Nevada Test Site Oral History Project
University of Nevada, Las Vegas

Interview with Marie McMillan

March 5, 2004
Las Vegas, Nevada

Interview Conducted By
Mary Palevsky

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[00:00:00] Begin Track 3, Disk 1.

Mary Palevsky*: OK. Well, you were just beginning to talk to me a little bit about clearance, how hard it was to get clearance in those days.*

Marie McMillan: It was. I don't know who was in charge of getting the clearances but I know it went through the military process and the civilian process and they went through *all* of your background. You had to fill out many papers in order for them to investigate you. So after that was all done, while we were awaiting our clearance, I would go to work each morning and it was in a place that was not cleared. And we called it the Rat Shack because they had these big, beautiful, huge, white rats, and so that's why we called it the Rat Shack. And of course I don't really recall what we did there, but just some sort of paperwork to keep us busy until our clearances came through.

After we had our top secret clearances, the first place that I worked instead of with the scientific people was I learned all about repositories. And we had a huge, big room. Because we had these clearances—this huge, big room—with all these repositories and we had to learn how to open and close them. It was all fireproof and of course windowless, and only certain people could go inside there.

And this was—now you're still—

Oh, I'm talking about the the University of California at Livermore, which was the Lawrence Radiation Laboratory.

Right. So you're already at Livermore. You're not still at Berkeley.

That's correct. I never, ever worked up on the hill in Berkeley. I only worked at Livermore and the test site in Nevada near Las Vegas.

OK. I was unclear about that.

So these repositories we would open, and there were lots of different divisions. I would have to think back, do a lot more remembering to remember—oh, you probably have access to all of the divisions.

You don't need to know that.

But all of these divisions would require—in order for them to carry on their scientific work, they would require secret documents. All of the secret documents were locked up at night in these repositories. I can't recall how many; there were a great number of them. It was kind of difficult. It would take us an hour or so to get them all opened, you know, so we could get—it was more like a clerical position—to get all these documents coded, stamped, sorted, and what do you call it? Like perhaps there were six documents and they'd want number two of six, and they were all secret and—what do you call that?

I'm not sure.

Recorded. Well, I don't remember.

Cataloged or something?

Something like that, yes.

So how would the request come? You'd get a request in your office—

Yes, like one of the reaction history group or electrical engineering or maybe Dr. Teller or Dr. York or whoever was in charge at that time would need access to some of these secret documents. And so we had a list. Only certain people could receive these documents. And there was not a long list, of course. So that was the first job that I had. I was in charge of the

repositories. Which actually led later on, you know, I was talking to you about when I was here in Las Vegas, I was loaned to the Atomic Energy Commission [AEC] to set up files and it was because of my background in the repositories at Livermore.

That's what I wanted to ask you about too. So once you had that experience—so the AEC here, you got loaned to them by Holmes and Narver.

Well, yes, but this was later on.

Yes. That's OK, we can jump around. What's interesting when you think about that now is that so much of that is now computerized in some way or another.

Yes. Oh yes.

And that you all—it's still controlled, right? Only certain people have access to certain files.

That's correct. And that's what we called them at that time were "controlled documents."

You did.

"Controlled documents." And after that actually I went to work—and controlling the documents. **[00:05:00]** After the different divisions would do their—I have to think what I can say and what I cannot. I don't know which or what I can't anymore so I just—

Yes. Be general.

So when a particular division had experimented and recorded what they found, these documents would have to be—at that time we did typing—someone would type them out. And then the security specialist—I don't know if that's what they called us or not—but we would then document them. For instance, there would be one document—it was to be the master document—and we would make, perhaps they would want six. Only six people would be allowed to see this to carry on *their own* experiments. And so we would document them. There would be six documents and we would have to stamp them and certify them like as to numbers,

like one of six, two of six, three of six, four of six, five of six, six of six, and then make a list of who could see them and who could not see them. And then these were put in the repositories and only certain people could have access to them.

So there would actually be people who couldn't see certain things who would be named.

Ohhh, actually very—no, people who could not see them were not named. Only people who *could* see them. There was a list of people who had access to them, which was very limited. And so I would imagine—I guess I shouldn't imagine but—so different groups—so they couldn't—one person couldn't get all of these documents. They only had access to the information that they needed to carry on their project.

Right. What they needed. Like they say, "need to know."

"Need to know." Exactly. Exactly. And then we would deal with couriers that came from Los Alamos and I can't remember where all, the other scientific places.

