6-22-2015

Interview with Don Herzog

RCA Heritage Program

File Name: 0806151412_Don_Herzog
File Length: 00:52

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[0:00:07] Don Herzog: Okay. I started 1959 in Morristown Missile and Surface RADAR System. I worked on the BMEWS program, which is very interesting project because everybody had required overtime. At least 20% overtime a time of week. What amaze me is the factory-like engineering because there were four desks, desk here, desk here phone in the middle and then an aisle and then another one and then an aisle and then another one and an aisle and then on this way, this way and this way and this way. I mean hundreds, literally hundreds of engineers in this big building row after row after row. Very noisy environment because people are always talking and the phones ring. But it got job done. That was my first experience into RCA. I said, "Boy, this is really a factory system of engineering."

[0:01:21] Male Speaker 2: Was that good or bad?

[0:01:23] Don Herzog: I think it was good. One of the things I learned is how to put noise out of my mind, background noise, so I could concentrate better and certainly well over the years.

[0:01:33] Male Speaker 2: Did you have any mentors or anybody to help you along there?

[0:01:38] Don Herzog: No, not really. You had your supervisor, your team leader. That was about it. He sat off onto the side in his little cubicle. We had a laboratory, which we could do our prototypes and things like. But BMEWS was terrific success.

[0:02:01] It worked perfectly. In fact, some people may remember the big golf ball that sat next to the turnpike. That was the BMEWS system. After all this went on, BMEWS design was over, the installation support was over and all bunches of us got laid off. Yeah, this is the scenario. He had these big contracts; you bring a bunch of people in. You'd fill in the contract and you laid people off.

I got laid off. The best thing that ever happened to me. I immediately got a job in Advanced Technology Laboratories, which then was called applied research. That was the greatest job, I think, I've ever had. I pretty quickly got into doing research on LASERS and more important LASER applications. I worked a lot with the Sarnoff Laboratories to develop some of the LASERS. We focus primarily on LASER diodes. As a matter of fact, our laboratory had the first demonstration of room temperature LASER diode operations.

Before that, it was all cryogenic 77 degrees (K) kind of temperature of operation.

That was a major, major breakthrough in LASER diodes because LASER diodes today are all over the place. Every DVD and CD uses a LASER diode.

[0:04:03] They're all in all the fiber optic communications, LASER diodes. That first development of room temperature operation that was posted at that time only. Pretty soon thereafter, we were able to get to continuous operation at room temperature. That was another major breakthrough that us working with the laboratories at Sarnoff got through.

[0:04:33] Male Speaker 2: It seems like your work environment was different from the BMEWS experience.

[0:04:39] Don Herzog: Absolutely. Yes. We had much smaller cubicles to work in. We had very nice laboratory facilities. Yeah, it was much nicer room. We had a close organization. You had access to very, very broad brush skilled people. Practically every technology you could think of was available there, including major development which people have never even heard of now. It was the first of the very low noise receivers for space communications. Of course, LASERs, thermoelectric devices, major development going on there along with the labs. That proved very viable into a lot of the space-based work because what they are, you put electric and you get cooling on one side and heat on the other side as all solid state.

For small cooling systems, very, very viable.

[0:06:01] Male Speaker 2: Where were you located now?

[0:06:03] Don Herzog: I'm located in Building 10, 8th floor. I remember because lots of times I used to walk up to this, which is quite a jog. Yeah. We had a lot of firsts in the LASER development. First room temperature LASER diode, they said. The first LASER communications Army contract for point-to-point battlefield communications that was secure and not visible. We had the first sun pump LASER were designed for space applications and communications where you use the energy of the sun directly to pump the LASER. So you had virtually no electronics other than the modulation that comes to modulate the light output.

That was a major first. We have the first LASER tracking system. We also developed a LASER tracker that could go onto a RADAR tracker. The RADAR tracker only had so much resolution in terms of tracking capability. We got to that point you need more resolution, you

switch to LASERs. You put down the accuracy by 10 to 1. It's amazing accomplishment in terms of accuracy performance. We also did, I don't know, maybe a lot of you have heard of Hellfire LASER designation system for providing missiles designated to a specific target. They're called smart weapons today. That… we had some major success in terms of developing some of the silicon detectors that were used in the front end for that.

