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### Interview with Chip McGrogan

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[START OF TRANSCRIPT]

[0:07.5] McGrogan: I'm Chip McGrogan. I started in RCA in 1957 on the graduate study program. I was out of Drexel, graduated class of 57, second in my class. Drexel, of course, was a co-op school. It was about the only way I could really get to college. So after five years, I had five years of education that included two years of practical work experience. The last two years of co-op experience was at Boroughs where I worked as essentially the personal technician of a real transistor expert. That was before the transistor was widely known. That experience paid off when I got... I was looking for a place to go to graduate school. I want to take an assistantship and teach and make very little money but yet a master's degree. And then RCA came along with a graduate study program which was new in 1957. It essentially offered you essentially a free tuition and books for two years into University of Pennsylvania, which was one of my favorite schools. And we got paid for essentially 80% of our time. They paid us like a dollar an hour for the time we're in school. They paid us a regular salary for the rest of the time and that was after two years we'd have a master's degree and two more years of work experience, so that really paid off and that was the deciding factor that brought me to RCA.

I interviewed a number of places at RCA including they called the Home Instrument Division which is where these guys were breaking their neck and working all night to develop color TV. I was very impressed by that but I interviewed in Advanced Technology Labs in Camden which were doing somewhat the same kind of work I was doing as a co-op and met several people there. When I was doing co-op work, I picked up a book, the only book that existed on transistor electronics. It turned out the authors were all from RCA. I met some of them during my interview time. They hired me on the spot. I never had to co-op. I never had to basically rotate to another assignment. They wanted me there. So I spent the first few years of my career working with the... essentially, was the beginning of the transistor age taking all the old vacuum tube circuits and learning how to transistorize them, write a patent. I think I ended up in the first couple of years with about 13 patents doing that, which I don't think they were ever worth anything but it looked good on a resume. And I worked in that. I did some work in Advanced Technology on which was called Neural Networks which were simulations of how the brain works with essentially threshold type logic. I wrote a paper on that, submitted it to National Electronics Conference in, I think, 1960. I won first prize for the best paper of the conference, \$500 prize which that time was like a month's salary. It was the beginning of my work in Advanced Technology area but a few years into

that, a job was awarded to the Advanced Technology labs which was a product development thing which was strange but it seemed the way the government wanted to do business. It was to develop a secured IFF, Identification Friend or Foe system that turned out to be the first application of integrated circuits. Now integrated circuits in those days were TO-5 CAN with two gates or flip flop or something like that. That was radical at the time. I mean more than everything was discrete devices and was in what they called the INFOSEC area was called COMSEC at that time, Communication Security, and that was a black art. There were no textbooks. There were no college courses. There were no courses that you could attend or seminars that you could attend to learn that. Everything was self-taught. Customers would come in, tell us what they wanted, tell us how to do it. We'd asked questions. We'd have very interesting lively exchanges with them and then we taught each other. That was part of that family spirit. We didn't know anything. What we did know we passed on to our coworkers to make them just as *expert*... We needed experts and the only way we could find them was not to go out and hire them. We had to create them within our own organization. That bonded us as a team.

The IFF system later had another spinoff project which was a Combat Net Radio security device, the KY 38, which was at that time the essential communications device at the Vietnam War. That's where I met Eddie Mozzi who was running that project. We were using the same technology, sharing the same team efforts, sharing our knowledge with each other, co-developing, essentially similar but different functionality products. That started my career in INFOSEC. That was 1964. I remember that year very well because I think that's the year the Phillies were 13 games ahead going in to September and then lost the Pennant. I don't think any of us will ever... any of us local Philadelphia people will never forget that year. Morph or Gene Mauch was the manager at that time and that was the year I started in the INFOSEC area and that basically was almost the rest of my career. That evolved into other projects that were similar. In the late 1970's, 1980, we won an award for a TRITAC Communication System which involved several devices one of which was a secure telephone called the DSVT. I saw one in the case coming in today out in the lobby, a field telephone that was secure. There was a teletype crypto device built from the same technology and this was a little bit more of an integrated circuit than the ones we had in the earlier equipment. This was basically a custom chip that we designed not complex by today's standards but very advanced at the time. We were developing the technology to that design and developed these chips at the same time we were building them, not waiting for something to be developed and then use it. It was developing your tools at the same time you're developing the products. The KG-84 was a teletype encryptor at that time using first real product using integrated circuits. They were CMOS which still is the technology of choice today even though the geometry is

