An Interview with

FRED LACCABUE

OH 401

Conducted by Jeffrey R. Yost

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Fred Laccabue Interview

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Oral History 401

Abstract

This oral history briefly addresses Fred Laccabue's early career with Convair, and his work on the COOP monitor and other early Control Data Corporation (CDC) software systems, but the bulk of the interview focuses the Air Force's Advanced Logistics System. Control Data was the lead contractor for the ALS of the Air Force Logistics Command, and Laccabue was the project manager for seven years—from the pre-bid stage until late in the project. The interview details CDC's pre-bid work, bidding for the project, the problematic design specifications in the Air Force RFP, the challenges of the project, project redefinition and renegotiation, and the decision to discontinue ALS. It also touches briefly on Laccabue's work with CDC's STAR program, and, after leaving CDC, his work with Fairchild Semiconductor and Tandem/Hewlett-Packard.

Keywords: Control Data Corporation, Advanced Logistics System, Air Force Logistics Command, Air Force computing, Supply management, ZODIAC, SCOPE, Cyber 70 and COOP monitor.

Yost: My name is Jeffrey Yost from the Charles Babbage Institute at the University of Minnesota. I'm here this afternoon with Fred Laccabue in his home in Cupertino, California. It is December 4th, 2009. Fred, can you begin by answering a few basic biographical questions. First, where and when were you born?

Laccabue: I was born in Chicago, Illinois in May of 1933.

Yost: Did you grow up in Chicago as well?

Laccabue: I grew up in Chicago, through high school I lived in Chicago. Then I spent a semester at Saint Mary's College in Winona, Minnesota and then transferred down to the University of Illinois where I got my undergraduate degree in Math.

Yost: Before college were there particular subjects or areas of study that you were particularly interested in or you had a special aptitude for?

Laccabue: Math and Physics were my two favorite subjects in high school and so that was kind of my focus when I went to the University.

Yost: What was your first job once you graduated from Illinois?

Laccabue: My first job was with Convair in San Diego. I went to work as a dynamics engineer at Convair. This was in the era of the F102 and the F106 fighter aircraft and I

was doing work on flight simulation and modeling and dynamic loads analysis in the group that I was assigned to.

Yost: What was your title when you started?

Laccabue: I can't remember but it was just some associate engineer or something like that—working for, I think, a whopping four hundred and fifty dollars a month. [laughs] My first assignment was to convert a program from a Univac 1103 to an IBM 704. We, at Convair, were just on the verge of getting IBM 704s into our computer labs at that time. So I had a couple of the programmers assigned to me as kind of a program manager to port this application to the 704. And it was written in octal of course. And there was no documentation for it; it was flight simulation program so it was quite a challenge for the people who were working on it, but we got it done.

Yost: Did you have any experience with computers when you were in college at Illinois?

Laccabue: No, I didn't. Unfortunately, you know, there I was at one of the foremost technology centers for computing and I didn't get into computing while I was there. But I got into it knee deep at Convair there and it captured my interest. So I decided I wanted to focus my attention on computers and kind of adopt that field as my progression in my career. I transferred into the computer lab after a couple of years and then from there I got interested in working for a computer company. I knew some people who had gone to Control Data Corporation from Convair and got recruited to join the company.

Yost: And what year was that?

Laccabue: That was in 1960.

Yost: Do you recall your original title in taking that position?

Laccabue: I don't remember it. I've got it in my files. It was something like associate programmer analyst or programmer analyst, something like that.

Yost: What did you initially begin working on at Control Data?

Laccabue: We were just deploying the Control Data 1604 computers and one of the first deliveries, I think Serial 3 went to Lockheed Missiles & Space division and I think Serial 1 went to the Naval Post Graduate School. We had virtually no low-level software at the time and so I worked in conjunction with a partner of mine, Irv Elliot, on the Control Data Assembly program for the 1604. Irv actually authored the initial version of this program and then I went to work with him and the two of us worked together to finish it up. We developed some library routines for the Navy and subsequently for Lockheed because at that point in time computers didn't come with a full-blown operating system and all of the assemblers and compilers and tools that are typically shipped with computer systems today. So we worked on a lot of the early versions of this kind of stuff.

Yost: Were these customized for different systems, for different clients?

Laccabue: There was a lot of customization that was taking place at that time because we were just gathering requirements and trying to develop programs in response to those requirements, as you would for a customer base. But of course, we wanted to… we understood that it was beneficial for us to develop some standard products that we could deploy to a wider customer base. One of the first missions that I had—after I spent about a little shy of a year in Sunnyvale working at the post-graduate school and with Lockheed—was going back to Minneapolis and working out of the Control Data headquarters on Park Avenue in downtown Minneapolis. One of my first assignments there was to initiate a program to develop an operating system for our customer base. I had some experience at Convair with an operating system that was developed for the IBM 704 and used some of that technology as the basis for what came to be known as the COOP Monitor. So I had a little team of about four or five people who I recruited to help me with the development of the COOP Monitor. Spent some time down at the University of Texas because they were an early 1604 customer who was interested in the technology that we were developing for the COOP Monitor, we got their ideas and integrated them into our plans. This was a three phase operating system that took input, went into an execution phase and then an output phase. So, it was kind of a three phase operating system as we referred to it at that time. It was a pretty successful venture. The COOP Monitor became a product that was embraced by the Control Data user group and that user group was called COOP. So we had a lot of interaction with the COOP team to

define requirements going forward and build on the base operating system that we had developed in Minneapolis from that point forward.

