Oral History of Robert L. (Bob) Massard

Interviewed by:
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Gardner Hendrie: Well today [June 27, 2005] we have Bob Massard with us, who is one of the founders of Computer Control Company, 3C and he has been very gracious in agreeing to do an oral history for the Computer History Museum. Thank you very much Bob. The first question I guess, maybe you could tell us a little bit about your family background? Where you were born. You know how many siblings you have. What your parent's did. Just to sort of understand where you came from.

Robert L. (Bob) Massard: Yes. I was born in Ouray, Colorado. My dad had been born there himself in 1897 and I was born in 1925. My mom came to town to teach high school math and they got interested in each other in 1922, they were married at her parent's home in California where there was an orange grove that her dad was taking care of. And my mom and dad lived in the same house from 1923 on through to the time that they both passed away. My mom in 1976 and my dad in 1998. He was 101 and nine months old when he passed away. I grew up there and went to high school there and graduated. I was valedictorian of my class.

Hendrie: Can I role back just a little bit?

Massard: Yes.

Hendrie: Do you have any brothers or sisters?

Massard: I had a brother who graduated from high school but he got a strep infection on a company picnic and when they were swimming in the pool and died from it. So that's the end of, so I have no siblings.

Hendrie: You have no siblings.

Massard: My dad was… He and his partner bought a drugstore in 1920, the busy corner pharmacy at the time and they bought it and turned it into the Post Office Drugstore and they ran that until 1965 or so. They both took correspondence courses on drug, becoming pharmacists, so that they both became registered pharmacists in Colorado and could dispense drugs then. Which was much more simple than it was these days. My mom taught, I mentioned math in high school for a year and then she was married and she became superintendent of the schools after that for a while and my dad was mayor of the little town. There was only about 4,000 people. The high school had a science teacher that inspired me and my mom to become a chemist so I took up thinking I would go to college and get a degree in chemistry. So I went to Western State College in Gunnison, I got a chance to go there, it was all pre-paid.

Hendrie: Oh you got a scholarship there?

Massard: Got a scholarship.

Hendrie: That's very nice. Now where is Gunnison?

Massard: Gunnison is right in the middle of Colorado, it's the coldest spot in the nation once in a while. It was -35 there one time, but it wasn't noticeable it was dry. So there was a chemistry teacher there, Dr. Schumann who had come from Texas A&M and he inspired me to continue being chemist but along came World War II and I decided maybe the Navy would have more use for electronics then for chemistry. So I got into the V-12 program and went to the University of Colorado under the V-12 program and became an ensign in the Navy. And got a degree, BS in EE from University of Colorado.

Hendrie: So it was really not some life long interest in electronics, but the fact that it was war time and you decided this would be a good move to make?

Massard: Right, it was my secondary interest and I thought it would work out and it seemed to work out very well. And then after the war was out, I graduated November '45 from University of Colorado and so things were settling down as far as World War II were concerned. But I became an educational services officer and was sent out to the Philippines and did a little bit of duty but it wasn't active war duty at all. And I was on a LS-T953 [tank landing ship] for quite a while, coming back and decommissioning it and got down to Beaumont, Texas when it was decommissioned. And after that I—

Hendrie: So how many years was this? How long was your Navy career, roughly?

Massard: This was in '46. Then I went back to Colorado and was at Ouray a year or so.

Hendrie: At Ouray?

Massard: Ouray—

Hendrie: Oh university.

Massard: — O-U-R-A-Y is the name of an Indian chief, his wife was Chipeta and he was named Ouray, Ute Indians. And they use to summer in, or winter in Colorado where the warm springs were in Ouray so that they named the town after him. So that I decided I didn't have enough electronics. I went and applied to University of California and to MIT and I got accepted at both for a master's degree. And I—

Hendrie: Which university of California? Berkeley or—

Massard: Yes. And I flipped a coin, got accepted to both, flipped a coin and ended up in Massachusetts. So I drove back to Massachusetts and attended MIT and got my masters degree there and was very fortunate. I felt badly for the undergrads there because they were really worked to death. But I was very fortunate to be assigned to the computer lab, when they were building the Whirlwind Computer. And there I met my future wife and that worked out fine.

Hendrie: Now tell me a little bit about that period? What did you work on when you were—?

Massard: I was looking around for a thesis project that would fit in with the work that they were doing there and the oscilloscopes that they were using were very minimal, they didn't have the Tekronix scopes yet, they just had old DuMont scopes. And so I thought maybe it would be a good idea to work on, they assigned me a job to work on a high wideband amplifier to put in these scopes. So you could look at pulses, one megacycle of pulses which had a frequency response up to five or five megacycles.

