the factionalism was healthy competition?

MCDONALD: It was healthy up to a point. And I've always believed that that type of thing was worthwhile if you could keep it under control. But it takes some pretty adept top management to know when it's getting out of control and when you have to step in and say alright this is the way we're going to do it and knock off the factionalism, or knock off the very differences in opinion. And I think that it was very difficult to do that because of the very powerful characters that were involved. I mean Eckert was a very strong person in terms of his ability to articulate, he had some very fine accomplishments under his belt in terms of the ENIAC and some of the other equipment. And I think there were others in the ERA organization that similarly had very strong capabilities, so I don't know.

ROSS: So just to review a little bit. The organization as it stood in -- where are we in time here, about '56?

MCDONALD: What I presume we're talking now...

ROSS: Just prior to the...

MCDONALD: ...just prior to the departure of Norris and the setting up of Control Data Corporation.

ROSS: Norris was the head of what had been three separate installations. Norwalk, Philadelphia and St. Paul.

MCDONALD: Right. Norris had the title, I forget his specific title, but it was in essence vice president and general manager of Univac, which was sort of a division of Remington Rand. Now, I use the term "sort of" because Remington Rand up to that point had been organized outside of its computer activities from the top pretty much on a functional basis--that is functional departments reported to the president of the company. There was a vice president of manufacturing, there was a vice president of engineering, and of course vice president of finance, and so on, reporting to the top. B. F. Anderson was head of manufacturing, with many years of manufacturing experience, and was responsible for manufacturing in Remington Rand. That was his mission, and Andy wanted to be sure that he had a chance to put his expertise and his factories to work in manufacturing all these new computer products. As a matter of fact he did have the responsibility for manufacturing a lot of the Eckert-Mauchly products. Norris's responsibility was quite clear in that he had the responsibility for the development activities of Norwalk Connecticut, for all of the development and pre-production activities at Eckert-Mauchly in Philadelphia and for all of the activities at ERA including the manufacturing activities at ERA which existed out here in the Twin Cities. I think there was possibly an indication, as I learned later, that the manufacturing activities in St. Paul under ERA's direction would be transferred in some fashion over to the so-called Remington Rand Corporate manufacturing function and would be removed from the direction of Norris. This, of course, was a very difficult thing to contemplate, because really in the computer industry at that stage in history the degree of engineering thoroughness contained in drawings and specifications that were released to factories was of nowhere near the type that the factories were used to when they received the product specs and drawings for adding machines, typewriters, and so on.

ROSS: No, you spelled out the dynamic organization as it stood, and that was the question.

MCDONALD: Right.

ROSS: Norris's departure as well as other capable people from St. Paul left a hole, definitely. What was the top

management's response to this exodus to Control Data?

MCDONALD: Now of course when I answer that question you must recognize that I'm answering it from my viewpoint as a member of the organization in St. Paul, not one who sat in the weekly staff meetings or any crisis meetings down in the Rockledge or New York City atmosphere. Certainly it was one of concern. I think, and I knew later as I got to know the top management people in the Remington Rand organization better, that all of them respected Norris's capability, totally. And they recognized that they were losing a leader. They were terribly concerned about the potential loss of very competent technical people that might result from the setting up the Control Data Corporation. And I would imagine that they were concerned about all of that knowledge that resided in the minds of those men about the marketplace. And that the tremendous investments made by Remington Rand in ERA and in Eckert-Mauchly, those investments which had been written off, might be to a large degree lost if this new company was able to go into business and become successful quickly.

ROSS: Did the Remington Rand management advocate promotions for highly technical and accomplished people to try to keep them? Was that one strategy, for example? I realize it's hard from your perspective to say yes to that definitely.

MCDONALD: I don't know how to answer that question.

ROSS: The reason I asked was because some people didn't leave immediately.

MCDONALD: Well according to Control Data they could not fund the people right away, and let me go on to put balance in all of this if I may. Control Data in its formation was perhaps the most unique new company formation in high technology that may ever be experienced in the country and let me spell out some of those unique characteristics if I may to answer your question. Bear in mind the top leader was a very capable gentleman and accepted by people with whom he'd worked in ERA, technical people, as a leader. He was very knowledgeable in the government circles and very knowledgeable about the business. Also he had developed as an individual with a great

deal of knowledge of the cost of getting started in leading ERA and then later Univac. He was moving not far away from ERA's offices and laboratories, within 20 miles, so that anybody that would like to join that new organization that was being formed would have no family life disruption, it would be an easy move. The top technical people in ERA, by the very nature of the business in which they were involved, interfaced with the customers a great deal; that was a characteristic of the military defense and scientific computation business. So the top engineering people who might go to CDC, and many of whom did go to CDC, were very knowledgeable about their early potential customers. In other words, what the Control Data people might go after as their first market. Also, those technical people had quite a bit of knowledge about computers that might be the next product line of ERA. There was a ready pool of talent available to Control Data as it got off the ground and was moving forward. This region here, the Twin Cities area, was somewhat provincial and highly proud of what it does. This might tend to develop in the people a greater feeling of identity if they joined a new organization being formed here in the Twin Cities than perhaps by staying with an organization that was managed in the East. Their perception might be, if both companies were successful, possibly promotion for them as individuals might be faster with less disruption of their family life if they were part of Control Data than if they remained with Univac. So you see you had some of the best computer talent available for a new company who knew each other, who knew the customer, knew the product, and would like to stay in the area. So you had a no cost of recruiting, and you had a no cost of placing people, and you knew what their capabilities were because those people were known by the customers, and the potential customers of Control Data would have confidence in this new organization if financially they could hack it. This was a rare situation you had technical people who had worked as a team. You didn't ask people to join you if they were not compatible and you could pick the R & D people who were able to come up with R & D ideas that were probably exploitable. So those are some of the rare characteristics that permitted Control Data to become successful. Now, in turn, the Remington Rand management would come to the Twin Cities and expose themselves to groups of the people here in Univac who remained and told them that they intended to continue to support this organization. They were going to stay in the business, and that there were opportunities for the people if they would stay. That's sort of an answer to your question as to whether they were promising promotion. And there may have been cases where certain key individuals would had been talked to by one of the top management people in the Remington Rand organization, "If you stay this is the type of a position we can see you moving in to."

ROSS: Do you remember any instances like that?

MCDONALD: I have a vague recollection of something like that but it wasn't of a significance enough to me to have left a lasting impression.

ROSS: That's fine.

MCDONALD: Yes.

ROSS: What particular actions did the Remington Rand top management take. One, for instance, I understand was a suit against the leaving Univac employees.

