

An Interview with
LYLE BOWDEN AND TONY BLACKMORE

OH 439

Conducted by Thomas J. Misa

on

18 November 2013

Control Data Corporation History Project

Melbourne, Australia

Charles Babbage Institute
Center for the History of Information Technology
University of Minnesota, Minneapolis
Copyright, Charles Babbage Institute

Lyle Bowden and Tony Blackmore Interview

18 November 2013

Oral History 439

Abstract

In November 2013, CBI director Tom Misa conducted a series of oral history interviews with 13 former employees of Control Data Australia (1963-89) including the details of each person's career, before and after working for Control Data. Topics that are common to many of the interviews include Trevor Robinson's key role in organizing Control Data Australia; the early computer sales in Australia to the Bureau of Census and Statistics, Department of Defence, Postmaster General, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Bureau of Meteorology, and several prominent Australian universities. Control Data Australia did business data processing for such large concerns as Broken Hill Proprietary (BHP), Telstra, and others. A distinctive emphasis was its work in developing computer systems for race-track betting for the state of Victoria's Totalisator Agency Board (TAB) as well as for other Australian states and New Zealand. Other topics include relations with Control Data's headquarters in Minneapolis, business data processing, data centers, database management, networking and Cybernet, and projects done in several Far East countries.

Interviews were conducted with Richard Bament, John Baxter, Ron G. Bird, Tony Blackmore, Lyle Bowden, Marcel Dayan, Ian Downie, Julie James, George Karoly, John O'Neil, Garry Pearce, Rob Robertson, and Bruce Wilson.

Misa: My name is Tom Misa; it's 18 November 2013. I'm here in Melbourne, Australia, talking with Lyle Bowden and Tony Blackmore. We'll be focusing mostly on their experiences with Control Data Australia Company, and they have a history that goes back and forth and will be complementary, I think. Tony, could I ask you to start, about how you entered the computer industry and how you got interested in that field?

Blackmore: You need to know the Australian government advertises all employment opportunities in *The Commonwealth Gazette*. I was living in Perth, having just majored in economics from the University of WA [Western Australia]. I responded to an advertisement for a job in Canberra as a research officer on international trade. I arrived in Canberra to take up my new job and was told you're going to work on the 1961 population census processing. I was given a team of about eight elderly women at the time, 1961, with the task of processing early requests for information from the census. That meant collating collections of stenographic pages, 20, 30 or 40 pages at a time, and then stapling them together. I came up with the idea of having a table-tennis table with pages stacked around it, and having my team of elderly women marching around one behind the other picking up page one, page two, page three, page four, page five; and so on. At the end I'd constructed a foot operated stapler so they'd staple the bundle and on to the next. One day the statistician (a very important person at the time) visited, saw this and said, "whose bright idea was that?" One of the women said, "his." A few days later she said to me, you're going to be in the *Commonwealth Gazette* next week. I can't be because I haven't applied for any new jobs. She says well, you're going to be in the

Gazette. When it came out, there was Tony Blackmore promoted to the position of computer programmer.

Misa: Computer programmer, okay.

Blackmore: What's a computer programmer? What's it all about? What do you do? Oh, says management, we'll send you off to a training course. And that's how I got into computing.

Bowden: My entry was also accidental. I had completed a degree in psychology and I had been working towards an M.A. in industrial psychology. But my thesis was interrupted due to some industrial arguments. Anyway, I applied for a job in Melbourne as a senior research officer, and mainly to do with selection techniques. That was at the head office of the PMG's Department; I was at the Perth office.

Misa: Just to be sure, PMG is Postmaster General.

Bowden: Postmaster General's Department, which at the time was both what we now call Australia Post, and Telstra. Anyway, I went to the pub and a guy there who was working for the same organization said you interested in getting into computers? And I said what's a computer? And the guy gave me an explanation, which I didn't really understand. Anyway, I think that basically I was also headhunted because he organized me to go on a three-month training course. And after that was completed, I was actually

failed by the people, because of something which occurred, which in my view meant that I knew a lot more about what was going on in the computers. What it was about; there [were] 20 exercises to do for homework, five different ones, and the other ones were repeats or effectively the same thing, you just wrote out the code with a different name.

Misa: Programming exercises.

Bowden: So anyway, I was failed by the supervisors but my sponsor was quite happy to have me, and he organized for me to go and work for head of the department. Sorry, the point was that there were many other departments on this course. The training we did was on a thing called a SILLIAC, it was 1024 20-bit words directing a valve machine, and it had paper tape input and output, and that was my beginning. And it was machine language.

Misa: SILLIAC, that was in Sydney, correct?

Bowden: Sydney, a version of the ILLIAC, which is Sydney Illinois Automatic Computer, at the time. When we got back, I started working on the computers, and we were using an IBM 1401; no, 1410, it was a decimal machine. Anyway, that was how I got into it.

Misa: And [before the recording] you were just relating your joint entry with Control Data, so would you go ahead and record that story for us?

Blackmore: I had completed my training at the Bureau of Census, worked there on programmable calculators, been promoted to a higher level job with the PMG in Melbourne, programming the CDC 160A among other things, and was working with Lyle. I joined Control Data, in response to an advertisement Lyle drew my attention to. It was for people with an interest in operating systems. Joining Control Data happened quickly. I had my interview with Trevor Robinson and Bob Barton. Bob Barton I'll comment on later on. At the end of the interview, Trevor and Bob looked at each other and said well, what do you think? Okay, when can you start? So I had to race off and get a passport, go home, arrange for my wife and children to go back home to Perth for a few months. And that was it.

Misa: And you needed a passport for?

Blackmore: To go to Minneapolis.

Misa: For training, then?

Blackmore: Yes.

Misa: Okay.

Blackmore: So within weeks, the family had gone to Perth and I'd gone to the USA.

Misa: So they returned to Perth, you went off.

Blackmore: Yes. We were renting a house so it wasn't a case of keeping the house. I was going to be away for three months and they went home to Perth for a while, and I went to the States.

Misa: Can you say a little bit about what kind of training that involved?

Blackmore: My introduction to the company was rather strange, but so was my first visit to the USA. We had been directed to Palo Alto and told to report to John Wise.

For a few days, perhaps a week or so, we did very little until it was announced that we should have been sent to Minneapolis. There we met up with a few more new CDA hires and settled into apartments on the corner of Marquette and 12th. My training with John Marquet, was all to do with the [CDC] 3600, software mainly, and we were trained to become familiar with how the SCOPE operating system worked, how it could be modified, the sorts of things we might have to get involved with back in Australia. It was interesting. Our course included a group from India, whose names I can't remember, but there were three of them. That was part of some U.S. Hands Across the Ocean Aid to India, where a [CDC] 3600 was going into the country and these three Indians were there to do the same training that we were.

Misa: That would've been 1963?

Blackmore: 1964. That would've been early 1964.

Misa: Early 1964. And Lyle?

Bowden: The three month training course that I had done and was programming and now system design.

Misa: That was the training here in Melbourne?

Bowden: For three months. That's right. A lot of it was in Sydney actually; well, Sydney and Melbourne. Anyway, I was assigned a task, actually an applications task, to design and implement a system to track the faults on PMG lines. That would be what we call Telstra these days. I did that on the [IBM] 1410 and that project went for maybe one year; and turned out to be quite successful. And then in the meantime, the company, the organization had purchased a Honeywell 800 computer and other people had started working on projects on that. I didn't do any applications but I was put in a software valuation group, you might call it; think we called it standards or something like that. Almost immediately Honeywell released a COBOL compiler. They had been using FACT, which is another language, which used to go from source language to what they coded in, then would code it in machine language. The COBOL compiler went straight from COBOL to machine language. I was given the task of evaluating this COBOL compiler, comparing it with FACT, and making a recommendation as to whether the

PMG should start using COBOL. In fact, it was so obviously superior; for instance, compile time would go down from maybe 40 minutes to five minutes.

Misa: Fourteen minutes?

Bowden: *Forty*.

Misa: Forty minutes to five minutes. Almost a factor of 10.

Bowden: So I made that recommendation. That recommendation was accepted. The next thing was to analyze the machine language, which was forebear of the COBOL compiler. These were word-oriented machines. Depending on where you stored your data as how efficient it was going to be. If you had to unpack different words to get into a field or a number, that took some doing. And you take and you'd unpack it, then edit, and put it back again. So by knowing how to align the data within the word boundaries it was calling for, and so we just didn't make a recommendation, you know, that you allocate the storage in this way. And that was what I did. Then I spent quite a lot of time on that; and then I later went on to training exercise where I was training programmers, and training a one-year course. I came straight out of university without any knowledge of computing, and I was responsible in each of three years, [for] 25 people, to convert them into working professionals.

Misa: That was working for; with the university?

Bowden: The PMG's Department.

Misa: So you were doing training within the Postmaster General department.

Bowden: It could be because I became something of an — at the time — I was going to be an expert in COBOL because of the fact that it was a new language and I had been allowed time to basically familiarize myself with it.