Hendrie: And they couldn't really see them very well?

Massard: They couldn't see them, they couldn't get them through the amplifier that was there, which was much lower bandwidth. So I used several transmitting tubes that were very hot and came up with an amplifier that had peaked circuits to it and so forth, that really did do a good job, though it was quite warm. Had a lot of heat to it, had to be cooled, but it did give a really good response. And then my thesis was on the basis of testing those amplifiers with pulses and predicting what was going to happen to the pulses when you put them through these various circuits. And it worked out pretty well. So that was very fortunate, it worked out.

Hendrie: And it ended up with an amplifier that they could use on their scopes—

Massard: Yes, that's right.

Hendrie: —to look at Whirlwind, do work with Whirlwind.

Massard: Right and later they got the Tektronix scopes like at Raytheon. I went down to Univac and I met General Leslie Groveson. He showed me around and whatever, but it was a little remote and I thought maybe I'd try Raytheon instead.

Hendrie: It was in Philadelphia. Well had you met your future wife already?

Massard: Yes, we were married in 1930, 1950, wake up, wake up.

Hendrie: Okay, which was while you were still doing your master's thesis or was that after that?

Massard: I had just got the masters degree then I had been working at Raytheon but working on the master’s degree at the same time after 1949. So I applied to Raytheon and was interviewed by Charlie West, the fellow in charge of the RAYDAC Computer and was hired in 1949 at Raytheon.

Hendrie: Okay, but you still had your thesis work to finish; you'd done all the course work?

Massard: Thesis work, yes, I had to finish up my thesis.

Hendrie: Okay, you looked at Univac. Did you meet either Eckert or Mauchly there?

Massard: No. Just General Leslie Groveson that showed me around. But it was just a little remote from here and I didn't want to stray too far. So I thought Raytheon would be much better and it turned out to be fine.

Hendrie: And this is when you applied to Raytheon and they allowed you work on your thesis too while you worked there or how did you arrange that?

Massard: Yes, it was at night, I had a lot of the things worked out, the formulas and graphs worked out. And so I got a draftsman at Raytheon to do on her own time the graphs that I needed and I had taken all of the pictures I needed and just needed to duplicate them and so forth. So I got the thesis out and got the degree.

Hendrie: So you know you were hired in this group that was working on the RAYDAC Computer. What stage was the RAYDAC at that point when you—

Massard: It was just being designed including even some of the circuits. They had some flip-flops that were single entity with a couple of little tubes that came from the lab 16 next door that they used for in missiles and they were subminiature tubes. They had no sockets but they just had wires coming out of the bottoms of them. And so they had those flip-flop circuits designed but then they were working on something called a pulse stretcher which was a regenerative circuit that would go into either of two states by itself with a single tube. And that was used pretty universally in the circuitry. The flip-flops were 3.9 megacycles I think, something like that.

Hendrie: Okay. That was the clock rate?

Massard: Yes, the clock rate.

Hendrie: Of the machine?

Massard: Right. So I was assigned to the external memories along with Ken Rehler (ph?) and the tape drives were furnished to us, the half inch tape drives were furnished to us.

Hendrie: Who made those?

Massard: Norm Gibbs, it was all internal design to Raytheon there was nothing purchased. There was nothing available—

Hendrie: Okay, but it was made in another department?

Massard: Well no, it was part of the computer department.

Hendrie: Oh so it was designed by a fellow at Raytheon?

Massard: Oh Yes, everything was done within, same way with Whirlwind at MIT, it was just everything was done within, you'd have a machine shop, they made their own mercury delay line memories and whatever for RAYDAC, kept in constant temperature.

Hendrie: All right so all of those—

Massard: Everything was—

Hendrie: —the transducers—

Massard: —made from scratch.

Hendrie: —for the delay lines, they just had to design everything?

Massard: Everything, and including the heads that were on the magnetic tape, they were very, very narrow, made out of mu-metal or something maybe and had a little winding in the middle and they had to be fitted so that there was six or eight of them across the tape.

Hendrie: How wide was the tape? Do you remember?

Massard: It was half-inch.

Hendrie: Half-inch tape, okay.

Massard: Yes, and on the backside were these marks that marked a block of photoelectric reading with the number of the block.

Hendrie: So that you could spin the tape faster than you could read it, counting the blocks, so that you could find a block without having to read every—

Massard: Yes.

Hendrie: —single bit on the tape?