MCDONALD: Yes. There was consideration of bringing court action against Control Data, and attorneys were hired locally. I think the terms were the theft of trade secrets and know-how, and there was a fair amount of fact-finding as I recall on the part of the legal people on both sides. And that was not, to the best of my knowledge, brought into court, it was settled out of court. Whether at that same time or shortly thereafter there were some patent litigation--questions and some suits on patents, and some of those were settled out of court, and I'm quite sure that at least one of them was brought to court.

ROSS: Do you remember over which patent or what...?

MCDONALD: No I don't really.

ROSS: Who were the attorneys in the human knowledge or the theft of trade secrets case that never went to court? Do you remember?

MCDONALD: You mean the local legal firm?

ROSS: Yes, for Remington Rand.

MCDONALD: No, if I looked at a group of attorneys...Dorherty, Rumble, Butler, and Clark was the representative for Remington Rand, Yes, I think that was the firm.

ROSS: Okay, so their other response was to fill Norris' place, how?

MCDONALD: Prior to Norris' departure, and whether Norris had told them that he was going to leave several months before his actual departure or not I don't know but they may have also made a judgement that he was probably going to leave they brought in a man by the name of Thornton Frye, who had been head of the Bell Laboratory's Engineering activities in New Jersey. Bell Labs had an early retirement requirement, so Frye had retired at 60. He was brought in as a consultant by Remington Rand management and then upon Norris' departure Frye, according to my recollection, was the first man put in a direct line management position to be responsible for all the engineering development activities at Philadelphia, St. Paul, and Norwalk.

ROSS: And did the structure of the organization underneath him change?

MCDONALD: Yes, prior to Norris' departure we operated under a concept of operation managers for locations, and there was an operations manager for Norwalk, an operations manager for Philadelphia and an operations manager for St. Paul. Now you see I've dropped out the terms Eckert-Mauchly, and ERA because, while they were thought of as Eckert-Mauchly and ERA, really they had disappeared as names or units. And then the manufacturing activities were more clearly organized under Anderson for the product activity that emanated from Philadelphia and from Norwalk. It was not quite that clearly delineated for the manufacturing responsibility here in St. Paul because the St. Paul activity was different from the Norwalk and Philadelphia or Eckert-Mauchly organization in that it had more manufacturing capability that had been developed here than was true in Philadelphia.

ROSS: So, now who reported to Frye? Just to finish the story.

MCDONALD: Well, I reported to Frye as head of the military activities which embraced the engineering and manufacturing service on the military activities or the so called defense activities.

ROSS: Which was a new position for you.

MCDONALD: It was essentially a new one, yes. Actually Pres Eckert was head of the engineering activities at Philadelphia and I have a little difficulty remembering but probably Bob Sorensen stayed with the company for awhile in Norwalk...

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MCDONALD: Let me explain some of these titles and what their scope was. The Univac organization under Norris after he had been General Manager for a period of time. He set up an organization of decentralization of the activities under him and the delegation of authority along with the responsibility. So he set up an operations manager concept for the Philadelphia complex, that was Art Draper, and for the St. Paul complex that was myself, and for the Norwalk complex, and that was Bob Sorensen. Now, Norwalk had no manufacturing it was practically all engineering and development. Philadelphia had research, it had development, it had engineering and it had preproduction manufacturing. And St. Paul had the defense activities of development engineering, marketing, and manufacturing, and servicing, and St. Paul also had the commercial activities of development, manufacturing, and servicing. Actually at that stage, there was a start of manufacturing of some ERA products or St. Paul products done outside of St. Paul. These products were the File Computer produced at the Remington Rand factories at Utica, New York. The concept that Norris implemented of having an operations manager was to try to push down lower in the organization the resolution of the differences and finger pointing that inevitably would crop up between engineering and manufacturing, concerning when engineering was complete and when did you have drawings that the factory could manufacture from and from which they could make tooling and produce a product which in fact would work?" Under

a functional organization, particularly in that stage of development of the people and the management and the technology which was changing very rapidly, the degree of coordination required in the functional organization was virtually impossible. Because if the factory could not get something to work after they had built it, they would say it was an engineering problem and conversely the engineers would say it was a manufacturing problem. The resolution of those problems could very easily go all the way up to the top management in New York, and that would be characteristic of any company organized that way. So it was logical to push down that responsibility lower. So the operations manager, particularly here, had responsibility for getting a product from an approved engineering budget to the customer. And if manufacturing had a problem it was his responsibility to resolve that, and conversely. And also if the product went out the door to the customer, he really had the responsibility to see that it worked at the acceptance stage in the customer's house. And, of course, that pushed down the responsibility and the finger pointing, and it was the right type of an organizational concept at that stage in the development of the computer industry. This was true provided, and this I think is important, that your top management people would not just depend upon one key management individual who in turn could keep his problems to himself until you had an explosion. You had to have a top management organization that would continue to be in communication with the operations management to see how things really were going. And then when Norris left, and the Remington Rand management began to reorganize they reverted back to a functional organization. That functional organization lasted for a period of time until Remington Rand could pick new people and begin again to push down responsibility and authority in a decentralized fashion. I don't know whether that covered it or not.

ROSS: It does very definitely. It sounds like they needed some stability in that interim.

MCDONALD: Sure, sure. And the top management very logically needed to develop confidence now in new people. I mean they knew Norris and they knew how their organization was working, he was gone, people were leaving, and the best way to find out what's going on in an organization under such circumstances is through a functional organization. You pay a price because it's not the best way to implement programs or products, but you get good communication that way.

ROSS: What would you characterize as the most successful Univac projects?

MCDONALD: That would be difficult. Let me answer your question this way. There's been so much attention focused on the difficulties of Univac...

ROSS: This is why I asked the question, we've been focusing on them as well.

MCDONALD: And I have a tendency to do it myself somewhat because basically I think the management, your problem solvers, and the press, I think, found it more fascinating to talk about the various defections, to use that word in connection with Control Data Company being organized and growing, and at that stage in the technology this general migration of people from one organization to another in a new technology field had not become so common. So, I recall that the revenue of Univac (in 19__ ?) was less than 100 million dollars. And the revenue of Univac in 1980 was about 2 and one half billion dollars and so there were a lot of successes. Now, in the early days, the early days I refer to as the Eckert-Mauchly--ERA days, when those two geographical units operated under those names so to speak, there was the Univac I, which was a very advanced concept implemented in usable hardware and software to apply the capabilities of electronics in the data processing field. There were difficulties, surely, in getting those first units to work, but I guess literally hundreds of Univac I's were sold, and some of them were still in operation, I would say, 5 years ago as I recall. And then there was a second addition, so to speak, of Univac I, the Univac II, which had new technologies introduced into it but was basically the same system, and hundreds of those systems were sold all over the world. Then they were great revenue generators and profit generators. And then also from the Eckert-Mauchly organization, so to speak, there were the first sort of small scale computers which, and I'm thinking now of the so called 1004, which were tabulator types of computer that used a plug board for programs but was very effective in the marketplace because it was an easy thing to introduce into the customer's house. It was not a complex thing to program, and thousands of those units were sold and then as they were later improved additional thousands of those units were sold, and they helped to make the transition from the old mechanical tabulating days into the electronic computer applications. And then later the Univac III. Now from the so called ERA product line area, many of the dramatic successes in terms of capability to perform a mission as well as to generate revenue and