slightly smaller now by orders of magnitude. The teletype encryptor replaced a device called the, I think it was the KW-7, which had a reputation that's the only teletype encryptor in the military but it had a mean time between failure for about three or four days. So they needed something to replace it, the KG-84 was that device. We developed a prototype that we called a new model of that. We sent several of amounts to the military to try out. They loved it. They said it worked beautifully. The complaint was from their real complaint was from their maintainability people who could not test their maintainability concepts because the damn thing never failed. So we took that as a compliment but they didn't. That was the beginning of Secure Voice. Secure Voice wherein in the several other products since then. One of them was the STU-III which was the first time we were really developing and working with other contractors to develop a similar product. We had three companies essentially developing the same product. We were not competing on the contract to develop it but we would be competing on the sale of the product. The other companies were Motorola and AT&T. I think John Rittenhouse was our vice president and he said how can you compete with a phone company. The two COMSEC contractors RCA and Motorola skunked AT&T. We built the best product, lowest price and AT&T was playing catch-up the whole time. They didn't have the spirit of the COMSEC community where you cooperated during the development even though you were competitors. It's something we learned the hard way. It's in everybody's interest. If you cooperate developing the specs and things, well AT&T commercial company always played things close to the best. They never socialized with us during the meetings we had together. All the other guys did know each other like brothers. They went back even to TRITAC days where we were not developing competing products but we're developing things that had to inner operate with our products. It was a spirit an area that I think the COMSEC community was unique to them. You had people competing companies working together in the common interest and it paid off for everybody. We learned that and paid off. The STU-III sold hundreds of thousands of them. It was at the time when the cold war was at its peak. There were communication towers that were in major cities that were being read in real time by Soviet Intelligence Operations and we needed to secure our communications. The STU-III was the answer at that time. The predecessor equipment was the KY-3 which was like a couple of steamer trunks worth of equipment. I think when Reagan was shot; they showed him going into the hospital followed by these two gurneys of... of carrying these big cases of equipment. You can see on the lettering on it. It said KY-3. That was the secure communication device prior to STU-III. So that was the beginning. It was the first really. At that time, we were trying to develop a product that required digital signal processors where at the same time digital signal processors were being developed. So we were the guinea pig for that. We had to build voice encoders, modems, all digital using products that were being developed at the same time that we were trying to use

them. It took a while but we succeeded, developed essentially one of the best two wire echo cancelling modem that ever existed in this world. We had experienced where people would take them into remote outpost and things, embassies, and backward or countries and they say good luck with your secure modem there because we can't even get a fax machine to work here. And they said it worked fine. It really compensated for all the odd-ball things that communication systems could do. It could live with them. That was one of our great successes. That led to other products which called the Secured Telephone Equipment which was an ISDN secure telephone and this was more advanced and things used newer technology but basically did the same function. As a matter of fact, they build an STU-III compatible mode because they had so many STU-III's out there. They had still to talk to and they couldn't replace them all. So that was the whole history of that. Again, we were working with other companies very similar, the same ones we did work with before, cooperating on a common specification that would work together. They had to inter-operate and we just had that community spirit not only within ourselves but within the community of interest which was small but very significant. The process of doing this work was still black art, no textbooks, no published papers to go on. The modems and things and the voice coders were pretty much open technology. The security aspects were still black art, worked with the customers, learned from the customers.

**[15:12.3] Speaker 2:** Are you... were in a kind of in a unique position... you have basically become essentially a national asset. You're the person who taught the other people as we came through the whole COMSEC area.