Massard: Right, you would spin it faster and read it photoelectrically and then when you came to the block that you wanted you could anticipate where it was, so far ahead or whatever and stop the tape within a half an inch or something like that. You could see the pulses on the tape if you put magnetic filings on there and put little steel filings on. You could see the little pulses all along the tape.

Hendrie: I think there's a picture that you showed me earlier in your collection of pictures.

Massard: Yes.

Hendrie: I saw of the—

Massard: Filings on the tape. So everything was from scratch and there was 16 racks of equipment that somehow worked, edits, acceptance test just like you wouldn't believe for two hours.

Hendrie: Well tell me a little bit more, before we get to that about the mag tape units. Now what did you have to do?

Massard: Well I was helping design the circuitry that went with the tape units along with Ken Rehler. They had amplifiers that amplified the little pulses being read off the tape as the magnetic marks went by and after that there were logic circuits we were designing to make use of and double check the bits coming off the tape. Because they were check bits and each word that was coming off the tape. So that you could regenerate by looking at the regular bits to see if the check bits checked and so there was a check unit on each of the mag tape units. And you just had to reliably read the blocks on the tape knowing what was on there and make sure that you transmitted it when it was asked for by the central control.

Hendrie: Okay, so there was some storage in the control unit for this?

Massard: Yes, some storage.

Hendrie: Yes, that would hold a block—

Massard: Yes.

Hendrie: —or something of tape information so the computer could look at it when it needed it.

Massard: Yes, so there are four tape units and four racks and there was a hunt unit next that was the one that was suppose to request the tapes to do so and so and produce so and so. Bill Wolfson was in charge of that.

Hendrie: Okay, so you were basically doing the rewrite amplifiers and the control of the motors?

Massard: Yes, the controls of the—

Hendrie: Actual drive?

Massard: Right and the logic associated with just transmitting the pulses in and out of the units. The pulse structures that everybody liked so much that had a single tube for a double state, on or off state was interesting in that if you varied the voltage on the supply to it you could actually get it to quiver in an in between state and so you had to make sure that your power supplies were always exactly you know right. That the voltages were exactly right and a way to check out a circuitry or whatever was to lower the voltages on that rack or on that chassis or whatever to see if something failed. So they would check it out that way sometimes, by selectively lowering voltages.

Hendrie: So they did voltage margin check?

Massard: Right, this is the only computer that I ever saw that was Freon cooled. The racks were hollowed had Freon flowing through them, cold like in air conditioners or whatever, but the Freon was cold and all the tubes were covered with drilled out soft aluminum blocks so that they would transmit their heat into the soft aluminum block that would be attached to the racks that had the Freon flowing.

Hendrie: So the soft aluminum it was like caps over all the tubes?

Massard: Yes, Yes, it was a four by four piece of aluminum that had holes drilled in the tubes fit into and screwed onto the racks and it was soft, it was an 18" rack or 16" rack and so it cooled it all right. And the memory was the 4,096 word memory mercury delay line, so they had a pot of mercury there that they kept within a tenth of a degree and it had crystal transducers in the mercury and you'd pulse those and send a string of pulses through the mercury, a delay line and hopefully get it out the other end. Keep recirculating it, have 4,096 words of 36 bits each I believe it was.

Hendrie: Now what units or what parts of the computer you know did the engineers have the most trouble with in terms of getting it up to the point where it would pass its acceptance test?

Massard: Well they had pretty high speed and very clever arithmetic units that sometimes had a bit of trouble in repeating themselves. But there could be a loose 75 ohm cable somewhere or a loose tube or a failing tube and it could really just happen anywhere and you go check this and check that and then replace a tube, a flip-flop or replace something and it was just amazing, we worked all night for acceptance tests and we didn't know if it was going to pass or not, but the darn thing ran for two hours. It would never run like that before.

Hendrie: So do you think there was some luck in there maybe?

Massard: Yes, every much so and also the whole stable environment of having it had it run all night long and not be affected by anything else so that it was really very good.

Hendrie: Now when was this? Do you remember?

Massard: That was 1952, November, possibly something like that.

Hendrie: Okay, so you worked there a couple of years before the—

Massard: I worked there from 1949 to 1953. And left there in mid-fifties.

Hendrie: Okay, who was the project—

Massard: Mid 1953.

Hendrie: —engineer there on that project?

Massard: Well there were two different ones, Lou Fein was the project engineer early on but above him was Dick Block and I think Dick was totally in charge of the whole RAYDAC at the time and had other mathematicians and the software people and all the hardware engineers under him.

Hendrie: Okay, so he had everybody?

Massard: Richard Block.