I wonder if Sandia—

Oh yes, Sandia Corporation was one. Exactly. Sandia and LASL. [Los Alamos Scientific Laboratory] Well, at that time I believe there were only the three that I dealt with actually: Sandia, Los Alamos, and Livermore. As I recall, just the three places.

Sounds right to me. Marie, when someone—so someone checks it out. Then obviously there's some point at which you want to make sure you get it back?

Oh yes.

Yes. It would seem to me—

Oh yes, the security was heavy. I've been wondering about what I've read in the paper recently the last couple of years. I'm sure that things have changed so much since then and I don't understand what is going on. I don't see how people could—oh, I do know how. It's because of

the access now to computers. That's the difference. That's how people could get super secret information and jeopardize the system.

So after that job I was with an engineering group that was going up to the Athabasca oil fields, you know, up near Russia. And I was working into an administrative position actually, is what happened.

This is an engineering group at Livermore?

Yes. I can't remember—what was it called? I think it was called L-6 Division. I'd have to think a little longer about that, it's been so long. L-6 Division. And so we did all kinds of administrative work for that division and we took care of the things that they found in Alaska. We also arranged special clearances, for their travel and their documentations, and all of that.

After I did that, I went with Dr. Louis Wouters. He headed a group called "reaction history," and it was the reaction after they tested the bombs. And the same thing, we administered the results of the tests that they did and had them documented and sent them to the repositories, **[00:10:00]** *et cetera.* It's the same thing. And that's actually how, when I did come to Las Vegas and I did work for Holmes and Narver, I worked as an administrative assistant to the man who was the head of Holmes and Narver. Holmes and Narver was the engineering construction company and they were the prime contractors out at the Nevada Test Site. [Pat Ryan]

So I knew all about documentation and everything that was secret because I had worked in Livermore. When the Atomic Energy Commission put in an office in Las Vegas, they had nobody who knew how to do the things who was experienced and who knew how to do the special secret documentation. And of course Holmes and Narver did estimating for costs, for doing secret scientific events out at the test site in Nevada and also the Pacific test site, *et cetera*.

So I worked as an administrative assistant to the head of Holmes and Narver. [Pat Ryan]. Then also I worked for a while at the Las Vegas office of Homes and Narver for Jack Elder, the head of the estimating department and also at the test site and Las Vegas office and I worked for him at both offices. Because their estimates—we had quite a large department, I would hire girls to work in that department and put together the figures of the estimates that Holmes and Narver gave to the Atomic Energy Commission and the "users" [LRL, Sandia, and LASL] to do all kinds of tests, such as when they put in actually the tunnels, the towers, the—

Yes. That must have been an amazing feat, to try to think about all the different elements that go into estimating the cost of something like that. I mean I know just from putting together small budgets what that must involve.

Yes. Well, after they would do the estimating, these documents were all cataloged. They were all secret documents, had to be locked up. And I know that they would have big meetings in different offices and states and between the "users" of course I never attended those meetings. I was not the scientist or head of a department. But they would have meetings that included the Los Alamos Scientific Laboratory, the University of California Radiation Laboratory, the Atomic Energy Commission, the Sandia Corporation, Edgerton, Germeshausen, and Grier [EG&G], all of these people. And I don't know what happened in the meetings because I was not there, but I would see that the documents got there to be used in the meetings, *et cetera*. And then when they decided to do all this estimating out in the—at that time they called the PPG, the Pacific Proving Grounds, the Atomic Energy Commission put in all of these repositories to take care of that. And of course then Holmes and Narver loaned me to the Atomic Energy Commission in order to set up those files and repositories for them. So that's what I did.

So that was in Las Vegas.

Yes.

So you physically had to go to another place or—?

Well, Holmes and Narver had two offices. They had a big office out at the Nevada Test Site and they also had an office in town on Highland Avenue, which was almost across the street from the Atomic Energy Commission office. So I worked in all of those offices.

[00:15:00] *OK. So they were all in the same neighborhood.*

Yes.

Now when you say "repository," I'm just trying to visualize what this was. Were they like big safes or were they rooms with locks or what?

No. No, they were like huge—it was in a safe room and they were like large safes with great big complicated—

Locks? Like combination locks?

Combination—they were combination safes.

And so you'd open it up to get in to where the documents were?

That's correct.