Yost: How long did it take to develop the COOP Monitor?

Laccabue: I think it was about four months. I think we started in something like October, November and we delivered the first version of the COOP Monitor to the University of Texas there I think in April.

Yost: In what year?

Laccabue: That would have been 1961.

Yost: After that what types of projects did you work on for Control Data?

Laccabue: After that I got a longing to come back to California and so I decided I was going to do that and I actually was recruited by Fletcher Jones at Computer Sciences Corporation. Do you know who Fletcher was?

Yost: Yes—just by name. I'm doing a book on the history of the computer services industry—so he, of course, figures in.

Laccabue: Okay. A friend of mine went to work for Fletcher. They were in Palos Verdes at the time. They had about thirty people at Computer Sciences Corporation at that time. My interview was with Fletcher and he made me a job offer and I submitted my resignation to Control Data Corporation. The first thing that happened was Bob Price and Claire Miller – Do you know Claire?

Yost: No, I don't.

Laccabue: Bob Price and Claire Miller said, 'What do you want to go do that for?' 'Well, I want to get back to California.' 'Well, we're going to open up our software development headquarters in Palo Alto. Let's talk.' So we went out to dinner and before that was all over they made an offer that I couldn't refuse. I sent a letter to Fletcher Jones expressing my apologies for changing my mind about his offer and I moved to Palo Alto. So we were first in Sunnyvale, had a little building in Sunnyvale. We finished up some of the work that had been started on the assembly programs and other software, other low level software for the 1604. We were expanding at the time, of course, and then we moved into our first building up in Palo Alto, at Stanford Industrial Park. In fact if you look behind you there that's a picture of me at a console of a 1604 in about 1961, 1962 possibly. Bob Duncan, if you know him, took that photograph.

Yost: No, I don't.

Laccabue: Bob Price and Dick Zemlin, who was my immediate boss in Palo Alto, were among the people at Control Data at that point in time. We started working, I don't know the exact year, probably 1962, 1963 on the 3600. Chuck Casale – do you know him? He was one of the early hardware engineers that was involved in the development of the 3600 computer system and I was responsible for the software that ran on it. The assembly program for the Control Data 3600 and the operating system for the 3600 were major projects that I was working on at that time. Subsequently, we decided that we wanted to address some of the commercial portions of the marketplace because we were primarily a scientific computing company at that point in time. In fact there was a lot of controversy about whether we wanted to dip our toes in the commercial side of things. But we decided that we needed to at least develop a COBOL compiler because a lot of RFPs that would come out from the government had a check list and if you didn't have a COBOL compiler you didn't get to bid. We actually went and I knew a guy at Convair, Charlie Swift, I don't know if you know who Dr. Charlie Swift was but he left Convair and joined Computer Sciences Corporation. He was at CSC at the time and I started negotiating with CSC to do our COBOL compiler and they were in fact the subcontractors who did the first COBOL compiler for the 3600. That kind of takes me to somewhere in the mid-1960s.

Yost: Was that just outsourced to them or did they work with together with you to co-develop it.

Laccabue: It was outsourced. It was pretty well outsourced to them. We had a monitoring team, of course, and went through phase and specifications and the like but, yes, it was totally subcontracted to them.

Yost: In the early years out here, can you tell me roughly how many were employed at the launch of the Sunnyvale facility, and how many in the first few years?

Laccabue: I think that when we were in the first building in Sunnyvale on Arques Avenue, we had maybe twenty people in there. When we moved to Porter Drive, our first building in Palo Alto, we maybe had fifty. So we probably got to a hundred or more people there. Then we started expanding into additional buildings in Stanford Industrial Park. We went to another building after the building on Hillview, to another building just down the street on Hillview, which was a building where we put not only our development team but we had the sales team in there as well. We were expanding with sales people and application people. One of our sales people there, you might know a guy named Jim Guzy who later was on the board of directors for Intel for many, many years. He, in fact, just retired from the Intel board of directors. So he was in that building at 3260 Hillview. Then we moved into a new complex on Porter Drive which was a three building complex with a huge data center in one of the buildings in between these three other people populated buildings. We were in that Porter Drive facility up until about 1969, somewhere in there before we opened up the building on Moffett Park Drive in Sunnyvale. Then we consolidated everything into the Sunnyvale facility there on Moffett Park Drive. I was in that facility until I left Control Data in 1979. That's kind of the…

Yost: Can you tell me about the origins of the Special Systems Division?

Laccabue: The Special Systems Division actually was formed back in Arden Hills, or in the Minneapolis area I'm pretty sure it was headquartered in Arden Hills. As the name implies, they were doing special systems—typically in response to RFPs and typically on government contracts. We started doing some work for Worldwide Military Command and Control System. This was in the very early days when transaction oriented operating systems were being discussed and not much had happened beyond discussion at that point in time. WWMCCS as it was known, there was a project called WWMCCS, the Worldwide Military Command and Control System, and Special Systems Division got involved in bidding on that. So we started doing some work at that point in time on the WWMCCS program and a colleague of mine at that time became the program manager for that program. Then ALS followed shortly thereafter in about the 1969 timeframe. Some of the technology that we had been working on seemed applicable to the needs of the ALS program and so we used some of that same transaction oriented operating system technology that we had developed for WWMCCS as a basis for the work that we did for the Advanced Logistics System.