Hendrie: Richard Block, he isn't any relationship to Erich Bloch, is it Erich Bloch?

Massard: I don't think so. The last I saw of him he was out on the west coast with us when we were installing the RAYDAC out there, but I don't know—

Hendrie: What happened after that.

Massard: I don't know.

Hendrie: All right.

Massard: I was the one that went to him and said you know all these engineers are going to have to go out there and spend six weeks at a time installing this thing. You know and I'm not going to leave my wife behind and baby and so he said, “Okay, well we'll send them too.” Larry Bolange (ph?) and his wife and children and Frank Dean and his wife and children and Ann and I and our one child at the time and so we all got out there and spent six weeks and then later on another six weeks in 1953 installing the RAYDAC.

Hendrie: Wow okay.

Massard: It's very helpful and it wouldn't have worked out any other way really.

Hendrie: Yes, you really needed to have the people who designed it there to just figure it out.

Massard: Yes, and so then Lou Fein and all of us started getting together to form Computer Control Company and Lou had the idea, which was a darn good idea get the RAYDAC contract to maintain the computer out there. And since we were totally familiar with it, since we'd designed and built it why it was very sensible of the Navy to give our little company the contract, award the contract to do it.

Hendrie: Okay. Do you remember anything about the early discussions about whether to start a company and you know what you thought about it and what some of the other people? Were some people more enthusiastic than others?

Massard: Well the idea, Lou Fein got people together and he selected persons who had different hardware capabilities in the group that was at Raytheon and he wanted a representative from each section and the external memory, there was Ken Rehler and I. And the hunt unit was Bill Wolfson and the central control was Frank Dean and the earth medic unit was Ben Kessel and the software was Bob Brooks and I was also working for Norm Gibbs the one who designed the external memories tape drives. So I was useful in that way too, so we were all contacted and got together just on our own time from time to time and started talking about well what are we going to do in the future? Raytheon had joined up with Honeywell to do a 458 project make another big computer with some really heavy duty mag tape like four inch tapes that they were designing with pneumatic controls on them and everything. So we thought we'd like to do something on our own and we thought also that we had skills that were good enough to be able to get a job any time, therefore we weren't taking that much chance on getting together and trying to do something and then Lou had the idea to get the RAYDAC contract which indeed supported everybody minimally for three or four years. And gave us an opportunity to generate ideas for new products and it wasn't until sometime that we decided to come up with the V-Pacs and the Logic Pacs and things. But we went through several different ideas, tried to get contracts.

Hendrie: Okay, when you got the contract and decided to leave Raytheon, who went out to do the maintenance? Or did you shuttle back and forth? Everybody take their turn, or how did you organize the company? Your original plan was to have the contract to support you while you thought up, got some other contracts or products?

Massard: That's right. It did the contract gave us some G&A and profit money on a CPFF contract to support persons, a couple of people back here. So originally back here was Bob Massard and Bill Horton and Bob Forsberg and we were joined by Bob Brooks shortly after that. And we were in Belmont at a friend of Bill Horton's, Dick Brew who had a machine company and he was making transducers for quartz delay lines, and so we were able to rent a little space in Belmont from him. And went west was Lou Fein and Ken Rehler and Bill Wolfson and many others went west and stayed there for some years. Julian Harwood went out and Lou and Ken decided that they really didn't want to come back here and be part of the organization back here. So there was this schism that occurred that should we have a major part of the company on the west coast which had most of the employees, or should we have the research back here and come up with the products here and we decided to stay here. So we stayed and we bought Lou and Ken out of their original investment. We were all going to put in $5,000 over a period of time each to buy our stock, we were all going to have equal amount of stock, except Lou had double. And so those people went out there like 1955 or so, Bill Wolfson came back and Bob Mascho (ph?) came back but he was not a founder and so some people were hired directly from Raytheon to go out there and that grew up to be about 50 people and stayed 50 people for as long as we had the contract.

Hendrie: So this took a lot of people to maintain and operate this computer?

Massard: It was a $250,000 a year contract and it took quite a few people to do it. There was a lot of mathematics to it, the Navy was doing a lot of work on missile or trajectories and so they worked it out. But eventually the company got to be a smaller version and we finally didn't have the contract anymore and we had a couple of products out there, but it didn't amount to much, because we didn't want it to. So we're doing everything back here.

Hendrie: All right, good. Back here, getting back to what sort of you were doing and the part you were directly concerned with. You know what were your first thoughts about products? You didn't have to spend any time worrying about the RAYDAC—

Massard: Right, no.

Hendrie: —back here. So what were you and your partners thinking?