profitability, many of those early successes were not publicized because they tended to be for customers who were involved either in intelligence work like the National Security Agency, or in defense department activities of a classified nature or at least sensitive, with the exception of the Bureau of Standards where the 1100s were used and were very, very successful. And then as time went on the so called 1100 series was further developed and entirely new electronics was introduced and more sophisticated architecture was introduced and the capability of peripherals was added and it became a very broadly capable large scale system for commercial data processing applications and remote terminal types of applications. All these were outstanding successes. I also should include the 9000 series of computers. Many thousands of those machines were developed in the Philadelphia operation and were placed around the world in the marketplace and eventually produced a significant profit. That was a tough part of the market segment (where the 9000s were marketed) in which to become profitable, but they helped to build a customer base. So there were many products that were successful. Some of the most outstanding successes I think would be in the fields where Univac really was the leader in the world in such applications as the so called real-time applications such as airline reservations. The growth of the commercial airline industry was exploding also during this period. People wanted to travel and faster, better airplanes were coming into being and now you had the problem of all of that inventory, very perishable, the "seat-mile."

ROSS: Yes, once it's gone, it's gone.

MCDONALD: It is gone. And you could afford to make a significant investment if you could keep that perishable inventory working for you. Now there were a few people in ERA who knew something about the airline industry. Carl Swanson was head of engineering in ERA for a good period of time. He came out of the airline industry at Northwest. I had worked in the airline industry for several years, and we had a few others. And we had good rapport with people in the airline industry so we could talk with them as to what their needs were. And we were in high enough management positions so that we could generate their confidence. So Univac actually did (I think, IBM would probably agree to this also, maybe not on tape or on the record but in conversation) did lead the way in putting computers into the airline reservations control marketplace. We were so successful that it caused IBM to really begin to do some things in a hurry and try to go after that market. Now, that type of application, and this

would be back in the early '60s late '50s that type of application was successful for many reasons. Univac was able to draw upon this vast experience from the Navy computer systems that it had developed for command and control purposes. These were real-time machines that worked with remote peripherals and communication environments. And so a lot of the technology, basic technology had been proven; now it just became a case of modifying systems. There was a lot of programming that would have to be accomplished by the customer in order to install these systems as well as by the manufacturer. So the customer had a big investment. Fortunately the technology that we used in that implementation, was so advanced that it had a long life. And those were great revenue generators for Univac. The 494 system which was used in those applications was a commercialized Naval tactical data system central computer with a lot of peripherals added to it of course that the military didn't use. And in turn that particular system then was used by the military in many of their activities as well. And then of course the 494 system was superseded by the 1100 series in the airline reservations. And as industry and commerce developed new needs these "on line" computer systems were used for inventory control and other sophisticated applications.

ROSS: Inventory.

MCDONALD: ...in control.

ROSS: And product quality.

MCDONALD: Yes. In high technology manufacturing, where you have tremendous number of engineering changes and you have to implement engineering changes very rapidly, you really needed a system that was more of a real-time type of a thing than a batch oriented type of a system. I think probably those would be some of the outstanding successes.

ROSS: Who guided you into the airline reservation business?

MCDONALD: I would say primarily Carl Swanson because of Swanson's very deep knowledge of the airline industry

while he was head of Northwest Airlines engineering function, and he was very close to total operations problems in Northwest as it was blossoming after World War II. Carl could see the need for this and he could very informally chat with the people at Northwest, and so that there was sort of a product planning type of activity going on in a somewhat informal fashion, and I think that type of product planning probably went on in many other types of new market areas that the computer people were exploiting or were about to exploit.

ROSS: So did you in St. Paul have to make a bid to the top management of Remington Rand for a program like this or did the form of organization that you had set up at that time allow you just to pursue it?

MCDONALD: Each year the Univac management in whatever form, even if the word Univac was not being used, had to present its engineering budget to the top management of Remington Rand. And the presentation of the engineering budget included studies that would indicate the probably market, market size, the number of units that might be sold and over what period of time as support information to justify going ahead with these engineering budgets. That type of corporate management review was given to all of the engineering programs at Eckert-Mauchly or the Philadelphia location and to the Norwalk location and too the commercial activities in St. Paul. By that time, (middle, late '50s), Sperry had entered the act and the very top corporate management of Sperry, Harry Vickers himself who was the head of Sperry Corporation was a radio amateur, understood electronics. He was knowledgeable about our type of industry in general because he had headed the Vickers organization that manufactured products in the field of hydraulics and diverse manufacturing locations and deeply knowledgeable of the airline industry because those other organizations had served the airline industry with accessories. Here was a gentleman who understood that tremendous developments were being made in Univac's defense area and he could see the applicability of that type of thing in the commercial field just as he had seen the applicability of some of the defense developments in the hydraulic field to be applicable over in the commercial sections of the market. So the question then that came from the top corporate management quite often was, "Why aren't you considering commercializing many of the military developments you have?" So it was a very receptive atmosphere for that type of thing if we could show that it had a high probability of success and it was also quite specialized. Let me back off and say that I think that the St. Paul management, Norris and whoever remained, had a high credibility factor in this area with corporate management.

ROSS: After the Sperry....

MCDONALD: So those budgets would have a very high priority as far as approval is concerned. Now they might have had them cut back somewhat from what they asked for, but they were never cut back to the point that precluded the company from going ahead in those areas.

ROSS: Is it possible that historians might locate those budget reports?

MCDONALD: No, I don't think so.

ROSS: These were formal documents.

MCDONALD: Surely but the way that the approval system worked and the studies were submitted was that the divisional locations would prepare their requests, let's say under the structure where Mr. Norris was head of Univac. A location would prepare its request they would be reviewed by Norris's staff and then pared down here and there because of course everybody asked for the world. They believed the world was their oyster, and it was impractical to implement everything. And so then eventually there was shaping of these budgets and cutting out and prioritizing as to probable market return and time and so on. And then those budgets would be provided to the corporation in verbal reviews and pitches with flip charts and supported then by documents, but quite often those types of things were reduced to detailed writing and engineering budgets after perhaps you'd gone through 90% of the approval process. And they were then finally reduced to detailed paper so that you could get approval. This was in contrast with the way it worked on later dates where one developed reams and reams and reams and reams of paper. But it was very effective, because it was communicating with corporate management.