Yost: Was the earlier system, the WWMCCS for a particular branch of the military?

Laccabue: Yes, it was for the space center in Houston, for the shuttle launches.

Yost: Was there a branch of the Division here in California?

Laccabue: Yes, actually Special Systems Division moved its headquarters from Arden Hills to Sunnyvale and I was working for –

Yost: Do you recall when that was?

Laccabue: That was right about the 1968-69 timeframe. The guy I worked for was a guy named Pete Smead, H. K. Smead, and Carl Ousley and Norm Dufresne and myself and Bill Fitzgerald who later became a high level finance guy at Control Data headquarters back in Minneapolis, were all working in that division at the time. When the ALS RFP came out I took a group of about ten selected people form this Special Systems Division to study the RFP and develop a proposal and a plan to develop a system to respond to the RFP.

Yost: When was the RFP sent out?

Laccabue: I think the RFP came out in 1969.

Yost: What was the initial response of the executives to this opportunity? Was there any sense of risk or resistance or was it was it just seen as a great opportunity?

Laccabue: The first response to it – of course our first job was to read the RFP, determine the requirements and determine our ability to respond to these requirements. One of the first and most obvious things was that we didn't have an off-the-shelf system that was capable of doing what the Air Force was asking for and it was also our sense that nobody else in the computer industry had an off-the-shelf system to do this either. Technically the Air Force was asking for an off-the-shelf system, but they also recognized that nobody had one. So our initial analysis of the RFP was that, first of all, there was a major requirement in the RFP that the Air Force dictated how they were going to address these requirements that we thought were big, big design mistakes on the part of the Air Force. My little team of ten people, with some sales and marketing folks involved with us, did an analysis. We strategized about 'how are we going to deal with this, because the Air Force specified that they were going to develop this central control system and when we read what the central control system was all about it seemed to us like it was a pretty low-level operating system and the Air Force was writing this central control system program in COBOL. We thought that that was a major design error in what they had provided us with. SO we strategized over that and decided the thing that made sense for us to do was to request an interview back with the people at Hanscom Field who were responsible for the RFP and the bidding process. We went back to Hanscom Field, a small team of us, probably four or five of us, went back to Hanscom Field for our discussion with the Air Force folks back there. We politely tried to talk to them about the things that we thought were mistakes in the RFP that were going to be real impediments to achieving success for this program. We were, not so politely, rebuffed and told that if we were interested in bidding on this program that we should bid in accordance with specifications as defined

in the RFP; that they had employed many experts in the computer field to define the RFP and the requirements and the plans for the central control system and the unified database that they had specified, and that they were absolutely confident that they were going down the correct path. So we kind of tucked in our tails and went back home and decided to have another strategy meeting.

Yost: I understand that they contracted before that with Comress Corporation, the RAND Corporation, as well as computer Sciences Corporation to analyze their goals with the system. Did they make reports that were produced by these service providers available to you?

Laccabue: I don't remember ever reading reports that were produced by any of them – I think Mitre was one of them as well – and I don't remember ever reading any of the reports that were published by or produced by those companies. It was just the encapsulation of that design and specification in the RFP that was basically the material that we had to work with. So we went back to the headquarters here in Sunnyvale and said, 'How are we going to deal with this? Do we even want to bid this thing?' We decided that it was too big an opportunity to not bid, but we also needed to develop a strategy whereby if this thing failed, we weren't going to go down with the ship. We carefully crafted questions back to the issuing agency at Hanscom Field to protect ourselves. One of the key questions that we asked, and probably the most important question we ever submitted formally back to Hanscom Field was, 'We understand that you have specified that any company that can provide a system that can successfully run

the Air Force logistics command specified bench-mark program within the sixteen

minute wall clock time that is specified in the RFP, that the Air Force will be guaranteed

that that system that successfully performs that bench-mark within that required time will

be guaranteed to be able to satisfy the requirements of the ALS program for the seven

year period of the program.' We carefully crafted all those words, although more

elegantly than I just said, but that was the gist of it. We got back a response, of course,

and this response was published to everybody who bid because the rules of government

procurements are that everybody is entitled to the same information. So any question you

ask is published to all of the bidders and all of the answers that you get back are

published to all of the bidders. We got back an affirmative response to that and one of the

things that I insisted upon as the program manager was that when we got to a point where

we were successful in running that bench-mark, every transmittal of any updates to the

base systems that we provided to the Air Force were always preceded by a successful

repeat of the exact bench-mark run that we had done for the Air Force when we got

qualified for the bid. And that strategy paid off in spades because, as you know, the

program ultimately failed.

Yost: Were other computer companies also asking questions and getting responses that

you remember? Or were there concerns among the other companies interested in making

a bid?

