Interview Contents

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Rich Daly, Narrator, John Lindley, Interviewer.

January 27, 2016

Prologue

JL: This is John Lindley. It's January 27, 2016. I'm at JoJo's Rise and Wine in Burnsville and I'm interviewing Richard Daly who goes by the name Rich. We're going to talk about Rich's involvement with Engineering Research Associates or ERA as it was known then and is known sometimes in today's literature. Rich, where were you born?

RD: I was born in White Bear Lake.

JL: And then you lived in Minnesota most of your adult life or did you move around?

RD: I've been in Minnesota…we lived in the Washington, D.C. area, a place called Vienna, Virginia, a suburb of Washington from about 1957 to 1969, about twelve years. The reason I was down there was because of some of the things that happened at ERA.

High School

JL: Where did you go to school?

RD: I went to school at White Bear High and then I went to the University of Minnesota.

JL: And when did you graduate?

RD: I graduated from the University in 1949 in EE and then I stayed on and got an MBA in 1950.

JL: So, you started out with a degree in Electrical Engineering. At that point, were you single or were you married?

RD: I was single when I graduated. Got married shortly thereafter. (chuckles)

JL: What drew you to the Institute of Technology at the U and the Electrical Engineering field?

WWII Experiences

RD: Of course I was in the service.

JL: At that time?

RD: No. I went into the service right out of high school.

JL: Which would have been when?

RD: That would have been February of 1943. I actually got out of high school in June of '42. I was going into a special program that the Army Air Corps had then called pre-meteorology.

JL: So, you would be a weatherman.

RD: Right. They had a big shortage of meteorologists, so they were out contacting the high schools to get the names of certain students who met their criteria to get into the program. The pre-meteorology program was a twelve-month, intense, college curriculum and it was set up at colleges like Carleton and Washington University in St. Louis where I happened to go and a couple others.

JL: So, you went to Washington University in St. Louis for this program.

RD: Right. And then when you graduated from the program they were supposed to move on to the meteorology program but by that time, which was, of course, twelve months later, they had enough meteorologists so we were all assigned to other programs and I had an opportunity to get into the electronics program where you went through…it was probably nine months…pretty intense electronics training but you didn't get a commission out of that. So, after some what they call basic training, we ended up at Yale where they had the actual program there and we went through a lot of electronics stuff and got a commission out of there.

JL: So, what rank were you?

RD: Second lieutenant. I think the MOS, Military Occupation Specialty was 0141, electronics officer, and the people that got out of that program went several ways. I ended up in Florida near Boca Raton for some additional training in special radar type equipment and I went on there to Warner Robbins, Georgia where I became…I got what we called a **LORAN Team**.

JL: I know about LORAN. I was in the Navy. I've operated with LORAN. You don't want to hear my story.

{sic, LORAN (Long Range Navigation) is a hyperbolic radio navigation system used to determine location based on the time difference of arrival of radio pulses from multiple land-based transmitters.}

RD: It's good because then you know what LORAN is.

JL: Yes.

RD: I went over, and I took a group of five enlisted men overseas then to the Pacific because they were having a lot of trouble searching for downed aircraft.

JL: Yes.

RD: And LORAN was perfect for that.

JL: So, you were at a LORAN station?

RD: No. I was at the Air Force station on Okinawa, and we installed the new LORAN systems in the Air-Sea Rescue planes and ran training for the navigators. That was pretty near the end of the war because we didn't get over there until September-October 1945. So, the war was just over.

JL: You got there when?

RD: I believe it was September of 1945.

JL: So just after the atomic bombs.

RD: Right. We were the first technology team, LORAN team, to be sent out. We called it PCS, **P**ermanent **C**hange of **S**tation. Nobody in the theatre knew what to do with us. Usually, those teams went out temporarily. Anyway, when we got out there…it was interesting…I finally got the order changed back to TBY because I thought we would fly back. A week before I got it changed back. The whole system came down to points to get back. Of course we didn't have very many points. (chuckles)

JL: Yes. You had to have a lot of points. They would be the result of being in combat and awards such as a medal of some kind, the number of months overseas. I know how that system worked because I've interviewed several other veterans and heard their stories about how difficult it was to persuade the authorities that they had enough points to get sent home. So how long were you at Kadena Air Force Base?

RD: Yes.

JL: What was the base primarily used for at that time? Obviously, they weren't running bombing missions over Japan. The war was over. So, what was the Air Force's primary mission from that facility?