[0:08:08] We also had some army contracts to advance the capability of that in terms of providing for better precision and better, wider field of view. Field of view is important because if you had a narrow field of view, that's all the seeker, could get into which had to be in there. Whereas you open the wider field of view, then the seeker didn't have too much of a problem getting through the verification. We did in Advanced Technology all the suit designs that the astronauts did on the moon. In terms of all the temperature, temperature control in the moon on the suit even in space. It's a tremendous problem because if you had to be the shade or something the temperature drops. But in the sun, the temperature goes way up and by a lot. By a very, very saving amount.

So, the temperature controls the suits. They're very, very important. They did that by a thermoelectrics developed at ATL. Also using wax to store the energy because wax has a very high latent heat of melting that allows you to take the heat, take the heat out of it, and put the heat back into it as necessary. We were very involved with that development. We also did the first LASER image recording.

[0:09:59] As a matter of fact, the first satellite weather systems which communicated weather images of the earth. They have much better resolution in most recorders here on earth composed with those images of. We developed a LASER image recording system that had tremendous resolution and could support that. We actually did the first high-resolution image recording from space on the weather satellite. One of the early imaging satellites was called ERST, Earth Resources Satellite Technology, I think it was. You probably may have seen some of these images, their false colors. That was the color is reversed that you could identify things better.

We did the first recordings of those and actually produce a number of recorders that were sold to NASA, the weather systems, the Army, the Air Force. We had quite a little business going in terms of imagery course. A lot of very, very secure systems were… in fact, I can't tell you about it because I have to kill you kind of thing. You know about that, don't you?

[0:11:32] Male Speaker 2: Yeah, I've heard about it. How many years did you spend at ATL?

[0:11:37] Don Herzog: I spent from 63 to 76, some 13 years. Then I moved into the operational base of Camden into the communication systems, more specifically for recording systems. That's where we did our LASER recorders.

[0:12:03] We also did a lot of advanced designs in terms of the recording capability both from magnetic tape and also optical disc. A little known because people don't react to RCA and DVDs or CDs particularly of the ones that you can re-record or record once. It's because RCA made a decision not to go into that business. Although we had all the technology developed and as a matter-of-fact Sony and Matsushita, Panasonic paid Camden some major royalties. It was actually one of the largest Camden profit benefits for a number years from those patents. RCA was really did all the ground work on those things.

[0:13:08] Male Speaker 2: While you're doing all of this work, what about your coworkers? What was it like?

[0:13:16] Don Herzog: It was great. RCA noted themselves as a family company. As a matter of fact, most companies, you can't hire your nephew or your brother, or something like that. RCA was the opposite; they encourage that and the philosophy was that if you're the nephew, brother, cousin, whatever, you're going to make sure you're doing a better job because you don't want that feeding back to your family. What a lousy job Joe is doing. RCA encourage that and I thought that was good.

[0:14:01] I thought that RCA had a very much of a 'can do' attitude. Somehow someway we'll get the job done. As a matter of fact, 99% of the case that we did fighting against some amazing schedules. You can only do that when you have the people who work there molding themselves together as a team and working together, not for a personal benefit but to make the program successful. In a lot of cases, layoff was so predominate. When I first went to Camden in 1963, I think there were 12,000 people who work there.

When I left in '94, there were 1,200. There were constant layoffs. That was a real negative. I think once the General Sarnoff left CEO; the company went downhill largely because Bob Sarnoff, his son, wanted to invest into all kinds of things other than fundamental RCA technology and manufacturing capability. He wanted to buy banquet foods Hertz Rent A Car, Coronet Carpet, and so on and so forth. And bought them for cash, not even mergers, for cash and just sucked all the resources out of the company.

In addition to that, you had to justify everything nine times from Sunday before you got a project going at the RCA level.

[0:16:01] Noted for that was the videodisc. A videodisc…you smiled. You remember that. Videodisc was one of the first video recording systems, a video playing systems, excuse me. It was not recording. Video playing systems where you could buy a video disc and plug it into your player and you can watch two hours of movies, or whatever was on the on the videodisc.