Laccabue: I don't remember other companies being quite so insightful and open. I'm sure

that there must have been concerns by them, I mean they had bright people too. They

were probably happy that we asked those questions but I don't remember seeing

questions from other vendors that replicated the things that we had asked, because why

would they need to, we had already done it.

Yost: O.K. At what point were you awarded the contract? And how much was it for?

Laccabue: It was for eighty-four and a half million bucks and this is the actual award.

[Showing award to Yost.] What was the day on there? 4/5/1972. If we go back to the

bench-mark we worked for about two years developing this system to respond to this bid.

It required a huge amount of mass storage, huge at that time. We had a whole bunch of

these bathtubs, they called them. We had disk drives that occupied huge amounts of

space that you can get on a device this big [gestures very small size] today. I think it was

a twenty-three billion character database that we were dealing with and a whole bunch of

terminals all over. We had a huge complex in the Sunnyvale facility that was filled with

just the ALS systems and the terminals and the mass storage devices and so on, set up in

our Sunnyvale lab to do this bench-mark. What we had done in developing our

transaction oriented operating system, which was a platform that this CCS, this Central

Control System of the Air Force ran on. We knew exactly how much CPU time we

allocated for each one of the operating system modules that were time consumers. So we

used a model where we budgeted each one of the pieces of the operating system that were

sequential in the execution of the bench-mark. We, on a regular basis, monitored a

program that was part of that kernel; had a budget and when they finished coding and

debugging of that kernel, we ran it, got the measurement of how much time it consumed

and we did that for every piece of code that was in the string. So we had a high level of confidence, based upon that technique that we used that we were going to be able to achieve this thing. And sure enough a couple of months before the Air Force came out for our bench-mark, we were running the bench-mark and we were running it within the sixteen minute window of time. When the Air Force got to our facility, we didn't know this at the time but they had already been to several of the other vendors and each of the vendors that they had been to before they got to Control Data had failed the bench-mark. So when they got to our facility and we had our meetings and introductions and all that stuff and went down to the lab and there was I think a team of about fifteen or twenty people from the Air Force that came out for this meeting in the bench-mark run. We fired it up and they had a message that would come out on the screen upon the successful completion of all of the transactions and it would also display the amount of time that it took to run all the transactions and we came out at fifteen minutes and fifty seconds or some thing like that – just right under the bench-mark time. They gasped and they ran for their telephones. It was like, 'We got one!' [laughs] They were on the telephones calling who knows, headquarters probably to let them know that Control Data had qualified for the bench-mark. We had a little postmortem meeting after that up in a conference room. So we talked a little bit about the bench-mark and some of the characteristics of it and they were going to come back the next morning for a little debriefing and I said, 'we've got a little surprise that we'd like to show you tomorrow morning. So if you have time we'd like to take you back down to the lab and show you some additional capabilities that we have.' 'O.K.,' they said, 'fine.' So the next morning we brought them down to our lab and we fired up some additional computer power that we had in reserve as a contingency

of our own before we achieved the successful bench-mark run. So we fired up the system and ran the bench-mark in twelve minutes. So that was pretty impressive. We said, 'Just in case you guys ever need any additional computer power to satisfy your needs here, there it is.' So it was a pretty happy ending to a story until about three or four weeks later, they extended the bench-mark schedule because everybody else failed the bench-mark.

Yost: Do you know which other companies tried to and failed?

Laccabue: Yes. So they extended by about six months the bench-mark qualification process to allow Univac and IBM to qualify. And they did. I don't know how much they had to bend any of the requirements to allow them to qualify but presumably they did qualify on a legitimate basis and we got into a bidding contest with Univac and IBM and we won the contract award at the eighty-four and a half million which at the time was a lot of money. Eighty-four and half million is still a lot of money [laughs] but it's pretty small compared to some of the awards of the day. But at that time that was I think the biggest –

Yost: Was that the largest single contract that Control Data had to that point?

Laccabue: I believe it was, yes. There was another interesting facet to our proposal and that was that the Air Force said that there were certain rules that you had to comply with regarding your pricing proposal. So we had a special purchase conversion privilege as part of our pricing proposal. The purchase conversion credits were structured in a way

that the earlier that they did the purchase conversion the more credit they got for the purchase conversion. The purchase conversion was based upon a purchase conversion date [hex] and then that was the basis on which they evaluated your bid. It turned out that if they delayed the purchase conversion beyond that date, we got more money but the basis for determining the winning bid was based upon the date that they were scheduled to make the purchase conversion. It was a double-edged sword because if the Air Force didn't take acceptance of our systems on the date that they were scheduled to, they had no recourse but to pay us more money for the systems. Subsequently the GAO issued a modification to their bidding rules that any bid of that type was not permissible. So they got caught in a situation there.

Yost: So it sounds like very careful planning was done in your bid.

Laccabue: Yes. I don't know if you know Dick Clover – H.D. Clover – he was our contract V.P. and Dick was the brain trust behind crafting that bid structure. So it was again another way of protecting ourselves from, if the Air Force got in trouble and couldn't deploy the system successfully, we had some built in protection there in the price. We weren't really attempting to be unfair, we were just trying to protect ourselves.

Yost: Right. Can you describe the department within the Air Force Logistics Command for electronic data processing and how large was that group; what level of skill and experience did these individuals have in computing; and also describe the leadership of the Air Force's IT unit within the logistics command?