RD: They did run them from there to some extent. That was over by the time we got there. They were primarily B-29s and some B-36s.

JL: Were these used for reconnaissance?

RD: Not B-36. B-17s.

JL: Were they doing reconnaissance primarily?

RD: No. Things had changed back, and everything was moving, equipment and cargo and supplies and that kind of thing.

JL: So, support for the occupation of Japan?

RD: Not really. That was all done now because the war was over and the things that we addressed, which was the Air-Sea Rescue, became more of an important priority because airplanes were going down.

JL: Due to the long distances?

RD: Right. And they were difficult to find. So, it was a priority to get better equipment to do Air Sea Rescue.

JL: I used LORAN on a ship. A ship doesn't go very fast relative to a B-17 or a B-29. Ship rates may be twelve, fifteen, max eighteen knots. That's nowhere close to what…how does the LORAN operator in an airplane keep his triangulation current given that speed?

RD: What they used LORAN for other than Air-Sea Rescue was…most of the bombing runs from Saipan and Guam…they took Iwo Jima, so they had a runway. That's about halfway to Tokyo. But most of the flights that went up there came from Saipan and Guam and those islands and it was a long haul up and back and they had barely enough gas to make that. In fact, on a lot of those islands the roads were all designed to be runways as well so airplanes could land just about anywhere. So, when you took off from Saipan, you were assigned a LORAN number and that was a hyperbola that you flew at a certain altitude that took you into Tokyo or wherever you were going there. Then you had another number to come back on. Then all you had to do in the set was…it wasn't digitized then, so we just lined up those waves, put them over each other and you'd just…

JL: You'd have a sine wave or something like that on the screen and you would superimpose your sine wave on the shore-based sign wave, correct?

RD: Yes. The two base…you had the master station and two slaves and you picked those on your set and you tried to pick one where you were…which fit your location and you were measuring the distance and time of arrival of the radio signal to your airplane and that number…if you stayed on that number you were flying on a hyperbola.

JL: And everything was great if radio conditions were fine but any kind of interference…

RD: Yes. Although the frequency they were at which is just above the broadcast band was pretty good. There wasn't much interference like you would normally get on shortwave or higher frequencies.

JL: I was a navigator in the Navy on a ship in the Pacific and my experience was there were all sorts of holes out in the ocean where your LORAN coverage was not particularly good because of the extreme distances between shore facilities and land facilities.

RD: Yes. That's true and the maps were pretty accurate. It was amazing how accurate they were. So, if you were having trouble with one station you had some options. And if you were flying at 20-25,000 feet it's a little different than being right on the water.

JL: Yes. I'm sure. (laughter)

RD: That's an advantage too.

JL: So, let's go fast forward. You had this assignment at Okinawa. How long were you there?

RD: I think we got on that boat in the summer of '46 and we had a passage back. So, we got back I'd say August maybe of '46. Then I was back at the University that fall.

U of MN, fall 1946

JL: You enrolled at the U in the fall of '46?

RD: Yes. I had accrued a bunch of credits from the George Washington University and so I was able to get through…the University at that time had a …if you had the right grades and all that you could take both EE and business at the same time and get a degree in EE and in business. From the start it would be about a five-year program but…in fact I had the great pleasure of introducing the dean of IT to the dean of the business school. I'm being a little facetious here, but they originally didn't know each other too well and this program was designed to integrate a little bit more the engineering and business curriculums which is a good idea.

Korean War Service

So anyway, I did get back into the service for the Korean War because I was in the Reserve out here at Wold-Chamberlain. So, I was back in the service from around April '51 until October maybe or so of '52. It was about eighteen months. That was because the Reserve squadron here was activated and moved to Fairchild Air Force Base in Spokane and transitioned from mostly C-47 and C-54 planes that carried cargo to B-36s. The B-36 was an airplane with three big pusher engines on each wing. It was designed to fly 10,000 miles. Mid-air refueling. It was supposed to be able to carry an atom bomb to Russia and back. Most of their training was done over the Arctic. All the crew had skis and Arctic clothing. I mention that because that's when I joined ERA. I believe it was before…right at the end of 1952. We were married in December of '50. When we were recalled into the service in April of '51 and we were back out in the fall of '52.

then I joined ERA.

I believe it was before the first of the year there. Right about that time. ERA had just completed their deal with Remington Rand.

JL: So that was when Remington Rand bought ERA. How did you hear about ERA?

Obviously…I'm guessing your obligation to the Air Force was finished and so you were released from active duty.