Massard: We had some contacts, Lou Fein had some contacts with Navy Sub Signal in Boston and they wanted a Vector Impedance Locus Plotter, VILP built, so we tried to develop one of those for them, which would plot out the impedance of a circuit by checking it out and we weren't able to do that. So we didn't get the job.

Hendrie: Would you like a break for a second?

Massard: Yes.

Hendrie: Okay, here we go. All right we're back on.

Massard: Since RD Brew and Company over in Belmont was turning out these transducers, these delay lines for other people, we thought maybe we could make and did a product out of a sonic delay line. And so Bill Horton was in charge of that and he worked with RD Brew and got some delay lines turned out and the amplification of the mini signal that comes out the other end of the delay line has to be pretty sensitive. So he turned those out and so we came out with a sonic delay line product and we kept that for quite a long while.

Hendrie: And that was really the first product?

Massard: Right, and another product we came up with that we thought was quite useful for ourselves and we sold a few of them, but it wasn't anything wonderful. It was a unit that plugged into a oscilloscope, these were tectonic scopes by then finally, in 1955 I think the Tektronix came out with scopes and they were designed specifically to help people see pulse circuits. So we came out with a dual beam scope, so that we could have two beams at the same time and compare timing on the two beams. You couldn't get that within the original Tektronix, after a while they started doing it themselves.

Hendrie: Yes, I remember they came out with a dual beam later.

Massard: Yes, so we did that, it's blinking. Is it running out.

Hendrie: We're still fine, we have another five minutes.

Massard: Okay.

Hendrie: So that really shared the beam—

Massard: We could put two beams with the same timing on them and have the same sweep on both beams, but feed from another scope, whatever [the] signal was so that two could be compared timing wise.

Hendrie: So you had to have your own tube, a cathode ray tube and all of that, a dual beam tube or—

Massard: Yes.

Hendrie: Okay, so you acquired those—

Massard: It sat on top of one of the scopes and plugged into both of them.

Hendrie: Wow, all right, very good.

Massard: That was good, and then somebody got the idea of a universal logic package and I think that was Frank Dean and that was done with a tube and one micro-second delay through the package. So you could have all sorts of gating into the tube would amplify back up to whatever level that was normal throughout the thing. Then you could plug these into a rack and connect them together and make all sorts of different logics circuits out of it. It was called a Universal Logic Circuit and we called it a V-Pac, I believe it was. So that was our first real digital product.

Hendrie: That was the beginning of the pacs?

Massard: Right.

Hendrie: Okay, very interesting. I'm going to change the tape right now, just so we don't get stuck.

Hendrie: Who did you sell those to, the V-Pacs?

Massard: Well, I believe—I don't recall directly but I believe that the interest in them was pretty great in universities, in all the navy installations, army installations, and very few companies were interested at that point although some of our first system products were for companies directly but the original V-Pacs I think we sold most to universities or military.

Hendrie: Who did the original selling? Do you remember hiring the first salesman?

Massard: Well, Bill Wolfson was the sales department and he would—he did an awful lot of work although on a system unit. Bob Brooks was president and I was treasurer and engineer at the time. We went to Eastman Kodak and did a—

<crew talk>

Hendrie: We were interrupted.

Massard: So Bob Brooks and I went to visit Eastman Kodak for example and had quite—many conversations with Art Tyler, the head of their Minicard program and they were interested in getting a unit built that would handle their Minicards which were little pieces of film about a half inch wide and about two inches long that had a- several pages of information on microfilm plus an area with a bunch of coded dots that could be read by a scanner to handle— It's a library filing system in effect. And so we talked to Art Tyler quite a bit and we got a job from them to build a Minicard selector and it was quite a sizable unit that we turned out, many, many engineers working on it and whatever. It was 92 Broad Street.

Hendrie: Was this a relative of one of the early systems contracts?

Massard: It was one of the early systems.

Hendrie: Do you remember when you started talking to them or when this sort of genesis was?

Massard: No. Well, I'd say 1956, just a guess. Yes.

Hendrie: Something like that.

Massard: So some systems were handled by different persons but ordinarily Bill Wolfson did an awful lot of traveling to visit all these different facilities, navy and army and air corps facilities, to either sell them on buying a bunch of Pacs to do their own systems. Some of them were able to do that or sell them some kind of system. One of the companies we made a system for was Westinghouse- or Western Electric and well, there's a whole lot of them that could be listed off but—

Hendrie: Just—

Massard: I don't remember them.