Laccabue: O.K. So headquarters was Wright-Patterson Air Force base in Dayton, Ohio, and after we won the award of contract the team that was going to be responsible for implementing, finishing the integration and implementation of the system and then deploying it to the AMAs (Air Material Areas) was headquartered at Wright-Patterson Air Force base. The first leader that I met was Colonel Ernst Volgenau, who came out with the team and there were about twenty, twenty-five people that came out to Sunnyvale for the initial visit. They were GS-13, GS-15 level—at the highest levels; very qualified and competent computer scientists. They were kind of the main group but then they had thousands of programmers that were doing applications and queries and things that were in support of the logistics activities that this system was going to be responsible for managing and handling. One of the reasons that they rejected our concerns about the program, the central control system and other pieces of their program being written in COBOL was that they had thousands of people and they were more concerned about the effectiveness of their people than they were about some CPU cycles. Well, within reason that makes sense but this was not within reason. There were lots and lots of participants on the outskirts but the people that we worked with at Wright-Patterson Air Force base were a good qualified and skilled set of people. Incidentally, they knew about the shortcomings of the RFP. I had a conscience and at the same time that I was making sure that we were structuring this response in a way that protected Control Data Corporation, I also felt an obligation to be open and honest with the people I was dealing with in the Air Force. The day that Colonel Volgenau and his team showed up in Sunnyvale, I made the opening presentation to these guys and I told them exactly where we were, what we had,

what was working, what additional work was going to be required before they could

deploy this system. I think they were a little bit surprised by some of what they heard

because I think even they didn't recognize all of the work that remained to be done before

they could possibly deploy these systems. But I wanted to make sure that we were open

and honest with these guys because once you lose trust with people it's gone forever. So I

went to General Bailey, when we later on, several weeks later we were at Wright-

Patterson Air Force base and we spent huge amounts of time at Wright-Patterson Air

Force base, so those of our folks from the Sunnyvale area who were involved in the

program were commuting on a regular and frequent basis back to Dayton, Ohio. I was

open and honest with Colonel Volgenau with Colonel Stringer, who was one of the guys

responsible for the downstream deployment in these systems and with General Bailey

about the shortcomings of the RFP. I told them "you know before you guys are going to

be successful with the central control system, we believe it is going to have to be

rewritten in a low-level language and we'll be happy to submit a proposal to you for what

we think you need to do with that program". And we did. We gave them a proposal to

redo the central control system, write it in machine language, like it should have been

written in the first place. They were receptive to that. General Bailey's view was, 'Look,

keep working with us. We'll continue to work with you and as we get to some of the next

steps in the program we'll entertain giving you a contract to do the CCS over in machine

language and so on.' So that was kind of how we progressed but it became difficult. It

became difficult because they started to see some of the bottlenecks in the system and

one of the moments of truth was when they had deployed some systems to some of the

AMAs. We had a system at San Antonio and they fired up a transaction from the San

Antonio Air Material Area and I got a call on a Saturday night that they thought

something was wrong with the system because they fired up this transaction, the system

seemed to be hung up in a loop. So I called a few of my people and got them looking at

consoles and information and they told me everything was working just like it was

supposed to work, everything seemed to be progressing in the way that they would have

expected it to and about twenty-three hours later the transaction finished. This was just

like some simple transaction to replenish a part from Wright-Patterson Air Force base, for

a part that needs to be shipped to Guam or some place like that and to decrement the

inventory level and so on, the things you do in a logistics application. And it finished.

And it finished successfully…twenty-three hours later. And I think it finally hit

everybody who was associated with that test that, 'Wow, we have a problem here.' 'Well,

just like we told you, right?' The next thing that happened is that they decided that they

needed these systems to do a lot of batch processing. And well, batch processing was

never part of this RFP. So we started talking about the batch processing that they wanted

to do and this was at about the point when General Bailey got reassigned and General

Louis Alder came in to replace General Bailey. It wasn't very long after he was there that

he smelled that there were problems and he blew the whistle on the program. So that's

when we went into kind of a re-plan phase with the Air Force.

Yost: When was this?

Laccabue: This was about 1973, 1974 timeframe. Maybe just a little later than that,

maybe 1974ish.

Yost: The Air Force initially wanted this to be a real-time system so they didn't anticipate it being a batch?

Laccabue: They must not have anticipated it because there was nothing in the RFP about it. [laughs]

Yost: O.K.

Laccabue: So this was 1972 when we won the award so, yes, it was about 1974, about two years later when they finally decided that, 'wow, we're in trouble here.'

Yost: ZODIAC refers to the operating system?