That was first demonstrated in the late 60s. Sarnoff worried about,.. Bobby Sarnoff, worried about whether that was a good thing to invest into. Then he decided he would then he changed his mind, and he decided he wasn't. Then he finally decided he would. They had a plant in the Indianapolis, so they moved all their capability there to start manufacturing. In the meantime he got fired. He had a RCA board revolt to get him out and there. They replaced him with Conrad. I can't remember if he was Conrad. Maybe it's David Conrad. I can't remember his first name. He took a look at the videodisc and decided, "Let me look at it for a while." Another three or four years went by and finally decided, "Yeah, let's go with it."

In the meantime, this is a parallel track which I'll talk about. I'll get back to it in a minute. Let me go off track and start something else.

[0:18:00] RCA also developed a magnetic tape recorder that had a cassette that you could plug in to the tape recorder and you could play up to two hours of video recording. You could record a video and play it back. Off your TV, you could record whatever you wanted and then play it back at some other time that you prescribed. This was a major breakthrough because the first time ever you could record TV programs.

Well, like normal, they turned it over to RCA Manufacturing and said, "Okay, see what you can do to manufacture this design." They had several prototypes already done. They said, "Okay, take a look at it and, oh by the way, it's going to cost $2,500 to manufacture it."

[0:18:55] Male Speaker 2: What?

[0:18:57] Don Herzog: Well, we can't get it any cheaper. We looked at nine ways on a Sunday and we can't figure out how to get it any cheaper. The mechanics in the head is so complex and so many pieces to it that it takes a lot of labor and a lot of parts just to make that happen. One of our entrepreneurial engineers decided to see what he could do to peddle it around the world to see if he could get them any cheaper. He ended up in Japan talking to Matsushita, who you all probably

know as Panasonic. Panasonic took a look at the design and the models and said, “Yeah, we can do it. We can do it for less than a thousand dollars.” Now, the way manufacturing and sales goes, it’s like two to one. Whatever your manufacturing cost is, your sales course is.

[0:20:01] New products like that is going to be two to one. That means I could sell it for under $2,000, major breakthrough. In the market, if you get it down into the thousand dollar category you have, a market that is way open.

That Matsushita did is not go to the normal manufacturing techniques but develop a whole robotic system to put this magnetic transport together. It was no hands actually touched the manufacturer of this. That’s how they got the cost down. This was the difference between energetic ways of solving problems. What should be hanged up, figure out how you can get around the hang out. That’s Masushita did. RCA by this time have gotten very bureaucratic. That’s why they couldn’t see the other ways of getting around it, plus, the fact that Japan had a little bit lower cost of operation.

This became known as the VHS. VHS, is that right?

[0:21:22] Male Speaker 2: Yeah.

[0:21:23] Don Herzog: VHS. VCR, VCR, I’m sorry, video cassette recording, which serves the world for a number of decades until DVD recordable DVDs came out and also solid-state recording. RCA made a fortune on it, on the VCR.

[0:22:01] Now, let me come back to videodisc. By playing around with decisions not to go into manufacturing of the videodisc, time went on, a whole decade went on. In fact almost 12 years. If they had come out first with that when they could have, they would have beat the videocassette recording capability and that would never been an object because at that point we probably would’ve figured out how to do recording on optical disc as well.

Coming back to the RCA family, RCA promoted this… in the very beginning. One of the things that the general Sarnoff who is the first CEO of RCA, he didn’t need a lot of marketing analysis, technology analysis. He knew when a product has the capability of making money. He says, “Just make it happen.” He didn’t have to do a lot of analysis and projects and future projections and things like that for him. That’s the way he did the development of television from its infancy and radio transmitters with very high-power. He just says,

"Just make it happen." The engineers could make it happen. Colored TV he says, "Just make it happen."

With that kind of authority things went on and we make things happen. He also projected a concept of routine, "We're family. We can make things happen together. You and me together can make things happen."

[0:24:00] That was just a tremendous psychological influence in terms of getting things done because when you're working with your family, you do things better. You do things in a kinder way. Too many companies had this, "Who struck John? I'm not going to put my neck out." There was none of that. If you put your neck out and you're wrong, oh well, let's go on and fix it. That kind of attitude left people making decisions and going forward rather than being afraid to make a decision.