I'm ignorant of these things. Would you have to open up the individual files with a lock? Or once you were inside, you were inside.

No. First of all, only certain people could get in this room to get to the repositories. You had to get into there, and after you were in there, then only certain people could get in certain safes also.

OK. So there were several repositories with different safes. I misunderstood you.

No, actually the repositories, I guess is what I'm calling the safes.

Oh, the repositories were the safes.

There is a room and inside the room were repositories that—it's what we *called* them. Now I need to look that up, I guess. I'd never thought of that. Instead of safes, we called them repositories.

Yes, that's interesting. So I was thinking it was like two different things. Maybe that sounds more official for the government. But they are repositories of documents, so I understand that, because if a safe, you usually think of money being in the safe, I guess. They're documents in a repository, I suppose.

Well, I guess—no, I always think of—no, I don't think of it that way. I think of a repository as a safe holding documents.

That's funny.

Yes, it is.

So when you say "we," there was a team of you, then, that were the—

A very few. Let me see. If I remember correctly, I believe there were only two of us that had access to these safes. And I guess they were—and I think there was someone else that was on standby in case—you know, there were times when they had to call us in for the weekends because scientists don't work nine to five. They work whenever their creative ability comes to a head, and we'd have to go in on the weekends and get them something.

Yes. And I wonder what kind of systems were in place to make sure you got it back. That's what I'm really curious about.

I do not remember. We had a list or something and we had to make—well, first of all, I believe they could only keep it out a certain length of time. I really don't—I do not recall. I believe if the document was not back [in] the time, we had to notify security, something like—I just really do not remember. I don't recall how it was done but yes, it was done.

There must have been a procedure for it.

Yes, there was.

So when you go over to the AEC, are you starting basically from scratch?

Exactly. The person in charge of the AEC had to order safes, or repositories, and physically set up the rooms, but that was not so voluminous at that time because it was new. So there were not many, in contrast to Livermore which had been—they'd been working for years, as you know—on these scientific studies. Experiments.

Right. So I wonder did then copies—that's the thing you said about the couriers. When there were joint operations, I guess a certain document might need to be seen by people at several places?

That's correct. That's correct. Like the military or the Navy or the—

And so they would have to be physically picked up?

Yes. There were certain couriers. I did not have anything to do with that, so I can't address that, but these people would be on our list. We could only give them to certain people.

Yes. Interesting. And I wonder if they actually had to physically carry them or if there was—

Oh yes.

They did.

Yes, they did.

[00:20:00] *O.K. So then—this is good because it fits in with what we talked about last time, about when you had the French scientists come over. That sort of fills in that story a little bit.*

Yes. Yes. So there were only a few of us actually who had top, you know, a clearance to talk to the scientists that came to buy equipment from the Edgerton, Germeshausen, and Grier. And these French scientists, they needed specialized equipment to carry on their tests in the Sahara

Desert—you know, just outside of Morocco—because , you see, the United States—and the timing and firing for these tests were all done by Edgerton, Germeshausen, and Grier. And they manufactured this equipment, and the French government needed this equipment to carry on their atomic tests in the Sahara Desert. And so when they came over here, they did not know what to do, where to go, and so my husband and myself were on the list because he worked for Edgerton, Germeshausen, and Grier and I worked for Holmes and Narver and the Atomic Energy Commission and we had these special clearances.

So you were a cleared couple.

So we were a cleared couple, and we were to meet them and take them around where they needed to go and show them Las Vegas. I have no idea who else was cleared to entertain them. Not entertain them. I guess they were buying equipment. My husband was a senior scientific executive with Edgerton, Germeshausen, and Grier. I believe he went to Boston or someplace with them. I don't know. I can't address that. I was only on the social committee to entertain them actually. Social committee; there was a committee of two.

Right. You were the social committee. So you take them out to shows and stuff like that?

Yes, exactly, and then I have several pictures that were taken at the shows.

Oh, you do?

Yes.

Oh, OK. Did we see those last time? I don't think we did.

Probably not.

After.

I only have a couple of them.

After. But see, that's interesting. You know, from the inside it may not seem that interesting but it's really interesting because in a lot of cases of the men, usually the men that worked at the test site, you get a lot of stories of wives who didn't know anything that was going on, you know, so the fact that it was a couple—

I was very fortunate in that actually that I did that type of work, and then I knew what was going on and I was very, very fortunate indeed. And you know it was a wonderful job.

In what ways?