Misa: COBOL became a standard language. You said it was a new language; did people have ideas about why it was being used? You said it was quite a bit more efficient than FACT.

Bowden: Well, FORTRAN would've been the scientific language and probably many organizations still use FORTRAN. And FACT, I believe was just a Honeywell language; I don't think anyone else used it.

Blackmore: My recollections of COBOL, at that time when it was being introduced was, this is where you could just write stuff and it was believed that you could just write text down. You know, do this; add this word; get this value, which you'd give a name like "take my income and add it to this; take off my tax." You could virtually write words. That was a kind of belief that you could write a textual thing and stick it into a compiler and you had a computer program.

Misa: You had to use the right words.

Blackmore: It wasn't quite that easy.

Bowden: The mnemonic COBOL is one of this common business-oriented language. The emphasis was on business as opposed to science.

Misa: And then how did you end up getting to work for CDA, for Control Data?

Bowden: Tony was aware that I was doing this type of thing, and I also, during that process, the Department of Defence had a Honeywell 800 computer and they were using FACT. And then when the Department of Defence found out about this project, which was being done by the PMG, the evaluation project, they became aware of that and I became somewhat notable, you know, as the person who was to be consulted about whether or not they should change over.

Misa: You went down the COBOL pathway early on.

Bowden: So I became the COBOL guru. That's my version, anyway. So Tony also had heard about this thing from me, and when Control Data, they released COBOL compilers for the 3000 series, not at the time but I think sort of after that, the new Cyber series; but

at the time it was the new 3000 series. He recommended to George Karoly that I might be a person who should be recruited.

Blackmore: Up until that time, in Control Data Australia, and probably the corporation, as well, the common languages were FORTRAN, Compass, an assembler language and ALGOL, mainly by the Europeans. Nobody in Control Data Australia could've written a line of code in COBOL, in my opinion. Well, maybe we were smart enough to learn fast, but if someone said go and cut code, we'll damn near say where can I get the reference manual please? [Laughs.]

Bowden: Perhaps to go back; the project that I did, which I implemented, was in fact written in COBOL on an IBM, original COBOL; so I had actually used it in that project, in that program, I think; in that application. So I had actually implemented systems using COBOL. Then I went on to evaluate these compilers, and efficiency, all that sort of stuff. I had quite a few years of experience with COBOL by the time that I joined. And then I'd, during my training, when I was training I was also teaching people COBOL. I spent probably five years on COBOL before I came to Control Data.

Misa: So that would've been, coming to Control Data in [pause]

Bowden: 1967.

Misa: 1967.

Bowden: 1962-67 I worked in Melbourne [with] the PMG and effectively on COBOL all that time. And I came to CDC in 1967 and I basically [introduced] the company to COBOL.

Misa: Was there a particular strategic vision? Control Data had been based on scientific computing, for which FORTAN was and remains an important language. So do you think that CDA was interested in developing business applications and so COBOL then was an important language to get expertise in?

Blackmore: We had government users doing ordinary government and non-scientific type work; Australia Public Service would've been one of those. But even Census, and others wanted to branch out and do things in COBOL, I believe.

Misa: Could you say just a little bit about some of the projects, just so that we understand their character?

Blackmore: I probably can't comment on any of those because everything I was involved with was on the scientific side. Even when I was Victoria manager, it was Victoria TAB, the Bureau of Census, CSIRO, Aeronautical Research Laboratories, Defence Signals [Directorate]; every one of the people that I always dealt with was on the scientific side. So I know that we were being asked for COBOL expertise, and that we had some pressure to get into this area.

Misa: Would it make sense to talk a little bit about those scientific applications, then?

Blackmore: Yes. When I came back to CSIRO from my first training because that lead into a lot of the scientific stuff. When I went to Minneapolis in March, I was accompanied by John Marquet. And John and I were the two 3600 software support people; John destined for Census, and I was destined for CSIRO. We went to Minneapolis; did our training; came back.

I get back to CSIRO, who had the 3600 in Canberra, and they had three 3200s in other States. I had nothing to do with the 3200s, there were two other people, Len Whitehouse and Mike Keys, were the 3200 people.

Misa: Len Whitehouse and ?

Blackmore: Mike Keys.

Misa: Can you spell his last name?

Blackmore: K-E-Y-S. It might be K-E-Y-E-S.

Bowden: No, just K-E-Y-S.

Blackmore: I get back to CSIRO, and you need to know this was the computing research division of CSIRO, located in a lovely building in Canberra. Everything about it was beautiful. We had the big computer there; and the computing research division was staffed by a few CSIRO staff and a number of ex-academics, or people that had an academic experience in a related industry or a relevant industry. I had a lot to do with Terry Holden, an expert in concrete structures, who'd been with their building research division, now part of the computing research division. But other people from the CSIRO staff were mostly PhDs. The division was headed by Dr. Godfrey Lance.

Misa: Please spell his last name.

Blackmore: L-A-N-C-E. Known as God. [Laughs.] He was an interesting bloke. And other people like Dr. Brian Austin from Cambridge University, and quite a number of well-qualified academics, many recruited from the U.K. I do remember a CSIRO American, Henry Hudson from JPL [Jet Propulsion Laboratory in Pasadena]. A very significant person was Trevor Pearcey, the deputy head and a co-designer of CSIRAC, a very early Australian computer. Trevor was later recruited by CDC and worked in Minneapolis. They may have had trouble dealing with some of his eccentricities, but he really was brilliant. On the Control Data side, there was me, fulltime at CSIRO and just the 3600 software person, and Dr. Robin Kerr, New Zealander, who had done his computing training at the University of Manchester with its Atlas computer.

Misa: Important computing center.

Blackmore: Yes. Also Peter Jones, Dr. Peter Jones was an Australian, he'd also done his bit at Manchester on Atlas. One of the CSIRO people, Brian Austin, was from Cambridge where they had Titan. And Titan was an Atlas relation, in terms of where it fitted into things. I honestly wondered what Kerr and Jones ever did for Control Data except engage in all sorts of interesting discussion and debate on the fringe of the real work. I would be busy as a beaver trying to fix software problems, trying to write drivers for plotters, things like that; helping CSIRO customers, convert their FORTRAN programs from the Weapons Research Establishment [WRE] IBM 7090, to run on Control Data gear. So I was a busy little body running, helping their customers get programs and fixing all these problems — something's wrong with your compiler, it doesn't work right — I can give you an intriguing story there. There was a Dr. Wunderlich, a renowned crystallographer whose tables had been published globally. One day he said there's a problem in your FORTRAN compiler. It tells me that I'm trying to square root a negative value and that can't be right. So, we get to work. Well, I checked through his program, and he is *definitely* trying to square root a negative number. His response was that he was right and we still had a problem. One of our Control Data support people was Jack Cleary, who'd come from Weapons Research Establishment, and Jack said I know what that problem is: the [IBM] 7090 FORTRAN compiler doesn't have as good error detection diagnostics as CDC FORTRAN has, and he's probably had this square rooting the negative value all along. And that was the answer. So these globally published tables on crystallography of the eminent Dr. Wunderlich had their problems.

Misa: Just to be clear, the IBM machine was doing something that at least (unless you do imaginary numbers) is not possible to do, but somehow skipped over that so there was a hidden error.

Blackmore: Yes.

Misa: The Control Data machine spotted that it was a mathematically disallowed move.

Blackmore: Yes. And the significant thing I mention about — it's not just a gripe that I was doing all the work and all these other fellows were having a good time — but it was quite funny that Canberra office was a very elegant office. Canberra had an office at 122 Empire Circuit, right in the middle of the embassy district. I think our next door neighbor was the Dutch Embassy, and over the road was the Israeli Embassy, and we were about a block away from the U.S. Embassy. One of the Americans was a fellow called Al Collins, from Dallas, Texas, who named the Control Data office the Texan Embassy. We actually had a flagpole in the car park; it was a building that had been built to sell as an embassy, like a readymade building for some embassy what wants to set up. Well, Control Data rented it and we had our Texan Embassy.

Misa: I understood that it was very difficult to find office space in Canberra at the time.

Blackmore: It would've been, yes.

Misa: . . . you were lucky, in a way, to get an elegant building.

Blackmore: Non-existent office space. Yes, this was very elegant; it was good car parking, too. Bob Barton was an American who was said to have designed the Burroughs 5000 computer before he came to Australia, and he had his buddies. Trevor Robinson told me – years later – that when he asked what’s your job, Al? The reply was “My job is to keep Bob happy.” The two Control Data PhDs, Robin Kerr and Peter Jones, together with some of the CSIRO people got involved with an exercise known as Project X. It became one of my main annoyances at the time because you could never find out what the hell are these blokes doing? They’re all working on this Project X and here am I, fronting up at CSIRO every day to sort out the day’s problems, and it eventually came out that Project X was the design of a radical new computer, and the inputs to this were these guys who were familiar with Atlas in the U.K. The almost certain truth of this — and I had it verified from a U.S. Burroughs person — that when Barton returned to the U.S., he went back to Burroughs and that the Project X, which had been developed at CSIRO with Control Data staff, became the Burroughs 6700.