**[15:30.7] McGrogan:** That was really part of the joy of doing it is taking somebody raw to the business, teaching them. We had some of the most rigorous design review you ever saw. They were really bloody but nobody ... it wasn't vicious. It was educational. People learned and we taught them and then they taught others. It was that close-knit group of people. We had our fights internally but nothing vicious. It was all friendly things. Things like you wouldn't do today. We make ethnic jokes to other people in our team but today in this day in the world that's not even allowed or permitted. But it was friendly. Nobody took it seriously and it was a form of bonding and friendship.

**[16:28.3] Speaker 2:** As you were the younger engineer, did you feel like you had any mentors?

**[16:33.9] McGrogan:** A lot of the mentoring came from the customer. There was no real technical expertise to draw on but there was some good management and marketing expertise we had, we got a lot of business sole-source because of the personal relationships that were formed between our team and the customer's team.

**[16:59.7] Speaker 2:** And you were in the forefront of that.

**[17:01.5] McGrogan:** Yeah, we went with them, right? We would go to meeting. Marketing guy would take us. He would get us on the door. We'd sit down with counterparts and workout things and they liked us because they didn't really know what they want and we didn't know what they want. And it evolved over the course of the program but there was none of those let's rewrite the contract every time they wanted to change something. We're working together to solve the same problem, alright. Let's work it together. You help us with our problems, will help you with yours. There was no employer sitting in the way of impeding progress. It was good natured. Let's work. We're a team. We're teamed with our customer. We're teamed even with our competitors. We're all working at the same problem and it's our common interest to solve the problem.

**[18:02.6] Speaker 2:** And you had some significant competitors.

**[18:05.8] McGrogan:** Oh, yeah.

**[18:06.6] Speaker 2:** How do you feel the customer looked at RCA?

**[18:11.3] McGrogan:** I think they liked us. We got a lot of sole source awards or at least two source or three source awards. We didn't have to run out and compete with upstarts. As a matter of fact, it was hard for an up-start to get into this business because of the lure and the culture of not only working with this customer but the technology itself was essentially hush, hush. It wasn't published. We taught each other. We taught our coworkers. And they learned from it and then they became the mentors to the next generation.

**[18:51.6] Speaker 2:** And what about your supervisors?

**[18:55.0] McGrogan:** They never got in our way. That's all I can say. I eventually became one of them for a while but then I didn't really like that aspect of the job and went back and became a staff engineer.

**[19:08.4] Speaker 2:** So you're saying that just with that you do your work?

**[19:11.4] McGrogan:** As long as they were happy. I mean I had some tough supervisors that makes you ... Charlie Schmidt. I mentioned name, but a lot of people he hated and he was hated. But I got along with him fine because let me do my job. If I disagreed with him, he accepted my opinion rather than his own.

**[19:36.9] Speaker 2:** Yeah, Charlie had a reputation as a very demanding person but the people who produced always seemed to like him.

**[19:46.2] McGrogan:** Oh, yeah and he threw some of the best Christmas parties ever. Won't ask him how he finance them because it may not be legal but there was a lot of trips to Summerfield that paid for Christmas parties that nobody remembers ever going on.

- [20:10.5] Speaker 2:** So you've been through some very significant projects basically as a trailblazer. How do you think the RCA valued you as a part of this?
- [20:25.0] McGrogan:** Well, they let me keep working after I retired so... I think I retired the first time when the Lockheed Martin took over and I was 62 at that time so I could cash out my own RCA lump sum and keep working and go back to work the next day. Worked there three more years till I was 65 and retired again and then worked as essentially a full time consultant for a few more years and I think that really worked... I kind of phased into retirement gradually which was probably the best thing. I phased my way from full time to part time just call me when you need me sort of thing and that went on until about two years ago when I decided I've had enough and stopped coming into work. That was retirement. It wasn't sudden. It was gradual and enjoyed every minute of it.
- [21:30.7] Speaker 2:** Now, as an observer of what used to call or referred to you people as a cryptographers, there were some rather unusual people in your group, did you notice that?
- [21:47.9] McGrogan:** I was probably one of them. I didn't think of them as unusual but everybody had their own personality and everybody accepted the way everybody else was and we could insult each other till we turned blue in the face and get together and work on solving a common problem the next day. It was just part of the team spirit.
- [22:13.8] Speaker 2:** Okay. What would you say was the best thing about working for RCA?
- [22:20.9] McGrogan:** I think it was the fact that we wanted to be the best and we tried to be the best. Sometimes we succeeded, not always, but it was always a team effort. Everybody contributed and everybody got credit.
- [22:40.4] Speaker 2:** You've heard some other people talk about the transitions from RCA into GE into Martin Marietta. How did that affect you?
- [22:53.1] McGrogan:** Well I think there was an era where I think they called like harvesting the seeds that we planted and that went on for a while, it didn't result any growth and then all of a sudden we kind of find out what we were doing right in the beginning and then went back to it with some new opportunities. I remember my age 65 retirement was September of 1999. I retired on the day we submitted a proposal for something called ACTS that I had worked on that proposal. I was retired and taking a long vacation. I was over in Spain with my wife and we got a call that we won that program. That program went on. It started out, I think, maybe a hundred millions and it went on to hundreds of millions of dollars and I remember doing consulting by phone when I was away and working on that when I was here. It was one of the classic type programs. It was our roots. It was a replacement for the Mil Star system with secure communications basically from Mil Star. But it