In those years, most women stayed at home and were housewives. And I was working and I was pleased to be an administrative assistant and I was just fortunate in how when I went to work at the laboratory, the things that I went through to get this job. And I felt later on I was very, very pleased when my twelve, thirteen-year-old daughter went to school in Switzerland and I could call the Frenchman that I knew that had been over here in the United States buying equipment, I could call him and ask him to meet her in Paris on her way to Switzerland, and it was just nice having international friends.

Yes. I mean I really—I think what you're saying is important. It's interesting to think of women in that era now looking back and how—it sounds like what you're saying is it really did make a difference that you had that kind of—I want to find the right word. "Status" isn't quite the right word, but you had that kind of position that had a certain **[00:25:00]** *amount of respect and a certain amount of importance—*

It felt important to me. The part that was—I can't say not so good—it was that I could never, ever tell anybody what I did, ever, never, ever. For instance, well, we were so busy at that time, we worked long hours and if we went out, if for instance the French engineers came over to buy some equipment from EG&G, my husband would say, `You know we have some people in`

town. Would you like to go out and take them out? You know we need to take them out. Would you like to go? And I would say, yes.

We didn't have lots and lots of close friends but if, you know, friends that I had, when you would see them the following week, they'd say, Well, what'd you do last weekend?

And I'd say, Oh, we went out to a show this weekend with some out-of-town people. But you could never tell them exactly who it was with and where you went what it was, ever. So I guess that's why until now, that's why I am so amazed to talk to you because I can talk about these things to you now that I've never, ever spoken to anyone else about because they were always locked inside.

You have to appreciate how interesting and important that is.

Well, I thought it was only important and interesting to me.

No, I think it's important and interesting historically of the kinds of ways that people were living their lives in this world during the Cold War in that era and what that actually meant about your day-to-day life. That's one of the great things about oral history, you know, you don't get this kind of stuff necessarily when you're reading the big, official history about how these necessities impacted individuals.

I had not thought about it in that light but that's true. That's absolutely true. But inside myself I was very, very pleased at what I was doing. I felt that I was helping in some way just by keeping secrets. That's why I'm kind of a secretive person; I guess, because I was quite young when I did these jobs and I grew up keeping things to myself. [laughter]

Yes. So that's really interesting, Marie. You think it may have sort of influenced a whole sort of outlook on life.

Oh, absolutely. Absolutely. I really see it right now, yes, it influenced my life. My entire life.

Interesting. Really interesting.

Probably that's why right now I'm not very good at telling about it, because I've never, ever spoken about it and the words just don't come easily, and it's been *so* long that I've forgotten a lot of it, never having spoken to anyone about what I did.

Well, I think that's really a big, important piece of the story, you know, what happens to young women coming of age in that particular era, smart, sharp, so you get to be in these kinds of positions, and then you just don't talk about it because you never talked about it. Life goes on and the world changes.

That's right. That's why I was so—I felt so strongly about first meeting you. I just couldn't believe that I could talk to someone about, you know, things like this. It brings back memories too that after twenty or thirty years you kind of lose what is in your mind, you've kind of forgotten about it, you've changed your life.

Yes. I think that's probably true generally of us humans, but I think layered on top of that—I'm guessing now, I'm speculating—is the behaviors and the culture that are necessary to keep these secrets. Maybe, you know, it's like your memories are in a little bit of a repository too, in the same way.

Exactly.

I don't know if you would agree with this, but in a certain sense you could say that maybe there was a price that you had to pay to serve your country in this way. I don't know if that's speaking too strongly. But there was a consequence to the fact that you had that kind of job.

Yes, there was a consequence. Let me tell you, Mary, you've hit it exactly right. It did make me feel that way, that I was **[00:30:00]** doing something to help my country by just being implicated actually in the scientific community. And even though it was a little, small part I was doing something, and especially since it was so secret. But also in my later life, after I met McMillan

and married him, he was so tied up in civil rights and other things that I also, because of my background and I guess the secrecy, growing up with the secrecy, always made me feel that I should be in the background helping him and not saying anything about it. And so my whole life has been affected by that first work that I did.

And I wonder how much it also—I'm just free-associating here, Marie—the fact that you're a young woman and women's identities in that era are mostly within the home, that you're molded in a certain way by this work. I suppose that's true of all young people though who would go into work like this, would find themselves molded in certain, you know, pretty powerful ways.

Did you think at all about the weapons part, the Cold War peace, the political piece?