RD: Yes.

JL: And you started job hunting. Am I correct in guessing how the process worked?

RD: That's right.

JL: How did you hear about ERA?

RD: That's kind of an interesting story too. When we were in the service, we spent six months in Spokane and then six months in Denver and back to Spokane because we had to get the cross training from electronics into armament and we had a new MOS, Armament and Electronics Officer. The reason for that was because the B-36 had a lot of electro-mechanical and electronic device capability on the plane for armament. Everything was automated. Anyway, while we were in Denver, we really liked it there and we had a campaign underway to get everybody in the family to move to Denver. (chuckles). When we got back here, I did start to look around and one afternoon I just happened to be driving on Minnehaha and Prior in St. Paul, just north of University there, and I saw this company and it said ERA. It was about four o'clock in the afternoon and I pulled in there and ran in and got a job app and filled it out and Jim Miles called me the next day and hired me that week. I just hit them at a time when they were staffing up a little more. Jim was heading up sales.

JL: And what was his job title at the time?

RD: I think he was probably Director of Sales. He hired me and he hired a guy by the name of Fred Lang and Fred was an interesting guy. Fred started, later of course, Analysts International and took that forward. He did a good job on that. Became about a $900 million company in services and in current Minneapolis-St. Paul Magazine there's an article in there about Analysts and there's a little blurb there on Fred. He and I went to school together in the U and then we both got hired there and they had three or four other people. At that time ERA was still back in the pre-glider days and our post-glider days and pre-electronic days, so they had devices that they had come up with to stay in business after the gliders and one of them was called a Borehole camera. It was designed to drop down a hole that was drilled for oil.

JL: And see what the rock formation…

RD: Take pictures on the way down, colored pictures of the sides of the hole and later on, the pipes. Then they also had the…it was an antenna…it was a box about like this and it put out a long trailing wire out the back of an airplane to serve as an antenna….

JL: So that was for ASW[1]?

RD: Yes. They sold a lot of them because the Air Force standardized on it for a lot of their…certain types of aircraft. Anyway, it's in that book that you got from…that ERA pamphlet.

JL: Yes.

RD: I think it's…a fella by the name of Fred Hargesheimer was the product manager on that.

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[1] ASW is usually Ant-Submarine Warfare – The reference here was to the Automatic Antenna Coupler (ACC)$_{LAB}$

Fred has a very interesting story about how he got shot down over New Guinea and after the war he went back there, and he spent a good deal of the rest of his life helping those people put up schools and things like that. Pretty interesting story. Anyway, Fred had headed that program up.

So, we had the Borehole camera. They had another product they called the accelerometers, and they would be buried in the ground near a test site where they set off an explosion and they would measure the…they would collect data around that site as they were reacting to the force of the explosion. They also…I think this was a little bit earlier than that…but they built a more advanced form of…they were used to unload the toilets in the plane. So, they would drive this cart up to the plane and put a hose up and pull a dump. So, they did all…and another thing that came along as things moved towards the electronics area more were some systems that I was involved in. So, it was a transition there which is kind of interesting. They were really scrambling to find things they could do after the glider program. Of course, a lot of that involved the expansion of what ERA was formed to do in the first place, which was the computers for the Navy.

JL: According to what Arthur Norberg says in *Computers and Commerce*, a lot of these other products were developed to give legitimacy to ERA as a developer of electronic and other devices as a cover for all the secret work that they couldn't talk about that they were doing with the Navy. Is that accurate?

RD: I think that makes sense. Sure. There was a very heavy security issue there of course, and the company was struggling to raise money, and they had to have something to show investors. But I think what…something that happened that always struck me as being interesting was that they ended up being acquired by Remington Rand and that wasn't…. when you look back at that, that wasn't that big a deal really. But Parker probably…and Norris and some of the key people there probably felt that was the best they could do at that time. But when you think about it, if they hadn't done that deal with Remington Rand…the reason that Control Data was formed was because of that deal with Remington Rand. As you probably know, Remington Rand acquired ERA, after they had acquired Eckert-Mauchly.

JL: Yes. In Philadelphia.

RD: Then they took those two plus their labs in Connecticut and punch-card business and they took the punch-card marketing salespeople, and they put that all into what they called Univac Division and then Bill Norris was appointed to head that up and it was supposed to be headquartered here in St. Paul. Some of the key people like George Campbell and Morrissey and some others that were in New York and really headed up the sales and marketing of the punch card business actually bought some houses out here and were in the process of relocating out here when for some reason the board at Remington Rand reversed that decision and decided they were going to have the headquarters of Univac stay in New York. That was the tipping point for Norris and people to leave and form Control Data.