Misa: Oh, okay.

Blackmore: Now, George Karoly might know a bit more about this. My source was Jack Cleary, a support person with me at CSIRO. Jack was an almost 100 percent FORTRANer; but Jack went back to the U.S. with Bob and worked for Burroughs; and it was Jack told me that Project X became the Burroughs 6700.

Misa: Which was a notable machine, of course.

Blackmore: Yes. So that was my life at CSIRO, just working on supporting the software. Census had a [CDC] 3200 and a 3600, and a satellite coupler. A satellite coupler is a very elegant way of connecting the two computers. When they connected, 3200 was treated as a peripheral device, just as though it was a disk drive or anything else; worked very well. Although I wasn't working on that, I became familiar with it. One day I got a telex from George Karoly, who was in Minneapolis at the time, saying they want somebody — me — to go to Tokyo to install the software on a 3600 that's being shipped to Tokyo. And because Christmas is coming up, tell them you won't go unless your wife can go as well. I always remember George adding that into the Telex. So I duly said I'm prepared to go. That lead to about three months in Tokyo installing the software on what was then a very large 3600/3200 combination with a 98k 3600, and the [Japanese] had one of everything (peripherals). Again I think it was one of these U.S. Hands Across the Ocean AID things because all the boxes had a stencil of clenched hands and U.S. AID on them.

Misa: Can I ask, just to clarify some of this; you're working at CSIRO, but you're working for CDA?

Blackmore: Yes.

Misa: So you were, in essence, a resident application support person . . .

Blackmore: Yes, but SCOPE bug fixer also.

Misa: On the Control Data payroll, but working closely with the CSIRO people on their problems.

Blackmore: Yes. I didn't even have a chair in the Control Data office, but I did get back there pretty often to have meetings. But yes, I was 100 percent located in the CSIRO premises. And my colleague John Marquet was 100 percent located in the Bureau of Census, on Control Data's payroll, looking after their 3600.

Misa: It wouldn't be common now — but that was quite common then.

Blackmore: Yes. I was there [interrupted]

Bowden: We used to call it site support.

Blackmore: I would've been at CSIRO for probably about two or three years.

Misa: Three years.

Blackmore: Yes. And one of the very interesting things — and I mentioned this the other day, I think — was the acquisition of drums. That became one of the critical things that

this was going to be a new peripheral and nobody else had any drums running sensibly on Control Data systems.

Misa: Drum memories . . .

Blackmore: Drum memories.

Misa: . . . as a peripheral device?

Blackmore: Yes. There were two million 48-bit words of memory on these drums so they weren't very big, but they were fast and I recall clearly that a critical part of operating drums was to know the angular position. This requires an angular position register so you could shuffle drum requests, knowing where the drum was at the time and re-sequence the request. Minneapolis announced that they were not going to implement that the register and that resulted in a real yell. For a while Minneapolis persisted that they weren't going to have the angular position register. I know that Trevor Robinson got very much involved in this because it just meant that drums became silly if you couldn't work out where they were, they would be severely handicapped.

Misa: So a register would've turned them into something useful.

Blackmore: Yes. You could've slowed down the performance a hundredfold because you would just be putting in requests, not knowing where the drum was. Anyway, that

was eventually turned around and they put the angular position register in, but SCOPE software didn't accommodate drums and so there was a very substantial rewriting of SCOPE. I was involved in finding space for a larger resident part of SCOPE which was still a pretty primitive system. When you did a compilation of a FORTRAN program, you loaded the FORTRAN compiler and the COMPASS assembler together into of the available memory and did the compiling. There was no way in which we could implement the drum software that didn't use some of that space with the consequence that the FORTRAN compiler and COMPASS assembler would no longer fit. So it was my job to compress them, somehow. So it was a case of working through the FORTRAN compiler and the assembler to reduce their size. That was interesting.

Misa: To allow them to fit within the memory constraints.

Blackmore: Yes. That was my job. It turned out to be easier than I thought and was accomplished.

Misa: Can I ask you; this is interesting because there's innovation going on, not in Sunnyvale where SCOPE came from, but here. Do you know whether those innovations with FORTRAN and COMPASS, as well as the angular position, did that go back to Sunnyvale?

Blackmore: Yes. I know that because SCOPE's name was then called the DAD project, Drums and Displays, because along with the drum people getting a graphics Vista display

and a half a dozen character displays, so the DAD project evolved into implementing the drums and displays into SCOPE; and I do know that it was shipped elsewhere. I can't tell you where, but I remember that it had to be tidied up a bit.

Misa: Then that would be something available across Control Data in the same way that SCOPE would've been available across Control Data.

Blackmore: Yes, it definitely went back to the corporation, and also a lot of software to do with getting these displays to work sensibly, because they were really just bits of hardware with no application software. Somewhere along the line, after my little Tokyo stint, which was good fun, I started to get more involved in sales support, and I think it was probably in this time we sold a 3400, which was like a reduced capability 3600, to Defence Signals Directorate and I was given the appropriate security clearances. DSD — you need to know [that it] is similar to the U.S.'s NSA — I was sent off to teach them about software maintenance and programming on that machine. Shortly after, John O'Neil got me to work as sales support on the proposal to the Bureau of Meteorology. Originally, that was to be based on the Control Data 3400s, and I had 3400 and 3600 expertise. I think that during that sales support effort I was instrumental in convincing John that we really should be bidding 6400's. There was a supplementary bid for 6400s but we were unsuccessful with that [Met] bureau.

Misa: Do you remember who got that?

Blackmore: It was IBM. I think that we should've been wholly on the 6400 on the proposal and not any part of it on the 3400. I did hear back from Trevor Robinson that the Met Bureau had people that said to him, why is the proposal about 3400s and not the 6400?

Misa: Because meteorology, of course, is hugely data intensive and computationally intensive, so a 6000 version machine.

Bowden: If I can just inject there, in my view, CSIRO was already a Control Data customer and remained so after the Cyber series, etcetera, etcetera; and Met Bureau; once Met Bureau had gone IBM, there really weren't any other scientific organizations around. So that's why, really the only [remaining computer] market was the racing industry or commercial. Would you agree?

Blackmore: Yes. I came down to Melbourne after that Met Bureau exercise. I was asked to move to Melbourne and shortly after I was made Victoria Sales Manager. It was during this period that Lyle got recruited, somewhere in 1967. And New Zealand activity started then. That required going to New Zealand to put in proposals. We didn't have a New Zealand office but we had a New Zealand agent, formerly Group Captain A.H. Harding, known as Digger Harding.

Misa: A.H. "Digger" Harding.

Blackmore: His nickname was Digger Harding, H-A-R-D-I-N-G. And Digger was just an interesting bloke who worked hard for us, and eventually, we did get business in New Zealand.

Bowden: Well, they got the racing system over there, didn't they?

Blackmore: What else was there in that last period of my time at Control Data? There was the TAB; Royal Thai Turf Club was an interesting sale that was made with the assistance of an agent in Bangkok, called Amnuey Kasemsap. That was an interesting sale that was wholly based on what we'd done for Victoria TAB, and it was just to provide on-course bidding and equipment for the Royal Thai Turf Club. I put in the original proposals for that, and through to the point where we actually got the order.

Bowden: Actually, there is another organization; that was the Defence Signals [Directorate], and that was also a Control Data site. That was quite controversial because we were never allowed to put it on our corporate lists, like we couldn't mention their name because it was all supposed to be top secret. It was rather ridiculous because in the government gazette, they would publish the fact that Defence Signals had purchased another tape unit from Control Data. It's recently become [a] topic because of all this spying business.

Blackmore: This is a true story. There was a computer magazine; at the time when Control Data got the order for the 3400, *Data Trend*, I think it was called. And it was

edited by a bloke called — what the hell was his name? He’s dead anyway. But that magazine came out with the item that Control Data Australia had sold a 3400 computer to Defence Signals Division and the security people jumped on the editor — jeez, what was his name? — who’s leaked this information to you? I was personally interviewed; have I told anybody about this? No. Trevor was interviewed. No, he hadn’t told anybody. I think John O’Neil knew about it but I’m not sure. Eventually, the editor said I can tell you how I found out that Control Data’s made a sale of a 3400; here’s the *Commonwealth Gazette*: “Sale Commonwealth.” The editor knew that GCHQ in the UK had a 1604 and correctly arrived at the conclusion that the procurement was for cryptanalysis.

Misa: Big secret! [Laughs.]

Blackmore: . . . a Control Data 3400 is being sold to the Defence Signals Division for the sum of whatever.”

Bowden: But do you agree — well I’m sure you will agree — that whenever we put out corporate lists; later on, we had BHP, we had University of Melbourne, we had [SGIO] Queensland, blah blah blah.