Yes. Well, this actually was before the Cold War. At that time we were concerned about the atomic bomb and what devastation it would cause, and actually where I worked there was one division that was working on, what did they call it? They were doing experiments trying to find a way to use atomic energy for peaceful purposes.

Right. There was Atoms for Peace and then there was Plowshare.

Operation Plowshare. That's the one that I was most interested in. Operation Plowshare. And we did do a lot of thinking about that and wondering and thought about a lot inside ourselves whether we should be doing this or not. Whether we should continue on with our experiments with atomic energy for weapons instead of peaceful uses such as things they were trying to put together for Plowshare.

Right. When you say "we," who was that?

I'm thinking mostly of my husband and myself and also the laboratories. We could talk about it because we both worked in the area of atomic energy. And I knew what a huge—the general public did not realize what a huge operation this was and how much energy and time and how

important it was to do these atomic tests, both in Nevada and out in the Pacific. And when you're in that mode, you do a lot of thinking about whether you're doing something good or not, whether it's for good or—I can't say "evil"—but whether you're doing the right thing.

So you were *able to talk to your husband about these things?*

Oh yes, my husband and I talked about it, yes, together, and also with a few others we worked closely with.

And he thought about it then.

Oh, well much more than I did actually.

Really?

[00:35:00] Yes. Oh I'm sure, yes, because when he first went to work up at the lab up on the hill in Berkeley, I was a housewife with young children, and he was gone to the Pacific Proving Grounds a lot. He was gone probably half our married life, you know, several months at a time in the Pacific and then a month or so at the Nevada Test Site and then back out to the Pacific and back and forth.

That must've been hard for you. I mean it was hard for him in his own way.

Well actually sometimes, you know, absence makes the heart grow fonder. So the time that we did have together was quality time. And the one time that I did spend in Hawaii, I think it was for Operation Redwing, and I knew he would be gone a long time and so we went to Hawaii and the children went to school there. And that was one of the happiest times actually of my entire life. It was really nice. And I was really disappointed when—Mary Kay Johnson and her children, yes, and we'd planned to spend that year and at the last minute she didn't come. And I actually did not spend the year there. I spent a little over six months there and the children went to school there and it was really nice.

Yes. Yes, you talked about that last time. But I'm just curious because this is a subject that is interesting to me. So you think that your husband—or you know that your husband was doing this work but he was also thinking about whether it was worthwhile, whether—

Whether, and what the impact would do on the world. He thought about more the consequences of all of these things. He was a brilliant man and it was on his mind of what they were *all* doing out there with these tests.

Was he involved, do you know, with the Bravo test, that one that ended up being bigger than it was supposed to be?

I don't recall.

I can find that out. Did you ever see a test, Marie? Did you ever see an atmospheric test?

Yes. Yes.

You did? Where?

Out at the Nevada Test Site when I worked there.

Yes, I guess you couldn't have seen it in the Pacific.

No. But actually before we moved to Nevada, when we lived in San Leandro and I knew when these tests were going to be, I would go out on the upstairs balcony at whatever time it was scheduled to go off in the morning and I could see it from California. I would be looking at my trusty watch and all of a sudden it would be like the sun would be coming up in the east and you could see the hills in the foreground and it would light up like the sun was coming up for a couple of seconds and then go down. Yes, oh, that was an amazing sight.

Amazing. It must've been.

I was wondering how, actually I do not know, how the newspapers got the pictures of them because we have some newspaper clippings of the tests going off. I guess at one time the time was given out to the newspapers.

Yes, there was a period when—well, you know this later at the test site they would have the news people come out.

Exactly.

I don't know about the early ones. I'm pretty sure from what Herb York told me that some of those first early ones were not *announced, because he told me the story of I think it was on the first series, the Ranger series, that he was called by Los Alamos to please go out in Berkeley and tell them what he saw. And so I have a feeling on that one it may have been unannounced, but I don't know. That would be an interesting thing to find out.*

[00:40:00] It would.

But then you actually saw atmospheric tests at the test site as well.

Yes. Yes. But only because I had the clearance and I was working out there, yes.

Yes. So you were out there. Did you actually go to a forward position or—?

At one time I was at the—what do they call it? The—

Control point?

The control point. It was a building out there where they had all of the instruments for EG&G. Only once. But I was out there before the tests were done. I was up in one of the towers once. I suppose that was not legal but I have done that, and been in the tunnels also. Which was really, [pause] well, I can't say "traumatic." It was really an experience for me. Especially up on the tower!