When you think about it, if that decision had...if they left that like it was with the headquarters here what probably would have happened is Univac would eventually have been sold at a very attractive price to Remington Rand or it might have been Sperry Rand and it would have probably been even more successful than Control Data because it had a punch card, it had the business ties.

File Computer

When I was working in that area for about two years as a sales engineer, I was Mr. Univac File Computer and traveled all over the country to the Remington Rand offices. The Remington Rand office was in every major company because they had all the office equipment, files and all that stuff. They could open any door into any…you name it, Safeway, anything. So, I went around to those offices, and they took me into those companies, and we made proposals to do all kinds of things with random-access memory and the Univac computer. It was just interesting. I mean there were things all the way from…we went to Gray Drug, like a Walgreens. Their biggest problem was knowing what they had on the shelf, and they had huge numbers on the amount of business they lost because people would come in the store and they'd be all out of aspirin. So, all we had to do was tell them…use their random-access inventory control so they knew what their inventory was always in the stores. For example, at U.S. Steel they would pour these ingots. When they got down to the last ingot it was only half full. It became scrap and the total dollar lost because of the drop in valuation of that material was huge. We could tell them how much to put in each metal ingot so there weren't any leftovers at the end. There's a whole bunch of those things that took place in that time frame that to me anyway, as I look back on it, would have been a huge benefit for the Univac Division being at Kennedy and the value and return to the individuals involved would have been very attractive as well. So, it's just a little interesting sidelight on the decision that was made at the board of Remington Rand to locate that office where they did.

JL: When you got hired at ERA this was something new…I mean even though you had a business degree along with your electrical engineering you were put into sales. Did you get a lot of training in sales or did they just say, "Okay here are some clients or customers. We want you to call on them"? How did you get out of school into that first job?

RD: I didn't get any training. I shouldn't say that. I got on-the-job training for two things: on all the products that we were dealing with at the time because I had great people to bring in that had built the products, and they had to know how to use them. The sales training I got from these Remington Rand offices…because these guys were…they had a guy here, *Al Yacht* (sp?) in the Minneapolis office and he was their top sales guy, and he sold office equipment and Cardex and all those things and made a lot of money. Lived out at Lake Minnetonka and all that.

We had a program…Great Northern was one of his accounts and Great Northern had a big problem up in Duluth with their ore car weighing system, 10,000 ore cars, and we had a solution for that. *Al Yacht* (sp?) and I used to ride up there on the train because they had that train up there. We'd sit in the club car, and we'd talk. I got more experience on sales from him. So it was that kind of thing. But ERA didn't really have anything like that.

Remington Rand bought them of course. Remington Rand already had a very strong sales and marketing team. They just used us.

Minnehaha Ave. and Parker

JL: When you were first hired were you working from 1902 Minnehaha where ERA was building these products or did you have an office somewhere else?

RD: No. We were at 1902.

JL: What was 1902 Minnehaha like? There's an account of it in the Norberg book. Do you feel that's pretty accurate or is there something that you recall about working out of that building?

RD: Somewhere in my archives I've got a little certificate awarded to me because I was enrolled into the GSOB…for Guy Shit on By Bird (chuckles). We were in a barn and there were a lot of birds in the barn. Mostly sparrows but there were some pigeons. It wasn't unusual to come to sit down at your desk and there were a few droppings on it.

JL: Oh my.

RD: You've probably seen the building.

JL: I've only seen photos of the building.

RD: It's a big, big building. You can imagine. Another thing about it was that we always kidded around because we said Norris would never heat or cool this hallway which went from the big hangar-like building to the offices and went right by the cafeteria. But on the other hand, it was…because the Navy had their people stationed there and it was doing a lot of classified work it was well supported with infrastructure in connection with that type of thing. But we often wore our coats.

JL: In the wintertime?

RD: In the wintertime. Yes. That one book you have there I think there's some diagrams of the building.

JL: Yes. So, have you ever met John Parker?

RD: Yes.

JL: How was that? What kind of person was Parker?

RD: Parker was pretty much with…I think he's played up to be…in things I've looked at anyway, he was a …he was an executive. He came across that way. He was a financier. He was somewhat of a legend to a lot of us. As the story goes, and I don't know how true this is, but Norris met him on an airplane and Parker had this facility and Norris was looking for a place to put his company. I'm not sure that was true because Norris didn't like to fly. He always took the train. Even when he went to New York, he always took the train. But Parker was a…he always was dressed for business. Of course, most people were then anyway.