Blackmore: An indication of how crazy they were about security, when I did my initial briefing, and you know, clearance, and eventually shown into their premises, they’re in an old army barracks, which is located not far from here; it was in Albert Park just here.

Misa: Albert Park is very close, yes.

Blackmore: The same Albert Park, and down that end of it was a big area fenced off with barbed wire and had been an army camp during World War II. Inside that were a lot of timber huts, timber siding hut-type things, and that was where Defence Signals was. I was strictly told, and John and Trevor were also, you are not to discuss our business in open air at any stage because people could be lip reading. I don't know anything about their business anyway, I was just there to teach them programming, and so forth. But it was really very funny. The barbed wire was really around a larger group of Defence establishments, not just DSD, but DSD had their own barbed wire enclosure inside the barbed wire enclosure and all the windows were painted so you couldn't see through the glass.

Bowden: Just to show how [interrupted]

Blackmore: Frank Linton Simkins, that was the editor of *Data Trend* magazine. Frank Linton Simkins.

Misa: Can you spell that?

Blackmore: Yes. Linton, L-I-N-T-O-N. Simkins, S-I-M-K-I-N-S.

Misa: Great, thank you.

Bowden: Just another little anecdote that shows how this attempted secrecy was overdone, you might say. There's a place called Salisbury in south Australia, where they're developing various defense things, and one thing was a thing called a Bloodhound, which was surface-to-air missile type of thing. And one day, on the front of the newspapers, was the announcement that they had successfully developed this thing called a Bloodhound, and all the things that it could do. But the people who were working on the development of it were never to mention the word "Bloodhound." It was just; you just don't mention it, even in company, in the organization. And apparently — I wasn't there but I believe it was true, someone told me it is — one guy came in and said oh, I see they've announced the Bloodhound and security people just jumped on him because you know, he had erred by using the word "Bloodhound" you know, and he . . .

Misa: Had spoken the forbidden term.

Bowden: . . . and all he said was I see they've announced the Bloodhound. It probably all got sorted out but that was the initial reaction of these so-called security people, you know?

Blackmore: This has a little bit that has relevance to Control Data history, and it goes back to my first time at Control Data. In about 1969, Lyle and I were both in Florida at the Control Data Hundred Percent Club. For some reason I'd taken a carousel of slides about Victoria TAB; I'd put on a pitch about that quite a few times. Anyway, we were at

the Hundred Percent Club and on the second to the last day of it or maybe the last day, Bob Price came up and said Tony, you're coming to New York with me, you're going to put on a presentation to a company called Ticketron, about Vic TAB. I said okay. And so I thought I'd better check with Trevor, he was there, and he said yes, we're coming too. So off we go, and I was told that the presentation's going to be made at this company located in the Seagram's Building on Wall Street, and the Wall Street salesmen were going to be there. I thought gee, this will be good; I'll get an opportunity to see how a real hotshot U.S. salesman operating in this very prestigious territory would perform. I'm waiting to be impressed. So I front up and there's a fellow called Mike Portanova who I think, was the president of Ticketron, and I can't remember the salesman's name, which is probably good from his point of view because I had told him that we would need to get extension leads because I had the carousel projector and so forth. Well, he hadn't done any preparation and when we arrived and the presentation's to be in the president's office, he says, hey Mike, is it alright if we drag your desk over? So he drags his desk over near the power outlet so we could get connected. I think well, this is pretty informal relationships. Then in comes a shoe shine person. And the salesman said hey, I'll shout everybody a shoe shine, and there we are. I just couldn't believe this performance.

Anyway, I duly put on my presentation about Vic TAB.

Misa: Did you get your shoes shined? [Laughs.]

Blackmore: I can't even remember. I came back to Australia, I said these bloody hotshot U.S. salesmen, they're bloody awful. [Laughs.] Anyway, that's just a little thing that

happened on that last trip to the U.S. in my first term of Control Data employment. I think we eventually bought Ticketron and it reminds me of that advertisement you used to see on TV about the man who bought the Remington razor company. The advertisement used to be, "I like the razor so I bought the company."

Misa: Ticketron became one of those interesting assets. I mean, they did tickets, but they didn't do gambling, so far as I know; any kind of wagering system.

Blackmore: Well, by that time, Vic TAB was really selling tickets all over the place, you know, with the remote selling and printing out tickets on the spot, and all that sort of thing. And that's just what Ticketron wanted to do. Anyway, it was after that that I went to work for Information Electronics, founded by Malcolm McCauley, who was a former member of Engineering Research Associates.

Misa: And the name of the company again?

Blackmore: Information Electronics.

Misa: And that was here in Australia?

Blackmore: Yes, in Canberra. Manufactured displays and other gear.

Misa: And Tony, you worked for them approximately 'til when?

Blackmore: 1970-72.

Misa: 1970-72. Great, thanks.

Bowden: Actually, there was a bit of a spinoff. When Control Data was bidding for the TAA [Trans Australian Airlines] there, which we didn't get, one thing which we did was a demonstration reservation system for the Australian market, where you'd only have maybe six to 10 main cities where people visit; not like America where there's everywhere. You don't fly everywhere from everywhere here. Instead of us typing in PER for Perth, and MEL for Melbourne we had a single key and if you just pressed that, that would enter PER as if you had typed it in the three letters. It was novel at the time.

Misa: Melbourne, one key.

Bowden: You've got to remember that software was a lot more primitive than now. And then it turned out that Information Electronic introduced that onto their terminals.

Blackmore: I think that was a real innovation that we probably invented the function key.

Bowden: That's right.

Misa: The function key?

Bowden: That's what a function key does these days.

Blackmore: When I left Control Data, I left on the 30 June 1970. Trevor had left and we had an acting general manager called Peter MacGregor, who I thought was a pain in the bum. We had an argument one day and Peter said to me, "it's going to very difficult for us to work together." And I said, "I'll solve that," I quit.

Bowden: Was that when you left?

Blackmore: Yes, but I'd already been talking with Bill Taylor, who worked for Malcolm McCauley at Information Electronics. They'd been trying to persuade me to go and join them as a sales manager for Information Electronics, and I'd given them the undertaking if I'd work for them I'd guarantee to get the TAA reservation terminal order, which was a huge order for Information Electronics, it was hundreds of reservations terminals. And, anyway; I gave Control Data the flick caught the plane the next day up to Information Electronics, and we eventually got that order. The TAA reservation terminals were all made in Australia, partly based on the work that I'd done on the Control Data TAA proposal.

Misa: And TAA . . . ?

Bowden: Trans Australian Airlines.

Misa: Trans Australian Airlines.

Bowden: A government-owned airline, which doesn't exist anymore.

Blackmore: It was a precursor, got assimilated into Qantas, didn't it? I don't think it just disappeared off the face of the earth.

Bowden: I can't remember.

Blackmore: I think TAA became Qantas, part of Qantas. Anyway, that's by the by.

There were only two major airlines at that time: Ansett which was a private one; and TAA, which was a government one; and they were very similar. They serviced the same cities, they flew the same sorts of airplanes. Ansett was the one Information Electronics got with IBM computers and Information Electronics terminals.

Misa: Would you like to pick up this story in the early 1970s, then?

Bowden: Okay, really I've got to go back because my first task in Control Data in sales support was to respond to the benchmark requirements of BHP, Broken Hill Proprietary Limited. BHP had two, actually three sites; they had the Port Kembla site, the Newcastle site, and the Melbourne Ministry site. I think at that stage most of the emphasis was on

the two functioning sites; that was Newcastle and Port Kembla. But they had existing IBM 360 series computers, using COBOL language.

Misa: 360s.

Bowden: 360s, originally, and using COBOL. They also had 1401s using AutoCAD; and they had a sort of a linear programming type group, I think, up in Newcastle. Anyway, one day they dumped about 100 boxes of punch cards in our office and said that's the benchmarks, you've got to run all those programs and give us the results, and you're going to assist in your ability to blah blah blah blah.

Misa: So the benchmarks would be standard applications?

Bowden: They were programs that had been running; so *were* running then on their equipment. I'd say Program M takes so long to run on our machine, how long will it take on your machine? And the other thing was that the 3000 series, which was what we were offering; that was the beginning of multi programming, certainly from Control Data's point of view, I think. And so the exercise was to test both the efficiencies and the adequacies of your compilers — and some things were in FORTRAN, I think, as well — and also the efficiency of your multi programming in operating system. That became quite important, actually, and if I might just hark back to my days at working with Honeywell, in the PMG, I had been taught by the site support person at Honeywell, who

was [a] Honeywell employee working with the PMG, about reading memory dumps. And that was a skill that not many people had.

Misa: A memory dump would happen if the program hung up. You'd freeze the memory and then try to understand what's in every register.