ROSS: Tell me a little bit about Jay Frank Forrester.

MCDONALD: Forrester was a graduate of the Naval academy and an athlete in baseball and golf who became a member of the Sperry organization well before the Sperry Remington merger and was a key man in the Sperry organization and then at one stage headed the Vickers organization. Vickers was in hydraulics, and Forrester became the president of Vickers under Harry Vickers direction; Harry Vickers of course moved to New York City for his headquarters of the Sperry company which then had Sperry Gyro post World War and pre World War as well and the Vickers hydraulic products company and the New Holland machine company. Forrester was an outstanding financial man, he loved financial analysis but he was also an outstanding executive in terms of leadership and communication capability, and I guess those two terms are probably almost synonymous. He was a man who liked to "wallow in the figures." And then meet with people, listen to their problems, and his mode of operation when he got into some new field was to do a lot of communicating, a lot of listening with the people, collect a lot of information, and then probably go to the beach and spend a week and think about it. He would formulate certain ideas and then come back, get the groups together. He was a person who brought people together at probably three management levels at the same time from different locations for cross communication. Because of his financial background, he approached things generally on the basis of a total budget. Many years before Forrester's management in Univac--let's say the early days--that's Eckert-Mauchly and the ERA and the Norwalk days, many years before there was an overall budget. There were engineering budgets, there were manufacturing budgets, there were capital equipment budgets, there were marketing budgets, but an overall budget was something that really had never been installed in the so called Univac computer activities. When Daus Bibbey came in he really had to push for, "Let's put it all together into a total budget." Norris had been working on this but it required a tremendous education among the management people. Well, of course, Forrester was able to implement this by pointing out to people how you would be measured. You would be simply measured on what kind of return you could produce on the assets that you had under your command. And every year you turned in those chips and you got a new allocation of chips, because he was a good poker player. And he had adopted the so called Dupont System that had been developed--the Dupont System of financial management, which was essentially a system of assigning assets to management responsibility. You made a return on those assets and you set objectives and it as quite applicable to more stable industries. It was a little less directly applicable to very rapidly changing technologies and rapidly changing marketplaces, because there you had to add the question of rapid growth. How much could you allocate to growth? I set up a system later on which I

called the ROAG System. The so called Dupont System was an ROA system referring to "Return on Assets" and I set up a system called to ROAG System which was not just a return on assets but emphasized the growth factor as well. In other words you had to harmonize the return on assets which is really a short term thing with the growth factor--a long term thing.

ROSS: Let me interrupt you for just a moment.

MCDONALD: Sure.

ROSS: You're saying that as a Sperry president you implemented that. This is later?

MCDONALD: No as a Univac President.

ROSS: Okay, alright.

MCDONALD: Yes.

ROSS: So, middle to late '60s?

MCDONALD: And after Forrester moved on up to the Presidency of Sperry that I became president of Univac.

ROSS: So this is the last half of '60s?

MCDONALD: Correct.

ROSS: Okay, okay. Go ahead and continue.

MCDONALD: Yes. Now, after the Norris situation and the development of Control Data there had been a series of top executives brought into the company from outside to head the Univac activities. Bibby left and then there was a gentleman brought in by the name of Lou Rader, Dr. Rader, who had come from General Electric, and he was really brought in by the Sperry organization, as I recall. And actually what was going on at that stage of the game was that Vickers recognized his age and he was also now pretty knowledgeable about all of the things in the Sperry organization and all of the executives in Sperry and he realized that Forrester was the man he really wanted to have succeed him, but it took time. Vickers sat there now with the situation that for years Remington's investment in the computer industry really hadn't paid off, and after the Sperry Remington merger which he, Harry Vickers, worked out personally with Jim Rand, after several years of that merger Sperry Rand still really hadn't pulled it off that is, made a profit. This was his big challenge, Vickers' challenge. The man that he had the greatest respect for, and he told me these things, the greatest trust in was Forrester who had headed the Vickers Division. But he had to do something before he could move Forrester up to replace him (Vickers) he had to do something to solve the Univac problem. So he asked Forrester to take over Univac, and Rader left the company. Forrester quickly moved in with no hesitation to become president of Univac.

ROSS: This is early '60s?

MCDONALD: This would have been early '60s yes. Now Forrester had developed top management capabilities to move up in the Vickers Division and Forrester had his eyes set on the top job in Sperry. He had a man ready to take over the job of president of Vickers--Meryl Hyden was made president of Vickers immediately, and that was a smooth transition. And of course Frank Forrester understood that if he was going to get to the top job in Sperry he had to be damn sure he had the Univac problem solved, and so here was an outstanding opportunity. He immediately moved in physically and he moved around with the people, he called meetings, he immersed himself totally. And after he sat ruminating over the situation on the beach for awhile, he made certain organizational changes and then called strategy meetings and setting up and explaining strategic planning, operations planning, budget and so on.

TAPE 2/SIDE 1

MCDONALD: Okay. I guess I left off on the last tape with Forrester's coming in as head of the Univac organization.

ROSS: What particular organizational changes did he make? You referred to them.

MCDONALD: He wanted to go back to more divisionalization and basically set up organizational units that could be measured by a profit-loss statement and on the return on assets. So he set up the organization with a very clearly defined defense function and activity totally. And then the commercial activity. And he set up an international activity in a formalized fashion, so he had from a line management aspect the defense activities of Univac, the commercial activities of Univac, domestically and the international activities of Univac, and then staff. Fred Rock had come into the organization from I think McKensie and Company and was heading up what was called the Data Processing Division of Univac, headquartered in Philadelphia, responsible for the development, manufacturing and marketing of all commercial products. And Dave Baker, who was a retired Air Force general, was in charge of the international division. Baker had worked for Forrester in Vickers' Division. Forrester respected Baker and he was an internationalist by tendency. Then he offered me the job of heading up the defense activity. This was all within probably a month from his becoming president of Univac. Then he got this group together, the very top leaders, probably ten, in regular sessions where there was strategizing and accountability reporting concepts, and the need for planning was discussed, and a system of annual planning was really inaugurated at that point where the top management plus at least two levels of management below in selected cases would be brought together at some location remote from any of the installations, some golf resort because Frank was a great golfer and he also learned a great deal about people on the golf course, and he liked the informal atmosphere. At which time planning was really described to the people in great detail--the need for a strategic plan probably a three or five year program, the need for development plan, the two or three year program, and then an operations plan which in essence was a one year budget. And he brought enough people together in these sessions so that it was a continual and intense training program. And then people reported against these budgets, so we had a very short term measurement that was reasonably accurate. And now, of course, the entirely new set of management controls, planning concepts and so

on, were being introduced in a total fashion with a lot of people understanding them, and I think that latter point was a very key thing. You had very capable, outstanding people, intelligence wise, but perhaps primarily in their field of specialty, but not a great deal of breath in the financial and the control area, being introduced to all of these types of things and they loved it. So then we were on the way towards success. And then also he understood the accounting aspects because he was with Arthur Anderson at one stage in his career as a CPA, and he looked at the Univac balance sheets and he could see there were a lot of rental income assets that were never going to produce enough to cover their depreciation so there was a big write off in Sperry on a lot of those assets. They were written off against surplus directly and so he cleaned up the Sperry balance sheet in a short period of time, I'm talking now about a year and a half after he became President of Univac. And then we were on our way.