JL: All the pictures I've seen of John Parker he's in a suit right out of the 1950s.

RD: He was an entrepreneur.

JL: I mean if you see these TV shows that are set in the 1950s, I can imagine that based on what I've seen of the photos of John Parker.

RD: Yes. John was active as I recall. He was not an absentee guy even though Norris was running the company and John I think had some…I'm guessing a little bit here now…but I believe that he had some considerable influence with the Remington Rand people once they bought the company. For a while anyway. But I don't recall Parker being involved in sales meetings or that type of thing. The one area…as I think here now…an area that was pretty interesting was with the airline reservation systems that started out with…do you have any background in that at all?

JL: Only what I've read in Norberg's book about how…at one time Parker had been on the Board of Directors of Northwest Airlines, and he had throughout World War II because of his involvement with building gliders and the fact that some of Northwest Airlines personnel didn't have a lot to do during the war they were assigned to work on building gliders. Probably the most prominent example of that was James Lamont who was the chief inspector at Northwestern Aeronautical because he'd been an inspector for the airline. So, he was essentially on NWA's payroll, but he worked for NAC inspecting the glider production. So, Parker was very familiar with the problems that airlines would have with reservations and was keen I think to find a solution for that using the devices that companies like ERA were developing and I don't think he was the only entrepreneur who saw opportunity there. I'm sure that people in Philadelphia at Eckert-Mauchly may also have had some interest in trying to develop a reservation system.

RD: Yes. I think that's right. I think Parker and Norris had picked several areas that they felt they had potential in and one of them was airline reservations because they had problems. If you went to the reservation center at TWA in New York, which I did at the time because I was kind of the main sales engineering guy on the airline reservation systems at ERA and at Remington Rand. They had probably three hundred or more reservation clerks in an auditorium and then in the last ten or fifteen rows in the auditorium, those clerks all had binoculars.

JL: To see what was up on the front screen.

RD: Yes. They had those big boards with everything on them. The people walking across on a walk there to post. Of course, they had communication with them but…another example is in Copenhagen for the SAS airline, they had…it was amazing…they had a rotary device about as big as this part of the room here. Actually, it turned, and it had Cardex drop downs, the three by five cards. Of course, they had all the flights on that all the way around and then the clerks sat on the circular bench, and they took the calls and then this thing would come around and they would post the flights. So, it was a perfect example of a magnetic drum.

JL: Yes.

RD: They would fall down this little drum at high speed. But the device that…there was a committee…it was a company called Tele Register that handled…that had a hard-wired non-software registration system that some of the airlines were using. We came to the table with a programmable software-driven system that could be changed. The airlines had a committee that met regularly on this subject because they communicated to each other and they could sit around for two or three days and argue about whether there should be a comma here because the messages had to be very, very precise and compatible for them to use the system they were using. So, when we came in and told them that our system was programmable. You could do anything you want with it. That was a huge change in their thinking and because of that ERA, Remington Rand, Sperry Rand got a real leg up in the airline reservation system business and it moved all the way up. I think 1108 was probably the largest computer that handled all the airline reservations for United Airlines. There were two huge systems. One was run by American Airlines and the other was run by United. Sperry Rand had the United business, and American Airlines owned the other system. That whole thing evolved and…I remember when I went overseas the first time to visit these international airlines, Norris wanted to see my presentation. So, I'm in the middle of the presentation and he comes back. Sits down. We knew each other well. I just talked to him. He just sat there and when it was all through, he came up and he shook my hand. He said that it was a pretty good presentation. I kind of turned away and then he turned back and said, "By the way, you had that drum upside down." Norris had eidetic memory capability (chuckles). That's the kind of guy he was.

JL: So, if you wanted to quantify the number of times you met John Parker or talked to him would it have been just a handful of times or once a week or…

RD: I would be more in a handful. I didn't have any reason to meet with him regularly.

JL: To your knowledge, did Parker ever walk around the plant floor looking at actual manufacturing operations or did he pretty much keep to the executive offices?

RD: When he was there…I can't…some of this is hearsay too, you know, because you hear things. You see things. But my impression on John was that he was very interested in what was going on and when he was there, he would go and speak with Seymour and Jim and some of the other…maybe Jack Hill. Seymour Cray and Jim Thornton headed up the two projects for solid state, Magstec and TransTec. They were right across the hall from each other, and I was their referee. (chuckles) But they went to the U too.