Bowden: That's right. And of course, one of the problems there was the thing would often clear its own memory. That was one of the problems with the 1400 series, it would just wipe its own memory. Anyway, it's only just an aside, but it was my personal relationship with this guy, Kerry something — I can't remember his name now — that he actually taught me how to do memory dumps because he was an expert and he didn't want to give away his trade secrets. But I got to be very friendly with him and he taught me how to do it. Of course, I mean I wouldn't blab it to the world after that; but when it came to Control Data, that was the way it worked out, why programs were efficient or not efficient. Anyway, one of the tasks we had to do for BHP were to run these programs but they were written in a version of COBOL, which was slightly different from the standard. Control Data had implemented the COBOL standard, which was, you know, one of those [standards] organizations where you would have to run these things. But IBM's COBOL was not according to that standard and there [were] some little things about punctuation and a few verbs or something, which weren't there which should've been; whatever. Anyway, I personally wrote a translator, and what that'd do was read the IBM program and it would eliminate; well, it would substitute certain parts of the program with other bits and pieces in order to allow it to work on that computer. And that was something. I

think my thing would be that what was required there was inventiveness, or innovation, or something like that, you know; it wasn't just a case of selling a product. You had to refine the product in order to make it successful. We also had to learn to run the 1401 simulator, which is to read all their code and translate that into our own code. Anyway, I think [there was] actually a translator. It would read a 1401; might even have been a 1401 machine language program, I'm not quite sure; and then route it on our machine. Anyway, that was quite an exercise.

Misa: This kind of work, trying to take an IBM COBOL variant and to standardize it, that's being done here in Australia. Did you have a sense that that translation program was then taken back to Control Data?

Bowden: I couldn't comment, I don't remember. It could well have.

Misa: Because it seems a very general thing.

Bowden: Oh yes, it could well have. I don't know. It was a program written in COBOL, which was really punch card input. And the program's all in punch cards. And yes, read the punch cards, and punch another deck, which was what we put onto tape, actually, or onto disk.

Blackmore: I think that there's two levels where things would've gone back to Minneapolis, quite often through a buddy network, you know. If you could do something

here you'd always have somebody in Minneapolis you were talking to who was doing similar things, and you'd swap programs or you'd swap tips with them. So it's very likely that lots of stuff that had gotten done [here] was taken back to Minneapolis because somebody took a deck of cards back with him. Things like that happened all the time.

Misa: So the buddy network worked. I mean, there's no e-mail, I understand that.

Blackmore: There was a lot of intercompany travel.

Bowden: I worked for Control Data for ten years, and in that time went to the U.S. seven times. At one time, I was there for two months.

Blackmore: There were always people traveling and there were always people coming out here to CDA to do things or to help you do something, and we'd go back there. It was just a regular pattern of your life; there was always somebody overseas. In fact, [laughs] I remember Trevor Robinson saying to me one time that John O'Neil is never happy unless he's got a bloody airplane seat strapped to his ass. And it was a problem when they looked at John's travel. I think it was something like John had spent — I can't remember now — but it was something like 187 days of the year traveling somewhere on company business.

Misa: More than half the year.

Blackmore: Yes. But another comment I could make on this benchmarking I don't know whether it was the custom in the U.S., but benchmarking was the normal way of doing every sales thing that I was involved in, and I was mainly in FORTRAN related activities. You would always be asked how long does it take to invert matrices of this dimension? How long is it going to take to sort this many records? And things of that nature; there'd be lots of specific things but then there would be collections of small applications. Here is a deck of cards that might be a couple of thousand cards, that consists of seven or eight different programs, or more; how long does it take to run them? And so forth. And those times got to be pretty critical; and in the case of Control Data's FORTRAN, we were very, very good; we could beat anybody. Our FORTRAN had instructions that didn't exist in other people's FORTRAN. For example, standard FORTRAN has a read statement and a write statement. It just says try to read a card; when I've read the card, I'll proceed to the next step of the program. Control Data had a buffer in/buffer out that said I'm going to initiate this read and while that's being read I'll go on and do this. And then I'll do an "and if" the read's complete, go back there, so you could overlap things and that made our FORTRAN a hell of a lot faster than if it involved changing the program, where they had reads and writes, input buffer-ins and buffer-outs, and "if completed" statements.

Misa: With standard FORTRAN, if you had "read" then the program would be waiting until the read was complete.

Blackmore: Yes, whereas we could initiate the read, go off and invert your matrix and come back, say is that read finished yet? So we had to change FORTRAN programs, sometimes quite a lot but we'd always win. We could always run miles faster than anybody else's FORTRAN apart from the machine speed. Machines were fast, and the compiler was faster still.

Misa: That's a really interesting thing, too, you zeroed in because people always talked about Seymour Cray's machines being fast. But I think he ended up having some version of FORTRAN, maybe some of these characteristics that made the software fast, and the two together were really a winning combination.

Blackmore: Well in the case of the 6000 series, it got to be even more complicated because the 6000 had multiple arithmetic units and I'll give a simple example. If I had a program that said that $A = B + C$, and $D = E + F$, I could do those at the same time because I had two adders on the 6000. But if the second one said $A = B + C$, and $D = A + F$, I couldn't proceed, I had to wait until the first computation was complete because it didn't know the value of A yet. And that's an over simplification, but the optimization of FORTRAN on the Crays with that multiple of arithmetic units was very difficult, took a long while to do that.

Bowden: The 6600 had some of that; the 6400 didn't have all those.

Blackmore: No.

Bowden: That's why the 6600 was three times as powerful, I think; or one of the reasons, anyway. Getting back to what sort of people you had to have in those days. You had to also be able to get on with their people. When you did these benchmarks, the people who offered the benchmark had an axe to grind because they wanted to make sure that any new computer was bought was going to suit them, right? And at two physical sites, and within each site there was this, you might call them interest groups, and they wanted to get the best deal for their own little projects. In order to understand some of these tasks that we'd been given, you had to sort of, well, we chose to talk to the people who had written these programs, and not always were we able to do things exactly the way they'd done. I can't remember how it worked out, but the IBM had this independent interrupt system. They're thinking that when they wrote a program they knew that the machine were going to; interrupt meant something that had to go off somewhere else. But where we didn't have an identical feature we had to convince them that we had an equivalent feature, which they could quite easily comprehend because they were intending to develop new programs. These programs they were giving us had to continue running, they were sort of bread and butter things that existed. But they obviously wanted to expand it and write new stuff so these benchmarks were really just to satisfy them that they could chug away in the background and then they'd go on and do all this stuff; a great thing, you know. So that was it. The other thing is that because it was multi programming computers, and that was quite important because you had the size of the program but you had to get more than one program physically in the machine at the same time. And you also had to see it in [CPU] cycle. So it was very important that you reduce

the program size and also that the number of cycles used was possible. And one example of that was that one of the benchmarks we were given, just used to just do a lot of calculations, and when we ran that program on its own it took quite a long time to run. And if it was with other programs, it would mean that — don't correct me on the numbers. I think we took, one time, something from 14 minutes down to about 9 minutes when we cleaned up this one program, it was running inefficiently. Because you could imagine that someone wanted to get into the bathroom and you could only get two people in at a time, and this bloke's here, he's here for half an hour and everybody else can't get in.

Misa: Soaking up the CPU.

Bowden: So he goes out quickly then other people come, and bang, bang, bang. So what we did, with BHP's agreement, we showed them that this particular program, if it was written a different way, that it would run a lot more quickly. So we made up a mockup of the modifications to it; so it wasn't the original benchmark, but it was the same function, and with their agreement, they accepted it. So we finally had times for the mix, the total mix; we had used a more efficient version, which wasn't the original one and that was quite important in getting that sale.

Blackmore: You need to be aware BHP was a very, very significant sale. Should've been as significant as CSIRO and Census because it was the biggest industrial company.

Everybody just took for granted that IBM would get BHP, well, they didn't. Control Data got it and held it for years. That was just a major, major sale.

Misa: So what you're saying, Lyle, is understanding the customer's real needs, because the benchmarks were quite formal but that's not the complete picture. You're trying to understand and have some insight into the type of programming and, in fact, what you're doing is improving the benchmarking in some way.

Bowden: Yes.

Misa: So you're improving the standard in some way.

Bowden: Yes.

Misa: So that's an important additional dimension, not just the formal benchmark.

Bowden: That's right.

Blackmore: Then there's another thing here. It gives you the opportunity to show the client or the prospective client your capability as a support organization; that you can understand their problem, you can find a better way to do it, and to combine that information's important.

Bowden: The other thing which I believe is quite significant in that particular contract was the relationship between our people and their people. I wasn't the only one. I was one person that got on well with their people; and as I said, they had their own little interest groups. You'd deal with Harry, who was interested in that aspect; Fred was interested in that aspect; and other people were also dealing with people, too. And I think that the people at the ground had got that contract initiated that back to Peter MacGregor. And Peter MacGregor was wining and dining all the executives until we got the contract, and then after that he took them to Hungry Jack's but then left. [Laughter.]

Blackmore: Actually, it wasn't Hungry Jack's it was Mick Suttle's[?].

Misa: Somewhat less.

Bowden: It wasn't quite Hungry Jack's but it certainly wasn't the oysters and liqueur; but anyway. He was dealing with the corporate side; other people would say I was the [technical] leader of the group. We won the order technically.