ROSS: When you say cleaned it up, did he actually introduce new techniques of moving the numbers around and declaring....

MCDONALD: Yes. The first thing he did, or one of the very early things he did, was have a very intensive study of the so called assets on the balance sheet that were categorized as rental income assets, and he asked, "Were they going to produce enough rental income?" and they weren't, and so they were segregated and written down. It was a reasonably significant write off, I don't remember the dollar magnitude. And then he approached this very peculiar industry that had such a very high engineering and technical cost component. And he said, "Okay, one of the basic principles in accounting is that the cost and revenue should be related time-wise in the profit and loss statement in the balance sheet, and as I look at all these engineering costs in order for this industry to survive it is going to have to spend a lot of money in development in engineering." And no way was it ever going to be successful if you wrote those high costs off as you went, and this knowledge came from his background in other high technology industries in Sperry and Vickers, so he said, "It is a legitimate accounting principal to capitalize those engineering costs." If you had a product defined and approved and you had gone through the development stage and now were generating engineering costs to permit manufacturing the product we will capitalize such engineering costs and then we will write them off against the product as shipped when the product is generating revenue. Now this permitted the company to begin to show profitability much earlier. And then also we were getting into an era when leasing was

going to be acceptable, longer term leases. In the earlier days it was a rental type industry which came out of the punched card era. As the industry moved over to computers from punched cards and this new technology was being introduced, customers really weren't interested in making long-term commitments to this new type of product, if they had an alternative, because they recognized that it was a rapidly changing technology and if they bought something in the late '50s or if they made a long-term lease commitment it might be obsolete too soon. So it was a rental industry, because of IBM's financial resources. Remington Rand had more difficulty in that respect. But that was what the commercial marketplace dictated. It was a rental industry. And I think that I might have mentioned earlier that it's easy to show by the mathematics of the thing that if you are renting computers with these high engineering costs and high installation costs, the faster you grow, each year your red figures, your losses will, increase because you see you don't recover your costs of engineering and the high installation costs. Installation costs in this case meaning the applications work, not just the physical work of connecting stuff. Well that was a terrible dilemma. As time went on, the technology was not moving quite as rapidly, and also management was becoming more sophisticated in recognizing you should not launch new product programs until you were a little more sure perhaps of what the technological life of a product might be. And then also if you became reasonably strong in the marketplace, you would not introduce new technologies prematurely so you would obsolete your own product. So now you got into an era in the middle '60s of being able to sell outright in some cases to the commercial marketplace, and perhaps to write longer term leases to the commercial marketplace. So now you had several things. You had washed through the system many of the early losses, high investments of trying to exploit a rapidly changing technology without really knowing how to make these risk decisions without a high probable error. You had washed a lot of that through the system, and the marketplace was more receptive to this new thing called a computer and was willing to make longer term commitments. So that you had a greater opportunity to sell outright because the cost over a five year period to the customer would be lower if he purchased than it would be if he rented. And the financing cost for the computer manufacturer was lower if he didn't have to rent or have short term leases. Now you had a situation that was really ready for profitability in the commercial computer industry. Management that couldn't do the job had been washed out of the system. Some of them might start anew based on all of the knowledge they had, and would be successful and not make these mistakes again, and I think this probably happens in all high technology industries. The early entrepreneurs bring it to a certain point. Some are able to broaden and

go on from there, some aren't. And then many of the entrepreneurs go on and start a new entrepreneurial outfit. But that's when the industry began to get profitable, and then if you had good products in place you developed quite a market base where the leverage is fairly good. So Univac then broke into the black in about 1965, and we were on our way provided we could keep it under control.

ROSS: And in '66 Forrester did move out.

MCDONALD: Right.

ROSS: And you filled his....

MCDONALD: Right. He wanted somebody to take over Univac after he felt he'd spent enough time in there so he understood the organization and he had done enough teaching, so to speak, to get the message across and he offered me the job to head the Data Processing Division. Actually he had offered me the job to go East earlier, and other Remington Rand managements had offered me a job to go East earlier, but I had always turned them down. I had made a conclusion that perhaps I could be successful if I went East, but I could see that the industry was still on a lot of change and turmoil and very frankly I didn't think I was ready for it. I liked what I was doing out here, I liked the area, and I felt I was continuing to learn so I turned down these opportunities under Schnakle, and under others, and then when Forrester first asked me if I would go East I had to say, "No, I didn't want to take the job..." because I--actually I had a sort of personal problem that made it very difficult for me to move at that stage. But in '65 he told me he was now willing to go to New York to head Sperry, and he was confident that Univac could make it provided and I'll mention the proviso real fast and he would like to have me take on that assignment and I said, "Well tell me the provided." and he said, "Well, you've been studying this return on assets and as an objective what I want done is for you to make 20% return on your assets." And I remember his telling me that at dinner at the Sheraton Ritz.

ROSS: Over what period of time? Outright terms or something?

MCDONALD: Well that was his first comment and after I recovered and I said "over when?" He said, "Well that's an objective that you've got to have in mind and you should be shooting for, and be shooting for it real hard." But you know obviously five years or something in that area. I thought his point was well taken, he had set a very specific objective, it was a target and he'd also spent a lot of time teaching people how to think that way and how to make decisions. And I had a tremendous respect for the man, I liked him. I could see that I could be very happy working with him, I think we had established a rapport of mutual respect and so on and so I said, "Yes, I'd take the job." And that was implemented in '66.

ROSS: Just to fill in a couple of spaces, the trend reversal that he had effected by '65, is absolutely amazing. And you've essentially accredited that success, in other words coming out of the red and into the black, in that short period of time, to financial almost wizardry.