Hendrie: That's fine. You personally were still doing engineering back in the early days—

Massard: I was doing some, right, but I did get— Bill Wolfson was just put up as treasurer originally but I did decide that I was interested in finance so I took a Alexander Hamilton correspondence course, tried to get caught up on business aspects and accounting and so forth and so that worked out all right and so I took over the whole treasurer's department and hired Julian Harwood and a bunch of others and we took care of all the internal financial situations.

Hendrie: So you would probably have been called chief financial officer in today's world.

Massard: Yes. It stayed that way through our public offerings and everything until 1965 or so and then Dick Mills was hired and he eventually became VP Finance when I left and he was controller to begin with. He came from DEC.

Hendrie: Let's continue with some more of the history of 3C's from your eyes now more in worrying about the finances than the actual projects. After V-Pac and the big Kodak contract, were there other big contracts that you remember that were pretty important in the growth of the company?

Massard: I remember what the checks looked like but I don't really remember what the projects all amounted to unless I reviewed a bunch of them. There were quite a goodly number of them of different sizes from a few thousand dollars to $3–400,000 size and they varied depending on what state our product development was going [through]. We went through several different— When transistors came

out, we started making the transistorized Pacs and that was a real step forward from tubes and more and more circuits per Pac and so forth.

Hendrie: In the management of the company, at some point there was a transition and Ben Kessel became the president. Could you talk a little bit about what led up to that and then—?

Massard: Well, I don't really recall much of the details except that I know Bob Brooks was president for quite a while after Lou Fein left and Bob did a reasonably creditable job. On the other hand, it was almost as if we were all equal and therefore somebody else ought to take a turn being president and I wanted to do something else but I'm not sure that that was—it's hard to distinguish why things really happen but Ben took over. He was a little more inclined to be president I guess than Bob was.

Hendrie: Do you remember when this was or approximately . . . ?

Massard: I suspect it was near the time that we moved to Framingham but I'm not absolutely sure and that was 1959. We got to be a size over here that was absolutely amazing. There was only 3,000 square feet over there if I recall correctly and we had 85 people in that- in- at 92 Broad Street and it was a nice facility but my gosh, we were just climbing all— Oh, we'd moved accounting out and it was down in Wellesley Hills in a rental space and it was just amazing how many people we squeezed in there.

Hendrie: You just decided you had to do this.

Massard: Yes. So we contacted Wyman and I don't know what the connection was, why it was, but he had a nursery land out there and it was a huge, huge area from practically Speen Street down to the meadows and it was Wyman's Nurseries and he had it just all the way back up to Old Connecticut Path and so he said I'll give you a 99 year lease on the land or something like that I guess it was and build a building and lease it to you so that's what we did. We didn't want to put our money—

Hendrie: You hadn't raised any capital yet, had you?

Massard: Only our own money was in all the way until 1962 and that was—Yes.

Hendrie: So you just grew with making a profit and retained earnings were how you sort of financed the growth by always being profitable.

Massard: Yes. One person who came in and became equal to be a founder was Ed Hampson and that was in maybe 1955. I'm not sure. So we made him an equal partner and he became manufacturing VP and decided that he'd find less expensive labor in New Hampshire and went up to Peterborough and opened Electropac and that was our manufacturing facility for all of our regular Pacs.

Hendrie: Yes, all those sort of standard products—

Massard: So we went through all sorts of wave soldering techniques and so forth to solder the back of the Pacs. It's kind of interesting how it developed. It was quite tricky getting a really good solder job on the back of that circuit Pac.

Hendrie: So there was even engineering there to try to make them—

Massard: A little bit.

Hendrie: —make it reliable. Do you remember the discussions that went about deciding that maybe you ought to try to raise some money and have an initial public offering? Did you need the capital particularly or was it—

Massard: I think we got enough systems in the house which were not necessarily profitable that we wanted to expand the company and we were not generating as— We were growing at a pace which we didn't generate the earnings to support. And I used to do some studies on how much- what was a growth rate that we could support with these profitabilities and so forth and if you went over 20% growth or whatever a year you had quite a time increasing your net worth that fast and so we decided that we'd go public and also get a price on our stock to have some liquidity for some people if they wanted it.

Hendrie: —There'd be some people by this time. Did everybody get stock options as you were going along or—?

Massard: As we went along, there were at least up- probably up to 100 people. Virtually everybody in the company had some kind of an option and—

Hendrie: Ok. You tended to do it as options. Right?

Massard: Everybody was happy that way. Yes, and most everybody did buy the stock or we offered stock to the people over a period of time. It wasn't a huge amount but it was worthwhile.

Hendrie: So everybody felt they were an owner?