JL: Yes.

File Computer part two

RD: And they were competing with which technology would win out in solid state. Of course, the transistors did. That was an Air Force project and Magstec was a Navy project. Magnetic amplifiers. Another thing that was kind of interesting there too is the Univac file computer…that should be the machine that should be in the Smithsonian because there's everything you can think of with technology at that time in that machine and the transition to solid state because they went all the way from vacuum tubes to magnetic amplifiers to transistors to magnetic cores and it had a magnetic drum as memory.

It also had a plug board like the punch card equipment has. So, all those things were incorporated into this computer, the Univac file computer, and the input-output devices on it were all punch-card readers, punches, a tabulator as a printer. If you put it all together and the magnetic drum and some other things it was a perfect configuration. Even today if you were going to try to build something that represents technology evolvement from punch cards to computers…it was perfect for that.

JL: And what was the formal name of this device?

RD: It was called the Univac File Computer, and we used that in the…we had that installed in about seven or eight airlines. Northwest had it. Capitol Airlines, Eastern Airlines. Two or three international airlines.

JL: What was the work environment like? Was the compensation reasonable for that time period?

RD: The compensation was reasonable, yes. On the high side. When I graduated from college these two friends of mine were driving…one of them had a car…. we were going to drop one guy off and then take me home. This was right after our graduation. Just before we dropped him off, we were talking about this compensation and I remember him and his comment he said, "Boy, if I can just someday make $10,000 a year, I'll be very happy."

JL: That's in 1950 dollars which probably would…you'd have to multiply that maybe by eight today to match …I don't know what the inflation rate would calculate it out to be.

RD: If you were making $10,000 a year then….

JL: That was good money.

RD: That was REALLY good money. Yes.

JL: The engineers who first worked at ERA all had the opportunity to buy stock. I'm reflecting on Norberg's account here. It was like ten cents a share is what they paid for that stock. Were you ever offered the opportunity to buy stock in ERA?

RD: Have you heard of Bill Drake?

JL: Yes.

RD: Bill and a couple other guys and I were involved a little bit in that but not directly…they set up an office in Bill's basement and they sold ~~ERA stock~~. I'm sorry. They sold Control Data stock at a dollar a share when Control Data was formed. I don't have any…I don't know anything about the ERA deal because that was in 1946.

JL: Yes.

RD: Of course, Remington Rand bought ERA before I…I think that deal was pretty well done before I got there.

More Minnehaha Ave.

JL: When you were working what would you estimate was the number of people who were employed there at 1902 Minnehaha?

RD: (deep sigh)

JL: Was it several hundred? More than that?

RD: I'd be guessing on that. I would say that it was at least a hundred. It's hard for me to…what I'm doing right now is I'm thinking about the offices and people.

JL: The physical layout.

RD: I probably knew and would recognize and have actually worked with about twenty-five people there, mostly engineers and some sales and marketing people. Twenty-five or thirty.

JL: Did the engineers ever ask people like you who were in sales what kind of feedback you were getting from customers about things that worked or didn't work? Trying to get ideas about how they could improve the product that they were working on.

RD: No. The reason for that is because almost all the work they were doing was classified and they were building something very specific for that type of customer. But, on the other hand, when they did finally get…they took one of their computers, I think it was called the Logistics Computer for the Navy, and they gave it a new name, the 1101.

That was the first 1100, I think. They built that for commercial applications. They gave a couple of those to universities. One in particular to…what's that college down in Atlanta?

{Editor's notes: Mr. Daly's memory must be hazy. 1) The 1101 was the commercial number of the classified ATLAS. S/N 3 1101 was in the Washington DC ERA office for a few years before going to the Tahoma Technical Institute then to Georgia Tech. (https://vipclubmn.org/CP24bit.html#1101). 2) The Logistics Computer was the predecessor to the File Computer. It was delivered to the Office of Naval Research in 1953.}

JL: Emory?

RD: Yes. Emory. They gave one to Emory. I remember going down to Emory and they had the Coca Cola people, big funders of Emory. We stayed at the founder of the Coke…I forget his name now…we stayed at his estate.

JL: That must have been fun.

RD: It was a big deal.

JL: And what did the university use it for? Was it for their science and engineering programs or…

RD: Yes. Science and engineering.

JL: So, it was seen as an asset to their research.