Misa: So this was a major push for CDA strategically, to be landing a really huge corporate client; taking business that might've fallen to IBM.

Bowden: And you may or may not include this in the whole history, but what I'm saying is that they wouldn't have gotten that business without technical people.

Misa: And these kind of connections.

Bowden: It wasn't the case of a super salesman, you know.

Misa: Right.

Bowden: In fact, very last day, you might say, before the decision was made, Peter MacGregor was upstairs somewhere, in some place, wining and dining the executives and I was drinking in the local links club. The links clubs are rugby clubs and I was there drinking with the operations manager from one of the companies. And he actually said to me, now look, Lyle, he said, I think you're a straight shooter. If you look me in the eye and say all the things that you're saying about this are true, I will give the endorsement to my management that if what you say is true, we should buy Control Data. But I'd like you to tell me whether it is true. Now it turns out that I'm a straight shooter, but that actually happened. And I said yes, it's all true, and he went and recommended it.

Misa: You always think of money being important but trust is really important as well.

Bowden: Exactly.

Misa: It sounds to me that you ended up building up trust and having a personal relationship with this person from BHP that counted for a lot.

Bowden: That's right. At the technical level. So that was BHP, so we can go on to other things, if and when you wish.

Misa: Okay.

Bowden: I suppose the next was really the launch of what was called the Cyber range. BHP was probably the last 3000 we installed; after that, they were all Cybers. The Cyber was really the SCOPE operating system with additional features.

Misa: And the additional features, were any of them particularly notable?

Bowden: Yes, there were. They added a business processing unit, which would handle byte-oriented stuff. And also they had a register. The 6000 series and the Cybers had these triple processors that all used to talk to each other through the memory paths of the central processor; and they introduced a register in the mainframe, which is basically, actually, equivalent to the IBM interrupt system. And if peripheral processor A wanted to have preference to do something forward, it would post basically a bit, say I'd like you to talk to me and do something for me. That sped up the process. I mean, I couldn't comment on the different; I know it wasn't a significant change. To get into the memory of the central processor, you had to wait in the queue as well. Whereas, say, I wanted to tell you how I'd talk to you, I'd have to wait to even put my message out there; whereas this register, they all had access to it and then that central processor used to say does

anyone want anything done? You know, that's the thing. I don't know if you have come across that before, anyone talking about it, with the Cyber, technically.

Misa: I don't know that I've seen that register concept.

Bowden: It was quite important. Quite important. Okay, the next thing was that at the same time, they released a program called Intercom, which was a time share system based on a product they had called KRONOS.

Misa: KRONOS, yes.

Bowden: KRONOS was a product they had developed for another organization. K-R-O-N-O-S it was; I think it had something to do with the god of time.

Misa: Intercom.

Bowden: Intercom, I-N-T-E-R-C-O-M, that was the name of the time-sharing software. You could also get KRONOS operating system, if you wanted to. That was separate. You could spend all your time on interactive and not do any batch work. So anyway, that led terminals to do various bits and pieces. At the time they released that, they also released a copy of subroutines, which were called Multi User Job, MUJ for short. And what this meant was there are actually subroutines which are part of the Intercom operating system, you know, the Intercom software. And once again, this is important in my view for why

Control Data was able to get all these customers in Australia. I looked at these things and said oh no, because I'm obviously a very technically oriented person; what's this all about? And there was a guy that was much more; he was into COMPASS and all that sort of stuff, you know; and because I'd been trained in machine language the very first day, and also when I worked on the 1410, we knew exactly what would happen if we said this in COBOL, or what would happen at machine level.

Misa: It was more deterministic, you'd say.

Bowden: And so I said to him what's this all about and can we use it? It turned out you could write what we called a kernel. This guy created this kernel in COMPASS code, and somehow interfacing with these Multi User Job subroutines. And then that could be embedded into a COBOL program, and that allowed you to write COBOL programs, which would control multiple terminals. Basically, an online inquiry system. And I think the first one we sold was to State Government Insurance Office in Queensland. Pretty sure. And once again, I think they had IBM, too; not sure. I know that I personally wrote the program which was equivalent to something they were running on their system. I don't know whether I took some of their code and converted it; anyway, I wrote a demonstration program and that was the beginning of that. We eventually sold these online inquiry systems to Western Mining, Main Roads Department in Western Australia, Western Mining was [also] in Western Australia. And Main Roads Department was actually a government service-type thing, they had other clients that were using it on the

service bureau concept, and the Town Planning Department was one of them. Who else did we sell Cybers to? Melbourne University.

Blackmore: We got a few universities with Cybers.

Bowden: Adelaide had already had a 6400, didn't they?

Blackmore: Yes. Sydney University or University of New South Wales; one of those.

Bowden: Just trying to think who else. One other thing, which was important in getting the University of Queensland was the [unknown?] devices, at the time. We mickey-moused it but they were superb devices[?].

Blackmore: Yes.

Bowden: And Control Data had a dump routine, which would dump your programs. But it didn't discriminate between the databases and other programs that people were using to develop. SGIO, they had their own backup procedures, and they didn't want to spend hours dumping their database every night. They said we need to go, say dump this and not dump that. The official Control Data answer was we don't have such capacity. All data areas had a sequence number, like a volume number, and I said to SGIO Queensland, if you are prepared to allocate all your main databases, say between one and 100, we can write a program which doesn't dump if its number is one to 100.

Misa: Yes.

Bowden: So we worked out it would take either two or one instructions added to the dump routine to achieve this, right?

Misa: Because the original dump was just the whole thing, regardless.

Bowden: What I'm saying is you make a change to the dump routine, which just says it's this volume. And depending on the way only one instruction or two would do that. But we had people at the time who said we can't offer any software without it goes to Minneapolis, and we were given a quote of a quarter of a million dollars to make this software work. We hadn't given them our piece, okay? We would ask, because that's the way things worked in those days; and I'm pretty certain; well, I *am* certain it was about a quarter of a million dollars to make this modification. So we, being rather rebellious people, we made the change, tested it out, and said, you know, well sorry fellas, that's the way.

Misa: You'd done it.

Bowden: We'd done it.

Blackmore: It's a done deal.

Bowden: And we're gonna do it. And I think in actual fact, we never got official blessing. I think we actually implemented that in Australia.

Misa: And with the wide use of databases, again, that capacity would've been useful across Control Data.

Bowden: Quite possibly they did take it up; but I'm just saying that we never got their blessing at the time. You know there's a lot of rivalry goes on in Control Data and people, you know, protecting their little bailiwicks. When these guys came out from, at one stage from Minneapolis, there's about six of them, and each of them was there to make sure that their part of the organization didn't get doubted by all the other ones, you know? And there was one African American guy, who sat there and never said anything the whole time. I said to him, which part of the organization are you from? He says oh, I'm the token black man, or something like that. Because they had to have, you know, what was that called? Affirmative Action, the quotas they had to have at the time.

Misa: Tony, how are we doing on your list?

Blackmore: I dealt with term one. I've just got my time with the company after 1981. Don't really have anything more to say about my first term. And there was a period when I just lost track of Control Data, really, when I left June 30, 1970. We would've had drinks together; I'd just really lost track of Control Data but kept in touch with Trevor

Robinson, of course. I went and worked for all sort of odd companies; started my own business a couple of times, unsuccessfully; didn't get rich. Then Trevor Robinson asked me to join Control Data Business Advisors in 1981, which I joined on December 1, 1981. A note that I put down here about Control Data Business Advisors is "what was it all about?" because I don't know whether you're aware of Control Data Business Advisors . . .

Misa: Yes.

Blackmore: . . . but we were supposed to advise businesses. And in Australia, it consisted of Trevor and his secretary; a finance person, Les Smythe; and myself. There was a hint that we were going to have; not a hint, it was actually said that we're going to have access to venture capital and we were looking for investment opportunities, and things like that. There was one occasion when the money came close but then it disappears, the company had more difficulties. The corporation had more difficulties. Business Advisors, to the best of my knowledge, didn't get very far; we made a couple of small sales. I remember one of our assignments was to see if the Malvern Star Bicycle Manufacturing Company could be saved from becoming a totally importing company; could we save the manufacturing capability? What the hell was that going to do with Control Data, you might ask. Well, Les Smythe and I went out to the factory, which was owned by the Philips Company at the time. We got paid for it, Control Data Business Advisors gained some revenue, but it was one of those things, there was no way you could maintain manufacturing. It was the case that the cost of importing components into

Australia was greater than the cost of importing completed bikes. So I had to stand up in the staff room in front of about 500 members of the union and announce I'm very sorry chaps, but we can't save your company. And they thanked me for it. Anyway, that was Business Advisors.

Misa: I think it was one of those visions that came out of Bill Norris, and maybe other people as well. I think it had a checkered experience even in the U.S.