Massard: Part. Yes, that's right.

Hendrie: When you decide that it might be wise to have more capital so that—

Massard: Well, it was 1960 or 1961 and unfortunately just as we were getting our ducks lined up regards our submission to the SEC the bottom fell out of the stock market and so we had to wait a year virtually before we could go public. So instead of 1961 we went in 1962 or something like that and a somewhat

different kind of an offering because it hadn't gotten back to where it was before- the market hadn't gotten back to where it was before.

Hendrie: So you couldn't get as good a price as you had thought you might be able to get—

Massard: No, not quite as good.

Hendrie: How big was that first offering? Do you remember?

Massard: I don't remember.

Hendrie: It's in the documents that you have.

Massard: Yes. I hesitate to say and I know that Kidder, Peabody at the time was-, and I don't blame them, it's the usual thing to keep the secondary part of the offering down to a bare minimum and so if the founders were selling 5% of their stock or whatever and raising mostly capital for the company that's a nice, normal way to handle things but if the founders were selling quite a bit of their stock and not raising much for the company, unless the company was going great guns which we weren't as far as profitability goes, why that wouldn't work out very well.

Hendrie: You raised some money, went public. Then you had some more offerings that—

Massard: Yes, a couple. At some point or other I think one of the—Bob Brooks or one of the founders wanted to sell more than usual so I think we had a secondary at one point although we probably raised money for the company but at least everybody knew us and how we were doing so there was some impetus for somebody to sell a little bit more, Bob Brooks.

Hendrie: Do you remember how many more offerings you had? You had a few.

Massard: Well, there might have been a shelf offering. I'm not sure where the stock was registered and you'd just keep filing the information with the SEC but you don't actually sell any but just in case you want to sell some or just in case you want to offer stock options that are of a certain size or whatever. I don't really recall the other reasons for the other offerings except that I know Brooks wanted to sell some one time.

Hendrie: What were some of the next events in the business history of the company, the part that you would particularly know? When were the earliest discussions you remember about maybe selling the company?

Massard: Well, after 13 years or 12 years in business, we'd gotten to the size where we were in the 20 million range and had maybe 13 or 1400 employees at the time and we'd just decided that it might be a good time to sell out because it wasn't the same company anymore. It was getting too big to handle. It wasn't much fun, you didn't know everybody and it took an awful lot of effort to run the company and whatever and so maybe we'd like to—some of us like to try something else. Ben might have contacted Honeywell on the QT and had a visit or two from the Honeywell people and talked to them and whatever and in May of '66 we made the announcement and had filed all the information with the SEC and whatever and everybody— It was a really big secret and everybody was quite surprised.

Hendrie: Do you remember whether you looked at selling it to anybody else?

Massard: I really don't recall. Possibly so but not seriously as far as I know. They just seemed logical having—

Hendrie: Ben was sort of the lead. Yes.

Massard: Our people from Raytheon and Raytheon and Honeywell having this joint venture that they did on this one computer and it just seemed kind of logical to fold it back into the Honeywell who had the whole computer business then and Raytheon was out totally.

Hendrie: Right. They had bought out Raytheon's portion—

Massard: Yes.

Hendrie: —of the datum. Datamatic I think was the— Do you remember how much the company sold for or what the value of the Honeywell stock was at that time?

Massard: I was trying to think. I could almost figure it out. Something around one time sales of $30 million or something like that sticks in my mind but I'm not absolutely sure. I'd just guess that.

Hendrie: It was probably in that range. Yes.

Massard: I think the founders each got 2-1/2 or 3 million out of it or something like that.

Hendrie: In 1966, that's—

Massard: —a good—

Hendrie: That's a good amount of money.

Massard: Good amount, right.

Hendrie: The founders did not have to go find another job if they didn't want.

Massard: No, they didn't—

Hendrie: Before I continue with your personal history, do you remember anything about the early computer contracts or the DDP-19? Anything about how those came about or—

Massard: No.

Hendrie: I need to ask somebody else.

Massard: Have to ask somebody else. I don't know. No.

Hendrie: They were done out of the West Coast, weren't they?

Massard: I—

Hendrie: I think they were but—

Massard: I got to be pretty financially oriented and not really—

Hendrie: The engineer and you just sort of went—

Massard: —involved in marketing or whatever—

Hendrie: What did you decide to do after?

Massard: Well, I—

Hendrie: You retired from?

Massard: Well, I—

Hendrie: Did all the founders retire when they sold the company?