Laccabue: ZODIAC was the code name that we attached to the operating system that we shipped to the Air Force for this program. ZODIAC. We had a system called SCOPE at Control Data Corporation which was a batch oriented operating system, the standard kind of an operating system. It was clear that some of the batch work that they needed and wanted to do would be better served by SCOPE systems. Part of our strategy to respond to the revised requirements in the Air Force at that time was to develop what we called an integrated system concept and that was to take the best features of ZODIAC and the best features of SCOPE and combine them into an implementation for the Air Force. So we

made a proposal to General Alder for this Integrated System Concept and ultimately that
– [phone rings]

So that's when we moved into a recovery phase for this program. Prior to getting into that
recovery phase we went through the Air Force, or the government actually, established
this blue ribbon committee to go in and find out what was going on. This was in response
to General Alder blowing the whistle on the program and so they launched this blue
ribbon panel to do what ultimately was published in that GAO study that I'm sure you
have read. It was after all of that interrogation and re-planning that took place that led to
our integrated system concept. And subsequently we did install a lot of that system in
Wright-Patterson and the other Air Material Areas in response to those needs. They
replaced a bunch of RCA 301s and outdated IBM equipment and Burroughs equipment,
and modernized their data centers with the newest and greatest equipment from Control
Data Corporation. So it wasn't such a bad deal for the Air Force at the end, it's just that
the original ALS concept that they were trying to achieve failed.

Yost: Can you speak a bit about the hardware of the system—that, of course, was the
Cyber 70s?

Laccabue: They were Cyber 73s or 74s, I can't remember for sure. I think they were
Cyber 73s. We had a hardware unit called extended core storage and extended core
storage was comparable in speed to central memory on a system. Extended core storage
was accessible through ports to different systems that could be connected through the
extended core storage unit. In the ALS configuration I think we had three Cyber 73s that

were interconnected with extended core storage. So the extended core storage was a vital link between these different systems and then beyond that we had interconnected terminals and mass storage were the major components of the system.

Yost: What about the history of SCOPE? When was that developed?

Laccabue: SCOPE was developed initially for the 3600 and so the later versions that ran on Cybers, they were derivatives of the original SCOPE system that was developed with the 3600. I was responsible for the team that did the operating system development for the 3600, for the assembler, for the COMPASS assembler as it was called. The SCOPE – Supervisory Control Program Execution is what SCOPE stood for – later on that was the system that ran on the Cyber 73, Cyber74s, that system was derived from that same basic platform.

Yost: What was the plan for deployment to different the different AMAs? Were there a few that were tested or was it a rapid deployment to many facilities?

Laccabue: I think it was a pretty rapid deployment. There were test sites at each of the AMAs so there were activities there and preparation for the ultimate deployment. This was using ARPANET as connectivity for all of these systems. So that's how that was planned.

Yost: Did you get a sense that there was a much heightened urgency given the Vietnam war for the development of this centralized logistics system?

Laccabue: I didn't have that sense but it may have been that that was a factor for the heightened urgency but I just didn't have my antenna up on that aspect of it. I was more concerned with my own little world here and the challenges that we faced. I was concerned from the first day I went to Hanscom Field and reviewed this RFP and talked to the Air Force about the shortcomings, about this project failing, and that's why I wanted to be clear with everybody that I interfaced with that there were issues because I didn't want to be in a position where somebody said, 'Well, if you knew that this system was going to fail, why didn't you tell us?' Now it turns out that I had a conversation with General Alder after we were into this blue ribbon panel investigation and he asked me that question. He said, 'If you knew of these things why didn't you escalate?' And I said, 'General Alder, I told all of the people I dealt with from day one about the issues and problems. I told them that ultimately you were going to have to rewrite CCS in machine language and you were going to have to do something about his unified database to get the kind of performance you need.' But I said, 'The Air Force took the position, run the bench-mark, it guarantees that you will be capable of doing our job.' And I said, 'In spite of that I escalated this to General Bailey. We escalated it to the Air Force Office of Data Automation.' He said, 'You should have gone higher. You should have gone to Congress.' [laughs] Maybe they should have gone to Congress!

Yost: Yes, that seems an unusual position to expect of a contracting company, to expect that they would go to Congress. There was another large project that I've read a bit about and I was wondering if it was out of the Special Systems Division as well, the Union Bank of Switzerland UBISCO and that was contemporaneous to this.

Laccabue: Yes, that was also in the same era as WMMCS and UBS and ALS were all kind of in that same era. This technology was also employed in – and you know I can't remember now what ever happened to the UBS program. I don't think it ever came to full fruition. I've just gotten kind of fuzzy because I wasn't directly involved in the UBS program. They were taking some of the technology we were using and applying it for the Union Bank of Switzerland, but I wasn't directly involved in it.

Yost: You kind of anticipated my next question. Was there learning from one project to the other and did it go both ways or primarily from your ALS project to them?

Laccabue: I think it was more of a one way but there was probably some cross leverage as well but I think it was mostly deriving capability from what we had done on the ZODIAC system.

Yost: Were there people that worked on both projects that you know of?

Laccabue: There were a few, yes. In fact one of them is a lady that worked for me here in Control Data Sunnyvale who was directly involved with the UBS program and went over to Switzerland for several months to participate in that program.

Yost: The contract was renegotiated, was that at the recovery phase that you've mentioned?

Laccabue: The ALS contract? Yes.

Yost: Yes. Can you discuss the terms of that new contract?

Laccabue: I opted out of the program at that point in time. Bob Price came out to Sunnyvale to meet with me for half a day at the point in time when we had presented the integrated systems concept to the Air Force. We had agreed upon a recovery plan and Bob wanted to talk to me about what I wanted to do going forward. I'd had seven years of ALS and I wanted to go do something else. [laughs] So I wasn't directly involved with the revised contract and the negotiations going forward. But it was pretty good. I mean we ultimately wound up with well over a hundred million dollars in sales to the Air Force and I think they were satisfied with the products that we delivered to them. But I went off from there to a different challenging program called Star, if you know what that was. That was our vector computing program where we were competing with Cray in vector computing space. And that was a pretty interesting program too, and a challenging one.