Making decisions, people think of making a decision as the big CEO making a decision to do something or the big manager. Decisions come down to every day in the world of technology. Every day as you're making hundreds of decisions, was the decision, that component or this component that design versus this design do interface this way or do interface that way. There are decisions that can be troublesome if you had fear of making them. Consequently, you spend more time trying to decide whether that's the right decision or not as opposed to making a decision and getting on with it. More than likely you're going to be right. That had a tremendous capability in terms of our performance.

With that, you do better on schedule; you do better on design performance and the capability of the product.

[0:25:47] Male Speaker 2: Talk about your supervisors.

[0:25:51] Don Herzog: Good and bad like any place in the world. I have one supervisor which… This was at ATL. I won't mention his name, but He's the worst supervisor I ever had. He would tell you to come in… he'd call you into his office and say, "Okay. Now, explain this, explain that. How come we're doing this? How come we're doing that?" Just the opposite of the family attitude I was talking about. He would criticize you for little bitty things which didn't matter. Whether you did A or B doesn't really matter in the grand scheme of things. I'd spend two hours in his office going through A or B, which was a decision you could make in two minutes. He was not even nice. He was very dictatorial. He look down on you, like "You subservient you! How dare you even cross-examine me or say back to me?"

I really got to hate this guy. Then one day I was driving to work. I said, "This can't go on." I have to find something in this guy to like. The next time I was in his office, he had a nice tie on. I said, "Don, that's a nice tie." I think about that. There's something nice about him. The next time I thought of something else. Each time I went back I thought of something else that was nice about him. Eventually, we got to pass all this garbage and we got to be fairly close. At that point, he was fired for his performance and I felt bad for him. Instead of feeling, "Yay he's out," I felt bad for him.

[0:28:00] That's just a little indication of how that family attitude comes around. Now, I had another boss, Don Parker, who I know you know. He was a great boss. If you didn't need anything from him, don't bug him. If you need help, go to him. He'll find help. Great boss. I worked for him for the longest of any boss in RCA. He's just a great guy. Unfortunately, he's passed away. Great statistician. Great technologist. Great strategy in terms of him. He was a good people person**.** Also, an ex-ATL-er.

[0:29:00] Male Speaker 2: Several inferences of RCA changing South Jersey have come up, do you have any opinions on that?

[0:29:12] Don Herzog: It certainly changed Camden, that's for sure. I mean Camden was a majority manufacturer and employer in the whole South Jersey area. Between Campbell's Soup and RCA was a lion's share of employment in South Jersey. Unfortunately, Campbell's Soup imported all kinds of vegetables, including tomatoes. During the tomato season, they used to bring these huge trucks in just filled with tomatoes.

[0:30:00] Sometimes the truck would turn a little fast on the corner and bunch of tomatoes would land on the street. We smelled tomatoes for quite a while. Campbell's Soup decided to stop the production of their vegetables and their soup products in Camden and moved out to other parts of the country. Major loss in employment there.

As I indicated before, there was 12,000 people who worked in Camden when I first went there. As it died down to 1,200 when I left in '94… that is huge in terms of the amount of employment. Consequently, the Camden City itself nosedived into depression and people moved out as decay crept in. Camden is almost a ghost town nowadays. Filled with all kinds of crime and every week there's a fire someplace.

[0:31:10] Male Speaker 2: From your perspective, what was the best thing about working for RCA?

[0:31:18] Don Herzog: The ability to get things done and the people I had to work with and being a little advance in technology. I loved working with new technology and moving technology from the labs to a product. That was just very motivating.

[0:31:45] Male Speaker 2: Did you ever associate with your coworkers outside of work?

[0:31:51] Don Herzog: Not very often. There were a few now and then, but no, not really. One of the more usual ones is my secretary I had for a number of years. She became a very good friend and we had her over our house for dinner a number of times. In general, there is another association that was kind of interesting. I think it goes back in 1955. There is a poker game that met once a month in various houses. In other words, they rotate it with the individuals that play and all RCA people. I think almost all Camden people. They'd rotate around the individual players' houses. That game went on and on and on. Finally dissipated about two, three years ago.

[0:32:57] Male Speaker 2: Do you have anything to say on the RCA celebrations, parties etcetera?

[0:33:05] Don Herzog: You mean like Christmas parties?

[0:33:07] Male Speaker 2: Mm-hmm.