Blackmore: We had some interesting companies that we went to talk to, but we really didn't have much to offer them. It was hard to see; we didn't have any money; what were we going to offer them? One of the companies, very significant, was a little Melbourne company called Mold Flow, that was a prospective supercomputer client — and I think they eventually did buy a small Cyber at one time. Mold Flow was very interesting because it was founded by a guy at Royal Melbourne Institute of Technology who got into the business of designing injection molds for plastics injection. The things they try to do there is increase the cycle time, get more units done per cycle, reduce wastage, and improve quality of the product. When Mold Flow finished up, they had clients all around the world. Most of the automotive companies were Mold Flow clients, also Fisher Price, and we spent quite some time talking to them but they never accepted our services to help them at all. Eventually, as the corporation got to have more and more financial troubles, we just folded up our tent and left. I left early and moved back into the computer company. That was back into the Control Data Australia in 1982. For the next six or seven years, that was a pretty unhappy time as far as I was concerned because many

things had changed. I'll give a good example; we had a major proposal effort to sell equipment to the Defence Department, called the Desine Project. An illustration of how things worked, I went to Minneapolis to get a lot of questions answered, technical questions about security and equipment. We didn't have operating systems that were rated; you know, A1s, A2s, A3s, B1s, etcetera.

Misa: The Orange Book series was really important.

Blackmore: The Defence Department, this is not for their secret work but for their ordinary business-type work, they wanted B2 security capability. I went to Minneapolis, and because I was familiar with how things worked there, I went to the ordinary troops the guys who worked on the project, and they assured me that there's no hope of getting a B2 [computer system] in the next couple of years. The best we can offer is a C3, whatever it was; can't remember it now. I then went to the general manager of that group, fellow called Norm someone-or-other and I told him I was disappointed to find that we weren't going to be able to offer B2 or even a date earlier than two years away. He said oh no, it'll be done before then. I said not according to the troops that are working on it. Being a former coder, I understood what the problems were, and they explained how it just couldn't be done. So I was then getting ready to head back to Australia and the — I forget what his job was, but above this guy Norm was a fellow called Bill Williams, a British former Sandhurst Military graduate — Bill Williams, who'd been a brigadier or a general somewhere, and he asked me if I was satisfied. I said no, I wasn't and told him about the security thing, and he said what did the general manager tell you? I said he told

me that it would be available. Then that's the answer. But I said it's not the truth. That's the answer, he repeated, and I said it isn't the truth and the people aren't going to be able to do it until X year. "Read my lips, that is the answer."

Misa: You're getting an order.

Blackmore: So I did not convey that. I just said well, you can get stuffed. I came back to Australia and we just said we couldn't offer it yet, but we could offer it in a few years' time. It wasn't such a terrible problem because IBM couldn't offer it either. But that was a kind of a thing that had come in, and I'll come back to something Bob Price told Trevor about that. We were part of the Pacific region, for management purposes. Previously, the first term, we looked after ourselves with a certain amount of control from Minneapolis; now we're part of the Pacific region with management in Tokyo, even to the point where there was a regional manager, there was the marketing manager, and quite a little cluster up there.

Misa: So you were essentially being managed not with a direct connection to Minneapolis, but via Tokyo.

Blackmore: Via Tokyo, right. And one of Trevor Robinson's whinges was that we were paying \$3 million a year for management fees to Tokyo, which would've been a tax thing because we were profitable in Australia. So by moving those management fees to Tokyo, it took some of the Australian profits from being taxable in Australia, to now being

expended in Japan, operating the Tokyo office and it was useless. I used to visit up there every year for three or four — I can't remember how many visits. Go up to Tokyo, you just sit down and have a bit of a yap for a couple of days, get in the plane and come back; that satisfied the \$3 million of management. But you did always have to communicate things via them, on technical issues we just went straight to Minneapolis. On one occasion, I'd gone to Minneapolis and attended a marketing managers conference where the Europeans were very concerned about Control Data's approach to UNIX. Control Data Corporation appeared to think that UNIX was nothing very important, and the corporate effort on UNIX was puerile, it was just some little pseudo-UNIX attachment to the Cyber operating system. I came back to Australia and reported on this, and became convinced that the people in Minneapolis didn't understand the coming importance of UNIX, that they weren't doing anything about it. We weren't proposing to produce a real UNIX operating system. Anyway, one day I'm having a meeting with Trevor, we've got the new vice president international, who was a West Point graduate, another military man, one Tom Roberts. Tom Roberts, vice president international, who came out and I'm putting on my presentation on marketing things we're doing in Australia. I said I was concerned about the UNIX operating system position, but Minneapolis clearly didn't understand what it was all about. He jumped up and he says, what do you mean Minneapolis didn't understand; and he really gave me a serve. I said well, I was there three months ago and unless they've done something since, Minneapolis doesn't understand what UNIX is all about. And he really gave me a serve; and I thought well, I might've pushed that a bit far. Anyway, later that afternoon Trevor came to me and he said well, I've saved your job. Now, the relevance of that was there were two of these

military pricks, neither of them knew anything about computing, hired because of some belief that these well-trained military men might have some kind of management ability. It must have been about 1990, I'd left Control Data by then — I had a lunch with Trevor Robinson and he said, he'd just had time with Bob Price, just come back from Minneapolis. Trevor wasn't working for Control Data but he met Bob somewhere. Bob was telling me how he really blamed himself for a lot of corporation's problems and he hired so many wrong people; and he mentioned these two military guys. It was very interesting that Price had said that — you're getting this third hand, but — Price had told Trevor that he blamed himself for the wrong people he'd hired. They were just non-productive; were counterproductive people; they just didn't understand anything; useless.

Misa: Funny, my reading of Control Data is that they needed people with military background in the late 1950s and early 1960s, but at this point in time they really needed people connected to the wider computing world, essentially to businesses and then to people out in the research field. So these military guys were a little out of synch, I guess.

Blackmore: Yes. They did not know what UNIX was all about; not knowing about how major it was becoming. There were so many Minneapolis people with closed vision. The worst part of these visits to Tokyo, for the last couple of visits before I eventually retired or resigned again, each time I'd come back and there'd be a five percent budget cut.

We'd fly back on the plane; there'd be Doug Dent, who was the engineering manager; Bernie Tallis was the finance manager; and me; and Trevor. And you'd be thinking well, we've cut everything to the bone, it's just more people cutting. Anyway, on the last time I

said to Trevor, I've got one of the five percent cuts that I could think of and it is me. He said, what, are you thinking of leaving? I said well, yeah, I just can't think of any other way to cut five percent out of my part of the business, except me.

Misa: Except yourself.

Blackmore: Yes. So that was it. I left.

Misa: That was when?

Blackmore: 1989. To me, the company in that first period, and the company in the second period were just different organizations. The first time it was all success and gung ho, and everything was yippee, we're technology leaders, we're doing everything right. The second turn, I felt ah, gee; I got very enthusiastic about the ETA computer and the demise of ETA contributed to my low morale at the time.

Bowden: I'm just writing in a couple more Cybers I didn't tell you about. It might be worthwhile recording them in one place.

Misa: Sure, would you?

Bowden: Okay. University of Melbourne I think was the only one in Victoria. Am I correct there? I'm not sure; did BHP ever buy a Cyber as well?

Blackmore: I don't know.

Bowden: Perhaps you could ask somebody else that question. SGIO Queensland.

Misa: And can you say, S-

Bowden: State Government Insurance Office Queensland. These are Cybers I'm talking about. They were 3200s in that; but they were all sold before I got around. And there was one university in Western Australia. Anyway, in Western Australia there was University of WA, and [Department] of Health, which each had a Cyber and they were run out of the same site, and UWA used to do the management for them. And Main Roads, which is a government department, which also operated as sort of service bureau to other departments. Western Mining Corporation [and] Australian Taxation Office in Canberra. And one which we didn't sell but CSIRO bought, was the Cyber 76. CSIRO used to ring up and say we'd like to buy one of your computers. That's the way it was done.

Misa: They would contact you with an order: we'd like to buy a computer.

Bowden: Yes. CSIRO actually had a 7600, which existed before the Cyber was released and the Cyber was a bit more powerful when it was basically half the price. CSIRO basically said look, we're going to cancel that other order and order one of these. The way that the commission system worked at that stage, the commission salesman was due

to get commission on delivery; sorry, it was so much on signing and so much on delivery. Anyway, this particular guy called and he was going to lose most of his commission, so he resigned before they could . . .

Blackmore: I think he'd already got half and then he quit.

Bowden: . . . I think they were going to try and get it back off him, anyway, so he resigned.

Misa: The initial signing was much larger than the delivered machine.