Yost: Did you have any – you testified at one point, you mentioned in our phone conversation, could you talk about that and that was after the renegotiation I take it?

Laccabue: No, that was prior to the renegotiation. I think I mentioned to you in one of our phone calls that I went to a meeting with Deputy of the GAO, the Government Accounting Office, and I think his name is C.O. Smith. We went to meet with this Deputy and I think I mentioned to you that above his desk there was a sign that said, 'If you've got them by the balls their hearts and minds will follow.' So I think he liked to be an intimidating type of negotiator, right? [laughs] We got into his office, there were about four or five of us from Control Data that went to that meeting. He welcomed us into his office with that sign and then he got mean after that. He spent about twenty minutes reaming us out; telling us how we had screwed the Unites States Air Force and we had screwed the citizens of the United States because of all the money that they had squandered on this concept that was flawed and we were responsible for it and on and on and on. Just non-stop talking; we couldn't get a word in edgewise. But he finally ran out of wind and he stopped and he said, 'Well, what have you got to say for yourselves?' I responded with "Well, for openers I disagree with everything you've said for the past twenty minutes.' And then we had a real fun discussion. [laughs] But I didn't loose any ground with this guy. He didn't know what he was talking about and I did. So we came out of that unscathed. I can only say that ultimately Control Data did not get monetarily penalized for this procurement. In fact, it was a successful program – profitable and meaningful.

Yost: What about the IT infrastructure for the Air Force? You mentioned that even though the original goals for ALS, those objectives were not achieved, that they had a different level of IT infrastructure at the end of the project. Can you talk about that?

Laccabue: Yes, just a bit. The people who were involved with IT in the Air Force were operating with these ancient RCA 301s and IBM whatever they were. They were delighted to get this new technology. The Control Data Cyber equipment was a decade newer and better than anything that they were dealing with so most of the people that we talked to in the aftermath were very pleased with what they were getting. It was a modern upgrade to what they had and been working with for years and years. So I think it was pretty well received.

Yost: It was in 1974 then that you went to Star?

Laccabue: Yes, about 1975 that I went off to the Star program.

Yost: Was that on the programming side?

Laccabue: I was the general manager of the team that was responsible for the software for Star. One of the challenges is that Seymour Cray had come out with a system that was optimized around short vectors and Star was really optimized around long vectors. It did a bang up job on some of the bubble chamber reactor codes that were characterized by very, very long vectors, but on short vectors it was a disaster. One of the things that we

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developed was the world's first vectorizing Fortran compiler. What this compiler did was

look for repetitive operations and translated them into strings of code that worked on long

vectors as opposed to ten element vectors. So it was I think, as I said, the world's first

vectorizing compiler that looked for constructs in the code that we could translate into

paradigms that would be amenable to reaping performance from the long vector

technology that was implemented in Star. We made progress in that space but ultimately

the Star program was not a very successful program for the company. I don't know if you

followed any of that but frankly the Cray technology kind of ate our lunch in that area.

Yost: How long were you working on that?

Laccabue: From about 1975 to 1979 which is when I left the company to join Fairchild.

Yost: So moving back to ALS for a second, you were the project leader is that right?

Laccabue: The program manager. So it was not just the software but it was the whole

program, including the extended core storage, the total system implementation, the

terminals that we interfaced to the system, some of which were special feature additions

to our standard terminal offerings, and putting the whole system together to address the

Air Force's requirements. We had a guy in Dayton who was the general manager for the

sales team and so he was kind of responsible for all of the sales motion that was going on

in Dayton. And then we had contracts from Minneapolis, a team from the contracts

organization of three or four people that were involved and then most of the rest of it was

my team in Sunnyvale. And then we leveraged the terminal products from the Roseville

division in Minnesota. And mass storage obviously from the peripheral products division.

But the program management responsibility was pulling all this stuff together to satisfy

the program requirements of the Air Force.

Yost: Were other vendors involved in smaller parts of the project or was CDC the sole

vendor?

Laccabue: It was pretty much CDC as the sole vendor for all of the system requirements.

Now the Air Force may have had some other vendors who were responsible fore some of

the applications work that was going on. I don't know I didn't really get into that.

Yost: What led to your decision to leave CDC for Fairchild?

Laccabue: Personal reasons. I actually had accepted a job – Well, first of all, in terms of

my career I had gone about as high as I could go and remain in California. So I decided

that if I was going to continue a career path with Control Data Corporation I'd better

move to Minneapolis. I had lived there previously for about a year and a half prior to

coming back to California. So I accepted a position as general manager of Health

Education Courseware Company. It was going to be a little spinoff company funded by

Control Data Corporation, you know one of their little equity spinoffs. It was about a

week or two before I was going to go back to Minneapolis to begin that assignment when

I got a phone call from somebody at Fairchild, a senior vice president at Fairchild. He

said he wanted to talk, 'could I talk?' 'Oh, O.K.' And that led to an offer to go to work at

Fairchild. Basically they said, tell us what you want, we'll give you anything you want.