[0:33:10] Don Herzog: They were fun. We used to have a Christmas party every year. Of course, you bring your wives and things like that and you got to talk to people outside the work environment and got to know them a little bit better personally. Sometimes there is a little bit too much drinking going on and people said things that they later on regretted having said. Generally, it was good. It helped promote this family attitude. I mean it was costly to put these things on, but I think they were all worth it in terms of elevating the attitude and professionalism of the company. We used to periodically have summer getaways to some lake someplace to have a good summertime kind of timeframe get together outside. That was kind of nice and fun.

[0:34:18] Male Speaker 2: How would you overall sum up your career in RCA? Just a job?

[0:34:30] Don Herzog: Oh no.

[0:34:30] Male Speaker 2: Did you have a good journey?

[0:34:32] Don Herzog: No, no, no. It was a lifetime experience going from one technology to another. It was part of me, it became part of me. My wife can attest to the fact that I spent way too much time at work largely to maintain schedules and get things done, make things work right,

meet specifications, but I loved it. Part of the love of it was working with good people who got things done and wanted to get things done. A lot of people, it was much more than just job. They were there to make things happen. That makes all the difference in the world.

It was a real lifetime experience that I just loved. It wasn't Monday morning, "Oh, I got to go to work." But, "Monday morning, I'm going to go to work. I can do more things again. Yeah."

[0:35:53] Male Speaker 2: What was it like to retire?

[0:35:54] Don Herzog: I didn't retire. I got laid off after 37 years, which is the best thing that ever happened to me because I did… I've been working ever since and doing really great work, great projects. I went on to help hospitals go from film-based operations to electronic-based operations, worked with many, many hospitals around the country. Then to where I presently am doing. We're developing a new imaging technology for medical applications where its focus is right on imaging cancer. The first product, which is now in FDA trials, is for breast cancer.

The initial performance is outstanding in terms of any other application that's out there in terms of imaging technology to be able to detect cancer. It's a technology I breathed life into and manage the whole operation for it.

[0:37:20] Male Speaker 2: Okay. Now, RCA was essentially acquired by GE.

[0:37:24] Don Herzog: Yes.

[0:37:26] Male Speaker 2: Did you notice any change in the environment? What's your opinion on that?

[0:37:31] Don Herzog: Yeah, major change in environment. One of the first things they did is to get rid of layers of management, which I thought was good. I think they had only four tiers from the base of those who do to the general manager or the vice president, whoever it happened to be. I thought that was good because likely we had way too many layers of management. However, they also put an attitude that any manager could manage any operation if you are GE-trained. That was a catastrophe because "any manager can manage any operation" attitude coming into the family kind of structure that we had. Just was a clash like this and caused all kinds of operational inefficiencies, destruction of capabilities, people leaving, other people… they brought a massive amount of GE people into Camden who knew nothing about the operations or the attitude or the

personality of the operation. That was very destructive and I don't think it ever got fixed.

[0:39:03] Male Speaker 2: What about our customers, how did they be the team in RCA?

[0:39:11] Don Herzog: You know, RCA and electronics were almost synonymous in the 30s and 40s. As a matter of fact, the Department of Defense or Department of War as it was known at that time, wanted to move a lot of the RCA skills out of the East Coast deeper into the country because they're concerned about some catastrophe happening and all that technology being… and capability being lost. A lot of places were moved inland further. RCA in terms of… they built almost all the communication capability during World War II and a lot of other electronics in terms of the RADAR.

[0:40:13] I guess RADAR and communications were the major things. Now, as we go out past World War II, more and more companies started to get developed and a lot of spinoffs from RCA. The Motorola, the Philco's, all the old TV manufactures were all spin offs… a lot of spinoffs from RCA where guys who got capabilities moved out of RCA into these other companies to help promote their capabilities and technologies. They started a lot of technology competition. RCA slowly lost the lead of being synonymous with electronics, although they certainly were the forefront of developing TV and also color TV.

There was a major battle between what was the format for TV before it came out. The FCC had to make determination as to what format. RCA proposed one. I think it was Philco, but I'm not sure, proposed another one. It was more of a spinning filter that Philco had, if it was Philco. And RCA, was predominantly electronics.