was one of the type programs that we done before and did better than anybody else. I think the customer loved it.

**[24:34.8] Speaker 2:** I asked what was the best part about working for RCA? What was the worst part about working for RCA?

**[24:43.4] McGrogan:** I guess the Camden environment. It was never impressive. It didn't bother me but it made it hard to get other people to come. We tried to hire somebody and they'd have to drive through Camden to get here and they said no thanks. It never bothered me. I mean I just got used to it I guess, developed a thick skin.

**[25:06.6] Speaker 2:** Do you have any opinions on the assertion that RCA may have actually changed South Jersey?

**[25:16.4] McGrogan:** I think it was South Jersey. When I come up to... I mean nowhere you went. It was RCA. Go to a gas station, sign a credit card, receipt and they'd hand you an RCA pen. It was everywhere. Everybody had either knew somebody or had a family member. I mean at one time I worked with third generation RCA employees. It's the mother. Grandfather started there during World War II and their children went there and they were the third generation all working at RCA. It was a way of life.

**[25:58.3] Speaker 2:** So how would you sum up your career? Evidently, it was more than just a job.

**[26:05.8] McGrogan:** Oh yeah. It was something that I couldn't ... it was hard to retire actually. Eventually got old enough that I like to sleep late in the morning but when I was working it felt nothing about getting up and coming in before seven o'clock in the morning and going home after six o'clock at night because I enjoyed every minute of it. It was getting something done and it was useful, enjoyable, and working with other people that I enjoyed.

**[26:45.1] Speaker 2:** Well, Chip, I appreciate you coming in to do this and let me just say as just having been around here and having followed your career, you retired and then were asked to come back several times because they really felt you had knowledge that they simply couldn't do without. You are genuinely one of the few national assets that we can talk about and what you have done with RCA is just phenomenal. So I appreciate you coming in.

**[27:30.0] McGrogan:** Part of it was I go back to my training and when I was in high school; somehow if you were in the first track of high school I went to, you were in the first track of everything. So if I was good in science and math, I also got into the first track with English and Literature and everything else. So in spite of the fact that there are a lot of people who were better writers than I back in when we were high school, when I got to college and work, I was the best writer among the people because of my training and communication was a skilled that very few engineers had which I had somehow manage to



hone and teach. I had one coworker who will tell me to this day that I taught him to write in English. He was from South America originally and Poland and then South America and grew up in Brooklyn and never really learn to write clearly and he would give me something he had written and I bleed to death on reading, can give it back to him, and next time it'd read a lot better and it was communication skills that's important as engineering skills or logic skills or anything else and writing proposals was much part of the business as performing on the job.

**[29:04.3] Speaker 2:** We won't mention his name but I can tell you that he did recognize you as one of his teachers. I think he actually appreciated it.

**[29:14.3] McGrogan:** Actually he ended up being a cowriter on a book. So that's how far he came. So I feel good about some of the people I met who are now the leaders in this business.

**[END OF TRANSCRIPT]**