Well, if you could describe the impact, what would it have been? Was it—I'm just trying to imagine because I've never done anything like that.

Oh, to go up in the tower?

Or the tunnels. I mean does it make you think more about the weapon itself?

Oh, absolutely.

That's what I'm asking.

Yes, absolutely, it made you think about, What are we doing here? This is what we do. Should we be doing this? This is awesome! This is really awesome that the government spends all of this money in doing this. Is it worthwhile? Should we be doing it? Will it help civilization? Will it put us behind? Will it put us ahead? Yes, it's mind-boggling the things that you think of, you even dream about it, especially after seeing it. And I suppose, too, when you're young this is new, you see, it's like, I don't know how to explain what it's like. It's something brand new. You feel fortunate that you're in on the ground floor that you see how it is before we're all blown up or whether we can use it to really, really do something great. Which way is it going to go?

Yes. That's so interesting, what you just said, because the juxtaposition of your own youth and the awareness that you are seeing something being created, being born, that's, well, civilization has never seen it before.

It's a creation. You're wondering if perhaps something like this is what created the world. Your mind thinks about how did this world evolve, you know? Is it coming from stars blowing up and are there other—of course my husband would think a lot about—of course since he was an electrical engineer, he would think about sending electricity through the air with no wires, you know, like—

Like Tesla.

Like Nicola Tesla and things like that. Had he lived longer, I am sure he would have discovered how to send electricity through the air without wires. And we did talk, he and I, about, oh, perhaps sending your thoughts without wires to someone else and we often talked about sending messages to each other if one of us died, but so far I haven't received any messages from him. So maybe we're still working on that experiment.

Maybe. Maybe. Interesting.

Yes, but he was a brilliant man to be thinking about that. I wish he'd been here longer. I bet he could, like Tesla, I think that he could probably send electrical energy through the air without wires. Yes, he died a young man before he got to do any of that.

Now, do you mind my asking how he died?

[00:45:00] No. He had a bad heart. [pause] It ran in his family actually. He had an irregular heartbeat, and actually he didn't know it for a long time until one time he wanted to fly, and that's how I got interested in flying. Actually you know how scientists or electrical engineers or people working at the laboratory are when they first start out, they're rather poor, and only one of us could take flying lessons. And of course it was him because I stayed home with the children, but I was happy that he could go. He took some flying lessons and he was interested in it because he was helping, was it, Luis Alvarez, working on that navigational system for the Air Force, and so he started taking flying lessons, and that's actually how I first got interested in flying. I always wanted to fly but he had first choice, so he joined a flying club and he flew. When he went to take his physical examination to get his license, they found he had this bad heart. And that's how he found out. And ever since that time, you know, I always thought that I always wanted to fly. And when I got here to Las Vegas I started to fly, and it was actually ten years before I could actually get licensed. And that's how I started my flying career.

Because your husband couldn't be the pilot.

Well, we were just interested in flying.

I want to get over to that, but before we do, you actually told me the Luis Alvarez and the large tube story.

That wasn't Luis Alvarez, the large tube story. The Luis Alvarez story was the Instrument Landing System [ILS] story.

OK. Now I'm confused. You told me some of this on the phone and so it'd be great if we could get it on—you told me that after we spoke.

Well, my husband did several things aside from working for the—he really had a scientific mind. Aside from working at the University of California Radiation Laboratory, one of the things he did was work with Luis Alvarez on this navigational system. I'm not sure at the time [if] it was called the ILS or 'Instrument Landing System" or what it was called at that time, but he worked on that with Luis Alvarez, developing that at the Oakland International Airport. He also created a little company that was called—we called it DSG for Daly, Sinnott, and Gibson [Elisha Daly, Richard Sinnott, and Leonard Gibson]. They were three young men that were making different kinds of things. I don't recall now exactly what they were [one product was a vacuum tube volt meter]. Duke also worked with a man who worked up on the hill, a young fellow whose name was Ross Aiken. And in Duke's little DSG company that he created—I've forgotten what they called it, some kind of equipment to help Ross Aiken design this tube. So he and Ross Aiken designed this television tube—well actually it was just a tube. He built at his Daly, Sinnott, and Gibson Corporation some kind of equipment that—I forget what they're called. They sucked air out of—

Like a vacuum. It made a vacuum.