[0:42:01] Although the actual performance by the other company was a little bit better, but the RCA process had a lot more capability to evolve and get better in its performance. Anyway, RCA won the format, which left RCA to be in a ground position in terms of broadcast technology, broadcast market. They owned the broadcast market, not only in this country but worldwide. Gradually, they let the competition get ahead of them because they weren't investing into it, whereas competition was investing in technology. So they gradually lost more and more business.

One of the interesting things about the broadcast business was the recording of television programs, which is a major thing. Initially what they do is they record the TV images on film. They had a film recording of the TV program. They could play it back and transfer that through cameras into live broadcast again. They were called Cinescope recordings, I think. They were pretty bad. RCA developed

a magnetic tape recording capability which could record real-time television programs and it had a certain format. So the world used that format for recording their broadcasts. The Japanese and also RCA technology both in the Sarnoff Labs and also in ATL and recording systems develop what's called… the one was transverse and the other was called… I can't remember now.

[0:44:10] Anyway, it was more an elliptical recording capability where you could put a complete frame on one stripe. That was a major breakthrough rather than putting four stripes on one frame. RCA decided… and now this is way past Bobby Sarnoff. Decided, "No, we own the format. We own this marketplace. We don't want to change. We're not going to develop a product because the competition may hear wind of it." The Japanese came out with one… sucked up the market immediately. Cheaper, better performance, smaller.

Let's get back to what does the customers think of RCA? For a long while over many, many decades until I would say the late 70s, the customers thought RCA was almost a miracle worker in terms of the capabilities that they had and what they could perform and do and provide. But then it started to slip. Many customers just came to RCA and said, "This is what I need." We would generate the specifications for them and develop schedules and things like that, where a lot of times the customers normally have to do that kind of stuff.

We used to go out and talk to customers and say, "What's your problem? What do you need to have solved?" and come back with solutions for them. They thought a lot of RCA.

[0:46:07] Consequently, it took very little management to run the programs with RCA. As the GE started to come in and the top management start to get very funny, the performance degraded. Pretty soon customers spent more and more time at RCA making sure they did their job. Top management makes a huge difference in terms of the performance of those underneath. The attitude, the personality and the character at the top actually makes a huge difference at the lowest person on the bottom. That attitude and determination and intimacy with people. It makes all the difference in the world. Personality at the top is what the personality at the bottom becomes. It was mixed, depending on what era you're talking about.

I remember, just as an example, Boeing Virtol in Philadelphia area had a ...were awarded a contract for a heavy-lift helicopter. I said, "Well, they got the contract. Maybe they need some help from us." I went over and started talking to some of their management and

made a little presentation of the capability RCA has, and things like that.

[0:48:00] They said, "We got two problems; one is we haven't figured out how to be able to stabilize this helicopter, how it should be stabilized within one inch and then be able to move from this stabilization in one inch over by one inch and over by one inch. We also wanted to hit the stick and be able to move at very slow constant rate whatever direction you wanted to go.

Oh, by the way, it's going to lift a lot of dust. They had to be able to see through a dust. By the way, we ought to be able to see through dust and manage the cargo because that's what the heavy lift supposed to do, they supposed to go out the ships, pick up the cargo, land them on shore. It was an army contract. I said, "I can solve that problem for you." We went back and we put our heads together. We came back with solution and we went over and I made the presentation in terms of how we're going to solve their problems.

Then there's a bunch of questions. How about this, how about that? I said, "Well, we solved that problem by doing this. We solved that problem by doing that. We had a contract that we put in place. I guess it was about nine months we put the systems together that we can put into their prototype helicopter and we flew it. Today they have inertial guidance capability that can stabilize helicopter. Then, they didn't have those capabilities and they had too much drift in it. It's kind of eerie to see a huge helicopter just sit in the mid-air not moving, just sitting there. All the things they wanted to be able to move it over by an inch, it passed every specification.

[0:50:00] They loved us. Unfortunately, the Navy went to Congress and said, "That's our job to unload the ship, not the army." The contract was never canceled, but again no money was ever put into it. It never got beyond the prototype. Yes. With how I liked my job or what I thought about the job and the people, that's just an example, one example of how we went to a customer solved their problem for them. They didn't know how they're going to attack it or where to even go about doing it and they loved us for it. They worked very closely with us. I also had a team back here that said, "Okay, we'll do it this way and that way," and they actually were able implement by the architecture that's laid out.

[END OF TRANSCRIPT]