Bowden: But I know that he resigned because he wanted to [pause] keep it. Anyway, Australian Taxation Office is another important one; one I didn't even mention before. And it's important because you've got, once again, we talked about the trust in getting the order from BHP. When we got to Taxation, we had another difficulty. They bought a computer, which had relatively limited memory, it wasn't one of their more restrictive memory size. They had been told by the salespeople they could run two copies of operational programs at the same time, and blah blah blah. They then wrote that — these were programs that hadn't been written — they wrote these programs and lo and behold, they wouldn't fit; two wouldn't fit in. So, I know the numbers sound ridiculous, but they actually requested Control Data give them another computer worth, at the time, not worth but would cost a million dollars. And everybody started to sort of throw up their hands and saying I need help. They came to me, as the programming guru — I'm sorry, I *was*

the programming guru — and I said look, I'll go to Canberra and I'll see what they've done. So it turned out that they were using what was a trendy thing called “structured programming.” It was a sort of an approach to programming; don't know if you've come across the word, but it was a very inefficient method of programming. It might've made programming easier, but it certainly wasn't efficient. And we certainly didn't endorse it as a company. Sorry, *I* didn't endorse it. [Laughs.]

Blackmore: On behalf of the company, you didn't endorse it.

Bowden: So I went up there and I spent one week up there, and I rewrote; I didn't rewrite the whole thing; I took out this destructive programming philosophy and did it a lightly different way.

Misa: This is the “perform” function that we were talking about the other night?

Bowden: Yes. It's all to do with they had perform, perform, perform, perform, perform, perform, perform, you know; they had ten lines of performs. I rewrote the program, it all fitted in, and I saved the company a million dollars.

Misa: A million bucks.

Bowden: Yes. Remember how I told you I was failed on my original training course, that was because of my attitude. I was reported to my superiors that I had been uncooperative

with the local analyst manager because he wanted me to come in every afternoon and report to him on how things were going. I said Barry, I haven't got time to come report to you. I've got nobody; head down, ass up, writing this code; and you can go and get nicked. The end of the week, I stood up before the Taxation Executive hierarchy, the executive kingpin was there, the big boss; and said well, the short story is, gentlemen, that you chose to use structured programming and I've shown by the fact that I did it a different way, that that's not an efficient way to behave. They said well, we accept that. So once again, it was a little bit of diplomacy as well as technical knowledge to get them to accept that.

Blackmore: Probably a little thing I should say on the personal angle about the feeling and atmosphere of my second time at Control Data towards the very end, concerning the very last managing director of Control Data Australia. We had the feeling that everything was being controlled by Minneapolis, even though we were nominally part of the Pacific region. In one sense, you had to report to Minneapolis and Co., but in other respects, these people like this Tom Roberts, vice president international, they were calling all the shots. And the new managing director was recruited by Control Data to be – in effect VP Australia, and only for a year or something like that. An unpleasant person. Control Data Australia had a board and they were significant people and it had worked well, and it was a kind of a courtesy thing. Anyway, when they actually were selecting a new managing director for the company, it wasn't to be anybody from within Control Data Australia. It had to be the result of a good look around the industry. So this person pops up, and got recruited. Now the bit that Trevor filled me in on was that the person had worked for a

company called Tech Way, a company founded by Dr. Peter Jones, former Control Data employee, and everybody knew Peter, I'd done things for Peter, and I knew him very well. He told Control Data, well, he told Trevor, that he'd had to sack this person for cooking the books for advancing certain sales forward to maximize his own bonuses and so forth, very much to the disadvantage of Tech Way, and that he'd been given the shove. So far as that was known to Trevor, it was known to Control Data Australia's board, and when he became the favorite choice of Minneapolis people, we said look, we don't want him. So even though the guy was known to be suspect and Control Data Australia's board advised against his appointment, he still got appointed by Minneapolis.

Misa: So that's a signal, then.

Blackmore: Why would you do it? You've got this story; the guy is essentially fired by his previous company for cooking the books to his personal advantage, and you hire him to be the managing director. I only got this from hearsay — but there are all sorts of unhappy Control Data employees over the superannuation system. Superannuation monies got manipulated. People like — I don't know who would be able to tell you about this out of the people that were still there — some of them that did. I know George Crawford was one that told me about it.

Misa: Basically, that's a pension fund, I would say; but you would say superannuation.

Blackmore: Yes, it was a pension fund. There was a management buyout of Control Data Australia. The MD, and perhaps others, bought the business of Control Data Australia. That's when the corporation was in full retreat. And in that purchase there was involved some fiddling of the pension fund, to the disadvantage of employees. That was sort of pretty widely reported to me whenever I'd have lunch with somebody there would be these sorts of grumbles. That's all hearsay, but it's reliable hearsay.

Misa: Worth recording, again, is your perspective and knowledge that was circulated.

Blackmore: I'd left Control Data. I sort of said well, the five percent cap can include me so from then on, I just worked for myself. Had a ball.

Bowden: Just getting back to my belief that the reason that we did reasonably well in an area which other parts of Control Data didn't do so well commercially, or I don't believe they did. It was technical stuff, and I don't know whether it's because Australia's a small place but we used to go on; we'd have to stand up there, and all these guys that were recognized as computer gurus would try and shoot you down, you know, and all that sort of stuff; you'd really get a bloody grilling. And going back to the BHP, that was what, you know, giving sales pitches; going back to the BHP, I told you the night when Peter MacGregor was wining and dining executives and I was talking to the operations manager. Come to think of it, I also made a sort of a tentative agreement. He said we've decided that we will buy off you, but we want to put you through a few more hoops. So I actually had to go up there, me personally, and they had all their executives and all their

offsite, you know, all the sort of leading men, it's probably about 10 people or something; and they're all shooting these questions at me. And anyway, we survived.

Blackmore: Has anybody talked to you about the Data 100 spinoff? That sequence of events?

Misa: I think somebody this week.

Bowden: Ron Bird.

Misa: Ron, tomorrow afternoon.

Blackmore: It comes to mind, thinking about BHP, that we used to have Bruce Bambrough as the Sydney manager. When I was located in Canberra with CSIRO, Bruce would continually get me to come down to Sydney to go and make calls on BHP either at Port Kembla or Newcastle, because the sales effort certainly started in 1965 with BHP. Anyway, Bruce eventually got to Minneapolis and he was the one that set up Data 100; and of course, Trevor eventually joined him and several people left Control Data to go to Data 100.

Misa: So it's a classic spinoff.

Blackmore: Yes. Bruce apparently made a pile of money before he died.

Bowden: We haven't mentioned the RAAF Message System because that was nothing to do with me, but you're aware about that?

Misa: John O'Neil said a few words about that.

Bowden: That was a system up in Darwin . . .

Blackmore: John Marquet would know all about it, if John Marquet's one of the people you are meeting.

Bowden: . . . but anyway, that was written by Control Data. That was interesting, too, because — I haven't mentioned this — I spent the first few years of my career as what I call a senior analyst. You know I was actually the applications manager for Australia for about four years, or something. See, Peter MacGregor used to refer to me as a pirate chief. He said you're not a manager, you're a pirate chief, because I was always at cutlass, see, because I was still the best programmer, commercial programmer, that we had. Not scientific, I wasn't in that. So it seemed sensible to me, you know, if we got a tough one, I'd just go and do it. Then the last three years I spent as a consultant, and anyway, during the time when I was analyst manager I was called into a meeting with this guy from Asia. He sort of said to us, all this need-to-know stuff in there, he said, go ahead. And was it Doig?

Blackmore: Doig was the finance manager.

Bowden: Yes, he was the finance manager. Graham Doig is the man in Control Data, and he will tell you who you can talk to and who you can't talk to. Anyway, after a while, I said before we go any further, can you show me your credentials and why it is that you're here telling us what we can and can't do. Where's your ID? What do you mean; what do you mean? I said, well you come in here and say we'll throw out this that and the other and what we can kind of do; you know, where's your paper of authority? He couldn't understand what I was saying.

Misa: You're supposed to respect his authority, I suppose.

Bowden: [Laughs.] Anyway, it didn't go anywhere.

Misa: Gentlemen, are there any other topics?

Blackmore: No.

Bowden: No, no, no.

Misa: This has been so splendid. Thank you so much.

Blackmore: I'd mentioned about all the big industrialists that used to come out for the demo of the Vic TAB system. That was a lot of fun because you'd always have a great lunch. TAB had a beautiful board room with wonderful lunching facilities, well set up. I mean, it would've done a major U.S. enterprise proud to have seen what they had there and Ken Davis, the GM, used to relish the opportunity and Control Data would be forever sending these VIPs out. I mentioned the head of Yale Locks, and I can't remember others, but there was always some really very, very senior businessmen with a couple of these vice presidents, being shown this amazing money-collecting system.

Bowden: Going back, Tony and I both worked for PMG. We did what's called a cadetship, four-and-a-half years of personnel management stuff, and during that time we were together and we traveled a lot. We've been to training courses, and job rotation in various departments, so we've been sort of joined at the hip for quite a few years.

[Laughs.]

Misa: For quite some time. It's nice that you still have a chance to [interrupted]

Bowden: And our families, of course, very close as well.

Blackmore: He's my daughter's godfather.

Bowden: I'm an atheist and I'm a godfather.

Misa: And a godfather. Okay, well thank you so much for a great conversation.