MCDONALD: Yes, and that would be an incorrect picture to paint, because all during this period of time that we've been talking about from the very early ERA days, managements, different people were continually improving their understanding and their decision making. A lot of people with a technical background were getting a better understanding of financial aspects. A lot of people with financial background were getting a better understanding of high technology aspects. People who were very capable in marketing were beginning to rise or fall. The marketing man that can sell a million dollars worth of typewriters probably wasn't going to be so not necessarily going to be successful as a leader in the marketing function of this new kind of business. But a man who could sell small systems and think in those kinds of terms might very well be successful. So all of these things were really going on, and you see there were many of these very key technical people that did stay with the organization, they didn't all go over to Control Data, and they were learning in a more broad fashion and they were being--it was a continual case of education. Presentations to management at whatever level, if well done, is really laboratory education of the graduate level. So there was a tremendous amount of improvement going on amongst people and in management. I think perhaps there were a few characteristics of Forrester that were vital ingredients. He was very personable, very knowledgeable, there was no question about his capability and his candor. He said, "You know I don't know anything about the computer industry but I sure know how to make money and I sure hope that I can explain how

you work as a group on shared accountabilities and primary accountabilities, and there was a lot of that needed in this kind of a business." And there was no question as to whether he was going to be around for long because of his position in the corporation, and so here was a leader. And he was an outstanding man, in all aspects, the more time you spent with him. And this is the way people felt; they would give him their allegiance. Now, he was a tough task master, and if after a reasonable period of time you did not produce, you were out, no questions about that, but most people can adapt to that.

ROSS: What about technological changes that were occurring during the early '60s, what...?

MCDONALD: Well of course there were very rapid technology changes going on and these largely, I think, maybe I'm biased, were being implemented in the defense and space and military areas, and we haven't talked about that. But the military wanted and needed very advanced technologies in their applications, and this is where Univac of course did an outstanding job of working with the Defense Department, the Navy particularly but also with the intelligence community. And those sources of funds in the government were very closely tied with the computer people in other companies as well as ours. The government funded large programs that included direct funding of development as separate projects and then the funding of very large programs that included the shipment eventually and the installation of hardware. And those contracts had tremendous budgets for advanced development, and, if I may, let me touch on just three or four of them that I think were very, very significant. The Navy was modernizing its warfare systems into a command and control system of a real-time nature where a great deal of information would be brought in from the aircraft that were operating in an area. The various outposts that were operating to the central--to the so-called CIC room concept which was a command information center concept where all that data was being reduced and then in turn displayed for the people in the CIC room type of thing. This then included digital communications. As a matter of fact, I had worked on during the latter part of World War II a project called Project Cadillac which was a forerunner of this sort of thing where we put a radar antenna in a small airplane at 10,000 feet altitude and it picked up all the radar targets from that altitude and digitized them and sent them down to the aircraft carrier along the communications link and then the computers in the aircraft carrier were to produce all kinds of information that would go on out in a real-time mode. And a lot of this sort of thing was being implemented by the

Navy. Now, the Navy needed reliable equipment, so they would spend money on highly reliable equipment development and in the Navy the equipment would be under very rigorous, very difficult environment and temperature, corrosion and shock so designing electronic equipment for that type of an application resulted in one learning a tremendous amount about designing for reliability. Reliability had been one of the weaknesses in the early commercial computer applications. And then the next big significant thing was the Air Force ballistic missile program where a very special organization in the Air Force had been set up with the idea of having atomic warheads that would be launched by very large missiles--very, very large space vehicles, so called. And these were the programs that were worked on by Bell Laboratories, Western Electric, and other subcontractors. Now we had developed a very close relationship with the Bell Laboratories in their defense area, so we were associate contractors, Univac was, with Bell Laboratories in the field of computers. And we had the contracts for the very early Titan missile program which was really the second large missile after the early Atlas. The Atlas was the early missile that was launched by solid fuels and the Titan also. Here reliability [was the key]. The cost of sending that missile up and the importance of the system not failing was fantastic. So tremendous amounts of money were available for developing the electronics that on the ground would be guiding that missile by radio control and which would be failureless as an objective, literally. So we had very large funding for developing fail-safe electronics in terms of the architectural structure, and in terms of the components and the testing of the components and then also that all of that equipment would continue to work in unusual environments. We were actually an associate contractor to the Air Force, we were an associate with Bell Labs. Bell Labs would have rather have had us as a sub, but this gave us an excellent position. You see, we were not a sub to Bell Lab, but Bell Lab's equipment would not work unless our equipment worked. And so we had access to the total knowledge of Bell Lab in this field, and they were very open; we had an excellent working relationship with them, very compatible. And these were very successful programs. Then the next big military program was the NIKE-X program. There was a NIKE-ZUSE and a NIKE-X. These were anti-ballistic missile programs, systems that would send missiles up to intercept missiles coming in. Now you have accuracy, you had reliability, you had fail-safe requirements if stuff failed that you just hiccuped but you'd continue to guide the missile and so on, and these types of programs permitted us to test all kinds of components--magnetic little flip-flops versus diodes, versus transistors. So that here we had funding from the government to make all of these tests and we worked with--the unit worked with, the top scientists in part of defense and at MIT, so we had very, very outstanding

people looking at what we were proposing and in essence blessing it or not blessing it, so it was a fantastic combination for technological development that would be implemented in a testable environment.

ROSS: Sounds to me as if the character of research and development had changed primarily because of the scale of the very task oriented research you were doing.

MCDONALD: Right.

ROSS: You were still doing task oriented research, but by the very requirements of the systems, you were actually doing very theoretical and broad natured research into wide ranging areas. That's different from what you and I talked about earlier about early ERA projects.

MCDONALD: Very true. And of course we also had the access in these areas to a fair amount of fundamental research that had been done at the Bell Laboratories for example.

ROSS: And I assume at MIT.

MCDONALD: Sure. After all where was the transistor invented but at Bell Labs.

ROSS: Well this is a totally different approach to the computer industry than you set out doing, yet the customer still the same.

MCDONALD: Yes, to a large extent the customer was the same. We had an unusual situation here, I think, relative to some of our competition in that we had in this geographical area of St. Paul all of our very top defense development and engineering and production activities of Univac for these sophisticated systems, and we also had in St. Paul, physically, the development engineering and manufacturing of the very large scale commercial systems. Many of the engineers, but not all, but many of the engineers who did the work on the very large scale commercial

systems had had tours of duty and experience in defense programs. So we were able to show, for example, to the defense department that we had large commercial funded development programs, which was true, which could support our ability to go in and take on these very large defense programs, and conversely we could show to our sophisticated customers of commercial equipment this type of backing. And I can remember making presentations to the president of the Bowry Bank in New York City. He was contemplating installing a so-called real-time system with teller units and so on, and he was very impressed when we described what we were doing in these fields as applicable. We followed this practice. We would like to move people, technical people and others, from our defense unit to our commercial unit and conversely. We had to use judgement in this. We couldn't emasculate our defense projects as our commercial units were growing. But as these bookings of new business and large scale growth that we were experiencing occurred, we had tremendous opportunities for recruiting all around the country. So we could bring technical people into the Twin Cities from California and all around the country to go to work on these very advanced defense systems. Most of the Californians generally didn't stay long which we finally learned. And we of course grew very effectively as a result of this combination of defense and commercial in the same location where people could move back and forth without a major family disruption.