Like a vacuum tube volt meter system. Yes, something like that. And when he and Ross got together they designed this tube. It was a flat tube instead of a tube that you think of like a light bulb with a neck that goes out in the back. The larger the light bulb, the longer the neck. And television at that time was in its infancy. So to get a larger picture, the neck of the tube had to be long. So they developed a flat tube and Duke made the electrons turn so the electronic gun could go in the side of the tube instead of out at the back then the tube could be very large. And so they **[00:50:00]** developed this tube and they demonstrated and showed it to a lot of the companies that made tubes, such as General Electric and Kaiser Electronics [Also Ratheon, Zenith, RCA, Sylvania, Magnavox, Hoffman, Phillips, and Westinghouse. Later sold to the U.S. Government for jet airplanes.], and actually at that time they showed it to most companies that manufactured television sets.

Right, right, probably Sylvania and those kinds of companies.

Yes, exactly. Exactly. I can't think of the names but that's exactly right, all of those companies. And I can remember making trips to Los Angeles with him so he could demonstrate the tubes. When they sold that the tube, I guess some of the first money that he ever made, he bought me a mink stole. I still have it. I've forgotten who bought it, to tell you the truth, but it doesn't matter. Whoever it was, the company that did it, you know what they used it for?

No.

They demonstrated it to the government and they used it as the windscreen on airplanes. This is another reason I'm interested in airplanes. They demonstrated it as a windscreen on the airplanes because jets were new at that time and jets went so fast that the pilot did not have time enough to put—this was the thinking at the time—did not have time for their eyes to go down to the instrument panel and then up out of the window and down to the panel and out of the window to

fly. So what they did was project the instruments from the airplane up in the panel so they could look through the windscreen and the instruments would be right there.

That's the piece that we didn't—yes, that you told me about on the phone, but I'm still not clear on how that works. You've got the actual—you have to be able to look through the windscreen out the window.

Yes. Yes, like a tube, like a light bulb, only think of a flat light bulb, you can see through it, a clear one.

You can see through it but you can also see what's being projected?

Well yes, because they made it flat. Instead of a long tube like a light bulb, they made it so the electronics went up through the side and projected the instruments here on the windscreen where you're looking, so you're looking outside and seeing the instruments right there without—

OK, so you're seeing the images of the instruments through the tube. The instruments are down here, you're seeing their images—

I don't know where the instruments are.

Wherever they are.

Yes, exactly.

Amazing. And I wonder if that was used for any period of time.

I have no idea. I have no idea. I did hear that that was what it was first used for and I suppose the government—I have no idea. *I* never flew an airplane like that after I learned to fly. Now I don't fly jets actually.

That's an interesting story. That's an interesting story.

And then Ross Aiken, of course he was the—he built—whoever they sold it to, he built a laboratory and it's over on what we call Silicon Valley now. It was a laboratory to design and build things.

I've heard that name.

Oh, you have?

I don't know why.

Well, he had one of the first laboratories over there. Electronic, I guess, and you know that's where—

A lot of important things happened over there. Absolutely.

That was one of the most interesting things, I thought, that—yes, vacuum tube, that's what they were building, vacuum tubes, the DSG Corporation.

Yes, I don't know enough of—go ahead.

Well, I was just thinking, back in my old papers I probably have the corporation certificates number one, two, and three or whatever for the DSG Corporation somewhere. I'm sure I would have them if I'd look. It would be interesting.

It would be interesting to see. All that documentation is interesting.

So flying seems to be a theme. Did I interrupt what you were going to say?

No. I was just thinking myself, I'd never thought, that's what interested me in flying, I guess, aside from when I was young, I read all of those books about Admiral Byrd and the North Pole and all those adventure stories, when I was very young. And I always wanted to fly and that's why, **[00:55:00]** actually only one of us could fly when we were married. And so Duke took the lessons. And I learned how to fly after I was forty years old here in Las Vegas. So you can do what you want to do if you're motivated, you know, enough to do it. And when I speak out to

groups, especially to older people, [I say]: You just have to keep trying and you can do it. Like it took me fifty years to get through college, doing a little bit at a time. But you finally can do it if you put your mind to it, and if *I* can do it, anybody can.

I feel the same way.

Good!

So when you learned to fly, was your first husband still alive or—?

Yes, when I soloed, yes. That was about the end.

[00:56:27] End of Track 3, Disk 1.

[End of interview]