Massard: The ones I— Bob Brooks had left the company in 1964 or something like that and he moved down to the Cape so he was gone already. Then Kessel was killed in an air crash. Bill Wolfson took over running the company in the later years and- when we sold out to Honeywell and then— No. Wait. Wake up. No. Ben was alive. No. Ben was making contract—

Hendrie: Contacts with—?

Massard: Contact with Honeywell and everything and Ben was in charge when we sold out to—and of course—and Bill was—

Hendrie: I remember he was executive vice president.

Massard: —executive vice president and was running the whole organization but Ben was alive and then after we merged with Honeywell then it was a decision that Honeywell made and the wrong one but typical. They chose Ben over Bill Wolfson as—to run—continue running the company, the division, and Bill decided to leave and I believe I had left and I and Frank Dean and Bill Horton had all gotten together and then Bill Wolfson came along at about the same time and we formed a company called Investment Research Associates. It was IRA. So we decided to do some stock trading and investments in little companies over the counter type investments, but then Bill came along and we decided to form Fin-Tech [Financial-Technical Assistance Corp.] and it was a much better way to go so we decided to become venture capitalists and did so with our own money. So we- Bill put in twice as much as the rest of us and we were all partners in Fin-Tech and we contacted the SBA for- to become an SBIC early on but decided that it was way too much paperwork and way too much control over their allowing us to use leverage on our investments. So we could have borrowed money and invested it and then paid them back the loan and taken the difference but it just wasn't worth it. So we wanted to be independent so became independent and we ran Fin-Tech as a personal investment mechanism until Bill died in 1995 and Frank Dean, we bought him out probably around 1990 or 1991 or 1992, Bill Horton moved west and was out earlier in the 1970s or whenever and so there were just Frank and Bill Wolfson and I at- in the 1980s and 1990s and that worked out well because Bill was a very astute person regards judging people and investments and so we looked at several hundreds situations and invested in probably 50 or 60 over the years and about two or- one or two out of 10 became a real winner and one or two would be a total loser and all the rest would be mediocre, in between, when you finally were able to cash your chips in <inaudible> whatever.

Hendrie: —could figure out what—

Massard: Figure out what to do with it or whatever. Ran across all sorts of personalities running companies and things but it was very good because we were our own masters, had nobody telling us what to do, did our own deal.

Hendrie: Excellent.

Massard: Yes.

Hendrie: I know you had one really successful company in Modicon.

Massard: Modicon was very good, right. Perception technology was very good and there was some really good ones. One that's still in existence is Citadel Computer. It's very good.

Hendrie: Very good.

Massard: Yes. So we're happily going along.

Hendrie: You aren't doing any new investments—

Massard: No. No, haven't done since Bill- not for 10 years. Right.

Hendrie: Is it still a legal entity with the owning the companies—

Massard: No. No. When Bill— We knew Bill was getting more ill all the time so we dissolved Fin-Tech in 1993 or 1994 and disbursed all of the stocks to the individuals and got it split up like 150 shares of so and so would get split up three ways or— <inaudible>

Hendrie: I understand.

Massard: So we cleaned that all up and filed the final tax return and so forth and—

Hendrie: Are you still on the board at any of those companies or—

Massard: No. Well. I'm on the board of Citadel Computer. I was not on the one that just got sold finally that was down in Rhode Island. I was trying to think of the name of it now. Carbon Filter Company.

Hendrie: So you're still involved—

Massard: Still involved a little bit, right.

Hendrie: I understand that. That's what I tell everybody about my venture capital career. I'm acetonically retiring which means you can't get to zero but you can get very low.

Massard: No. You can get pretty close, right. That's right. Yes.

Hendrie: Are there any other areas that I should be quizzing you on or asking you about?

Massard: Well, the only thing— My comment now is that I'm really amazed at the feelings that people still have about Computer Control Company and what a nice company it was and nice to work for and fun and very enjoyable. It's very heartening to see so many people have such strong feelings toward it so that's great.

Hendrie: I think it was the company's—

Massard: Good thing to go.

Hendrie: I think the companies reflect the personalities of their founders—

Massard: Yes, that's true. What it—

Hendrie: —so there are people that are basically nice people and like to enjoy what they're doing—

Massard: Right. What it—

Hendrie: —create that kind of atmosphere.

Massard: What it didn't make in profit it made in goodwill.

Hendrie: Yes, and it made a lot of that.

Massard: Yes.

Hendrie: Thank you very much, Bob—

Massard: Okay. You're welcome.

Hendrie: —for doing this oral history for the Computer History Museum.

Massard: No problem.

Hendrie: Thank you.

Massard: You're welcome.

END OF INTERVIEW