RD: The ERA technology was scientific and Eckert-Mauchly technology was considered to be business. That had to do a little bit with the way the core technology and the word length, size of registers, and the core of the computer was built. As it turned out, that became less-and-less of an issue in terms of how the devices were used, but initially that was a big deal.

Women and Software

JL: Were there women who worked for ERA? There had been with NAC a large corps of employees who were women because building the gliders required a lot of hand work. They had women who were employed operating sewing machines to stitch up the cotton fabric that went over the wings and the fuselage. They had a lot of women who were involved in finishing and applying paint and things of that sort. So, I'm trying to get a sense of did that employment end with the end of the war and ERA was primarily men or not?

RD: There were women secretaries and that was about it. I can't recall one woman engineer or even in sales for that matter. Just weren't there.

JL: Okay.

RD: There was a woman that was quite prominent in the industry, Grace Hopper.

JL: Yes. That's a name that even I'm familiar with as a non-expert. But she had been in the employment of the Navy throughout World War II.

RD: She was very instrumental of course in building COBOL.

JL: Did you ever meet her?

RD: Yes. Several times.

JL: What was your impression of Grace Hopper?

RD: She was all business. No monkeying around and she could put you down pretty fast.

JL: Yes. She's credited with developing COBOL language. Did you have to learn programming languages like COBOL as part of your job?

RD: I did. I programmed Univac I, but I never got into that too…when you wrote programs at that time you wrote them out and then you punched cards.

JL: Yes. I am familiar with that process.

RD: Then you took your cards and turned them in and a couple days later you got them back. That type of thing.

JL: Would you get back a printout of what the program is, the execution of the program?

RD: Yes, you got a little printout too.

JL: Was that done with your typical printer character by character?

RD: Typewriter or…

JL: You'd have that paper that has holes on either side.

RD: Tabulator. Yes.

JL: So that would be your printout.

RD: Yes. You took the cards over and put them in the tabulator. The punch card tabulator. Printer. Although the Univac I did have a magnetic tape. It was the first typewriter that was driven by magnetic tape, not punch tape.

JL: Besides COBOL were there any other programming languages that you learned?

RD: I learned a little bit about Fortran. Not a lot. That was about it. There were two or three other languages that were used, but they were very specialized. You can imagine when you wrote programs with assembly language you had to know the registers in the machine. You had to take code and character by character and register A and then into B. Then you did have a command that would add them up or do something with them and put them in C. (chuckles)

JL: So, it was a long, slow process.

RD: Yes.

JL: Writing a program.

RD: Very much so. Yes. COBOL was a huge step forward.

JL: I'm familiar with COBOL but I never learned anything about it other than okay it's another programming language and it's used a lot in science. That's about where I got with that.

RD: Actually, Fortran was the…COBOL was more of a business language and Fortran was the science.

JL: Okay. I got them backwards.

RD: COBOL used a subset of instructions that were written to do what I just said with a command of add or subtract. So, they just kind of moved things up to a level.

JL: Do you remember anything particularly funny or memorable about your time at ERA? I want to try to wrap this up. I realize you have other things on your calendar.

RD: I've just got to watch my time a little bit here. On an overall basis what I suggested on the….

JL: When did your employment with ERA end?

RD: When I started a company with Fred Lang in…we started that company in 1961 or 62. I was in Washington, D.C. at the time because I'd been moved down there by Remington Rand to take over from Hank Forrest who was one of the founders of Control Data on all their government business. Fred was back here. We, along with four other individuals, formed a company called Aries Corporation to do programming and support services work.

(Recording ends here)

Editor's notes:

1. The 1952 ERA Directory has Daly, Richard P. at 5148 Xerxes Ave. So, Mpls. 10, Minn.
2. By Peter Patton: Fred Lang left Univac to start the first software company Aires International with Rich Daly. When all the business went to DC, he sold out to Daly and started Analysts International Corp. At that time, I had left Univac to join Vic Benda and Fred Lang (creator of Univac's first FAA On-Line system using the file computer and those little paper strips] to join Aires International (AiC) as General Manager.
3. Lowell, I misspoke when I called Fred Lang's FAA project the "OnLine" system. Of course it was the EnRoute System. He used the Univac File Computer which succeeded the old RemRand mechanical punched card units. The machine kept track of all flights in an FAA airspace control area and was updated by radar and/or manual inputs. It printed out little strips of paper about 3/4" by 8" and these were posted in slots on the ATC's "board" and moved about manually as flights took off/landed, entered/left airspace, etc. www.vipclubmn.org/People6.html#Patton