ROSS: Very uncharacteristic as far as the rest of the industry is concerned.

MCDONALD: True. There was a philosophy amongst many that people who developed and designed a product or systems for the defense had the wrong orientation and could not be successful in coming up with a commercial product. Now there's some truth in that, but that was an oversimplification. There were such attitudes expressed in the Sperry Corporation at times. They really didn't think this was a good thing to happen under the same organization (having defense and commercial work in the same sub-organizational unit). I agreed to that. It was better to have the people who worked on defense programs in terms of specs and design drawings and so on in a unit that was different from that which built for the commercial market because you could have never sold a product commercially if the same defense design specs were implemented for commercial applications. But by the same token there were many similar needs in commercial applications that were required in the defense. You did not need the type of reliability in a batch processor that you had in a missile guided system. To a degree, however, you needed

the same kind of reliability in an airline reservation system that you needed an Naval tactical data control system, you see. So these were things that I think made Univac quite unique amongst the many other companies. And I think that we exploited it very effectively and we made money on it while we went.

ROSS: Yes by '69 company or excuse me the division was the biggest money maker for the Parent Company.

MCDONALD: That's correct.

TAPE 2/SIDE 2

ROSS: Tell me a little bit about the case of the United States government brought against IBM.

MCDONALD: Right.

ROSS: To which you were called as a witness.

MCDONALD: The case on the part of the Federal Government was an anti-trust case against IBM and, presumably, IBM, the way it operated, precluded competition from developing this industry. The non-IBM Computer Companies, presumably, might be sympathetic to the government's case. The government attorneys did talk to the individual computer companies other than IBM with the idea of trying to ascertain how they were able to progress and prosper or not progress and prosper in this environment. There was a strong motivation on the part of some of the computer companies, and my comments now are not going to be about IBM but the others and in particular Sperry Rand, a strong desire to really get in there and spend a lot of time and effort on this case and help the government out, depending upon the orientation of the legal people to a degree. In any event, we knew we had to respond to the government's request for information. And, eventually, the heads of the computer companies were expected to go on the witness stand, subject themselves to examination on the part of the government and on the part of IBM's attorneys. There were interrogatories that were required in advance. I personally had about three or four days of

interrogatory in federal court in Philadelphia and then when the case went to court in New York under Judge Edelson I was called to testify. Basically what the government was asking me was the pricing policies of IBM and the pricing policies of Univac and some of the competitive problems that we faced and I guess that's about all I can say. The rest of it is all in transcript form available for reading.

ROSS: How did you become aware of the competition's pricing policies for example?

MCDONALD: In the marketplace.

ROSS: Okay, so it's a very indirect...

MCDONALD: No it was quite direct, I mean...

ROSS: But it's an after-the-fact type of...

MCDONALD: Well, you were bidding competitively, so you had rather rapid feedback. You didn't know whether you won or lost until the decision was made. IBM tended in large scale systems and also in their lower product line to maintain the prices pretty much. They would provide pricing changes, in effect, by offering more service, which was a way of price cutting, but that's where we learned. And of course there were little organizations that were developing then that did industry surveys, there was International Data Corporation, an outfit in Boston, that was sort of a market survey type of an organization that we had access to, and I guess that's it.

ROSS: Part of your responsibilities as Univac Division President, included international markets.

MCDONALD: Correct, for computer systems and punched cards and so on.

ROSS: Tell me a little bit about the strengths and weaknesses of the Univac International markets.

MCDONALD: Yes. Univac had a good name in the International markets from Remington Rand's background and past. The Remington Rand product was well accepted in Europe, generally, and in Japan. And Europe had a high regard for American technology, and as Univac moved into the computer field and started to move those products abroad, to go after some of that market over there, it was well accepted. Now it was more difficult to get into place management people in the different nations and different countries who understood this new type of business. The problems of pricing and the problems of staffing service people in Germany, and in England, and France, and countries such as that, and to have a general manager who knew how to make management decis ions and pricing decisions and staffing decisions and so on in those areas was a bigger challenge than of course it was in the United States. Univac started selling the smaller scale systems in Europe by its European subsidiaries. It sold the larger scale systems in Europe in two ways. If they were batch systems, such as the Univac I's and II's, they were sold by the subsidiary's management with some assistance from the United States. If they were airline reservation systems, and Univac did have a very high percentage of the non-U.S. airlines around the world, they were sold directly out of the United States by special marketing team that would work through a subsidiary but did not depend upon the subsidiary in any way. That was the approach we used in Europe. In Japan we had a different situation. Remington Rand's equipment was well-known in Japan, from its punched card days and earlier, and after World War II as we came out with computers, one of the moves made by Jim Rand was to hire General MacArthur to come in and head up the organization because he knew the man, he liked him and he felt here is a man of stature and he would be a good man for customer relations activities, and General MacArthur of course had an outstanding reputation in Japan and this facilitated our entry into Japan. He didn't actively engage in marketing but the mere fact that he was head of the organization by the Japanese custom gave our people a receptive audience, and Univac was very, very successful in Japan.

ROSS: What particular problems were you facing in trying to understand as well as improve the international market?

MCDONALD: The biggest problem I think we felt we faced in the individual countries in Europe was the mismatch