And I was stupid; I asked for too little. [laughs] But anyway, I took that job at Fairchild.

It was in the automatic test equipment group at Fairchild and we were doing a lot of

semiconductor component testing in that division of the automatic test systems group.

We had board testers and memory testers in other locations. Simi Valley was our

headquarters for memory testers and on the east coast we had board testers, but it was

semiconductor testing here in the valley. One of the things that they wanted to do was get

into – they were all digital LSI testing. And with the advent of a lot of analog technology

that was coming into play, you know automobile [applications] and stuff like that with

analog content. They wanted to develop some technology to address the testing

requirements for analog. So I got assigned to do a startup division to develop an analog

tester. That was my first job after I left Control Data.

Yost: How long were you with Fairchild?

Laccabue: From about 1979 to 1985. 1985 was the year of a huge recession in the

electronics industry and we were de-booking orders for digital LSI testers faster than we

were booking them. After I did my little startup analog test systems division, I got

promoted to vice president of sales and service for all of the tester products in North

America. My timing was wonderful. That was just on the front edge of this terrible

recession that we hit there. I left after about a year in that job. I did a few venture capital

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backed startups and then I wound up coming back into Hewlett Packard through Tandem. And that's where I've been for the past eleven years or so.

Yost: And your work at HP has been in what area?

Laccabue: It's all in enterprise level systems. It's kind of a return to my roots. I mean the Tandem systems – I don't know how familiar you are with the Tandem NonStop systems but it's fault tolerant technology. But it's big systems. It's running all of the major stock exchanges in the world and serving a lot of the banks payments, retail payments and other people to whom availability is of prime importance. Twenty-four seven availability is kind of our brand. That's what I'm involved in at HP. We've integrated the Tandem division into HP's business critical systems organization and we are operated as a separate P&L within that space.

Yost: Moving back for a moment, I meant to ask you about security with ALS but I neglected to ask you that. Can you talk about what the Air Force wanted with security and what you provided to them?

Laccabue: We never got too far down that path because the interest in getting security functionality into the product was in kind of a real early stage at that time and that was just about the time that things were starting to collapse. So we never really got too far down the path of doing anything in that space.

Yost: Is it surprising to you that the Air Force would not be looking at security with a system that has potentially important logistics information for the military?

Laccabue: [laughs] It certainly is today! But nothing was too surprising at that point in time because you know of the huge blunder in this whole requirements specification. Incidentally as it's my understanding, and I've not done significant research on this but maybe you have. This was not the first ALS program as I understand it, there was one earlier that was – are you familiar with it? There was an ALS program that preceded this one that came out in this 1969 RFP and it had a much shorter span of life and I don't think it ever came to fruition. I think it went down the path of a procurement and some failed attempts to automate the logistics command, prior to the ALS RFP that came out in 1969.

Yost: I have not come across that. Do you know the time span?

Laccabue: I think it was around the 1965 timeframe.

Yost: Were they working with a particular vendor?

Laccabue: I think it might have been RCA.

Yost: Well, I'll definitely have to look into that.

Are there areas that I haven't asked questions on that you feel are important to cover ALS or with your career that you'd like to talk about?

Laccabue: I think we've hit the high points, and some of the low points maybe. [laughs] I've had a very rewarding career. My job at Convair was pretty short, even though it was about four years, in the overall scheme of things it was a short period of time in my overall career. My twenty years, nineteen to be exact, at Control Data Corporation were a lot of fond memories, a lot of interesting stuff that happened during that period of time. It was very difficult for me to decide to leave Control Data Corporation when I did. I don't think I slept the night before I flew back to Minneapolis to submit my letter of resignation. Because it was where I grew up; it was where my career developed and all of the great people that I got to know and so on. So it was kind of a difficult decision for me to do that. But you know as I thought about my career going forward and I really didn't want to leave California. I looked around me and here was Oracle and Intel and Fairchild and all of these very successful companies. And I said hey, there is a bigger world here than just Control Data Corporation and here I am in the midst of the greatest creativity and technology on the planet, why do I have to feel like I'm constrained here? So that was a big part of my decision. And I'm glad that I left, not because any of my fond memories changed, but it was a growth experience for me. It's good for people to move around a little bit and expand their horizons. I think it does a lot of good for you personally and it gives you a lot of growth opportunity and I think you get to be a more capable individual who has more to offer industry by virtue of doing that. This is probably my last job; in fact it is my last job. It's just a matter of deciding at what point

I'm going to retire. I still work about sixty, seventy hours a week and I have more energy than a lot of younger people in my organization. So as long as I'm having fun and making good money and doing some good things for my company I'm going to keep doing it. And besides that I've got a kid in college. My son is a sophomore at the University of Illinois so I figure maybe two more years until he finishes college would be a good point for me to hang it up.

Yost: Well, it's been fascinating talking to you and this has been very helpful to my research. Thank you.

Laccabue: Good. Anytime you want to talk more, feel free you know how to get a hold of me by email or phone.

Yost: I may develop some questions and perhaps follow up by email or a call.

Laccabue: O.K.

Yost: Thanks.