Mr. Daly's Obit

Extracted from the March 2022 VIP Club newsletter:

Richard P. Daly – Age 97, a former ERA/UNIVAC pioneer in our business, passed away peacefully on January 26, 2022, surrounded by family. Besides publishing the usual obituary, Neal St. Anthony, a Star Tribune business columnist/reporter, wrote this column on the 'Godfather' of Minnesota's software industry:

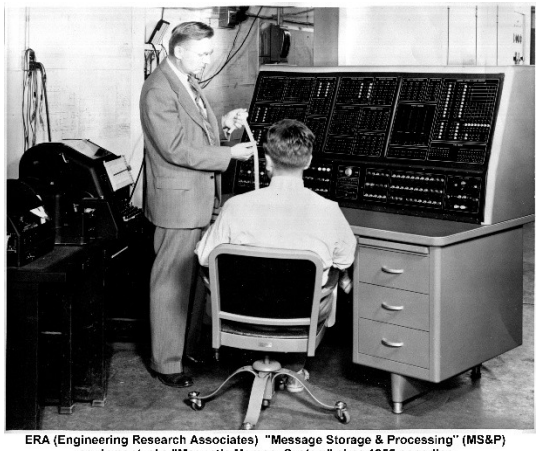
https://www.startribune.com/richard-daly-was-a-godfather-of-minnesota-software-industry/600145833/

Richard Daly, a 'godfather' of Minnesota software industry, dies at age 97 - StarTribune.com. A dynamic optimist and fearless entrepreneur, Rich charged through life with a can-do positive attitude. He was a fixer, adventurer, Boy Scout pack leader and career coach. He could and would do anything for his family and those who became adoptive families under his welcoming wings. A love of country rang true throughout his lifetime with a distinguished military service career serving in World War II and the Korean War, and the Air Force Reserve. He was a visionary and enthusiastic entrepreneur with a career in the computer software and services industry.

After earning a bachelor's degree in electrical engineering and an MBA at the U of MN, he worked at Engineering Research Associates, Remington Rand, and UNIVAC in the nascent days of Minnesota's computer industry. He moved his family to Vienna, VA, to start Aries Corporation and then came home to MN to lead Comserv from a small start-up to a successful international corporation. Often referred to as the grandfather of Minnesota's software industry, Rich was instrumental in creating the Minnesota Software Association (now the Minnesota High Tech Association) and is featured in the Minnesota Science and Technology Hall of Fame and received many other industry awards and honors.

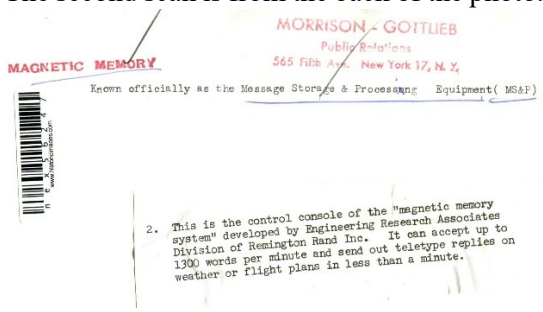
Mystery Computer

On July 7, 2025, Computer History Archives Projector (CHAP) Director Mark Greenia sent a message to Lowell: "I recently purchased this photo of an ERA Message Storage and Processing machine, which was from the photo files of Morrison-Gottlieb Public Relations, NY dated 1955.



ERA (Engineering Research Associates) "Message Storage & Processing" (MS&P) equipment, aka "Magnetic Memory System" circa 1955 or earlier

The second scan is from the back of the photo.



I was wondering if anyone knows of more information about this machine?"

The answer is yes! Lowell immediately recognized the person standing as Jack Hill, an ERA pioneer.

The date and back of the picture "flight plans in less than a minute." are the clues that this is the control console of a File Computer delivered to the FAA's predecessor for en-route flight monitoring and controlling. Section 2 of www.vipclubmn.org/aircontrol.html, shows the time frame of the file computer use for air traffic control. www.vipclubmn.org/Computers.html, Section 3 lower left shows the *flight plan storage system* leading to the File Computer models.

At the Lawshe Memorial Museum, archivist Keith Myhre found picture 7234A which has a similar console without people, a blow-up of the console nameplate is:

It is serendipitous that this "Mystery Machine" inquiry would come to us while editing the interview of Rich Daly who was involved with the marketing of these machines!