between the capability of many of our European subsidiary managers and the requirements for that type of a position with the advent of the computer going into the marketplace because it required the subsidiary company to assess the capability of a potential customer to be able to make the installation (referring here to the applications programming). In other words, how much could that customer, or potential customer, do with his internal capability to facilitate the installation of a computer. This is something that the Americans couldn't very well assess because it was a different language, and so you had to depend upon the nationals to make this judgement and you basically had to depend upon the general manager of the subsidiary. Most of the subsidiary general managers who were successful with the office machines equipment, were not able to develop an understanding of this type of product and their nature as executives was such they really had the motivation and the custom to not reveal to people below them in their organizations their personal inadequacy in some area. In other words, it was difficult for them to take in to their organization somebody who knew that business and they didn't, where they could have provided the overall continued leadership and openly show that they were depending upon this man in his field of specialty (i.e. in programming, etc.) And that was foreign to many of the so-called old-time oriented managers in many of the European countries. Those who could adapt were very successful. So the biggest challenge we had was to get the right managers in place. The challenges that we faced and the opportunities in the international field, now speaking primarily about Europe because it was different from Southeast Asia and Africa. The South American and then the Japanese situation was a story in itself, but in Europe there were tremendous market opportunities. The European technology had not progressed to the point where national companies were going to be adequately acceptable to the large corporations and the large banks in Europe. They wanted American technology. I'm sure they always wanted to get to get to European technology, but they had to wait for that. Alright, how could you sell effectively? The management techniques, the so-called American management techniques, of if a man succeeds, fine; if he fails, get rid of him, really weren't adequate to meet this challenge over there because you could say, "This man has failed so we'll get rid of him," and we did, but you have to have who is going to replace him and how do you then take that man, how long will it take before you know whether he is going to be successful or not. There's going to be a minimum of a year and if he isn't successful, he will generate losses that are significant. Okay, back to what do you do about these managements who are not able to meet the challenge. Generally speaking, the weaknesses of these people were that they would not communicate openly with their own staffs; they had the tendency to be a little aloof. I'm

speaking now of a period in the late '50s and throughout the '60s. It was an authoritarian type of management. The challenge I felt that we faced over there was to assess the situation so we could stem losses as they were being generated. In order to do that required getting in there and finding out what was going on and being able to generate the language barrier and also penetrate the reluctance to reveal bad news. We approached this in a couple of ways. Obviously, a key decision is who you pick to be the head of your total international function. A man was picked who understood the computer business reasonably well. He had been an executive in Univac's commercial and defense operations and was quite willing to travel very extensively and did for years. He set up what we called quarterly reviews. Now we had these quarterly reviews going in the U.S., but abroad it was more difficult. Every quarter a group of management people from the United States, together with the head of the international division and his staff went into a country and spent probably two days reviewing everything. Every customer situation; installation progress; expenses; failures and so on. And there was a group of people in a staff capacity that were involved in this in such a way that you could assess where your problems lay and you could stem the losses. You also could ascertain where there were greater market opportunities than were being exploited by, let's say the general manager, because he may have had a reluctance to grow a little too fast. I guess what I'm getting at is this; if ever there was a case where listening to what was going on and trying to understand before you act, it was in the international arena.

ROSS: And the way the customer conducted business was different too.

MCDONALD: Correct, correct. And so the key was to get the right type of general manager to insure that he had competent staff with him and that he would in some cases get rid of incompetent staff because of expenses. And that is a whole new story because you couldn't get rid of people in certain countries without tremendous termination costs. And then somehow or another on the larger scale installations it was necessary to go into see the customers myself. Now that was a delicate thing. You had to do that as someone working with you general manager rather than around your general manager. These were very important visits with high level customers in order to somehow or another make an assessment of what he thought, and not be totally dependent [on your general manager's assessment.] [These meetings were with the] president of your European customer, let's say, of his chief financial officer or somebody in the first or second layer of management, in big banks, in department stores or mail order

houses, and in factory organizations, and so on. [We needed to] make some kind of a judgement here as a validation of verification with new inputs that intuitively you might have felt existed or that gave you an indication you better do some more digging. A system of just getting rid of managers and getting a new one that could go on for long periods of time without progress. That is a challenge, and we were quite successful. Our biggest disappointment was in trying to get foreign nationals to broaden their scope of responsibility and interest in Europe. We would try all kinds of organizational techniques for our general manager in Germany, for example, to be responsible for three countries. Generally, they wouldn't move. If they took on the responsibility they wanted to remain in their home city and also handle their home country at the same time which precluded somebody really rising to handle their home country. Many of them talked about wanting to come to the United States for opportunities. Very few of them if they were in a management position would move. That was our greatest challenge to get foreign nationals, Europeans, to take over more and more geographical territory and more and more nationalities under their direction.

ROSS: As Univac Division President and later President of Sperry, did you make those visits to the European customers?

MCDONALD: I did.

ROSS: Who were some of them?

MCDONALD: Oh, I remember going into Quella in Germany which is a very large mail order company which was really pushing the state of the art in rapid inventory control by a computer systems. I worked personally very closely with the Union Bank of Switzerland which was using a lot of computerization and was the biggest Univac customer in Switzerland. I don't remember many large customers in Britain because there wasn't a language problem in that country. In France I would frequently go in to see all the very large governmental agencies that were our customers, the French National Railway, Air France and then Shell in the oil field. Scandinavia was not such a big problem because there wasn't a language problem there, but I would visit with all the top customers in Sweden. France was the most difficult one from a language aspect. The Italians were delightful. We had very large customers in Italy

both in government and in industry, and I always think that this was a fun type of a trip because they wanted to see you and the government wanted to see you, and they would explain that we're becoming dependent on large systems, and they wanted to be sure that we in the U.S. would support the National Company (with programming assistance) if it became necessary.

ROSS: Who were some of the general managers?

MCDONALD: In the countries? There was a man in Germany, well we had several in Germany, but Detlaff Meyer-Ohlert was the general manager of Germany for a long period of time, a young very well educated, very capable tough German executive. In France I don't remember the names of the people now except at one point we had Robert Mitterand who is the President of France's brother heading our French company. One thing in certain countries was always important was that your top general manager be able to move with a relatively high level of people in government and in industry. So we tried to get that type of thing. In Sweden one of our men was Olaf Beulow who was a Dane and headed our Scandinavian operations. And Mario Nuti, who at one time worked for IBM in Europe, is a very outstanding Italian executive, and headed our Italian operations for many years. He was one of the few European executives who could, and who wanted to, and was able to broaden himself and be responsible for other countries. He had France and Spain under his direction in addition to Italy.

ROSS: What about Britain?

MCDONALD: I don't remember the first general manager, I don't remember his name. He wasn't with us for very long. At one stage our British manager was a fellow by the name of Dez Pitcher. We earmarked him early in the game as a comer, and he was a comer and he moved on up to the top of the organization and then he moved over into the British automobile industry, I think it was British Leland.

ROSS: Now is it possible over a period of years to actually try to centralize the management of the European market?

MCDONALD: We needed a European headquarters from which the general manager of Europe, with a reasonable staff, could operate because of the conduct of these quarterly reviews. As we added countries in Europe, it meant that you couldn't effectively travel and handle all of this from the United States. So we did have our Univac European headquarters in London.

I think we were almost always in England. We started out with the Univac European headquarters in Lausanne, Switzerland, this was when Gordon Smith headed up what we call the EMEA which is the European and Middle East. However, we found Lausanne was not a good place transportation wise and Switzerland was an awfully expensive place to operate. We moved from Switzerland to England in our first relocation of the headquarters.

END OF INTERVIEW